

MADHAV INSTITUTE OF TECHNOLOGY AND SCIENCE GWALIOR
(A govt. Aided Autonomous Institute under RGPV, Bhopal (M.P) Established in 1957)

IN PARTIAL FULFILLMENT FOR REQUIREMENT FOR THE AWARD OF THE DEGREE OF

BACHELOR of TECHNOLOGY
In
CIVIL ENGINEERING



2018-2022

INTERNSHIP REPORT
ON

“Construction of Mahal Road”

Submitted By–

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Madhav Institute of Technology & Science, Gwalior
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to R.G.P.V. Bhopal)

CERTIFICATE



PROJECT DEVELOPMENT AND MANAGEMENT CONSULTANT
For Implementation of Smart City Mission Project
Of Gwalior City

CERTIFICATE

Date: 23.05.2022

This is in reference to the ongoing Internship of **Ms. Smriti Garg** at IPE Global Limited under Gwalior Smart City Project from 18th January, 2022 to 23th May, 2022.

We found her sincere, hardworking, and technically sound and result oriented. She worked well as a part of the team during her tenure. We take this opportunity to thank and wish her all the best for her future.

As a part of her institute grading we would like to grade her as **Excellent** during these course of months.

For IPE Global Limited

Authorized Signatory



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Designation: professor
Civil Engineering Department

Sanjay
Professor & Head of
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CERTIFICATE

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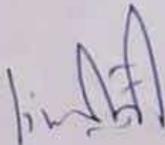


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RECOMMENDATION

It is hereby recommended that the internship report entitled — Construction of Mahal Road which is being submitted by Smriti Garg completed under the guidance of Dr. Sanjay Tiwari may be accepted in the partial fulfillment of the award of the degree of Bachelor of Engineering in Civil Engineering.



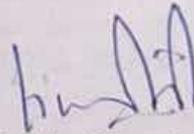
Head



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MITS, Gwalior

MENTOR NAME



Dr. Sanjay Tiwari

Professor

Civil Engineering Department

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ACKNOWLEDGEMENT

When it comes to properly acknowledging someone's support and assistance, it may be a challenging undertaking, chiefly when the support offered is so wholehearted and unwavering.

I am eternally grateful to my renowned guide, **Dr. Sanjay Tiwari**, Professor of Civil Engineering Department, MITS Gwalior.

Also, I would like to thank , Head of Civil Engineering Department, MITS Gwalior, and all other academics and staff members of MITS Gwalior's Civil Engineering Department for their unwavering support throughout the project.

I am really grateful to **Dr RK Pandit**, Director of MITS Gwalior, for establishing an outstanding institutional environment and for giving all facilities and assistance in the preparation of my dissertation. I also acknowledge with gratitude to our supporting **Mr. VIKRAM** for providing the facilities needed for the accomplishment of this project.

I take great pleasure for my institute **MADHAV INSTITUTE OF TECHNOLOGY AND SCIENCE, Gwalior (M.P)** for providing me the opportunities.

The environment of Organization has been valuable experience for me. It has provided an opportunity to learn at our own pace in discipline of interest. I would like to thank all those who helped me during different stages of completion of this project.

SMRITI GARG

(0901CE181107)

DEPARTMENT OF CIVIL ENGINEERING

MITG GWALIOR (M.P.)

ABSTRACT

The project named “Construction of Mahal Road” is a project under GWALIOR SMART CITY (GSCDCL) and IPE Global Gwalior.

This four-month full time internship details the work of construction of road at Mahal Road and Sevanagar, Phoolbagh Gwalior.

The elements of this report are practical as well as theoretical as per my onsite experience. This report gives the brief knowledge about the Mahal Road project, including all layers of pavement and testing of materials performed on site.

Gwalior Smart City Development Corporation Limited (GSCDCL) is the pioneer organization which is successfully implementing all construction projects and serving in Gwalior since long time. It also undertakes projects from autonomous bodies that can contribute to development of city. GSCDCL has highly qualified and experienced professionals forming a multidisciplinary team of engineers and architects who work alongside in order to make the work Impeccable.

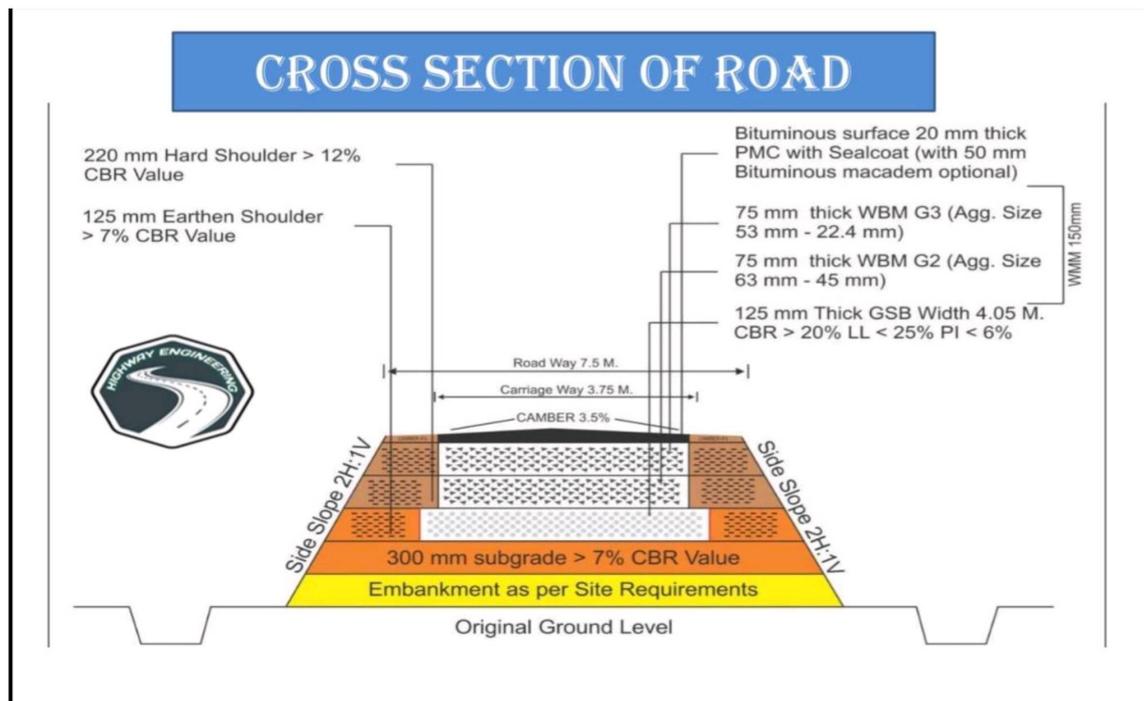
I am highly obliged to work with such esteemed personalities Er. Atul Tewari, Er. Kanchan Goswami and Er Sachin Saini who helped me throughout my internship journey and guided me at every step of the project.

CONTENT

S NO.	TOPIC	PG NO.
1.	Introduction	7
2.	What is road or pavement?	9
3.	Types of pavement	9-10
4.	Construction of road from mahal road to Aamkho road	11-18
5.	Test for Road Aggregate	18-21
6.	CBR Test	21
7.	Test of Bitumen	21
8.	Sevanagar Site Specification	21-23
9.	Some tests performed at Sevanagar site	23-25
10.	Result of Standard Tests performed at site	25-27
11.	Conclusion	28
12.	References	29

INTRODUCTION

Road transportation in the development of country is multidimensional. The road transportation is the only mode which could give maximum service to one and all. Transportation is essential for the economic development of any particular region, since every product produced such as food, clothing, industrial products or medicines needs transport at all stages from the production to distribution stage. The poor transportation facilities retard the process of socio-economic development of the country. There are different types of pavements which differ in their suitability in different environment. Each type of pavement consist of its own merits and demerits.



WHAT IS A ROAD OR PAVEMENT ?

A road or pavement is defined as a layered structure that is supported by the subgrade to form a carriageway of a road is known as road pavement. It is a type of a [surface](#) that is hard and made from durable surface materials which are laid down to carry a heavy load of vehicular traffic.

The surface of the road must be stable and should be non-yielding in order to allow the heavy load vehicle on road traffic to move with least possible rolling resistance. road surface has to be even

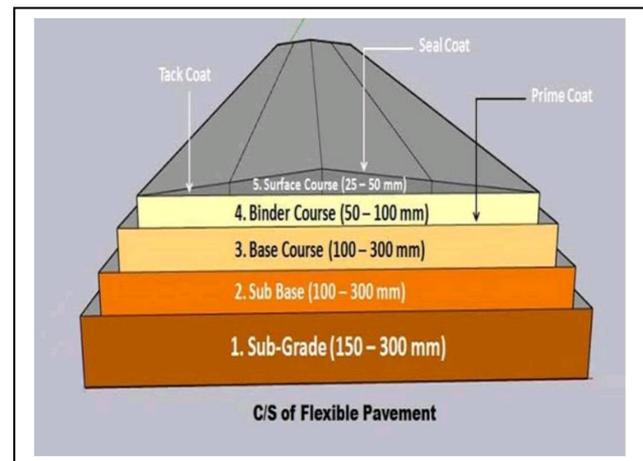
throughout the longitudinal profile in order to enable the high speed vehicles to move comfortably and safely . The main objective of the well designed pavement is to provide a stable and even surface for the traffic and to elastic deformations of pavements within permissible limits in order to sustain a large no of repeated load applications during the design life of pavement

Road pavement should be easy to construct and cheap in budget provided that it is durable and strong . It should provide good visibility at day and night . vehicle must be safe and comfortable on the pavements to drive.

TYPES OF PAVEMENT

Flexible pavement

- The pavements which have very less flexural strength are called flexible pavements .
- These are the type of road pavement that can show change in its shape to some extent without rupture.
- This type of pavement transmits the the load to the lower layer by grain to grain transfer.
- Bituminous concrete , granular materials with or without bituminous binders , water bound macadam etc are some common examples of flexible pavement.

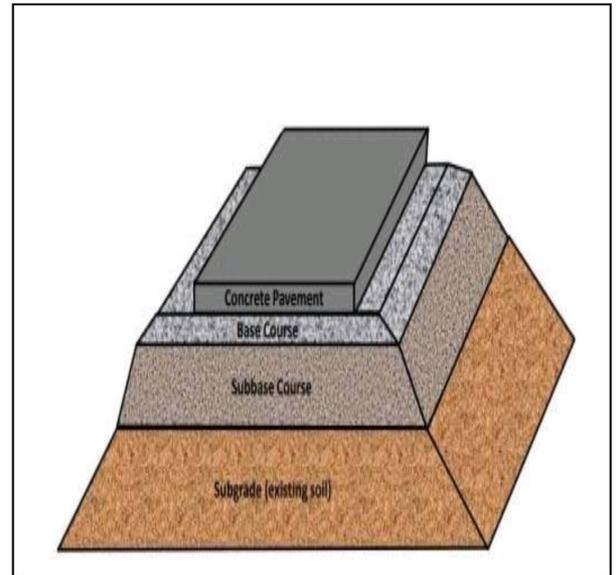


- Cost of completion of such pavements are less but have high maintenace cost.
- Flexible pavements are commonly designed using empirical charts and equations.

Rigid pavement

- These pavements possess worthy flexural strength.

- It transmits the wheel load stresses through wider area below by the slab action
- Generally made of Portland cement concrete.
- Joints are used.
- Cost of completion of such pavement is high but maintenance cost is low.
- It is suitable for the movement of heavy load vehicles.
- These pavements are designed using elastic theory.



CONSTRUCTION OF ROAD FROM MAHAL ROAD TO AAMKHO ROAD

Before starting construction of road survey of proposed work was done by engineers and survey experts with the help of total station. Survey of geographical details and existing soil properties of mahal road was done and noted down for further process.

After performing survey procedures, a team of experienced architectures ,engineers and interns prepared detailed plan of site using softwares such as autocad.

Beside preparing the site plan estimation of proposed work was also done that includes requirement of materials, equipments and labour .

- Proposed width of mahal road was 8.5 m.
- Median on road provided was of dimension 1.2 m.
- Camber provided on road was 2.5% (it was provided in bitumen concrete layer)

1. Construction of subgrade

- Generally the materials used for subgrade are soil,moorum/ gravel/ mixture of these materials which does not contain any organic matter. But at mahal road site existing road was excavated using machines and subgrade was prepared.

- Generally the requirement of soil properties are:

- Liquid limit of soil must be less than 50%.
- Plasticity index of soil must be less than 25.
- Soil has to be Non expansive soil.
- Minimum acceptable CBR value must be provided.

(All requirements was checked by performing tests on site)

- Compaction of highway subgrade layer was done 97% in terms of maximum dry density of the soil.
- Compaction was done on site by using vibratory rollers.

2. Construction of subbase

- Materials used for constructing subbase was GSB(Granular Sub Base).

- GSB is made by crushed stones gravel/ coarse sand.
- GSB was placed in multiple thin layers.
- This layer acts as load bearing layer.
- This layer provide strength to the pavement structure .
- This layer is also called as drainage layer.

- Base formation was covered with 50-75 mm sand layer.
- Compaction was done by after spreading each layer in order to get maximum dry density of 70% or more.
- For successful completion of construction of this layer we must make sure that the soil subgrade is not over stressed.

☐ Requirement of materials used for GSB are:

- Liquid limit less than 25%.
- Plasticity index less than 6
- Minimum acceptable CBR of material should be within limit.
(these requirements was checked by performing tests on site)
CBR test and Plate Bearing test was performed on site.
 - On site we placed GSB layer of thickness 200mm.
 - Compaction done in GSB layer was 15-20mm.

GSB layer placed on Mahal Road Site



3. Construction of Base Course

- Generally materials used for construction of base course are WMM(wet mix macadam) and WBM (water bound macadam) . but on mahal road construction WMM was used.
- Base course is the layer which is placed just after subbase and below surface course. Generally, thickness of this layer lies between 4 to 6 inches.
- This is the layer which holds continuous heavy loads and stresses.
- Base course materials was mixed with cement and bitumen in order to provide improved support for heavy loads. It acts as moisture barrier between base and surface layers.
- It consist of a well graded crushed aggregates and required proportion of water mixed thoroughly.

- Primary function of the base course is to contribute to sub surface drainage and provide load distribution.
- We placed WMM in two layers each of thickness 125mm
- Compaction done in this layer was 15 - 20 mm

❑ **DBM (Dense Bituminous Macadam)**

- DBM is one of the layer in road construction and is binder course used for roads and very heavy commercial vehicles.
- DBM is a close-graded premix material having water content of 5-10 percent.
- temperature of (DBM) should be more than 90°C
- On site DBM was placed in two layers having thickness of 115mm each.
- Compaction performed in this layer was 12-15mm .



4. Coatings provided between layers of road

❑ Prime coat

- First application of low viscous liq bituminous material over an existing porous pavement surface like WBM base course.
- Prime coat is done to plug capillary pores of surface and bond the loose mineral particles on existing surface.
- Only low viscous binders are used.
- Generally tar, low viscous bitumen is used so it was used on site.
- Primed surface is required to be cured for 24 hrs so it was done 1 day before applying next layer during which no traffic was allowed on site.



❑ Tack coat

- Pavement surface on tack coat has to be applied was cleaned and dried in order to provide maximum bonding.
- Thin uniform coating was applied over pavement.
- Application of bituminous material over an existing pavement surface in order to provide the bond between existing layer and new layer of pavement is called process of tack coating.
- Bituminous material of higher viscosity like hot bitumen is used and in cold state emulsions may also be applied. hot bitumen was applied on site.



❑ Seal coat

- It is topmost coat over certain bituminous pavements which are not impervious.
- It can also be provided over worn out existing bituminous pavement.
- Its main function is to seal the surfacing against action of water and develop skid resistance texture.
- It extends the life of pavement.

5. Surface dressing

- Bituminous surface dressing is placed on an already placed layer to serve as thin wearing coat.
- Single coat surface dressing consist of single application of binding material followed by spreading of aggregate and rolling.

➤ Main functions are-

1. Protect base course
2. To waterproofs pavement surface

❑ Premixed Method

- ❑ In this method the aggregates and Bituminous binders are mixes thoroughly before spreading and compacting.



Bituminous concrete layer

- On site BC layer was placed having thickness of 40mm.
- Compaction done in this layer was 6-8 mm.

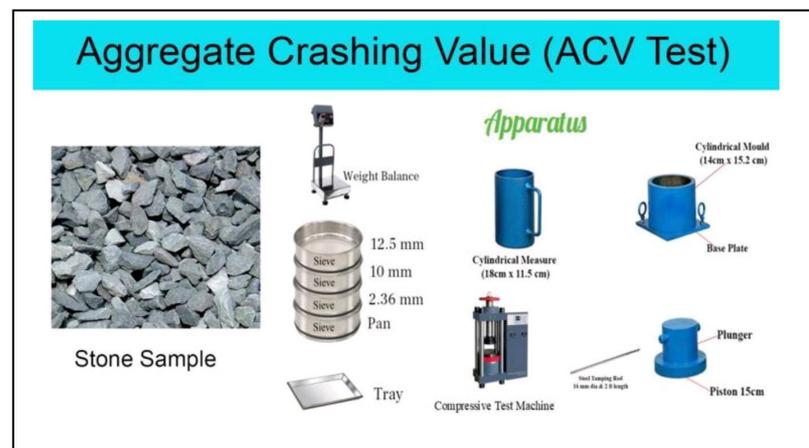


□ Tests For Road Aggregate

1. Crushing Test

(for strength)

- aggregate size :10-12mm
- No of layers:3
- Rate of loading :4T /min
- Time :10 min
- Sieve size:2.36mm



- ❑ $ACV = (\text{Weight of aggregate passing 2.36 mm sieve} / \text{total weight of aggregate}) * 100$
- ❑ ACV should not be greater than 30% for surface course and 45% for base course.

2. **Impact Test** (for toughness)

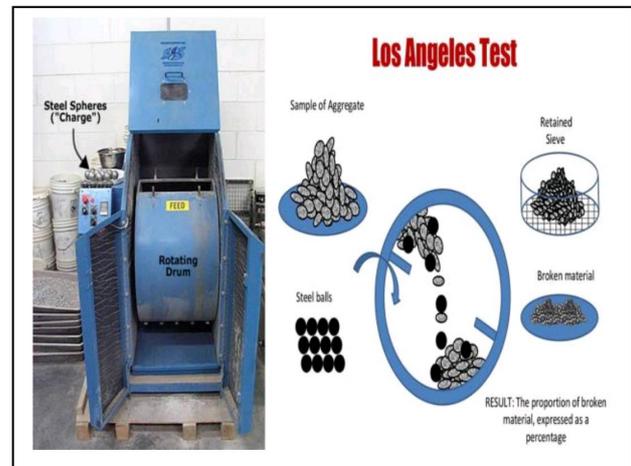
- Size of aggregate: 10 -12 mm
- Height of fall: 38cm
- Weight of hammer :13.5-14.5 kg
- No of blows: 15
- Sieve size :2.36 mm

- ❑ $AIV = (\text{Weight of aggregate passing 2.36 mm sieve} / \text{total weight of aggregate}) * 100$
- ❑ AIV must not be greater than 30% for surface course and 35% for base course.

LARSEN & TOUBRO CONSTRUCTION					
Project Name: Gwalior Smart City Project					
SL NO: 098					
Format No: QMSO-CIVL-21					
AGGREGATE IMPACT VALUE					
Material:	Coarse Aggregate		Product No: 015-210		
Source:	RT Road, Madhya Pradesh		Date		
Test as per IS:	IS:2386 Part 4				
No.	Details	Unit	Trial		
			1	2	3
	Wt. Of aggregate passing 12.5mm and retained 10mm sieves +Cylinder measure	g	434	370	
	Weight of Cylinder measure	g			
	Weight of aggregate taken (T+T)	g	364	295	
	Wt. of crushed aggregate passing 2.36 mm sieve	g	70	75	
	Aggregate Impact Value $100 * (4) / (3)$	%	16.2	20.37	
	Average Impact Value		18.19 %		

3. **Abrasion Test** (for wear and Tear)

- Rate: 33rpm
- No of revolution:500
- Sieve size: 1.7 mm
- ❑ $AIV = (\text{Wt of aggregate passing 2.36 mm sieve} / \text{total wt of aggregate}) * 100$
- ❑ AIV should not be greater than 30% for surface course and 50% for base course.



4. Soundness Test (for durability and weathering)

- Aggregates of given size are subjected to cycles of alternate wetting in a saturated solution of either sodium sulphate or magnesium sulphate at a certain temperature and drying it in air.
- Each cycle involves between 16-18 hrs of submergence in sulphate solution followed by 4 more hour of drying.
- After five cycle of loss of weight is determined.
- Loss of weight should not be greater than 12% for Na₂SO₄ and 18% for MgSO₄.



Fig: Sample Container, magnesium sulphate and sodium sulphate

5. Shape Test

I. Angularity number (AN):

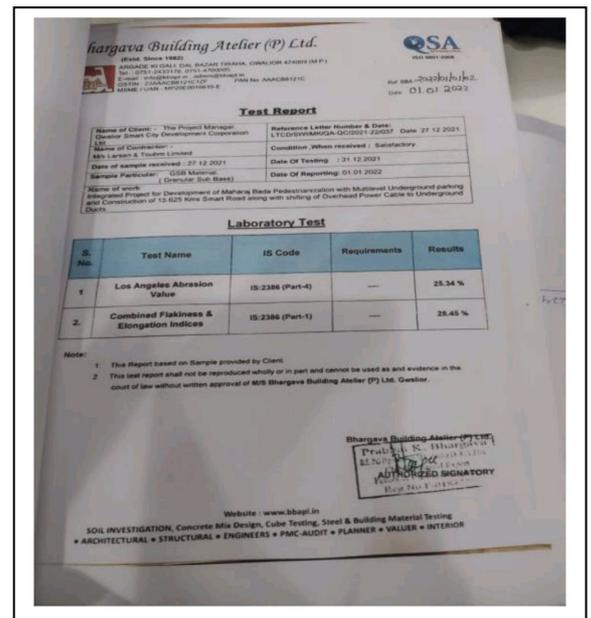
- acceptable range of construction (0-11)
- Rounded aggregate AN=0
- For angular aggregate AN is not equal to 0

II. Flakiness index(FI):

- Size of aggregate should be greater than 6.3mm
- FI should not be greater than 25% for bituminous concrete and 15% for WBM.

III. Elongation index(EI):

- EI should not be greater than 15%



6. Water Absorption Test

- water absorption should not be more than 0.6% of weight of aggregate.

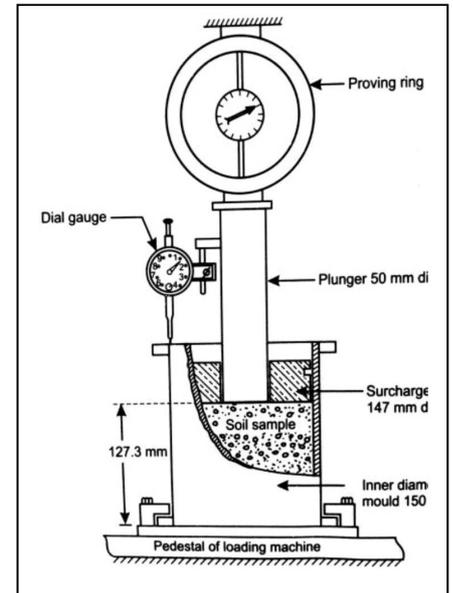
7. Specific Gravity test

- It measures the quality of strength of material.

- Specific gravity of solids lies between 2.6 to 2.9.

❑ CBR TEST (CALIFORNIA BEARING RATIO TEST)

- A penetration test meant for evaluation of subgrade strength of roads and pavements
- The results came by these test are used with the empirical curves to determine the thickness of pavement and its component layers.



❑ Test for Bitumen

1. Penetration test
2. Viscosity test
3. Float test
4. Ductility test
5. Softening point test
6. Flash and fire point test
7. Marshall Mix Design

❑ SEVANAGAR SITE SPECIFICATIONS

- WMM was placed in two layers with thickness 250mm and tests conducted were determination of dry density and sieve analysis.
- DBM was laid with thickness of 75 mm.
- BC layer was placed with thickness 40 mm.



WMM LAYER AT SEVANAGAR





DBM layer at sevanagar

❑ Some important test performed at sevanagar phoolbagh site

➤ **Sieve Analysis**



SIEVE ANALYSIS REPORT FOR GRANULAR SUB BASE [As per MoSRT & H]									
Laboratory Job No.	LE20M19H			Date Of Sample	21.02.2022				
Type of Material	GSB GRADE			Sampled By	L4T4PDMC				
Source	BILOVA			Date of Testing	21.02.2022				
Location	Amkhroad J.			Tested By	L4T4PDMC				
Proposed Use	RCC PIPE CROSSING WORK USE ONLY			Testing Method	Dry sieve Analysis				
11220 grams Total Weight of sample									
Sieve size	Wt. Retained (gm)	% wt. Retained (gm)	Cum. % Retained	Cum. % Passing	% Passing as per Specification MoRTH			Remarks	
					Grading 1	Grading 2	Grading 3		
53.00 MM	0	0	0	100	95-100	100	100	GSB is As per MoRTH limits Grading	
20.0 MM	10.65	9.49	9.49	90.51	55-90	70-100	85-75		
7.5 MM	32.15	28.65	38.15	61.85	35-65	50-80	-		
4.75 MM	1925	17.16	55.30	44.70	25-55	40-65	10-30		
2.36 MM	1142	10.36	65.66	34.34	20-40	30-50	-		
425 MIC	2225	19.83	85.49	14.51	10-15	10-15	-		
15 MIC	1325	11.81	97.30	2.70	0-8	0-5	0-6		
Pan wt.	303								
Total wt.	11220								

➤ Sand replacement test

- It is used to measure the in-situ density of natural or compacted soils using sand pouring cylinders.

It is used to estimate the relative density of base course or subgrade materials

- This method is used to determine the in-place density of compacted soil in order to compare it with the designated compaction degree, hence it specifies how much the compaction of the soil is close to the required compaction degree.



L&T Construction		LARSSEN & TOUBRO CONSTRUCTION	
Project Name: Gwalior Smart City Project		Job No. 8888	Form No. GMSO-CVSL-6
Date of Test: 2-2-2020		Project No. 11157/2019-20	Tested On: 2-2-20
TEST NO.	3163	TEST LOCATION	
DEPTH OF TESTING	3163	DEPTH OF HOLE	1.50
DEPTH OF MATERIAL	1.44	WT OF MATERIAL FROM HOLE	794.0
DEPTH OF SAND		WT OF SAND + CYLINDER BEFORE POURING	1550.3
		WT OF SAND + CYLINDER AFTER POURING	1013.0
		WT OF SAND IN CONE	34.2
		WT OF SAND IN HOLE	443.4
		VOLUME OF PIT	34.34
		WET DENSITY OF MATERIAL	2.280
MOISTURE CONTENT MEASUREMENT (By Rapid Moisturemeter Method)			
MOISTUREMETER GAUGE READING	57	3%	
RESULTS			
FIELD MAX DRY DENSITY OF MATERIAL	2.17	1.98	
RELATIVE COMPACTION	98.1%	89.5%	
VPASS/FAIL			

➤ **Determination of Moisture Content of soil sample using Rapid Moisture meter**

- Rapid moisture meter method is a method to obtain the water content of a given soil sample. This method is performed by using an equipment called as Rapid moisture meter. It is a suitcase type portable equipment and can be effectively and conveniently used in the field.



❖ RESULTS OF STANDARD TESTS PERFORMED AT SITE

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 GSTIN: 23AAACB1212127
 Website: www.sbagpl.in

QSA
ISO 9001:2015

Ref No. 2022/bh/161
 Date: 01.01.2022

Test Report

Name of Client: The Project Manager Gwalior Smart City Development Corporation Ltd.	Reference Letter Number & Date: LTCDSVMMKGA-GC/2021/22637 Date: 27.12.2021
Name of Contractor: M/S Larsen & Toubro Limited	Condition When received: Satisfactory
Date of sample received: 27.12.2021	Date of Testing: 28.12.2021
Sample Particular: WBM Material (Wet Mix Macadam)	Date Of Reporting: 01.01.2022

Name of work:
Integrated Project for Development of Mahara Bada Pedestrianization with Multilevel Underground parking and Construction of 10.625 Kms Smart Road along with shifting of Overhead Power Cables to Underground Ducts

Laboratory Test

S. No.	Test Name	IS code	Requirements as per (MORTH 408.2.1.1)	Results
1	Los Angeles Abrasion Value	IS:2386 (Part-4)	40 % Max	31.34 %
2	Combined Flakiness & Elongation Indices	IS:2386 (Part-1)	35 % Max	29.74 %

Note:
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 Website: www.sbagpl.in

QSA
ISO 9001:2015

Ref No. 2022/bh/162
 Date: 01.01.2022

Test Report

Name of Client: The Project Manager Gwalior Smart City Development Corporation Ltd.	Reference Letter Number & Date: LTCDSVMMKGA-GC/2021/22637 Date: 27.12.2021
Name of Contractor: M/S Larsen & Toubro Limited	Condition When received: Satisfactory
Date of sample received: 27.12.2021	Date of Testing: 31.12.2021
Sample Particular: GSB Material (Crusher Sub Base)	Date Of Reporting: 01.01.2022

Name of work:
Integrated Project for Development of Mahara Bada Pedestrianization with Multilevel Underground parking and Construction of 10.625 Kms Smart Road along with shifting of Overhead Power Cables to Underground Ducts

Laboratory Test

S. No.	Test Name	IS Code	Requirements	Results
1	Los Angeles Abrasion Value	IS:2386 (Part-4)	—	25.34 %
2	Combined Flakiness & Elongation Indices	IS:2386 (Part-1)	—	28.45 %

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LARSEN & TOUBRO CONSTRUCTION
 Project Name: Gwalior Smart City Project
 SL NO: 960
 Format No: LMSO-CIVIL-02

Bitumen Content Test

Material: WBM
 Source: AT Plant Kheriyani Manual, RD Cat. - 125-230
 Test as per IS: 1386-Part-1 Date: 23/12/21

Sl. No.	Particular	Unit	Test No.	
			1	2
1	Weight of Sample taken (W1)	gm	500	
2	Weight of Sample after extraction (W2)	gm	478.5	
3	Bitumen Content (W1-W2)/W1*100	%	4.12	
4	Average	%	4.12	

Remarks: wt of dilute water before extraction = 0 gram
 wt of dilute water after extraction = 0.01 gram

Prabhu K. Shargava
 CLIENT

L & T

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LARSEN & TOUBRO CONSTRUCTION
 Project Name: Gwalior Smart City Project
 SL NO: 956

SIEVE ANALYSIS REPORT FOR GRANULAR SUB BASE [As per MoSRT & H]

Laboratory Job No. LE00000 Date of Sample 23/12/21
 Type of Material GSB GRADE Sampled By JKY
 Source Bitumen Plant Date of Testing 25/12/21
 Location Tested By Varun
 Proposed Use Roadwork Testing Method dry sieve method

Sieve size	Wt. Retained (gm)	% wt. Retained	Cum. % Retained	Cum. % Passing	% Passing as per Specification MoSRT			Remarks
					Grading 1	Grading 2	Grading 3	
75.00 MM	0	0	0	100	100	100		
20.00 MM	3330	14.31	14.31	85.69	65-90	65-75		
4.75 MM	7098	31.45	45.76	54.24	35-65	50-80		
4.25 MM	2098	9.22	54.98	45.02	25-55	40-60		
3.00 MM	9320	40.28	95.24	4.76	30-40	30-50		
425 MIC	5126	22.71	77.29	22.71	10-15	10-15		
75 MIC	1576	6.98	84.27	15.72	0.5	0.5		
Fin. wt.	2356							
Total wt.	2356							

GSB is As per MoSRT limits Grading

Prabhu K. Shargava
 CLIENT [V.K. Shargava]

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LARSEN & TOUBRO CONSTRUCTION
Project Name: Gwalior Smart City Project
SL NO: 600
Format No: QMSG-CIVIL-21

AGGREGATE IMPACT VALUE

Material: Coarse Aggregate / Trial no. 135-230
Source: RT Plant Kheriy / IR 2386 Part 7
Date: 23/12/21

No	Details	Unit	Trial		
			1	2	3
1	Wt. Of aggregate passing 12.5mm and retained 10mm sieves + Cylinder measure	g	134	370	
2	Weight of Cylinder measure	g			
	Weight of aggregate taken (1)+(2)	g	364	295	
	Wt. of crushed aggregate passing 2.36 mm sieve	g	70	75	
	Aggregate Impact Value 100*(4)/(3)	%	16.2	20.37	
	Average Impact Value		18.19%		

Remarks: wt of aggregate before extraction 0.92%
wt of aggregate after extraction 0.80%

L&T [V.K. Shrivastava] POME

LARSEN & TOUBRO CONSTRUCTION
Project Name: Gwalior Smart City Project
SL NO: 606
Format No: QMSG-CIVIL-22

Bitumen Content Test

Material: DBM / Trial no. 135 to 230
Source: RT Plant (Kheriy) / IR 2386 - Part - 7
Date: 23/12/21

Sl. No.	Particular	Unit	Test No.	
			1	2
1	Weight of Sample taken (W1)	gm	500	
2	Weight of Sample after extraction (W2)	gm	479	
3	Bitumen Content (W1-W2)/W1*100	%	4.04	
4	Average	%		

Remarks: wt of aggregate before extraction 0.92%
wt of aggregate after extraction 0.80%

L&T [V.K. Shrivastava] POME

LARSEN & TOUBRO CONSTRUCTION
Project Name: Gwalior Smart City Project
SL NO: 600
Format No: QMSG-CIVIL-15

SIEVE ANALYSIS REPORT OF DENSE BITUMINOUS MACADAM [As per MoSRT & H]

Laboratory Job No: LE20M159
Date Of Sample: 21/12/21
Type of Material: DBM
Sampled By: J.J.POME
Source: RT Plant
Date of Testing: 21/12/21
Location: RT Plant / Trial no. 135-230
Tested By: J.J.POME
Prepared Use: B T ROAD WORKS
Testing Method: Dry sieve Analysis

Sieve size	grams Total Weight of sample			% Passing as per Specification MoSRT&H	Remarks
	Wt. Retained (gm)	% Retained	Cum. % Retained		
37.5 MM	0	0	0	100	DBM GRADE-1 is As per MoRTH
28.5 MM	26	0.26	0.26	99.74	
19.2 MM	3020	30.81	31.07	68.93	
4.75 MM	3012	30.73	61.80	38.54	
2.36 MM	942	9.61	71.41	28.42	
300 MIC	1840	18.77	90.18	7.21	
75 MIC	956	9.75	99.93	2.8	
Pan wt.	4				
Total wt.	9800				

L&T [V.K. Shrivastava] POME

LARSEN & TOUBRO CONSTRUCTION
Project Name: Gwalior Smart City Project
SL NO: 606
Format No: QMSG-CIVIL-15

SIEVE ANALYSIS REPORT OF DENSE BITUMINOUS MACADAM [As per MoSRT & H]

Laboratory Job No: LE20M159
Date Of Sample: 21/12/21
Type of Material: DBM
Sampled By: J.J.POME
Source: RT Plant
Date of Testing: 21/12/21
Location: Kheriy / Trial no. 135-230
Tested By: J.J.POME
Prepared Use: B T ROAD WORKS
Testing Method: Dry sieve Analysis

Sieve size	grams Total Weight of sample			% Passing as per Specification MoSRT&H	Remarks
	Wt. Retained (gm)	% Retained	Cum. % Retained		
37.5 MM	0	0	0	100	DBM GRADE-1 is As per MoRTH
28.5 MM	400	4.09	4.09	95.93	
13.2 MM	1236	12.51	16.60	83.40	
4.75 MM	764	7.69	24.29	75.71	
2.36 MM	814	8.30	32.59	67.41	
300 MIC	950	9.69	42.28	57.72	
75 MIC	800	8.16	50.44	49.56	
Pan wt.	230	2.35	52.79	47.21	
Total wt.	5194				

L&T [V.K. Shrivastava] POME

CONCLUSION

As an undergraduate of MITS Gwalior, I would like to conclude that internship programme was an excellent opportunity for me to enhance the knowledge in this field.

I have learnt so many things during this project and after completion of this training programme, I am achieving a high level of confidence and knowledge. I am really grateful to GSCDCL and IPE global for providing me this wonderful opportunity.

The main aim of this internship was to provide an opportunity to undergraduate student to identify, observe and practice application of civil engineering on real site, to get real time experience of technical as well as management practices, to deal with the real time problems arised on site and to interact with field workers. In this internship project I have been able to see the important theoretical as well as practical aspects of road construction . This experience and knowledge gained me is definitely going to help me in my future projects.

References

-<https://www.slideshare.net/RatneshKushwaha1/report-on-summer>

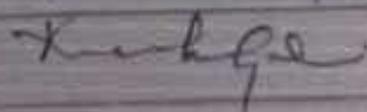
-MORTH

-site data and drawing

-Help of industry mentors

FORMAT

FORTNIGHTLY PROGRESS REPORT (FPR) FROM INDUSTRY MENTOR

Name of student	SHRITI GARG		Department	CIVIL	
Industry/Organization	GISC DCL		Date/Duration	1/04/2022 to 15/04/2022	
Criterion	Poor	Average	Good	Very Good	Excellent
Punctuality/Timely completion of assigned work					✓
Learning capacity/Knowledge up gradation				✓	
Performance/Quality of work					✓
Behaviour/Discipline/Team work				✓	
Sincerity/Hard work					✓
Comment on nature of work done/Area/Topic	Construction of Road Testing of Material				
<u>OVERALL GRADE (Any one)</u>	<u>POOR/AVERAGE/GOOD/VERY GOOD/EXCELLENT</u>				
<u>Name of Industry Mentor</u>	KANCHAN GOSWAMI				
<u>Signature of Industry Mentor</u>					



Receiving Date	16/04/22	Name of Faculty Mentor	Dr. Sanjay Tiwari	Sign	
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FORMAT

FORTNIGHTLY PROGRESS REPORT (FPR) FROM INDUSTRY MENTOR

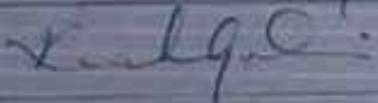
Name of student	SMRITI GARG		Department	CIVIL	
Industry/Organization	GSCDCL		Date/Duration	1/03/2022 to 16/03/2022	
Criterion	Poor	Average	Good	Very Good	Excellent
Punctuality/Timely completion of assigned work			✓		
Learning capacity/Knowledge up gradation				✓	
Performance/Quality of work				✓	
Behaviour/Discipline/Team work			✓		
Completion of assigned work				✓	
Comment on nature of work done/Area/Topic	Construction of Road. Consist of Storm Water Drain & Sewer Drain.				
<u>OVERALL GRADE (Any one)</u>	<u>POOR/AVERAGE/GOOD/VERY GOOD/EXCELLENT</u>				
<u>Name of Industry Mentor</u>	SACHIN SH				
<u>Signature of Industry Mentor</u>					

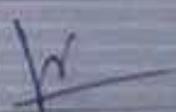
Receiving Date	16/03/22	Name of Faculty Mentor	Dr Sanjay Tiwari	Sign	
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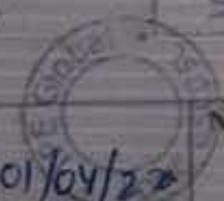
FORTNIGHTLY PROGRESS REPORT (FPR) FROM INDUSTRY MENTOR

Name of student	SMRITI GARG		Department	CIVIL	
Industry/Organization	GSC.DCL		Date/Duration	1/05/2022 to 23/05/20	
Criterion	Poor	Average	Good	Very Good	Excellent
Punctuality/Timely completion of assigned work					✓
Learning capacity/Knowledge up gradation				✓	
Performance/Quality of work					✓
Behaviour/Discipline/Team work					✓
Sincerity/Hard work					✓
Comment on nature of work done/Area/Topic	Construction of Road Testing of Material ✓				
<u>OVERALL GRADE (Any one)</u>	<u>POOR/AVERAGE/GOOD/VERY GOOD/EXCELLENT</u>				
<u>Name of Industry Mentor</u>	KANCHAN GOSWAMI				
<u>Signature of Industry Mentor</u>	 				

Receiving Date	24/05/22	Name of Faculty Mentor	Dr. Sanjay Tiwari	Sign	
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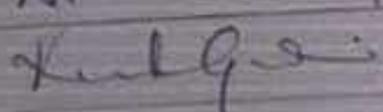
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FORTNIGHTLY PROGRESS REPORT (FPR) FROM INDUSTRY MENTOR

Name of student	SMRITI GARG		Department	CIVIL	
Industry/Organization	GSCDCL		Date/Duration	16/03/2022 to 31/03/2022	
Criterion	Poor	Average	Good	Very Good	Excellent
Punctuality/Timely completion of assigned work				✓	
Learning capacity/Knowledge up gradation				✓	
Efficiency/Quality of work				✓	
Behaviour/Discipline/Team work				✓	
Sincerity/Hard work			✓		
Comment on nature of work done/Area/Topic	Cont. of Steel water system, Cont. of Road Duct for underground Electric cables. Cont. of Road. ✓				
<u>OVERALL GRADE (Any one)</u>	<u>POOR/AVERAGE/GOOD/VERY GOOD/EXCELLENT</u>				
<u>Name of Industry Mentor</u>	Sachin Sharma				
<u>Signature of Industry Mentor</u>					
Receiving Date	 01/04/22	Name of Faculty Mentor	Dr. Sanjay Thosari	Sign	

FORMAT

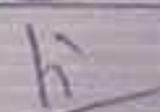
FORTNIGHTLY PROGRESS REPORT (FPR) FROM INDUSTRY MENTOR

Name of student	SMRITI GARG		Department	CIVIL	
Industry/Organization	G.S.C.DCL		Date/Duration	16/04/2022 to 30/04/2022	
Criterion	Poor	Average	Good	Very Good	Excellent
Punctuality/Timely completion of assigned work					✓
Learning capacity/Knowledge up gradation					✓
Performance/Quality of work					✓
Behaviour/Discipline/Team work					✓
Sincerity/Hard work					✓
Comment on nature of work done/Area/Topic	<p align="center">Construction of Road Testing of Materials</p>				
<u>OVERALL GRADE (Any use)</u>	<u>POOR/AVERAGE/GOOD/VERY GOOD/EXCELLENT</u>				
<u>Name of Industry Mentor</u>	KANCHAR GOSWAMI				
<u>Signature of Industry Mentor</u>	 				

Receiving Date	01/05/22	Name of Faculty Mentor	Dr. Sanjay Tewari	Sign	h
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FORMAT

FORTNIGHTLY PROGRESS REPORT (FPR) FROM INDUSTRY MENTOR

Name of student	SMRITI GARG		Department	CIVIL	
Industry/Organization	GSDCL		Date/Duration	DD/MM/YR - DD/MM/YR 18/01/2022 - 15/02/2022	
Criterion	Poor	Average	Good	Very Good	Excellent
Punctuality/Timely completion of assigned work					✓
Learning capacity/Knowledge up gradation				✓	
Performance/Quality of work				✓	
Behaviour/Discipline/Team work					✓
Sincerity/Hard work					✓
Comment on nature of work done/Area/Topic	Roads. Building work. P.C.C. Kemp.				
<u>OVERALL GRADE (Any one)</u>	<u>POOR/AVERAGE/GOOD/VERY GOOD/EXCELLENT</u>				
<u>Name of Industry Mentor</u>	Dr. ATUL TEWARI				
<u>Signature of Industry Mentor</u>	 				
Receiving Date	16/02/22	Name of Faculty Mentor	Dr. SANJAY TIWARI	Sign	

FORMAT

FORTNIGHTLY PROGRESS REPORT (FPR) FROM INDUSTRY MENTOR

Name of student	SMRITI GARGI		Department	CIVIL	
Industry/Organization	GISCDEL		Date/Duration	16/02/2022 To 28/02/2022	
Criterion	Poor	Average	Good	Very Good	Excellent
completion of assigned work			✓		
Learning capacity/Knowledge up gradation				✓	
Performance/Quality of work			✓		
Behaviour/Discipline/Team work				✓	
Sincerity/Hard work			✓		
Comment on nature of work done/Area/Topic	<p>Consistent of Road, Road Duct for underground electric cable, Storm water drainage.</p>				
<u>OVERALL GRADE (Any one)</u>	<u>POOR/AVERAGE/GOOD/VERY GOOD/EXCELLENT</u>				
<u>Name of Industry Mentor</u>	Sandeep Singh				
<u>Signature of Industry Mentor</u>	Sandeep Singh				
Receiving Date	01/03/22	Name of Faculty Mentor	Dr. Sanjay Thakur	Sign	h

