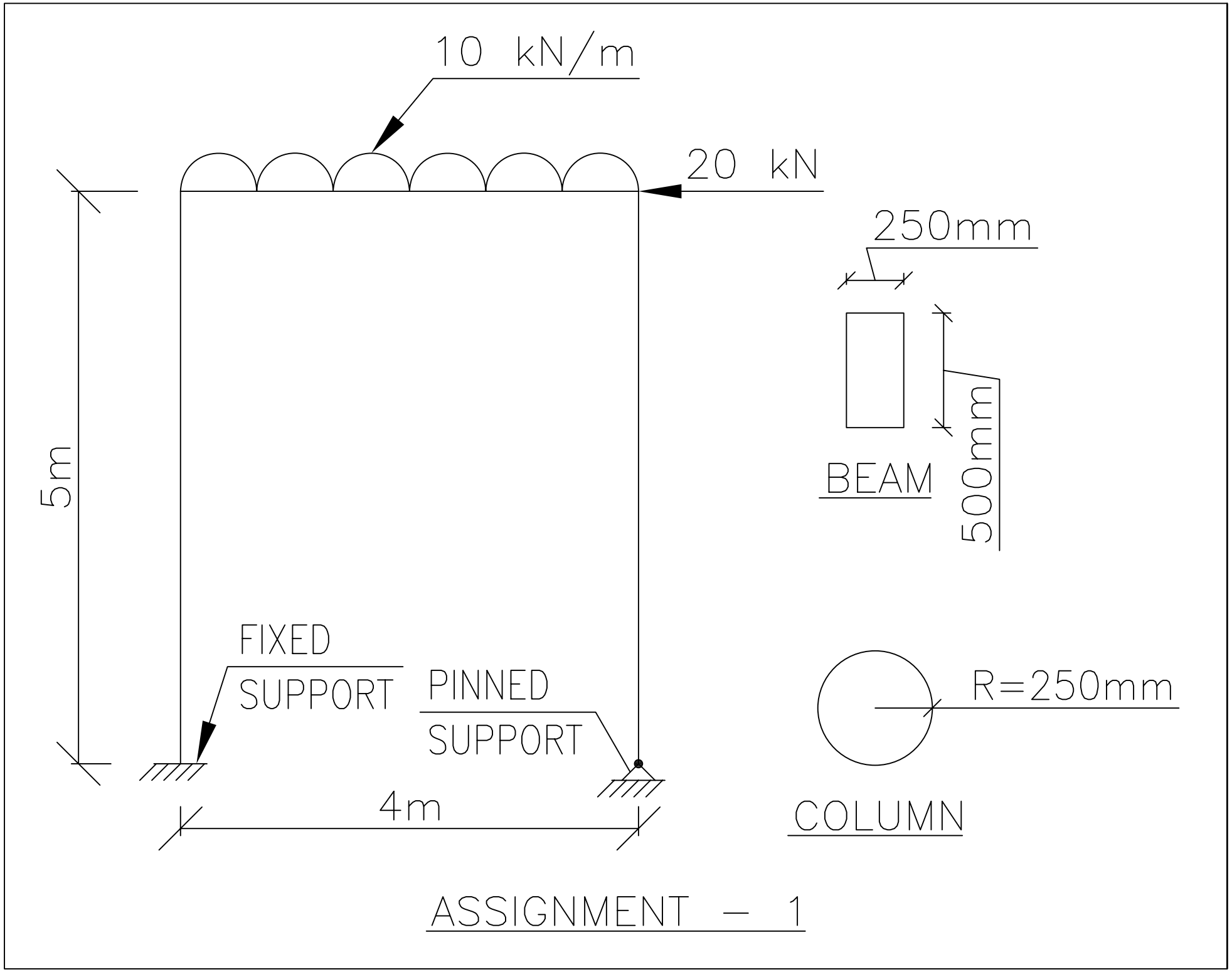
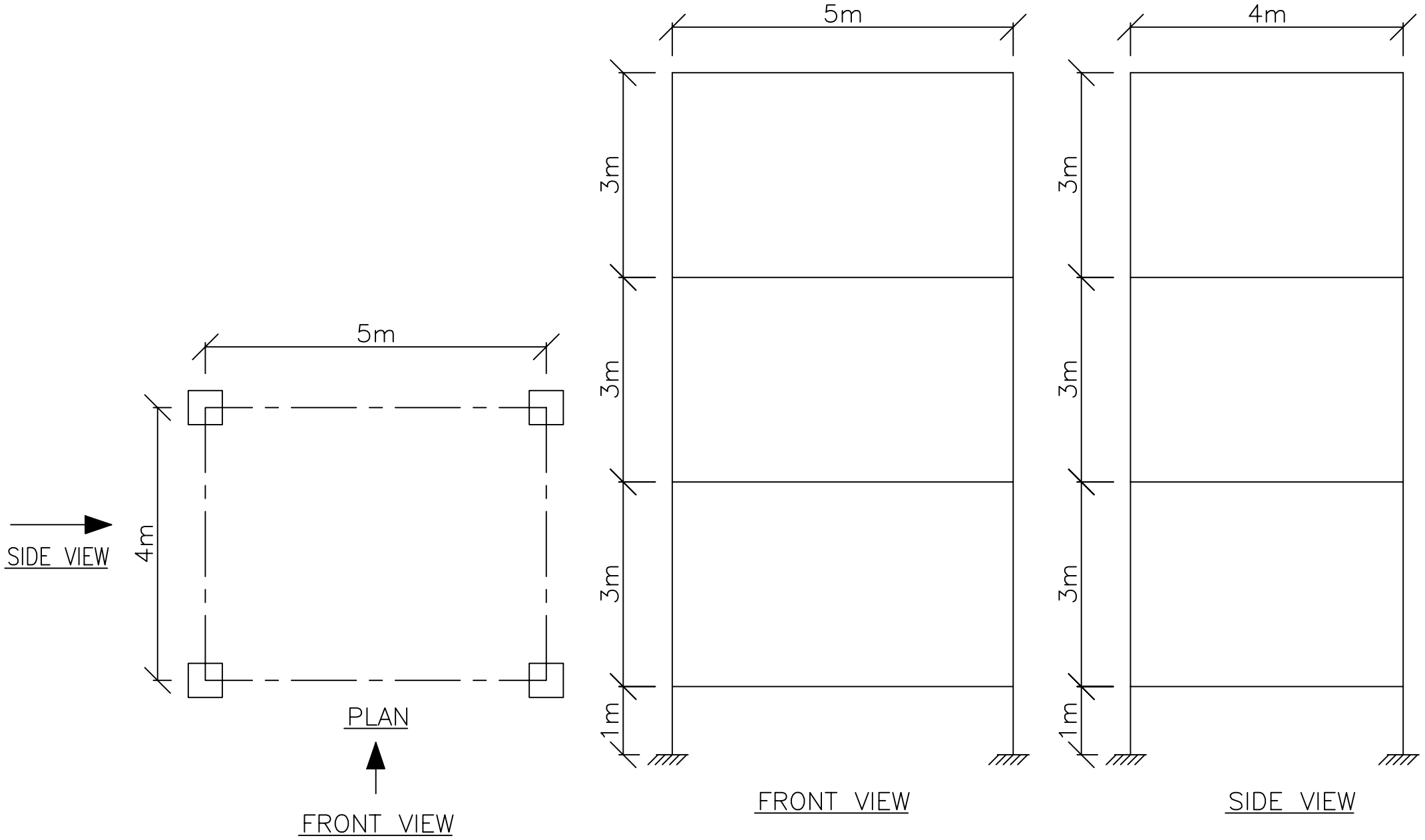


ASSIGNMENT – 1



ASSIGNMENT – 6

R.C.C. BUILDING

Answers:

1.a. Following are the applications of data science in Civil Engineering:

- Population forecasting for urban planning, water supply & sewerage system.
- Risk assessment and mitigation such as prediction of floods, earthquakes, cyclones.
- Predicting traffic trends in Highway engineering.
- Soil simulation and modeling in Geotechnical engineering.
- Finite element applications in Structural engineering.
- Construction management.
- ML (Machine Learning) applications such as automation in structural design and drawings.

1.b. Definition of Estimating:

Estimate is the method for finding out the quantity of various construction item and materials which are used in construction work.

• An estimate is a probable cost of the work, arrived by mathematical calculations based on the Introduction to Estimating and Costing measurement of quantities of various items of work involved in the work.

• The quantities of the various items of work are then multiplied by the present market rates for those items to arrive at the cost of all such items.

• Summation of costs of all such items gives the total estimated cost of the work.

Long Wall and Short Wall Method

For calculating the quantity of various construction item, long wall and short wall method is used.

• For measuring the long wall and short wall the external Long Wall and Short Wall Method out-to-out length of walls running in the longitudinal direction generally is considered as “long wall” while the in-to-in internal length of walls running in the transverse direction is called as “short wall” or “cross wall”.

• For calculating quantity multiply the length into the breadth and height of the wall.

Length of Long Wall = Center to Center Length of wall + Half Breadth on One Side + Half Breadth on the Other Side = Center to Center Length of wall + One Breadth.

• For finding out length of short wall or cross wall subtract from the centre length, so the one breadth of the wall, which gives the length of the short wall (in-to-in) (instead of adding).

• Length of Short Wall = Centre to Centre Length – One breadth

Centre Line Method

• In this method first, calculate the centre line length of the wall, and then multiply it with the breadth and depth of the wall to find out quantity.

• Center to centre line method is suitable for rectangular,circular (polygonal, hexagonal, octagonal) buildings having no inter or cross walls(the cross wall is an interior dividing wall of a building.).

• Centre to centre line method is quick, but it requires special attention and consideration at the junctions or meeting points of partition or cross walls, etc.

• For each junction, half breadth of the respective item should be deducted from the total centre length for accurate quantity one has to learn seriously as the accuracy is very important while preparing bills rather than working out estimates.

1.c.

Steps for Static Analysis

- Geometric Modeling
- Material Properties
- Sectional Properties
- Supports : Boundary Conditions
- Loads & Load combinations
- Special Commands
- Analysis Specification
- Design Command

3.a.

```
# To find the volume of frustum of cone
r = int(input("enter the radius of smaller circle: "))
R = int(input("enter the radius of the larger circle: "))
h = int(input("enter the height of the cone frustum: "))
import math
pi = math.pi
v = 1/3*pi*h*(r**2+r*R+R**2)
print("the volume of cone frustum is: ", v)
```

3.b.

```
#To find the Back Bearing
FB=int(input("enter the fore bearing: "))
if FB<180:
   BB=FB+180
   print("BACK BEARING",BB)
else:
   BB=FB-180
   print("BACK BEARING",BB)
```

3.c.

```
# To find the balanced section or under-reinforced section or over-reinforced section for a RCC beam
fck = int(input("value of fck in Mpa: "))
fy = int(input("value of fy in Mpa: "))
b = int(input("value of width of the beam: "))
d = int(input("value of depth of beam: "))
ast = int(input("value of reinforcemnet used in mm2: "))
x = int ((0.87*fy*ast)/(0.36*fck*b))
print ("depth of nutral axis in mm", x)
if (x<0.479*d):
   print ("the section is under reinforced")
elif (x==0.479*d):
   print ("the section is balanced")
else :
   print ("the section is over reinforced")
```

3.d.

```
# comparision between numbers
x=int(input("enter the number: "))
y=int(input("enter the number: "))
if(x>y):
   print("x is greater than y")
elif(x==y):
   print("x equal to y")
else:
   print("x is smaller than y")
```

Q4.a. Need for excel in Civil Engineering:

- Excel is one of the most powerful tools available to Civil Engineers.
- Be it execution, surveying, planning, contracts, budgeting, designing, quality control, quantity estimation, you name it. Everyone uses MS Excel.
- The data when represented in tables looks good. The required calculations are done by MS Excel. You can store, replicate, modify the data however you want.
- For example: Let's say the quantity estimation engineer wants to know the quantity of steel to be used at site, he/she will have to make use of an excel sheet to make a bar bending schedule and assess the quantity of steel.
- Even if you take surveying, the number of points plotted at site are noted in the excel sheet to determine the level of land. Maintaining all the data in head is very difficult and remembering the level of plot at regular intervals will be very difficult without the help of an excel sheet.
- For designing, One can easily program excel to calculate the amount of steel required for a particular section and to calculate the total cost. You may calculate the size of columns required in a building all you have to do is program the sheet as per the formula and Just. Keep adding the values of load at different floor levels and you can easily get the size and no.of bars required.
- Excel has truly made the life of Civil Engineers easy by obviating the need for manual calculations in majority of the works

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport & Highways, Govt. of India)
परियोजना निदेशक का कार्यालय, परियोजना कार्यान्वयन इकाई
एन एच ए आई कमप्लेक्स, सेक्टर – २ (ए), विधाननगर, दुर्गापुर–१२
Office of the Project Director, Project Implementation Unit
NHAI Complex, Sector-2(A), Bidhannagar, Durgapur-713212
दुरभाष / Phone No. : (0343) 253 5766, 253 4815, फैक्स नं० / Fax No. : (0343) 253 4676, ई-मेल / E-mail : dur@nhai.org, nhaipiudgp@yahoo.com

Ref. No. : 11021/3/2020/PIU(DUP)/BCREC/6853 Dated : 13.03.2024

To

Dr. Sanjay Sengupta
Nodal Officer
HOD, Deptt. Of Civil Engineering
Dr. B.C. Roy Engineering College
Jemua Road, Fuljhore, Durgapur - 713206

Sub: Certificates of 20 nos. undergraduate students for paid internship in the projects under PIU-Durgapur.

Ref.: i) MOU no. 11021/3/2020/PIU(DUP)/BCREC/4315 dated 28.10.2020.
ii) Your office letter dated 25.04.2023.
iii) Your office letter dated 05.10.2023.

Sir,

With reference to your office letter under ref-(iii) above, it is to inform that the stipend amount of Rs.8000/- each has been disbursed to the respective Bank Accounts of the following students in terms of MOU dated 28.10.2020 signed between NHAI and Dr. B.C. Roy Engineering College. The Certificates of the said 20 nos. undergraduate students who have completed their one month internship from 01.07.2023 to 31.07.2023 in the project "Six Laning of National Corridor NH-19 from Panagarh to Palsit from km. 521.120 to km. 588.870 (total design length 67.750 km) in the State of West Bengal under Bharatmala Pariyojana to be executed on BOT (Toll) basis" are attached herewith.

Sl. No.	Name of the student	Sl. No.	Name of the student
1.	Sagen Marandi	11.	Deeya Chattopadhyay
2.	Subhajit Banerjee	12.	Niraj Kumar
3.	Partha Sarathi Majhi	13.	Abhishek Kumar
4.	Ramesh Mondal	14.	Subhajit Pradhan
5.	Pritam Biswas	15.	Mirza Sariful Islam
6.	Atanu Sinha Mahapatra	16.	Koushik Nayek
7.	Subhajit Dutta	17.	Prakash De
8.	Subir Ghosh	18.	Biswapriya Bandopadhyay
9.	Soumodeep Das	19.	Basu Bhowmick
10.	Sonalpriyo Banerjee	20.	Md. Anaj Khan

Yours faithfully

Encl. : As stated

(Manish Kumar)
Project Director

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport & Highways, Govt. of India)
परियोजना निदेशक का कार्यालय, परियोजना कार्यान्वयन इकाई
एन एच ए आई कमप्लेक्स, सेक्टर - २ (ए), विधाननगर, दुर्गापुर-१२
Office of the Project Director, Project Implementation Unit
NHAI Complex, Sector-2(A), Bidhannagar, Durgapur-713212
दुरभाष / Phone No. : (0343) 253 5766, 253 4815, फैक्स न० / Fax No. : (0343) 253 4676, ई-मेल / E-mail : dur@nhai.org, nhaipiudgp@yahoo.com

Dated : 13.03.2024

To Whom It May Concern

This is certified that **Sagen Marandi** of Dr. B.C. Roy Engineering College, Durgapur has successfully completed internship in the project "6 Laning of National Corridor NH-19 from Panagarh to Palsit from Km.521.120 to Km.588.870 (total design length 67.750 Km) in the state of West Bengal under Bharatmala Pariyojana to be executed on BOT (Toll) basis" of National Highways Authority of India during the period from **01.07.2023** to **31.07.2023** under the supervision of the Concessionaire, M/s Panagarh Palsit Road Pvt. Ltd. and Independent Engineer, M/s L.N. Malviya Infra Projects Pvt. Ltd.

(Manish Kumar)
Project Director

सत्यमेव जयते

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport & Highways, Govt. of India)
परियोजना निदेशक का कार्यालय, परियोजना कार्यान्वयन इकाई
एन एच ए आई कमप्लेक्स, सेक्टर - २ (ए), विधाननगर, दुर्गापुर-१२
Office of the Project Director, Project Implementation Unit
NHAI Complex, Sector-2(A), Bidhannagar, Durgapur-713212
दुरभाष / Phone No. : (0343) 253 5766, 253 4815, फैक्स न० / Fax No. : (0343) 253 4676, ई-मेल / E-mail : dur@nhai.org, nhaipiudgp@yahoo.com

Dated : 13.03.2024

To Whom It May Concern

This is certified that **Subhajit Banerjee** of Dr. B.C. Roy Engineering College, Durgapur has successfully completed internship in the project "6 Laning of National Corridor NH-19 from Panagarh to Palsit from Km.521.120 to Km.588.870 (total design length 67.750 Km) in the state of West Bengal under Bharatmala Pariyojana to be executed on BOT (Toll) basis" of National Highways Authority of India during the period from **01.07.2023** to **31.07.2023** under the supervision of the Concessionaire, M/s Panagarh Palsit Road Pvt. Ltd. and Independent Engineer, M/s L.N. Malviya Infra Projects Pvt. Ltd.

(Manish Kumar)
Project Director

सत्यमेव जयते

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport & Highways, Govt. of India)
परियोजना निदेशक का कार्यालय, परियोजना कार्यान्वयन इकाई
एन एच ए आई कमप्लेक्स, सेक्टर – २ (ए), विधाननगर, दुर्गापुर–१२
Office of the Project Director, Project Implementation Unit
NHAI Complex, Sector-2(A), Bidhannagar, Durgapur-713212
दुरभाष / Phone No. : (0343) 253 5766, 253 4815, फैक्स न० / Fax No. : (0343) 253 4676, ई-मेल / E-mail : dur@nhai.org, nhaipiudgp@yahoo.com

Dated : 13.03.2024

To Whom It May Concern

This is certified that **Partha Sarathi Majhi** of Dr. B.C. Roy Engineering College, Durgapur has successfully completed internship in the project "6 Laning of National Corridor NH-19 from Panagarh to Palsit from Km.521.120 to Km.588.870 (total design length 67.750 Km) in the state of West Bengal under Bharatmala Pariyojana to be executed on BOT (Toll) basis" of National Highways Authority of India during the period from **01.07.2023** to **31.07.2023** under the supervision of the Concessionaire, M/s Panagarh Palsit Road Pvt. Ltd. and Independent Engineer, M/s L.N. Malviya Infra Projects Pvt. Ltd.

(Manish Kumar)
Project Director

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport & Highways, Govt. of India)
परियोजना निदेशक का कार्यालय, परियोजना कार्यान्वयन इकाई
एन एच ए आई कमप्लेक्स, सेक्टर – २ (ए), विधाननगर, दुर्गापुर–१२
Office of the Project Director, Project Implementation Unit
NHAI Complex, Sector-2(A), Bidhannagar, Durgapur-713212
दुरभाष / Phone No. : (0343) 253 5766, 253 4815, फैक्स न० / Fax No. : (0343) 253 4676, ई-मेल / E-mail : dur@nhai.org, nhaipiudgp@yahoo.com

Dated : 13.03.2024

To Whom It May Concern

This is certified that **Ramesh Mondal** of Dr. B.C. Roy Engineering College, Durgapur has successfully completed internship in the project "6 Laning of National Corridor NH-19 from Panagarh to Palsit from Km.521.120 to Km.588.870 (total design length 67.750 Km) in the state of West Bengal under Bharatmala Pariyojana to be executed on BOT (Toll) basis" of National Highways Authority of India during the period from **01.07.2023** to **31.07.2023** under the supervision of the Concessionaire, M/s Panagarh Palsit Road Pvt. Ltd. and Independent Engineer, M/s L.N. Malviya Infra Projects Pvt. Ltd.

(Manish Kumar)
Project Director

सत्यमेव जयते

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport & Highways, Govt. of India)
परियोजना निदेशक का कार्यालय, परियोजना कार्यान्वयन इकाई
एन एच ए आई कमप्लेक्स, सेक्टर – २ (ए), विधाननगर, दुर्गापुर–१२
Office of the Project Director, Project Implementation Unit
NHAI Complex, Sector-2(A), Bidhannagar, Durgapur-713212
दुरभाष / Phone No. : (0343) 253 5766, 253 4815, फैक्स न० / Fax No. : (0343) 253 4676, ई-मेल / E-mail : dur@nhai.org, nhaipiudgp@yahoo.com

Dated : 13.03.2024

To Whom It May Concern

This is certified that **Pritam Biswas** of Dr. B.C. Roy Engineering College, Durgapur has successfully completed internship in the project "6 Laning of National Corridor NH-19 from Panagarh to Palsit from Km.521.120 to Km.588.870 (total design length 67.750 Km) in the state of West Bengal under Bharatmala Pariyojana to be executed on BOT (Toll) basis" of National Highways Authority of India during the period from **01.07.2023** to **31.07.2023** under the supervision of the Concessionaire, M/s Panagarh Palsit Road Pvt. Ltd. and Independent Engineer, M/s L.N. Malviya Infra Projects Pvt. Ltd.

(Manish Kumar)
Project Director

सत्यमेव जयते

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport & Highways, Govt. of India)
परियोजना निदेशक का कार्यालय, परियोजना कार्यान्वयन इकाई
एन एच ए आई कमप्लेक्स, सेक्टर – २ (ए), विधाननगर, दुर्गापुर–१२
Office of the Project Director, Project Implementation Unit
NHAI Complex, Sector-2(A), Bidhannagar, Durgapur-713212
दुरभाष / Phone No. : (0343) 253 5766, 253 4815, फैक्स न० / Fax No. : (0343) 253 4676, ई-मेल / E-mail : dur@nhai.org, nhaipiudgp@yahoo.com

Dated : 13.03.2024

To Whom It May Concern

This is certified that **Atanu Sinha Mahapatra** of Dr. B.C. Roy Engineering College, Durgapur has successfully completed internship in the project "6 Laning of National Corridor NH-19 from Panagarh to Palsit from Km.521.120 to Km.588.870 (total design length 67.750 Km) in the state of West Bengal under Bharatmala Pariyojana to be executed on BOT (Toll) basis" of National Highways Authority of India during the period from **01.07.2023** to **31.07.2023** under the supervision of the Concessionaire, M/s Panagarh Palsit Road Pvt. Ltd. and Independent Engineer, M/s L.N. Malviya Infra Projects Pvt. Ltd.

(Manish Kumar)
Project Director

सत्यमेव जयते

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport & Highways, Govt. of India)
परियोजना निदेशक का कार्यालय, परियोजना कार्यान्वयन इकाई
एन एच ए आई कमप्लेक्स, सेक्टर – २ (ए), विधाननगर, दुर्गापुर–१२
Office of the Project Director, Project Implementation Unit
NHAI Complex, Sector-2(A), Bidhannagar, Durgapur-713212
दुरभाष / Phone No. : (0343) 253 5766, 253 4815, फैक्स न० / Fax No. : (0343) 253 4676, ई-मेल / E-mail : dur@nhai.org, nhaipiudgp@yahoo.com

Dated : 13.03.2024

To Whom It May Concern

This is certified that **Subhajit Dutta** of Dr. B.C. Roy Engineering College, Durgapur has successfully completed internship in the project "6 Laning of National Corridor NH-19 from Panagarh to Palsit from Km.521.120 to Km.588.870 (total design length 67.750 Km) in the state of West Bengal under Bharatmala Pariyojana to be executed on BOT (Toll) basis" of National Highways Authority of India during the period from **01.07.2023** to **31.07.2023** under the supervision of the Concessionaire, M/s Panagarh Palsit Road Pvt. Ltd. and Independent Engineer, M/s L.N. Malviya Infra Projects Pvt. Ltd.

(Manish Kumar)
Project Director

सत्यमेव जयते

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport & Highways, Govt. of India)
परियोजना निदेशक का कार्यालय, परियोजना कार्यान्वयन इकाई
एन एच ए आई कमप्लेक्स, सेक्टर - २ (ए), विधाननगर, दुर्गापुर-१२
Office of the Project Director, Project Implementation Unit
NHAI Complex, Sector-2(A), Bidhannagar, Durgapur-713212
दुरभाष / Phone No. : (0343) 253 5766, 253 4815, फैक्स न० / Fax No. : (0343) 253 4676, ई-मेल / E-mail : dur@nhai.org, nhaipiudgp@yahoo.com

Dated : 13.03.2024

To Whom It May Concern

This is certified that **Subir Ghosh** of Dr. B.C. Roy Engineering College, Durgapur has successfully completed internship in the project "6 Laning of National Corridor NH-19 from Panagarh to Palsit from Km.521.120 to Km.588.870 (total design length 67.750 Km) in the state of West Bengal under Bharatmala Pariyojana to be executed on BOT (Toll) basis" of National Highways Authority of India during the period from **01.07.2023** to **31.07.2023** under the supervision of the Concessionaire, M/s Panagarh Palsit Road Pvt. Ltd. and Independent Engineer, M/s L.N. Malviya Infra Projects Pvt. Ltd.

(Manish Kumar)
Project Director

सत्यमेव जयते

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport & Highways, Govt. of India)
परियोजना निदेशक का कार्यालय, परियोजना कार्यान्वयन इकाई
एन एच ए आई कमप्लेक्स, सेक्टर – २ (ए), विधाननगर, दुर्गापुर–१२
Office of the Project Director, Project Implementation Unit
NHAI Complex, Sector-2(A), Bidhannagar, Durgapur-713212
दुरभाष / Phone No. : (0343) 253 5766, 253 4815, फैक्स न० / Fax No. : (0343) 253 4676, ई-मेल / E-mail : dur@nhai.org, nhaipiudgp@yahoo.com

Dated : 13.03.2024

To Whom It May Concern

This is certified that **Soumodeep Das** of Dr. B.C. Roy Engineering College, Durgapur has successfully completed internship in the project "6 Laning of National Corridor NH-19 from Panagarh to Palsit from Km.521.120 to Km.588.870 (total design length 67.750 Km) in the state of West Bengal under Bharatmala Pariyojana to be executed on BOT (Toll) basis" of National Highways Authority of India during the period from **01.07.2023** to **31.07.2023** under the supervision of the Concessionaire, M/s Panagarh Palsit Road Pvt. Ltd. and Independent Engineer, M/s L.N. Malviya Infra Projects Pvt. Ltd.

(Manish Kumar)
Project Director

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport & Highways, Govt. of India)
परियोजना निदेशक का कार्यालय, परियोजना कार्यान्वयन इकाई
एन एच ए आई कमप्लेक्स, सेक्टर – २ (ए), विधाननगर, दुर्गापुर–१२
Office of the Project Director, Project Implementation Unit
NHAI Complex, Sector-2(A), Bidhannagar, Durgapur-713212
दुरभाष / Phone No. : (0343) 253 5766, 253 4815, फैक्स न० / Fax No. : (0343) 253 4676, ई-मेल / E-mail : dur@nhai.org, nhaipiudgp@yahoo.com

Dated : 13.03.2024

To Whom It May Concern

This is certified that **Sonalpriyo Banerjee** of Dr. B.C. Roy Engineering College, Durgapur has successfully completed internship in the project "6 Laning of National Corridor NH-19 from Panagarh to Palsit from Km.521.120 to Km.588.870 (total design length 67.750 Km) in the state of West Bengal under Bharatmala Pariyojana to be executed on BOT (Toll) basis" of National Highways Authority of India during the period from **01.07.2023** to **31.07.2023** under the supervision of the Concessionaire, M/s Panagarh Palsit Road Pvt. Ltd. and Independent Engineer, M/s L.N. Malviya Infra Projects Pvt. Ltd.

(**Manish Kumar**)
Project Director

सत्यमेव जयते

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport & Highways, Govt. of India)
परियोजना निदेशक का कार्यालय, परियोजना कार्यान्वयन इकाई
एन एच ए आई कमप्लेक्स, सेक्टर - २ (ए), विधाननगर, दुर्गापुर-१२
Office of the Project Director, Project Implementation Unit
NHAI Complex, Sector-2(A), Bidhannagar, Durgapur-713212
दुरभाष / Phone No. : (0343) 253 5766, 253 4815, फैक्स न० / Fax No. : (0343) 253 4676, ई-मेल / E-mail : dur@nhai.org, nhaipiudgp@yahoo.com

Dated : 13.03.2024

To Whom It May Concern

This is certified that **Deeya Chattopadhyay** of Dr. B.C. Roy Engineering College, Durgapur has successfully completed internship in the project "6 Laning of National Corridor NH-19 from Panagarh to Palsit from Km.521.120 to Km.588.870 (total design length 67.750 Km) in the state of West Bengal under Bharatmala Pariyojana to be executed on BOT (Toll) basis" of National Highways Authority of India during the period from **01.07.2023** to **31.07.2023** under the supervision of the Concessionaire, M/s Panagarh Palsit Road Pvt. Ltd. and Independent Engineer, M/s L.N. Malviya Infra Projects Pvt. Ltd.

(Manish Kumar)
Project Director

सत्यमेव जयते

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport & Highways, Govt. of India)
परियोजना निदेशक का कार्यालय, परियोजना कार्यान्वयन इकाई
एन एच ए आई कमप्लेक्स, सेक्टर - २ (ए), विधाननगर, दुर्गापुर-१२
Office of the Project Director, Project Implementation Unit
NHAI Complex, Sector-2(A), Bidhannagar, Durgapur-713212
दुरभाष / Phone No. : (0343) 253 5766, 253 4815, फैक्स न० / Fax No. : (0343) 253 4676, ई-मेल / E-mail : dur@nhai.org, nhaipiudgp@yahoo.com

Dated : 13.03.2024

To Whom It May Concern

This is certified that **Niraj Kumar** of Dr. B.C. Roy Engineering College, Durgapur has successfully completed internship in the project "6 Laning of National Corridor NH-19 from Panagarh to Palsit from Km.521.120 to Km.588.870 (total design length 67.750 Km) in the state of West Bengal under Bharatmala Pariyojana to be executed on BOT (Toll) basis" of National Highways Authority of India during the period from **01.07.2023** to **31.07.2023** under the supervision of the Concessionaire, M/s Panagarh Palsit Road Pvt. Ltd. and Independent Engineer, M/s L.N. Malviya Infra Projects Pvt. Ltd.

(Manish Kumar)
Project Director

सत्यमेव जयते

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport & Highways, Govt. of India)
परियोजना निदेशक का कार्यालय, परियोजना कार्यान्वयन इकाई
एन एच ए आई कमप्लेक्स, सेक्टर – २ (ए), विधाननगर, दुर्गापुर–१२
Office of the Project Director, Project Implementation Unit
NHAI Complex, Sector-2(A), Bidhannagar, Durgapur-713212
दुरभाष / Phone No. : (0343) 253 5766, 253 4815, फैक्स न० / Fax No. : (0343) 253 4676, ई-मेल / E-mail : dur@nhai.org, nhaipiudgp@yahoo.com

Dated : 13.03.2024

To Whom It May Concern

This is certified that **Abhishek Kumar** of Dr. B.C. Roy Engineering College, Durgapur has successfully completed internship in the project "6 Laning of National Corridor NH-19 from Panagarh to Palsit from Km.521.120 to Km.588.870 (total design length 67.750 Km) in the state of West Bengal under Bharatmala Pariyojana to be executed on BOT (Toll) basis" of National Highways Authority of India during the period from **01.07.2023** to **31.07.2023** under the supervision of the Concessionaire, M/s Panagarh Palsit Road Pvt. Ltd. and Independent Engineer, M/s L.N. Malviya Infra Projects Pvt. Ltd.

(Manish Kumar)
Project Director

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport & Highways, Govt. of India)
परियोजना निदेशक का कार्यालय, परियोजना कार्यान्वयन इकाई
एन एच ए आई कमप्लेक्स, सेक्टर – २ (ए), विधाननगर, दुर्गापुर–१२
Office of the Project Director, Project Implementation Unit
NHAI Complex, Sector-2(A), Bidhannagar, Durgapur-713212
दुरभाष / Phone No. : (0343) 253 5766, 253 4815, फैक्स न० / Fax No. : (0343) 253 4676, ई-मेल / E-mail : dur@nhai.org, nhaipiudgp@yahoo.com

Dated : 13.03.2024

To Whom It May Concern

This is certified that **Subhajit Pradhan** of Dr. B.C. Roy Engineering College, Durgapur has successfully completed internship in the project "6 Laning of National Corridor NH-19 from Panagarh to Palsit from Km.521.120 to Km.588.870 (total design length 67.750 Km) in the state of West Bengal under Bharatmala Pariyojana to be executed on BOT (Toll) basis" of National Highways Authority of India during the period from **01.07.2023** to **31.07.2023** under the supervision of the Concessionaire, M/s Panagarh Palsit Road Pvt. Ltd. and Independent Engineer, M/s L.N. Malviya Infra Projects Pvt. Ltd.

(Manish Kumar)
Project Director

सत्यमेव जयते

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport & Highways, Govt. of India)
परियोजना निदेशक का कार्यालय, परियोजना कार्यान्वयन इकाई
एन एच ए आई कमप्लेक्स, सेक्टर - २ (ए), विधाननगर, दुर्गापुर-१२
Office of the Project Director, Project Implementation Unit
NHAI Complex, Sector-2(A), Bidhannagar, Durgapur-713212
दुरभाष / Phone No. : (0343) 253 5766, 253 4815, फैक्स न० / Fax No. : (0343) 253 4676, ई-मेल / E-mail : dur@nhai.org, nhaipiudgp@yahoo.com

Dated : 13.03.2024

To Whom It May Concern

This is certified that **Mirza Sariful Islam** of Dr. B.C. Roy Engineering College, Durgapur has successfully completed internship in the project "6 Laning of National Corridor NH-19 from Panagarh to Palsit from Km.521.120 to Km.588.870 (total design length 67.750 Km) in the state of West Bengal under Bharatmala Pariyojana to be executed on BOT (Toll) basis" of National Highways Authority of India during the period from **01.07.2023** to **31.07.2023** under the supervision of the Concessionaire, M/s Panagarh Palsit Road Pvt. Ltd. and Independent Engineer, M/s L.N. Malviya Infra Projects Pvt. Ltd.

(Manish Kumar)
Project Director

सत्यमेव जयते

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport & Highways, Govt. of India)
परियोजना निदेशक का कार्यालय, परियोजना कार्यान्वयन इकाई
एन एच ए आई कमप्लेक्स, सेक्टर - २ (ए), विधाननगर, दुर्गापुर-१२
Office of the Project Director, Project Implementation Unit
NHAI Complex, Sector-2(A), Bidhannagar, Durgapur-713212
दुरभाष / Phone No. : (0343) 253 5766, 253 4815, फैक्स न० / Fax No. : (0343) 253 4676, ई-मेल / E-mail : dur@nhai.org, nhaipiudgp@yahoo.com

Dated : 13.03.2024

To Whom It May Concern

This is certified that **Koushik Nayek** of Dr. B.C. Roy Engineering College, Durgapur has successfully completed internship in the project "6 Laning of National Corridor NH-19 from Panagarh to Palsit from Km.521.120 to Km.588.870 (total design length 67.750 Km) in the state of West Bengal under Bharatmala Pariyojana to be executed on BOT (Toll) basis" of National Highways Authority of India during the period from **01.07.2023** to **31.07.2023** under the supervision of the Concessionaire, M/s Panagarh Palsit Road Pvt. Ltd. and Independent Engineer, M/s L.N. Malviya Infra Projects Pvt. Ltd.

(Manish Kumar)
Project Director

सत्यमेव जयते

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport & Highways, Govt. of India)
परियोजना निदेशक का कार्यालय, परियोजना कार्यान्वयन इकाई
एन एच ए आई कमप्लेक्स, सेक्टर - २ (ए), विधाननगर, दुर्गापुर-१२
Office of the Project Director, Project Implementation Unit
NHAI Complex, Sector-2(A), Bidhannagar, Durgapur-713212
दुरभाष / Phone No. : (0343) 253 5766, 253 4815, फैक्स न० / Fax No. : (0343) 253 4676, ई-मेल / E-mail : dur@nhai.org, nhaipiudgp@yahoo.com

Dated : 13.03.2024

To Whom It May Concern

This is certified that **Prakash De** of Dr. B.C. Roy Engineering College, Durgapur has successfully completed internship in the project "6 Laning of National Corridor NH-19 from Panagarh to Palsit from Km.521.120 to Km.588.870 (total design length 67.750 Km) in the state of West Bengal under Bharatmala Pariyojana to be executed on BOT (Toll) basis" of National Highways Authority of India during the period from **01.07.2023** to **31.07.2023** under the supervision of the Concessionaire, M/s Panagarh Palsit Road Pvt. Ltd. and Independent Engineer, M/s L.N. Malviya Infra Projects Pvt. Ltd.

(Manish Kumar)
Project Director

सत्यमेव जयते

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport & Highways, Govt. of India)
परियोजना निदेशक का कार्यालय, परियोजना कार्यान्वयन इकाई
एन एच ए आई कमप्लेक्स, सेक्टर – २ (ए), विधाननगर, दुर्गापुर–१२
Office of the Project Director, Project Implementation Unit
NHAI Complex, Sector-2(A), Bidhannagar, Durgapur-713212
दुरभाष / Phone No. : (0343) 253 5766, 253 4815, फैक्स न० / Fax No. : (0343) 253 4676, ई-मेल / E-mail : dur@nhai.org, nhaipiudgp@yahoo.com

Dated : 13.03.2024

To Whom It May Concern

This is certified that **Biswapriya Bandopadhyay** of Dr. B.C. Roy Engineering College, Durgapur has successfully completed internship in the project "6 Laning of National Corridor NH-19 from Panagarh to Palsit from Km.521.120 to Km.588.870 (total design length 67.750 Km) in the state of West Bengal under Bharatmala Pariyojana to be executed on BOT (Toll) basis" of National Highways Authority of India during the period from **01.07.2023** to **31.07.2023** under the supervision of the Concessionaire, M/s Panagarh Palsit Road Pvt. Ltd. and Independent Engineer, M/s L.N. Malviya Infra Projects Pvt. Ltd.

(Manish Kumar)
Project Director

सत्यमेव जयते

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport & Highways, Govt. of India)
परियोजना निदेशक का कार्यालय, परियोजना कार्यान्वयन इकाई
एन एच ए आई कमप्लेक्स, सेक्टर – २ (ए), विधाननगर, दुर्गापुर–१२
Office of the Project Director, Project Implementation Unit
NHAI Complex, Sector-2(A), Bidhannagar, Durgapur-713212
दुरभाष / Phone No. : (0343) 253 5766, 253 4815, फैक्स न० / Fax No. : (0343) 253 4676, ई-मेल / E-mail : dur@nhai.org, nhaipiudgp@yahoo.com

Dated : 13.03.2024

To Whom It May Concern

This is certified that **Basu Bhowmick** of Dr. B.C. Roy Engineering College, Durgapur has successfully completed internship in the project "6 Laning of National Corridor NH-19 from Panagarh to Palsit from Km.521.120 to Km.588.870 (total design length 67.750 Km) in the state of West Bengal under Bharatmala Pariyojana to be executed on BOT (Toll) basis" of National Highways Authority of India during the period from **01.07.2023** to **31.07.2023** under the supervision of the Concessionaire, M/s Panagarh Palsit Road Pvt. Ltd. and Independent Engineer, M/s L.N. Malviya Infra Projects Pvt. Ltd.

(**Manish Kumar**)
Project Director

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन और राजमार्ग मंत्रालय, भारत सरकार)
National Highways Authority of India
(Ministry of Road Transport & Highways, Govt. of India)
परियोजना निदेशक का कार्यालय, परियोजना कार्यान्वयन इकाई
एन एच ए आई कमप्लेक्स, सेक्टर - २ (ए), विधाननगर, दुर्गापुर-१२
Office of the Project Director, Project Implementation Unit
NHAI Complex, Sector-2(A), Bidhannagar, Durgapur-713212
दुरभाष / Phone No. : (0343) 253 5766, 253 4815, फैक्स न० / Fax No. : (0343) 253 4676, ई-मेल / E-mail : dur@nhai.org, nhaipiudgp@yahoo.com

Dated : 13.03.2024

To Whom It May Concern

This is certified that **Md. Anaj Khan** of Dr. B.C. Roy Engineering College, Durgapur has successfully completed internship in the project "6 Laning of National Corridor NH-19 from Panagarh to Palsit from Km.521.120 to Km.588.870 (total design length 67.750 Km) in the state of West Bengal under Bharatmala Pariyojana to be executed on BOT (Toll) basis" of National Highways Authority of India during the period from **01.07.2023** to **31.07.2023** under the supervision of the Concessionaire, M/s Panagarh Palsit Road Pvt. Ltd. and Independent Engineer, M/s L.N. Malviya Infra Projects Pvt. Ltd.

(Manish Kumar)
Project Director

GOVERNMENT OF WEST BENGAL
OFFICE OF THE EXECUTIVE ENGINEER
NATIONAL HIGHWAY DIVISION NO.-XII
P.W. (ROADS) DIRECTORTE
TILPARA, SURI, BIRBHUM
PHONE & FAX NO: 03462-796942 email: -nhdivisionxii@yahoo.com

TO WHOM IT MAY CONCERN

This is to certify that **Sri AMAN RAHAMAN MUNSHI (Roll No.12001320009)**, student of Civil Engineering branch in **"Dr. B.C. ROY ENGINEERING COLLEGE, DURGAPUR", (Campus: - Jemua Road, Fuljhore, Durgapur, West Bengal, Pin-713206)** *has completed* the Internship Training from **25/06/2023 to 24/07/2023** under this office. He has been given the exposure to different type of Road & Bridges works as well as acquaintance to plant and machineries during this training period.

I wish his every success in life.

Office of the Executive Engineer N. H. Division No-XII, P.W. (Roads) Directorate
Govt. of West Bengal
सत्यमेव जयते
Suri, Birbhum

02.08.23
Executive Engineer
N. H. Division No. XII
P.W (Roads) Directorate

Executive Engineer
National Highway Division No.XII
P.W. (Roads) Directorate
Tilpara, Suri, Birbhum

Government of West Bengal

Office of the Assistant Engineer
Public Works Department
Durgapur Sub-Division

City Centre, Durgapur-713216,
Paschim Bardhanan,
Email: acpwdsubdgp@gmail.com

TO WHOM IT MAY CONCERN

It is hereby certified that Md Adif Naushad, a student of Civil Engineering Department of Dr. B.C. Roy Engineering College, Durgapur, West Bengal has gone through a Practical Training under Office of the Assistant Engineer, Durgapur Sub-Division, PWD during the period from 01.07.2023 to 01.08.2023 satisfactorily. He was actively involved in supervision of Construction of 100 Bedded COVID Hospital Building (RCC structure-including infrastructure development works) within the premises of Sub Divisional Hospital Durgapur in the District of Paschim Bardhaman under PWD, Asansol Division during that Period.

He has completed the training successfully with utmost interest, obedience and respect.
I wish him every success in life

11.09.23

Assistant Engineer, P.W.D
Durgapur Sub Division

Office of the Assistant Engineer (P.W.D.) Durgapur Sub-Division GOVT OF WEST BENGAL सत्यमेव जयते

दामोदर घाटी निगम

Damodar Valley Corporation

CHANDRAPURA THERMAL POWER STATION

Chandrapura, Bokaro (Jharkhand)

TO WHOM IT MAY CONCERN

No. CT/PL-31 (Trg) / 460 Date 20.07.2023.

This is to certify that Mr./Mrs. Sreepriya Verma

Roll / Reg. No. 12001321067 a student of 6th semester

B.Tech. in Civil Engineering

from Dr. B.C. Roy Engineering College, Durgapur has successfully completed the vocational Training ar Damodar Valley Corporation, Chandrapura Thermal Power Station with effect from 30.06.2023 to 20.07.2023.

He/She was found attentive, sincere, punctual and energetic during the period of his / her Training

We wish him / her all success in his life.

Place : Chandrapura

Dated : 20.07.2023.

20/07/2023

उप निदेशक (मा० सं०)
Dy. Director (H. R.)
दा.घा.नि., चं.ता.वि.के. चन्दपुरा
DVC, CTPS, CHANDRAPURA

SDE (E) - HR
DVC, CTPS

DR. B. C. ROY ENGINEERING COLLEGE

DURGAPUR

INDUSTRIAL INTERNSHIP

CE(IN)791

REPORT

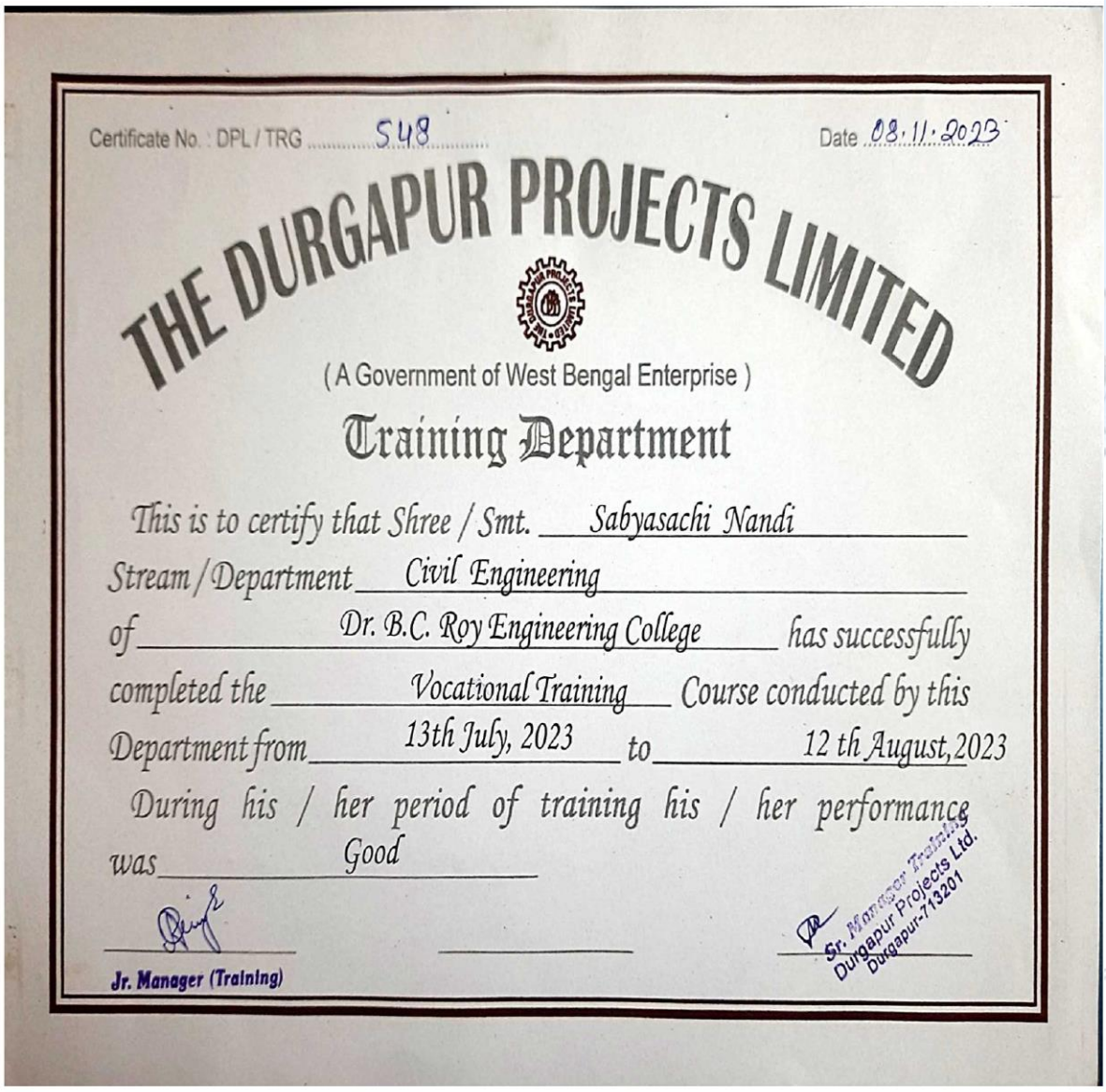
On

"THE DURGAPUR PROJECTS LIMITED (DPL) PLANT VISITING AND THE WATER TREATMENT PLANT & DRINKING WATER TREATMENT PLANT VISITING (DPL)"

Submitted By

SABYASACHI NANDI (12001321052); (2023-24)

CERTIFICATE



Certificate No. : DPL / TRG 548 Date 08.11.2023

THE DURGAPUR PROJECTS LIMITED

(A Government of West Bengal Enterprise)

Training Department

This is to certify that Shree / Smt. Sabyasachi Nandi

Stream / Department Civil Engineering

of Dr. B.C. Roy Engineering College has successfully completed the Vocational Training Course conducted by this Department from 13th July, 2023 to 12 th August, 2023

During his / her period of training his / her performance was Good

Jr. Manager (Training)

Sr. Manager Training
Durgapur Projects Ltd.
Durgapur-713201

THE DURGAPUR PROJECTS LIMITED (DPL)

A Government of West Bengal Enterprise

A Project Report on Vocational Training at DURGAPUR PROJECTS LIMITED (DPL)

SUBMITTED BY: SABYASACHI NANDI (12001321052)

STREAM: CIVIL ENGINEERING (B. TECH)

SEMESTER: 7TH; YEAR: 4TH

COLLEGE NAME: DR. B. C. ROY ENGINEERING COLLEGE; DURGAPUR.

ACKNOWLEDGEMENT

We the students of 4th year of **civil engineering** department of **DR. B. C. ROY ENGINEERING COLLEGE, DURGAPUR** have undergone a vocational training for a period of one month at the **DURGAPUR PROJECTS LIMITED (DPL).**

we are thankful to our college and especially **DR. Sanjay Sengupta (HOD), MR. Anupam Kumar Biswas (Asst. prof.)** for facilitating us with this opportunity. This study work would not have been possible without the valuable guidance of **MR. AVIJIT GHOSH** & **MR. ARNAB BANERJEE** training officer of D.P.L. for permitting us to take vocational training in this reputed concern.

We are also thankful to D.P.L. management and other asst. manager or employees of civil department for giving us their precious time and constructive guidance in training period. Without their co-operation we do not complete this training and report in this short period.

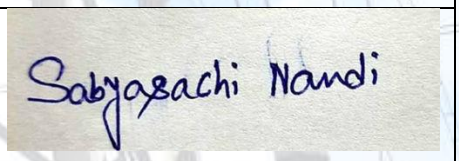
NAME	ROLL NO.	SIGNATURE
SABYASACHI NANDI	12001321052	

TABLE OF CONTENTS

INTRODUCTION

In this modern world the dependence of electricity is so much that it has become a part of our life. There has been ever increasing use of electric power for domestic, commercial, and industrial purposes. This is achieved with the help of suitable power producing units known as power plant or Electric power generating station. The design of power plant should incorporate two important aspects. Firstly, the selection and placing of necessary power generating equipment should be such so that a maximum return will result from a minimum expenditure ever working of life of plant. Secondly, the operation of the plant should be such to provide cheap, reliable, and continuous service.

OVERVIEW

"DURGAPUR PROJECT LIMITED (DPL)" was established in the year 1950 by the West Bengal Government. It has a power plant; water works and coke oven plant. DPL today is a renovated and upgrade power utility. A total of 2 units running unit no. 7 of 300MW and unit no. 8 of 250MW capacity. After fulfilling total requirements of its command area, DPL surplus power goes to the West Bengal State Electricity Board (WBSEB).

PRODUCTION FACILLITIES

POWER PLANTS

Durgapur Projects Limited's total power generation capacity after the recent renovation and up gradation today stands at 550MW. It is engaged in all the three functional areas of a power utility- generation, transmission, and distribution.

DPL' s unit wise power plant capacity and availability

Description	Unit VII	Unit VIII	Total
Capacity (MW)	300	250	550
Boiler Make	Dung Fang	BHEL	
Generator Make	Dung Fang	BHEL	
Availability (%)	100	100	

WATER WORKS

To supply industrial and drinking water to the residents of DPL township, the company maintains its captive water storage facility. It has its own water treatment plant. While water pumping capacity remains at 35 million gallons per day (MGD), the water treatment capacity has been augmented by 6 MGD to 41 MGD.

Water Works

Description	1st Phase	2nd Phase	Total
Pumping Capacity (MGD)	35	-	35
Treatment Capacity (MGD)	35	6	41
Type of Treatment	Clariflocculator, filter & chlorinator	Clariflocculator, filter & chlorinator	

Chemicals for Treatment	**Ferric Alum, Lime & Chlorine**	**Ferric Alum, Lime & Chlorine**	
Distribution Network	**Overhead Tank, Pumping Station & Piping**	**Overhead Tank, Pumping Station & Piping**	

<u>Coal-fired thermal power station:</u> There are many parts in the thermal power station: **1. Cooling tower, 2. Cooling water pump, 3. Transformer, 4. Electrical generator, 5. Low pressure steam turbine, 6. Pump, steam control valve, 7. High pressure steam turbine, 8. Water heater, 9. Coal conveyor, 10. Coal hopper, 11. Precipitator, 12. Boiler steam drum, 13. Ash silo, 14. Boiler.**

Boiler: The boiler is a rectangular furnace about 50feet (15m) on a side and 130feet (40m) tall. Its walls are made of a web of high-pressure steel tubes about 2.3 inches (58mm) in diameter.

Ash silo: Fly ash is captured and removed from the flue gas by electrostatics precipitators or fabric bag filters located at the outlet of the furnace and before the induced draft fan. The fly ash is removed from the collection hoppers below the precipitators or bag filters. Generally, the fly ash is transported to storage silos for subsequent transport by trucks or railroad cars.

COOLING TOWERS

Cooling towers are heat removal devices used to transfer process waste heat to the atmosphere. Cooling towers may either use the evaporation of water to remove process heat and cool the working fluid to near the wet-bulb air temperature or, in the case of closed-circuit dry cooling towers, rely solely on air to cool the working fluid to near the dry-bulb air temperature.

Cooling towers vary in size from small roof-top units to very large structures that can be up to 200m tall and 100m in diameter, or rectangular structures that can be over 40m tall and 80m long. The cooling tower are used in nuclear power plants, some large chemical and other industrial plants.

With respect to the heat transfer methods, the main types are:

1. **Dry cooling towers.**
2. **Wet cooling towers.**
3. **Closed circuit cooling towers.**

CONVENTIONAL DRINKING WATER TREATMENT

Design or primary objectives are removal of:

Microbial pathogens (coli forms pathogens) – health – health concerns.

Particles (colour and turbidity) – health and aesthetic concerns.

Total dissolved solids removal (hard waters) – health and aesthetic concerns.

GROUNDWATER (GW): In comparison to surface waters, groundwater (GW) tends to have lower dissolved oxygen again, compared to surface waters, GW can have very little microbial contamination especially if GW is from a deep aquifer, much higher concentrations of inorganic compounds: anions chloride, carbonates, sulphates, bromide, nitrates, fluorides, arsenide and arsenate and cations – calcium, magnesium, iron. (Hardness is the concentration of all multivalent cations- mainly Ca and Mg in GW). Surface waters have high turbidity and microbial concentrations. Dissolved oxygen concentrations vary depending on organic matter concentration.

WATER TREATMENT PLANT

PUMPING SYSTEM

The concrete platforms used to house large motors or pump assemblies that brought sewage up from a deep main drain into several outfall sewers, taking it away from the city centre. Pumping stations in sewage collection systems, also called lift stations, are normally designed to handle raw sewage that is fed from underground gravity pipelines. Sewage is fed into and stored in an underground pit, commonly known as a wet well. The well is equipped with electrical instrument to detect the level of sewage present. When the sewage level rises to a predetermined point, a pump will be started to lift the sewage upward through a pressurized pump system called a sewer force main or rising main from where the sewage is discharged into a gravity manhole. From here the cycle starts all over again until the sewage reaches its point of destination- usually a treatment plant. By this method, pumping stations are used to move waste to higher elevations. The storage volume of that wet well between the “pump on” and “pump off” setting is designed to minimize pump starts and stops.

CHLORINATION

Chlorination is the process of adding chlorine to drinking water to kill parasites, bacteria, and viruses.

CHLORINE CHEMISTRY

Reactions in water

Addition of chlorine to water results in the formation of hypochlorous [HOCL] and hydrochloric acids [HCL]:

$CL + H_2O \longrightarrow HOCL + HCL$, PH = 3.39

PROBLEMS WITH CHLORINE

- Hazardous material.
- Difficulty in transportation, handling, and storage.
- Pungent compound.
- Disagreeable teste and Odor.
- Dermal and eye irritation.
- Microbial resistance to chlorine.
- More affective against bacteria rather than spores, cysts, and viral particles.
- Disinfection byproducts (DBPs) formation.
- Potential health hazard: carcinogenic, mutagenic, and teratogenic.
- Non-carcinogenic effects little information or discussion in literature.

LIME ($Ca(OH)_2$) AND / OR CaO TREATMENT

Lime is the generic term used to describe hydrated lime and quicklime. Calcium hydroxide (hydrated lime) and calcium oxide (quicklime) are chemicals frequently used to raise the pH of raw water before the water is treated with alum or ferric sulphates for coagulation or flocculation. Hydrated lime and quicklime are colourless crystals or white powders that are available for purchase in bags, bulk, or truckload. Both the forms should be handled with care since the dust can be quite irritating to the skin and eyes. Hydrated lime can be directly applied to the water treatment process. Quicklime, (in pellet form) must first be slaked, or mixed with water then heated to turn into hydrated lime before use. When quicklime is mixed with water there is potential for explosions due to the heat released from the chemical combinations. Lime also has reactions with alum and ferric sulphates, so direct mixing should be avoided. Storage of these products should be in cool, dry places. Always wear goggles, a dust mask and protective clothing wile handling lime. A face shield for protection from splattering should be worn when inspecting lime slackers.

FERRIC ALUM TREATMENT

- Alums are useful for a range of industrial processes. They are soluble in soluble; they react acid to litmus; and crystallize in regular octahedral.
- Alum is used to clarify water by neutralizing the electrical double layer surrounding very fine suspended particles, allowing them to flocculate (stick together). After flocculation, the particles will be large enough to settle and can be removed.
- Alum may be used to increase the viscosity of ceramic glaze suspensions; this makes the glaze more readily adherent and slow its rate of sedimentation. Alum is an ingredient in some recipes for homemade modelling compounds intended for use by children.

PROCEDURE FOR TREATMENT OF DRINKING WATER

FILTRATION:

Removal of flocculated particles of smaller size (those that cannot be removed by settling)

- Rapid sand filters: higher throughput.
- Slow sand filters: lower throughput.
- Adsorption is another important mechanism for particle removal.
- Backwashing of rapid sand filters is essential to regain head loss due to clogging.
- Generally done with chlorinated water to disinfect filters.

PHOTOGRAPHY TAKEN

CONCLUSION

My internship at the DURGAPUR PROJECTS LIMITED (DPL) plant site and water treatment plant site was a great experience. I learned a lot about the water treatment process and different safety that are taken in the working time. It was a good experience and memories as not only I have gained experience but also new friends and knowledge. I also gained a better understanding of the safety hazards associated with this type of work. Overall, I enjoyed my internship and would recommend THE DURGAPUR PROJECTS LIMITED (DPL), DURGAPUR. I am grateful and thankful to contractors and Engineers for guiding me.

Dr. B. C. Roy Engineering College

Department of Civil Engineering

Date: 28.02.2024

NOTICE

Workshop on MS Project

This for the information to the students of the 3rd year B. Tech Civil Engineering Department that the two days workshop **on MS Project** to be conducted by CAAD Centre, Ultodanga on 15th & 16th March 2024 will be held at Digital Room of Civil Engineering Department. All the registered students are advised to attend the workshop which will start from 10 am on both the days.

Sanjay Sengupta 28/02/2024

Dr. Sanjay Sengupta
Prof. and Head of the Department
Civil Engineering Department, BCREC

H.O.D
CIVIL ENGG. DEPT.
Dr. B. C. ROY ENGINEERING COLLEGE
DURGAPUR

DR. B.C. ROY ENGINEERING COLLEGE * Durgapur

TWO - DAY WORKSHOP

on

Microsoft Project

Organized by

Department of Civil Engineering

DR. B. C. ROY ENGINEERING COLLEGE, DURGAPUR

Conducted by

CADD Center, Ultodanga, Kolkata

AUTODESK REVIT

Date: 15th & 16th March, 2024 (10 am to 5pm)

Venue: 3rd Floor, Seminar Hall, APC Roy Bhawan

Workshop on M.S Project (3rd Year) on 15/3/24 & 16/3/24)

Under Civil Engineerting Department

Registered Student List

SL. NO.	UNIVERSITY ROLL NO.	NAME	REGISTRATION FEES
1	12001321003	ARNAB MONDAL	250.00
2	12001321004	ASHUTOSH BADHUK	250.00
3	12001321006	MAMUN RAHAMAN	250.00
4	12001321020	SUBHRANIL DUTTA	250.00
5	12001321023	KOUSHIK MAHATA	250.00
6	12001321026	BALARAM DEY	250.00
7	12001321027	AIHIK MAHINDER	250.00
8	12001321029	PRIYANSHU DAS	250.00
9	12001321035	MUSKAN NISHA	250.00
10	12001322015	SOMNATH SEN	250.00
11	12001322016	JOYDEEP MONDAL	250.00
12	12001322017	SUDIPTA GHOSH	250.00
13	12001322018	MANAS SAHA	250.00
14	12001322019	NEHA BHATTACHARJEE	250.00
15	12001322020	ANKITA KUNDU	250.00
16	12001322022	ANIRBAN KAR	250.00
17	12001322023	ABHIJIT SAR	250.00
18	12001322024	DEBDEEP BASURI	250.00
19	12001322025	ARGHAJIT GAN	250.00
20	12001322026	NAYNA DAS	250.00
21	12001322027	DIPIKA SEN	250.00
22	12001322028	SHUVAM MAJEE	250.00
23	12001322029	BHAIRAB MAJI	250.00
24	12001322031	ANANYA GHOSH	250.00
25	12001322032	ANINDYA CHATTERJEE	250.00
26	12001322033	SNEHA KARMAKAR	250.00
27	12001322034	RAHUL PANDIT	250.00
28	12001322035	SANDIP PAL	250.00
29	12001322036	SAYAN PATHAK	250.00
30	12001322037	TIRTHA PRATIM DATTA	250.00
31	12001322039	ROHIT DEOGHARIA	250.00
32	12001322041	SUDESNA PAUL	250.00
33	12001322042	PURBA SAHA	250.00
34	12001322043	ALOK	250.00
35	12001322045	SUMAN GHOSH	250.00
36	12001322047	SUJOY BIT	250.00

Sanjay Sengupta
12/03/2024

H.O.D
CIVIL ENGG. DEPT.
Dr. B. C. ROY ENGINEERING COLLEGE
DURGAPUR

DR. B. C. ROY ENGINEERING COLLEGE * Durgapur

About the workshop:

Two Days Workshop on **"MS Project"** was organized by Civil Engineering Department on 15th & 16th March, 2024 from 10 a.m. to 5 p.m. It was conducted by Kolkata CADD Centre, Ultodanga. Mr. Sandip Banerjee & Mr. Sandip Kumar Saha were the resource persons for the workshop. Microsoft Project is project management software that's used to create schedules, project plans, manage resources and keep track of time. It is designed to assist a project manager in developing a schedule, assigning resources to tasks, tracking progress, managing the budget, and analyzing workloads. Project calendar, Recurring task & Constraints, Resource defining and assigning, Resource analyze and leveling, Tracking, Earned value, Filters and Groups etc. were the content of this workshop. Students had done hands on practice on it. These courses are not only trending in today's date but offer ample opportunity and career prospects for the students graduating in Civil Engineering discipline. Students were given projects to complete and after completion of the project they were given certificates by CAAD Centre.

About the resource persons:

SANDIP BANERJEE

(Sr. Consultant & Mentor)
BE- CIVIL from Bengal Engineering College, Shibpur; PGCPM from IIM, Indore
Council member & Independent Consultant in National & Multinational Management Consultancy Groups.

Mr. Sandip Banerjee has rich industry experience of 22 years in the field of Management & Engineering, Sales & Marketing, Teaching, Training & Mentoring. He has worked in senior management cadre in large Public Limited Organizations & MNCs, like ACC Cement, Prism Cement, Ambuja, Lafarge, SIKA AG. He served as guest faculty & lecturer in several Management Colleges in Kolkata teaching General Management, Sales, Marketing, HR, Business & Operational Excellence. He is a council member & independent consultant attached to several Management Consultancy Groups, like Gerson Lehrman Group, New York & Third Bridge, UK. He is a Trainer, Business coach and Mentor. He is helping in course design, training & mentoring our students for a bright career.

SANJIB SAHA

He is working as a Technical Head in Civil CAD & Project Mgmt. He is DCE, B.Tech in Civil Engineering.
Mr. Sanjib Saha has rich experience of 18 years as CAD Engineer /PMC & Trainer.

Workshop on M.S Project (3rd Year) on 15/3/24 & 16/3/24)
Under Civil Engineerting Department

ATTENDANCE SHEET (15/3/24)

SL. NO.	UNIVERSITY ROLL NO.	NAME	1st Half	2nd Half
1	12001321003	ARNAB MONDAL	Arnab Mondal	Arnab Mondal
2	12001321004	ASHUTOSH BADHUK	Ashutosh Badhuk	Ashutosh Badhuk
3	12001321006	MAMUN RAHAMAN	Mamun Rahaman	Mamun Rahaman
4	12001321020	SUBHRANIL DUTTA	Subhranil Dutta	Subhranil Dutta
5	12001321023	KOUSHIK MAHATA	Koushik Mahata	Koushik Mahata
6	12001321026	BALARAM DEY	Balaram Dey	Balaram Dey
7	12001321027	AIHIK MAHINDER	Aihik Mahinder	Aihik Mahinder
8	12001321029	PRIYANSHU DAS	Priyanshu Das	Priyanshu Das
9	12001321035	MUSKAN NISHA	Muskan Nisha	Muskan Nisha
10	12001322015	SOMNATH SEN	Somnath Sen	Somnath Sen
11	12001322016	JOYDEEP MONDAL	Joydeep Mondal	Joydeep Mondal
12	12001322017	SUDIPTA GHOSH	Sudipta Ghosh	Sudipta Ghosh
13	12001322018	MANAS SAHA	Manas Saha	Manas Saha
14	12001322019	NEHA BHATTACHARJEE	Neha Bhattacharjee	Neha Bhattacharjee
15	12001322020	ANKITA KUNDU	Ankita kundu	Ankita kundu
16	12001322022	ANIRBAN KAR	Anirban Kar	Anirban Kar
17	12001322023	ABHIJIT SAR	Abhijit Sar	Abhijit Sar
18	12001322024	DEBDEEP BASURI	Debdeep Basuri	Debdeep Basuri
19	12001322025	ARGHAJIT GAN	Arghajit Gan	Arghajit Gan
20	12001322026	NAYNA DAS	Nayna Das	Nayna Das
21	12001322027	DIPIKA SEN	Dipika Sen	Dipika Sen
22	12001322028	SHUVAM MAJEE	Shuvam Majee	Shuvam Majee
23	12001322029	BHAIRAB MAJI	Bhairab Maji	Bhairab Maji
24	12001322031	ANANYA GHOSH	Ananya Ghosh	Ananya Ghosh
25	12001322032	ANINDYA CHATTERJEE	Anindya Chatterjee	Anindya Chatterjee
26	12001322033	SNEHA KARMAKAR	Sneha Karmakar	Sneha Karmakar
27	12001322034	RAHUL PANDIT	Rahul Pandit	Rahul Pandit
28	12001322035	SANDIP PAL	Sandip Pal	Sandip Pal
29	12001322036	SAYAN PATHAK	Sayan Pathak	Sayan Pathak
30	12001322037	TIRTHA PRATIM DATTA	Tirtha Pratim Datta	Tirtha Pratim Datta
31	12001322039	ROHIT DEOGHARIA	Rohit Deogharia	Rohit Deogharia
32	12001322041	SUDESNA PAUL	Sudesna Paul	Sudesna Paul
33	12001322042	PURBA SAHA	Purba Saha	Purba Saha
34	12001322043	ALOK	Alok	Alok
35	12001322045	SUMAN GHOSH	Suman Ghosh	Suman Ghosh
36	12001322047	SUJOY BIT	Sujoy Bit	Sujoy Bit

Sanjoy Sengupta 15/3/24

DR. B.C. ROY ENGINEERING COLLEGE * Durgapur

Anindita Sengupta 15/3/24

Anindita Sengupta 15/3/24

Workshop on M.S Project (3rd Year) on 15/3/24 & 16/3/24)
Under Civil Engineerting Department

ATTENDANCE SHEET (16/3/24)

SL. NO.	UNIVERSITY ROLL NO.	NAME	1st Half	2nd Half
1	12001321003	ARNAB MONDAL	Arnab Mondal	Arnab Mondal
2	12001321004	ASHUTOSH BADHUK	Ashutosh Badhuk	Ashutosh Badhuk
3	12001321006	MAMUN RAHAMAN	Mamun Rahaman	Mamun Rahaman
4	12001321020	SUBHRANIL DUTTA	Subhranil Dutta	Subhranil Dutta
5	12001321023	KOUSHIK MAHATA	Koushik Mahata	Koushik Mahata
6	12001321026	BALARAM DEY	Balaram Dey	Balaram Dey
7	12001321027	AIHIK MAHINDER	Aihik Mahinder	Aihik Mahinder
8	12001321029	PRIYANSHU DAS	Priyanshu Das.	Priyanshu Das
9	12001321035	MUSKAN NISHA	Muskan Nisha	Muskan Nisha
10	12001322015	SOMNATH SEN	Somnath Sen	Somnath Sen
11	12001322016	JOYDEEP MONDAL	joydeep Mondal	Joydeep Mondal
12	12001322017	SUDIPTA GHOSH	SudiptaGhosh	sudipta Ghosh
13	12001322018	MANAS SAHA	Manas Saha.	Manas Saha.
14	12001322019	NEHA BHATTACHARJEE	Neha Bhattacharjee	Neha Bhattacharjee
15	12001322020	ANKITA KUNDU	Ankita kundu	Ankita Kundu
16	12001322022	ANIRBAN KAR	Anirban Kar.	Anirban Kar
17	12001322023	ABHIJIT SAR	Abhijit Sar	Abhijit Sar
18	12001322024	DEBDEEP BASURI	Debdeep Basuri	Debdeep Basuri
19	12001322025	ARGHAJIT GAN	Arghajit Kran	Arghajit Gan
20	12001322026	NAYNA DAS	Nayna Das	Nayna Das
21	12001322027	DIPIKA SEN	Dipika Sen.	
22	12001322028	SHUVAM MAJEE	Shuvam majee	Shuvam majee
23	12001322029	BHAIRAB MAJI	Bhairab Maji	Bhairab Maji
24	12001322031	ANANYA GHOSH	Ananya Ghosh	Ananya Ghosh
25	12001322032	ANINDYA CHATTERJEE	Anindya Chatterjee	Anindya Chatterjee
26	12001322033	SNEHA KARMAKAR	Sneha Karmakar	Sneha Karmakar
27	12001322034	RAHUL PANDIT	Rahul Pandit	Rahul Pandit
28	12001322035	SANDIP PAL	Sandip Pal	Sandip pal
29	12001322036	SAYAN PATHAK	Sayan Pathak	Sayan Pathak
30	12001322037	TIRTHA PRATIM DATTA	Tirtha Pratim Datta.	Tirtha Pratim Datta
31	12001322039	ROHIT DEOGHARIA	Rohit Deogharia	Rohit Deogharia
32	12001322041	SUDESNA PAUL	Sudesna Paul	Sudesna Paul
33	12001322042	PURBA SAHA	Purba Saha	Purba Saha
34	12001322043	ALOK	Alok	Alok
35	12001322045	SUMAN GHOSH	Suman Ghosh.	Suman Ghosh.
36	12001322047	SUJOY BIT	Sujoy Bit	Sujoy Bit

Soumya Sengupta 16/3/24

DR. B. C. ROY ENGINEERING COLLEGE * Durgapur

Anindita Sengupta 16/3/24

Anindita Roy 16/3/24


GPS Map Camera
Durgapur, West Bengal, India
First Year Academic Building, B C Roy Engineering College, Fuljhore Road, Kaliganj, Durgapur, West Bengal 713206, India
Lat 23.54355°
Long 87.343771°
16/03/24 04:37 PM GMT +05:30
Google


GPS Map Camera
Durgapur, West Bengal, India
First Year Academic Building, B C Roy Engineering College, Fuljhore Road, Kaliganj, Durgapur, West Bengal 713206, India
Lat 23.54362°
Long 87.343748°
16/03/24 11:26 AM GMT +05:30
Google