

CIVIL ENGINEERING SUPPLEMENTARY SERVICES REPORT

(including Interim Potable Water supply)

PROJECT: New Retreat, Boschendal Farm Ptn. 11 of Farm 1674

PROJECT NUMBER: S5960 / 2021

DATE

10 November 2021

PREPARED BY:	CHECKED BY:
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1 BACKGROUND

Services reporting for the proposed New Retreat on the Boschendal farm, Portion 11 of Farm 1674, has been addressed in the Neil Lyners & Assoc. report (ref C20087/COR/RS/rs/03) of 12 August 2020.

Subsequent to the Lyners report, Mutaba Hurworth & Assoc. (MH&A) have assumed the civil consultancy service on this project, and there has been further design development as well as engagement with the Stellenbosch Municipality.

The following comment is made on certain engineering services, progressed since the Lyners report, and is supplementary to the Lyners report.

2 WATER SUPPLY

2.1 LINK INFRASTRUCTURE

It has been confirmed by Stellenbosch Municipality (refer capacity letter by Colin Taylor, dated 19 April 2021) that the preferred water supply option will be from the existing municipal reticulation network in Lanquedoc.

A new 160mm diameter uPVC link main is proposed to be constructed from a connection point (exact location still to be finalised) on the northern fringe of the Lanquedoc PRV water distribution zone.

This pipe will be aligned along Hoof Road and into Boschendal property. A bulk meter will be required at the Boschendal boundary, and the pipeline will continue as a private main up to the Retreat development, on Ptn 11 of Farm 1674.

The route investigation and detail design of this link infrastructure will be subject to a formal engineering approval process.

The water demand for the New Retreat is estimated at 13,4m³/day, as indicated in the Lyners report, and the local authority has confirmed that sufficient capacity exists (again, refer capacity letter of 19 April 2021).

MH&A drawing C5960 / 06 Rev B, appended as Annexure D, indicates the link pipeline schematically.

2.2 PRIVATE RETICULATION

The link main will continue into Boschendal farm, along Hoof Road, and terminate at the New Retreat, to supply both potable and fire water to the development. This supply will be managed through a private sub-meter, and is proposed to separate on-site into a 110mm uPVC Class 16 fire ring and a 50mm uPVC Class 12 domestic system.

Further layout detail of the private and on-site reticulation is indicated on MH&A drawing C5960 / 04 / 02 Rev H, included in Annexure B.

2.3 INTERIM PRIVATE RETICULATION

Due to difficulties experienced in obtaining approvals and consent for traversing private property owned by The Boschendal Trust for the construction of the new bulk water main an alternative interim potable and fire water system is proposed.

The proposal involves tying into the existing York Dam 300mm diam irrigation supply line that currently feeds a part of the Boschendal Estate irrigation reticulation. There is an existing "take-off" for water supply to existing houses just off Hoof Road withing the York Farm boundary. (MH&A dwg number C5960/07 RevA refers).

- > The existing connection will be upgraded to a 160mm connection.
- A new 160mm diam uPVC Class 12 pipe will be laid as shown to supply the New Bertha Retreat development.
- The new pipe route requires 282m of the abovementioned pipe, excavated and buried within the Hoof Road current road reserve.
- Approximately 20m of this pipe will be strapped to the existing culvert structure crossing the perennial stream.
- > The pipe will terminate at the entrance to the New Bertha Retreat.
- A 160 mm diam uPVC Class 12 connection will be T'd into the main line and feed the proposed meter chamber within the development boundary.
- > The internal reticulation will be exactly as proposed for the future Municipal system.



- In the interim a holding tank and combination sand filter and Ultra-violet water treatment plant will be installed to treat the "irrigation water" to the required quality and standard for Municipal potable water.
- The Fire Water will be supplied as indicated on the attached layout and will be controlled by Fire Truck.

Further layout detail of the private and on-site reticulation is indicated on MH&A drawing number C5960/07 Rev A Appendix E

3 SEWER RETICULATION

3.1 PUMPED PRIVATE SYSTEM

There is no existing functional sewer system for the development. The historic pipe and septic tank systems have been abandoned and will not be rehabilitated.

The new private sewer system comprises a conventional underground 110mm diameter class 34 uPVC gravity pipe and manhole system, collecting waste and ablution flow from all the cottages, as well as washdown from the refuse enclosure.

The system will gravitate to a small underground pumpstation at the western edge of the development. This pumpstation is proposed to comprise two 1,5kW pumps that will operate 'flip-flop' (alternating standby and duty), with simple flexible hoses, non-return valves, external wall mounted control panel and alarm link.

The 75mm diameter rising main will be aligned along the south western edge of the development footprint, and discharge is proposed to be contained in a conservancy tank located outside of the development but on private property on the south side of Hoof Road.

The conservancy tank will have capacity for $30m^3$, approximately 3 x the daily flow of $10m^3$. Daily flow is calculated at 75% of daily water consumption. The layout of the on-site sewer system is indicated on MH&A drawing C5960 / 04 / 01 Rev H.

3.2 FUTURE PUMPSTATION AND MUNICIPAL DISCHARGE

The conservancy tank is proposed to be a structure suitable for conversion to a main pumpstation, at a future time when the local authority capacity upgrades to the Dwars River Waste Water Treatment Works (WWTW) between Pniel and Lanquedoc are complete. At this time, the conservancy tank will be equipped as a pumpstation, and a new rising main is



proposed along Hoof Road to discharge into the Lanquedoc pumpstation, which in turn lifts effluent to the WWTW.

The above has been confirmed in principle by Stellenbosch Municipality (refer capacity letter of 19 April), and again will be subject to a formal engineering approval process.

4 STORMWATER MANAGEMENT AND FLOODING

4.1 STORMWATER MANAGEMENT

Stormwater will be managed sensitively, primarily by infiltration through existing soft or new landscaped or permeable surfaces. Car parking areas will be constructed from permeable gravel-fix systems, or permeable grass blocks, and edge restraints will be low and/or have drainage gaps. There will not be any increase in hard surfaces under the post development scenario and it is therefore not envisaged that on-site attenuation will be necessary.

Surface flow that may be generated by extreme or high rainfall events will be allowed to pass through the development by surface escape, without causing flow concentration.

4.2 FLOOD CONTROL

Flood management measures to protect the development from flooding of the adjacent watercourse will be required. These measures comprise the conversion of the existing culvert crossing on Hoof Road to an engineered low level road crossing to contain flood flow safely under and over the new culverts, within the river corridor. The existing berm on the development side of the watercourse will also be formalised to be continuous, reprofiled and raised.

These measures are in accordance with the Flood Study report by Mark Obree of 25 February 2021, and are indicated on the MH&A flood protection drawing C5960 / 05 / 01, included in Annexure C.



Report prepared by:

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M P MIDDELMANN

MUTABA HURWORTH & ASSOCIATES

Report reviewed by:

para la Piag. 900251

M A HURWORTH Pr Eng



APPENDIX A: SEWER LAYOUT

Refer Drawing C5960 / 04 / 01 Rev H included overleaf.

ENGINEERING REPORT

APPENDIX B: WATER LAYOUT

Refer Drawing C5960 / 04 / 02 Rev H included overleaf.



ENGINEERING REPORT



APPENDIX C: FLOOD PROTECTION

Refer Drawing C5960 / 05 / 01 Rev G included overleaf.

ENGINEERING REPORT



APPENDIX D: WATER LINK INFRASTRUCTURE

Refer Drawing C5960 / 06 Rev B included overleaf.

5 APPENDIX E : INTERIM POTABLE WATER RETICULATION

Refer Drawing 5960/07 Rev A included overleaf



APPENDIX A: SEWER LAYOUT

Refer Drawing C5960 / 04 / 01 Rev H included overleaf.



APPENDIX B: WATER LAYOUT

Refer Drawing C5960 / 04 / 02 Rev H included overleaf.





APPENDIX C: FLOOD PROTECTION

Refer Drawing C5960 / 05 / 01 Rev G included overleaf.

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APPENDIX D: WATER LINK INFRASTRUCTURE

Refer Drawing C5960 / 06 Rev B included overleaf.

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- SURVEY EXTENDED BY FRIEDLAENDER VOLKMAN OF MARCH 2021
- FINAL ARRANGEMENT OF BUILDING TO BE CONFIRMED BY ARCHITECT.
- 5 FINAL ARRANGEMENT OF EXTERNAL FINISHES AND LANDSCAPING TO BE CONFIRMED BY LANDSCAPE ARCHITECT.
- 6 EXISTING BULK SERVICES & NEW SERVICES CONNECTIONS TO BE EXPOSED AND VERIFIED PRIOR TO WORKS COMMENCING

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BERTHA FOUNDATION

BERTHA RETREAT PTN 11 OF FARM 1674

THIS DRAWING IS TO BE USED FOR APPROVAL PURPOSES ONLY							
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5 APPENDIX E : INTERIM POTABLE WATER RETICULATION

Refer Drawing 5960/07 Rev A included overleaf



PTN 11 OF FARM 1674

BERTHA RETREAT

BRAAI AREA

110Ø FIRE RING

50Ø TO DOMESTIC TREATMENT SYSTEM

160Ø uPVC CL.12 CONNECTION TO BERTHA RETREAT

LAYOUT PLAN SCALE 1: 50000

30



YORK DAM



- 1. NO DIMENSIONS TO BE SCALED. ANY DISCREPANCIES TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
- 2. TOPOGRAPHICAL SURVEY BY FRIEDLAENDER, BURGER & VOLKMAN OF FEBUARY 2020.
- 3. SURVEY EXTENDED BY FRIEDLAENDER, BURGER VOLKMAN OF MARCH 2021.
- 4. FINAL ARRANGEMENT OF BUILDING TO BE CONFIRMED BY ARCHITECT.
- 5. FINAL ARRANGEMENT OF EXTERNAL FINISHES AND LANDSCAPING TO BE CONFIRMED BY LANDSCAPE ARCHITECT.
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