



UNNAT BHARAT ABHIYAN

St.Thomas Institute for Science & Technology (STIST)

AISHE code : C- 43651

Report on Project titled
“SMALL SHED LIGHT STRAW CLAY WALL CONSTRUCTION”(RP-03525G)

Objectives of project: -

1. This project was an attempt to make a sustainable building with bricks made of light clay and straw strips which can be used in contemporary housing.
2. Light straw clay's relatively low thermal conductivity provides good thermal insulation, which reduces energy use and CO₂ emissions due to heating and cooling.
3. Upon decommissioning of the building, the walls safely decompose without becoming a solid waste.

Justification for the project :-

In recent years light straw clay has gained international attention as an ecological building material. Since the brick consists of straw and clay which are locally available, raw materials and technology needed to construct a light straw clay wall using this brick was relatively simple. The problem with conventional building materials is that it will produce a lot of non-biodegradable waste. Light straw clay has numerous advantages like relatively low thermal conductivity (provides good thermal insulation) and thereby reduces energy use and CO₂ emissions due to heating and cooling. When designed and built correctly, protecting from moisture damage, light straw clay has proven to be durable and resistant to deterioration. This building method can be used for making houses, temporary sheds for storage of agricultural goods and other temporary constructions needed in farming areas and schools.

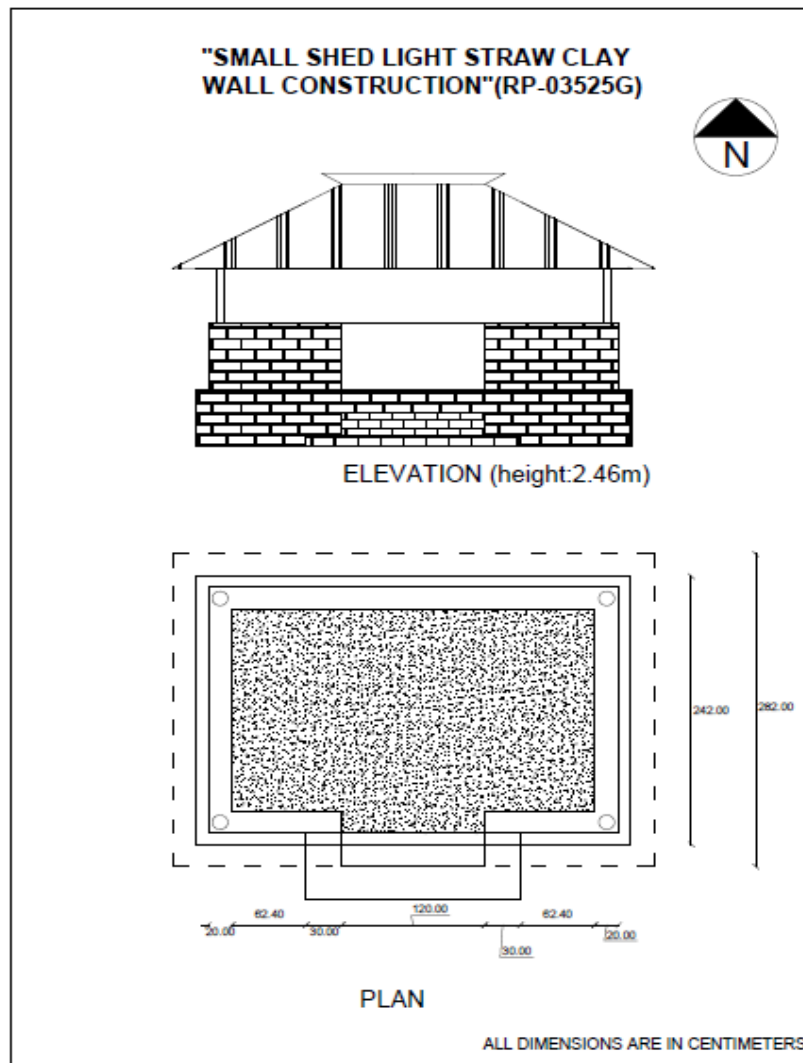
Activities and implementation timeline :-

Plan of action was to implement the project in Iroopara. The permission was granted for implementing the project in Govt. UPS, Kattaikonam by Kattaikonam councilor Sri. D Rameshan. Resource allocation of clay and straw was made available from nearby locality

Mangalapuram. Project was completed successfully on 09/01/23 and was handed over to school authorities on 10/01/2023.

Work Schedule

1. 27/06/2022 to 15/09/22 :- Planning and site selection
2. 16/09/22 to 14/10/2022:- Approval from concerned authorities and making of bricks
3. 15/10/22 to 05/11/22 :- Stone masonry foundation and brick wall construction
4. 09/11/22 to 06/01/23 :- Roof fabrication, installation of roof and roofing materials
5. 09/01/23 :- Painting and finishing works
6. 10/01/23 :- Handing over of shed to school authorities



Plan & Elevation of shed

Methodology, materials and financial resources

The initial endeavor of this project was to plan for the project. We tried to find the apt location for implementation of the project with the help of Sri. D.Rameshan (Kattaikaonam, Councilor). At the same time, the plan of the shed was also prepared by the CE department, STIST. After the selection of the site, the focus was on the production of bricks. The production process of bricks was to collect high clay content soil from Mangalapuram and then mixed it with chopped straw and allowed it to ferment. The breaking down of the straw into thin fibers created an ideal mix and this mix was used to make bricks. The above specified bricks were used in the construction of the shed. Initially the foundation was completed using stone masonry, cement and clay. Above that, the brick wall was constructed with the help of a mortar mixture of cement, M sand and clay. The roof frame was made using four GI circular pipes and GI rectangular pipes welded together to form a frame. In the frame, GI sheets were fixed using screws to complete the roof. The constructed light clay wall shed was painted using Terracotta. The completed shed had been handed over to school authorities on 10/01/2023. The school authorities plan to use this shed as an open reading room for students. UBA logo bearing G.I sheet board was also placed near the shed as per recommendations. Consolidated details of expenditure are attached in a separate sheet. We would like to thank NCI-UBA, IIT Delhi for providing approval and funding for this project. The management of our college, MarThoma Church Educational Society (MTCES) and Principal Dr. A.G Mathew, Sri. D.Rameshan (Kattaikaonam, Councilor), Sri.Madhu.S (Head Master , Govt. UPS, Kattaikonam), faculties and students of STIST had fully supported us throughout this project.

Faculty In-charge :-

A. Project Co-ordinators:

1. Dr. A.G Mathew, UBA Chairman & Principal, STIST.
2. Mr.Tony Alwin, UBA Co-ordinator & Asst.Professor Dept. of ECE, STIST.
3. Mr.Asish Prasad, Asst.Professor Dept. of CE, STIST.
4. Mrs.Athira C H, Asst.Professor ,Dept. of CE, STIST.

B. Project Implementation Location Approval Committee:

1. Sri. D.Rameshan (Kattaikaonam, Councilor)
2. Sri.Madhu.S (Head Master , Govt.UPS,Kattaikonam)

C. Construction Team:-

1. Sri.Saju V Rajan and team (from College Management- MarThoma Church Educational Society, Construction Dept.)

D. Lab Instructors involved: -

1. Mr.M.Sheriff, Lab Instructor, STIST.

2. Mr.Ajimon Karunakaran, Lab Instructor, STIST.
3. Mr.Febin Stephen, Lab Instructor, STIST.

Students involved:-

A. Graduated students

1. Abhinav Suresh (STI18CE001)
2. Amar Muhammad (STI18CE002)
3. Neethu Krishna S (STI18CE016)
4. Neha Rafi (STI18CE018)

B. Semester 5 - B.Tech Civil Engineering

1. Adwaith R (STI20CE003)
2. Faris N (STI20CE007)
3. Gokul G S (STI20CE009)
4. Mohammed Yasim A (STI20CE017)
5. Ali Jafar J (LSTI20CE027)
6. Firoz Khan Y (LSTI20CE028)
7. Goutham G (LSTI20CE029)
8. Midhun M.R (LSTI20CE031)
9. Prasanth P (LSTI20CE032)

C. Semester-7- B.Tech Civil Engineering

1. Anandhu Mohan (STI19CE004)
2. Ismayil Hussain (STI19CE010)
3. Jerin Joseph (STI19CE012)
4. John Tony V (STI19CE013)
5. Sanju Sajeev (STI19CE019)

D. Semester-7- B.Tech Electronics & Communication Engineering

1. Akshay L S (STI19EC002)
2. Muhammed Salman (STI19EC008)
3. Nishanth K J (STI19EC009)

Reference:-

1. Journal Reference:- Kyle Holzhuetter & Koji Itonaga (2017) The Potential for Light Straw Clay Construction in Japan: An Examination of the Building Method and Thermal Performance, Journal of Asian Architecture and Building Engineering, 16:1, 209-213, DOI: 10.3130/jaabe.16.209
2. Site Location:- JV2X+F6W, Kattaikonam, Kerala 695584

Outcomes/Impact:-

Outcome of this project is to promote eco-friendly building methods in agricultural areas ,public places and there by developing economical and sustainable building culture.The following program outcomes(POs) PO5,PO6,PO7,PO8,PO9,PO12 were attained.

PHOTOS



Photo.1 Sri. D.Rameshan (Kattaikaonam, Councilor), Sri.Madhu.S (Head Master ,Govt.UPS,Kattaikonam), Dr.AG Mathew (Principal ,STIST), Sri.Asish Prasad (Project Coordinator & Asst.Professor, Civil Dept., STIST), Smt.Athira C H(Project Coordinator & Asst.Professor, Civil Dept., STIST), Sri.Tony Alwin (UBA Co-ordinator & Asst.Professor, EC Dept., STIST)at stone laying function of project held at Govt.UPS, Kattaikonam



Photo.2 Sri.D.Rameshan (Kattaikaonam,Councilor) laying foundation stone



Photo.3 Bricklaying in Progress



Photo.4 Four G.I circular pipes installed for roof support



Photo.5 .Roof frame welding completed with GI circular & rectangular pipes in STIST workshop



Photo.6.Roof GI sheet (JSW COLOURON)laying in progress



Photo.7. Terracotta Painted Shed with board bearing UBA logo in Govt.UPS ,Kattaikonam



Photo.8.UBA logo highlighted in G.I sheet board