



## **WATER AND SANITATION DEPARTMENT**

### **ANNEXURE A:**

## **RESPONSIBILITIES OF CONSULTANTS SUBMISSION AND APPROVAL OF DOCUMENTS AND DRAWINGS**

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## NOMENCLATURE

BBBEE	Broad Based Black Economic Empowerment
CCTV	Close circuit television
CoE	City of Ekurhuleni
CV	Curriculum Vitae
DDR	Detail Design Report
DTM	Digital terrain models
EMP	Environmental Managment Plan
HDI	Historically disadvantaged individual
HVAC	Heating, ventilation, and air conditioning
JASWIC	The Joint Acceptance Scheme for Water Services Installation Components
PDR	Preliminary Design Report
O&M	Operation and maintenance
OH&S	Occupational health and safety
SMME	Small, Medium and Micro-sized Enterprises
SABS	South African Bureau of Standards
SANS	South African National Standards

# 1 REQUIREMENTS FOR CONSULTANTS APPOINTED FOR PRIVATE DEVELOPMENTS

## 1.1 General requirements

Suitably qualified and registered civil engineers / technologists (consultants) must provide the input and information required for the township layout process, draft the Preliminary Design Report (PDR), execute designs and provide construction management services for all new developments. All designs must be approved by CoE: Planning Division prior to construction. Only consultants registered in terms of the Engineering Profession Act (Act No 46 of 2000) will be allowed to fulfil this role.

The consultant must ensure that all the necessary servitudes have been registered and that all wayleaves required for services, have been obtained from CoE's Roads and Storm Water Division, as well as from all other services authorities, and must provide the Divisional Head: Planning Division with copies of the relevant documents.

The consultant is responsible for compiling a tender specification for the project and must ensure that the specification is comprehensive and clear. It must comply with the CoE's Guidelines and Standards for Planning and Design of Water Sanitation Services, as amended from time to time. All exceptions must be approved by CoE prior to implementation.

The consultant is further responsible for the supervision of the work and other services related to the work and must ensure that it is done in accordance with the Contract. Consultant shall ensure that all work conforms to CoE Specifications and conditions before handing over to CoE. Certificate of Compliance should be submitted to CoE for all internal water and sewer materials used within stands / developments and should comply with SANS or JAZWIC.

To ensure construction activities align with the approved drawings and relevant CoE specifications, CoE: Planning and Operations Divisions must be involved in the setting out of the works, attend site meetings, witness pressure testing and perform interim site inspections. Taking over inspections must be attended by a representative of CoE: Operations Division. The first inspection will be attended free of charge, but should the inspection fail to comply, subsequent inspections will be charged.

The consultant must act as a liaison between the contractor, applicant and the CoE at all times and, under normal circumstances, the contractor will not have direct access to the staff of CoE. The consultant will remain responsible for the design of the services and the rectifying thereof.

## 1.2 Procedures for drafting of Preliminary Design Reports and installation of services

***The consultant must follow the procedure below for the drafting of PDR and the installation of services for new developments:***

- a. Ascertain if sufficient bulk services exist on the boundary or near the boundary of the development
- b. Compile a Master Capacity Services Report
- c. Draft a PDR for the development, which includes -
  - a letter of appointment;
  - plans of the development;
  - a schematic layout of services;
  - design parameters;
  - a document setting out the link pipelines, if applicable;
  - the standards for construction; and

- an indication of the estimated costs of outstanding external (where applicable) and internal services.
- d. The PDR must also provide -
    - the name and other particulars of the applicant/land owner/consultant for agreement purposes;
    - the physical and postal address of the applicant/land owner/consultant;
    - contact person's name and e-mail address;
    - a copy of the deeds of transfer or the title deed; and
    - The conditions of establishment of the township, if available (otherwise it must be provided as soon as possible);
    - Draft SG Diagram of where servitudes will be required;
  - e. Further requirements as specified in Section 4.1.2 of this Annexure
  - f. The PDR must be submitted to, and approved by the CoE: Planning Division
  - g. A Services Agreement need to be drafted and signed by CoE
  - h. Following the approval of the PDR and signing of the Services Agreement, tender drawings and specifications must be drafted
  - i. A complete set of tender drawings (minimum A2 size) and specifications should be submitted and approved by CoE: Planning Division
  - j. Following the approval of the tender drawings and specifications, a DDR, construction drawings and updated specifications must be drafted
  - k. One copy of the DDR as well as a complete set of construction drawings (minimum A2 size) and updated specifications should be submitted and approved by CoE: Planning Division
  - l. Upon approval, two further copies of the construction drawings in this format shall be lodged with CoE: Planning Division for reference purposes during construction as well as in electronic format (CD or USB) of the layouts only
  - m. Notify the Divisional Head: Planning Division of the date the construction of the services will commence, arrange for inspections, and give notice of every site meeting one week prior to the meeting date

### **1.3 Upon completion of installation**

- a. Sample of the water quality of installed network must be submitted to Water Quality Division for approval prior to connecting to the CoE network
- b. Pressure test water pipes, CCTV / mirror test & air testing of sewers
  - Arrange for the necessary pressure test of water pipes and the CCTV / mirror test & air testing of the sewer pipelines on completion of the construction, but before the take-over inspection.
  - Final testing, for taking over purposes, will only be done after all services have been installed (including optical fiber, electrical, roads, storm water, etc.).
- c. Upon completion, provide the following to CoE: Planning and Operations Divisions:
  - Completion Certificate to specifying that –
    - all services have been installed and have undergone all the prescribed tests under the consultant's supervision, according to specifications;
    - the consultant take full responsibility for the design of the installation
    - the contractor takes full responsibility for the work; and
    - both the contractor and consultant will be available during the maintenance period to attend to any defects.
  - A complete set of the As Built drawings (2 x film hard copies (minimum A2), 1 x paper hard copy (minimum A2) of the As Built drawings, as well as in electronic format).
  - Updated SG Diagrams;
  - Provide details of
    - The final cost of construction for water and sanitation services separately,

- The details of the lengths of all the different sizes of pipes, the number of manholes, valves, hydrants and connections in the “Completion Inspection Report”.
- d. Arrange with CoE: Planning Division for the final inspection after the twelve-month retention period.

#### 1.4 **Take-over of new township services by the City of Ekurhuleni**

The new services installed by the applicant will only be taken over by the City of Ekurhuleni after –

- the proclamation of the development / township;
- all inspections have been carried out to the satisfaction of the Divisional head: Planning Division;
- the consultant's acceptance certificate have been received;
- all As-Built information will be completed within 60 days;
- the required retention monies / guarantees have been lodged; and,
- a land Surveyor's Certificate has been submitted by the consultant or contractor confirming that all erf pegs and beacons have been verified and replaced where necessary.

During the defects liability period, all problems, faults or breakages that are due to inherent or latent defects shall be reported by the CoE to the consultant. The consultant shall be responsible for inspecting the defect and report it to the contractor, who shall be responsible to repair and reinstate the defect to an acceptable level within a reasonable period.

Should the contractor fail to do so, CoE will, at the cost of the applicant, do whatever it deems necessary to effect the reinstatement. The cost of this will be calculated in advance by the Divisional Head: Project Division -, and the applicant will be required to pay this amount in cash and in advance. Should the applicant fail to do so, the guarantee lodged with the CoE will be called up immediately and all work required will be funded from this guarantee.

Should the cost in respect of any defect found during the maintenance period exceeds the amount of the guarantee lodged with the CoE, the applicant will be held liable for all costs incurred by the CoE due to the defects.

#### 1.5 **Approval of Building Plans**

***The following requirements must be met before the applicant may have Building Plans approved:***

- a. Payment of bulk contribution  
A Services Agreement may only be drawn up after the PDR has been completed, a Surveyor-General plan of the development has been approved, and final conditions of establishment have been approved. In most cases the client will have to make engineering services contributions to CoE, according to the approved policy. These contributions are calculated by the CoE: Planning Division.
- b. On completion of the installation of services, the applicant must provide the required retention guarantees, which must remain valid for at least 12 months after the date of proclamation or the date after which erven are allowed to be transferred, whichever is the later. The guarantee may not be reduced or cancelled unless the reduction or cancellation has been duly authorized in writing by the Divisional Head: Planning Division.
- c. A section 82 or 38 Certificate (to the effect that building work may commence) will only be issued by CoE: Planning Division when –
  - the two preceding paragraphs' requirements have been satisfactorily met;
  - the installation of water, sewerage has been completed;
  - the township has been proclaimed;

- the contributions have been made;
- the necessary guarantees have been provided; and,
- As-built requirements as per Item 1.10 have been met.

## 2 REQUIREMENTS FOR CONSULTANTS APPOINTED BY THE CITY OF EKURHULENI (PROJECTS DIVISION)

*The consulting services required by the CoE will be specified in the Letter of Appointment. However, the following general requirements must be met over and above those stipulated in Section 1 of this Annexure:*

### 2.1 Notices to owners of developed and/or adjacent properties

#### 2.1.1 Mid-block sewer pipe notices

Should the use of mid-block sewer pipes be approved, the consultant shall prepare notices showing the proposed route of the municipal sewers through the affected private properties (in duplicate). These notices must reach the owners of the properties at least three weeks before work on their erven commences.

#### 2.1.2 Proposed erf connection notices

The consultant shall prepare erf connection notices showing, the proposed position of the sewer connection for developed erven (in duplicate) and must reach the owners of the erven at least three weeks before work on the erven commences.

**NOTE:** The blank notice forms, as well as the names and addresses of all affected property owners, will be supplied by the Divisional Head: Operations Division. The completed but undated notices must be submitted by the consultant to the Divisional Head: Operations Division for signing, at least fourteen (14) days in advance.

#### 2.1.3 Notification of occupant of each erf

The consultant must instruct the contractor to notify the occupants timeously of when work is to commence on their properties and must simultaneously discuss with them all relevant matters to minimise inconvenience.

### 2.2 Design phase

The responsibilities of the consultant include all those set out in Section 1.1 (Appointment of consultants for private developments).

#### 2.2.1 Connection of new networks / pipes to existing municipal system

It is the responsibility of the Consultant to establish the connection point to the existing CoE water supply system during the preliminary design stage of a project. The position for the connection point and available residual pressure must be obtained from the CoE. In the design of a new reticulation system the existing infrastructure and future development must be taken into consideration.

## 2.3 Tender documentation and procurement phase

### 2.3.1 Tender documentation – General requirements

The consultant is responsible for drafting the Construction Tender Document which must comply to the following requirements:

- All Tender Documents must be drawn up in English.
- The Tender Advertisement must be drafted in English and must stipulate the non-refundable tender deposit amount as determined by a CoE Council resolution from time to time.
- If so required, the Tender Document format may be adapted to make special provision for emerging contractors or less formal tender procedures.
- Should it be required that multiple contractors be appointed on the same rates for one tender, it must be stated in the Tender Document and in the Tender Advertisement that rates will be renegotiated to market-related rates after the tenders have closed.
- The Tender Documents must always contain the standard SANS preference claim forms for local content. No other preference claims will be entertained.
- Documents must be submitted to the Procurement Division for handing out and for the receipt of deposits.
- The consultant must prepare sufficient sets of drawings for tender purposes.

### 2.3.2 Tender documentation - Specifications and Conditions of Contract

#### 2.3.2.1 *Materials*

All materials used in water and sewerage networks and pipelines must conform to the specifications set out by the CoE. All materials that are to be used, but that is not specified, must conform to the applicable National Standard, or be listed on the current JASWIC acceptancy listing. However, permission to use any materials not specified in the *City of Ekurhuleni Guidelines and Standards for the Planning and Design of Water and Sanitation Services* must be obtained from the Divisional Head: Projects, Planning and Operations Divisions

#### 2.3.2.2 *Conditions of Tender*

The Conditions of Tender are the Standard Conditions of Tender as contained in Annex F of the Construction Industry Development Board's Board Notice 136 of 2015 (contained in Government Gazette No. 38960 of 10 July 2015)..

#### 2.3.2.3 *Conditions of Contract*

The General Conditions of Contract for Construction Works 2015 issued by SAICE shall be applicable or **any other relevant contract shall be applicable**. Should a later edition be available at the stage of preparing the Tender Document for a project, the consultant shall verify with CoE which edition shall be used.

The Conditions of Contract for plant and design-build issued by FIDIC shall be used for the detail design, supply and installation of electrical and mechanical work for pumping stations.

#### 2.3.2.4 *Specifications document*

This document titled *City of Ekurhuleni Guidelines and Standards for Planning and Design of Water and Sanitation Services* and the SANS 1200/SABS 1200 Standardized Specifications must be used as the basis for the specifications. The standards

and specifications in these documents shall be supplemented and amended in the “Scope of Work” in the Tender Document for each project.

### 2.3.3 Tender evaluation

After the tenders have been received by the consultant, a full Tender Evaluation Report in electronic format must be submitted for approval. The Report must discuss in full –

- all disqualifications of bidders; and
- At least the three lowest bidders, with an analysis of each firm's capabilities, financial position, ownership and historically disadvantaged individual (HDI) claims according to CoE policy, and previous experience.
- The Report must also provide a recommendation and a final cost analysis, including fees. In order to verify HDI claims, certified copies of shareholding certificates must be provided. (NB: HDI claims must also comply with the requirements of the Preferential Procurement Policy Framework Act, 2000 (Act 5 of 2000).

The due date for the Tender Report must be determined with due regard for dates for the submission of CoE Reports and the need to obtain comments from other CoE Departments.

After the CoE has approved the Report and the preferred contractor(s), the consultant must inform the contractor(s) accordingly in writing.

## 2.4 Construction phase

### 2.4.1 General requirements

The responsibilities of the consultant during the construction include the following:

- a. Should it be a requirement that the consultant provide full-time supervising staff, the consultant must propose a works clerk and submit a full justification and a CV (of the works clerk) to the Divisional Head: Project Division for approval.
- b. If specified by CoE in the consultant's appointment letter, the consultant shall act as the safety agent for the client (CoE) in terms of the Construction Regulations, 2014, as promulgated on 7 February 2014 under section 43 of the Occupational Health and Safety Act, 1993 (Act no 85 of 1993) and the consultant shall accordingly be responsible for the duties as specified in the Act and Regulations.
- c. Compliance with and monitoring of all aspects of the requirements of the Occupational Health and Safety Act, 1993 (Act 85 of 1993), the latest version of the Construction Regulations and other amendments to the applicable regulations. The duties and responsibilities of the consultant in this regard must be specified in the consultant's appointment.
- d. If requested to do so, appoint independent environmental site officers to ensure that all aspects of the environmental management plan (EMP) and the National Environmental Management Act, 1998 (Act 107 of 1998), that are relevant to the construction work are complied with and adhered to.
- e. If requested by CoE, the consultant shall appoint a community liaison officer from the community and guide him or her.
- f. The consultant must ensure that the work is carried out strictly according to the plans and specifications, and on completion, must certify that this has indeed been done.
- g. During the process of setting out, the consultant must verify the design in respect of the feasibility of house connections.



- h. Ensure that the contractor is a qualified plumber or has a qualified plumber on site. Ensure that the plumber has experience in the installation of municipal services - a CV of the plumber has to be provided for approval.
- i. Regular site meetings and inspection visits to the works by a partner or senior engineer from the head office of the consultant unless otherwise arranged with CoE.
- j. Should it be necessary to make changes to the design during the construction of the works owing to existing services "clashing" with any new pipeline, the consultant must make these changes.
- k. Preparation of any further plans that may be necessary for the execution of the work or for site inspections or that may be required by CoE.
- l. Obtaining of approval for any substantial amendments to approved plans.
- m. Amendments which have no financial impact must be submitted to the project manager for approval.
- n. Prior approval must be obtained from the Divisional Head: Water and Sanitation – Project Division for all amendments that have cost implications for the CoE, as well as for all instructions to the contractor that will cause substantial amendments to, omissions from or additions to the contract.
- o. Surveying of the work as it progresses and the preparation and issuing of payment certificates.
- p. All measurements and records kept for the purposes of payment, cost and contribution calculations.
- q. Reporting to the City of Ekurhuleni of any damage to existing services immediately. The costs of the damage to services and water loss will be recovered according to the standard tariffs of CoE
- r. Dealing with all complaints and problems experienced by the contractor and the public.
- s. The compilation of As-Built drawings for the records of the Divisional Head: Planning Division.
- t. The issuing of "Completion" and "Final" Certificates on completion of the work in accordance with the standard Conditions of Contract.
- u. The payment of final professional fees will only be made when As-Built drawings have been handed over and a Completion Certificate has been produced on completion of the work.

#### 2.4.2 Existing services

All the necessary right of access and wayleaves shall be in place before construction commences.

Before the excavation of any service is started, the contractor must ensure that all the existing services are detected and exposed.

The CoE's Roads and Storm Water Department, Water and Sanitation Department and Electricity Department, as well as the external service providers, must be notified in advance that work is going to be done in a certain area. No construction work may commence without their written consent of these departments and service providers.

If necessary, the position of the pipeline must be adjusted to fit in with the positions of the existing services, after the changes required have been approved by the CoE.

Sample of the water quality of installed network must be submitted to Water Quality Division for approval prior to connecting to the CoE network

#### 2.4.3 Excavation of trenches

The laying of pipes may not be more than 300 m in total behind the excavation of the trenches, unless the Divisional Head: Project Division has approved in writing any deviation from this requirement.

#### 2.4.4 Work on private property

No pipes may be laid on privately owned land unless the following requirements have been satisfied:

- Before any work is carried out on private property, the contractor, together with the consultant, must examine the property and come to an agreement with the owner regarding the repairing of damage to structures, fences, services, etc. It is important that CoE's valuator also be involved in all cases where any claims for damages may be expected.
- The contractor must be in control of his or her employees at all times, and unnecessary damage to private property must be avoided. The specifications for the work must be strictly complied with.
- The contractor and the applicant must indemnify the CoE in writing against all liability for work done on private property.
- A municipal servitude to the width required by the CoE must be surveyed and registered at the cost of the Applicant.

#### 2.4.5 Supervision

Engineers and other technical staff from the relevant Water and Sanitation Divisions will randomly visit the site for inspections during the execution of the contract and must be allowed free access to the site at all reasonable times. However, the designated Water and Sanitation project manager or inspector for the project must remain the only official contact for communication regarding quality control.

#### 2.4.6 Professional responsibility

The consultant must supervise all stages of the construction work adequately and effectively. On completion of the work the consultant must in writing certify that –

- all materials used for the construction of the scheme comply with the CoE's specifications;
- the installed services have successfully undergone all the prescribed tests under the consultant's supervision; and,
- In the case of municipal sewers, the CCTV camera inspection was done in accordance with the CoE's specification and all the required repairs were done.

### 3 **TESTING AND COMPLETION**

***The conditions specified in this section is applicable to both consultants appointed for private developments as well as consultants appointed by CoE.***

#### 3.1 **Operation and Maintenance Manuals**

During the design of water and sewer infrastructure, due consideration shall be given to operation and maintenance requirements, which shall be fully documented in an Operation and Maintenance (O&M) Manual.

The consultant/contractor shall supply two (2) copies of the O&M Manuals to the Divisional Head: Project Division and one (1) copy to Divisional Head: Planning Division, before the infrastructure is taken over by CoE. The contractor shall be responsible for obtaining all manufacturers' manuals and operating instructions for inclusion in the O&M Manuals as separate volumes.

Pdf versions of the O&M Manuals, including the manufacturers' manuals and operating instructions, will also be submitted to Divisional Head: Projects and Planning Divisions.

The Operation and Maintenance Manual shall include the following information:

- A flow diagram, indicating all components, working pressures and flow rates of equipment installed in pump stations.
- Detailed description of all operating processes and sequence of operations. This will include a description of the operation and interaction of systems and sub-systems during start-up and shutdown, operation in automatic mode, operation in manual mode and operation with backup power. This is applicable, but is not limited to, equipment, pumps, piping, valves, HVAC, electrical, controls and instrumentation, etc.
- Applicable design data for all equipment e.g. pumps, motors, main and standby power, telemetry (where applicable)
- Pump curves and system curves indicating design operating points.
- Analyses of critical safety issues and procedures, as well as a vulnerability analysis.
- An inventory of all critical components.
- A consolidated summary of required routine scheduled maintenance and scheduled preventative and predictive maintenance for all equipment. Reference shall be made to the location in the manual where detailed information. These will include lubrication, cleaning, inspection, oiling, adjusting, equipment condition monitoring and rebuilding to factory specifications. Scheduled maintenance shall be triggered by frequencies (elapsed calendar days, run time, etc.) or on demand.
- A complete list of emergency spares to be kept in store shall be listed.
- A list of vendors and manufacturers of critical system components, including afterhours contacts, (name, location and telephone number) of nearest supplier and spare parts retailer for all components used in the pump station, pipe work and pipelines.
- Contingency plan, including redundancy considerations.
- Emergency plans and procedures.
- All safety related aspects.
- Required training and training plan for O&M teams.
- A complete set of the as built drawings, as well as electrical panel drawings.
- Description of the maintenance management system, including preventative and predictive maintenance.

The following information shall be included in an equipment literature supplement to the O&M manual:

- Disassembly and reassembly instructions.
- Parts lists and information for all installed equipment – by generic title and identification number.
- Manufacturer's certifications, including calibration data sheets and specified calibration procedures and/or methods for installed equipment.
- Warranty forms.

### **3.2 CCTV Inspection of newly built municipal sewers**

All newly built sewers must be CCTV inspected once backfilling has been done. Only the services of CCTV contractors approved by the Division Head: Operations Division may be used for these inspections.

Consultants are expected to supervise construction in order to ensure that their professional responsibilities are fulfilled. CCTV inspections should only be a confirmation of correct construction.

The cost of CCTV inspections must be included in the tender for the work (including possible laser profiling).

CCTV inspections shall be done at the cost of the applicant and to the satisfaction and specifications of the Divisional Head: Projects Division, including at least the following:

- Colour CCTV cameras equipped with inclinometers must be used, and a pipeline profile must be produced. If ovality as a general fault is present, CoE reserves the right to call for laser profiling of the pipelines as well, in addition to the CCTV inspections ("ring of light technology").
- For the purposes of CCTV inspection, manholes shall be numbered in accordance with the CoE's manhole numbering procedure. This nomenclature requires that each manhole has a unique number consisting of the suburb code followed by the erf number of the stand closest to the manhole followed by an A, B, C etc. in the case of more than one manhole in the vicinity of the stand. Pipelines have the same name as the upstream manhole. The latest cadastral data for this purpose is available from CoE's Planning Division.
- The CCTV contractor must produce a status quo report to all concerned containing the normal CCTV report and inter alia recommending which pipes should receive remedial action. The report shall contain maps showing incidents reported on as symbols, according to CoE's system of which an example can be supplied if necessary.
- The CCTV inspection reports (both hard copy and in electronic format) form part of the as-built information that must be submitted to the Divisional Head: Planning Division. The inspection reports in electronic format must be submitted in pdb and pdf formats, as the information has to be uploaded to CoE's consolidated CCTV inspection database.
- Any attempt to influence the CCTV contractor to inspect only certain lines, to falsify reporting, or threats to withhold payment etc. shall result in the party concerned being blacklisted.
- Consultants must analyse the CCTV inspection results, with due cognisance of what every reported incident actually represents, and report and advise the contractor appropriately as to what remedial action is required to ensure compliance with the standards and specifications of CoE.
- Any suitable proprietary front-end software or camera system may be used but CCTV inspections must be done according to the Sewer Inspection Manual as used by CoE.
- Inspections should not all be done at the end of the project, but should be phased from the start of the project in order to avoid a situation later on when defects have accumulated and are difficult to rectify.

## **4 SUBMISSION AND APPROVAL OF DOCUMENTS AND DRAWINGS**

*This section specifies CoE's requirements in terms of documentation which must be submitted for approval. It is applicable to both consultants appointed for private developments as well as consultants appointed by CoE.*

### **4.1 Submission of design Reports for approval**

#### **4.1.1 Stage 1: Concept and Viability (Inception) Report**

The Inception Report shall include at least the following sections:

- Introduction
- Scope of consulting services
- Investigations and site surveys required
- Environmental matters
- Occupational Health and Safety matters
- Land access matters

- Design approach
- Site Development Plan
- Proposed infrastructure
- Construction cost estimates(construction and professional fees)
- Procurement Plan
- Project Programme
- Cash flows
- Conclusion and recommendations

#### 4.1.2 Stage 2: Preliminary Design Proposals

The consultant may not proceed with Stage 2 without written approval of the Divisional Project Manager, after consultation with the Divisional Head: Projects Division.

The PDR shall include at least the following sections:

- Introduction
  - Purpose of the report;
  - Project brief and project team;
  - Development structure and agreements.
- Description of the site
  - Project location;
  - Climatic conditions;
  - Topographical survey;
  - Geotechnical investigations.
- Land use (existing and future)
- Land access rights and wayleaves required
- Environmental management and OH&S related matters
  - Environmental management requirements;
  - Occupational health and safety risks and requirements.
- Procurement and implementation strategy
- Scope of work and terms of reference
  - Scope in terms of appointment;
  - Project program;
  - Deliverables.
- Project design
  - Availability and proposed upgrading of existing services / alignment with Master Plan Capacity Report;
  - Proposed level of service and alternatives;
  - Design Codes and Standards;
  - Design Specifications.
- Water demand / sewerage flow
- Preliminary sizing of infrastructure components
- Material standards
- Preliminary drawings
- Specific maintenance/operational issues

- SMME involvement and BBBEE issues
  - Labour intensive construction method;
  - Local labour.
- Project cost estimate and financing
- Recommendations and conclusions

#### 4.1.3 Stage 3: Design Development Report

The consultant may not proceed with Stage 3 without written approval of the Design Review Committee, after consultation with the Divisional Head: Project Division.

The Consultant shall prepare a DDR presenting and justifying the designs developed in the Preliminary Design Stage. This report should contain the following minimum information:

- Introduction
  - Purpose of the report;
  - Project brief and project team;
  - Development structure and agreements.
- Description of the site
  - Project location;
  - Climatic conditions;
  - Topographical survey;
  - Geotechnical investigations.
- Land use (existing and future)
- Land access rights and wayleaves
- Environmental management and OH&S related matters
  - Environmental management plan;
  - Occupational health and safety specification.
- Project design
  - Upgrading of existing services;
  - Level of services;
  - Design Codes and Standards;
  - Design Specifications.
- Water demand/sewerage flow
- Detail Design of infrastructure components
- Material standards and specifications
- Construction drawings
- Maintenance/operational requirements
- Project cost estimates and cash flow
- Recommendations and conclusions

#### 4.1.4 Stage 4: Document and Procurement

The Tender Document shall be compiled in accordance with the latest CoE template tender document and must conform to the CIDB's Standard for Uniformity in Construction Procurement policies.

Documentation shall be based on the General Conditions of Contract 2015 issued by the SAICE, SABS 1200 (SANS 1200) and include the latest City of Ekurhuleni Special Conditions of Contract.

The City of Ekurhuleni's latest policy regarding Targeted Procurement and the relevant forms shall be incorporated into the document.

Calling for and the acceptance of tenders is a function of CoE. To enable the City of Ekurhuleni to advertise the Contract for tender, a Pre-Tender Estimate and Site Clearance must be submitted with the printed tender documents.

The Consultant will be expected to conduct a tender site briefing and to report and make **recommendations on the acceptance of tenders**. An agenda must be issued for, and minutes kept of the tender site inspection. Notices to Tenderers (Addendums) must be avoided as far as possible. If it should be essential to issue a Notice to Tenderers arising from the site inspection, it must be approved by the Divisional Head: Projects Division and issued to the tenderers by the Consultant not later than **7 days** before the closing date of the tender.

**CoE shall evaluate the received tenders on an impartial basis**, to ensure that the most cost-effective tender is accepted. In the recommendations for the award of the Contract, due cognizance shall be taken of the issues highlighted in the Tender Document to achieve the successful completion of the works within the specified parameters and with minimal risk accruing to CoE.

## **4.2 Submission of drawings for approval**

### **4.2.1 Surveying**

A survey of the site must be made in the following manner:

- A steel peg, with the top bent double (reference mark), must be placed in a concrete base on the sidewalk next to the boundary on the north-eastern corner of each street block. The number of the adjacent erf must be written in the concrete.
- For ground based surveys (tachometry or GPS), the elevation of the four corners of every erf must be measured, as well as the break lines and elevation of terraces, cavities, etc., to obtain a true image of the topography of the premises. Trigonometric elevations must be used and contour lines with 1.0 m intervals must be drawn and be indicated on the drawings.
- For digital terrain models (DTM) prepared from aerial surveys, points must be spaced in a grid of 10 m between points and all break lines must be indicated.
- For LIDAR surveys, the number of points must be weeded in relation to the rate of variation in elevation such that an acceptable accuracy is maintained but the date is kept to a manageable size.
- The accuracy of the elevation of the points in aerial and LIDAR surveys shall be such that the mean square error is less than 100 mm.
- The site or layout plan must be drawn to an acceptable scale (1:1 000, 1:2 000 or 1:2 500) with north normally at the top of the sheet, and the plan must indicate the following:
  - The erf numbers
  - The land surveyor's reference pegs and erf pegs and their elevations in relation to sea level
  - The street names
  - The street numbers of the developed erven
  - The positions and particulars of existing services
  - The names of the neighboring erven and townships

Contours obtained from the elevations of the erf corners must be indicated with 1.0m intervals on the plan. In instances where the site is particularly flat, additional 0.5m contours must be added.

#### 4.2.2 Title block

The standard title block of the Municipality must be used. It must at least contain the following:

- Township name and extension;
- Project description;
- Drawing and reference number;
- Scale;
- Date of plan;
- Space for the signature of the Divisional Head: Water and Sanitation;
- Space for the As-Built certification by the consultant;
- Space for certification by the consultant before submission for approval;
- Space for the revisions record;
- Professional registration No. of the Consultant.

#### 4.2.3 Working drawings

- All text must be clear and easily legible, even after reproduction.
- All text and lines must be in black and as per drawing office specifications.
- All plans must be available in dwg / dxf / pdf format or a similar approved format.
- A separate plan must be provided to an acceptable scale, indicating all existing services such as, but not limited to, storm water, sewerage, electrical and telephone cables and poles from service providers such as CoE, Eskom, Telkom, Rand Water, etc. Physical obstructions such as buildings, structures, swimming pools, large trees, walls, etc. must also be indicated;
- The diagrammatical layout with details of all connections and nodal points must be provided.
- Any details of the design that are specific to the contract must be indicated in full so that tenderers will have a proper indication of what is expected.
- Standard symbols shall be used on sanitation drawings – refer to Appendices A & B of this document.

##### 4.2.3.1 *Layout plans – sewer networks*

A layout plan, to a suitable and clear scale, must show the following:

- Locality plan;
- Plans must be drawn to an acceptable scale, such as 1:500, 1:1 000, 1:2 000 or 1:2 500 (not 1:3 000 or 1:1 500);
- Sufficient cadastral information, as well as adjacent towns and farms;
- North arrow
- At least three grid lines in both directions, for orientation
- Contours
- Pipeline routes
- Positions of existing services and servitudes



- Manholes and cleaning eyes, properly named, including pipe invert levels and depth to invert
- Pipe sizes and slopes between manholes
- Sewer connection point to every erf
- Reference points and converted heights
- Erf numbers
- Street names

If development is larger than 50 even a separate plan must be provided with a list to show on which plan number is which manhole e.g.

- Plan X01: MH 105, 8-11, 15-16;
- Plan X02: MH 6-7, 12-14, 17-20, etc.

#### 4.2.3.2 *Longitudinal sections – sewer networks*

The longitudinal section must show the following (also refer to Standard Guideline Drawings):

- Manhole reference numbers, according to the approved CoE manhole numbering system;
- Chainage distances (starting from the lowest point);
- Depth of sewer to invert level;
- Distance between manholes;
- Ground and sewer invert levels at each manhole;
- The ground level and sewer invert level, with manholes to scale;
- Diameter and type of pipe;
- Pipe bedding class;
- The gradient of all pipe sections (1: ..... format);
- Maximum Design flow (Qd) and corresponding flow velocity (Vd);
- Capacity (Q70) of pipe at 70% full flow and corresponding flow velocity (V70);
- Datum height;
- The manhole coordinates list (x, y and z (cover and invert levels) – coordinates, all within a surveyed accuracy of 20 mm). CoE coordinate system and datum - WGS84 Hartbeeshoek;
- The distance of pipelines and other services from erf boundaries (water, sewer, storm water, electrical and Rand Water pipelines/services, telecommunications services, gas pipelines, etc.);
- Street names and width where crossed by a pipeline;
- Fall through manhole, indicated in millimetres;
- The positions of all erf connections.

#### 4.2.3.3 *Layout plans – water reticulation / bulk water lines*

A layout plan, to a suitable and clear scale, must show the following:

- Locality plan;
- Plans must be drawn to an acceptable scale, such as 1:500, 1:1 000, 1:2 000 or 1:2 500 (not 1:3 000 or 1:1 500);
- Sufficient cadastral information, as well as adjacent towns and farms;
- North arrow

- At least three grid lines in both directions, for orientation
- Contours
- Pipeline routes
- Positions of existing services and servitudes
- Water connection point to every erf
- Reference points and converted heights
- Erf numbers
- Street names

#### 4.2.3.4 *Longitudinal sections – water reticulation / bulk water lines*

The longitudinal section must show the following (also refer to Standard Guideline Drawings):

- Static pressure (m);
- Residential pressure (m);
- Chainage distances;
- Flow rate;
- Pipe diameter, material and pressure class;
- Air release valves at critical points;
- Scour valves at low points;
- Pipe grades  $>0.3\%$  (0.3m / 100m) or  $>0.2\%$  for larger pipes ( $>1000\text{mm}$  diameter) to avoid air pockets;
- Pipes must be laid in straight line and marked with pipeline markers;
- The positions of all erf connections and water meters;
- Depth of pipeline to invert level;
- The gradient of all pipe sections (1: ..... format);
- Datum height;
- The distance of pipelines and other services from erf boundaries (water, sewer, storm water, electrical and Rand Water pipelines/services, telecommunications services, gas pipelines, etc.);
- Street names and width where crossed by a pipeline;
- The positions of all erf connections.

#### 4.2.4 As-Built drawings

As-built drawings must be submitted to the Divisional Head: Project Division who will forward it to CoE: Planning Division on completion of the work, via respective project manager.

The drawings must indicate the surveyed position of all pipelines, valve installations, flow meters, house connections, manholes, etc. All copies of plans must be reproduced on A1-size drawing paper, and a .dxf, .dwg, .shp or similar electronic file format, as agreed. All surveyed manhole information, must be submitted in hard copy and approved electronic format (typically .xls).

It is important that complete and accurate As-Built drawings are produced and submitted for all work carried out on behalf of the Water and Sanitation Department. These drawings ensure that the records can be updated to enable future planning, operation, maintenance and protection of these assets.

Record drawings of alterations of existing CoE networks or assets must also be submitted. These include new capital works, extensions to the network, relocations and upgrades.

The As-Built drawings must be submitted one month after project completion according to the following guideline:

- For private developers – prior to the issuing of Section 82 or Regulation 38 Certificates.
- Capital Projects by external Consultants – as part of the Final Close-Out Report and within one month after project completion (issuing of the Completion / Taking-Over Certificates in terms of the General Conditions of Contract).

Each As-Built drawing must include the following:

- The locality plan and site plan of the area
- In the case of sewer lines, surveyed manhole coordinates list (x, y and z (cover and invert levels) – coordinates, all within a surveyed accuracy of 20 mm). CoE coordinate system and datum - WGS84 Hartbeeshoek
- Depth and dimensioned location of house connections must also be shown for each erf
- The longitudinal section indicating at least the following:
  - Details as specified above;
  - Surveyed manhole cover and invert levels;
  - Distance between manholes;
  - Constructed grade;
  - Maximum design flow (Qd) and corresponding flow velocity (Vd)
  - Capacity (Q70) of pipe at 70% full flow and corresponding flow velocity (V70)

Sewer connection slips shall be submitted together with the As-Built drawings in hard copy and approved electronic format.

Payments certificates will not be issued and the final payments for Professional Service Providers will not be processed until full As-built drawings are received.












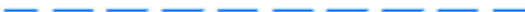



















## APPENDICES

- Appendix A:** List of Symbols to be used on Drawings and Standard Disclaimer – Water
- Appendix B:** List of Symbols to be used on Drawings and Standard Disclaimer – Sewer
- Appendix C:** Sewer Connection Slip
- Appendix D:** Completion Inspection report for new townships – Water
- Appendix E:** Completion Inspection Report for new townships – Sewer
- Appendix F:** Guidelines for the application for and construction of a new sewer connection

**APPENDIX: A**

**LIST OF SYMBOLS TO BE USED ON DRAWINGS:  
WATER**

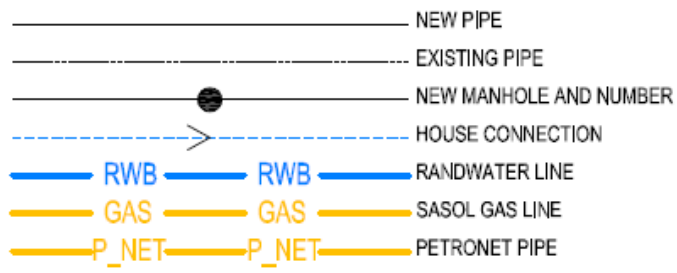
# WATER SYMBOLS :

	NEW HYDRANT
	PROPOSED PIPE / NEW PIPE
	NEW VALVE
	NEW VALVE ON EXISTING PIPE
	NEW HYDRANT ON EXISTING PIPE
	NEW END CAP
	NEW PRV
	NEW AIR VALVE
	NEW WATER METER
	EXISTING PIPE CAPPED
	EXISTING END CAP
	EXISTING NETWORK PIPE
	EXISTING HYDRANT
	NODE NUMBER
	CLOSED VALVE
	EXISTING VALVE
	EXISTING AIRVALVE
	EXISTING WATER METER
	EXISTING PRV
	EXISTING PUMP
	PIPE TO BE ABANDONED
	REDUNDANT PIPE
	EXISTING RES DISTRIBUTION ZONE
	PROPOSED RES DISTRIBUTION ZONE
	EXISTING RAND WATER PIPE
	SUBURB BOUNDARY
	SASOL GAS LINE
	PETRONET PIPE
	NEW PIPE IN NEW SLEEVE
	DOUBLE HOUSE CONNECTIONS
	SINGLE HOUSE CONNECTIONS

**APPENDIX: B**

**LIST OF SYMBOLS TO BE USED ON DRAWINGS:  
SEWER**

# SEWER SYMBOLS :





**APPENDIX: C**

**SEWER CONNECTION SLIP**



**Ekurhuleni**  
METROPOLITAN MUNICIPALITY

**WATER AND SANITATION DEPARTMENT**

Tel: 011 999 xxxx

P.O Box 13

Fax: 011 999 xxxx

Kempton Park

1620

Room A601, 6th Floor, Civic Centre, CR Swart Road, Kempton Park 1619

## SEWER CONNECTION SLIP

### IMPORTANT NOTICE

The indicated position of house connection is approximate. No trenches shall be excavated or drains laid BEFORE the house connection has been located. This office must be notified of any problems with connection positions **within 30 days** from the issued date of this connection slip. Ekurhuleni Metropolitan Municipality **do not** take any responsibility for the correctness of connection position after the 30 day period.

Date:..... Plan: ..... Erf Number: .....

Township:..... Street: .....

Sewer connection provided on the .....boundary.....from the

..... boundary.

Depth:.....

CONSULTING ENGINEER/CONTRACTOR DETAILS:

Name:.....

Address: .....

.....  
For DIVISIONAL HEAD WATER AND  
SANITATION

.....

.....

Tel: .....

Fax: .....

Date: .....

E-mail: .....

**APPENDIX: D**

**COMPLETION INSPECTION REPORT FOR NEW TOWNSHIPS:  
WATER**



**WATER AND SANITATION DEPARTMENT**

Tel: 011 999 3820  
Fax: 011 999 0000

P.O Box 215  
BOKSBURG  
1460

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Room 638, 6th Floor, Boksburg Civic Centre, CR Trichardt & Market Street, BOKSBURG 1460

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Your Ref: \_\_\_\_\_

Initiator: \_\_\_\_\_

Our Ref: \_\_\_\_\_

Tel: \_\_\_\_\_

Fax: \_\_\_\_\_

Date: \_\_\_\_\_

E-mail: [\\_\\_\\_\\_\\_@ekurhuleni.gov.za](mailto:_____@ekurhuleni.gov.za)

**COMPLETION INSPECTION REPORT FOR NEW TOWNSHIPS – WATER**

NAME OF TOWNSHIP: \_\_\_\_\_

DATE OF INSPECTION: \_\_\_\_\_

"AS BUILT DRAWING NO: \_\_\_\_\_

**Meters of pipes installed:**

25mm diameter PE \_\_\_\_\_

32mm diameter PE \_\_\_\_\_

40mm diameter PE \_\_\_\_\_

63mm diameter PE \_\_\_\_\_

25mm diameter PVC-U \_\_\_\_\_

90mm diameter PVC-U \_\_\_\_\_

110mm diameter PVC-U \_\_\_\_\_

160mm diameter PVC-U \_\_\_\_\_

200mm diameter PVC-U \_\_\_\_\_

250mm diameter PVC-U \_\_\_\_\_

315mm diameter PVC-U \_\_\_\_\_

Other diameter (specify) \_\_\_\_\_

**Number and size of valves installed:**

Line valves: \_\_\_\_\_

Air valves: \_\_\_\_\_

PRV's: \_\_\_\_\_

Number of fire hydrant installed: \_\_\_\_\_

**Please confirm the following:**

- 1. One paper copy of "as built" is available on site: \_\_\_\_\_
- 2. All valve positions are marked with a "V" and a white Painted block on the kerb: \_\_\_\_\_
- 3. All water pipe road crossings are marked with a "W" In the kerb: \_\_\_\_\_
- 4. All fire hydrants are in the correct position: \_\_\_\_\_
- 5. All fire hydrants are painted correctly: \_\_\_\_\_
- 6. All pressure tests have been done successfully: \_\_\_\_\_

**Other comments:** \_\_\_\_\_

\_\_\_\_\_

**"AS BUILT" INFORMATION REQUIRED\***

MEDIA	NUMBER OF COPIES
1. Signed hard copies of "as built" drawings	3
2. "As built" drawings in electronic format (CD/DVD). dwg or .dxf file format	1

I, \_\_\_\_\_ Professional Engineer/Technologist

(Reg. No: \_\_\_\_\_), Of the firm

\_\_\_\_\_, hereby certify the following:

1. All materials used for construction complies with the specifications of the City of Ekurhuleni.
2. The construction methods used complies with the specifications of the city of Ekurhuleni.
3. I and the firm of Consulting Engineers with which I associate myself assure professional responsibility of the work performed.

Signatures of registered Plumber: \_\_\_\_\_

Signatures of responsible Engineer: \_\_\_\_\_

Signatures of municipal representative: \_\_\_\_\_

**PLEASE NOTE: NO "AS BUILT" DRAWINGS WILL BE ACCEPTED IF NOT ACCOMPANIED BY THIS SIGNED COMPLETION CERTIFICATE**

**CHECKLIST FOR "AS BUILT" DRAWINGS INFORMATION**

NO:	INFORMATION	YES	NO
1	The word " <b>AS built</b> " must be indicated clearly on the plan together with the signature of the Engineer and Inspector of works.		
2	All <b>dimensions</b> with regard to the distance of the pipes from the boundary must be shown.		
3	The <b>meter size</b> must be clearly indicated.		
4	The <b>legend</b> must be shown indicating:-pipe sizes, symbols, existing and new services, and phases where applicable.		
5	The pipes must be clearly shown on the "As Built" drawings as new pipeline and not as a <b>proposed</b> pipeline.		
6	The <b>scale</b> must be clearly indicated.		
7	Any revisions where applicable		
8	The Township Name and Extension must be indicated in the title block.		
9	Notes and remarks where necessary.		
10	A space in the title block where the <b>municipality drawing number</b> can be entered. Can be obtained from technical information office.		
11	The City of Ekurhuleni standard title block with <b>logo</b> .		
12	A <b>north arrow</b> must be shown.		
13	At least <b>three grid lines</b> in both directions for orientation.		
14	The layout must be from the approved SG diagram indicating the correct street names and erf numbers. <b>The SG diagram must be attached.</b>		
15	A <b>locality plan</b> is necessary due to the fact that Ekurhuleni is a large area.		
16	<b>Electronic format</b> of drawings in .dxt or .dwg.		
17	<b>Pipe material</b> must be specified on drawing.		
18	When applicable, provide key plan of all the <b>phases</b> when township is done in phases, and show phase boundary clearly of new township drawing.		

APPROVED / NOT APPROVED BY INFORMATION OFFICE

SIGNATURE: \_\_\_\_\_

DATE: \_\_\_\_\_



**APPENDIX: E**

**COMPLETION INSPECTION REPORT FOR NEW TOWNSHIPS:  
SEWER**



Room A601, 6th Floor, Civic Centre, CR Swart Road, Kempton Park 1619

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Your Ref: \_\_\_\_\_

Initiator: \_\_\_\_\_

Our Ref: \_\_\_\_\_

Tel: \_\_\_\_\_

Fax: \_\_\_\_\_

Date: \_\_\_\_\_

E-mail: [\\_\\_\\_\\_\\_@ekurhuleni.gov.za](mailto:_____@ekurhuleni.gov.za)

**COMPLETION INSPECTION REPORT FOR NEW TOWNSHIPS – SEWER**

NAME OF TOWNSHIP: \_\_\_\_\_

DATE OF INSPECTION: \_\_\_\_\_

“AS BUILT DRAWING NO: \_\_\_\_\_

(List all applicable drawings to be attached)

**Meters of pipes installed:**

160mm diameter PVC-U \_\_\_\_\_

200mm diameter PVC-U \_\_\_\_\_

250mm diameter PVC-U \_\_\_\_\_

315mm diameter PVC-U \_\_\_\_\_

Other diameter (specify) \_\_\_\_\_

**Number of house connections to be installed:** \_\_\_\_\_

**Number of manholes and lampholes to be installed:**

Manholes: \_\_\_\_\_

Lampholes: \_\_\_\_\_

**Please confirm the following:**

1. All manholes clearly visible: \_\_\_\_\_

2. All connections marked with wire and concrete marker: \_\_\_\_\_

3. All pipes have been inspected with camera and found to in order: \_\_\_\_\_

**Other comments:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**"AS BUILT" INFORMATION REQUIRED**

MEDIA	NUMBER OF COPIES
1. Hard copy of approved "as built" drawings	3
2. "As built" drawings in electronic format (CD/DVD). dwg or .dxf file format	1
3. CCTV inspection report on CD/DVD (.pdb format)	1

I, \_\_\_\_\_ a Professional Civil Engineer

(Reg. No: \_\_\_\_\_),

Of the firm \_\_\_\_\_, hereby certify the following:

4. All materials used for construction complies with the specifications of the City of Ekurhuleni.
5. The construction methods used complies with the specifications of the city of Ekurhuleni.
6. I and the firm of Consulting Engineers with which I associate myself assume professional responsibility of the work performed.

Signatures of registered Plumber: \_\_\_\_\_

Signatures of responsible Engineer: \_\_\_\_\_

Signatures of municipal representative: \_\_\_\_\_

**PLEASE NOTE: NO "AS BUILT" DRAWINGS WILL BE ACCEPTED IF NOT ACCOMPANIED BY THIS SIGNED COMPLETION CERTIFICATE**

**CHECKLIST FOR “AS BUILT” DRAWINGS INFORMATION**

<b>NO:</b>	<b>INFORMATION</b>	<b>YES</b>	<b>NO</b>
1	The word “ <b>AS built</b> ” must be indicated clearly on the plan together with the signature of the Engineer and Inspector of works.		
2	All <b>dimensions</b> with regard to the distance of the pipes from the boundary must be shown.		
3	The <b>meter size</b> must be clearly indicated.		
4	The <b>legend</b> must be shown indicating:-pipe sizes, symbols, existing and new services, and phases where applicable.		
5	The pipes must be clearly shown on the “As Built” drawings as new pipeline and not as a <b>proposed</b> pipeline.		
6	The <b>scale</b> must be clearly indicated.		
7	Any revisions where applicable		
8	The Township Name and Extension must be indicated in the title block.		
9	Notes and remarks where necessary.		
10	A space in the title block where the <b>municipality drawing number</b> can be entered. Can be obtained from technical information office.		
11	The City of Ekurhuleni standard title block with <b>logo</b> .		
12	A <b>north arrow</b> must be shown.		
13	At least <b>three grid lines</b> in both directions for orientation.		
14	The layout must be from the approved SG diagram indicating the correct street names and erf numbers. <b>The SG diagram must be attached.</b>		
15	<b>A locality plan</b> is necessary due to the fact that Ekurhuleni is a large area.		
16	<b>Electronic format</b> of drawings in .dxt or .dwg.		
17	<b>Pipe material</b> must be specified on drawing.		
18	When applicable, provide key plan of all the <b>phases</b> when township is done in phases, and show phase boundary clearly of new township drawing.		

APPROVED / NOT APPROVED BY INFORMATION OFFICE

SIGNATURE: \_\_\_\_\_

DATE: \_\_\_\_\_

## **APPENDIX: F**

### **GUIDELINES FOR THE APPLICATION FOR AND CONSTRUCTION OF A NEW SEWER CONNECTION**



Room A601, 6th Floor, Civic Centre, CR Swart Road, Kempton Park 1619

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**WASTEWATER COLLECTION**

**GUIDELINES FOR THE APPLICATION FOR AND CONSTRUCTION OF NEW SEWER CONNECTIONS (CHIEFLY AT SUBDIVISIONS)**

1. Supervision and Approval

Ownership over municipal sewers rests with the City of Ekurhuleni (hereafter "CoE" or "Municipality"). As such no work may be done on any municipal sewer infrastructure without the supervision and approval of the Divisional Head: Operations - Water and Sanitation or his/her delegate. Such work may only be done according to the specifications as indicated on the standard drawings for sewerage of the municipality as available on the date of construction and as specified in this document. The aforementioned supervision and approval will only be considered under the conditions as set out in this document.

2. Application for a New Municipal Sewer Connection Point

2.1 Official application not required

It is not required to lodge an official application to CoE if a new sewer connection can be constructed by joining onto a municipal sewer line situated directly alongside the erf boundary of the erf for which the connection is required.

Only the relevant Municipal officer must be contacted for inspections and construction work may only be done according to the conditions as set out in this document. (Also refer to points 4 and 5 below).

2.2 Official application required

It is required to lodge an official application with the Section: Township Development if an additional sewer connection cannot be constructed by joining into a municipal sewer line situated directly alongside the erf boundary of the erf for which the connection is required. In such instances the additional sewer connection could also include a pipeline that crosses an adjacent neighbor's stand or a road reserve. Such an application may only be made by a professional civil engineer, officially appointed and paid by the owner (hereafter the "consultant"), with the explicit qualification that the consultant takes full responsibility for the installation of the sewer connection.

Actual construction work may only commence after the approval of the application and construction drawings, and must be done according to the conditions of the approval and the conditions as set out in this document, under supervision of the consultant.

The relevant system Municipal officer must be contacted for inspections after approval for the planned construction work has been obtained from the relevant Sub-Section: Township Development.

3. Competent Contractor

Only a competent contractor (hereafter the "contractor"), with an acceptable Public Indemnity Policy, at the exclusive discretion of the Divisional Head: Planning - Water and Sanitation or his delegate, may perform work on municipal sewerage infrastructure.

4. Arrangement for Inspections (Connections as Per 2.1)

Inspections must be arranged with the relevant municipal officer (hereafter the "municipal officer") of the division - Water and Sanitation. All appointments for any of the inspections must be confirmed with the relevant foreman at least 48 hours before such an inspection is desired.

The following telephone numbers are applicable:

- Southern Region  
(All areas included in the area of the Germiston Service Delivery Area)  
Tel: 011 999 1236 - Ask for the municipal officer responsible for the specific area.
- Northern Region  
(All areas included in the area of the Kempton Park, Tembisa, Pomona, Rhodesfield etc.)  
Tel: 011 999 3783 - Ask for the municipal officer responsible for the specific area.  
(All areas included in the area of the Edenvale Service Delivery Area)  
Tel: 011 999 3192 - Ask for the municipal officer responsible for the specific area.
- Eastern Region  
(All areas included in the area of the Springs Service Delivery Area)  
Tel: 011 999 8636 - Ask for the municipal officer responsible for the specific area.  
(All areas included in the area of the Benoni Service Delivery Area)  
Tel: 011 999 7132- Ask for the municipal officer responsible for the specific area.

5. Relevant Inspections

The contractor must take cognisance of the following inspections that must be executed and approved during installation:

- Inspection 1  
Pipe exposed with hole in the municipal sewer completed. The actual saddle/junction to be used must be shown to the foreman for approval.
- Inspection 2  
Connection completed and concrete anchor already placed. Depending on the contractor's planning and capability, it can be arranged that this action takes place and is inspected while the inspector is on site for inspection 1.
- Final Inspection  
All work must be completed in full and the work area must be reinstated to its original condition (improvements included). With this inspection the connection slip, as prescribed in this document, must be handed to the foreman for endorsement. It is an absolute necessity that a fully detailed connection slip be handed over to the foreman at this stage. Failing this, the provided connection point will not be approved. No private sewer pipeline shall therefore be allowed to be connected to this connection point.

6. Broken Municipal Infrastructure

When municipal infrastructure is exposed and found to be damaged, the relevant foreman must be informed immediately telephonically and in writing so that the necessary repairs can be attended to. If the contractor fails to give such notice, it will imply that the contractor was responsible for the damage and that he will then reinstate it at his own cost to the satisfaction of the owner of the infrastructure.

7. Junctions

Where conditions necessitate the use of a junction rather than a saddle piece, one of the inspections will have to be done during the actual installation. Sewage flow must in such an instance be handled by the contractor to the satisfaction of the Divisional Head: Operations - Water and Sanitation, all in accordance with Health Regulations.

8. Re-Inspections

An administrative fee, as per the municipality's annually promulgated tariff, will be payable for any re-inspection in cases where an inspection was requested and the work found to be incomplete or unacceptable, or for the non-compliance with any of the aspects prescribed herein. No further inspections or approval will be given until the administrative fee has been paid via the Water and Sanitation.

9. Connections to Pipes Larger Than 300 mm

Connections to pipes of a larger diameter must be done in consultation with and to the satisfaction of the Divisional Head: Operations - Water and Sanitation. Connections on pipes up to and including 300 mm in diameter can be done with a saddle or a junction, unless a manhole is required in terms of these guidelines.



10. Occupation Health and Safety  
The contractor shall at all times be responsible for all Occupational Health and Safety issues (such as safety relevant to excavations), as set out in the relevant acts and regulations.
11. Road Reserves  
Where a connection is made inside a road reserve, the necessary consent must be obtained from the Roads and Stormwater Department as per area of service.
12. Services  
The Contractor must obtain and confirm all appropriate service positions beforehand since all reinstatement costs of any services that may be damaged during construction will be for his account. The applicant will obtain information as per the Service Delivery Area office of work.
13. Compaction  
Backfilling of the excavation for connections must be done in layers of 150 mm maximum thickness, compacted to:
- Midblock- and outside road reserves: Minimum 90% MOD AASHTO density.
  - Inside road reserves: According to conditions of the Departmental Head: Roads and Transport Development.
- CoE retains the right to do tests on the work at any stage of construction. If any test fails, the contractor will rectify the mistake and the cost of such test or tests will be for the account of the applicant.
14. Access to a neighbor's erf  
The applicant must give a neighbour written notice that access to his/her site would be required for the purpose of construction work before any work may commence. In instances where a neighbour refuses such access the relevant municipal representative can be contacted to provide assistance.
15. Sewer Connection Slip  
A sewer connection slip including the contractor's/Engineer's detail (depending on the situation), as in Annexure R1, in A4 size, must be furnished to the municipal representative at the final inspection. (Also refer to Annexure R1 for an example.) This official document must clearly show the following information:
- Contractor's/Engineer's name and particulars, clearly legible.
  - Erf number, suburb, street name and number.
  - Erf diagram.
  - Local heights of all the erf corners. The heights do not need to be part of the mean sea level height system.
  - A North arrow.
  - The applicable scale (1:1000 or 1:500).
  - Connection detail: Position and depth, with distance from nearest erf boundary clearly indicated, as well as type of connection (Type 1,2,3 or 4).
  - Name in block letters, with signature and certification by the contractor that the work was done to the Department Water and Sanitation's standards and specifications.
  - Space for date and the signature of the relevant CoE representative after the final inspection and acceptance of the completed work, must be provided.
- 15.1 The responsibility rests with the applicant to ensure that at least 80% of the full erf can drain to any new sewer connection. In cases where this is impossible, this must be pertinently indicated after consultation with and approval of the Divisional Head: Planning - Water and Sanitation, and the area of the erf that cannot be drained must be clearly indicated (shaded) on the connection slip.
- 15.2 A signed and completed duplicate connection slip may be delivered to the Water and Sanitation area office by the applicant to expedite the administration process, if he so wishes. Otherwise at least the original and one copy of the connection slip must be handed to the relevant CoE representative.
16. Public Liability Policy  
The contractor or owner must, at own cost, procure a public liability policy to the satisfaction of the Chief Financial Officer of CoE, before construction of the sewer connection may be commenced with. CoE, the owner and the contractor must be fully

covered for their respective rights and interests for the full duration of the construction period. The policy must provide a coverage of at least R5 million per event, with the number of events unlimited during the period of insurance coverage.

NB: A copy of the valid insurance document must be handed to the relevant foreman at the first site visit. The municipality has the right to verify the authenticity of the Insurance Policy.

A copy of a valid public liability policy of the contractor must be provided to the foreman with the first site visit, and if this is not done, no inspection will take place and the administration fee as per the municipality's annually promulgated tariff could be payable for the additional inspection. The contractor shall furthermore not be allowed to continue with work until proof of this policy has been provided and authenticated.

#### 17. Approval of Building Plans and Other Applications

No sewer related aspect of any amendments to the town planning scheme or application where a sewer connection is involved will, under any circumstances, be signed off for final approval and/or acceptance if the aforementioned conditions have not been met and the sewer connection slip has not been supplied as prescribed.

#### 18. Guideline Notes

The following information is not meant to be exhaustive but is included to highlight the more important issues and to serve as a guideline for the contractor.

##### 18.1 General

- Is the public liability policy in place? (Refer to par. 16 above)
- All required inspections must be done and the municipal representative must use his own judgment to decide if the re-inspection fee is payable or not.
- Only material with the SANS mark may be used. If a specific fitting is not obtainable, an alternative product must be discussed with the depot manager prior to installation.
- Ensure that only dolomitic aggregate (sand and stone) is used. Any other material will in time be corroded by sewage.
- All work to be done according to the municipality's specifications.
- A connection that has been backfilled without having been inspected must be re-excavated for inspection.
- Once all work has been completed, the "sewer slip" created on the letterhead of the contractor should be handed to the municipal representative for signing off. Typically the contractor should provide 1 original and 3 copies
- Original to the foreman for forwarding to the Municipality planning office (compulsory).
  - 1 Copy to the municipal representative for filing at his depot (compulsory).
  - 1 Copy to the plumbing company file (optional).
  - 1 Copy to the client (optional).

##### 18.2 Connections to Pipelines:

- Is the hole made in the municipal pipeline of the correct size and is it properly aligned with the saddle?
- A PVC-U saddle should be joined on the municipal line by means of 687/617 Prostruct with either cable ties or aluminum straps.
- A clay pipe saddle should be joined to the municipal line by means of the appropriate cement mortar mixture.
- In the case of PVC-U and clay saddles the entire saddle should be encased in concrete on all sides. Excessive use of concrete will only complicate future rehabilitation projects, so limit the thickness to 100 mm.
- The inside of the connection should be smooth and free of any sharp points or edges.
- A concrete stop block of minimum 300 mm wide must be constructed where required.
- Concrete should be left for not less than 24 hours before backfilling commences.
- The alignment of the municipal pipeline must remain straight after the connection is completed
- In the case of a clay pipe it must be checked to ascertain if any cracks are present. If so, the contractor must repair.
- The new saddle or Y-junction installed should be aligned in the direction of the forthcoming connection pipeline at an angle not exceeding 45° (measured from the vertical).

- The new connection should be installed at an angle not exceeding 45° and should be installed in the correct direction to correspond to the flow direction of the municipal pipeline.
- The correct pipe bedding, blanket and backfilling material must be used as specified. The foreman must as far as practically possible, make sure that no rocks are backfilled onto the pipeline or connection.
- The site must be completely finished and all building rubble removed prior to the final inspection.

### 18.3 Connections in Manholes:

- Usually only the portion of the benching where the connection must join up is broken away. The contractor must either use a cement mortar mixture or a commercially available wet-dry bonding application to ensure that the newly built benching properly joins to the existing benching.
- The new connecting pipeline should join soffit to soffit (levelled from the inflow side) and the contractor should ensure that a constant positive slope in the new channel is maintained up to the connecting point with the municipal pipeline.
- Ensure that the new connection is encased in concrete for at least 500 mm (measured from the outside of the manhole chamber). The new connecting point should end in a hepsleave encased in concrete to ensure that a flexible joint is created.
- The contractor should use 687/617 Prostruct to ensure that the manhole is sealed against any possible groundwater infiltration.
- The foreman will inspect the manhole for any structural damage. The manhole will have to be repaired or, if required, rebuilt by the contractor if such damage is a result of the work of the contractor.