Government of the People's Republic of Bangladesh
Ministry of LGRD and Cooperatives
Local Government Division

Feasibility Study

For

"Construction of 5 Storied Mymensingh Nagar Bhaban with 18 story foundation including 1 Basement for Mymensingh City Corporation"

Mymensingh City Corporation

STUDY TEAM

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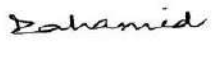
2.	Dr. Syed Abdul Hamid, Professor, Institute of Health Economics, University of Dhaka, Dhaka.	
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ACKNOWLEDGEMENT

We are highly grateful to Ministry of LGRD and Cooperatives Local Government Division, Government of the People's Republic of Bangladesh, for conducting the feasibility study of the project titled **"Construction of 5 Storied Mymensingh Nagar Bhaban with 18 story foundation including 1 Basement for Mymensingh City Corporation"**. We offer our sincere thanks to Honorable Mayor Mr. Md. Ekramul Haque Titu, Chief Engineer, Mr. Md. Rafiqul Islam Miah, Chief Executive Officer, Mr. Md. Yousof Ali, Engineering Department and all Ward Councilors of Mymensingh City Corporation for their kind support and valuable comments and suggestions for the successful completion of the study. We also offer our sincere gratitude for their valuable information and cordial cooperation. We are highly indebted to the respondents and local people who spent their valuable time for providing information.

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EXECUTIVE SUMMARY

The feasibility study is an attempt to find out technical effectiveness, socio-economic aspect and cost-benefit analysis, environmental aspect and schedule analysis of proposed project titled **"Construction of 5 Storied Mymensingh Nagar Bhaban including 1 Basement with 18 story foundation for Mymensingh City Corporation"**. The major objective of the study was to find out technical, economic, social and environmental viability of the project. The objective of this project is to ensure better civic services for the inhabitants of Mymensingh City through creating opportunities for all the associated stakeholders related to Mymensingh City Corporation work together. Through feasibility study, the magnitudes will be done whether the project is financially and economically viable or not.

The feasibility study has been done considering different factors like technical, financial, economic, social, environmental, schedule analysis and option analysis. For environmental aspect, the positive and negative impacts were considered in such a way that it may be possible to avoid environmental hazards. Fire protection system has also been incorporated. Proper waste management process has been ensured while mitigation measures to avoid negative impacts have been incorporated too in order to make it a sustainable one.

Adequate human resources and administrative support analysis has also been conducted with a view to identifying the human resources and managerial capabilities of Mymensingh City Corporation Authority to carry out all phases of the project including construction and operational phase.

It has been identified that the **"Construction of 5 Storied Mymensingh Nagar Bhaban including 1 Basement with 18 story foundation for Mymensingh City Corporation"** will facilitate the authority to lead the development works and civic services in a collaborative manner.

From the above facts and findings, it can be stated that the project has a positive impact on citizens, communities, service receivers, providers and surrounding peoples considering economic, social, economic and contextual point of view.

Based on the feasibility study, it can be said that "Construction of 5 Storied Mymensingh Nagar Bhaban including 1 Basement with 18 story foundation for Mymensingh City Corporation" will revitalize the socio-

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economic status of all the city dwellers. Investments in such project will surely ensure help in developing a well-organized City Corporation.

Project Feasibility Study Report

SECTION 1: BASIC INFORMATION

1.	Name of the Project(s)	:	**"Construction of 5 Storied Mymensingh Nagar Bhaban with 18 story foundation including 1 Basement for Mymensingh City Corporation"**
2.	(a) Sponsoring Ministry/Division	:	Government of the People's Republic of Bangladesh Ministry of LGRD and Cooperatives Local Government Division
	(b) Implementing Agency	:	Mymensingh City Corporation
3.	Project objectives	:	The main objective of the project is to construct Mymensingh City Nagar Bhaban. Specialties of this project implementation as follows: 1. To create beautiful work environment by constructing a modern and eco-friendly office building. 2. Arranging the workplace for officers/employees as per organogram. 3. Improving the quality of civic services. 4. To establish the MCC as a beneficiaries service organization.
4.	Estimated Project Cost (In Lac Taka)	:	21822.63 lac Taka
5.	Sector & Sub-Sector	:	
6.	Project Category	:	Building Works
7.	Project Geographic Location (a) Division (b) District (c) Upazila (d) City Corporation	 : : : :	 Mymensingh Mymensingh Mymensingh Sadar Mymensingh City Corporation
8.	Project Duration	:	36 months

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SECTION 2: INTRODUCTION

2.A: PROJECT BACKGROUND: RATIONALE AND GENESIS:

Having more than 160 million people, Bangladesh is one of the world's most densely inhabited countries. After the liberation war in 1971, it has witnessed remarkable economic development, achieving lower middle-income status in 2014, and presently has a per capita income of roughly US$1,514 per year (2017). During the last decade, the country's gross domestic product (GDP) increased by an average of roughly 6.5 percent every year. In recent years, economic prosperity has been accompanied by social and human development. When compared to other South Asian countries, Bangladesh has made significant progress toward meeting the Millennium Development Goals (MDGs) in terms of poverty reduction, increasing enrollment in primary schools, lowering infant and maternal mortality, increasing immunization coverage, and reducing the incidence of communicable diseases.

For administrative purposes, Bangladesh has twelve city corporations. One of them is the "Mymensingh City Corporation," which was founded on April 2, 2018. This city corporation has a total area of 90.17 square kilometers. Mymensingh City Corporation is currently responsible for a wide range of services for over ten lakh citizens, including infrastructure development, building plan approval, street lighting, water supply, vaccination, birth & death certificate , trade license, inheritance certificate, and marriage certificate. Mymensingh City Corporation is struggling to provide civic services to the general public due to a lack of adequate workplace facilities, and this problem is becoming more acute as the number and quality of civic services grows. Engineering, Administration, Revenue, Social Welfare, Accounting, Property, Reserves and Purchasing, Transportation, Waste Management, Urban Planning, and Health are all parts of the Mymensingh City Corporation's organizational structure that collaborate for the city's and residents' development. Considering the future population growth of the city corporation and increasing the manpower in the organizational structure to ensure services accordingly, it has become a crying need to establish a multi storied City Corporation building with modern facilities. The establishment of "Construction of 5 Storied Mymensingh Nagar Bhaban including 1 Basement with 18 story foundation for Mymensingh City Corporation" is expected to be a milestone in the development journey of "Mymensingh City Corporation" through ensuring adequate workplace facilities for every organizational entity within the city corporation to work together with a view to ensuring remarkable participation in building "Digital Bangladesh", the dream of the Honorable Prime Minister Sheikh Hasina.

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2.B: OBJECTIVES OF THE FEASIBILITY STUDY:

Establishing such facilities involves some challenges which need to be considered before finalizing the plan of such initiatives. Therefore, it is essential to carry out a feasibility study to identify potential scopes, opportunities, risks, and challenges in establishing a new multi storied modern **"Construction of 5 Storied Mymensingh Nagar Bhaban with 18 story foundation including 1 Basement for Mymensingh City Corporation"** in the context of Mymensingh. On the other hand, under the clause 4(1) of a circular titled **"Formulation, processing & approval of development project in public sector and procedure of its revision"**, it is mandatory to conduct a feasibility study for the development project costing over 50 crores. The feasibility study is a critical component of project preparation and a technical working document for project appraisal. Any project regardless of its scale and nature can have long-term implications once implemented. It is the basis on which government would make an investment decision on the project. Using both quantitative and qualitative tools, the study attempted to look into the feasible options for the establishment of the **"Construction of 5 Storied Mymensingh Nagar Bhaban with 18 story foundation including 1 Basement for Mymensingh City Corporation"** in Mymensingh city. This project would certainly cost much more than 26796.29 lacs BDT. Thus, it necessitates carrying out a feasibility study as per the government regulation. Furthermore, the feasibility study is helpful to understand whether government investment in such projects is worthwhile. The specific objectives are:

(i) Assessing the needs;
(ii) Assessing the economic benefits;
(iii) Analyzing the social and environmental impacts;
(iv) Understanding whether establishing the **"Construction of 5 Storied Mymensingh Nagar Bhaban with 18 story foundation including 1 Basement for Mymensingh City Corporation"** will increase the opportunity to provide better civic services.
(v) And assessing the possible risks and threats of establishing the **"Construction of 5 Storied Mymensingh Nagar Bhaban with 18 story foundation including 1 Basement for Mymensingh City Corporation"** in the proposed site considering the context.

2.C: APPROACH AND METHODOLOGY OF THE FEASIBILITY STUDY:

This study delivers a feasibility report focusing on an in-depth analysis of identifying potential scopes, benefits, opportunities, risks, and challenges in establishing the **"Construction of 5 Storied Mymensingh Nagar Bhaban with 18 story foundation including 1 Basement for Mymensingh City Corporation"** Using both primary and secondary data, the study assessed the feasibility in terms of the economic, social, and environmental impact of establishing premises of the Nagar Bhaban in the proposed location. The study used both secondary data and primary data that were collected based on consultation meetings, FGDs (Focus

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Group Discussions) required for assessing all the aspects of feasibility. To conduct different components of the feasibility study we conducted consultation meetings with the local administration including the Honorable Mayor, Md. Ekramul Haque Titu and different government departments such as environment, agriculture, PWD, FIRE and other relevant departments. A consultative meeting was also conducted with the city corporation administration and the ward councilors to understand the present situation of the city corporation and their expectations. Two FGDs were conducted: one with the Honorable Mayor and the ward councilors and another with technical professionals. In addition, some in-depth interviews were conducted with the local people.

Using both primary and secondary data, the study assessed the feasibility in terms of the economic, social, environmental impact of establishing premises of the Nagar Bhabanin the proposed location. This study delivers a feasibility analysis focusing on an in-depth analysis of identifying potential scopes, benefits, opportunities, risks, and challenges in establishing the **"Construction of 5 Storied Mymensingh Nagar Bhaban with 18 story foundation including 1 Basement for Mymensingh City Corporation"** The components of the feasibility study explain the key concepts, identifies the major steps involving the feasibility of the establishment of this dream project of the inhabitants of Mymensingh.

Components of the feasibility studies are-

1. Market demand analysis;
2. Technological and engineering analysis;
3. Environmental sustainability and climate change analysis;
4. Cost-benefit analysis;
5. Administrational and legal analysis;
6. Risk and sensitivity analysis.

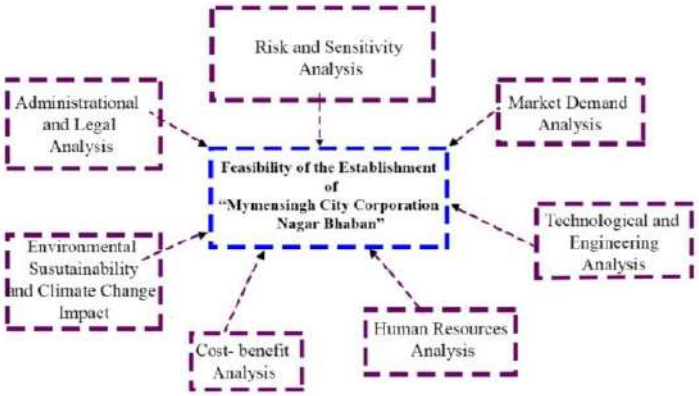

Fig: Components of the feasibility studies

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1. Market demand analysis:

It provides a rationale for establishing the Nagar Bhaban by highlighting the future need of adequate workplaces for important administrative purposes of Mymensingh City Corporation and intensive development initiatives for the betterment of Mymensingh. It also explains why the current capacity of City Corporation building might not be enough to cope with future challenges. It also shed light on the necessity of increasing modern civic facilities. It also identifies the main sources of risk for the project and assess their impact on the Feasibility of Establishment of **"Construction of 5 Storied Mymensingh Nagar Bhaban with 18 story foundation including 1 Basement for Mymensingh City Corporation"** and presents a plan for managing the key risks, including mitigation measures.

2. Technological and engineering analysis:

It includes the availability of sufficient land depending on the functional plan of the **"Construction of 5 Storied Mymensingh Nagar Bhaban with 18 story foundation including 1 Basement for Mymensingh City Corporation"** and its future expansion, approaching roads, soil condition suitable for construction, proper drainage of rainwater, subsoil water, and mineral level, water supply and electricity, adequate water supply, proper waste management system, good maintained sewerage system, electric substation, dedicated electric supply line, stand by generator, transport and communication, and easy transport access.

3. Environmental sustainability and climate change analysis:

It contains possible adverse environmental and climate change impacts of the proposed area resulting from the establishment of the **"Construction of 5 Storied Mymensingh Nagar Bhaban with 18 story foundation including 1 Basement for Mymensingh City Corporation"** and the proposed mitigation plans.

4. Cost-benefit analysis:

It consists of several steps including identification of appropriate approaches for estimating benefits and costs, identification and valuation of relevant inputs, estimation of costs and benefits, description of the data inputs, estimation techniques, and assumptions used, and performing cost-benefit analysis.

5. Administrational and legal analysis:

It ascertains whether there are any administrational and legal challenges related to the establishment of the permanent campus of **"Construction of 5 Storied Mymensingh Nagar Bhaban with 18 story foundation including 1 Basement for Mymensingh City Corporation"** at the proposed site.

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6. Risk and sensitivity analysis:

It identifies how the costs and benefits of the project can be varied due to change in the assumptions based on which costs and benefits are estimated.

2.C.1 DATA COLLECTION:

The study incorporated both primary and secondary data in order to evaluate all aspects of feasibility.

Table 2.1: The documents examined and the procedures followed by the feasibility study's components

Scope of work	Documents/Methods followed
Market demand analysis	• Desk Review - SDG - City Corporation Act, 2009 - Strategic Investment Plan - Annual Development Plan - Mymensingh City Corporation Gazette - Project Documents - Mymensingh Strategic Development Plan (MSDP) Project, 2011-2031 - Organogram of LGED: Local Government Division • Secondary Data Analysis • Primary Data Analysis (Qualitative)
Technological and engineering analysis	• Site Assessment - Site Survey Report - Geographical location and physical characteristics • Public utilities accessibility • Sub-soil test • Topographical Survey
Environmental sustainability and climate change analysis	• Environmental Review -Bangladesh -- Environment Conservation Act, 1995. • Environmental considerations - Consultation with various stakeholders and meetings with relevant agencies - FGDs with local government representatives

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	- Case Studies and literature review - Environmental analysis using soft wares
Cost-benefit analysis	• Consultation with various stakeholders and meetings with relevant agencies • FGDs with local government representatives • Case Studies and literature review • Mymensingh Strategic Development Plan (MSDP) Project, 2011-2031 • Discussion with Mayor and Ward Councilors
Administrational and legal analysis	• Consultation with various stakeholders and meetings with relevant agencies • FGDs with Honorable Mayor and Ward Councilors • FGD with relevant government departments i.e., LGED, PWD, Department of Fire, CAAB, gas and electricity distribution companies etc.
Risk and sensitivity analysis	• Analysis of price and physical contingencies
Findings from project feasibility study	• Conclusions from the feasibility study

In addition, we conducted a day-long field visit at the proposed location to gather additional information.

2. C.2 RESEARCH APPROACH:

We held consultation meetings with the local administration, including the Honorable Mayor and Ward Councilors, officials, and various government departments such as environment, architecture, FIRE, PWD, and other relevant departments, to conduct various components of the feasibility study. Engineers, architects, and other technical professionals from the city corporation met for a consultative meeting to better understand the current state of the city corporation building and their expectations. FGDs were held with representatives from the administration and the local government.

In addition, some in-depth interviews with locals were conducted. A consultative meeting was also held with the Honorable Mayor, Ward Councilors, officials, and others to get their feedback on the **"Construction of 5 Storied Mymensingh Nagar Bhaban with 18 story foundation including 1 Basement for Mymensingh City Corporation"** functional plan.

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Table 2.1: THE FEASIBILITY STUDIES APPROACH IN DETAIL.

Activity Types	No	Participants/ Respondents	Purpose
1. Consultation meeting	1	• Local administration, including the Honorable Mayor and Ward Councilors • Additional Chief Engineer, PWD • Executive Engineer, PWD • FIRE Department • Representatives from Mymensingh City Corporation • Architects	• Cost-benefit analysis, • Environment and climate change impacts analysis, • Risk and sensitivity analysis, • Human resources and administrative support analysis, • and administrational and legal analysis
2. Site Visit and consultation meeting	1	• Representatives from Mymensingh City Corporation • Executive Engineer, PWD • Two Ward Councilors as representative of Mymensingh City Corporation	• Cost-benefit analysis, • Environment and climate change risk analysis, • Risk and sensitivity analysis, technical • And engineering analysis
3. Consultation meeting	1	• City Corporation Authority	• Technical and engineering analysis, • Environment and climate change risk analysis, • Human resources and administrative support analysis • and cost benefit analysis
4. Focused Group Discussion (FGD)	2	• Honorable Mayor • Ward Councilors • Engineers • Officials • Local people	• Cost-benefit analysis, • Environment and climate change risk analysis, • and administrational and legal analysis

2.D: ORGANIZATION OF THE FEASIBILITY STUDY:

The following is a breakdown of the report's structure:

Section 1: Contains basic information related to the establishment of **"Construction of 5 Storied Mymensingh Nagar Bhaban with 18 story foundation including 1 Basement for Mymensingh City Corporation"**.

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Section 2: The feasibility study's background, objectives, and methodology are presented in this section.

Section 3: The market demand analysis is presented in Section 3.

Section 4: The technical and engineering analysis is presented in Section 4.

Section 5: Explains environmental and climate analysis.

Section 6: The cost-benefit analysis is explained here.

Section 7: The social analysis is explained here.

Section 8: Human Resource and Administrative Support analysis is explained here.

Section 9: Institutional and legal analysis is explained here.

Section 10: Risk and Sensitivity analysis is explained here.

Section 11: Alternative/ Options analysis is explained here.

Section 12: Recommendations and conclusion is explained in section 12.

Section 13: Annexes are attached in this section.

SECTION 3: MARKET/ DEMAND ANALYSIS:

The market demand analysis was conducted by reviewing the project's context, including the existing institutional framework, and summarizing government policies in the sector/sub-sector to which the project belongs.

3. A: PROBLEM STATEMENT:

Mymensingh is governed by Mymensingh City Corporation which comprises of 33 wards. The population of Mymensingh is increasing day by day with a growth rate of 1.73% recorded in 2021 by UN World Urbanization Prospects. In 1950, the population of Mymensingh was 65,043 and in 1960 within ten years the population became 76,828. At that time the recorded growth rate of population was 1.64%. The growth rate of population increased rapidly and the recorded population growth rate was 2.76% within ten years in 1970 and the total population of Mymensingh was 100,223 then. After the liberation war of Bangladesh in 1971, the population growth rate started to increase at an alarming level and in 1980, the population growth rate became 4.74%. The total population was 148,446 then. And the maximum population growth rate was recorded in 1990 which was 467,957and the population of Mymensingh was 281,098 then. At present year, the population of Mymensingh City is 467,957. So, it is easily noticeable that the population of Mymensingh became almost

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twice within thirty years. And according to, UN World Urbanization Prospects, the population of Mymensingh will be 638,425 within the year, 2035 which is almost 1.36 times of the recorded population in 2021

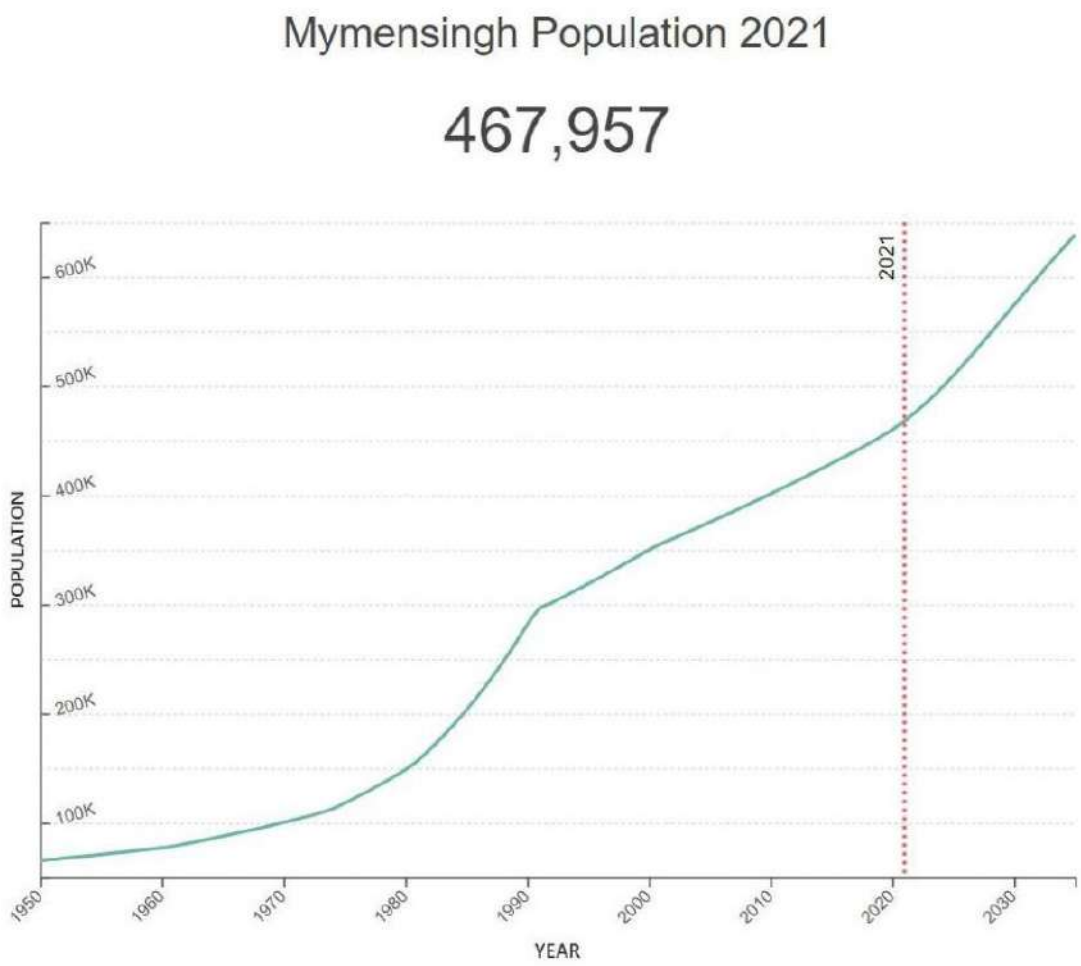

Fig: Population Growth Chart of Mymensingh City Corporation from 1950 -2021.

Source: UN World Urbanization Prospects.

The above chart shows the rapid growth of population in Mymensingh City from 1950 to 2021.

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Year	Population	Growth Rate	Growth
2035	638,425	1.98%	12,400
2034	626,025	2.07%	12,683
2033	613,342	2.15%	12,909
2032	600,433	2.23%	13,094
2031	587,339	2.31%	13,239
2030	574,100	2.37%	13,305
2029	560,795	2.42%	13,274
2028	547,521	2.46%	13,121
2027	534,400	2.46%	12,824
2026	521,576	2.42%	12,339
2025	509,237	2.35%	11,675
2024	497,562	2.23%	10,832
2023	486,730	2.07%	9,855
2022	476,875	1.91%	8,918
2021	467,957	1.73%	7,974
2020	459,983	1.55%	7,043

Fig: Estimated Population Growth Chart of Mymensingh City Corporation.

Source: UN World Urbanization Prospects.

The above chart shows the rapid growth of population in Mymensingh City which was produced through estimating and analyzing the previous growth rate of population records of Mymensingh considering its contextual background.

Mymensingh City Corporation was formed to ensure better development of Mymensingh city as well as for improving the quality of civic services provided to the inhabitants of Mymensingh City Corporation. At present whole administrative activities are maintained through 21 administrative wards. But as population increases at a rapid rate, to ensure flawless development and better civic services, City Corporation is going to be divided into more wards. The ward numbers can be 33 in future, according to City Corporation administration. As a

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result, the requirement of office spaces for running different administrative activities of City Corporation will increase day by day that cannot be allocated in current city corporation office building. So, it has become a crying need to establish a multi storied new Nagar Bhaban for ensuring the continuous development of Mymensingh City.

Administrative and civic services may be affected at a great rate if no government intervention is made with a view to establishing a new multi storied **"Construction of 5 Storied Mymensingh Nagar Bhaban with 18 story foundation including 1 Basement for Mymensingh City Corporation"**.

3. B: PROBLEM STATEMENT:

Mymensingh City Corporation authority works in a collaborative manner with all of its departments, wards, stakeholders, decision makers, social workers for the betterment of Mymensingh City. As population is increasing day by day, Mymensingh City Corporation authority is also facing challenges to ensure effective and flawless activities of all of its departments due to unavailability of insufficient office spaces. Mymensingh City Corporation has adopted many strategic goals to increase the quality of the civic services offered to the city dwellers. Some of them are-

- To ensure efficient and affordable basic services to all residents of Mymensingh
- To strengthen the economy of Mymensingh for sustainable growth and job creation.
- To develop a municipal governance system that complies with international best practice.
- To create an institution that can align planning with implementation for effective and efficient service delivery.
- To be a financially viable institution geared to provide affordable and sustainable services to the inhabitants.
- To create job opportunities for the unemployed citizens
- To establish and lead community clinic facilities at a great rate.
- To ensure one stop solution for any administrative problems that may be noticed in future.

To achieve these strategic goals, **"The Establishment of Mymensingh City Corporation Nagar Bhaban"** has become a 'talk of the town' in the development and planning sectors.

3. C: PROPOSED PROJECT INTERVENTIONS:

The proposed project will have several interventions which would be helpful of overcome the challenges discussed above such as:

- Adequate work places for all departments of Mymensingh City Corporation.

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- Councilors Office for all wards under a single roof to run the civic works smoothly
- Employment scopes for the unemployed citizens
- Social Development Works can be controlled properly
- Quality of Civic Services will be increased rapidly

All these interventions will be necessary to overcome the future and current challenges of achieving local as well as national goal.

3. D: STAKEHOLDERS:

There are several key stakeholders from both the government and non-government entity that are likely to be associated with the project interventions. The possible key stakeholders include:

- Mymensingh City Corporation Authority
- Local Government Engineering Department
- Public Works Department (PWD)
- Fire Service and Civil Defense
- Titas Gas Transmission and Distribution System Ltd.
- Power Grid Company of Bangladesh Limited
- Bangladesh Power Development Board
- Civil Aviation Authority, Bangladesh (CAAB)
- Department of Environment (DOE)
- Local inhabitants
- Local Elites

3. E: DEMAND ANALYSIS:

As per the available secondary data, there is a huge shortage of workplaces for different disciplines which may affect the quality of civic services offered by the City Corporation in future as the population is increasing day by day. At present City Corporation needs workplaces for total 237 officers, staffs etc. and the required number of office spaces is going be total 752 within next three years.

At present, Mymensingh City Corporation runs one primary school. City Corporation has a plan to establish one secondary school and one college too that will be run and maintained by City Corporation Authority. For this purpose, City Corporation administration need to accommodate office spaces in order to control and maintain the educational institutions properly for ensuring proper education.

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City Corporation runs many welfare activities for cultural, social development that may required office spaces in City Corporation Building with a view to ensuring desired development in a collaborative nature. For collaborative approach of development, all stakeholders related to the development works of Mymensingh City Corporation will require adequate office spaces under one same roof in **"Mymensingh City Corporation Nagar Bhaban."**

For woman empowerment and their economic development, Mymensingh City Corporation administration runs many training programs on handicrafts and tangible art effects so that they can sell their products to be economically independent. It will also help to ensure regular practice and development of tangible cultural art effects of Mymensingh. For this purpose, City Corporation administration need to accommodate office spaces in order to control and maintain the training sessions properly.

At present Mymensingh City Corporation has to take challenges to solve some problems. Such as-

- Water Clogging
- Proper Waste management
- Traffic Congestion
- Challenges for collaborative development
- Inadequate Underwater Utility Services
- Street Lamp Control
- Inadequate recreation center facilities
- Inadequate child care facilities
- Public transport management system

For solving these issues, City Corporation needs to work in together with all the stakeholders or departments related to these challenges. For this purpose, City Corporation administration need to accommodate office spaces in order to control and maintain the development works properly.

As a result, it can be understood easily that Mymensingh City Corporation administration needs adequate office space es for ensuring continuous development of Mymensingh City which won't be possible with the **"Establishment of Mymensingh City Corporation Nagar Bhaban".**

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3. F: SWOT ANALYSIS:

To identify the risks and threats of this project we performed SWOT analysis. The SWOT analysis is used to assess an organization's strengths (S), weaknesses (W), opportunities (O), and threats (T). Strengths and weaknesses are internal to the organization - things that are under some control over and can be changed. Opportunities and threats are external—things that are outside of control of the organization. A SWOT analysis helps to bring forth the strengths and opportunities, and minimize the weaknesses and threats of the project.

3. F.1: POSITIVE IMPACTS ANALYSIS:

Strengths	Opportunities
• Government's continuous support for the development of Mymensingh City Corporation • Extensive support from relevant stakeholders • There are no other project activities in the project area. • There will be no damage to any existing heritage site during project implementation. • Project implementation will not cause environmental pollution. • No activity or materials used will have an adverse effect on the environment. • In fact, the environment will improve with the creation of expanded workplaces and the growth of civic services.	• A city with continually growing development projects • Favorable political environment • If the project is implemented, economic activities will increase. • Business will expand and socio-economic conditions will be improved. • People from all walks of life will benefit from improved civic services. • Many skilled and unskilled workers will be employed during the implementation of the project with the existing manpower of Mymensingh City Corporation.

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• There will be no regional disparities in the implementation of the project. • It will have a good effect on the overall urban area. • The project has no detrimental effects on women and children. • The implementation of the described project will not cause pollution of environment such as soil, air and biodiversity. • The proposed initiative is a service-oriented project. • Administrative activities already in operation in Mymensingh City Corporation Availability of land suitable for construction • Favorable land acquisition condition • No loss of land base employment of any local people • Hardly any homestead displacement • No risk of water-clogging • Well road connections	• If the project is implemented, many jobs opportunities will be created and socio-economic conditions will be improved. • The experience of implementing such a project will obviously improve the Mymensingh City Corporation management capacity. • Creating expanded workplaces will improve the environment, including increasing civic services. • The project will develop infrastructure for high levels of economic growth and protect the environment and prevent degradation. • The city will reduce poverty and improve the quality of the life of the people. • Strong social acceptance

3. F.2: NEGATIVE IMPACTS ANALYSIS:

Weakness	**Threat**
• There is a possibility of air pollution during the implementation of the project. • There is a possibility of creating congestion. • Proper use of infrastructure used in the project, waste transport vehicle handling equipment and maintenance needs to be arranged.	• Potentiality to increase number of vehicles in future due to the development of City Corporation complex networks may result in noisy atmosphere. • Possibility of increasing the incidence of road traffic accidents. • Mymensingh is the remarkable area for earthquake. • Potentiality of Sound Pollution

Qualitative data is collected through consultation meetings with the relevant national and local level stakeholders. Quantitative data regarding the development projects, how people are going to be benefitted, possible economic, social, environmental impacts, and the acceptance of the project by local people are

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collected from a focus group discussion (FGD) with the Honorable Mayor, Ward Councilors, Technical Professionals, Elite groups and local people.

From this study, we find out various aspects that make it justifiable and necessary in all dimensions to establish "**Mymensingh City Corporation Nagar Bhaban**." Besides, weakness and threats are identified to overcome any undesirable circumstances. There is a need for the Government to establish "**Mymensingh City Corporation Nagar Bhaban**." for introducing a super tertiary level development to ensure better civic services.

3. F.3: MITIGATION MEASURES:

-Tree plantation in multiple layers of appropriate varieties in the roadside of the "Construction of 5 Storied Mymensingh Nagar Bhaban including 1 Basement with 18 story foundation for Mymensingh City Corporation" to create a natural sound barrier.

- Keeping provision of planned parking space, especially for public transports

- Engaging the local administration and local government bodies to make planned establishment outside the boundary wall.

- Constructing overpass for highway vehicles in front of the entry gates, proper interventions in front approach road such as extra-vehicular lane in front of **"Construction of 5 Storied Mymensingh Nagar Bhaban with 18 story foundation including 1 Basement for Mymensingh City Corporation"** premise, installing speed guns in addition to speed breaker for control over speed.

- Proper plantation in front of the **"Construction of 5 Storied Mymensingh Nagar Bhaban with 18 story foundation including 1 Basement for Mymensingh City Corporation"** to protect from dust

- Proper planning and adjustment in the architectural design to preserve the current greenery

- Local NGOs with cooperation of local government can play role to secure new employment opportunities by providing necessary information and training

Considering all the relevant consequences, it is evident that the strengths and opportunities of **"Construction of 5 Storied Mymensingh Nagar Bhaban with 18 story foundation including 1 Basement for Mymensingh City Corporation"** are vast in comparison to weaknesses and threats. Areas of concern regarding weaknesses and future consequences of threats are explored meticulously. Appropriate measures can avert such consequences. Besides, proper monitoring and coordination among the stakeholders can ensure the smooth functioning of the **"Construction of 5 Storied Mymensingh Nagar Bhaban with 18 story foundation including 1 Basement for Mymensingh City Corporation"** in the respective areas. Eventually,

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it is optimistic if quality in civic services prevails, then the best will stand and survive in the long run for the betterment of the country.

SECTION 4: TECHNICAL/TECHNOLOGICAL & ENGINEERING ANALYSIS

4.A: LOCATION:

Mymensingh Nagar Bhaban will be such a building that it will be the pride of newly formed Mymensingh division. The site of this complex is at Amlapara, Gulpukurpar, KB Ismail Road, which is the heart of the city. Area of the site is 2.238 acre and longest portion of the site is North South oriented. One of the main attraction of the site is it has wide view of Brahmaputra river at the East side which is front of the site.

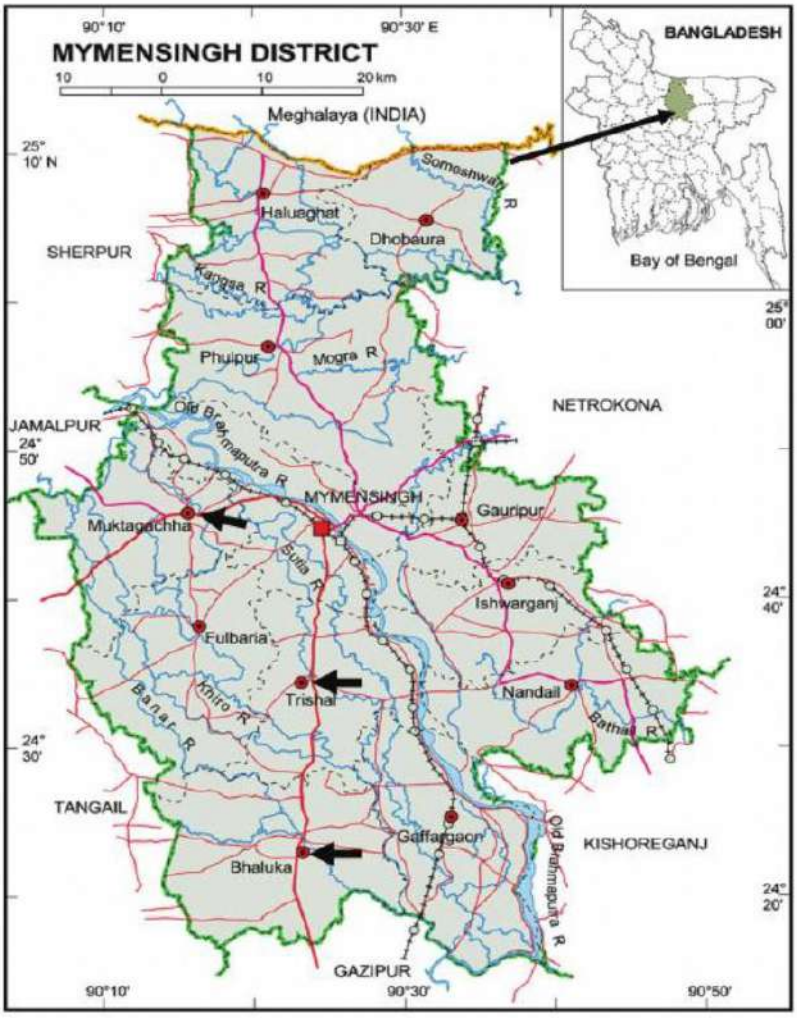

Fig: Location Map of Mymensingh District

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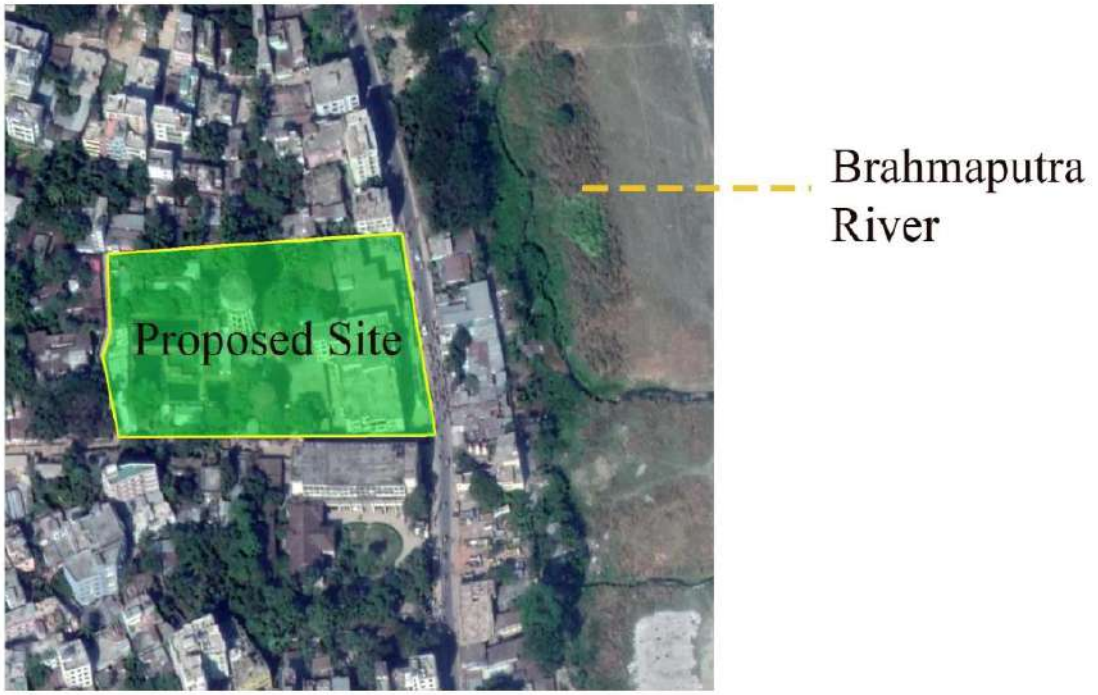

Fig: Location of the proposed

4.B: TECHNICAL DESIGN:

Building complex of **"Mymensingh City Corporation Nagar Bhaban"** is designed to represent the pride of the city. It generate the fusion of modern design and heritage. Local climatic considerations are implemented in a very concerned way. Building complex has two major towers. Each floor has variable 1050 sqm to 5600 sqm floor area on various floor and total buildable area is 70924.84 sqm. Both of them placed such a way that the beautiful river view of Brahmaputra. The Space Program for **"Mymensingh City Corporation Nagar Bhaban"** has been developed in line with its functional plans. The program consists of Room to Room (RtR) planning.

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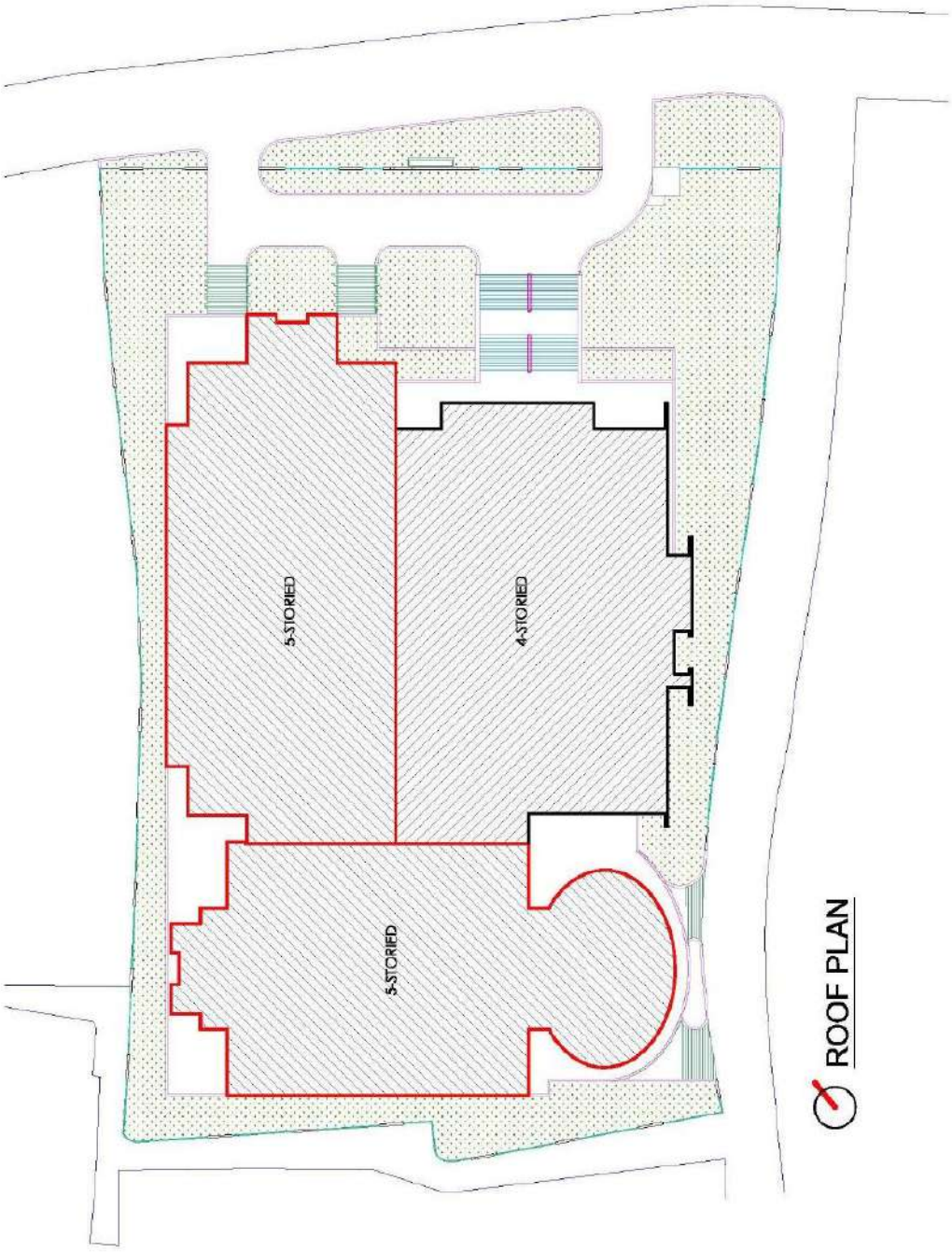

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4.B.1: FAR ANALYSIS:

As per **"Imarat Nirman Bidhimala, 2008"**

01	Approved Occupancy Type	= F-1 (Commercial Building)
02	Land Area	= 9057.81 sqm (2.238 acre)
03	Front Road Width	= 10.70 m
04	Basic FAR	= 8.50 [For this size of land the basic FAR is 9.5 but it requires 12m road width. In this case front road width is 10.70m, so applicable FAR is 8.5]
05	Total FAR Including Construction Area (9057.818 x 8.50)	= 76991.453 Sqm.

Setback:

01	Front side set back	= 1.50 m.
02	Both side set back	= 3.00 m.
03	Back side set back	= 3.00 m.

Design Criteria:

01	Maximum Ground Coverage (50.0% of land area)	= 4528.90 Sqm.
02	Ground Coverage Of Podium (75.0% of land area) (Up to 12m Height)	= 6793.36 Sqm.
03	Additional Ground Coverage For Parking, Driveway, Paved Area (50.00 % of the Rest Land)	= 2264.45 Sqm.
04	Mandatory Green Area (25.00 % of Land Area)	= 2264.45 Sqm.

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Proposed Condition:

01	Maximum Ground Coverage at Tower	= 4494.53 Sqm. = 49.62% < (50% of Land Area)
02	Ground Coverage at Podium Level (Up to 12m Height)	= 5686.59 Sqm. = 62.78% < (75% of Land Area)
03	Additional Ground Coverage For Parking, Driveway, Paved Area	= 806.58 Sqm.= 8.90% < (25% of Land Area)
04	Mandatory Green Area	=2564.64 Sqm. = 28.31% > (25% of Land Area)

Car Parking Calculations:

Area Description	Total Area	Minimum Parking Requirement	Maximium Parking Allowed	Number of Parking Provided	Number of Disable Parking 5%
1 car parking need for every 200 Sqm. usable area	71252.67 sqm	$\frac{70924.84}{200} = 354.62 \simeq 355$ nos	= 710 nos	= 363 nos	= 18.15 ≃ 19 nos

Floor Area Analysis:

S.L	TYPE OF SPACE	TOTAL AREA	PERCENTAGE OF LAND AREA
01	Semi Basement Floor	5606.78 sqm	61.89 %
02	Ground Floor	5686.59 sqm	62.78 %
03	1st Floor	4558.45 sqm	50.32 %
04	2nd Floor	4276.02 sqm	47.20 %
05	3rd Floor	4494.53 sqm	49.62 %
06	4th Floor	3143.76 sqm	34.70 %

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4.B.2: EQUIPMENT AND FURNITURE:

As already mentioned in the methodology, the RtR planning has been made based on the function and HR capacity. Basic feature of specific equipment/furniture has been mentioned as far as practicable. Highly expensive equipment has been centralized, as far as possible, to maximize use and save capital as well as operational resources.

4. B.3: POWER SUPPLY:

There is a planning for establishing solar panel in the Nagar Bhaban complex which need to be connected directly with the national power grid. City Corporation Authority can use the electricity generated by the solar panels at night and during the daytime the electricity 19 can be supplied to the national grid. This will make establishing the solar panels more cost-effective. Besides, the Nagar Bhaban complex must have high-capacity electricity generators as a power backup during emergency. To avoid the voltage fluctuations, voltage stabilizers with matching capacity will have to be installed. Separate uninterrupted power supply devices (such as UPS) needs to be installed also.

4. B.4: WATER SUPPLY:

The daily water demand will be met through water supply from the responsible authority. Besides, deep tube-wells will be built in the Nagar Bhaban complex. Special water purification plants will be installed in selected places for drinkable water.

4. B.5: WASTE MANAGEMENT:

Proper Waste management policy is an important concern for keeping the environment clean.

4. B.6: SANITARY WORKS:

For the sanitary works, a properly designed sewer-system has been planned. There will be separate systems for discharging of the two types of water- grey water and black water.

4. B.7: FIREFIGHTING:

Fire alarm and fire hydrant systems must be installed in the Nagar Bhaban complex. For emergency fire, there has to be a direct connection of water reservoir for the firefighting system. Fire extinguishers need to be installed in each floor of every building. Besides, emergency fire exit must have to be incorporated in the master plan.

4.C: OUTPUT PLAN:

-"Mymensingh City Corporation Nagar Bhaban" will play a vital role in ensuring desired development of Mymensingh which has positive impact on the development of Bangladesh also. It will bring hope to the millions of people seeking civic services.

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- Employment opportunities will expand with the establishment of **"Mymensingh City Corporation Nagar Bhaban"** in the proposed site. It will work as a key factor in socio-economic development such as, improvement of life standard of local people and upward social mobility.

- The change and diversification of economic and related activities is one of the most powerful trends.

- According to a FGD respondent, the establishment of **"Mymensingh City Corporation Nagar Bhaban"** will replace the existing agricultural production-based employment by emerging of service-related activities.

- During our FGD, another respondent describe the potential opportunities for getting employment

- Establishment of the **"Mymensingh City Corporation Nagar Bhaban"**in the proposed location will extend urbanization along with multi-facet development activities. This development perspective can be described as social progress in terms of expansion of facilities such as market places, private clinics, housing projects, hotels, improved transportation system, bus-stops, etc. This will result in an upward social mobility and increase life standards of the local people.

- The **"Mymensingh City Corporation Nagar Bhaban"** will create a greater opportunity for women empowerment.

- Establishment of the **"Mymensingh City Corporation Nagar Bhaban"** will lead to improve security system through developing road networks and increasing economic activities in the locality.

- Female population will also get job opportunities during construction as well as operational phases.

- This will result in an increase specialized and skilled workforce required to meet the desired goal of Mymensingh City Corporation as well as Bangladesh Government.

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4.D: COST ESTIMATES:

Total estimated project cost is BDT 21822.63 Lacs only including the contingency costs.

Based on Plinth area Rate of PWD Rate Schedule 2022

Super Category

Abstract of Cost (Up to 4th Floor)

Sl	Description		Tk.	Amount in Taka	
1	**Cost of Sub Structure**		Tk.	**Tk.**	**817,640,494.10**
2 (a)	**Cost of Super Structure**				
	a	Ground floor	Tk.	**Tk.**	**204,782,067.13**
	b	1st floor	Tk.	**Tk.**	**160,137,734.04**
	c	2nd floor	Tk.	**Tk.**	**152,616,185.07**
	d	3rd floor	Tk.	**Tk.**	**160,071,476.92**
	e	4th floor	Tk.	**Tk.**	**112,329,988.42**
	f	Other Common Cost	Tk.	**Tk.**	**106,130,123.32**
2 (b)	a	Boundary wall, Apron maingate	Tk.	**Tk.**	**15,025,250.00**
	b	Arboriculture works	Tk.	**Tk.**	**42,000,000.00**
3	**Electro-Mechanical**		Tk.		
	a.	Internal Electrification	Tk.	**Tk.**	**53,588,630.90**
	b.	Solar System	Tk.	**Tk.**	**10,273,468.10**
	c.	Lift	Tk.	**Tk.**	**40,232,016.00**
	d.	Firefighting system	Tk.	**Tk.**	**44,279,152.00**
	e.	Air Conditioning System (VRF)	Tk.	**Tk.**	**83,079,717.50**
	f.	Sub-Station	Tk.	**Tk.**	**44,425,808.00**
	g.	Generator full Load	Tk.	**Tk.**	**40,260,888.50**
	h.	External Electrification & Security System	Tk.	**Tk.**	**22,500,000.00**
	i.	Extra Cost (Semi-Basement Floor to 4th floor)	Tk.	**Tk.**	**22,500,000.00**
			Total Amount (A)=	**Tk.**	**2,131,873,000.00**
4	**Others**				
	a.	Stationary Stamp and seal	Tk.		200000.00
	b.	Publicity and advertisement	Tk.		200000.00
	c.	Allowance	Tk.		300000.00
	d.	Supervision advisor	Tk.		6900000.00
	e.	Physical contingency	Tk.		21395000.00
	f.	Price contingency	Tk.		21395000.00
			Total Amount (B)=		**50390000.00**
			Total (A+B)=		**2,182,263,000.00**

In Word: Taka Two Hundred eighteen crore twenty two lac sixty-three thousand only.

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Building type	**Non-Residential**
Type of Structure	**RCC frame Structure with stone chips (f'c=32Mpa)**
Building Category	**Super**
Type of foundation	**Pile Foundation (Cast in situ pile)**
Site	**Other than Coastal area**
Storey	**18 Storey**

SL	FLOOR	QUANTITY	UNIT	REMARKS
1	Basement	5606.78	Sqm	Super
2	Ground floor	5686.59	Sqm	Super
3	1st floor	4558.45	Sqm	Super
4	2nd floor	4276.02	Sqm	Super
5	3rd floor	4494.53	Sqm	Super
6	4th floor			
	Front Tower-1	1829.16	Sqm	Super
	Back Tower-2	1314.41	Sqm	Super
	Total Area=	**27765.94**	**sqm**	

1. Cost of Sub Structure

SL	Description	Quantity	Unit	Rate in Taka	Amount in Taka	PWD Item No 2022
1	Pile Foundation	5606.78	Sqm	Tk. 82,623.00	Tk. 463,248,983.94	Annexure-A Table-1 PWD PLAR-2022 Substructure
2	Extra Cost for 24 to 30 meter pile	5606.78	Sqm	Tk. 20,387.00	Tk. 114,305,423.86	Annexure-A Table-1 PWD PLAR-2022 Substructure
3	Basement Cost					
3.1	Retaining Pile	497	Rm	Tk.106,230.00	Tk. 52,796,310.00	Annexure-A Table-4 PWD PLAR-2022 Basement Construction
3.2	Basement floor	5606.78	Sqm	Tk. 11,848.00	Tk. 66,429,129.44	
3.3	Extra Cost for Member Weightage	5606.78	Sqm	Tk. 3,999.00	Tk. 22,421,513.22	
3.4	Bracing	5606.78	Sqm	Tk. 1,755.00	Tk. 9,839,898.90	
3.5	Excavation in CUM	16820.34	Sqm	Tk. 1,380.00	Tk. 23,212,069.20	
3.6	Water Proofing Wall & floor	7096	Sqm	Tk. 1,742.00	Tk. 12,361,232.00	
3.7	Back wall of Brick	1490	Sqm	Tk. 1,790.00	Tk. 2,667,100.00	
3.8	R.C.C Retaining wall	1490	Sqm	Tk. 7,061.00	Tk. 10,520,890.00	
3.9	System Managemnet	5606.72	Sqm	Tk. 161.00	Tk. 902,681.92	
				Total=	**Tk. 778,705,232.48**	
3.10	Add Extra cost for wind and earthquake load resisting structure @ 3% of pile				Tk. 23,361,156.97	
3.11	Add Extra 2% cost for Fc 32 Mpa				Tk. 15,574,104.65	
				Total=	**Tk. 817,640,494.10**	

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2 (a) Cost of Super Structure Ground floor to 4th floor

SL	Description	Quantity	Unit	Rate in Taka	Amount in Taka	PWD Item No 2022
1	**Ground floor**					
a	Civil works	5,686.59	Sqm	Tk. 28,615.00	Tk. 162,721,772.85	Annexure-A Table-2 PWD PLAR-2022 Super Structure
b	Extra cost for member weightage	5,686.59	Sqm	Tk. 4,193.00	Tk. 23,843,871.87	Annexure-A Table-3 PWD PLAR-2022 Structural Member Weightage
				Sub Total=	**Tk. 186,565,644.72**	
				Add Extra @ 2% for 32 Mpa	Tk. 3,731,312.89	
				Add Extra @ 3% for Earth Quake	Tk. 5,596,969.34	
				Total Civil=	**Tk. 195,893,926.96**	
2	Internal Sanitary and Water Supply (Non-Residential Building-Super)	5686.59	Sqm	Tk. 1,563.00	Tk. 8,888,140.17	Additional Cost Chart No. 6
				Total Amount Ground Floor=	**Tk. 204,782,067.13**	

SL	Description	Quantity	Unit	Rate in Taka	Amount in Taka	PWD Item No 2022
1	**1st Floor**					
a	Civil works	4,558.45	Sqm	Tk. 27,153.00	Tk.123,775,592.85	Annexure-A Table-2 PWD PLAR-2022 Super Structure
b	Extra cost for member weightage	4,558.45	Sqm	Tk. 4,001.00	Tk. 18,238,358.45	Annexure-A Table-3 PWD PLAR-2022 Structural Member Weightage
c	Add 3% extra for 12 ft height	4,558.45	Sqm	Tk. 814.59	Tk. 3,713,267.79	Annexure A Table 2
				Sub Total=	**Tk.145,727,219.09**	
				Add Extra @ 2% for 32 Mpa	Tk. 2,914,544.38	
				Add Extra @ 3% for Earth Quake	Tk. 4,371,816.57	
				Total Civil=	**Tk.153,013,580.04**	
2	Internal Sanitary and Water Supply (Non-Residential Building-Super)	4558	Sqm	Tk. 1,563.00	Tk. 7,124,154.00	Additional Cost Chart No. 6
				Total Amount 1st Floor=	**Tk.160,137,734.04**	

SL	Description	Quantity	Unit	Rate in Taka	Amount in Taka	PWD Item No 2022
1	**2nd Floor**					
a	Civil works	4,276.02	Sqm	Tk. 27,561.00	Tk.117,851,387.22	Annexure-A Table-2 PWD PLAR-2022 Super Structure
b	Extra cost for member weightage	4,558.45	Sqm	Tk. 3,809.00	Tk. 17,363,136.05	Annexure-A Table-3 PWD PLAR-2022 Structural Member Weightage
c	Add 3% extra for 12 ft height	4,558.45	Sqm	Tk. 826.83	Tk. 3,769,063.21	Annexure A Table 2
				Sub Total=	**Tk.138,983,586.48**	
				Add Extra @ 2% for 32 Mpa	Tk. 2,779,671.73	
				Add Extra @ 3% for Earth Quake	Tk. 4,169,507.59	
				Total Civil=	**Tk.145,932,765.81**	
2	Internal Sanitary and Water Supply (Non-Residential Building-Super)	4276.02	Sqm	Tk. 1,563.00	Tk. 6,683,419.26	Additional Cost Chart No. 6

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					Total Amount 2nd Floor=	**Tk.152,616,185.07**	

SL	Description	Quantity	Unit	Rate in Taka	Amount in Taka	PWD Item No 2022
1	**3rd Floor**					
a	Civil works	4,494.53	Sqm	Tk. 27,974.00	Tk.125,729,982.22	Annexure-A Table-2 PWD PLAR-2022 Super Structure
b	Extra cost for member weightage	4,494.53	Sqm	Tk. 3,617.00	Tk. 16,256,715.01	Annexure-A Table-3 PWD PLAR-2022 Structural Member Weightage
c	Add 3% extra for 12 ft height	4,494.53	Sqm	Tk. 839.22	Tk. 3,771,899.47	Annexure A Table 2
				Sub Total=	**Tk.145,758,596.70**	
				Add Extra @ 2% for 32 Mpa	Tk. 2,915,171.93	
				Add Extra @ 3% for Earth Quake	Tk. 4,372,757.90	
				Total Civil=	**Tk.153,046,526.53**	
2	Internal Sanitary and Water Supply (Non-Residential Building-Super)	4494.53	Sqm	Tk. 1,563.00	Tk. 7,024,950.39	Additional Cost Chart No. 6
				Total Amount 3rd Floor=	**Tk.160,071,476.92**	

SL	Description	Quantity	Unit	Rate in Taka	Amount in Taka	PWD Item No 2022
1	**4th Floor**					
a	Civil works	3,143.57	Sqm	Tk. 28,270.00	Tk. 88,868,723.90	Annexure-A Table-2 PWD PLAR-2022 Super Structure
b	Extra cost for member weightage	3,143.57	Sqm	Tk. 3,425.00	Tk. 10,766,727.25	Annexure-A Table-3 PWD PLAR-2022 Structural Member Weightage
c	Add 3% extra for 12 ft height	3,143.57	Sqm	Tk. 848.10	Tk. 2,666,061.72	Annexure A Table 2
				Sub Total=	**Tk.102,301,512.87**	
				Add Extra @ 2% for 32 Mpa	Tk. 2,046,030.26	
				Add Extra @ 3% for Earth Quake	Tk. 3,069,045.39	
				Total Civil=	**Tk.107,416,588.51**	
2	Internal Sanitary and Water Supply (Non Residential Building-Super)	3143.57	Sqm	Tk. 1,563.00	Tk. 4,913,399.91	Additional Cost Chart No. 6
				Total Amount 4th Floor=	**Tk.112,329,988.42**	

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4.E: IMPLEMENTATION TIMELINE:

The total implementation period is three years, from economic year 2022 to economic year 2025.

Descriptions of Works	Implementation Timeline
Construction works up to ground floor	Will start from June,2023 and will be completed within June 2024
Construction works up to Five stories & Finishing Works, Commissioning, Handing over	Within June, 2025

A detailed Gantt chart has been attached in Section 13.

SECTION 5: ENVIRONMENTAL AND CLIMATE ANALYSIS:

This section mainly discusses the environmental impact assessment which also include climate change and disaster risk analysis. Environmental Impact Assessment (EIA), as a prerequisite for any development activities, includes the following structures: stating the laws and regulations based on which the EIA is conducted; presenting an overview of the existing environmental condition to set the baseline for the comparison; identifying the potential sources required mitigation plans; finding the environmental impacts by two different phases of the project (i.e., construction phase and operation phase); providing mitigation strategies; and explaining the importance of environmental management and monitoring plans. Bangladesh follows two protocols namely, United Nations Framework Convention on Climate Change (ratified in April, 1994) and Kyoto Protocol (ratified in October, 2001) to conduct the Environmental Impact Assessment (EIA). The climate change focus starts with The National Environmental Management Action Plan (NEMAP) which was prepared in 1995. As part of this process a separate ministry is created which is known as "Ministry of Environment and Forestry" (MoEF). The Department of Environment (DoE), under the MoEF, mainly monitors the climate-related activities in the country. Recently, a Climate Change Cell (CCC) has also been established. The government of Bangladesh is fully aware of protecting the environment from industrial and development work related pollution. The government has promulgated the environmental rules, regulations ("Environment Conservation Act-1995" and the "Environment Conservation Rules-1997")

5. A: ENVIRONMENTAL, CLIMATE CHANGE AND DISASTER RISK ANALYSIS:

The primary goal of assessing the current environmental situation is to provide a baseline against which to analyze the project's possible impacts during the construction and operational stages. Furthermore, defining

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baseline values for land, air, and water quality ensures that any problems emerging from existing sources are not incorrectly blamed on the proposed project. The current study looks at a variety of environmental factors in order to establish baseline conditions for the project region, including the physical, biological, and socioeconomic environment.

Fig: The Location map with environmental components of the proposed project site

5. A.1: ENVIRONMENTAL FACTORS ANALYSIS:

A. Physical environment:

Physical environment includes land, water quality, air quality, and the climate which are described below.

A.1: Land Conditions:

Topography:

Mymensingh District is located in between 24°15' and 25°12' north latitudes and in between 90°04' and 90°49' east longitudes. It is bounded by Garo Hills and Meghalaya.

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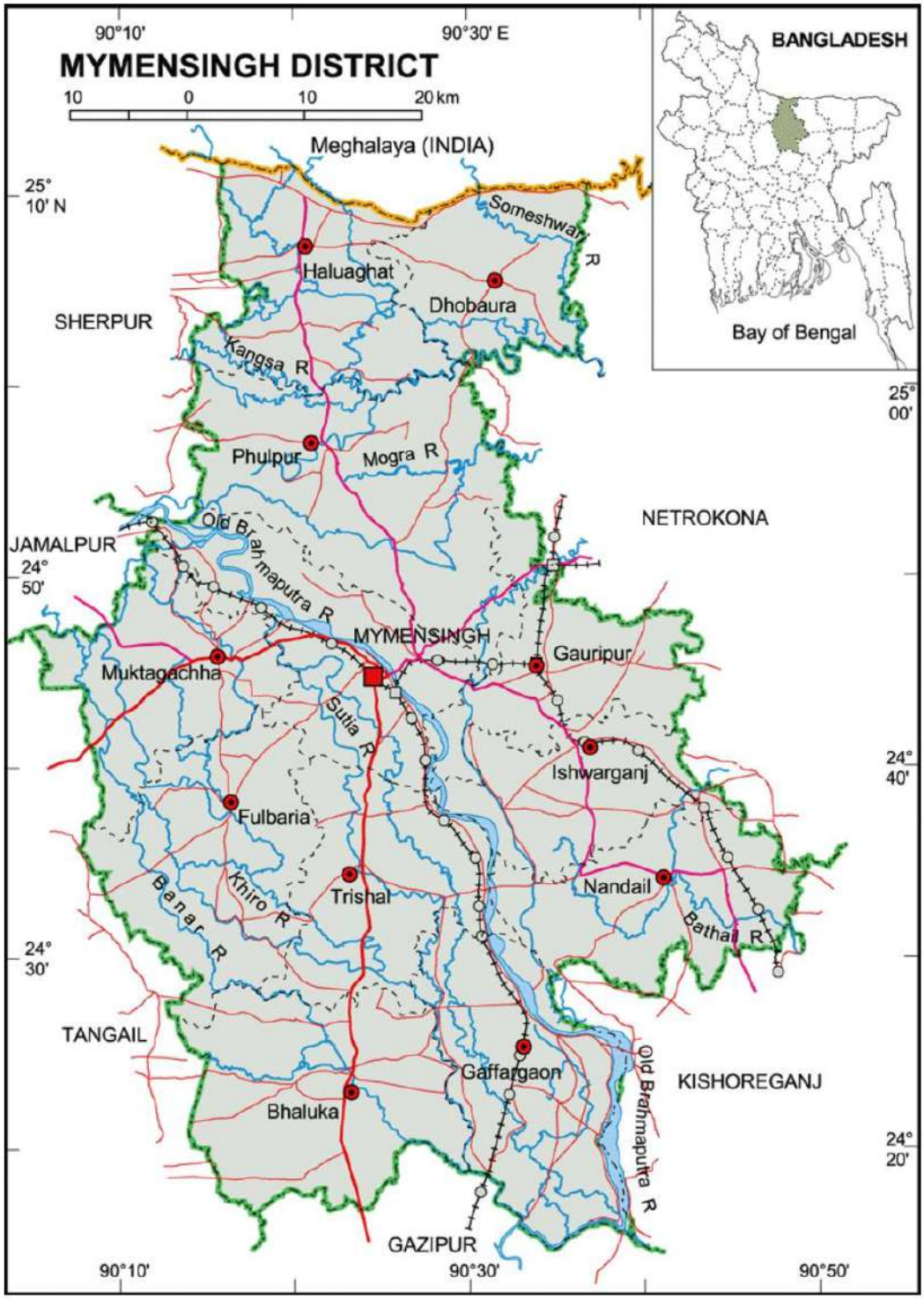

Fig: Topographical Map of Mymensingh

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Soil:

Soil texture in the study areas varied from silt loam to silty clay, particle density from 2.40 to 2.70 g/cm3, bulk density from 1.19 to 1.57 g/cm3, soil porosity from 41.67 to 55.80%, soil pH from 5.2 to 7.8. Following measures were taken during soil test for better understandings of the soil condition-

- **Exploratory Borings:** A total of 7 (seven) numbers of 100mm. dia. exploratory borings were drilled down to a maximum depth of 33.45m below the existing ground level. The depth of each boring has been furnished below for reference. The boring holes are drilled by percussion method with the help of a manually operated rig and using a 125mm dia. Casing pipe. In this method soil formations are broken by repeated blows of chisel suspended by drill. Rod. Clear water was added to the holes during borings. Seamless 50mm dia. M.S. drill rod in section of 3 meter length connected to each other by means of coupling with threaded joints were used for drilling. A chopping bit is attached to lower end of the drill rod and put to the bore hole fitted with the swivel head which was connected to the water pump through a high-pressure hose pipe. When the pumping is started, water circulates through the swivel head into the drill rod and then to the soil through opening of the chopping bit under high pressure. On the top of the swivel head manila rope is attached which passes through the pulley block of the tripod into the hand of the crawler who chopped up-down and rotated to disintegrate the soil. The disintegrated loose soil is thus forced out of the bore hole with circulation of water and the drilling is advanced to the desired elevation.
    - **Standard Penetration Test (SPT):** Standard Penetration Tests (SPT) have been executed in each bore hole at 1.50m intervals from the existing ground level to the final depth of exploration. The test were made by using a split spoon of 50. 8mm.outer dia. and 35mm. inner dia. attached to the lower end of drill rod. A 63.52 Kg. Hammer was allowed to fall freely from a height of 760mm on a socket attached to the drill rod. The blows of the hammer drove the spoon into the soil upto 450mm. The number of blows required for each 150mm of penetration of spoon was recorded. The blows required for last 300mm of penetration of the spoon was entered into the bore chart as being the standard penetration test results. The disturbed samples collected in the spoon during the test were kept in polythene bags and marked with bore hole number and blows recorded.
    - **Undisturbed Soil Samples (U):** The undisturbed soil sample have been collected from the cohesive deposit from different depths. The samples are shown on the bore logs against respective depth by proper symbol. The samples were collected in thin walled shelby tubes by pressing the tubes into the cohesive soil.

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- **Disturbed Soil Samples (D):** Disturbed soil samples were extracted at every 1.5m intervals or at every change of strata and examine the changes in the color and type of drill water returned with cutting of soil from the bore holes during operation. The samples were collected by means of split spoon sampler. This sampler was attached to the bottom of the drilling rod in place of the cutting bit and lowered into the hole at the desired depth. It was then driven into the soil up to a measured depth by means of hammering in a prescribed manner and then removed from the hole. The samples were then preserved in polythene bags, properly labeled and shifted to the laboratory for testing.
- **Ground Water Level (GWL):** The ground water level was recorded in each bore hole. Measurement for ground water level was taken after an overnight stabilization on completion of boring of that hole and followed by the measurement after 24 hours. The last measurement was taken as final for ground water level and recorded.

- **Laboratory Tests:**The following laboratory tests were performed in accordance with ASTM/AASHTO specification. During this period, the bore hole was protected from any physical disturbance or caving

a. Natural Moisture Content Test
b. Specific Gravity Test
c. Atterberg Limit test
d. Liquit Limit test 7 Plastic limit test
e. Density Test (Wet & Dry)
f. Grain Size Analysis of soil by sive& hydrometer analysis
g. Consolidation Tests
h. Unconfined Compression Tests
i. Direct Shear Test

A.2. Hydrological Conditions (Surface and Ground Water and Water Quality):

Ground and surface water:

The Mymensingh city is situated on the bank of the river Brahmaputra. Here an upper semi-impervious layer overlies aquifer — the source for large-scale groundwater development. The groundwater resource study using Visual MODFLOW modeling shows that recharge occurs mainly due to infiltration of rainfall and water from urban return flow, and groundwater level fluctuates seasonally in response to recharge and discharge. Hydraulic connection between river and aquifer indicates inflow from high river water levels beyond its boundaries to the city aquifer.

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A.3. AIR QUALITY:

The air quality of Mymensingh is shown in the following chart-

Air pollution level	Air quality index	Main pollutant
Unhealthy	151 US AQI	PM2.5

Pollutants	Concentration
PM2.5	56.2 µg/m³

PM2.5 concentration in Mymensingh air is currently 5.6 times above the **WHO annual air quality guideline value.** The major sources of atmospheric pollutants are motorized vehicles. The motor vehicles on road are bus, truck, tractor, motor cycle, auto rickshaw and micro.

A.4. Sound Conditions:

Sound pollution in Mymensingh city is excessively high from the acceptable noise level provided by WHO and DoE. This high level of pollution affects the environment, human health, and the psychological environment of human.

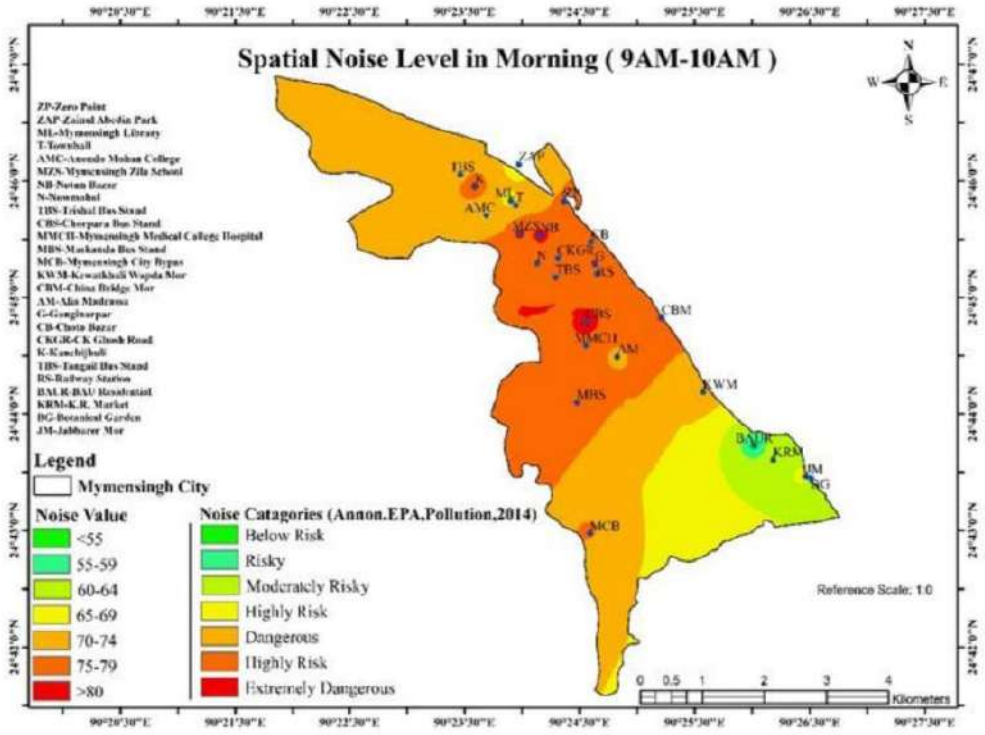

Fig: Spatial Noise Level in Morning in Mymensingh

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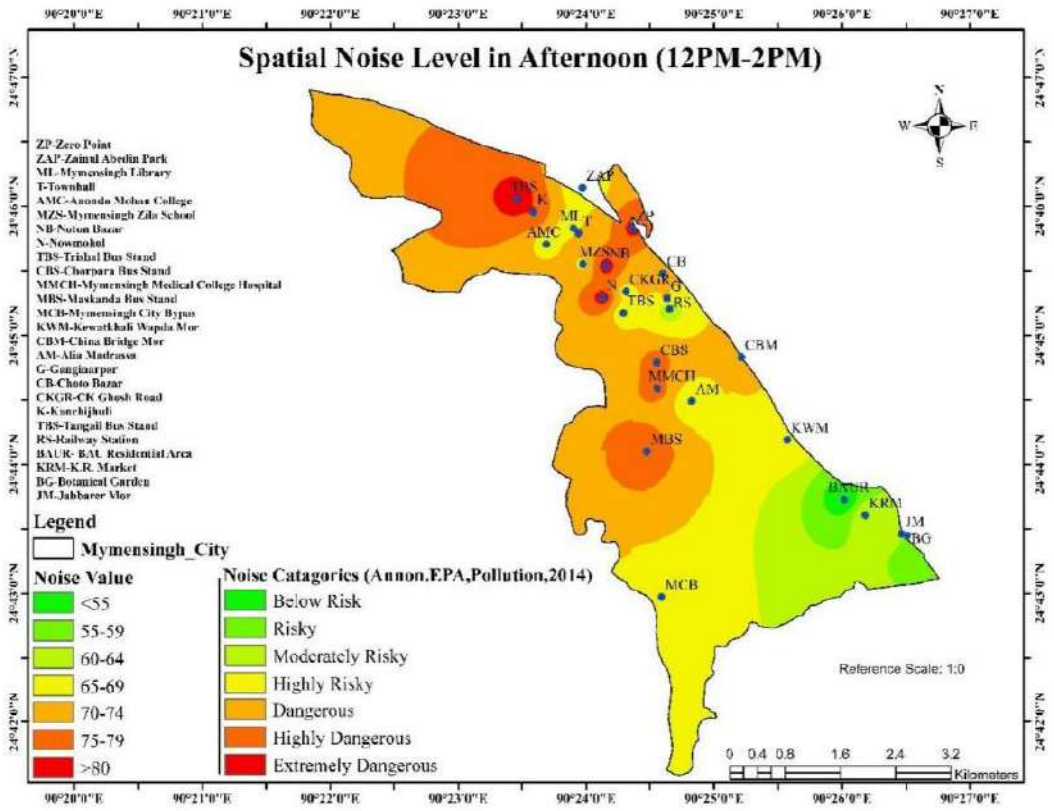

Fig: Spatial Noise Level in Afternoon in Mymensingh

A.5. Climate Conditions:

Bangladesh has a subtropical monsoon climate characterized by wide seasonal variations in rainfall, high temperatures and humidity. There are three distinct seasons in Bangladesh: a hot, humid summer from March to June; a cool, rainy monsoon season from June to October; and a cool, dry winter from October to March. Thirty years average climatic data of Temperature, Rainfall and Humidity of Mymensingh are presented here:

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Temperature:

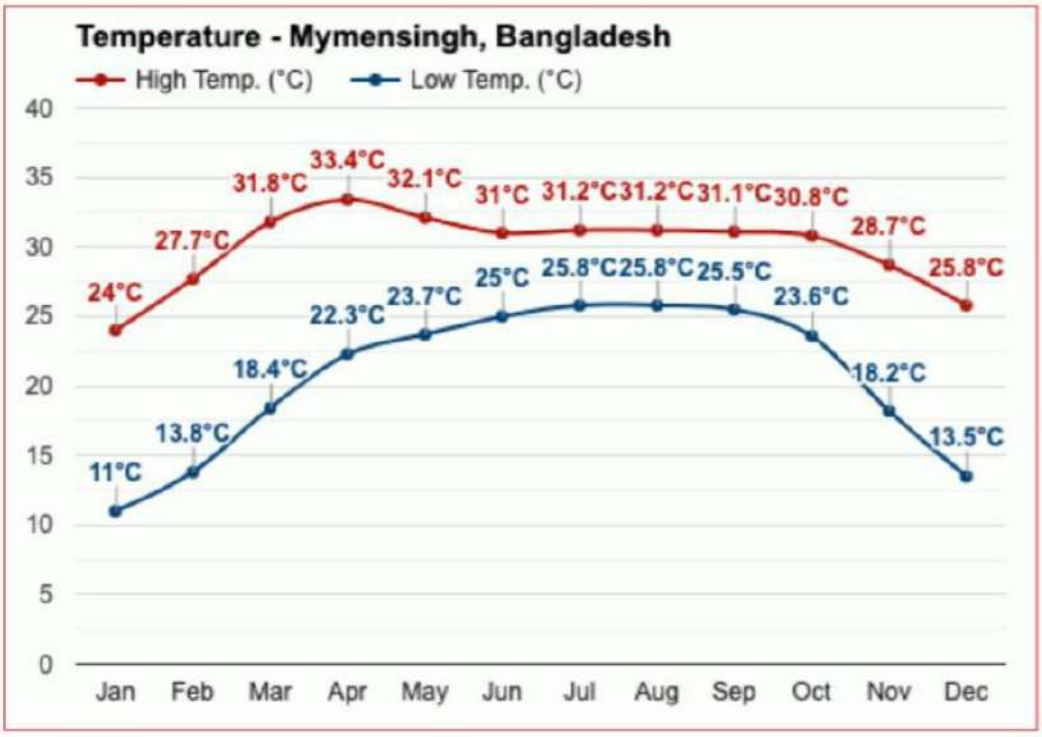

Fig: Monthly Air Temperature of Mymensingh

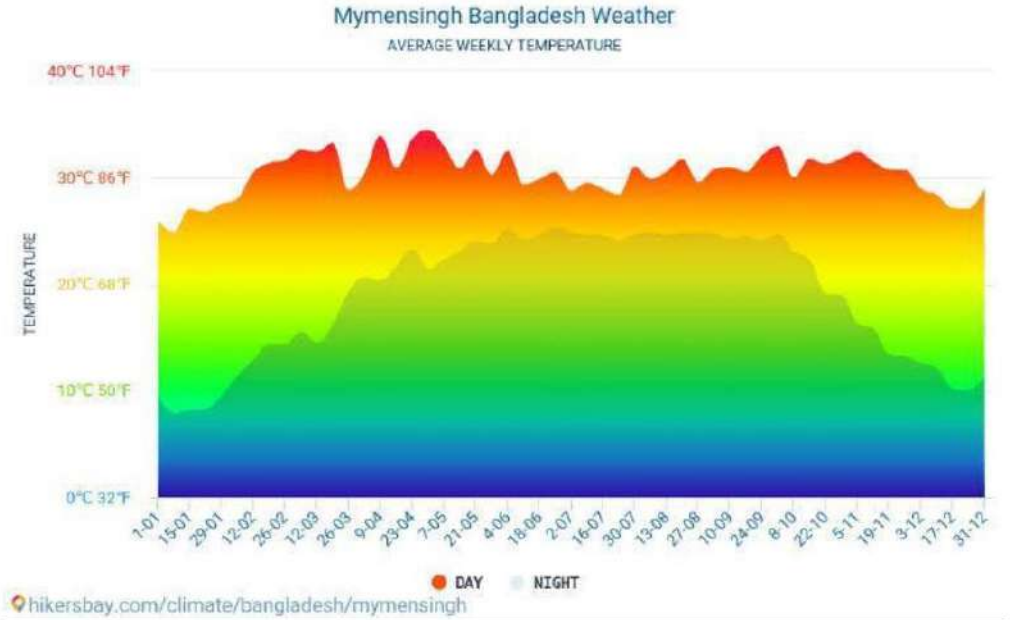

Fig: Weekly Average Air Temperature of Mymensingh

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The warmest month (with the highest average high temperature) is April (33.4°C). The month with the lowest average high temperature is January (24°C) Months with the highest average low temperature are July and August (25.8°C). The coldest month (with the lowest average low temperature) is January (11°C).

Rainfall:

The wettest month (with the highest rainfall) is June (469mm). The driest month (with the lowest rainfall) is December (2mm)

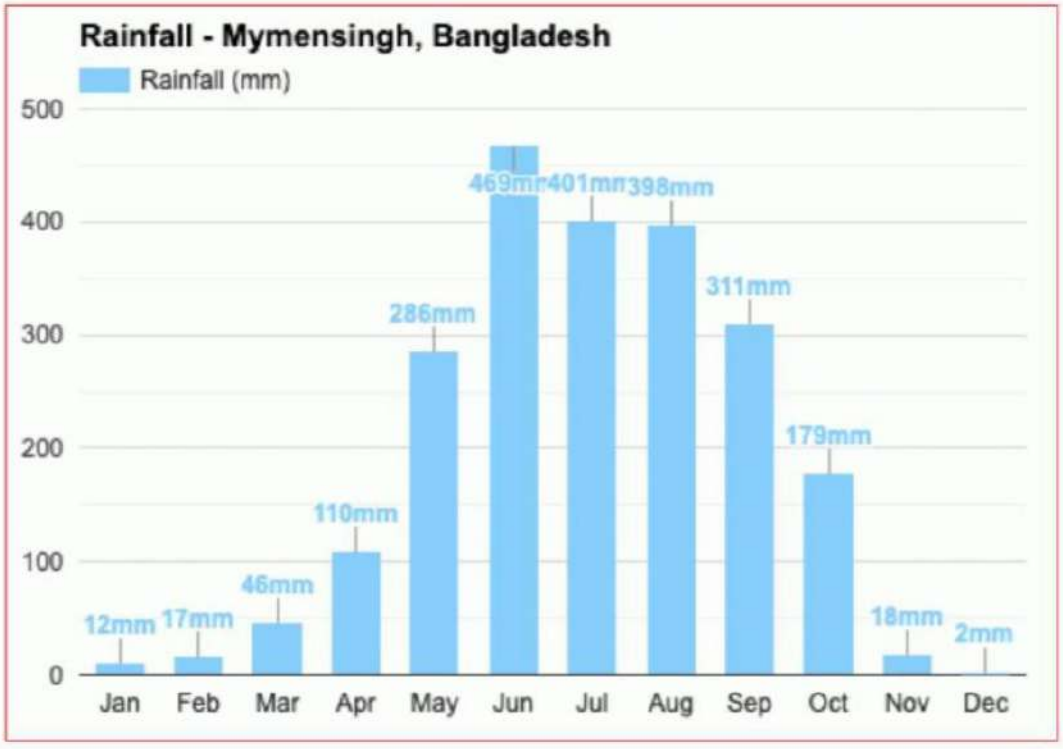

Fig: Monthly Average Rainfall of Mymensingh

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Humidity:

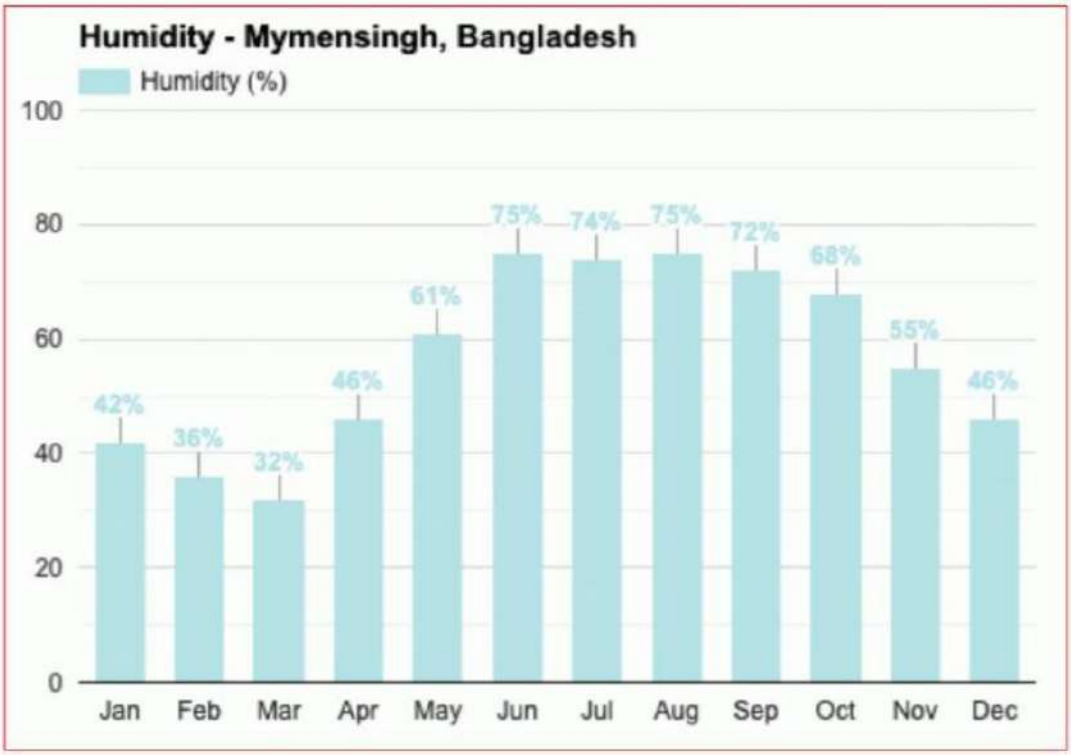

Fig: Monthly Humidity of Mymensingh

Months with the highest relative humidity are June and August (75%). The month with the lowest relative humidity is March (32%).

5. A.2: ENVIRONMENTAL IMPACTS ANALYSIS:

A. Environmental Impacts during construction phase:
This section highlights the adverse environmental impacts during the construction. In most of the cases if construction process is planned properly then these impacts can be reduced to zero. I.

- **Impacts on air quality:**

The air quality impacts of the construction phase will mainly be restricted to the potential dust generation from earth cutting activities. Undertaking the construction works at the dry season and moving a large number of materials may create dust and increase the vehicle-related pollutants (such as COx, SOx, PMs, NOx, and HCs) which will affect people who live and work near the site.

- **Impacts on water quality:**

During the construction phase, there are few possibilities of deterioration of water quality. Trenching and excavation, run-off from stockpiled materials, and contamination from fuels and lubricants may result in

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siltation and reduction in the quality of adjacent water-bodies. The expected impacts are moderate negative and short-term, site-specific within a relatively small area, and reversible by mitigation measures.

- **Impact on soil and land :**

There will be a possibility to use topsoil during construction related works (i.e., land cutting and filling). The soil of the study area is mainly the flood plain soils which are rich in materials that increase fertility. Improper drainage may cause erosion of the road surface during the rainy season which could have minor impacts on adjacent land. The impacts is indirect in nature and can sustain for few months. As proposed project will be constructed over the existing roads, no encroachment of additional agricultural land will occur.

- **Impact on Biological Environment:**

Due to construction some trees will be cut down. There are no ecologically protected areas in or around the project sites and no areas of ecological interest. Hauling of construction materials and transport of equipment on the site can cause traffic congestion occasionally. However, the impacts are short-term, site-specific, and manageable with the appropriate mitigation measures.

Although the construction of project involves quite simple techniques of civil work, being in the existing networks of city, the construction may have adverse impacts on residents, businesses and the community in general. However, the impacts are short-term and reversible by mitigation measures.

B. Environmental Impacts during Operation phase:

During the operation phase, the assessment of environmental impacts is very crucial. Thus, if not identified properly before the construction, proper mitigation plans cannot be adopted in the construction process.

- **Impacts on air quality:**

During the operation phase, the possibility to increase dust at the site of the evacuation is very little. The vehicle movement to the proposed project will be limited which will result in less emission. During operational phase the project will not have activities associated with air-pollution. Therefore, the assessment of air quality degradation in not necessary.

- **Impacts on water quality:**

The proposed evacuation route will not cross any natural channel. The project will not impede the natural drainage facility and will not interfere with the normal flow of the river. As a result, it does not create water logging in the adjacent area. It will not lead to significant change in the water level and flow rates of the adjacent river. The construction of the proposed project does not hamper the groundwater quality. But the installation of latrine may hamper groundwater if not design properly.

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- **Impacts on ambient noise standards:**

The proposed project will not use any type of heavy machinery during project running period. Hence, it will not produce excessive noise.

- **Impact on biological resources**:

Vegetation: It is expected that the proposed project will not affect homestead forestry, agriculture, or the precious aquatic vegetation during its operation.

Wildlife: There is no wildlife sanctuary, or any natural protected area lies near the project area. Hence, there will be no possibility of impact on wildlife by the presence or activity of the proposed project.

Aquatic species and habitat: As already mentioned, that the proposed project will not hamper the water body and does not create water logging problem. As a result, it does not create any unfavorable situations in the river ecology. Thereby, have no impacts on the existing condition of the aquatic habitat.

5. B: COUNTER MEASURES TO REDUCE THE ENVIRONMENTAL, DISASTER AND CLIMATE CHANGE IMPACTS:

The mitigation plans are classified as the three different phases namely, the planning and design, construction, and operational. During the design and planning phase, there are fewer mitigation strategies. However, the mitigation strategies during the construction and operation phases are more crucial because of the possibility of larger environmental impact. Counter measures are given below-

5. B.1: CONSTRUCTION METHOD:

It is suggested to use of backhoe digger for the excavation of foundation structure with manual digging where necessary. Excavated soil and other materials need to be stored on the unused land nearby and unnecessary wastes and any excess materials need to be disposed-off in the pre-approved disposal sites. The debris accumulated from the demolition of the existing old structure at the site must be stored in a safe place

5. B. 2: SITE AND ROUTE MAINTENANCE:

The contractor must plan haul routes to avoid congestion and schedule transportation to avoid peak traffic periods. Speed limits and other traffic rules need to be strictly enforced among drivers. Traffic detours need to be identified. Flagmen need to be posted at the start and finish of construction areas as necessary to direct the movement of traffic. Movable sanitary facilities must be provided at the site which need to be kept clean, free of odors, and usable. No materials should be stored onsite for longer than a day before their use. Excess materials have to be removed after a segment is completed. The contractor need to avoid stockpiling earth

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and construction materials in areas with flooding and water flowing. Discharge of fuel oil, engine oil, and other types of pollutants to the soil or drainage need to be prohibited.

5. B. 3: TOPOGRAPHY, LANDFORMS, GEOLOGY, AND SOILS:

A significant amount of gravel, sand, and cement will be required for this project. The extraction of construction materials may cause changes in local topography and landforms. Utilization of readily available sources of materials can reduce adverse effect. For instance, contractor can procure materials from existing burrow pits and quarries with complying of all relevant regulatory requirements.

5. B. 4: WATER QUALITY:

It necessary to prepare and implement a soils management plan that prioritize the re-use of excess soils and materials in construction activities. All earthworks must be conducted during the dry season at least as much as possible to avoid the difficult working conditions prevail during monsoon. The stockyards for construction materials and storage areas for fuels and lubricants must be placed far away (at least 30m) from watercourses. Need to take all precautions to prevent the dilution of wastewater into streams, watercourses, or irrigation system. Construction materials like earth, stone, or appendage must not be disposed-off in a manner that may block water flow. Finally, water quality should be monitored regularly according to the environmental management plan.

5. B. 5: AIR QUALITY & DUST:

To control dust windscreens, water sprinklers, and dust extraction systems can be provided for all the construction related works generating dust (i.e., demolishing existing structures, cutting of land, sand filling, etc.). Besides, tarpaulins can be used to cover soils, sand, and other loose material when transported by trucks. Regular monitoring of the air quality as per the environment management plan is very important.

5. B. 6: ACOUSTIC ENVIRONMENT:

The work program need to develop through consultation with the community people so that any particularly noisy or invasive activities can be scheduled appropriately. For example, high noise generating equipment must be prohibited during night time. Besides, use of modern vehicles and machinery that produce lower noise and emissions is recommended. In the areas where the noise level will be above the exospore limit, warning signs need to be placed. The workers going to be working in noisy areas must wear hearing protection. According to the international standard, it is important to maintain maximum sound levels not exceeding 80 decibels (DBA) measured at a distance of 10m or more.

5. B. 7: BIODIVERSITY:

As mentioned, bio-diversity is not a concern except cutting down of few trees at the construction site. A detailed planning during the construction phase can avoid the unnecessary cutting down of trees. All efforts shall be

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made to preserve trees by evaluation of minor architectural design adjustments as applicable. Besides, removing and damaging vegetable gardens, animal nurturing fields need to be avoided as much as possible.

5. B. 8: EXISTING PROVISIONS FOR MOVEMENTS:

Firstly, it is important to plan the transportation routes so that heavy vehicles do not use narrow local roads except near delivery sites. Scheduling deliveries of construction materials during periods of low traffic volume can reduce the traffic congestion. Maintaining safe passage for vehicles and pedestrians throughout the construction period may reduce the road accidents. To reduce the impact on sensitive receptors (such as, children, elderly people, women, business community, etc.) signboards, informing the nature and duration of construction activities and contact numbers for complaints, can be placed in the areas where applicable.

5. B. 9: OCCUPATIONAL HEALTH AND SAFETY:

There should be basic safety plan for workers which ensure the personal protective gear and proper training. Emergency care have to be available on call. Besides, high standard of safety need to be maintained during the construction works. For instance, workers need to be informed about the potential risks associated with activities especially the ones going to work around the moving equipment. Workers must not be allowed to enter deep trenches unless they are properly shored.

5. C: COST OF REDUCING ENVIRONMENTAL, DISASTER AND CLIMATE CHANGE IMPACTS:

The counter or mitigation measures as described earlier involved some costs. However, those costs are mostly associated with the construction works. Hence, these costs are the integrated parts of cost of construction as estimated in the Development Planning Project (DPP).

5. D : ALTERNATIVE WAYS TO DELIVER THE REQUIRED BENEFIT OF THE PROJECT:

The importance and justification of the project has already been discussed in the market demand analysis. To ensure better civic services, "**Establishment of Mymensingh City Corporation Nagar Bhaban"** is a better option. In addition, the environmental costs in the proposed location are not high. There are also no other ways by which the environmental costs could be minimized.

5. E: REQUIRED ASSESSMENT FOR THE PROJECT:

The required assessment for the current project is Environment Impact Assessment (EIA). In the context of a project, the Environmental Management Plan (EMP) is concerned with the implementation of the measures necessary to minimize or offset adverse negative impacts and to enhance beneficial impacts. Unless the mitigation and benefit enhancement measures, identified in EIA, the prime function of EIA cannot be achieved. All the measures are said to be successful when they comply with the national environmental requirements particularly the Environmental Quality Standards (EQS) of Bangladesh.

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5. F: RESETTLEMENT ISSUES:

The environmental damage of this project is minimal which can be reduced further by taking measures as recommended in the counter measures. Therefore, there are no resettlement issues involved in this project.

SECTION 6: COST-BENEFIT ANALYSIS:

6.1: FINANCIAL ANALYSIS:

As a social project the financial analysis is less indicative for the investment case as it only consider financial costs and benefits. Rather an economic analysis, which includes both direct and indirect costs and benefits, would be more appropriate for the proposed project.

6.2: ECONOMIC ANALYSIS:

In order to increase the quality of civic services offered by the Mymensingh City Corporation Authority to the inhabitants of the Mymensingh City, it's obvious to accommodate all the stake holders, departments, technical professionals etc. under one roof. It is expected that "**Establishment of Mymensingh City Corporation Nagar Bhaban"** will play a great role in fulfilling this purpose. This Nagar Bhaban will enable the City Corporation Authority to provide better civic services for desired development, which is the ultimate goal of Mymensingh City Corporation. Since investment in this project will ensure the adequate workplaces for all departments of City Corporation in a better environment, there will be some direct benefit as well. Moreover, investment in research and its expected outcome is regarded as public good which will reap countless benefits.

However, all these benefits require a significant amount of investment that would tie up the capital for longer term, and it will continue to incur recurrent costs. Hence, the project to be socially optimal, the project benefits need to be higher than the project costs, in the long run in particular.

6.2.A.1: IDENTIFYING DIRECT, INDIRECT AND ASSOCIATED BENEFIT COMPONENTS:

For estimating benefits, benefit from various sources need to be captured. The following direct, indirect and associated benefits are expected to be achieved with the "**Establishment of Mymensingh City Corporation Nagar Bhaban"** (but are not limited to)-

- Adequate workplace facilities for all the departments of Mymensingh City Corporation
- Office for every selected Councilor of all of the wards of Mymensingh City Corporation. At present there are 22 wards in Mymensingh City Corporation. But the number of wards will be increased in future for continuous development of Mymensingh. The assumed ward number of Mymensingh City Corporation is going to be 33 in future.
- City Corporation will run specialized training facilities on handicrafts for the empowerment of local women. Women empowerment is important for the overall development of Mymensingh city which will result in development of Bangladesh.

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- Local women will get opportunity to sell their handmade products, tangible art effects in front of visitors in established outlets in Mymensingh City Corporation Nagar Bhaban. It will play a great role in ensuring economic development.
- Mymensingh City Corporation authority will get extra income through office spaces rents.
- Income will be generated from community center / gymnasium/ other retail etc.
- Income will be generated from guest houses too.
- City Corporation authority will hire parking spaces on hourly or monthly basis which will be another source of income.
- City Corporation will run a 300 seated restaurant in Nagar Bhaban complex. It will generate income also.
- Auditorium space will be available for rent on daily or weekly basis. It will generate income also.
- Now the existing MCC offices are in scattered places. There are system losses. Now building will integrate them all together within a single umbrella. It will reduce the time and cost substantially.

6.2.A.2: IDENTIFYING DIRECT, INDIRECT AND ASSOCIATED COST COMPONENTS:

The direct costs are the costs of implementation of the project. The detail direct costs are estimated in the DPP such as the costs of MEP works, costs of equipment and furniture for both construction and operational phase, costs of land development and other costs of construction.

6.2.B: CALCULATING THE VALUE OF COST AND BENEFIT COMPONENTS:

Components	Estimated cost benefits
Rental of office spaces	25,00,000/= per month after completion of construction
community center / gymnasium/ other retail etc.	Per month projected income is about BDT 30 to 50 lac
50 beds guest house	Per month projected income is about BDT 8 to 10 lac
Car parks rental at ground and semi basement floor	Per month projected income is about BDT 15lac
Auditorium / Restaurant/ other retail	Per month projected income is about BDT 15lac

Fig: Chart showing assumptions of benefits

6.2.C: CASH FLOW:

This project will be implemented under the revenue and development budget of the government. The construction of cash flow is as of designed in the DPP.

6.2.D: ASSUMPTIONS:

For cost benefit analysis few assumptions are taken to calculate the value of the benefit components. The detail assumption is represented in 6.2.b.

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6. E: COMPUTING THE INDICATORS AND INTERPRETING THE RESULTS FOR ECONOMIC & FINANCIAL ANALYSIS:

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Economic Analysis:

Arithmatical calculation for NPV, BCR, IRR for Economic Analysis

Rentable income from Back Tower:

1st floor 16530.85 sft. Rent per month Tk. 95.00 per sft = Tk.15,70,430.75 per month x 12 = Tk. 1,88,45,169.00	= Tk.	188.45	lakh
2nd floor 16530.85 sft. Rent per month Tk. 95.00 per sft = Tk.15,70,430.75 per month x 12 = Tk. 1,88,45,169.00	= Tk.	188.45	lakh
3rd floor 16530.85 sft. Rent per month Tk. 95.00 per sft = Tk.15,70,430.75 per month x 12 = Tk. 1,88,45,169.00	= Tk.	188.45	lakh
4th floor 14143.14 sft. Rent per month Tk. 95.00 per sft = Tk.13,43,598.30 per month x 12 = Tk. 1,61,23,179.60	= Tk.	161.24	lakh
Total =	Tk.	726.59	lakh
Basement floor car parking area by renting 200 cars @ Tk. 12000.00 per parking per month. 200 x Tk. 12000.00 = Tk 24,00,000.00 per month x 12 = Tk. 2,88,00,000.00	= Tk.	288.00	lakh
Total Annual income =	= Tk.	1,014.59	lakh
Income in terms of social benefits	= Tk.	500.00	lakh
Possession & Bookong money 50% of total annual income(1st year)	= Tk.	363.30	lakh
1st year income including Booking money & social benefits	= Tk.	1,877.89	lakh
Annual income including social benefits	= Tk.	1,514.59	lakh

Assumptions

Benefit as savings of rent which is cosidered on the basis of present market rate and that cost will be increased by 50% after every 5 years

Project Life assumed = 50 years considered for service life and calculation of NPV, BCR, IRR accordingly)

Maintenance period will be started after 3 years from date of completion of construction.

Maintenance cost is considered as 2% of the total investment cost in every year and that cost will be increased by 10% after every 5 year.

Salvage value = 10% of total project cost.

Investment

Construction year 1	= Tk.	4,113.52	lakh
Construction year 2	= Tk.	8,593.86	lakh
Construction year 3	= Tk.	9,115.25	lakh
Total Investment =	Tk.	21,822.63	lakh

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NAME OF PROJECT : CONSTRUCTION OF NOGOR BHABAN OF MYMENSINGH CITY CORPORATION.

Economic Analysis (Economic calculation for NPV, BCR, IRR.)

Year	Cost		Undiscounted Total		Discount Factor (12%)	Discount Factor (20%)	Discounted Total (12%)		Discounted Total (20%)		Net Benefits		
	Investment	Maintenance	Total Cost	Total Benefit (Economic Value)			Cost	Benefit	Cost	Benefit	Undiscounted	Discounted (12%)	Discounted (20%)
1	2	3	4	5	6	7	8	9	10	11	12=5-4	13=9-8	14=11-10
Construction year 1	4,113.52	0.00	4,113.52	0.00	0.8929	0.8333	3,672.79	0.00	3,427.93	0.00	-4,113.52	-3,672.79	-3,427.93
Construction year 2	8,593.86	0.00	8,593.86	0.00	0.7972	0.6944	6,850.97	0.00	5,967.96	0.00	-8,593.86	-6,850.97	-5,967.96
Construction year 3	9,115.25	0.00	9,115.25	0.00	0.7118	0.5787	6,488.05	0.00	5,275.03	0.00	-9,115.25	-6,488.05	-5,275.03
1st	0.00	0.00	0.00	1,877.89	0.8929	0.8333	0.00	1,676.68	0.00	1,564.90	1,877.89	1,676.68	1,564.90
2nd	0.00	0.00	0.00	1,514.59	0.7972	0.6944	0.00	1,207.42	0.00	1,051.80	1,514.59	1,207.42	1,051.80
3rd	0.00	0.00	0.00	1,514.59	0.7118	0.5787	0.00	1,078.06	0.00	876.50	1,514.59	1,078.06	876.50
4th	0.00	436.45	436.45	1,514.59	0.6365	0.4823	277.87	962.55	210.48	730.42	1,078.14	684.68	519.94
5th	0.00	436.45	436.45	1,514.59	0.5674	0.4019	247.65	859.42	175.40	608.68	1,078.14	611.76	433.28
6th	0.00	436.45	436.45	2,271.89	0.5066	0.3349	221.12	1,151.01	146.17	760.85	1,835.43	929.89	614.68
7th	0.00	436.45	436.45	2,271.89	0.4523	0.2791	197.43	1,027.89	121.81	634.04	1,835.43	830.26	512.24
8th	0.00	436.45	436.45	2,271.89	0.4039	0.2326	176.26	917.58	101.50	528.37	1,835.43	741.30	426.86
9th	0.00	480.10	480.10	2,271.89	0.3606	0.1938	173.13	819.26	93.05	440.31	1,791.79	646.14	347.26
10th	0.00	480.10	480.10	2,271.89	0.3220	0.1615	154.56	731.49	77.54	366.92	1,791.79	576.91	289.38
11th	0.00	480.10	480.10	3,407.83	0.2875	0.1346	138.02	979.67	64.62	458.66	2,927.73	841.65	394.04
12th	0.00	480.10	480.10	3,407.83	0.2567	0.1122	123.23	874.70	53.85	382.21	2,927.73	751.48	328.36
13th	0.00	480.10	480.10	3,407.83	0.2292	0.0935	110.03	780.99	44.87	318.51	2,927.73	670.96	273.64
14th	0.00	528.11	528.11	3,407.83	0.2046	0.0779	108.06	697.31	41.13	265.42	2,879.72	589.25	224.29
15th	0.00	528.11	528.11	3,407.83	0.1827	0.0649	96.48	622.60	34.28	221.19	2,879.72	526.11	186.91
16th	0.00	528.11	528.11	5,111.74	0.1631	0.0541	86.15	833.84	28.56	276.48	4,583.63	747.69	247.92
17th	0.00	528.11	528.11	5,111.74	0.1456	0.0451	76.92	744.50	23.80	230.40	4,583.63	667.58	206.60
18th	0.00	528.11	528.11	5,111.74	0.1300	0.0376	68.67	664.73	19.84	192.00	4,583.63	596.05	172.17
19th	0.00	580.92	580.92	5,111.74	0.1161	0.0313	67.45	593.51	18.18	160.00	4,530.82	526.06	141.82
20th	0.00	580.92	580.92	5,111.74	0.1037	0.0261	60.22	529.92	15.15	133.33	4,530.82	469.70	118.18
21th	0.00	580.92	580.92	7,667.61	0.0926	0.0217	53.77	709.71	12.63	166.67	7,086.69	655.94	154.04
22th	0.00	580.92	580.92	7,667.61	0.0826	0.0181	48.01	633.67	10.52	138.89	7,086.69	585.66	128.37
23th	0.00	580.92	580.92	7,667.61	0.0738	0.0151	42.86	565.78	8.77	115.74	7,086.69	522.91	106.97
24th	0.00	639.01	639.01	7,667.61	0.0659	0.0126	42.10	505.16	8.04	96.45	7,028.60	463.05	88.41
25th	0.00	639.01	639.01	7,667.61	0.0588	0.0105	37.59	451.03	6.70	80.38	7,028.60	413.45	73.68
26th	0.00	639.01	639.01	11,501.42	0.0525	0.0087	33.56	604.06	5.58	100.47	10,862.41	570.50	94.89
27th	0.00	639.01	639.01	11,501.42	0.0469	0.0073	29.97	539.34	4.65	83.73	10,862.41	509.38	79.07
28th	0.00	639.01	639.01	11,501.42	0.0419	0.0061	26.75	481.56	3.88	69.77	10,862.41	454.80	65.89
29th	0.00	702.91	702.91	11,501.42	0.0374	0.0051	26.28	429.96	3.55	58.14	10,798.51	403.68	54.59
30th	0.00	702.91	702.91	11,501.42	0.0334	0.0042	23.46	383.89	2.96	48.45	10,798.51	360.43	45.49
31th	0.00	702.91	702.91	17,252.13	0.0298	0.0035	20.95	514.14	2.47	60.57	16,549.22	493.20	58.10
32th	0.00	702.91	702.91	17,252.13	0.0266	0.0029	18.70	459.06	2.06	50.47	16,549.22	440.35	48.41
33th	0.00	702.91	702.91	17,252.13	0.0238	0.0024	16.70	409.87	1.71	42.06	16,549.22	393.17	40.35
34th	0.00	773.20	773.20	17,252.13	0.0212	0.0020	16.40	365.96	1.57	35.05	16,478.92	349.56	33.48
35th	0.00	773.20	773.20	17,252.13	0.0189	0.0017	14.64	326.75	1.31	29.21	16,478.92	312.10	27.90
36th	0.00	773.20	773.20	25,878.19	0.0169	0.0014	13.08	437.61	1.09	36.51	25,104.99	424.53	35.42
37th	0.00	773.20	773.20	25,878.19	0.0151	0.0012	11.67	390.72	0.91	30.42	25,104.99	379.05	29.52
38th	0.00	773.20	773.20	25,878.19	0.0135	0.0010	10.42	348.86	0.76	25.35	25,104.99	338.43	24.60
39th	0.00	850.52	850.52	25,878.19	0.0120	0.0008	10.24	311.48	0.69	21.13	25,027.67	301.24	20.43
40th	0.00	850.52	850.52	25,878.19	0.0107	0.0007	9.14	278.11	0.58	17.61	25,027.67	268.97	17.03
41th	0.00	850.52	850.52	38,817.29	0.0096	0.0006	8.16	372.47	0.48	22.01	37,966.76	364.30	21.53
42th	0.00	850.52	850.52	38,817.29	0.0086	0.0005	7.29	332.56	0.40	18.34	37,966.76	325.27	17.94
43th	0.00	850.52	850.52	38,817.29	0.0076	0.0004	6.51	296.93	0.33	15.28	37,966.76	290.42	14.95
44th	0.00	935.57	935.57	38,817.29	0.0068	0.0003	6.39	265.11	0.31	12.74	37,881.71	258.72	12.43
45th	0.00	935.57	935.57	38,817.29	0.0061	0.0003	5.71	236.71	0.26	10.61	37,881.71	231.00	10.36
46th	0.00	935.57	935.57	58,225.93	0.0054	0.0002	5.09	317.02	0.21	13.27	57,290.35	311.93	13.05
47th	0.00	935.57	935.57	58,225.93	0.0049	0.0002	4.55	283.05	0.18	11.06	57,290.35	278.51	10.88
48th	0.00	935.57	935.57	58,225.93	0.0043	0.0002	4.06	252.73	0.15	9.21	57,290.35	248.67	9.07
49th	0.00	1,029.13	1,029.13	58,225.93	0.0039	0.0001	3.99	225.65	0.14	7.68	57,196.80	221.66	7.54
50th	0.00	1,029.13	1,029.13	58,225.93	0.0035	0.0001	3.56	201.47	0.11	6.40	57,196.80	197.91	6.29
Sulvage value.				2,182.26	0.0031	0.0001	0.00	6.74	0.00	0.20	2,182.26	6.74	0.20
Total =	**21,822.63**	**31,692.25**	**53,514.88**	**660,788.57**	**10.71**	**7.11**	**19,956.20**	**29,690.06**	**16,024.15**	**11,634.86**	**607,273.69**	**9,733.86**	**-4,389.29**

PV of Total Revenue at 12% = 29,690.06
PV of Total Cost at 12% = 19,956.20
Net Present Value(NPV) at 12% 9,733.86
IRR = (20-12)*(NPV at 12% discount/(NPV at 12%+NPV at 20%))+12
8*{(9733.86)/(9733.86 + 4389.29)} + 12
17.51

BCR PV of Total Revenue at 12% = 29,690.06 1.49
PV of Total Cost at 12% = 19,956.20

Assumptions

Benefit as savings of rent which is cosidered on the basis of present market rate and that cost will be increased by 50% after every 5 years

Project Life assumed = 50 years considered for service life and calculation of NPV, BCR, IRR accordingly)

Maintenance period will be started after 3 years from date of completion of construction

Maintenance cost is considered as 2% of the total investment cost in every year and that cost will be increased by 10% after every 5 year.

Salvage value = 10% of total project cost.

TARIQUE HASAN & ASSOCIATES LTD. DHAKA

Engr. Md. Rafiqul Islam Miah
Chief Engineer
Mymensingh City Corporation

Financial Analysis:

Arithmatical calculation for NPV, BCR, IRR for financial analysis.

Rentable income from Back Tower:

1st floor 16530.85 sft. Rent per month Tk. 95.00 per sft = Tk.15,70,430.75 per month x 12 = Tk. 1,88,45,169.00	= Tk.	188.45	lakh
2nd floor 16530.85 sft. Rent per month Tk. 95.00 per sft = Tk.15,70,430.75 per month x 12 = Tk. 1,88,45,169.00	= Tk.	188.45	lakh
3rd floor 16530.85 sft. Rent per month Tk. 95.00 per sft = Tk.15,70,430.75 per month x 12 = Tk. 1,88,45,169.00	= Tk.	188.45	lakh
4th floor 14143.14 sft. Rent per month Tk. 95.00 per sft = Tk.13,43,598.30 per month x 12 = Tk. 1,61,23,179.60	= Tk.	161.24	lakh
Total =	Tk.	726.59	lakh
Basement floor car parking area by renting 200 cars @ Tk. 12000.00 per parking per month. 200 x Tk. 12000.00 = Tk 24,00,000.00 per month x 12 = Tk. 2,88,00,000.00	= Tk.	288.00	lakh
Total Annual income =	= Tk.	1,014.59	lakh
Possession & Bookong money 50% of total annual income(1st year)	= Tk.	363.30	lakh
1st year income including Booking money	= Tk.	1,377.89	lakh

Assumptions

Benefit as savings of rent which is cosidered on the basis of present market rate and that cost will be increased by 50% after every 5 years

Project Life assumed = 50 years considered for service life and calculation of NPV, BCR, IRR accordingly)

Maintenance period will be started after 3 years from date of completion of construction.

Maintenance cost is considered as 2% of the total investment cost in every year and that cost will be increased by 10% after every 5 year.

Salvage value = 10% of total project cost.

Investment

Construction year 1	= Tk.	4,113.52	lakh
Construction year 2	= Tk.	8,593.86	lakh
Construction year 3	= Tk.	9,115.25	lakh
Total Investment =	Tk.	21,822.63	lakh

TARIQUE HASAN & ASSOCIATES LTD. DHAKA

Engr. Md. Rafiqul Islam Miah
Chief Engineer
Mymensingh City Corporation

NAME OF PROJECT : CONSTRUCTION OF NOGOR BHABAN OF MYMENSINGH CITY CORPORATION.

Financial Analysis (Financial calculation for NPV, BCR, IRR.)

Year	Cost		Undiscounted Total		Discount Factor (12%)	Discount Factor (20%)	Discounted Total (12%)		Discounted Total (20%)		Net Revenue		
	Investment	Maintenance	Total Cost	Total Benefit (Economic Value)			Cost	Revenue	Cost	Revenue	Undiscounted	Discounted (12%)	Discounted (20%)
1	2	3	4	5	6	7	8	9	10	11	12=5-4	13=9-8	14=11-10
Construction year 1	4,113.52	0.00	4,113.52	0.00	0.8929	0.8333	3,672.79	0.00	3,427.93	0.00	-4,113.52	-3,672.79	-3,427.93
Construction year 2	6,593.86	0.00	6,593.86	0.00	0.7972	0.6944	6,850.97	0.00	5,967.96	0.00	-6,593.86	-6,850.97	-5,967.96
Construction year 3	9,115.25	0.00	9,115.25	0.00	0.7118	0.5787	6,488.05	0.00	5,275.03	0.00	-9,115.25	-6,488.05	-5,275.03
1st	0.00	0.00	0.00	1,377.89	0.8929	0.8333	0.00	1,230.25	0.00	1,148.24	1,377.89	1,230.25	1,148.24
2nd	0.00	0.00	0.00	1,014.59	0.7972	0.6944	0.00	808.82	0.00	704.58	1,014.59	808.82	704.58
3rd	0.00	0.00	0.00	1,014.59	0.7118	0.5787	0.00	722.17	0.00	587.15	1,014.59	722.17	587.15
4th	0.00	436.45	436.45	1,014.59	0.6355	0.4823	277.37	644.79	210.48	489.29	578.14	367.42	278.81
5th	0.00	436.45	436.45	1,014.59	0.5674	0.4019	247.65	575.71	175.40	407.74	578.14	328.06	232.34
6th	0.00	436.45	436.45	1,521.89	0.5066	0.3349	221.12	771.03	146.17	509.88	1,085.43	549.91	383.51
7th	0.00	436.45	436.45	1,521.89	0.4523	0.2791	197.43	688.42	121.81	424.73	1,085.43	490.99	302.92
8th	0.00	436.45	436.45	1,521.89	0.4039	0.2326	176.28	614.66	101.50	353.94	1,085.43	438.39	252.44
9th	0.00	480.10	480.10	1,521.89	0.3606	0.1938	173.13	548.81	93.05	294.95	1,041.79	375.68	201.91
10th	0.00	480.10	480.10	1,521.89	0.3220	0.1615	154.58	490.01	77.54	245.79	1,041.79	335.43	168.25
11th	0.00	480.10	480.10	2,282.83	0.2875	0.1346	138.02	656.26	64.62	307.24	1,802.73	518.24	242.63
12th	0.00	480.10	480.10	2,282.83	0.2567	0.1122	123.23	585.94	53.85	256.03	1,802.73	462.72	202.19
13th	0.00	480.10	480.10	2,282.83	0.2292	0.0935	110.03	523.17	44.87	213.36	1,802.73	413.14	168.49
14th	0.00	528.11	528.11	2,282.83	0.2046	0.0779	108.06	467.11	41.13	177.80	1,754.72	359.05	136.67
15th	0.00	528.11	528.11	2,282.83	0.1827	0.0649	96.48	417.06	34.28	148.17	1,754.72	320.58	113.89
16th	0.00	528.11	528.11	3,424.24	0.1631	0.0541	86.15	558.57	28.56	185.21	2,896.13	472.42	156.65
17th	0.00	528.11	528.11	3,424.24	0.1456	0.0451	76.92	498.72	23.80	154.34	2,896.13	421.81	130.54
18th	0.00	528.11	528.11	3,424.24	0.1300	0.0376	68.67	445.29	19.84	128.62	2,896.13	376.61	108.78
19th	0.00	580.92	580.92	3,424.24	0.1161	0.0313	67.45	397.58	18.18	107.18	2,843.32	330.13	89.00
20th	0.00	580.92	580.92	3,424.24	0.1037	0.0261	60.22	354.98	15.15	89.32	2,843.32	294.76	74.17
21th	0.00	580.92	580.92	5,136.36	0.0926	0.0217	53.77	475.42	12.63	111.55	4,555.44	421.65	99.02
22th	0.00	580.92	580.92	5,136.36	0.0826	0.0181	48.01	424.48	10.52	93.04	4,555.44	376.47	82.52
23th	0.00	580.92	580.92	5,136.36	0.0738	0.0151	42.86	379.00	8.77	77.53	4,555.44	336.14	68.76
24th	0.00	639.01	639.01	5,136.36	0.0659	0.0126	42.10	338.39	8.04	64.61	4,497.35	296.29	56.57
25th	0.00	639.01	639.01	5,136.36	0.0588	0.0105	37.59	302.14	6.70	53.84	4,497.35	264.55	47.14
26th	0.00	639.01	639.01	7,704.54	0.0525	0.0087	33.56	404.65	5.58	67.30	7,065.53	371.09	61.72
27th	0.00	639.01	639.01	7,704.54	0.0469	0.0073	29.97	361.29	4.65	56.09	7,065.53	331.33	51.43
28th	0.00	639.01	639.01	7,704.54	0.0419	0.0061	26.75	322.58	3.88	46.74	7,065.53	295.83	42.86
29th	0.00	702.91	702.91	7,704.54	0.0374	0.0051	26.28	288.02	3.55	38.95	7,001.63	261.74	35.40
30th	0.00	702.91	702.91	7,704.54	0.0334	0.0042	23.46	257.16	2.96	32.46	7,001.63	233.70	29.50
31th	0.00	702.91	702.91	11,556.81	0.0298	0.0035	20.95	344.41	2.47	40.57	10,853.90	323.46	38.10
32th	0.00	702.91	702.91	11,556.81	0.0266	0.0029	18.70	307.51	2.06	33.81	10,853.90	288.81	31.75
33th	0.00	702.91	702.91	11,556.81	0.0238	0.0024	16.70	274.56	1.71	28.17	10,853.90	257.86	26.46
34th	0.00	773.20	773.20	11,556.81	0.0212	0.0020	16.40	245.15	1.57	23.48	10,783.61	228.74	21.91
35th	0.00	773.20	773.20	11,556.81	0.0189	0.0017	14.64	218.88	1.31	19.57	10,783.61	204.24	18.26
36th	0.00	773.20	773.20	17,335.22	0.0169	0.0014	13.08	293.14	1.09	24.46	16,562.02	280.07	23.37
37th	0.00	773.20	773.20	17,335.22	0.0151	0.0012	11.67	261.74	0.91	20.38	16,562.02	250.06	19.47
38th	0.00	773.20	773.20	17,335.22	0.0135	0.0010	10.42	233.69	0.78	16.98	16,562.02	223.27	16.23
39th	0.00	850.52	850.52	17,335.22	0.0120	0.0008	10.24	208.65	0.69	14.15	16,484.70	198.42	13.46
40th	0.00	850.52	850.52	17,335.22	0.0107	0.0007	9.14	186.30	0.58	11.79	16,484.70	177.16	11.22
41th	0.00	850.52	850.52	26,002.83	0.0096	0.0006	8.16	249.51	0.48	14.74	25,152.31	241.35	14.26
42th	0.00	850.52	850.52	26,002.83	0.0086	0.0005	7.29	222.77	0.40	12.29	25,152.31	215.49	11.88
43th	0.00	850.52	850.52	26,002.83	0.0076	0.0004	6.51	198.90	0.33	10.24	25,152.31	192.40	9.90
44th	0.00	935.57	935.57	26,002.83	0.0068	0.0003	6.39	177.59	0.31	8.53	25,067.26	171.20	8.22
45th	0.00	935.57	935.57	26,002.83	0.0061	0.0003	5.71	158.57	0.26	7.11	25,067.26	152.86	6.85
46th	0.00	935.57	935.57	39,004.25	0.0054	0.0002	5.09	212.36	0.21	8.89	38,068.67	207.27	8.67
47th	0.00	935.57	935.57	39,004.25	0.0049	0.0002	4.55	189.61	0.18	7.41	38,068.67	185.06	7.23
48th	0.00	935.57	935.57	39,004.25	0.0043	0.0002	4.06	169.30	0.15	6.17	38,068.67	165.24	6.02
49th	0.00	1,029.13	1,029.13	39,004.25	0.0039	0.0001	3.99	151.16	0.14	5.14	37,975.12	147.17	5.01
50th	0.00	1,029.13	1,029.13	39,004.25	0.0035	0.0001	3.56	134.96	0.11	4.29	37,975.12	131.40	4.17
Salvage value.				2,182.26	0.0031	0.0001	0.00	6.74	0.00	0.20	2,182.26	6.74	0.20
Total =	**21,822.63**	**31,692.25**	**53,514.88**	**577,463.38**	**10.71**	**7.11**	**19,956.20**	**19,998.01**	**16,024.15**	**7,893.94**	**523,948.49**	**41.82**	**-8,130.21**

PV of Total Revenue at 12% = 19,998.01
PV of Total Cost at 12% = 19,956.20
Net Present Value(NPV) at 12% 41.82
IRR = (20-12)*(NPV at 12% discount/(NPV at 12%+NPV at 20%))+12
8*{(41.82/(41.82 + 8130.21)} + 12
12.04

BCR

PV of Total Revenue at 12% = 19,998.01
PV of Total Cost at 12% = 19,956.20
1.002

Assumptions

Benefit as savings of rent which is cosidered on the basis of present market rate and that cost will be increased by 50% after every 5 years

Project Life assumed = 50 years considered for service life and calculation of NPV, BCR, IRR accordingly)

Maintenance period will be started after 3 years from date of completion of construction.

Maintenance cost is considered as 2% of the total investment cost in every year and that cost will be increased by 10% after every 5 year.

Salvage value = 10% of total project cost.

TARIQUE HASAN & ASSOCIATES LTD. DHAKA

Engr. Md. Rafiqul Islam Miah
Chief Engineer
Mymensingh City Corporation

SECTION 7: SOCIAL ANALYSIS:

Social cost-benefit analysis is an extension of economic cost-benefit analysis, adjusted to take into account the full spectrum of costs and benefits (including social and environmental effects) borne by society as a whole as a result of an intervention.

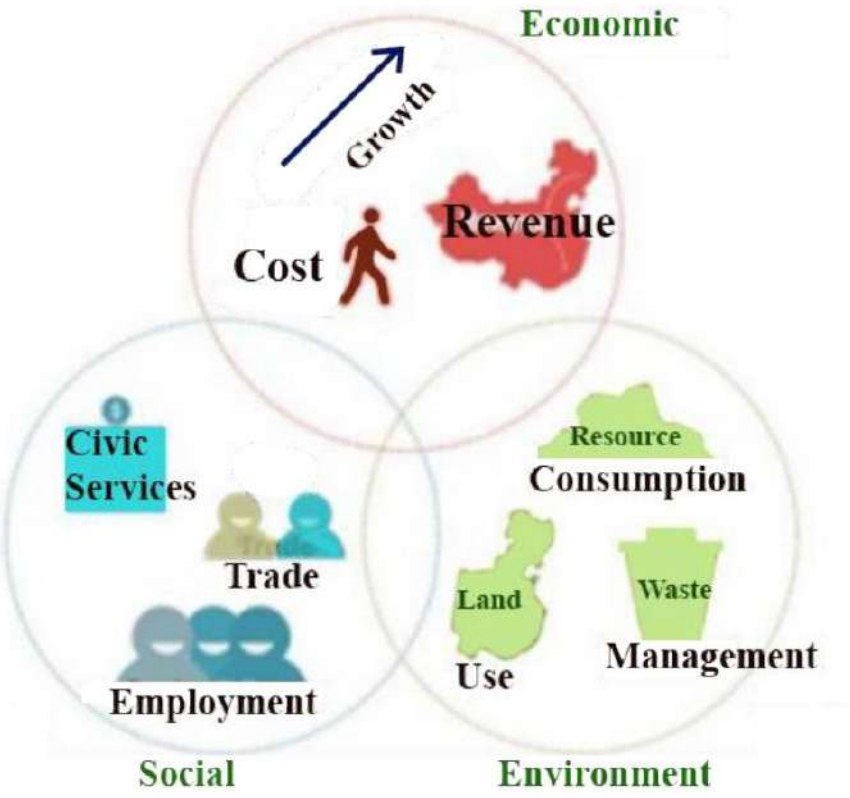

Fig: Aspects of Social cost benefit analysis

Social cost benefits of the **"Establishment of Mymensingh City Corporation Nagar Bhaban"** are discussed below:

- Through the establishment of **"Construction of 5 Storied Mymensingh Nagar Bhaban with 18 story foundation including 1 Basement for Mymensingh City Corporation"**, infrastructural development of whole Mymensingh City will be flourished.
- Development of business and trade will be flourished whenever infrastructural development takes place
- Economic development is the ultimate outcome of infrastructural development
- Human Resources Development through specialized trainings.

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- Socio - Economic Development will take place
- Guest House, Community facilities will enhance cross- district business activities in the fields of agriculture, farming, fishing, local trades etc.
- Community center, Gym, Auditorium etc. public facilities will be available with reasonable prices
- Through the **"Establishment of Mymensingh City Corporation Nagar Bhaban"**, job opportunities will be flourished.
- Standard of the living of overall areas will be developed rapidly
- Number of household coverage under the City Corporation will be increased
- Rural under developed areas will be revitalized
- Will reduce communication cost at great level through bringing all offices under one roof
- Income will be generated from direct rental services
- Expenses will be saved for the purposes of running city corporation offices at various locations
- Easy Managerial integration
- One stop solution will be possible for all civic services
- Development of Mymensingh City will take effective role in ensuring national strategic plan.
- City corporation area may be increased in future due to development
- Will ensure integral development with different departments
- Cultural development of Mymensingh City will take place because of adequate exposure

SECTION 8: HUMAN RESOURCES AND ADMINISTRATIVE SUPPORT ANALYSIS:

8. A: REQUIRED MANAGERIAL AND SKILL WORKFORCE:

Required quantity of managerial and skill workforces for both phases- operational and construction phase are shown in the following tables-

8. A.1: Required Managerial and Skill Workforce During Operational Phase:

Sl. No	Departments	Grade 1-9	Grade 10-20	Total Manpower	Floor
1	Mayor's Office	2	5	7	3rd
2	Office of the Chief Executive Officer	1	4	5	3rd
3	Administration Department - Office of the Secretary	1	2	3	3rd
4	Department of Administration General Division	1	15	17	
5	Department of Administration - Establishment Division	1	13	14	
6	Administration Department - Public Relations Division	2	5	7	
7	Department of Administration - Computer and Information Technology Division	3	3	6	
8	Department of Administration - Law	1	8	9	
9	Department of Administration - Magistrate	3	9	12	
10	Department of Administration - Security		11	11	1st
11	Property Division	1	15	16	

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12	Accounts Department - Office of the Chief Accounting Officer	1	2	3	4th
13	Accounts Department-Bill Division	1	8	9	4th
14	Accounts Department-Audit Division	1	7	8	4th
15	Accounting Department - Budget, Cash, Miscellaneous	1	7	8	4th
16	Revenue Department - Office of the Chief Revenue Officer				
17	Revenue Department - Tax		15	15	2nd
18	Revenue Department- Assessment		10	10	2nd
19	Revenue Department- Market Division		7	7	
20	Revenue Department- License Division		10	10	1st
21	Deposit and Purchasing Division	2	13	15	4th
22	Department of Engineering Chief Engineer's Office	2	5	7	
23	Engineering Department of Public Works, Planning, Design and Monitoring	4	16	20	
24	Engineering Department- Water Supply	4	4	8	1st
25	Department of Engineering Power Supply	2	3	5	
26	Department of Engineering - Environment, Climate And disaster Management	1	6	7	
27	Engineering Department-Amusement Park	1	6	7	
28	Engineering Department - Construction Materials Laboratory	1	9	10	
29	Engineering Department - Plant Management	1	4	5	
30	Department of Transportation- General Manager	1	2	3	
31	Department of Transportation Transport and Mechanical Repair Division	3	15	18	
32	Department of Social Welfare and Slum Development	2	22	24	4th
33	Department of Social Welfare and Slum Development - Cemetery	All outsourcing		0	4th
34	Department of Social Welfare and Slum Development - Crematorium	All outsourcing		0	4th
35	Crematorium Urban Planning Department	3	29	32	3rd
36	Waste Management Department -office of the Chief Waste Management Officer	3	2	5	
37	Waste Management Department - Waste Collection Division		13	13	
38	Waste Management Department - Sewage Waste Management Division		9	9	
39	Waste Management Department - Medical Waste Management		9	9	
40	Waste Management Department - Landfill and Waste Processing Branch	1	15	16	
41	Waste Management Department - Waste Transport and Mechanical Repair Division	2	10	12	
42	Department of Health- Office of the Chief Health Officer	1	2	3	4th
43	Department of Health - Health Branch	2	20	22	4th
44	Department of Health-Food and Sanitation		7	7	4th

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45	Department of Health - Public Health Food Laboratory Division	1	4	5	4th
46	Department of Health - Pest / Mosquito Control Division	1	7	8	4th
47	Department of Health - Birth-Death Registration Division		5	5	4th
	Total	**58**	**394**	**452**	

8. A. 2: REQUIRED MANAGERIAL AND SKILL WORKFORCE DURING CONSTRUCTION PHASE:

i. From City Corporation Authority:

Professional Entity	Required quantity	Experiences Required
Project Director	1	B.Sc.(Civil) with minimum 20 years Experiences
Assistant Project Director	1	B.Sc.(Civil) with minimum 10 years Experiences
Diploma Engineer	2-3	Diploma in Civil, Mechanical, Electrical with minimum 8 -10 years experiences
Accountant	1	At least graduation in relevant field

ii. From Consultant:

Professional Entity	Required quantity	Experiences Required
Team Leader	1	At least **B.Arch.** or **B.Sc.(Civil)** with minimum 20 years Experiences
Resident Engineer	1	B.Sc.(Civil) with minimum 15 years Experiences
Project Engineer (Civil)	1-2	Diploma in Civil, with minimum 10 years experiences
Project Engineer (Mechanical/Electrical)	1	Diploma in Electrical/ Mechanical with minimum 10 years experiences
Quantity Surveyor	1	Diploma in Civil, with minimum 10 years experiences

iii. Required quantity of labors:

On an average approximately 100 labors/ per day will be required throughout the construction process for three sauces.

8. B: REQUIRED MANAGERIAL AND SKILL WORKFORCE:

Ability to provide managerial and skill workforce for implementation of the project. The project entity has all the required managerial and skilled workforce as mentioned.

8. C: ABILITY TO MANAGE THE PROJECT:

It is expected that the project entity has capacity to manage the project.

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8. D: CAPACITY TO CONTINUE THE PROJECT OUTPUT:

The required human resource during the operational phase is presented above. It turns out that the project entity has all the required capacity to continue the project output.

8. E: PROJECT TIMELINE AND ORGANIZATIONAL CAPACITY:

The proposed project will be required 3 years for implementation. During this period different components of the project will be implemented which is designed according to the capacity of the project entity.

SECTION 9: INSTITUTIONAL AND LEGAL ANALYSIS:

Building complex of **"Construction of 5 Storied Mymensingh Nagar Bhaban with 18 story foundation including 1 Basement for Mymensingh City Corporation"** designed to represent the pride of the city. It generate the fusion of modern design and heritage. One of the most important features of this development project is that City Corporation Authority is going to build the project in their own land. So, there is no land ownership related complexities in this development project.

"Construction of 5 Storied Mymensingh Nagar Bhaban with 18 story foundation including 1 Basement for Mymensingh City Corporation" authority has collected no objection clearance (NOC) from civil aviation authority for establishing more than 200 feet building.

They also have NOC from the Department of Environment (DoE) and relevant authorities of gas and electricity department, and other relevant authorities.

Apart from this the important aspect of institutional and legal analysis are:

A. Legal boundary:

The project is consistent with the legal boundary of the project entity.

B. Capabilities and facilities:

The capabilities and facilities will be fully utilized.

C. Need for adjustment in the policy:

There is no need for any adjustment in the policy and acts.

D. Required adjustment before project implementation:

There will be no adjustment required before the project is implemented.

E. Required skill and capacity:

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All the institutions under which the proposed will be implemented have the required skills and capacities.

F. Incentives and penalties for timely delivery:

The price contingency and physical contingency have been adopted in DPP to avoid any delay in implementation of the project.

G. Governance issue:

There are few governance issues related to the implementation of the project. The designing and supervision of the detail engineering drawing of the project, environmental monitoring, and timely procurement of construction materials, equipment, furniture (both construction and operation phase), etc.

H. Challenges and cross-cutting issues:

All the challenges and cross-cutting issues has been discussed in SWOT and environmental impact assessment analysis. The relevant counter measure has been discussed accordingly.

SECTION 10: RISK (UNCERTAINTY) AND SENSITIVITY ANALYSIS:

10. A: MAJOR RISK OF THE PROPOSED PROJECT:

- Existence of water body in proposed land
- Existing trees
- Existing structures

10.B: EFFECT ON THE PROPOSED PROJECT:

During construction period, some trees will be uprooted which might result in loss of biodiversity of proposed area.

10. C: PROPOSED MEASURES:

Measures should be taken so that the tress can be protected as much as possible. The use of environmentally friendly construction materials can also reduce dust and sound pollution during the construction to have less adverse impacts on the environment.

10. D: SENSITIVITY ANALYSIS:

The sensitivity analysis has been carried out the in the economic analysis. As the assumptions taken to calculate the value of the benefit and cost components which can be varied in different setting, sensitivity analysis covered those variation in the calculation.

10. E: RISKS AND OTHER OBLIGATIONS THAT CAN INCREASE COSTS AND CONTINGENCY ANALYSIS:

Cost overruns in construction projects has become more common in developing countries and it's important to understand the root of the problem to address these. Possible causes of cost overrun in construction

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projects include: inaccurate project estimates, serious project design errors, not planning for change orders, administration errors, poor site management, not hiring the right team etc. If these causes are in place, it will surely result in increased cost of the project. Addressing the increased cost is not quite easy due to further revision of DPP which is time consuming and lengthy as well. Considering contingencies, namely physical contingency and price contingency, may contribute to addressing increased cost.

SECTION 11: ALTERNATIVE/ OPTIONS ANALYSIS:

The selection of the proposed site was determined by the highest authority of the Government in consultation with the City Corporation administration, local administration, and the local elites. Thus, the feasibility study team did not have any option to find an alternative location. Hence, the team had to concentrate only on the proposed land. The attributes of proposed land, key challenges and probable mitigation measures has also been discussed. It appears that the proposed land is suitable for construction. However, all the precautionary measures, as stated in the recommendation and mitigation measures, need to be taken into account.

SECTION 12: RECOMMENDATION& JUSTIFICATIONS:

The feasibility of the **"Establishment of Mymensingh City Corporation Nagar Bhaban"** based on analyzing both primary and secondary data in the following contexts:

- Needed assessment,
- Spatial planning,
- Economic analysis,
- Environmental impact assessment,
- Social impact assessment,
- Risk analysis and
- Mitigation strategies.

The study finds that the **"Establishment of Mymensingh City Corporation Nagar Bhaban"** will contribute to meet the current as well as future needs of the Mymensingh City Corporation for better development. It will also create ample opportunities for the people of the unemployed citizens of this region. The SWOT analysis shows that threats and weaknesses are minuscule in comparison to the strengths and opportunities of the proposed project. The potential threats are a noisy atmosphere due to the presence of adjacent highway, the possibility of traffic congestion etc. However, appropriate measures as described in SWOT, can reduce these threats significantly as described earlier.

The cost-benefit analysis shows that investment in such project has immense economic benefits both in direct and indirect forms including employment creation, quality civic services etc.

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The environmental, climate change and disaster risk analysis reveals that the proposed project involves some adverse environmental and climate change effects. For instance, during construction phase dust creation due earth cutting activities, possibility of water and sound pollution due to heavy vehicles movements, and cutting of trees. During the operational phase of the proposed project all the adverse effects appear to be negligible. However, in the long-term, subject to the adoption of necessary and effective environmental mitigation measures as described. In addition, regular and effective environmental monitoring by the Environmental Management and Monitoring Cell can overcome all the adverse effects.

No major institutional and legal constraints for the **"Establishment of Mymensingh City Corporation Nagar Bhaban"** at the proposed land.

The feasibility study is conducted by analyzing both primary and secondary data. Based on required assessment and other necessary analyses including spatial planning, socio-economic impact, environmental impact, and potential risk and threats, the study finds that the **"Establishment of Mymensingh City Corporation Nagar Bhaban"** is a highly worthy and timely investment. As the project is going to be built in the own property of Mymensingh City Corporation, there is no land clearance related complexities in this project. Besides, Civil Aviation Authority of Bangladesh (CAAB) has also given permission to build more than 200 feet height building in proposed site. Based on these analyses, it is highly recommended to establish the **"Construction of 5 Storied Mymensingh Nagar Bhaban with 18 story foundation including 1 Basement for Mymensingh City Corporation"** at the proposed site.

SECTION 13: ANNEXES

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13.a: Gantt Chart

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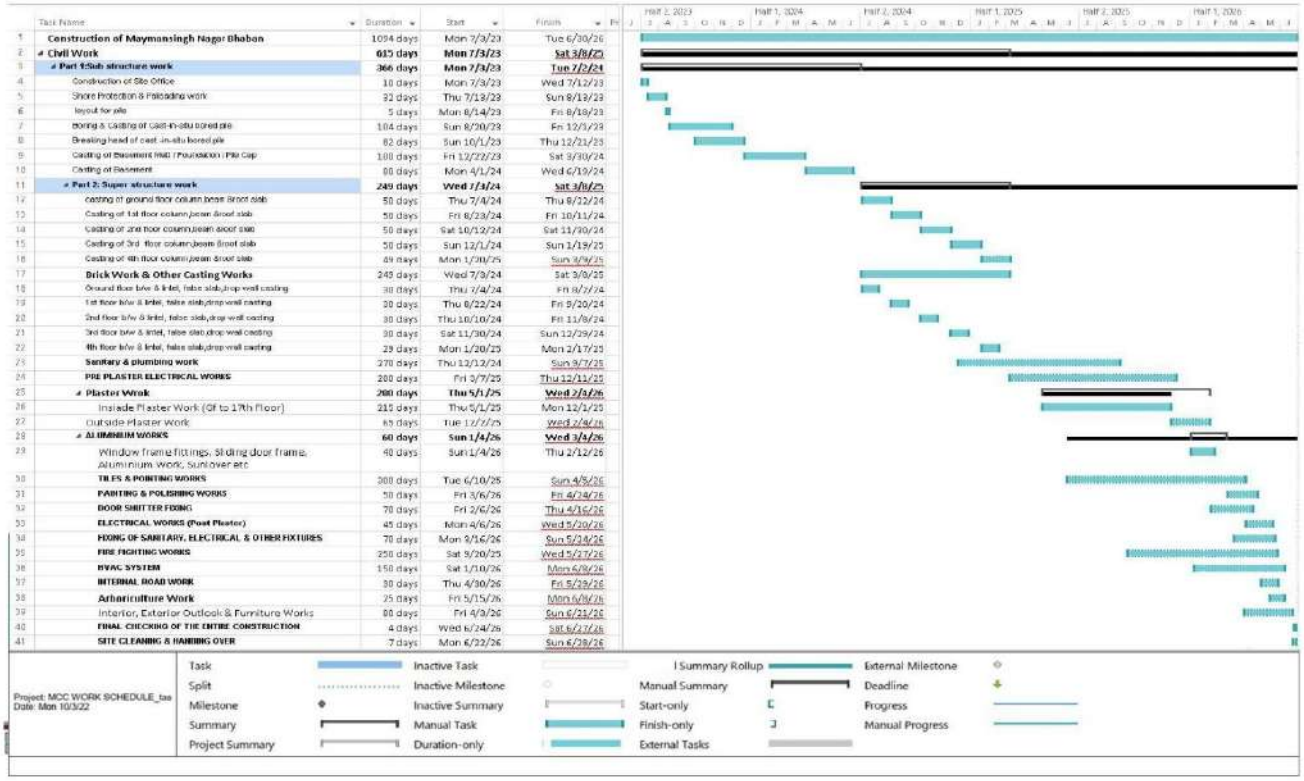
13.a: Gantt Chart



	Task Name	Duration	Start	Finish
1	**Construction of Maymansingh Nagar Bhaban**	1094 days	Mon 7/3/23	Tue 6/30/26
2	**Civil Work**	**615 days**	**Mon 7/3/23**	**Sat 3/8/25**
3	**Part 1:Sub structure work**	**366 days**	**Mon 7/3/23**	**Tue 7/2/24**
4	Construction of Site Office	10 days	Mon 7/3/23	Wed 7/12/23
5	Shore Protection & Palisading work	92 days	Thu 7/13/23	Sun 8/13/23
6	layout for pile	5 days	Mon 8/14/23	Fri 8/18/23
7	Boring & Casting of Cast-in-situ bored pile	104 days	Sun 8/20/23	Fri 12/1/23
8	Breaking head of cast -in-situ bored pile	82 days	Sun 10/1/23	Thu 12/21/23
9	Casting of Basement Mat (Foundation) Pile Cap	100 days	Fri 12/22/23	Sat 3/30/24
10	Casting of Basement	80 days	Mon 4/1/24	Wed 6/19/24
11	**Part 2: Super structure work**	**249 days**	**Wed 7/3/24**	**Sat 3/8/25**
12	casting of ground floor column beam &roof slab	50 days	Thu 7/4/24	Thu 8/22/24
13	Casting of 1st floor column,beam &roof slab	50 days	Fri 8/23/24	Fri 10/11/24
14	Casting of 2nd floor column,beam &roof slab	50 days	Sat 10/12/24	Sat 11/30/24
15	Casting of 3rd floor column,beam &roof slab	50 days	Sun 12/1/24	Sun 1/19/25
16	Casting of 4th floor column,beam &roof slab	49 days	Mon 1/20/25	Sun 3/9/25
17	**Brick Work & Other Casting Works**	249 days	Wed 7/3/24	Sat 3/8/25
18	Ground floor b/w & lintel, false slab,drop wall casting	30 days	Thu 7/4/24	Fri 8/2/24
19	1st floor b/w & lintel, false slab,drop wall casting	30 days	Thu 8/22/24	Fri 9/20/24
20	2nd floor b/w & lintel, false slab,drop wall casting	30 days	Thu 10/10/24	Fri 11/8/24
21	3rd floor b/w & lintel, false slab,drop wall casting	30 days	Sat 11/30/24	Sun 12/29/24
22	4th floor b/w & lintel, false slab,drop wall casting	29 days	Mon 1/20/25	Mon 2/17/25
23	**Sanitary & plumbing work**	270 days	Thu 12/12/24	Sun 9/7/25
24	**PRE PLASTER ELECTRICAL WORKS**	200 days	Fri 3/7/25	Thu 12/11/25
25	**Plaster Work**	**280 days**	**Thu 5/1/25**	**Wed 2/3/26**
26	Inside Plaster Work (Of to 17th Floor)	215 days	Thu 5/1/25	Mon 12/1/25
27	Outside Plaster Work	65 days	Tue 12/2/25	Wed 2/4/26
28	**ALUMINIUM WORKS**	**60 days**	**Sun 1/4/26**	**Wed 3/4/26**
29	Window frame fittings, Sliding door frame, Aluminium Work, Sunlover etc	40 days	Sun 1/4/26	Thu 2/12/26
30	**TILES & POINTING WORKS**	300 days	Tue 6/10/25	Sun 4/5/26
31	**PAINTING & POLISHING WORKS**	50 days	Fri 3/6/26	Fri 4/24/26
32	**DOOR SHUTTER FIXING**	70 days	Fri 2/6/26	Thu 4/16/26
33	**ELECTRICAL WORKS (Post Plaster)**	45 days	Mon 4/6/26	Wed 5/20/26
34	**FIXING OF SANITARY, ELECTRICAL & OTHER FIXTURES**	70 days	Mon 3/16/26	Sun 5/24/26
35	**FIRE FIGHTING WORKS**	250 days	Sat 9/20/25	Wed 5/27/26
36	**HVAC SYSTEM**	150 days	Sat 1/10/26	Mon 6/8/26
37	**INTERNAL ROAD WORK**	30 days	Thu 4/30/26	Fri 5/29/26
38	**Arboriculture Work**	25 days	Fri 5/15/26	Mon 6/8/26
39	Interior, Exterior Outlook & Furniture Works	80 days	Fri 4/3/26	Sun 6/21/26
40	**FINAL CHECKING OF THE ENTIRE CONSTRUCTION**	4 days	Wed 6/24/26	Sat 6/27/26
41	**SITE CLEANING & HANDING OVER**	7 days	Mon 6/22/26	Sun 6/28/26

Project: MCC WORK SCHEDULE_tas
Date: Mon 10/3/22

Task, Split, Milestone, Summary, Project Summary, Inactive Task, Inactive Milestone, Inactive Summary, Manual Task, Duration-only, Summary Rollup, Manual Summary, Start-only, Finish-only, External Tasks, External Milestone, Deadline, Progress, Manual Progress

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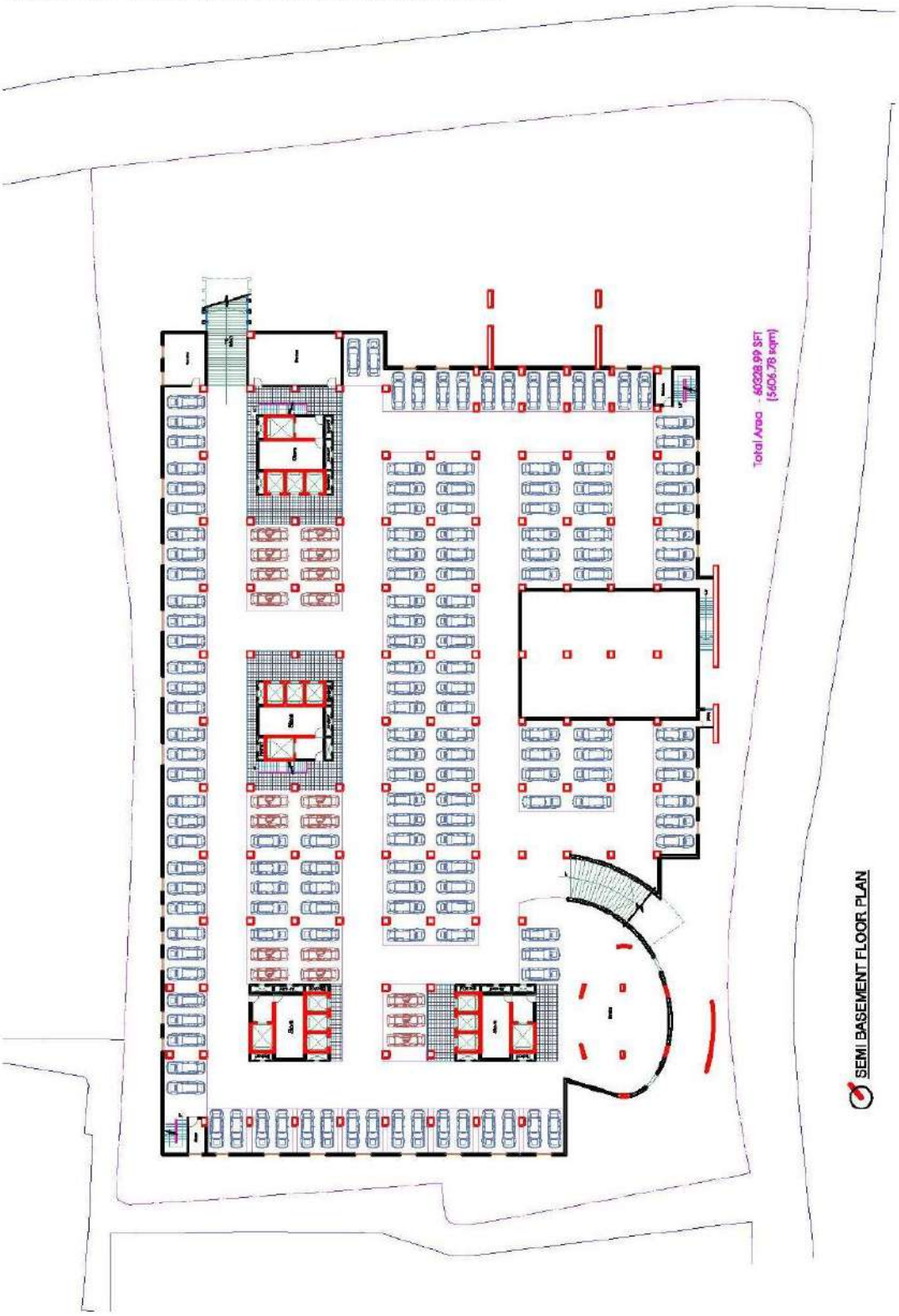
13.B: PROPOSED ARCHITECTURAL DRAWING



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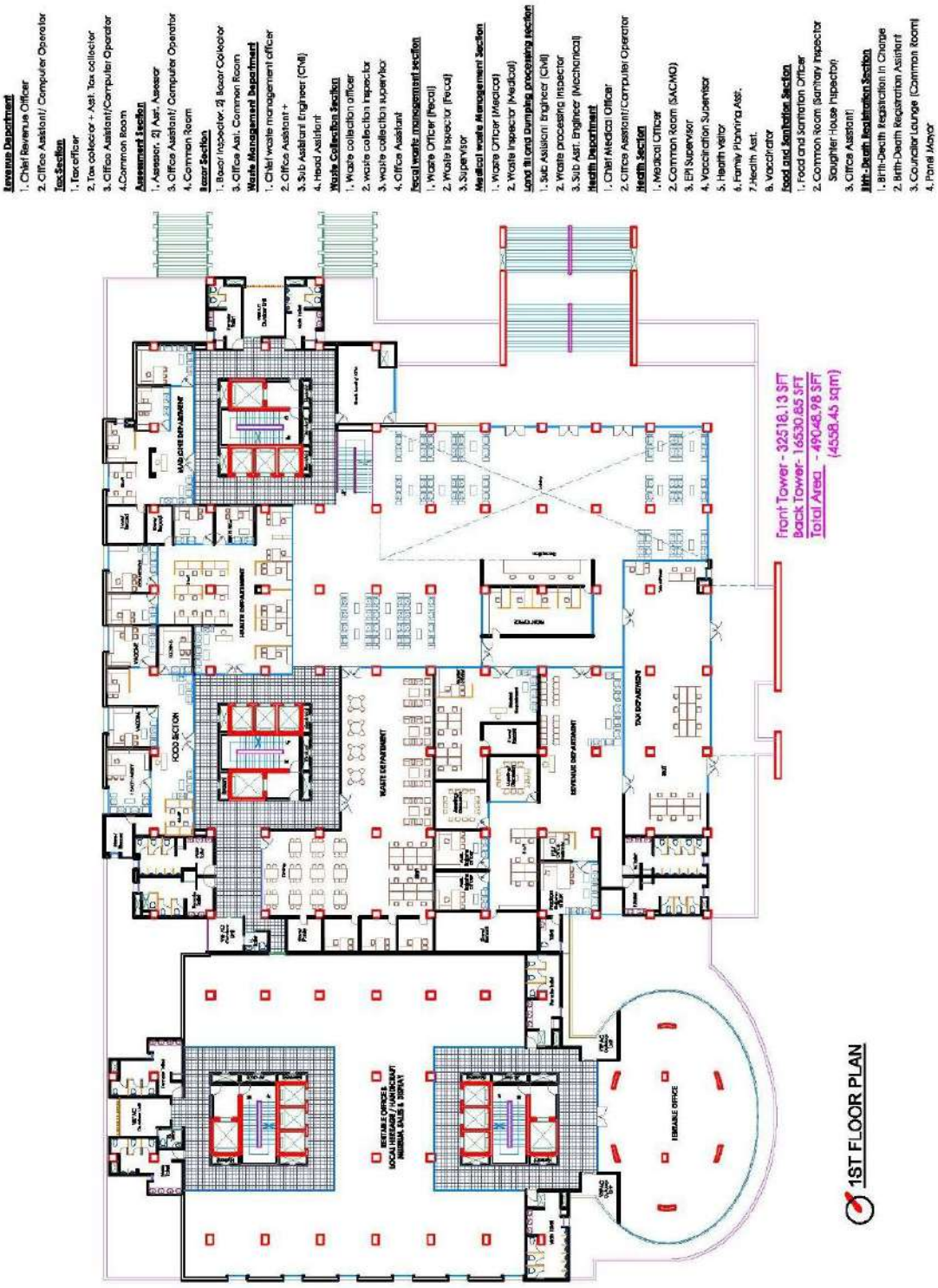

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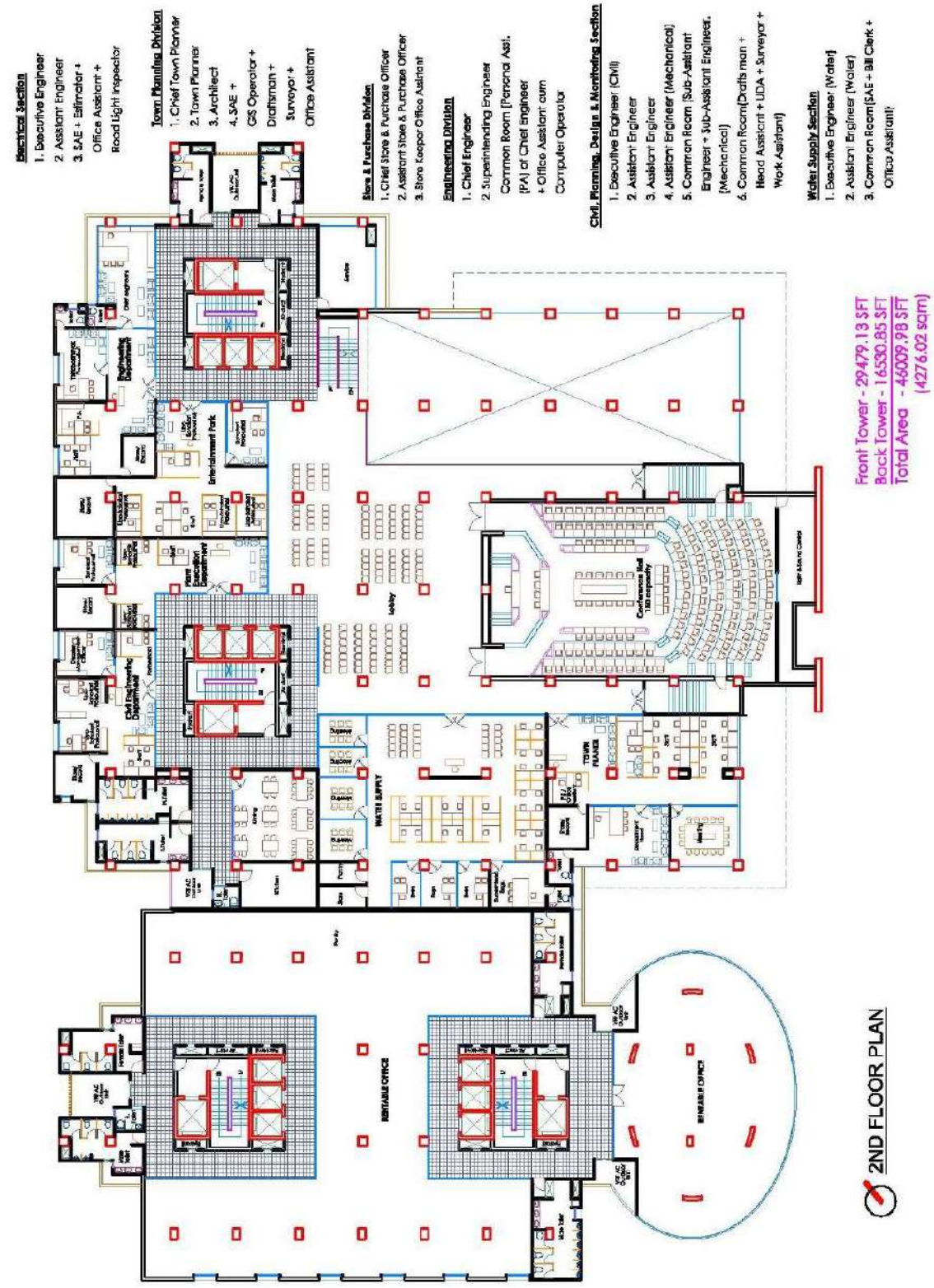

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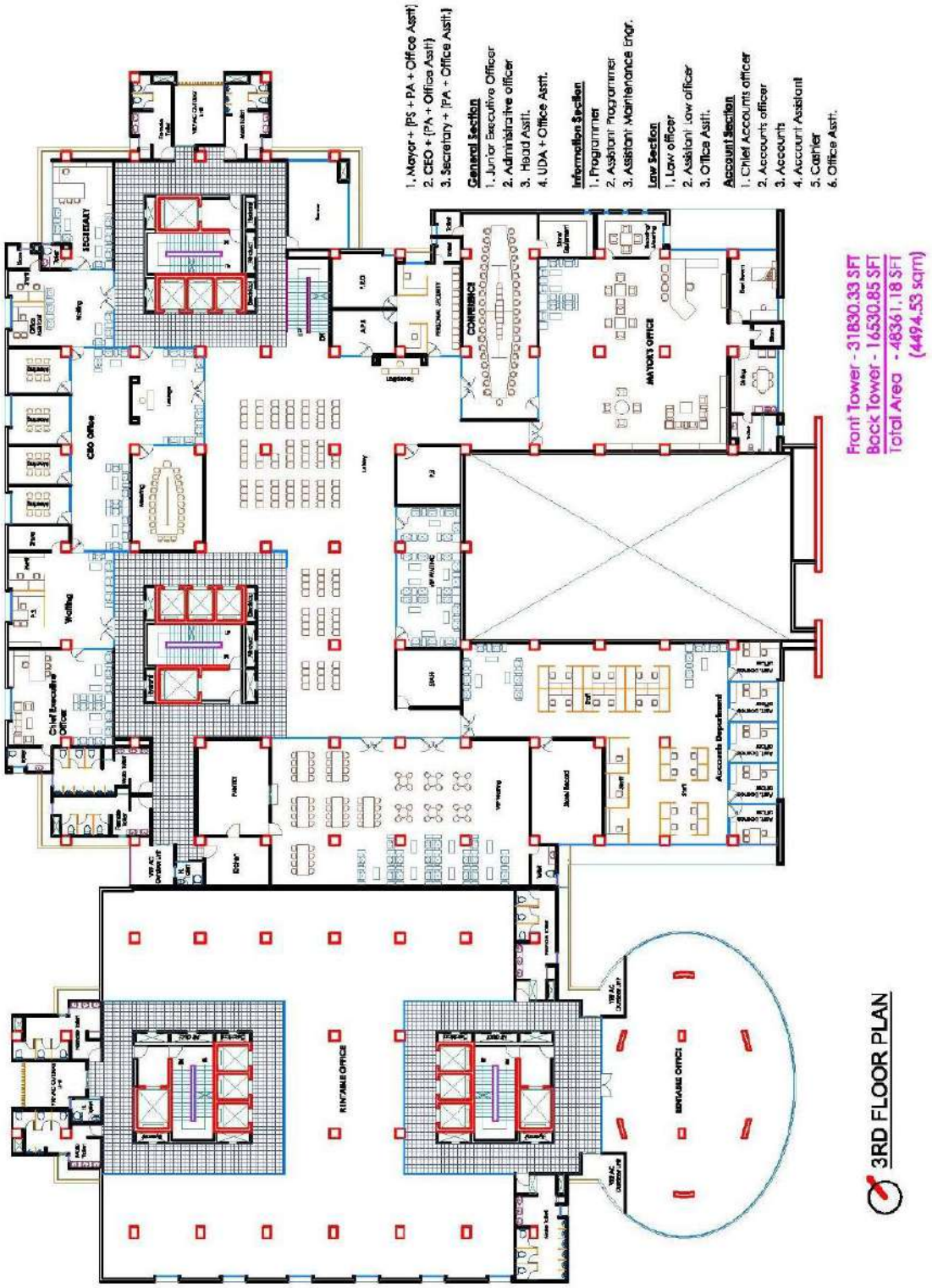

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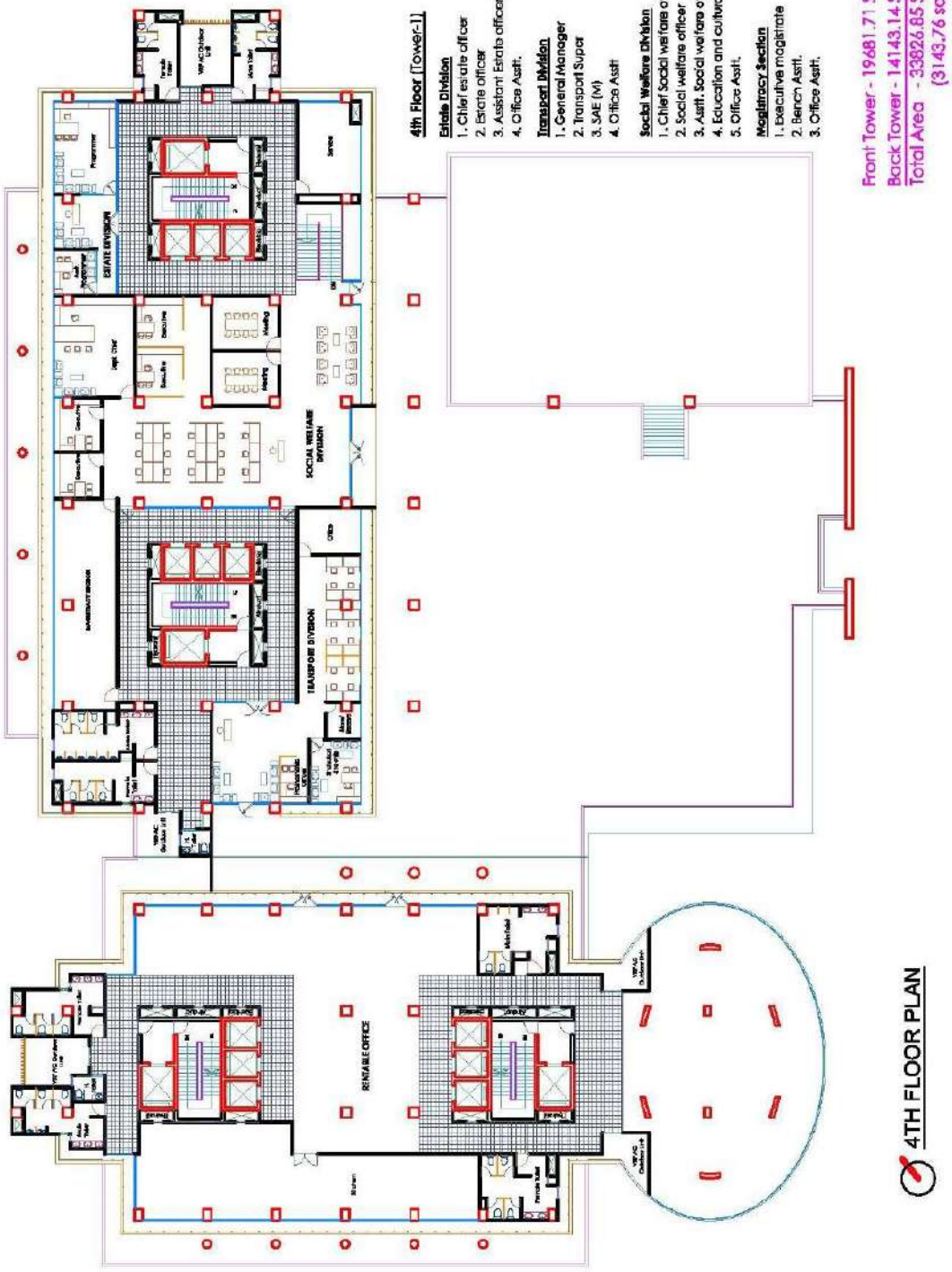

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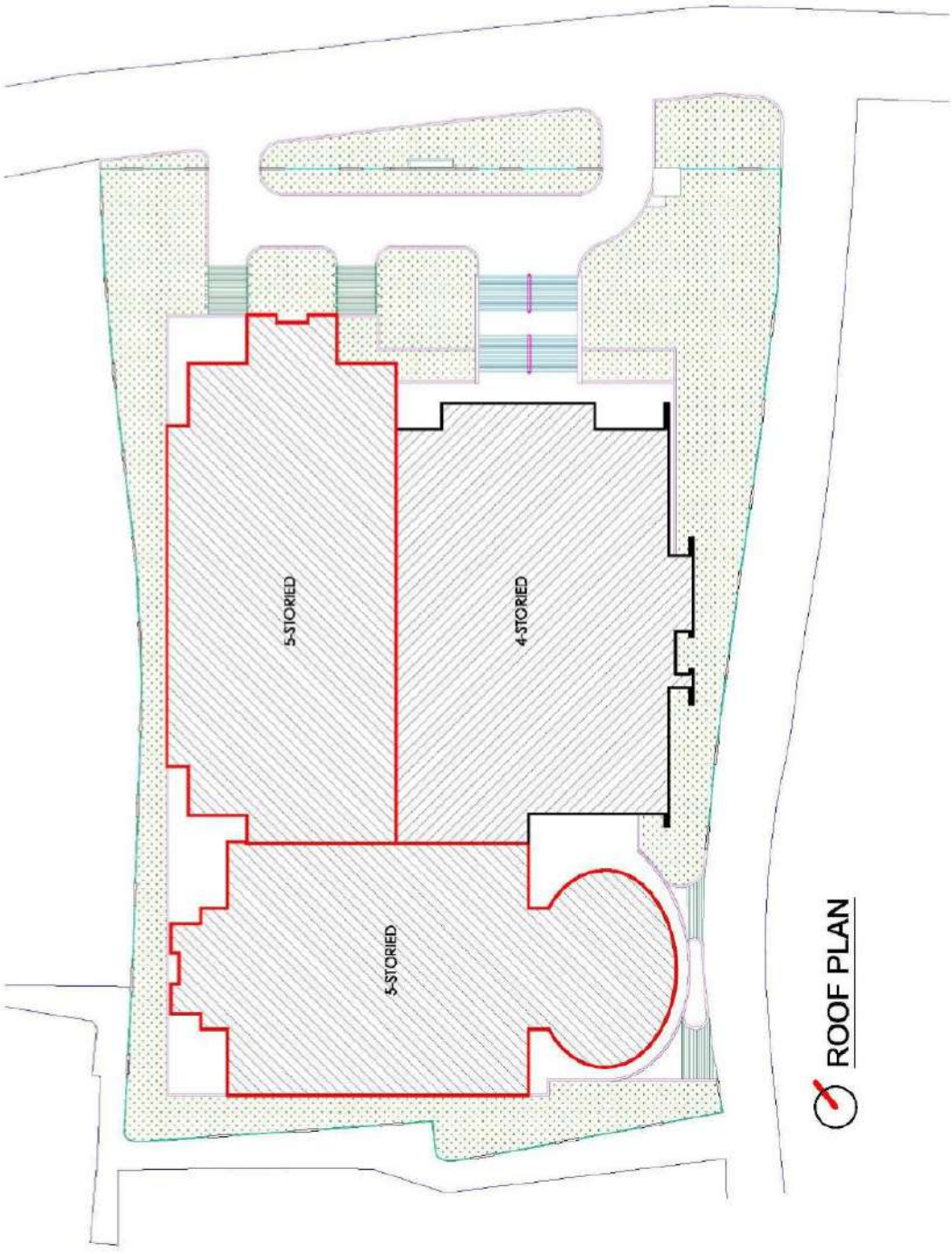

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