

TECHNICAL GUIDELINE

Checklist: Detail Design of Major Wastewater Collection Infrastructure



Issued by: Principle Engineer Water & Wastewater Networks

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No Changes Required In the January 2007 Edition

The following lists the major changes to the November 2004 edition of TG 16, which have been incorporated in this edition:

1. Nil

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Referenced Documents

TG 17	Checklist: Detailed Design of Wastewater Collection Infrastructure
PC150	Panel of Consultants Period Contract
E&P-GP_0500	General Procedure: Employment of Consultants

Section 1: Objective

To provide direction on preparing the detail design of major wastewater collection infrastructure so that it is produced in an economical and efficient manner and meets the current SA Water standards and the requirements of the Client's Project Brief.

Section 2: Definitions

Detail Design	The preparation of the detail drawings and documentation (eg specifications, construction notes etc) for the construction by contract of waste water collection infrastructure. Major projects often require further development of the scheme concept during Detail Design.
Design Leader	Appointed to coordinate and control the Detail Design Phase of a project and where required, to carry out the Project Manager's duties in relation to the engagement of Consultants.
Scheme Concept	Is included in the Technical Planning Report to: <ul style="list-style-type: none">• provide the strategic plan concept for the development of SA Water's Wastewater Collection infrastructure,• determine staging and packaging of work and to• enable budget estimates to be prepared for inclusion of the project on the Capital Works Program.
Final Concept	Results from the further development of the scheme concept during the Detail Design Phase to incorporate changes as stated in the below Prerequisite Work. Most of this work is generally carried out inhouse to provide the Detail Design Consultants with an accurate Brief of the Client's requirements.

Section 3: Methodology

The detail design for most Wastewater Collection Infrastructure is carried out by external consultants and will only involve E&P officers in preparing Consultant Briefs, monitoring their progress, providing technical advice and auditing the output provided by the consultants.

The Detail Design Phase is part of the Delivery Phase of the Project Management System. A Project Team is appointed to assist the Project Manager in progressing the project through to the end of the Delivery Stage.

A Design Leader may also need to be appointed to coordinate the technical aspects of the Brief and the Consultants work especially for large projects that involve pumping stations and other special works.

A Check List (TG 17) has been prepared for the Detailed Design of Wastewater Collection Infrastructure to ensure that all issues and activities are addressed at the detail level.

Section 4: Prerequisite Work

The Technical Planning Report only provides a preliminary concept for the infrastructure. It is prepared for strategic planning purposes and to enable budget estimates to be prepared. It only provides a guide to aid in the development of the Final Concept and the Detail Design. Considerable further concept development (eg resizing and realignment of sewers to suit final grades and changes to sewer routes) generally needs to be made during Detail Design.

Section 5: Procedures

5.1 CLIENT ISSUES

Action	Responsibility
Review the: <ul style="list-style-type: none"> • Technical Planning Report Findings • Scheme Concept • Contract Packages and Timeframe for the Project. 	Principal Engineer Water & Wastewater Networks: <ul style="list-style-type: none"> • Determine the changes that have occurred to land development and use since the Technical Planning Report was prepared and its effect on the Project. • Review staging and packaging of contracts with the Project Manager and the Client • Check on current operating problems. • Agree timeframe for the Detail Design Phase • If required assist the Project Manager and the Client in preparing a new Project Brief for the Stage (Contract Package). • Agree check points to review progress and the remaining work to complete the design documentation.
Sign off the Revised Project Brief	Section Manager or Principal Engineer Water & Wastewater Networks: <ul style="list-style-type: none"> • Sign-off the information provided for the revised Project Brief (if required) certifying that it includes all aspects necessary to complete the Detail Design and that the Detail Design can be achieved within time and cost constraints.
Obtain Funding for the Detail Design Work	Section Manager or Principal Engineer Water & Wastewater Networks: <ul style="list-style-type: none"> • Estimate Detail Design costs including those for Consultant involvement. • Seek approval and obtain a Work Order from the Project Manager /Client before detail design commences.
Agree with Project Manager/Client the Appropriate Communication Interfaces	Section Manager or Principal Engineer Water & Wastewater Networks: <ul style="list-style-type: none"> • Agree the points of contact Between the Client and the Wastewater Collection Unit for the day to day issues associated with the Detail Design.

5.2 DESIGN LEADER

Action	Responsibility
Appoint a Design Leader.	<p>Section Manager or Principal Engineer Water & Wastewater Networks:</p> <ul style="list-style-type: none"> • A Design Leader shall be appointed to control and coordinate the technical aspects of the Detail Design. <p>Duties shall include:</p> <ul style="list-style-type: none"> • Represent the Unit at Project Team meetings • Ensure the Detail Design is carried out in accordance with the Project Brief and the Technical Planning Report. • Coordinate the detail design work performed in other E&P Sections as required. • Monitor progress and identify potential problems notifying Section Manager and the Project Manager of their implications. • Monitor design costs on a monthly basis and notify Section Manager and the Project Manager of likely cost overruns. • Carry out Assignment Manager Duties (as required) when Detail Design Consultants are engaged.

5.3 RESOURCES

Action	Responsibility
Resources for Detail Design	<p>Section Manager or Principal Engineer Water & Wastewater Networks:</p> <ul style="list-style-type: none"> • The resource requirements to complete the Detail Design shall be fully evaluated with the Project Manager to determine if the work can be achieved inhouse or if Consultants should be used.
Arrange for Engagement of Consultants	<p>Section Manager or Principal Engineer Water & Wastewater Networks:</p> <ul style="list-style-type: none"> • Where Consultants are employed to carry out the work suitable consultant resources shall be sought from within SA Water's Agreed Panel of Consultants under Period Contract PC150. The engagement, briefing and auditing the Consultant's engagement/work and the appointment of a Assignment Manager shall be in accordance with Procedure E&P-GP_0500

5.4 INHOUSE DETAIL DESIGN

Action	Responsibility
Utilising the Check list (Appendix A) Develop the Scheme Concept Design so that the Consultants Brief for the Detail Design can be Prepared.	<p>Design Leader:</p> <ul style="list-style-type: none"> Inspect the site with the Client and review all sewer alignments. Obtain preliminary survey data for proposed routes if required. Review land and easement requirements. Review sewer sizes and alignments, locations of vents, pipe materials pumping station locations and their duties etc. Determine duplication/temporary bypassing requirements Review the environmental issues with the Project Manager and the Manager EMU. Prepare a Project History Report. Check that the technology is the most appropriate for the infrastructure. Prepare final concept drawings and Briefs for the Pumping Plant for inclusion in the Consultant Brief. Assist the Project Manager in obtaining budget estimates for the project. Prepare the Consultant Brief for the Detail Design coordinating input from other Design Units.. Obtain comment from client and operators on the draft brief and finalise the Brief.
Sign off the Brief	<p>Principal Engineer Water & Wastewater Networks/Section Manager:</p> <ul style="list-style-type: none"> Sign off information provided for the Consultant Brief certifying that the brief achieves the requirement of the Client Project Brief and the Strategic Plan, and that it will achieve infrastructure to SA Water standards

5.5 CONSULTANT DETAIL DESIGN INPUT

Action	Responsibility
Identify Detail Design to be carried out by the Consultant	<p>Design Leader:</p> <p>Input by Consultants will generally include:</p> <ul style="list-style-type: none"> Arrange and carry out detail surveys of the sewer. routes and ground profile. Advise of easement requirements/variatioins. Obtain and evaluate geotechnical data. Grade sewers, finalise sewer sizes and indicate connection details. Design appurtenances for the scheme. Determine sewer bedding conditions and the class of pipe required. Determine dewatering requirements. Prepare detail drawings, specifications and construction notes for the construction of the infrastructure.

5.6 COMMUNITY AND ENVIRONMENTAL CONSULTATION

Action	Responsibility
Determine Environmental /Community Considerations	Principal Engineer Water & Wastewater Networks and Design Leader: <ul style="list-style-type: none"> Assess with Project Manager and Manager EMU the impact proposals will have on the environment and the community. Assist in preparing the Environmental Impact Assessment. Assist with negotiation with the relative authorities on these issues. Ensure infrastructure proposals meet EPA requirements. Participate at meetings to gain Council and Community opinion on proposals.

5.7 AUDIT OF CONSULTANT'S WORK

Action	Responsibility
Ensure the Consultant's Input Meets the Requirements of the Project Brief and the Consultant's Engagement Brief.	Design Leader: <ul style="list-style-type: none"> Audit the inputs and outcomes of the consultant's work deliveries and any critical issues (eg pumping costs) in accordance with TG17: Checklist: Detailed Design of Wastewater Collection Infrastructure. Obtain comments from operators. Finalise delivery documents with the Consultant.

5.8 APPROVAL ESTIMATE

Action	Responsibility
Provide an Approval Estimate for the Contract Package.	Design Leader: <ul style="list-style-type: none"> Assist the Project Manager in organising the Approval Estimate by providing relevant information.

5.9 PROJECT REPORT

Action	Responsibility
Finalise Delivery Phase Documents.	Design Leader: <ul style="list-style-type: none"> Provide a Summary of the detail design phase and the associated documentation for inclusion in the Project Report.
Sign off Project Report.	Section Manager/Principal Engineer Water & Wastewater Networks: <ul style="list-style-type: none"> Sign off information provided for the Project Report certifying that the documentation achieves the requirement of the Client brief and the Strategic Plan, and will achieve infrastructure to SA Water standards.