

**PROPOSED SOCIAL HOUSING  
DEVELOPMENT**

**ERVEN 3303 & 3304,  
MONTCLAIR, MANDALAY, CAPE TOWN:  
STINKWOOD ROAD  
CIVIL ENGINEERING REPORT:  
REVISION B**

**05 SEPTEMBER 2023**

CLIENT:



**ASRIN**  
PROPERTY DEVELOPERS

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05 September 2023

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**PROPOSED SOCIAL HOUSING DEVELOPMENT, ERVEN 3303 & 3304, MONTCLAIR,  
MANDALAY, CAPE TOWN: CIVIL ENGINEERING REPORT: REV B**

## 1. INTRODUCTION

Edifice Consulting Engineers was appointed as the Structural and Civil Engineers for the proposed development: **Erf 3303 and 3304, Stinkwood Road, Montclair, Mandalay, Cape Town**. This investigation will cover the civil engineering services of the project.

The proposed development is situated on Erf 3303 and 3304 within Mandalay and accessed off Stinkwood Road. Refer to **Annexure A** for the Locality drawing and **Annexure B** for the Layout drawing.

The site is situated at approximately 31.4m above sea level and has a total area of 49 882m<sup>2</sup>. The central position of the development is at Lat: 34° 1'12.41"S and Long: 18°37'25.24"E.

## 2. DEVELOPMENT

The site has a natural flat slope of 0.5% from the west towards the east. The site is currently covered with sand and grass with a little amount of vegetation in the summer months.

The residential development will consist of 770 social housing apartment units, as well as ancillary uses such as a 50-learner crèche and ±235m<sup>2</sup> GLA.

The units will be developed over an area of 49 882m<sup>2</sup>. The development will consist of 1- and 2-bedroom apartments.

### 3. WATER RETICULATION NETWORK

#### 3.1 Existing Infrastructure

Currently, the site does not have a water reticulation network in place. An existing 110mm Ø water main exists in Red Alder Crescent (closer to Erf 3303). This 110mm Ø water main in Red Alder Crescent has sufficient capacity to supply water to the proposed development. However, this water main has very low pressures.

A 160mm Ø water main exists in Wild Pepper Tree Close (on the western boundary of erf 3304), the pipe diameter needs to be confirmed.

According to the water analysis model of the City of Cape Town, the pressure in Red Alder Crescent is approximately 57m but the peak pressure in the main drops to approximately 45m (theoretically) which will be sufficient pressure for the water to reach the top floors of this development. Fire boosters might be required.

It is proposed that our connection should be off this existing 160mm Ø municipal water main in Wild Pepper Tree Close, once the diameter is confirmed.



It should be noted that during drought periods extreme pressure management can be expected and the developer is encouraged to incorporate water management interventions.

### 3.2 Planned Development Consumption

The planned development will use approximately 370 800 l/day (4.292 l/s). The calculation was based on the figures from the “*Guidelines for Human Settlement Planning and Design*”.

| TREATED WATER DEMAND                |                                |            |                |              |
|-------------------------------------|--------------------------------|------------|----------------|--------------|
| DEVELOPMENT                         | Units                          | l/Unit/day | TOTAL (l/d)    | TOTAL (m³/d) |
| 1. Residential Units                | 770                            | 480        | 369600         | 369.6        |
| 2. Retail                           | 3                              | 400        | 1200           | 1.2          |
| 3. Crèche                           | 50                             | 20         | 1000           | 1.0          |
|                                     |                                |            | <b>370 800</b> | <b>370.8</b> |
| Annual Average Daily Demand (AADD)  | 370 800.00 l/d<br>4.292 l/s    |            |                |              |
| Equivalent Erven                    | 371                            |            |                |              |
| Peak Factor                         | 3.6                            |            |                |              |
| Peak Demand                         | 1 334 880.00 l/d<br>15.450 l/s |            |                |              |
|                                     |                                |            |                |              |
| RESIDUAL PRESSURES                  |                                |            |                |              |
| Minimum Head                        | 20 m                           |            |                |              |
| Maximum Head                        | 90 m                           |            |                |              |
|                                     |                                |            |                |              |
| WATER LINE DESIGN CRITERIA          |                                |            |                |              |
| Minimum Diameter House Connection   | 20 mm                          |            |                |              |
| Minimum Pipe Size Distribution Main | 150 mm                         |            |                |              |
|                                     |                                |            |                |              |
| CONNECTION DIAMETER REQUIRED        |                                |            |                |              |
| 0.6 m/s AADD                        | 110 mm                         |            |                |              |
| 0.6 m/s Peak                        | 200 mm                         |            |                |              |
| 1.2 m/s AADD                        | 75 mm                          |            |                |              |
| 1.2 m/s Peak                        | 160 mm                         |            |                |              |

The minimum domestic water pressure supply to the development should be at least 20m head and should not exceed 90m head.

The internal reticulation system of the development will connect to the existing City of Cape Town Municipal network with the required water meter as per the applicable standard technical requirements and specifications of the local authority, provided that sufficient capacity is available to accommodate the proposed development as stated in the capacity report.

The proposed main connection from the municipal line to the development should be 160mm (ND) in diameter, Class 16 uPVC.

## 4. SEWER RETICULATION NETWORK

### 4.1 Existing Infrastructure

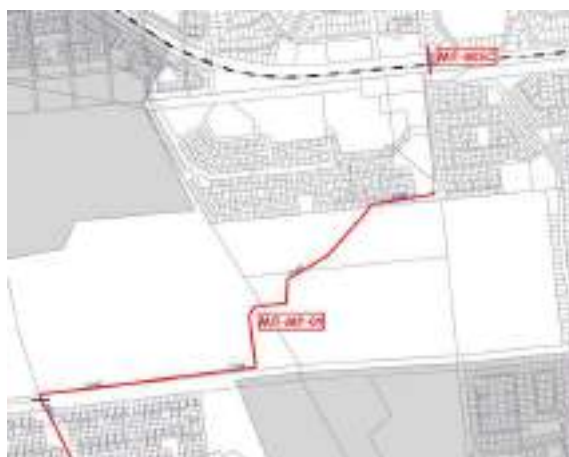
Currently, the site does not have an existing sewer reticulation network in place.

An existing 160mm Ø sewer main exists in Red Alder Crescent (to service erf 3303). An existing 160mm Ø sewer main exists in Stinkwood Road (to service erf 3304). This 160mm Ø main has limited capacity and cannot accommodate this large flow expected from the development.



The nearest major sewer is along Lente Road to the east of the proposed development provided the invert level is low enough to avoid pumping. The capacity is limited in this 225mm Ø collector sewer that progressively increases to a 450mm Ø.

According to the master plan, items that will be upgraded by The City of Cape Town is the bulk downstream system all the way to the Spine Road outfall sewer. This upgrade will progressively increase from 315 mm at the boundary of the development to 600mm just north of the Spine Road Bulk Sewer. See diagram shows this sewer Master Plan item by The City of Cape Town.



Currently the Spine Rd Bulk outfall sewer is being upgraded with a major part of the installation completed.

#### 4.2 Planned Development Flow Rate

The average sewer flow rate for the proposed development was determined by taking the AADD at 70%, which resulted in an ADWF (Average Dry Weather Flow) of 259 560.00 l/d (3.004 l/s).

From the “*Guidelines for Human Settlement Planning and Design*” a peak factor of 3.50 was set. The PDWF (Peak Dry Weather Flow) will be 908 460.00 l/d (10.515 l/s).

By adding the 15% of infiltration for the PWWF (Peak Wet Weather Flow), the PWWF will be 1 044 729.00 l/d (12.092 l/s).

| SEWER FLOW RATE                       |                                |
|---------------------------------------|--------------------------------|
| Annual Average Daily Demand (AADD)    | 370 800.00 l/d<br>4.292 l/s    |
| Average Dry Weather Flow (ADWF) @ 70% | 259 560.00 l/d<br>3.004 l/s    |
| Approximate Population                | 2310                           |
| Peak Factor                           | 3.50                           |
| Peak Dry Weather Flow (PDWF)          | 908 460.00 l/d<br>10.515 l/s   |
| Peak Wet Weather Flow (PWWF)          | 1 044 729.00 l/d<br>12.092 l/s |
| SEWER PIPE DIAMETERS PROPOSED         |                                |
| Main sewer line @ 0.7m/s              | 150mm (160mm)                  |

The minimum slope for the 150mm (ID) pipe should be at least 1:80.

## 5. ROAD NETWORK

### 5.1 Existing Infrastructure

Currently the site does not have an internal road network or entrance in place.

Stinkwood Road is parallel to the southern boundary fence line.

## 5.2 Planned Development Road Infrastructure

The proposed access road will be off Stinkwood Road.

The site is located within a suburban roadside development environment predominantly surrounded by residential-zoned properties and is well served by the surrounding road network and is partially bound by Stinkwood Road to the south, Lente Road to the east and Montclair Drive to the north.

The following intersections were investigated during the traffic impact assessment:

- Intersection 1: Swartklip Road (M49) / Highlands Drive
- Intersection 2: Swartklip Road / Hillcrest Road
- Intersection 3: Highlands Drive / Montclair Drive / Samantha Street
- Intersection 4: Montclair Drive / Hillcrest Road
- Intersection 5: Montclair Drive / Geranium Road
- Intersection 6: Geranium Road / Lente Road
- Intersection 7: Lente Road / Stinkwood Road

The traffic count surveys were conducted on the road network on Tuesday, 18 April 2023.

The surveys were undertaken during the following periods:

- AM Peak Period: 06:00 – 09:00
- PM Peak Period: 15:00 – 18:00

The proposed development is expected to have a low to medium impact on the traffic operations at the study intersections during the future year scenarios.

### Proposed Mitigation

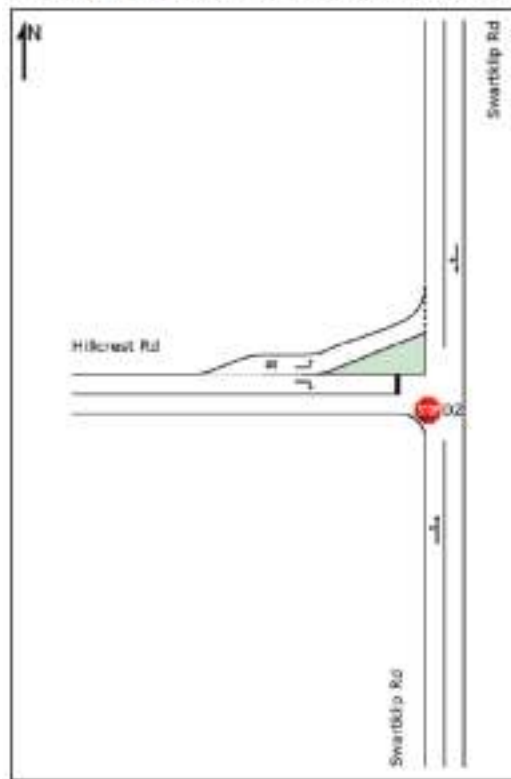
The intersections of Swartklip Road / Hillcrest Road (Study Intersection 2) and Montclair Drive / Hillcrest Road (Study Intersection 4) were found to operate at unacceptable LOS during the peak periods which is attributed to increased traffic in the Montclair area as a result of the approved traffic and further exacerbated by the additional site traffic. The following mitigation measures are recommended to restore the traffic operations to an acceptable state:

- Intersection 2: Dedicated left turn slip-lane in Hillcrest Road
- Intersection 4: One-way stop control in Hillcrest Road

If the above intersection improvements are implemented the proposed development can be considered to have a low impact on the surrounding road network.

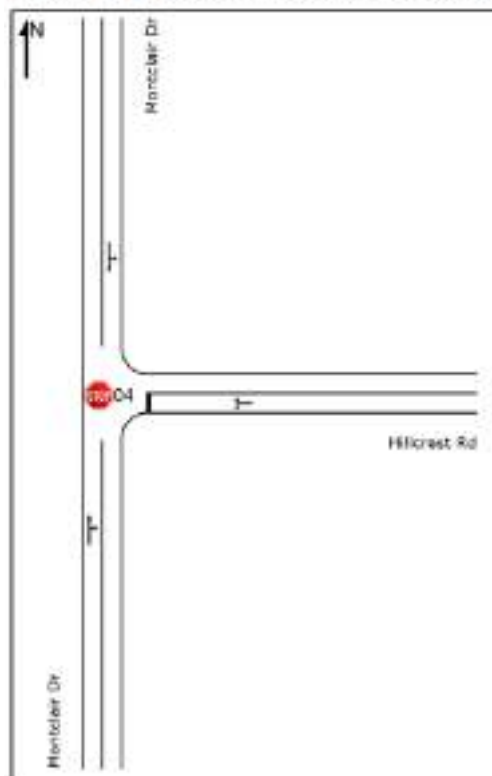
The Swartklip Road / Hillcrest Road (Study Intersection 2) upgrade proposal is indicated in the diagram below.

Figure 10: Improved intersection Geometry of Swartlip Rd / Hillcrest Rd



Montclair Drive / Hillcrest Rod (Study Intersection 4) upgrade proposal is indicated in the diagram below.

Figure 11: Improved intersection Geometry of Montclair Dr / Hillcrest Rd



### Site Access

A single vehicular access will be off Stinkwood Road. The width of the access will be wider than 8m, therefore departure for the carriageway crossing (CWC) will be required. According to the SDP, the access control gates will be set back at 12m into the site, measured from the site boundary line, and is therefore deemed adequate.

Pedestrian access will be achievable via turnstiles on either side of the site access road.

### Public Transportation

The Montclair area is serviced by minibus taxis and buses. There are bus stops on both sides of Montclair Drive and Hillcrest Road. The walking distance to the bus stops from the proposed development is in excess of 700m which is not ideal. However, there is a minibus taxi stop at the Mandalay train station as well as an informal taxi rank on the corner of Montclair Drive / Geranium Road, mainly in operation during the AM peak period. The informal taxi rank is located approximately 450m in walking distance from the site. The Golden Arrow bus service has a handful of buses operating in the area between 06:00 – 06:30 to Cape Town City Centre and Claremont CBD. In the PM peak, a single bus from both Cape Town and Claremont returns to Montclair.

The taxi stop at the Mandalay train station is not in use as the train services are still suspended due to historic vandalism of the trains and rail infrastructure on the Central Line. The Passenger Rail Agency of SA (Prasa) concluded phase one of their restoration project on the Central line in March this year with services running from Nyanga to Maitland. The Mandalay train station may form part of the Phase 2 restoration.

According to the SDP, a future pedestrian access is envisaged within the proposed development to provide direct access to the Mandalay train station.

### Non-Motorised Transportation

The existing sidewalks within the Montclair area are adequate to serve the needs of pedestrians. Most of the sidewalks measure 2,0m in width. The internal sidewalks will measure at least 1,5m in width.

### Parking Requirements

The site is located in a 'PT2 area' which is defined as areas where the use of public transport is promoted and the City considers the provision of public transport good, or where the use of motor vehicles is very limited.

In accordance with the City of Cape Town's Development Management Scheme (DMS), developments within a PT2 area have a zero-parking requirement. However, provision shall be made for parking at a ratio of 0,53 bays/unit which is higher than the 0,5 bays/unit ratio adopted for social housing developments endorsed by the Social Housing Regulatory Authority (SHRA). Furthermore, dedicated parking will be provided to serve the ancillary uses with 14 bays and 12 bays allocated to the crèche and retail shops, respectively.

It is therefore recommended that;

1. The City of Cape Town consider supporting the application as the proposed development was found to have a low impact on the surrounding road network, provided the following mitigation measures are implemented at Study Intersections 2 & 4:

- Intersection 2: Dedicated left turn slip-lane in Hillcrest Road
- Intersection 4: One-way stop control in Hillcrest Road

2. All internal sidewalks measure at least 1,5m in width.

### Internal Design

The parking bays will consist of dimensions in line with normal parking standards (2,5 x 5,0m) with a minimum 7,0m aisle width. Disabled parking bays will be included in the parking area (3,5 x 5,0m, or 6.0 x 5.0m for adjacent disabled bays).

Refer to **Annexure C** for the Traffic Impact Assessment (TIA).

## **6. STORMWATER**

### *6.1 Existing Infrastructure*

Currently the site does not have any existing stormwater infrastructure in-place. Existing stormwater services exists in Stinkwood Road, however the size of these existing pipes are unknown at this stage. We assume that it is 375mm Ø and 450mm Ø concrete pipes.

### *6.2 Proposed Stormwater Infrastructure*

The internal stormwater will be collected by grid inlets. These inlets will be linked by means of stormwater pipes to manholes. An outlet stormwater pipe (375mm Ø) will be installed to the internal stormwater pond. The internal stormwater pond will have an outlet structure which will be linked to the existing stormwater pipe in Stinkwood Road.

The internal stormwater pipe to the municipal network will consist of 250mm diameter uPVC, class 34 pipes from the grid inlets. The main branches, acting as outlet pipes will be 375mm diameter, class 75D concrete pipe which will connect to the existing municipal stormwater network.

BK2 kerbs with C1 channels will be used at the entrance (CWC) and refuse embayment. A combination BK1 kerbs with C1 channels will be used internally for the parking areas and internal roads. The road surfaces will be constructed with 80mm interlocking concrete pavers, 40MPa/2.0.

We trust that this report meets your requirements.

Please do not hesitate to contact the undersigned for any additional information.

Yours faithfully,



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