HARTLAND

Lifestyle Estate

HARTLAND II (JAKKALSKOP) ESTATE
REMAINDER OF THE FARM VAALE VALLEY 219
MOSSEL BAY

HIGH LEVEL BULK ENGINEERING SERVICES REPORT

REVISION 1

MAY 2025

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MAY 2025

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REVISION 1

CONTENTS

1 INTRODUCTION

1.1 Background

Element Consulting Engineers has been appointed for the rendering of the multi-disciplinary package of professional engineering services for the development of the Hartland II (Jakkalskop) Estate.

1.2 Purpose of the report

This report will detail and discuss the high level bulk engineering services of the proposed development and is intended to be utilized for the Environmental Impact Assessment (EIA) application as well as the Town Planning Application.

1.3 Locality and layout

The development is situated on Remainder of farm Vaale Valley 219, Mossel Bay, approximately 11km north of Mossel Bay and 34km west of George.

The farm is bound by Outeniquasbosch Estate (Farm 248 Oude Duinzigt) to the north-west, Monte Christo Residential Estate to the west, New Vintage Residential Estate (Portion 99 of Farm Hartenbosch 217) to the south-west, National Road 2 (N2) as well as the R102 (MR344) to the south-east and the Klein Brak River to the north-east.

Access is obtained from the R102 (MR344) on the south-eastern boundary.

The locality and layout of the development, in relation to the adjacent road network and developments, is indicated in the figure below.

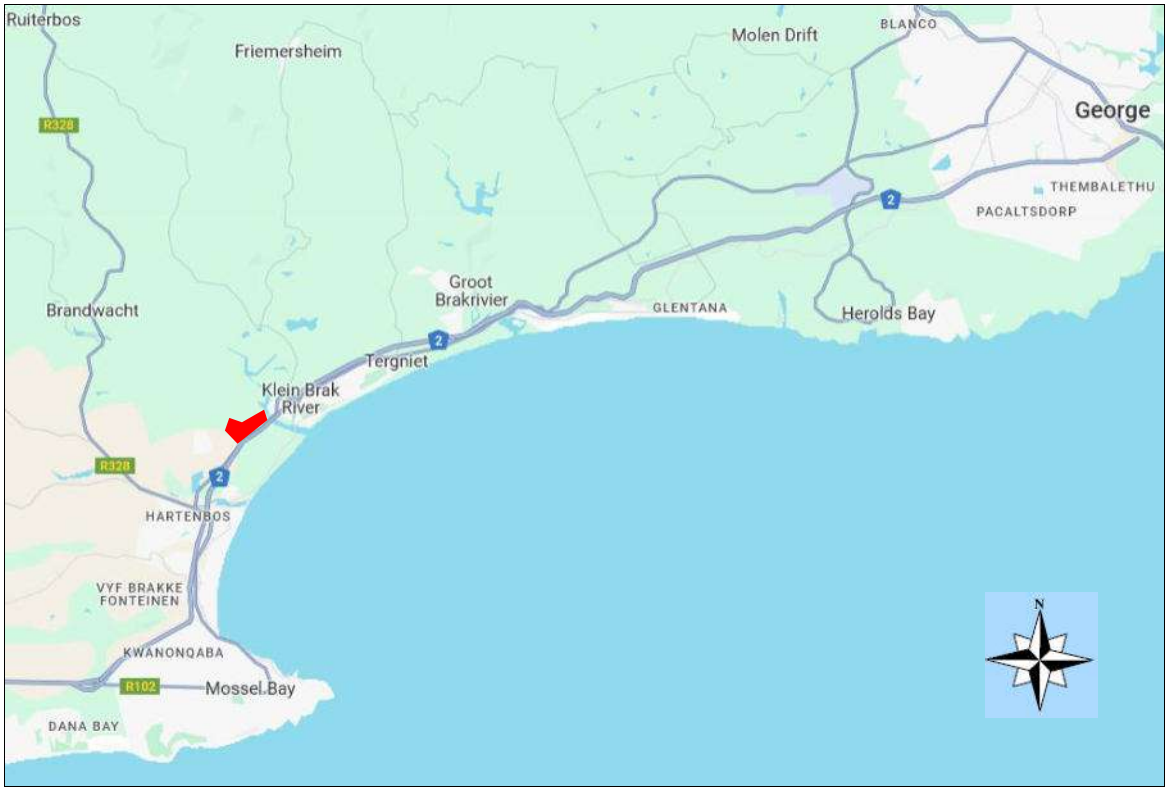


Figure 1: Locality plan

Figure 2: Layout plan

1.4 Site Development Plan

A Site Development Plan (SDP) has been prepared and is presented in the following diagram and is attached to the report as addendum.

Figure 3: Site Development Plan (SDP)

1.5 Proposed land use

The proposed development envisages the following:

- Hospital – 200 beds
- School – 2600 students
- Tertiary Education Centre – 450 students
- Hostels – 136 students

2 GEOTECNICAL INVESTIGATION

A formal geotechnical investigation has been commissioned and has been conducted by Terra Geotechnical Services. The full report is available upon request. Holistically, the conclusion is reached that the in-situ materials found on site are adequate for the construction of engineering services and foundations for commercial development.

Slope Stability

Gradients on the site are flat to undulating. No natural slope instability is present.

Ground water and stormwater

No ground water and/or perched water are evident. A high water retention rate is expected. Lateral movement of stormwater will be moderate due to the flat to undulating gradient. Erosion of the silty sands may occur. A number of drainage lines crosses the development footprint and need to be incorporated into the SDP of the development. A number of existing farm dams may be repurposed as stormwater detention dams and incorporated into the stormwater management plan (SMP) and SDP of the development.

Engineering Services

A TLB will suffice for trenching and excavations of all services and foundations in all materials.

Foundations for commercial and institutional development

The in-situ materials are adequate to support commercial and institutional development. A combination of medium reinforced raft foundations, medium strip footings and medium reinforced concrete column foundations will be adequate for the development. Fill areas to be adequately compacted to a minimum specification.

3 ENGINEERING SERVICES

This chapter will discuss the high level bulk engineering services of the development as well as the engineering standards and technical design criteria applicable to the project.

3.1 Services agreement

A services agreement (SA) will be signed between the developer and the municipality on conclusion of the EIA and townplanning processes. This bulk services engineering report, as well as inputs from the EIA and townplanning processes, will form the basis of the SA.

3.2 Water

3.2.1 Water Demand

The Average Annual Daily Demand (AADD) for the development, in line with accepted design consumptions, assumptions, criteria and standards, is 337kl/day.

3.2.2 Bulk Availability

Bulk water is available for this development. A letter of confirmation has been requested from the Mossel Bay Municipality.

3.2.3 Connection Point

The development is serviced by the new municipal 7Ml Jakkalskop Reservoir, situated centrally on the highest point on the proposed development.

The new Jakkalskop reservoir feeds into a new 500mm municipal uPVC bulk water line that has recently been constructed along the R102 (MR344) on the south eastern boundary of the development.

The bulk water connection to the development may be at any of a number of positions, along the new 500mm line. The bulk water connection for the school and hospital will be from a new line along the new access road. The bulk water connection for the tertiary education centre is proposed at a point adjacent to the centre on the R102 (MR344).

3.2.4 Design Criteria and Standard of Engineering Services

- AADD Design consumption
    - Hospital – 0.6kl/bed
    - School – 60l/student
    - Tertiary Education Centre – 60l/student
    - Hostel – 240l/student

- Peak factors as prescribed
- Minimum pressures for the network are calculated for a fire flow 30l/sec and peak demand at the point of lowest pressure under peak conditions.
- Maximum of 4 valves to isolate a pipe section.
- Maximum length of 600m of main pipe per isolated section.
- Air valves provided where applicable.
- Minimum cover to pipes 900mm.
- Pipe type and class uPVC class 6 to 12, depending on network pressure.
- Pipe diameters varying between 90mm and 200mm depending on pressure available and flow required.
- Erf connections HDPE Class 10.
- Erven serviced with a 20mm connection and Aqua-Loc box and meter.
- Fire hydrants provided in accordance with relevant guidelines and legislation.

3.2.5 Bulk water layout

The bulk water layout is presented in the following diagram.

Figure 4: Reservoir and bulk water line

3.2.6 Internal bulk water preliminary design drawing

The bulk water preliminary design drawing is presented in the following diagram and is attached as addendum to the report.

Figure 5: Bulk water preliminary design drawing

3.3 Sewer

3.3.1 Site layout considerations

The proposed development spans over a number of watersheds and a number of drainage zones are identified. Each zone will be serviced with a gravity sewer network and pump station. The primary drainage zone drains towards the southernmost corner of the site adjacent to the R102 (MR344) and is indicated diagrammatically in the figure below.

Figure 6: Primary sewer drainage

3.3.2 Design flow

The Average Dry Weather Flow (ADWF) of the development, in line with accepted design criteria and standards, is 304kl/d.

The design peak flow, inclusive of a specified peak factor of 3.0 and 15% extraneous flow, will be calculated during detail design stage.

3.3.3 Connection point, pressure line and sewer pumpstation

The site is not serviced by a municipal sewer connection or a municipal sewer network in close vicinity.

A new main sewer pump station (Pump Station 1 – PS1) shall be constructed in the southern corner of the proposed development. Sewer will be pumped from here to the Hartenbos Regional WWTW with a new pressure line. The routing of the new pressure line shall be finalized with the municipality during the detail design stage, but shall in concept be as per the diagram below.

Figure 7: Sewer PS1 and pressure line to Hartenbos Regional WWTW

3.3.4 Capacity at Hartenbos regional WWTW

Hartenbos regional WWTW has sufficient capacity to accommodate the bulk sewer from the development. A letter of confirmation has been requested from the Mossel Bay Municipality.

3.3.5 Design Criteria and Standards of Engineering Services

- The following design flows are utilized:
  - Hospital – 0.54kl/bed
  - School – 54l/student
  - Tertiary Education Centre – 54l/student
  - Hostel – 220l/student
- Specified peak factor of 3.0
- Allowance for 15% extraneous flow
- A conventional waterborne sewerage system is provided.
- Minimum flow velocities designed for as 0.7m/s.
- Minimum cover to all pipes of 800mm.
- Pipe diameters of generally 110mm for all service connections and minor lines and 250mm for main lines, as required per the detailed designs.
- Minimum design gradients as follows:

Units	Grade
1	1:60
1-5	1:80
6-10	1:100
11-80	1:120
81-110	1:150

>110	1:180

- Erf connection depth minimum 1.0 m and at least be able to drain 80% of the erf.
- Precast concrete rings manholes, concrete floor, premanufactured concrete lid.
- Manhole covers and frames Polymer Concrete.
- Manholes central over main pipe on downstream side.
- Manhole spacing maximum 80m
- All concrete, mortar or screed used with manholes from dolomite aggregate and low alkali sulphate resistant cement to SABS 471.
- Pipelines uPVC class 34, laid on Class C bedding.

3.3.6 Internal bulk sewer preliminary design drawing

The bulk sewer preliminary design drawing is presented in the following diagram and is attached as addendum to the report.

Figure 8: Bulk sewer preliminary design drawing

3.4 Roads and access

3.4.1 Access

Access may be obtained from the MR344 (R102) at approximately chainages km 2.299, km2.763, km3.422 and km4.643. Sight distances at these accesses to the development are excellent in both directions in both the horizontal and vertical alignments.

Primary access for phase 1 will be obtained from km2.763 at the existing formalized Hartland Estate access. Secondary access for phase 1 will be obtained from km2.299.

The necessary applications will be lodged to the Provincial Roads Authority for the formalization of these accesses.

The access points are indicated in the following diagram.

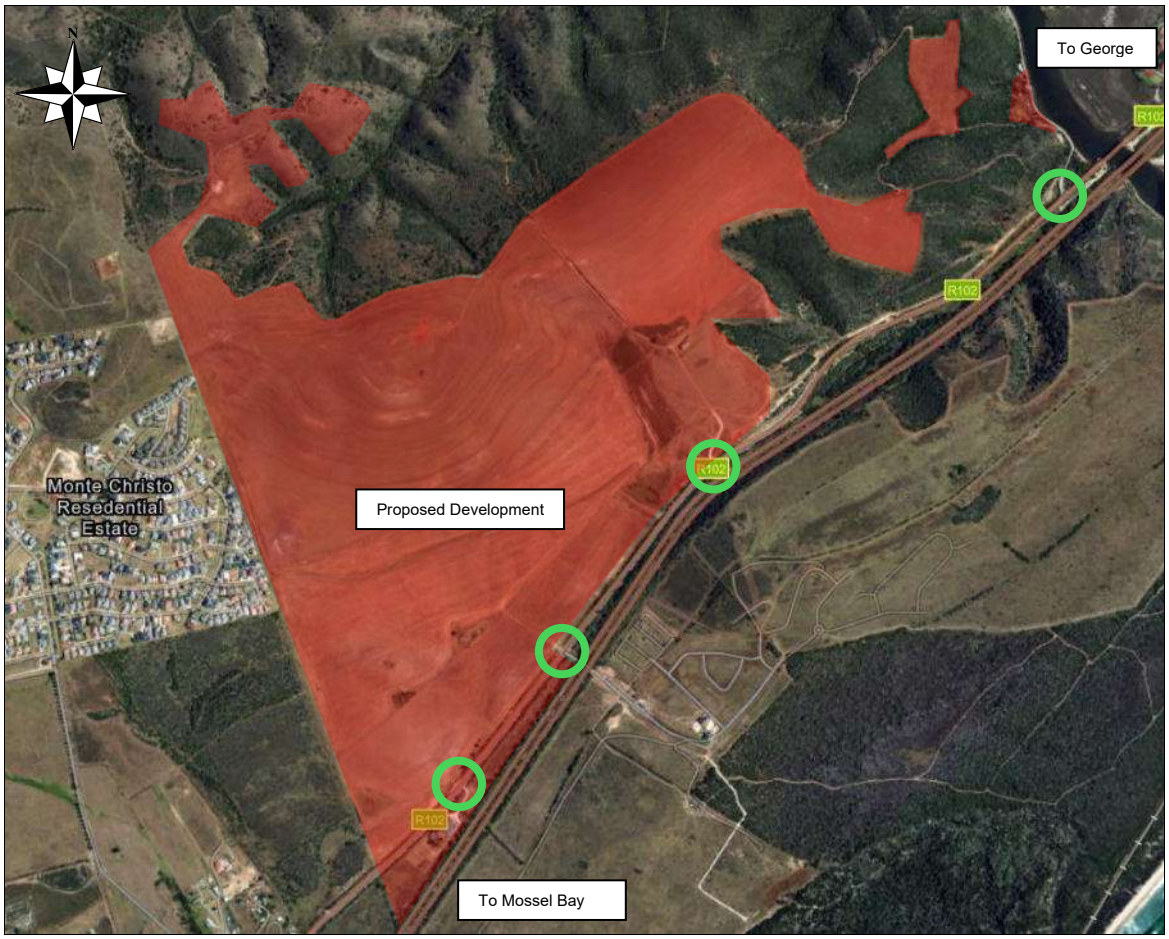


Figure 9: Access to the development from the R102 (MR344)

3.4.2 Access configuration

In accordance with provincial roads guidelines, the access configuration for the accesses onto the R102 (MR344) shall be a full access with stop control from the development. The accesses will trigger right turn lanes on the R102 (MR344). The length of the right turn lane shall be a nominal length to be determined through negotiations with the provincial roads' authority, in line with minimum geometric standards. All of the above to be determined during the detail design stage.

3.4.3 Internal Standards and Design Criteria

Internal standards and design criteria are specified as follows:

- Internal road widths of between 5.2m and 7.4m, depending on road class
- Asphalt surfacing 30mm.
- Pavement structural materials to be imported from commercial sources.
- All minimum radii at bellmouths to be 8m.
- Minimum road grade of 0.4% and camber of 2%.
- Road design life of 20 years.

3.4.4 Preliminary design drawing

The preliminary access and roads layout design drawing is presented in the following diagram and is attached as addendum to the report.

Figure 10: Preliminary access and roads layout design drawing

3.4.5 Traffic Impact Assessment

A Traffic Impact Assessment (TIA) will be required to be conducted for the development. The TIA will be required to be conducted in line with all provincial and municipal prescriptions and guidelines.

3.4.6 Public transport facilities

The provision of public transport facilities like minibus-taxi drop-off facilities to be investigated on the R102 (MR344) at the access points to the development.

3.4.7 Parking

Sufficient parking shall be provided on the SDP of the proposed development in line with all municipal guidelines. Parking shall be provided for disabled persons at all public and/or commercial facilities.

3.5 Stormwater

3.5.1 Site layout considerations and internal drainage

The proposed development spans over a number of watersheds and a number of drainage zones are identified. Each zone will be serviced with a formal stormwater network. The primary drainage zone drains towards the southernmost corner of the site adjacent to the R102 (MR344) and is indicated diagrammatically in the figure below. The secondary drainage zone drains towards the Little Brak River to the east and is also indicated diagrammatically in the figure below.

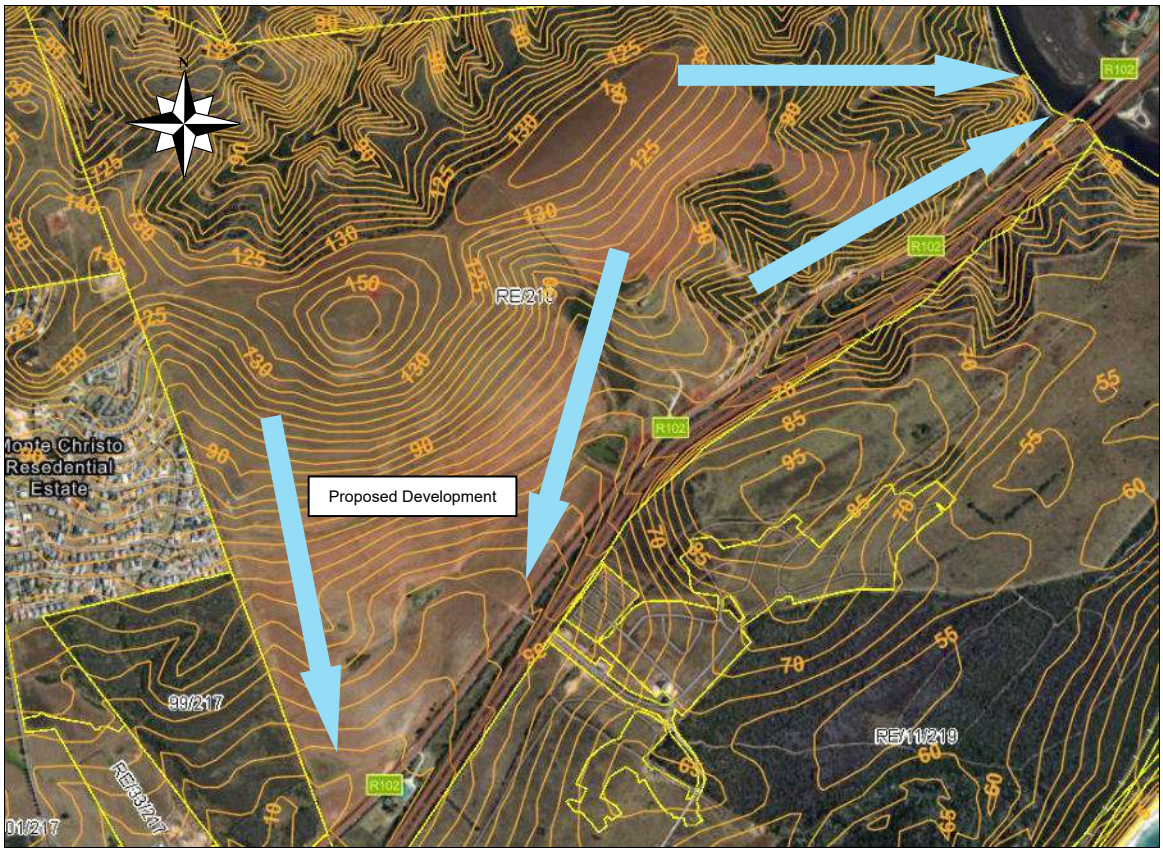


Figure 11: Primary stormwater drainage (south) and secondary drainage (east)

3.5.2 External stormwater drainage

For the primary drainage area, stormwater will be collected in a detention pond on the lowest point of the site on the southern corner. Stormwater will drain south-west in a dedicated concrete culvert, underneath Monte Christo Road, where it will drain into the

existing municipal detention pond on the municipal erf (Ptn 101 of Farm 217). Drainage from the municipal detention pond is into the Hartenbos River.

For the secondary drainage area, stormwater will drain directly into the Little Brak River.

The proposed infrastructure is indicated on the figure below:

Figure 12: External stormwater drainage: Detention Pond 1 with culvert to municipal detention pond.

3.5.3 Internal design, standards and criteria

A formal stormwater reticulation system will be provided by a combination of surfaced roadways, kerbs, channels, cut-off drains, strormwater pipes, detention ponds and various minor structures. Energy dissipation will be performed as standard practice with gabion mattresses at all outlets. All pipe outlets will be standard concrete headwalls. Litter traps will be provided at all stormwater outlets and will be cleaned on a regular basis by the estate's landscaping and maintenance teams.

The integrated stormwater and road system form an integral part of layout planning. The system rests on three legs, namely the minor system, the major system and the emergency system. Minor storms and normal flowoff are catered for in the normal road prism and piped system. Major storms are routed through a linked system of road prisms and public open spaces, using attenuation techniques. The emergency system recognizes failure of the minor and major systems and provides for emergency runoff by providing continuous overland flow routes to minimize flooding of residential areas.

The following standards and design criteria are relevant:

- Minor system designed for 2-year return period and conveyed in a combination of maximum 200m aboveground in the road prism and underground piped system.
- Major system designed for 50-year return period. Difference between the 50 year and 2-year flood to be conveyed in the road prism with depths not exceeding 150mm and into designated public open spaces, using attenuation techniques.
- Minimum gradients for pipelines allow minimum flow speeds of 0.7m/s at full flow.
- Maximum pipeline flow velocities are 3.5m/s.
- Stormwater pipes - 100D.
- Bedding - Class C.
- Minimum cover on pipes - 800mm.
- Minimum pipe diameter - 450mm.
- Gabion mattresses to be provided at all outlets for energy dissipation.
- Outlets to be standard concrete headwalls.

All designs will be confirmed with the municipality during the detail design stage.

3.5.4 Stormwater preliminary design drawing

The stormwater preliminary design drawing is presented in the following diagram and is attached as addendum to the report.

Figure 13: Stormwater preliminary design drawing

3.6 Solid Waste

Refuse removal shall be performed by the Mossel Bay Municipality. A dedicated solid waste collection facility shall be provided and designed to the satisfaction of the Mossel Bay municipality. Solid waste removal to be included in- and performed in accordance with a signed services agreement.

3.7 Electricity

3.7.1 Bulk Supply

The bulk electrical services to the development will be provided by the Mossel Bay Municipality from the existing Hartenbos North (11/11kV) Switching Station, which is located along Monte Christo Road, Hartenbos. This substation has recently been constructed by the Mossel Bay Municipality, specifically for providing bulk electrical power to all planned developments within this area. The position of the planned Hartland 2 development, relative to the substation position, is indicated in the figure below.

The Developer will be responsible for the provision of two (2) new 11kV, air-insulated circuit breakers, to be added onto the existing 11kV switchboard within the Hartenbos North (11/11kV) Switching Station. Sufficient space has been allowed for in this substation for the addition of future circuit breakers, which means that the building will not need to be extended. A project has already been initiated by the Developer as part of the provision of the Bulk Electrical (MV) Supply to the Hartland 1 development for the installation of the two (2) new circuit breakers within the Hartenbos Noord Substation. The same circuit breakers will be used to also supply the Hartland 2 development.

From the new 11kV circuit breakers, the Developer will be responsible for the installation of an 11kV underground cable ring network to the erf boundary of the planned development. A project has already been initiated by the Developer as part of the provision of the Bulk Electrical (MV) Supply to the Hartland 1 development for the installation of 1x 11kV, 150 mm^2, 3-core, Copper, PILC cable (rated 280A, 5.4 MVA @ 11kV) along the Western Access Road. As part of this project, a second 11kV cable (with the same rating and a length of 300m) will be installed in the same trench from the Hartenbos Noord Substation to the Monte Christo / R102 crossing and then turning east along the R102 in the direction of the new Hartland 2 development and will be left coiled and energized in the trench, until such time as the new development is constructed and the bulk supply being required.

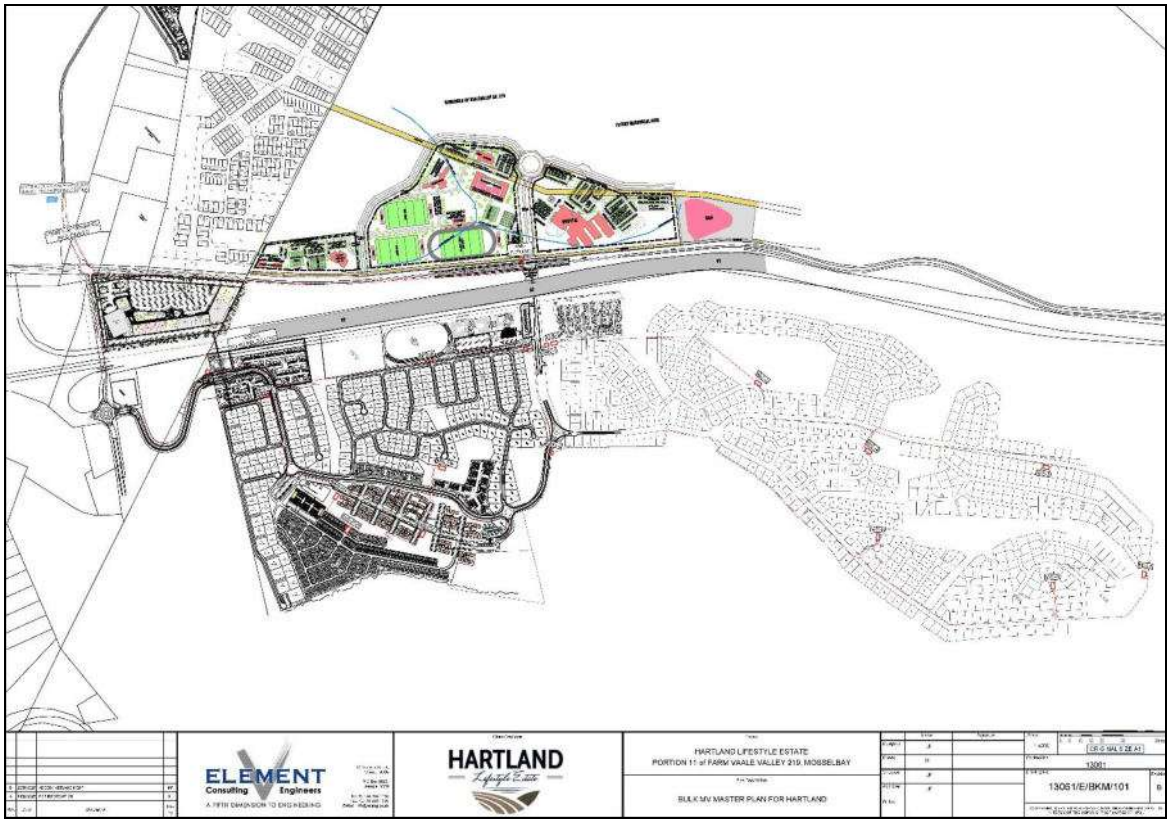


Figure 14: Bulk Electrical (MV) Supply Network

A new 4-way Ring Main Unit (RMU), which will also be supplied by the Developer, will serve as the main supply (and metering) point, from where the rest of the development's medium and low voltage networks will be supplied. The proposed position of this new RMU will be in close proximity to the main entrance to the development. Once the new RMU has been installed, the final sections of 11kV, 150 mm^2, 3-core, Copper, PILC cable between the RMU's for Hartland 1 and Hartland 2 developments will be installed (as indicated in the figure above) to complete the ring network from the Hartenbos Noord Substation to the two Hartland developments. This ring network will be dedicated for the Hartland developments and will not be shared with other future developments in the area.

It is important to note that there are currently no dedicated cable routes and/or servitudes along the R102, between the Hartenbos North (11/11kV) Switching Station and the planned development. This will have to be negotiated with the relevant parties and landowners during the planning stage of the project.

3.7.2 Maximum Demand

Based on the latest proposed layout plans, the following table provides an estimate of the number of units as well as the estimated load per category, based on the area allocated. The following major sub-divisions of development have been allowed for:

Category B: Hospital
Category C: Secondary Schools with Hostel and Sport Fields

Category D: Tertiary Education with Hostel and Sport Fields

Description	Area	Units	Total Load Before Diversity (kVA)	Diversity	Total Load After Diversity (kVA)
Category B					
Hospital	17162m^2	1	1090	0.8	872
Category C					
Secondary School	8582m^2	1	423	0.7	296
School Sport Field Lighting		1	109	0.8	87
School Hostels	1289m^2	1	107	0.9	96
Category D					
Tertiary Education Centre		1	302	0.7	211
Student Accommodation		1	107	0.9	96
Sports Facilities		1	20	0.8	16
TOTAL			**2168**		**1680**

Figure 15: Estimated Load per Category

The estimated After Diversity Maximum Demand (ADMD) for the entire development, catering for all the different categories as well as some general electrical load (street lighting, public lighting, pump stations, etc.), as per accepted design assumptions, criteria and standards, is estimated to be 1.7 MVA. This capacity is currently available at the Hartenbos North (11/11kV) Switching Station. A confirmation letter has been requested from the Mossel Bay Municipality.

3.7.3 Internal Medium Voltage (MV) Reticulation

The internal MV reticulation will be in the form of an underground cable ring network, connecting to various mini-substations, strategically located throughout the estate. It is recommended that separate minisubs be provided for each of the different categories, i.e. hospital, secondary school and tertiary education. The developer will be responsible for the installation of the MV infrastructure from the bulk connection point (ring main unit). Mossel Bay Municipality will by default not take over the internal MV network and the developer will remain responsible for all operations and maintenance of the entire network.

3.7.4 Internal Low Voltage (LV) Reticulation

An internal low voltage reticulation network will be provided from the minisubs to standard street-front kiosks and/or distribution boards. All LV cabling and service connections will be installed underground. It is recommended that the metering for the individual premises be in the form of Pre-Paid Metering, where the meters will be installed in the kiosks and customer interface unit will be installed in the client's building.

A specific service provider will be appointed to install the pre-paid meters and to manage the vending of electricity sales on behalf of the developer.

Mossel Bay Municipality will by default not take over the internal LV network and revenue metering to customers as the developer will remain responsible for all operations and maintenance of the entire network.

3.7.5 Street Lighting

Decorative and energy saving street lighting will be provided for the development and will be supplied from the closest minisub. Streetlights will be controlled via day-night sensors and switches.

3.7.6 Data Reticulation

A data reticulation sleeve network will be provided as part of the detail design and construction phase of the project. This will include all the required PVC sleeves and manholes from a central connection point at the entrance to the development, all the way to each individual site. It is important to note that no data cabling (fibre optic) will be allowed for as part of the initial development, but only the back-bone infrastructure will be installed as part of the bulk services installation for the development. This will ensure that when a fibre network service provider is appointed at some point in the future, all the infrastructure will be in place for them to only install the fibre cables and that no roads or other bulk infrastructure services will be damaged in the process of doing so.

4 CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

The following conclusions can be reached from the High Level Bulk Engineering Services Report on the development of Hartland II (Jakkalskop) Estate on Remainder of farm Vaale Valley 219, Mossel Bay:

1. A services agreement (SA) will be signed between the developer and the municipality on conclusion of the EIA and townplanning processes. This bulk services engineering report, as well as inputs from the EIA and townplanning processes, will form the basis of the SA.
2. The in-situ materials found on site are adequate for the construction of engineering services and foundations for residential and commercial development.
3. Water:
    a. The Average Annual Daily Demand (AADD) for the development, in line with accepted design consumptions, assumptions, criteria and standards, is 337kl/day.
    b. Bulk water is available for this development. A letter of confirmation has been requested from the Mossel Bay Municipality.
    c. The development is serviced by the new municipal 7Ml Jakkalskop Reservoir, situated centrally on the highest point on the proposed development.
    d. The new Jakkalskop reservoir feeds into a new 500mm municipal uPVC bulk water line that has recently been constructed along the R102 (MR344) on the south eastern boundary of the development.
    e. The bulk water connection to the development may be at any of a number of positions, along the new 500mm line. The bulk water connection for the school and hospital will be from a new line along the new access road. The bulk water connection for the tertiary education centre is proposed at a point adjacent to the centre on the R102 (MR344).
4. Sewer:
    a. The proposed development spans over a number of watersheds and a number of drainage zones are identified. Each zone will be serviced with a gravity sewer network and pump station. The primary drainage zone drains towards the southernmost corner of the site adjacent to the R102 (MR344).
    b. The Average Dry Weather Flow (ADWF) of the development, in line with accepted design criteria and standards, is 304kl/d.
    c. The site is not serviced by a municipal sewer connection or a municipal sewer network in close vicinity.

d. A new main sewer pump station (Pump Station 1 – PS1) shall be constructed in the southern corner of the proposed development.
e. Sewer will be pumped from here to the Hartenbos Regional WWTW with a new pressure line.
f. Hartenbos regional WWTW has sufficient capacity to accommodate the bulk sewer from the development. A letter of confirmation has been requested from the Mossel Bay Municipality.

5. Roads & access
    a. Primary access for phase 1 will be obtained from km2.763 at the existing formalized Hartland Estate access. Secondary access for phase 1 will be obtained from km2.299. Sight distances at these accesses to the development are excellent in both directions in both the horizontal and vertical alignments.
    b. The necessary applications will be required to be lodged to the Provincial Roads Authority for the formalization of these accesses.
    c. The access configuration for the accesses onto the R102 (MR344) will trigger right turn lanes on the R102 (MR344).
    d. A Traffic Impact Assessment (TIA) will be required to be conducted for the development. The TIA will be required to be conducted in line with all provincial and municipal prescriptions and guidelines.
    e. The provision of public transport facilities like minibus-taxi drop-off facilities to be investigated on the R102 (MR344) at the access points to the development.
    f. Sufficient parking shall be provided on the SDP of the proposed development in line with all municipal guidelines. Parking shall be provided for disabled persons at all public and/or commercial facilities.
6. Stormwater:
    a. The proposed development spans over a number of watersheds and a number of drainage zones are identified. Each zone will be serviced with a formal stormwater network. The primary drainage zone drains towards the southernmost corner of the site adjacent to the R102 (MR344). The secondary drainage zone drains towards the Little Brak River to the east.
    b. For the primary drainage area, stormwater will be collected in a detention pond on the lowest point of the site on the southern corner. Stormwater will drain south-west in a dedicated concrete culvert, underneath Monte Christo Road, where it will drain into the existing municipal detention pond on the municipal erf (Ptn 101 of Farm 217). Drainage from the municipal detention pond is into the Hartenbos River. For the secondary drainage area, stormwater will drain directly into the Little Brak River.
    c. A formal stormwater reticulation system will be provided by a combination of surfaced roadways, kerbs, channels, cut-off drains, strormwater pipes, detention ponds and various minor structures. Energy dissipation will be performed as standard practice with gabion mattresses at all outlets. All pipe outlets will be standard concrete headwalls. Litter traps will be

provided at all stormwater outlets and will be cleaned on a regular basis by the estate's landscaping and maintenance teams.

7. Solid waste:
    a. Refuse removal shall be performed by the Mossel Bay Municipality. A dedicated solid waste collection facility shall be provided and designed to the satisfaction of the Mossel Bay municipality. Solid waste removal to be included in- and performed in accordance with a signed services agreement.
8. Electricity:
    a. The bulk electrical services to the development will be provided by the Mossel Bay Municipality from the existing Hartenbos North (11/11kV) Switching Station, which is located along Monte Christo Road, Hartenbos. This substation has recently been constructed by the Mossel Bay Municipality, specifically for providing bulk electrical power to all planned developments within this area.
    b. The Developer will be responsible for the provision of two (2) new 11kV, air-insulated circuit breakers, to be added onto the existing 11kV switchboard within the Hartenbos North (11/11kV) Switching Station. Sufficient space has been allowed for in this substation for the addition of future circuit breakers, which means that the building will not need to be extended. A project has already been initiated by the Developer as part of the provision of the Bulk Electrical (MV) Supply to the Hartland 1 development for the installation of the two (2) new circuit breakers within the Hartenbos Noord Substation. The same circuit breakers will be used to also supply the Hartland 2 development.
    c. From the new 11kV circuit breakers, the Developer will be responsible for the installation of an 11kV underground cable ring network to the erf boundary of the planned development. A project has already been initiated by the Developer as part of the provision of the Bulk Electrical (MV) Supply to the Hartland 1 development for the installation of 1x 11kV, 150 mm2, 3-core, Copper, PILC cable (rated 280A, 5.4 MVA @ 11kV) along the Western Access Road. As part of this project, a second 11kV cable (with the same rating and a length of 300m) will be installed in the same trench from the Hartenbos Noord Substation to the Monte Christo / R102 crossing and then turning east along the R102 in the direction of the new Hartland 2 development and will be left coiled and energized in the trench, until such time as the new development is constructed and the bulk supply being required.
    d. A new 4-way Ring Main Unit (RMU), which will also be supplied by the Developer, will serve as the main supply (and metering) point, from where the rest of the development's medium and low voltage networks will be supplied. The proposed position of this new RMU will be in close proximity to the main entrance to the development. Once the new RMU has been installed, the final sections of 11kV, 150 mm2, 3-core, Copper,

PILC cable between the RMU's for Hartland 1 and Hartland 2 developments will be installed to complete the ring network from the Hartenbos Noord Substation to the two Hartland developments. This ring network will be dedicated for the Hartland developments and will not be shared with other future developments in the area.

e. The estimated After Diversity Maximum Demand (ADMD) for the entire development, catering for all the different categories as well as some general electrical load (street lighting, public lighting, pump stations, etc.), as per accepted design assumptions, criteria and standards, is estimated to be 1.7 MVA. This capacity is currently available at the Hartenbos North (11/11kV) Switching Station. A confirmation letter has been requested from the Mossel Bay Municipality.
f. The internal MV reticulation will be in the form of an underground cable ring network, connecting to various mini-substations, strategically located throughout the estate. The developer will be responsible for the installation of the MV infrastructure from the bulk connection point (ring main unit).
g. An internal low voltage reticulation network will be provided from the minisubs to standard street-front kiosks. All LV cabling and service connections will be installed underground.
h. Decorative and energy saving street lighting will be provided for the development and will be supplied from the closest minisub. Streetlights will be controlled via day-night sensors and switches.
i. A data reticulation sleeve network will be provided.

It can holistically be concluded that the proposed development can be designed and constructed to acceptable specifications and standards from an engineering design perspective.

4.2 Recommendations

It is the holistic recommendation that the proposed development be approved from an engineering design perspective.

5 ADDENDA

5.1 Addendum 1: Site Development Plan

5.2 Addendum 2: Preliminary Bulk Engineering Services Design Drawings

5.3 Addendum 3: Municipal Confirmation Letters

HOSPITAL SCHEDULES

BED SPLIT

PAEDIATRIC	10
30 BED MEDICAL	30
35 BED MEDICAL ONCOLOGY	35
36 BED SURGICAL ONCOLOGY	36
6 BED DAY WARD	6
30 BED SURGICAL WARD	30
NNICU / HC	6
10 BED OBSTETRIC WARD, 10 BED GYNAECOLOGY WARD	20
16 BED ICU, 12 BED HC	28
TOTAL no of BEDS:	201

PARKING REQUIREMENTS

HOSPITAL

	Requirement	Area/Number	Required
Hospital	1/bed	201 beds	201
Admin	4/100m²	731m²	29
Coffee Shop	6/100m²	153m²	9
TOTAL			240

CONSULTING ROOMS

	Requirement	Area/Number	Required
Consulting Rooms	6/100m²	3500m²	210

SCHOOL SCHEDULES

ROOM SCHEDULE (ALL BUILDINGS -...

Name	Internal Floor Area
CLUBHOUSE	
ABLUTIONS	66.0 m²
B.O.H.	65.7 m²
CLUBHOUSE	267.7 m²
	350.0 m²
HOSTEL BUILDING	
3 BED	73.7 m²
6 BED	243.2 m²
ABLUTIONS	42.4 m²
CIRCULATION	109.2 m²
COVERED TERRACE	56.8 m²
DINING ROOM	239.2 m²
ENTRANCE	144.1 m²
KITCHEN	77.9 m²
OFFICE	8.8 m²
RECEPTION	14.2 m²
STAFF ROOM	36.1 m²
STORE	14.4 m²
STUDY HALL	264.1 m²
	1205.7 m²

ROOM SCHEDULE (ALL BUILDINGS -...

Name	Internal Floor Area
MAIN HALL & ADMIN BUILDING	
ADMIN	39.1 m²
AV ROOM	17.9 m²
BOARDROOM	51.3 m²
CLASSROOM	339.9 m²
COPE SPACE	70.7 m²
ENTRANCE	44.2 m²
FEMALE	33.8 m²
FOYER	65.5 m²
HEADMASTER	39.3 m²
MAIN HALL	516.8 m²
MALE	35.8 m²
SCHOOL OFFICE	57.1 m²
SCHOOL RECEPTION	41.3 m²
SICK BAY	9.7 m²
STAFF	4.8 m²
STAGE	87.8 m²
STORE	5.8 m²
WC	5.5 m²
	1439.8 m²

ROOM SCHEDULE (ALL BUILDINGS -...

Name	Internal Floor Area
SCHOOL CLASSROOMS BUILDING	
ABLUTIONS	577.2 m²
CIRCULATION	1096.3 m²
CLASSROOM	4825.9 m²
COMPUTER SCIENCES	125.2 m²
COVERED PODIUM	48.6 m²
HALL	126.3 m²
LIBRARY	172.1 m²
STORE	193.7 m²
	7120.9 m²
Grand total: 183	10366.7 m²

PARKING SCHEDULE

SDP

TOTAL BAYS REQUIRED	= 984
TOTAL BAYS PROVIDED	**= 1 116**
FUTURE BAYS	= 325

SCHOOL COMPLEX

SCHOOL

1,5 BAYS PER CLASSROOM	101 CLASSROOMS	= 152
1 BAY PER OFFICE	5 OFFICES	= 5
1 STOP & DROP		= 1
REQUIRED		= 158

SPORTS FIELD

1,0 BAYS PER 8 SEATS	1000 SEATS	= 125
REQUIRED		= 125
TOTAL BAYS REQUIRED		**= 283**
BAYS PROVIDED		= 279
DROP & GO		= 14
PARAPLEGIC		= 5
TOTAL PROVIDED		**= 298**
ADDITIONAL PROVIDED (CLUBHOUSE)		= 40

SCHOOL HOSTEL

1 BAY PER ROOM	16 ROOMS	= 32
2 BAYS PER CARETAKER	3 CARETAKERS	= 6
TOTAL REQUIRED		= 38
BAYS PROVIDED		**= 40**

UNIVERSITY (PLACE OF INSTRUCTION)

1,5 BAYS PER CLASSROOM	5	1,5	= 9
1 BAY PER OFFICE	12	1	= 12
1 BAY PER 6 STUDENTS	450	1/6	= 75
REQUIRED			= 86

SPORTS FIELD

1,0 BAYS PER 8 SEATS	200 SEATS	= 25
REQUIRED		= 25
TOTAL BAYS REQUIRED		**= 111**
BAYS PROVIDED		**= 126**

STUDENT ACCOMMODATIONS (FLATS)

1,0 BAYS PER DWELLING	48 units	= 48
0,25 VISITOR BAYS PER DWELLING	48 units	= 12
TOTAL REQUIRED		= 60
BAYS PROVIDED		**= 67**

HOSPITAL COMPLEX

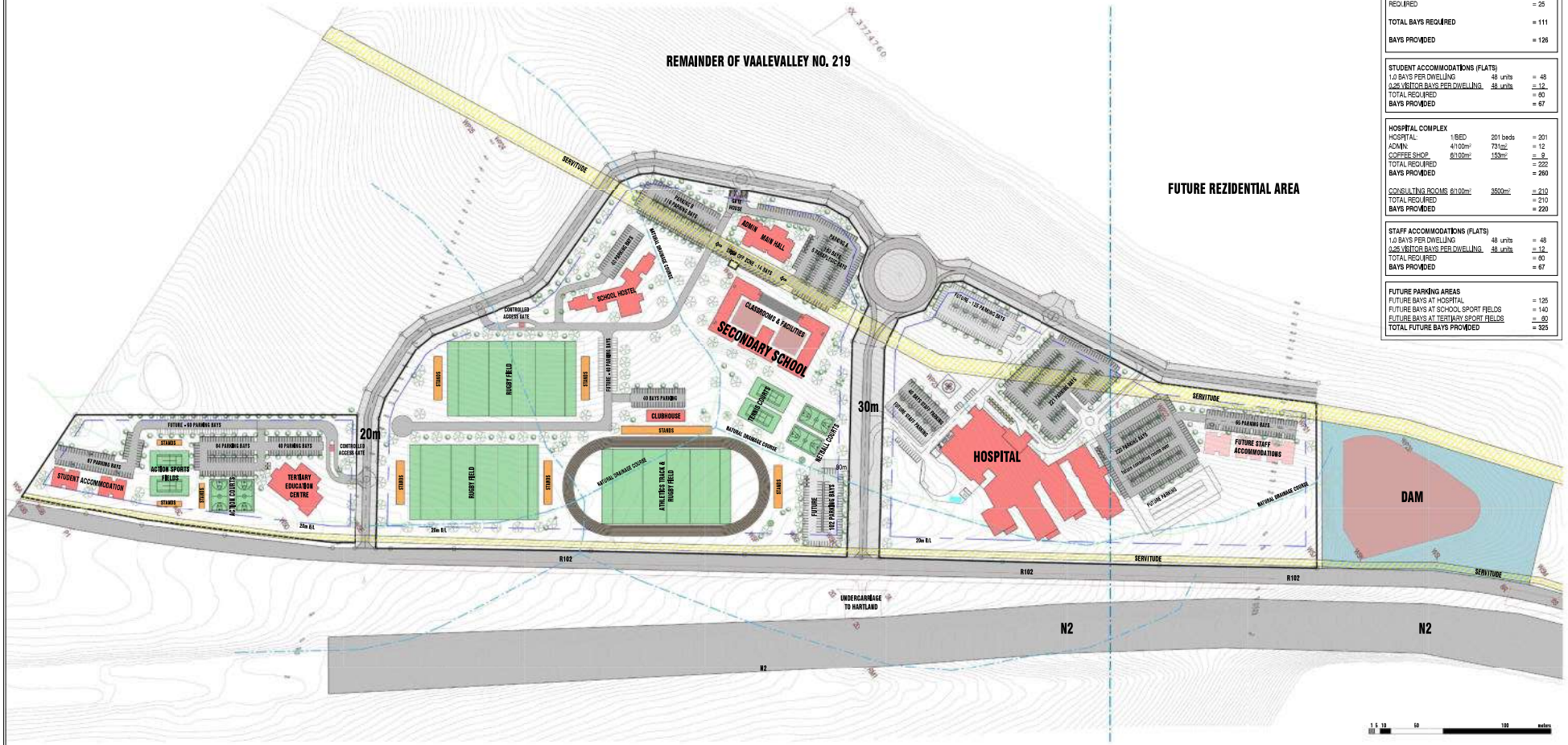
HOSPITAL:	1/BED	201 beds	= 201
ADMIN:	4/100m²	731m²	= 12
COFFEE SHOP	6/100m²	153m²	= 9
TOTAL REQUIRED			= 222
BAYS PROVIDED			**= 260**
CONSULTING ROOMS	6/100m²	3500m²	= 210
TOTAL REQUIRED			= 210
BAYS PROVIDED			**= 220**

STAFF ACCOMMODATIONS (FLATS)

1,0 BAYS PER DWELLING	48 units	= 48
0,25 VISITOR BAYS PER DWELLING	48 units	= 12
TOTAL REQUIRED		= 60
BAYS PROVIDED		**= 67**

FUTURE PARKING AREAS

FUTURE BAYS AT HOSPITAL	= 125
FUTURE BAYS AT SCHOOL SPORT FIELDS	= 140
FUTURE BAYS AT TERTIARY SPORT FIELDS	= 60
TOTAL FUTURE BAYS PROVIDED	**= 325**



1 SITE PLAN
1 : 2000

1 5 10 50 100 meters

GENERAL:
This drawing is not to be scaled, and is to be read in conjunction with Engineers and Consultants drawings where applicable. Use figured dimentions only. All dimensions and heights to be checked on site. Any discrepencies shall be reported immediatly.
All building work to comply with NATIONAL BUILDING REGULATIONS ACT 103 OF 1977 and the latest edition of the SANS 10400 and any amendments thereto as well as the by-laws of the relevant local municipality.
The Contractor is responsible for all site visits by local inspectors and is to pay all fees in connection therewith. All existing services on site to be located, identified and protected from damage throughout the duration of works. The site is to be treated in accordance with SABS Code of Practice no. 0124-1977 with 'Chlordine' termite proof soil poisoner. All levels heights or plinths, depths or excavations and number of steps to be checked by the contractor on site. Electrical installations shall have 'Heinemann's' earth leakage system in the distribution board.

DRAINAGE NOTES:
All drainage work to be in accordance with PART P of SANS 10400
SABS materials used throughout. Sewer drain pipe to be minimum ø100mm with a minimum fall of 1:60. ø100mm stub vent at head of sewer drain pipe. Rodding eyes (RE's) at head of drain, at all changes of direction and at a maximum of 25metre intervals. Inspection eyes (IE's) at all junctions of drain, and to have marked covers at ground level. Drain pipes under buildings to be encased in minimum of 100mm concrete. All waste fittings to have 65mm deep re-seal traps, all waste pipes to be accessible over entire length for cleaning and repairs. All waste pipes under floor slabs to be sleeved. All soil fittings with a vertical discharge greater than 1220mm to have antisyphon vent pipes (ASVPS).
Pipe sizes: WCs min. ø100mm, Sinks min. ø40mm,
Showers, Baths & Bidets min. ø50mm. WHBs min. ø32mm.
All i.p's to be marked at the surface and sealed. WC's to have "S" or "P" traps with side access cleaning eyes.

SURFACEBEDS DPCs & DPMs:
All D.P.M.s to be in accordance with PART J of SANS 10400. D.P.M.s & D.P.C.s to be SABS approved throughout.
Top of concrete surface bed to be a minimum of 150mm above finished ground level. Refer to sections.

WALLS:
Walls to be in accordance with PART K of SANS 10400. Brickforce to be laid at every 5th course. Slip joint to be provided at junction to brickwork and upper floor slabs. Top of foundations to be a minimum of 400mm below natural ground level. Backfilling to foundations. All openings to have prestressed lintols over, with brickforce to every course for 5 courses above lintol. Weep holes, with weep hole inserts, to be spaced every 690mm cc above all DPC flashing.

GLAZING:
All glazing to be in accordance with PART N of SANS 10400) SANS 10137 and 1263-1. Safety glazing to all bathroom glazing, doors & shopfronts below 2.1m, and windows with sills below 800mm, unless otherwise specified.

ROOFS:
Roofs to be in accordance with PART L of SANS 10400. Refer to sections and structural engineer's drawings where specified. all roof linings to be in accordance with PART K of SANS 10400

HABITABLE ROOMS:
All habitable rooms to have a minimum of 10% natural light and 5% natural ventilation to comply with the NATIONAL BUILDING REGULATIONS (SANS 10400) unless otherwise specified, refer to mechanical engineer's specification.

mere GROUP PTY LTD.

S	P	2025-06-19	ENTRANCES REVISED, UNI CAMPUS REVISED	RP
S	N	2025-06-17	ROAD LAYOUT REVISED	RP
S	M	2025-06-13	UNIVERSITY POSITION ADDED	CNR
S	L	2025-06-01	issued FOR INFORMATION	CNR
S	K	2025-05-24	issued FOR INFORMATION	CNR
S	J	2025-11-14	issued FOR INFORMATION	CNR
S	H	2024-10-15	issued FOR INFORMATION	CNR
S	G	2024-10-10	issued FOR INFORMATION	CNR
S	F	2024-09-09	issued FOR INFORMATION	CNR
S	E	2024-08-02	issued FOR INFORMATION	CNR
S	D	2024-07-23	issued FOR INFORMATION	CNR
S	C	2024-07-23	issued FOR INFORMATION	CNR
S	B	2024-07-12	issued FOR INFORMATION	CNR
1	A	2024-06-28	issued AS PRELIMINARY	CNR

ST. | REV | DATE ISSUED | REVISION DESCRIPTION | BY

ISSUE TYPES (I.T.): (1) PRELIMINARY (2) FOR APPROVAL (3) FOR INFORMATION (4) FOR TENDER (5) FOR CONSTRUCTION (6) FOR REVISION (7) AS BUILT (8) DEMOLITION

SCALE: As indicated | PAGE SIZE: A1

mere GROUP PTY LTD.

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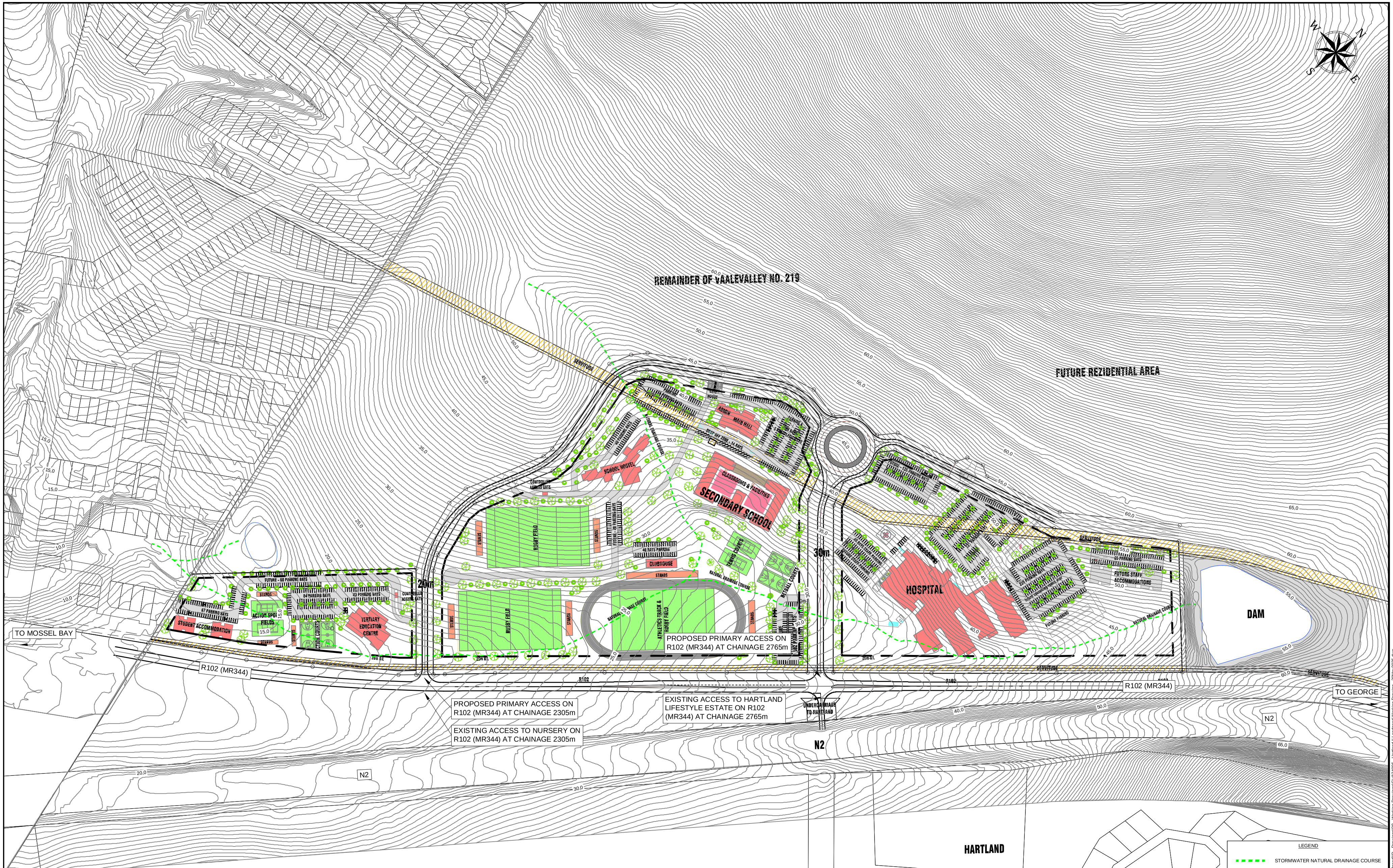
project description
NEW SCHOOL & UNIVERSITY
ERF: HARTLAND
ADDRESS: HARTENBOS
FOR: HARTLAND LIFE STYLE ESTATE

sheet description
PROPOSED SITE LAYOUT
FOR NEW SECONDARY SCHOOL, SCHOOL HOSTEL

project no. 24664 | drawing number 01 - 01 - D101 | rev no. P


REMAINDER OF VAALEVALLEY NO. 219
FUTURE REZIDENTIAL AREA
SECONDARY SCHOOL
CLASSROOMS & FACILITIES
SCHOOL HOSTEL
MAIN HALL
HOSPITAL
FUTURE STAFF ACCOMMODATIONS
FUTURE PARKING
DAM
CLUBHOUSE
RUGBY FIELD
ATHLETICS TRACK & RUGBY FIELD
TENNIS COURTS
NETBALL COURTS
STANDS
TERTIARY EDUCATION CENTRE
STUDENT ACCOMMODATION
ACTION SPORT FIELDS
SERVITUDE
NATURAL DRAINAGE COURSE
20m
30m
TO MOSSEL BAY
TO GEORGE
R102 (MR344)
N2
HARTLAND
UNDERPASS TO HARTLAND
PROPOSED PRIMARY ACCESS ON R102 (MR344) AT CHAINAGE 2765m
PROPOSED PRIMARY ACCESS ON R102 (MR344) AT CHAINAGE 2305m
EXISTING ACCESS TO NURSERY ON R102 (MR344) AT CHAINAGE 2305m
EXISTING ACCESS TO HARTLAND LIFESTYLE ESTATE ON R102 (MR344) AT CHAINAGE 2765m
LEGEND
STORMWATER NATURAL DRAINAGE COURSE

Rev.	Date	Description	Rev. by
A	21/05/2025	FOR SERVICES REPORT	MP

ELEMENT Consulting Engineers
A FIFTH DIMENSION TO ENGINEERING

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P O Box 9962, George, 6529
Tel: +27 44 884 1138
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E-Mail: info@eceng.co.za

Client/Employer: DALMAR 1973

Project: SUID-KAAP LANDGOED
PORTION OF FARM 219, VAALE VALLEI

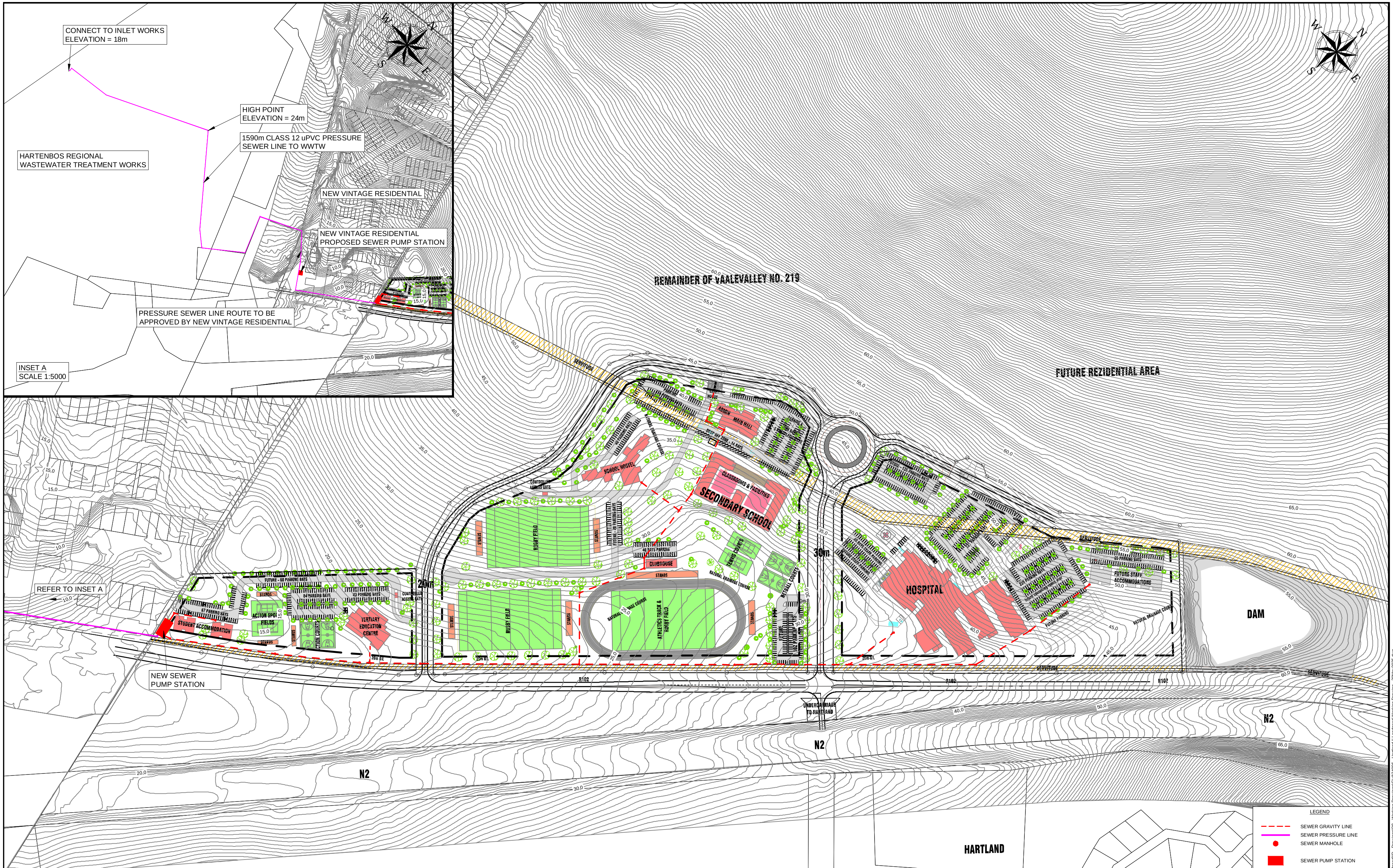
Plan Description: ROADS LAYOUT

	Name	Signature
Designed	MP	
Drawn	MP	
Checked	HL	
Approved	HL	
Pr. No.		

Scale: 1:2000 — ORIGINAL SIZE A1

Contract No.: 24006

Drawing No.: 24006/C/R01 — Revision: A


CONNECT TO INLET WORKS
ELEVATION = 18m
HIGH POINT
ELEVATION = 24m
1590m CLASS 12 uPVC PRESSURE
SEWER LINE TO WWTW
HARTENBOS REGIONAL
WASTEWATER TREATMENT WORKS
NEW VINTAGE RESIDENTIAL
NEW VINTAGE RESIDENTIAL
PROPOSED SEWER PUMP STATION
PRESSURE SEWER LINE ROUTE TO BE
APPROVED BY NEW VINTAGE RESIDENTIAL
INSET A
SCALE 1:5000
REMAINDER OF VAALEVALLEY NO. 219
FUTURE REZIDENTIAL AREA
SERVITUDE
SECONDARY SCHOOL
CLASSROOMS & FACILITIES
MAIN HALL
SCHOOL HOSTEL
RUGBY FIELD
STANDS
CLUBHOUSE
ATHLETICS TRACK & RUGBY FIELD
TENNIS COURTS
NETBALL COURTS
HOSPITAL
FUTURE STAFF ACCOMMODATIONS
FUTURE PARKING
DAM
STUDENT ACCOMMODATION
ACTION SPORT FIELDS
TERTIARY EDUCATION CENTRE
REFER TO INSET A
NEW SEWER
PUMP STATION
30m
20m
R102
N2
UNDERCARRIAGE TO HARTLAND
HARTLAND
LEGEND
SEWER GRAVITY LINE
SEWER PRESSURE LINE
SEWER MANHOLE
SEWER PUMP STATION

Rev.	Date	Description	Rev. by
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Project: SUID-KAAP LANDGOED
PORTION OF FARM 219, VAALE VALLEI

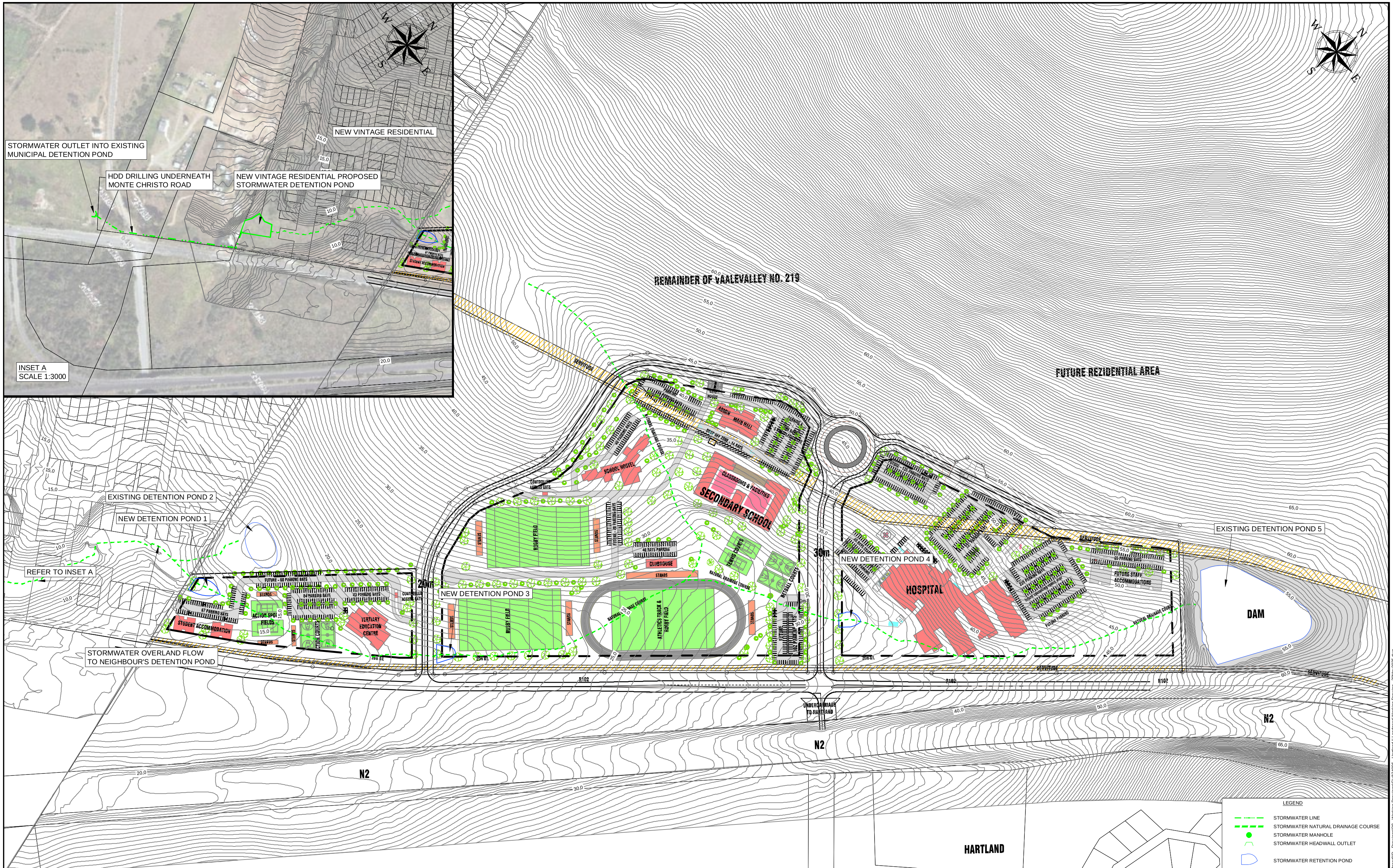
Plan Description: SEWER RETICULATION LAYOUT

	Name	Signature
Designed	MP	
Drawn	MP	
Checked	HL	
Approved	HL	
Pr. No.		

Scale: 1:2000 — ORIGINAL SIZE A1

Contract No.: 24006

Drawing No.: 24006/C/S01 — Revision: A


STORMWATER OUTLET INTO EXISTING MUNICIPAL DETENTION POND
HDD DRILLING UNDERNEATH MONTE CHRISTO ROAD
NEW VINTAGE RESIDENTIAL PROPOSED STORMWATER DETENTION POND
NEW VINTAGE RESIDENTIAL
INSET A
SCALE 1:3000
REMAINDER OF VAALEVALLEY NO. 219
FUTURE REZIDENTIAL AREA
EXISTING DETENTION POND 2
NEW DETENTION POND 1
REFER TO INSET A
STORMWATER OVERLAND FLOW TO NEIGHBOUR'S DETENTION POND
NEW DETENTION POND 3
NEW DETENTION POND 4
EXISTING DETENTION POND 5
SCHOOL HOSTEL
SECONDARY SCHOOL
CLASSROOMS & FACILITIES
RUGBY FIELD
ATHLETICS TRACK & RUGBY FIELD
CLUBHOUSE
STUDENT ACCOMMODATION
TERTIARY EDUCATION CENTRE
HOSPITAL
FUTURE STAFF ACCOMMODATIONS
DAM
HARTLAND
N2
R102
SERVITUDE
UNDERCARRIAGE TO HARTLAND
LEGEND
STORMWATER LINE
STORMWATER NATURAL DRAINAGE COURSE
STORMWATER MANHOLE
STORMWATER HEADWALL OUTLET
STORMWATER RETENTION POND

Rev.	Date	Description	Rev. by
A	21/05/2025	FOR SERVICES REPORT	MP

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Project: SUID-KAAP LANDGOED
PORTION OF FARM 219, VAALE VALLEI

Plan Description: STORMWATER RETICULATION LAYOUT

	Name	Signature
Designed	MP	
Drawn	MP	
Checked	HL	
Approved	HL	
Pr. No.		

Scale: 1:2000 — ORIGINAL SIZE A1
Contract No.: 24006
Drawing No.: 24006/C/SW01
Revision: A

Rev.	Date	Description	Rev by
A	21/05/2025	FOR SERVICES REPORT	MP

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Client/Employer

1973 DALMAR

Project

SUID-KAAP LANDGOED
PORTION OF FARM 219, VAALE VALLEI

Plan Description

WATER RETICULATION LAYOUT

	Name	Signature
Designed	MP	
Drawn	MP	
Checked	HL	
Approved	HL	
Pr. No.		

Scale: 1:2000

ORIGINAL SIZE A1

Contract No.: 24006

Drawing No.: 24006/C/W01

Revision: A