REHABILITATION OF TALIYE VILLAGE

Ms. Kajal Deshmukh , Ms. Payal Dhawale,
Prof.Vaibhav Poman

Diploma. Students, Department Of Civil Engineering, Navsahyadri Institute of Technology, Naigaon, Bhor, Pune, Maharashtra, India.

Diploma. Students, Department Of Civil Engineering, Navsahyadri Institute of Technology, Naigaon, Bhor, Pune, Maharashtra, India.

Professor, Department Of Civil Engineering, Navsahyadri Institute of Technology, Naigaon, Bhor, Pune, Maharashtra, India.

ABSTRACT

The Study deals with the main aspects of geological hazard assessment by presenting a review of the GIS based methodology for identification and analyses of hazard. In India every year more than hundred disaster occrues. Whole Maharashtra effectuated from different disasters like a cyclones, tsunamis, earthquake, and volcanic eruption, etc. Landslide is one of the common threats in many parts of the word.

On this day 13th July 2021 landslide is occurred in Taliye Gaon on Mahad at Raigad district rain water is infiltrated in crunical depth of hill and the top soil layers moved under the influence of gravity and destroy the houses, roads and amenities Etc. We are visiting the village and discuss with the villagers and sarpanch Mr. Sampat Tandalekar to know the problem facing and which facilities Govt. can provide to village. Our project deals with the design the Houses in low-cost budget with new built-up technique Expanded Polystyrene Sandwich (EPS) and also design the amenities like primary healthcare villagers, water tank design for whole village, design the road with waste from plastic.

Keyword – Taliye village, EPS panel, construction, Primary Health Care, Water Tank etc.

1. Introduction

In the INDIA every year more than hundred disaster accrues. In these main aspects of Geological hazard assessment by presenting the GIS-based methodology for identification and analyses of hazard. In INDIA Maharashtra State is one the Landslide hazard affected areas. Landslide is a Geological hazard accordin Taliye Gaon on 13th July 2021. The village is located in Mahad at Raigad district, lower reaches of their respective potential threating mountain slope, forest and hilly area, the settlement of the village is scatted butalong the hill slope. Our Research attempted to study understand the cultural, technical, structural, and economics complexities that were in rebuilding those dwellings and coming up with the cost-effective solution.

The dwellings have been designed with stand serve landslides to the best considering the above side aspects illuminated by natural light during the day with and provision for proper ventilation this house drafted foster a healthy living. This research is emphasis in cost effective construction This paper present and applies a conceptual frame work to deal with Nature`s Vulnerability action such as landslide, earthquake, floods, cyclone etc. and also design and preparing estimate the house, amenities like, Water Tank, Roads.

2. Related Work

This study has analysed a strip footing is that in which a continuous strip of concrete is placed below the load bearing walls. It spreads the load of the load wall evenly across the entire area of the soil. 4 The footing are often made in either Plain concrete or ferroconcrete Strip footing is usually used as foundations for load bearing walls; and when the soil has good bearing capacity. It is preferred for low rise to medium

rise residential buildings. Here a strip of concrete runs below the entire length of the wall, thereby distributing the load from the walls to ground. This offers better stability to the building.

In this study, mesh-based method such as the finite element method (FEM) are the most usually used techniques for analyzing soil-structure interaction problems in geotechnical engineering. Nevertheless, standard FEM is unable to simulate large deformations and contact, hindering the realistic simulation of rotational, sliding, pull-out and overturning behaviors. Contemporary 'particle' methods, such as the material point method (MPM), do not use a mesh to discretise the material, allowing large deformations to be simulated. In this paper, a recently developed technique to simulate contact using implicit MPM is tested by simulating soil-structure interaction problems and a l

Expanded Polystyrene (EPS) Core Panel system may be a modern, Efficient Safe and economic construction system for the development of buildings. These panels can be used both as load bearing and non-load bearing elements. 9 (EPS) core panel is a 3D panel consisting of 3-dimensional welded wire space frame provided with the polystyrene insulation core. Panel is placed in position and shotcrete on both the edges . 11 EPS panel includes welded reinforcing meshes of high strength wire diagonal wire, and self-extinguishing expanded polystyrene uncoated concrete, manufactured in factory and shotcrete is applied to the panel assembled at construction site, which give the bearing capacity of the structure.

In this study 10 report deals with study and development of village as a sensible village as bundle of services of which are delivered to its residence and businesses in an effective and efficient manner. "Smart 6 village" is that modern energy access acts as a catalyst for development in education, health, security, productive enterprise, environment that in turns support further improvement in energy access. In this report we focused on improved resources use efficiency, local self-governance, access to assure basic amenities and responsible individual and community behavior to build happy society. We making smart decisions using smart technologies and services.

Various methods adopted for Landslide Hazard Assessment in India include heuristic, Semi-quantitative, quantitative, Probalistic, etc. 8 However, no single method are often perfectly suitable considering the variability and variety of landslides. to spot the varied approaches to landslide hazard assessment, different articles are compared supported landslide type, geo-environmental factors, and approaches to landslide hazard assessment during this review.

3. Objective

1. To analysis and discussing with villagers to know the problems are facing.
2. To design the House in EPS (Expanded Polystyrene Sandwich) panel in low cost and extreme weather suitable.
3. To estimate the overall budget coming to developing the village.
4. To prepare a data of village to design like a (no. of house. Total population of village as per they need)
5. To design the amenities to villagers, roads, water tank, sewer line, school, primary health care etc.

4. Introduction of EPS sandwitch panel

EPS (Expanded Polystyrene Board) cement wall panel is filled with polystyrene EPS, Cement and Sand, to form a non-load bearing light weight composite wall panel. The wall panel on both sides is 5 mm calcium silicate board, with the advantage of light weight, economic, environmental friendly, energy saving, anti- earth quake, fire proof , waterproof, sound insulation, heat preservation, enlarge using area, easy and fast installation, recycling use and 2440mm (length)*610mm (width)*75/90/100/120/150 (thickness) sizes are optional. Usually, we suggest to use 75mm thick for simple partition, 90~100mm thick for inner wall partition, 120~150mm thick for outer or exterior wall partition.

Features of EPS panel:

1. High weight the economic benefits, reduce project cost.

   The light energy-saving composite wall plate is made of industrial residue fly ash, calcium silicate panel, Ceram site, silicate cement and EPS foam particles as main raw materials, the production process is simple, the cost is low, and the economic benefit is considerable.

2. Advanced technology level.

   The industrialization of housing construction in this century has become irreversible. According to the

analysis of the development of wall materials in developed countries, the product is in accordance with the development law, which overcomes the defects of other light wall panels and has unique performance, and will be the leader of the new wall material.

3. Sound insulation.

Lightweight sandwich panels have good sound insulation, it is 40dB for 90mm thick wall and much better for thicker panels, the sound effects in the line with national residential sound requirements, much higher than other excuses brick wall of sound effects.

4.Waterproof.

The light partition board can be filled with cement to form a pool body without making any waterproof decoration. The back of the light partition panel can persist in dryness, leave no trace, and will not show condensed water droplets in a humid climate. Light partition panel is a professional waterproof board, with good waterproof, moisture-proof performance, can be applied to kitchen, cleaning room, basement and other wet areas.

5. Easy to construct, transport and time saving.

Brick masonry construction capacity of 12 individuals for eight hours a day, if use EPS cement wall panel in construction, three people could complete in 60 minutes, so efficiency advantage is very significant

6. Application of cement sandwich panel.

can be used as both interior and exterior partition walls and all kinds of decoration and building construction, and also the best materials for plants, apartments, hotels, office buildings and public constructions, etc.

DESIGN PHILOSOPHY AND METHODOLOGY

In this discusses about the structural design of non-load bearing wall panel, load bearing wall panel, floor panel along with the design of EPS panels

General Requirements

- The design shall satisfy the standards of IS 456, IS 1905, IS11447, IS875 (Part 1-5), IS 1893 (Part 1), IS 4326, IS13920.
- Cutting drawings shall be prepared with clarity to facilitate the cutting at the manufacturing plant of the various wall or floor panels to appropriate sizes. In case of wall panels opening for doors, windows etc. shall be suitably marked in the respective panels.
- Plinth beams shall be supported on appropriate foundations, typically comprising spread footings or raft foundations suitably designed.
- In construction using EPS panels as load-bearing structural walling, the walls in the ground floor shall be typically founded on the reinforced concrete (RC) plinth beam, Plinth beams shall be supported on appropriate foundations, typically comprising spread footings or raft foundations suitably designed.
- EPS panels used as walls or floors shall be shotcrete with a concrete of grade not less than M20 using aggregate of size less than 5mm with 40 mm of shotcrete applied to both sides, each panel achieves a fire rating of 90 minutes [EVG].
- The insulation core of expanded polystyrene (EPS) must comply with ASTM C578 and IS 4671: 1984, reinforcement mesh with steel wires shall be used in accordance with ASTM A185 [EVG], the diagonal truss wires, as well as the wire used in the manufacture of welded wire fabric, must be in conformity with ASTM A82 [EVG].
- Special care shall be taken during construction to ensure proper connections at the junction such as plinth to wall panels, wall panel to wall panel, wall panels to slab panel etc.

Specification of EPS wall panel

- Standard panel size of 1200 mm (width) X 3000mm (height) x custom thickness in mm
- Custom sizes available in 2700mm, 2400mm or as required
- Electro-welded high tensile steel wire mesh on both sides of the EPS core which acts in composite with the

shotcrete to perform as a stress-skin panel capable of bearing both axial and lateral wall loads

- 3.0mm high tensile steel wire @ 70mm spacing transversely and 2.5mm high tensile steel wire @ 100mm spacing longitudinally.
- EPS density >15kg/m3
- Panel weight is approximately 15kg
- Max. Wall thickness of 150mm with shotcrete of 35mm on both sides

Construction of EPS wall panel

Specification of EPS floor panels

• Standard panel size of 1200mm (width) x 3000mm (length) x Custom thickness in mm

• Thickness available in 150mm, 190/200mm, 260mm, 290mm or as required/specified by the Client or his/her engineer.

• Electro-welded high tensile structural steel wire mesh on both sides of the EPS core for meeting requirements of BS 8110: Structural use of Concrete. Therefore, no need for specifying separate BRC mesh reinforcement

• 3.0mm high tensile steel wire @ 70mm spacing transversely (As=101mm2/m; fy>600N/mm2)

• 2.5mm high tensile steel wire @ 100mm spacing longitudinally.
EPS density >15kg/m3.

COST COMPARISON OF EPS CORE PANEL CONSTRUCTION VS R.C.C. CONSTRUCTION

Sr.No	**Item of the work**	**Conventional type**			**EPS Panel Type**		
		Quantity	**Rate as per DSR**	**Amount**	**Quantity**	**Rate as per SoR**	**Amount**
1	**Walling material** **230 mm thick brick masonry in superstructure** **(4*76.56*0.23*2.7) (4.31.92*0.23) =160.81** **180 mm thick EPS Panels: (4*84.64*3.0) – (4*31.92) = 888.0 sq.m** **115 mm thick brick masonry in superstructure** **(4*40.08*2.7) – (4*25.2) =** **332.06 sq.m** **130 mm thick EPS Panels (4*39.96*3.0) – (4*25.2) = 378.7 sq.m**	**160.81cu.m** 332.60 sq.m	**5483.55** 665.80	**881809.70** 221085.50	**888.0 sq.m** 378.7 sq.m	**1350.00 as per item** 1124.00 As per item	**1198800.00** 425658.80
2	**Extra for joining two sheets/ corners strengthening on both sides** **EPS Panels Length=** **(888.0+378.7)*4.2/3.6=1477.8 m**	-	-	-	1477.8m	283.00 as per item	418217.40
3	**Extra for strengthening around wall opening on both sides** **EPS Panels Length= 4*4*38.9=622.4m** **RCC Column (300mm*300mm)**	-		-	**622.4m**	**120.00 As per item**	**74688.00**

Sr.no	Item of the work	Conventional type			EPS Panel type		
		Quantity	Rate as per DSR	Amount	Quntity	Rate as per SoR	Amount
4	Quantity of concrete in structure 4*26*0.3*0.3*3.0=28.08 cu.m	28.08 cu.m	7014.55	196968.56	-	-	-
5	Centring & shuttering of column in structure 4*26*2*(0.3+0.3)*3.0=374.4 sq.m	374.4 sq.m	453.35	169734.24			
6	Reinforcement in columns in structure L.S. 2% of quantity of concrete i.e. 2*28.08*78.5=4408.6 kg	4408.6 kg	68.10	300222.94	-	-	-
7	Quantity of concrete in s/str: 4*4*32*0.23*0.3=35.33cu.m	35.33cum	7014.55 as per 5.332	247824.05	-	-	-
8	Centring and shuttering of beams in s/str: 4*4*32*(0.23+0.3+0.23)=389.1 sq.m	389.1sq.m	332.15 As per 5.9.5	129239.57	-	-	-
9	Reinforcement in Beams in s/str. L.S 1.5% of quantity of concrete i.e 1.5*35.33*78.5=4160.0kg	4160.0kg	68.10 as per 5.22 A.6	283296.00	-	-	-
10	Roof Slab Quantity of concrete in s/str 4*4*32*.98*0.11=58.04cu.m	58.04cu.m	7014.55 As per 5.33.2	407158.15	527.68	1332.00 as per item no.2 SOR .	702869.76
	EPS Panel Roof 4*4*32.98 = 527.68 sq.m			211942.67	527.68 sq	200.8 : as per of 50 % 5.9.3	105973.97
	Centring and shuttering of slab in s/str 4 ×4× 32.98= 527.68 sq.m	527.68 sq.m	401.65 as per 5.9.3				
	EPS Panel Roof 4*4*32.98 =527.68 sq.m Since only centring is required for EPS hence 50% cost of item no.5.9.3 is being considered			310270.41	-	-	-
	Reinforcement in slab in/str L.s 1%of quantity of construction i.e 1.0*58.04*78.5 = 4556.1 kg	4556.1 kg	68.10 as per 5.22 A6				

	Total cost of 527.68 sq.m covered Area			**3359551.79**			**2926207.93**

- **EPS Panel type structure are 12.9% cheaper than conventional type structure**

Cost comparison of Conventional type brick masonry & RCC framed structure Vs. EPS Core Panel System

1) 3 times faster than conventional RCC construction
2) 12 – 14 % cheaper than conventional RCC construction
3) Low carbon footprint, as the material used in the construction is sustainable in nature.

The houses and amenities are designed in low cost at govt. budget providing fund. The product designed is eco-friendly or economical.

A water supply system for a per houses as per need per house and also designed a road for transport

CONCLUSION

Exploratory meeting to be held with Sarpanch / Panchayat for 13 briefing about the project, aim & objective, scope value addition to the village, planning &development, process and methodology to be followed for implementation and consent for going ahead with the project.

Discuss with the all residents or villagers for understanding the problems, needs and priorities, their vision, participatory mechanism, suggestions from villagers. Carrying out a Socio-economic survey and asking for priorities of development / infrastructure in the village. Preparing the inventory of problems, deficiency in infrastructure, amenities, additional facilities needed etc. Preparing Development plan of the village based on study made and analysis carried out, vision and priorities defined, problems identified needs and requirements of the village projected in terms of development/amenities/services quantified and rough cost development.

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