

This drawing is not to be scaled, all figured dimensions to be used.

All Dimensions and cadastral setting out information to be thoroughly checked on site and all or any discrepancies to be reported to the Architect or Lead Consultant before any work is put in hand.

All work is to comply with the NATIONAL BUILDING REGULATIONS (NBR) AND BUILDING STANDARDS act 103 of 1977 as amended

HEALTH AND SAFETY: All construction activities to conform to the OCCUPATIONAL HEALTH AND SAFETY ACT 1993 (Act No 85 of 1993)

All materials and workmanship to be as per the MODEL PREAMBLES FOR TRADES 2008, and any further additional preambles as noted in the Bills of Materials.

All work is to comply with all relevant specifications and codes of practice of the NATIONAL HOME BUILDERS REGISTRATION COUNCIL (NHBC) (Where applicable)

ELECTRICAL Engineer: (Where applicable) All materials and workmanship to be as specified on the Consultants drawings.

STRUCTURAL and CIVIL Engineer: (Where applicable) All materials and workmanship to be as specified on the Consultants drawings.

HVAC Engineer: (Where applicable) All materials and workmanship to be as specified on the Consultants drawings.

RATIONAL FIRE Engineer: (Where applicable) All materials and workmanship to be as specified on the Consultants drawings.

WET SERVICES Engineer: (Where applicable) All materials and workmanship to be as specified on the Consultants drawings.

SPECIALIST CONSULTANTS (Where applicable) All materials and workmanship to be as specified on the Consultants drawings.

COMPLIANCE WITH SANS 10400XA & SANS 204 REQUIREMENTS:

ORIENTATION:
The BUILDING QUARTERS & ENTERTAINMENT areas are north west orientated, with the MACHINE BAYS to the south and east.

FLOORS:
No under-slab heating is to be installed, thus building is compliant with SANS 10400XA, Clause 4.2.2.

WALLS:
Double skin masonry walls with cavity & no cavity, plastered internally and externally are deemed to be compliant in terms of SANS 10400XA, Clause 4.4.3.2.4.

EXCLUSIONS:
In random MACHINE BAYS and STORAGE OUTBUILDING are non-habitable rooms.

FENESTRATION CALCULATIONS:

CONDUCTANCE

Internal Net Floor Area = Ground + First floors
= 289.71sqm + 132.37sqm
= 422.08sqm

Permissible Conductance = 421.08 x 1.4
= 589.72

WINDOWS:

W01 x 1	-0.511 x 2.085	= 1.065sqm	= 1.065sqm
W02 x 2	-0.900 x 1.800	= 1.620sqm x 2	= 3.240sqm
W03 x 4	-1.200 x 1.800	= 2.160sqm x 4	= 8.640sqm
W04 x 14	-0.600 x 0.600	= 0.360sqm x 14	= 5.040sqm
W05 x 2	-0.600 x 0.600	= 0.360sqm x 2	= 0.720sqm
W06 x 2	-1.800 x 1.200	= 2.160sqm x 2	= 4.320sqm
W07 x 1	-1.800 x 2.085	= 3.753sqm x 1	= 3.753sqm
W08 x 2	-0.400 x 4.805	= 1.922sqm x 2	= 3.844sqm
W09 x 1	-1.800 x 1.200	= 2.160sqm x 1	= 2.160sqm
W10 x 4	-1.800 x 0.600	= 1.080sqm x 4	= 4.320sqm
W11 x 4	-0.300 x 2.220	= 0.660sqm x 4	= 2.640sqm
W12 x 2	-0.400 x 2.220	= 0.880sqm x 2	= 1.760sqm
W13 x 2	-0.300 x 2.220	= 0.660sqm x 2	= 1.320sqm
W14 x 4	-1.800 x 0.600	= 1.080sqm x 4	= 4.320sqm
W15 x 7	-0.900 x 1.200	= 1.080sqm x 7	= 7.560sqm

DOORS:

D04 x 2	-1.219 x 2.085	= 2.542sqm x 2	= 5.084sqm
D11 x 2	-1.613 x 2.085	= 3.363sqm x 2	= 6.726sqm
D12 x 1	-0.871 x 2.085	= 1.816sqm x 1	= 1.816sqm

Actual Conductance = sum of glazed areas
= 81.017sqm
= COMPLIANT (81.017 < 589.72)

SOLAR HEAT GAIN

Permissible SHG = 421.08 x 0.12
= 50.53

NORTH WEST:

W03 x 4	P=845, H=2320, G=544, PHI=0.361
W11 x 4	P=845, H=1050, G=459, PHI=0.798
W12 x 1	P=240, H=2220, G=0, PHI=0.108
W13 x 1	P=240, H=2220, G=0, PHI=0.108

NORTH EAST:

W02 x 1	P=845, H=3021, G=1226, PHI=0.295
D04 x 1	P=3808, H=2460, G=555, PHI=1.442
W05 x 2	P=3808, H=1155, G=555, PHI=0.297
D12 x 1	P=2835, H=2840, G=555, PHI=0.989
W07 x 1	P=2835, H=2840, G=555, PHI=0.989
W12 x 1	P=240, H=2220, G=0, PHI=0.108
W04 x 1	P=240, H=1070, G=170, PHI=0.224
D11 x 2	P=3808, H=2895, G=901, PHI=1.275
W08 x 1	P=240, H=4975, G=150, PHI=0.048
W14 x 1	P=3808, H=874, G=0, PHI=5.650

SOUTH WEST:

W02 x 1	P=845, H=2868, G=1073, PHI=0.295
W01 x 1	P=845, H=4043, G=1958, PHI=0.209
D04 x 1	P=2005, H=2460, G=515, PHI=0.835
W06 x 1	P=845, H=2337, G=1137, PHI=0.362
W08 x 1	P=240, H=4975, G=150, PHI=0.048
W13 x 1	P=240, H=2220, G=0, PHI=0.108
W10 x 1	P=845, H=2837, G=1637, PHI=0.298
W14 x 1	P=845, H=874, G=0, PHI=1.254

SOUTH EAST:

W17 x 7	P=845, H=1815, G=4985, PHI=0.137
W04 x 2	P=845, H=5885, G=4985, PHI=0.143
W08 x 1	P=845, H=2084, G=1825, PHI=0.405
W04 x 2	P=845, H=2825, G=1825, PHI=0.299
W16 x 4	P=845, H=1424, G=819, PHI=0.593

ACTUAL SHG NORTH WEST:

A1 x S1 x E1
= 4/0.540x0.630x0.177x1.080x0.630x0.341x2.108x0.630x0.94
= 0.888x0.630x0.94
= 0.512 x 1.198 + 1.249 + 0.526
= 3.885

ACTUAL SHG NORTH EAST:

A1 x S1 x E1
= (1.620x0.630x0.72x2.542x0.630x0.23x20.360x0.630x0.177x
(1.816x0.630x0.341x4.072x0.630x0.341x2.108x0.630x0.819x
(0.540x0.630x0.719x20.360x0.630x0.177x1.020x0.630x1.09x
(4.71x0.630x1.09x
(0.735x0.389x0.077x0.389x0.859x1.169x0.259x1.102x
1.320x0.504
= 6.782

ACTUAL SHG SOUTH WEST:

A1 x S1 x E1
= (1.620x0.630x0.72x1.080x0.630x0.76x2.542x0.630x0.431x
(2.232x0.630x0.651x1.622x0.630x1.04x0.888x0.630x0.861x
(2.232x0.630x0.72x4.71x0.630x0.333x
(0.735x0.510x0.689x0.914x1.259x0.481x1.012x0.979x
= 6.579

ACTUAL SHG SOUTH EAST:

A1 x S1 x E1
= 7/1.08x0.630x0.79x20.540x0.630x0.79x2.232x0.630x0.571x
20.540x0.630x0.177x1.080x0.630x0.52
= 3.763 + 0.538 + 0.802 + 0.458 + 1.415
= 6.574

ACTUAL SHG SOUTH WEST:

A1 x S1 x E1
= (1.620x0.630x0.72x1.080x0.630x0.76x2.542x0.630x0.431x
(2.232x0.630x0.651x1.622x0.630x1.04x0.888x0.630x0.861x
(2.232x0.630x0.72x4.71x0.630x0.333x
(0.735x0.510x0.689x0.914x1.259x0.481x1.012x0.979x
= 6.579

TOTAL ACTUAL SHG:

North West + North East + South East + South West
= 3.885 + 6.782 + 6.974 + 6.579
= 24.22
= COMPLIANT (24.22 < 50.53)

ROOF:

Climatic Zone = 2
Min Roof assembly R-Value = 3.75sqm/KW

ROOF COMPONENTS:

Outdoor Air Film	= 0.03sqm/KW
Corrugated Roof Sheeting	= 0.05sqm/KW
Roof Air Space	= 0.10sqm/KW
Aerolite 15mm Insulation	= 0.38sqm/KW
Rheoboard 6.4mm	= 0.03sqm/KW
Indoor Air Film	= 0.11sqm/KW
TOTAL	= 3.75sqm/KW < 3.75sqm/KW

ENERGY DEMAND:

Maximum Energy Demand for building classification G1 = 17W/sqm
Where total area = Ground floor + First floor
= 855.05sqm + 164.34sqm
= 1019.39sqm

And a

Permissible Energy Demand = 17W/sqm x 1019.39sqm
= 17.329.63W
Ground Floor = 855.05sqm
Total Light Wattage = 1708.50W
First Floor = 164.34sqm
Total Lamp Wattage = 2200W

ENERGY CONSUMPTION:

Maximum Energy Demand for building classification G1 = 42.5W/sqm
Where total area = Ground floor + First floor
= 855.05sqm + 164.34sqm
= 1019.39sqm

And a

Permissible Consumption = 42.5W/sqm x 1019.39sqm
= 43.324.88W/h.a
Assume lights are on 8 hours a day/year
(06.00 - 08.00 & 17.00 - 23.00)
52 weeks x 7 days x 8 hours = 2912hrs.a
Total lamp wattage = 3971.5x1000
= 3.972MW
Total Energy Consumption = 3.972MW x 2912hrs.a
= 11.565.01Wh.a
= COMPLIANT (11.565.01Wh.a < 43.324.88Wh.a)

Thus, the roof assembly is compliant in terms of SANS 10400XA, Clause 4.4.5.1, Table 7 and SANS 204, Table F3

AREA SCHEDULE

GROUND FLOOR:

MACHINE BAYS	323.63m²
OFFICES/DORMITORY	345.77m²
OUTBUILDING	35.65m²
CARPORTS	150.00m²

SUBTOTAL: 855.05m²

FIRST FLOOR:

OFFICES	164.34m²
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TOTAL 1019.39m²

EXISTING BUILDING:

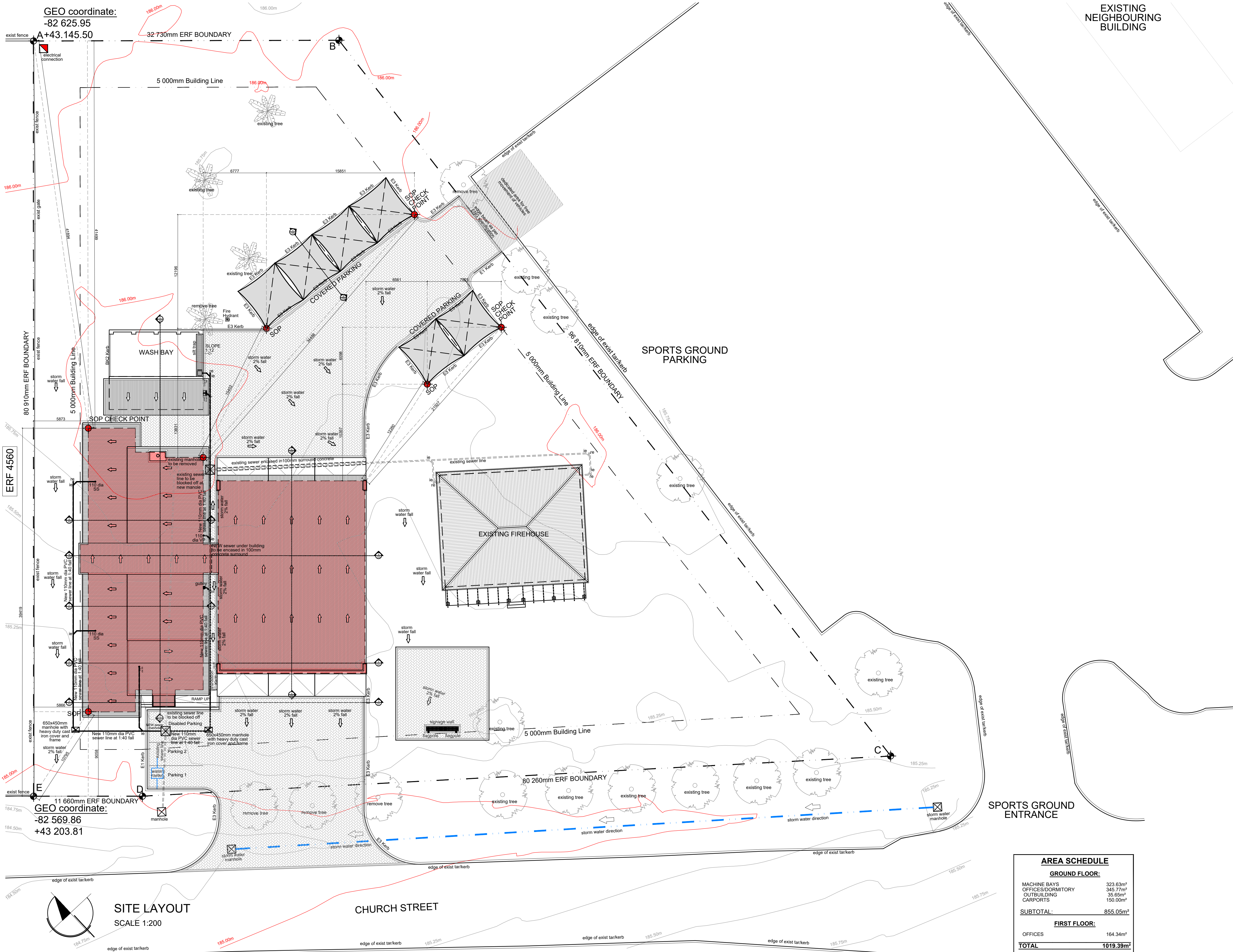
OFFICES	180.00m²
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GRAND TOTAL: 1199.39m²

STAND AREA 4996.00m²

COVERAGE: 20.71%

FLOOR FACTOR: 0.2



EXCAVATION NOTE:

- Builders waste is to be delivered to the ASHTON waste facility at the cost of the contractor.
- Clean excavated material from foundation and roadway excavations will be spoiled on site to create earth berms of 3 m base and approximately 1.8 m high and are to be compacted in layers of 250mm to 90% MOD ASHTON and neatly trimmed.

TENDER

PROPOSED NEW FIRE STATION for LANGEBERG MUNICIPALITY

ERF 8250 ROBERTSON



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SITE LAYOUT

SANS CALCULATIONS

Arch 1:200 2021.06.23

design: AN TG AN

project: RFS/21 100 TEN