

Environmental Impact Assessment On Ongoing Construction Project

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Abstract - The Environmental Impact Assessment (EIA) is a tool with the aim to identify, predict, evaluate, and prevent or, if necessary, correct and communicate the impacts of a project on the environment. The EIA is regulated by the environmental laws of each country, where commonly an Environmental Impact Statement (EIS) is required to obtain an environmental license. Colombian legislation, as in several other countries, does not determine what EIA methodology is used (rather it is limited to suggesting a few parameters). Ultimately, the decision is left to the work group responsible for developing the EIS. For this reason, many methodologies and variants are created, thereby affecting the process quality. It was determined that the best option is to adjust an already established methodology, taking advantage of its experience.

Key words: Water quality test, Wind Analysis, Ambient Air Quality.

1. INTRODUCTION

This Environmental Impact Assessment (EIA) is to provide information on the potential positive and negative environmental and social impacts of the project. It also aims to make recommendations for the mitigation of the potential negative impacts and enhancement of the positive ones. A field survey of the project site was conducted and potential environmental impacts of project activities were identified, assessed, and documented. The EIA team carried out consultation with local authorities and the affected people. The Environmental Protection Act (1986) policies have been considered during the assessment. The EIA has been proposed according to the EIA format regarding the guidelines of the Ministry of Environment, Forest & Climate Change. Importance of EIA links environment with development for environmentally safe and sustainable development. EIA provides a cost effective method to eliminate or minimize the adverse impact of developmental projects. EIA enables the decision makers to analyze the effect of developmental activities on the environment well before the developmental project is

implemented. EIA encourages the adaptation of mitigation strategies in the developmental plan. EIA makes sure that the developmental plan is environmentally sound and within the limits of the capacity of assimilation and regeneration of the ecosystem.

1.1. IMPORTANCE OF EIA

EIA is a process of measuring and evaluating the impact of any proposed project and development on the environment, including the benefits. Through environment impact assessments, project managers know which projects need full screening to prevent any damage to the environment.

Helps to assess potential impacts relevant to the environmental legislation based on the legislative requirements. Identifies problems and helps through the mitigation process in advance to anticipate disasters likely to happen. Protects the biodiversity environment by suggesting alternative safe project designs and methods.

1.2 Water Quality Test.

A Water Quality Impact Assessment (WQIA) is an analysis of the impacts on water quality when a project is proposed within a Resource Protection Area (RPA). Water Impact is assessed on the basis of its quantity, its quality and its stake holders. Assessing impact of water quantity will involve looking at the project as part of the local water cycle, how will the development add or subtract from that equation. benefits of environmental impact assessment. It's done by taking into consideration the social, economic, cultural, and human-based health risks and benefits.

Table -1: Sample Table format

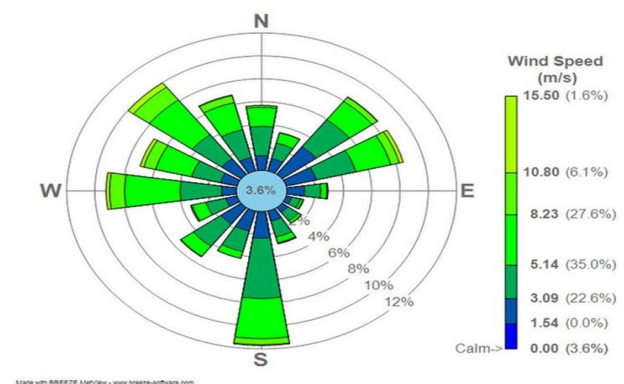
OF LAKE WATER IN INDIA		
Sr No	Parameter	BIS specification
1	Appearance	Clear
2	Colour	5 Hazen max
3	Turbidity	5 NTU max
4	PH	6.5-8.5
5	EC	Not mentioned
6	Alkalinity	200 mg/L max
7	Fluoride	1 mg/L max
8	Chloride	250 mg/L max
9	Phosphate	Not mentioned
10	Sulphate	200 mg/L max
11	T H	300 mg/L max
12	Ca H	75 mg/L max
13	Mg H	30 mg/L
14	TDS	500 mg/L max
15	Silica	Not mentioned
16	FRC	0.2 mg/L
17	Hydrazine	Not mentioned
18	COD	Not mentioned
19	BOD	Not mentioned
20	DO	Not mentioned
21	SO3	Not mentioned
22	NO3	50 g/L

1.3 WIND ANALYSIS

As worldwide temperatures rise, global weather patterns are following suit. Wind, or wind power, is one of the most critically affected factors of changing weather patterns. While global warming has some experts hypothesizing that wind strength across the world will decrease, others claim it will intensify in the Southern hemisphere while weakening in the Northern, along with various other schools of thought. As it is still too soon to determine the true consequences of global warming, wind pattern changes are already upon us. This poses a number of problems including decreasing the amount of power generated by wind farms, along with increasing conscientious construction of buildings that are experiencing fluctuating wind velocities. As this problem progresses, wind engineering, through wind analysis, is becoming an extremely important consideration for engineers, city planners, and architects alike. In this article, we will discuss how wind simulation through Sim Scale allows engineers to employ cloud-based CFD as a wind.

Wind analysis can include but is not limited to evaluating comfort, wind loading on structures, as well as pollution, and natural ventilation. Below, further explanation and

real-life wind evaluations and wind simulations will be discussed.



Ambient Air Quality monitoring or testing is a process of measurement of pollutants present in the atmosphere. It measures the healthiness and safety of our environment. Ambient air quality is defined as the quality of air outside and sometimes inside. Ambient air quality standards are limits to concentrations of pollutants in air stated for wellbeing of human, nature, animals, etc. There is no single specified definition of standards resulting, various organizations use standards which are not often similar. Ambient air quality monitoring is also called as Outdoor Air Quality Testing.

Air quality monitoring is the process of assessment of pollutants present in the atmosphere by their quantity and types as per air quality standards. Air quality monitoring helps us to take action based on pollutants present in atmosphere to improve air quality.

Ambient air quality monitoring & testing is required to determine the existing quality of air, evaluation of the effectiveness of the control program. National Air Quality Monitoring Program is described in this chapter along with details on pollutants measured and their frequency. Similarly, Guidelines for monitoring are made for carrying out AAQM under NAMP and description of the program is essential as the monitoring is carried out to meet the objectives of NAMP

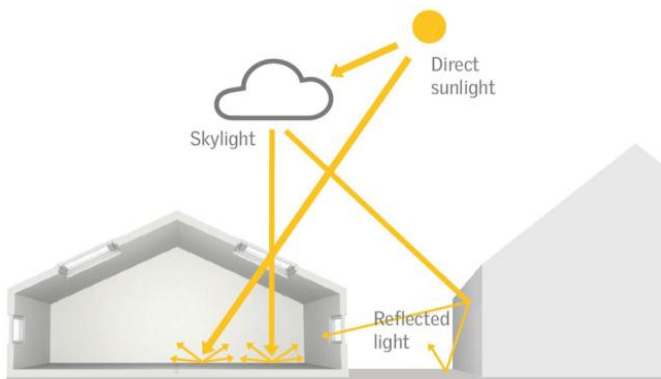
**CENTRAL POLLUTION CONTROL BOARD'S
AIR QUALITY STANDARDS**

AIR QUALITY INDEX (AQI)	CATEGORY
0-50	Good
51-100	Satisfactory
101-200	Moderate
201-300	Poor
301-400	Very Poor
401-500	Severe

1.5. DAY LIGHTING

Daylighting is the practice of placing windows, skylights, other openings, and reflective surfaces so that sunlight (direct or indirect) can provide effective internal lighting. Particular attention is given to daylighting while designing a building when the aim is to maximize visual comfort or to reduce energy use. Energy savings can be achieved from the reduced use of artificial (electric) lighting or from passive solar heating. Artificial lighting energy use can be reduced by simply installing fewer electric lights where daylight is present or by automatically dimming/switching off electric lights in response to the presence of daylight – a process known as daylight harvesting.

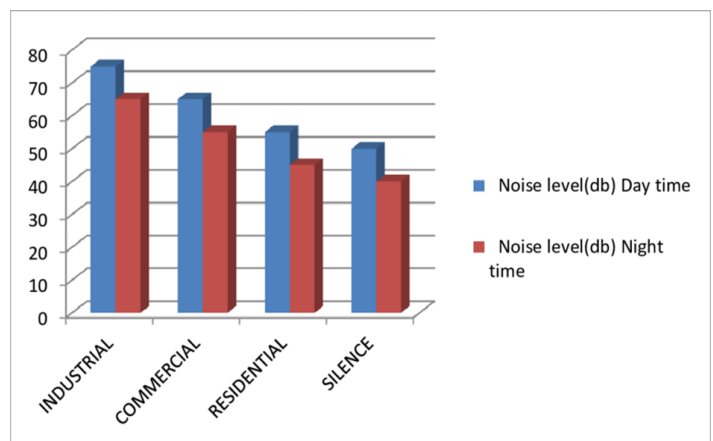
The amount of daylight received in an internal space can be analyzed by measuring illuminance on a grid or undertaking a daylight factor calculation. Computer programs such as Radiance allow an architect or engineer to quickly calculate benefits of a particular design. The human eye's response to light is non-linear, so a more even distribution of the same amount of light makes a room appear brighter.



1.6. NOISE QUALITY TESTING

A sound level meter (also called sound pressure level meter (SPL)) is used for acoustic measurements. It is commonly a hand-held instrument with a microphone. The best type of microphone for sound level meters is the condenser microphone, which combines precision with stability and reliability. [1] The diaphragm of the microphone responds to changes in air pressure caused by sound waves. That is why the instrument is sometimes referred to as a sound pressure level meter (SPL). This movement of the diaphragm, i.e. the sound pressure (unit pascal, Pa), is converted into an electrical signal (unit volt, V). While describing sound in terms of sound pressure, a logarithmic conversion is usually applied and the sound pressure level is stated instead, in decibels (dB), with 0 dB SPL equal to 20 micro Pascal's.

Sound level meters are commonly used in noise pollution studies for the quantification of different kinds of noise, especially for industrial, environmental, mining and aircraft noise.[2][3] The current international standard that specifies sound level meter functionality and performances is the IEC 61672-1:2013. However, the reading from a sound level meter does not correlate well to human-perceived loudness, which is better measured by a loudness meter. Specific loudness is a compressive nonlinearity and varies at certain levels and at certain frequencies. These metrics can also be calculated in a number of different ways.





2. RESULTS FOR WATER ANALYSIS.

Water analysis in Environmental Impact Assessment is one of the key tests to be performed. Ground water testing was performed on site and area surrounding our project site. Various locations were selected for extraction of ground water and to identify the depth of ground water table as the project area has flora and fauna surrounding it and also many water bodies around the project. As ground water level can vary at different locations two different locations on site were selected. As the ground water table consists of two zones, the unsaturated zone and the saturated zone. After selecting the location and calculating the depth of ground water table it was found to be at a higher depth with lies under saturated zone. The ground water was extracted using an aerator pump. After collecting the water samples, they are sent to Lab for testing and determining the contents of chemicals present and quality of water.

SR NO	PARTICULAR	RESULTS	STIPULATIONS
1	Quantity of 0.02N NaOH required to neutralize 100ml of water	1.00ml	Shall not be more than 5ml
2	Quantity of 0.02H H2SO4 required to neutralize 100ml of water	24.60ml	Shall not be more than 25ml
3	Chlorides as CL	735.08mg g/L	500mg/L max for RCC, 2000mg/L for PCC
4	Suplhates asSO3	142.08mg /L	400mg/L max
5	Suspended matter	21.00mg/ L	2000mg/L max
6	PH value	7.72	Shall not exceed 6

2.1 RESULTS FOR NOISE TEST

In the past few years, the importance of Noise control in Environmental Impact Assessment has grown extensively. Noise produced on site should be controlled while executing the project as so to minimize the effect on surrounding locality and people working on site. We selected different locations on site for measuring the decibels of current location. The locations were decided according to the activity on that location. The instrument we used for measuring the noise was 'Noise Meter-Center- C390-SL-I-08'. The locations selected were Main gate, Plot Area, Main Office etc. The noise meter was setup on the decided location at the time of activity and the noise level was recorded. After getting all the noise meter readings we compared it with the Indian Standards limits for Noise Level.

SR NO	LOCATION	NOISE DAYTIME DB(A) Leq
1	Gate-1, plot no-2- main gate	67.7
2	Plot-2 EA-2	57.1
3	Plot-2 excretion area	65.5
4	Plot-3 gate no 4 main gate	64.1
5	Plot-3 gate no 2 main gate	62.1
6	Main office area	56.2

2.2 AIR QUALITY TEST

Air quality test is one of the key factors for wellbeing of humans and other living organisms. Ambient air quality test is performed to know the types of gases present in the air on site. It also helps to determine the amount of dust particles present in the air and the amount of dust generated due to construction activity. Determining the number of harmful gases and other gases present in the air can help in implementing preventing measures to decrease the air pollution. The instrument used for determining the air quality on site was 'Air Sampler RDS-I-01'. Different locations were selected on site after inspection of site and according to construction activity. The air sampler was located at the selected locations and the readings were noted. After all readings from different locations were noted, they are compared with the Indian Standard Limits for Air pollution.

AQI LEVEL	HEALTH ISSUES	WHAT DOES IT MEAN?
0-50	Good	The air quality is safe and poses no health risks to anyone.
51-100	Unhealthy	The air quality is fine. However, sensitive people are still prone to health risks due to minor pollutants present in the air.
101-150	Poor	People who are sensitive to the air pollution are at health risk. The air quality is safe for healthy fit people.
151-200	Severe	Fit and healthy people will catch hold of infections and viral due to many harmful air pollutants present in the air. Highly sensitive people are exposed to severe health risk.
201-300	Dangerous	The contaminated air threatens everyone with various health issues.
301-500	Hazardous	High Alert Emergency: This level of air quality is a serious threat to life both for sensitive and healthy people. It can severely affect the health or even lead to death.

SR NO	PARAMETER	RESULTS	LIMITS	UNIT	METHOD OF ANALYSIS
1	SO ₂	15.2	80	µg/m ³	IS182 part 2 RA 2017
2	NO ₂	22.8	80	µg/m ³	IS5182 part 6 RA 2017
3	PM ₁₀	62.9	100	µg/m ³	IS5182 part 23 RA 2017
4	CO	0.26	4	µg/m ³	IA5182 part 10 RA 2019

● **2.3. DAYLIGHTING TESTS**

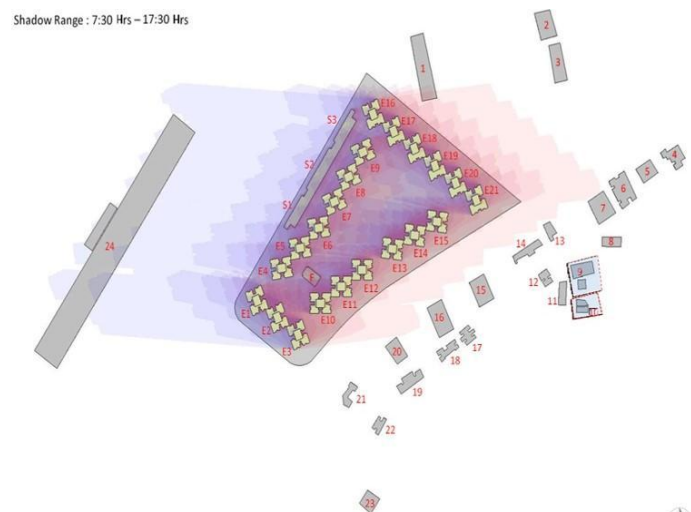
Daylighting is becoming an effective way of saving energy and providing more comfort to the customers. Daylighting uses natural sources of energy to provide brightness and comfort to consumers without the need of any lights and electronic objects. The location of the building of our project was selected after analyzing the wind direction and getting the satellite images provided by the government. The satellite provides images according to the sunlight falling on the ground and using the shadow range to show the area with most sunlight. The location of the building was tilted to 45 degrees to get the maximum possible sunlight and to minimize the use of alternate energy sources. The floor plan and the location of the windows and rooms are planned according to the daylighting results. Shadow range for different hours was

recorded to get accurate results and to minimize the use to energy.

1. The overall objective of daylighting is to minimize the amount of artificial light and reduce electricity costs, but it can also lower HVAC costs as well. Electrical lighting produces a lot of heat, whereas, if properly controlled, natural lighting generates hardly any heat at all.

2. For most buildings incorporating daylighting, the overall energy savings range from 15 to 40 percent. Although energy savings and sustainability may be the reasons companies initially opt for daylighting, it can also have an impact on the productivity and satisfaction of employees, students and even clients and retail customers.

3. People have a natural attraction and need for daylight. Studies suggest that daylighting has a direct impact on well-being, productivity and overall sense of satisfaction. Even retail stores like Wal-Mart have seen the environmental and monetary benefits of daylighting for both employees and consumers. In an experiment, stores that included skylights over certain departments found that overall sales per square foot were higher in the departments lit by natural light.



3.1. CONCLUSION

After conducting various tests on the impact of water, soil, air, noise, and daylighting on the environment, the following conclusions can be drawn:

1. Water: Based on the test result optioned from the site visit samples all the required parameters are within the limit of the Indian standards: The Ph of the sample water is 7.72 which is within the pH range provided by Indian codes and standard. NaOH required for the neutralization

of water is within the range of 5 ML as per IS Codes. SO₃ is 142.08 mg/ltr. Which is acceptable by IS codes as it is below the range given 400mg/ltr.

2. Soil: Soil quality can be impacted by land use changes, improper waste disposal, and erosion. As per IS 2720:2010 part 5 the liquid limit, plastic limit and plasticity index are feasible.

3. Air: Air quality can be negatively impacted by emissions from transportation, industrial processes, and other human activities. The essential parameters like SO₂, NO₂, PM₁₀, CO are within the range as per IS 5182.

4.Noise: Exposure to excessive noise can have negative impacts on human health and well-being. As per Indian standards limits after testing the noise level decibel, we achieved ranged between 60-70dB which is recommended for human limits.

5. Daylighting: Access to natural daylight is essential for human health and well-being, and can also impact energy consumption. Building design strategies such as passive solar design and use of Daylighting systems can help optimize natural daylight while reducing energy consumption. After analyzing all the satellite images provided from the gov, we adjusted the position of the project at an angle of 45°.To use the maximum possible natural energy and to reduce the use of other energy sources. In conclusion, it is evident from the testing that water, soil, air, noise, and daylighting have significant impacts on the environment, and it is important to adopt sustainable practices to minimize these impacts and promote environmental sustainability.

4.0. REFERENCE

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