Geopolymer Concrete With Binary Composition In Ambient Curing

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Abstract- *Geopolymer is a material occurring from the reaction of a source material which is rich in silica and alumina with alkaline solution. Geopolymer concrete is completely OPC free concrete. In geopolymer material, Binding property is shown by siliceous material and activation is carried out by alkaline solution. Siliceous material and alkaline activator undergo geopolymerization process to produce alumino silicate gel. Alkaline solution used for present study is combination of sodium hydroxide (NaOH) and sodium silicate (Na_2SiO_3) with specific ratio.*

There is huge scope for using various materials as a binder material like Siliceous and aluminous material in geopolymer. In this study we choose Fly ash and Ground Granule Blast furnace Slag (GGBS) as binding material which helps to reduce various problems regarding dumping and handling of the waste material of big industries. We can use naturally occurring materials like Red mud, Micro silica etc. as binder which performs well in geopolymer . But instead of that if we use waste materials from various industries like as Flyash, GGBS, Pond Ash, Bottom ash, Rice husk ash etc. which also gives good strength and mechanical property comparatively while using in Geopolymer solves many problems in Industries and Human beings.

Geopolymer concrete helps in reducing carbon footprints along with excellent engineering properties. It happens because it replaces Ordinary Portland cement which is responsible for huge carbon emission along with it also helps with the problem of handling industrial waste like Flyash and GGBS by consuming it in Geopolymer Concrete. Now a day's Geopolymer concrete becomes a popular construction material due to these positive aspects.

Most of the previous works on fly ash-based geopolymer concrete reveals that hardening is due to heat curing, which is considered as a limitation to cast in situ applications at low ambient temperatures. This study aimed to achieve geopolymer concrete suitable for curing at ambient temperature. GGBS was added in mix to enhance the early age properties of concrete. Setting times of geopolymer concrete, workability of fresh concrete and compressive strength after curing at 25-35°C are investigated.

Keywords- Geopolymerisation, OPC Free Concrete, Binder and Activator,Reduction in Carbon footprint, Utilisation of Industrial waste like GGBS and Flyash.

I. INTRODUCTION

As Concrete is the second most consuming fluid after water in the world, It is used as a construction material because of their many benefits like easily available, more durable, comparatively cheaper etc. Among all constituents of concrete ordinary Portland cement (OPC) is the main ingredient which binds the aggregates together. However, the manufacturing of OPC requires huge energy which is generating by burning of fuels and it is responsible for almost 5% of CO_2 emission in the world environment, which is the main cause of global warming. In another estimate it was found that the production of one tone of OPC releases approximately one tone of carbon dioxide to the atmosphere Due to an increase in global population and urbanization the increasing use of concrete in construction is unavoidable in near future. This geopolymer technique leads us to the new generation concrete or binding construction material which has potential to replace OPC partially or completely.

Davidovits [1988] proposed that an alkaline liquid can be used to react with Siliceous and Aluminous materials, which may be the naturally occurring material or any industrial waste product like Flyash, Slag etc to produce binder. Because the chemical reaction that takes place in this case is a polymerization process, he coined the term "Geopolymer" to represent these binders. The polymerisation process is a chemical reaction between alumina-silicate materials and alkaline solutions under elevated curing temperatures. It was found that the production of geopolymer based binding material requires approximately 60% less energy and it leads to 80% less CO2 emissions compared to the manufacture of OPC. So far, huge research work has been done on goepolymer binders and its applications worldwide to promote geopolymer as an sustainable and durable construction material for the future. Geopolymers are binders that exhibit good physical and chemical properties, and have a wide range of potential applications.

Cabinet Type Washing and Drying Machine

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Abstract - The requirements were to produce a washing idea which is very simple in application with less resource to input and fit for the purpose. For the purpose to achieve we studied the available washing machines in market and the one present on the site The requirements were to produce a washing idea which is very simple in application with less resource to input and fit for the purpose. For the purpose to achieve we studied the available washing machines in market and the one present on the site. Present washing machines studied were Cabinet Washing Machine, Most of machine were comprising of pumps for high pressure pumping of water on the components, motors for automatic oscillation of nozzle frame , heaters and chemical caustic additives to enhance the water quality in order for effective and qualitative cleansing properties.

Keywords - Nozzle, Heating Coils, Tank, Pump, CAD Modeling.

INTRODUCTION

The Industrial Cleaning today is a major problem. Each cleaning problem is unique from other because of many variables in a manufacturing process. Integrating the cleaning process with production and plant requirements through a proper equipment sizing and selection is very important. This machine is more preferred over the existing machine like less cycle time, less operating cost, economical for small surfaces and less maintenance cost.

This Special purpose machine (SPM) is not available in the market. Therefore they have to be designed as per the costumer requirement. They are also called as bespoke machines. This special purpose machine (SPM) is operating continuously for 24 hours a day, with minimum cycle time. The special purpose machine is generally used to washing of specific component. These special purpose machine (SPM) are used hydraulic and pneumatic energy. This machine is operating automatically or manually.

The productivity achieved after all the equipment is very high. Productivity of product is increase by 3 to 10 times than other washing. This industrial washing machine is a special purpose machine which is manufacturing for special purpose. This machine is designed according to the need as per the component to be washed for e.g. In various industries different jobs are manufacturing and as per the job the machine is designed. In this machine various sensors are provided which indicate and also reduce the chances of operations failure and assures the safety of operator.

This machine helps in quick operations as well as good performance. This machine highly cleans the job which is to be washed. This minimizes the time and this can be used in small as well as large scale industry. Purpose machine is a high productivity machine, with specially designed tooling and fixture, dedicated for mass producing the same component day in and day out. In this machine there are combination of limit switches, sensors, controller, and other safety devices etc. the essence of a SPM. A well-conceived Special Purpose Machine finds ways and means to utilize the man and machine to the optimum.

In this Special purpose machine (SPM) there are various components are used such as pump, blower, nozzle, filter, oil skimmer, tilting mechanism, water level indicator, temperature switches, etc.

A. PROBLEM STATEMENT:

In existing washing machine, there is a problem of washing and drying of casting components. Also the machine is working manually, due to this machine consuming more time in operation. The efficiency of machine and quality of washing component is also not good; due to this we are modifying the existing machine with new one.
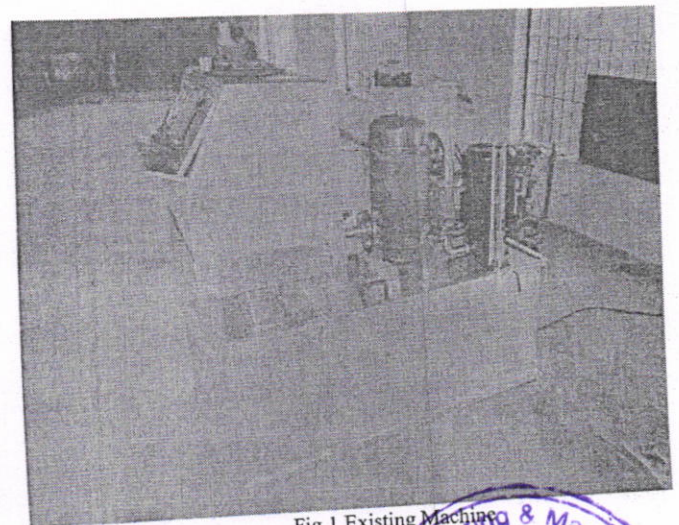

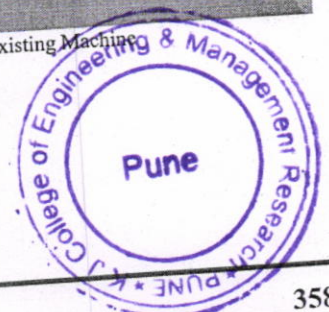Fig 1 Existing Machine

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Detection of Potholes, Humps and Measuring Distance between Two Vehicles using Ultrasonic Sensor and Accelerometer

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Abstract

The most common problem that is faced in India is the maintenance of roads. The maintenance of roads mostly focusses on improper roads which are due to potholes, humps etc. Our project mainly aims at detection of potholes and humps to avoid accidents & at the same time damage to the vehicle. We have used ultrasonic sensors for measuring the depth & height of the road surface. The data which are sensed by the sensors include the depth of the potholes & height of the hump & geographic location which is to be already stored in the database. This information serves as a valuable source to the government authorities i.e PWD office and vehicle drivers via GSM.

Keywords- Accelerometer, Ultrasonic Sensor, LCD, GSM, GPS

I. INTRODUCTION

India is one of the most popular country in the world and it has a fastest growing economy. Roads are the dominant means of transportation in India today. However, in India most of the roads are narrow and congested. It has a poor surface quality and less maintenance. Since we are in India driving is a breath holding, potentially threatening affair. Vehicle population has been increased tremendously over the last two decades. Nowadays traffic congestion and road accidents are increasing mainly due to this proliferation of vehicles.[4]. According to the survey report "Road Accidents in India, 2011", a total of 1, 42,485 people had lost their lives due to fatal road accidents by the ministry of road transport and highways[4]. These speed are unevenly distributed with unscientific heights. Heavy rains and movement of heavy vehicles are the main reasons for the formation of potholes. This also leads to major traumatic accidents and loss of human lives. The major benefit of our project will be in rainy season as this will be very helpful to take an action to furnish better road quality, as the bad roads will be detected by our system .We mainly focus on detecting pothole, Humps and vehicles which come across while driving.

II. PROBLEM STATEMENT

One of the increasing problem roads face are worsened road conditions .Unexpected hurdles on the roads may cause huge number of accidents , Also because of bad road conditions fuel consumption of vehicles increases ,causing wastage of precious fuel. All these reasons urge that it is important to get information of such bad road conditions, collect and distribute it to vehicles, which in turn can warn the driver. Pothole detection system is a system that aims at collecting information, sending and storing it to the PWD and warning the driver about the uneven roads and potholes in its path.

III. OBJECTIVES

The significance of our paper is to provide the best utilisation of our system to protect the users from accidents by sending the information to the authorities which will simply maintain the roads which will thereby reduce the number of accidents and hence cause no damage to humans nor vehicles.

This paper highlights the use of ultrasonic and accelerometer sensors in order to detect the potholes coming ahead the vehicles and inform the user vehicle about the potholes via GSM SIM900A in order to take precautionary actions to avoid accident.

The accelerometer sensor is a three axis sensor which has a bandwidth of 0-50Hz and helps detect the potholes with its tilt detection mode and hence is easy to use. [6]
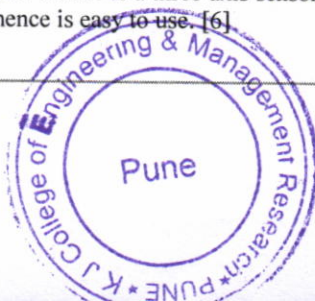
Non Linear Analysis of PSC Girder Bridge Subjected to Specified Ground Motion

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Abstract- *Now days the dynamic performance of structure is very much essential while designing any structure. Analyzing the PSC Box girder bridge, statically and dynamically is the basic aim of this dissertation. Here with and without application of dynamic loads, the performance of bridge is studied. The study of bridge with bearing between girder and top of pier are included. By applying moving load, vehicle (or) truck load, pre-stress and axial forces, the effects of bridge model is carefully studied. Determining the actual seismic demand of bridge depends on the behavior of these model and also the importance of bearing between girder and top of pier is taken into consideration. Box girder bridges can have a considerable effect on the behavior of the bridge especially in the short to medium range of span such as 30m, 40m and 50m. In our project we study the behavior of box girder bridges with respect to support reaction shear force, bending moment, torsion and axial force under standard IRC Class AA loading and the box girder bridges models analyzed by finite element method.*

Keywords- PSC Girder Bridge, time history analysis, ANSYS

Index Terms - Progressive collapse, Special moment resistant frame, DCR, LSA

I. INTRODUCTION

1.1 Introduction:-

The use of continuous concrete box girder bridges has increased recently. In construction of this type bridges having constant or variable section height, the cantilever method can be applied. Box girder section forms consist of single or more box girder based on bridge wide. The cantilever method is considered as the natural and logical solution in construction of box girder bridges. There are two basic alternatives in the cantilever method: one is single cantilever method and the other is the double cantilever method. In the former, the side span girders of the bridge are constructed on interim piers and afterwards the stiffening girder in main span is constructed by one-sided free cantilevering until the span centre or the anchor pier on the far end is reached. In the latter,

the bridge girder is constructed from both side of the tower towards the anchor piers and the main span centre by double-sided free cantilevering. The double cantilever method is also called as the balanced cantilever method. The method is especially recommended where scaffolding is difficult or impossible to construct over deep valleys, wide rivers or in case of expensive foundation conditions for scaffolds. In this method, bridges are built from one or more piers by means of formwork carriers. Normally the structure advances from a short stub on top of a pier symmetrically in segments of about 3–6 m length to the mid span or to an abutment, respectively. Each cantilevered part of the superstructure is tied to a previous one by concreting a key segment and post-tensioning tendons. The pre stressing tendons are arranged based on the moment diagram of a cantilever.In recent years, many interesting research topics have arisen such as to be taken in to account segmentally construction stages in the analysis. Normally, structures are analysed by assuming that they are instantly built in a time. However, this type of analyses may be give unreliable results which compared with those obtaining from that construction stage is considered. In the construction stage analysis, time dependent material properties should be taken into account. Several studies have dealt with the analysis of segmentally constructed bridges, as long as a few studies have been struggled the analysis of the deflection and internal moment redistribution in bridges. Abbas and Scorelessachieved nonlinear geometric,material and time dependent analysis of segmentally erected three-dimensional cable stayed bridges. Prestresed concrete bridges have found wide applications in railway engineering in recent years. Because of being chronically exposed to the natural environment, they are vulnerable to cracking under heavy trains, seismic excitation, and other loads. When the bridges are subjected to the independent action of static loads, especially prestressing forces, the cracks may be closed. However, if large dynamic loads, such as heavy trains, are present, the cracks will open and close in time depending on the structural vibration amplitude. Various studies over the last decade have shown that a structure with such cracks exhibits nonlinear dynamic behaviour, and its safety and serviceability are seriously affected. So it is essential to study the vibration of the Prestresed concrete bridge with such cracks under

The Comparative Study of Linear & Non Linear Analysis of Precast & RCC Beam Column Connections Subjected To Ground Motion

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Abstract- *The current study investigates the response of combined systems, RC frame pre-cast 3D wall sandwich panels in both linear and non-linear material properties. The seismic behavior of building constructed by 3D panels is studied in details, e.g. ductility evaluation in terms of load-displacement curves, energy loops and its dissipation during applied spectrum and material nonlinearities. The results are compared with regular bending RC frames and complete box type concrete sandwich panels system and present the differences of drifts and horizontal load distribution on floors.*

Keywords- linear & non linear analysis, RCC & Precast beam-column connections, ground motion

I. INTRODUCTION

Ancient Roman builders made use of concrete and soon poured the material into moulds to build their complex network of aqueducts, culverts, and tunnels. Modern uses for pre-cast technology include a variety of architectural and structural application including individual parts, or even entire building systems. The concept of precast (also known as "prefabricated") construction includes those buildings, where the majority of structural components are standardized and produced in plants in a location away from the building, and then transported to the site for assembly. These components are manufactured by industrial methods based on mass production in order to build a large number of buildings in a short time at low cost. Earlier Roman builders use concrete for construction of culverts, tunnels etc. Now a day's pre-cast technology include a variety of architectural and structural applications which can be used in various element of building. The process was invented by city engineer John Alexander Brodie, Actually idea was not taken up broadly in Britain Yet, it was adopted all over the world, The Precast Concrete industry focuses on utility, underground, and other non-pre-stressed products, and is represented primarily by the National Precast Concrete Association. Precast concrete elements are widely used in the construction industry. The precast elements are cast and cured in a controlled environment at a factory and then transported to the building site.

Reinforced concrete (RC) has become one of the most important building materials and is widely used in many types of engineering structures. The economy, the efficiency, the strength and the stiffness of reinforced concrete make it an attractive material for a wide range of structural applications. For its use as structural material, concrete must satisfy the conditions. The structure must be strong and safe. The proper application of the fundamental principles of analysis, the laws of equilibrium and the consideration of the mechanical properties of the component materials should result in a sufficient margin of safety against collapse under accidental overloads.The structure must be stiff and appear unblemished. Care must be taken to control deflections under service loads and to limit the crack width to an acceptable level.

Reinforced concrete interior beam-column connections are one of the least studied critical components of a building or bridge structure. It should be mentioned that a connection region comprises of the joint region along with the adjoining area within the beam and column where the inelasticity is concentrated. Reinforced concrete interior beam-column connections are one of the least studied critical components of a building or bridge structure. It should be mentioned that a connection region comprises of the joint region along with the adjoining area within the beam and column where the inelasticity is concentrated.

In precast construction, factory controlled conditions will enable the desired quality, dimension, and colored texture of precast concrete to be easily achieved. The history of precast concrete dates back to few decades ago in which several factors such as rising steel costs, material shortages during the Korean conflict, the expanded highway construction program, and the development of mass production methods to minimize labor costs have all been factors leading to the use of precast concrete. Precast concrete systems have many advantages like speed in construction,
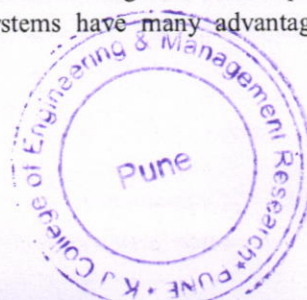
PROGRESSIVE COLLAPSE ANALYSIS OF SEISMICALLY DESIGN LOW RISE STEEL FRAME STRUCTURE

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ABSTRACT

The remarkable partial collapse of the Ronan point apartment tower in 1968initiatedan intellectual discussion among the engineering community on the possible ways to design buildings against such catastrophic progressive types of failure. There are, in general, three alternative approaches to designing structures to reduce their susceptibility to disproportionate collapse such as redundancy or alternate load paths, local resistance and interconnection or continuity from these one or more approaches should be used to avoid progressive collapse. For this study, we consider, simple, low rise three-dimensional steel frame is to be prepared using ETABS 2015 software and are designed according to the Indian Standard Codes, for all load combinations. This model is to be an analysis for progressive collapse analysis as per latest GSA guideline 2013. The main objective of this study is to determine and understand the critical locations of columns in three-dimensional steel frames, which will cause the structure to undergo progressive collapse or maximum damage. The location of column removal largely affects the joint displacement and deformation behaviour. Nodal displacement of joint changes abruptly, which indicates that beam-column junction becomes critical. Out of two location corner column removal is more critical as compare to Edge middle location due larger cantilever effect and less connecting members present to transfer extra load. Sudden increased in Shear force and Bending Moment values indicate increased the strength of Beam to avoid the progressive collapse in a structure. The alternative path method would be one of the best remedies or precaution to overcome the progressive collapses apart from the other methods mentioned by various researchers in the past.

Keywords: progressive collapse, steel frame, static analysis, remarkable partial collapse, alternate load paths, GSA guideline 2013.

INTRODUCTION

Progressive collapse has been one of the issues in building failures since the collapse of the Ronan Point apartment building in 1968 (Griffiths, *et al*. 1968). Progressive collapse is a failure sequence that relates local damage to large scale collapse in a structure. The local failure can be defined as a loss of the load carrying capacity of one or more structural components that are part of the whole structural system. Preferably, once any structural component fails, the structure should enable an alternative load-carrying path. After the load is redistributed through a structure, each structural component will support different loads. If any load exceeds the load-carrying capacity of any member, it will cause another local failure.

Such sequential failures can propagate through the structure. If a structure loses too many members, it may lead to partial or total collapse. This type of collapse behaviour may occur in framed structures, such as buildings (Griffiths, *et al*. 1968, Burnett, *et al*. 1973, Ger, *et al*. 1993, Sucuoglu, *et al*. 1994, Ellis and Currie 1998, Bazant and Zhou 2002), trusses (Murtha-Smith 1988, Blandford 1997), and bridges (Ghali and Tadros 1997, Abeysinghe 2002). On the morning of 16 May 1968, Mrs. Ivy Hodge, a tenant on the 18th floor of the 22-story Ronan Point apartment tower in Newham, east London, struck a match in her kitchen. The match set off a gas explosion that knocked out load-bearing precast concrete panels near the corner of the building. The loss of support at the 18th floor caused the floors above to collapse. The impact of these collapsing floors set off a chain reaction of collapses all the way to the ground. The ultimate result can be seen in Figure 1(a): the corner bay of the building has

collapsed from top to bottom. The Murrah Federal Office Building in Oklahoma City was destroyed by a bomb on 19 April 1995. The bomb, in a truck at the base of the building, destroyed or badly damaged three columns. Loss of support from these columns led to failure of a transfer girder. Failure of the transfer girder caused the collapse of columns supported by the girder and floor areas supported by those columns. The result was the general collapse evident in Figure-1(b).
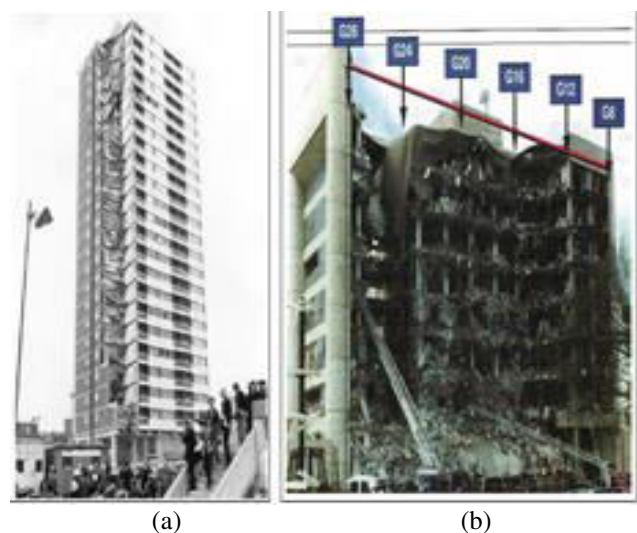

Figure-1. (a) Ronan point building after 16 May 1968 collapse. (b). Murrah Federal Office Building after 19 April 1995 attack.

Multipurpose Quadcopter Drone

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ABSTRACT

The usage of Unmanned Aerial Vehicles (UAVs) has grown drastically because of their ability to operate in dangerous locations while keeping their human operators at a safe distance. UAVs are widely used in military operations nowadays because of their reliability, cost effectiveness and multi-functionality. The problem we posed in this paper is Indian agriculture needed production and protection materials to achieve high productivity. Agriculture fertilizer and chemical frequently needed to kill insects and growth of crops. The WHO (World Health Organization) estimates there are more than 1 million pesticide cases in every year. In that more than one lakh deaths in each year, especially in developing countries due to the pesticides sprayed by human being. The pesticide affects the nervous system of humans and also leads to disorders in body. A remote-controlled UAV (Unmanned Aerial Vehicle) is used to spray the Pesticide as well as fertilizer to avoid the humans from pesticide poison. The UAV is operated by manual flight plans and the Sprayer is manually triggered by RF controlled Nozzle. The vertical take-off and landing quadcopter is used to spray the low volume pesticide in a small area. This project describes the development of quadcopter UAV and the sprayer module. And also discusses the integration of sprayer module to quadcopter system. This model is used to spray the pesticide content to the areas that can't easily accessible by humans. The Universal Sprayer system is used to spray the liquid as well as solid contents which are done by the universal nozzle. Camera is used to capture the remote sensing images which are used to identify the green fields.

Keywords: Unmanned Aerial Vehicle (UAV), Radio frequency (RF), Sprayer module, Remote sensing, Camera

I.INTRODUCTION

Agriculture is the key to the development of countries such as India, Japan, Israel, China and others. Trading of agricultural products is a crucial part of the economy. A developed agriculture employs a large number of people. Agriculture in India generates almost 52% of total number of jobs available. It contributes a share of around 18.1% of the GDP. Time and need has surfaced to increase the productivity of farming to feed the ever-growing population. The advent of technology might prove helpful in increasing productivity within the stipulated time. The use of fertilizers and pesticides was increased to improve the fertility of the land so as to improve productivity. The manual spraying of fertilizers and pesticides can affect the nervous system and can result in fatal diseases. The World Health Organization (WHO) statistics puts that there are more than 1 million

Layered Software Architecture for Heterogeneous Distributed Control System Using Hybrid Communication Channel

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Abstract: This paper addresses the pivotal issues of the software architecture like platform independent, hardware modularity, scalability, code maintainability, testability, etc. for Distributed Control Systems (DCS). To resolve these issues, it aims to develop the Layered Software Architecture (LSA) for the Heterogeneous Distributed Control System (HDCS). The system consists of a master and the multiple slave units equipped with the master software and hardware modules i.e. sensors and actuators respectively. The master and/ or slave units access the individual module services through the Hybrid Communication Channel (HCC) for information processing, monitoring and control. The performance of LSA is evaluated in terms of average round trip time at the standard baud rate of 9600 using Histogram and Probability Distributions. From the analysis, it reveals that the normal distribution is best suited amongst Beta, Normal and Gamma distributions. It validates the
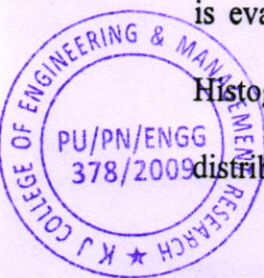
Seismic Analysis of G+18 RC Building by Varying Zones and Infill Materials

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Abstract— Due to increase in population, demand of land keeps on mounting which in turn leads the responsibility of civil engineer to greater extent. Earlier Horizontal system of construction was in use but now a day's vertical system of construction is preferred more due to a lesser amount of existing ground. Such multi-storey buildings demand for extra safety, therefore seismic analysis is necessary. The present study uses two methods namely, Seismic Coefficient Method, Response Spectrum Method for analysis of G+18 building. The zones and the infill materials used are also varied. The zones varied are III, IV, V and materials used are red brick, autoclave aerated clay and fly ash. The analysis is carried out for bareframe model and infill wall model. The software used to carry out the analysis is STAAD-PRO V8i.

Key words: Seismic Coefficient Method, Response Spectrum Method, Infill materials

I. INTRODUCTION

In modern times many multi-storey buildings in cities are in high demand owing to increase in population on one hand and limited available space on the other hand. With the immense increase in population, demand of land keeps on increasing, which increases the responsibility of civil engineer to greater extent. An earthquake may be defined as sudden release of energy from the earth's crust in the form of seismic waves, which cause shaking or vibration of ground. Earthquake induces lateral forces which transfer through Slabs which act as a deep beam further distributing this forces to columns and beams which form the lateral load resisting system of structure and therefore causing the structure to fail or collapse. Earthquake causes destruction, loss of life and property, damage to civic amenities (schools, hospitals),lifeline amenities (roads, bridges, power),heritage, etc. Therefore, to avoid or minimize these losses or damages it becomes necessary to construct earthquake resistant structures. Seismic analysis is a subset of structural analysis and is the calculation of the response of a building structure to earthquakes. The goal of the seismic design is to limit the damage in a building to an acceptable level.

The term infilled frame is used to represent a composite structure formed by the combination of a moment resisting R.C. frame & Infill walls. Most reinforced concrete (RC) frame buildings in developing countries are infilled with masonry walls. Experience during the past earthquakes has demonstrated the beneficial of the presence of infill masonry walls. In actual, infill walls add considerably to the strength and rigidity of the structures. Infill walls are non-structural elements. Adding infill wall is one of the retrofitting techniques. There are many alternatives which can be used as infill material like AAC (Autoclaved Aerated Concrete), Clay Brick, Fly Ash Brick, and Solid Concrete Blocks etc. As number of floors keeps on increasing, manual calculations process becomes tedious, consumes more time and there are chances of human errors, so it is necessary to use software.

II. OBJECTIVES

The present work aims at the following objectives:
1) To carry out seismic analysis of G+18 RC building by varying different infill materials and zones using STAAD-PRO software.
2) To compare results the results of bare frame and infill frame subjected to loading as per IS 1893:2016.
3) To compare various parameters like Base shear, Support reactions, Storey drift and Storey displacement.

III. PROBLEM STATEMENT

The building model in the study has eighteen storeys with constant storey height of 3.6m. The software used is STAAD-PRO V8i. Considering different zones and infill materials, and two methods i.e Seismic Coefficient Method, Response Spectrum Method the analysis is carried out. Also bare frame model and infill wall model is considered. The codes used are IS 1893-2016 and IS 875- part I, II. Other details are given below :

Plan dimension	30 X 30 m
Type of building	Residential building
Beam size	300 X 600 mm
Column size	750 X750 mm
Slab thickness	175 mm
Wall thickness	230 mm
Dead load	4.375 KN/m²
Floor finish on floor	1.5 KN/m²
Floor finish on roof	2 KN/m²
Live load	3.5 KN/m²
Materials	M25, Fe500
Redbrick	18 KN/m³
Fly ash	14.5 KN/m³
AAC	7 KN/m³
Zones	III, IV, V
Soil conditions	Hard
Importance factor	1.2
Response reduction factor (SMRF)	5
Material	Width of strut (m)
Red Brick	0.89
Fly Ash	0.92
ACC	0.95

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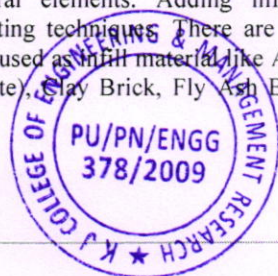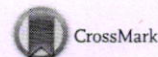
Detection and prevention of black hole and selective forwarding attack in clustered WSN with Active Trust

Deepak C. Mehetre[1] · S. Emalda Roslin[1] · Sanjeev J. Wagh[2]

Abstract

In the recent era, security is the major problem in sensor networks. Wireless sensor networks (WSNs) are mostly used for various real-world applications. However, WSNs face a lot of insider and outsider attacks, and it is complex to identify and protect towards insider attacks. Generally, an insider attack, in which the intruders choose several received data packets to drop, threatens the clustered WSNs. This situation has occurred because of the unattended clustered environments in the network. To overcome this problem, this paper proposes a trustable and secure routing scheme using two-stage security mechanism, and dual assurance scheme, for selecting the node and securing the data packet for WSNs. Both schemes are based on Active Trust to protect several kinds of attacks, such as black hole attack, and selective forwarding attack, during routing. Therefore, this paper identifies the trusted path and provides the secure routing paths using trust and Cuckoo search algorithm. Energy is the performance parameter utilized in the proposed scheme. The experimental result proves that proposed system provides the assurance to prolong the network lifespan and the probability of secure routing path in the network.

1 Introduction

Over last few decades, the popularity of a topic, which is more prone to be important for civil and military applications are increasing. Several applications of WSNs are emergency scenarios, manufacturing environments, battlefields, etc. Due to the advancements in fields, like microelectronics, integrated electronics, the development of sensor nodes is intensified [1]. The properties that combined in networks are mobile, sensors, wireless, and ad hoc. These properties are implemented in the real world for energy emergency response information [2], and monitoring factory environments [3]. The networks are vulnerable to various kinds of security threats from intruders at the network layer [4]. The main

motivation is that the sensor nodes form a structure to observe the actions in unpredictable environments by acting in a self-compositely, self-harmonize ad hoc manner, i.e., without the need of human intervention [1].

Routing is the process of selecting the most efficient paths in a network. The router presents the direction of traffic activated on the web [5]. The routing of data packets from a source to a sink through the network is of a more interesting challenge for the researchers in the WSN domain. Limitation of energy resources is a major impact, as energy is an important and fundamental component in designing of the routing protocols [1]. Routing is operated for various forms of sensor networks that consist of electronic information sensor networks, transportation networks, and the public switched telephone network. The main requirement of WSN is the trust on the behavior [6]. The data packets can be routed in the largest routing network around eloquent areas so that a complete mishap of the network can be overlooked [1]. The secure routing protocols [7] are not effectively averting malicious nodes that are authorized to the sensor network from doing any illegal activities [8]. In extension with, to dodge a strain of certain nodes to curtail the jeopardy barrier of the network, the routing algorithm should haul load balancing into rationale, directing to misplaced paths between the

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Survey on Minimizing Payment Cost of Cloud Service Provider

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Abstract— Many industries and research center using a cloud service provider (CSP) provider for storing data on that and CSP used many web applications such as web portal, online social network providing services to the clients all over the world. These types of datacenters provide the different unit prices and get/put latencies for resources reservation and allocations. Selection of different CSPs datacenters and cloud customers facing two challenges (I.) How to allocating data to the datacenters in worldwide to satisfy application Service Level Objectives (SLO) requirement which includes both data availability and retrieval latency. (II.) How to allocate reserve resources and data in the datacenters, which belongs to different CSP to minimizing payment cost. Find out the solution of these challenges firstly we used integer programming techniques for handles cost minimization problems. We propose three techniques for reducing the service latency and payment cost 1. Multicast Based Data Transferring, 2. Coefficient Based Data Reallocation and 3. Request Redirection Based Congestion.

Keywords: *Cloud Service Provider, Service Level Objectives, Payment Cost Minimization, and Data Availability.*

I INTRODUCTION

In recent year worldwide cloud storage such as Microsoft Azure, Google Cloud storage and Amazon S3, has become more popular. Cloud Service Provider (CSP) provides various data storage services such as Get and Put services help of worldwide geographically distributed datacenters. Fig. 1 Shows that the cloud storage service provider's overview. Most of enterprisers shift data workload on the cloud storage to save capital expenditure to maintain and build the hardware infrastructures and avoid the complexity of managing datacenters. CSP used many web applications such as web portal, online social networking for the providing services to clients all worldwide. Such type of web applications availability and data access delay are critical, which is affected on the cloud customer's incomes. In order to reduce data access latency, the data requested by clients needs to be handled by datacenters near the clients, which requires worldwide distribution of data replicas.
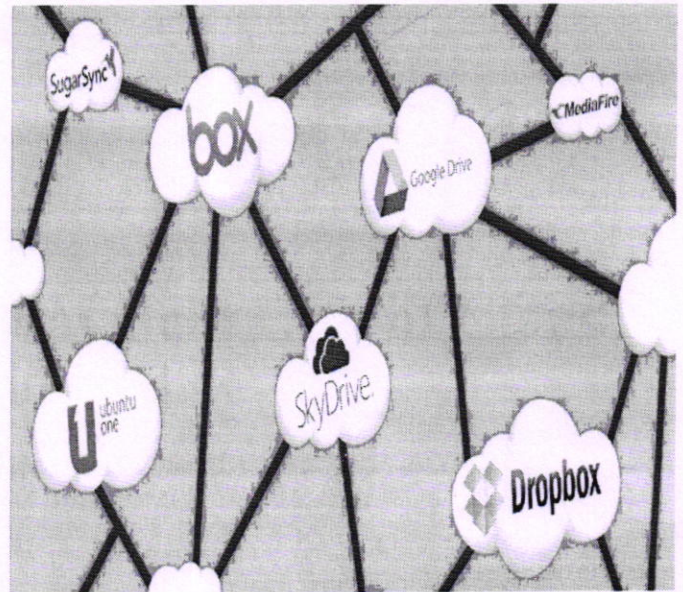

Figure 1 : Overview of Cloud Storage Service Providers

The payment cost of CSP depends on the cost of data GET/PUT, Storage and Transfer of Data. Different types of DSP have different cost. For examples Amazon provides less data storage cost (($0.01/GB and $0.005/1,000 request) and Windows Azure data Get/Put price ($0.024/GB and $0.005/100,000 requests). Table 1 Shows that the examples of CSS offered by cloud service providers.
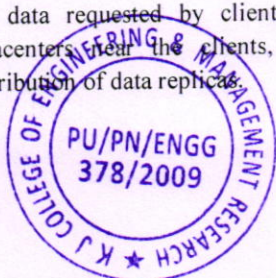
Table1. Cloud Storage Service Provider Examples

Provider Name	Storage Services
Amazon	Queue, File, Blob, Tables, Redis Cache
Google	EBS, S3, EFS, Glacier, DynamoDB
Microsoft	Data store, Big-table, Storage

II LITERATURE SURVEY

In this section discuss the literature review in detail about the multiple cloud storage providers:

In this paper [1] they propose SPANStore to export a unified view of geographically distributed storage services to applications and to automate the process of trading off cost and latency, while satisfying consistency and fault-tolerance requirements. SPANStore achieves this goal by spanning data centers of multiple cloud providers, by judiciously determining

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An Multipath Routing approach for Delay and Data Integrity using DCN in WSN

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Abstract

In the world of today WSN has made an extremely commendable impact in the various fields of sensor and computer technology because of its tremendous advancement. Sensor nodes plays important roles in the network, these nodes are deployed randomly in the network they are capable of communicating and sensing the gathered data from source to destination node. There are several problem's regarding the scalability, cost, topology change and power consumption of the networks. Researchers work on developing novel technologies to overcome all these issues. There are various QoS (Quality of Service) requirement of each WSN application which run on the same WSN platform. Two fundamental requirements are less delay and more data integrity. Current techniques have failed to provide these requirements. In the existing system, there is a system which fulfills this requirement but, the system fails to run when the hotspot is generated at the sensor nodes. In this work, to overcome this issue and improve the performance of the network delay and energy consumption of the network, the clustering and scheduling algorithm with IDDR algorithm is implemented. In this system if the hotspot is generated at sensor node at the time of communicating with node for sending data, node creates a cluster and finds the Cluster Head (CH) with high energy and minimum depth value. CH is selected on the basis of energy and distance of the node. Data in the queue within the hotspot will redirect through different rout using CH. This will reduce the packet drop and delay in the network. These systems gave less accurate results therefore we have proposed another system by using data cluster node(DCN). In this system DCN are deployed in the network and when the hotspot is generated then the data will be sent through the DCN which is nearest the to the hotspot node. This system improves the lifetime of the network and it also minimizes the loss of data.

Keywords: wireless sensor networks, energy consumption, IDDR, DCN, CH.

INTRODUCTION

Researchers throughout the world are showing a keen interest in WSN techniques, because of their attention and applications. The smart sensors are developed because of the production in Micro-Electro-Mechanical Systems (MEMS) technology. As compared to the existing sensor nodes, these sensors are small in size, low in cost, with restricted processing and computing resources. These sensors have lots many applications such as, they can measure, sense and collect the data from another nodes. These nodes communicate with other nodes to sense the data. Smart sensor nodes are low power devices equipped with one or more sensors, a processor, memory, radio, power supply, and an actuator. In the next generation of technological world WSN plays a very important role for securely communicating within the networks. In such networks the Quality of Service guarantee gains a great attention in the research community due to the multiplicity and difficulty of applications running over WSNs.

Researchers focus on the requirement of QoS, which is application or network specific. It has different requirements for different perspectives such as, for event tracking applications it can focus on coverage, optimum number of sensors that need to be active, exposure etc. For network perspective, the QoS requirement can be maximum usage of the sensors resources. There are some challenges faced by the researcher while developing the QoS protocol such as, resource constraint, mixed data, dynamic topology, scalability, multiple base station, and redundant data etc. which have to be addressed.

In this work we have focused on two basic requirements of Quality of Services which are; high data integrity and low delay. In most of the situations these requirements cannot be satisfied simultaneously. The most important to bjective of the paper is, how to design routing protocol tha tprovides data integrity and delay differentiated services over the same Wireless Sensor Networks simultaneously without wasting much energy and which should work efficiently even when the network is congested.

In this work basically we focus on:

- The two systems for fulfilling the requirements of QoS. In first system clustering process is used. In second system DCN is used.
- While generating the hotspot by the network, cluster is generated by it ,by the nearest neighbor node. After that CH node is selected and data is sent through it.

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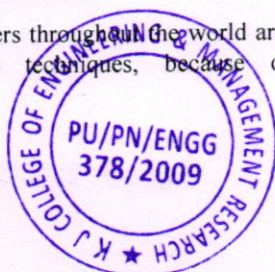
A Survey on Identity-Based Integrity Auditing and Data sharing with Sensitive Information Hiding For Secure Cloud Storage

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Abstract— **Now a day's cloud storage is used for the storage of large data and it provides storage platform for enterprise and individuals and also using cloud storage system user can store and access data remotely. It is avoiding committee of a large number of users for the managing and purchasing software and hardware. In cloud storage auditing key exposure is the one of security problems. In commonly used cloud storage system Electronic Health Records (EHR) it contains the sensitive information and this sensitive information can be exposed when cloud files are shared. Using the encryption techniques, sharing files is hiding from the other users. Addressing such type of problems we propose remote data integrity auditing techniques this system can hide sensitive information when data sharing in the cloud. For this, here we use a sanitized for sanitize data blocks which are regarded to the sensitive information of the files and after that it transfers these block signatures into valid ones for sanitized files. Signatures are used for verifying integrity of the sanitized file in phase of integrity auditing. These techniques are able to secure file storing and sharing on the cloud and also it hide sensitive information. This technique based on the Identity Based Cryptography.**

Keywords: Electronic Health Record, Sanitizer, Cloud Storage, Sensitive Information and Data Sharing.

I INTRODUCTION

With the large amount of data, it is burdened on users to store data locally. Thousands of organizations and individuals want to store data on the cloud. The data store on the cloud is corrupted or lost because of the Hardware fault, human error and software bug in the Cloud. So for verifying whether the data is secure and correctly stored in the cloud, proposed a several data integrity auditing schemes [1].

Cloud storage does trigger some new security threats to data owners. A number of cloud users would not like to use cloud storage due to some serious security worries. A primary concern of cloud users is the integrity of their outsourced files. There are a few factors that might lead to data corruption. First, cloud service providers are not fully trusted. As a result, for monetary reason, the cloud service provider might delete the data that are rare or have not been accessed so that it can save the space for storing other files for charging extra expenses. Second, the stored data could be corrupted due to cloud server failure, management errors or adversary attacks. However, in order to maintain a good reputation, a cloud service provider may

deliberately hide data loss events. In cloud storage, data integrity and leakage have become a primary concern of cloud users [2].

In remote data integrity auditing schemes for data blocks, data owner need to generate signatures before uploading data in the cloud. The cloud is processed these blocks. It proves by using signature in the phase of integrity auditing. After that the data owner uploads their data along with signature in the cloud [3]. The cloud stored data shared with multiple users in many cloud storage applications, like a cloud, google drive and Dropbox. Data sharing is the main and important feature in cloud storage. Using this feature user shares their data with others. The stored data on cloud contain some sensitive information. The Electronic Health Records (EHRs) contain patient sensitive information and hospital sensitive information. This data stored and shared on a cloud. If this HER data directly uploaded on cloud for research purpose, the sensitive information is exposed to the cloud. Because of the human error, hardware and software failure, the integrity of the EHRs needs to be guaranty. Remote data integrity protected the data with sensitive information [4].

A solution to this problem is to encrypt files before uploading in cloud and after that generate a signature for verifying the integrity of this encrypted file. Then upload this encrypted file along with its signature to the cloud. This method can only show hidden sensitive information. The encrypted file decrypt only by the data owner. Due to this the shared file does not used by others. The possible solution to this problem is to distribute the decryption key to the researchers. This method is not feasible in real scenarios. Firstly, for distributing decryption key to need secure channel [5]. It's very confusing to know which researchers will use his/her EHRs in the near future when he/she uploads the EHRs to the cloud. Encrypting the whole shared file for hiding sensitive information, as a result it's impractical. Thus, how to realize data sharing with sensitive information hiding in remote data integrity auditing is very important and valuable. Unfortunately, this problem has remained unexplored in previous researches [6] [7].

II AN ILLUSTRATIVE EXAMPLE FOR EHRs

Here to discuss about the EHR (Electronic Health Records). Figure 1 shows the example of the EHR (Electronic Health Records).

In these EHRs contains data with sensitive information in two parts. One is personal and second is organizational sensitive information. Patient sensitive information includes patient name, ID number and organizational sensitive information such as hospital name. Generally, the sensitive
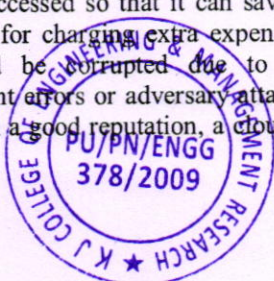
Survey on low latency live video streaming

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ABSTRACT

Video gushing over Internet has got bunches of consideration as of late. These days over half of the worldwide information activity is devoured by video bundles and it will be over 80% by 2020. Live gushing is testing, since it needs ongoing techniques with low dormancy. Advanced mobile phones and tablets are the new age of PCs with the capacity to do some of our days by day schedules. Live spilling between two cell phones has numerous applications, for example, reconnaissance, video talk, and so on. In this paper we proposed a technique to stream live video from a cell phone to another, utilizing a web-socket. For assessment, we have executed an open source library on Android, being used for any individual who needs to utilize live video gushing as a piece of their application, and showed that our strategy can play remote video with lower than 2 seconds delay in various situations. Moreover, our technique increment and decrement latency according to network condition so as to give a superior nature of experience to the viewer.

Keywords: *Low latency, Quality of Service, Long Term Revolution, WebRTC*

1. INTRODUCTION

Ongoing Communication (RTC) over voice and video has a few advantages, yet because of a few issues, for example, costly video and sound authorizing, RTC represents a few difficulties that have pulled in the exploration group [5]. The World Wide Web Consortium (W3C) and Internet Engineering Task Force (IETF) built up another standard known as WebRTC; they have remarked that the WebRTC is intended to allow the co-event of sound and video sessions without the need to modules or different expenses. WebRTC is a shared open source structure that is considered as an accumulation of guidelines, conventions, and JavaScript [6]. Additionally, it is upheld by Opera, Mozilla Firefox, and Google Chrome. Section 2 introduces the related work on adaptive video streaming. Section 3 consists of the system model, problem formulation, and performance metrics. Results and discussion are presented in Section 4, and Section 5 consists of conclusion and future works.

2. RELATED WORK

In Arun Raj*, Dhananjay Kumar, H. Iswarya, S. Aparna and A. Srinivasan [1] paper a new system to support streaming of

live and stored video through a wireless network is proposed which is based on adaptive playback buffer management on the top of HTTP at the client. The cushion completion is dealt with as an immediate state variable that mirrors the change of the system data transmission. The cradle totality estimation predicts the support status at a point later on in view of perceptions of the cushion over a stipulated timeframe.

Behin Molaei Tabari, Jafar Habibi, Abolhassan Shamsaie, Alireza Ma- Zloumiand Pedram Beheshti [2] proposed a method to stream live video from a mobile device to another one, using a web-socket. For assessment, they have actualized an open source library on Android, being used for any individual who needs to utilize live video spilling as a piece of their application, and showed that this strategy can play remote video with lower than 2 seconds delay in various situations. Besides this strategy increment and reduction inertness as per arrange condition keeping in mind the end goal to give a superior nature of experience to the watcher.

In Xu Na, Sun Shuang [3] paper, to improve the playback quality of P2P media streaming system terminal nodes and enhances the overall performance, a data scheduling algorithm(LDSA) is proposed, it is able to dynamically adjust the pending request according to the node ability. The algorithm in satisfies the media streaming living in the time response foundation had considered how to minimize the waiting time for the requests in the node and the rapid distribution in a network of scarce data blocks.

Naktal Moaid Edan, Ali Al-Sherbaz, Scott Turner [4] depicts the Web Real-Time Communication (WebRTC) innovation and the usage of its customers and server. The primary point is to plan and execute WebRTC video conferencing between programs in genuine usage utilizing Chrome and (Wired Wi-Fi) of LAN WAN systems. Additionally, an assessment of CPU execution, data transfer capacity utilization and Quality of Experience (QoE) was accomplished. Besides, a flagging channel between programs utilizing the Web Socket convention through Node.js stage has been made and executed. This paper gives web engineer a chance to appreciate the WebRTC innovation, and in addition to seeing how to plan WebRTC video conferencing.
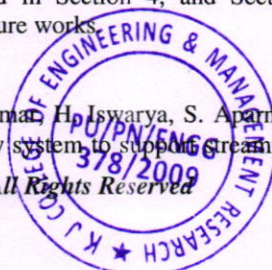
Comparative Study of Various Parameters for Pre-Engineered Building & Conventional Truss Building Taking Effect of Soil Structure Interaction

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Abstract— There are many circumstances in civil engineering for which interaction between structure and ground has to be considered prominently. Hence the behavior of soil strata under the structure plays an important role during the earth quake excitation forces and other lateral forces on the structure. The phenomena may be defined as "The process in which the response of soil influences the motion of structure and motion of structure influence the response of the soil is termed as SSI". In order to study structural behaviour of any structure, it is prominent to study the effects of soil structure interaction (SSI). In present study, attempt have been made to study the influence of soil structure interaction on Pre Engineered Building (P.E.B) and conventional truss shed building(C.S.B).Usually the structural behaviour is analysed assuming the fixed support conditions at the base of structure. In conventional method the foundation flexibility of soil mass is ignored which is likely to affect the structural response of building. The soil flexibility is integrated in the analysis of structure using Winkler's spring model approach. For analysis P.E.B and C.S.B with 15m, 21m, 24m, 30m spans are considered with equal bay spacing. Three different soil strata's i.e. hard, medium and soft are used for SSI study. The analysis is carried out in STAAD Pro.V8i software using response spectra of IS 1893-2002. The effect of SSI on various parameters like base shear, lateral displacement, etc. are studied and discussed. To get real behaviour of superstructure the subgrade must be modelled adequately well. The study reveals that the SSI significantly affects the performance of the structure.

Key words: Soil Structure Interaction (SSI), Pre-Engineered Building (P.E.B), Conventional Truss Building

I. INTRODUCTION

Steel is extensively used in the construction of industrial building of larger spans where concrete construction is not feasible or when construction time is critical. Any building structure used by industry to store raw materials or for manufacturing products of industry is known as an Industrial Building. In India steel constructions are most popular because of their ease in construction, low cost, availability of manpower for erection & fabrication. Now a day's three types of steel structures are used as industrial shed for various purposes. Such as warehouse, workshops and various industrial units. These industrial structures are as follows:

a) Conventional truss shed building.(CSB)
b) Pre-Engineered building.(PEB)
c) Truss less roof sheds (shell structure).

In case of industrial building, the economy of the structure plays an important role. For longer spans the design is optimized in order to minimize the use of materials, costs, and installation efforts. Manufacturer adopt Pre-Engineering Building concept to reduce the costs. Pre-engineering Buildings is a metal building that consist of light gauge metal standing seam roof and steel purlins spanning between rigid frames with light gauge metal wall cladding. If we go for conventional truss steel structures, time frame will be more, and also cost will be more, and both together i.e. time and cost, makes it uneconomical. Thus in pre-engineered buildings, the total design is done in the factory, and as per the design, members are pre-fabricated and then transported to the site where they are erected in a time less than 6 to 8 weeks. In such competitive decade problems associated with the practical application of SSI for building structures are rooted in a poor understanding of fundamental SSI principles. Soil- structure interaction topics are generally not taught in graduate earthquake engineering courses, so most engineers attempting SSI in practice must learn the subject on their own. Unfortunately, practice is hindered Buildings STAAD pro is one of the best software for Structural Analysis and Design Software Supporting Indian and major International codes.by a literature that is often difficult to understand, and codes and standards that contain limited guidance. Most articles rely heavily on the use of wave equations in several dimensions and complex arithmetic to formulate solutions and express results. Moreover, nomenclature is often inconsistent, and practical examples of SSI applications are sparse. This gives rise to the present situation in which soil-structure interaction is seldom applied

There are many circumstances in civil engineering for which interaction between structure and ground has to be considered prominently. Hence the behavior of soil strata under the structure plays an important role during the earth quake excitation forces and other lateral forces on the structure. The phenomena may be defined as "The process in which the response of soil influences the motion of structure and motion of structure influence the response of the soil is termed as SSI".

In 2009, the National Institute of Standards and Technology (NIST) initiated the Task Order 69221 Project entitled "Improved Procedures for Characterizing and Modeling Soil-Structure Interaction for Performance-Based Seismic Engineering." The purpose of this project was to develop consensus guidance for implementing soil structure interaction in response history analyses, such that input ground motions accurately reflect the input at the base of structures, and that structural models include elements that account for the geotechnical and foundation conditions associated with the building under consideration. Work also included an extensive review of available research on soil-structure interaction, evaluation of existing SSI guidelines for static-type analyses, and development of recommendations for improvement where necessary.

In last decade it is observed that in India all P.E.B providers and manufacturers are doing 1their best to prove that P.E.B is feasible in all aspects such as time and cost than other conventional steel buildings like C.S.B. But until yet