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Building construction and their risks in selected areas of Kerala

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ABSTRACT

Laterite soil is one of the types of soil, which is abundantly seen in coastal regions of Kerala state. Soil being a complex mixture of minerals, air and few organic matters , it becomes a major factor to study in detail about the nature of soil before carrying out any sort of work on it. The present study advocates, the study of laterite soil in the selected zones of Kerala with respect to the mineralogical properties and consequents geotechnical properties soil. Thus to understand the strength variations in the mapped zones and to characterize the zones which pose risk in construction of dwelling buildings. Risk Assessment is the first stage of risk management. Presently, a huge number of risk management approaches are present, but none of them relate to a condition where numerous factors are required to work on one plan. The first mission is to categorize the risk that happens by shaping the work in gradually multifaceted project systems .Risk Management's intend is to make out the opportunities and alleviation strategies to diminish possibility and happening of an event. The aim of the study is to know the impact of this laterite soil property on the foundation cost of residence buildings and to conduct a Risk in sequence Model, which will denote the Risk occupied in the construction in the places enclosed in the Zonal Map. As designers and contractors should realize the relationship with varying foundation soils and the infrastructures. Construction has three phases for its proceedings. It includes PreBuilding Phase, Building Phase and Post-Building Phase. Understanding the ecological effect on the structure in the pre-building phase can successfully lead to the wise selection of construction materials.

INTRODUCTION

Lateritic soil is one of the types of soil, which is abundantly seen in coastal regions of Kerala state. Soil being a complex mixture of minerals, air and few organic matters , it becomes a major factor to study in detail about the nature of soil before carrying out any sort of work on it. The present study advocates, the study of lateritic soil in the selected zones of coastal Karnataka with respect to the mineralogical properties and consequents geotechnical properties soil. Thus to understand the strength variations in the mapped zones and to characterize the zones which pose risk in construction of dwelling buildings. Risk Assessment is the first stage of risk management. Presently, a huge number of risk management approaches are present, but none of them relate to a condition where numerous factors are required to work on one plan. The first mission is to categorize the risk that happens by shaping the work in gradually multifaceted project systems. Risk Management's intend is to make out the opportunities and alleviation strategies to diminish possibility and happening of an event. The aim of the study is to know the impact of this laterite soil property on the foundation cost of residence buildings and to conduct a Risk in sequence Model, which will denote the Risk occupied in the

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construction in the places enclosed in the Zonal Map. As designers and contractors should realize the relationship with varying foundation soils and the infrastructures. Construction has three phases for its proceedings. It includes Pre-Building Phase, Building Phase and Post-Building Phase. Understanding the ecological effect on the structure in the pre-building phase can successfully lead to the wise selection of construction materials.

AIMS AND OBJECTIVES

The main aim of the project is to analyse the risk assessment of construction of high rise buildings in laterite soils laterite soils in laterite soils in selected zone of Kerala. To identify the major cause of delays in construction project

- To study the minarological properties of the laterite soils
- To study the geotechnical properties of laterite soils
- To understand the risk matrix of the laterite soil

METHODOLODY

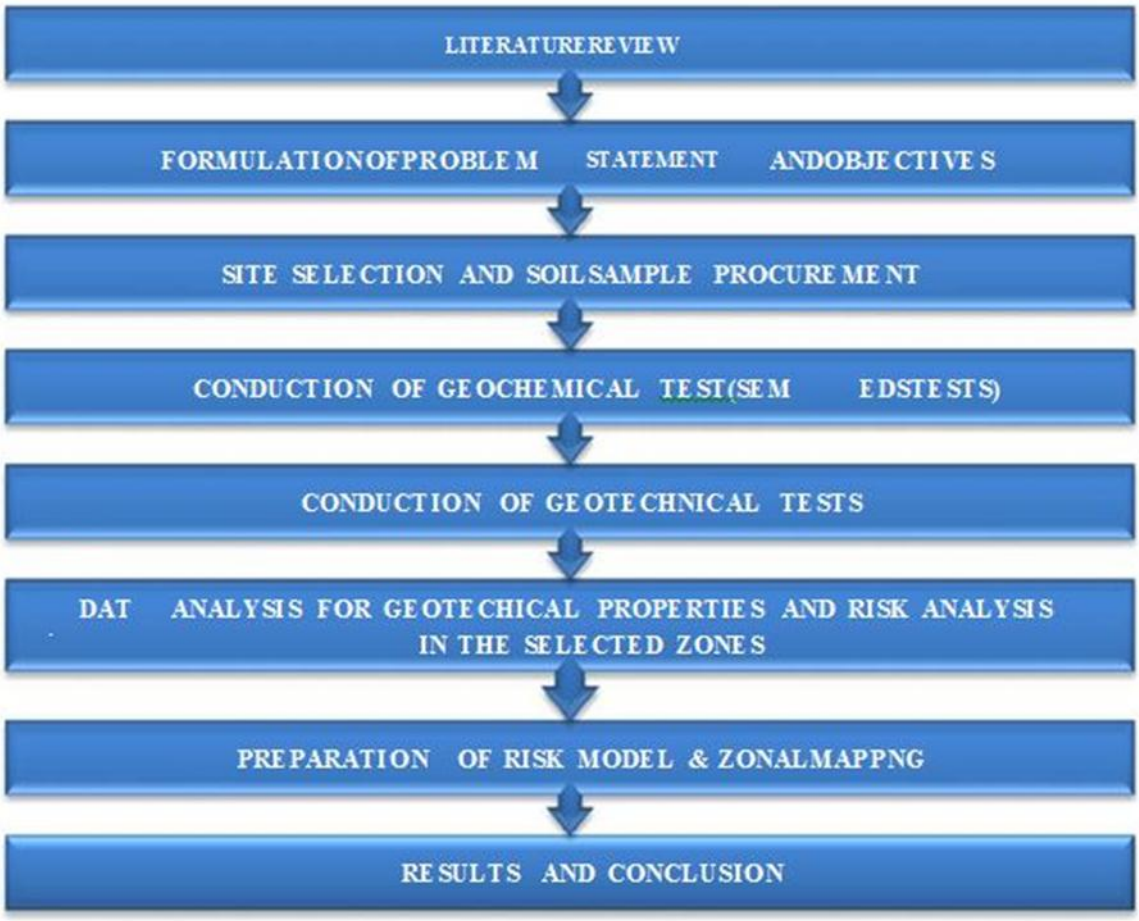

Fig1.Chart showing the methodology

DATA COLLECTION

Site Selection and Soil Sample Procurement

The first step was the selection of strategic points or sites; this was done considering Adoor, Pandalam, Thiruvala, Kozhenchery, Konni, Ranni, Erumeli and Mallappalli from those places the soil samples were collected.

RESULT AND DISCUSSIONS

Table -1: Geotechnical results of the sample

	PLACES AND RESULTS OBTAINED						
	CORE CUTTER	**SPECIFIC GRAVITY**	**LIQUID LIMIT**	**PLASTIC LIMIT**	**SHRINKAGE LIMIT**	**STANDARD PROCTOR TEST**	**UCC**
	DRY DENSITY(g/ cm^3)	SPECIFIC GRAVITY	AVG. LIQUID LIMIT (%)	AVG. PLASTIC LIMIT (%)	AVG. SHRINKAGE LIMIT (%)	DRY DENSITY(g/cm ^{3})	SBC (KN/m^2)
ADOOR	1.54	2.52	26.37	24.12	16.05	1.68	123.66
PANDALAM	1.94	2.58	38.79	34.52	13.86	1.76	109.118
THIRUVALLA	1.65	2.4	43.21	26.67	14.21	1.7	279.562
KOZHENCHERY	1.6	2.31	45.74	31.10	21.14	1.5	292.911
KONNI	1.73	2.37	38.43	27.89	15.32	1.7	246.696
RANNI	1.5	2.25	47.73	25.24	17.1	1.69	209.846
ERUMELI	1.62	2.20	41.74	34.18	20.2	1.75	229.813
MALLAPPILLI	1.52	2.47	39.57	21.13	16.5	1.72	163.019

Conduction of geochemical test

For mineralogical test, the soil samples were collected from a depth below 2.5 m and for easy Purpose of sorting, we have named as top, middle and bottom profile. Scanning electron microscope (SEM) and Energy-dispersive X-ray spectroscopy (EDAX) analyses where valued to identify the geochemical Characteristics of the samples.

Conduction of geochemical test

According to IS the test was conduct to establish the geotechnical property of the soil sample.

Table -2: Safe bearing capacity of soil samples

SI NO	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
PLACES	**Adoor**	**PANDALAM**	**THIRUVALLA**	**KOZHENCHERY**	**ERUMELI**	**KONNI**	**RANNI**	**MALLAPPILLI**
AVG SBC (KN/m^2)	123.66	109.118	279.562	292.911	246.696	229.813	108.53	209.846

Preparation of risk model and zonel mapping

Choosing these colors to indicate risks is purely based on assumptions. The risk is denoted according to the scale from green to red representing low risk to high risk. With the help of above formed table level of risk is drawn. The probability of risk is considered by multiplying SBC risk and cost risk and thus the peak of risk is calculated.

Table -3: Showing the level of risk based on SBC

	SBC	SBC Risk Probability	SBC Risk	Cost Risk	RISK MATRIX VALUE	RISK
Adoor	123.66	VERY LOW	5	5	25	EXTREME
PANDALAM	109.118	VERY LOW	5	5	25	EXTREME
THIRUVALLA	292.911	HIGH	3	3	9	MEDIUM
KOZHENCHERY	279.56	HIGH	3	3	9	MEDIUM
ERUMELI	246.69	NORMAL	3	3	9	MEDIUM
KONNI	229.813	NORMAL	4	4	16	VERY HIGH
RANNI	108.525	VERY LOW	5	5	25	EXTREME
MALLAPPILLI	209.846	NORMAL	4	4	16	VERY HIGH

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