Bitou Municipality

Feasibility Study for Municipal Offices Delivered under a proposed Public Private Partnership

Engineering Aspects

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				Discipline Director	Functional Director	PLP Coordinator

Safety • Quality • Sustainability • Innovation

Executive Summary

The various service departments of the Bitou Local Municipality (Bitou) are dispersed across a number of offices and locations throughout the town of Plettenberg Bay and surrounds. This results in service fragmentation, lack of accessibility and general inefficiency in service delivery for the residents and community of the Bitou Municipality.

Consequently, in June 2015, Hatch Goba were appointed by Grant Thornton PS Advisory to assist them with a potential National Treasury Public Private Partnership (PPP) process, beginning with a feasibility report, for a proposed single municipal office for the Bitou Municipality.

Hatch Goba's appointment was to provide Engineering and Transportation Planning input for 3 potential sites, namely:

- Erf 12624 Plettenberg Bay (near Ladywood)
- Erf 2138 Plettenberg Bay coupled and Erf 4131 Plettenberg Bay (in Plettenberg Bay CBD)
- Remainder of Erf 2096 Plettenberg Bay and Erf 2323 Plettenberg Bay (on Marine Way)

Figure 1 – Potential Sites

1. Ladywood (Erf 12624)

Erf 12624 is located on the N2 and is currently undeveloped. The location of the site mid-way between the Kwanokuthula and the Plettenberg CBD is favoured as the most suitable of the 3 sites as it best addresses the Bitou Municipality's ''Coming Together'' Strategy which aims to create more effective spatial integration of communities and inclusive service delivery.

Access Management: In order to achieve acceptable levels of service, SMEC, as part of the proposed Public Safety Centre to be constructed on the same site, have proposed a traffic circle to replace the current 2 way stop controlled intersection. SANRAL have in principle agreed to the proposed traffic circle but consideration needs to be given to SANRAL's plans to dual this section of the N2 (4 lanes with median barrier) with construction programmed to start in 2020.

Services: Bulk sewer and water services appear to be available in close proximity to the site. SMEC have proposed a 600 mm Ø stormwater pipe to be installed in order to drain the site. An extension to the existing 11kV electrical reticulation network is required to provide the site with electricity. The cost of the bulk stormwater and electrical infrastructure would accrue to the Public Safety Centre project which is planned to be constructed prior to the Municipal Office Complex.

Geotechnical: The entire site comprises two distinct layers of silty clay. Due to the potentially expansive nature of this type of soil, and the lack of suitable backfill material for soil rafts, stiffened raft foundations are recommended. The expansive clay will need to be removed to a depth of 1m below underside of foundations and replaced with a granular, non-expansive fill which will need to be sourced off site. No major bulk earthworks are envisaged for this site.

Environment: No significant environmental constraints have been noted. Environmental Authorization for the development of the Public Safety Centre on the site has been granted.

2. Plettenberg Bay CBD (Erf 2138 and Erf 4131)

Erven 2138 and 4131 are located near the traditional commercial centre of Plettenberg Bay. Erf 2138 is the current site of the main Bitou Municipal Offices and Council Chamber while the opposite erf 4131 is vacant.

Access Management: Any increase in office density on these 2 erven will lead to an increase in vehicular and pedestrian traffic. Intuitively, the location of this site in a built up area close to the Plettenberg Bay CBD will make the provision of parking and traffic accommodation more expensive when compared to the other 2 sites where more space is available.

Services: Bulk sewer and water services appear to be available in close proximity to the site. The sewer and water networks may however require upgrading in order to accommodate the proposed municipal office development. The existing stormwater system is likely to be able to cope adequately with the additional runoff from the municipal office complex development however Water Sensitive Urban Design (WSUD) principles should be adopted in the design of the site specific stormwater drainage. The additional electrical demand as a result of the municipal office complex would require the existing electrical mini substation (and switchgear) to be upgraded.

Geotechnical: A detailed geotechnical investigation at detail design stage is required to determine the existing ground conditions of both erven. This will inform the most appropriate foundation solutions. Due to the fairly significant slope of the site, building and parking layouts and levels will need to be carefully considered to reduce any bulk earthwork requirements.

Environment: No significant environmental constraints have been noted.

3. Marine Way (Erf 2096 and Erf 2323)

Erven 2096 and 2323 are located in a mixed land use, but predominantly residential area of Plettenberg Bay. The erven support a number of uses including housing, a fire station, engineering depot and water treatment plant. The portion of land identified as potentially being able to accommodate the municipal offices is currently the site of the Engineering Division.

Access Management: Access to the proposed municipal office complex on this erf is only possible off Marine Way who's road reserve is sufficiently wide to accommodate any potential road widening that may be required.

Services: Bulk sewer and water services appear to be available in close proximity to the site. The sewer and water networks may however require upgrading in order to accommodate the proposed municipal office development. The existing stormwater system is likely to be able to cope adequately with the additional runoff from the municipal office complex development however Water Sensitive Urban Design (WSUD) principles should be adopted in the design of the site specific stormwater drainage. The additional electrical demand as a result of the municipal office complex would require an additional electrical mini substation (and switchgear) to be installed.

Geotechnical: As is the case with the Plettenberg Bay CBD site, a detailed geotechnical investigation at detail design stage is required to determine the existing ground conditions of this site. This will inform the most appropriate foundation solutions. Due to the fairly significant slope of the site, building and parking layouts and levels will need to be carefully considered to reduce any bulk earthwork requirements. There is evidence that suggests the presence of a spring / fountain on the proposed municipal office site. A detailed geotechnical investigation will inform possible solutions (if any) to deal with its impact on any proposed new structure.

Environment: No significant environmental constraints have been noted.

Irrespective of the choice of sites, Green Star Design and Construction should be incorporated into the design, construction and operational practices of the building. The intention of green building is to significantly reduce or eliminate the negative impact of development on the environment and people by designing buildings that are energy efficient, resource efficient and environmentally responsible.

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Safety • Quality • Sustainability • Innovation

1. Introduction

Municipal Services offered by the Bitou Local Municipality (Bitou) are currently dispersed over a number of offices and locations throughout the town of Plettenberg Bay and surrounds, resulting in service fragmentation, lack of community accessibility and general inefficiency in service delivery.

Accordingly, in June 2015, Bitou, needing to assess the feasibility of establishing a single working environment to address these issues, appointed Grant Thornton to assist them with a potential National Treasury Public Private Partnership (PPP) process, beginning with a feasibility report. This process, if successfully concluded, will lead to a new efficient consolidated "one stop shop" single municipal office for Bitou.

Hatch Goba were in turn appointed by Grant Thornton as a sub-consultant to provide Engineering and Transportation Planning input to this process. The Engineering Scope at this feasibility stage is broadly to:

- Review existing engineering services and plans, including water, sewer, stormwater, electricity and transportation aspects
- Comment on Services Capacities
- Provide Order of Magnitude Costs for bulk service augmentation and / or optimization
- Review Traffic and Transportation plans and capacities
- Review Environmental issues that may apply

2. Potential Location of New Offices

Three potential sites have been shortlisted for this project, as shown in Figure 1 below.

Figure 1 – Potential Sites

The following summarizes the findings of the Engineering and related investigations for the 3 potential sites.

2.1 Ladywood – Erf 12624

2.1.1 Location

This property is located on the southern side of the N2, opposite the Saringa Drive intersection, and approximately 1.6 km due west of the main N2 / Marine Drive traffic circle.

It should be noted that a new magistrate's court complex is under construction on the north side of the N2 directly opposite the Ladywood site.

It should be further noted that the Ladywood site is favoured as the most suitable option for the new offices for a number of reasons, including the fact that it best addresses the approved "Coming Together" Strategy of the Bitou Council – creating an environment conducive to adequate developmental investments from both the public and private sectors, more effective spatial integration of communities and inclusive service delivery.

Through a separate project process, plans for a standalone municipal building complex, namely the Multi-Functional Public Safety Centre on the same erf, are also at an advanced stage. For this reason, Bitou is now co-ordinating the planning teams for both projects.

Investigations by other consultants into traffic impact, availability of bulk services and similar engineering aspects have therefore been carried out for the Public Safety Centre, and made available to Hatch Goba who acknowledges the input of Messrs Jono Trust, SMEC, SSI, GLS, Clinkscales Maughn-Brown and Tuiniqua.

2.1.2 Current Use

The site is undeveloped.

2.1.3 Summary of Existing and Proposed Bulk Engineering Services

(Refer Drawing H349807/Ladywood)

Ladywood – Erf 12624	
Sewer	Existing Bulk Sewer Services: • Information from Bitou's GIS data indicates a 160 mm Ø sewer located at the eastern boundary of the site, crossing the N2 (as a 200mm Ø pipe), and joining with a 350 mm Ø bulk sewer running along the north side of the N2. An August 2015 report by Tuiniqua Consulting Engineers entitled ''Upgrading of Kwanokuthula main outfall sewer and pumping main'' appears to confirm this information. GLS Consulting Engineers have further confirmed the existence of a 160 mm Ø / 200mm Ø sewer pipe. • An earlier report by SMEC (Feb 2015) entitled ''Professional Services for the Planning and Development of a Multi-Functional Public Safety Centre'' indicates however that there is no bulk sewer pipe that either crosses the site or runs along any of its borders. SMEC therefore proposes installing a new 200 mm Ø, 500 m long sewer pipe crossing under the N2 via an

Ladywood – Erf 12624	
	existing culvert. This pipe could then tie in to the existing 350 mm Ø bulk sewer pipe running along the north side of the N2, • The 350 mm Ø bulk sewer pipe along the north side of the N2 forms part of the existing bulk system that includes a rising main and outfall pipe running from Kwanokuthula to the Ganzevallei Waste Water Treatment Works (WWTW), • However this bulk sewer is reported as overloaded and also requires some embankment rehabilitation, • Upgrade of the bulk sewer to sizes ranging from 525 mm to 600 mm Ø is therefore planned for implementation over the next 3 years with approved MIG funding at an estimated cost of R12.6m (Tuiniqua, February 2016), • The PDDWF (Peak Daily Dry Weather Flow) design parameter used for the upgrade is 12,500 kL/day which is considered appropriate given that there are a number of planned new housing developments and a projected growth rate of 4.62%. This should be sufficient to cater for increased load from the municipal offices, • The Ganzvallei WWTW operates a 9 ML per day plant and was considered a top performer with Green Drop status award in 2011. <u>Proposed Bulk Sewer Services:</u> • Despite the SMEC report (Feb 2015) indicating otherwise, more recent information confirms the existence of bulk sewer services to the eastern edge of the Ladywood site. • A first order check of the sewer masterplan indicates that the municipal office complex may trigger sewer network reinforcements (i.e. upgrading of sewer lines and / or installing additional lines to increase capacity). A more detailed investigation and analysis during detailed design will confirm the need for network reinforcements and whether these existing bulk sewer pipes are of sufficient depth to easily tie into. <u>General Comments:</u> 1. Assuming bulk sewer services exist at the eastern edge of the Ladywood site, only costs associated with connecting into the bulk sewer system will attract costs. These can only be accurately determined during detailed design but are not expected to be significant. 2. All bulk services required for the site are expected to be constructed and paid for under a separate Public Safety Centre contract. The Public Safety Centre will be constructed on the same site but implemented prior to the construction of the Municipal Office Complex.

Ladywood – Erf 12624	
Water	Existing Bulk Water Services: • Information from Bitou's GIS data shows a 160 mm Ø uPVC water pipe running along the southern boundary of Erf 12624 and a 200 mm Ø pipe along the eastern boundary. • GLS Consulting Engineers have reported that this 200 mm Ø pipe is part of the New Horizon reservoir zone, with 4 bar residual pressure. Proposed Bulk Water Services: • Bulk water services appear to be available to the Ladywood site. • A first order check of the water masterplan indicates that the New Horizons reservoir has sufficient capacity to accommodate the proposed municipal office complex. There also appears to be adequate capacity in the water network for this development. A more detailed investigation during detailed design will confirm the existing pressures and flow rates in the existing bulk water pipes and whether these are sufficient to supply the water demand requirements of the fully developed site. General Comments: 1. Due to uncertainty in pressure and flow rate, SMEC's report entitled ''Professional Services for the Planning and Development of a Multi-Functional Public Safety Centre'' (Feb 2015) recommends a small on-site reservoir being fed via the existing 200 mm Ø bulk water pipe. A more detailed analysis of the existing bulk water supply and water demand requirements would however need to be performed to determine the most efficient and cost effective solution to supplying water to the Municipal Offices and / or the Public Safety Centre. 2. Assuming bulk water services exist adjacent to the Ladywood site, only costs associated with locally connecting into the bulk water network will attract costs. These can only be accurately determined during detailed design but are not expected to be significant. 3. All bulk services required for the site are expected to be constructed and paid for under a separate Public Safety Centre contract. The Public Safety Centre will be constructed on the same site but implemented prior to the construction of the Municipal Office Complex.
Stormwater	Existing Bulk Stormwater Services: • There are no existing bulk stormwater pipes that serve the Ladywood site. • The N2 which borders the site to the north is on a crossfall away from the site. Stormwater from the N2 itself therefore does not influence the site as it is conveyed via a drainage channel on the northern side of the N2.

Ladywood – Erf 12624	
	Proposed Bulk Stormwater Services: • The site is relatively flat with an average fall of approximately 1:36. The site does not attract significant runoff from adjacent properties and therefore only stormwater generated from the site will need to be adequately dealt with. • In their report Feb 2015 report, SMEC has indicated a 600 mm Ø, 450 m long stormwater collector pipe as the proposed mechanism for the overall site stormwater drainage (Drawing C1520-04). They plan to discharge this pipe into an existing stormwater channel east of the site which runs parallel and adjacent to the N2. • Stormwater management for the site should consider Water Sensitive Urban Design (WSUD) principles which attempt as far as possible to maintain or mimic the natural flow systems as well as prevent the washoff of urban pollutants to receiving waters. Examples of engineering solutions to manage runoff quality and quantity may include litter traps, permeable paving, bio retention cells or basins, detention ponds and constructed wetlands. A site specific stormwater study would need to be performed to establish the most appropriate WSUD solution(s). The space available on the site may influence the choice of WSUD solution. • Careful stormwater management may provide a significant source of water which could be reused for irrigation, flushing of toilets and washing of cars for example. • Should WSUD principles be adopted, the 600 mm Ø pipe proposed by SMEC could possibly be reduced in size. General Comments: 1. All bulk services required for the site are expected to be constructed and paid for under a separate Public Safety Centre contract. The Public Safety Centre will be constructed on the same site but implemented prior to the construction of the Municipal Office Complex.
Electricity	Existing Bulk Electrical Services: • There is no existing bulk electrical connection to the Ladywood site however an 11 kV reticulation connection point exists on the north side of the N2 directly opposite the proposed Ladywood site. An 11kV overhead line also exists just west of the site and runs in a north-south direction. Proposed Bulk Electrical Services: • Clinkscales Maughan-Brown Consulting Electrical Engineers have proposed extensions to the existing 11 kV network to serve the entire Ladywood site. Their proposal includes 2 options (option 1 and option 2)

Ladywood – Erf 12624	
	with each option making allowance for future internal LV connections to the future Municipal Offices. • At a meeting on 29 January 2015 between Clinkscales Maughan-Brown and Bitou Municipality, it was decided that Option 2 is the preferred option and should be implemented due to its long term benefits in the future expansion of the region. • An allowance of R1,1 million has been made under the budget of the Public Safety Centre to allow for the required electrical connection. <u>General Comments:</u> 1. Assuming the Public Safety Centre will be constructed first via a separate project, will any bulk work required for the later municipal office complex project estimated at R 1.1 million, attract costs that require consideration for the PPP feasibility process?
Access Management	<u>Existing Road Layout:</u> • The Ladywood site is located at the junction of the N2 and the Ladywood Access Road. This is a two-way stop controlled intersection. • The south and north approaches from Ladywood and New Horizons are stop controlled with continuous traffic flow from the eastern and western approaches on the N2. • The current Level of Service (LOS) for all approaches is acceptable. • Pedestrian movement across the N2 is unsafe as vehicles on the N2 travel at high speed and there is no median refuge. <u>Proposed Road Layout:</u> • In June 2015, SMEC performed a Traffic Impact Assessment (TIA) for the proposed development. They report that the post development scenario will result in an unacceptable LOS F for the south and north approaches with heavy delays being experienced by traffic exiting the municipal offices and northern access road. • SMEC has therefore proposed a 2 lane traffic circle to replace the current stop controlled intersection at an approximate estimated cost of R6 million. • SMEC reports that the traffic circle will have the added benefit of acting as a traffic calming measure which will reduce vehicular speeds and improve pedestrian safety. Refuge islands will facilitate safer pedestrian crossing, particularly for pedestrians crossing the N2.

Ladywood – Erf 12624	
	Engagement with SANRAL: • As this site is directly adjacent to the N2, with proposed access directly from the N2, Hatch Goba also held discussions in Cape Town with Mr Emile du Preez of SANRAL Southern Region, the Project Manager responsible for this section of the N2. The following main points were noted: ✓ SANRAL plans to dual this section of road (4 lanes with median barrier) with the following proposed programme: ○ Appoint consultants for design – 2018 ○ Start of construction – 2020 ○ Contract period – 36 months ✓ Part of the upgrade will be the elimination of at-grade accesses where possible, and linking these with access roads, ✓ SANRAL are in the process of constructing traffic circles at various problematic intersections on the N2 and would consider such a solution at Ladywood/Saringa Drive, ✓ From SANRAL's own point of view, the upgrade of this intersection would logically be done during the dualling contract, ✓ It is however possible for SANRAL to move the programme forward if the Municipality requires it to be constructed earlier, ✓ SANRAL may ask the Municipality for a contribution towards the cost of the intersection upgrade, ✓ In any event, the Municipality should submit an application to SANRAL at the appropriate time and include the following information: ○ Proof of rezoning ○ Traffic Impact Assessments ○ Pedestrian traffic study ○ Type of access required • SANRAL has no specific plans for a pedestrian bridge in this vicinity but pedestrian safety will be considered in the planned upgrade, • Should the Municipality specifically require a pedestrian bridge at Ladywood, this should be included in the application.

Ladywood – Erf 12624	
	General Comments: 1. The SMEC TIA did not consider the following points which may influence the proposed geometric layout of the traffic circle: • Public transport operations may reduce the vehicular trips generated, • Seasonal fluctuations in traffic volumes in the area, • The need for a pedestrian bridge over the N2 which would provide unobstructed pedestrian access for residents of New Horizons 2. The current 2 lane traffic circle layout as proposed by SMEC (TIA - 2015) does not take into account the future 4 lane and median barrier solution envisaged by SANRAL. 3. Discussions should be held between Bitou and SANRAL to agree whether to proceed with a 2 or 4 lane traffic circle solution from the start. 4. The Bitou Municipality has proposed that the traffic circle be funded from its own sources and not via the PPP.
Geotechnical / Structural / Bulk Earthworks Considerations	General Comments: 1. Ground conditions are generally consistent across the entire site and comprise two distinct layers of silty clay, the upper layer being significantly sandier than the lower layer, 2. Due to the potentially expansive nature of these clayey soils, and the lack of suitable backfill material for soil rafts, the geotechnical report for the site as prepared by SMEC (Oct 2014) generally recommends stiffened raft foundations. The expansive clay will need to be removed to a depth of 1m below underside of foundations and replaced with a granular, non-expansive fill which will need to be sourced off site. 3. As the site has only a gentle slope (about 1:36), no major bulk earthworks are envisaged.
Environmental Considerations	General Comments: 1. A Final Basic Assessment Report for the Public Safety Centre was submitted in February 2016 by Cape Environmental Assessment Practitioners and did not highlight any environmental restrictions/constraints on the site, 2. Environmental Authorization for the development of the Public Safety Centre on the site has been granted. 3. Green design of buildings and infrastructure is required by Bitou Municipality, and are addressed under Section 3 of this report.

2.2 Plettenberg Bay CBD Area – Erven 2138 and 4131

2.2.1 Location

This property is located near the traditional commercial centre of Plettenberg Bay, close to the corner of Sewell and Church Streets. Erf 2138 is abutted by Anchor Crescent and Sewell Street and is currently used as the Bitou Municipality head office. Erf 4131 is adjacent to Erf 2138 and is located between Church Street on the north, Sewell Street on the west and Rectory Lane on the south.

2.2.2 Current Use

Erf 2138 is the current site of the main Bitou Municipal Offices and Council Chamber, while Erf 4131 on the opposite side of Sewell Street to Erf 2138 is vacant. Jono Trust Professional Planners comment that the area is located adjacent to areas with business and general residential zoning, and that the potential for these sites to accommodate a more intensive development type that is informed by locational advantages may be more suitable here.

2.2.3 Summary of Existing and Proposed Bulk Engineering Services

(Refer Drawing H349807/CBD)

CBD – Erven 2138 and 4131	
Sewer	Existing Bulk Sewer Services: • Information from Bitou's GIS data indicates a 150 mm Ø sewer located in Sewell Street and appears to serve erf 2138 only. • A 150 mm Ø sewer located in Rectory Lane is shown to exist on Bitou's GIS data. This is the nearest existing bulk sewer downstream of erf 4131. Proposed Bulk Sewer Services: • A first order check of the sewer masterplan indicates that the municipal office complex may trigger sewer network reinforcements (i.e. upgrading of sewer lines and / or installing additional lines to increase capacity). A more detailed investigation and analysis during detailed design will confirm the need for network reinforcements and whether the 150 mm Ø sewer located in Sewell Street is of sufficient depth to accommodate the additional load generated by the concentration of more building on erf 2138. • As erf 4131 is on a fairly significant slope, the most likely sewer connection point would be in Rectory Lane which is towards the south eastern corner and near a low point of the site. It is likely that a sewer connection to this existing bulk sewer could be achieved at minimal cost. A more detailed investigation during detailed design however will confirm whether this is possible.

CBD – Erven 2138 and 4131	
	General Comments: 1. GLS Consulting Engineers reported that this sewer system forms part of Pump Station No. 2 Catchment. The capacity of Pump Station No. 2 needs further investigation to verify capacity.
Water	Existing Bulk Water Services: • Information from Bitou's GIS data shows a 100 mm Ø AC bulk water pipe along Sewell and Church Streets. A 100 mm Ø AC bulk water pipe is also shown to roughly follow part of the eastern border of erf 4131 before crossing the site in a northerly direction up to Church Street. • GLS Consulting Engineers have reported that the 100 mm Ø pipe is connected to the Lower Tower Zone, with 3 bar residual pressure. Proposed Bulk Water Services: • Bulk water services appear to be available to the CBD site. • A first order check of the water masterplan indicates that the Town reservoirs have sufficient capacity to accommodate the proposed municipal office complex. The additional water demand however may trigger network reinforcements. A more detailed investigation during detailed design will confirm the existing pressures and flow rates in the existing bulk water pipes and whether these are sufficient to supply the water demand requirements of the fully developed site. General Comments: 1. It is likely that some of the pipes will need to be rerouted across erf 4131 to avoid crossing underneath buildings. Existing AC (Asbestos Cement) pipes to be rerouted will be replaced with uPVC. The extent of rerouting will depend on the architects final site layout. Detail costs can only be accurately determined during detailed design but are not expected to be significant.
Stormwater	Existing Bulk Stormwater Services: • Limited existing stormwater information is available at this stage but a visit to the site has indicated the existence of a series of kerb inlets along the northern side of Church Street which are connected by a number of underground stormwater pipes. Sewell Street and Rectory Lane have no formal stormwater system. Proposed Bulk Stormwater Services: • As this site is within an existing built up area, the stormwater system is deemed adequate to cater for any new development. • Notwithstanding the ability of the existing stormwater system to cater with

CBD – Erven 2138 and 4131	
	additional runoff due to hardening up of surfaces on mainly the undeveloped erf 4131, but also 2138, Water Sensitive Urban Design (WSUD) principles should be adopted to manage any potential flood risk and improve stormwater runoff quality. (Refer General Comments below.) • Careful stormwater management may provide a significant source of water which could be reused for irrigation, flushing of toilets and washing of cars for example. <u>General Comments:</u> 1. Stormwater management for the site should consider Water Sensitive Urban Design (WSUD) principles which attempt as far as possible to maintain or mimic the natural flow systems as well as prevent the washoff of urban pollutants to receiving waters. Examples of engineering solutions to manage runoff quality and quantity may include litter traps, permeable paving, bio retention cells or basins, detention ponds and constructed wetlands. A site specific stormwater study would need to be performed to establish the most appropriate WSUD solution(s). The space available on the site may influence the choice of WSUD solution.
Electricity	<u>Existing Bulk Electrical Services:</u> • Erf 2138 is currently served by an LV electrical connection to the existing municipal offices. Erf 4131 is adjacent to erf 2138 and located within an already built up and electrified area. <u>Proposed Bulk Electrical Services:</u> • The additional load of approximately 500kVA required for the proposed municipal offices would require the existing electrical mini substation (including switchgear) to be upgraded. The cost of the upgraded mini substation (including switchgear) is estimated to be approximately R450 000.00 (excluding VAT) and does not include the cost of a metering unit or any required cabling. • The existing mini substation is likely to be able to be refurbished and re-used elsewhere by the municipality. The cost to upgrade the existing switchgear and mini substation could therefore be offset by the value of the existing mini substation.
Access Management	<u>Existing Road Layout:</u> • Current access to the municipal offices (Erf 2138) is in Anchor Crescent off Sewell Street. Erf 4131 is accessed from Sewell Street, Rectory Lane and Church Street. <u>Proposed Road Layout:</u> • No Traffic Impact Assessment (TIA) has yet been carried out for this site.

CBD – Erven 2138 and 4131	
	Also, no preliminary layouts have been drawn up for this site and as such very limited information is available to inform points of access and changes to the existing road layout. General Comments: 1. Notwithstanding the fact that no Traffic Impact Assessment (TIA) has yet been done and no architectural or preliminary layouts are available, the following points are relevant: • With comparatively little space available for development (0.92ha versus 2.58ha for Ladywood and 9.67ha for Marine Way) it is likely that dedicated, possible multi storey parking for Bitou staff (250 estimate) and public visitors would be required, • Congestion in peak hours / periods should be considered, • The options of road widening to accommodate increased traffic in built up areas are limited. • Any increase in office density coverage will lead to increased vehicular and pedestrian traffic in the area, and as this site is in a built up area close to the CBD the traffic considerations will be an important aspect in final site choice. 2. Definitive costs of traffic impact require more basic architectural planning and a Traffic Impact Assessment (TIA). Intuitively however it would appear that the provision of parking and traffic accommodation in general would be more expensive on this site compared to the proposed Ladywood and Marine Way sites, where more open space is available.
Geotechnical / Structural / Bulk Earthworks Considerations	General Comments: 1. A detailed geotechnical investigation is required to determine the existing ground conditions for both erven. This is required at a more detail design stage and will inform the most appropriate foundation solutions. 2. Erf 4131 is on a fairly significant slope away from Sewell Street. Building and parking layouts and levels will need to be carefully considered to reduce any bulk earthwork requirements.
Environmental Considerations	General Comments: 1. Green design of buildings and infrastructure is required by Bitou Municipality, and are addressed under Section 3 of this report.

2.3 Marine Way – Erven 2096 and 2323

2.3.1 Location

This site is located in a mixed use, but predominantly residential area, and is abutted by Marine Way and Cutty Sark Avenue. The area identified for the proposed Municipal Offices is shown on drawing H349807 / Marine Way and occupies part of erf 2096 and erf 2323.

2.3.2 Current Use

The properties support a number of uses including housing, a municipal fire station, engineering depot, clinic and a water treatment plant. Jono Trust Professional Planners comment that properties in the area largely enjoy urban residential rights, which suggest that future development types with similar zoning are appropriate here.

2.3.3 Summary of Existing and Proposed Bulk Engineering Services

(Refer Drawing H349807/Marine Way)

Marine Way – Erven 2096 and 2323	
Sewer	Existing Bulk Sewer Services: • Information from Bitou's GIS data indicates a main 150 mm Ø sewer pipe crossing erf 2096. A network of sewer pipes connect into this main sewer at various points across erf 2096. Proposed Bulk Sewer Services: • The most likely connection into the main 150 mm Ø sewer is near to the point where the main 150 mm Ø sewer enters erf 2096 from the south. From the southern point of entry into erf 2096 the bulk 150 mm Ø sewer runs parallel and adjacent to the eastern border of the proposed municipal offices for a short section. • A first order check of the sewer masterplan indicates that the municipal office complex may trigger sewer network reinforcements (i.e. upgrading of sewer lines and / or installing additional lines to increase capacity). A more detailed investigation and analysis during detailed design will confirm the need for network reinforcements and whether the 150 mm Ø sewer is of sufficient depth to accommodate the additional load generated by proposed municipal offices. • Should the existing 150 mm Ø sewer have sufficient depth and capacity, a sewer connection could be achieved at minimal cost. General Comments: 1. GLS Consulting Engineers reported that this sewer system forms part of Pump Station No. 2 Catchment. The capacity of Pump Station No. 2 needs further investigation to verify capacity.

Marine Way – Erven 2096 and 2323	

Water	Existing Bulk Water Services:
	• Information from Bitou's GIS data shows the following bulk water pipes which are relevant to the proposed municipal offices site:
	  • A 300 mm Ø AC bulk water pipe on the southern side of Marine Way,
	  • 2 pipes (100 mm Ø AC & 200 mm Ø AC) supply water to erf 2323,
	  • A 200 mm Ø AC pipe runs parallel to and just inside the southern boundary of erf 2096.
	• GLS Consulting Engineers have reported that these pipes are connected to the Archiewood Reservoir Zone, with 3 bar residual pressure.
	Proposed Bulk Water Services:
	• Bulk water services appear to be available to the Marine Way site.
	• A first order check of the water masterplan indicates that the Archiewood reservoir has sufficient capacity to accommodate the proposed municipal office complex. There also appears to be adequate capacity in the water network for this development. A more detailed investigation during detailed design will confirm the existing pressures and flow rates in the existing bulk water pipes and whether these are sufficient to supply the water demand requirements of the fully developed site.
	General Comments:
	• The site for the proposed municipal offices is currently occupied by buildings which are supplied with water. It is therefore unlikely that any significant cost will be incurred should the municipal offices be constructed.

Stormwater	Existing Bulk Stormwater Services: • Limited existing stormwater information is available at this stage but a visit to the site has indicated the existence of a formal stormwater system along both Marine Way and Cutty Sark Avenues. These consist of a series of kerb inlets which are connected by underground stormwater pipes. Proposed Bulk Stormwater Services: • As this site is within an existing built up area, the stormwater system is deemed adequate to cater for any new development. • Notwithstanding the ability of the existing stormwater system to cater with the proposed stormwater runoff from the municipal offices site, Water Sensitive Urban Design (WSUD) principles should be adopted to manage any potential flood risk and improve stormwater runoff quality. (Refer General Comments below.) • Careful stormwater management may provide a significant source of water

Marine Way – Erven 2096 and 2323	
	which could be reused for irrigation, flushing of toilets and washing of cars for example. General Comments: 1. Stormwater management for the site should consider Water Sensitive Urban Design (WSUD) principles which attempt as far as possible to maintain or mimic the natural flow systems as well as prevent the washoff of urban pollutants to receiving waters. Examples of engineering solutions to manage runoff quality and quantity may include litter traps, permeable paving, bio retention cells or basins, detention ponds and constructed wetlands. A site specific stormwater study would need to be performed to establish the most appropriate WSUD solution(s). The space available on the site may influence the choice of WSUD solution.
Electricity	Existing Bulk Electrical Services: • Erf 2093 and 2323 are currently served by LV electrical connections that supply existing buildings. Proposed Bulk Electrical Services: • The additional load of approximately 500kVA required for the proposed municipal offices would require an additional electrical mini substation (including switchgear) to be installed. The cost of an additional mini substation (including switchgear) is estimated to be approximately R450 000.00 (excluding VAT) and does not include the cost of a metering unit or any required cabling. As the existing 11kV electrical infrastructure along Marine Way is located on the northern side of the road, any new cabling required to service the proposed municipal offices would need to cross Marine Way. This would need to be approved by the relevant road authority.
Access Management	Existing Road Layout: • Current access to Erf 2096 and 2323 is off Marine Way. Proposed Road Layout: • No Traffic Impact Assessment (TIA) has yet been carried out for this site. Also, no preliminary layouts have been drawn up for this site. Despite limited layout information, it appears that access to the proposed municipal offices site (i.e. Portion 1 as indicated by Jono Trust Professional Planners) is only possible off Marine Way. Any widening of Marine Way (to accommodate possible acceleration or deceleration lanes) as may be recommended by a Traffic Impact Assessment for this development is likely to be achievable as Marine Way's road reserve sufficiently wide.

Marine Way – Erven 2096 and 2323	
	General Comments: 1. Notwithstanding the fact that no Traffic Impact Assessment (TIA) has yet been done and no architectural or preliminary layouts are available, the following points are relevant: o Congestion in peak hours / periods should be considered, o Both erven are generally built up with existing buildings having a large number of different uses. In particular, Portion 1, designated by the Planners as potentially being able to accommodate new offices is currently the site of the Engineering Division, o Demolition of buildings is likely in order to create space for the proposed municipal offices, 2. Definitive costs of traffic impact require more basic architectural planning and a Traffic Impact Assessment (TIA). 3. Although this site is in a less predominantly commercial area, compared to the CBD site, any increase in office density coverage will lead to increased vehicular and pedestrian traffic in the area, and therefore traffic impact considerations will be an important aspect in final site choice.
Geotechnical / Structural / Bulk Earthworks Considerations	General Comments: 1. A detailed geotechnical investigation is required to determine the existing ground conditions for both erven. This is required at a more detail design stage and will inform the most appropriate foundation solutions. 2. Recent correspondence from the Department of Transport and Public Works (who own erf 2323) to the Bitou Municipality suggests there is a spring / fountain under the existing building which has resulted in the building being condemned. A detailed geotechnical investigation is required to confirm the presence of the spring / fountain and to inform possible solutions (if any) to deal with its impact on any proposed new structure. 3. Both erf 2096 and erf 2323 fall fairly steeply towards Marine Way. Building and parking layouts and levels will need to be carefully considered to reduce any bulk earthwork requirements.
Environmental Considerations	General Comments: 1. Green design of buildings and infrastructure is required by Bitou Municipality, and are addressed under Section 3 of this report.

2.4 Tabular Summary of Existing and Proposed Bulk Services for Ladywood, CBD and Marine Way Sites

	Ladywood	CBD	Marine Way	*Comments*
Sewer	• Connect into existing bulk sewer appears to be possible • Municipal office complex may trigger sewer masterplan network reinforcements • Cost of site sewer connection to accrue to Public Safety Centre and not the Municipal Office Complex	• Connect into existing bulk sewer appears to be possible • Municipal office complex may trigger sewer masterplan network reinforcements	• Connect into existing bulk sewer appears to be possible • Municipal office complex may trigger sewer masterplan network reinforcements	• *Depth and capacities of existing sewers to be confirmed during detailed design*
Water	• Bulk water services appear to be available i.e. sufficient capacity in water network and water reservoir • Cost of site water connection to accrue to Public Safety Centre and not the Municipal Office Complex	• Water supply reservoirs appear to have sufficient capacity • Water masterplan network may require reinforcements • Rerouting of existing AC pipes across site will be required	• Water supply reservoirs appear to have sufficient capacity • Water masterplan network may require reinforcements	• *Available water pressures and flow rates to be confirmed during detailed design*
Stormwater	• No existing bulk stormwater. SMEC propose a 600 mm Ø bulk stormwater pipe to be installed	• Existing bulk stormwater deemed adequate	• Existing bulk stormwater deemed adequate	• *Water Sensitive Urban Design (WSUD) principles to be adopted in design of site stormwater*

	Ladywood	CBD	Marine Way
…Stormwater continued	• Cost of site stormwater connection to accrue to Public Safety Centre and not the Municipal Office Complex		
Electricity	• No existing bulk electrical connection • Existing 11 kV reticulation to be extended to Ladywood site at a cost of R1.1m • Cost of site electrical connection to accrue to Public Safety Centre and not the Municipal Office Complex	• The additional load of 500kVA would require the existing electrical mini substation (including switchgear) to be upgraded at a cost of approximately R450 000.00 (ex VAT).	• The additional load of 500kVA would require the an additional electrical mini substation (including switchgear) to be installed at a cost of approximately R450 000.00 (ex VAT). • Any electrical road crossings would need to be approved by the relevant road authority.
Access	• 2 lane traffic circle proposed • SANRAL intend dualling N2 which may affect design of traffic circle • Bitou Municipality has proposed that the traffic circle be funded from its own sources and not via the PPP	• Limited space to accommodate possible road widening due to increase in vehicular and pedestrian traffic • Limited space means provision of parking and traffic accommodation would be more expensive compared to Ladywood and Marine Way sites	• Widening of Marine Way is likely to be achievable as Marine Way's road reserve sufficiently wide.

	Ladywood	CBD	Marine Way
Geotechnical / Structural / Bulk Earthworks	• Expansive clayey soils to be removed to accommodate stiffened raft foundations	• A detailed geotechnical investigation is required to determine the existing ground conditions for both erven • Architectural layouts to consider site slopes in order to reduce bulk earthworks	• A detailed geotechnical investigation is required to determine the existing ground conditions for both erven • Architectural layouts to consider site slopes in order to reduce bulk earthworks • A spring / fountain appears to exist under the existing building on erf 2323 which has resulted in the building being condemned. Further geotechnical investigation is required to confirm the presence of the spring / fountain and to inform possible solutions (if any) to deal with its impact on any proposed new structure
Environmental	• No major environmental constraints • Environmental Authorization for the development of the Public Safety Centre on the site has been granted	• No major environmental constraints	• No major environmental constraints

3. Green Star Design and Construction

3.1 Why go green?

The following considerations are abstracted from "About Green Buildings" – Green Building Council SA Website – www.gbcsa.org.za :

*"Green building incorporates design, construction and operational practices that significantly reduce or eliminate the negative impact of development on the environment and people. Green buildings are energy efficient, resource efficient **and** environmentally responsible.*
Benefits include:

- *Lower operating costs*
- *Higher returns on assets*
- *Increased property values*
- *Enhanced marketability*
- *Reduced utility liability costs and associated risk*
- *Increased productivity*
- *Attracting and retaining talent*
- *Combat climate change"*

3.2 Factors affecting green star Rating

The "Green Star SA – Office v 1 Rating Tool" should be utilized by the professional team to influence design, minimize environmental impact and capitalize on obvious advantages of green design and build.

Depending on levels of achievement, buildings can achieve ratings of 4 to 6 stars.

3.3 Categories

Categories listed below are used to rate the building.

3.3.1 Management

This includes utilizing accredited professionals, building tuning, environmental and waste management

3.3.2 Indoor Environment Quality

Includes but not limited to ventilation, daylight, electric lighting levels, thermal comfort, external views and internal noise levels

3.3.3 Energy

This includes efficient use of energy, lighting and peak energy demand reduction. Easy wins such as automatic electric light on-off control should be specified, as well as use of most efficient light bulbs. Other considerations should be the use of solar and wind power, energy storage and excess energy sale back into the grid.

3.3.4 *Transport*

This is an important consideration for Bitou, especially as far as the Erf 12624 option is concerned. The shifting of the locus of municipal offices closer to New Horizons and Kwanokuthula provides much greater convenience to these communities, with consequent time and energy savings. The existing cycle and pedestrian pathways along the N2 will also enable easier access to municipal services by these residents, who generally do not have the same mobility as residents of the more established Plettenberg Bay section

3.3.5 *Water*

Water for amenities, irrigation, fire systems, heat rejection and water meters are areas for obtaining green star credits, and the professional team should ensure maximum design efficiency in these areas, including automatic flushing, grey water use

3.3.6 *Materials*

Besides maximum re-use of materials, recycling considerations, fit outs, local sourcing of material becomes an important factor.

3.3.7 *Land Use and Ecology*

Ecological Requirements, use of topsoil, reuse of land and change in ecological value are listed.

3.3.8 *Emissions*

Reference is made to Ozone Depletion (ODP) and Global Warming Potential (GWP) refrigerants. In this regard, careful air conditioning design is required. Watercourse pollution and sewer discharge are also highlighted. A proper site stormwater management plan will be required. Sewer design will need to consider impact of grey water re-use.

3.3.9 *Innovation*

Innovative Strategies and Technologies, exceeding Green Star SA Benchmarks and Environmental Design Initiatives are encouraged.

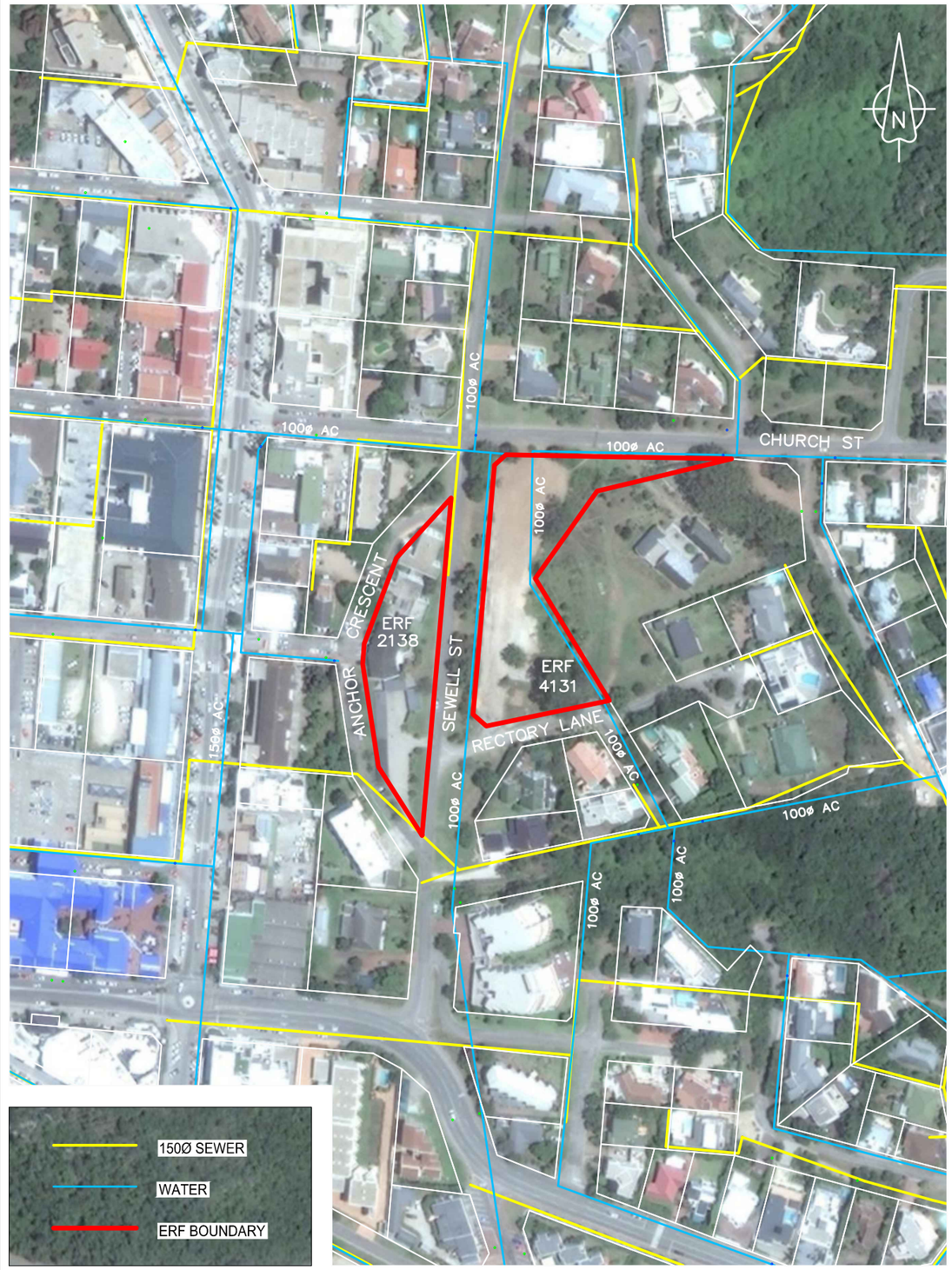
Scale 1 : 2500

PROJECT
BITOU MUNICIPALITY
FEASIBILITY STUDY FOR MUNICIPAL OFFICES

DETAIL
PROPOSED LADYWOOD SITE

Drg. No.
H349807/ LADYWOOD

HATCH GOBA
Member of the Hatch Group
Reg. No. 1995/007273/07



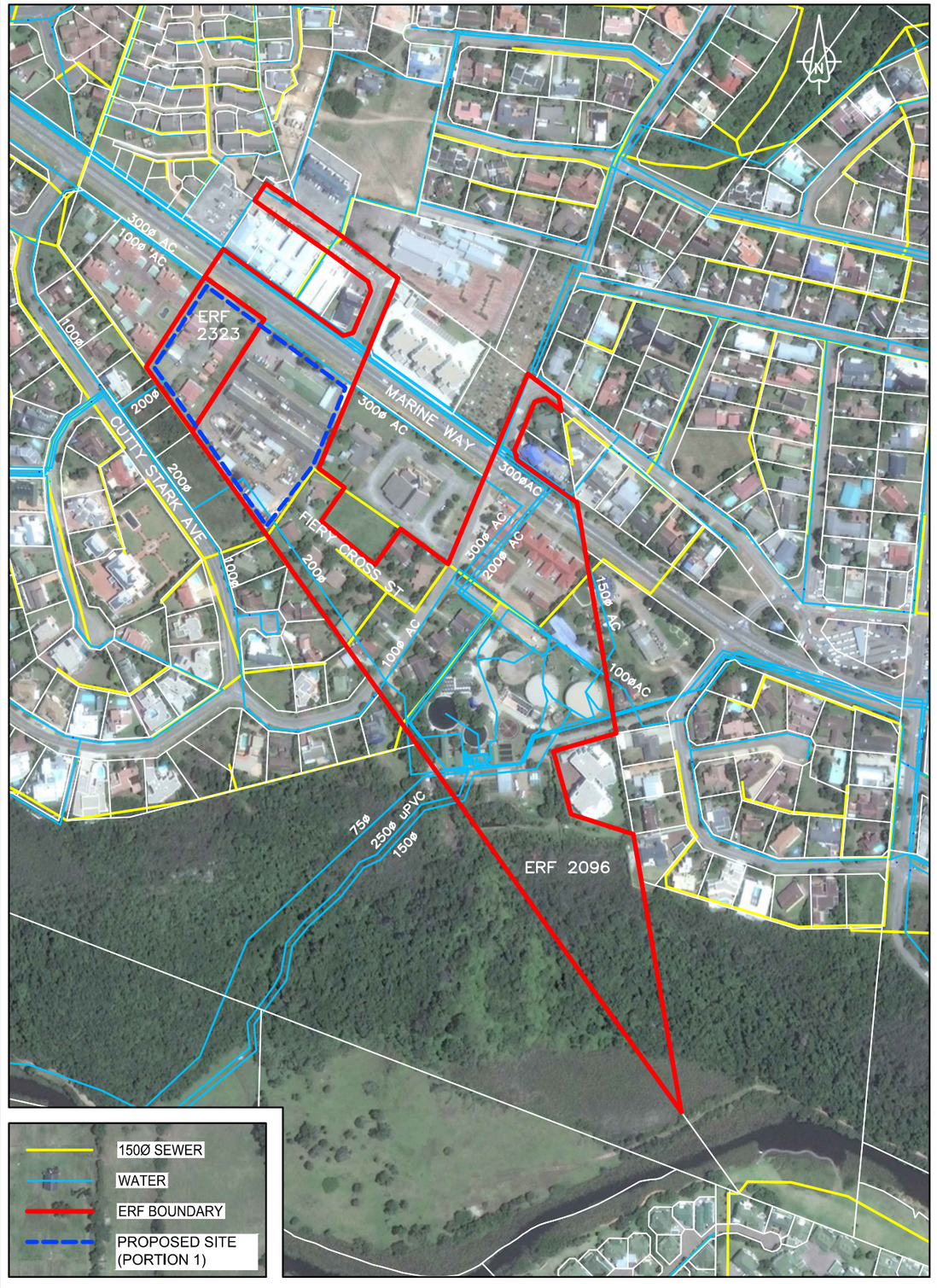
Scale 1 : 2500

PROJECT
BITOU MUNICIPALITY
FEASIBILITY STUDY FOR MUNICIPAL OFFICES

DETAIL
PROPOSED CBD SITE

Drg. No.
H349807/ CBD

HATCH GOBA
Member of the Hatch Group
Reg. No. 1995/007273/07



Scale 1 : 4000

PROJECT
BITOU MUNICIPALITY
FEASIBILITY STUDY FOR MUNICIPAL OFFICES

DETAIL
PROPOSED MARINE WAY SITE

Drg. No.
H349807/ MARINE WAY

HATCH GOBA
Member of the Hatch Group
Reg. No. 1995/007273/07