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A Report on

“Internship Course” Course Code: BCI8801

In the partial fulfillment of requirement
for

Final Year B. Tech.

(Civil Engineering)

Submitted By

TEJAS ANIL KALE

Under the Guidance of
Internal Internship
Supervisor

Dr. AJAY GAIKWAD



**DEPARTMENT OF CIVIL ENGINEERING
PIMPRI CHINCHWAD COLLEGE OF ENGINEERING**

(An Autonomous Institute)

NIGDI, PUNE-411044, INDIA

Academic Year: 2023-24

**PIMPRI CHINCHWAD COLLEGE OF ENGINEERING
NIGDI, PUNE – 411044**

(SAVITRIBAI PHULE PUNE UNIVERSITY, PUNE)



CERTIFICATE

This is to certify that the following student have satisfactorily carried out the Internship Course (Code: BCI8801) of Final Year B. Tech. (Civil Engineering).

This work is being submitted in the partial fulfillment of the prescribed syllabus of the Internship Course (Course Code: BCI8801) of First Year B. Tech. (Civil Engineering) of Pimpri Chinchwad College of Engineering, Pune (An Autonomous Institute) for the academic year 2023 – 24.

PRN Number

120B1A024

Name of the Student

KALE TEJAS ANIL

Prof. Dr. AJAY GAIKWAD

(Internal Internship Supervisor)

**Dr. S. T. Mali
(HOD Civil)**

**Dr. G. N. Kulkarni
(Director)**

ACKNOWLEDGEMENT

It gives me great pleasure in presenting my Internship Report for partial fulfillment of my Final Year B. Tech. (Civil Engineering) for Internship Course (Code: BCI8801).

I take this opportunity to thank Prof. **Dr. AJAY GAIKWAD**, my Internal Internship Supervisor who has been a constant source of inspiration and also took keen interest in each and every step of the internship. I am grateful for his/her encouragement in guiding throughout the internship duration.

I take this opportunity to thank **M/S T. G. TORADMAL & Co., AHMEDNAGAR**, for providing me the opportunity to work as an intern in their reputed organization. Their expertise and insights have been instrumental in shaping my understanding of the industry. My sincere thanks to the **Mr. Zeeshan Shaikh**, External Internship Supervisor for guiding me and making me understand the internship related activities.

I take the opportunity to express my deep sense of gratitude to **Dr. S. T. Mali** for the valuable guidance as H.O.D of Civil Department for providing us with the opportunity to undergo industrial training, enhancing our practical knowledge and also to all staff members who have helped us directly or indirectly.

I thank to our Director, **Dr. G. N. Kulkarni**, who is always a constant source of motivation for us.

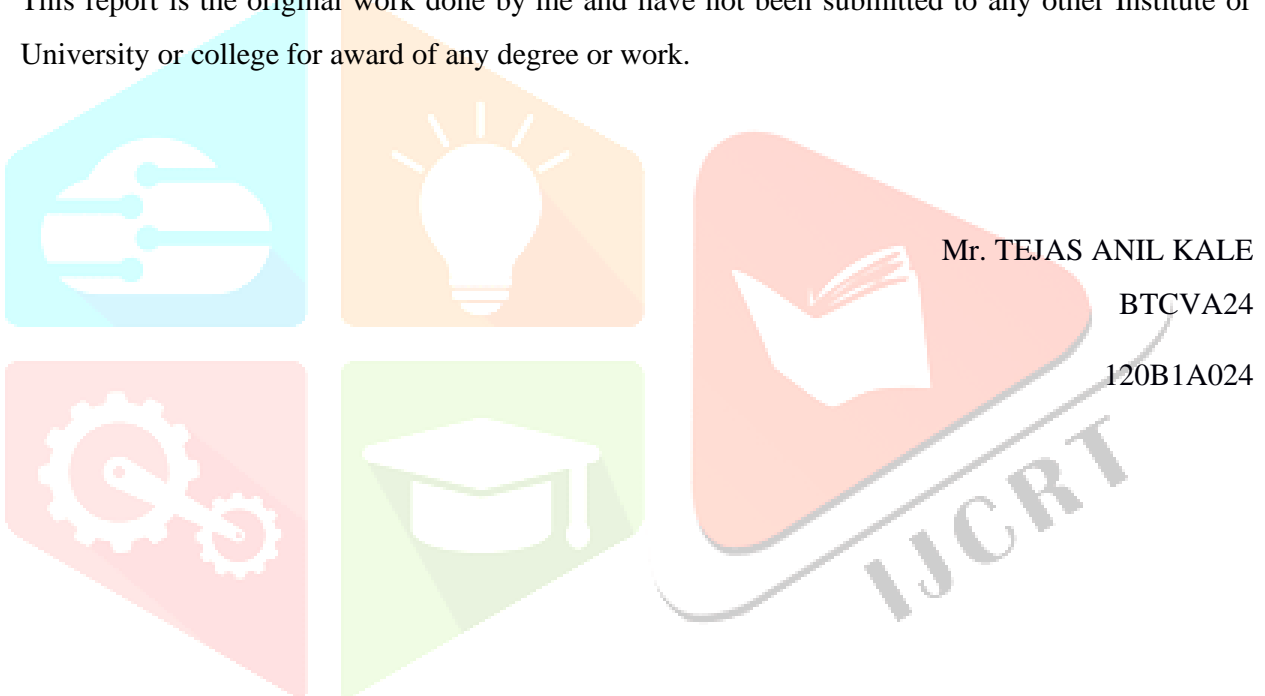
Mr. TEJAS ANIL KALE

DECLARATION

I, Mr. **TEJAS ANIL KALE** hereby declared that the Internship Report submitted here with tilted is for the partial fulfillment of the Final Year B. Tech. (Civil Engineering) Internship course (Course Code: BCI8801).

The work is carried out under the guidance of Dr. Sandip Mali, Internal Internship Supervisor, Civil Engineering Department, PCCoE, Pune and **Mr. Zeeshan Shaikh**, External Internship Supervisor of **M/S T. G. TORADMAL & Co., AHMEDNAGAR.**

This report is the original work done by me and have not been submitted to any other Institute or University or college for award of any degree or work.



INTERNSHIP COMPLETION CERTIFICATE



M/S. T.G. TORADMAL & Co.

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **MR. TEJAS ANIL KALE**, a student of Civil Engineering from **Pimpri Chinchwad College of Engineering, Pune** has successfully completed his Course : **Internship (BCI8801)** at **M/s. TG TORADMAL AND CO INFRASTRUCTURE PVT LTD** during **29 MAY 2023 To 29 JUNE 2023**.

He has been found sincere and hardworking to the best of our knowledge during his tenure.

We wish him success in the future endeavors.

Sincerely Yours,

AMIT TORADMAL

CEO,

M/s. TG TORADMAL AND CO INFRASTRUTURE PVT LTD



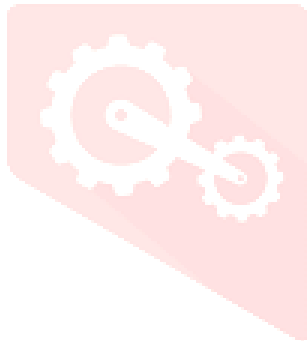
For M/s. T.G. Toradmal & Co


Partner
(Govt. Reg. Contractor)

Reg. Office : At Post. Bahirobawadi, Tal. Karjat, Dist. A'Nagar.
Corporate Office - At. Buwasaheb Nagar, Near TVS Showroom, Karjat, Dist. A'Nagar.
Ph. : (02489) 223533, Cell : +91 7709318281
E mail : ms.tgtoradmalandco@gmail.com

CONTENTS

TITLE
Certificate
Acknowledgement
Declaration
Internship Completion Certificate
Index
List of Tables
List of Figures



INDEX

CHAPTER	TITLE	PAGE NO.
1	Introduction	9
1.1	Details of the Firm	11
1.2	Mission & Vision	11
1.3	Objectives of Internship	12
1.4	Work Progression	13
2	Project Details	15
2.1	EPC Contract	16
2.2	Construction Methodology	17
2.3	Quality	24
2.4	Billing Department	29
3	Internship Outcome	30
4	References	31

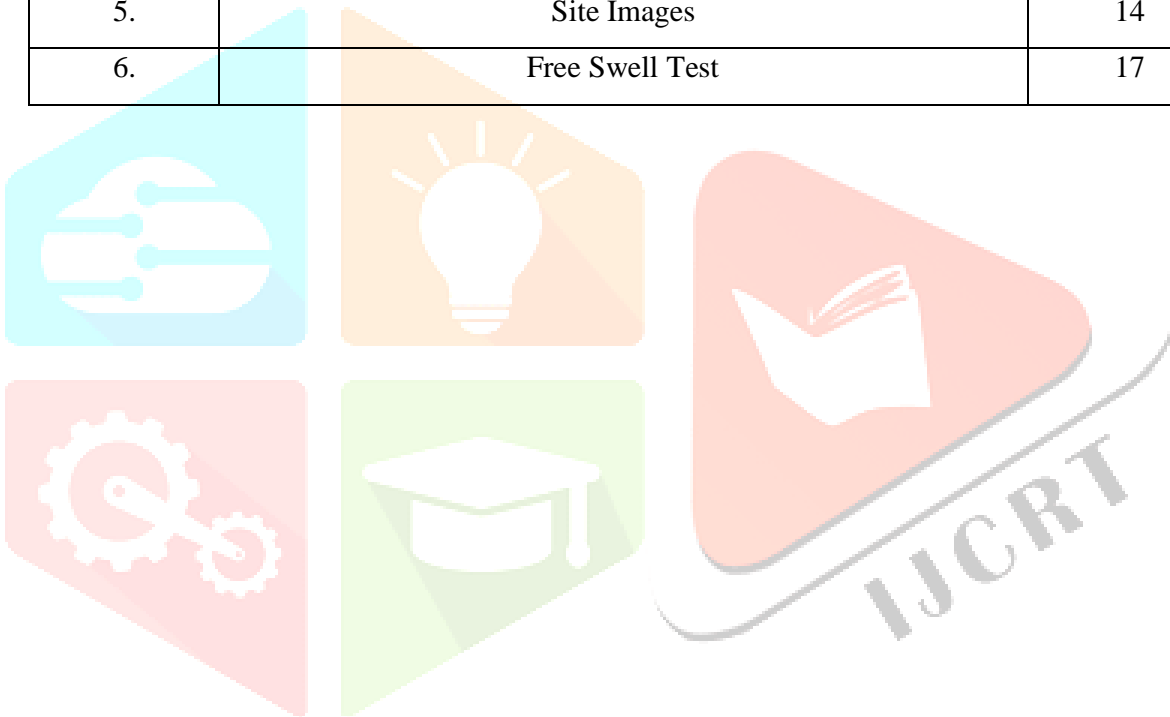
List of Tables

Table No.	Title of Table	Page No.
2.1	Construction Methodology	12
2.2	Quality (Control & Assurance)	16
2.3	Soil Tests	20



List of Figures

Figure No.	Title of Figure	Page No.
1.	Location	10
2.	Inspection Work	13
3.	Clearing & Grubbing	13
4.	Embankment	14
5.	Site Images	14
6.	Free Swell Test	17



INTRODUCTION

The internship serves as a crucial platform for individuals to gain practical workplace experience, offering valuable opportunities for students to learn and develop their skills. Throughout the internship at **M/S T. G. TORADMAL & Co., AHMEDNAGAR**, facilitated by my college, I had the privilege of joining a company leading significant infrastructure projects in Maharashtra and India. This experience provided insights into applying theoretical knowledge on ongoing sites, addressing challenges, and collaborating with industry mentors to navigate the complexities of **Roadway Networks, Highways and Pedestrian Ways**.

Encountering various difficulties and obstacles during the internship, I learned to encourage and complete tasks, gaining a deeper understanding of my attitude and behavior when dealing with diverse individuals and situations. This practical experience helped me identify my weaknesses and strengths, particularly enhancing my communication skills and ability to interact effectively with people.

Over the one-month internship, I successfully bridged theoretical knowledge with practical implementation, gaining insights into the challenges faced by engineers and honing my skills in managing responsibilities. This hands-on experience significantly contributed to my understanding of an engineer's duties, fostering both practical and technical skills essential for the field.

DETAILS OF THE FIRM

M/S T. G. TORADMAL & Co., AHMEDNAGAR

Address:

Reg. Office: A/P. Bahirobawadi, Tal. Karjat, Dist. A'Nagar.

Corporate Office: A/P. Buwasaheb Nagar, Near TVS Showroom, Dist. A'Nagar.

T. G. Toradmal And Co. is a 11 years 6 months old Partnership Firm incorporated on 06-Jul-2012. The major activity of T. G. Toradmal And Co. is Services, Sub-classified into Civil engineering and is primarily engaged in the Construction and maintenance of motorways streets roads other vehicular and pedestrian ways, highways, bridges, tunnels and subways.

Organisation Details :

Name of Enterprise – T. G. Toradmal And Co.

Type of Enterprise :

Small 2023-24 (09-May-2023)

Small 2022-23 (26-Jun-2022)

Small 2021-22 (16-May-2021)

Organisation Type - Partnership

Services - Social Category

Commencement of Production/Business - 06 July, 2012

Vision:

To be a leading innovator in Civil engineering, contributing significantly to Maharashtra and India's infrastructure development.

Mission:

Provide high-quality, sustainable solutions in motorway, street, road, and pedestrian way construction, ensuring safety and excellence in every project.

OBJECTIVES OF INTERNSHIP

- Gain practical experience in Civil engineering projects.
- Enhance skills in project management, problem-solving, and communication.
- Build professional networks within the Civil engineering sector.
- Identify personal strengths and weaknesses for professional development.
- Bridge the gap between theoretical knowledge and practical application.
- Actively contribute to ongoing projects, realizing the significance of one's role.



WORK PROGRESSION

Week 1:

- Survey and Clearing -
Surveyed designated areas to prepare for clearing operations, ensuring accurate boundaries and assessment of vegetation.
- Vegetation Removal -
Removed vegetation exceeding 150mm thickness to clear the area for further construction activities.
- Tree Cutting -
Initiated cutting of trees and bushes as part of the clearing process to prepare the site for construction activities.
- Tack Coat Inspection -
Conducted an inspection to verify the thickness (4/6 inch) of the tack coat, ensuring proper bonding between asphalt layers.

Week 2:

- Continued Clearing -
Continued cutting and removing trees, bushes, and debris to clear the site effectively.
- Excavation -
Began excavation work in the cleared areas to prepare the ground for further construction activities.
- Carpet Inspection -
Conducted an inspection to assess the thickness (0.5 inch) and uniformity of the carpet layer, ensuring quality and uniform installation.

Week 3:

- Excavation and Subgrade Preparation -
Continued excavation work and started preparing the subgrade for embankment construction, ensuring proper ground leveling and compaction.
- Hauling of Excavated Materials -
Initiated the hauling of excavated materials to designated sites for disposal or reuse, ensuring efficient waste management.
- Seal Coat Inspection -
Conducted an inspection to verify the thickness (1/4 inch) and application method of the seal coat, ensuring proper coverage and durability.

Week 4:

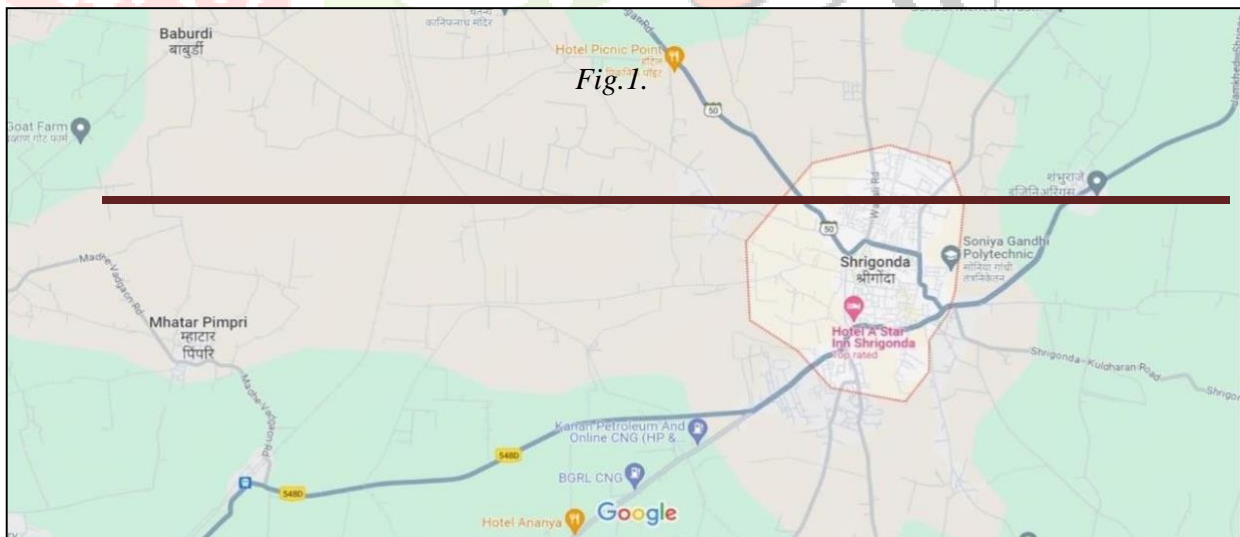
- Embankment Construction -
Completed embankment construction, ensuring full coverage and compaction to provide a stable base for the road.
- Site Inspections and Quality Control -
Participated in site inspections and quality control checks to ensure that construction activities meet project specifications and regulatory standards.
- Comprehensive Inspections -
Conducted various inspections, including Retaining Wall, Road Gradient, Layers, Reinforcement, and Drainage Chamber, to ensure compliance with design requirements and safety standards.
- Contract Review -
Reviewed contracts and milestones for compliance, ensuring that the project is progressing according to the agreed terms.
- Material Inspections -
Inspected Murum and Crushed Stone Aggregate Layers for thickness and quality, verifying compliance with project requirements and specifications.

PROJECT DETAILS

STRENGTHENING AND ASPHALTING OF RAHATA-LOHARE-MANDAVE- PARNER-SHRIGONDA-KULCHARAN-KARJAT-KARMALA ROAD NH 67 FROM **KM 116/00 TO KM 126/00**, TALUKA: SHRIGONDA, DISTRICT: AHMEDNAGAR IN THE STATE OF MAHARASHTRA EXECUTED ON **EPC MODE** UNDER **BHARATMALA PARIYOJANA**.

EPC Contractor: M/S T. J. Toradmam and Co.

Bharatmala Pariyojana was announced by Mr. Nitin Gadkari, the Minister of Road Transport and Highways of India to improve the road network in the country. Bharatmala project envisions improving the efficiency of the National Corridor including the Golden-Quadrilateral and North, South –East West corridor by decongesting the choke points through the construction of elevated corridors, bypasses, ring roads, lane expansion, and logistics parks at identified points.



EPC CONTRACT

In the realm of Engineering, Procurement, and Construction (EPC), a distinctive contractor-client relationship unfolds, encapsulating a comprehensive understanding of various project facets. This encompasses intricate details such as project design, material procurement, and the acquisition of both labor and equipment essential for project completion. Moreover, the intricacies extend to defining precise timelines for the construction process, coupled with a meticulous consideration of the remuneration allocated to the contractor.

Key Aspects:

1. **Thorough Project Exploration:**

- The collaborative efforts of the contractor and client delve deeply into each project stage, ensuring a nuanced understanding to prevent any ambiguity and variance from the client's requirements.

2. **Stringent Cost Management:**

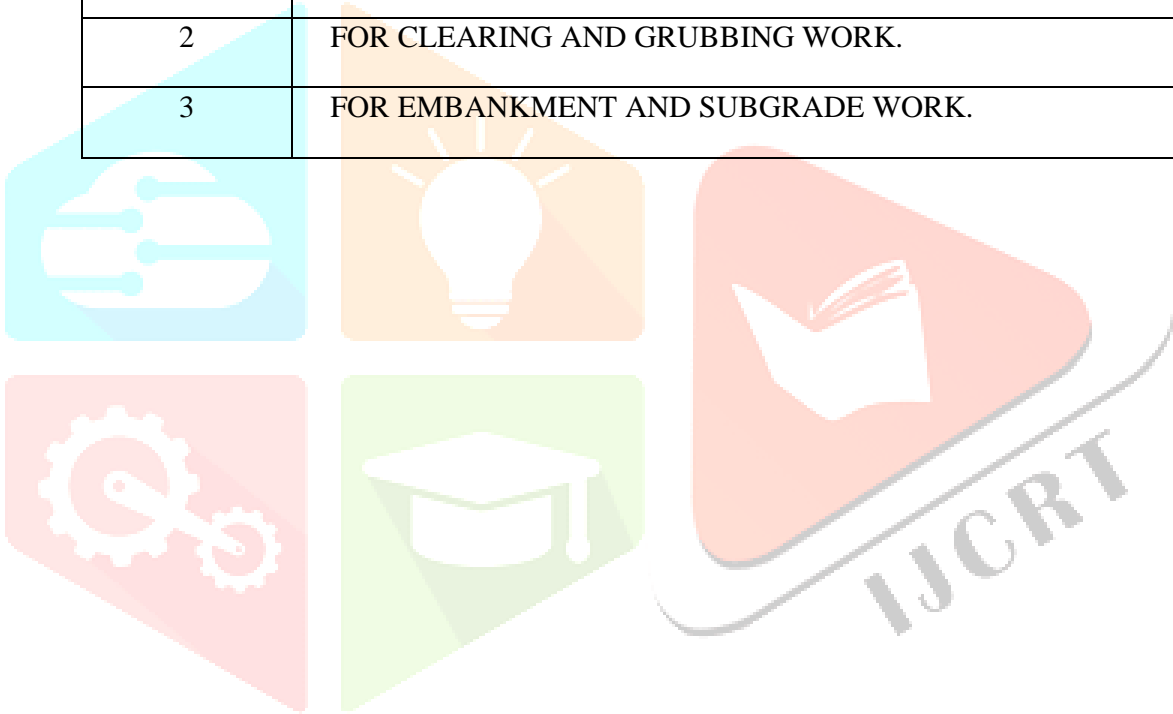
- Upon the signing of the contract, the contractor shoulders the responsibility of maintaining costs within established budgets, underscoring a commitment to financial prudence. Simultaneously, there is an explicit mandate to conclude the assignment within the stipulated timeline.

3. **EPC Contractor Responsibility:**

- The contractual framework places the onus on the EPC contractor to successfully navigate and conclude the project within the predefined budget and time constraints. This arrangement underscores a holistic commitment to achieving project goals efficiently.

CONSTRUCTION METHODOLOGY

Sr. No.	Description
1	FOR INSPECTION WORK.
2	FOR CLEARING AND GRUBBING WORK.
3	FOR EMBANKMENT AND SUBGRADE WORK.



Inspection Work

1) (Tack Coat, Carpet, Seal Coat):

Tack Coat Inspection (4/6 inch)	<ul style="list-style-type: none"> - Verify tack coat thickness (4/6 inch). - Ensure proper bonding between asphalt layers.
Carpet Inspection (0.5 inch)	<ul style="list-style-type: none"> - Assess carpet layer thickness (0.5 inch). - Verify uniform installation and compaction.
Seal Coat Inspection (1/4 inch)	<ul style="list-style-type: none"> - Inspect seal coat thickness (1/4 inch). - Verify application method and coverage.

2) (Retaining Wall, Road, Gradient, Layers, Reinforcement, Drainage, Chamber)

Retaining Wall Inspection	<ul style="list-style-type: none"> - Assess structural integrity and alignment. - Verify construction techniques and materials.
Road Gradient Inspection	<ul style="list-style-type: none"> - Evaluate slope and drainage. - Verify measurements and alignment.

<p>Layers Inspection</p>	<ul style="list-style-type: none"> - Inspect pavement layers for thickness and quality. - Verify properties meet project specs.
<p>Reinforcement Inspection</p>	<ul style="list-style-type: none"> - Examine placement and alignment. - Ensure compliance with design requirements.
<p>Drainage Chamber Inspection</p>	<ul style="list-style-type: none"> - Assess functionality and installation. - Verify design for proper drainage.

3) (Contracts and Lengths):

<p>Contract Inspection</p>	<ul style="list-style-type: none"> - Review contract terms and milestones. - Verify compliance for two contracts (200m & 1000m).
<p>Murum & Crushed Stone Aggregate Layers Inspection</p>	<ul style="list-style-type: none"> - Inspect layer thickness and quality. - Verify compliance with project requirements.

Fig.2.1

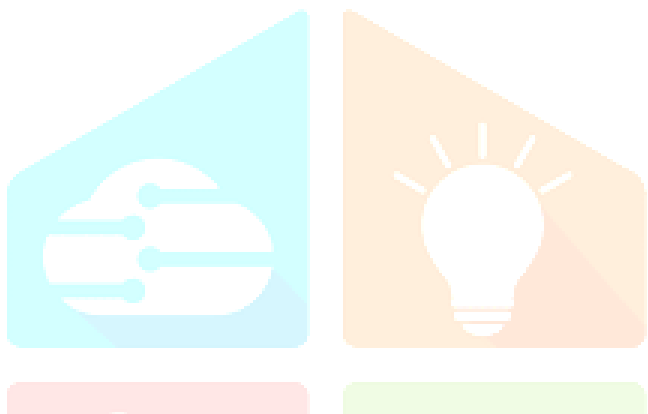


Fig.2

Cleaning & Grubbing

Clearing and Grubbing:

Cutting, removing, and disposing of all materials such as trees, bushes, shrubs, stumps, roots, grass, weeds, organic soil not EXCEEDING 150 MM in thickness.

- **Ground levels** are taken prior to and after C & G.

CH.NO.	OFFSET	BS	IS	FS	HI	ARL	REMARK
184+450	0	2.190	2.740		624.558		V-24 TBM (622.368)
	3		2.705				
	6		2.710				



Fig.3

Excavation

Excavation:

Excavation work consists of **removal and satisfactory disposal of raw materials** necessary for the construction for the construction of roadway side drains and waterways in economics with the requirements of **Section 301 MORTH**.

Also includes hauling to sites of embankment and subgrade.

Classification of Excavation Material -

- Soil - top soil, sand, silt, loam, clay, BC.
- Ordinary Rock - laterite, shales, limestone, sandstone.
- Hard Rock
- Marshy Soil



Fig.3.1

Embankment

Embankment:

Construction of embankment includes **subgrades, earthen shoulders and miscellaneous back fills** with approved material obtained from approved sources including material from roadway and drain excavation borrow pits or other sources.

Materials Used -

Murum, Gravel, Reclaimed material from pavement.

Size of Material -

- Not exceeding 75 mm for Embankment.
- Not exceeding 50 mm for Subgrade.
- Materials to be used in subgrade shall confirm to the design **CBR value** at the specified **dry density** and **moisture content** of the test specimen.



Fig.4.

Embankment & Subgrade

- **Layers should be layed in uniform thickness.**
- **Not more than 250mm if vibrator roller/vibrator soil compactor is used.**
- **Not more than 200mm, if 80-100kn static roller is used.**

Moisture content of each layer of soil is checked as per IS 2720 PART 2 (RAPID MOISTURE METER).

Also check for FDD by sand replacement method as per IS 2720 PART 28, we get to know percentage of compaction i.e. for **EMB it should be above 95% and for SG it should be above 97%.**

- Grader is used to give slope or camber.
- Watering and Compaction helps to reduce voids.

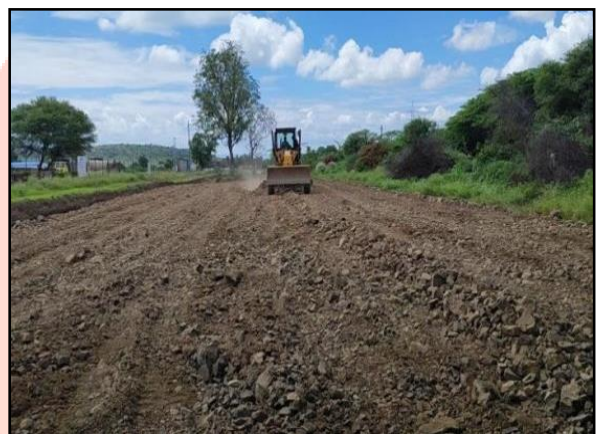


Fig.5 (Site Photos)

QUALITY
(Control & Assurance)

Soil Test

Soil Test		
1.	Sand Replacement Method	IS 2720: Part 28
2.	Free Swell Index	IS 2720: Part 40



Sand Replacement Method (IS 2720: Part 28)

Scope -

To determination of field density by sand replacement method.

Apparatus -

Sand pouring cylinder equipment, Tools for levelling and excavating, Containers, Sand, Balance.

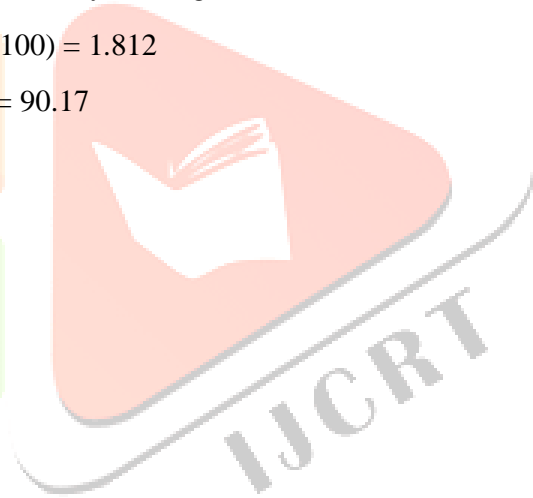
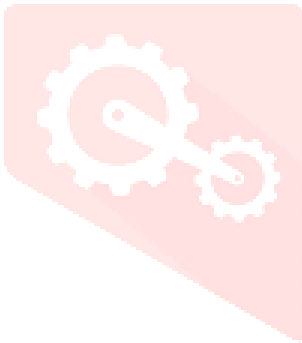
Procedure -

The site where the field density test is to be conducted is cleaned and levelled.

- The metal tray central hole is placed on the prepared surface. Using this central hole as pattern, the soil/material is excavated using a dibber or a trowel up to a required depth and the loose material removed is carefully collected in the metal container and is weighed.
- The sand-pouring cylinder is refilled with sand such that its weight is again W_1 . The metal tray with central hole is removed and the sand-pouring cylinder is placed centrally over the excavated hole. The shutter is opened till the sand fills the excavated hole and the cone completely and there is no further movement of sand in the cylinder.
- The shutter is closed and the cylinder is weighed again = W_4 , so that the weight of sand filling the excavated hole alone = W_b can be found.
- The sand pouring cylinder is now placed on a clean plane surface (glass or Perspex plate), the shutter is kept open till the sand fills up the cone fully and there is no visible movement of sand as seen from the top of the cylinder by removing the cap. The shutter is closed, the cylinder is removed and the sand which occupied the cone is carefully collected from the plate and weighed = W_2 .

Results -

- Wt. of material from hole (w_w)gm = 5291
- Wt. of sand + cylinder before pouring (w_1)gm = 15666
- Wt. of sand + cylinder after pouring (w_F)gm = 11104
- Wt. of sand in hole $w_s = w_1 - w_F - w_2 = 3602$
- Wt. of sand in cone (w_2)gm = 960.
- Volume of hole $V = w_s/\gamma_s = 2629.19$
- Bulk Density Of Materials $\gamma_b = w_w/V = 2.012$
- Moisture Meter Reading in % (obtained from RMM by shaking it) = 11%
- Field Dry Density $\gamma = \gamma_b \div (1 + (\text{RMM reading}/100)) = 1.812$
- % of compaction obtained = $(\gamma \div \text{MDD}) * 100 = 90.17$



Free Swell Index (IS 2720: Part 40)

Scope -

Determination of free swell index of soil which helps to identify the potential of aswell.

Apparatus -

Sieve (425 micron), Glass Graduated Cylinders (IS: 878-1956).

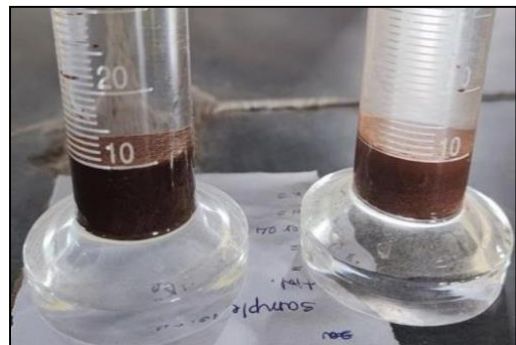
Procedure -

- Take two 10 grams soil specimens of oven dry soil passing through 425- micron IS sieve.
- Each soil specimen shall be poured in each of the two glass graduated cylinders of 100ml capacity.
- One cylinder shall then be filled with kerosene oil and the other with distilledwater up to the 100ml mark.
- After removal of entrapped air the soils in both the cylinders shall be allowedto settle. Sufficient time (not less than 24 hours) shall be allowed for the soil sample to attain equilibrium state of volume without any further change in the volume of the soils.
- The final volume of soils in each of the cylinders shall be read out.

Fig. 6



Fig. 6.1



v_d = The volume of soil specimen read from the graduated cylinder containing distilled water.

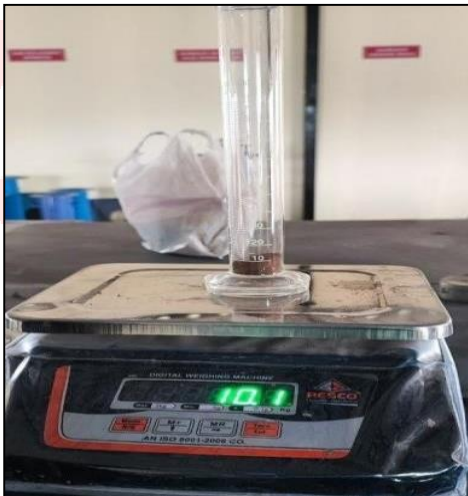
v_k = The volume of soil specimen read from the graduated cylinder containing kerosene.

$$\text{Free Swell Index} = \frac{v_d - v_k}{v_k} * 100$$

$$= [(14 - 10)/10] * 100$$

$$= 40\%$$

Fig. 6.2



BILLING DEPARTMENT

The Billing Department oversees every aspect of on-site work, aligning activities with work orders, and valuations are derived from Daily Progress Reports (DPR) recorded in the Enterprise Resource Planning (ERP) system. T. J. Toradmal in Ahmednagar manages the overall project as the contractor, utilizing subcontractors for specific tasks due to constraints in manpower, machinery, and time. Subcontractors receive work orders, and their valuations are calculated, generating corresponding bills for the completed work.

Daily Progress Reports (DPR) serves as a vital tool, allowing higher authorities to track project details and identify any delays. This information is crucial for planning and addressing potential setbacks. Coordination between DPR and ERP ensures accurate recording and reporting of project dynamics.

For instance, at a specific chainage, if there's a requirement for 6 m³ of M-20 grade for the First lift of a headwall, the approval process involves the Store Department. DPRs inform higher authorities about project progress, enabling informed decision-making. The ERP system, managed by engineers, records and organizes this data.

A work order, a comprehensive document, outlines task details, including authorization, scope, assignment, and expectations. Work orders play a pivotal role in driving the entire project forward.

INTERNSHIP OUTCOME

The information outlined above was acquired during my tenure on-site, providing a valuable and enriching experience as I worked on a substantial project. Witnessing the intricate processes involved in completing a significant construction project has been both insightful and rewarding.

Adherence to established guidelines, specifically those outlined in the Ministry of Road Transport and Highways (**MORTH**) standards, governs every aspect of the work. The client meticulously examines the completed tasks to ensure they meet the stipulated standards.

Given the objective to complete a 10 KM construction project in **Ahmednagar**, specific milestones and timeframes have been established. Tasks such as clearing and grubbing, embankment, and subgrade must be accomplished within the first month following land acquisition.

Effective project management is crucial, with dedicated teams formed for each milestone. **Regular weekly meetings, overseen by the Project Manager and General Manager, facilitate comprehensive follow-ups.** Should Site Engineers encounter challenges, these are promptly escalated to the relevant department for resolution. Challenges related to land acquisition are escalated to the Licensing Officer for appropriate resolution.

As the project progresses, each milestone is systematically completed. **Planning and execution** for subsequent phases are meticulously organized, demonstrating the multifaceted responsibilities of an engineer on-site. Integral to this process is effective management, encompassing labor, machinery, public interactions, and the creation of a conducive working environment. Engineers must adeptly manage these elements to ensure the success of each task.

REFERENCES

- QAP i.e., Quality Assurance Procedure given by NHAI & M/S T. G. Toradmal & Co.
- MORTH i.e., Ministry of Road Transport and Highway.
- IS Codes for testing of Soil, Aggregates, and Cement.

