

Forensic Engineering Report : ERF (E957)

Unit Details

Province:	North West	Status:	RDP House	Name:	RDP House
Township:	Ditso	Erf Non :	E957	Date:	[[date]]
Municipality:	Ditso	BQIH Score :		Village:	



1.0 PLATFORM

- 1 Platform is adequately compacted.
- 2 Platform has no signs of erosion.
- 3 The platform is adequately shaped to drain away.
- 4 No apron or paving provided around the unit
- 5 The proximity of trees and vegetation is not acceptable.

2.0 FOUNDATION RAFT

- 1 The depth of the edge beam below ground level is acceptable.
- 2 The foundation concrete slab is acceptable and void of defects.
- 3 The brickwork overhang is not acceptable.

4.0 FLOORS & STAIRS

- 1 The floor screed is in good condition.
- 2 Height of floor above ground level is acceptable

5.0 SUPERSTRUCTURE

- 1 The DPC is installed correctly. The house wall plumbness is compliant with specification requirements.
- 2 The movement joints installed in the house are compliant. The brickwork is installed correctly to specification.
- 3 The house walls are not plastered or painted(adequately).

6.0 ROOF

- 1 The wallplate is correctly installed.
- 2 The timber members are compliant(approved) - Visible SABS Stamp.
- 3 The roof truss spacing is compliant with NHBRC HBM Specifications.
- 4 The roof timber members are sealed to specifications.
- 5 No roof leaks observed or reported. The house roof coverings and supports are installed to specification and are in good condition.

7.0 PLUMBING & ELECTRICAL

- 1 Plumbing installations not properly done.

1.0 PLATFORM

Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Soil Compaction								
1	Adequately done	SANS10400 Part F & G NHBRC HBM Part 1 Section 2 Table 1	N/A	N/A	N/A	N/A	0	0
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Soil Erosion								
1	No sign of erosion	SANS10400 Part F & G NHBRC HBM	N/A	N/A	N/A	N/A	0	0
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Ponding								
1	No ponding	SANS10400 Part F & G NHBRC HBM	N/A	N/A	N/A	N/A	0	0
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Shaping of Ground								
1	Shaped to drain away	SANS10400 Part F G R & P NHBRC HBM	N/A	N/A	N/A	N/A	0	0
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Impervious Layer								
0	Not Provided	SANS10400 NHBRC HBM	No apron or paving provided	No apron initially built.	Construct a new 1m wide apron around the perimeter of the house.	m2	1	110
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Proximity Of Trees								
0	Not acceptable	SANS10400 Part F NHBRC HBM Part 1 Section 2.9	Vegetation planted/growing next house walls	Lack of Maintainance.	Remove vegetation and replant were applicable	No.	1	600
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Stability Of Embarkment (Cut Side)								
1	Acceptable	SANS10400 Part F & G NHBRC HBM Part 1 Section 2.9	N/A	N/A	N/A	N/A	0	0
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Stability Of Embarkment (Fill Side)								
1	Acceptable	SANS10400 Part F & G NHBRC HBM Part 1 Section 2.9	N/A	N/A	N/A	N/A	0	0

1.0 PLATFORM Images



Ponding 1



Shaping of Ground 1



Impervious Layer 1



Proximity Of Trees 1

2.0 FOUNDATION RAFT

Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Depth of edge beam below ground level								
1	Acceptable	SANS10400 Part B & H NHBRC HBM Part 2 Section 2	N/A	N/A	N/A	N/A	0	0
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Concrete condition (Re-bar exposed/Honeycombing,etc)								
1	Good condition (No readily detectable defects in concrete)	SANS10100 SANS10400 Part B & H NHBRC HBM Part 2 Section 2	N/A	N/A	N/A	N/A	0	0
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Dimension tolerance (levelness & skewness)								
1	Compliant	SANS10400 Part B & H NHBRC HBM Part 2 Section 2	N/A	N/A	N/A	N/A	0	0
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Brickwork overhang								
1	Acceptable	SANS10400 Part B & H NHBRC HBM Part 2 Section 2	N/A	N/A	N/A	N/A	0	0

2.0 FOUNDATION RAFT Images

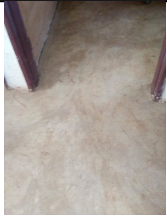


Concrete condition (Re-bar exposed/Honeycombing,etc) 1

4.0 FLOORS & STAIRS

Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Appearance of Screed or power floated								
1	Good condition (No readily detectable defects in concrete)	NHBRC HBM SANS10400 Part J SANS10100	N/A	N/A	N/A	N/A	0	0
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Height of floor above ground level (150mm Min.)								
1	Acceptable	NHBRC HBM SANS10400 Part J SANS10100	N/A	N/A	N/A	N/A	0	0

4.0 FLOORS & STAIRS Images







Appearance of Screed or power floated 1

5.0 SUPERSTRUCTURE

Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
DPC under brickwork (On walls)								
1	Correctly Installed	NHBRC HBM Part 1 Section 3 SANS10400 Part A B & K	N/A	N/A	N/A	N/A	0	0
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Consistency of bed-joint & perpend thickness, to standards								
1	Correctly Installed	NHBRC HBM Part 1 Section 3 SANS10400 Part A B & K	N/A	N/A	N/A	N/A	0	0
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Wall plumbness & squareness								
1	Compliant	NHBRC HBM Part 1 Section 3 SANS10400 Part A B & K	N/A	N/A	N/A	N/A	0	0
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Movement joints/Articulation joints (if applicable)								
1	Compliant	NHBRC HBM Part 1 Section 3 SANS10400 Part A B & K	N/A	N/A	N/A	N/A	0	0
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate

Brickforce								
1	Compliant	NHBRC HBM Part 1 Section 3 SANS10400 Part A B & K	N/A	N/A	N/A	N/A	0	0
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Cracks (as per HBM)								
	Moderate Cracks	NHBRC HBM Part 1 Section 3 SANS10400 Part A B & K SANS10100	N/A	Inadequate material strength.Bad/Poor construction methods/methodology.	Repair cracks under supervision of specialist and products.	m	4	600
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Dampness								
0	Dampness	NHBRC HBM Part 1 Section 3 SANS10400 Part A B & K	N/A	Insufficient wall waterproofing	Plaster or bagwash and paint wall to NHBRC HBM specification.	m ²	1	55
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
External Wall Finishes								
0	Not Acceptable	NHBRC HBM Part 1 Section 3 SANS10400 Part A B & K	Wall not plastered or bagwashed.	Bad/Poor construction methods/methodology.	Plaster or bagwash and paint wall to NHBRC HBM specification.	m ²	1	55
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
ExternInsertion of doors and window frames (No loose and gaps, Correct level)								
0	Not Acceptable	NHBRC HBM Part 1 Section 3 SANS10400 Part A B C & N	Damaged Door/Frames.Damaged Window/Frames	Poor material quality.	Reinstall door & frame to NHBRC specification.Reinstall window & frame to NHBRC specification	No	3	1500
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Correct installation of window sills (Incl. DPC)								
0	Incorrectly installed	NHBRC HBM Part 1 Section 3 SANS10400 Part A B C & L	Window sill not Installed.	Bad/Poor construction methods/methodology. Poor material quality.	Install window sill incl. DPC to NHBRC HBM specifications.	m	1	360
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Installation of Roof anchors								
1	Acceptable	NHBRC HBM Part 1 Section 4 & 5 SANS10400 Part A B C & L	N/A	N/A	N/A	N/A	0	0

5.0 SUPERSTRUCTURE Images



 <p>DPC under brickwork (On walls) 1</p>	 <p>Cracks (as per HBM) 1</p>	 <p>Dampness 1</p>	 <p>ExternInsertion of doors and window frames (No loose and gaps, Correct level) 1</p>
 <p>Correct installation of window sills (Incl. DPC) 1</p>	 <p>Installation of Roof anchors 1</p>		

6.0 ROOF

Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Wallplate correctly installed								
1	Compliant	NHBRC HBM Part 1 Section 4 & 5 SANS10400 Part A B & L	N/A	N/A	N/A	N/A	0	0
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
SABS approved timber members								
1	Compliant	NHBRC HBM Part 1 Section 4 & 5 SANS10400 Part A B & L	N/A	N/A	N/A	N/A	0	0

Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Standard roof truss spacing/Rational design								
1	Compliant	NHBRC HBM Part 1 Section 4 & 5 SANS10400 Part A B & L	N/A	N/A	N/A	N/A	0	0
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Roof bracing								
1	Compliant	NHBRC HBM Part 1 Section 4 & 5 SANS10400 Part A B & L	N/A	N/A	N/A	N/A	0	0
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Timber sealing								
1	Compliant	SABS 1388 SABS 42/38 NHBRC HBM Part 1 Section 4 & 5	N/A	N/A	N/A	N/A	0	0
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Roof leaks								
1	Compliant	NHBRC HBM Part 1 Section 4 & 5 SANS10400 Part A B & L	N/A	N/A	N/A	N/A	0	0
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Underlay								
1	Compliant	NHBRC HBM Part 1 Section 4 & 5 SANS10400 Part A B & L	N/A	N/A	N/A	N/A	0	0
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Beamfilling								
1	Compliant	NHBRC HBM Part 1 Section 4 & 5 SANS10400 Part A B & L	N/A	N/A	N/A	N/A	0	0
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Roof coverings and supports installed to specifications and in good condition								
1	Compliant	NHBRC HBM Part 1 Section 4 & 5 SANS10400 Part A B & L	N/A	N/A	N/A	N/A	0	0

6.0 ROOF Images

			
Standard roof truss spacing/Rational design 1		Roof leaks 1	

7.0 PLUMBING & ELECTRICAL

Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Plumbing installations (fall, size of pipes, connections, position of ie, etc)								
0	Not properly done	NHBRC HBM Part 1 Section 9 SANS10400 Part Q	No plumbing installed	Civil/ Structural Engineering design.	N/A	N/A	0	0
Rating	Element Description	Applicable Standard	Site Observation	Probable Cause	Solutions/rectification methods	Unit	Quantity	Rate
Electrical installations								
1	Properly done		N/A	N/A	N/A	N/A	0	0

7.0 PLUMBING & ELECTRICAL Images



Plumbing installations (fall, size of pipes, connections, position of ie, etc) 1



Electrical installations 1

Bill of Quantities

1.0 PLATFORM

Item No.	Description	Unit	Quantity	Rate	Amount
EARTHWORKS					
1	EXCAVATE, GRADE & COMPACT PLATFORM TO SPECIFICATION Grade the yard to fall at less than 5% around the house at least 1.5m around the house.	m ³	0	180	0
2	Rip and compact platform area to 93% Mod AASHTO density and shape to drain away.	m ³	0	90	0
3	Excavation undesired material and dispose excess offsite.	m ²	0	30	0
4	Backfill over area of platform area and compact platform area to 93% Mod AASHTO density.	m ³	0	195	0
5	EXCESS HAUL Transport materials and debris to unspecified sites and dump (provisional)	m ³	1	100	100
6	RETAINING WALL Construct retaining wall	m ²	0	240	0
7	SLOPE STABILISATION Stabilise slope by grassing (Hydro-seeding)	m ²	0	240	0
8	Stabilise slope by grouted stone pitching	m ²	0	240	0
9a	CONSTRUCT APRON AROUND HOUSE Construct 1000mm wide (85mm deep) concrete apron around the perimeter of the house.	m ³	1	110	110
9b	Demolish existing apron and reconstruct new 1000mm by 85mm thick apron.	m ³	0	130	0
TREES & VEGETATION					
10	CLEAR AND GRUB DENSE VEGETATION Clear vegetation in close proximity of the house and replant trees	No	1	600	600
SUB TOTAL - 1.0 PLATFORM					R810

2.0 FOUNDATION RAFT

EXPOSED FOUNDATIONS

11	COVER , BACKFILL AND COMPACT EXPOSED AREA AROUND FOUNDATION Backfill in confined spaces up to 150mm below FFL to 93% ModAASHTO	m ³	0	250	0
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12	Underpin the foundation under the supervision of a Competent person		0	0	0
13	Expose , clean damaged areas and repair damaged areas with high strength grout.	m ²	0	30	0
DAMP-PROOF COURSE					
14	Drill holes at regular interval & inject approved liquid membrane to manufacturer's spec.	m ³	0	100	0
	SUB TOTAL - 2.0 FOUNDATION RAFT				R0

4.0 FLOORS & STAIRS					
CRACKED FLOOR					
15a	CONCRETE FLOOR REPAIRS Clean & apply self-levelling screed to manufacturer's specifications (smooth finish)	m ²	0	90	0
15b	Remove existing screed and apply self-levelling screed to manufacturer's specifications	m ²	0	110	0
15c	Clean and grout cracks with high strength cementitious grout	m	0	30	0
15d	STAIRS AND BALUSTRADES Demolish and rebuild stairs to NHBRC specification	m	0	220	0
15e	Repair stairs (treads and risers) and balustrades	m	0	112	0
15f	Rebuild balustrades	m	0	800	0
	SUB TOTAL - 4.0 FLOORS & STAIRS				R0

5.0 SUPERSTRUCTURE					
MOVEMENT JOINTS					
16a	Cut movement joint through wall and seal with silicone or polysulphide sealant	m	0	460	0
16b	Repair movement joints with approved product to specification	m	0	310	0
WALL DEFECTS					
17a	Clean and Fill cracks with approved specialist products to manufacturer's specifications.	m	4	600	2400
17b	Apply plaster and paint to wall.	m	2	55	110
17d	Paint walls with an approved waterproof impervious paint.	m ²	0	120	0
DOOR & WINDOW FRAMES					
18a	Take out and replace door and door frame as specified in the HBM.	No	3	1500	4500
18b	Take out and replace window and window frame as specified in the HBM	No	3	1500	4500
18c	Install window sill to NHBRC HBM specifications.	m	1	360	360
18d	Repair/Reinstall window sill to NHBRC HBM specifications.	m	0	210	0
18e	Provide/Install roof anchors to NHBRC HBM specifications	No	0	16	0
18f	Replace or fix (tighten) roof anchors to meet specification.	No	0	36	0

SUB TOTAL - 5.0 SUPERSTRUCTURE

R11870

6.0 ROOF

ROOF MEMBERS AND COVERINGS

19a	Remove roof and install wall plate compliant with NHBRC Specifications	m	0	85	0
19b	Replace non-SABS members with certified members	m ²	0	92	0
19c	Reinstall roof bracing to NHBRC specification.	m	0	20	0
19d	Treat or Repaint roof purlins with approved wood presevative or metal paint.	m	0	8	0
19e	Waterproof or Seal roof sheeting holes and cracks with approved sheeting sealant.	m ²	0	120	0
19f	Repair damaged roof covering	m ²	0	65	0
19f	Repair damaged roof covering	m ²	0	65	0
19g	Take out and replace damaged roof sheets or tiles.	m ²	0	130	0
19h	Remove roof sheet and place underlay, replace roof sheet.	m ²	0	170	0
19i	Install or provide beamfilling with mortar/grout to NHBRC specifications.	m	0	55	0
19j	Remove damaged or in compliant beamfilling and replace to NHBRC specifications.	m	0	55	0
19k	Repair damaged beamfilling	m ²	0	170	0
19l	Take out and replace roof coverings and support	m ²	0	156	0
SUB TOTAL - 6.0 ROOF					R0

7.0 PLUMBING & ELECTRICAL

DEMOLISH/REBUILD HOUSE

20a	Demolish existing structure and remove material from site	No	0	2000	0
20b	Construct house as per NHBRC specifications	No	0	95000	0
SUB TOTAL - 7.0 PLUMBING & ELECTRICAL					R0

PROJECT SUMMARY:

DEMOLISH & REBUILD HOUSE	R0
1.0 PLATFORM	R810
2.0 FOUNDATION RAFT	R0
4.0 FLOORS & STAIRS	R0

5.0 SUPERSTRUCTURE

R11870

6.0 ROOF

R0

Sub Total

R12680

Add VAT

R1775.2

TOTAL VALUE OF REPAIRS

R14455.2