INTERNSHIP / PROFESSIONAL PRACTICE

Internship Report submitted to

Visvesvaraya Technological University

in partial fulfilment of the requirements for the award of degree of

Bachelor of Engineering

in

Civil Engineering

Submitted by

BHARGAV M 1KG20CV401

Internship carried out at

V CONSULTING ENGINEERS
CIVIL ENGINEERING SERVICES & SOLUTIONS

#194/A/17, GROUND FLOOR, 5TH E CROSS, KALYANI NAGAR, VASANTHAPURA, BENGALURU -560061

CHIEF EXECUTIVE

Department of Civil Engineering
K.S. School of Engineering and Management
No. 15, Mallasandra, off Kanakapura Road, Bangalore - 560109
2022-23

REQUISITION LETTER

KAMMAVARI SANGHAM (R), 1952
K.S. School of Engineering and Management
Approved by AICTE-1-5279601, Affiliated to VTU, Belagavi
15, Near Vajarahalli, Mallasandra, off Kanakapura Road,
Bengaluru - 560 019, www.kssem.edu.in
Tel : +91 80 28425012/013/163, Fax : +91 80 28425164, Mob : 8884444408

REF: KSSEM/CIV/069/2022-23

DATE: 06/09/22

To

MANAGING DIRECTOR
V CONSULTING ENGINEERS,
KALYANI NAGAR , BSK 5TH STAGE
BENGAULURU – 560061.

Respected sir,

Subject: Request for permission to undergo internship in your Organization.

The following student from 4th year (7th SEM), Civil Engineering branch has to mandatorily undergo internship for a period of four weeks. They are interested to undergo internship in your organization for a period of four weeks from September 6th 2022, as a part of their academic curriculum. I request you to provide them an opportunity to observe, understand and implement the best practices of your Organization.

During the period of internship, they will follow the rules and regulations stipulated by your Organization.

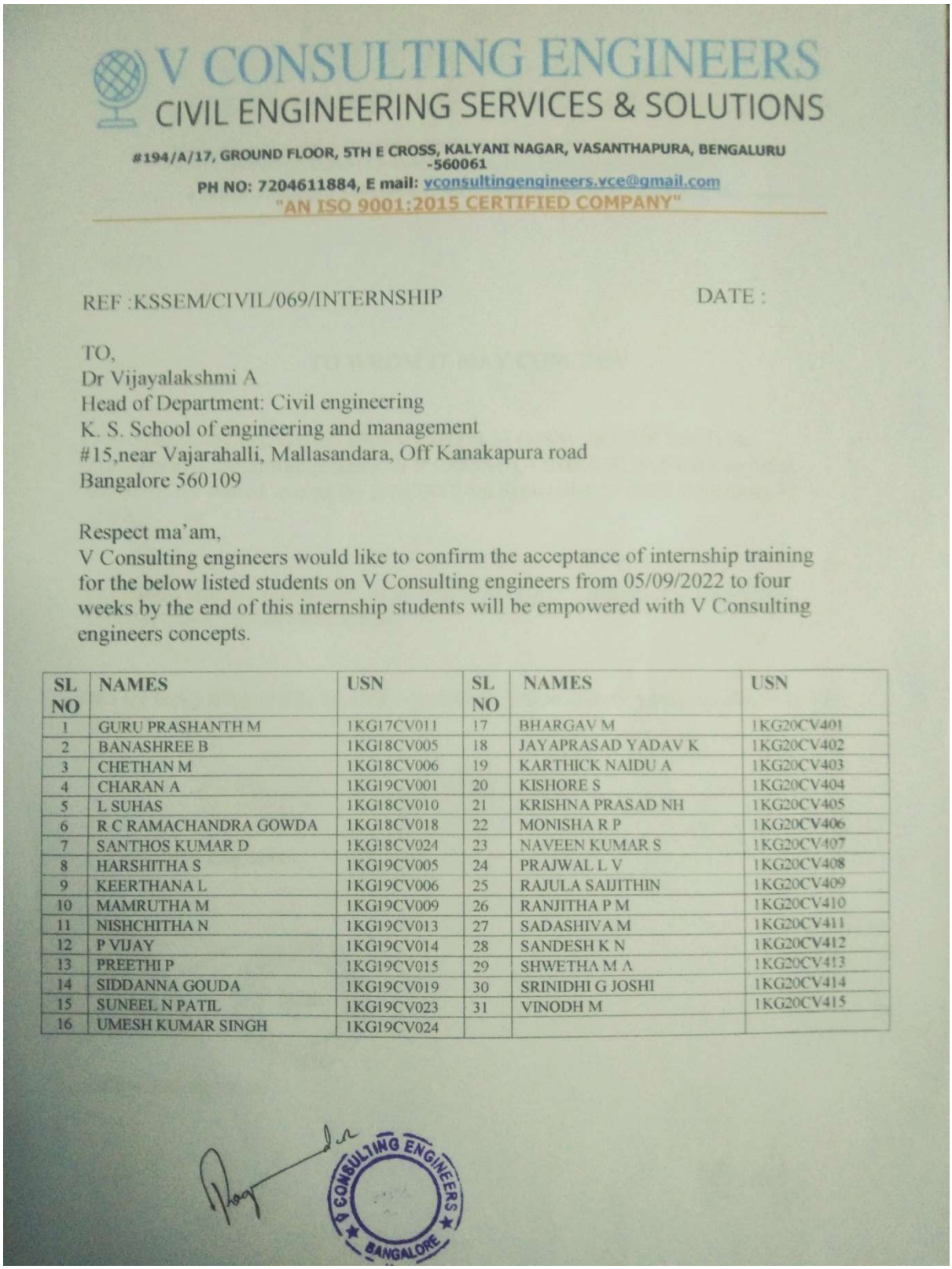
SL NO	NAME OF THE CANDIDATE	USN	SL NO	NAME OF THE CANDIDATE	USN
1.	GURUPRASHANTH M	1KG17CV011	16.	BHARGHAV M	1KG20CV401
2.	BANASHREE B	1KG18CV005	17.	JAYA PRASAD YADAV	1KG20CV402
3.	CHETHAN M	1KG18CV006	18.	KARTHICK NAIDU A	1KG20CV403
4.	L SUHAS	1KG18CV010	19.	KISHORE S	1KG20CV404
5.	R C RAMA CHANDRA GOWDA	1KG18CV018	20.	KRISHNA PRASAD	1KG20CV405
6.	SANTHOSH KUMAR D	1KG18CV024	21.	MONISHA R P	1KG20CV406
7.	HARSHITHA S	1KG19CV005	22.	NAVEEN KUMAR S	1KG20CV407
8.	KEERTHANA L	1KG19CV006	23.	PRAJWAL L V	1KG20CV408
9.	MAMRUTHA M	1KG19CV009	24.	RAJULA SAI JITHIN	1KG20CV409
10.	NISCHITHA N	1KG19CV013	25.	RANJITHA P M	1KG20CV410
11.	P VIJAY	1KG19CV014	26.	SADASHIVA M	1KG20CV411
12.	PREETHI P	1KG19CV015	27.	SANDESH K N	1KG20CV412
13.	SIDDANNA GOUDA	1KG19CV019	28.	SHWETHA M A	1KG20CV413
14.	SUNEL N PATIL	1KG19CV023	29.	SRINIDHI G JOSHI	1KG20CV414
15.	UMESH KUMAR SINGH	1KG19CV024	30.	VINODH M	1KG20CV415

Thanking You

Head of the Department

Professor & Head
Dept. of Civil Engineering
K.S. Group of Institutions
K.S. School of Engineering & Management
Bangalore-560 062

ACCEPTANCE LETTER



V CONSULTING ENGINEERS
CIVIL ENGINEERING SERVICES & SOLUTIONS

#194/A/17, GROUND FLOOR, 5TH E CROSS, KALYANI NAGAR, VASANTHAPURA, BENGALURU -560061
PH NO: 7204611884, E mail: vconsultingengineers.vce@gmail.com
"AN ISO 9001:2015 CERTIFIED COMPANY"

REF :KSSEM/CIVIL/069/INTERNSHIP DATE :

TO,
Dr Vijayalakshmi A
Head of Department: Civil engineering
K. S. School of engineering and management
#15,near Vajarahalli, Mallasandara, Off Kanakapura road
Bangalore 560109

Respect ma'am,
V Consulting engineers would like to confirm the acceptance of internship training for the below listed students on V Consulting engineers from 05/09/2022 to four weeks by the end of this internship students will be empowered with V Consulting engineers concepts.

SL NO	NAMES	USN	SL NO	NAMES	USN
1	GURU PRASHANTH M	1KG17CV011	17	BHARGAV M	1KG20CV401
2	BANASHREE B	1KG18CV005	18	JAYAPRASAD YADAV K	1KG20CV402
3	CHETHAN M	1KG18CV006	19	KARTHICK NAIDU A	1KG20CV403
4	CHARAN A	1KG19CV001	20	KISHORE S	1KG20CV404
5	L SUHAS	1KG18CV010	21	KRISHNA PRASAD NH	1KG20CV405
6	R C RAMACHANDRA GOWDA	1KG18CV018	22	MONISHA R P	1KG20CV406
7	SANTHOS KUMAR D	1KG18CV024	23	NAVEEN KUMAR S	1KG20CV407
8	HARSHITHA S	1KG19CV005	24	PRAJWAL L V	1KG20CV408
9	KEERTHANA L	1KG19CV006	25	RAJULA SAIJITHIN	1KG20CV409
10	MAMRUTHA M	1KG19CV009	26	RANJITHA P M	1KG20CV410
11	NISHCHITHA N	1KG19CV013	27	SADASHIVA M	1KG20CV411
12	P VIJAY	1KG19CV014	28	SANDESH K N	1KG20CV412
13	PREETHI P	1KG19CV015	29	SHWETHA M A	1KG20CV413
14	SIDDANNA GOUDA	1KG19CV019	30	SRINIDHI G JOSHI	1KG20CV414
15	SUNEEL N PATIL	1KG19CV023	31	VINODH M	1KG20CV415
16	UMESH KUMAR SINGH	1KG19CV024			

V CONSULTING ENGINEERS BANGALORE

CERTIFICATE OF INTERNSHIP

V CONSULTING ENGINEERS
CIVIL ENGINEERING SERVICES & SOLUTIONS

#194/A/17,GROUNDFLOOR,5THECROSS,KALYANINAGAR,VASANTHAPURA,BENGALURU-560061
PHNO:7204611884,Email:vconsultingengineers.vce@gmail.com
"ANISO9001:2015CERTIFIEDCOMPANY"

DATE:

TO WHOM IT MAY CONCERN

This is to certify that **BHARGAV M (USN: 1KG20CV401)** has completed the internship program at **V CONSULTING ENGINEERS** as a site engineer. He started joining the program from September 5th 2022 to October 3rd 2022.

During his stay in the company as an intern, he displays enthusiasm, leadership, self-discipline, and self-motivation.

We are lucky to have him as one of our interns before and we would like to wish him all the best.

V Consulting Engineers

V CONSULTING ENGINEERS BANGALORE

Authorized signature

K.S. School of Engineering and Management

No.15, Mallasandra, off Kanakapura Road, Bangalore - 560109

Department of Civil Engineering

Certificate

This is to certify that the "INTERNSHIP" is a bonafied work carried out by

BHARGAV M 1KG20CV401

in partial fulfilment for the award of Bachelor of Engineering in Civil Engineering of Visvesvaraya Technological university, Belgaum, during the year 2022-23. It is certified that all the suggestions indicated during internal assessment have been incorporated in the report and this report satisfies the academic requirement with respect to the internship prescribed for the degree.

Head of the Department

Dr. Vijayalakshmi Akella

Professor and Head
Dept. of Civil Engg.
KSSEM, Bangalore.

Principal / Director

Dr. K Rama Narasimha

Principal
KSSEM,
Bangalore.

Name and Signature of

Examiner 1

Name and Signature of

Examiner 2

Contents

ACKNOWLEDGEMENT

The internship opportunity I had with V CONSULTING ENGINEERS was a great chance for learning and professional development. Therefore, I consider myself a very lucky individual as I was provided with an opportunity to be a part of it. I am also grateful for having a chance to meet so many wonderful people and professionals who led me through this internship period.

I express my deepest thanks to Mr. R. Ragavendra (Civil Engineer) for providing this brilliant opportunity, for giving the necessary advice, guidance, and arranged all facilities. I choose this moment to acknowledge her contribution gratefully. I would like to express my deepest gratitude and special thanks to Mr. R Ragavendra who despite being extraordinarily busy with his duties, took time out to hear, guide and clear all my doubts regarding the various process in construction.

I perceive this opportunity as a big milestone in my career development. I will strive to use gained skills and knowledge in the best possible way, and I will continue to work on their improvement, in order to attain my desired career objectives. Hope to continue cooperation with all of you in the future.

EXECUTIVE SUMMARY

The internship report contains four chapters in which I tried to explain my one-month experience in my hosting company. The content of all four chapters is broadly explained and it is constructed from the practical basis of the site work.

In the opening chapter 1 give details to the company background including its mission, vision, the project those runs through the company consultation. In this chapter I have put all record or history and futurity of my hosting company with its official address. So, it gives details of company in which reader can easily know about the company.

Second chapter gives details about the department under which I have worked during my internship.

Third chapter is the most important chapter which explains my overall internship familiarity in one month. This chapter is main chapter and gives details on overall work I have executed in internship and gives highlights of main works of the construction industry.

Final chapter explains the main benefits of the internship in terms of different aspects and areas. It is obvious that the internship has a plus in terms of improving skills and different abilities as a whole. The gains of internship have been put in short and concluded with what I learnt and understood from this internship programmed.

Chapter-1

About the Organization

1.1 About the Company

V Consulting Engineers, a consulting engineering firm established in the year 2017 with an aim to serve the society in the broad area of civil engineering. The VCE operates from its office located in the address; #194/A/17, Ground Floor, 5th E Cross, Kalyani Nagar, Vasanthapura, Bengaluru -560061.
From the past two years, V Consulting Engineers has successfully continued to serve the industry through executing major projects both in the private and public sectors.

VCE started its service by providing topographical survey & geotechnical investigations for the major infrastructure works. Today VCE is diversifying its activities for all kinds of construction projects detailed project report preparation, investigation, planning, and design of civil engineering projects.

VCE, strive to provide each client with the best engineering solutions available in the market in an economically feasible, structurally sound and environmentally safe manner.

VCE dedicatedly working to provide the improved work performances, productivity and economic benefits to the satisfaction of customers.

1.2 OUR VISION & MISSION

Vision: To build value through ideated end to end infra solutions.
Mission: To deliver unsurpassed quality and value to our customers.

1.3 COMPETENCY & FACILITIES

Competency

- Competency
- Advanced design tools
- Equipped office
- E Library having all IS, IRC & MORTH Codebooks & Text books
- Computers & Laptops

Computers & Laptops

- E-TABS
- Auto cad software
- STAAD
- REVIT
- LUMINOR
- Sketch up

1.4 ARCHITECTURAL & STRUCTURAL DESIGN WORK

VCE undertake following Architectural and Structural Consultancy works which are required for major infrastructural, residential building and industrial projects.

- Design and planning of working plans
- Designing of safe and economical structural designs
- Architecture interior design
- Structural analysis
- Non-Destructive testing (Rebound hammer & Profoscope)
- Pile foundation designing
- Architectural exterior design
- Electrical Layout plan & Plumbing Layout plan
- Approval plan

1.5 GEOTECHNICAL ENGINEERING WORKS

- VCE undertake following geotechnical engineering works which are required for major infrastructural, building and industrial projects.
- Design and planning of ground investigations
- Geotechnical Design of Deep Formylations (Piles, Well) & Mat Foundations
- Borehole drilling & soil investigation (SPT) Sample coring and analysis
- Trial pits and testing
- Slope stability analysis & studies
- Plate beating Tests (Plate load Pile load) as per IS and DIN

- Electrical Resistivity Test
- Pile foundation and micro pilling Groundwater Monitoring, Sampling, and Analysis Soil Nading and Shotcreting

1.6 MATERIAL TESTING LABORATORY

- A wide variety of laboratory tests performed on soils and construction materials to measure their properties.
- Particle size Analysis
- Atterberg limits
- Swell index, Swell pressure and well potential test on soil samples California Bearing Ratio (CBR) Soaked & Un-soaked
- Direct Shear Test Walter Content
- Uniaxial Compressive Strength of Rock simples
- Specific gravity and water absorption test on rock samples
- Compassion Test on concrete cubes
- Tests on Aggregates

1.7 GROUND IMPROVEMENT/SOIL STABILIZATION /PILE FOUNDATION

V Consulting Engineers undertakes a wide range of works for stabilization of side slopes in case of deep V Consulting Engineers undertakes a wide range of works for stabilization of side slopes in case of deep adopting the same professional approach to both large multi-disciplinary investigation projects as well as small simple structures.

GROUND IMPROVEMENT WORKS

- Sand piling to improve the poor sub-soil conditions.
- Underpinning works for the improvement of stability of the existing structures.
- Soil Nailing & Shotcreting.
- Pile foundations Micro piles.
- We undertake Installation of bored cast-in-situ piles for foundations of multi-storeyed buildings, bridges and other structures.
- We undertake pile installation for stabilization of slopes/sides in case of deep excavation.
- Sand piling to improve the poor sub-soil conditions Underpinning works for the improvement of stability of the existing structures.

- Soil Nailing & Shotcreting Pile foundations Micro piles.
- We undertake Installation of bored cast-in-situ piles for foundations of multi-storeyed buildings, bridges and other structures.
- We undertake pile installation for stabilization of slopes/sides in case of deep excavation.

1.8 COMPLETED PROJECT

- Preparing of detailed Geo-technical report for Ms. HINDUSTAN UNILEVER LIMIT for construction of solar power plant at Tal Khed, Dist. Ratnagiri, Maharashtra.
- Conducting Non-Destructive Test by core cutting method for M/s. Shell India market Pvt Ltd. for construction of Modular building at Seegehali Shell petrol bunk.
- Preparing of detailed Geo-technical report for M. HINDUSTAL UNILEVER LIMIT for construction solar power plant at SIPCOT Industrial Complex, Hosur.
- Preparing of detailed Geo-technical report for M/s. Toyota Tsusho India Pvt Ltd for construction of UG Sump at Bidadi industrial area Designing & Execution of End bearing pile foundations for M/s Divine techno zone Pvt Ltd for construction of Airtel tower base plate at Bellary, Karnataka.
- Preparing of detailed Geo-technical report for Mix. MVN Infratech Pvt Lad for Development of High Raised Residential Apartment at Devanhalli Conducting Non-Destructive Test and analysing of structure for M/s. Phoenix Fitness at Green field hub, Kadugodi, Bangalore.
- Conducting Non-Destructive Test and analysing of structure for M/s. Kambi siddaramanna kalyaana mantap at Haveri. Karnataka.
- Architectural and Structural Designing of multi storey building for M/s. SNV Developers at Nagarbhavi, Bangalore.
- Architectural and Structural Designing of multi storey building for M/s. SNV Developers at Pampa extension Hebbal.
- Execution of End bearing pile foundations for M/s. Navaneetham Building Construction for construction of Industrial building at Jigani industrial area, Karnataka.
- Architectural and Structural Designing of Residential building for M/s. VR Constructions at Sarjapur road, Bangalore.
- Architectural and Structural Designing of multi-storey building at M/s. VR Constructions Kothanur, Hennur road, Bangalore.

- Conducting Proctor Density test and preparing of reports for M/s. Cheluvamba Enterprises Pvt Lad for Construction of New industry at KIADB Industrial area, Kumbalagodu.
- Preparing of detailed Geo-technical report for M/s. Akanilla Constructions for Development of High Raised Residential Apartment at Adugodi, Bangalore. Providing structural consultancy Service for M/s. AMS Constructions for Development of High raised Residential Apartment at HSR Layout, Bangalore.
- Preparing of detailed Geo-technical report for M/s. Davengere Smart City Limited for Extension of roads at Davengere.
- Conducting Proctor Density test and preparing of reports for M/s. UKN Properties Pvt Ltd for back filled earth at footings.
- Non-Destructive Test and Preparing of report for M's. Pura Parkridge for renovation of Club house and gym area Providing structural consultancy Service for M/s. SLV Constructions for Development of Residential Building at Heball Bangalore Providing structural consultancy Service for M/s. SNV Developers for Development of High Raised Residential Apartment at Nagarbhavi circle, Bangalore.
- Non-Destructive Test and Preparing of report for M/s. SNV Developers for Residential Building at ISRO Layout Architectural and Structural Designing of multi storey building for M/s. NEW Developers at Bannerghatta Road, Bangalore.

Chapter-2

About the Department

This internship was basically carried out in Civil Engineering department of Simplex Constructions, which was led by Project Manager Mr. Ragavendra R.

This department basically composed of Civil Engineering works like (structure and Finishing), Electrical, Plumbing (mechanical) and Admin (which governed QS and Planning).

2.1 Civil Engineering

Whereas Simplex Constructions is one of the prestigious developers in Karnataka. While coming to the Civil Engineering team. They have highly Qualified Engineers to carry out the assessment, Quality Check and major works of checking and Inspection as a developer side. This Civil Engineers are further divided based on the work as Structural Engineer, Site Engineer, Interior Team, and Admin Team.

1. Structure Engineers – Structural works like designing and related works.

2. Site Engineers – Who establish and inspects the work which has been done.

3. Interior Team – Are those who look after the interior part of the building design.

4. Admin Team – Major team which plays major role in bill payment to the contractor also the administrative works and Planning.

Chapter-3

Task Performed

3.1 Soil Investigation

Soil investigation must be undertaken to determine the bearing capacity of the soil, its settlement rate and the position of the water table. One of the easiest methods is to dig trial pits and visual inspections carried out then samples with minimum disturbance are collected for subsequent laboratory testing. Where possible, drilling should be undertaken as this enables one to obtain undisturbed samples from which settlement rate and bearing capacity may be obtained. For soils that loosen, such as sand and gravel, a plate-bearing test can be used to determine the bearing capacity of the soil in-situ and designing of the static loads on spread footings. If the strength of the soil is not adequate for the increased loading, it is necessary to improve on the foundations by introducing piles or enlarging the footing and reinforcing it betters to sustain the increased loading.

Proposed Development

The proposed development is the building at #217, NGEF Layout, Nagarbhavi, Bengaluru.

Field Investigation

The field work for the Geotechnical investigation works were carried on Sept 2022. The scope of work for the current Geotechnical investigation work is as follows.

• Drilling of three boreholes to a maximum depth of 3.0m BGL (Below Ground Level) at locations given in the drawing attached in this report. Location of boreholes is shown in Annexure 1.

Exploratory Boreholes

The locations of all the drilled boreholes were identified and marked on the site by Client representatives as per the drawing. Drilling was performed using Hand Auger. The method of drilling was manually rotating with Auger. As drilling progresses, the auger fills with soil and must be periodically lifted to the surface

and emptied. Field test data and observations of all boreholes in the form of bore log are presented in Annexure 2.
During drilling of boreholes, Standard Penetration Tests; SPT were conducted in accordance with IS 2131 – 1981. The test involves driving a 50mm external diameter thick-walled tube (Split-Barrel) Sampler into the bottom of the borehole with successive blows from a 63.5kg hammer, falling freely through 760mm height. The sampler is driven in three intervals of 150mm each and the number of blows required to penetrate each interval is recorded. The initial 150mm is intended to ensure "seating" of the sampler such that it penetrates beyond the zone of influence of any soil disturbance at the base of the borehole.

The total number of blows to drive the sampler over the final 300mm is termed as the "N" value and is considered indicative of the in-situ relative soil density. In a very dense and/or cemented soil layers it is often not possible to ensure complete penetration of the SPT sampler, due to driving refusal, or the risk of damage to sampling equipment. In such cases, where a penetration of 300mm was not achieved, the distance driven, and number of blows are recorded on the Borehole Logs. SPT was performed wherever the soil conditions are appropriate for SPT and the N values are reported. Disturbed SPT and bulk samples collected during drilling were retained in sealed, labelled plastic bags. Relatively undisturbed soil samples, if available, were taken from cohesive soils using Shelby tube samplers, later transported to our laboratory for further sample descriptions and determination of engineering properties.

Laboratory Testing

The laboratory testing was performed in our laboratory on selected soil/rock samples obtained during the fieldwork. The laboratory testing has been performed as per the relevant parts of IS 2720. The tests results were used to classify the soils and determine the physical and strength properties of soil/rock.
The following tests were conducted:
1. Natural Moisture content
2. Density Test
3. Grain Size Analysis
4. Atterberg’s Limit
5. Specific Gravity
6. Direct Shear Strength test

The summary of Laboratory tests of the borehole samples is presented in Annexure 3.

GROUND WATER TABLE

At time of investigations, after completion of borehole and after allowing water level to stabilize for minimum 24 hours, water table was not encountered during the time of investigation within the exploration depth; however, a point to be noted is that water levels are invariably subjected to seasonal fluctuations.

TYPE OF FOUNDATION

Based on the subsoil profile and the type of structure Isolated Footing is Recommended.

ENGINEERING ANALYSIS

Based on the subsurface conditions revealed from the field investigation and laboratory test results, engineering analysis and previous practical experience in the area with the soil and rock materials encountered, and in general, taking into consideration the nature and type of loads that the proposed development of structures will transmit to the underlying soil/rock layers, it is concluded that the proposed structure can be satisfactorily supported by the ground materials at the site.

1. Observed Sub-Soil Profile

The field investigation was performed by drilling borehole at three locations and the following were observed.

- The boreholes drilled showed general similarities with some local variations. The sub-soil stratification essentially comprises of Silty Sand.
- The standard penetration tests revealed medium to Hard strata available at 1.5m to 3.0m depth having N Values ranges from 21 to >50.

CONCLUSIONS & RECOMMENDATIONS

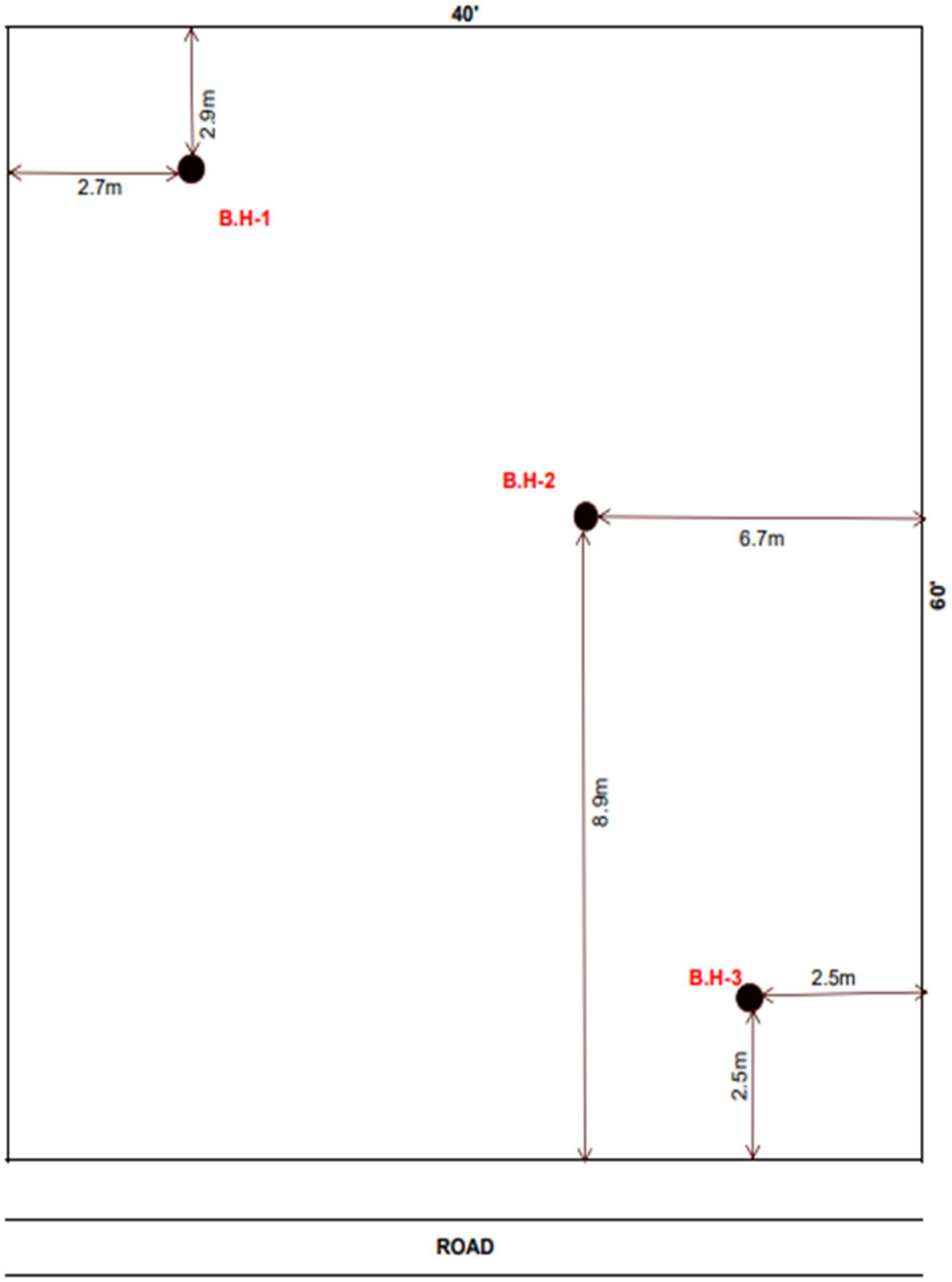
Based on the results of Geotechnical investigation, the site appears suitable from a Geotechnical standpoint and feasible. The allowable bearing pressure on founding strata depends on stratification, loads coming on the foundation, type of structure, permissible settlement etc.

BH No	Type of structure	Type of foundation	Depth of the foundation from EGL (m)	Foundation size (L x B) m	Foundation strata	Recommended Safe bearing capacity (t/m2)
1	Building	Isolated	1.5	2.0 x 2.0	Filledup soil	11.5
	Building	Isolated	3.0	2.0 x 2.0	Silty Sand	20.6
2	Building	Isolated	1.5	2.0 x 2.0	Filledup soil	11.5
	Building	Isolated	3.0	2.0 x 2.0	Silty Sand	20.6
3	Building	Isolated	1.5	2.0 x 2.0	Filledup soil	11.5
	Building	Isolated	2.5	2.0 x 2.0	Silty Sand	17.2

REPORT LIMITATIONS

The depicted subsurface conditions of this site are solely based on the drilled boreholes which are specific to their locations and provide information about a relatively small column of the soils and rock and the possibility of actual conditions differing must be recognized.

Annexure 1 - LOCATION OF BORE HOLE



Annexure 2 - BORE HOLE LOG

TABLE-A BORELOG DETAILS

Client : Mr B Munirathnam Naidu
Project: Building
BH No : 1 to 3
Site : NGEF Layout, Nagarabhavi

Date of commencement : Sept 22
Borehole diameter : 150mm
GWT below GL : NIL

Depth below EGL (m)	Description of stratum	Legend	Sample	SPT TEST			
				1st 15cm	2nd 15cm	3rd 15cm	$N = \frac{N_2 + N_3}{2}$
				N_1	N_2	N_3	
B.H-1							
1.5	Silty Sand		SPT	5	5	8	13
3.0	Silty Sand		SPT	14	25	27	>50
B.H-2							
1.5	Silty Sand		SPT	3	4	3	7
3.0	Silty Sand		SPT	17	25	30	>50
B.H-3							
1.5	Silty Sand		SPT	7	8	10	18
2.5	Silty Sand		SPT	15	27	30	>50

SPT : Standard Penetration Test
EGL Existing Ground level
WS- Washed Sample
DS- Disturbed Sample
GWT- Ground water table
CR- Core Recovery

Annexure 3 – LABORATORY TEST

TABLE-B LABORATORY TEST RESULTS

Client : Mr B Munirathnam Naidu

Project : Building

Site : NGEF Layout, Nagarabhavi

Lab Tests: Moisture Content, Index Test, Grain Size Analysis & Specific Gravity

			INDEX TEST			GRAIN SIZE DISTRIBUTION					
B.H	DEPTH (M)	MOISTURE CONTENT (%)	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX	GRAVEL (%)	COARSE SAND (%)	MEDIUM SAND (%)	FINE SAND (%)	SILT & CLAY (%)	SPECIFIC GRAVITY
		IS 2720 (Part-2)	IS 2720 (Part-5)			IS 2720 (Part-4)					
1	1.5	11.3	22.6	21.1	1.5	38.5	18.5	15.4	16.3	11.3	2.63
	3.0	12.1	24.3	22.5	1.8	26.4	16.5	14.3	15.3	27.5	2.64
2	1.5	11.3	22.3	20.8	1.5	39.2	18.2	15.2	16.7	10.7	2.63
	3.0	12.5	24.2	22.6	1.6	28.5	16.4	14.2	15.2	25.7	2.64
3	1.5	11.4	22.8	21.4	1.4	33.4	18.3	15.4	16.2	16.7	2.63
	2.5	12.3	24.6	23.0	1.6	29.6	15.7	13.6	14.8	26.3	2.64

TABLE-C LABORATORY TEST RESULTS

Client : Mr B Munirathnam Naidu

Project : Building

Site : NGEF Layout, Nagarabhavi

Lab Tests: Density & Direct Shear Test

B.H	DEPTH	TEST		
	Below Ground Level in m	DRY DENSITY (g/cm^3)	C (kpa)	Ø
1	1.5	1.65	2.5	28
	3.0	1.72	1.5	29
2	1.5	1.65	2.5	28
	3.0	1.72	1.5	29
3	1.5	1.65	2.5	28
	2.5	1.68	1.8	29

Annexure 4 – CALCULATIONS

SBC SOIL (shear criteria)

Footing Shape	Square
Shear Failure	Local Shear Failure

Depth of Ground Water Table (m)	-

BH No./TP No./Chainage	BH-01

Input

N =	13	blows
ø =	28	deg
ø' =	20	deg
c =	2.5	kPa
c' =	1.68	kPa

B=	2	m
L=	2	m
D=	1.5	m
Y=	16.19	kN/m^3
Y'=	6.38	kN/m^3

Bearing Capacity Factors

General Shear Failure	N_q	14.70	N_c	25.78	N_γ	16.70
Local Shear Failure	N'_q	6.15	N'_c	14.46	N'_γ	5.10

Shape Factors

Square Footing	s_c	1.30	s_q	1.20	s_γ	0.80
Rectangular Footing	s_c	1.20	s_q	1.20	s_γ	0.60

Depth Factors

	d_c	1.25	d_q	1.12	d_γ	1.12

Factor of Safety 2.5

Water Table Reduction Factor (W') 1.00

For c = 0 & c - phi soils

q_{nf}= Local Shear Failure

c	N_c	s_c	d_c	ic
1.68	14.46	1.30	1.25	1.00

Y	D	N_q	s_q	d_q	iq
16.19	1.50	6.15	1.20	1.12	1.00

B	Y	N_γ	s_γ	d_γ	iy	W'
2.00	16.19	5.10	0.80	1.12	1.00	1.00

For phi = 0 soils

q_{nf}= Local Shear Failure

c	N_c	s_c	d_c	ic
2	5.14	1.30	1.25	1.00

q_{nf}	282.4 kN/m^2
q_s	113.0 kN/m^2
q_a	11.5 t/m^2

Immediate Settlement Criteria Joseph E. Bowles 5th Edition

Foundation and Type of Soil Information		Calculations	
Width of Foundation "B" (in m)	= 2	Modulus of Elasticity E_s (in kN/m^2)	= 5700
Length of Foundation "L" (in m)	= 2	B'	= 1.000
Depth of Foundation "D" (in m)	= 1.5	L'	= 1.000
Thickness of influence zone "H" (in m)	= 3	N	= 3.000
Type of Soil	= Silts, sandy silts or clayey silts	M	= 1.000
Poissons Ratio "μ"	= 0.5	Influence Factor I_1	= 0.257
SPT value "N"	= 13	Influence Factor I_2	= 0.048
Type of Foundation	= Spread footing	Steinbrenner Influence factor I_s	= 0.257
Influence Factor "I_f" (From Fox's Curve)	= 0.9	L/B	= 1.000
No. of corners contributing to settlement "m"	= 4	D/B	= 0.750
Intensity of contact pressure q_0 (in kPa)	= **113.0**	Design Settlement	= 25.0
Calculated Immediate Settlement ΔH (in mm)	= **13.75**	**Design Pressure is SAFE**	

3.2 Pile Foundation

Foundations provide support to the structure and transfer the loads from the structure to the soil. But the layer at which the foundation transfers the load shall have an adequate bearing capacity and suitable settlement characteristics.

Pile foundations are deep foundations. They are formed by long, slender, columnar elements typically made from steel or reinforced concrete, or sometimes timber. A foundation is described as 'piled' when its depth is more than three times its breadth.

Reinforced cement concrete piles were adopted in the site visited

3.2 Ready Mix Concrete Plant

Ready-mix concrete (RMC) is a type of concrete which is manufactured in a cement factory, or specifically known as the batching plant, according to a given set of proportions, and then delivered to a work site, by truck mounted with mixers. This results in a precise mixture, allowing special concrete mixtures to be developed and implemented on construction sites.

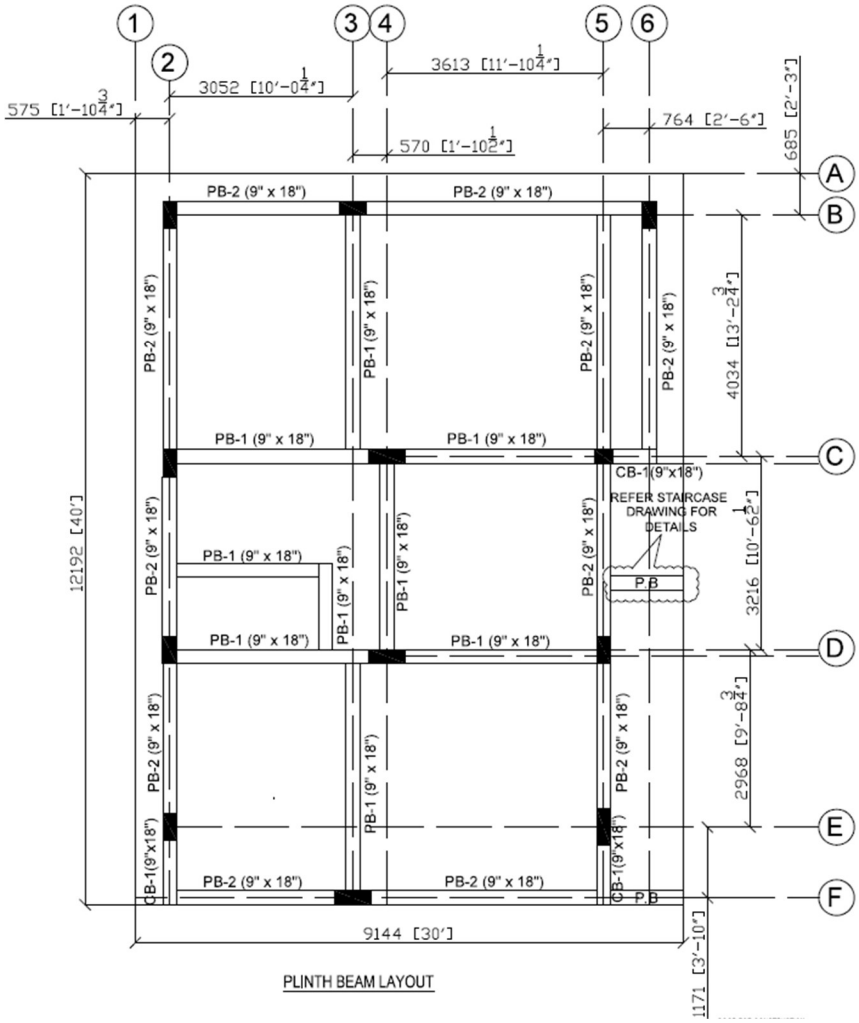
Process Of Ready-Mix Concrete

Ready mix concrete has cement, aggregates, sand, water and other chemicals, which are weigh- batched at a centrally located plant for a premium quality. The concrete is then delivered to the construction site in transit mixers and can be used straight away without any further treatment. The automatic plant monitors weigh-batching, water-cement ratio, dosage of admixture, moisture content, with precision to produce quality concrete.

All ingredients used for the preparation of ready-mix concrete are thoroughly tested for their quality and physical properties in a well-equipped laboratory attached to the plant for conformity to relevant international standard codes. The moisture probe determines the water content in the sand and aggregates. This accordingly helps in fixing the proportion of water to be added for the preparation of the mix. Trial mixes are carried out and tested to ensure that each and every batch of concrete coming out of the plant meets various mix designs as per the client's requirement with different grades of concrete.

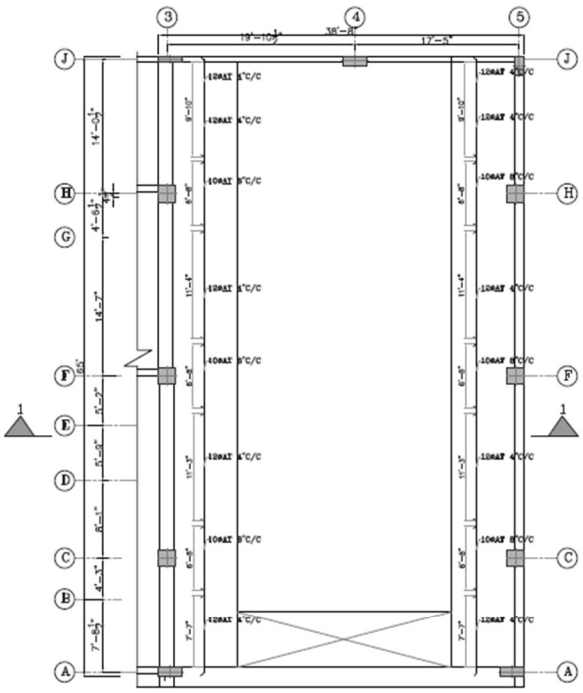
3.2 Plinth Beam

Plinth beam is a reinforced concrete beam constructed between the wall and its foundation. Plinth beam is provided to prevent the extension or propagation of cracks from the foundation into the wall above when the foundation suffers from settlement. Plinth beams distributes the load of the wall over the foundation evenly.

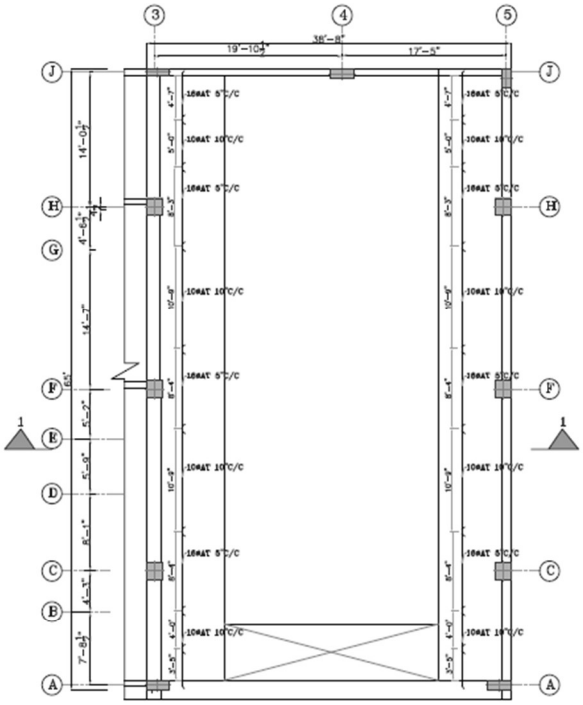


3.2 Flat Slab with Drop Panels (Drop Slab)

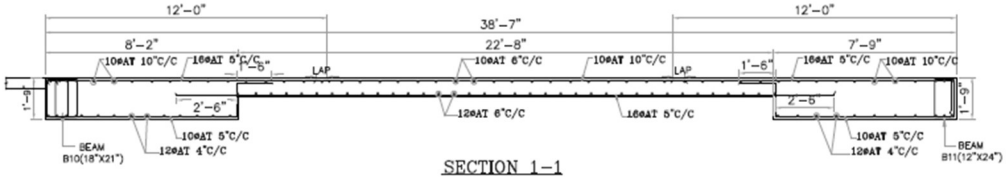
The flat slab with drop panels are slabs supported by a drop panel and a column capital. The drop panel is defined as the slab's thickened part above the supporting column. These drop panels act as a perfect solution to increase the shear strength of the flat slab. Similarly, the flat slab with drop panels increases the negative moment capacity of the structure. The negative moment capacity is the bending moment produced by the compression from the bottom side of the beam and the tension force from the top side. These flat slabs also reduce deflection by increasing the stiffness of the slab.



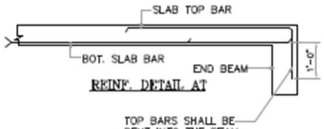
SLAB DROP BOTTOM DISTRIBUTION RENFORCEMNET



SLAB DROP TOP DISTRIBUTION RENFORCEMNET



SECTION 1-1



DISCONTINUOUS EDGE OF SLAB

Chapter-4

Outcomes

The internship provided me with the opportunity to learn and experience the work of a site engineer. During the internship period, I have successfully understood:

- An understanding of professional and ethical responsibility.
- The ability to communicate effectively.
- The ability to view and understanding plans or drawings.
- To learn the application of knowledge in real world problems.
- To get exposure to team-work and leadership quality.
- To deal with industry-professionals and ethical issues in the work environment.

Conclusion

As an undergraduate of KS school of engineering and management college, I would like to say that this training program is an excellent opportunity for us to get to the ground level and experience the things that we would have never gained through going straight into job or higher education. This training is important because it closes the gap between scientific and practical study.

Finding teamwork is most important element in every successful project.

Overall, the internship program laid a strong foundation to start our career.