



# **Geo-referenced Dwelling Frame Project:**

## **Detail tender specifications for spatial referenced fieldwork verifications**

## TABLE OF CONTENT

<b>1. Fieldwork – critical point of departure.....</b>	<b>4</b>
1.1. Why fieldwork is needed.....	4
<b>2. Scope of work.....</b>	<b>4</b>
2.1. Attribute Specification.....	4
2.2. Spatial Point Specification.....	11
2.3. Imagery Specifications.....	12
2.4. Fieldwork Verification.....	12
2.5. Dwelling Frame Team Training.....	12
<b>3. Workflow per geography type.....</b>	<b>13</b>
3.1. Urban formal areas.....	13
3.2. Informal Areas.....	15
3.3. Traditional Areas.....	18
3.4. Farms.....	19
<b>4. Quality Assurance.....</b>	<b>20</b>
4.1. Images.....	20
4.2. Spatial point mapping.....	21
4.3. Fieldwork (Stats SA only).....	22
<b>5. Project Management.....</b>	<b>26</b>
5.1. Deliverables.....	26
5.2. Management of Project.....	26
5.3. Progress Reports.....	26
5.4. Payment.....	26
5.5. Penalties.....	27

CONTROL PAGE					
<b>Project:</b>	Geo-referenced Dwelling Frame				
<b>Title:</b>	Detail tender specifications for spatial referenced fieldwork verifications				
<b>Revision:</b>	2	<b>Status:</b>	Working document	<b>Date of Issue:</b>	August 2006
Record of Revisions					
Revision Number	Date	Description			
1	25 August 2006	<p><b>Dense Informal areas</b> - It is important that the local community leaders are approached, as their cooperation is vital. In the dense informal areas the name and surname and contact details of the community leader must be obtained. Registers of residents are kept by community leaders in these areas and copies of these registers must be obtained. This will assist in the cross referencing of the number of dwellings</p>			
Purpose					
To keep all interested parties involved in the project up to date with any amendments.					
Distribution					
Dr L Gavin		Stats SA		DDG	
Ms S Laldaparsad		Stats SA		Executive Manager	
Ms H Verhoef		Stats SA		Manager	
Mr A Erasmus		Stats SA		Manager	
Mr H Moletsane		Stats SA		Manager	
Feedback					
<b>Contact Person</b>		A Erasmus			
<b>Tel:</b>	(012) 3108693	<b>Cell:</b>	084 962 5217	<b>Fax:</b>	(012) 310 8915

## 1. Fieldwork – critical point of departure

### 1.1. Why fieldwork is needed

The reason why fieldwork is needed during this tender is to have a true reflection of what is actually on the ground which will assist Stats SA during surveys in these municipalities. Furthermore, detail information regarding the use of structures, which cannot be obtained during an office exercise, will be obtained. Accurate fieldwork help to minimise sample bias when dwelling units and units in special dwellings are selected for any given survey.

## 2. Scope of work

### 2.1. Attribute Specification

This section provides information regarding the attributes that must be captured. All the attributes will however not be compulsory to be completed for all the geography areas, namely urban, informal, traditional and farm areas. Indications of which attributes are mandatory are specified in the discussion of each of the above geography areas. The following table provides the various attributes to be captured:

Attribute	Abbreviations to be used in database
Municipality	Munic
Traditional Authority	Trad_Auth
Administrative Area ( <i>applicable to former Transkei</i> )	Admin
City/Town/Township	M_Place
Suburb	S_Place1
Village	S_Place2
Alternative Village Name	S_Place2a
Sub-Village	S_Place4
EA Number	EA_No
Unique ID	Unique_ID
Latitude (S)	Lat
Longitude (E)	Long
Height	Z_value
Street Number	Str_Num
Street Name	Str_Name
Street Name Suffix	Str_Suffix
Surname of Head of Household	HHSurname
Name of Head of Household (western or Christian name)	HH_Name1
Name of Head of Household (traditional or African name)	HH_Name2
Unit or Other Number	Unit_No
Source of Number	Source
Feature use	Feature
Building/Complex Name	B_C_Name
Contact details of sectional title development, high-rise flats, cluster developments, community leader's name in dense informal areas, etc.	Contact
Registered Farm Name	F_Name1
Registered Farm Number	Farm_No
Farm Name at gate	F_Name2

Magisterial District	Mag_Dist
Unit Count	UnitCount
Structure Count (traditional and informal areas)	StrucCount
Structure Description (traditional and informal areas)	StrucDesc
SD Identifier (room)	Sd_ID_r
SD Identifier (bed)	Sd_ID_b
Coordinates logged at	Logged
Name and Surname of Head of Household obtained from	Name_from
Photo Number	Photo_No
Comments	Comments

**Note: Refer to supplied MS Access database as example.**

The following is a short explanatory overview of each attribute.

**Municipality:**

This is the current name of the municipality.

**Traditional Authority:**

The name of the traditional authority in which the EA falls must be given here. For example Mutale etc. **Important to note that this column must not just be populated by the existing Stats SA data but must be verified in the field.**

**Administrative Area** (applicable to former Transkei):

A traditional area can be subdivided into smaller areas and will have different names than the traditional authority under which it falls. For example: Amandela, Bomvini, Cwebe.

**City/Town/Township:**

The name of the city or town or township in which the EA falls must be given here. For example Thohoyandou, Port St Johns, Mamelodi, etc. **Important to note that this column must not just be populated by the existing Stats SA data but must be verified in the field.**

**Suburb:**

The name of the suburb in which the EA falls must be given here. For example: Sunnyside, Atteridgeville Zone A, Sea Point, etc. **Important to note that this column must not just be populated by the existing Stats SA data, but must be verified in the field.**

**Village:**

The name of the village in which the EA falls must be given here. For example: Elalini, Masisi, etc. **Important to note that this column must not just be populated by the existing Stats SA data, but must be verified in the field.**

**Alternative Village Name:**

Should the local community have an alternative name for a village, the name must be given here. For example: Maphoko is also known as Pidima

**Sub Village:**

In larger villages the possibility exist that sub villages exist. These sub sections of the larger village must be captured and verified in the field.

**EA Number:**

This number must correspond with the EA in which fieldwork is being done. The EA number consists of 8 digits and will be supplied by Stats SA. For example: 23200263

**Unique Identification:**

The unique identification comprises of a combination between the EA number and a unique waypoint. For example: 23200263\_00012

**Latitude:**

This is the latitude coordinate as indicated by the GPS. The format must be in degrees: minutes: seconds. For example: -27:17:33.12345

**Longitude:**

This is the longitude coordinate as indicated by the GPS. The format must be in degrees: minutes: seconds. For example: 27:58:24.12345.

**Height**

This is the height in meters of the specific point above sea level. For example: 256.49

**Street number:**

In this space the physical street address is given where possible. In those areas where settlements do not have physical addresses, then the name of the village or settlement is captured in the respective space provided for.

<b>Examples:</b>	<b>Street number:</b>
8 Pedi Street	8
	or
B2508 Soshanguve East	B2508

**Street Name:**

In this column the street name is given. In those areas where settlements do not have physical addresses, then only the name of the village or settlement is captured in the Village/Suburb column. An example of a street name: Pedi

**Street Name Suffix:**

In this column the street suffix is provided. Table 1 below indicates the abbreviations that should be used in this column.

Table 1: Abbreviations for street suffix

Street Type	Abbreviation
Avenue/Laan	Ave
Circle/sirkel	Cr
Close	Cl
Crescent	Cres
Drive	Dr
Grove	Gr
Lane	Ln
Road	Rd
Ryland	Rla
Singel	Sgl
Street/Straat	Str
Way/Weg	W
Boulevard	Bvr
Place	Pl
Plain/plein	Pln
Stairs	St
Steps	Stp
Terrace	Tr

Source: Social Stats, 2005

An example of a street name: Str

**Surname of Head of Household:**

The surname of the head of household is written down in cases where there is no number available especially in traditional and informal areas. Example: Segage

**Name of Head of Household (western or Christian name):**

The western or Christian name of the head of household is written down in cases where there is no number available especially in traditional and informal areas. Example: Michael

**Name of Head of Household (traditional or African name):**

The traditional or African name of the head of household is written down in cases where there is no number available especially in traditional and informal areas. Example: Tshabisang

It is important that the Non Contact form is completed in cases where the fieldworker was unsuccessful to obtain any info regarding the name and surname. Furthermore, it is important that all indicated steps were followed to ascertain the name and surname. Reasons for not following all the steps must be provided. The following abbreviations can be uses in the field to include reasons for not populating the name of head of the household:

1	Non-Contact
2	Formal area (with proper street name, number and suffix) - not required

Example of the non contact form:

NON CONTACT FORM		
CONTRACTOR NAME:		
FIELDWORKER NAME:		
MUNICIPALITY:		
TRADITIONAL AUTHORITY / MAIN PLACE:		
VILLAGE / SUB PLACE:		
EA Number		
Unique ID:		
Latitude :		
Longitude :		
<b>STEPS TAKEN TO OBTAIN INFORMATION:</b>		
	Please tick if applicable	Date
1. Traditional Authority [iNkosi (chief), iNduna (headman)]		
2. Ward Councillor		
3. Civics Association		
4. Proxy (neighbours)		
5. Other		
Signed .....		

**Unit or Other Number:**

This column is used to give any other visible numbers that are used to identify the dwelling which are not already captured in the street name and number columns. Where there are multiple sets of numbers capture all the numbers. The photo shows a typical dwelling with various numbers.



SAPO numbers are important. The possibility exists that not all the areas will have been allocated with a SAPO number. The number SAPO has been allocated to a house either by painting it on or fixing a plate on the house. The SAPO numbers in the traditional areas comprises a 5 to 6 digit number. An example of a SAPO number: 10301

The photo shows a typical SAPO number painted on a house.



**Source of Number:**

In this column the source of the number that has been allocated in the column “Unit or Other Number” is given.

SOURCE	ABBREVIATIONS
South African Post Office	Sapo
ESKOM	Eskom
Telkom	Telkom
Local Authority	LA
Census	Stats_SA
Other	Write down name of organisation

**Feature use:**

In this column the main land use is indicated, in other words the type of building, or the use of the piece of land. Tables 2 and 3 below indicate the abbreviations that should be used in this column. **For anything that does not have a code (such as cemetery), the feature use must be written out in full.**

**Table 2: Abbreviations for different structures or land use**

FEATURE USE (LAND USE)	ABBREVIATIONS
Dwelling Unit	Du
Vacant Dwelling	Vd
Holiday Home	Rec
Students' residence	Sd_Stres
Home for aged (other than a frail care centre)	Sd_Home
Workers' hostel	Sd_Whost
New dwelling under construction	Nduc
Park	Park
Garage	Gar
Offices	Off
Business	Bus
Post office	Po
Market	Mark
Shop	Shop
School	Sch
Vacant land	VI
Vacant stand/plot	Vs
Factory	Fact
Bank	Bank
Police station	Plsn
Filling station	Flsn
Church or other place of worship	Ch_Msq
Day clinic	Cl
Sports, oval, stadium	Oval
Bottle store	Bs
Storage room	Store
Residential hotel	Resh
Guest house/Lodge	Gh
Demolished Structure	Dem

Source: Social Stats, 2005

**Note:** It is important to ensure that the correct codes are allocated to the structures. Dwelling unit numbers will be allocated by Stats SA to all dwelling units coded as PD (PD stands for private dwelling, which is the same as a dwelling unit). If for example vacant land has been allocated a PD code by accident it will create problems when sampling as a PD number will be allocated and then if that that particular PD is sampled it will be a non-response. The same is applicable for special dwellings.

**Table 3: List of feature use for Special Dwellings (SD) and abbreviations**

INSTITUTION	ABBREVIATION
Non-residential hotel	Sd_Hotel
Hospital/ frail care centre	Sd_Hosp
Old Age homes	Sd_Home
Child care institution/ orphanage	Sd_Ccare
Workers Hostel	Sd_Whost
Boarding school hostel	Sd_Shost
Initiation school	Sd_Init
Convent/ monastery/ religious retreat	Sd_Con
Defence force barracks/ camp/ ship in harbour	Sd_Barr
Prison/ correctional institution/ police cells	Sd_Prsn
Community/ church hall (in cases of refuge for disaster)	Sd_Hall
Refugee camp/ shelter for the homeless	Sd_Shel

Source: Social Stats, 2005

**Building/Complex Name:**

In the case of blocks of flats, townhouse complex, hospitals, hostels, etc. the name of building is given here.

**Examples:**

14 Loerie Street, Country Lane Estate

or

21 Andries Street

**Building/Complex Name:**

Country Lane Estate

Hilton Heights Apartments

**Contact details of sectional title development, high-rise flats, cluster developments, etc:**

This the contact details (name and telephone number) of the body corporate, care taker, iNduna/chief of hostel to enable Stats SA to make follow up queries after the project.

**Registered Farm name:**

The registered name of the farm as in the title deed is given here. For example: Portion 2 of the farm Tweespruit.

**Registered Farm Number:**

The registered number of the farm as in the title deed is given here. For example: Tweespruit 375JR.

**Farm Name at the gate:**

This is the more known or commonly used farm name within the local community. For example: Koedoespan.

**Magisterial District:**

This field is only completed in case of farms. Magisterial Districts is still the reference framework for official farm demarcation.

**Units Count:**

In this column the number of other dwellings units is given. The fieldworker will probe from the caretaker or administrator or iNduna the number units.

Example:

Block of flats	Number of flats
Townhouse complex	Number of townhouses (units)
Hospital	Number of beds
Hotel	Number of rooms
Retirement village	Number of units
Old Age homes	Number of rooms
Prison	Number of cells
Defence force barracks	Number of beds
Boarding school hostel	Number of rooms
Hostel	Number of rooms/beds

Source: Geography, 2005

**Structure Count:**

In this column the number of structures per traditional homestead is given. This field is also applicable for informal areas.

**Structure Description:**

In this field a short description of the structure, being it a traditional homestead or informal dwelling, is given. The description must **not** make reference to the colour of the front door or roof as this can change over time. As a cross reference the number of structures must be mentioned. Example:

Three rondawels and a red brick house with large veranda. OR

One double store corrugated (zink) structure together with half completed brick room.

**Number of room (SD Identifier):**

In a Special dwelling (SD), the number of rooms and beds are important. Arrangements in Special dwellings can be that each bed or room is treated as a dwelling and this is important for EA demarcation. The fieldworker will probe from the administrator or iNduna to determine the number of rooms in the SD.

**Number of beds (SD Identifier):**

In a Special dwelling (SD), the number of rooms and beds are important. Arrangements in Special dwellings can be that each bed or room is treated as a dwelling and this is important for EA demarcation. The fieldworker will probe from the administrator or iNduna to determine the number of beds in the SD.

**Coordinates logged at:**

This will provide an indication where the GPS point was taken in the field. Note in the event that no access to a property is possible it is important that the GPS point must be taken as close as possible to the location of structure in question.

**Table 5: List of codes**

Logged at	Code
Office created point	01
At front door	02
At fence outside stand (centre)	03
At the corner of stand	04
At the gate	05

**Name and Surname of Head of Household obtained from:**

This field will provide an indication of the source from which the name and surname of the head of household was obtained.

Source	Code
Head of household	01
Family member	02
Neighbour	03
Traditional Authority [iNkosi (chief), iNduna (headman)]	04
Ward Councillor	05
Civics Association	06
Other (Specify)	07

**Photo Number:**

The photo number must correspond with the unique identification number and comprises of a combination between the EA number and a unique waypoint. For example: 23200263\_00012.

**Comments:**

The purpose of this attribute is to provide reasons why fields are not populated.

**2.2. Spatial Point Specification**

The following is the minimum specifications that Stats SA will allow with respect to the spatial point:

- The coordinate system is: Geographic, Hartebeeshoek 94 datum, WGS84 ellipsoid.
- The coordinates must be captured in degrees:minutes:seconds. Five decimal seconds must be provided with each degrees:minutes:seconds coordinate set (29:31:51.**12345**, -26:30:49.**12345**)
- Attribute information linked to each spatial point must at least include EA number and Unique ID.

- Data must be supplied in a personal geo-database format (ESRI).
- No multi points ( .Shp file characteristic associated with .shp exported by means of Intergraph's Geomedia software)

### 2.3. Imagery Specifications

Stats SA will supply the images for each applicable municipality as received from the Chief Director Surveys and Mapping. The over-all image processes can be divided into five parts, namely:

- (i) reprojecting the images into the correct coordinate system
- (ii) mosaicing of the imagery set
- (iii) resampling of the imagery set
- (iv) clipping the images into 1:10 000 scale grid
- (v) converting the images to Mr Sid format

Imagery is an important aspect of the tender and the following is the minimum specifications that Stats SA will allow:

- Background (void areas) must be transparent with a value of zero
- The unit of delivery of the aerial photography must be in 1:10 000 tiles similar to the national ortho-photo map series.
- The coordinate system is: Geographic, Hartbeeshoek 94 datum, WGS84 ellipsoid
- The format in which the images must be delivered is Mr. Sid format and the compression ratio must be 1:10
- Both the tiff and sid format must be supplied to Stats SA
- The above mentioned coordinate system must be allocated to each of the images. Erdas / Arc map must be able to read the allocated coordinates system automatically without any post processing i.e. allocation of coordinate system.

### 2.4. Fieldwork Verification

After the spatial point exercise field workers can start to verify structures and complete the associated attributes. Important aspects to keep in mind during the field verification exercise are as follows:

- The capturing of the name and surname of the household head is compulsory **except** in situations where there is a proper street address (name and street number).
- Final delivery of data must be in a personal geo-database.
- During the verification of structures a photo (in jpeg format) must be taken of each structure that is verified. The photo number must correspond with the unique ID of that specific structure.
- Five decimal seconds must be provided with each degrees:minutes:seconds coordinate set (29:31:51.**12345**, -26:30:49.**12345**)
- The location of the final field verified spatial point **must be on the roof** of the structure.

### 2.5. Dwelling Frame Team Training

The capacitating of the Stats SA internal dwelling frame team during the duration of the project is crucial. It will be expected that members of the Stats SA dwelling frame team join the successful contractors during the field exercise. Therefore, a proposal for training and capacitating the Stats SA dwelling frame team must accompany this tender submission. The proposal should make provision for the following:

- Assessment of staff on programme entrance
- Structured training programme with specific goals
- Assessment of staff at the end of the programme/project

### 3. Workflow per geography type

#### 3.1. Urban formal areas

**Definition:** For the purpose of the project formal urban areas are those areas in a municipality that have infrastructure, are planned and surveyed in small units such as erven/stands with different land uses assigned to them, and are serviced in terms of water, electricity and sanitation by the local authority.

**Note:**

- One spatial point per cadastral parcel is required.
- Completion of attributes must be in Title Case (example: Port St Johns)
- In formal areas, the local municipality can be approached to determine whether they have an address system in place and if so this address system can be incorporated into the spatial point creation process as long as the data conforms to the format as specified in this document and is verified on the ground.
- With respect to sectional title development, high-rise flats, cluster developments, hospitals, hotels and hostels the name as well as the number of units must be determined.
- Every building that has a name (schools, clinics, hospitals, police stations, churches, and post offices) must be captured.
- If no information is available the field must be populated with a "0" (zero value). NULL values are not accepted.
- In terms of cities and towns that do have existing address data sets the following methodology must be followed:
  - √ Stats SA will do an assessment on the existing address data sets benchmarking the data against the household count and dwelling count. Not all EAs will have to be verified in the field. Stats SA will indicate the number of EAs that needs to be completed and the spatial location of these EAs (refer to annexure 1).
  - √ Important to keep in mind that very few existing data sets make provision for Special Dwellings and the following attributes (apart from the standard address attributes) that has specific reference to Special Dwellings (refer to Table 3) and must be completed when a Special Dwelling is identified:
    - Building/Complex/Farm Name or Farm Number
    - Type of main dwelling
    - Unit count
    - SD Identifier (room or bed)
- During the verification of structures a photo (**in jpeg format**) must be taken of each structure that is verified. The photo number must correspond with the unique ID of that specific structure.
- Cognisance must be taken in the following cases:



#### High rise flat buildings

- One spatial point per property.
- Should there be more than one building with different names, all the names must be captured in the Building/Complex name field.



### **Town house developments**

- One spatial point per development
- Name of development (complex name)
- Number of units



### **Hospitals**

- One spatial point for the hospital building itself
- Should the hospital development make provision for a nurses home a separate spatial point must be placed on the nurses home(if applicable)
- Furthermore, a “staff village” can be developed on the same property. In this case the staff village must be treated as urban formal.



### **Schools/Universities**

- One spatial point for the school or main university building and
- One spatial point per school or university residence.

### 3.2. Informal Areas

**Definition:** Informal settlements or 'squatter camps' occur on land, which has not been surveyed or proclaimed as residential, and the structures are usually informal. They are usually found on the outskirts of towns or in pockets of 'infill' inside towns, or along railways and roads. Some informal areas are also found in tribal areas (e.g. in Mpumalanga) and in townships. Although informal settlements occur within rural areas all EAs of this type were classified as urban informal in 2001

**Note:**

There are **two** methodologies to follow when capturing urban informal areas.

**Methodology 1: Lesser dense urban informal areas :**

This includes less dense informal areas where the separate dwelling/structure are clearly visible and it is possible to place a spatial point with confidence on every dwelling/structure.



- Each structure should be allocated a spatial point.
- Completion of attributes must be in Title Case (example: Port St Johns).
- In the case of informal areas instead of completing the Village or Suburb name it will be necessary to complete a Locality name (example: Winnie Mandela Squatter Camp)
- It is important that the local community leaders are approached, as their cooperation is vital.
- Most community leadership committees keep a register of the community members and their housing unit numbers. Such registers may come in handy during fieldwork, depending on the accuracy and

updating of the register. These registers must however be verified on the ground.

- Capture ALL visibly displayed numbers, and their sources.
- Not all informal areas will have street names and numbers.
- Unofficial street names as use by the communities must be captured.
- Every building that has a name (schools, clinics, hospitals, police stations, churches, post offices) must be captured.
- If no information is available the field must be populated with a "0" (zero value). NULL values are not accepted.
- The following attributes (apart from the standard address attributes) has specific reference to Special Dwellings (refer to Table 3) and must be completed when a Special Dwelling is identified:
  - Building/Complex/Farm Name or Farm Number
  - Type of main dwelling
  - Number of Other Units
  - Further Identification
  - SD Identifier (room or bed)
- In cases where rooms are rented out, the name of the landlord must be provided in the head of household field.
- During the verification of structures a photo (**in jpeg format**) must be taken of each structure that is verified. The photo number must correspond with the unique ID of that specific structure.

### Methodology 2: Dense urban informal areas:

This includes dense informal areas where the separate dwelling/structure are not clearly visible and it is not possible to place a spatial point with confidence on every dwelling/structure.



- Demarcate the extent of the urban informal area clearly. The boundary of the dense informal areas should be a polygon.
- **Contractors should submit the demarcated dense informal areas to Stats SA for acceptance of the informal areas as dense informal areas before proceeding with the process or going into the field.**
- After confirmation of the dense informal areas by Stats SA fairly accurate office spatial points on visible structures can be captured in order to determine the approximate structure count are needed in these kind of urban informal areas.



- In terms of dense urban informal areas it is important that all fields associated with place names must be verified. The following attributes in terms of the place name must be completed:

Municipality
Traditional Authority
Administrative Area ( <i>applicable to former Transkei</i> )
City/Town/Township
Suburb
Village
Alternative Village Name
Sub-Village
Contact details of sectional title development, high-rise flats, cluster developments, community leader's name in dense informal areas, etc.

- No door to door fieldwork will be undertaken in these kind of urban informal areas, however institutions located in these areas need to be verified. The following attributes (apart from the standard address attributes) that have specific reference to Special Dwellings (refer to Table 3) and must be completed when a Special Dwelling is identified:
  - Building/Complex/Farm Name or Farm Number
  - Type of main dwelling
  - Unit count
  - SD Identifier (room or bed)
- Completion of attributes must be in Title Case (example: Port St Johns).
- In the case of informal areas instead of completing the Village or Suburb name it will be necessary to complete a Locality name (example: Winnie Mandela Squatter Camp)
- It is important that the local community leaders are approached, as their cooperation is vital. In the dense informal areas the name and surname and contact details of the community leader must be obtained. Registers of residents are kept by community leaders in these areas and copies of these registers must be obtained. This will assist in the cross referencing of the number of dwellings.
- Every building that has a name (schools, clinics, hospitals, police stations, churches, and post offices) must be captured.
- If no information is available the field must be populated with a "0" (zero value). NULL values are not accepted.

- During the verification of Special Dwellings a photo (in jpeg format) must be taken of each Special Dwelling that is verified. The photo number must correspond with the unique ID of that specific structure

### 3.3. Traditional Areas

Definition: Traditional areas are trust land declared as such, with surveyed boundaries and registered at the SG. Traditional leadership manages these areas. Settlements within these areas are villages or wards, which could have basic services or not. Some have a formal appearance.

Within villages, housing units on distinguishable stands are frequently visible but mostly not surveyed. The smallest land parcel surveyed in most traditional areas is the Traditional Authority area that usually contains more than one village.

#### Note:

- In the event that service provider(s) have assigned more than one set of numbers per what is deemed as one homestead it will be necessary to enquire whether more than one household is living at the homestead, before allocating the same number of spatial points. This necessary due to the social dynamics e.g. separate homesteads due to polygamous marriages etc.
- In areas where service provider(s) have not assigned any numbers, it will be necessary to investigate the living arrangements, thus, the number of households and ownership of land parcel, before a spatial point(s) may be allocated.
- Capture ALL visibly displayed numbers, and their sources.
- Completion of attributes must be in Title Case (example: Port St Johns)
- It is important that the correct procedures and protocol is followed before entering the area, as the cooperation of the tribal authority body [iNkosi (chief), iNduna (headman), ward Councillors] is essential.
- Most traditional areas will not have street names and numbers.
- Unofficial street names as used by the communities must be captured.
- Number of all structures per homestead must be determined and completed in the "Structure count" field.
- Although a photo is taken the "Structure description" field must be completed for each homestead.
- Every building that has a name (schools, clinics, hospitals, police stations, churches, and post offices) must be captured.
- If no information is available the field must be populated with a "0" (zero value). NULL values are not accepted.
- The following attributes (apart from the standard address attributes) has specific reference to Special Dwellings (refer to Table 3) and must be completed when a Special Dwelling is identified:
  - Building/Complex/Farm Name or Farm Number
  - Type of main dwelling
  - Unit count
  - SD Identifier (room or bed)
- Similar to the above in the event that cluster developments as well as high rise flat buildings are developed in traditional areas, these developments must be treated the same as in urban areas.
- If state parks or recreational land is encountered, a meeting with the management must be arranged to obtain layout maps that can help with the fieldwork. Formal camps with chalets and permanent staff villages will be captured the same as for urban areas. The potential exist that villages may be found within these parks, which should then be handled as traditional areas.
- In cases where rooms are rented out, the name of the landlord must be provided.
- Villages in traditional areas can be seen as formal. If villages have street names and street numbers it is not necessary to obtain the name of the head of the household.
- Office captured spatial points for large open areas are sufficient after it was verified in the field that the large area is vacant.

- During the verification of structures a photo (**in jpeg format**) must be taken of each structure that is verified. The photo number must correspond with the unique ID of that specific structure

### 3.4. Farms

**Definition:** Farms cover extensive areas and are used for agricultural activities. Farms are registered as such at the SG, with a name and unique number.

**Note:**

- Spatial points must be allocated to the farmer's dwelling as well as to the dwelling units of the workers and the associated attributes must be completed per spatial point.
- It is not necessary to capture other small structures on the farm such as a pump house and garden shed, however, for reference purposes big implement sheds and dairies can be captured.
- Completion of attributes must be in Title Case (example: Port St Johns)
- If access to the farm is denied, the name of the farm and farmer should be completed in the space provided.
- **Local agricultural unions must be approached before entering in order to assist in the fieldwork.**
- If no information is available the field must be populated with a "0" (zero value). NULL values are not accepted.
- The following attributes (apart from the standard address attributes) has specific reference to Special Dwellings (refer to Table 3) and must be completed when a Special Dwelling is identified:
  - Building/Complex/Farm Name or Farm Number
  - Type of main dwelling
  - Unit count
  - SD Identifier (room or bed)
- If state parks or recreational land is encountered, a meeting with the management must be arranged to obtain layout maps that can help with the fieldwork. Formal camps with chalets and permanent staff villages will be captured the same as for urban areas. The potential exist that villages may be found within these parks, which should then be handled as traditional areas.
- Office captured spatial points for large open areas are sufficient after it was verified in the field that the large area is vacant.
- During the verification of structures a photo (**in jpeg format**) must be taken of each structure that is verified. The photo number must correspond with the unique ID of that specific structure.

## 4. Quality Assurance

The overall quality assurance will be performed on various stages during the project. The over-all QA process can be divided in three parts, namely: images, spatial point mapping and fieldwork. Consultants must implement the QA procedures as submitted in the tender application. It is expected from the consultants to submit the following with regards to the QA process:

- Copies of the QA control workflow form as done for each EA.
- A certificate/affidavit that the QA as indicated on the control workflow form was done.

Furthermore, apart from the consultants own QA procedures, it is expected that the final delivery must also pass QA checks (to be done by both the consultant and Stats SA). The outcome of both QA checks will be compared with each other to verify completeness. It is therefore important that both the consultant and Stats SA must conduct the same QA checks as far as possible. The QA process within Stats SA will be managed by **Mr Harebatho Moletsane**, however it is requested that the consultants correspond via the respective project manager and not directly to the QA manager. Most of the QA tests can be done by the contractors as well; however there is some that will only be done by Stats SA as we are the only source of the information. The QA checks that will be done by Stats SA will be indicated as "(Stats SA only)".

### 4.1. Images

The aspects that have to be part of the image QA process are described in the following section. The process will include the check of the file format, coordinate system, published date, coverage and accuracy of the images. The following checks will be carried out:

- **Image format**

The images received from the suppliers must be the MrSID format and compression ratio of 1:10.

- **Coordinate system**

The coordinate system must be Geographic, Datum: Hartbeeshoek 94, Ellipsoid: WGS84

- **Clipped**

Images must be clipped in 1:10 000 scale grid

- **Quality of "job"**

The quality of the "job" of images must be measured by:

- Seamless tiles with no dark overlay strips where tiles were fitted;
- The void areas must be transparent with a zero value;
- No duplicate tiles.
- No tiles in wrong location due to wrong geo-referencing.

- **QA control form and certificate**

After the completion of the process a QA control form must be generated as well as a certificate or affidavit that the QA as indicated is correct. The QA control form is as follows:

<b>Image quality assurance form</b>			
Batch no:	<input type="text"/>	Municipality name	<input type="text"/>
Date received:	<input type="text"/>	Date QA completed:	<input type="text"/>
<b>QA checklist</b>			
<b>QA procedure</b>	<b>Yes</b>	<b>No</b>	<b>If no give reason</b>
Image format	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Coordinate system: (Automatically to register on Arc Map / Erdas)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>
Accuracy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>

❖ EA overlay			
❖ Grid overlay			
Quality of job			
❖ Seamless			
❖ Void			
❖ Duplicates			
Certificate of QA attached			
QA report attached			
Signature of QA controller		Date	
Signature of QA manager		Date	
Signature of Stats SA QA controller		Date	
Signature of Stats SA QA manager		Date	

## 4.2. Spatial point mapping

The aspects that have to be part of the spatial point mapping QA process are described in the following section. The process will include the check of the point coverage and includes the following:

- **Coordinate system**

The coordinate system must be Geographic, Datum: Hartbeeshoek 94, Ellipsoid: WGS84.

- **Coverage**

The spatial point coverage QA will include point for structures and settlement area coverage.

- **Point coverage**

The following rules should be applied:

- The spatial points per EA must be more or the same as the Census 2001 dwelling count. If it is not the same a visual check should be done in the areas where are differences (Stats SA only);
- Spatial points per EA must be the same as the NAD points per EA. If it is not the same a visual check should be done in the areas where there are differences.
- The spatial points must not fall on an EA boundary. Sum of points must be the same for sum of points per EA.
- The geometry type must be point and nothing else.
- **Settlement coverage**
  - The spatial points must correspond with the EA place name feature types for the area. For example: concentration of points in place name feature type village (Stats SA only).
  - Spatial points per EA must correspond with EA dot density of total dwellings per EA (Stats SA only).
  - A visual inspection must also be done.
- **QA control form and certificate**

After the completion of the process a QA control form must be generated as well as a certificate or affidavit that the QA as indicated is correct. The QA control form is as follows:

<b>Spatial point quality assurance form</b>			
Batch no:	<input type="text"/>	Municipality name	<input type="text"/>
Date received:	<input type="text"/>	Date QA completed:	<input type="text"/>
<b>QA checklist</b>			
<b>QA procedure</b>	<b>Yes</b>	<b>No</b>	<b>If no give reason</b>
Point Coverage:			
❖ Comparison with dwelling count			
❖ Comparison with existing addresses			
❖ Points not on EA boundaries			
Settlement coverage			
❖ Place name types			
❖ Visual inspection			
❖ Comparison with dwelling dot density			
Certificate of QA attached			
QA report attached			
Signature of QA controller		Date	
Signature of QA manager		Date	
Signature of Stats SA QA controller		Date	
Signature of Stats SA QA manager		Date	

### 4.3. Fieldwork (Stats SA only)

The aspects that have to be part of the fieldwork QA process are described in the following section. The process will include the check of non-contacts and database correctness. The following checks will be carried out:

- **Sample of EAs**

A 3% sample of the EAS must be drawn. The fieldwork will be done in the selected EAs.

- **Sample of spatial points per EA**

A sample of spatial points needs to be drawn from each selected EA. The sample must not be less than 10 points per EA.

- **Fieldwork list**

A list of sampled EAs and spatial points must be printed for the fieldwork QA team.

- **EA maps**

A map of each sampled EA and spatial points must be printed and used in the field.

- **Fieldwork**

The fieldwork QA will include the following:

- **Non-contacts**

All non-contact forms must be checked;

- **Sampled spatial points**

All fields of the selected spatial points must be checked. The field-based Quality Assurance checks will be made in all the municipalities that the contractors are working in. Though these field checks may be randomly selected, there will be checks where it might be felt that physical information is required.

**• Fieldwork report**

A fieldwork report that is based on the fieldwork list must be completed for each batch. QA control form and certificate. After the completion of the process a QA control form must be generated as well as a certificate or affidavit that the QA as indicated is correct. The QA control form is as follows:

<b>Fieldwork quality assurance form</b>			
Batch no:	<input style="width: 90%;" type="text"/>	Municipality name	<input style="width: 95%;" type="text"/>
Date received:	<input style="width: 90%;" type="text"/>	Date completed:	<input style="width: 95%;" type="text"/>
Number of non-contact forms:	<input style="width: 40%;" type="text"/>	QA	<input style="width: 50%;" type="text"/>
<b>QA checklist</b>			
<b>QA procedure</b>	<b>Yes</b>	<b>No</b>	<b>If no give reason</b>
Non contact forms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sampled spatial points	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fieldwork report attached	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Certificate of QA attached	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Signature of QA controller			Date
Signature of QA manager			Date
Signature of Stats SA QA controller			Date
Signature of Stats SA QA manager			Date

Apart from the fieldwork exercise the database still needs to be verified. The process will include the check of the point coverage and database correctness.

**• Database**

The check of the attributes will include if the data adhere to the standard database rules and those specified in the tender. The database must have the following:

- There must be a spatial link between the spatial points and the database;
- No duplicate IDs, each point must have a unique ID;
- There must be no duplicate spatial features;
- Field types must be as indicated;
- Correct EA number must be filled;
- City/Town/Traditional area must be filled;
- Village/Suburb must be filled;
- All abbreviations must be correct as indicated in tender document;
- All fields per geography type must be completed as indicated in tender document.

**• Consistency**

The following rules must be followed:

- Formal geography EA type must have street no, street name and street type filled in.
- Informal, traditional must have head of household and unit number/comments filled in.

- Type of dwelling must be completed;
- Check for wrong spelling.

**Table 4.2: Data field types**

Attribute	Data Type
Municipality	Text
Traditional Authority	Text
Administrative Area ( <i>applicable to former Transkei</i> )	Text
City/Town/Township	Text
Suburb	Text
Village	Text
Alternative Village Name	Text
Sub-Village	Text
EA Number	Text
Unique ID	Text
Latitude (S)	Text
Longitude (E)	Text
Height	Text
Street Number	Text
Street Name	Text
Street Name Suffix	Text
Surname of Head of Household	Text
Name of Head of Household (western or Christian name)	Text
Name of Head of Household (traditional or African name)	Text
Unit or Other Number	Text
Source of Number	Text
Feature use	Text
Building/Complex Name	Text
Contact details of sectional title development, high-rise flats, cluster developments, community leader's name in dense informal areas, etc.etc.	Text
Registered Farm Name	Text
Registered Farm Number	Text
Farm Name at gate	Text
Magisterial District	Text
Unit Count	Number
Structure Count (traditional and informal areas)	Text
Structure Description (traditional and informal areas)	Text
SD Identifier (room)	Text
SD Identifier (bed)	Text
Coordinates logged at	Number
Name and Surname of Head of Household obtained from	Number
Photo Number	Text
Comments	Text (not memo! Otherwise no queries can be run on this field)

- **Number of non contact forms**

The numbers of non-contact forms that will be accepted are only for surname and name of head of household. All other information for a record must be completed. Only 10% non-contacts of spatial points of traditional, informal and farm points will be acceptable.

Traditional, informal and farm areas	Code 1 (only 10% is acceptable)
Urban formal areas	Code 2 for all records

Contractors must submit non-contact forms for all Code 0. The non-contact forms will be evaluated to determine if an effort was made to obtain the head of household name.

- **QA control form and certificate**

After the completion of the process a QA control form must be generated as well as a certificate or affidavit that the QA as indicated is correct. The QA control form is as follows:

<b>Spatial point Attribute quality assurance form</b>			
Batch no:	<input style="width: 95%;" type="text"/>	Municipality name	<input style="width: 95%;" type="text"/>
Date received:	<input style="width: 95%;" type="text"/>	Date QA completed:	<input style="width: 95%;" type="text"/>
Number of non contact forms:	<input style="width: 50%;" type="text"/>		
<b>QA checklist</b>			
QA procedure	Yes	No	If no give reason
Database:			
❖ No duplicate features			
❖ Unique ID for each data entry			
❖ Correct field types			
❖ Correct EA number for each record			
❖ City/Town/Traditional area filled in			
❖ Village/Suburb filled in			
❖ Abbreviations correct			
❖ Fields per geo type completed			
❖ Formal geo type street information completed			
❖ Informal/Traditional number information completed			
❖ Type of dwelling completed			
❖ Check for wrong spelling			
Total non contact forms attached			
Certificate of QA attached			
QA report attached			
Signature of QA controller	Date		
Signature of QA manager	Date		
Signature of Stats SA QA controller	Date		
Signature of Stats SA QA manager	Date		

Stats SA reserve the right to visit the offices of the consultant or to accompany the consultant on field trips during the duration of the project. Any work referred back to consultants to redo will be to the expense of the consultant.

## 5. Project Management

### 5.1. Deliverables

The deliverables of the project is as follows (in order of priority):

**i. Detailed project plan and time schedules**

A detailed project plan in hard copy as well as electronic (MS project) must be provided before commencing with the work. The project detail must be provided per municipality and must indicate all deliverables mentioned in Section 3. Furthermore, it is expected that the delivery of data must be done in phases during the duration of the project. Furthermore, contact details of the project manager who will be responsible for the project must be provided.

**ii. Images**

The delivery of images is the second deliverable expected from consultants.

**iii. Spatial points (office mapped)**

Before the fieldworkers go into the field, the office mapped spatial points must be delivered to Stats SA.

**iv. Spatial points and populated attributes (fieldwork)**

The final delivery is seen as a complete database of all spatial points linked to the specified attributes per municipality.

### 5.2. Management of Project

The consultants will be reporting to the following Stats SA staff members:

Stats SA Managers	
Creation phase	QA phase
André Erasmus Tel: 012 310 8693 / 084 962 5217 andree@statssa.gov.za	Harebatho Moletsane Tel:012 310 8689 / 082 884 3999 harebathom@statssa.gov.za

### 5.3. Progress Reports

Progress reports must be submitted on a weekly basis to Stats SA. Progress reports must reach Stats SA at 15:00 on every Friday. Consultants have to use the progress report template as provided below.

Activity*	Start date as on project plan	End date as on project plan	Actual start date	Actual end date	Achievements/ Milestones:	Deviations and Reasons	Planned for next period	Comments
Municipality name								
Imagery								
Office spatial points								
Field verification								

Furthermore, all consultants will be required to attend fortnightly progress meetings at Stats SA's head office if required.

### 5.4. Payment

A phased approach for payment will be adopted during the project. The following payment schedule will be followed:

<b>Deliverable</b>	<b>Payment</b>
1. Delivery of images per municipality	20% of budget per municipality
2. Delivery of spatial points (office mapped)	20% of budget per municipality
3. Delivery of final product	30% of budget per municipality paid out on the basis that the deliverable passed the Office QA.  20% of budget per municipality paid out on the basis that the deliverable passed the Fieldwork QA.
4. Retention Fee	10% retention fee per municipality is applicable until all processes (Closure report included) have been received.

Final payment (10% retention) will only be paid once Stats SA is satisfied with the quality of the final deliverable by means of the QA process. Any work referred back to consultants to redo will be to the expense of the consultant.

### **5.5. Penalties**

Penalties will be incurred by the contractor for non-compliance to contract and to not meeting any stipulated delivery deadlines. In the event that the deadlines are not met (e.g. weather conditions) sufficient proof must be submitted. Should no valid reason and proof are submitted on why deadlines are not being met, penalties imposed will be deducted from the contract price and will comprise of the following:

- 5% for the first calendar week following the deadline
- 10% for subsequent weeks thereafter