

Victoria Falls municipality

Engineering Services Department.

1. Roads Section.

Procedure

The roads section would normally be divided into three (3) divisions and these include Planning and Design, Works and Construction and Rehabilitation Maintenance Divisions. The work involved in each of them is outlined below.

1. Planning and Design Division.

- Engineering surveys to get ground levels and the general terrain of the earth and other natural structures.
- Design of road structure such as road pavement, drains and Culverts.
- Testing of the soils and carrying out of experiments to determine Engineering parameter of the soil structures.
- Gravel prospectors done in this division.

2. Works and Construction.

- Determination of the bills of quantity and cost them.
- Inspection of road construction material on delivery, to verify as per the designer's specification.
- Setting out of the roads and the related structures such as curves, drains etc.
- Transfer of level from drawings to the ground for construction purposes and interpretation of the working drawings.
- Change of designs where needed in consultation with the Design section.
- Formation and building the road structures to the specification of the designer.
- Surfacing and marking of the road.

3. Rehabilitation and maintenance.

- Preparation of Programme of maintenance works.
- Repair of defected road structures such as surfaces, culverts, storm water drains and road signs.
- Analyse of the condition of the roads, recommending and implementing the remedies appropriate.
- Analysis of cause of structural failures, recommending and applying the corrective measures.
- Renewal of road markings as and when they are invisible.

The aim of the Section should be to provide durable, reliable and serviceable road structure. Thus, the major thrust should be adherence to standard and specification. Soils test to ensure

quality of material at construction should be emphasized and given the due importance. It is thus imperative to establish soils laboratory with qualified personnel.

The effectiveness of the section depends largely on the availability of resources (material and Human) and equipment. The earth moving equipment and compacting equipment are the back born of the section.

2. Sewerage Section.

Procedure.

The Sewerage section would normally be a subsection of Water Section. The would have two (2) branches, that is the Portable Water branch (normally referred to as Water) and the Sewerage, which deals with

4. Planning and Design Division.

- Engineering surveys to get ground levels and the general terrain of the earth and other natural structures.
- Design of Sewer and water structure such as longitudinal, manholes, valves spacing, hydrants and sand traps.
- Testing of the soils and carrying out of experiments to determine Engineering parameter of the soil structures.
- Gravel prospectors for bedding done in this division.
- Liaison with consultants for major works such as design of treatment plants for both water and sewerage.

5. Treatment Plants.

- Determination of the bills of quantity and cost them.
- Inspection of road construction material on delivery, to verify as per the designer's specification.
- Setting out of the roads and the related structures such as curves, drains etc.
- Transfer of level from drawings to the ground for construction purposes and interpretation of the working drawings.
- Change of designs where needed in consultation with the Design section.
- Formation and building the road structures to the specification of the designer.
- Surfacing and marking of the road.

6. Rehabilitation and maintenance.

- Preparation of Programme of maintenance works.
- Repair of defected road structures such as surfaces, culverts, storm water drains and road signs.
- Analyse of the condition of the roads, recommending and implementing the remedies appropriate.
- Analyse of cause of construction failures and recommending and applying the corrective measures.
- Renewal of road markings as and when they are invisible

3. Transport & Fleet Management Section

A Vehicle Accidents

When a vehicle is involved in an accident, the driver reports to both the Police and the Transport & Workshop Manager in turn reports to the Town Engineer and the Council Insurance. The Driver would then write a report to the Transport Manager and with the assistance of the transport manager completes insurance claim form. A driver's photocopy of driver's license should also be submitted together with the claim form. The manager would then submit a report of both the driver and Police to TE giving recommendations of the way forward. Furthermore, he would then facilitate the sourcing of quotations and submit them to the Insurance together with the claim form through the Town Treasurer.

The driver should be suspended from driving with immediate effect until a board of enquiry is conducted to determine the position.

NB: Driving suspension is affected to every driver who has been involved in an accident whether innocent or guilty until proved innocent by the board of enquiry.

Furthermore, if the driver is found to be at fault, he should be made to pay the excess. (Excess is part of the claim not paid by Insurance). The excess currently is 3% of value for private vehicles and 5% of value for commercial vehicles.

B Requirements for driving Municipality Fleet

A minimum of two years experience shall be required for one to drive a council vehicle/ plant or equipment. After submission of proof required experience is obtained, the driver undergoes practical tests with the workshop and Transport Manager and if successful the driver completes an

NB All heavy vehicle drivers must be in possession of Defensive Driving Certificates as prescribed in the Road Traffic Act Section 81(Cap 13:11) of 2001.

C. Transport, Plant & Equipment Hire

Enquiries for equipment hire are done at the workshop to ascertain availability. The intending client details are filled in a Plant & Equipment hire form before the actual hiring

takes place. The hire form consists of the following information: date, clients name, type of equipment to be hired, hire charges, approximate duration & the conditions of hire. The letter states the equipment will be operated by a council employee while on hire. In addition, where the hired plant/ equipment remains on site overnight, the hiring company shall secure the equipment on council's behalf. The Workshop and Transport Manager signs recommending the hire, while the Town Engineer approves. The Town Treasurer also signs to authorize terms of payment. While on hire the driver/ operator shall complete both the journey sheet and log book. Opening mileage shall be recorded on hire form. On completion of the job, the closing mileage shall be recorded on the hire form, journey sheet and log book. The completed form shall then be forwarded to the accounts section for invoicing and payment.

D. Fleet Movement

Vehicle movement should be accompanied by a journey sheet. The journey sheet acts as a proof of authorization for the journey being undertaken. A journey sheet should be completed in triplicate, one copy to go with the driver, a second copy to remain with the security and the last one to remain with the Transport & workshop Manager. The journey sheet comprises of the following details; Drivers' name, accompanying person(s), vehicle fleet number and registration, make & date of notification. Proposed date of departure, duration, mileage out – in and time. Signatures of applicant, Workshop & Transport Manager & of the Head of Department approving.

E. Fleet Renewal Policy

Since vehicles do not operate indefinitely and in a reliable and cost effective way, there is need for a renewal policy. The standard life of a vehicle is 5 years, however considering the prevailing economic climate a 10 year renewal policy is more appropriate.

F. Rules Governing Use & Parking of Vehicles

1. All vehicles are controlled by the Town Engineer and are on 'Hire' to other departments. All faults, damage and loses of any items from a vehicle should be reported to the Transporter Officer immediately.
2. No vehicle shall be taken beyond the Victoria Falls Town Boundary without the permission of a head of department and without informing the Transport Officer in advance so that the vehicle may be checked. (This does not apply to Fire vehicles on emergency Calls).
3. Each vehicle has a logbook, which must be kept within the vehicle and must be completed fully for each journey undertaken (Unless exemption has been granted). The statement 'General Duties' is not acceptable. Fuel should be recorded within logbooks. Log book sheets must be given to the Transport Officer for signing on the first working day of each month.
NOTE when collecting fuel the Driver should ensure that the pump reads 'zeros' and should confirm that the quantity entered on the fuel card is correct.
4. All journeys outside normal working hours should be clearly indicated in the logbook.

5. Vehicles should be parked overnight and at weekends at the locations specified below and the keys left with the Council Security section unless alternative arrangements have been made with the Transport Officer.
6. Officers who have not been designated “Essential Users’ and who wish to use a vehicle outside normal working hours must seek authority from their Head of Department.
7. Vehicles other than those used by essential users, should be parked at designated parking places during lunch hour.
8. Any driver driving, attempting to drive or have driven a council vehicle while under the influence of alcohol shall be suspended from driving.
9. Unauthorized passengers may not be carried in or on any other vehicle , tipper, item of plant or tractor and may only be carried in any other vehicle with the permission of the HOD.
10. Council resolution on use of vehicles shall always be observed.
11. Should any of these rules not be adhered to, disciplinary action will be taken against the driver concerned.

Designated Parking Areas

Standby Vehicles	- Security Offices
Fire Vehicles	- Fire Station
Ambulance	- Clinic
HODs	- Residence
Rest of vehicles	- Workshop

Security Officials have the authority to impound any vehicle found parked at unauthorized places or being misused.

4. Town Planning & Development Control

Layout Preparation

Planning in residential areas is guided mainly by the guidelines from the Ministry of Local Government, Public Works & National Housing through circulars and to a certain extent by the Local authority’s requirements. The most recent circular on National Housing is Circular No 70 of 2004 & in summary, the standards are outlined below. The Ministry reserves the right to change these standards are outlined below. The Ministry reserves the right to change these standards.

1. Stand sizes

Low Cost/ High Density Housing

- These range from 70 m² & 200m².
- 70m² & 89m² to be for semi – detached & terraced housing only.
- 90m² – 200m² for detached housing
- Minimum frontage 7m.

Middle Income/ Medium Density.

- Ranges between 300m² & 500m².

- Single family dwelling only (no outbuildings permitted).

Low Density / High Cost Housing.

- Ranges between 800m² & 2000m².

2. Building Lines

High Density Housing

Except where otherwise justified & approved by the Director of Physical Planning, the minimum building lines

- a) 1m from the side boundary.
- b) 3m from the front boundary.
- c) 2m from the rear boundary.

Medium Density

5m from front boundary, 2m from side boundary & 3m from the rear boundary.

Low Density

5m front boundary & 3m all other.

3.0 Road Widths & Access

District Distributors (main internal traffic routes) & Primary Distributors (Major Regulations through roads) show ranges between 20m - 25m & 25m – 30m respectively.

3.1 High Density

- All stands to have direct road access.
- Access roads 8m distributors 10m & 12m.

3.2 Medium Density

- Access roads 10m & local distributors 12m –15m.

3.3 Low Density

- Access roads 12m & local distributors 15m.

4.0 Open Spaces & Buffers

4.1 Open Space & Recreation

Open spaces to cater play areas, passive recreation & general community use to be provided for in each layout but should not exceed 5% of the plan area. In medium & low density areas land set aside for this purpose to be very limited.

4.2 Buffers & green belts

These are created to separate residential from rivers and other water bodies. Other buffers between residential stands & major road distributors shall be in accordance with the design manual.

5.0 Infrastructure

To reduce costs for servicing, minimum standards are set as follows:-

5.1 High Density

- a) Access roads to be appropriately graveled with a cross gradient of about 5%.
- b) Wherever possible, dish drains be used instead of piped culverts.
- c) Higher Order roads to be surfaced.
- d) All stands to be connected to a reticulated water supply network as a standard requirement & to a reticulated sewerage system.
- e) Minimum of 100mm diameter sewer with 0.3m depth of cover at the head of sewer. Sewer gradients of between 1:60 & 1:50 for 100m diameter sewers.

5.2 Medium Density & Low Density

- a) All roads to be surfaced
- b) Water supply standards

Forward planning

This looks ahead to avoid being caught unaware, to be pro-active in the sense you look at socio-economic and political changes and plan accordingly. Under forward planning, we prepare local plans from master plans as well as Local Subject Plans. Carrying out soil tests before preparing layouts, as well as keeping Registers for all local plans, permits subdivisions and enforcement orders.

Standards for the preparation of layouts

E.g one primary school per every 500 stands, one secondary school per every two primary schools. Primary and secondary school sizes 5ha and 10 ha respectively with 10% variation permitted .

Due to the rising cost of living BCC has come up with several options to cater for the informal sector, starting from service industrial bays that vary from 50m² to 100m², factory shells and employment creation zones (downstream industry) that are +/-300m².

All incidental open spaces in residential areas were identified and infill residential stands created to reduce the housing backlog as well as to create a compact city.

- Forward planning is very important in ensuring society's demands are met or partially met in time.

Development Control

Main aims of development control are as follows

- To ensure that development takes place in the designated land use, e.g. residential, commercial e.t.c.
- To protect people and property by ensuring that buildings are safely constructed, and that living conditions are healthy and free of pollution.
- To improve the environment through the imposition of conditions in development permits to ensure disposal of waste products and conservation of valleys and mountains.

- To improve standard of development by improving the architectural landscape of a town and the quality of the buildings.
- To promote development through the co-ordination of private and public investment for the more efficient use of land.

Development control is done through several mechanisms provided for in the Regional, Town & Country Planning Act.

Any person who wishes to carry out development must first get permission from the Local Authority in the form of a Development permit. Attached is a development permit specimen that we are going to use. All uses that require a development permit are outlined in the Regional, Town & Country Planning Act CAP 29:12. The following procedure has to be followed when considering a special consent application.

1. After receiving an application that falls within the provisions of section 26 ss 3 of the Act, the applicant has to be advised that the application requires council's special consent and the requirements thereof. The applicant is therefore advised to complete a TPD 1 form and attach a Photostat of title deeds or lease agreement.
2. A memorandum is sent to the Town Clerk giving names & addresses of adjacent property owners and an advert is attached.
3. After advertising, if there are objections, the applicant is advised and given time to respond.
4. The planning section then considers the application, taking into consideration the application's implications on town planning,, the objections and response from the applicant then recommends to the relevant committee.
5. If approved a development permit is issued with conditions clearly stated.

Application for a subdivision permit

- 1) The applicant collects a TPSC1 form from the municipal offices and submits it to the Town Planning Section, signed and completed together with a copy of title deeds and bondholder's consent if the property is mortgaged. The application must be accompanied by a layout plan on sepia with 12 copies of the layout plan and a planning report to support & justify the application.
- 2) A permit is issued within 4 months of the application if all requirements are met to the satisfaction of the Town Engineer.
- 3) The permit stipulates all municipal requirements and it should be read in conjunction with the manuals from water & roads section and the housing & community services department of the municipality.
- 4) The developer shall submit to council a layout plan depicting the phasing of the development together with a development program for the different phases.
- 5) Once a permit to subdivide is issued, the developer is required to submit to the respective departments, detailed layouts for water, sewer and roads together with drainage details for approval by council before work commences on the project.
- 6) The developer is required to engage a registered surveyor to survey the land and clearly indicate pegs for each stand. Upon surveying the stands, the developer shall submit to council a layout approved by the surveyor general, the municipal surveyor shall double check the works on the ground to ensure compliance, and this shall be at the developer's cost.

- 7) Servicing shall commence once council approves the detailed layouts and this shall be done in liaison with respective departments and under close supervision by the Municipal Engineer to ensure compliance with council specifications as stated in the design manuals.
- 8) The transfer of stands can be done once servicing is completed to municipal satisfaction and in accordance with the approved layouts and specifications.
- 9) The municipality will be in a position to accept building plans for the respective properties once metered water connections are provided for the stands and each stand is provided with entrance slabs, culverts where necessary as specified by the Roads Technician.
- 10) The developer can only move on to the next phase of the development once the first phase is complete.

Building & Building Inspectorate Section

Buildings in broad terms include all structures. These are beer halls, clinics, schools, public toilets, halls, football pitches, offices, swimming pools, residential houses and a workshop. All maintenance it means repairing them to be in good order again. This includes doors, keys, roofs, floors, windows and terraces.

Construction designs denote the building plans; all building plans designs of council properties are done by this section. When plans have been designs, all materials estimates have to be done and construction estimates are produced as well.

Building Plan Approval

It can be noted that in urban areas all building plans should go through council before construction starts. All building plans have to be evaluated for determining the total estimated building costs at 1% or 3% is chargeable for residential and commercial respectively. After the charges have been paid up, the owners then submit their respective plans for approval. When the plans have been submitted, all the plans will go under registration book and each plan is given its plan number, stand number and the date submitted. In the register book, all the players are shown. In this, the players are all officers responsible for checking the plans. Checking the plans means examinations of all building plans. The assessment of plans goes through these offices, Housing, town Planning, Health, Fire, Roads, Building Inspectorate and finally The Town Engineer.

Responsibilities – In this case, responsibility means what each office is expected or required of in terms of building plans submitted. Following the office's responsibilities as shown above, housing has to look into the ownership of the stand on the plans and the validity of leases. The Town Planning has to look at land uses, type of development against the given stand number and whether it concurs with local planning provisions. Health Inspectorate looks at health issues in terms of plans, designs. Fire office looks at fire hose reel points, exists in cases of fire breakouts. Roads office looks at roads against properties and storm water drains in terms of protection of established roads. In this case, the building lines at frontages would be observed. Building Inspectorate looks at the accuracy of all designs, whether they comply with the standards. Type of materials to be used. Servitudes and building lines, whether they comply or not. Sizes of window frames used to determine pitch/apex of the roof. To check and determine what is required in domestic sewer systems.

Whether that required manholes, i.e. or vent pipes all this has to be checked by building Inspectorate section.

Development Control

All developments in urban areas have to be controlled. Standards are laid down in order to be followed. We look at heights of buildings especially of buildings especially. The highest buildings must not exceed eleven meters. No building is permissible on or against the streets, no building is permitted on pavements or lanes. There are controls of building lines and servitudes for industrial, commercial and residential. No developments are allowed to encroach into the neighboring properties. This has to be checked and controlled by the building inspectorate section. The section has to see to it, that the rules and regulations in terms of development controls is enforced.

Standards; Enforcements;

It is the duty of the building inspectorate to see to it that the set standards are adhered to, for example in commercial, industrial and low density, standard bricks have to be used only. While in the low cost houses, one can use either standard or Kimberly bricks. The concrete mixtures must always be checked and the overall workmanship must be at standard.

Survey administration

After pegging, the surveyors indicate the pegs to the Building Inspectorate. These beacons are then indicated to the stand owners whenever they demand to be shown. If one forgets their pegs, a fee is charged.

PLUMBING

ACTIVITY	MODALITIES
PROJECTS	<p>(1) When doing water reticulation servicing</p> <ul style="list-style-type: none"> - An Engineer have to be consulted for positive identification pipe diameter - In comparison with possible users. - Also building inspector for identification of pegs before excavation to a recommended depth is done. - Bedding surface needs to be rammed. - After laying of pipes tear Tees junctions exposed, Bends, valves and end caps - Backfill in stages as you ram - Tees, bends and valves must be concrete encased. - The line can be tested over night with air release valves fitted.
WATER METER REPLACEMENT	<ul style="list-style-type: none"> - After a new meter has been recommended. - old meter reading have to be recorded. - a new meter has to be tested for speed. - A serial number and new reading and a new reading have to be taken to treasury as well as

	<p>date of installation.</p> <ul style="list-style-type: none"> - Painting of council meters for positive identification is recommended.
BURST PIPES AND SERVICE PIPES	<ul style="list-style-type: none"> - Notify bulk consumers affected for example bakeries, Breweries, Abattoirs, Brick boulders - Isolate linking valves - Open scare valve to drain the line. - Excavate and replace broken pipe - Back fill it central before open valves - Close the scare valve when the line is free from air. - Check for leaks and back fill completely.
WATER CONNECTION	<p>-Before application for water connection is approved, the client should at least have her site fully serviced.</p> <ul style="list-style-type: none"> - Have a lease agreement with council - Chose between the following options available, that is (a) To buy your own material and council to provide labour plus transport. (b) Council supplies every thing required. Once connected, forms must be filled and returned to treasury for billing.
WATER DISCONNECTION	<ul style="list-style-type: none"> - Tenants should be notified in time. - Close council stopcock before the meter, remove the water meter and place a cut-off disc in between the stop –cock and the meter then tighten. - Re connection should be made after full debt have been settled plus penalty.
PROJECTS	<ul style="list-style-type: none"> - When doing water reticulation servicing an engineer has to be consulted for positive identification of pipe diameter in comparison with possible users. - The Building Inspector has to identify pegs before excavation to a recommended depth is done. - Bedding surface needs to be rammed - After laying of pipes tear tees junction exposed, bends, valves and end caps. - Backfill in stages as you ram for tees, bends and valves they must be concrete encased. - The line can be tested overnight with air release valves fitted.

WATER WORKS

The core duty of the waterworks is to produce portable and adequate water supplies.

The production of portable water is complex. There are guide lines as follows which need to be followed for the provision of attractive disease free and adequate water supplies.

A Source raw water should be analysed for abundance and the four characteristics of water i.e. Chemical 2.Radiological 3. Biological and physical make up. This is must be done before water source can be designed for extraction.

B.Before treatment the water supplies should carry out a laboratory jar test to determine the amount of chemicals needed for clarification PH connection and disinfections.

C. Chlorine Residual Levels should be tested at the waterworks and at selected sites after the reservoirs. The levels are important, as low levels cannot disinfect water. Testing should be done three times daily.

D PH levels to safeguard fittings against corrosion. It should also be done three times daily.

E. Samples should be taken to a fully-fledged laboratory at least twice a month for bacteriological testing an order to conform to World Health Organization standards.

F. Samples shows should be sent to a laboratory for chemical analyses at least every standard. Quarter.

NB. Local ZINWA ITN who set standards should be adhered to concerning water and efficient quality.

- 5 Records should be kept on consumption patterns for both chemicals and water Reservoirs should be clean every 2years.The above information is important when -- --with a comprehensive water management system and if followed are a ----quality and resource control mechanism.

MAINTENANCE

A preventive maintenance Programme should be in place servicing of pumps, motors, valves and records kept on all equipment breakdowns and new installations.

There should be annual practice plant shut downs for servicing of plant and equipment.

SEWER PONDS

Management of the sewer ponds is not as complex as the waterworks or a convectional sewage works. Emphasis is on pond maintenance and quality control by sending samples to laboratories as quality as set by ZINWA pollution control unit are to be adhered to failure which Council will be penalized.

VICTORIA FALLS MUNICIPALITY

ENGINEERING SERVICES DEPARTMENT

OPERATION MANUAL

2005