13. APPENDIX

LSC BRUNETTE CONSULTING ENGINEERS: REPORT ON INSPECTION OF BUILDINGS OF THE GIRLS AND BOYS TOWN CAMPUS AT TONGAAT BEACH

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Ref: HAB/lb

30 April 2015

Girls and Boys Town, South Africa
P O Box 91661
Auckland Park
2006

Att: Mr T Veldman

Dear Sir

REPORT ON INSPECTION OF BUILDINGS ON THE GIRLS AND BOYS TOWN CAMPUS AT TONGAAT BEACH

LSC Brunette cc were approached by Mr Tommie Veldman on 2 October 2014 with a request to check the buildings on the Tongaat Campus for soundness and the supply of an Engineers Certificate. LSC Brunette cc proposed to undertake an inspection of foundation exposures, floors, walls and roofs and report on the general condition of these elements but were not prepared to supply Engineers Certificates for the buildings. The above proposal was accepted by Mr Tommie Veldman and a LSC Brunette cc letter detailing the proposal together with a cost therefore was submitted on 7 October 2015. (See Annexure A). Mr Tommie Veldman instructed LSC Brunette cc per e-mail, on 12 January 2015 to proceed with their proposal (See Annexure A).

Twelve buildings were investigated in terms of the proposal. A key plan identifying the relative location and numbering system used for the buildings is attached as Annexure B. The un-numbered buildings between building 10 and 11 was not included in the investigation as it had previously been investigated and reported on by Lees & Short Architects assisted by LSC Brunette cc and Hays-Hill Quantity Surveyors.

The exposure of the foundations, the conducting of DCP tests on the soils and the measurement of the foundation sizes and depths at appropriate and accessible locations to each of the twelve buildings was undertaken by Soilco Materials Investigations and LSC Brunette cc between 27 January 2015 and 4 February 2015.

The data obtained from the foundation exposures and dcp testing of the soils at the exposures, together with the interpretation of the data and a conclusion as to the condition/suitability of the foundations to each building is attached to this report as Annexure C.

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L S C BRUNETTE cc Reg. No. CK 99/46105/23

The inspection of the floors, walls, roof voids (where accessible) to the twelve buildings was undertaken by LSC Brunette cc between 7 March and 20 March 2015. Site notes and photographs of the "defects" to the floors, walls, doors, windows, ceilings and roofs were taken and are attached to this report as Annexure D.

The writer recommends that the contents of Annexure C and D are studied before the Summary of Condition of each building, recorded below, is read, in order to more clearly understand the summary.

Summary of Condition
Building 1

The foundations are too shallow, certain are inadequately sized and significant differential settlement of the foundations has occurred. Underpinning is required if the building is to remain and be habitable. The veranda floor and certain areas of the internal floors have settled badly. The affected floors will need to be replaced. Floor screeds are badly cracked in certain areas and will need to be replaced.

Significant cracking of external walls (as a consequence of the differential settlements) will require extensive stitching. Widespread plaster cracks may require replacement of the plaster. Internal partition walls stop at 2.0m; there is a band of breeze bricks above. The latter will require replacement if the rooms are to be made habitable.

Timber doors and windows are rotten and damaged by "borer" (dry wood termite) activity. Windows are missing and openings have been bricked up. All door and windows will need to be replaced and bricked up windows reinstated.

There are no ceilings in 70% of the spaces. Ceilings that exist are in poor condition. New ceilings are required.

The timber roof trusses, rafters, purlins are all heavily infested with "borer". Exposed timber ends are rotten. The asbestos roof sheeting is cracked in many places. Roof screws have corroded to nothing. A new roof is required.

The plumbing and sanitary fittings are in very poor condition.

The extent of repair and replacement required to make this building safely habitable is significant and the cost may not be warranted. - STAFF

Building 2

The foundations are generally adequately sized, however those to the eastern elevation double storey section of the building are founded at too shallow a depth (partly exposed). Underpinning is required to these foundations and at the northeast corner where some differential settlement has occurred (as evidenced by cracking of brickwork).

The floors are generally in sound condition. There are a few cracks through quarry tiles and chipped/broken quarry tiles. The cracks are of no significance.

The walls to the building are generally in sound condition except for settlement induced cracking in the northeast corner and corroding reinforcement cracking (horizontal) of face-brickwork above the windows on the north elevation. The cracking in the plaster to the south elevation may require local replacement of loose plaster.

There is water ingress at floor level through the courtyard retaining wall that is the west wall to the lower ground floor spaces north of the reception area. This is a result of there being no stormwater drainage system to the open, grassed, courtyard and of the failure of the waterproofing system to the retaining walls to the habitable spaces at lower ground floor level. An adequate drainage system needs to be installed in the courtyard which should be graded away from the building to such a drainage system. A new adequately sized discharge pipe from the new drainage system will need to be installed below the building. In addition, the waterproofing to the retaining walls should be redone and a subsoil drain installed to collect and discharge any seepage water near the bottom of the retaining walls.

The external timber window shutters and windows require replacement where missing, repair where dilapidated, and preservation where the paint has peeled away and the timber is drying out and splitting. Missing and damaged barrel bolts, latches, stays, etc need replacement. Internal timber doors and their frames are generally in poor condition due to abuse and in several instances, damage by "borer" activity.

Ceilings are generally in moderate to poor condition with stains from leaks in the roof. There is "borer" activity in cornices and cover strips. A number of ceilings will need to be replaced.

Access into the roof void was limited to one point at the northeast corner of the courtyard. Safe access through the roof void was not possible due to low headroom and widely spaced roof "trusses". Widespread "borer" activity was evident in the timber ceiling battens and wallplates. The extent of borer activity in the large timbers to the roof trusses could not be established. There is however clear evidence of "borer" and wood beetle damage and dry rot to the overhanging rafters. The roof trusses incorporate two steel round bar tension hangers which are corroding. The roof sheeting is corrugated asbestos.

Access onto the roof to determine the extent of cracking of sheets was not considered safe due to the brittleness of the sheets and the uncertainty of the integrity of the timber purlins infested by "borer". Photographs of the east overhanging sheets indicate numerous cracked sheets (and haphazardly replaced purlins). In general, the roof will require the replacement of damaged truss and purlin timbers and probably all ceiling battens and wall plates. To achieve this, the asbestos roof sheets will need to be removed and replaced with non asbestos nutec sheets of a similar profile. All the facia and barge boards are missing and the rafter and purlin ends are exposed and being affected by weather.

There is spalling of the concrete to the east elevation window head reinforced concrete sun shading slabs (due to corrosion of the reinforcement).

There are a number of large cracks in the brick retaining walls between the south and central wing on the east side of the buildings. These cracks indicate either inadequately thick walls or poorly founded walls. Further investigation should be done to establish the precise cause and most appropriate remedial works required.

Building 3

The south annex to this building has no foundations, is settling away from the main part of the building and there is widespread rising damp in all the internal walls. This annex should be demolished. The main building foundations could not be assessed due to tiled surrounds/verandas to all side. The veranda slab eastern edge, supporting the columns supporting the veranda roof, is settling and the columns are cracking. The slab edge will require underpinning and the cracked column replaced. There is minor cracking in the main building external walls that indicate minor differential settlement of these walls foundation. The extent and size of wall cracks indicate that no underpinning of the main building is necessary at present. Should the crack width increase in size the aprons, courtyards and verandas will need to be penetrated to install underpins to the buildings foundations.

The tiled internal floors and external veranda appear in moderate to good condition except for the edge settlement noted above.

The internal walls show only minor cracks and appear in moderate to good condition.

No access is available into the roof void. There is evidence of "borer" damage to the veranda purlins, south annex roof timbers and to some internal door frames. All this indicates that it is highly probable that there is "borer" infestation of the main roof timbers. The veranda roof rafters, purlin and veranda eaves beam are all undersized and they are sagging significantly. The roof sheeting is corrugated asbestos. Replacement of the inadequate veranda roof timbers and probably "borer" damaged main roof timbers will require the replacement of the asbestos roof sheets with a non-asbestos Nutec profiled roof sheet.

Building 4

The foundation widths to the eastern external walls are inadequate. Some slight settlement has occurred at the southeast corner. Underpinning of this eastern wall should be considered. The balance of the wall appears in good condition. The floors are in good condition. There is one area of timber skirting that has been damaged by "borer", no current activity was evident.

The ceilings are in good condition. The plaster to the soffit of the veranda slab over the stairway down to the garage has/is falling off (probably due to poor preparation)

The roof timber trusses and purlins appear adequate and there was no evidence of "borer" damage or infestation of the timbers. The roof covering is corrugated asbestos.

Building 5

The foundation width at the single exposure (southeast corner) is adequate but the founding depth is too shallow for the very loose soil conditions. Some minor differential settlement has occurred in the southeast corner. Underpinning in this corner may be necessary in the future if the settlement continues. Crack widths should be monitored. Possible blocked/leaking stormwater drains at this and other corners should be attended to.

The balance of the walls appear to be in moderate to good condition with only minor cracks.

The floors appear to be in moderate condition. Timber skirting's could be infested with "borer". A number of doorframes are infested with "borer".

The ceilings are in moderate condition (minor undulations).

There is widespread "borer" activity in the roof timbers, particularly the ceiling battens and roof truss overhanging chords and veranda rafters. The roof truss and purlins sizes appear adequate provided they have not been compromised by "borer" activity. The roof covering is corrugates asbestos.

Due to the noted "borer" activity in the ceiling battens, veranda rafters, truss overhanging chords there is a reasonable likelihood that the entire roof structure and its coverings may need to be replaced.

Building 6

There are no foundations to the walls of this building. The clay brick walls are built off stone "foundation" walls (no mortar to stones). Substantial cracking of the walls (crack widths approaching 150mm) has occurred due to differential settlements. Walls are leaning over. The bricks to the walls are "soft" and the mortar is extremely friable. Plaster is falling off the walls.

The veranda floor is screeded earth and is settling and breaking up.

An original timber mezzanine floor has been removed, probably due to the timber floor joists being badly damaged by "borer" (timbers stored in building 11). The timber floor will have assisted in the stability of the walls.

Several of the roof tied rafters have fractured. Several rafters are missing; several tie beams are missing. The roof has sagged dramatically. There is widespread "borer" damage to the roof timbers. The roof covering is corrugated asbestos.

This building is structurally unstable. The writer is of the view that this building should be demolished subject to the approval of Amafa.

Building 7

The foundations were exposed and inspected at nine locations. Generally the foundation sizes are adequate except for the foundations to the western extension of north west wing which are inadequate. The depths of the footings are all inadequate for the very loose soil conditions. Differential settlement and cracking of walls has occurred in the walls of the western extension of the northwest wing. As access to underpinning of these walls would require the breaking of holes through the internal floors it is recommended that the crack widths be monitored and underpinning only takes place should the crack widths increase. There is significant differential settlement in the southeast corner of the south wing of the building. Underpinning of the external walls (through the veranda slab) is required to stabilize the foundations. There is cracking in the wall to the east of the north entrance into the south wing indicating probable differential settlement of the eastern walls relative to the western parts of this wing. Local underpinning of the north external walls to the dining area is required.

The cracking of walls due to differential settlement is as noted above. The other masonry walls to be building are in moderate condition. The lightweight drywalling to the west and north of the dining room is in extremely poor condition having been extensively infested and damaged by "borer". The west drywall supports the dining room roof and the stability of this wall is in doubt. The west drywall should be replaced with a masonry wall off a new foundation. The north drywall should be replaces with a gypsum board and steel stud drywall.

The tiled floor finish to the dining room appears to have been constructed off a screed or slab which was laid ontop of the original suspended timber floor. The floor is uneven; there is a small step in the floor to the south and part of the east side; there is settlement in the southeast corner and there are numerous cracked and loose tiles. Safe access under the suspended timber floor was not possible to investigate the size, adequacy and condition of the timber joists. In view of the widespread "borer" infestation to the timber drywalling, window and roof in this area, it is reasonable to suspect that there will be "borer" infestation and damage of the timber floor joists. The floor to the dining room should be demolished and a new reinforce concrete floor slab constructed on imported earth filling.

The floors to the other rooms are in moderate condition; vinyl floor coverings are in poor condition. The west link walkway quarry tile finishes have been compromised with plumbing pipes chased into the floor finish. The walkway slabs have cracked away from the east walls of the building.

There is spalling of concrete (due to corroding reinforcement) to the bottom of the flower boxes to the northeast wing east elevation, to the lintel beams over the piers to the western link walkway and to the north entrance canopy slab to the south wing.

The roof trusses to the dining room are structurally unstable. They are missing a crucial member and there general member sizes and the overall depth of the trusses are inadequate; the trusses sag dramatically. The two temporary lines of props that have been installed to support this roof should be supplemented with further props over the full north/south length of the dining room. There is evidence of widespread " borer" infestation of the dining room roof timber. The roof structure to the dining room must be replaced.

Inspection through three other ceiling trap doors indicated widespread " borer" infestation of the roof timbers to the northwest and northeast wings of the building.

There are numerous rotten or "borer" damaged overhanging rafter ends, "borer" damaged wallplates and "borer" damaged south veranda roof timbers. The roof coverings are corrugated asbestos.

Numerous areas of water damage to ceilings indicate widespread roof leaks. Roof sheeting fixing screws have rusted away in many locations. Most of the asbestos facia and barge boards are missing. All the roof structures and roof coverings to this building should be replaced.

Building 8

This is a wood and iron structure. The plinth walls below the wood and iron walls do not have any foundations. The bottom of the plinth wall is nominally at ground level to 200mm below ground level.

The corrugated iron to the walls is badly corroded. The timber framing is "borer" infested and damaged. Dry and wet rot is also evident in the framing timbers.

The internal drywalls are in poor condition; there is rising damp.

The ceilings are in poor condition; there is widespread dampness indicating roof leaks.

The writer is of the view that this building should be demolished subject to the approval of Amafa.

Building 9 (Garages)

The foundations are inadequately sized and too shallow for the very loose soil conditions.

There is widespread cracking of the clay brick and hollow concrete block walls due to differential settlement of the inadequate foundations. The cracked walls are unstable. The east wall to the southern two garages east storerooms is leaning over eastwards and has cracked away from the inter-store party walls. These walls are unstable. Several of the garage east walls appear to have been impacted by vehicles.

The screeded earth floors are badly cracked; certain areas of screed are missing.

There is spalling of concrete (due to corroding reinforcement) to the reinforced concrete lintels over several of the garage doors.

The asbestos "Canalit" roof sheets are cracked at a number of locations (this sheet profile is no longer available).

The writer is of the view that this building should be demolished.

Building 10

The Church building has no foundations. There is widespread cracking in the walls due to differential settlement. The buttresses added to the walls at the south end of the Church have no foundations. The thickness and depth of the stone "foundation" walls is inadequate for the very loose soil conditions. If the Church is to be restored, new concrete foundations will have to be systematically installed to all walls.

The east accommodation wing has no foundations to the "recently" built west wall, no foundations to the veranda north and east wall and inadequately sized and too shallow concrete foundations to the balance of the walls. Cracking due to differential settlement has occurred in a number of the walls. Underpinning of the foundations will be required if this building is to be restored.

The Church walls are built of stone (plastered). At one exposure of the stone walling, the mortar was found to have no binder (cement or lime) and was easily raked out from between the stones. It is speculated that the original mortar may have been a lime mortar where the lime content was very low and its binding capacity had diminished with time due to moisture ingress. There is rising damp in all the walls. If the Church is to be restored, the plaster will have to be removed and the stones repointed to approximately 100mm depth in order to re-establish the integrity of the walls. Additional buttresses may need to be added to ensure the walls are stable. The timber windows are in poor condition (dry rot, "borer" damage). Missing sections have been crudely replaced with square SA Pine timbers.

The east accommodation wing walls are in moderate to poor condition. There are a number of settlement induced cracks, the plaster to certain walls is in poor condition, there is rising damp in certain walls, paint is peeling off walls, wall tiles are missing/chipped. Timber window and door frames are rotten, damaged and certain are "borer" infested. Timber window & door shutters are missing or in poor condition.

The roof timbers to the Church are not visible other than at the wall overhangs, due to a ceiling fixed to the underside of the rafters. The ceiling is in very poor condition (dampness, stains, rusting nails). It is probable that there will be "borer" (or possibly white ants) damage to the roof timbers. The stability of the roof relies entirely on the stability of the walls of the Church. As the latter is in doubt due to the condition of the mortar, the roof stability is in question. The roof covering is corrugated asbestos. If the Church is to be restored it will require the partial or full replacement of the roof timbers and ceiling. All the roof sheeting will need to be replaced with non-asbestos Nutec corrugated sheeting. At least one of the bell tower bell support timber columns and several timber tie beams have been severely damaged by white ant and "borer" activity. This structure is unstable and will require repair if the Church is to be restored.

There is widespread evidence of "borer" infestation to the east accommodation roof timbers, particularly the tile and ceiling battens. The roof rafters and tie beam appear in size to be structurally adequate provided they have not been compromised by "borer" or white ants activity. The roof covering to the rooms is clay tiles. The ceilings are in poor condition. The veranda roof timbers are in moderate condition except for the north east eaves beam and timber column which is sagging/leaning over (probably due to wet rot at the base of the column) and at the southwest corner where the corrugated asbestos roof sheets are missing and the timbers are exposed. All the roof timbers and timber columns are in need of preservation. The corrugated asbestos roof sheets to the veranda are cracked at a number of locations and as mentioned above are missing at the south west corner. Asbestos gutters and downpipes are missing. Facias are damaged and missing.

The writer is of the view that this building (Church and east accommodation wing) should be demolished subject to Amafa approval.

Building 11

The stable/piggery/dairy building has an inadequately wide foundation to the west wall, no foundation to the south wall and an inadequately sized foundation to the east wall that has been exposed by the lower floor of the bus parking lean-to. The bus parking lean-to east wall foundation is inadequately sizes. All foundations are too shallow for the very loose soil conditions. There are settlement related cracks in the walls to the stable/piggery/ dairy building and the bus parking walls are cracked and are separating from those of the stable/piggery/dairy building.

The mass concrete walls to the stable/piggery/dairy building are being split apart horizontally due to corroding reinforcement in these walls. The bus parking concrete block walls are too thin for the height and length of the walls. There is rising damp in the walls.

The floor to the stable/piggery/dairy was not generally accessible due to stored materials. The floor to the bus lean-to is concrete or screeded earth.

The timber roof structure to the stables/piggery/dairy has been rendered unstable by the removal of some of the supporting intermediate timber posts (adjacent the feeding troughs) and by damage due to "borer" infestation and dry/wet rot. The bus lean-to timber roof rafters and purlins are inadequately sizes and are precariously and inadequately supported at their western end. The roof coverings to both sections of the building are corrugated asbestos which is cracked and holed at numerous locations.

The writer is of the view that this building should be demolished subject to Amafa approval.

Building 12

The wall foundations are adequately sized; however they should have been constructed a greater depth due to the very loose soil conditions. Despite this there are no cracks indicating differential settlement of the foundations.

The walls are in moderate condition. There is rising damp in the walls and the faces of a number of bricks have eroded away due to this rising damp and the bricks possibly being underfired when made. Paint is peeling off the walls.

The window and door frames need preservation and the south replacement window is a very poor fit into the opening.

There are signs of "borer" damage to certain overhanging timber roof rafters and purlins. Certain overhanging purlins are split at their fixings to the rafters. The roof timbers appear adequate in size provided their integrity has not been compromised by "borer" activity. There is no ceiling. The roof covering is corrugated asbestos; several sheets are cracked. Gutters, downpipes, facias and barge boards are missing. Roofing screws are badly corrugated. The roof timbers and its covering should be replaced.

We trust that the above Summary of Condition of the buildings, together with the site notes and photographs provides Girls and Boys Town with a good idea of the status of the buildings on the campus and gives a sense of the magnitude of the repair/renovation/restoration needed to the buildings that the writer does not recommend be demolished.

Girls and Boys Town should, in the writers opinion, give thought to sub-dividing the eastern part of their large property with all the building on it, from the western undeveloped section, selling off the eastern section (so that the purchaser has the "problems" of obtaining Amafa approval for demolitions and the enormous costs of repairs/renovation/restoration) and developing purpose specific buildings on the western section of the property.

Please contact the writer should you require any clarification of the contents of this report or further assistance.

Yours faithfully

H.A.BOWMAN
LSC BRUNETTE cc

Attachments – Annexures A, B, C and D