

# **LUTHERAN TRAINING INSTITUTE**

## **ASSESSMENT REPORT**



### **LUTHERAN TRAINING INSTITUTE ALUMNI ASSOCIATION OF THE AMERICAS (LUTISAA)**



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### **INTRODUCTION**

The Lutheran Training Institute located in Salayea, Lofa Country was accredited by the Ministry of Education of Liberia and approved as a Christian Institution in 1860. The work at the institution was enhanced by Rev. David A. and Mrs. Emily Day after their arrival in 1874 to the Muhlenberg Mission near Monrovia. The earlier development of the school focused on agriculture, carpentry, and mechanics. Since then, the Lutheran Training Institute has contributed to the overall development of Liberia by providing academic and technical vocational education until the early 1990's when the country was engulfed with in a civil crisis. The school had and continues to contribute to the local economy through the provision of employment for its residents.

The Lutheran Training Institute Alumni of the America (LUTISAA) was founded to support the mission and vision of the school and by working alongside the Lutheran Church in Liberia to keep the school operational.

It is in this spirit of cooperation and dedication that the LUTISAA embarked on thus project of conducting a comprehensive engineering assessment and feasibility study/audit of the entire LTI campus. The current officers of LUTISAA hired the Alliance Consulting Engineers, Planners and Surveyors Inc. in Monrovia, Liberia to conduct the audit of all the buildings and structures within the campus. The scope of the work is described below. Additionally, Alliance Consulting Engineers Planners and Surveyors, Inc. is to submit a final report to the officers which will include, but is not limited to a comprehensive assessment of the buildings and develop a detailed report of the repairs, if any, that may be required.

As such, a team of architects, engineers and technicians departed Monrovia on December 14, 2021, to conduct a two-day assessment (December 15, and 16, 2021) of the existing facilities and associated structure on LTI's campus. In accordance with the Statement of Work (SOW) described by LUTISAA's officers, the Alliance Consulting Engineers Planners and Surveyors Inc. conducted an assessment which are detailed in the following sections:

1. Architectural Plan
2. Structural Analysis on the Buildings Report
3. Electrical and Plumbing Report
4. Layout Plan
5. Bill of Quantity
6. An Assessment Report.



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### **PURPOSES:**

The purpose of this task order is to conduct a comprehensive structural analysis of all buildings on LTI campus that will guide the officers in making a decision on the modernization and reconstructions of the campus.

### **OBJECTIVES:**

The objective of this project is to assess twenty-three (23) buildings and associated structures. The project is to provide structural, plumbing and electrical systems integrity assessments, prepare a cost analysis, provide building and structural layouts/drawings and make professional recommendations.

### **TASK: ASSESSMENT OF BUILDINGS AND ASSOCIATED STRUCTURES ON THE LUTHERAN TRAINING INSTITUTE CAMPUS**

The Alliance team conducted a full assessment of all twenty-three buildings and associated structures and here-in contains the observations along with recommendations for your consideration:

### **OBSERVATIONS:**

#### **1. Instructional Rooms**

- **General**

This unit consists of all the instructional rooms (classrooms #1 & #2). Alliance inspected the interior and exterior walls and found it to be in a very poor condition with signs of discoloration. The concrete screed floor has dark discoloration but the general condition is fair.

- Recommendation: the floor requires a terrazzo tile finishing.

- **Doors and Windows**

The overall conditions of the doors and frames are poor and need replacement. The window screens and frames are in similar condition as the doors. There are signs of failure in the ceiling joist. The ceiling or hard board are damaged and falling. There are signs of water leak on the existing hard board.

- **Roofing**

The corrugated zinc alloy has signs of minor to major corrosion and are (failing) in some areas of the roof. The roof needs replacement along with some of the wooden truss.

Recommendation: the roof and portion of wooden truss, and the ceiling are to be replaced. The bill of quantities listing the cost is attached. (**See Photo 1 & 2**)



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### 2. Science Lab

- **General**

The science laboratory consists of three (3) large rooms used as the Chemistry, Physics, and Biology Laboratories. This building also consists of four offices and two storerooms.

- **Walls & Floors**

The present condition of the interior walls is fair, and the floor condition is poor. Due to the high foot traffic in this area and chemical spill, the floors and walls need to be finished with terrazzo and ceramic tiles.

To further improve the area, the walls should be painted, the electrical system (wiring) and electrical fixture should be checked; the plumbing and piping system is not functional and should be checked and replaced. The ventilation system, which consists of window(s) with screens and frames, is in very poor condition and should be replaced.

- **Roof**

The corrugated sheeting of roof is in fair condition as there are signs of leaks on the ceiling.

- **Doors**

The lab has twelve doors which include three double leaf panel doors, three single leaf panel doors and six plywood doors that are severely damage. To adequately protect this unit, the three exterior double doors should be replaced with steel grid doors. (See Photo 3-8).

### 3. Chapel/Auditorium/Administrative Offices and Clinic

- **General**

This structure is considered to be the main administrative building, the auditorium / chapel, administrative offices, and the clinic make up the main administrative building. The general condition of this building is good but requires repair/renovation which will increase its service life. The building was constructed with concrete masonry units (CMU) and reinforced concrete structural systems.

- **Floor/Wall and Doors**

The floor is concrete screed floor and in fair condition. The floor was previously screed but has developed wear and tear on the top layer due to the high traffic and lack of maintenance. The walls have sign of hair cracks, both horizontal and vertical, at different sections of the wall. The wall paint shows signs of discoloration and peeling in some sections.

- **Recommendation:** to increase the service life of the floors and walls within the Chapel/Auditorium, it is recommended that the building be painted with high



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quality grade paint. The floors and walls of the offices and clinic must be finished with terrazzo and painted. The walls in the bathrooms and clinic must be finished with paint and ceramic tiles.

There are several doors and frames that are poor conditions. For security reasons the main entrance door should be replaced with steel door complete with frame. Presently, all the doors are not secure and need new locks. The windows are in poor condition and need to be reconditioned or completely replaced with new windows. The electrical wiring and electrical fixtures (receptacles, sockets, switch and ceiling lights) are partly functioning and need to be upgraded and/or replaced.

- **Roof/Ceiling and Slab**

The aluminum corrugated roofing sheet on steel trusses are in good condition and there is no sign of leaks and/or corrosion on the trusses. There are no ceiling or ceiling joists installed in the entire Chapel/Auditorium.

The slab over the portion of the Chapel/Auditorium, where the offices are located, has signs of minor cracks and exposed re-bars. The re-bars show signs of carbonation and minor corrosion. **The concrete appears hollow and has begun to spall due to earlier water damage.** There are major structure failures in the walls and slabs of the upper floor section of the Chapel/Auditorium. There are signs of cracks and frail in the vertical and horizontal structures which are visible from both exterior and interior locations.

(See Photos 9-20).

#### 4. Student Residence (Female Dormitories 1, 2 &3)

##### Dormitory #1

- **General**

Dormitory #1 consist of eight (8) rooms for female students, two (2) matron quarters, and two (2) designated areas utilized for culinary purpose. The dormitory consists of a shower unit, water closet and laundry area which are located at the rear of the building. The dormitory structure, presently being used by the female students, is in fair condition for occupancy.

- **Roof/Doors/Windows & Ceiling**

The roof is in good condition but periodic inspection is required for leaks, discoloration and carbonation. A portion of the interior ceiling boards need to be replaced. A few of the interior doors and all locks need to be replace for better security. It is also recommended that the wooden entry doors be replaced with steel doors to prevent termite infestation and intrusion of unauthorized individuals.

**The electrical system** needs to be updated. All the wiring (AWG grade), panel breaker distribution centers, throw switches, GCFI, receptacles, light fixture and





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switches need to be replaced. It is recommended that some of the junction boxes be changed as well.

- **Bathroom/Shower Unit/Laundry Depot**

Due to the lack of pipe borne water and non-use of the lavatory and shower units, the entire plumbing system need a total overhaul and plunging. The shower diverters, floor drains, and other drain accessories are to be replaced. The water closets (toilets) and basins are to be replaced in order to be fully functional. At the laundry depot, the installation of faucets, p-traps, and proper drain lines are essential. The waste lines are to be connected to a collection tank (septic tank) at the rear of the water closet facility.

### **Dormitory #2 (Senior Dormitory)**

- **General**

This unit consist of ten (10) single rooms, one double room, utility room, lobby, a panel box room, store room, toilet, shower and lavatory unit. This facility has not been used over the past few years rendering the facility in a poor functional state.

- **Roofing**

The roof on this unit shows major signs of corrosion and leaks in multiple spots is visible to the eyes. A thorough inspection of the trusses must be conducted for further verification. The removal and replacement of all affected truss is required. The areas of the ceiling boards that warrant strengthening and replacement must be replaced.

- **Windows/Doors/Walls/Floor**

The condition of the doors, windows, screens and frames are in poor condition and need to be replaced. All doors should have a complete set of locking mechanism. It is recommended that new steel grid doors be installed at the two main entrances for adequate security. All walls and ceiling need to be prepped and painted with approved quality grade paint and varnish. The floor maintains the original terrazzo tiles which is in good condition except for some replacement tiles in a few locations. A thorough scrubbing and buffing will restore it to its original shine.

- **Electrical Works**

The electrical system is in poor condition and needs replacement to restore full functionality to the system. The panel breaker distribution center, receptacles, light sockets, switches, ceiling lamp, and electrical wiring system.

- **Plumbing**

The bathroom is in poor condition. The supply lines, waste lines and floor drains are to be replaced due to clogging from debris and an extended period of being unused. The faucets and shower diverters are corroded, there are missing wall and floor tiles and all the water closets (toilets) and face basin are damaged and



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very unsanitary. All connecting accessories are also damaged. Based on this observation, the entire bathroom facility must be demolished and renovated.

### **Dormitory #3**

- **General**

Dormitory #3 is an unfinished structure that is overcome by vegetation growth that has seriously undermined the integrity of the structure from the foundation to roof level, rendering the structure unusable. Therefore, it is recommended that the structure be demolished. Please note that early construction was not completed due to the Liberian conflict of the early 1990's to post war Liberia. **See Photos (21-28)**

### **5. Student Residence (Male Dormitories 1 & 2)**

- **General**

The main male dormitory consists of two wings namely, right and left wings. The right-wing houses twelve (12) rooms whilst the left-wing houses (9) rooms. There are eight (8) closets and study area located in the left-wing. The building also has a living quarter for the Dean of boys with a living room, shower, and bathroom unit. The male dormitory that is presently being occupied by the students is structurally sound except for a hairline crack at an area in the right-wing section that can be readily repaired.

- **Roof and Ceiling**

The roof is in good condition and seems to have been recently replaced. There is no sign of leaks and/or carbonation and corrosion. It is recommended that the ceiling boards, in sections of the exterior and interior, be replaced. It is recommended that termite treatment be applied on the entire truss system and the ceiling be painted and varnished where applicable.

- **Doors/Windows/Walls and Floor**

The doors, closets, and windows are in poor condition. All exterior and interior door panels are in poor conditions due to termite infestation and neglect by residents. The doors are to be replaced and should include durable locking mechanism. The entry doors should be made of steel metal with security locks and weatherproof material. All windows and screens are to be replaced due to wear and tear. The interior and exterior painted surfaces of the structure are showing signs of fading and peeling. Therefore, they must be prepped and repainted with quality grade paint.

- **Plumbing and Electrical Works**

Alliance's team noticed a water leak in the bathroom of the left-wing, which is believed to be due to a broken pipe somewhere. The bathroom seems to be currently out of use. After inspecting the shower and water closet facility, a total demolition



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and renovation of this facility is recommended. The fixtures to be changed are water closet (toilet), floor drains, shower diverters, face basins, wall, and floors tiles. The electrical system of the male dormitory needs to be fully replaced. The fixtures and system to be replaced include the panel breaker distribution center, light fixture, receptacles, switches, GCFI and sockets. (See Photos 29-33)

### 6. Library

- **General**

The building consists of the library and six attached classrooms. The overall structural integrity of the building is fair.

- **Walls/Windows/Doors and Floor**

The library walls and floor are still in good condition. The walls need to be reconditioned and prepped for painting. The windows are in poor condition with signs of termite infestation on the window frames and doors. A total removal and replacement are recommended. The installation of a steel metal entry door is recommended for the prevention of future termite infestation.

- **Electrical Works**

The electrical system of the library and all electrical fixtures including panel breaker distribution center, light fixtures, receptacles, switches, GCFI and sockets needs to be checked.

- **Roof and Ceiling**

The roof on this building needs to be dismantled and replaced due to major deterioration. There are signs of leaks and the aluminum corrugated roofing sheet is rusted. The wooden trusses and members need to be removed and all ceiling boards removed and replaced. (See Photo 34)

### 7. Home Economic Building

- **General**

The existing Home Economics building is occupied by the Home Economics and ICT Laboratory (computer lab). It is structurally in good condition.

- **Walls and Roof**

The walls are in a structurally good condition and the surface of the exterior and the interior need to be prepped and repainted. The roof is in poor condition due to deterioration from carbonation and weather. All truss members and roof covers are to be replaced and termite proofed. Currently, there isn't any ceiling covering in the building and which is needed to prevent dust destruction to the ICT equipment and sewing machines.

- **Walls / Windows / Doors and Floor**

The walls and floor are still in good condition. The walls need to be prepped and repainted by applying two (2) coats of approved paint. The floors require high





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traffic floor paint for aesthetic and durability. The windows and doors are in poor condition and need replacing. In order to secure the equipment and materials, the building requires steel metal entry doors with security locks. (See Photo 35)

### 8. Student Center

- **General**

It is recommended that the existing student center building be demolished due to total structural failure. A new building design drawing is being submitted for consideration. (See Photos 36-38).

### 9. Generator House

- **General**

The existing generator house that has been operated by the institution is structurally in a good condition.

- **Walls and Roof**

Structurally, the wall is in a good condition but the surface of the wall needs to be painted with approved paint. The roof is in poor condition therefore; it needs to be replaced along with all roofing members (wood).

- **Other**

The generator house will have to be wired based on the specification of the generator to be installed. It is important that the building is lightning proofed. It is recommended that Class ABC fire extinguishers be installed in and around the interior perimeter of the building.

### 10. Dining Hall

- **General**

The existing dining hall, not currently in use by the institution, is structurally in a good condition.

- **Walls and Roof**

The walls and the surface of the wall are structurally in a good condition but it is recommended that they be painted with approved paint. The roof is in good condition therefore, there is no change needed. The existing ceiling is not in good condition, and as such it needs to be removed and replaced.

- **Windows / Doors / Floor**

The floors are in good condition. The walls need to be reconditioned by applying two coats of approved paint. The windows and doors are not in good condition and it is recommended that all new windows be installed. To protect this facility, a new steel grid gate should be installed at the entrance and exit of the dining hall.



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### 11. Faculty Residence

#### Single Family Quarter (8 Building)

- **General**

This unit has three unique designs which consists of four bedrooms, living room, dining room, kitchen etc. The family quarter unit walls are structurally good. One unit has been abandoned and there is no roof, door, and window.

- **Walls / Windows / Floor / Ceiling**

We observed that all the windows, doors floor, ceiling and wall surface are in poor condition. All windows (louver window, screens and frames), doors (frames and panel and plywood doors) have been damaged by termites, not locking and/or improper closing of the doors, as well as some doors have been removed from the frame. All doors, frames, locks and/or hinges need to be replaced. The paint on the wall is fading; the walls need to be scraped and painted with approved paint. Some of the dwelling have tiles, with missing pieces whilst others do not. The floor condition is good but there is a need for new tiles to be installed in each house.

- **Roof**

All the roofs on the single-family quarters are in very poor conditions. Damages were due to rust and signs of leaks. It is recommended that all the roofs along with its members (wooden) be replaced.

#### **Plumbing and Electrical**

We observed that the bathroom sink, commode, face basin, wall tiles and floor tiles are poor condition, it is recommended that they be replaced. The plumbing lines and water lines need to be checked. Electrical wiring and fixtures must be checked (sockets, receptacles, switches etc.) (See Photo 39-46).

### 12. Bachelor Quarter (3 Buildings)

- **General**

This unit consist of two-bedroom apartment complete and one bedroom with bathroom. There are two sets of the two-bedroom apartments, and they need to be fully renovated.

- **Walls / Windows / Floor / Ceiling**

We observed that all the windows, doors, floor, ceiling, and wall surface are in poor condition. It is recommended that all windows (louver window, screens and frames) and doors (frames, panel, plywood doors, lock and/or hinges) be replaced. The paint on the wall is fading and as such, it is recommended that the walls be scraped and painted with approved paint. Some of the dwellings have tiles, with missing pieces whilst others do not. The floor condition is good; it is recommended that new tiles be installed in each house.



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- **Roof**

The roofs on all the dwellings are in very poor conditions, based on damage due to rust and signs of leaks from the ceiling. It is recommended that all the roofs along with its members (wooden) be replaced.

- **Plumbing and Electrical**

The plumbing lines and water lines need to be checked. We observed that the bathroom sink, commode, face basin, wall tiles and floor tiles are not in good condition. As such, it is recommended that they be replaced. Electrical wiring and fixtures must be checked. It is recommended that (sockets, receptacles, switches etc.) be replaced.

### **13. Recommendation and Conclusion for the Renovation and Remodeling of the Facilities**

After carefully assessing twenty-three (23) buildings on the campus, Alliance Consulting Engineers, Planners and Surveyors Inc. recommends that Lutheran Training Institute Alumni Association of the Americas (LUTISAA) carry out full renovation work on the buildings in order for the institution to be structurally sound. Work that needs to be done properly includes:

- 1.0 Total roof replacements on all buildings
- 2.0 Installation of new ceilings
- 3.0 Painting of all buildings
- 4.0 Installation of terrazzo or ceramic floor tiles in most of the buildings
- 5.0 Installation of steel gates at entrance and exit points of all the buildings
- 6.0 Installation of louver windows on the administrative buildings, laboratory, clinic, library, residential buildings, etc.
- 7.0 All plumbing lines need to be checked and installation of new bathroom and/or kitchen fixtures
- 8.0 All electrical wiring needs to be checked and new electrical fixtures need to be installed on all buildings
- 9.0 Structural evaluation of the administrative building is needed due to cracks in the slab and the outside the building
- 10.0 Demolition of the Boys Dormitory 2, Girls Dormitory 3, and the student center due to structure failure



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### GALLERY



Photo 01: Showing inside classroom



Photo 02: Hallway of classroom #1



Photo 03: showing damage ceiling & sign of leakage



Photo 04: showing window, door and wall

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Photo 05: showing door that need to be changed



Photo 06: showing room with broken wall tile



Photo 09: showing damaged ceiling



Photo 08: showing damaged terrazzo floor tile



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Photo 09: showing walls, roof and no ceiling in chapel



Photo 10: Showing walls and roof



Photo 11: showing wall and window



Photo 12: showing window screen

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Photo 13: showing wall and steel door frame



Photo 14: showing roof without ceiling



Photo 15: showing rusted rebar from slab



Photo 16: showing slab, column that have cracks

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Photo 17: showing damage ceiling



Photo 18: showing cracks on slab and rebar



Photo 19: Showing mold on slab



Photo 20: showing front of building with cracks





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Photo 21: Showing windows in the dormitory



Photo 22: Showing Floor in the dormitory



Photo 23: of female dormitory



Photo 24: Showing female dormitory that need to be demolished



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Photo 25: showing senior female dormitory



Photo 26: showing laundry & bathroom for female



Photo 27: showing shower unit for female



Photo 28: showing back of female dormitory



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Photo 29: Showing boys dormitory that need to be demolished



Photo 30: showing rusted steel trusses



Photo 31: showing holes in the wall



Photo 32: showing back of dormitory

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Photo 33: showing cracks on the boys dormitory



Photo 34: showing library @ the far right



Photo 35: showing home economics building



Photo 36: showing damage floor



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Photo 37: showing student center



Photo 38: showing crack on wall of student center



Photo 39: showing faculty residence



Photo 40: showing faculty residence

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Photo 41: showing kitchen (wall, window & cabinet)



Photo 42: showing living room (floor, fire place and wall)



Photo 43: showing exterior of faulty residence



Photo 44: showing damage ceiling and roof

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Photo 45: showing back of the residence



Photo 46: showing interior of residence