BAGMANE

To,
The Member Secretary,
SEAC
Department of Environment, Ecology & Forests,
MS Building, Bengaluru - 560 001.

Date: 12/12/2017

Dear Sir,

Sub: Submission of additional documents to obtain Environmental Clearance Proposed Commercial Construction Project "Bagmane Taurus-3" at Survey Nos. 58/2 & 59/2 of Doddanekundi Village, K. R. Puram Hobli, Bengaluru East Taluk, Bengaluru, Karnataka – reg. (SEIAA 113 CON 2017).

Ref. No.: 188th SEAC proceedings dated 25th November 2017.

With reference to above subject, we are herewith submitting the additional information sought, as follows:

Sr. No.	Clarifications Sought	Compliance
1.	The Proponent to submit the revised Form IA after correcting the typographical error and to upload to E Portal.	Revised Form IA is enclosed as **Annexure No. I.**
2.	As far as traffic study is concerned the status of the connecting road moves from D category to F category at the end of three years. The proponent to submit the detailed mitigative measures to improve the status.	The revised Traffic Density Study is enclosed as **Annexure No. II.**
3.	The proponent to relook into the storm water management plan within the site keeping in view the carrying capacity of the drain.	Storm water Management Plan is revised, keeping in view the carrying capacity of the drain and enclosed as **Annexure No. III** along with Storm water management plan, wherein 5 recharge pits of 120 KLD capacity having 3m dia * 3m effective depth is proposed.

Received
11/1/18

Bagmane Developers Pvt. Ltd., Iskra View 'A' Block, 8th Floor, Bagmane Tech Park, C.V. Raman Nagar, Bangalore - 560 093.
Tel: +91 80 40200000, Fax: +91 80 40200000 | www.bagmanegroup.com
E-mail : admin@bagmanegroup.com | CIN: U70102KA1998PTC019532

Sr. No.	Clarifications Sought	Compliance
4.	The proponent to monitor and submit the air quality data for 24 hours.	Air monitoring report for 24 hrs is enclosed as **Annexure No. IV.**
5.	The proponent to submit the detailed energy conservation measures adopted in selection of the building material.	Detailed energy conservation measures adopted in selection of the building material. The detailed report is enclosed as **Annexure No. V.**

Trusts the above information is in order and request you to kindly recommend us the Environmental Clearance at the earliest.

Thanking you in anticipation,

Yours faithfully,
For **Bagmane Developers Pvt. Ltd.,**

Authorized Signatory

Encl: as above

Bagmane Developers Pvt. Ltd., Lake View 'A' Block, 8th Floor, Bagmane Tech Park, C.V. Raman Nagar, Bangalore - 560 093
Tel: [illegible] Fax: [illegible] | www.bagmanegroup.com
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ANNEXURE NO - I

Revised Form I and Form IA

APPENDIX 1
(See Paragraph – 6)
FORM 1

(I) **Basic Information**

Sr. No.	Item	Details
1	Name of the project/s	Construction of Commercial building Project- "Bagmane Taurus 3" by M/s. Bagmane Developers Pvt. Ltd.
2	Sr.No. in the schedule	8(a), Category B -Building and Construction Projects.
3	Proposed capacity/area/length/tonnage to be handled/command area/lease area/number of wells to be drilled	Plot area: 20,224.00 Sqm (4.99 acres) Built-up Area: 84,996.02 Sqm (2B+1GF+11 Upper Floors)
4	New/~~Expansion/Modernization~~	New
5	Existing Capacity/ Area etc.	Plot Area: 20,224.00 Sqm.
6	Category of Project i.e. 'A' or 'B'	Category B
7	Does it attract the general condition? If yes, Please specify.	No
8	Does it attract the specific condition? If yes, Please specify.	No
9	Location	At Survey Nos. 58/2 & 59/2 of Doddanekundi Village, K.R.Puram Hobli, Bengaluru East Taluk, Bengaluru. Geological Coordinates Latitude : 12°58'51.0"N Longitude : 77°41'54.4"E
	~~Plot~~/Survey/ Khatha No.	At Survey Nos. 58/2 & 59/2
	Village	Doddanekundi Village
	Tehsil	Bengaluru East Taluk
	District	Bengaluru
	State	Karnataka
10	Nearest Railway station / airport along with distance in Kms.	1. K R Puram Railway Station is located at a distance of 3 Km from the project site. 2. Kempegowda International Airport Limited at Devanahalli, 24km from the project site.

11	Nearest town, city, District headquarters along with distance in Kms.	Located within Bengaluru City limits.
12	Name of the applicant	M/s. Bagmane Developers Pvt Ltd.
13	Registered Address	M/s. Bagmane Developers Pvt. Ltd. Lake View 'A' Block, 8th Floor Bagmane Tech Park C.V. Raman Nagar, Bangalore – 560093
14	Address for correspondence :	M/s. Bagmane Developers Pvt. Ltd. Lake View 'A' Block, 8th Floor Bagmane Tech Park C.V. Raman Nagar, Bangalore – 560093
	Name	K.C. Ravi Kumar
	Designation (Owner/Partner/CEO)	Senior General Manager M/s. Bagmane Developers Pvt Ltd.
	Address	M/s. Bagmane Developers Pvt. Ltd. Lake View 'A' Block, 8th Floor Bagmane Tech Park C.V. Raman Nagar, Bangalore -
	Pin Code	560093
	E-mail	ravikumar@bagmanegroup.com
	Telephone No.	+91 – 9844247714
	Fax No.	080 – 4032 9900
15	Details of Alternative Sites examined, if any. Location of these sites should be shown on a Topo sheet.	No alternative sites were examined.
16	Interlinked Projects	Nil
17	Whether separate application of interlinked project has been submitted	Nil
18	If yes, date of submission	NA
19	If no, reason	Proposed site is within the existing campus of Bagmane Constellation Business Park.
20	Whether the proposal involves approval/ clearance under: (a) The Forest (Conservation) Act, 1980 (b) The Wildlife (Protection) Act, 1972 (c) The C.R.Z Notification, 1991	This proposal does not require approval /clearance under Forest Act, Wild life Act, & C R Z Notification.
21	Whether there is any Government order / policy relevant /relating to the site	Nil

22	Forest land involved (hectares)	No forest land is involved.
23	Whether there is any litigation pending against the project and/or land in which the project is propose to be set up (a) Name of the Court (b) Case No. (c) Orders/directions of the Court, if any and its relevance with the proposed project.	No
24	Expected cost of the project	**Total project cost: Rs 208 Crores** Land Cost: 41 Crores Construction Cost: 167 Crores

(II) Activity

1. Construction, operation or decommissioning of the Project involving actions, which will cause physical changes in the locality (topography, land use, changes in water bodies, etc.)

Sr.No.	Information/Checklist confirmation	Yes /No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
1.1	Permanent or temporary change in land use, land cover or topography including increase in intensity of land use (with respect to local land use plan)	Yes	The project is being developed on a plot of land measuring about 20,224.00 Sqm; The proponent wants to use the land to develop office buildings. BDA CDP Plan has been enclosed along with EMP Report.
1.2	Clearance of existing land, vegetation and buildings?	No	Not Applicable. Presently the land is devoid of vegetation and buildings. Photographs of the project site are shown in EMP report.
1.3	Creation of new land uses?	No	The proposal is in conformity with the land use of the area as per the Bangalore Development Plan.
1.4	Pre-construction investigations e.g. bore houses, soil testing?	No	Nil
1.5	Construction works?	Yes	Construction works will be undertaken as per the conceptual plan.
1.6	Demolition works?	No	Not Applicable
1.7	Temporary sites used for construction works or Housing of construction workers?	No	There will be no settlement of construction labourers inside the project site.

1.8	Above ground buildings, structures or Earthworks including linear structures, cut and fill or excavations	Yes	Excavation work will be undertaken for the foundation of the building. The excavated earth will be used for filling low lying areas, pavements, etc and surplus amount will be utilized for back filling of construction site.
1.9	Underground works including mining or tunneling?	No	NA
1.10	Reclamation works?	No	NA
1.11	Dredging?	No	NA
1.12	Offshore structures?	No	NA
1.13	Production and manufacturing processes?	No	NA
1.15	Facilities for treatment or disposal of solid waste or liquid effluents?	Yes	Solid waste will be collected separately as biodegradable (Organic) and non biodegradable (inorganic/recyclable) in the respective bins provided. Organic wastes will be treated using Organic Waste Converter and recyclable waste will be handed over to the authorized vendors for further processing. Sewage from the project will be around 18.75 Kg/d which will be treated in STP of capacity 350 KLD. E-Wastes from the project will be around 34.18 tonnes; this will be handed over to authorized E-Waste processors. *Refer STP feasibility report attached as* ***Annexure.***
1.16	Facilities for long term housing of operational workers?	No	As local people will be hired for the routine maintenance, no permanent facilities are proposed. Only temporary site office /room/ shed will be provided.
1.17	New road, rail or sea traffic during construction or operation?	No	The existing road facility will be made use of.
1.18	New road, rail, air, waterborne or other transport infrastructure including new or altered routes & stations, ports, airports etc?	No	Not Applicable.

1.19	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	No	There is no change in the existing route or the traffic movement. Traffic pattern in the approach road during construction and operation phase is expected to Increase. The existing traffic scenario & LoS towards K R Puram and towards Marathalli is 'C' & 'D' respectively, which is likely to remain as its is even after the project becomes fully operational. Further to it, proposed Doddanekkundi Metro Phase II station is expected to be constructed near the Bagmane Tech Park which will ease the traffic inflow to a greater extent. Also, the BDA has proposed to construct a flyover at the Doddanekkundi junction, which will further reduce the traffic congestion. A detailed Traffic density study has been carried out to assess the increase in the existing traffic scenario. *The traffic report is enclosed as Annexure.*
1.20	New or diverted transmission lines or pipelines?	Yes	New electrical and water supply lines shall be arranged for the project.
1.21	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No	NA
1.22	Stream crossings?	No	No
1.23	Abstraction or transfers of water from ground or surface waters?	No	Tertiary treated water will be used for curing and dust suppression during construction phase. Concreting and Domestic water requirements during construction shall be met by external authorized supplier. Operation phase water requirements will be met by the BWSSB & treated water from STP.

1.24	Changes in water bodies or the land surface affecting drainage or run-off?	No	Natural drainage and water bodies are not affected by this project. Runoff from the project site will be utilized for ground water recharge through recharge pits within the site.
1.25	Transport of personnel or materials for construction, operation or decommissioning?	Yes	Raw materials for construction will be transported by trucks. The transportation trucks will be covered with tarpaulin sheets to avoid dust emissions.
1.26	Long-term dismantling or decommissioning or restoration works?	No	Not Applicable
1.27	Ongoing activity during decommissioning which could have an impact on the environment?	No	Not Applicable
1.28	Influx of people to an area in either temporarily or permanently?	Yes	Construction Phase: There will be a temporary and minor influx of construction laborers due to employment opportunities generated during construction phase. Operation Phase: There will be an influx of people including the staff, securities and visitors commuting on the Project site.
1.29	Introduction of alien species?	No	NA
1.30	Loss of native species or genetic diversity?	No	NA
1.31	Any other actions?	Yes	Rainwater harvesting (storage tank & 5 recharge pits) are proposed

2. **Use of Natural resources for construction or operation of the Project (such as land, water, materials or energy, especially any resources which are non-renewable or in short supply):**

Sr. No.	Information/checklist confirmation	Yes /No	Details thereof (with approximate quantities /rates, wherever possible) with source of information data
2.1	Land especially undeveloped or agricultural land (ha)	No	Construction of the project is on a plot of land measuring about 20,224.00 Sqm which is a converted empty land.

2.2	Water (expected source & competing users) unit: KLD	Yes	Construction phase: Approx. 20 KLD Source: Treated Sewage water will be used Operation phase: Approx. 350 KLD Source: BWSSB
2.3	Minerals (MT)	No	--
2.4	Construction material - stone, aggregates, sand/ soil (expected source – MT)	Yes	Construction materials for built-up area of 84,996.02 Sqm from nearby sources. As per estimation: Steel: 8138MT Cement: 25200 MT Solid Block Work: 525000 Nos. Sand: 367500 Cu. ft. Aggregates: 1365000 Cu. ft.
2.5	Forests and timber (source – MT)	No	Minimal use of timber during construction and operational phase.
2.6	Energy including electricity and fuels (source, competing users) Unit: fuel (MT), energy (MW)	Yes	The power requirement during operational phase will be met from Bangalore Electricity Supply Company of 5200 KVA
2.7	Any other natural resources (use appropriate standard units)	No	--

3. Use, storage, transport, handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health.

Sr.No.	Information/Checklist confirmation	Yes /No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
3.1	Use of substances or materials, which are hazardous (as per MSIHC rules) to human health or the environment (flora, fauna, and Water supplies)	No	Diesel & lube oil to be used for DG sets during power failure is stored in leak proof containers on impervious floors in the designated places within the site.
3.2	Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)	No	Nil
3.3	Affect the welfare of people e.g. by changing living conditions?	Yes	Socioeconomic status will improve.

3.4	Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc.,	No	Nil
3.5	Any other causes	No	--

4. Production of solid wastes during construction or operation or decommissioning (MT/month)

Sr. No.	Information/Checklist confirmation	Yes /No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
4.1	Spoil, overburden or mine wastes	No	--
4.2	Municipal waste (domestic and or commercial wastes)	Yes	**Construction Phase** Project proponents are not going to provide any labour colony, so there will be less quantity of domestic solid waste generation during construction phase, which will be handed over to local body. **Operation Phase** Solid waste generation during operation phase: • Total solid waste: 1.63 MT/day • Organic waste: 0.33 MT/day • Inorganic waste : 1.3 MT/day
4.3	Hazardous wastes (as per Hazardous Waste Management Rules)	Yes	Spent oil from DG sets will be given to authorized hazardous waste recyclers & the generated E-Waste (during operation phase) will be handed over to the approved and authorized E-Waste recyclers.
4.4	Other industrial process wastes	No	NA
4.5	Surplus product	No	NA
4.6	Sewage sludge or other sludge from effluent treatment	Yes	Total sewage sludge generated from the proposed activity will be about 18.5kg/day which will be used as manure / organic fertilizer for horticulture in the Project Site.

4.7	Construction or demolition wastes	Yes	Construction waste generated will be used within the project site for leveling. Non-recyclable such as concrete waste, etc. will be used for road construction and all the recyclable wastes such as steel, other metal scrap, etc. will be sold to recyclers/scrap dealers.
4.8	Redundant machinery or equipment	No	NA
4.9	Contaminated soils or other materials	No	NA
4.10	Agricultural wastes	Yes	Horticulture waste will be used as manure.
4.11	Other solid wastes	No	NA

5. Release of pollutants or any hazardous, toxic or noxious substances to air (Kg/hr)

Sr. No.	Information/Checklist confirmation	Yes /No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources	Yes	There will be minor vehicular pollution during construction phase and operation phase. Negligible emissions from DG set in case of power failure
5.2	Emissions from production processes	No	NA
5.3	Emissions from materials handling including storage or transport	No	Negligible emissions from vehicular transportation during construction.
5.4	Emissions from construction activities including plant and equipment	Yes	Fugitive emissions during unloading of construction material, concrete mixers are negligible. Emissions from DG sets, graders, levelers etc. only
5.5	Dust or odors from handling of materials including construction materials, sewage & waste	Yes	There will be dust emission during construction operation which is controlled by water sprinkling and by erecting barricades around the site. Sewage treatment plant will be well maintained to ensure aerobic conditions. Solid wastes are handled using closed containers to avoid odour nuisance.
5.6	Emissions from incineration of waste	No	NA

5.7	Emissions from burning of waste in open air (e.g. slash materials, construction debris)	No	NA
5.8	Emissions from any other sources	No	NA

6. **Generation of Noise and Vibration, and Emissions of Light and Heat:**

Sr. No.	Information/Checklist confirmation	Yes /No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
6.1	From operation of equipment e.g. engines, ventilation plant, crushers	Yes	Construction phase: Noise will be generated from following sources during construction phase: 1. Construction machinery and vehicles 2.On-going construction activity Operation phase: Potential noise generating sources during operation phase is vehicular traffic & from DG sets only.
6.2	From industrial or similar processes	No	Not applicable.
6.3	From construction or demolition	Yes	Noise from construction activities where plant and machinery will be used. Noise due to demolition will be of short duration. Localized noise is expected during construction phase.
6.4	From blasting or piling	No	--
6.5	From construction or operational traffic	Yes	Construction phase: Noise will be generated due to trucks carrying the construction material. Operation phase: During operation phase, noise will be generated due to traffic.
6.6	From lighting or cooling systems	No	--
6.7	From any other sources	No	--

7. **Risks of contamination of land or water from releases of pollutants into the ground or into sewers, surface waters, groundwater, coastal waters or the sea:**

Sr. No.	Information/Checklist confirmation	Yes /No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
7.1	From handling, storage, use or spillage of hazardous materials	No	Nil.

7.2	From discharge of sewage or other effluents to water or the land (expected mode and place of discharge)	No	STP of 350 KLD is designed and will be constructed to treat waste water to acceptable standards for utilization for use as makeup water for flushing, HVAC & horticulture thereby ensuring zero discharge.
7.3	By deposition of pollutants emitted to air into the land or into water	No	Nil
7.4	From any other sources	No	There will not be any spillover even during monsoon because of the proposed RWH (storage tank & 5 recharge pits), thereby ensuring zero discharge during monsoon season also.
7.5	Is there a risk of long term build up of pollutants in the environment from these sources?	No	Nil

8. **Risk of accidents during construction or operation of the Project, which could affect human health or the environment**

Sr.No.	Information/Checklist confirmation	Yes /No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
8.1	From explosions, spillages, fires etc from storage, handling, use or production of hazardous substances	Yes	Storage of HSD, fresh and used lube oil are prone to dangers. Care is taken that these are stored in closed tanks/ containers, away from any possible sources of ignition at specified locations only.
8.2	From any other causes	No	--
8.3	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslides, cloudburst etc)?	No	Area falls under Zone II which is Low Damage Risk Zone.

9. **Factors which should be considered (such as consequential development) which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality**

Sr. No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
9.1	Lead to development of supporting utilities, ancillary development or development stimulated by the project which could have impact on the environment e.g.: • Supporting infrastructure (roads, power supply, waste or waste water treatment, etc.) • housing development • extractive industries • supply industries • other	Yes	Infrastructure that accompanies proposed development include: • STP for treatment and recycling of waste water generated on the project site. • Rainwater harvesting. • Adequate parking space. Proportionate development of infrastructure, creation of associated tertiary service sector and employments. • Expected in increase traffic due to the project, which can be easily handled by the existing infrastructure to the project.
9.2	Lead to after-use of the site, which could have an impact on the environment	No	Not applicable.
9.3	Set a precedent for later developments	Yes	The proposed development will facilitate further sustainable development of Commercial areas.
9.4	Have cumulative effects due to proximity to other existing or planned projects with similar effects	Yes	This project, along with many such developments in the surrounding area is likely to exert more loads on the resources such as water and electricity.

(III)**Environmental Sensitivity**

Sr. No.	Areas	Name/ Identity	Aerial distance (within 15 km.)Proposed project location boundary
1	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	NIL	Not applicable.
2	Areas which are important or sensitive for ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests	NIL	Not applicable.

3	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration	NIL	Not applicable.
4	Inland, coastal, marine or underground waters	NIL	Not applicable.
5	State, National boundaries	NIL	Not applicable.
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	NIL	Not applicable.
7	Defense installations	NIL	Not applicable.
8	Densely populated or built-up area	Yes	The proposed project falls within Bangalore city limits.
9	Areas occupied by sensitive man-made land uses (hospitals, schools, places of worship, community facilities)	Yes	Project is within Bangalore city where in all community facilities are available. Schools, Hospitals exist within 1-2 Km radius.
10	Areas containing important, high quality or scarce resources (Ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)	No	Not applicable.
11	Areas already subjected to pollution or environmental damage. (those where existing legal environmental standards are exceeded)	No	Not applicable.
12	Areas susceptible to natural hazard which could cause the project to present environmental problems (Earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions)	--	The area falls under the Zone II as per seismic zone map of India. Hence the proposed area for construction is not susceptible to natural hazard.

(IV) Proposed Terms of Reference (TOR) for EIA Studies.

Not Applicable

I hereby give undertaking that the data and information given in the application and enclosures are true to the best of my knowledge and belief and I am aware that if

any part of the data and information submitted is found to be false or misleading at any stage, the project will be rejected and clearance given, if any to the project will be revoked at our risk and cost.

Date: / /2017
Place: Bangalore

Signature of the Applicant
for Bagmane Developers Pvt Ltd.

K. C. Ravikumar
Senior General Manager

FORM – 1A

APPENDIX II

(See paragraph 6)

SECTION 1- LAND ENVIRONMENT

(Attach panoramic view of the project site and the vicinity)

Panoramic view of the proposed project site is enclosed as Drawings.

1.1 Will the existing land use get significantly altered from the project that is not consistent with the surroundings? (Proposed Land use must conform to the approved Master Plan/ Development Plan of the area. Change of land use if any and the statutory approval from the competent authority are 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.

No, the project site is designated as High Tech Zone as per the CDP. Location Map, Google map of the project site & Topo map are enclosed along with EMP report. The contour plan indicating the difference in level is enclosed as Drawings.

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.

Yes. The Details are given in below table.

Sl No.	Particulars	Details
1	Total Land Area	20,224.00 Sqm (4.99 Acres)
2	Height of the Building	48.0 meters
3	Total Built up area	84,996.02 Sqm
4	FAR area	59,694.98 Sqm
5	Ground coverage area	5536.83 Sqm
6	Landscape area	On ground 6813.0 Sqm On podium 1460.0 Sqm Total 8273.0 Sqm
6	Total Water Consumption	Construction Phase: 20 KLD Operational Phase: 350 KLD

7	Power Requirement	Construction Phase: 250 KVA Operational Phase: 5200 KVA
8	Accessibility	Outer Ring Road
9	Parking Requirement	1195 Nos.

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 facility, details of the existing land use, disturbance to the local ecology).

Due to good architectural views and well designed landscape, the project is expected to enhance the aesthetics of the surroundings. Project site is situated in the neighbourhood of other residential apartment and commercial developments, hence does not alter the local ecosystem.

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

No. It is proposed to develop professionally designed landscaping to avoid the erosion of the texturally disturbed soil.

Soil type: Clayey Sand

Vulnerability to subsidence: The soil is not vulnerable to subsidence.

Seismicity: The project site is located in the Seismic Zone – II, which is classified as the low damage risk zone.

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

The proposed project activity does not involve any alteration of natural drainage system. Site Plan / Contour Plan are enclosed as **Drawings.**

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.)

The demolition waste/debris arising from the site will be reused as filters for internal roads and pavements and remaining excess will be used to back fill low lying areas within the project site. Rocks arising from the project site will given to nearby crushers, Steel from the debris will be recycled.

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

Water requirement and domestic water needs for the labourers during construction phase are met by the external authorized tanker water suppliers. The water used for construction gets consumed into chemical reactions with cement and also partly gets evaporated. Hence, there will be no wastewater generation from this. However, there will be discharge of domestic wastewater to the tune of 20 KLD and will be collected in collection tank and will be lifted to BWSSB sewage treatment plant for further treatment. Proponents are not going to provide any labour colony; therefore there won't be any domestic solid waste generation.

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 are no low-lying areas or wetlands around the proposed project site. The excavated Earth during Construction will be used for filling the low lying areas within the site and also for levelling of the roads etc., but no alteration will be done outside the 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).

The wastes generated during the construction phase are mainly earthy and rocky

matter, which do not have any adverse effect on human health. The construction waste such as left over concrete, rejection due to wrong workmanship will be used for back-filling and road pavement. The metallic waste of construction will be sold to scrap dealers and recyclers.

SECTION 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.

The total quantity of water required for Proposed Project is about 350 KLD and the same will be met through BWSSB. Detailed Water Balance Chart is enclosed in EMP report.

Water requirement:

1. Construction Phase: 20 KLD

2. Operation Phase: 350 KLD

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

Fresh water is proposed to be sourced from BWSSB.

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).

Potable water quality as per IS: 10500 for use of hand wash, human contact etc. Tertiary treated water will be used for non-potable use such as Green belt, Flushing & HVAC.

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)

During operation stage tertiary treated water from the STP to the tune of about 286

KLD, out of this, 147 KLD shall be used for flushing of toilets, about 64 KLD shall be used for gardening and 75 KLD for HVAC purposes.

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)

Requirement of water will be met thorough BWSSB and Treated water from STP inside the Project. No such impact is anticipated on other existing users.

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)

The domestic sewage will be treated in STP of capacity 350 KLD.

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

Details given in EMP report.

2.8 What would be impact of the land use change 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?

There will be no impact on the runoff characteristics from the proposed project. The terrace rain water will be collected in the roof rain water collection tank of suitable capacity and the same will be used after prior treatment. Internal storm water drain will be provided within the site in order to carry out the storm water from landscape and hardscapes into the recharge pits, to recharge the ground water which will be provided with perforated pre-cast cover all along the site boundary as well as in walk way & pavements. Excess will be routed to existing external storm water drain on the northern side of the project site. Hence it won't cause any flooding or water logging problems.

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

No. Ground water will not be tapped.

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

No significant runoff anticipated due to construction activities. Also no lake is existing in the vicinity of the proposed project.The concrete is proposed to be sourced from ready mix plants, and hence there will not be any runoff due to concrete making. Care shall be taken during mortar preparation and curing to avoid runoff. However, if found necessary, during construction, separate catch pits shall be constructed to collect runoff. This shall be allowed to settle and clear water shall be reused for construction purposes.

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

Details of Storm water drain / Rainwater harvesting Management has been given in EMP report & Strom Water Management plan attached as Annexure.

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)

During constructional phase, average 600 labourers will be employed at the site. The total water requirement for 600 workers for drinking & other purpose is around 20 KLD. Sufficient drinking water is provided for Labourers.

Facilities created for workers during the construction phase include the following:

- About 600 construction workers will be employed during the construction stage.

- Open defecation will not be allowed. Temporary toilets will be provided based on the requirement
- First Aid facilities will be provided at the site.
- Health check up will be carried out.
- Arrangement with local hospital for any emergency will be made for all the laborers working at site.
- Safety measures like PPE (Personal Protective Equipments) – Helmets, Safety shoes, Nose Mask, Hand gloves, Goggles and Safety Belts, etc will be provided for the construction, depending on the nature of their work.

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)

Sewage generated shall be treated in full fledged STP of capacity 350 KLD. The treated water will be utilized for secondary purposes like gardening, flushing etc. The sewage shall be treated to the stipulated KSPCB standards. The STP feasibility reports is enclosed as **Annexure.**

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

Dual plumbing system Drawing is enclosed. Treated water will be used for gardening and Flushing.

SECTION 3 –VEGETATION

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

No threat, since no unique biodiversity features in the project area.

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

The proposed project site is an empty land with no vegetation existing. However as the design proposal the project will develop rich landscape on an area of 6813 Sqm and on podium 1460 Sqm, which will improve the vegetation in a significant way.

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)?

As a responsible corporate citizen of our country, it is our moral duty to protect and sustain the environment. To comply to our commitment, extensive green belt development, in and around the site premises would be carried out with a survival rate of > 85%. Native multi-culture species would be selected for their sustainability. More than 33% of the area would be brought under green cover in compliance with the regulatory norms. The plantation will be undertaken only with local species.

SECTION 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 is no unique faunal community within the core and buffer zone of the proposed project area, except most common ones like toad, frog, crow, sparrow, maina, etc.

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

The proposed project will not have any direct or indirect impacts on the avifauna of the area.

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

Not Applicable.

SECTION 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 result of the proposed constructions).

Concentration of SO_2 in the ambient air is expected to increase when DG sets are operational for standby power. The present baseline levels are low enough and the accretions are not expected to be over 2 mg/cum of SO_2. There will be no significant impact on SPM, NOx due to the project norms. They will also be provided with chimneys with sufficient height as per the norms for the proper dispersion of pollutants. It is expected that there will be a marginal increase in the pollutant levels due to vehicular emissions from operational traffic. However, the occupants shall be encouraged to use mass transit system and optimal use of vehicles. The impacts from the proposed project is marginal, hence doesn't cause heat island effect.

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

The Only source for generation of dust will be construction activity, which is a temporary phenomena for which barricades will be put up around the site and water will be sprinkled at regular intervals. Since it is a Commercial development, there will be no generation of smoke, odorous fumes or hazardous gases.

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

Sufficient parking space is provided within the campus for the number of vehicles anticipated. Transport infrastructure is adequate. Detailed Traffic Density Survey has been carried out to know the impact.

Car Parking Details:
a. Car Parking Provided: 1195

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

Major roads are provided with provisions for footpath, pedestrian pathways for hassle-free movement of all users of the project, as shown in the Site Plan/ Conceptual plan enclosed in Pre feasibility Report.

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

All precautionary measures are ensured for the safety of construction laborers while working at the site. There will be some incremental noise due to additional traffic. It is proposed to be mitigated by enforcing Silence Zones, limiting speed by rumble strips etc. Vibrations are not expected since not much of heavy vehicular traffic is envisaged.

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

DG sets 5 x 1500 KVA would be installed in acoustically treated enclosures with anti-vibration mountings, which will mitigate noise significantly. Fuel used would be Low Sulphur HSD, which will have sulphur content less than 0.005%. Stacks will be provided as per prevailing pollution control norms, which would ensure minimal impact on ambient air quality. No other equipment, which would impact noise and ambient air quality, is envisaged in the project.

SECTION 6 – AESTHETIC

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

There are no scenic amenities or landscapes in the surroundings of the project, hence doesn't cause any adverse impacts. And due to good architectural view and well planned landscape, the artistic beauty of the surrounding area is going to increase.

6.2 Will there be any adverse impacts from new construction on the existing structures what are the considerations taken into account.

No adverse impacts will be noticed from new construction on the existing structures.

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

There will not be any local considerations of urban form and urban design influencing the design criteria.

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.

There is no anthropological or archeological site or artifacts surrounding the Project site.

SECTION 7 – SOCIO ECONOMIC ASPECTS

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

Yes. From the proposed project, the surrounding demography will experience some changes. It is expected that there will be an increase in literate population by assuming that all the employees and other staffs are literate. Apart from this, there will also be increased job opportunities from the project and the maintenance labour requirements of the Project after completion. Therefore, the overall socio-economic conditions would improve due to the proposed project.

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

The project site is surrounded by commercial and residential establishments like Petrol Bunks, Hotels and Commercial establishments. The Project site is adjacent to many commercial establishments located on BDA outer ring road in Doddanekundi. The proposed project will benefit the local infrastructure positively on completion.

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

The proposed project doesn't result in any adverse effects on local communities, disturbance to sacred sites or the other cultural values. Environment Pollution control and Safety are the proposed project's top priority.

SECTION 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).

Construction materials are specified based on life-cycle assessment and use of materials that are extracted or recovered in the region emphasizes. Whenever possible, materials such as carpets, paints, wall coverings and adhesives have been used that carry the Green Seal Label, reducing emission of potentially harmful organic compounds or gases.

Yes, General energy efficient processes were adopted in production of construction materials. Some of the embodied energy materials used in proposed project is aluminum, stainless steel, copper, steel, glass, cement, plaster board, lime, gypsum plaster, concrete Insitu, concrete blocks, sand, aggregates & precast lintels.

- Maximum use of local resources and skills for the production of construction materials.
- Recycling of solid wastes into the building construction and for building products.
- Reduced transportation.
- Used renewable energy resources.
- Used energy efficient process.

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

There will be vehicular movement due to transport of construction materials, tools and tackles, required for construction. However this is only a temporary phenomenon that exists only during the construction phase of the project. Optimal routes shall be planned for the transportation of construction materials. The traffic

will be scheduled to operate during night hours.

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

Construction debris & waste during construction will be minimized & handled in an eco-friendly manner. It is not possible to project the quantity of wastes accurately at present time. All left over concrete, rejection due to change in design or wrong workmanship shall be used for leveling ground area and road pavement. Other wastes will be segregated and shall be handed over to KSPCB authorized recyclers for recycling the waste materials.

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

Solid wastes shall be collected separately as biodegradable (organic) and non biodegradable (recyclable waste) in separate bins from each floor, door to door collection shall be done from each unit to collect the solid wastes. The organic waste will be processed in organic waste converter and recyclable waste will be handed over to the authorized vendors for further processing. E-Wastes shall be collectively handed over to the authorized E-Waste recyclers for component recovery. Around 6.2 MT/d (Inorganic & Organic) will be generated during the operation phase.

Collection: The solid waste will be collected manually and segregated in a centralized area. Organic waste will be taken to organic waste convertors and used as manure for gardening and inorganic waste will be given to BBMP authorized recyclers.

Disposal: Organic waste will be converted in to manure through Organic Converter. Inorganic waste will be disposed by authorized recyclers.

SECTION 9- ENERGY CONSERVATION

9.1 Give details of the power requirements, sources 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 total power requirement for the project during construction phase is about 250KVA and during operational phase is about 5200 KVA. The electricity will be sourced by BESCOM. It is proposed to install 5 DG sets of 1500 KVA capacity for backup power supply. Adequate measures have been taken in the design of the structure to utilize the natural light to the maximum extent possible.

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

DG sets of capacity 5 x 1500 KVA are proposed for Commercial units to meet the demand. However, all essential service like external lighting and landscape lighting, ventilation, water supply and others will be fully linked with the DG sets.

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

The proposed project will provide heat reflected glass wherever required-having properties, which will make it energy saving element in the building and will provide safety and transparency of the desired level.

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

The proposed project will provide enough daylight factors in the building to permit maximum daylight to interior to minimize overall energy consumption. These features will also minimize the impact on weather both in summer & in winter and as a result, the use of electricity will likely to be reduced. However solar equipments

will be proposed for water heaters, Landscape and external lighting.

9.5 Does the layout 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 building complex? Substantiate with details.

The layout on the proposed plot has been designed in such a fashion that maximum daylight could be utilized. However use of solar equipments has been proposed for water heaters, external lighting and landscape 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 & the West & the roof? How much energy saving has been effected?

The overall design of the proposed project layout has adequately taken care of shading factor into consideration as per ECBC 2006 and will result in significant saving in energy consumption.

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

Yes, it is proposed to install energy-efficient & environment-friendly space conditioning, lighting & mechanical system as well as construct building structures which minimize energy consumption.

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 building block design has been made in such a way that it causes minimal hindrance to the wind movement according to the prevailing wind direction and also sufficient set back will be provided in accordance with the height of the building.

Additionally, good landscape features with greenbelt vegetation are also intended to abate the impact of heat island & inversion effects.

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

Thermal insulation for the building.

Data for Brick Walls External: - According to DS: 3792-1966.

Thermal conductivity (k) for different building materials & insulation materials are K cal cm/m2h deg c.

K1 = k3 = 81.8 (cement mortar)

K2 = 69.7 (Brick work common) &

L1, L2, L3 are the thickness of the plastering with cement mortar & Brick wall thickness.

L1 = L3 = 1.2 cm

L2 = 20 cm

R1 = (L1/K1) = 1.2/81.8 = 0.0146

R2 = (L2/K2) = 20.0/69.7 = 0.2869

R3 = (L3/K3) = 1.2/ 81.8 = 0.0146

FOR WALLS

1/fi = 0.125 & 1/Fo = 0.0151

Total Thermal resistance.

RT = 1/f1 + 1/fo + R1 +R2 +R3

= (0.125 + 0.0515 + 0.0146 + 0.2869 + 0.0146)

= 0.4926

Thermal Conductivity (U) is the reciprocal of thermal resistance.

U = 1/RT = 1/0.4926 = 2.03

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

The proposed commercial project is a development of Office Building & the height of the building is 55 meters.

The project has been designed based on all the relevant fire safety as per NBC norms.

. Fire extinguishers systems are deployed throughout the building.

. Fire hydrants will be provided around the building.

. Fire hose cabinets provided at every floor.

. Indentified Assembly points will be provided for fire accidents.

. Frequently Fire Mock Up drills will be conducted.

Precautions & safety measures proposed are:

. Fire Extinguishers for common areas and Signage.

. Wet Risers through the dedicated shafts till terrace with valves as required.

. Electrical Fire Alarm system for Entire Building.

. Public Address system.

. Sprinkler system for entire building including upper and lower basement which will be used for Parking of two and four wheelers.

. Landing Hydrants on all floors near each staircase with necessary accessories.

9.11 If you are using glass as wall material, provide details and specifications including emissive and thermal characteristics.

The project proponent will provide heat reflecting glass, wherever required, as a measure towards energy saving element in the building. .

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.

The proposed project encompasses the usage of non-conventional energy source i.e.

use of solar energy. The proposed project will comprise of solar water heating, solar street lighting, hence utilizing maximum solar energy. Apart from this other alternative energy efficient devices will be used to promote use of alternative / renewable energy.

Date: 12/12/2017
Place: Bangalore

Signature of the Applicant
for Bagmane Developers Pvt Ltd.

K. C. Ravikumar
Senior General Manager

ANNEXURE NO - II

Traffic Density Report

Annexure No – II

Traffic Studies and Analysis

1.1 Introduction

M/s. Bagmane Developers Pvt. Ltd. is proposing to develop the prestigious project called "Bagmane – Taurus 3" at Survey Nos. 58/2 & 59/2, Doddanekundi Village, K. R. Puram Hobli, Bengaluru East Taluk, Bengaluru – 560048. This project will be developed on a plot of land measuring 4.99 Acres i.e. 20,224.00 Sqm. The Project will be consisting of 2 basements + 1 ground floor + 11 Upper office floors. The maximum height of the proposed building is 48.0 Meters and the road width in front of the project is 16.5 m.

The Proposed project is a commercial building consisting of office space. It has one Ground parking + two upper parking floors.

1.2 Objective of the Study

- To review the existing traffic conditions of the adjacent road network.
- To estimate the potential traffic generation due to the proposed development.
- To assess the future traffic situation in the surrounding road network
- To appraise the potential traffic impact of the proposed development on the surrounding road network.
- To suggest mitigate measures to improve the status.

1.3 Parking facility

The provision of transport facilities for the proposed development will be 1195 Nos. of parking space. It is envisaged that adequate off-street parking facilities should be accommodated within the building.

The proposed building should be functional in the present scenario of the traffic system as well as the future possibility of improvements to the abutting roads.

The proposed building should be integrated with its surroundings especially to the Ring Road situated adjacent to it. The building should have a smooth traffic circulation system along with maximum amount of car parking space.

The entry/exit to the proposed property development shall be conflict free and the traffic dispersal shall be smooth. The junction at the entry/exit point to the proposed site will be

improved geometrically with appropriate traffic control systems, street furniture's and pedestrian facilities.

1.4 Traffic Surveys

Bengaluru has now grown quite a bit towards east, beyond these marks. The development of the infrastructure in this project site has ensured that Doddanekundi Village has become a very important location for people to habitat.

1.4.1 Methodology for Traffic Surveys

Manual traffic counts for 24 hours were conducted to cover all the vehicular movements on the road. The Vehicles are classified as follows.

- Cycle
- Two Wheeler
- Three Wheeler
- Car/Jeep
- Bus
- LCV (Light Commercial Vehicle)
- HCV (Heavy Commercial Vehicle)

The collected traffic volume data is computed using the commonly used spreadsheet package. The traffic volume data collected has been processed direction wise.

The peak hourly directional vehicular movement data was used to plan and design the improvement scheme for the existing road.

1.4.2 Data Analysis

The data and pertinent information collected from the traffic surveys have been analysed using the utility software package to obtain the required information concerning traffic characteristics on the said road.

The data was analysed to study hourly variation of traffic, peak hourly flows, traffic composition etc. The counts were classified by category of vehicles and by direction of movement. The various vehicle types having different sizes and characteristics were converted into equivalent passenger car units. The passenger car unit (PCU) factors recommended by Indian Road Congress in 'Guidelines for capacity of urban roads in Plain Areas' (IRC 106-1990) were used and same is given in table below.

Recommended PCU factors for various types of vehicles in urban roads

Sl. No.	Vehicle Type	Equivalent PCU Factors	
		% composition of vehicle type	
		Up to 10%	10% and above
A.	Fast Vehicles		
1.	Two wheeler	0.5	0.75
2.	Passenger car, Pickup van	1.0	1.0
3.	Auto Rickshaw	1.2	2.0
4.	Light Commercial Vehicle	1.4	2.0
5.	Truck or Bus	2.2	3.7
6.	Agricultural Tractor, Trailer	4.0	5.0
B.	Slow Vehicles		
1.	Cycle	0.4	0.5
2.	Cycle Rickshaw	1.5	2.0
3.	Tonga (Horse drawn Vehicle)	1.5	2.0
4.	Hand cart	2.0	3.0

1.4.3 Hourly Variation of Traffic

The hourly variation of traffic along with the hourly variation of PCU is given in Figure 2 & 3. The hourly variation observed in Direction-1 (Towards K R Puram) adjacent to the site varied in the range of 315-2118 VPH (Vehicles per Hour) and in Direction-2 (Towards Marathalli) varied in the range of 277-2651. In terms of PCU in Direction-1 it varied from 353 - 2035 PCPH (Passenger Car Unit per Hour) and in Direction-2 it varied from 355 - 2952 nos. PCPH (Passenger Car Unit per Hour). Peak traffic flows in Direction-1 observed during 9.00 am – 10.00 am in the morning and 06.00 pm to 07.00 pm in evening in both Direction - 1 & Direction - 2.

1.4.4 Traffic Composition

Composition of traffic as observed in the road adjacent to the proposed M/s. Bagmane Developers Pvt. Ltd. is shown in Figure 4 & 5. It is seen that the share of Car/Jeep is the highest being 43 % in direction-1 and 37 % in direction-2.

From the figure 4 & 5 it is seen that 2-Wheeler constitute 39%, 3-Wheelers constitute 5%, Light Commercial Vehicle constitute 5%, Bus constitute 3% & Heavy Commercial Vehicle

constitute 5% in direction-1 and 2- wheeler constitute 37%, 3-Wheelers constitute 8%, Light Commercial Vehicle constitute 3%, Bus constitute 6% & Heavy Commercial Vehicle constitute 6% respectively.

1.5 Likely Traffic in the Post Development Scenario

Considering the provision given for a total car parking of 1195 nos. and the conservative peak hour trip is assumed to be 10% of daily trips, the proposed property development is likely to contribute about 120 PCU's during peak hour.

The existing traffic scenario & level of service was found is C means good and total traffic generated from the proposed project, the level of service will be "D" means Fair.

1.6 Existing Traffic Scenario & LoS

For the Road	V	C	Existing V/C Ratio	LOS	Performance
Direction-1	1850	3600	0.51	"C"	Good
Direction-2	2127	3600	0.59	"C"	Good

Note: The highest peak observed is 1850 PCU's during 9.00 am to 10.00 am and 2127 PCU's during 6.00 pm to 7.00 pm.

1.7 Modified V/C Ratio & LOS

Total for the Road	V	Existing V/C Ratio	LOS	Add'l Vol	MOD V/C	Mod LOS	Performance
Direction-1	1850	0.51	"C"	1850+120 = 1970	0.54	C	Good
Direction-2	2127	0.59	"C"	2127+120 = 2247	0.62	D	Fair

The level of service will be 'C' in Direction 1 and 'D' in Direction - 2 after the commissioning & adding of vehicles from the project to the existing traffic.

Direction-1 (Towards K R Puram) existing C ——— after project ——→ C

Direction-2 (Towards Marathalli) existing C ——— after project ——→ D

1.8 Projection of Traffic

Projection of traffic for 3 years by considering 5% of traffic growth in the project vicinity, traffic density has been projected for 3 years which is given in the table below.

Projection	Growth of traffic			Projected V/C	Projected LOS	Performance
	1st Year	2nd Year	3rd Year			
Direction-1	1970	2068	2171	0.57	C	Good
Direction-2	2247	2359	2476	0.65	D	Fair

1.9 Factors Considered in Planning

The important factors considered in planning of the entrance road to the proposed project sit from the main road are.

- It is planned such a way that it blends well with the existing road.
- Layout will be harmonised so that it is aesthetically pleasing.

1.10 Proposed Improvements

- Improvement to the entrance road geometry.
- Separate entrance & exit
- Quick traffic dispersal
- Entrance Bell gates
- Controlled /regulated traffic flow, ensuring conflict free entry/exit of vehicles to the property.
- Appropriate street furniture comprising of lane markings, pedestrian facilities etc.
- Also, the construction of BDA proposed **flyover at the Doddanekkundi** junction is started and it will further REDUCE THE TRAFFIC congestion.

- The proposed Doddanekkundi **Metro Phase II station** is expected to be constructed near the Bagmane Tech Park, which will EASE THE TRAFFIC INFLOW to a greater extent. Below is the proposed Metro Phase II route plan.

Figure showing the nearby location of proposed Metro station

1.8 Projection of Traffic after Metro

Considering 35% of the traffic will be reduced after metro and flyover at the Doddanekkundi junction, traffic density has been projected after metro, which is given in the table below.

Projection	Growth of Traffic	Traffic reduced @ 30%	Projected V/C	Projected LOS	Performance
Direction - 1	1970	1379	0.38	B	Very Good
Direction - 2	2247	1572	0.43	C	Good

Note: Courtesy Deccan Harold dates 30th May 2016 and Mirror news.

The level of service will be 'B' in Direction 1 and 'C' in Direction - 2 after the commissioning Metro & Flyover at Doddanekundi Junction from the project to the existing traffic.

Direction-1 existing C → after project C after METRO B

Direction-2 existing C → after project D after METRO C

1.12 Conclusions

The proposed improvements plans ensure smooth traffic flow, adequate pedestrian facilities and highest pedestrian safety in addition to contributing to an aesthetically pleasing location. The proposed site and the adjoining road have a potential of becoming a landmark in the city blending harmoniously with the surroundings and city's heritage. The proposed project will slightly affect the traffic flow as towards Marathalli & it will be eased once the BDA proposed flyover at the Doddanekkundi junction & proposed Doddanekkundi Metro Phase II station are completed and starts operating.

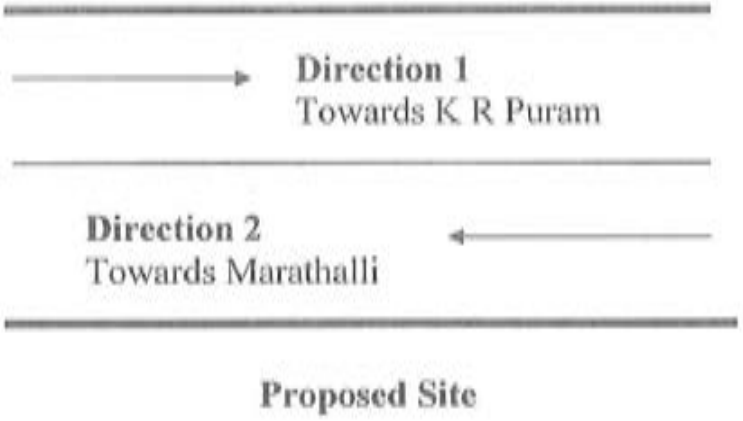


Figure 1: Sketch showing details of directions

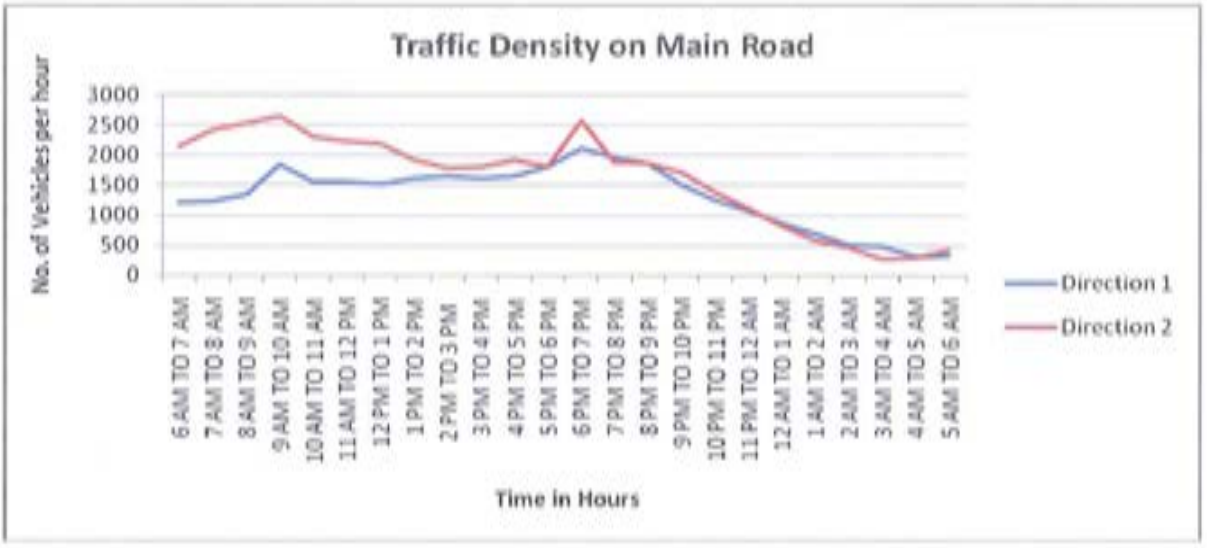


Figure 2: Hourly Variation of Traffic in direction 1 & 2

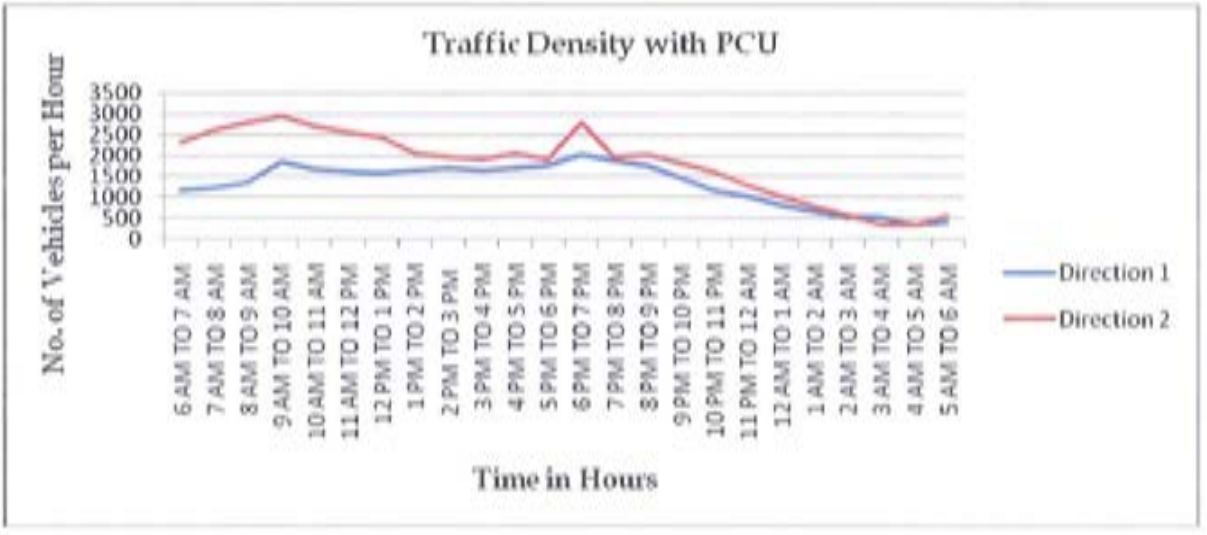


Figure 3: Hourly Variation of Traffic with direction 1 & 2 with PCU

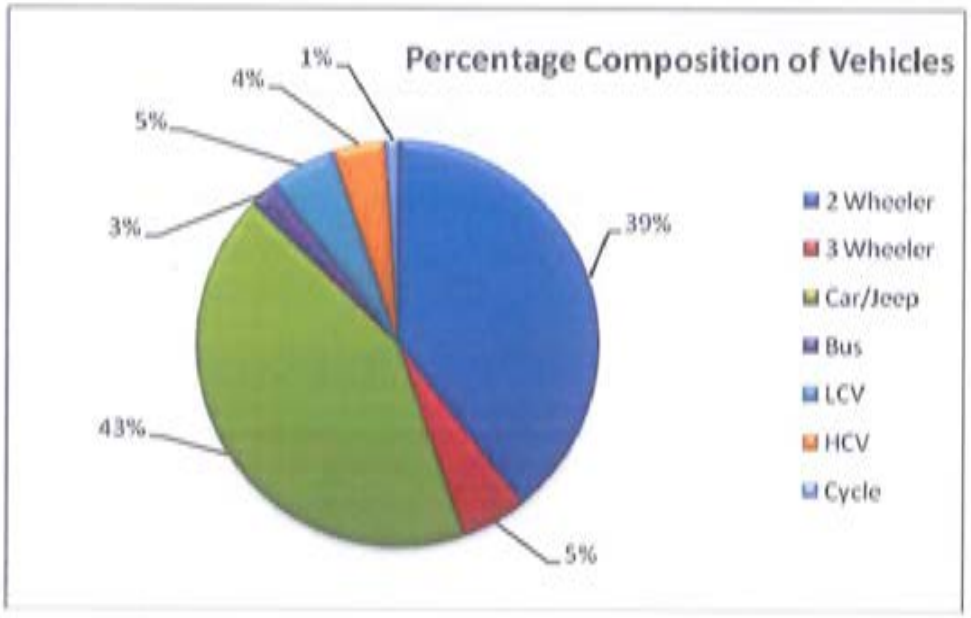


Figure 4: Composition of Vehicles towards K R Puram (Direction - 1)

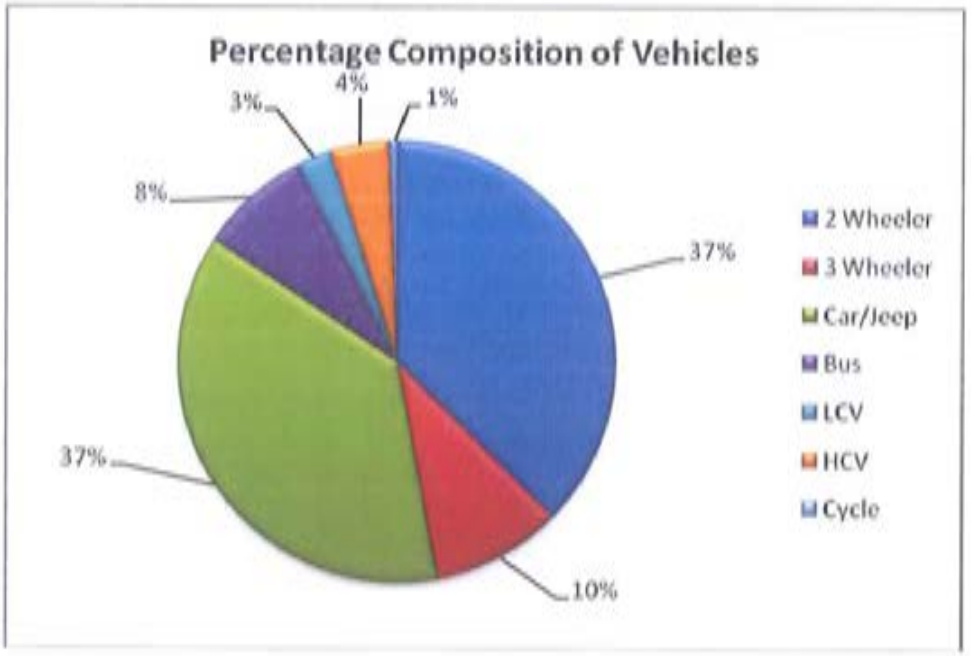


Figure 5: Composition of Vehicles towards Marathalli (Direction - 2)

Table: 1: Vehicular composition towards K R Puram

Traffic Density study of M/s. Bagmane Developers Pvt. Ltd.								
DIRECTION 1: Towards K R Puram								
Time	2 Wheeler	3 Wheeler	Car/Jeep	Bus	LCV	HCV	Cycle	TOTAL
6 am to 7 am	600	94	378	27	27	28	16	1217
7 am to 8 am	555	112	351	31	23	59	57	1237
8 am to 9 am	627	124	399	34	53	42	26	1357
9 am to 10 am	691	130	764	39	82	51	23	1851
10 am to 11 am	558	132	558	45	83	94	23	1553
11 am to 12 pm	547	124	615	40	95	59	18	1559
12 pm to 1 pm	548	116	594	41	75	72	22	1526
1 pm to 2 pm	638	135	605	27	52	75	29	1623
2 pm to 3 pm	701	147	566	39	69	57	16	1660
3 pm to 4 pm	673	70	561	22	101	114	17	1620
4 pm to 5 pm	695	87	578	47	101	92	0	1663
5 pm to 6 pm	891	59	585	49	90	71	3	1819
6 pm to 7 pm	855	76	896	28	130	45	6	2118
7 pm to 8 pm	766	62	868	29	105	47	22	1974
8 pm to 9 pm	735	44	843	30	91	39	16	1871
9 pm to 10 pm	572	23	666	39	82	51	23	1514
10 pm to 11 pm	523	13	551	18	59	34	5	1252
11 pm to 12 am	422	11	484	19	72	29	4	1084
12 am to 1 am	224	5	529	11	49	12	0	863
1 am to 2 am	203	4	412	12	25	21	0	704
2 am to 3 am	125	0	306	15	15	28	0	509
3 am to 4 am	100	0	267	18	30	51	0	485
4 am to 5 am	85	2	145	13	18	39	0	315
5 am to 6 am	25	12	150	19	53	53	0	325
TOTAL	12359	1583	12671	693	1580	1263	328	31697

Table: 2: Vehicular Composition towards Marathalli

Traffic Density study of M/s. Bagmane Developers Pvt. Ltd.								
DIRECTION 2: Towards Marathalli								
Time	2 Wheeler	3 Wheeler	Car/Jeep	Bus	LCV	HCV	Cycle	TOTAL
6 am to 7 am	820	159	795	159	51	83	12	2162
7 am to 8 am	921	235	847	183	52	55	27	2413
8 am to 9 am	941	259	860	196	72	74	34	2533
9 am to 10 am	968	268	935	219	59	83	16	2651
10 am to 11 am	750	270	795	241	52	93	12	2301
11 am to 12 pm	750	245	784	203	65	81	14	2228
12 pm to 1 pm	800	250	741	171	54	76	11	2187
1 pm to 2 pm	741	208	687	85	53	70	5	1924
2 pm to 3 pm	710	231	579	83	32	80	13	1798
3 pm to 4 pm	664	130	719	90	36	90	13	1811
4 pm to 5 pm	718	173	708	92	56	91	4	1916
5 pm to 6 pm	749	91	627	111	47	105	8	1807
6 pm to 7 pm	995	230	908	190	49	91	16	2578
7 pm to 8 pm	798	94	641	155	39	65	12	1876
8 pm to 9 pm	792	185	564	151	34	62	15	1874
9 pm to 10 pm	734	149	537	121	35	52	13	1706
10 pm to 11 pm	420	139	521	128	29	81	12	1383
11 pm to 12 am	370	129	370	112	27	53	8	1111
12 am to 1 am	210	95	327	95	16	59	0	835
1 am to 2 am	36	85	305	85	15	43	0	592
2 am to 3 am	28	0	304	75	12	39	0	476
3 am to 4 am	23	0	153	56	18	16	0	277
4 am to 5 am	20	0	162	45	19	29	0	287
5 am to 6 am	90	16	171	50	39	52	2	437
	14048	3641	14040	3096	962	1623	247	39163

Table: 3: Vehicular Composition towards K R Puram (with PCU)

Traffic Density study of M/s. Bagmane Developers Pvt. Ltd. (With PCU)								
DIRECTION 1: Towards K R Puram								
Time	2 Wheeler	3 Wheeler	Car/Jeep	Bus	LCV	HCV	Cycle	TOTAL
6 am to 7 am	450	188	378	59	38	62	6	1182
7 am to 8 am	416	225	351	69	32	131	23	1247
8 am to 9 am	470	249	399	74	74	93	10	1369
9 am to 10 am	710	156	750	47	99	61	27	1850
10 am to 11 am	419	264	558	100	117	207	9	1673
11 am to 12 pm	410	249	615	88	133	131	7	1634
12 pm to 1 pm	411	231	594	90	104	159	9	1599
1 pm to 2 pm	479	270	605	59	73	164	12	1662
2 pm to 3 pm	526	294	566	86	97	126	6	1701
3 pm to 4 pm	505	141	561	48	141	250	7	1652
4 pm to 5 pm	521	173	578	102	141	202	0	1718
5 pm to 6 pm	668	119	585	107	126	157	1	1763
6 pm to 7 pm	641	151	896	62	182	100	3	2035
7 pm to 8 pm	575	123	868	64	147	102	9	1888
8 pm to 9 pm	551	89	843	67	127	86	6	1769
9 pm to 10 pm	429	45	666	86	115	112	9	1462
10 pm to 11 pm	392	26	551	40	83	74	2	1169
11 pm to 12 am	317	22	484	43	101	64	2	1032
12 am to 1 am	168	11	529	24	68	26	0	826
1 am to 2 am	152	9	412	26	35	45	0	679
2 am to 3 am	94	0	306	33	21	62	0	516
3 am to 4 am	75	0	267	40	42	112	0	537
4 am to 5 am	64	4	145	29	26	86	0	353
5 am to 6 am	19	24	150	43	74	117	0	426
TOTAL	**9462**	**3063**	**12657**	**1486**	**2196**	**2729**	**148**	**31742**

Table: 4: Vehicular composition towards Marathalli (with PCU)

Traffic Density study of M/s. Bagmane Developers Pvt. Ltd. (With PCU)								
DIRECTION 2: Towards Marathalli								
Time	2 Wheeler	3 Wheeler	Car/Jeep	Bus	LCV	HCV	Cycle	TOTAL
6 am to 7 am	615	318	795	350	71	183	5	2337
7 am to 8 am	691	470	847	403	73	121	11	2615
8 am to 9 am	706	518	860	431	101	162	13	2792
9 am to 10 am	726	536	935	482	83	183	6	2952
10 am to 11 am	563	540	795	530	73	205	5	2710
11 am to 12 pm	563	490	784	447	91	178	6	2558
12 pm to 1 pm	600	500	741	376	76	167	4	2464
1 pm to 2 pm	556	416	687	187	74	155	2	2077
2 pm to 3 pm	533	462	579	183	45	176	5	1983
3 pm to 4 pm	498	260	719	198	50	198	5	1927
4 pm to 5 pm	539	346	708	202	79	200	2	2075
5 pm to 6 pm	562	182	627	244	65	231	3	1914
6 pm to 7 pm	827	91	957	34	156	55	8	2127
7 pm to 8 pm	599	188	641	341	55	143	5	1971
8 pm to 9 pm	594	370	564	332	47	136	6	2049
9 pm to 10 pm	551	298	537	266	48	114	5	1820
10 pm to 11 pm	315	278	521	282	41	178	5	1620
11 pm to 12 am	278	258	370	246	38	117	3	1309
12 am to 1 am	158	190	327	209	23	131	0	1037
1 am to 2 am	27	170	305	187	21	95	0	805
2 am to 3 am	21	0	304	165	17	86	0	592
3 am to 4 am	17	0	153	123	26	36	0	355
4 am to 5 am	15	0	162	99	27	64	0	368
5 am to 6 am	68	32	171	110	55	114	1	551
Total	**10622**	**6913**	**14089**	**6427**	**1435**	**3428**	**100**	**43008**

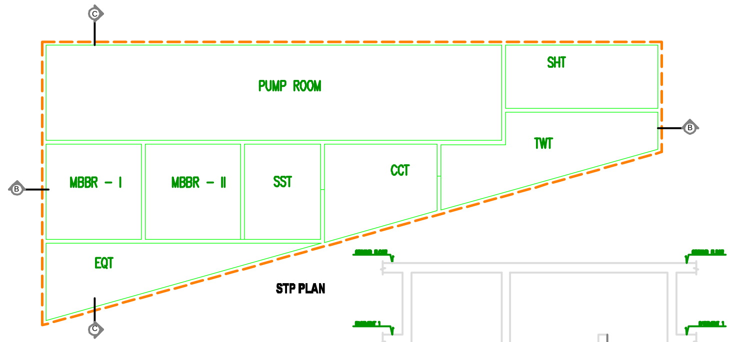
ANNEXURE NO - III

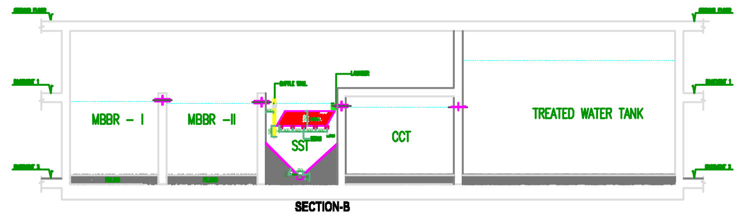
Storm Water Management Plan

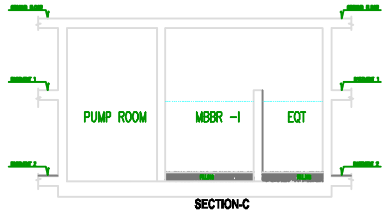
SITE AREA= 20224 SQMTRS

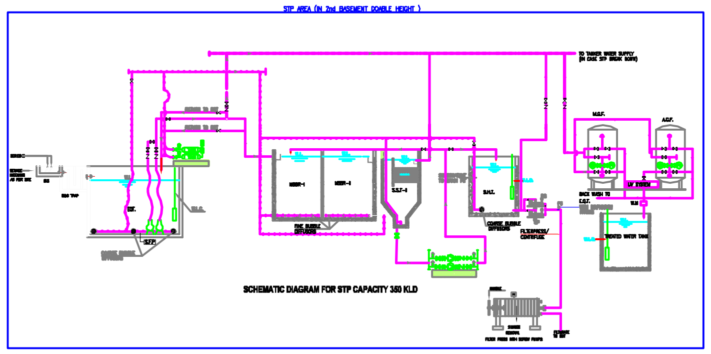
AREA STATEMENT - PROPOSED BUILDING

	FLOOR	GROSS AREA in sqm	DEDUCTIONS in sqm	BUILTUP AREA in sqm	Non FAR Areas		TOTAL NON FAR AREA	FAR AREA
		1.00	CUTOUTS (2)	3=(1-2)	LIFT (4)	PARKING/OTHERS (5)	6=(4+5)	3-6
1	LOWER BASEMENT	12403.95	0.00	12403.95	94.72	12136.69	12231.41	170.54
2	UPPER BASEMENT	12403.95	419.45	11984.50	94.72	11326.32	11421.04	563.46
3	GROUND FLOOR	5695.80	900.16	4795.64	98.42	122.00	220.42	4575.22
4	FIRST FLOOR	3350.13	2211.57	1138.56	98.42	0.00	98.42	1040.14
5	SECOND FLOOR	4297.65	108.99	4188.66	98.42	0.00	98.42	4090.24
6	THIRD FLOOR	5695.80	120.69	5575.11	94.72	0.00	94.72	5480.39
7	FOURTH FLOOR	5695.80	120.69	5575.11	94.72	0.00	94.72	5480.39
8	FIFTH FLOOR	5695.80	120.69	5575.11	94.72	0.00	94.72	5480.39
9	SIXTH FLOOR	5666.76	120.69	5546.07	94.72	0.00	94.72	5451.35
10	SEVENTH FLOOR	5695.80	120.69	5575.11	94.72	0.00	94.72	5480.39
11	EIGHTH FLOOR	5695.80	120.69	5575.11	94.72	0.00	94.72	5480.39
12	NINTH FLOOR	5695.80	120.69	5575.11	94.72	0.00	94.72	5480.39
13	TENTH FLOOR	5666.76	120.69	5546.07	94.72	0.00	94.72	5451.35
14	ELEVENTH FLOOR	5695.80	120.69	5575.11	94.72	0.00	94.72	5480.39
15	TERRACE	491.19	124.37	366.82	94.72	272.10	366.82	0.00
	TOTAL IN SQM	90446.77	5450.75	84996.02	1491.93	23869.11	25201.04	59694.98

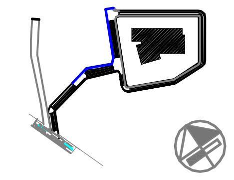


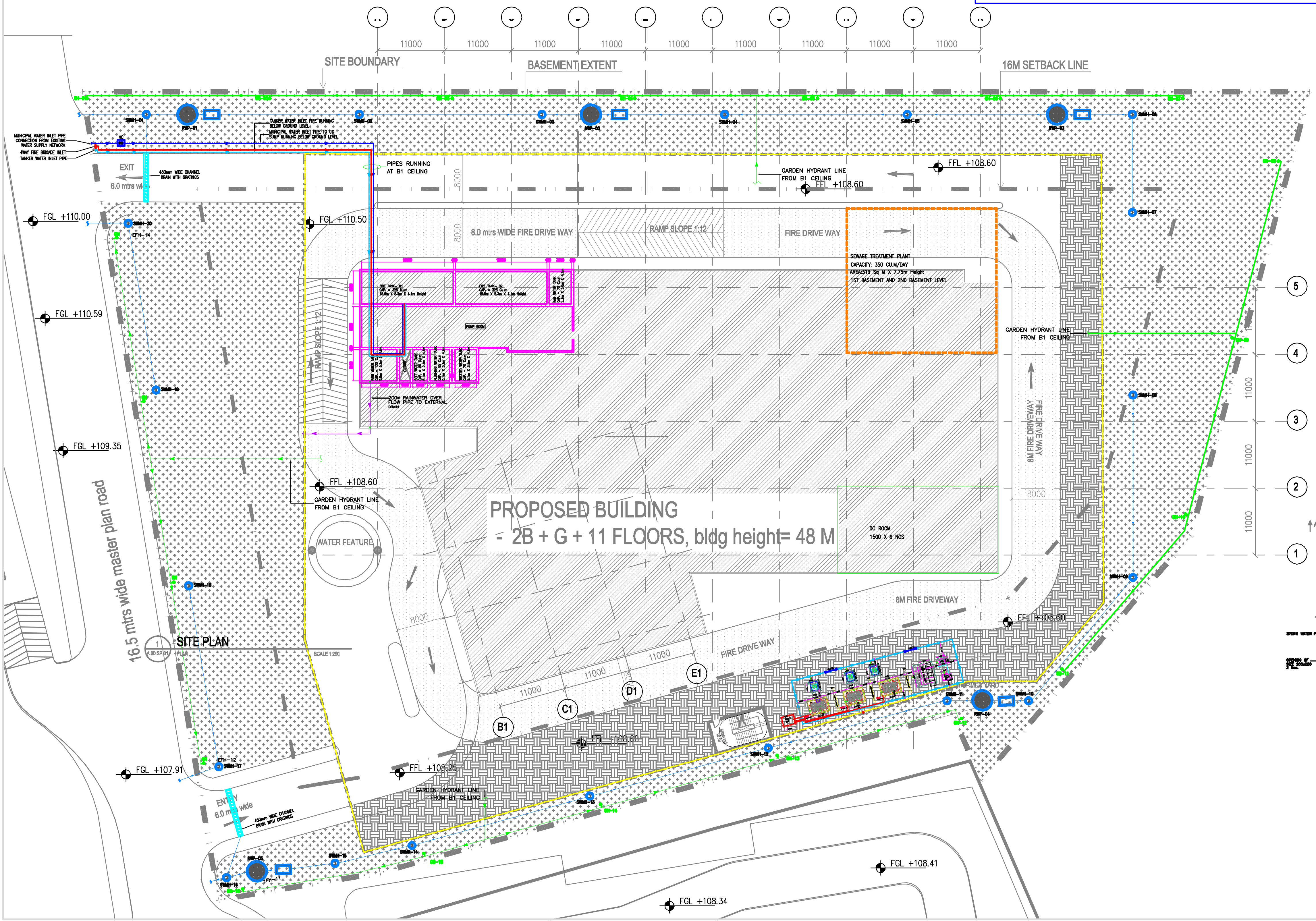


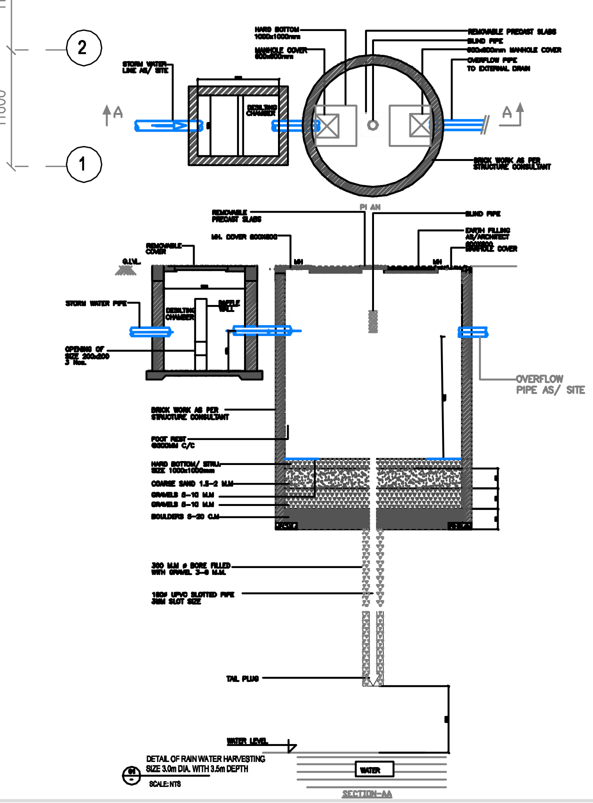




Symbol	Description
WM	WATER METER
VC	VALVE CHAMBER
FB	FREE BOARD
SWMH	STORM MANHOLE WATER
RWP	RAIN WATER HARVESTING PIT
GH	GARDEN HYDRANT LINE







MoEF SANCTION DRAWING

Date : 08.08.17 Sign:

Rev	Date	Issued to	Description	Drwn	C

ELECTRICAL CONSULTANTS:
SRIPEKSHA ENGINEERING CONSULTANCY SERVICES PVT. LTD.

HVAC CONSULTANTS:
Cerebration Consultants

DEVELOPER / LANDOWNER:
BAGMANE DEVELOPERS PVT. LTD.

STRUCTURAL ENGINEER:
optimal STRUCTURAL ENGINEERS

DESIGN CONSULTANTS:
DP ARCHITECTS PTE LTD
6 RAFFLES BOULEVARD
SINGAPORE
DPA CONSULTANTS PVT LTD
BANGALORE

PHE SERVICES CONSULTANT:
thinBiM Unit No. 228-236, 2nd Floor, Towe Spaze I Tech Park, Sohna Road, Sector 49, Gurgaon 122018, Haryana PH-0124-4069379, 4145060-61

LANDSCAPE CONSULTANT:
SITE CONCEPTS PRIVATE LIMITED

PROJECT MANAGEMENT CONSULTANCY:
COLLIERS INTERNATIONAL(I) PROPERTY SERVICES PVT.LTD

PROJECT TITLE:
PROPOSED NON RESIDENTIAL (IT/BT ACTIVITIES) OFFICE BUILDING CENTAURUS- NO.7 IN

DRAWING TITLE:
SITE PLAN FOR PLUMBING AND FIRE FIGHTING

SCALE	DATE	DESIGNED	DRAWN
1:250	08-09-2017	MJK	VS
STAGE	CONTRACT	CHECKED	APPROVED
MoEF		SAV	DKT
JOB NO.	DRAWING NO.		RE
TB-0353	TB-0353-P-A1-001		R

MoEF SANCTION DRAWING

ANNEXURE NO - IV

Air Analysis Report

An ISO 9001: 2008
OHSAS 18001: 2007

METAMORPHOSIS SM
LABORATORY PRIVATE LIMITED
thought.....process.....reality!!
Recognized by MoEF & CC and Accredited by NABL

TEST REPORT

MLPL/A/17/12/01

AMBIENT AIR QUALITY DATA

Name of the Project : **Bagmane Taurus - 3**
Name of the Project Proponent : **M/s. Bagmane Developers Pvt. Ltd. Sy No. 58/2, 59/2 Doddanekundi Village, K.R. Puram Hobli, Bengaluru East.**

Month : **December 2017** **Duration** : **24 Hours** **Location Code** : **BTS/CZ/A1**

Location Name	Date of Sampling	SO_2 µg / Nm^3	NO_2 µg / Nm^3	PM_{10} µg / Nm^3	$PM_{2.5}$ µg / Nm^3	Ammonia µg / Nm^3
Project Site	14.12.2017	19.5	23.4	85.1	24.9	--
Protocol / Method		IS:5182 (Part 2) – Improved West and Gaeke method	IS:5182 (Part 6) – Jacob and Hochheiser method	IS:5182 (Part 23) – Gravimetric method	MLPL/SOP/44 - Gravimetric method	MLPL/SOP/41 – Indophenol blue method
NAAQ Standards		80	80	100	60	400

INFERENCE	As per KSPCB Standards Report Status: All values are within the standard.
Sample Collected By	M/s. METAMORPHOSIS Laboratory Private Limited, Bengaluru

** End of Report **

Analysed By

Chemist
Mr. Ramesh. S

Authorised Signatory

Laboratory Head
Dr. Shanth A. Thimmaiah

JAS-ANZ
T-5841

"PRAKUTHI BHAVAN", #200, 1st & 2nd Floor, 40th Main, 1st Cross, BTM Layout II Stage, Behind Central Silk Board, Bengaluru – 560068, Karnataka, India, Telefax: +91 80 26783006
Email: mail@metamorphosis-india.com

ANNEXURE NO - V

Detailed energy conservation measures

En3
Engineering | Environment | Energy

[GREEN MEASURES SIGN OFF STATUS REPORT FOR TAURUS 3]

Date Circulated:	14-Dec-2017
Author:	ANANDH

List of activities to be completed by Bagmane Developers Pvt Ltd as on 14-Dec-2017

1) Need to locate the project site on prevoiusly developed land which do not disturb prime farmland and species habitat etc., check with flood hazard zone or wetland areas around the site.

This is required to comply with **LT-Credit 2 – Sensitive Land Protection.**

2) Need to share the site location on google maps to check on the credit for residential and non-residential densities or combined density value to be located within 1/4 mile distance from the project building (OR) possibility of varied diverse uses located within 1/2 mile distance from the site..

This is required to comply with **LT-Credit 4 - Surrounding Density and Diverse Uses.**

3) Need the details of bus stops within ¼ mile walking distance from the project entrance. Also share the details of the bus and street car with their numbers and weekday trips to calculate the requirement may met..

This is required to comply with **LT-Credit 5 - Access to Quality Transit**

4) Client needs to develop a tenant guidelines on green measures to be done by tenants and this needs to become a part of the tenant agreement that they will execute with all tenants

This is required to comply with **SS-Credit 8 - Tenant Design & Construction Guidelines.**

5) Client needs to confirm that the entire inside of the buildings will be non-smoking and also provide a letter reconfirming that the entire building will be non-smoking

This is required to comply with **IEQ-Prerequisite 2 - Environmental Tobacco Smoke (ETS) Control.**

List of activities to be completed by Architects as on 14-Dec-2017

1) Need to reserve 5%of car parks for green vehicles. Additionally 2% of car parks for electrical vehicle supply equipment (EVSE) needs to be installed. The EVSE must have charging capacity (208-240 Volts) or greater and it must confirms to SAE Electric Vehicle Conductive Charge coupler or IEC 62196 of the international Electrotechnical Commission.

This is required to comply with **LT-Credit 8 - Green Vehicles**

2) If the project have earned points under LT Credit Surrounding Density and Diverse Uses or LT Credit Access to Quality Transit need to reduce 40% from the total car parking capacity to reserve 5% for car pool spaces after deductions are made.

This is required to comply with **LT-Credit 7 - Reduced Parking Footprint.**

3) We need to ensure that at least 75% of the roof area of 4526 sqm & 100% of the non roof areas with high reflective paint/tile/paver/ open grid pavers. Project needs to revert on this. SRI value of the roof finish material should be 82 or higher and reflectance value of the non roof finish material should be 0.33 or higher.

This is required to comply with **SS-Credit 6 - Heat Island Reduction**

4) Energy simulation has been done and the total energy savings as compared to ASHRAE 90.1 2010 is 14.15 %. Report attached in annexure

This is required to comply with **EA-Credit 2 - Minimum Energy Performance.**

5) Energy simulation has been done and the total energy savings as compared to ASHRAE 90.1 2010 is 14.15 %. Report attached in annexure

This is required to comply with **EA-Credit 6 - Optimize Energy Performance.**

6) A centralized recycling room to be provided of area around 47 sqm in the ground floor or basement to collect all recyclable materials, segregate and store them untill they can be recycled outside. The room shall have 5 bins to segregate and store - paper, plastic, metals, cardboard and glass. Also please take appropriate measures for the safe collection, storage, and disposal of any two of the following: batteries, mercury containing lamps and electronic waste.

This is required to comply with **MR-Credit 1 - Storage & Collection of Recyclables.**

7) Drawing indicating the location of outdoor smoking areas on-site to be provided. Please note that these outdoor designated smoking areas must be at least 25 feet away from building entrances, windows and air intakes. Hence the drawing to also include distance between the outdoor designated smoking areas and entry point

This is required to comply with **IEQ-Prerequisite 2 - Environmental Tobacco Smoke (ETS) Control.**

8) This credit covers volatile organic compound (VOC) emissions into indoor air and the VOC content of materials, as well as the testing methods by which indoor VOC emissions are determined.To ensure that these requirements are clearly indicated in the BOQ and tender documents to ensure that the contractor implements the same on-site. To provide copy of the BOQ/ tender and also a comprehensive list of adhesives and sealants to be used in the project.

This is required to comply with **IEQ-Credit 4 - Low-Emitting Materials.**

9) To ensure that these requirements are clearly indicated in the BOQ and tender documents to ensure that the contractor implements the same on-site.To provide copy of the BOQ/ tender and also a comprehensive list of paints and coatings to be used in the project.

This is required to comply with **IEQ-Credit 4 - Low-Emitting Materials, Paints & coatings.**

List of activities to be completed by HVAC consultant as on 14-Dec-2017

1) Energy simulation has been done and the total energy savings as compared to ASHRAE 90.1 2010 is 14.15 %. Report attached in annexure

This is required to comply with **EA-Credit 6 - Optimize Energy Performance.**

2) As per LEED mandatory requirement, the refrigerant in all HVAC systems should be non CFC and non HCFC based. Also no halons to be used in any of the fire extingusher.

This is required to comply with **EA-Prerequisite 4 - Fundamental Refrigerant Management.**

3) The HVAC system to be designed with minimum fresh air requirements+30% extra as per ASHRAE 62.1.2010 Standard. Also please note that it is necessary to provide outdoor airflow measuring device, CO2 sensorsa as applicable. In line with this kindly share HVAC DBR cleary indicating low side system details as well as high side system details. Also share HVAC drawings indicating the location of all the systems involved in our project.

This is required to comply with **IEQ-Credit 2 - Enhanced Indoor Air Quality Strategies.**

Other HVAC related information like chiller spec, AHU details etc has been captured in the Energy simulation report and the same has been attached in the annexure.

List of Activities to be completed by Landscaping Consultant as on 14-Dec-2017

1) Utilize STP treated water for 50% of the landscaping requriements:Need to provide landscaping drawing indicating the area of lawn, shrubs and number of trees, species of landscaping so that we can do the calculations and confirm.

This is required to comply with **WE-Credit 1 - Water Efficient Landscaping**

2) Restore 30% of total site using native or adapted vegetation and restore all disturbed or compacted soils that will be vegetated within the project's development footprint. Please note that vegetated space over roof can also be considered in this credit calculation and all vegetated space in the site should not contain any turf grass.

This is required to comply with **SS-Credit 3 - Site Development - Protect or Restore Habitat**

List of Activities to be completed by Plumbing Consultant as on 14-Dec-2017

1) To select water fixtures for flow rates not exceeding the requirements as follows:

- Dual flush closets – 4 / 2 liters per flush
- Sensor based/push type urinals < 1 liter per flush
- Handwashes < 1.4 liters per minute at 60 psi pressure
- Showers < 5 liters per minute at 80 psi pressure and
- Sinks < 5 liters per minute at 60 psi pressure

Need fixture make, model numbers and flow rates (at respective pressure for all flow fixtures) for the fixtures proposed for the project. Also need cut sheets or letters for each of these fixtures confirming the flow rates.

This is required to comply with **WE-Prerequisite 2 –Indoor Water use reduction.**

2) Need to provide STP in the project site and use STP treated water for 100% of landscaping water requirement. Also need to provide high efficient irrigation systems like drippers and sprinklers. Kindly share all the design brief details of STP in the CAD drawing and clearly indicating effluent and influent treatment values in the DBR.

This is required to comply with **WE-Credit 2 – Outdoor water usage reduction.**

3) Need to provide separate water meters for the following

1) Potable water consumption:

a) Water consumption through bore well

b) Water purchased from external sources like tankers

c) Rain water reuse

d) Anyother potable water use

2) Recycled/Potable water consumption:

a) Water consumption/ supply for flushing

b) Water consumption/ supply for irrigation requirements

3) Other areas such as

a) Domestic hot water

b) Other process water such as dish washers, clothes washers.

This is required to comply with **WE-Credit 7 - Water Metering.**

List of activities to be completed by Electrical consultant as on 14-Dec-2017

1)Need to reserve 5%of car parks for green vehicles. Additionally 2% of car parks for electrical vehicle supply equipment (EVSE) needs to be installed. The EVSE must have charging capacity (208-240 Volts) or greater and it must confirms to SAE Electric Vehicle Conductive Charge coupler or IEC 62196 of the international Electrotechnical Commission.

This is required to comply with **LT-Credit 8 - Green Vehicles**

2) To ensure that the requirements for interior and exterior lighting are met. For exterior lighting there shall be no uplighters and only down lighters should be used. Also no light should leave the boundary and the overall LPD for exterior lighting must not exceed 0.12 watts/sq ft. Also no interior lights must leave the building. Need exterior lighting scheme and fixture details along with fixture IES files so we can simulate and confirm

This is required to comply with **SS-Credit 7 - Light Pollution Reduction.**

3) Energy simulation has been done and the total energy savings as compared to ASHRAE 90.1 2010 is 14.15 %. Report attached in annexure

This is required to comply with **EA-Credit 6 - Optimize Energy Performance.**

4) Separate metering to measure the following needs to be provided as applicable.

- Internal Lighting
- External Lighting
- Connected power
- HVAC
- Energy meter to measure the whole building energy consumption.

Also each tenant space needs to be provided with seperate meters to measure the energy consumption and Btu meters to independently measure the chilled water consumption. Tenant guidelines document must include that tenants will be billed only based on actual consumption and not as part of the base rent. With regards to the meters, meters in the system must be capable of reporting hourly, daily, monthly and annual energy use. Also the system must be capable of storing all meter data for a period 36 months atleast.

This is required to comply with **EA-Credit 7 - Advanced Energy Metering.**

List of Activities to be completed by Civil Contractor as on 14-Dec-2017

1)An erosion and sedimentation plan needs to be developed to prevent loss of soil during construction by storm water runoff & wind erosion, prevent sedimentation of storm sewer and polluting the air with dust and particulate matter. Kindly implement the followings and provide Photographs of various measures

implemented at the site.

a) Need to barricade the entire site boundary up to a height of 10ft or more.

b) Since this is a previously developed site so kindly check on the availability of Top Soil. If it is available then Top soil up to 20 cm has to be removed carefully and stacked for reuse later in the site. Adjoining areas of the top soil should be barricaded to prevent construction activities. A sediment trap to be built around the area on the inner side of barricading and stacked soil to be covered with a Plastic sheet to prevent erosion by wind/water.

c) Single or Multiple basins can be constructed depending on site requirement i.e.,Lowest Convenient point of the site (Usually located on the boundary of the site at a lower elevation).If sedimentation basin is not possible then we can construct sedimentation trenches.

d) Need to provide basin with grill arrangement at the site entry and exit point to capture the soil that is to be carried away due to vehicular movement.

e) All existing trees to be fenced to prevent damage to them. Height of fence can be 2ft and the diameter equal to the drip line of the tree. Also for every tree that is uprooted, plant at least ten new saplings.

f.) Photographs pertaining to all the replanted trees.

g.) Grading and Marking areas for

i. Movement (Vehicular and Pedestrian)

ii. Undisturbed Areas

iii. Construction Areas

2.) Proper storage of Construction materials and all the materials should be covered with fabric to prevent loose particles from becoming airborne.

This is required to comply with **SS-Prerequisite 1 - Construction activity pollution prevention.**

3) Step 1: Contractor to identify one or more places to segregate and store the construction debris. This area should be clearly marked and photographs of the same to be taken.

Step 2: Classify the construction debris into two- Debris that can be recycled on site and debris that can be sold for recycling or as scrap.

Step 3; Maintain copies of delivery challans and/or gate passes for scrap taken offsite for recycling including steel, Aluminium, glass, plastics, paint cans, cement bags, gypsum,etc.

Step 4: For scrap reuse within the site such as broken brick refill, etc take photographs of the

recycling measure used.

Step 5: Kindly tabulate the waste being reuse/recycled within the site and provide all CWM documents on monthly basis.

Please note that the construction waste not more than 12.2 kg/sqm of the building's floor area.

This is required to comply with **MR-Credit 7 - Construction and Demolition Waste Management**

4) Need to implement and provide the following from Day 1 based on construction activities:

a) Housekeeping at site: This includes Housekeeping signage's at various point of the site and housekeeping practices like sweeping floors etc., at the time of construction.

b) Signage for protection gears, belt gears, labourers attending the induction camp & fire extinguishing training, labourers working with protection gears like scaffoldings, hard hat, face masks, welding gears, etc.

c) Photos of dedicated places of storage of civil and mechanical materials like Cement, Steel, ducting materials, HVAC Equipments, AHUs, cement bags, steel rebar's, glass, etc. are required. Please note that the storage place should be dry, dust free and devoid of contact with water. Porous building materials should be protected from exposure to moisture and stored in a clean area prior to installation.

d) Barricading of the site area at which construction works are to take place / are in progress,

1, Barricading voids if any

2, Demarking of finished areas with barricades.

e) Duct Ends covered with plastic sheets.

f) Temporarily sealed electrical conduits

This is required to comply with **IEQ-Credit 5 - Construction IAQ Management Plan, During Construction.**

5) This credit covers volatile organic compound (VOC) emissions into indoor air and the VOC content of materials, as well as the testing methods by which indoor VOC emissions are determined.To ensure that these requirements are clearly indicated in the BOQ and tender documents to ensure that the contractor implements the same on-site. To provide copy of the BOQ/ tender and also a comprehensive list of adhesives and sealants to be used in the project.

This is required to comply with **IEQ-Credit 4 - Low-Emitting Materials.**

List of Activities to be completed by Fire Consultant as on 14-Dec-2017

1) Need letter or data sheets confirming that no halons are used in the fire suppression systems

This is required to comply with **EA-Credit 4 - Enhanced Refrigerant Management.**

List of Activities to be completed by Commissioning Agent as on 14-Dec-2017

1) Commissioning team must ensure that enhanced commissioning process activities for MEP and renewable energy systems and assemblies in accordance with ASHRAE Guideline 0-2005 and ASHRAE Guideline 1.1-2007 for HVAC&R systems need to be included in the OPR and BOD.

This is required to comply with **EA-Prerequisite 1 - Fundamental Commissioning of Building Energy Systems.**

List of Final Energy Saving /Conservation Measures agreed for Implementation in the project

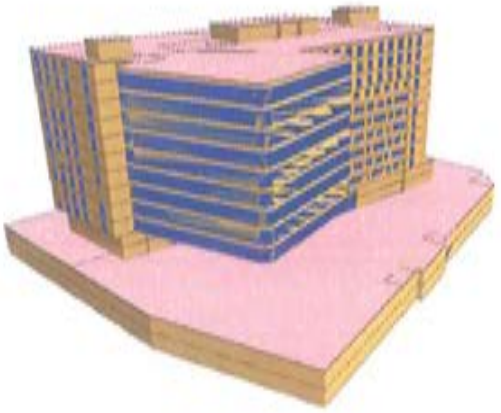
PROJECT SUMMARY

The Bagmane Tarus-3 at Bangalore, India. This new commercial use building with 2 Basement+ Ground+ 11 Floors has an approximately gross floor area approximate 908,895 square feet, and includes office area, food court, AHU room, Toilet, Electrical Room and service area. The net air conditioned area of the project is approximately 471,974 square feet.

MODELING METHODOLOGY

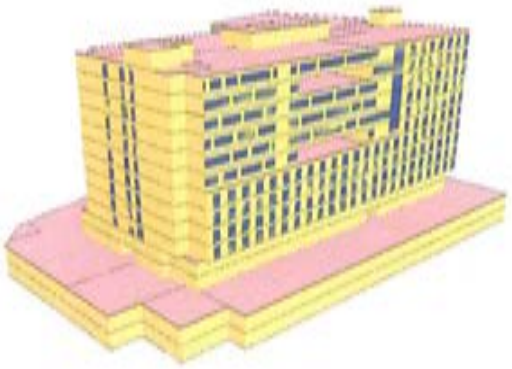
The Proposed Building has been evaluated on the basis of the methodology outlined in Appendix G, The Performance Rating Method of ASHRAE/IESNA 90.1-2010. Visual DOE 4.1, a front-end to the DOE-2.1E engine, has been used as the simulation tool.

Below are some model images of the building from Visual DOE



View-1

View-2



View-3

View-4

SUMMARY OF THE BASELINE BUILDING PARAMETERS

Model Input Parameter	Taurus 3 Design Case
Exterior Wall Construction	8'' Block wall + 0.5 '' plastering on both sides, U – factor = 0.386 Btu/hr.ft².°F
Roof Construction	6'' RCC Slab + 2'' underdeck insulation + 0.5 '' water proofing + 0.5 '' Screed U – factor = 0.099 Btu/hr.ft².°F Roof reflectivity=0.30
Floor/Slab Construction	RCC Slab U – factor = 0.464 Btu/hr.ft².°F
Window-Wall Ratio	Overall Window Wall Ratio: 32.50% North WWR: 30.70% West WWR: 41.20% Non-North WWR: 33.30%
Fenestration type	Double Glass
Fenestration U value	U – factor = 0.9 Btu/hr.ft².°F
Fenestration SHGC	SHGC = 0.25

	VLT = 30%
Shading Devices	As per Design
Interior Lighting Power Density(W/ft^2)	Space by Space Method Lighting Power Density Office Area – 0.9 (W/ft^2) Common Areas – 0.50 (W/ft^2) Parking Areas – 0.10 (W/ft^2)
Exterior Lighting Power (kW)	11.38 KW [Refer Appendix– E]
Receptacle Equipment Power Density (W/ft^2) and Elevator Power(kW)	The Default Receptacle and Process loads Cost Considered as 25% of Total Energy Cost Elevator – 170 kW
Primary HVAC system type	Water Cooled Screw Chiller Air Cooled Screw Chiller
Fan Parameters	AHU's Fan Power: 0.0006 BHP/CFM Fan Control: Variable Volume
Fresh Air	30% Enhanced Ventilation has been Considered
Occupancy	Office – 100 ft^2/Person Meeting – 70 ft^2/Person
HVAC parameters	2 x 350 TR Water Cooled Screw Chiller with a full load efficiency of 0.620 KW/TON [COP of 5.67] at ARI conditions. 2 x 350 TR Air Cooled Screw Chiller with with a full load efficiency of 1.256 KW/TON [COP of 2.80] at ARI conditions.
Chilled Water loop & pump parameters	Variable secondary flow, Chilled water ΔT of 10 degree F
Cooling tower parameters	Cooling Tower with Variable Speed Drive
Condenser water loop & pump parameters	Flow:3.0 gpm/ton
Interior Exhaust Fan	Fan Power – [Refer Appendix – H] Fan Control – Constant control
Basement Ventilation	Fan Power – [Refer Appendix – I] Fan Control – Constant control with CO Sensor

Energy Savings Table

Alternatives	Lights	Equipment	Heating	Cooling	Tower /Heat Rejection.	Pump	Fan	Basement Ventilation	Toilet Exhaust Fan	Ext Light	Ext Equip.	Total Consumption	Difference	Savings
	KWh/Annum													%
Base Case average	1,920,786	1,709,116	1,623	1,643,946	400,023	127,052	1,176,594	123,733	16,578	71,221	258,658	7,449,329		
Taurus 3	1,573,532	1,709,116	10,456	1,651,723	205,075	119,788	306,067	367,044	143,910	49,844	258,658	6,395,213	1,054,116	14.15%