FORM 1A

for

PROPOSED EXPANSION OF "THE 42" (A GREEN BUILDING PROJECT)

at

42B, Chowringhee Road, KMC area, P.S. Shakespeare Sarani, Kolkata – 700071

SUBMITTED TO

STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT AUTHORITY, GOVT. OF WEST BENGAL

Project Proponent

M/s Chowringhee Residency Pvt. Ltd.
(previously known as Diamond Empire Estates Pvt. Ltd.)
42B Chowringhee Road, Kolkata – 700071

FORM 1A

CHECK LIST OF ENVIRONMENTAL IMPACTS

(Project proponents are required to provide full information and wherever necessary attach explanatory notes with the Form and submit along with proposed environmental management plan & monitoring programme)

1. **LAND ENVIRONMENT**

1.1. Will the existing landuse get significantly altered from the project that is not consistent with the surroundings? (Proposed landuse must conform to the approved Master Plan / Development Plan of the area. Change of landuse if any and the statutory approval from the competent authority be submitted). Attach Maps of (i) site location, (ii) surrounding features of the proposed site (within 500 meters) and (iii) the site (indicating levels & contours) to appropriate scales. If not available attach only conceptual plans.

M/s. Chowringhee Residency Pvt. Ltd. (previously known as Diamond Empire Estates Pvt. Ltd.), the project proponent is intending to take up expansion of the project "THE 42" at 42B, Chowringhee Road under P.S. Shakespeare Sarani, Kolkata – 700071, within Ward No. 63 of The Kolkata Municipal Corporation, Kolkata, West Bengal.

The project proponent under Phase-1 programme had applied for environmental clearance for 1 Block – G+58+2 refuge floors, Heritage Building G+2 storied, 1 Block of 2B+G+7 storied MLCP & Residents Activity Centre.

Environmental Clearance has already been received for Phase – 1 of the project vide memo No. EN / 2087 / T-II-1 / 063 / 2013 dated 19.08.2014.

The project proponent now intends to take-up an expansion programme, under which 4 floors shall be added above the G+58 Tower (vertical expansion), which will become of G+62 configuration, a new residential Tower of 2B+G+29 configuration, 1 Block of 2B+G+4 storied MLCP & Residents Activity / Amenity Centre will be constructed within the available land in the Phase-1 area.

The entire development will follow a Master Plan which has been prepared taking into consideration the land use pattern of the surrounding areas.

Attachment:

- Site Location Plan: **Annexure- I**.
- Surrounding features of the proposed site (within 500 meters): **Annexure- II**.
- Master Plan : **Annexure- III**
- Site Contour Map- **Annexure - IV**

1.2. List out all the major project requirements in terms of the land area, built up area water consumption, power requirement, connectivity, community facilities, parking needs etc.

Project Details	As per Environmental clearance already received	Expansion Project	Total Project Scenario
Land Area	14365.457 sqm	- (Expansion shall takes place in the same premises)	14365.457 sqm
Nos. of flats	57	44	101
Expected Population	692 (Fixed – 662, maintenance – 30)	355 (Fixed – 285, Temporary – 70)	1047 (Fixed – 947, Temporary – 100)
Total Water requirement	145.5 KLD	67.61 KLD	213.11 KLD
Fresh Water requirement	97 KLD	41.28 KLD	138.28 KLD
Wastewater generated	109 KLD	48.60 KLD	157.60 KLD
Treated Wastewater from STP	109 KLD	47.39 KLD	156.39 KLD
Wastewater recycled	48.5 KLD	26.33 KLD	74.83 KLD
Wastewater discharged	60.5 KLD	21.06 KLD	81.56 KLD
Solid waste disposal	330 kg/day	186.88 kg/day	516.88 kg/day
Total Built-up Area	**63614.62 sqm**	**13261.853 sqm**	**76876.473 sqm**
Ground Coverage	3804.26 sqm (26.48%)	680.204 sqm (4.74%)	4484.464 sqm (31.22%)
Exclusive Plantation Area	3345 sqm (23.28%)	17.6 sqm (0.13%)	3362.6 sqm (23.41%)
No. of Plantation proposed	305 nos.	-	305 nos.
No. of Solar Street Lights proposed	33 nos.	-	33 nos.
No. of Parking spaces proposed	486 nos.	115 nos.	601 nos.
Total Power requirement	2777 KVA, CESC	2500 KVA, CESC	5277 KVA, CESC
Backup Power	DG sets (2X1250 KVA)	DG sets (4X625 KVA)	DG sets (2X1250 KVA & 4X625 KVA)
Block details	1 Block – G+58+2 refuge floors, Heritage Building G+2 storied, 1 Block of 2B+G+7 storied MLCP & Residents Activity	Additional 4 floors above G+58 tower, 2B+G+29 new Tower, 2B+G+4 – MLCP (modified)	1 Block – G+62, 2B+G+29 Tower, 1 Block of 2B+G+4 storied MLCP & Residents Activity Centre

	Centre		

Connectivity: The proposed project is located about 3.1 km away from Sealdah Railway Station. It is about 18 kms away from Netaji Subhas Chandra Bose International Airport.

Community Facilities: There are well developed community facilities in the vicinity of the project.

1.3. What are the likely impacts of the proposed activity on the existing facilities adjacent to the proposed site? (Such as open spaces, community facilities, details of the existing landuse, disturbance to the local ecology).

The proposed unit is coming up on urban land. Hence, there will not be any negative impact of the proposed project on the existing facilities such as open spaces and community facilities. The proposed project will have good green cover and other amenities. The impact on ecology is insignificant as there is no major flora and fauna in the area. There will not be any disturbance to the local ecology of the existing residential & commercial areas.

The storm drains of the complex will collect and convey the rainwater into the adjacent Kolkata Municipal Corporation (KMC) drain. The internal drainage system will be designed considering the invert level of the Kolkata Municipal Corporation (KMC) drain (outfall) in-front of the project site to avoid any flooding or water logging in the site.

During construction phase pollution due to air borne dust, wastewater, noise and vibration will be anticipated. The site will be enclosed to a reasonable height (about 15-20 feet) to prevent transportation of air borne dust and to create barrier for the noise. No significant additional load is anticipated to existing noise and air quality status.

During construction activities water sprinkling arrangement will be made in regular manner for dust suppression. Wastewater originating from labour hut will be discharged to the Kolkata Municipal Corporation (KMC) drain through temporary septic tank during construction phase.

Both during construction and operational phase vehicle movement will be increased but the level of increment will be accommodated easily with the prevailing traffic load. Traffic movement will be controlled by the security personnel inside the premises.

1.4. Will there be any significant land disturbance resulting in erosion, subsidence & instability? (Details of soil type, slope analysis, vulnerability to subsidence, seismicity etc. may be given).

This zone is not susceptible to subsidence and seismicity. As per the seismic zoning map of India, the country has been divided into four seismic zones, namely, Zone-II to V. Zone-V is considered to be the most seismically active region, while zone-II is the least. The project site falls in seismic zone III. Seismic load has been considered in structural design. During construction phase removal of top soil may cause soil erosion at the construction site. The construction site run off with eroded soil will be routed through catch pit / sedimentation basin prior to final disposal to Kolkata Municipal Corporation (KMC) drain.

There will not be any disturbance due to erosion, subsidence & instability of soil due to this project.

1.5. Will the proposal involve alteration of natural drainage systems? (Give details on a contour map showing the natural drainage near the proposed project site)

This is a plain developed land with no undulation. The surrounding area is predominantly residential and commercial area. The total land area of the proposed project is 14365.457 sqm (3.55 acres).

The storm drains of the complex will collect and convey the rainwater into the adjacent Kolkata Municipal Corporation (KMC) drain. The internal drainage system will be designed considering the invert level of the Kolkata Municipal Corporation (KMC) drain (outfall) in-front of the project site to avoid any flooding or water logging in the site.

1.6. **What are the quantities of earthwork involved in the construction activity-cutting, filling, reclamation etc. (Give details of the quantities of earthwork involved, transport of fill materials from outside the site etc.)**

This is a developed land. 31150 cum of excavated soil will be generated during construction of Phase-2 of the project. Major portion of the excavated soil will be utilized in the filling of foundation and rest will be disposed off outside the project area. As the land is already developed, so, there is no requirement of fill materials.

1.7. **Give details regarding water supply, waste handling etc. during the construction period.**

Total water requirement during the construction phase shall be met from KMC water supply.

All the topsoil excavated during construction activities will be stored for use in horticulture, landscape development within the project site. Adequate erosion and sediment control measures will be adopted before initiating construction activities.

Adequate arrangements will be made to ensure proper drainage of wastewater / surface run-off from the construction site so that such water do not form stagnant pools, nor cause soil erosion. The construction site wastewater would be routed through catch pit / sedimentation basin prior to final / ultimate disposal to proper drainage system. Sewage from the toilet blocks will be treated in septic tank- soak pit system.

Solid waste during construction phase would mainly comprise of excavated earth, concrete debris with bits and pieces of steel, cement bags, waste paper and cardboard packing materials, etc. Usable / recyclable materials will be sold off to waste recyclers. Unusable construction will be used for land development activities within the project site.

Water demand during construction phase (in phase-2) will be around 42 kld during peak construction period (average water demand in the construction work – 10 kld and average water demand for domestic purpose – 32 kld).

No construction material or wastes e.g. excavated soil, debris etc., will be dumped outside the project area.

Construction waste originating from construction activities will be 671 MT. Construction waste will be used in the site and road preparation work.

Garbage will be segregated at source for biodegradable, recyclables and inert material. Waste generated during construction period will be 90 kg/day and finally disposed of by Kolkata Municipal Corporation (KMC) as per MSW (M&H) Rules 2000.

During construction phase wastewater originating from labour hut (around 25 kld) will be discharged to Kolkata Municipal Corporation (KMC) drain through septic tank by temporary sewer connection from Kolkata Municipal Corporation (KMC).

1.8. Will the low lying areas & wetlands get altered? (Provide details of how low lying and wetlands are getting modified from the proposed activity)

There is no wetland or low lying area within the proposed project site.

1.9. Whether construction debris & waste during construction cause health hazard? (Give quantities of various types of wastes generated during construction including the construction labour and the means of disposal)

Construction waste does not contain any remarkable harmful substances that can cause health hazards. The hazardous waste is mainly generated from centering oil, grease, water proofing compounds, paints, wood dust from treated wood, discarded lube oil, etc. Special care will be taken to prevent mixing of these harmful substances with non-hazardous construction waste. Discarded lube oil will be stored in HDPE container and finally sold to the authorized vendor of MoEF. Therefore, possibility of any health hazard will be negligible.

Waste originating from construction activities will be 671 MT. Demolition and construction wastes will be used in the site and road preparation work. No, the construction debris includes brick, gravel, rubbish and waste from plaster, metal tiles, etc. will be used within the project site for land filling activities, road work and landscaping.

Workers' rest rooms within the project site shall be provided with proper onsite sanitation facilities. Awareness programme shall be conducted amongst the workers to educate them on good housekeeping practices and keeping the neighborhood of their working places neat

and clean as far as possible. Best care shall be taken to maintain good housekeeping within the project site.

2. WATER ENVIRONMENT

2.1. Give the total quantity of water requirement for the proposed project with the breakup of requirements for various uses. How will the water requirement met? State the sources & quantities and furnish a water balance statement.

Daily water demand of the proposed project during operation phase will be 67.60 KLD, out of the total water demand 41.28 KLD will be the fresh water demand and rest 26.33 KLD (landscaping – 8.00 KLD, car washing – 4.60 KLD and toilet flushing – 13.73 KLD) will be recycled from treated wastewater. The fresh water will be provided by KMC. (Phase – 2)

Indicative Water Requirement for Phase – 2

Sl. No	Category	Population	Per capital Water demand (lpcd)	Water demand (kld)			Type of water	
				Domestic	Flushing	Total	Fresh (kld)	Treated Sewage
1	Residential Population	285	150	29.93	12.83	36.76	29.93	12.83
2	Floating Population	30	15	0.15	0.30	0.45	0.15	0.30
3	O & M	40	45	1.20	0.60	1.80	1.20	0.60
4	Irrigation	-	-	-	-	8.00	-	8.00
5	Car wash	115	-	-	-	4.60	-	4.60
6	Swimming pool	-	-	10.00	-	10.00	10.00	-
	TOTAL			**41.28**	**13.73**	**61.61**	**41.28**	**26.33**
Total Water Required : 67.61								

Source: KMC supply.

The wastewater will be collected through a well-designed sewer network leading to STP. The proposed STP will be based on MBBR (Moving Bed Biofilm Reactor) technology followed by tertiary treatment and UV radiation as disinfection.

Total Recycling: 26.33 kld
Landscaping: 8.00 kld
Car Washing: 4.60 kld
Toilet Flushing: 13.73 kld

Wastewater Generation

ESTIMATED WASTE WATER GENERATION: PHASE-2

Sl. No.	Category	Water requirement (Kld)		Waste water to the STP (Kld)
		Fresh Water (Kld)	Treated Waste water (Kld)	
1	Residential Population	29.93	12.83	34.20
2	Floating Population	0.15	0.30	0.36
3	O&M Population	1.20	0.60	1.44
4	Swimming pool	10.00		8.00
5	Irrigation	-	8.00	-
6	Car Wash	-	4.60	4.60
	Total	**41.28**	**26.33**	**48.60**
Raw Wastewater to S.T.P.				48.60
Treated Wastewater from S.T.P.				47.39
Treated Wastewater for Reuse				26.33
Treated Wastewater for disposal				21.06

Treated waste water to be discharged to KMC drainage system: 21.06 kld.

2.2. What is the capacity (dependable flow or yield) of the proposed source of water?

Water will be supplied by KMC water supply system.

2.3. What is the quality of water required, in case, the supply is not from a municipal source? (Provide physical, chemical, biological characteristics with class of water quality)

KMC will supply the required quantity of water.

2.4. How much of the water requirement can be met from the recycling of treated wastewater? (Give the details of quantities, sources and usage)

Total Recycling: 26.33 kld
Landscaping: 8.00 kld
Car Washing: 4.60 kld
Toilet Flushing: 13.73 kld

2.5. Will there be diversion of water from other users? (Please assess the impacts of the project on other existing uses and quantities of consumption)

No, there is no diversion of water from the other users. Fresh water demand of the project will be met from KMC Water Supply system. Treated wastewater, meeting the relevant standard will be used for non- critical purpose like flushing, car washing and irrigation.

2.6. What is the incremental pollution load from wastewater generated from the proposed activity? (Give details of the quantities and composition of wastewater generated from the proposed activity)

Operation phase wastewater (to the tune of 48.60 kld) will be subjected to an extensive treatment. Treated wastewater, meeting the relevant standard will be used in non-critical purposes within the project. Treated wastewater in the tune of 21.06 kld will be discharged into the public sewerage / drainage system of KMC. As the treated wastewater will meet the relevant discharge standard, no incremental pollution load is envisaged due to such wastewater discharge. The composition of raw wastewater is given below.

pH	: 6.5 - 8.5
TSS	: 150 – 250 mg/L
BOD	: 175 – 200 mg/L
COD	: 350 – 400 mg/L
OIL & GREASE	: 5-25 mg/L

Treated wastewater quality would conform to the CPCB standards for discharging into surface water bodies.

2.7. Give details of the water requirements met from water harvesting? Furnish details of the facilities created.

A rainwater harvesting scheme following the guidelines of SEAC will be developed. Apart from ground water recharge facility, 2 nos. of surface water storage tanks of 50 cum capacity each will be constructed for harvesting the roof top rainwater. Such stored rainwater will be used in suitable non-critical usage in the project.

2.8. What would be the impact of the land use changes occurring due to the proposed project on the runoff characteristics (quantitative as well as qualitative) of the area in the post construction phase on a long term basis? Would it aggravate the problems of flooding or water logging in any way?

Due to proposed development there will be an increase in the storm run-off from the site. A well designed storm drainage network will be constructed in the project site. Storm drains of the complex will collect, convey and dispose the storm run-off into the public drainage system. The internal drainage system will be designed taking into consideration the drainage pattern, ground

profile, invert level, capacity of the recipient public drain etc. In fact, no negative impact in terms of flooding or water logging in the area is expected due to the change in imperviousness of the site.

2.9. What are the impacts of the proposal on the surface water? (Will there be tapping of surface water; give the details of surface water table, recharging capacity, and approvals obtained from competent authority, if any)

The water requirement for the proposed project will be met from KMC Water Supply System. Hence there will be no impacts on ground water resource of the area. Moreover, under the rain water harvesting proposal 2 nos. 150 mm dia. recharge tube well will be installed for ground water recharging purpose.

2.10. What precautions/measures are taken to prevent the run-off from construction activities polluting land & aquifers? (Give details of quantities and the measures taken to avoid the adverse impacts)

Very negligible quantity of construction materials are expected to be deposited on the construction site, which may be carried through surface run off. As a preventive measures surface run off will be routed through catch pit /sedimentation basin prior to final / ultimate disposal to Kolkata Municipal Corporation (KMC) drain. Special care will be taken while using some hazardous substances such as oil, paint, wood dust from treated wood, etc. to prevent mixing with the surface run off. Therefore no possibility is expected to pollute land and aquifers due to the construction activities.

2.11. How is the storm water from within the site managed? (State the provisions made to avoid flooding of the area, details of the drainage facilities provided along with a site layout indication contour levels)

The land is a developed land. The storm water coming from roof top will be connected with the rain water harvesting tank (partially) and partially recharging in to the deep aquifer as proposed earlier and the overflow will be diverted to the well-designed storm water drain inside the complex. The inside storm water drain will be designed considering the invert level of the Kolkata Municipal Corporation (KMC) drain so that the excess storm water and surface run off can easily go to the Kolkata Municipal Corporation (KMC) drain.

2.12. Will the deployment of construction labourers particularly in the peak period lead to unsanitary conditions around the project site (Justify with proper explanation).

Mostly the construction workers shall come to the site from the adjoining areas. They will be provided with clean drinking water from Kolkata Municipal Corporation (KMC). The labour huts will be temporarily constructed with adequate number of decentralized latrines and urinals. The

wastewater will be finally connected to Kolkata Municipal Corporation (KMC) drain by temporary connection through septic tank. As such, development of unsanitary condition due to deployment of construction workers is not expected.

2.13. What on-site facilities are provided for the collection, treatment & safe disposal of sewage? (Give details of the quantities of wastewater generation, treatment capacities with technology & facilities for recycling and disposal)

Wastewater generation from the proposed Phase – 2 of the complex will be around 48.60 kld. Such wastewater will be treated in the well-designed MBBR based S.T.P. Treated effluent meeting relevant standard will be used in non-critical purposes within the complex. Treated wastewater, in excess will be discharged into the public sewerage / drainage system.

Details and Flow chart of S.T.P are presented in **Annexure-V**.

2.14. Give details of dual plumbing system if treated waste is used for flushing of toilets or any other use.

Dual plumbing system is envisaged to utilize treated wastewater from STP for toilet flushing.

2. VEGETATION

3.1 Is there any threat of the project to the biodiversity? (Give a description of the local ecosystem with it's unique features, if any)

No, there is no threat to the Biodiversity. The operation stage of the proposed project will not pose any significant impact to the biodiversity of the area. Moreover plantation program will give shelter to the avifauna.

3.2 Will the construction involve extensive clearing or modification of vegetation? (Provide a detailed account of the trees & vegetation affected by the project)

There are 32 nos. of existing trees within the project site. Out of these 6 nos. need to be relocated. Remaining 26 nos. of trees shall be retained.

3.3. What are the measures proposed to be taken to minimize the likely impacts on important site features (Give details of proposal for tree plantation, landscaping, creation of water bodies etc. along with a layout plan to an appropriate scale)?

The proposed residential complex will have landscape garden and plantation along with boundary, road side and inside the hard surface. This plantation programme will create a better landscape quality as well as a barrier for dust and noise.

Total area measuring around 3362.6 sqm (23.41% of the total plot area (Phase 1 + Phase 2)) will be used for exclusive tree plantation area.

Around 305 numbers of trees will be planted in the Complex. 32 nos. of tress existing within the project site shall be retained. In addition the project will have other green areas in form grass cover etc.

Landscape plan of the project is presented in **Annexure-VI.**

4. FAUNA

4.1. Is there likely to be any displacement of fauna - both terrestrial and aquatic or creation of barriers for their movement? Provide the details.

There will be no significant impact on the faunal resource of the area due to the construction & operation of the proposed project. The project is not expected to hamper the natural movement corridor of any terrestrial fauna.

4.2. Any direct or indirect impacts on the avifauna of the area? Provide details.

The construction activities will be confined to the project site. The site development work will not lead to any significant loss of any important taxonomy. Plantation with a variety of plant species will be carried out. This may offer habitat as well as food for avifauna. As such, no likely tangible negative impact is expected during construction whereas a positive impact is expected during operation on the avifauna of the area.

4.3. Prescribe measures such as corridors, fish ladders etc. to mitigate adverse impacts on fauna.

Extensive greening programme with plantation will be done at the project site. It will not only act as a pollution sink for dust emissions, gaseous pollutants and noise pollution but will also offer habitat as well as food for avifauna and enhance the aesthetic of the project site. Therefore, a positive impact is expected on the faunal resource of the area.

5. AIR ENVIRONMENT

5.1 Will the project increase atmospheric concentration of gases & result in heat islands? (Give details of background air quality levels with predicted values based on dispersion models taking into account the increased traffic generation as a result of the proposed constructions)

Summary of Ambient Air Quality in the Study Area (in μg/m^3)

S. No	Parameter	Min	Max	Mean	Standard for Res. & Rural Area
1	PM_{10} (μg/m^3)	147	208	174	100
2	$PM_{2.5}$ (μg/m^3)	63	94	78	60
3	Sulphur Dioxide (SO_2) (μg/m^3)	8	17	10	80
4	Oxides of Nitrogen (NO_x) (μg/m^3)	42	70	52	80

There will be an increase in vehicular activity in this proposed project which will spread over the construction period. However, vehicle having valid auto emission control certificate will be used during the construction phase. In addition a proper traffic management system will be followed to control pollution due to movement of construction vehicles. As such, there will be an insignificant negative impact on the ambient air quality of the area due to increased traffic activities during the construction activities.

5.2. What are the impacts on generation of dust, smoke, odorous fumes or other hazardous gases? Give details in relation to all the meteorological parameters.

General micro-meteorological data of the study period confirms that the climate status of study area is consistent with the regional meteorology. Possible impacts on local air quality during construction of the proposed project in general include fugitive dust (particulate) emissions from earth movement, and loading, unloading activities. There will not be any significant incremental rise of PM and other gaseous pollutants concentrations in the ambient air due to the operation of DG sets or any other source of air emissions. Therefore it can be concluded that the project will have nominal impact on different meteorological parameters.

5.3. Will the proposal create shortage of parking space for vehicles? Furnish details of the present level of transport infrastructure and measures proposed for improvement including the traffic management at the entry & exit to the project site.

A well-designed internal road network within the proposed complex will be constructed to ensure free flow of traffic within the complex.

Adequate guards / traffic controllers will be posted at the entry, inside the Complex and exit points of the Complex to supervise smooth traffic management in and around the Complex.

5.4. Provide details of the movement patterns with internal roads, bicycle tracks, pedestrian pathways, footpaths etc., with areas under each category.

Internal wide road will be constructed by the project authority. The proposed traffic circulation plan is presented in **Annexure- VII**

5.5. Will there be significant increase in traffic noise & vibrations? Give details of the sources and the measures proposed for mitigation of the above.

There may be some increase in movement of light vehicles, private cars, and two wheelers in the area due to the proposed project. The movement of such vehicles in the area and blowing of their horns may marginally contribute to the noise level. Adequate guards / traffic controllers will be posted at the entry and exit points of the Complex to supervise smooth traffic flow and avoid traffic congestion. Adequate car parking will also be provided within the complex. As such the magnitude of negative impact due to traffic noise & vibration would be insignificant.

5.6. What will be the impact of DG sets & other equipment on noise levels & vibration in & ambient air quality around the project site? Provide details.

Impacts:

Impacts on ambient noise level during operation phase would be due to noise from the DG sets which will operate only during power failure and due to running of pumps.

Mitigation Measures

- Back up DG set & pumps will comply of the applicable emission norms.
- Adequate stack height for DG set will be provided as per norms.
- DG sets will be put up in sound attenuated enclosure.
- Back up DG set will be used only during power failure.

As such these activities will have insignificant impact on noise level and vibration in the neighborhood.

Electricity will be supplied by CESC. The connected load will be about 2500 kVA. DG sets (4 nos. 625 kVA) with a provision for limited power supply will be installed for backup power. The emission from DG sets will be discharged through a 5 meter stack for 625 kVA each above the roof of the DG building. Fuel (diesel) required for DG sets will be about 300 litre/hr. As such, these activities will have insignificant impact on noise level and vibration in the neighbourhood.

6. AESTHETICS

6.1. Will the proposed constructions in any way result in the obstruction of a view, scenic amenity or landscapes? Are these considerations taken into account by the proponents?

Obstruction of view, scenic amenity or landscapes will not be there.

6.2. Will there be any adverse impacts from new constructions on the existing structures? What are the considerations taken into account?

Not expected.

6.3. Whether there are any local considerations of urban form & urban design influencing the design criteria? They may be explicitly spelt out.

High-rise structure is proposed to create more open space on ground. All flats will be well lighted & ventilated. Design will be in accordance with local authority norms and NBC Guidelines.

6.4. Are there any anthropological or archaeological sites or artifacts nearby? State if any other significant features in the vicinity of the proposed site have been considered

No.

7. SOCIO-ECONOMIC ASPECTS

7.1. Will the proposal result in any changes to the demographic structure of local population? Provide the details.

No, there will be no change in the demographic pattern or displacement.

Some local people will get job during the construction phase of the project. Some manpower will be required for regular operation and maintenance of the complex building. The project will generate job opportunities in both direct and indirect sector.

7.2. Give details of the existing social infrastructure around the proposed project.

The area around the site is predominantly urban having all infrastructure facilities. This housing complex will improve the local conditions, increase employment opportunities thereby improving the local economy.

7.3. Will the project cause adverse effects on local communities, disturbance to sacred sites or other cultural values? What are the safeguards proposed?

No adverse effect is anticipated due to development of this project, instead will have positive impact on the local communities.

8. BUILDING MATERIALS

8.1. May involve the use of building materials with high-embodied energy. Are the construction materials produced with energy efficient processes? (Give details of energy conservation measures in the selection of building materials and their energy efficiency)

The project will be conceived mostly using RCC and brick wall. The building materials to be used are of low to moderate-embodied energy as major percentage of construction materials will be covered by cement mixed with fly ash, sand, bricks (conventional and fly ash), tiles and reinforcement (steel). A little amount of high-embodied energy content material such as aluminium and glass will be used as required for residential housing complex. Where ever possible eco-friendly and conventional construction material will be used.

8.2. Transport and handling of materials during construction may result in pollution, noise & public nuisance. What measures are taken to minimize the impacts?

Suitable mitigation measures will be adopted to reduce air & noise pollution and traffic congestion. The mitigation measures are:

- Vehicles having valid auto emission certificate will be deployed in construction related activities.
- Traffic controllers will be engaged to control movement of the construction vehicles.
- No construction material or debris will be stored outside the project site.
- Attempts will be made to keep the debris under cover during storage at site and while transporting.
- Limiting queuing of trucks to on site and on area roadways.
- Regular water spraying for dust suppression at the project site and on the roads being used by the construction vehicles.
- Loading and unloading operations at the construction site will not be carried out at night to avoid disturbance in the neighborhood.

8.3. Are recycled materials used in roads and structures? State the extent of savings achieved?

Yes, waste from construction activity will be used for road constructions and land development purpose. Iron rods will be recycled as far as possible.

8.4. Give details of the methods of collection, segregation & disposal of the garbage generated during the operation phases of the project.

The garbage (solid waste) within the project site will be biodegradable, recyclables and inert material in nature. The total quantity of solid waste generated during operational phase will be 186.88 kg/ day. The solid waste will be segregated at source and collected in bins. The solid waste will be collected through containerized system and finally it will be transported, treated and disposed off as per MSW (M&H) Rule 2000 by Kolkata Municipal Corporation (KMC).

9. ENERGY CONSERVATION

9.1. Give details of the power requirements, source of supply, backup source etc. What is the energy consumption assumed per square foot of built-up area? How have you tried to minimize energy consumption?

The details of power requirement, source, and backup power arrangement are given in Table below.

Power Requirements, Source and Backup Arrangement

Power requirement	2500 KVA
Sources of power and supply capacity	CESC
Backup power supply arrangement	Power backup shall be provided with 4 nos. 625 KVA. DG set will be installed in sound attenuated enclosure.
Stack Height of the DG Sets	5 meter stack for each DG set
Fuel Requirement	300 litre / hour

Solar lights, in conjunction with conventional lights will be used for outdoor lighting purpose.

9.2. What type of, and capacity of, power back-up do you plan to provide?

For backup power 4 nos. 625 kVA each D.G. sets will be installed.

9.3. What are the characteristics of the glass you plan to use? Provide specifications of its characteristics related to both short wave and long wave radiation?

Performance glass will be used. The thickness of glass is 6-8 mm depending upon the panel size.

9.4. What passive solar architectural features are being used in the building? Illustrate the applications made in the proposed project.

Efforts will be taken for energy conservation using passive solar architecture (solar light etc.) wherever possible.

9.5. Does the layout of streets & buildings maximize the potential for solar energy devices? Have you considered the use of street lighting, emergency lighting and solar hot water systems for use in the building complex? Substantiate with details.

Energy efficient lighting system e.g. High Pressure Sodium Vapour (HPSV) lamps, LED etc will be used. Emergency lighting will be provided by DG sets. Solar energy will be used in street lighting.

9.6 Is shading effectively used to reduce cooling/heating loads? What principles have been used to maximize the shading of Walls on the East and the West and the Roof? How much energy saving has been effected?

Details of effective utilization of shading to reduce heating/cooling loads has been provided in the page no. 31 of Microclimate Study Report presented in **Annexure VIII**.

9.7 Do the structures use energy-efficient space conditioning, lighting and mechanical systems? Provide technical details. Provide details of the transformers and motor efficiencies, lighting intensity and air-conditioning load assumptions? Are you using CFC and HCFC free chillers? Provide specifications.

Emphasis will be made for procurement of Energy efficient appliances to minimize the energy consumption to the extent possible. Use of compact fluorescent lamps and low voltage lighting will be encouraged. The details are:

- Roof-top thermal insulation
- Appropriate design to shut out excess heat and gain loss
- Use of solar energy in external lighting
- Maximum utilization of natural light
- Lifts and pumps will be on VFD drives
- Photo sensors are proposed at critical junctions
- Most of the common area lightings are proposed to work on high energy efficient lamps (LED)

Lighting Specification:

Space	Targeted LPD Watt/sq.m	IGBC Base case LPD Watt/sq.m
Common Areas Lighting		
Lobbies & Corridors	3.2	4.0
Staircases	3.2	4.0
Terrace	3.2	4.0
Exterior Areas		
Landscaped Areas	2.0	2.5
Tot lots or Children play area	2.0	2.5
Roadways & Pathways	2.0	2.5
Parking		
Parking	2.0	2.5

**LPD: Lighting Power Density (watt / Sqm)

9.8 What are the likely effects of the building activity in altering the micro-climates? Provide a self-assessment on the likely impacts of the proposed construction on creation of heat island & inversion effects?

The project activities shall have negligible effect on micro-climates. The building will use energy efficient fittings and environmental friendly designs that will control formulation of heat island effect. There will be also sufficient green cover at the site to reduce formation of heat island.

Microclimatic Study report is presented in **Annexure- VIII**

9.9 What are the thermal characteristics of the building envelope? (a) roof; (b) external walls; and (c) fenestration? Give details of the material used and the U-values or the R values of the individual components.

The U-values of the roof, external wall and fenestration of the building will meet the requirements as specified in the Energy Conservation Building Code (ECBC).

S. No.	Component	Material Used	Permissible U-Value as per ECBC (W/m^2-°C)
1.	Roof	Concrete	0.04
2.	External Wall	Brick	0.07
3.	Fenestration	Glass Façade	3.3

9.10 What precautions & safety measures are proposed against fire hazards? Furnish details of emergency plans.

- Wet Riser system will be installed.
- Fire Consultant will be appointed for drawing up appropriate plan for control/management of any fire.
- Water from the proposed underground firewater storage tank will be drawn through fire pumps of fire brigade in case of a fire hazard. Fire alarm system will be provided at appropriate locations.
- Fire alarm system will be provided at appropriate locations.
- Special fire exits will be made at strategic locations.
- Security Manager will be stationed who will inform Fire Brigade/ Police Station/ Hospitals/ Local Administrations in case of an emergency / disaster.
- Automatic sprinkler system will be provided as per Fire department recommendation.

9.11. If you are using glass as wall material provides details and specifications including emissivity and thermal characteristics.

Performance glass shall be used.

9.12. What is the rate of air infiltration into the building? Provide details of how you are mitigating the effects of infiltration.

None.

9.13. To what extent the non-conventional energy technologies are utilized in the overall energy consumption? Provide details of the renewable energy technologies used.

To minimize the energy consumption solar energy will be used in street lighting.

10. **Environment Management Plan (EMP).**

The Environment Management Plan would consist of all mitigation measures for each item wise activity to be undertaken during the construction, operation and the entire life cycle to minimize adverse environmental impacts as a result of the activities of the project. It would also delineate the environmental monitoring plan for compliance of various environmental regulations. It will state the steps to be taken in case of emergency such as accidents at the site including fire.
Environment Management Plan & CSR is attached as **Annexure- IX**

Others Attachment:

- Land Deed as **Annexure-X**.
- Conceptual Plan showing existing Trees as **Annexure-XI**.