

Your (**Half Yearly Compliance Report**) has been **Submitted** with following details

<b>Proposal No</b>	SIA/HR/INFRA2/482176/2024
<b>Compliance ID</b>	565703778
<b>Compliance Number(For Tracking)</b>	EC/M/COMPLIANCE/565703778/2025
<b>Reporting Year</b>	2025
<b>Reporting Period</b>	01 Dec(01 Apr - 30 Sep)
<b>Submission Date</b>	24-11-2025
<b>RO/SRO Name</b>	Shri Satya Prakash Negi
<b>RO/SRO Email</b>	jhk119@ifs.nic.in
<b>State</b>	HARYANA
<b>RO/SRO Office Address</b>	Integrated Regional Offices, Chandigarh

**Note:-** SMS and E-Mail has been sent to Shri Satya Prakash Negi, HARYANA with Notification to Project Proponent.

Date: 18-11-2025

To,  
The Regional Officer,  
Ministry of Environment, Forest and Climate Change,  
Integrated Regional Office, Bays No. 24-25, Sector 31-A,  
Dakshin Marg, Chandigarh-160030

**Sub: Submission of Six-Monthly Environmental Clearance Compliance Report for the period of April-25 to Sep-25**

**Ref.: Environmental Clearance for proposed expansion Max Super Specialty Hospital at Sector 56, Gurgaon, Haryana by M/s Max Healthcare Institute Ltd. vide no EC24C3804HR5265005N dated 24/01/2025**

Sir,

With reference to the above-mentioned subject and reference, we are submitting the point-wise Six-Monthly Compliance Report on the conditions of the Environmental Clearance for the period of April-25 to Sep-25, along with the relevant supporting documents.

Kindly acknowledge the same.

Thanking You,  
Yours faithfully,  
For Max Super Speciality Hospital  
(A Unit of Max Healthcare Institute Ltd.)

  
  
Authorised Signatory

Encl: a/a

CC to:

- Member Secretary of MOEF & CC, JOR Bagh, New Delhi

**Half Yearly Compliance Report for period of Apr'25 – Sep'25**

S.No.	Items	Details
1	Name of Project	Expansion of Max Super Specialty Hospital at Sector 56, Gurgaon, Haryana
2	Address of project authorities	<b><u>Project Address:</u></b> Sector 56, Gurgaon, Haryana <b><u>Corresponding Persons</u></b> Max Super Specialty Hospital at Sector 56, Gurgaon, Haryana <b><u>Email:</u></b> <a href="mailto:Sustainability@maxhealthcare.com">Sustainability@maxhealthcare.com</a>
3	Environment Clearance letter no. & Date	EC24C3804HR5265005N
4	Status of Project	Construction Phase.

**Point wise compliance report of Environment Clearance vide no. EC24C3804HR5265005N**

**1- Specific Condition**

S.no	Condition	Status
1.1	The project is recommended on concept basis as such in case of any change in planning, the PP will obtain fresh EC	Noted and will be ensured.
1.2	Sewage shall be treated in the STP on latest Technology to achieve standards ordered by NGT. The Treated effluent from STP shall be recycled /reused for flushing, DG cooling and Gardening	The sewage will be treated in the STP using the latest technology to meet the standards mandated by the NGT. The treated effluent will be recycled and reused for flushing, DG cooling, and gardening as specified.
1.3	The PP should not mix the ETP effluent after treatment in the STP and ETP effluent shall be separately utilized for the purposes	The ETP effluent will not be mixed with the STP-treated sewage. It will be handled and utilized separately, in accordance with the prescribed guidelines and for the designated purposes.
1.4	The Project Proponent would devise a monitoring plan to the satisfaction of the State Pollution Control Board so as to continuously monitor the treated waste water being used for flushing in terms of faecal coli forms and other pathogenic bacteria	We will develop and implement a comprehensive monitoring plan, in consultation with the State Pollution Control Board, to ensure continuous monitoring of the treated wastewater used for flushing. This will include regular testing for faecal coliforms and other pathogenic bacteria, in line with the prescribed standards.
1.5	The PP shall ensure that total EMP Budget shall be spent on project during construction as well as during operational phase as per table given above. The EMP	We will ensure that the total EMP budget is fully utilized during both the construction and operational phases, as outlined in the referenced

	cost on Socio Economic activities shall be used before the commencement of the project & EMP recurring inside the project shall be implemented throughout the operation of the project. The PP shall establish Environment monitoring cell as per documents submitted	table. The EMP cost allocated for socio-economic activities will be expended prior to the commencement of the project, while the recurring EMP components within the project will be implemented throughout its operational life. Additionally, an Environment Monitoring Cell has been established to monitor these guidelines under the Senior VP. of Projects.
1.6	The PP shall not carry out any construct above and below revenue rasta if passing through the project and ensure that permission of the competent authority shall be obtained before carry out any construction above or below the revenue rasta. The PP shall put notice board on the revenue rasta for the passer byes	This is being ensure that no construction is carried out above or below the revenue rasta, if it passes through the project site, without obtaining prior permission from the competent authority. Additionally, appropriate notice boards have been installed along the revenue rasta for the information of passersby
1.7	The project proponent shall upload the status of compliance of the basic details (given in above tables), stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.	We uploaded the status of compliance with the basic details along with all stipulated Environmental Clearance conditions and monitored data results, on our official website. The link is appended below; <a href="https://www.maxhealthcare.in/environmental-clearances?report_type=HalfYearly&amp;hospital=">https://www.maxhealthcare.in/environmental-clearances?report_type=HalfYearly&amp;hospital=</a>
1.8	The Project Proponents would commission a third-party study on the implementation of conditions related to quality and quantity of recycle and reuse of treated water, efficiency of treatment systems, quality of treated water being supplied for flushing (specially the bacterial counts), comparative bacteriological studies from toilet seats using recycled treated waters and fresh waters for flushing, and quality of water being supplied through spray faucets attached to toilet seats.	Noted and will be ensured after installation of STP and operation of facility.
1.9	Separate wet and dry bins must be provided in each unit and at ground level for facilitating segregation of waste. Solid Waste shall be segregated into wet garbage and inert materials. Wet Garbage shall be composted in Organic waste convertor. Adequate area shall be provided for solid waste management within the premises which will include area for segregation, composting. The Inert waste from the project will be sent to solid waste dumping site through authorized vender	Separate wet and dry bins will be provided in each unit as well as at the ground level to facilitate effective segregation of waste. Solid waste will be segregated into wet garbage and inert materials. Wet garbage will be processed through an Organic Waste Converter for composting. Adequate space will be allocated within the premises for solid waste management activities, including segregation and composting. Inert waste generated from the project will be disposed of at authorized solid waste dumping sites through licensed vendors.
1.10	Traffic management plan as submitted shall be implemented in letter and spirit. Apart, a detailed traffic management and traffic decongestion plan shall be drawn up to ensure that the current level of service of the roads within a 05 kms radius of the project is	The traffic management plan has been conducted and presented during the EC approval. A copy of traffic assessment is attached as <b>annexure-1</b>

	<p>marinated and improved upon after the implementation of the project. This plan should be based on cumulative impact of all development and increased habitation being carried out or purpose to be carried out by the project or other agencies in this 05kms radius of the site in different scenarios of space and time</p>	
1.11	<p>The Project Proponent shall obtain all necessary clearance/permission from all relevant agencies including town planning authority before commencement of work. All the construction shall be done in accordance with the local building byelaws.</p>	<p>Noted and this is being ensured before starting of construction and will be taken care before operation of the hospital.</p>
1.12	<p>Consent to establish/operate for the project shall be obtained from the State Pollution Control Board as required under the Air (Prevention and Control of pollution) Act, 1981 and the Water (Prevention and control of pollution) Act, 1974</p>	<p>We obtained the CTE for earlier proposed expansion. Copy of CTE vide letter no. HSPCB/Consent/: 313099722GUNOCTE28646595 valid upto 06.12.2032 is attached as <b>annexure-2</b>.</p>
1.13	<p>The Approval of the Competent Authority shall be obtained for structural safety of building code due to earthquakes, adequacy of fire-fighting equipments etc. as per National Building Code including protection measures from lightening etc</p>	<p>We designed the hospitals as per NBC and relevant guidelines and necessary approvals have been taken.</p>
1.14	<p>The PP shall obtain the Fire NOC from the Competent Authority before taking the occupation of the building.</p>	<p>Noted and will be ensured.</p>
1.15	<p>The PP shall install the Eco-Friendly Green Transformer based on ester oil to reduce the carbon footprint. The PP shall shift to gas-based generator set when the gas is available. The PP shall install APCM for the DG set</p>	<p>We will install the dry type transformer and a detailed scheme will be provided in next compliance report. DG sets will be installed as per applicable norms.</p>
1.16	<p>The PP shall not mix ETP treated effluent with STP water</p>	<p>This will be ensured.</p>
1.17	<p>The PP Shall comply with SOP for reduction of Air and Noise pollution during construction and operation phase</p>	<p>This is being ensured during construction time and will be ensured in operation phase.</p>
1.18	<p>The PP shall follow SOP regarding single use plastic free</p>	<p>Noted and will be ensured.</p>
1.19	<p>The PP shall follow the SOP for reduction of carbon footprints</p>	<p>Building is being designed as per IGBC norms to have a minimum impact on environment.</p>
1.20	<p>PP shall not mix ETP treated effluent with STP treated effluent and MEE should be installed to evaporate ETP treated water.</p>	<p>We will provide separate treatment for ETP and treated waste water from ETP will be discharged as per applicable norms.</p>
1.21	<p>The PP shall obtain the permission regarding withdrawal of ground water, if any from HWRA/CGWA before the start of the project and also obtained the CTO from HSPCB after the approval from HWRA/CGWA</p>	<p>Noted and will be ensured.</p>
1.22	<p>The PP shall carry out the quarterly awareness programs for the stakeholders of the project</p>	<p>Regular training sessions are being conducted at site for all contractors as well as labour</p>
1.23	<p>The PP shall install Digital water level recorder for monitoring the water recharge and carry out quarterly maintenance and cleaning of RWH pits.</p>	<p>Noted and necessary action will be taken in this regard.</p>

1.24	The PP shall ensure the compliance of provisions of Plastic Waste Management (Amendment) Rules, 2022 relevant for the project	Noted
1.25	The PP may provide electric charging stations to facilitate electric vehicle commuters.	Noted and will be ensured.
1.26	The PP shall take all preventive measures including water sprinkles to control dust during construction and operational phase.	This is being ensured. Anti-smog guns have been deployed at site.
1.27	Any change in stipulations of EC will lead to Environment Clearance void-ab-initio and PP will have to seek fresh Environment Clearance.	Noted
1.28	The Project Proponent shall ensure that trees planted under the project shall be well grown healthy and established trees of more than 10cm DBH (diameter above 137cm above ground level) or more than 31.4cm in girth.	Noted and will be ensured.
1.29	The Project Proponent shall ensure raising the number of established trees as per norms proposed for the project and finally approved during the EC granting process.	Noted and will be ensured.
1.30	In the proposed landscape plan, native species shall be included as per the list of concerned DFO	Native species will be planted for landscaping as per the EC application.
1.31	The minimum growth of trees should be 03 meters with sufficient canopy	Acknowledged.
1.32	No tree can be felled/transplant unless exigencies demand. Where absolutely necessary, tree felling shall be with prior permission from the concerned regulatory authority	Two plants have been relocated for construction purpose. For these necessary approvals has been taken
1.33	Old trees should be retained based on girth and age regulations as may be prescribed by the Forest Department. Plantations to be ensured species (cut) to species (planted)	Two plants have been relocated for construction purpose. For these necessary approvals has been taken
1.34	A minimum of 1 tree (5' tall) for every 80 sqm of land should be planted and maintained and the existing trees will be counted for this purpose.	Noted
1.35	The species with heavy foliage, broad leaves and wide canopy cover are desirable	Noted
1.36	Water intensive and/or invasive species should not be used for landscaping	Noted
1.37	The Project Proponent shall ensure that trees planted under the project shall be well grown healthy and established trees of more than 10cm DBH (diameter above 137cm above ground level) or more than 31.4cm in girth.	Noted
1.38	The Project Proponent shall ensure raising the number of established trees as per norms proposed for the project and finally approved during the EC granting process	Noted and will be ensured.

1.39	The PP shall get project electrification plan approved from the competent authority before operation of the project	Noted and will be ensured.
1.40	As proposed 3240 m <sup>2</sup> 1.40 (15.25%) green area of the within the project site. In addition to the green area, the company undertakes to maintain 12% of the total plot area as a block plantation area by purchasing an alternate plot admeasuring 0.75 acre (3035.142 m <sup>2</sup> ) for development of block plantation in village Ranika Singhola (Khasra No. 16/17/15), Tehsil Sohna, District Gurugram, Haryana.	Noted and will be ensured.
1.41	04 Rain Water Harvesting Pits shall be provided for ground water recharging as per the CGWB norms	Noted and will be ensured.
1.42	The PP shall provide 250 kWp of solar power	Noted and will be ensured.
1.43	The PP shall install required number of Anti-Smog Guns at the project site as per the requirement of HSPCB	Noted and will be ensured.
1.44	The PP shall register themselves on <a href="https://dustapphspcb.com">https://dustapphspcb.com</a> portal as per the Direction No.14 dated 11.06.2021 issued regarding dust mitigation by Commission for Air Quality Management in National Capital Region and Adjoining Areas.	We registered on dust pollution control self-assessment, HSPCB. Details are enclosed as <b>annexure-3</b>
1.45	The PP shall carry out plantation of saplings in the proposed green area as a part of the tree plantation campaign “Ek Ped Maa Ke Naam” and shall upload the details of the same in the MeriLiFE Portal ( <a href="http://merilife.nic.in">http://merilife.nic.in</a> )	We planted 7500 nos of tree in Gurugram district after purchasing a land on the name of Max Healthcare. The village name is Haliaki, Pataudi, Gurugram. A tree plantation report is attached as <b>annexure-4</b>
1.46	That the company shall submit the land ownership documents regarding block plantation area in the name of M/s Max Healthcare Institute Ltd. within two months.	We purchased a land in Haliaki village, Tehsil Pataudi, District- Gurugram. Details are attached as <b>annexure-5</b> A total of seven thousand five hundred (7500) saplings of 43 species has been planted in an area of 0.8 acres. Plantation completion report attached as <b>annexure-4</b>
1.47	The Project Proponent will install DG sets for the project as per latest guidelines of GRAP, NCAP & CPCB	We are installing the DG sets as per CAQM norms. Technical specification is attached as <b>annexure-6</b>
1.48	The Project Proponent will undertake prescribed mitigation measures during the construction period.	This is being ensured and details are attached as <b>annexure-3.</b>
1.49	The Project Proponent will adopt nearby government school for improvement of infrastructure with a CER budget of Rs. 50 lakhs	We submitted a letter to the District Authority (DA) requesting the allocation of schools for this activity, and the DA has issued a letter selecting some schools. Letter is attached as <b>annexure-7</b>

## Standard EC Conditions for (Building / Construction)

### A. Statutory Compliance

S.No	Condition	Status
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1.1	The project proponent shall obtain all necessary clearance/ permission from all relevant agencies including town planning authority before commencement of work. All the construction shall be done in accordance with the local building byelaws.	This is being ensured and necessary approvals have been taken.
1.2	The approval of the Competent Authority shall be obtained for structural safety of buildings due to earthquakes, adequacy of firefighting equipment etc. as per National Building Code including protection measures from lightening etc.	This is being ensured.
1.3	The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1980, in case of the diversion of forest land for non-forest purpose involved in the project.	Noted and being ensured.
1.4	The project proponent shall obtain clearance from the National Board for Wildlife, if applicable.	Not applicable
1.5	The project proponent shall obtain Consent to Establish/Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from the Haryana State Pollution Control Board	We obtained the CTE for earlier proposed expansion. Copy of CTE vide letter no. HSPCB/Consent/:313099722GUNOCTE286465 95 valid upto 06.12.2032 is attached as <b>annexure-2.</b>
1.6	The project proponent shall obtain the necessary permission for drawl of ground water / surface water required for the project from the competent authority.	Noted and will be ensured.
1.7	A certificate of adequacy of available power from the agency supplying power to the project along with the load allowed for the project should be obtained.	Noted and will be ensured
1.8	All other statutory clearances such as the approvals for storage of diesel from Chief Controller of Explosives, Fire Department, Civil Aviation Department shall be obtained, as applicable, by project proponents from the respective competent authorities	Noted and will be ensured
1.9	The provisions of the Solid Waste (Management) Rules, 2016, e-Waste (Management) Rules, 2016, the Plastics Waste (Management) Rules, 2016 and Batteries waste (Management Handling Rules2001 as amended in 2020) shall be followed.	Noted and will be ensured
1.10	The project proponent shall follow the ECBC Act/ECBC-Rules prescribed by Bureau of Energy Efficiency, Ministry of Power strictly in addition of bylaws of the State Government.	Noted and will be ensured

## **2- Air Quality Monitoring And Preservation**

S.No	Condition	Status
2.1	Notification GSR 94(E) dated 25.01.2018 of MoEF&CC regarding Mandatory Implementation of Dust Mitigation Measures for Construction and Demolition Activities for	We are ensuring the dust control measures at site. Few action details is attached as <b>annexure-3</b>

	projects requiring Environmental Clearance shall be complied with.	
2.2	A management plan shall be drawn up and implemented to contain the current exceedance in ambient air quality at the site.	We are ensuring the dust control measures at site. Few action details is attached as <b>annexure-3</b> .
2.3	The project proponent shall install system to carryout Ambient Air Quality monitoring for common/criterion parameters relevant to the main pollutants released (e.g. PM10 and PM2.5) covering upwind and downwind directions during the construction period.	This is installed and displayed in entry of the constriction site, details are mentioned in <b>annexure-3</b> .
2.4	Diesel power generating sets proposed as source of backup power should be of enclosed type and conform to rules made under the Environment (Protection) Act, 1986. The height of stack of DG sets should be equal to the height needed for the combined capacity of all proposed DG sets. Use of low sulphur diesel. The location of the DG sets may be decided with in consultation with State Pollution Control Board.	DG sets will be installed only for power back-up following CAQM/CPCB norms to control emission and noise.
2.5	Construction site shall be adequately barricaded before the construction begins. Dust, smoke & other air pollution prevention measures shall be provided for the building as well as the site. These measures shall include screens for the building under construction, continuous dust/ wind breaking walls all around the site (at least 3-meter height). Plastic/tarpaulin sheet covers shall be provided for vehicles bringing in sand, cement, murrum and other construction materials prone to causing dust pollution at the site as well as taking out debris from the site	The entire site is barricaded by 10 meter height GI sheets. All vehicles carrying the construction materials are using the net to cover the construction materials.
2.6	Sand, murrum, loose soil, cement, stored on site shall be covered adequately so as to prevent dust pollution	Noted and being ensured.
2.7	Wet jet shall be provided for grinding and stone cutting.	Noted and being ensured.
2.8	Unpaved surfaces and loose soil shall be adequately sprinkled with water to suppress dust.	Noted and being ensured.
2.9	All construction and demolition debris shall be stored at the site (and not dumped on the roads or open spaces outside) before they are properly disposed. All demolition and construction waste shall be managed as per the provisions of the Construction and Demolition Waste Management Rules 2016	The C & D debris is being disposed through authorized channel of local body.
2.10	The diesel generator sets to be used during construction phase shall be low sulphur diesel type and shall conform to Environmental (Protection) prescribed for air and noise emission standards.	This is being ensured.
2.11	The gaseous emissions from DG set shall be dispersed through adequate stack height as per CPCB standards. Acoustic enclosure shall be provided to the DG sets to mitigate the noise pollution. Low sulphur diesel shall be used. The location of the DG set and exhaust pipe height	This is being ensured.

	shall be as per the provisions of the Central Pollution Control Board (CPCB) norms.	
2.12	For indoor air quality the ventilation provisions as per National Building Code of India.	Noted and will be ensured.

### **3- Water Quality Monitoring And Preservation**

S.No	Condition	Status
3.1	The natural drain system should be maintained for ensuring unrestricted flow of water. No construction shall be allowed to obstruct the natural drainage through the site, on wetland and water bodies. Check dams, bio-swales, landscape, and other sustainable urban drainage systems (SUDS) are allowed for maintaining the drainage pattern and to harvest rain water	Noted and will be ensured.
3.2	Buildings shall be designed to follow the natural topography as much as possible. Minimum cutting and filling should be done	Noted and will be ensured.
3.3	Total fresh water use shall not exceed the proposed requirement as provided in the project details. The per capita supply should adhere to NBC 2016 and CGWA Notification dated 12.12.2018.	Noted and will be ensured.
3.4	The quantity of fresh water usage, water recycling and rainwater harvesting shall be measured and recorded to monitor the water balance as projected by the project proponent. The record shall be submitted to the Regional Office, MoEF&CC along with six monthly Monitoring reports.	Noted and will be ensured.
3.5	A certificate shall be obtained from the local body supplying water, specifying the total annual water availability with the local authority, the quantity of water already committed, the quantity of water allotted to the project under consideration and the balance water available. This should be specified separately for ground water and surface water sources, ensuring that there is no impact on other users	Noted and will be ensured.
3.6	At least 20% of the open spaces as required by the local building bye-laws shall be pervious. Use of Grass pavers, paver blocks with at least 50% opening, landscape etc. would be considered as pervious surface	This will be ensured after completion of construction activities.
3.7	Installation of dual pipe plumbing for supplying fresh water for drinking, cooking and bathing etc and other for supply of recycled water for flushing, landscape irrigation, car washing, thermal cooling, conditioning etc. shall be done.	Noted and will be ensured.
3.8	Use of water saving devices/fixtures (viz. low flow flushing systems; use of low flow faucets tap aerators etc)	Noted and will be ensured.

	for water conservation shall be incorporated in the building plan.	
3.9	Separation of grey and black water should be done by the use of dual plumbing system. In case of single stack system separate recirculation lines for flushing by giving dual plumbing system be done.	Noted and will be ensured.
3.10	Water demand during construction should be reduced by use of pre-mixed concrete, curing agents and other best practices referred.	RMC is being used to reduce the water foot print during the construction.
3.11	The local bye-law provisions on rain water harvesting should be followed. If local bye-law provision is not available, adequate provision for storage and recharge should be followed as per the Ministry of Urban Development Model Building Byelaws, 2016. Rain water harvesting recharge pits/storage tanks shall be provided for ground water recharging as per the CGWB norms.	This will be ensured.
3.12	A rain water harvesting plan needs to be designed where the recharge bores of minimum one recharge bore per 5,000 square meters of built-up area and storage capacity of minimum one day of total fresh water requirement shall be provided. In areas where ground water recharge is not feasible, the rain water should be harvested and stored for reuse. The ground water shall not be withdrawn without approval from the Competent Authority	4 Nos rain water harvesting pits will be provided as per applicable norms of local body. We also in process for providing rain water collection tank with a volume of one days consumption.
3.13	All recharge should be limited to shallow aquifer	Noted
3.14	No ground water shall be used during construction phase of the project.	Noted, only STP treated waste water is being used.
3.15	Any ground water dewatering should be properly managed and shall conform to the approvals and the guidelines of the CGWA in the matter. Formal approval shall be taken from the CGWA for any ground water abstraction or dewatering.	Noted and will be ensured.
3.16	The quantity of fresh water usage, water recycling and rainwater harvesting shall be measured and recorded to monitor the water balance as projected by the project proponent. The record shall be submitted to the Regional Office, MoEF&CC along with six monthly Monitoring reports.	Noted and will be ensured.
3.17	Sewage shall be treated in the STP with tertiary treatment. The treated effluent from STP shall be recycled/re-used for flushing, AC make up water and gardening. As proposed, no treated water shall be disposed in to municipal drain	Noted and will be ensured.
3.18	No sewage or untreated effluent water would be discharged through storm water drains	Noted and will be ensured.
3.19	Onsite sewage treatment of capacity of treating 100% waste water to be installed. The installation of the Sewage Treatment Plant (STP) shall be certified by an independent expert and a report in this regard shall be submitted to the Ministry before the project is	Noted and will be ensured.

	commissioned for operation. Treated waste water shall be reused on site for landscape, flushing, cooling tower, and other end-uses. Excess treated water shall be discharged as per statutory norms notified by Ministry of Environment, Forest and Climate Change. Natural treatment systems shall be promoted	
3.20	Periodical monitoring of water quality of treated sewage shall be conducted. Necessary measures should be made to mitigate the odour problem from STP.	Noted and will be ensured.
3.21	Sludge from the onsite sewage treatment, including septic tanks, shall be collected, conveyed and disposed as per the Ministry of Urban Development, Central Public Health and Environmental Engineering Organization (CPHEEO) Manual on Sewerage and Sewage Treatment Systems, 2013	Noted and will be ensured.

#### **4- Noise Monitoring and Prevention**

S.No	Condition	Status
4.1	Ambient noise levels shall conform to residential area/commercial area/industrial area/silence zone both during day and night as per Noise Pollution (Control and Regulation) Rules, 2000. Incremental pollution loads on the ambient air and noise quality shall be closely monitored during construction phase. Adequate measures shall be made to reduce ambient air and noise level during construction phase, so as to conform to the stipulated standards by CPCB / SPCB.	This is being ensured.
4.2	Noise level survey shall be carried as per the prescribed guidelines and report in this regard shall be submitted to Regional Officer of the Ministry as a part of six-monthly compliance report.	Noise level survey will be conducted and will be share in coming compliance report.
4.3	Acoustic enclosures for DG sets, noise barriers for ground-run bays, ear plugs for operating personnel shall be implemented as mitigation measures for noise impact due to ground sources.	This will be ensured.

#### **5- Energy Conservation measure**

S.N.	Condition	Status
5.1	Compliance with the Energy Conservation Building Code (ECBC) of Bureau of Energy Efficiency as per ECBC Act, 2017 read with ECBC Rules, 2018 shall be ensured. Buildings in the States which have notified their own ECBC, shall comply with the State ECBC also which is in no case should be less than 25% as prescribed.	Entire hospital is designed as per ECBC compliance. We also obtained the green building certificate. A copy of certificate is attached as <b>annexure-8</b>
5.2	Outdoor and common area lighting shall be LED.	Noted and will be ensured.

5.3	Concept of passive solar design that minimize energy consumption in buildings by using design elements, such as building orientation, landscaping, efficient building envelope, appropriate fenestration, increased day lighting design and thermal mass etc. shall be incorporated in the building design. Wall, window, and roof u-values shall be as per ECBC specifications.	Entire hospital is designed as per ECBC compliance.
5.4	Energy conservation measures like installation of CFLs/ LED for the lighting the area outside the building should be integral part of the project design and should be in place before project commissioning	Entire hospital is designed as per ECBC compliance.
5.5	Solar, wind or other Renewable Energy shall be installed to meet electricity generation equivalent to 1% of the demand load or as per the state level/ local building bye-laws requirement, whichever is higher.	We will install 250 kWp onsite solar panel for electricity. We are installing on-site solar panels to generate renewable electricity. A portion of the generated power will be utilized for operating heat pumps to produce hot water. Additionally, we are in the process of signing a Power Purchase Agreement (PPA) with a solar energy provider to further enhance our clean energy sourcing.
5.6	Solar power shall be used for lighting in the apartment to reduce the power load on grid. Separate electric meter shall be installed for solar power. Solar water heating shall be provided to meet 20% of the hot water demand of the commercial and institutional building or as per the requirement of the local building bye-laws, whichever is higher. Residential buildings are also recommended to meet its hot water demand from solar water heaters, as far as possible.	
5.7	The PP will submit report indicating compliance of each parameter of ECBC requirement and submit quantification saving report for each component	Noted and we will share a detailed report after execution of all parameters of ECBC.

## **6. Waste Management**

S.N.	Condition	Status
6.1	A certificate from the competent authority handling municipal solid wastes, indicating the existing civic capacities of handling and their adequacy to cater to the M.S.W. generated from project shall be obtained.	Noted and will be ensured.
6.2	Disposal of muck during construction phase shall not create any adverse effect on the neighbouring communities and be disposed taking the necessary precautions for general safety and health aspects of people, only in approved sites with the approval of competent authority.	This was ensured during the excavation.
6.3	Separate wet and dry bins must be provided in each unit and at the ground level for facilitating segregation of	Noted and will be ensured during the operation of the hospital.

	waste. Solid waste shall be segregated into wet garbage and inert materials	
6.4	Organic Waste Converter within the premises with a minimum capacity of 0.5 kg /person/day must be installed. Leaves to be put in earmarked pits for converting them into compost to be used as manure	Noted and will be ensured during the operation of the hospital.
6.5	All non-biodegradable waste shall be handed over to authorized recyclers for which a written tie up must be done with the authorized recyclers.	Noted and will be ensured during the operation of the hospital.
6.6	Any hazardous waste generated during construction phase, shall be disposed off as per applicable rules and norms with necessary approvals of the State Pollution Control Board	There is no hazardous waste still generated from construction activities. We will dispose it through authorized channel only after generation.
6.7	Use of environment friendly materials in bricks, blocks and other construction materials, shall be required for at least 20% of the construction material quantity. These include Fly Ash bricks, hollow bricks, AACs, Fly Ash Lime Gypsum blocks, Compressed earth blocks, and other environment friendly materials.	Noted and being ensured.
6.8	Fly ash should be used as building material in the construction as per the provision of Fly Ash Notification of September, 1999 and amended as on 27th August, 2003 and 25th January, 2016. Ready mixed concrete must be used in building construction.	Noted and being ensured.
6.9	Any wastes from construction and demolition activities related thereto shall be managed so as to strictly conform to the Construction and Demolition Waste Management Rules, 2016.	Noted and being ensured.
6.10	Used CFLs and TFLs should be properly collected and disposed off/sent for recycling as per the prevailing guidelines/ rules of the regulatory authority to avoid mercury contamination.	Noted and being ensured.

### **7- Green Cover**

<b>S.N.</b>	<b>Condition</b>	<b>Status</b>
7.1	Where the trees need to be cut with prior permission from the concerned local Authority, compensatory plantation in the ratio of 1:10 (i.e., planting of 10 trees for every 1 tree that is cut) shall be done and maintained. Plantations to be ensured species (cut) to species (planted). Area for green belt development shall be provided as per the details provided in the project document.	This is being ensured.
7.2	Topsoil should be stripped to a depth of 20 cm from the areas proposed for buildings, roads, paved areas, and external services. It should be stockpiled appropriately in designated areas and reapplied during plantation of the proposed vegetation on site.	This is being ensured.

7.3	The PP shall ensure that the area marked for greenery and trees will not be rendered impervious by any means like soil, compaction or cement concrete or brick or tiles or rubber or plastic cover or any other impervious material in any manner and the area must be maintained pervious for water infiltration/percolation and air flow in the soil. It must be straight on earth and not on any roof or slab of any tile	This is being ensured.
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### **8- Transport**

<b>S.No</b>	<b>Condition</b>	<b>Status</b>
8.1	A comprehensive mobility plan, as per MoUD best practices guidelines (URDPFI), shall be prepared to include motorized, non-motorized, public, and private networks. Road should be designed with due consideration for environment, and safety of users. The road system can be designed with these basic criteria.	Acknowledged. Necessary actions will be taken to ensure compliance
8.2	Vehicles hired for bringing construction material to the site should be in good condition and should have a pollution check certificate and should conform to applicable air and noise emission standards be operated only during non-peak hours.	Acknowledged. Necessary actions will be taken to ensure compliance
8.3	A detailed traffic management and traffic decongestion plan shall be drawn up to ensure that the current level of service of the roads within a 05 kms radius of the project is maintained and improved upon after the implementation of the project. This plan should be based on cumulative impact of all development and increased habitation being carried out or proposed to be carried out by the project or other agencies in this 05 Kms radius of the site in different scenarios of space and time and the traffic management plan shall be duly validated and certified by the State Urban Development department and the P.W.D./ competent authority for road augmentation and shall also have their consent to the implementation of components of the plan which involve the participation of these departments.	Acknowledged. Necessary actions will be taken to ensure compliance

### **- 9 Human Health Issues**

<b>S.No</b>	<b>Condition</b>	<b>Status</b>
9.1	All workers working at the construction site and involved in loading, unloading, carriage of construction material and construction debris or working in any area with dust pollution shall be provided with dust mask	All safety measures have been provided for construction workers
9.2	For indoor air quality the ventilation provisions as per National Building Code of India.	Acknowledged. Necessary actions will be taken to ensure compliance

9.3	Emergency preparedness plan based on the Hazard identification and Risk Assessment (HIRA) and Disaster Management Plan shall be implemented.	Acknowledged. Necessary actions will be taken to ensure compliance
9.4	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project	It is being ensured.
9.5	Occupational health surveillance of the workers shall be done on a regular basis.	Regular surveillance is being conducted for worker safety and health.
9.6	A First Aid Room shall be provided in the project both during construction and operations of the project.	This is being ensured.
9.7	Corporate Environment Responsibility The project proponent shall comply with the provisions of CER, as applicable.	This will be ensured.
9.8	The company shall have a well laid down environmental policy duly approved by the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/ deviation/ violation of the environmental/ forest/ wildlife norms/ conditions. The company shall have defined system of reporting infringements/ deviation/ violation of the environmental/ forest/ wildlife norms/ conditions and/ or shareholders/ stake holders. The copy of the board resolution in this regard shall be submitted to the MoEF&CC as a part of six-monthly report.	We released the environmental policy of Max Healthcare. Copy of environmental policy is attached as <b>annexure-9</b>
9.9	A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of senior Executive, who will directly to the head of the organization.	A dedicated Environment Cell has been established under the supervision of the Unit Head. The members of the Environment Cell include: <ul style="list-style-type: none"> <li>• Unit Head</li> <li>• Project Manager</li> <li>• Project Supervisor</li> <li>• EHS Manager</li> <li>• Contractor-EHS Manager</li> </ul>
9.10	Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose. Year wise progress of implementation of action plan shall be reported to the Ministry/Regional Office along with the Six-Monthly Compliance Report.	This is being ensured.

## 10- Miscellaneous

S.No	Condition	Status
10.1	The project proponent shall prominently advertise it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days indicating that the project has been accorded environment clearance and the details of MoEFCC/SEIAA website where it is displayed.	The details of the approved EC were published in two local newspapers. Copies of the advertisements are attached as <b>annexure-10</b>
10.2	The copies of Environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt	Noted and it is done.
10.3	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.	The half-yearly compliance report is being updated on our website. The link is provided below. <a href="https://max-website20-images.s3.ap-south-1.amazonaws.com/sector_56_merged_f02af4734d.pdf">https://max-website20-images.s3.ap-south-1.amazonaws.com/sector_56_merged_f02af4734d.pdf</a>
10.4	The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the ministry of Environment, Forest and Climate Change at environment clearance portal.	Acknowledged. Necessary actions will be taken to ensure compliance
10.5	The project proponent shall submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company	The environmental statement will be submitted after the commencement of hospital operations
10.6	The project proponent shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities, commencing the land development work and start of production operation by the project.	Acknowledged. Necessary actions will be taken to ensure compliance
10.7	The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government	Acknowledged. Necessary actions will be taken to ensure compliance
10.8	The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report and also that during their presentation to the Expert Appraisal Committee.	Acknowledged. Necessary actions will be taken to ensure compliance

10.9	No further expansion or modifications in the plan shall be carried out without prior approval of the Ministry of Environment, Forests and Climate Change (MoEF&CC)/SEIAA, Haryana. The project proponent shall seek fresh environmental clearance under EIA notification 2006 if at any stage there is change of area of this project	Acknowledged. Necessary actions will be taken to ensure compliance
10.10	Concealing factual data or submission of false/fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986.	Acknowledged. Necessary actions will be taken to ensure compliance
10.11	The Ministry/SEIAA may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.	Acknowledged. Necessary actions will be taken to ensure compliance
10.12	The Ministry /SEIAA reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions	Acknowledged. Necessary actions will be taken to ensure compliance
10.13	The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports	Acknowledged. Necessary actions will be taken to ensure compliance
10.14	The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, and the Public Liability Insurance Act, 1991 along with their amendments and Rules and any other orders passed by the Hon'ble Supreme Court of India / High Courts and any other Court of Law relating to the subject matter.	Acknowledged. Necessary actions will be taken to ensure compliance
10.15	Any change in planning of the approved plan will leads to Environment Clearance void-ab-initio and PP will have to seek fresh Environment Clearance	Acknowledged. Necessary actions will be taken to ensure compliance
10.16	The PP should give unambiguous affidavit giving land promoters in accordance with your ownership and possession of land legal the case referred for Environment Clearance to SEIAA	Acknowledged. Necessary actions will be taken to ensure compliance
10.17	The validity of this environment clearance letter is valid up to 10 years from the date of issuance of EC letter in accordance with the MoEF & CC, GoI Notification No. S.O.1807 (E), dated the 12th April, 2022. The environment clearance conditions applicable till life space project will continue to apply. In case of violation the action will be taken as per the	Acknowledged. Necessary actions will be taken to ensure compliance

	laid down law of land. Compliance report shall be sent to this office till life of the project.	
10.18	If project is not completed within the validity period then the project proponent shall submit the application for extension of validity within one month before the lapse of validity period of Environment Clearance	Acknowledged. Necessary actions will be taken to ensure compliance



सत्यमेव जयते

File No: SEAC/HR/2024/132  
Government of India  
Ministry of Environment, Forest and Climate Change  
(Issued by the State Environment Impact Assessment  
Authority(SEIAA), HARYANA)

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Dated 24/01/2025



To,

M/S MAX HEALTHCARE INSTITUTE LTD. TH. DR. MRADUL KAUSHIK S/O SH. VINOD KUMAR KAUSHIK  
167 Floor 1 Plot-167A ready money Mansion Dr Annie Besant road worli Mumbai Maharashtra, 400018  
apurva.srivastava@maxhealthcare.com

Subject: **Environment Clearance for Proposed Expansion of Max Super Specialty Hospital at Sector 56, Gurgaon, Haryana by M/s Max Healthcare Institute Ltd. Th. Dr. Mradul Kaushik S/o Sh. Vinod Kumar Kaushik.**

Sir/Madam,

This has reference to your Proposal No. **SIA/HR/INFRA2/482176/2024** dated **18.06.2024** subsequent letter dated **03.07.2024** and **16.12.2024** for obtaining **Environment Clearance** under Category **8(a)** of EIA Notification dated 14.09.2006 along with submission of due Scrutiny fee (as applicable) of **Rs. 1,50,000/- vide DD No. 300798 dated 18.06.2024 & Rs. 50,000/-, DD no.201741 dated 05.09.2024** (in compliance of Haryana Government, Environment & Climate Change, Department Notification No. DE&CCH/3060 dated 14.10.2021). The proposal has been appraised as per prescribed procedure in the light of provisions under the EIA Notification, 2006 on the basis of the mandatory documents enclosed with the application viz., Form-1, Form1-A, Conceptual Plan and additional clarifications furnished in response to the observations of the State Expert Appraisal Committee (SEAC) constituted by MoEF&CC, GoI vide their Notification dated 21.02.2022, in its **295<sup>th</sup> meeting held on 28.06.2024**.

2. The particulars of the proposal are as below :

(i) EC Identification No.	EC24C3804HR5265005N
(ii) File No.	SEAC/HR/2024/132
(iii) Clearance Type	EC
(iv) Category	B2
(v) Project/Activity Included Schedule No.	8(a) Building / Construction Expansion of Max Super Specialty Hospital at Sector 56, Gurgaon, Haryana by M/s Max Healthcare Institute Ltd.
(vii) Name of Project	MAX HEALTHCARE INSTITUTE LIMITED
(viii) Name of Company/Organization	GURUGRAM, HARYANA
(ix) Location of Project (District, State)	

(x) Issuing Authority	SEIAA
(xii) Applicability of General Conditions	no
(xiii) Applicability of Specific Conditions	no

3. It is inter-alia, noted that the project involves in the **Environment Clearance for proposed project is Expansion of Max Super Specialty Hospital at Sector 56, Gurgaon, Haryana by M/s Max Healthcare Institute Ltd.**

**4. The basic details of project are as under:**

Sr. No.	Particulars	Quantity as per Existing EC	Proposed Quantity	Total Area (in M <sup>2</sup> )	
1.	Online Project Proposal Number	SIA/HR/INFRA2/482176/2024			
2.	Latitude	28°25'48.88" N			
3.	Longitude	77°5'59.09" E			
4.	Plot Area (m <sup>2</sup> )	21245.56	No change	21245.56	
5.	Proposed Ground Coverage (m <sup>2</sup> )	4,997.48	-667.658	4329.82	
6.	Proposed FAR (m <sup>2</sup> )	31,847.37	13152.34	44999.71	
7.	Non-FAR Area (m <sup>2</sup> )	42,460.07	540.266	43000.339	
8.	Total Built Up area (m <sup>2</sup> )	74,307.44	13,692.606	88000.049	
9.	Total Green Area with Percentage (m <sup>2</sup> )	6,440	-1993.74	3240 m <sup>2</sup> (15.25%) green area of the project site. In addition 0.75 acre (3035.142 m <sup>2</sup> ) 12% of the total plot area as a block plantation.	
10.	Rain Water Harvesting Pits (No.)	4	No change	4	
11.	STP Capacity (KLD)	300	180	480	
12.	ETP Capacity (KLD)	30	No change	30	
13.	Total Parking (ECS)	778	-2	776	
14.	Organic Waste Converter	1	1	2*400 kg/day	
15.	Maximum Height of the Building (m)	35	44.95	44.95	
16.	Power Requirement (KVA)	4000	474.6	4474.6	
17.	Power Backup (KVA))	6000	No change	6000	
18.	Total Water Requirement (KLD)	361	300	661	
19.	Fresh Water Requirement (KLD)	241	80	321	
20.	Treated Water (KLD)	120	220	340	
21.	Waste Water Generated (KLD)	239	168	407	
22.	Solid Waste Generated (TPD)	1.316	0.42	1.73	
23.	Biodegradable Waste (TPD)	0.5922	0.17	0.76	
24.	Bio-Medical Waste (KG/DAY)	434	193.60	627.60	
25.	Number of Floors	3B+LG+UG+ Service+6	Addition of 4 floors	3B+LG+ UG+10	
26.	Total Cost of the project (Cr.):	484.84	32.5	517.34	
27.	EMP Budget (Lacs)	Construction Phase	-	-	Capital Cost 1.5 Recurring Cost 2.25
		Operation phase.	-	-	Capital Cost Rs.62.89 Recurring Cost Rs.14.91
		Adoption of government school for renovation of infrastructure			Rs. 50 Lakhs (Capital Cost)
28.	Incremental Load in respect of:	-	-	0.114	
	PM 2.5 (g/m <sup>3</sup> )	-	-	0.190	
	PM 10(g/m <sup>3</sup> )	-	-	0.710	
	SO <sub>2</sub> (g/m <sup>3</sup> )	-	-	1.05	

	CO (mg/m3)	-	-	0.00193
29.	Construction Phase:	Power Back-up	-	300kVA
		Water Requirement & Source	-	50 KLD STP treated water supply from Behrampur Gurugram
		Anti-Smog Gun	-	4

#### EMP Budget during Construction Phase

Component	Capital Cost (Rs in Lacs)	Recurring Cost (Rs in Lacs)/Annum
Dust Mitigation Measures	1.5	0.25
Environment Monitoring & 6 Monthly Compliance Report of EC Conditions		2
<b>Total</b>	<b>1.5</b>	<b>2.25</b>

#### EMP Budget during Operation Phase

Component	Capital Cost (Rs in Lacs)	Recurring Cost (Rs in Lacs)/Annum
Sewage Treatment Plant (180 kld)	60	11
Solid Waste Storage Bins & Composter (2x 400 kg/day)	2.89	1.91
Environment Monitoring & 6 Monthly Compliances of Environment Clearance Conditions		2
<b>Total</b>	<b>62.89</b>	<b>14.91</b>

#### Budget outside the Project Site(CER)

Component	Amount in Lacs (Capital Cost)
Adoption of nearby government school for renovation of infrastructure	50

#### Total EMP Budget

Component	Capital Cost (Rs in Lacs)	Recurring Cost (Rs in Lacs)/Annum
During Construction Phase	1.5	2.25
During Operation Phase	62.89	14.91
Budget for nearby two Government School for improvement of infrastructure	50	-
<b>Total</b>	<b>114.39</b>	<b>17.16</b>

5. In view of the recommendations made by State Expert Appraisal Committee (SEAC) in the said case and further consideration of the documents/details submitted by the Project Proponent; the Authority after discussions decided during **190<sup>th</sup> Meeting held on 16.12.2024 "GRANT ENVIRONMENT CLEARANCE"** to M/s Max Healthcare Institute Ltd. Th. Dr. Mradul Kaushik S/o Sh. Vinod Kumar Kaushik (As per allotment letter Memo No. ZO002/EO018/UE029/GLOT/000000 dated 28.12.2021 issued by Haryana Shahri Vikas Pradhikaran) under category 8(a) of EIA Notification dated 14.09.2006 of the Ministry of Environment and Forest, Government of India.

#### Copy To

1. Director (IA Division), MoEF&CC, GoI, Indira Paryavaran Bhavan, Zorbagh Road-New Delhi-110003.
2. Chairman, State Environment Impact Assessment Authority, Bay's No. 55-58, Prayatan Bhawan, Sector-2, Panchkula, Haryana.
3. Chairman, Haryana State Pollution Control Board, C-11, Sector-6, Panchkula.

4. Director, Environment & Climate Change Department, Haryana, Bay's No. 55-58, Prayatan Bhawan, Sector-2, Panchkula, Haryana.
5. Director General, Town & Country Planning Haryana, Plot No. 3, Sector - 18A, Madhya Marg, Chandigarh- 160018.
6. Regional Office, Ministry of Environment, Forests & Climate Change, Govt. of India, Bay's No. 24-25, Sector 31-A, Dakshin Marg, Chandigarh-160018.
7. Concerned File/ Office Copy.

## Annexure 1

### Specific EC Conditions for (Building / Construction)

#### 1. Specific Conditions

S. No	EC Conditions
1.1	<b>The project is recommended on concept basis as such in case of any change in planning, the PP will obtain fresh EC.</b>
1.2	Sewage shall be treated in the STP on latest Technology to achieve standards ordered by NGT. The Treated effluent from STP shall be recycled /reused for flushing. DG cooling and Gardening.
1.3	The PP should not mix the ETP effluent after treatment in the STP and ETP effluent shall be separately utilized for the purposes
1.4	The Project Proponent would devise a monitoring plan to the satisfaction of the State Pollution Control Board so as to continuously monitor the treated waste water being used for flushing in terms of faecal coli forms and other pathogenic bacteria.
1.5	The PP shall ensure that total EMP Budget shall be spent on project during construction as well as during operational phase as per table given above. The EMP cost on Socio Economic activities shall be used before the commencement of the project & EMP recurring inside the project shall be implemented throughout the operation of the project. The PP shall establish Environment monitoring cell as per documents submitted.
1.6	The PP shall not carry out any construct above and below revenue rasta if passing through the project and ensure that permission of the competent authority shall be obtained before carry out any construction above or below the revenue rasta. The PP shall put notice board on the revenue rasta for the passer byes.
1.7	The project proponent shall upload the status of compliance of the basic details (given in above tables), stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.
1.8	The Project Proponents would commission a third party study on the implementation of conditions related to quality and quantity of recycle and reuse of treated water, efficiency of treatment systems, quality of treated water being supplied for flushing (specially the bacterial counts), comparative bacteriological studies from toilet seats using recycled treated waters and fresh waters for flushing, and quality of water being supplied through spray faucets attached to toilet seats.

S. No	EC Conditions
1.9	Separate wet and dry bins must be provided in each unit and at ground level for facilitating segregation of waste. Solid Waste shall be segregated into wet garbage and inert materials. Wet Garbage shall be composted in Organic waste convertor. Adequate area shall be provided for solid waste management within the premises which will include area for segregation, composting. The Inert waste from the project will be sent to solid waste dumping site through authorized vender.
1.10	Traffic management plan as submitted shall be implemented in letter and spirit. Apart, a detailed traffic management and traffic decongestion plan shall be drawn up to ensure that the current level of service of the roads within a 05 kms radius of the project is marinated and improved upon after the implementation of the project. This plan should be based on cumulative impact of all development and increased habitation being carried out or purpose to be carried out by the project or other agencies in this 05kms radius of the site in different scenarios of space and time
1.11	The Project Proponent shall obtain all necessary clearance/permission from all relevant agencies including town planning authority before commencement of work. All the construction shall be done in accordance with the local building byelaws.
1.12	Consent to establish/operate for the project shall be obtained from the State Pollution Control Board as required under the Air (Prevention and Control of pollution) Act, 1981 and the Water (Prevention and control of pollution) Act, 1974.
1.13	The Approval of the Competent Authority shall be obtained for structural safety of building code due to earthquakes, adequacy of fire fighting equipments etc. as per National Building Code including protection measures from lightening etc.
1.14	The PP shall obtain the Fire NOC from the Competent Authority before taking the occupation of the building.
1.15	The PP shall install the Eco Friendly Green Transformer based on ester oil to reduce the carbon footprint. The PP shall shift to gas based generator set when the gas is available. The PP shall install APCM for the DG set.
1.16	The PP shall not mix ETP treated effluent with STP water
1.17	The PP Shall comply with SOP for reduction of Air and Noise pollution during construction and operation phase
1.18	The PP shall follow SOP regarding single use plastic free
1.19	The PP shall follow the SOP for reduction of carbon footprints
1.20	PP shall not mix ETP treated effluent with STP treated effluent and MEE should be installed to evaporate ETP treated water
1.21	The PP shall obtain the permission regarding withdrawal of ground water, if any from HWRA/CGWA before the start of the project and also obtained the CTO from HSPCB after the approval from HWRA/CGWA.
1.22	The PP shall carry out the quarterly awareness programs for the stakeholders of the project.

S. No	EC Conditions
1.23	The PP shall install Digital water level recorder for monitoring the water recharge and carry out quarterly maintenance and cleaning of RWH pits.
1.24	The PP shall ensure the compliance of provisions of Plastic Waste Management (Amendment) Rules, 2022 relevant for the project
1.25	The PP may provide electric charging stations to facilitate electric vehicle commuters.
1.26	The PP shall take all preventive measures including water sprinkles to control dust during construction and operational phase.
1.27	Any change in stipulations of EC will lead to Environment Clearance void-ab-initio and PP will have to seek fresh Environment Clearance.
1.28	The Project Proponent shall ensure that trees planted under the project shall be well grown healthy and established trees of more than 10cm DBH (diameter above 137cm above ground level) or more than 31.4cm in girth.
1.29	The Project Proponent shall ensure raising the number of established trees as per norms proposed for the project and finally approved during the EC granting process.
1.30	In the proposed landscape plan, native species shall be included as per the list of concerned DFO
1.31	The minimum growth of trees should be 03 meters with sufficient canopy
1.32	No tree can be felled/transplant unless exigencies demand. Where absolutely necessary, tree felling shall be with prior permission from the concerned regulatory authority
1.33	Old trees should be retained based on girth and age regulations as may be prescribed by the Forest Department. Plantations to be ensured species (cut) to species (planted)
1.34	A minimum of 1 tree (5' tall) for every 80 sqm of land should be planted and maintained and the existing trees will be counted for this purpose.
1.35	The species with heavy foliage, broad leaves and wide canopy cover are desirable
1.36	Water intensive and/or invasive species should not be used for landscaping
1.37	The Project Proponent shall ensure that trees planted under the project shall be well grown healthy and established trees of more than 10cm DBH (diameter above 137cm above ground level) or more than 31.4cm in girth.
1.38	The Project Proponent shall ensure raising the number of established trees as per norms proposed for the project and finally approved during the EC granting process.
1.39	<b>The PP shall get project electrification plan approved from the competent authority before operation of the project</b>
1.40	<b>As proposed 3240 m<sup>2</sup> (15.25%) green area of the within the project site. In addition to the</b>

S. No	EC Conditions
	<b>green area, the company undertakes to maintain 12% of the total plot area as a block plantation area by purchasing an alternate plot admeasuring 0.75 acre (3035.142 m<sup>2</sup>) for development of block plantation in village Ranika Singhola (Khasra No. 16/17/15), Tehsil Sohna, District Gurugram, Haryana.</b>
1.41	<b>04 Rain Water Harvesting Pits</b> shall be provided for ground water recharging as per the CGWB norms
1.42	The PP shall provide 250 kWp of solar power
1.43	The PP shall install required number of <b>Anti-Smog Guns</b> at the project site as per the requirement of HSPCB.
1.44	The PP shall register themselves on <a href="https://dustapphspcb.com">https://dustapphspcb.com</a> portal as per the <u>Direction No.14 dated 11.06.2021</u> issued regarding dust mitigation by Commission for Air Quality Management in National Capital Region and Adjoining Areas.
1.45	<b>The PP shall carry out plantation of saplings in the proposed green area as a part of the tree plantation campaign “Ek Ped Maa Ke Naam” and shall upload the details of the same in the MeriLiFE Portal (<a href="http://merilife.nic.in">http://merilife.nic.in</a>)</b>
1.46	<b>That the company shall submit the land ownership documents regarding block plantation area in the name of M/s Max Healthcare Institute Ltd. within two months.</b>
1.47	<b>The Project Proponent will install DG sets for the project as per latest guidelines of GRAP, NCAP &amp; CPCB.</b>
1.48	<b>The Project Proponent will undertake prescribed mitigation measures during the construction period.</b>
1.49	<b>The Project Proponent will adopt nearby government school for improvement of infrastructure with a CER budget of Rs. 50 lakhs</b>

**Standard EC Conditions for (Building / Construction)**

**1. Statutory Compliance**

S. No	EC Conditions
1.1	The project proponent shall obtain all necessary clearance/ permission from all relevant agencies including town planning authority before commencement of work. All the construction shall be done in accordance with the local building byelaws.
1.2	The approval of the Competent Authority shall be obtained for structural safety of buildings due to earthquakes, adequacy of firefighting equipment etc. as per National Building Code including protection measures from lightening etc.
1.3	The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1980, in case of the diversion of forest land for non-forest purpose involved in the project.

S. No	EC Conditions
1.4	The project proponent shall obtain clearance from the National Board for Wildlife, if applicable.
1.5	The project proponent shall obtain Consent to Establish/Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from the Haryana State Pollution Control Board
1.6	The project proponent shall obtain the necessary permission for drawl of ground water / surface water required for the project from the competent authority.
1.7	A certificate of adequacy of available power from the agency supplying power to the project along with the load allowed for the project should be obtained.
1.8	All other statutory clearances such as the approvals for storage of diesel from Chief Controller of Explosives, Fire Department, Civil Aviation Department shall be obtained, as applicable, by project proponents from the respective competent authorities.
1.9	The provisions of the Solid Waste (Management) Rules, 2016, e-Waste (Management) Rules, 2016, the Plastics Waste (Management) Rules, 2016 and Batteries waste (Management Handling Rules 2001 as amended in 2020) shall be followed.
1.10	The project proponent shall follow the ECBC Act/ECBC-Rules prescribed by Bureau of Energy Efficiency, Ministry of Power strictly in addition of bylaws of the State Government.

## 2. Air Quality Monitoring And Preservation

S. No	EC Conditions
2.1	Notification GSR 94(E) dated 25.01.2018 of MoEF&CC regarding Mandatory Implementation of Dust Mitigation Measures for Construction and Demolition Activities for projects requiring Environmental Clearance shall be complied with.
2.2	A management plan shall be drawn up and implemented to contain the current exceedance in ambient air quality at the site.
2.3	The project proponent shall install system to carryout Ambient Air Quality monitoring for common/criterion parameters relevant to the main pollutants released (e.g. PM10 and PM2.5) covering upwind and downwind directions during the construction period.
2.4	Diesel power generating sets proposed as source of backup power should be of enclosed type and conform to rules made under the Environment (Protection) Act, 1986. The height of stack of DG sets should be equal to the height needed for the combined capacity of all proposed DG sets. Use of low sulphur diesel. The location of the DG sets may be decided with in consultation with State Pollution Control Board.
2.5	Construction site shall be adequately barricaded before the construction begins. Dust, smoke & other air pollution prevention measures shall be provided for the building as well as the site. These measures shall include screens for the building under construction, continuous dust/ wind breaking walls all around the site (at least 3-meter height). Plastic/tarpaulin sheet covers shall be provided for vehicles bringing in sand, cement, murrum and other construction materials prone to causing dust

S. No	EC Conditions
	pollution at the site as well as taking out debris from the site.
2.6	Sand, murrum, loose soil, cement, stored on site shall be covered adequately so as to prevent dust pollution.
2.7	Wet jet shall be provided for grinding and stone cutting.
2.8	Unpaved surfaces and loose soil shall be adequately sprinkled with water to suppress dust.
2.9	All construction and demolition debris shall be stored at the site (and not dumped on the roads or open spaces outside) before they are properly disposed. All demolition and construction waste shall be managed as per the provisions of the Construction and Demolition Waste Management Rules 2016.
2.10	The diesel generator sets to be used during construction phase shall be low sulphur diesel type and shall conform to Environmental (Protection) prescribed for air and noise emission standards.
2.11	The gaseous emissions from DG set shall be dispersed through adequate stack height as per CPCB standards. Acoustic enclosure shall be provided to the DG sets to mitigate the noise pollution. Low sulphur diesel shall be used. The location of the DG set and exhaust pipe height shall be as per the provisions of the Central Pollution Control Board (CPCB) norms.
2.12	For indoor air quality the ventilation provisions as per National Building Code of India.

### 3. Water Quality Monitoring And Preservation

S. No	EC Conditions
3.1	The natural drain system should be maintained for ensuring unrestricted flow of water. No construction shall be allowed to obstruct the natural drainage through the site, on wetland and water bodies. Check dams, bio-swales, landscape, and other sustainable urban drainage systems (SUDS) are allowed for maintaining the drainage pattern and to harvest rain water.
3.2	Buildings shall be designed to follow the natural topography as much as possible. Minimum cutting and filling should be done.
3.3	Total fresh water use shall not exceed the proposed requirement as provided in the project details. The per capita supply should adhere to NBC 2016 and CGWA Notification dated 12.12.2018.
3.4	The quantity of fresh water usage, water recycling and rainwater harvesting shall be measured and recorded to monitor the water balance as projected by the project proponent. The record shall be submitted to the Regional Office, MoEF&CC along with six monthly Monitoring reports.
3.5	A certificate shall be obtained from the local body supplying water, specifying the total annual water availability with the local authority, the quantity of water already committed, the quantity of water allotted to the project under consideration and the balance water available. This should be specified separately for ground water and surface water sources, ensuring that there is no impact on other users.

S. No	EC Conditions
3.6	At least 20% of the open spaces as required by the local building bye-laws shall be pervious. Use of Grass pavers, paver blocks with at least 50% opening, landscape etc. would be considered as pervious surface.
3.7	Installation of dual pipe plumbing for supplying fresh water for drinking, cooking and bathing etc and other for supply of recycled water for flushing, landscape irrigation, car washing, thermal cooling, conditioning etc. shall be done.
3.8	Use of water saving devices/fixtures (viz. low flow flushing systems; use of low flow faucets tap aerators etc) for water conservation shall be incorporated in the building plan.
3.9	Separation of grey and black water should be done by the use of dual plumbing system. In case of single stack system separate recirculation lines for flushing by giving dual plumbing system be done.
3.10	Water demand during construction should be reduced by use of pre-mixed concrete, curing agents and other best practices referred.
3.11	The local bye-law provisions on rain water harvesting should be followed. If local bye-law provision is not available, adequate provision for storage and recharge should be followed as per the Ministry of Urban Development Model Building Byelaws, 2016. Rain water harvesting recharge pits/storage tanks shall be provided for ground water recharging as per the CGWB norms.
3.12	A rain water harvesting plan needs to be designed where the recharge bores of minimum one recharge bore per 5,000 square meters of built up area and storage capacity of minimum one day of total fresh water requirement shall be provided. In areas where ground water recharge is not feasible, the rain water should be harvested and stored for reuse. The ground water shall not be withdrawn without approval from the Competent Authority.
3.13	All recharge should be limited to shallow aquifer.
3.14	No ground water shall be used during construction phase of the project.
3.15	Any ground water dewatering should be properly managed and shall conform to the approvals and the guidelines of the CGWA in the matter. Formal approval shall be taken from the CGWA for any ground water abstraction or dewatering.
3.16	The quantity of fresh water usage, water recycling and rainwater harvesting shall be measured and recorded to monitor the water balance as projected by the project proponent. The record shall be submitted to the Regional Office, MoEF&CC along with six monthly Monitoring reports.
3.17	Sewage shall be treated in the STP with tertiary treatment. The treated effluent from STP shall be recycled/re-used for flushing, AC make up water and gardening. As proposed, no treated water shall be disposed in to municipal drain.
3.18	No sewage or untreated effluent water would be discharged through storm water drains.
3.19	Onsite sewage treatment of capacity of treating 100% waste water to be installed. The installation of the Sewage Treatment Plant (STP) shall be certified by an independent expert and a report in this regard shall be submitted to the Ministry before the project is commissioned for operation. Treated

S. No	EC Conditions
	waste water shall be reused on site for landscape, flushing, cooling tower, and other end-uses. Excess treated water shall be discharged as per statutory norms notified by Ministry of Environment, Forest and Climate Change. Natural treatment systems shall be promoted.
3.20	Periodical monitoring of water quality of treated sewage shall be conducted. Necessary measures should be made to mitigate the odour problem from STP.
3.21	Sludge from the onsite sewage treatment, including septic tanks, shall be collected, conveyed and disposed as per the Ministry of Urban Development, Central Public Health and Environmental Engineering Organization (CPHEEO) Manual on Sewerage and Sewage Treatment Systems, 2013.

#### 4. Noise Monitoring And Prevention

S. No	EC Conditions
4.1	Ambient noise levels shall conform to residential area/commercial area/industrial area/silence zone both during day and night as per Noise Pollution (Control and Regulation) Rules, 2000. Incremental pollution loads on the ambient air and noise quality shall be closely monitored during construction phase. Adequate measures shall be made to reduce ambient air and noise level during construction phase, so as to conform to the stipulated standards by CPCB / SPCB.
4.2	Noise level survey shall be carried as per the prescribed guidelines and report in this regard shall be submitted to Regional Officer of the Ministry as a part of six-monthly compliance report.
4.3	Acoustic enclosures for DG sets, noise barriers for ground-run bays, ear plugs for operating personnel shall be implemented as mitigation measures for noise impact due to ground sources.

#### 5. Energy Conservation Measures

S. No	EC Conditions
5.1	Compliance with the Energy Conservation Building Code (ECBC) of Bureau of Energy Efficiency as per ECBC Act, 2017 read with ECBC Rules, 2018 shall be ensured. Buildings in the States which have notified their own ECBC, shall comply with the State ECBC also which is in no case should be less than 25% as prescribed.
5.2	Outdoor and common area lighting shall be LED.
5.3	Concept of passive solar design that minimize energy consumption in buildings by using design elements, such as building orientation, landscaping, efficient building envelope, appropriate fenestration, increased day lighting design and thermal mass etc. shall be incorporated in the building design. Wall, window, and roof u-values shall be as per ECBC specifications.
5.4	Energy conservation measures like installation of CFLs/ LED for the lighting the area outside the building should be integral part of the project design and should be in place before project commissioning.
5.5	Solar, wind or other Renewable Energy shall be installed to meet electricity generation equivalent to

S. No	EC Conditions
	1% of the demand load or as per the state level/ local building bye-laws requirement, whichever is higher.
5.6	Solar power shall be used for lighting in the apartment to reduce the power load on grid. Separate electric meter shall be installed for solar power. Solar water heating shall be provided to meet 20% of the hot water demand of the commercial and institutional building or as per the requirement of the local building bye-laws, whichever is higher. Residential buildings are also recommended to meet its hot water demand from solar water heaters, as far as possible.
5.7	The PP will submit report indicating compliance of each parameter of ECBC requirement and submit quantification saving report for each component

## 6. Waste Management

S. No	EC Conditions
6.1	A certificate from the competent authority handling municipal solid wastes, indicating the existing civic capacities of handling and their adequacy to cater to the M.S.W. generated from project shall be obtained.
6.2	Disposal of muck during construction phase shall not create any adverse effect on the neighbouring communities and be disposed taking the necessary precautions for general safety and health aspects of people, only in approved sites with the approval of competent authority.
6.3	Separate wet and dry bins must be provided in each unit and at the ground level for facilitating segregation of waste. Solid waste shall be segregated into wet garbage and inert materials.
6.4	Organic Waste Converter within the premises with a minimum capacity of 0.5 kg /person/day must be installed. Leaves to be put in earmarked pits for converting them into compost to be used as manure
6.5	All non-biodegradable waste shall be handed over to authorized recyclers for which a written tie up must be done with the authorized recyclers.
6.6	Any hazardous waste generated during construction phase, shall be disposed off as per applicable rules and norms with necessary approvals of the State Pollution Control Board.
6.7	Use of environment friendly materials in bricks, blocks and other construction materials, shall be required for at least 20% of the construction material quantity. These include Fly Ash bricks, hollow bricks, AACs, Fly Ash Lime Gypsum blocks, Compressed earth blocks, and other environment friendly materials.
6.8	Fly ash should be used as building material in the construction as per the provision of Fly Ash Notification of September, 1999 and amended as on 27th August, 2003 and 25th January, 2016. Ready mixed concrete must be used in building construction.
6.9	Any wastes from construction and demolition activities related thereto shall be managed so as to strictly conform to the Construction and Demolition Waste Management Rules, 2016.

S. No	EC Conditions
6.10	Used CFLs and TFLs should be properly collected and disposed off/sent for recycling as per the prevailing guidelines/ rules of the regulatory authority to avoid mercury contamination.

## 7. Green Cover

S. No	EC Conditions
7.1	Where the trees need to be cut with prior permission from the concerned local Authority, compensatory plantation in the ratio of 1:10 (i.e. planting of 10 trees for every 1 tree that is cut) shall be done and maintained. Plantations to be ensured species (cut) to species (planted). Area for green belt development shall be provided as per the details provided in the project document.
7.2	Topsoil should be stripped to a depth of 20 cm from the areas proposed for buildings, roads, paved areas, and external services. It should be stockpiled appropriately in designated areas and reapplied during plantation of the proposed vegetation on site.
7.3	The PP shall ensure that the area marked for greenery and trees will not be rendered impervious by any means like soil, compaction or cement concrete or brick or tiles or rubber or plastic cover or any other impervious material in any manner and the area must be maintained pervious for water infiltration/percolation and air flow in the soil. It must be straight on earth and not on any roof or slab of any tile

## 8. Transport

S. No	EC Conditions
8.1	A comprehensive mobility plan, as per MoUD best practices guidelines (URDPFI), shall be prepared to include motorized, non-motorized, public, and private networks. Road should be designed with due consideration for environment, and safety of users. The road system can be designed with these basic criteria.
8.2	Vehicles hired for bringing construction material to the site should be in good condition and should have a pollution check certificate and should conform to applicable air and noise emission standards be operated only during non-peak hours.
8.3	A detailed traffic management and traffic decongestion plan shall be drawn up to ensure that the current level of service of the roads within a 05 kms radius of the project is maintained and improved upon after the implementation of the project. This plan should be based on cumulative impact of all development and increased habitation being carried out or proposed to be carried out by the project or other agencies in this 05 Kms radius of the site in different scenarios of space and time and the traffic management plan shall be duly validated and certified by the State Urban Development department and the P.W.D./ competent authority for road augmentation and shall also have their consent to the implementation of components of the plan which involve the participation of these departments.

## 9. Human Health Issues

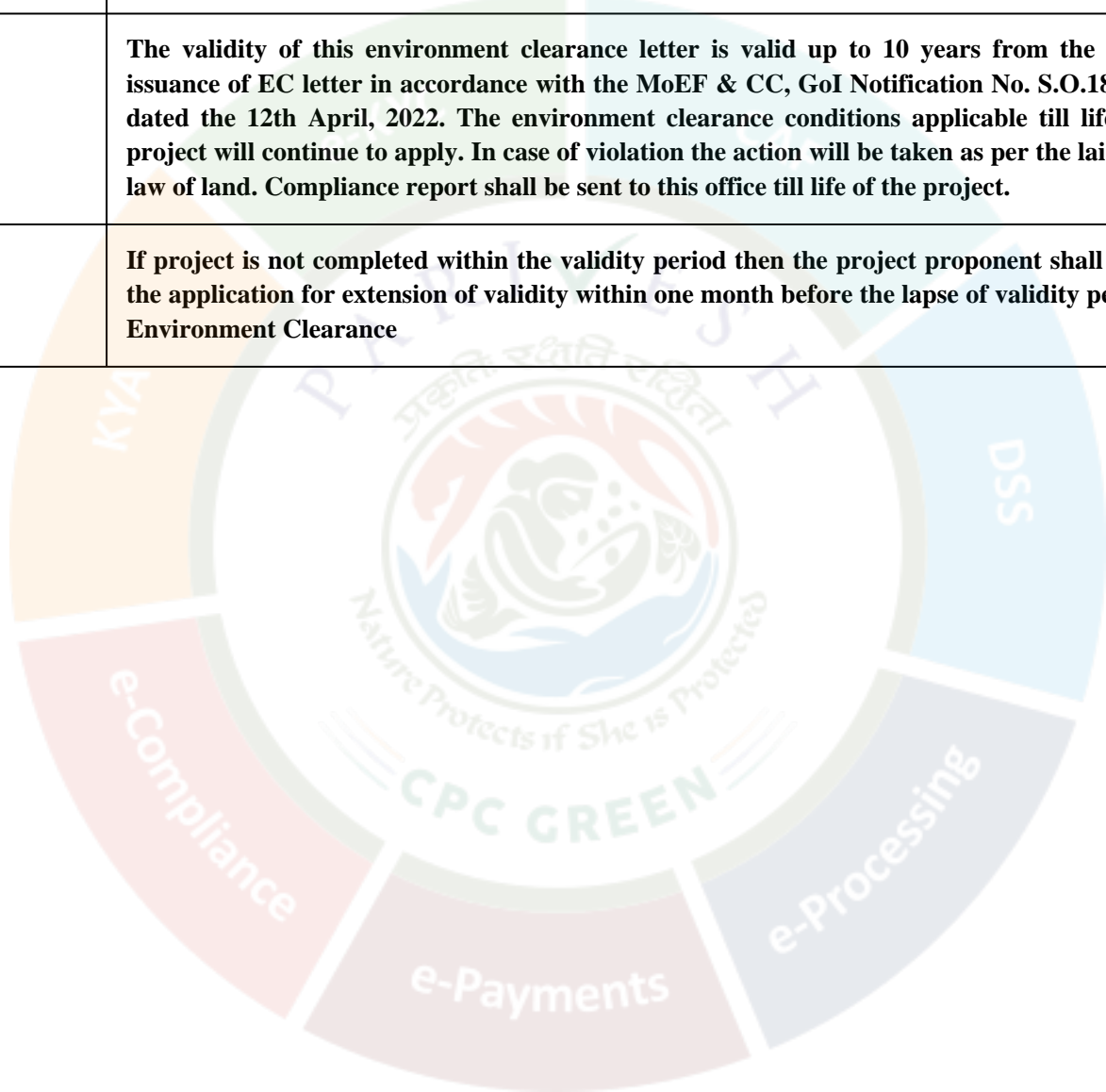
S. No	EC Conditions
9.1	All workers working at the construction site and involved in loading, unloading, carriage of construction material and construction debris or working in any area with dust pollution shall be provided with dust mask.
9.2	For indoor air quality the ventilation provisions as per National Building Code of India.
9.3	Emergency preparedness plan based on the Hazard identification and Risk Assessment (HIRA) and Disaster Management Plan shall be implemented.
9.4	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.
9.5	Occupational health surveillance of the workers shall be done on a regular basis.
9.6	A First Aid Room shall be provided in the project both during construction and operations of the project.
9.7	<p><b>Corporate Environment Responsibility</b></p> <p>The project proponent shall comply with the provisions of CER, as applicable.</p>
9.8	The company shall have a well laid down environmental policy duly approved by the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/ deviation/ violation of the environmental/ forest/ wildlife norms/ conditions. The company shall have defined system of reporting infringements/ deviation/ violation of the environmental/ forest/ wildlife norms/ conditions and/ or shareholders/ stake holders. The copy of the board resolution in this regard shall be submitted to the MoEF&CC as a part of six-monthly report.
9.9	A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of senior Executive, who will directly to the head of the organization.
9.10	Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose. Year wise progress of implementation of action plan shall be reported to the Ministry/Regional Office along with the Six Monthly Compliance Report.

#### 10. Miscellaneous

S. No	EC Conditions
10.1	The project proponent shall prominently advertise it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days indicating that the project has been accorded environment clearance and the details of MoEFCC/SEIAA website where

S. No	EC Conditions
	it is displayed.
10.2	The copies of Environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.
10.3	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.
10.4	The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the ministry of Environment, Forest and Climate Change at environment clearance portal.
10.5	The project proponent shall submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company.
10.6	The project proponent shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities, commencing the land development work and start of production operation by the project.
10.7	The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.
10.8	The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report and also that during their presentation to the Expert Appraisal Committee.
10.9	No further expansion or modifications in the plan shall be carried out without prior approval of the Ministry of Environment, Forests and Climate Change (MoEF&CC)/SEIAA, Haryana. The project proponent shall seek fresh environmental clearance under EIA notification 2006 if at any stage there is change of area of this project
10.10	Concealing factual data or submission of false/fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986.
10.11	The Ministry/SEIAA may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.
10.12	The Ministry /SEIAA reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.
10.13	The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports.
10.14	The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous and Other Wastes (Management and

S. No	EC Conditions
	Transboundary Movement) Rules, 2016, and the Public Liability Insurance Act, 1991 along with their amendments and Rules and any other orders passed by the Hon'ble Supreme Court of India / High Courts and any other Court of Law relating to the subject matter.
10.15	Any change in planning of the approved plan will leads to Environment Clearance void-ab-initio and PP will have to seek fresh Environment Clearance
10.16	The PP should give unambiguous affidavit giving land promoters in accordance with your ownership and possession of land legal the case referred for Environment Clearance to SEIAA.
10.17	<b>The validity of this environment clearance letter is valid up to 10 years from the date of issuance of EC letter in accordance with the MoEF &amp; CC, GoI Notification No. S.O.1807 (E), dated the 12th April, 2022. The environment clearance conditions applicable till life space project will continue to apply. In case of violation the action will be taken as per the laid down law of land. Compliance report shall be sent to this office till life of the project.</b>
10.18	<b>If project is not completed within the validity period then the project proponent shall submit the application for extension of validity within one month before the lapse of validity period of Environment Clearance</b>





Government of India  
Ministry of Environment, Forest and Climate Change  
(Issued by the State Environment Impact Assessment  
Authority(SEIAA), Haryana)

To,

The Sr. Director- Operations and Planning  
MAX HEALTHCARE INSTITUTE LIMITED  
B195 1floor farmer Apartments Sector13 Rohini 110085 -110085

**Subject:** Grant of Environmental Clearance (EC) to the proposed Project Activity under the provision of EIA Notification 2006-regarding

Sir/Madam,

This is in reference to your application for Environmental Clearance (EC) in respect of project submitted to the SEIAA vide proposal number SIA/HR/MIS/271568/2022 dated 06 May 2022. The particulars of the environmental clearance granted to the project are as below.

1. EC Identification No.	EC22B038HR190083
2. File No.	SEIAA/HR/2022/184
3. Project Type	New
4. Category	B2
5. Project/Activity including Schedule No.	8(a) Building and Construction projects
6. Name of Project	Proposed Max Super Speciality hospital
7. Name of Company/Organization	MAX HEALTHCARE INSTITUTE LIMITED
8. Location of Project	Haryana
9. TOR Date	N/A

The project details along with terms and conditions are appended herewith from page no 2 onwards.

Date: 07/12/2022

(e-signed)  
Pardeep Kumar, IAS  
Member Secretary  
SEIAA - (Haryana)

*Note: A valid environmental clearance shall be one that has EC identification number & E-Sign generated from PARIVESH. Please quote identification number in all future correspondence.*

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**Subject: EC for Proposed Max Super Specialty Hospital at Sector 56, Gurgaon, Haryana by M/s Max Healthcare Institute Ltd.**

1. This has reference to your Proposal No. **SIA/HR/MIS/271568/2022 dated 06.05.2022** and subsequent letter dated 09.07.2022, 18.08.2022, 04.10.2022 and 18.11.2022 for obtaining Environmental Clearance under category 8(a) of EIA Notification dated 14.09.2006 along with submission of **due Scrutiny fee (as applicable) of Rs. 2,00,000/- vide DD No. 564883 dated 04.05.2022 (in compliance of Haryana Government, Environment & Climate Change, Department Notification No. DE&CCH/3060 dated 14.10.2021)**. The proposal has been appraised as per prescribed procedure in the light of provisions under the EIA Notification, 2006 on the basis of the mandatory documents enclosed with the application viz., Form-1, Form1-A, Conceptual Plan and additional clarifications furnished in response to the observations of the State Expert Appraisal Committee (SEAC) constituted by MoEF& CC, GoI vide their Notification dated 21.02.2022, in its meeting held on 09.07.2022, 30.08.2022 & 10.10.2022 awarded “Gold” rating / grading to the Project.
2. It is inter-alia, noted that the project involves the EC for Max Super Specialty Hospital at Sector 56, Gurgaon, Haryana.
3. The details of project are as under:

**Basic Details**

S. No.	Description	Proposed
1.	Online Proposal No.	SIA/HR/MIS/271568/2022
2.	Latitude	28°25'48.41"N
	Longitude	77° 5'59.28"E
3.	Plot Area	21,245.560m <sup>2</sup>
4.	FAR Area	31,847.370m <sup>2</sup>
5.	Non - FAR Area	42,460.073m <sup>2</sup>
6.	Ground Coverage	4,997.478m <sup>2</sup>
7.	Proposed Built Up Area	74,307.443m <sup>2</sup>
8.	Green Area with Percentage	6,440m <sup>2</sup> (@30.31 % of Plot Area)
9.	No. of beds	289
10.	Cost of Project	484.84 Cr.
11.	Maximum Height of Hospital Building	35.00 m (Up to Mumty)
12.	Max. no. of floor	3 basements +LG floor + UG floor + Service floor+6 floors
13.	Expected Population	5,323
14.	Total Water Requirement	361KLD
	Domestic water Requirement	241KLD
	Daily Fresh water Requirement	207KLD
	Recycled water	215 KLD

15.	Wastewater Generation, STP & ETP Capacity & Technology	Domestic waste water - 217KLD, Effluent generation - 22KLD, STP Capacity - 300KLD; MBR ETP Capacity - 30KLD
16.	Sludge Generation	30 Kg/day
17.	Rainwater Harvesting Structure with Dimension	4 Nos. (4 mtrs *3mtrs* 4mtrs)
18.	No. of ECS Proposed	778 ECS
19.	Power Source & Requirement	4,000kVA Dakshin Haryana Bijli Vitran Nigam Limited (DHBVN)
20.	Power-backup supply	DG set of capacity 4*1500 kVA (3W + 1S)
21.	Total Solid Waste Generated Total bio medical waste generation Total Municipal Solid Waste	1,316 kg/day 434kg/day 882 kg/day
22.	Biodegradable Waste	529.2 kg/day
23.	SWM Area	85 sqm.
24.	BMW Area	142 sqm.
25.	EMP Cost/Budget	The total of 491 lakhs is allocated as Environmental Management capital cost. The estimated annual recurring environmental cost will be 57.5lakhs
26.	Renewal Energy	Solar PV of 250 kWp will be provided on roof top, which is 6.25 % of the electrical load
27.	Incremental Load PM HC + Nox CO	1.08 µg/m <sup>3</sup> 21.62 µg/m <sup>3</sup> 16.22 µg/m <sup>3</sup>
28.	Construction Phase:  I. Power Back-Up II. Water Requirement & Source III. Anti-Smoke Gun	Power requirement is 300kVA 50KLD STP treated water supply from Behrampur Gurugram Yes

**Table 2 - Environment Management Plan**

COMPONENT	CAPITAL COST (Rs. IN LACS)	RECURRING COST/ANNUM (Rs. IN LACS)
Rain water harvesting	26	1.5
Sewage treatment plant	120	15.0
Effluent Treatment Plant	120	10
Green belt development	25	2.5
Solid Waste Management	15	8.5
External pond adoption and its rejuvenation	60	5
Solar Generation	125	6

Environmental Awareness / Training Programme, Health and Safety measures	Nil	9
<b>Total</b>	<b>491</b>	<b>57.5</b>

4. In view of the recommendations made by State Expert Appraisal Committee (SEAC) in the said case and further consideration of the documents/details submitted by the Project Proponent; the Authority after discussions decided during **150<sup>th</sup> Meeting held on 25.11.2022** to **“GRANT ENVIRONMENT CLEARANCE” TO THE PROJECT, UNDER CATEGORY 8(a) OF EIA NOTIFICATION, 2006**, subject to the conditions listed below:

*PP is required to submit an Affidavit that **“no case(s) is/are pending before any Court relating to the Project”** within 30 days, positively, from the date of Grant of Environment Clearance. Failure to comply with the same will lead to withdrawal of Environment Clearance Granted to the Project”:-*

**A. Specific Conditions:-**

1. Sewage shall be treated in the STP on latest Technology to achieve standards ordered by NGT. The Treated effluent from STP shall be recycled /reused for flushing. DG cooling and Gardening.
2. The PP should not mix the ETP effluent after treatment in the STP and ETP effluent shall be separately utilized for the purposes
3. The Project Proponent would devise a monitoring plan to the satisfaction of the State Pollution Control Board so as to continuously monitor the treated waste water being used for flushing in terms of faecal coli forms and other pathogenic bacteria.
4. The PP shall ensure that total 2% of the cost of project shall be spent on EMP Budget. However, the amount and component shown in EMP table above shall also be included for the purpose of 2% amount. The EMP cost on Socio Economic activities shall be used before the commencement of the project & EMP recurring inside the project shall be implemented throughout the operation of the project. The PP shall establish Environment monitoring cell as per documents submitted.
5. The PP shall not carry out any construct above and below revenue rasta if passing through the project and ensure that permission of the competent authority shall be obtained before carry out any construction above or below the revenue rasta. The PP shall put notice board on the revenue rasta for the passer byes.
6. The project proponent shall upload the status of compliance of the basic details (given in above tables), stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.
7. The Project Proponents would commission a third party study on the implementation of conditions related to quality and quantity of recycle and reuse of treated water, efficiency of treatment systems, quality of treated water being supplied for flushing (specially the bacterial counts), comparative bacteriological studies from toilet seats using recycled treated waters and fresh waters for flushing, and quality of water being supplied through spray faucets attached to toilet seats.
8. Separate wet and dry bins must be provided in each unit and at ground level for facilitating segregation of waste. Solid Waste shall be segregated into wet garbage and inert materials. Wet Garbage shall be composted in Organic waste convertor. Adequate area shall be provided for solid waste management within the premises

- which will include area for segregation, composting. The Inert waste from the project will be sent to solid waste dumping site through authorized vender.
9. Traffic management plan as submitted shall be implemented in letter and spirit. Apart, a detailed traffic management and traffic decongestion plan shall be drawn up to ensure that the current level of service of the roads within a 05 kms radius of the project is marinated and improved upon after the implementation of the project. This plan should be based on cumulative impact of all development and increased habitation being carried out or purpose to be carried out by the project or other agencies in this 05kms radius of the site in different scenarios of space and time
  10. No tree cutting has been proposed in the instant project. A minimum of 1 tree for every 80sqm of land should be planted and maintained. The Existing trees will be counted for this purpose. The landscape planning should include plantation of native species. The species with heavy foliage, broad leaves and wide canopy cover are desirable. Water intensive and/or invasive species should not be used for landscaping. As proposed 6,440m<sup>2</sup> (@30.31 % of Plot Area) shall be provided for Green Area development for whole project, excluding plot areas. The PP shall carry out the plantation in phased manner with 20% every year from the date of start of construction.
  11. The Project Proponent shall obtain all necessary clearance/permission from all relevant agencies including town planning authority before commencement of work. All the construction shall be done in accordance with the local building byelaws.
  12. Consent to establish/operate for the project shall be obtained from the State Pollution Control Board as required under the Air (Prevention and Control of pollution) Act, 1981 and the Water (Prevention and control of pollution) Act, 1974.
  13. The Approval of the Competent Authority shall be obtained for structural safety of building code due to earthquakes, adequacy of fire fighting equipments etc. as per National Building Code including protection measures from lightning etc.
  14. The PP shall obtain the Fire NOC from the Competent Authority before taking the occupation of the building.
  15. The PP shall install the Eco Friendly Green Transformer based on ester oil to reduce the carbon footprint. The PP shall shift to gas based generator set when the gas is available. The PP shall install APCM for the DG set. The PP shall reduce the So<sub>2</sub> load by30% if HSD is used. The DG sets will be operated for maximum 04 hours during power failure through Executing Agency
  16. The PP shall not mix ETP treated effluent with STP water
  17. The PP Shall comply with SOP for reduction of Air and Noise pollution during construction and operation phase
  18. The PP shall increase the capacity of ETP
  19. The PP shall increase solar power upto 5% of total power demand
  20. The PP shall follow SOP regarding single use plastic free
  21. The PP shall follow the SOP for reduction of carbon footprints
  22. The PP shall adopt and maintain one external pond(Sarai Alawardi Pond, 02-HRGGM-GUR-0002-SAWD-001 - UID) for its rejuvenation.
  23. The PP shall obtain the permission regarding withdrawal of ground water, if any from HWRA/CGWA before the start of the project and also obtained the CTO from HSPCB after the approval from HWRA/CGWA.
  24. The PP shall carry out the quarterly awareness programs for the stakeholders of the project.
  25. 04 Rain water harvesting recharge pits shall be provided for ground water recharging as per the CGWB norms.
  26. The PP shall install Digital water level recorder for monitoring the water recharge and carry out quarterly maintenance and cleaning of 04 RWH pits.
  27. The PP shall ensure the compliance of provisions of Plastic Waste Management (Amendment) Rules, 2022 relevant for the project.
  28. The PP may provide electric charging stations to facilitate electric vehicle commuters.

29. The PP shall provide the Anti smog gun mounted on vehicle in the project for suppression of dust during construction & operational phase and shall use the treated water, if feasible.
30. The PP shall take all preventive measures including water sprinkles to control dust during construction and operational phase.
31. Any change in stipulations of EC will lead to Environment Clearance void-ab-initio and PP will have to seek fresh Environment Clearance.
32. PP shall maintain 30.31% of the Plot area as Green Area i.e. 6440 Sqm (as offered in the proposal & committed the same at the time of presentation before the Appraisal Committee). The same shall not be reduced/ modified or put to use for any other use / purpose.
33. PP shall make efforts to develop **“Miyawaki Forest”**, in all corners of the Project Land/ Area.
34. PP shall make arrangements for the **“Quick and Safe disposal of Anti-biotic Waste” by following the relevant guidelines.**

#### **B. Statutory Compliance:**

- [1] The project proponent shall obtain all necessary clearance/permission from all relevant agencies including town planning authority for ground coverage, FAR and should be in accordance with zoning plan approved by Competent Authority before commencement of work. All the construction shall be done in accordance with the local building byelaws.
- [2] The approval of the Competent Authority shall be obtained for structural safety of buildings due to earthquakes, adequacy of firefighting equipment etc as per National Building Code including protection measures from lightning etc.
- [3] The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1986, in case of the diversion of forest land for non-forest purpose involved in the project.
- [4] The project proponent shall obtain clearance from the National Board for Wildlife, if applicable.
- [5] The project proponent shall obtain Consent to Establish/Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from the Haryana State Pollution Control Board.
- [6] The project proponent shall obtain the necessary permission for drawl of ground water /surface water required for the project from the competent authority.
- [7] A certificate of adequacy of available power from the agency supplying power to the project along with the load allowed for the project should be obtained.
- [8] All other statutory clearances such as the approvals for storage of diesel from Chief Controller of Explosives, Fire Department, Civil Aviation Department shall be obtained, as applicable, by project proponents from the respective competent authorities.
- [9] The provisions of the Solid Waste (Management) Rules, 2016, e-Waste (Management) Rules, 2016, the Plastics Waste (Management) Rules, 2016 and Batteries waste (Management Handling Rules 2001 as amended in 2020) shall be followed.
- [10] The project proponent shall follow the ECBC Act/ECBC-Rules prescribed by Bureau of Energy Efficiency, Ministry of Power strictly in addition of bylaws of the State Government.

#### **I. Air Quality Monitoring and Preservation**

- i. Notification GSR 94(E) dated 25.01.2018 of MoEF&CC regarding Mandatory Implementation of Dust Mitigation Measures for Construction and Demolition Activities for projects requiring Environmental Clearance shall be complied with.
- ii. A management plan shall be drawn up and implemented to contain the current exceedance in ambient air quality at the site.

- iii. The project proponent shall install system to carryout Ambient Air Quality monitoring for common/criterion parameters relevant to the main pollutants released (e.g. PM<sub>10</sub> and PM<sub>2.5</sub>) covering upwind and downwind directions during the construction period.
- iv. Diesel power generating sets proposed as source of backup power should be of enclosed type and conform to rules made under the Environment (Protection) Act, 1986. The height of stack of DG sets should be equal to the height needed for the combined capacity of all proposed DG sets. Use of ultra lowsulphur diesel. The location of the DG sets may be decided with in consultation with State Pollution Control Board
- v. Construction site shall be adequately barricaded before the construction begins. Dust, smoke & other air pollution prevention measures shall be provided for the building as well as the site. These measures shall include screens for the building under construction, continuous dust/ wind breaking walls all around the site (at least 3 meter height). Plastic/tarpaulin sheet covers shall be provided for vehicles bringing in sand, cement, murrum and other construction materials prone to causing dust pollution at the site as well as taking out debris from the site.
- vi. Sand, murrum, loose soil, cement, stored on site shall be covered adequately so as to prevent dust pollution.
- vii. Wet jet shall be provided for grinding and stone cutting.
- viii. Unpaved surfaces and loose soil shall be adequately sprinkled with water to suppress dust.
- ix. All construction and demolition debris shall be stored at the site (and not dumped on the roads or open spaces outside) before they are properly disposed. All demolition and construction waste shall be managed as per the provisions of the Construction and Demolition Waste Rules 2016.
- x. The diesel generator sets to be used during construction phase shall be ultra lowsulphur diesel type and shall conform to Environmental (Protection) prescribed for air and noise emission standards.
- xi. The gaseous emissions from DG set shall be dispersed through adequate stack height as per CPCB standards. Acoustic enclosure shall be provided to the DG sets to mitigate the noise pollution. Ultra low sulphur diesel shall be used. The location of the DG set and exhaust pipe height shall be as per the provisions of the Central Pollution Control Board (CPCB) norms.
- xii. For indoor air quality the ventilation provisions as per National Building Code of India.

## **II. Water Quality Monitoring and Preservation**

- i. The natural drain system should be maintained for ensuring unrestricted flow of water. No construction shall be allowed to obstruct the natural drainage through the site, on wetland and water bodies. Check dams, bio-swales, landscape, and other sustainable urban drainage systems (SUDS) are allowed for maintaining the drainage pattern and to harvest rain water.
- ii. Buildings shall be designed to follow the natural topography as much as possible. Minimum cutting and filling should be done.
- iii. Total fresh water use shall not exceed the proposed requirement as provided in the project details. The per capita supply should adhere to NBC 2016 and CGWA Notification dated 12.12.2018.
- iv. The quantity of fresh water usage, water recycling and rainwater harvesting shall be measured and recorded to monitor the water balance as projected by the project proponent. The record shall be submitted to the Regional Office, MoEF&CC along with six monthly Monitoring reports.
- v. A certificate shall be obtained from the local body supplying water, specifying the total annual water availability with the local authority, the quantity of water already committed the quantity of water allotted to the project under consideration and the balance water available. This should be specified separately for ground water and surface water sources, ensuring that there is no impact on other users.

- vi. At least 20% of the open spaces as required by the local building bye-laws shall be pervious. Use of Grass pavers, paver blocks with at least 50% opening, landscape etc. would be considered as pervious surface.
- vii. Installation of dual pipe plumbing for supplying fresh water for drinking, cooking and bathing etc and other for supply of recycled water for flushing, landscape irrigation, car washing, thermal cooling, conditioning etc. shall be done.
- viii. Use of water saving devices/ fixtures (viz. low flow flushing systems; use of low flow faucets tap aerators etc) for water conservation shall be incorporated in the building plan.
- ix. Separation of grey and black water should be done by the use of dual plumbing system. In case of single stack system separate recirculation lines for flushing by giving dual plumbing system be done.
- x. Water demand during construction should be reduced by use of pre-mixed concrete, curing agents and other best practices referred.
- xi. The local bye-law provisions on rain water harvesting should be followed. If local byelaw provision is not available, adequate provision for storage and recharge should be followed as per the Ministry of Urban Development Model Building Byelaws, 2016. Rain Water Harvesting pits shall be provided for ground water recharging as per the CGWB norms.
- xii. A rain water harvesting plan needs to be designed where the recharge bores of minimum one recharge bore per 5,000 square meters of built up area and storage capacity of minimum one day of total fresh water requirement shall be provided. In areas where ground water recharge is not feasible, the rain water should be harvested and stored for reuse. The ground water shall not be withdrawn without approval from the Competent Authority.
- xiii. All recharge should be limited to shallow aquifer.
- xiv. No ground water shall be used during construction phase of the project.
- xv. Any ground water dewatering should be properly managed and shall conform to the approvals and the guidelines of the CGWA in the matter. Formal approval shall be taken from the CGWA for any ground water abstraction or dewatering.
- xvi. The quantity of fresh water usage, water recycling and rainwater harvesting shall be measured and recorded to monitor the water balance as projected by the project proponent. The record shall be submitted to the Regional Office, MoEF&CC along with six monthly Monitoring reports.
- xvii. Sewage shall be treated in the STP with tertiary treatment. The treated effluent from STP shall be recycled/re-used for flushing, AC make up water and gardening. As proposed, no treated water shall be disposed in to municipal drain.
- xviii. No sewage or untreated effluent water would be discharged through storm water drains.
- xix. Onsite sewage treatment of capacity of treating 100% waste water to be installed. The installation of the Sewage Treatment Plant (STP) shall be certified by an independent expert and a report in this regard shall be submitted to the Ministry before the project is commissioned for operation. Treated waste water shall be reused on site for landscape, flushing, cooling tower, and other end-uses. Excess treated water shall be discharged as per statutory norms notified by Ministry of Environment, Forest and Climate Change. Natural treatment systems shall be promoted.
- xx. Periodical monitoring of water quality of treated sewage shall be conducted. Necessary measures should be made to mitigate the odour problem from STP.
- xxi. Sludge from the onsite sewage treatment, including septic tanks, shall be collected, conveyed and disposed as per the Ministry of Urban Development, Central Public Health and Environmental Engineering Organization (CPHEEO) Manual on Sewerage and Sewage Treatment Systems, 2013.

### **III. Noise Monitoring and Prevention**

- i. Ambient noise levels shall conform to residential area/commercial area both during

day and night as per Noise Pollution (Control and Regulation) Rules, 2000. Incremental pollution loads on the ambient air and noise quality shall be closely monitored during construction phase. Adequate measures shall be made to reduce ambient air and noise level during construction phase, so as to conform to the stipulated standards by CPCB / SPCB.

- ii. Noise level survey shall be carried as per the prescribed guidelines and report in this regard shall be submitted to Regional Officer of the Ministry as a part of six-monthly compliance report.
- iii. Acoustic enclosures for DG sets, noise barriers for ground-run bays, ear plugs for operating personnel shall be implemented as mitigation measures for noise impact due to ground sources.

#### **IV. Energy Conservation Measures**

- i. Compliance with the Energy Conservation Building Code (ECBC) of Bureau of Energy Efficiency as per ECBC Act, 2017 read with ECBC Rules, 2018 shall be ensured. Buildings in the States which have notified their own ECBC, shall comply with the State ECBC also which is in no case should be less than 25% as prescribed.
- ii. Outdoor and common area lighting shall be LED.
- iii. Concept of passive solar design that minimize energy consumption in buildings by using design elements, such as building orientation, landscaping, efficient building envelope, appropriate fenestration, increased day lighting design and thermal mass etc. shall be incorporated in the building design. Wall, window, and roof R & U-values shall be as per ECBC specifications.
- iv. Energy conservation measures like installation of CFLs/ LED for the lighting the area outside the building should be integral part of the project design and should be in place before project commissioning.
- v. Solar, wind or other Renewable Energy shall be installed to meet electricity generation equivalent to 1% of the demand load or as per the state level/ local building bye-laws requirement, whichever is higher.
- vi. Solar power shall be used for lighting in the apartment to reduce the power load on grid. Separate electric meter shall be installed for solar power. Solar water heating shall be provided to meet 20% of the hot water demand of the commercial and institutional building or as per the requirement of the local building bye-laws, whichever is higher. Residential buildings are also recommended to meet its hot water demand from solar water heaters, as far as possible.
- vii. The PP will submit report indicating compliance of each parameter of ECBC requirement and submit quantification saving report for each component.

#### **V. Waste Management**

- i. A certificate from the competent authority handling municipal solid wastes, indicating the existing civic capacities of handling and their adequacy to cater to the M.S.W. generated from project shall be obtained.
- ii. Disposal of muck during construction phase shall not create any adverse effect on the neighboring communities and be disposed taking the necessary precautions for general safety and health aspects of people, only in approved sites with the approval of competent authority.
- iii. Separate wet and dry bins must be provided in each unit and at the ground level for facilitating segregation of waste. Solid waste shall be segregated into wet garbage and inert materials.
- iv. Organic Waste Converter within the premises with a minimum capacity of 0.5 kg /person/day must be installed. Leaves to be put in earmarked pits for converting them into compost to be used as manure.
- v. All non-biodegradable waste shall be handed over to authorized recyclers for which a written tie up must be done with the authorized recyclers.

- vi. Any hazardous waste generated during construction phase, shall be disposed of as per applicable rules and norms with necessary approvals of the State Pollution Control Board.
- vii. Use of environment friendly materials in bricks, blocks and other construction materials, shall be required for at least 20% of the construction material quantity. These include Fly Ash bricks, hollow bricks, AACs, Fly Ash Lime Gypsum blocks, Compressed earth blocks, and other environment friendly materials.
- viii. Fly ash should be used as building material in the construction as per the provision of Fly Ash Notification of September, 1999 and amended as on 27th August, 2003 and 25th January, 2016. Ready mixed concrete must be used in building construction.
- ix. Any wastes from construction and demolition activities related thereto shall be managed so as to strictly conform to the Construction and Demolition Rules, 2016.
- x. Used CFLs and TFLs should be properly collected and disposed off/sent for recycling as per the prevailing guidelines/ rules of the regulatory authority to avoid mercury contamination.

## **VI. Green Cover**

- i. No tree can be felled/transplant unless exigencies demand. Where absolutely necessary, tree felling shall be with prior permission from the concerned regulatory authority. Old trees should be retained based on girth and age regulations as may be prescribed by the Forest Department. Plantations to be ensured species (cut) to species (planted).
- ii. A minimum of 1 tree (5' tall) for every 80 sqm of land should be planted and maintained. The existing trees will be counted for this purpose. The landscape planning should include plantation of native species. The species with heavy foliage, broad leaves and wide canopy cover are desirable. Water intensive and/or invasive species should not be used for landscaping.
- iii. Where the trees need to be cut with prior permission from the concerned local Authority, compensatory plantation in the ratio of 1:10 (i.e. planting of 10 trees for every 1 tree that is cut) shall be done and maintained. Plantations to be ensured species (cut) to species (planted). Area for green belt development shall be provided as per the details provided in the project document.
- iv. Topsoil should be stripped to a depth of 20 cm from the areas proposed for buildings, roads, paved areas, and external services. It should be stockpiled appropriately in designated areas and reapplied during plantation of the proposed vegetation on site.

## **VII. Transport**

- i. A comprehensive mobility plan, as per MoUD best practices guidelines (URDPFI), shall be prepared to include motorized, non-motorized, public, and private networks. Road should be designed with due consideration for environment, and safety of users. The road system can be designed with these basic criteria.
  - a) Hierarchy of roads with proper segregation of vehicular and pedestrian traffic.
  - b) Traffic calming measures.
  - c) Proper design of entry and exit points.
  - d) Parking norms as per local regulation.
- ii. Vehicles hired for bringing construction material to the site should be in good condition and should have a pollution check certificate and should conform to applicable air and noise emission standards be operated only during non-peak hours.
- iii. A detailed traffic management and traffic decongestion plan shall be drawn up to ensure that the current level of service of the roads within a 05 kms radius of the project is maintained and improved upon after the implementation of the

project. This plan should be based on cumulative impact of all development and increased habitation being carried out or proposed to be carried out by the project or other agencies in this 05 Kms radius of the site in different scenarios of space and time and the traffic management plan shall be duly validated and certified by the State Urban Development department and the P.W.D./ competent authority for road augmentation and shall also have their consent to the implementation of components of the plan which involve the participation of these departments.

#### **VIII. Human Health Issues**

- i. All workers working at the construction site and involved in loading, unloading, carriage of construction material and construction debris or working in any area with dust pollution shall be provided with dust mask.
- ii. For indoor air quality the ventilation provisions as per National Building Code of India.
- iii. Emergency preparedness plan based on the Hazard identification and Risk Assessment (HIRA) and Disaster Management Plan shall be implemented.
- iv. Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.
- v. Occupational health surveillance of the workers shall be done on a regular basis.
- vi. A First Aid Room shall be provided in the project both during construction and operations of the project.

#### **IX. Corporate Environment Responsibility**

- i. The project proponent shall comply with the provisions of CER, as applicable.
- ii. The company shall have a well laid down environmental policy duly approved by the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/ deviation/ violation of the environmental/ forest/ wildlife norms/ conditions. The company shall have defined system of reporting infringements/ deviation/ violation of the environmental/ forest/ wildlife norms/ conditions and/ or shareholders/ stake holders. The copy of the board resolution in this regard shall be submitted to the MoEF&CC as a part of six-monthly report.
- iii. A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of senior Executive, who will directly to the head of the organization.
- iv. Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose. Year wise progress of implementation of action plan shall be reported to the Ministry/Regional Office along with the Six Monthly Compliance Report.

#### **X. Miscellaneous**

- i. The project proponent shall prominently advertise it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days indicating that the project has been accorded environment clearance and the details of MoEFCC/SEIAA website where it is displayed.
- ii. The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in

addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.

- iii. The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.
- iv. The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the ministry of Environment, Forest and Climate Change at environment clearance portal.
- v. The project proponent shall submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company.
- vi. The project proponent shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities, commencing the land development work and start of production operation by the project.
- vii. The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.
- viii. The project proponent shall abide by all the commitments and recommendations made in the form-IA, Conceptual Plan and also that during their presentation to the Expert Appraisal Committee.
- ix. No further expansion or modifications in the plan shall be carried out without prior approval of the Ministry of Environment, Forests and Climate Change (MoEF&CC)/SEIAA, Haryana. The project proponent shall seek fresh environmental clearance under EIA notification 2006 if at any stage there is change of area of this project.
- x. Any change in planning of the approved plan will lead to Environment Clearance void-ab-initio and PP will have to seek fresh Environment Clearance.
- xi. The PP should give unambiguous affidavit giving land promoters in accordance with your ownership and possession of land legal the case referred for Environment Clearance to SEIAA.
- xii. Concealing factual data or submission of false/fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986.
- xiii. The Ministry/SEIAA may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.
- xiv. The Ministry/SEIAA reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.
- xv. The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports.
- xvi. The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and Rules and any other orders passed by the Hon'ble Supreme Court of India / High Courts and any other Court of Law relating to the subject matter.
- xvii. The validity of this environment clearance letter is valid up to 10 years from the date of issuance of EC letter in accordance with the MoEF & CC, GoI Notification No. S.O.1807 (E), dated the 12th April, 2022. The environment clearance conditions applicable till life space project will continue to apply. In case of violation the action would be taken as per the laid down law of land. Compliance report should be sent to this office till life of the project.
- xviii. If project is not completed within the validity period then the project proponent

shall submit the application for extension of validity within one month before the lapse of validity period of Environment Clearance i.e. 10 years.

- xix. The Project Proponent should intimate to the Authority as well as to the quarter concerned in case of any change in the present communication address.

**(Pardeep Kumar, IAS)**  
**Member Secretary,**  
**State Level Environment Impact**  
**Assessment Authority, Haryana, Panchkula.**

**A copy of the above is forwarded to the following:**

1. Director (IA Division), MoEF& CC, GoI, Indira Paryavaran Bhavan, Zorbagh Road-New Delhi-110003.
2. Chairman, State Environment Impact Assessment Authority, Bay No. 55-58, Prayatan Bhawan, Sector-2, Panchkula, Haryana
3. Chairman, Haryana State Pollution Control Board, C-11, Sector-6, Panchkula.
4. Director, Environment & Climate Change Department, Haryana, SCO 1-3, Sector-17 D, Chandigarh-160017
5. Director General, Town & Country Planning Haryana, Plot No. 3, Sector - 18A, Madhya Marg, Chandigarh- 160018.
6. Regional Office, Ministry of Environment, Forests & Climate Change, Govt. of India, Bay's No. 24-25, Sector 31-A, Dakshin Marg, Chandigarh-160018.
7. Concerned File/ Office Copy

**(Pardeep Kumar, IAS)**  
**Member Secretary,**  
**State Level Environment Impact**  
**Assessment Authority, Haryana, Panchkula.**

**Signature Not Verified**

Digitally signed by Sh. Pardeep  
Kumar, IAS  
Member Secretary

Date: 12/7/2022 4:31:00 PM



प्रभागीय वन अधिकारी द्वारा अनुमति पत्र  
Permission letter by  
Concerned Divisional Forest Officer  
हरियाणा सरकार / Government of Haryana



हरियाणा भू-परिक्षण अधिनियम, 1900 (1900 का पंजाब का अधिनियम II) की धारा-4 के अधीन अधिसूचित भूमि में वृक्षों की कटाई की अनुमति।  
Permission for felling of trees in areas notified under general section-4 of Haryana Land and Preservation Act, 1900 (Punjab Act II of 1900).

नाम Name	दर मरडल कौशिक Dr Mradal Kaushik
संगठन का नाम Organisation Name	M/s Max Healthcare Institute Ltd
वर्तमान पता Current Address	Gautam Colony Narela, North West Delhi
भूमि स्थान Land Location	WAZIRABAD , Gurgaon (Haryana),
भूमि मापन Land Measurements	5.25(Acre)
खसरा/ प्लॉट नम्बर Khasra/Plot Number	115(0-5), 116(0-13), 117(1-9), 118 (1-7), 119(3-8), 123(3-2), 124(0-18), 126(3-5), 127(4-2)
रेंज अफसर का नाम Range Officer Name	Karamvir Malik

Reference No. (SRN):-YCX-WC3-TERX

जारी करने की तिथि / Date of Issuance: 28-04-2023

जारी करने का स्थान / Place of Issuance: Gurgaon

जारी करने वाला प्राधिकरण / Issuing Authority: Divisional Forest Officer (Rajeev Tejyan,)



This is a Digitally Signed Certificate and does not require physical signature. The authenticity of this certificate can be verified from the verification link mentioned below:

<https://164.100.137.243/eservices/mobileapi/verify/forest/YCXWC3TERX>



प्रभागीय वन अधिकारी द्वारा अनुमति पत्र  
Permission letter by  
Concerned Divisional Forest Officer  
हरियाणा सरकार / Government of Haryana



हरियाणा भू-परिक्षण अधिनियम, 1900 (1900 का पंजाब का अधिनियम II) की धारा-4 के अधीन अधिसूचित भूमि में वृक्षों की कटाई की अनुमति।  
Permission for felling of trees in areas notified under general section-4 of Haryana Land and Preservation Act, 1900 (Punjab Act II of 1900).

Species	Classwise number of trees							Under Size Trees	Total no. of trees	Total Volume (M3)
	V	IV	III	IIA	IIB	IA	IB			
Kikar	0	1	0	0	0	0	0	0	1	0.14
Neem	1	0	0	0	0	0	0	0	1	0.06
A. Tortlis (2 Tree Jointly Standing)	1	0	0	0	0	0	0	0	1	0.28
A. Tortlis	0	0	1	0	0	0	0	0	1	0.57
Alanthus	0	0	1	0	0	0	0	0	1	0.57
Sahtoot	1	0	0	0	0	0	0	0	1	0.06
Pipal	0	1	0	1	0	0	0	0	2	1.27
Total	2	3	2	1	0	0	0	0	8	2.95

जारी करने की तिथि / Date of Issuance: 28-04-2023  
जारी करने का स्थान / Place of Issuance: Gurgaon  
जारी करने वाला प्राधिकरण / Issuing Authority: Divisional Forest Officer (Rajeev Tejyan,)



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प्रभागीय वन अधिकारी द्वारा अनुमति पत्र  
Permission letter by  
Concerned Divisional Forest Officer  
हरियाणा सरकार / Government of Haryana



हरियाणा भू-परिक्षण अधिनियम, 1900 (1900 का पंजाब का अधिनियम II) की धारा-4 के अधीन अधिसूचित भूमि में वृक्षों की कटाई की अनुमति।  
Permission for felling of trees in areas notified under general section-4 of Haryana Land and Preservation Act, 1900 (Punjab Act II of 1900).

Applicant Dr Mradal Kaushik located at village Wazirabad district Gurgaon made a proposal to fell trees on this land with Khasra/ Plot number -.  
The report submitted by RFO, Karamvir Malik dated 14-04-2023.

CONDITIONS OF PERMIT

1. Only the numbered trees will be felled.
2. Trees to be felled will not be uprooted except in case of developmental works/ Individual plots.
3. No dragging of wood will be permitted.
4. Felling after sun set and before the sun rise will not be permitted.
5. No fire will be allowed.
6. No damage to unmarked trees will be caused during felling in the area and the owner will have to pay the compensation as determined by DFO for any such damage.
7. The owner of land shall be responsible for any illicit felling in the area and he will have to pay the compensation as determined by DFO for any such illicit felling.
8. No forest produce will be removed without a Rawana Challan from concerned Range Officer.
9. The permit is liable to be cancelled at any time if any violations of conditions of permit take place / facts given in the application for permit are found incorrect. The decision of DFO in this regard will be final.
10. The forest department does not hold any responsibility for distribution of sale proceeds among the owners of the land.
11. No separate permit for timber transit as per Indian Forest Act, 1927 is required within the territory of Haryana.
12. Permission Is Granted As Per Recommendation Of Dfo Subject To The Condition That The User Agency Will Plant Ten Times Of Felling Trees I.e.  $7 \times 10 = 70$  And 02 Ficus Tree To Be Transplanted. permission Valid For Three Month After Issu Date.



Date: 28-04-2023  
Place: Gurgaon

Rajeev Tejyan,  
(Divisional Forest Officer)

This is a Digitally Signed Certificate and does not require physical signature. The authenticity of this certificate can be verified from the verification link mentioned below:

<https://164.100.137.243/eservices/mobileapi/verify/forest/YCXWC3TERX>



# HARYANA STATE POLLUTION CONTROL BOARD

HSPCB Gurgaon North Vikas Sadan, 1st Floor, Near DC Court,

Gurgaon Ph.0124-2332775 Email:-

hspcbrogrn@gmail.com

Website: www.hrocmms.nic.in E-Mail - hspcbho@gmail.com

Telephone No.: 0172-2577870-73



No. HSPCB/Consent/ : 313099722GUNOCTE28646595

Dated:20/12/2022

To.

M/s : Proposed Max Super Speciality Hospital by Max Healthcare Institute Limited  
Sector-56, Gurgaon, Haryana  
GURGAON  
122011

## Sub. : Grant of consent to Establish to M/s Proposed Max Super Speciality Hospital by Max Healthcare Institute Limited

Please refer to your application no. 28646595 received on dated 2022-12-09 in regional office Gurgaon North.

With reference to your above application for consent to establish, M/s Proposed Max Super Speciality Hospital by Max Healthcare Institute Limited is here by granted consent as per following specification/Terms and conditions.

<b>Consent Under</b>	AIR/WATER
<b>Period of consent</b>	20/12/2022 - 06/12/2032
<b>Industry Type</b>	Health -care Establishment / Projects having discharge of 100 KLD or More with or Without Incinerator
<b>Category</b>	RED
<b>Investment(In Lakh)</b>	48484.0
<b>Total Land Area (Sq. meter)</b>	21245.56
<b>Total Builtup Area (Sq. meter)</b>	74307.44
<b>Quantity of effluent</b>	
1. Trade	22.0 KL/Day
2. Domestic	217.0 KL/Day
<b>Number of outlets</b>	2.0
<b>Mode of discharge</b>	
1. Domestic	STP
2. Trade	ETP
<b>Permissible Domestic Effluent Parameters</b>	
1. BOD	10 mg/l
2. COD	50 mg/l
3. TSS	20 mg/l

4. Total Nitrogen	10 mg/l
5. Total Phosphorus	1 mg/l
6. Faecal Coliform (MPN/100ml)	Less than 100
7. pH	5.5-9.0
<b>Permissible Trade Effluent Parameters</b>	
1. BOD	30 mg/l
2. COD	250 mg/l
3. TSS	100 mg/l
4. O&G	10 mg/l
5. pH	5.5-9.0
Number of stacks	1
<b>Height of stack</b>	
1. Stack to DG sets 1500 KVA x 3	6 METER
<b>Permissible Emission parameters</b>	
1. NA	
<b>Capacity of boiler</b>	
1. NA	Ton/hr
<b>Type of Furnace</b>	
1. NA	
<b>Type of Fuel</b>	
1. Diesel	22.2 KL/day

**Regional Officer, Gurgaon North**  
Haryana State Pollution Control Board.

### Terms and conditions

1. The industry has declared that the quantity of effluent shall be 239 KL/Day i.e 22KL/Day for Trade Effluent, 0 KL/Day for Cooling, 217 KL/Day for Domestic and the same should not exceed .
2. The above 'Consent to Establish' is valid for 60 months from the date of its issue to be extended for another one year at the discretion of the Board or till the time the unit starts its trial production whichever is earlier. The unit will have to set up the plant and obtain consent during this period.
3. The officer/official of the Board shall have the right to access and inspection of the industry in connection with the various processes and the treatment facilities being provided simultaneously with the construction of building/machinery. The effluent should conform the effluent standards as applicable
4. That necessary arrangement shall be made by the industry for the control of Air Pollution before commissioning the plant. The emitted pollutants will meet the emission and other standards as laid/will be prescribed by the Board from time to time.
5. The applicant will obtain consent under section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 and under section 21/22 of the Air (Prevention & Control of Pollution) Act, 1981 as amended to-date-even before starting trial production

6. The above Consent to Establish is further subject to the conditions that the unit complies with all the laws/rules/decisions and competent directions of the Board/Government and its functionaries in all respects before commissioning of the operation and during its actual working strictly.
7. No in-process or post-process objectionable emission or the effluent will be allowed, if the scheme furnished by the unit turns out to be defective in any actual experience
8. The Electricity Department will give only temporary connection and permanent connection to the unit will be given after verifying the consent granted by the Board, both under Water Act and Air Act.
9. Unit will raise the stack height of DG Set/Boiler as per Board's norms.
10. Unit will maintain proper logbook of Water meter/sub meter before/after commissioning.
11. That in the case of an industry or any other process the activity is located in an area approved and that in case the activity is sited in an residential or institutional or commercial or agricultural area, the necessary permission for siting such industry and process in an residential or institutional or commercial or agricultural area or controlled area under Town and Country Planning laws CLU or Municipal laws has to be obtained from the competent Authority in law permitting this deviation and be submitted in original with the request for consent to operate.
12. That there is no discharge directly or indirectly from the unit or the process into any interstate river or Yamuna River or River Ghaggar.
13. That the industry or the unit concerned is not sited within any prohibited distances according to the Environmental Laws and Rules, Notification, Orders and Policies of Central Pollution control Board and Haryana State Pollution Control Board.
14. That of the unit is discharging its sewage or trade effluent into the public sewer meant to receive trade effluent from industries etc. then the permission of the Competent Authority owing and operating such public sewer giving permission letter to his unit shall be submitted at time of consent to operate.
15. That if at any time, there is adverse report from any adjoining neighbor or any other aggrieved party or Municipal Committee or Zila Parishad or any other public body against the unit's pollution; the Consent to Establish so granted shall be revoked.
16. That all the financial dues required under the rules and policies of the Board have been deposited in full by the unit for this Consent to Establish.
17. In case of change of name from previous Consent to Establish granted, fresh Consent to Establish fee shall be levied.
18. Industry should adopt water conservation measures to ensure minimum consumption of water in their Process. Ground water based proposals of new industries should get clearance from Central Ground Water Authority for scientific development of previous resource.
19. That the unit will take all other clearances from concerned agencies, whenever required.
20. That the unit will not change its process without the prior permission of the Board.
21. That the Consent to Establish so granted will be invalid, if the unit falls in Aravali Area or non conforming area.
22. That the unit will comply with the Hazardous Waste Management Rules and will also make the non-leachate pit for storage of Hazardous waste and will undertake not to dispose off the same except for pit in their own premises or with the authorized disposal authority.

23. That the unit will submit an undertaking that it will comply with all the specific and general conditions as imposed in the above Consent to Establish within 30 days failing which Consent to Establish will be revoked.
24. That unit will obtain EIA from MoEF, if required at any stage.
25. In case of unit does not comply with the above conditions within the stipulated period, Consent to Establish will be revoked.
26. That unit will obtain consent to operate from the board before the start of product activity.

**Specific Conditions**

**Other Conditions :**



1. The project proponent will obtain all necessary clearances from all concerned departments  
2. Project proponent will not change the quantity of domestic effluent/trade effluent/air emission without prior permission of the Board. Project Proponent will obtain prior CTO before starting of production and apply for CTO/ CTE Extension at least 90 days before expiry date of this CTE. 3. Project Proponent will install STP/ETP/APCM along with the main project. 4. Project Proponent will install adequate acoustic enclosures/chambers on their DG SETS with proper stack height as per prescribed norms to meet the prescribed standards under EP Rules. 5. Project Proponent will comply with the provisions of Water Act, 1974, Air Act, 1981, Solid Waste Management Rules, 2016, Hazardous & Other Waste Management Rules, 2016, Plastic Waste Management Rules, 2016, E-Waste Management Rules, 2016, Battery Managements Rules, C&D Waste Management Rules, 2016& amendments and other applicable environmental legislation. 6. Project Proponent will use only treated effluent supplied from Sewage treatment plant during construction phase of the project 7. That this CTE will not provide any relaxation /benefit from any other Act/Rules/Regulations applicable to the project/land in question. 8. Project Proponent will not discharge any type Treated or untreated effluent outside the premises of the project. 9. Project Proponent will not use in their DG set as a fuel i.e. pet coke, furnace oil and LSHS etc. 10. Stack emission level should be stringent than the existing standards in terms of the identified critical pollutants. 11. Effective fugitive emission control measures should be imposed in the process, transportation, parking etc. 12. Encourage use of cleaner fuels (pet coke / furnace oil /LSHS may be avoided). 13. Best available technology may be used. For example usage of EAF/SAF/IF in place of Cupola Furnace, Usage of Supercritical technology in place of sub – critical technology. 14. Increase of green belt cover by 40% of the total land area beyond the permissible requirement of 33%, wherever feasible. 15. Stipulation of greenbelt outside the project premises such as avenue plantation, plantation in vacant areas, social forestry etc. 16. Assessment of carrying capacity of transportation load on the roads inside the industrial premises. If the roads required to be widened, shall be prescribed as a condition. 17. Project Proponent will not discharge any type of effluent inside & outside of the premises of the project and reuse/recycle of treated waste water be ensured. 18. Continuous monitoring of emission and effluent quality / quantity to be installed & will connect the same with server of CPCB and HSPCB. 19. A detailed water harvesting plan may be submitted by the project proponent. 20. Project Proponent will achieve zero discharge and install latest technology of STP/ETP and reuse/recycle of treated effluent. 21. In case, domestic waste water generation is more than 10 KLD, the industry may install STP. 22. Dumping of waste (fly ash, slag, red mud etc.) may be permitted only at designated locations approved by SPCBs/PCCs. 23. More stringent norms for management of hazardous waste. The waste generated should be preferably utilized in co-processing. 24. Monitoring of compliance of EC conditions may be submitted with third party audit every year. 25. Project Proponent will dispose off their waste/spent oil of DG sets only to authorize recyclers by the HSPCB. 26. The % of the CER may be least 1.5 times the slabs given in the OM dated 01.05.2018 for SPA and 2 times for CPA in case of Environmental Clearance. 27. Project proponent will comply all the directions of CPCB in this regard and will comply all the orders issued by any court in this regard. 28. Project Proponent will submit an affidavit regarding compliance of above said conditions within 30 days. 29. The above Consent to Establish is further subject to the conditions that the unit complies with all the laws/rules/decisions and competent directions of the Board/Government and its functionaries in all respects before commissioning of the operation and during its actual working strictly. 30. Unit will deploy anti –smog guns at site to comply with the above said directions & keep proper record of operation of the same and submit action taken report to this office within 03 days positively, failing which action shall be initiated as per applicable Acts/ Rules /Notifications. 31. Project proponent will comply with all the conditions mentioned in Environmental Clearance granted vide letter dated 03.09.2014 and submit the compliance of the same within 90 days to this office. 32. CTE so granted is on the basis of detail submitted by the unit in online application, CTE granted is without prejudice to any violation made by unit in past & will be deemed revoked & further action will be taken as per law if any violation is observed at any stage. 33. The Project Proponent/unit will not claim any benefits on the basis of this CTE in respect of past violation committed by them 34. This CTE is valid only valid for the area for which unit has obtained License from DTCP and Aravali clearance from Deputy Commissioner. 35. Unit will not do any construction work in their project without obtaining valid renewed license from DTCP and CTE/CTE extension will be become null and void if unit fails to renew DTCP license. 36. Unit will deposit environmental compensation as and when it will be finalized by HSPCB. 37. This CTE is granted to the unit would not provide any relief and immunity in prosecution action against the unit under Water Act and Air Act .This CTE is without prejudice to the action to be taken in respect of any violation found at any stage and time and this CTE also do not grant any relief to the unit in matter of applicable actions / penal proceedings under water act , Air act ,EP act including forfeiture of performance security,if any 38.At any stage, if any violation observed of any above conditions at any time, this CTE stands cancelled /revoked & further action will be taken as per law if any violation is observed at any stage.

*Regional Officer, Gurgaon North  
Haryana State Pollution Control Board.*



# हरियाणा तालाब एवं अपशिष्ट जल प्रबंधन प्राधिकरण

Plot No. 9, DHL Square Building, 3<sup>rd</sup> floor, HSIIDC IT Park, Sector-22, Panchkula-134109

E-Mail Id: [haryanapondauthority@gmail.com](mailto:haryanapondauthority@gmail.com)

Website: [www.hpwwma.org.in](http://www.hpwwma.org.in)

Letter No. HPA/ENGG/0098/2022/ 1732

Dated: 10/04/2024

To

Sh. Manvendra Singh

Mob No 8860091525.

Email: [Manvendra.Singh@maxhealthcare.com](mailto:Manvendra.Singh@maxhealthcare.com)

**Subject:** Request letter for seeking another of Pond for rejuvenation in District Gurugram.

**Reference:** Your Email dated 08.04.2024 on the subject cited above.

\*\*\*\*\*

With reference to your letter mentioned under reference, it is hereby suggested to carry out the renovation/ rejuvenation work on the Pond named Mandir Wala Pond in village Mankrola (**Annexure-A**) in lieu of already allotted "Sindroha Pond" in village Mankrola of Block Gurugram of District Gurugram as communicated vide letter no. HPWWMA/ENGG/0098/2022/1047-1048, dated 28/02/2024. The above change as requested may be confirmed along with a clarification whether the execution i.e. renovation work of pond will be done at your own level or be got executed through Pond Authority please.

DA : As enclosed



Technical Advisor

HPWWMA, Panchkula

Letter No. HPA/ENGG/0098/2022/ 1733

Dated: 10/04/2024

Copy of above is forwarded to following for information please:

1. PA to Executive Vice-Chairperson, HPWWMA, Panchkula.



Technical Advisor

HPWWMA, Panchkula

## Annexure – A

### Detail of Pond of Village Mankrola of Dist. Gurugram

S/N	District	Block	Village	Name of Pond	UID	Present condition of Pond	Revenue Area	Actual Area	Status
1	Gurugram	GURUGRAM	Mankrola(42)	Mandir Wala Pond	01HRG GMGG M0042 MAKD0 02	Polluted but not Overflowing	3.68	3.68	Not in AAP

## बकाया वेतन को लेकर सफाई कर्मचारियों का नगर परिषद कार्यालय के बाहर धरना

बलदुर्गाढ़, 28 जनवरी (बि.स)

बकाया वेतन को लेकर ठेकेदार के अधीन कार्यरत सफाई कर्मचारियों ने मंगलवार सुबह नगर परिषद कार्यालय के बाहर धरना देकर रोष जताया। कर्मचारियों ने कहा कि जब वे ठेकेदार से बकाया वेतन को लेकर बात करते हैं तो वह कोई स्पष्ट जवाब नहीं देता है। जब वे नगर परिषद अधिकारियों से बात करते हैं तो अधिकारी ठेकेदार को ठेका देने की बात कहकर अपना पल्ला झाड़ लेते हैं। ऐसे में वे किससे अपना बकाया वेतन मांगें, इसका किसी के पास कोई जवाब नहीं है। उन्हें 10 जनवरी तक का आश्वासन दिया गया था, मगर आज 28 जनवरी हो चुकी है, मगर उन्हें बकाया वेतन अभी तक नहीं मिला है।



बहादुरगढ़ नगर परिषद कार्यालय के बाहर मंगलवार को धरने पर बैठे सफाई कर्मचारी। बि.स

सफाई कर्मचारी शिव, अनिल, विनोद, आकाश, विशाल व मुकेश ने कहा कि उन्हें पिछले 3 माह का वेतन अभी तक नहीं मिला। इसके चलते उन्हें भारी परेशानियों का सामना करना पड़ रहा है। हालात ये हैं कि उन्हें उधार मांग कर अपने घर का खर्च चलाना पड़ रहा है। बच्चों को फ्रीस तक वे समय पर नहीं भर पा रहे हैं। काफ़ी कर्मचारी ऐसे हैं जो क्रियारे के मकान पर रहते हैं। ऐसे में समय पर क्रियारे न देने की वजह से मकान मालिक भी उन्हें घर खाली करने के लिए बोल रहे हैं। कर्मचारियों ने चेताया कि अगर 2 दिन के अंदर उनका बकाया वेतन नहीं दिया गया तो वे अनिश्चितकालीन हड़ताल पर चले जाएंगे।

## स्कूल प्रबंधन पर विद्यार्थी की हत्या का आरोप, पुलिस ने दर्ज किया केस

होलल, 28 जनवरी (बि.स)

हसनपुर पुलिस थाने के अंतर्गत सहदेव का नंगला की एक महिला ने हसनपुर स्थित डीके बचपन स्कूल में नैजमेट व झाड़वर पर उसके ड्राई साल के बेटे शिवांश की हत्या करने की शिकायत हसनपुर पुलिस थाने में करने पर पुलिस ने मामला दर्ज कर लिया है। प्राप्त जानकारी के अनुसार सहदेव का नंगला निवासी महिला रेखा ने हसनपुर पुलिस को दी शिकायत में कहा कि उसके दो लड़के डीके बचपन प्ले विद्यालय हसनपुर में प्ले क्लास में पढ़ते थे। 27 जनवरी को एक इको का झाड़वर दीपहर को उनके छोटे लड़के शिवांश को लेकर उनके घर पर आया व गेट घा घा व अनिश्चितकालीन हड़ताल पर चले जाएंगे।

हसनपुर में बच्चे को डॉक्टर को दिखाया गया। गंभीर हालत को देखते हुए पलवल ले जाने पर डाक्टर ने उनके बच्चे को मृत घोषित कर दिया। रेखा ने आरोप लगाया कि स्कूल प्रबंधन व झाड़वर की मिलीभगत के कारण उनके बच्चे की मृत्यु हो गई। हसनपुर पुलिस ने मामला दर्ज कर लिया है। खबर लिखे जाने तक मामले में कोई गिरफ्तारी नहीं हो पाई थी।

डीके बचपन प्ले स्कूल हसनपुर के प्रबंधक राहुल का कहना है कि यह बच्चा उनके विद्यालय में नहीं पढ़ता था व सहदेव का नंगला गांव में उसके घर पर ही यह हादसा घटित हुआ है। शिवांश का फाड़ल फोटो

## हरियाणा की जनता से माफ़ी मांगें केजरीवाल : मुकेश गौड़ पुतला फूंक यमुना पर दिखे बयान का जताया विरोध

भिवानी, 28 जनवरी (ह.प्र)



भिवानी में मंगलवार को गुजरात कार्यकर्ता हनुमान ढागी चौक पर आप नेता अरविंद केजरीवाल व दिल्ली की मुख्यमंत्री आतिशी का पुतला फूंकते हुए। -ह.प्र

यमुना के पानी में हरियाणा द्वारा जहर मिलाते के अरविंद केजरीवाल के बयान के विरोध में मंगलवार को भारतीय जनता पार्टी के कार्यकर्ताओं ने शहर में प्रदर्शन किया तथा स्थानीय हनुमान ढागी चौक पर आप नेता अरविंद केजरीवाल व दिल्ली की मुख्यमंत्री आतिशी का पुतला फूँका। प्रदर्शन का नेतृत्व जिला अध्यक्ष मुकेश गौड़ ने किया।

गौड़ ने कहा कि यमुना को साफ तो दिल्ली सरकार नहीं कर पाई और आरोप हरियाणा पर लगा रही है। दिल्ली के 12 गंदे नालों का वेस्ट यमुना में डाला जा रहा है। ऐसे में दिल्ली सरकार को पहले

सूनी से माफ़ी मांगनी चाहिए। उन्होंने कहा कि केजरीवाल आज तक झूठे वादे और नारों के सहारे ही सत्ता हासिल करते आ रहे हैं। इस बार उन्हें अपनी हार तय लग रही है इसलिए इस तरह के घंटिया बयान देने पर उतर आए हैं।

मुकेश गौड़ ने कहा कि केजरीवाल को हरियाणा के लोगों और फिर मुख्यमंत्री नायब सिंह

## शराबियों से जैन समाज के लोग परेशान

सफ़ीदौ, 28 जनवरी (बि.स)

कुछ शराबियों से सफ़ीदौ जैन समाज के लोग इसलिए परेशान हैं कि पियक्कड़ रात को यहाँ पुरानी अनाज मंडी के जैन स्थानक परिसर में न केवल शराब पीते हैं बल्कि मांस आदि भी पका कर खाते हैं। इस संदर्भ में आज जैन समाज के लोगों ने रोष व्यक्त करते हुए पुलिस प्रशासन से इस परिसर के आसपास पैट्रोलिंग की मांग की। सफ़ीदौ रासस मिलर्स एसोसिएशन के प्रधान सुभाष जैन व करियाना मचेंद्रस एसोसिएशन के राकेश जैन ने बताया कि कुछ शराबी इस परिसर में शराब पीते हैं और कई तरह की गलत चीजें पकाते हैं। उन्होंने बताया कि ऐसे लोगों को इस परिसर में इस तरह का गलत काम करने से उन्होंने रोका भी लेकिन वे रोकने पर अभद्रता पर उतर आते हैं।

## खाटू श्याम मेला 28 फरवरी से 11 मार्च तक, तैयारियां शुरू

### श्रद्धालुओं के लिए गांवों में आयोजित किए जाते हैं सेवा शिविर

कलीना, 28 जनवरी (बि.स)

राजस्थान के सीकर जिले की खाटू नगरी में आयोजित होने वाले लखी मेले को लेकर तैयारियां शुरू हो गई हैं। इस मेले में जाने वाले श्रद्धालुओं की सुविधा के लिए कनीना सब डिवीजन के विभिन्न गांवों में सेवा शिविरों का आयोजन किया जाता है। इनमें भोजन, नारता, स्नान करने, रात्रि विश्राम तथा चिकित्सा सुविधा उपलब्ध करवाई जाती है। 29 जनवरी को पौष माह की मौनी अमावस्या के माहुर बाद फाल्गुन माह प्रारंभ होगा जिसके लिए श्रद्धालु अभी से तैयारी शुरू करने लगे हैं। श्याम मंदिर कमेटी के सदस्य सेवक श्याम सिंह चौहान ने बताया कि

श्रीश्याम जी का लखी फाल्गुन मेला 28 फरवरी से 11 मार्च तक चलनेगा। इस मेले को लेकर सभी तैयारियां शुरू कर दी गई हैं। सुरुक्षा व्यवस्था को लेकर सीसीटीवी कैमरे लगाए जा रहे हैं। इसके अलावा विभिन्न प्वाइंटों की पहचान की जा रही है जहां सुरक्षाकर्मी तैनात किए जाने हैं। मंदिर कमेटी का मानना है कि पिछले वर्ष की भांति इस वर्ष भी करोड़ों श्रद्धालु बाबा के दर्शन कर पाएंगे।

बाता दें कि इस मेले में हरियाणा के महेंद्रगढ़, भिवानी, रोहतक, सिरसा, हिसार, चरखी दादरी, गुरुग्राम, फरीदाबाद, झज्जर के अलावा दूर-दराज से श्रद्धालु रेल, बस सहित अपने वाहन एवं ध्वज लेकर यात्रा करते हैं।

## डीसीआरयूसटी के 14 विद्यार्थियों का कैंपस प्लेसमेंट में चयन

सोनीपट, 28 जनवरी (ह.प्र)

दीनबंधु छोटूराम विज्ञान एवं प्रौद्योगिकी विश्वविद्यालय (डीसीआरयूसटी), मुखल के 14 विद्यार्थियों को कैंपस प्लेसमेंट में चयन हुआ है। चयनित विद्यार्थियों को 3 लाख से 5.50 रुपये का वार्षिक पैकेज मिलेगा। चयनित विद्यार्थियों को कुलपति प्रो. सिंह ने बधाई दी तथा उनके उज्वल भविष्य की कामना की। कुलपति प्रो. सिंह ने बताया कि विश्वविद्यालय में कैंपस प्लेसमेंट के लिए नेक्टर लाइफ साइंस लिमिटेड को प्लेसमेंट की कड़ी चयन प्रक्रिया के बाद आशीष मलिक, अंकित कुमार, भूपेंद्र सिंह, राहुल दहिया, रवि कुमार झा, अभिषेक कुमार, आकाश शर्मा, मयंक कुमार निवारि, राजा, यश अडलवात, दीपक मोहिला, मोहित व शशांक आदि का चयन किया गया।

## कार की टक्कर से परिवार के इकलौते बेटे की मौत

सोनीपट, 28 जनवरी (ह.प्र)

सेक्टर-23 आउटर पर कार की चपेट में आने से पैदल जा रहे परिवार के इकलौते बेटे की मौत हो गई। सूचना के बाद पहुंची पुलिस ने शव को कब्जे में लेकर पोस्टमॉर्टम करवाया। जरूरतमंद परिवार के बेटे का सफे इंडिया फाउंडेशन ने अंतिम संस्कार करवाया। युवक के परिवार में अब तीन बच्चे व माता-पिता हैं। मूलरूप से बिहार के वैशाली के गांव मुरादाबाद (हाल निवासी महलाना रोड सरस्वती विहार) मुकेश ने बताया कि वह अपने बेटे सनी के साथ राजमिस्त्र का काम करते हैं। वे पैदल सेक्टर-23 आउटर रोड पर जा रहे थे। उसी दौरान कार ने उसके बेटे सनी को पीछे से टक्कर मार दी। हादसे में उनका बेटा घायल हो गया। राहगीरों की मदद से उसे उपचार के लिए नागरिक अस्पताल सोनीपट लेकर पहुंचे, जहां चिकित्सक ने उन्हें मृत घोषित कर दिया। पुलिस ने कार चालक के खिलाफ मुकदमा दर्ज कर लिया है। सफे इंडिया फाउंडेशन के प्रधान संजय सिंघला ने बताया कि युवक के पड़ोसियों ने फाउंडेशन संपर्क किया था। परिवार की आर्थिक स्थिति बेहतर नहीं होने के चलते संस्था ने अग्रवाल वैश्य समाज के पूर्व प्रधान राजेश गर्ग के सहयोग से शव का अंतिम संस्कार कराया।

## कोबी से जुड़े उद्यमियों ने एंटी करप्शन ब्यूरो को लिखा पत्र करोड़ों के टेंडरों की उच्च स्तरीय जांच की मांग

बहादुरगढ़, 28 जनवरी (बि.स)

औद्योगिक क्षेत्रों में उद्योगों के विकास के नाम पर पिछले 10 साल में करोड़ों के टेंडर हुए लेकिन धरातल पर विकास कार्य नहीं है। औद्योगिक विकास को लेकर करोड़ों रुपये के बजट का प्रावधान हुआ है लेकिन जिले में विभिन्न वैध व अवैध औद्योगिक क्षेत्रों की हालत देखकर यह लगता है कि यहाँ विकास से कोई लेना देना नहीं। समस्याओं का मकड़जाल पूरी तरह से बना हुआ है। बहादुरगढ़ में छोटे-बड़े हजारों उद्योगों में लाखों कर्मचारी काम करते हैं, लेकिन सुविधाओं के अभाव में हर रोज उद्यमियों व श्रमिक परेशान होते हैं। कन्फेडरेशन ऑफ बहादुरगढ़ इंडस्ट्रीज ने प्रदेश सरकार के साथ-साथ प्रदेश के एंटी करप्शन ब्यूरो को पत्र लिखकर इस मामले की उच्च स्तरीय जांच की मांग की है।

कोबी से जुड़े कई उद्यमियों ने कहा कि कोबी से जुड़े उद्यमियों ने एंटी करप्शन ब्यूरो को लिखा पत्र औद्योगिक क्षेत्रों में सूवर पाणी व पेयजल के साथ विजली आदि की व्यवस्था के लिए 10 साल में करोड़ों रुपये दिए हैं। करोड़ों के टेंडर भी लगाए गए हैं लेकिन यहाँ काम 10 फीसदी भी नहीं हो पाया है जो दिखाई दे सके। इसी कारण अब पत्र में कहा गया है कि टेंडरों से लेकर एच.एस.आई.आई.डी.सी. द्वारा भेजे गए सभी पत्रों व भेजे गए रुपये की क्रमवाइज जांच की जाए तो उम्मीद है कि करोड़ों रुपये किसकी जेब में गए, इसका बड़े स्तर पर खुलासा हो सकता है। उद्यमियों ने कहा कि बहादुरगढ़ में चाहे सूर्य नगर क्षेत्र हो या बालाजी जैसे औद्योगिक क्षेत्र व एवं अन्य उद्योग नगर, लेकिन यहाँ से करोड़ों का टैक्स सरकार का जा रहा है। इसी तरह से गुणपति धाम, रोहद, दहकोरा रोड, बरहाना, सेक्टर 16, 17, 4 बी के साथ बहादुरगढ़ में लगभग 17 औद्योगिक क्षेत्र हैं। इनके द्वारा अरबों रुपये का उत्पादन कर करोड़ों का शुल्क अर्जित किया जाता है।

## हिन्दू शिक्षण संस्थान (रजि.) रोहतक

श्री लाल नाथ वलॉथ मार्केट, भिवानी स्टैंड रोहतक  
अदरगाहा सदरगाँव, हिन्दू शिक्षण संस्थान, रोहतक संस्कार के सभी अर्जन सदस्यों को सूचित किया जाता है कि संस्थान की जनरल बॉडी का चुनाव रविवार 16/02/2025 को प्रातः 9-00 बजे से सायं 4-00 बजे तक श्री लाल नाथ हिन्दू कॉलेज भिवानी रोड, रोहतक में होगा। चुनाव अधिकारी श्री नरेंद्र नाथ मिश्रा, एडवोकेट को नियुक्त किया गया है।  
सुनाय कार्यक्रम निम्न प्रकार से रहेंगे :-  
\* नामांकन पत्र दाखिल करने की तिथि : 06/02/2025 से 09/02/2025 प्रातः 09 बजे से सायं 04-00 बजे तक (संस्थान कार्यालय, श्री लालनाथ हिन्दू कॉलेज, भिवानी रोड, रोहतक)  
\* नामांकन पत्रों की जांच : 09/02/2025 को सायं 04-00 बजे से सायं 06-00 बजे तक (संस्थान कार्यालय, श्री लालनाथ हिन्दू कॉलेज, भिवानी रोड, रोहतक)  
\* नामांकन वापस लेने की तिथि : 10/02/2025 से 11/02/2025 प्रातः 09 बजे से सायं 04-00 बजे तक (संस्थान कार्यालय, श्री लालनाथ हिन्दू कॉलेज, भिवानी रोड, रोहतक)  
\* मतदान की तिथि : 16/02/2025 को प्रातः 09-00 बजे से सायं 04-00 बजे तक (स्थान, श्री लालनाथ हिन्दू कॉलेज, भिवानी रोड, रोहतक)  
\* वोट की गिनती एवं चुनाव परिणाम : 16/02/2025 को मतदान के तुरंत पश्चात (स्थान, श्री लालनाथ हिन्दू कॉलेज, भिवानी रोड, रोहतक)  
नोट - नामांकन पत्र 03/02/2025 से संस्थान कार्यालय, श्री लालनाथ हिन्दू कॉलेज, भिवानी रोड, रोहतक से प्रातः 09 बजे से सायं 04-00 बजे तक 1000/- रु. देकर प्राप्त किया जा सकता है तथा सदस्यता सूची (List of Members) को मूल्य 100/- रु. होगा। हिन्दू शिक्षण संस्थान कार्यालय श्री लालनाथ हिन्दू कॉलेज, भिवानी रोड, रोहतक 03/02/2025 से प्रोटीन प्रातः 09-00 बजे से सायं 04-00 बजे तक खुला रहेगा।  
सभी सदस्य आमना-जमान पहचान पत्र, अक्षर बर्तन अक्षर साक्षर। संस्था के सभी सदस्यों को सूचित किया जाता है कि चुनाव सम्बन्धी सभी कार्यवाही संस्थान कार्यालय श्री लालनाथ हिन्दू कॉलेज, भिवानी रोड, रोहतक के माध्यम से की जाएगी।  
नोट - नवीनीकरण शुल्क (Renewal Fees) दिनांक 03/02/2025 सायं 4-00 बजे तक संस्थान कार्यालय में जमा कराई जा सकती है।

गोवाडिन : 7988117022

जितेंद्र महता, महामंत्री

## रेलवे में गुप-ए तक पहुंचा गरीब का बेटा, गांव में बंटे लड्डू

सफ़ीदौ, 28 जनवरी (बि.स)

सफ़ीदौ क्षेत्र के गांव बहादुरगढ़ के एक गरीब परिवार में जन्मे मोहनलाल ने भारतीय रेलवे में गुप-ए वर्ग का अधिकारी पद पा लिया है। मोहनलाल चौधरी की इस उपलब्धि की खुशी में उनके गांव में आज लड्डू बांटे गए। कभी करनाल के नीलोखेड़ी के एक कॉलेज से सिविल इंजीनियरिंग का डिप्लोमा लेकर रेल विभाग में भर्ती हुए, आजकल दिल्ली के बड़ौदा हाउस स्थित उत्तर रेलवे मुख्यालय में कार्यकारी अभियंता के पद पर तैनात मोहनलाल ने आज दिल्ली से फोन पर बताया

कि वह उन 81 रेल अधिकारियों में शामिल हैं जिन्होंने वर्ष 2008 में यूपीएससी से गुप-ए के लिए परीक्षा पास की थी। उन्होंने बताया कि उसी वर्ष यूपीएससी ने 5 वर्ष की सेवा पर दी जाने वाली टाइम-बाउंड प्रमोशन पर रोक लगा दी थी तो उनकी अगली तत्कमी का मामला लटक गया था। इसके विरोध में यूपीएससी के साथ उनका विवाद चला। उन्होंने बताया कि उस विवाद के फलस्फुट में यूपीएससी ने उन्हें वर्ष 2019 से गुप-ए पद का लाभ देना मान लिया है जिसके बाद उनकी तैनाती आजकल अधीक्षक अभियंता के पद पर होने वाली है।

## स्कूली छात्रों को सिखाए योग के गुर

जौड़ (जुलाना), 28 जनवरी (ह.प्र)

जुलाना क्षेत्र के बुढ़ाखेड़ा लाठर गांव के राजकीय स्कूल में मंगलवार को छात्रों को योग के गुर सिखाए गए। योग सहायक शर्मिला ने बताया कि आयुष विभाग द्वारा 12 जनवरी से 12 फरवरी तक योग के प्रति जागरूकता के लिए अभियान चलाया जा रहा है। इसी कड़ी में बुढ़ाखेड़ा गांव के राजकीय स्कूल में छात्रों को योग के प्रति जागरूक किया गया है। उन्होंने कहा कि योग से शरीर स्वस्थ बनता है। योग हमारे पूर्वजों की पहचान है। आज योग को भारत ही नहीं दूसरे देश के नागरिक भी अपना रहे हैं। योग से शरीर की काफी बीमारियां कट जाती हैं।

## लायंस क्लब भिवानी सुरभि ने किया सम्मान समारोह का आयोजन

भिवानी, 28 जनवरी (ह.प्र)



भिवानी में मंगलवार को लायंस क्लब भिवानी सुरभि द्वारा आयोजित कार्यक्रम में उपस्थित सम्मानित किए गए सदस्य। -ह.प्र

जनपद अध्यक्ष लायन सुधा कामरा के आह्वान पर भविष्य निर्माण सेवा परियोजना में लायंस क्लब भिवानी सुरभि द्वारा 20 मरीजों का निःशुल्क चेकअप किया गया जिसमें शुगर, बीपी, हार्ट रेट, ऑक्सीजन, हृदय रोग पीडितों की निःशुल्क जांच की गई। इस दौरान 18 लोगों की शुगर जांची गई जिसमें से 6 शुगर पीडित मरीज मिले। मरीजों को जीवनचर्या में सुधार लाने को कहा गया, 18 लोग बीपी, हार्ट रेट, ऑक्सीजन के लिए जांचे गए जिसमें से 6 लोग शुगर, बीपी, हार्ट रेट, आंखों के लिए जांचे गए जिसमें से 6 लोग हाई ब्लडप्रेसर के पीडित मिले और 3 दवा पर होते हुए भी हाई

समाजसेविता को स्मृति चित्र में 4 लोगों का कोलेस्ट्रॉल बढ़ा देकर सम्मानित किया गया। मुख् डकघर अधीक्षक संजय कुमार के आमंत्रण पर डॉ. करन वजाज, वंदना पूनिया, मुकेश डकघर में आयोजित कार्यक्रम के दौरान 55 सर्वोत्तम कार्यकर्ताओं को पुरस्कृत किया।

### मैक्स हेल्थकेयर इंस्टिट्यूट लिमिटेड

सार्वजनिक सूचना - पर्यावरण मंजूरी

सर्व साधारण को सूचित किया जाता है कि मैक्स हेल्थकेयर इंस्टिट्यूट लिमिटेड को पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय द्वारा सेक्टर 56, गुडगांव, हरियाणा में मैक्स सुपर स्पेशियलिटी अस्पताल के प्रस्तावित विस्तार के लिए पर्यावरण मंजूरी दी गई है। इसके लिए मेसर्स मैक्स हेल्थकेयर इंस्टिट्यूट लिमिटेड को ईसी पहचान संख्या EC24C3804HR5265005N दिनांक 24.01.2025 के अनुसार मंजूरी दी गई है।

पर्यावरण मंजूरी की प्रति पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय के परिवेश पोर्टल और मैक्स हेल्थकेयर इंस्टिट्यूट लिमिटेड की वेबसाइट पर उपलब्ध है।

लिंक नीचे संलग्न है;

<https://parivesh.nic.in/newupgrade/#/trackYourProposal> (Proposal no. SIA/HR/INFRA2/482176/2024)

<https://www.maxhealthcare.in/environmental-clearances>

इच्छुक व्यक्ति निम्नलिखित से भी संपर्क कर सकते हैं;

**मैक्स सुपर स्पेशियलिटी अस्पताल, सेक्टर 56, गुडगांव, हरियाणा**

फोन नंबर: 0124-260 7777

ईमेल आईडी: Sustainability@maxhealthcare.com

### JKS DEVELOPERS LLP

सार्वजनिक सूचना

एतद्वारा नोटिस दिया जाता है कि जेकेएस डेवलपर्स एलएलपी, पहले मकान नं० 137, एलजीएफ, अर्जुन नगर, कोल्हा, मुबारकपुर, नई दिल्ली पर स्थित था। 1 अगस्त, 2024 से एक नए पते पर स्थानांतरित हो गया है। हमारा नया पता इस प्रकार है:

प्लॉट नंबर बी 21, फरीदाबाद इंडस्ट्रियल एरिया-भिय, सेक्टर-57, बरसभगड, फरीदाबाद - 121004।

सूचना सदस्यों को अपने रिफॉर्ड में दुरुस्त करें और भविष्य के सभी पत्राचार को नए पते पर निर्देशित करें। हम आपके निरंतर समर्थन की सराहना करते हैं और भूरे परिवर्तन के कारण होने वाली किसी भी असुविधा के लिए क्षमा चाहते हैं।

सार्वजनिक सूचना

विषय : अलार्म और विब्रेट करतारिया का वकील सहित मृत्यु के आधार पर मकान नम्बर-389, सेक्टर-12ए, गुरुग्राम, हरियाणा को संबंध में स्थापितबता हास्तान्त।

स्वामी श्री विवेक करतारिया, जो कि रिफॉर्ड में अग्रपंक्ति उप-प्रापटी को अलार्म वी, की दिनांक 09.06.2024 को मृत्यु हो चुकी है तथा पंजीकृत वकील नम्बर 139, दिनांक 23.05.2023 है जो कि अपने पत्र श्री लक्ष्य करतारिया के नाम पर छेड़ कर गए हैं।

अब, श्री लक्ष्य करतारिया पुत्र स्वामी श्री विवेक करतारिया निवासी मकान नंबर 389, सेक्टर-12ए गुरुग्राम ने वकीलता के आधार पर कानूनी धारित होने के नाते अपने पक्ष में उप-प्रापटी को दूरस्था के लिए आवेदन किया है तथा श्री लक्ष्य करतारिया के नाम पर पुन: अलार्म हेतु आवेदन किया है।

यदि किसी व्यक्ति को आवेदकों को पक्ष में उक्त सूच के हस्तान्तरण संबंधी कोई एतराज है तो वह इस सूचना को प्रकाशन की तिथि से 30 दिन के भीतर संघदा अधिकाारी-1, एचएचवीपी, सेक्टर-14, गुरुग्राम को कार्यालय में दिनांक प्रमाण सहित लिखित रूप में अपने एतराज सहित अथवा उक्त संपर्क एचएचवीपी नीति अनुसार संघदा अधिकाारी द्वारा हस्तान्तरित/पुन: अलार्म कर दी जाएगी और बाद में किसी दावे पर विचार नहीं किया जायेगा।

कानूनी धारित वकीलता के आधार पर: श्री लक्ष्य करतारिया (पुत्र) संपदा अधिकाारी-1, एचएचवीपी, सेक्टर-14, गुरुग्राम की ओर से।

### व्यापारियों की शिकायत पर डीएसपी ट्रैफिक ने किया रेलवे रोड का दौरा

ऑटो चालकों की मनमानी से परेशान हैं व्यापारी

रेवाड़ी के रेलवे रोड पर मंगलवार को डीएसपी ट्रैफिक विवेक शंकर के समक्ष समस्या रखते व्यापारी। -ह.प्र

रेवाड़ी, 28 जनवरी (ह.प्र)

दिया कि ऑटो को वन-वे नीति पर चलाया जाएगा।

रेलवे रोड बाजार के व्यापारी प्रवीण गोयल, आलोक सिंहल, रमेश यादव, ऋषि सिंहल, देवेन्द्र सोनी, रविन्द्र कुमार, तकदीर कुमार, ओमप्रकाश शर्मा, नवीन कुमार आदि ने कहा कि रेलवे रोड पर चलने वाले ऑटो चालकों से रेलवे रोड पहुंचे और शिकायत की जांच की। दुकानदारों के साथ डीएसपी ने उन स्थानों का दौरा किया, जहां-जहां ऑटो खड़े होते हैं। दौरे के बाद डीएसपी ने दुकानदारों की शिकायत को जायज ठहराया और आश्वासन प्रवेश दिया जाए।

### विद्यार्थियों ने सांस्कृतिक कार्यक्रम में दी प्रस्तुतियां

हिसार में मंगलवार को स्कूल के कार्यकारी अध्यक्ष बजरंग गर्ग अध्यापकों को स्मृति चित्र देकर सम्मानित करते हुए। -ह.प्र

हिसार, 28 जनवरी (ह.प्र)

कहा कि पीजीएसडी स्कूल के अध्यापकों के कारण स्कूल हमेशा हरियाणा में अव्वल स्थान व जेएन गौरवका स्कूल द्वारा भव्य सांस्कृतिक कार्यक्रम का आयोजन स्कूल के मैदान में किया गया। कार्यक्रम की अध्यक्षता स्कूल संस्था के कार्यकारी अध्यक्ष बजरंग गर्ग ने की। इस कार्यक्रम में स्कूल के छात्र-छात्राओं ने देशभक्ति, हरियाणावी व पंजाबी गाना, धार्मिक प्रस्तुतियों से दर्शकों का मनमोह लिया। बजरंग गर्ग ने कहा कि छात्र-छात्राओं को पढ़ाई के साथ-साथ खेलकूद व सांस्कृतिक कार्यक्रम में भी बढ़-चढ़कर भाग लेना चाहिए क्योंकि सांस्कृतिक कार्यक्रम व खेलकूद से शरीर स्वस्थ रहता है। बजरंग गर्ग ने



**MAX HEALTHCARE INSTITUTE LIMITED**

**CIN: L72200MH2001PLC322854**

**Environmental Policy**

## **Environmental Policy**

As a responsible corporate, Max Healthcare Institute Limited is committed to continual improvement of our environmental practices and adoption of renewable sources.

### **To achieve this, we are committed to:**

- Comply with all applicable legal and other requirements related to environment
- Progressively develop, implement and maintain environmental management system in our operations and new projects.
- Strengthen environmental awareness among all stakeholders including employees, contractors, key business partners and communities to broaden our understanding of environmental priorities.
- Eliminate, minimize and control the impact on the environment by adopting 3Rs (Reduce, Reuse and Recycle)
- Take initiatives towards efficient use of natural resources and energy; reduction and prevention of pollution; Prevention of pollution and promoting waste avoidance.
- Ensure environmental and sustainable growth as a goal within all areas of our business.
- Monitor, measure, report the progress, performance of environmental conservation and management initiatives.

# PLANTATION COMPLETION REPORT

SEP 2025

**Location-**

**Village Haliaki, Pataudi, Gurgaon  
District, Haryana**

**Supported by -**

**Max Healthcare**

**Submitted by-**

**Ikaya Earth Pvt Ltd**



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# Project Summary

Max Healthcare initiated a tree plantation program in collaboration with **Ikaya Earth Private Limited** in Pataudi, Gurgaon, Haryana. A total of seven thousand five hundred (7500) saplings of 43 species has been planted in an area of 0.8 acres under the contract in September 2025.

The land used for the plantation was selected by Max Healthcare and permissions were given by them to undertake the plantation.

15+ team members from Max Healthcare team participated in the voluntary plantation event on September, 25 2025.

## Objectives of the Plantation Project

This contract aims to plant 7500 saplings of 43 native species in 0.8 acres at the site of Village Haliaki, Pataudi, Gurgaon using the Miyawaki Plantation method.

The objective and expected outcome of the project is to sequester carbon, stabilize soil, filter water and air, regulate water flow, and perform other ecological services.

Planted trees will provide shade to cool microclimates, absorb some air pollutants, beautify green spaces, provide nesting and habitat for birds and other small animals, help to regulate stormwater, and contribute to human well-being. The project will play a small role and support the Government of India in increasing the country's forest cover to 33.33 percent.

## Implementation Strategy

Ikaya has experts in the field of sapling selection, soil testing, and organic gardening, who identify the soil condition, the need for the addition of additional biomass, and the selection of the suitable variety of saplings to be planted. Ikaya planted these saplings and will regularly tend to them for a year giving a 100% survival rate. We hope that the forest becomes self-sustainable in two to three years and continues to grow as an ecosystem.



## About Ikaya Earth

Founded with a mission to transform landscapes and livelihoods, Ikaya Earth is a pioneering climate-focused initiative committed to creating high-impact, nature-based solutions.

Our work integrates cutting-edge carbon modeling and verification to generate high-integrity carbon credits, connecting these emission-capturing projects with companies striving toward their net-zero targets. Each initiative ensures measurable carbon removal, enhances biodiversity, and creates additional income streams for farmers. Together, we deliver scalable climate solutions that balance environmental restoration with sustainable economic growth.

**Mission:** "Transforming The Planet With Scalable Nature-Based Climate Solutions"

**Vision:** Targeting 1 Billion Tonnes Of Carbon Sequestration By 2035



## Need for Plantation

A single tree can be home to hundreds of species of insects, fungi, moss, mammals, and plants. Depending on the kind of food and shelter they need, different forest animals require different habitat types. Trees help cool the planet by sucking in and storing harmful greenhouse gases like carbon dioxide in their trunks, branches, and leaves and releasing oxygen back into the atmosphere. Trees can reduce ambient temperatures by up to 8° Celsius in cities. Trees help reduce stress and anxiety and allow us to reconnect with nature. Trees play a crucial role in capturing rainwater and reducing the risk of natural disasters like floods and landslides.

# Plantation Information

The plantation was undertaken using the Miyawaki method of plantation.

The Miyawaki Technique maximizes the number of species planted and maintains the species diversity. This technique effectively creates dense forests, ensuring comparatively faster plant growth than the traditional methods of growing forests with a density of 10,000 saplings per acre. Along with trees, this plantation method includes woody shrubs, small shrubs, and herbs. A mixed-species plantation with a high level of biodiversity is healthier and creates a more suitable habitat for local fauna. Species were selected based on the local geographical conditions of the nearby areas.

The sapling's average height at the plantation was between 2 ft and 4 ft.

Geo Coordinates for the plantation location are 28.353778, 76.667139





## **Guidelines for Development of Miyawaki Forest**

### **1: Site Identification, Soil Analysis & Soil Preparation**

The site was identified by Max Healthcare and post visit we undertook a soil test to study the soil parameters. Post which the biomass materials and soil interventions were decided.

Understanding the texture of the soil helps to analyse the water holding capacity of the soil, the capacity of root perforation, water infiltration, and retention of nutrients by the soil. This includes assessment of soil parameters like physical texture, organic carbon, nitrogen, soil pH, potassium, phosphorus and visible evidence of micro or macro fauna in the soil. This analysis helps to design natural methods for treatment of soil. This includes use of perforation material such as rice husk which will significantly improve perforation and help the roots to grow. Water retention materials like coco peat help the soil retain water and moisture. Addition of vermicompost, cow manure helps to improve the soil nutrient conditions. Addition of cultures of bacteria and mycorrhiza can also be decided based on the assessment results. Soils that are deficient in nitrogen would benefit immensely through Arbuscular Mycorrhizal Fungi (AMF) and nitrogen fixing bacteria like Rhizobium. AMF is available commercially and can even be cultured. Nitrogen fixing bacteria can be cultured and can also be added to the soil by planting nitrogen fixing leguminous plants. Soil texture also needs to be studied. Loamy soils are the most preferred as they contain a good mix of sand, clay and organic matter and provide the ideal balance of water, nutrients as well as drainage, thereby supporting good plant growth. At the end, it is essential to add a layer of mulch. This will protect and insulate the soil, thereby preventing excessive water loss due to evaporation. Some excellent options are dried grass, dried leaves, barley stalk, wheat stalk, rice straw, and corn stalk.



## **Guidelines for Development of Miyawaki Forest**

### **Step 2 – Determination of Native Species and Floral Composition through Quadrat Survey**

This step involves developing a database of the floral diversity through a quadrat survey in a native forest in the same agroclimatic zone as the site where the Miyawaki forest is aimed to be developed. Through this survey, the potential natural vegetation can be determined. The same also needs to be validated using secondary information like the published flora of the region (in India, the Botanical Survey of India regularly updates the flora of different regions and the same should be referred to).

The data (quantitative and qualitative), thus collected will help to develop the plant community composition that will be developed through the Miyawaki technique. The community composition should comprise of plants of all forms (trees, shrubs, herbs) in order to develop a natural forest. Species selection should be done in a manner that a mix of flowering, medicinal, timber, and fruiting species are chosen. While choosing the trees for the Miyawaki forest to be developed, emphasis should be given on selecting the 5 most dominant native trees (based on the results from the quadrat analysis). These trees will constitute around 50 percent of the floral diversity of the forest. The next abundant native species (based on the results from the quadrat analysis) will constitute 25-40 percent of the forest. The rest of the forest will be comprised of native species which have been found in the next level of abundance in the quadrat study



## **Guidelines for Development of Miyawaki Forest**

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### **Step 3 – Procurement of Saplings**

This step involves finding nurseries which will provide good quality saplings of the desired species. It is important to make sure that planting materials match the quality standards defined and ensure no adulteration of any form has been done. Saplings from well-known private nurseries. The ideal height for each sapling is 2-4 ft.



## **Guidelines for Development of Miyawaki Forest**

### **Step 4 – Preliminary Preparation for Plantation**

Once the site for plantation/afforestation has been identified, it is necessary to procure all equipment and prepare for undertaking the plantation. This includes designing adequate water supply. The saplings will need to be watered daily for the first two years. Ideally space for site office, storing equipment, along with space to store the saplings area needs to be identified. The site should also be accessible for trucks, earthmovers, tankers etc. In case the access is not there, the same needs to be constructed

### **Step 5 – Undertaking Plantation**

This is the most critical step for the successful establishment of a Miyawaki forest. The sub-steps that need to be followed are:

- In the plantation area, separate plantation bed area needs to be drawn out.
- The soil needs to be excavated for 3-4 feet.
- This excavated soil then needs to be mixed with the appropriate amounts of perforators, organic fertilizers and water retainers. The mixed soil should then be put back into the land. Care needs to be taken that the land does not get compressed at this stage and should be left aerated and loose.
- The levelled soil needs to be marked with chalk.
- The saplings should then be placed in these pits, taking care that saplings of the same species are not planted next to each other.
- After the sapling is planted, 4-5 feet bamboo sticks should be inserted in the soil, close to the sapling. This will help prevent the sapling from drooping or bending in the first few months.
- Finally, a 5-7-inch-thick layer of mulch should be added to the soil (a minimum of half kg of mulch per tree needs to be added).
- For the first time, the saplings must be watered for an hour to make sure the mulching and the soil settle down.
- Tree density of 3trees/m<sup>2</sup> is ideal.

# Photos



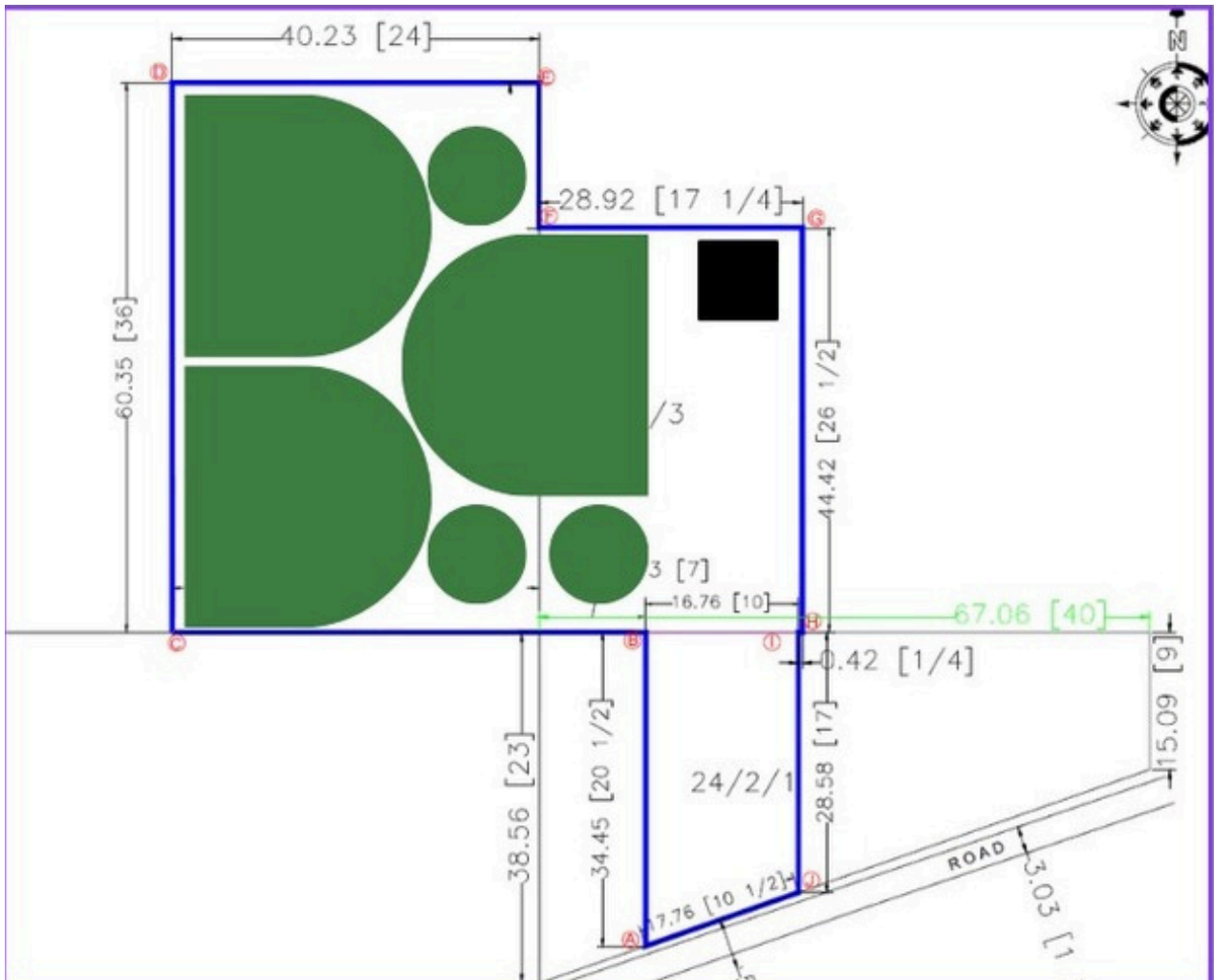
*Drone Images of the Site before Plantation*

# Photos



*DSLR Images of Site before Plantation*

# Photos



Final Plantation Layout as approved by Max Healthcare - 0.8 Acres

## Photos



*Land Clearing & Levelling*

## Photos



*Land Clearing & Levelling*

# Photos



*Land Clearing & Levelling*

## Photos



*Biomass Mixing at Site*

## Photos



*Levelling of Land Post Mixing of Biomass with Soil*

## Photos



*Levelling of Land Post Mixing of Biomass with Soil*

## Photos



*Boring for Submersible Pump (100 Feet)*

## Photos



*Saplings ( Unloading and Watering at Site)*

## Photos



*Making of Bunds and Spreading of Saplings for Plantation*

## Plantation

A voluntary plantation event was held on 25 Sep 2025, 15+ Volunteers participated in the voluntary plantation event. 200+ were planted during the voluntary event. Every sapling was planted where it was placed and tied to a bamboo stick (support stick).

After plantation, neem cake powder and EM solution were sprayed on the patch. The soil bed was covered with mulch (rice straw).

## Post plantation Activities

- A team has been deployed for one year to protect and maintain the site.
- The first few weeks are crucial, so watering is the most critical component of all activities. Water will be administered from the bore well available in the site.
- Mulching has been done after the plantation completion and weed removal will be done in regular intervals
- As the site is in a fenced area, no extra protection is required to prevent grazing



Plantation day picture

# Photos



*Plantation Via Volunteering*

## Photos



*Plantation Via Local Unskilled Workforce*

## Photos



*Watering of Plantation Site by Water Tankers/Engines*

## Photos



*Procurement of Mulching for Site*

## Photos



*Mulching of Plantation Site*

## Photos



*Mulching of Plantation Site*

# Photos



Site Pictures as of 10<sup>th</sup> Oct 2025

# Monitoring and Maintenance

For the Miyawaki plantation, The following monitoring and maintenance works will be done during the project period of two years.

- Regular watering of the plants
- Securing areas from grazing
- Spraying Organic Solution at regular intervals
- Mulching and weed removal

## Regular watering of the plants

A dense plantation, being a water-intensive plantation, requires 3 to 5 liters of water per sapling in the initial days (depending on local weather). The watering frequency will be adjusted with the weather and the sapling's growth. The standard protocol for watering in Miyawaki forest is below (for every 1000 saplings); however, this may change depending on the prevailing weather conditions.

Time	Frequency	Liters of water
First 6 months	Everyday	3000-5000
6 to 12 months	3 times a week	4000-7000
12 to 18 months	Twice a week	6000-8000
18 to 24 months	Once a week	7000-9000

## Securing areas from grazing

The area must be protected from grazing. Currently, as the site is fenced we don't require fencing.

## Spraying Organic Solution at regular intervals

Organic solutions like Effective Microbial Solutions (EM-solution) and Gan-jeeva-amrita will be sprayed as and when required—this will help boost saplings' growth.

## Mulching and Weed removal

Mulching using rice straw was done immediately after the plantation to reduce evaporation and moisten the soil bed. The mulch decomposes with time. Re-mulching will be done upon decomposition of the previous mulch. It usually takes 4-5 months.

Weed removal will be done at regular intervals. Since we put a high amount of organic biomass in the soil, weeds grow faster in the initial days. The first weed removal activity will be performed after 45-60 days from the plantation. After that, Weed removal will be done depending on the weed growth on the site.

# Monitoring Status

S. No.	Parameters	Timeline (if applicable)	Status
1	Identification and approval for plantation site	Before 25 <sup>th</sup> September	Completed
2	Selection of Biomass		
3	Selection of tree species		
4	Mound preparation		
5	Selection of Mulching material		
6	Sapling Placement and Plantation	25th-30th September	Completed
7	Maintenance of Forest		
7.1	Cleaning and deweeding of Forest	As per the site requirement till September 2026	Will be done upon weed growth and as per the site requirements. usually once in 2 -3 months.
7.2	Mulching of Forest bed	As per the site requirement till September 2026	Will be done after plantation completion during Nov. will be done after decay of Mulch. Usually once in every 4-5 months.
7.3	Watering of saplings	Sep 25- Sep 26	Will be done as per watering requirements
7.4	Audit visits	Every month by project officer	-
8	Reporting		
8.1	Plantation Completion Report	Post Plantation	Completed
8.2	Project Update Report's	Monthly	-
8.3	Project Completion Report	Upon completion of the project timeline	-

# Annexure - 1

## Species List:

<b>Aam</b>	150	<b>Papdi</b>	200
<b>Neem</b>	200	<b>Shami</b>	150
<b>Bakain</b>	200	<b>Chikoo</b>	200
<b>Semal</b>	150	<b>Cassia Semia</b>	200
<b>Palaash</b>	150	<b>Jungle Jalebi</b>	150
<b>Sheesham</b>	200	<b>Harshingar</b>	300
<b>Jamun</b>	200	<b>Lemon</b>	300
<b>Goolar</b>	50	<b>Orange</b>	300
<b>Pilkhan</b>	50	<b>Kari Patta</b>	300
<b>Bargad</b>	50	<b>Ber</b>	200
<b>Peepal</b>	50	<b>Putranjiva</b>	300
<b>Siris</b>	200	<b>Hamelia</b>	300
<b>Kathal</b>	50	<b>Ashok</b>	200
<b>Amaltaas</b>	200	<b>Champa</b>	50
<b>Kachnaar</b>	200	<b>Amrud</b>	150
<b>Jhau</b>	200	<b>Arjun</b>	100
<b>Sagwan</b>	200	<b>Moringa</b>	200
<b>Kanak Champa</b>	200	<b>Bottle Brush</b>	300
<b>Sehtoot</b>	200	<b>Imli</b>	150
<b>Alestonia</b>	200	<b>Amla</b>	150
<b>Molshree</b>	200	<b>Hibicus</b>	300
<b>Kadamb</b>	200		

# Annexure - 2

## Activity Status

<b>S.No</b>	<b>Activity</b>	<b>Status</b>
1	Pre Drone Photos	Done
2	Soil Testing	Done
3	Site Clearing	Done
4	Procurement of Biomass	Done
5	Designing of Layout	Done
6	Mixing of Biomass with Soil	Done
7	Levelling of Site for Plantation	Done
8	Procurement of Saplings	Done
9	Plantation	Done
10	Bamboo Sticks	Done

# Annexure - 2

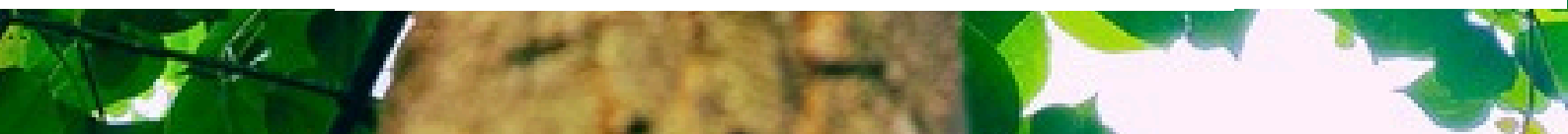
## Activity Status

<b>S.No</b>	<b>Activity</b>	<b>Status</b>
11	Procurement & Application of Mulching	Done
12	Watering of Saplings	Done
13	Boring	Done
14	Deployment of Gardener	Done
15	Procurement of Solar Pump/Panels etc	Done
16	Installation of Solar Pump	Pending
17	Drip Irrigation	Pending
18	Post Drone Photos	Pending



# IKAYA

E A R T H





**SUBMITTAL FORM**  
MAX Super Speciality Hospital, Sec-56



**Turner**

Submittal No. **MAXGRG-ACIL-EL-TA-XX-DSH-0006** Title **Electrical TDS for Diesel Generator Set (DG Set)**

Revision No. **1** Submittal Date **09-Nov-24** Doc. Type **Data Sheet**

Contractor Name **AHLUWALIA CONTRACTS INDIA LTD** Discipline **Electrical**

Specification: \_\_\_\_\_ Contract Ref: \_\_\_\_\_

BOQ Ref: \_\_\_\_\_ Other Ref: \_\_\_\_\_

Description: **Electrical TDS for Diesel Generator Set (DG Set)**

Enclosures: **1) Electrical TDS for Diesel Generator Set (DG Set)**


**CONTRACTOR DETAILS**

We certify that above submitted documents have been reviewed in detail and are correct and in strict conformity with the Contract Drawings and Specifications, except or otherwise stated. Approval by Turner shall not relieve the contractor from their responsibility.

Prepared By **Sanjay Tyagi**  Reviewed By **Sumit Cowshik**

Signature \_\_\_\_\_ Date **09-Nov-24**

**SUBMITTAL COMMENTS**

REVIEWER COMMENTS	STATUS					REVIEWED BY
	A	B	C	D	E	
<p>We have reviewed the re-submission of DG Set's TDS and found all comments/observations been complied as asked. Please proceed, ensure tech. Specs &amp; DSR to strictly followed.</p> <p align="center"></p>						

EMPLOYER COMMENTS (IF ANY):

**STATUS CODES:**

- A Approved
- B Approved as Noted
- C Revise and Resubmit
- D Rejected
- E Reference/Info only

**CONSULTANT DETAILS**

Prepared By: \_\_\_\_\_ Reviewed By: \_\_\_\_\_  
Title: \_\_\_\_\_ Title: \_\_\_\_\_



130002  
January 2019  
R00  
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Max Super Speciality Hospital Project PAGE | 1

**RECEIVED**

21  
13 NOV 2024

  
Turner Project Management India Pvt. Ltd.

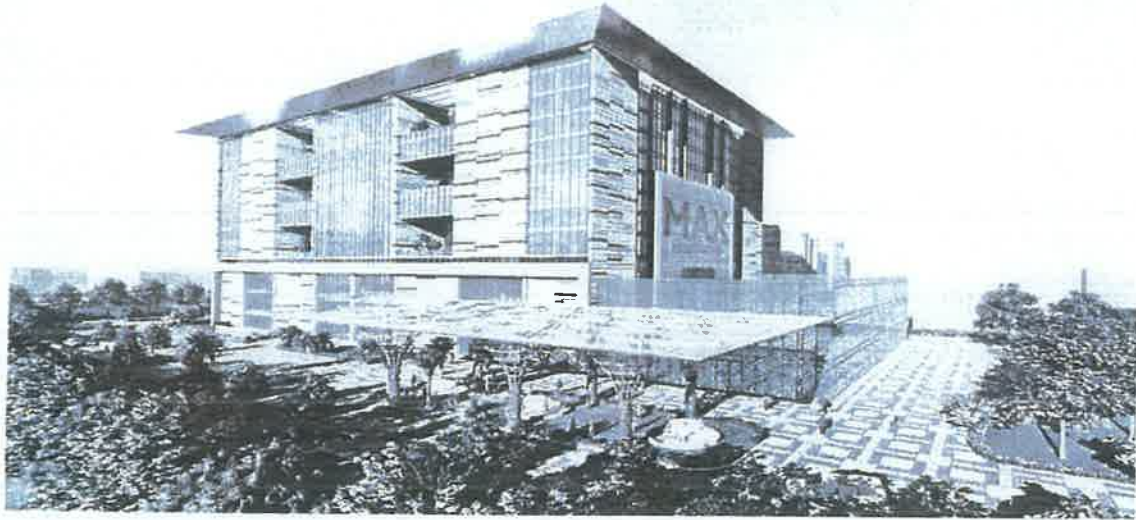
\* Note: Low side works TDS approval will be initiated/separately





AHLUWALIA CONTRACTS INDIA LTD.



STERLING & WILSON



**PROJECT: - MAX SUPER SPECIALITY HOSPITAL  
SEC-56, GURGAON, HARYANA**


**Submission of Diesel Generator Set - 415V including DG Fuel Exhaust Piping & Battery Charger Make of M/s Baudouin (Engine) & Leroy Somer (Alternator)**

Submitted by: Sterling & Wilson Pvt Ltd.

 AHLUWALIA CONTRACTS INDIA LTD.  STERLING & WILSON	M/s Ahluwalia Contracts India Ltd. Okhla, New Delhi-110020  M/s. Sterling and Wilson Pvt Ltd. C-56A/16, Infinity Technopark, 3rd Floor Sector-62 Noida, Uttar Pradesh 201307 
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Originated Department	MEP	Building / Tower	Phase-1		
Discipline	MEP Package	Level	All Levels		
01	08.10.2024	FA	Mr. Sandeep Negi (Assistant Manager)	Mr. Ashu Paul (DGM-Projects)	Mr. Sayeed Khan (HOD-Design & Engg. MEP)
REV	REV. DATE	STATUS	Prepared By	Reviewed By	Approved By





 M/s. Sterling and Wilson Pvt Ltd.	<b>ACIL- M/s. Sterling and Wilson Pvt Ltd,</b> <b>SWPL-EL-TDS-17</b>	Revision	01
		Rev. Date	08.10.2024
		Page	2 of 3
<b>Submission of Diesel Generator Set - 415V including DG Fuel Exhaust Piping &amp; Battery Charger Make of M/s Baudouin (Engine) &amp; Leroy Somer (Alternator)</b>			

REV	DATE	REV DETAILS
0	17.07.2024	First Issue
01	19.09.2024	Revised as per Comments
02	08.10.2024	Revised as per AEON Comments



Status Code	
D	Draft
FI	For Information
FR	For Review
FC	For Construction
PA	For Engineers Approval

 	<b>ACIL- M/s. Sterling and Wilson Pvt Ltd.</b> <b>SWPL-EL-TDS-17</b>	Revision	01
	<b>Submission of Diesel Generator Set - 415V including DG Fuel Exhaust Piping &amp; Battery Charger Make of M/s Baudouin (Engine) &amp; Leroy Somer (Alternator)</b>	Rev. Date	08.10.2024
		Page	3 of 3

<b>INDEX</b>		
Sr. No.	Description	Page No.
1.0	Submittal Cover Sheet	1-1 Page
2.0	Compliance (Technical Specification & List of Makes)	2-38 Page
3.0	General Arrangement drawing for 1500 KVA DG Sets	39-39 Page
4.0	General Arrangement drawing of Terminal Box for 1500 KVA DG Sets	40-40 Page
5.0	Foundation Drawing for 1500 KVA DG Sets	41-41 Page
6.0	General Arrangement drawing for 990 Ltrs. Day Oil Tank	42-42 Page
7.0	Foundation drawing for 990 Ltrs. Day Oil Tank	43-43 Page
8.0	Technical Data Sheet for 1500 KVA DG Sets (Engine, Alternator & Controller)	44-51 Page
9.0	Technical Data Sheet for Low Side Works	52-87 Page
10.0	Technical Data Sheet for Battery and Battery Charger	88-97 Page
11.0	Calculation for Back Pressure	98-98 Page
12.0	Calculation for Ventilation	99-99 Page
13.0	DG Sets Routine Test Procedure	100-100 Page
14.0	QAP for DG Set	101-102 Page
15.0	Type Test Report	103-127 Page



**MAX SUPER SPECIALITY HOSPITAL, SEC-56  
COMPLIANCE STATEMENT**

**Submission of Diesel Generator Set - 415V including DG Fuel Exhaust Piping & Battery Charger Make of M/s Baudouin (Engine) & Leroy Somer (Alternator) Submitted Via Transmittal on SWPL-MAX-TRANS-0017 Dated 17-07-2024**

S. NO.	Reference No.	Doc/ Dwg No.	Revision	CONSULTANT COMMENTS	SWPL RESPONSE DATED ON 08.10.2024
1				Please attach approval copy.	Baudouin approved in list of make of tender documents attached. Refer Annexure-A for Approved Make List. ✓
2				Precaution should be taken while shifting of DG set into basement.	Accepted. ✓
3				To be provided emergency push bottom.	Accepted. Engine control panel drawing enclosed for your ready reference. Refer Annexure-B for Emergency push bottom. ✓
4				CT to be provided alternator terminal for deferential protection.	Mounting space for Deferential Protection CT mounting in Alternator terminal box will be provided by SGPL. Deferential Protection CT will be supplied by panel supplier in loose condition and mounting will be done at site. ✓
5				Breather Pipe to be brought out and extended.	Accepted ✓
6				Type of AVM Pad should be specified	AVM Pad shall be factory fitted with IS 2062 GRA metal in top and bottom with rubber insert with loading capability of 2000 KG each. Data sheet enclosed for your ready reference. Refer Annexure-C for AVM Pad ✓
7				Ladder to be provided to access the top of engine.	It is not required for Sterling Baudouin DG set; however if needed will provide Movable type ladder. ✓
8	AEON Comments on Email Dated 30-09-2024	SWPL-EL-TDS-17	R1	submission of emission data by manufacturer at his letter pad with stamp and signed.	We have enclosed the actual emission level found during testing at our existing installations. Refer Annexure-D for Emission Certificate. ✓
9				Testing and submission of report during final commissioning from third party which is satisfied by NABL.	Accepted ✓
10				OEM /Engine Manufacturer to be ensure that there is no need to install any emission mechanism later.	AS per DBR we have consider Duel fuel kit. Details enclosed for your ready reference. Refer Annexure-E for Duel Fuel Kit. ✓
11				Duel fuel kit to be supplied along with DG Set as per technical Specification and DBR.	AS per DBR we have consider Duel fuel kit. Details enclosed for your ready reference. Refer Annexure-E for Duel Fuel Kit. ✓
12				Kindly confirm whether the engine is complaint to CAQM Guidelines	Yes the engine is complaint to CAQM guide lines with Duel fuel Kit as per DBR. There are sizeable number of installation in Delhi NCR. Test reports of the same ratings of some of the installations enclosed for your reference. Refer Annexure-D for Emission Certificate. ✓
13				If it complaint to CAQM guidelines to be supported with test result from manufacturers and same set is being installed in Delhi NCR.	AS per DBR we have consider Duel fuel kit. Details enclosed for your ready reference. Refer Annexure-E for Duel Fuel Kit. ✓
14				Any emission control Mechanism if required to be installed now whether inside engine or out side as per norms.	AS per DBR we have consider Duel fuel kit. Details enclosed for your ready reference. Refer Annexure-E for Duel Fuel Kit. ✓
15				Pedestal to be confirmed by Architect.	Noted ✓
16				Details of Drawing to be submitted	Submitted along with HSD system documents. ✓
17				TBC By Architect	Noted ✓



18			Manufacturer to highlight the product which he is to supply.	SGPL DG set Data sheet to be supplied by is enclosed for your ready reference. Refer Page No. 44 - 47 to 127 for Engine Data Sheet.
19			Ambient Temperature for 45 degree celeries to be submitted.	keeping in mind the site condition with base ment installation the ambient temperature shall not exceed 40 deg C as per All the alternator manufactures standard design and the same is more than sufficient for your project also.
20			RTD and BTD to be provided.	OK Noted, will provide.
21	AEON Comments on Email Dated 30-09-2024	SWPL-EL-TDS-17	R1	Alternators up to 2000 KVA LT machines are Offerd In Single bearing because of better product design and compatibility with prime mover.
22			Share details of rockwool.	It will be submitted along with Layout drawings separately within a week days time upon approval of the data sheets.
23			Highlight the size to be used (pipe data sheet)	It will be submitted along with Layout drawings separately within a week days time upon approval of the data sheets.
24			Kindly Share Skerch ( Structure steel section)	It will be submitted along with Layout drawings separately within a week days time upon approval of the data sheets.
25			Submit the drawing with compliance sheet (expansion bellow )	It will be submitted along with Layout drawings separately within a week days time upon approval of the data sheets.



*Comments*  
17/5/24

*OK*

# ANNEXURE-A

## LIST OF APPROVED MAKE

6	COMPUTER (MONITOR, CPU, KEYBOARD & MOUSE)	IBM, HP, DELL
7	LCD MONITOR	LG, SAMSUNG
8	POWER CABLES & WIRES	RR Kable, POLYCAB, FINOLEX, KEI
9	CAT -6 FIRE / OPTICAL CABLE	AMP(commscope), Belden Molex
10	SERVERS	DELL, HP, IBM
12	SWITCH POE LAYERS	CISCO, JUNIPER, NETGEAR, HP,
14	MS CONDUITS	As per Electricals Make
15	PVC RIGID CONDUIT	As per Electricals Make
<b>DG set</b>		
	Engine	Cummins, Caterpillar, Baudouin
	Alternator	Stamford, Leroy Somer



Sr No	Item	Makes
1	LED Light Fixtures & Drivers (Range as per approved sample only)	Philips
		Wipro
		Oppl
		Trilux
		Havells
		Bajaj
2	LED Chip	Cree
		Osram
		Lumileds
		Seoul
		Nichia
		EPI Star
	Ceiling Fan / Exhaust Fan	Havells
		Crompton Greaves
		Bajaj
		Usha
		Orient



11	12	13	14	15	16	17	18
PL. ASK IF IN DOUBT							
A	<p><b>A. EXECUTION</b></p> <p>1. PANELS SHALL BE DUST &amp; VERMIN PROOF; FREE STANDING; FLOOR MOUNTED AS PER RESPECTIVE G-A DRAWING</p>						
B	<p><b>B. SUPPLY CHARACTERISTICS</b></p> <p>1. SYSTEM : 415V, 3 PHASE, 4 WIRE 50HZ</p> <p>2. SUPPLY VARIATION : VOLTAGE - 415V ± 10% FREQUENCY - 50HZ ± 3%</p> <p>3. CONTROL SUPPLY : A) 240V AC SUPPLY B) 24V DC SUPPLY</p>						
C	<p><b>C. CONSTRUCTION</b></p> <p>1. COVER STRUCTURE : 1.2 MM C.R.C.A. SHEET STEEL DOORS : 1.2 MM C.R.C.A. SHEET STEEL</p> <p>2. DEGREE OF PROTECTION : IP-52</p> <p>3. GENERAL FEATURES : NEOPRENE GASKET SHALL BE PROVIDED INSIDE THE DOORS &amp; COVERS TO MAKE THE PANEL DUST AND VERMIN PROOF</p> <p>4. OPERATING HEIGHT : MINIMUM - 1100 MM</p> <p>5. CABLE ENTRY : REFER G-A DRAWING</p>						
D	<p><b>D. PAINTING</b></p> <p>1. PRETREATMENT : THE PANEL SHALL BE PRE-TREATED WITH FOURTEEN TANK PROCESS FOR DEGREASING, WATER RINSING, DERUSTING, ACTIVATION, PHOSPHATING AND PASSIVATION</p> <p>2. PAINT SHADE : PANEL - WHITE (RAL9003)</p> <p>3. PAINT THICKNESS : 60 MICRON (MINIMUM)</p>						
A	<p><b>E. EARTHING</b></p> <p>1. HINGED DOOR EARTHING BODY BY MEANS OF 2.5 SQ.MM. GREEN-COLOUR WIRES CONNECTED TO CUBICLES</p>						
B	<p><b>F. WIRING</b></p> <p>1. TYPE &amp; MAKE : FRLS &amp; SRINI LINK/POLY/CAB : CONTROL WIRING SHALL BE DONE WITH 1100V GRADE PVC INSULATED COPPER FLEXIBLE WIRE</p> <p>2. SIZE (POWER WIRING)</p> <p>UPTO 25A : 4 SQ.MM. RED, YELLOW, BLUE &amp; 2.5 SQ.MM. BLACK</p> <p>32A : 6 SQ.MM. RED, YELLOW, BLUE &amp; 4 SQ.MM. BLACK</p> <p>40A : 10 SQ.MM. RED, YELLOW, BLUE &amp; 6 SQ.MM. BLACK</p> <p>63A : 16 SQ.MM. RED, YELLOW, BLUE &amp; 10 SQ.MM. BLACK</p> <p>80A : 25 SQ.MM. RED, YELLOW, BLUE &amp; 16 SQ.MM. BLACK</p> <p>100A : 35 SQ.MM. RED, YELLOW, BLUE &amp; 25 SQ.MM. BLACK</p> <p>125A : 50 SQ.MM. RED, YELLOW, BLUE &amp; 25 SQ.MM. BLACK</p> <p>ABOVE 125A : BUS BAR LINK</p>						
C	<p>3. SIZE (CONTROL WIRING): ALL WIRING DONE BY PVC INSULATED 1100V GRADE COPPER FLEXIBLE CONDUCTOR HAVING FOLLOWING CROSS SECTION</p> <p>1) CT. CIRCUIT-2.5 SQ.MM. COLOUR CODED(R,Y,B&amp;N)</p> <p>2) POTENTIAL &amp; METERING-1.5 SQ.MM. COLOUR CODED(R,Y,B&amp;N)</p> <p>3) CONTROLLER/RELAY CIRCUIT-1.5 SQ.MM. RED/BLACK</p> <p>4) SENSORS &amp; SWITCHES(I/P)-0.5 SQ.MM. RED/BLACK</p> <p>5) FOR AC CONTROL CIRCUIT - 1.5 SQ.MM. GREY COLOUR</p> <p>6) FOR DC CIRCUIT - 2.5 SQ.MM RED(+VE) &amp; BLACK (-VE)</p>						
D	<p><b>G. LABELS</b></p> <p>1. MATERIALS : AL. ANODIZED</p> <p>2. LETTERS : PRINTED WHITE LETTERS OF SUITABLE SIZE AGAINST BLACK BACKGROUND</p> <p>3. COMPONENTS LABEL : PVC WITH BLACK LETTERING</p>						
E	<p><b>H. LCP</b></p>						
REV.	02	02	02	02	02	02	02
REV.	DESCRIPTION		DATE	DRWN.	CHKD.	APPD.	SCALE
REV.	FOR APPROVAL		10.01.2024	BALU	S.P.	D.K.	M3
REV.	TITLE		CLIENT		GENERAL NOTES		JOB No.
REV.	STERLING GENERATORS PVT. LTD. KHANVEL SILVASSA		STERLING AND WILSON PVT. LTD. * STERLING				---
REV.	PROJECT		CONSULTANT		DRG. No.		REV.
REV.	---		---		GPS-101		00
REV.	---		---		---		SHEET 01 OF 01

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S.NO.	DESCRIPTION	MAKE	TYPE	RATING	QTY.
01	DG CONTROLLER	DEIF	SGC 420MKII	415V AC, CTR - /5A AUX. - 24V, DC	1
02	NYLON CASING CURRENT TRANSFORMER	NEWTEK	NE830 7.5VA, CL-0.5	500KVA : 800/5A	3*
03	24V DC CONTROL AUX. CONTACTOR WITH (2NO+2NC) CONTACT	SCHNEIDER	CA3KN22BD	24V DC	1
04	INTERPOSING RELAY, 2C/O	PHOENIX	ELECTRONIC	24V DC	4
05	MUSHROOM HEAD STAY PUT TYPE PUSH BUTTUN, RED	TEKNIC	ø22.5 MM	1NC	1
06	MINIATURE CIRCUIT BREAKER	SCNEIDER	A9N4P06C A9N6152B A9N6153Z A9N2P10C A9N61506	6A, 4P, AC, 10KA 10A, 2P, DC, 6KA 20A, 2P, DC, 6KA 10A, 2P, AC, 10KA 6A, 1P, DC, 6KA	1 1 1 1 1
07	TERMINAL BLOCKS	CONNECTWELL	CTS2.5UN CTS6U	24A, 800V 41A, 800V	40 14
08	TERMINAL BLOCKS	CONNECTWELL	STH4DT	41A, 1000V	4
09	BATTERY CHARGER	SHIDORE	KG	I/P-230V AC, O/P-24V DC, 20A	1
10	HOOTER	IDEAL	-	24V DC	1

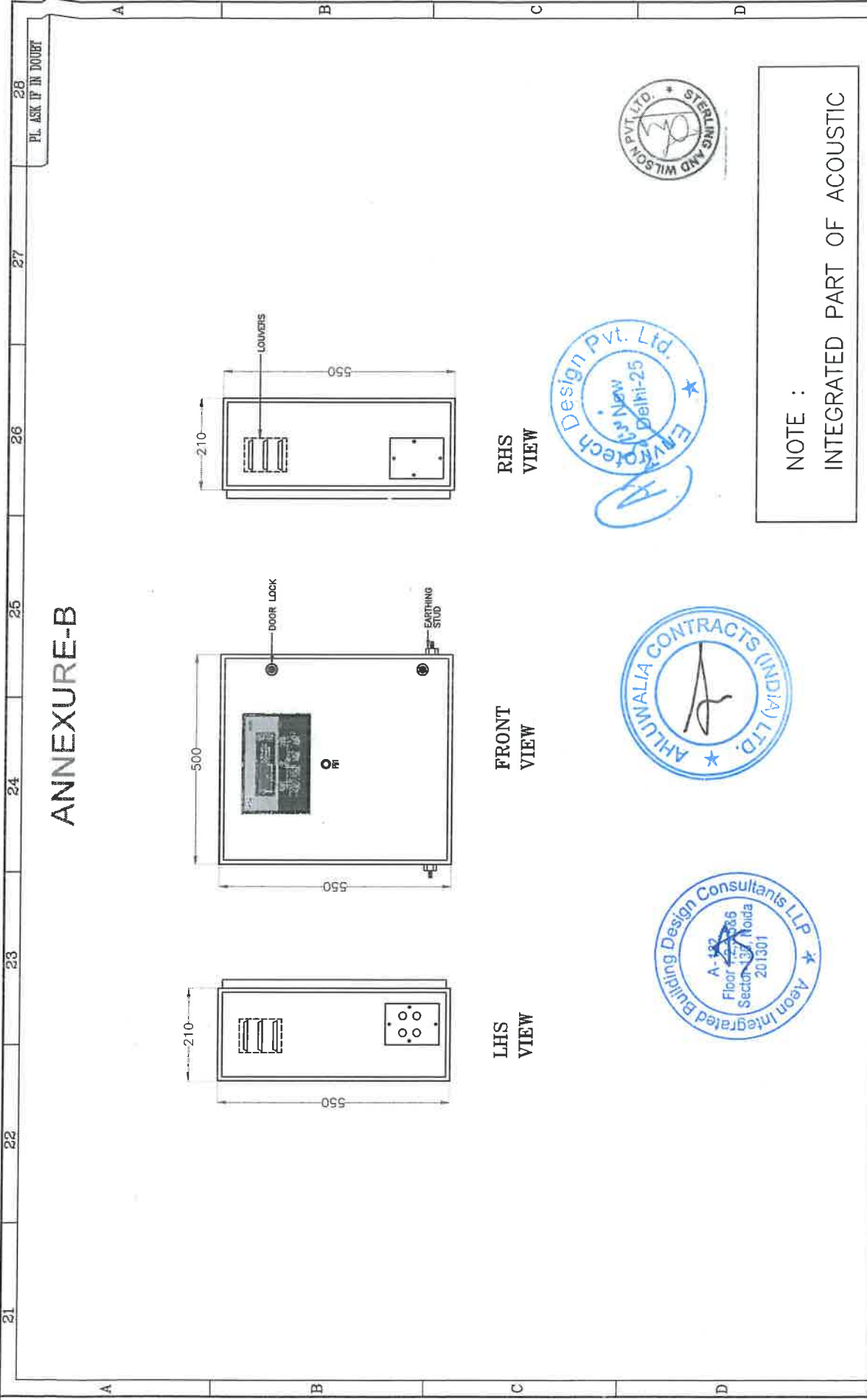
BILL OF MATERIAL

\* : MOUNTED IN ALTERNATOR

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REV.	DESCRIPTION	DATE	DRWN.	CHKD.	APPD.	SCALE	ALL DIMENSIONS ARE IN mm.	NTS	TITLE	BILL OF MATERIAL (LCP)	JOB No.	REV.
03									STERLING GENERATORS PVT. LTD. KHANVEL, SILVASSA	---	BD/6M21C/500/SGC420	
02									STERLING GENERATORS	---		
01									FOR APPROVAL	---		
00	FOR APPROVAL	10.01.2024	BALU	S.P.	D.K.				CONSULTANT	---	DRG. No. GFS-201	00
REV.	DESCRIPTION	DATE	DRWN.	CHKD.	APPD.	SCALE			PROJECT	---		SHEET 01 OF 01



**ANNEXURE-B**

28  
PL. ASK IF IN DOUBT

27

26

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23

22

21

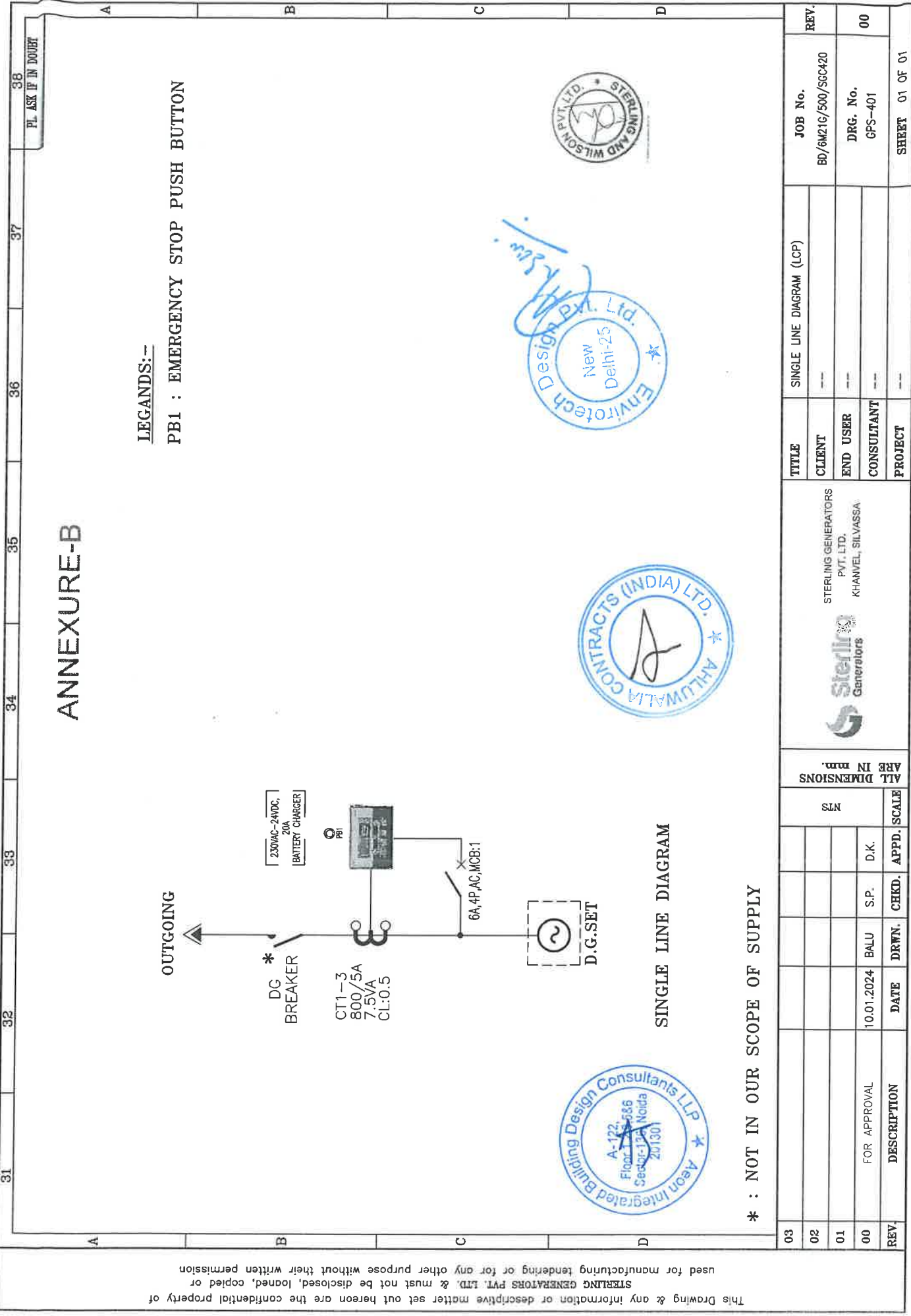
A B C D

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NOTE :  
INTEGRATED PART OF ACOUSTIC

REV.	DESCRIPTION	DATE	DRWN.	CHKD.	APPD.	SCALE	ALL DIMENSIONS ARE IN mm.	1 : 1	TITLE	GENERAL ARRANGEMENT (LCP)	JOB No.	REV.
03									STERLING GENERATORS PVT. LTD. KHANVEL, SILVASSA		BD/SM21G/500/SGC420	
02												
01									END USER			
00	FOR APPROVAL	10.01.2024	BALU	S.P.	D.K.				CONSULTANT		DRG. No. GPS-301	00
REV.	DESCRIPTION	DATE	DRWN.	CHKD.	APPD.	SCALE			PROJECT		SHEET 01 OF 01	



# ANNEXURE-B

**LEGANDS:-**  
**PB1 : EMERGENCY STOP PUSH BUTTON**

**\* : NOT IN OUR SCOPE OF SUPPLY**



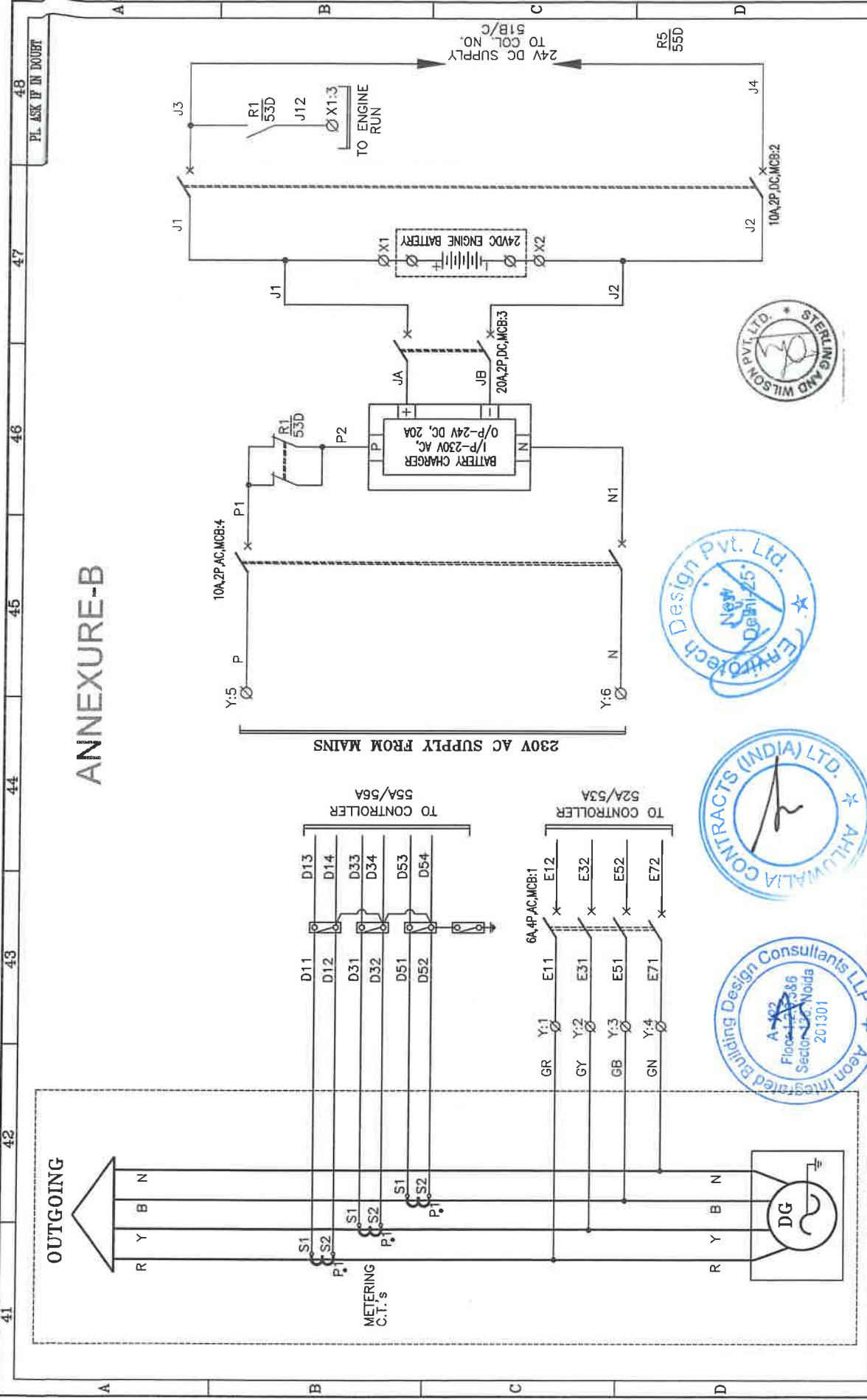
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REV.	DESCRIPTION	DATE	DRWN.	CHKD.	APPD.	SCALE	ALL DIMENSIONS ARE IN MM.		TITLE		SINGLE LINE DIAGRAM (LCP)	JOB No.	REV.
03							M/S		STERLING GENERATORS PVT. LTD. KHANVEL, SILVASSA			BD/6M21C/500/SCC420	
02									CLIENT				
01									END USER				
00	FOR APPROVAL	10.01.2024	BALU	S.P.	D.K.				CONSULTANT			DRG. No. GFS-401	00
									PROJECT				SHEET 01 OF 01



31 32 33 34 35 36 37 38  
 PL. ASK IF IN DOUBT

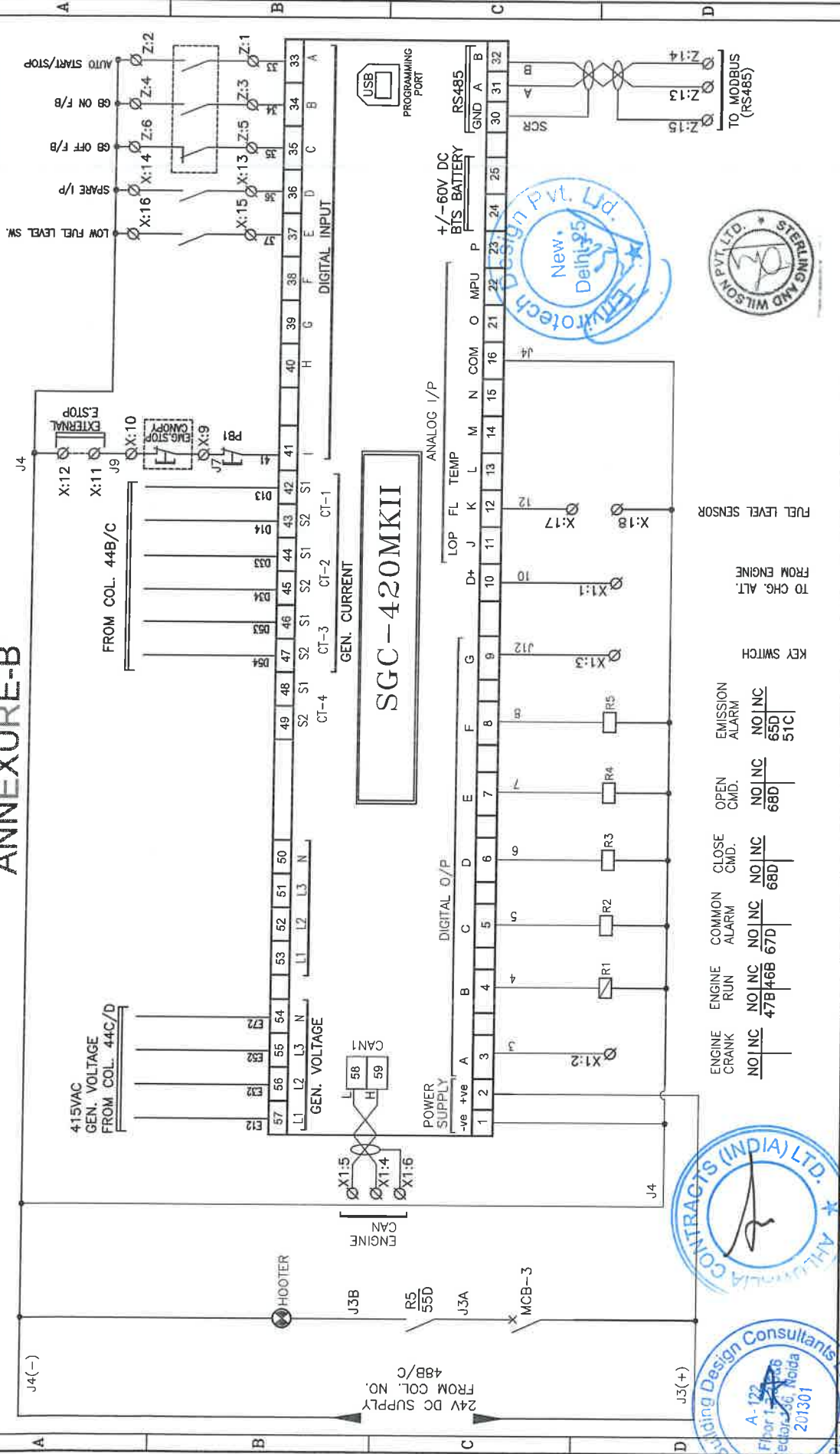
# ANNEXURE-B



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REV.	DESCRIPTION	DATE	DRWN.	CHKD.	APPD.	SCALE	ALL DIMENSIONS ARE IN MM.	NTS	TITLE	SCHEMATIC (LCP)	JOB No.	REV.
03									STERLING GENERATORS PVT. LTD. KHANVEL, SILVASSA	---	BD/6M21G/500/SGC420	
02												
01												
00	FOR APPROVAL	10.01.2024	BALU	S.P.	D.K.				END USER	---	DRG. No. CPS-501	00
REV.	DESCRIPTION	DATE	DRWN.	CHKD.	APPD.	SCALE	ALL DIMENSIONS ARE IN MM.	NTS	PROJECT	---	SHEET 01 OF 03	

# ANNEXURE-B

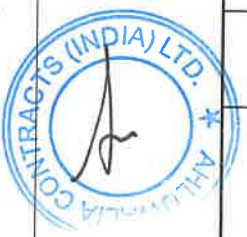


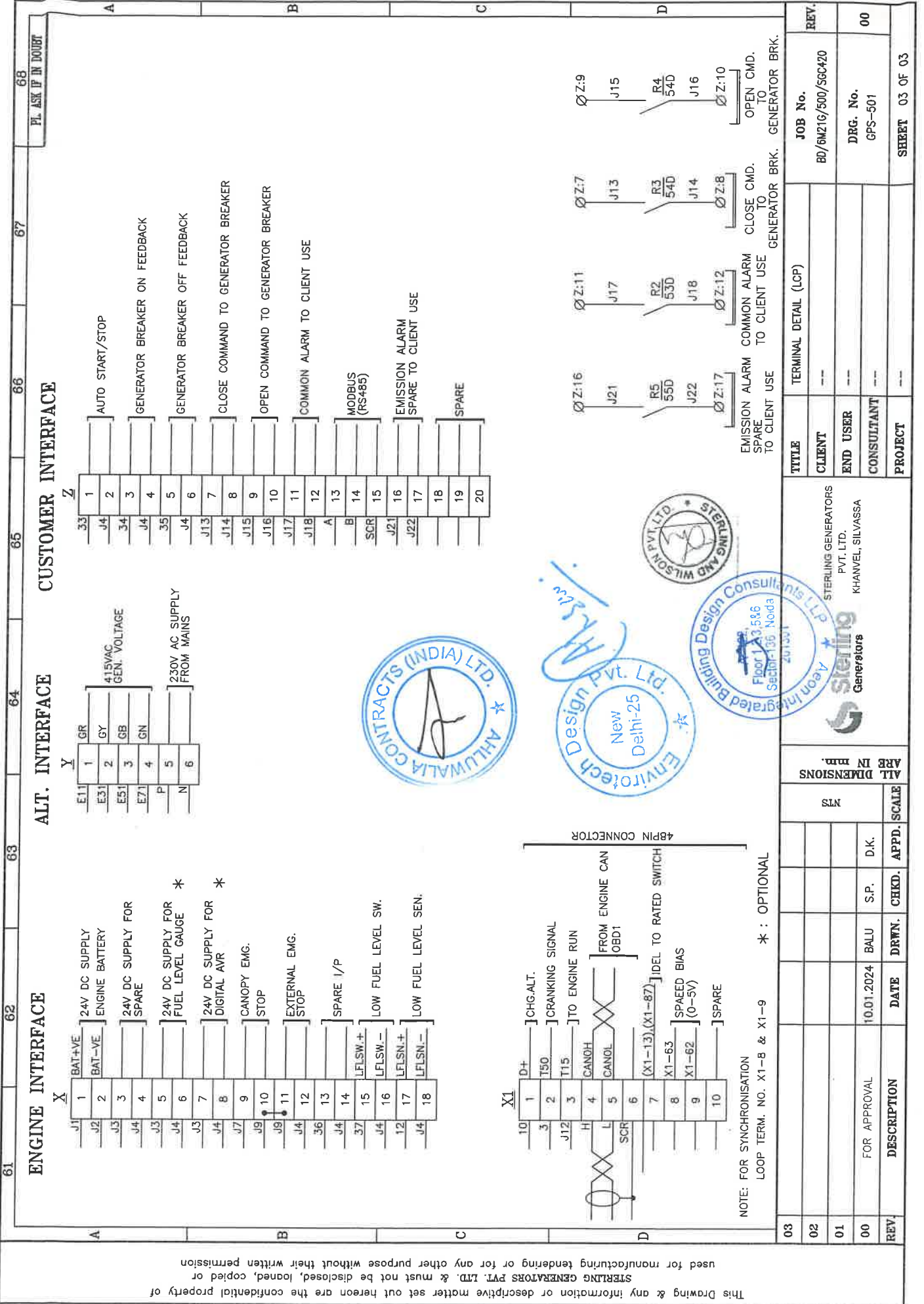
REV.	DESCRIPTION	DATE	DRWN.	CHKD.	APPD.	SCALE	ALL DIMENSIONS ARE IN mm.		STERLING GENERATORS PVT. LTD. KHANVEL, SILVASSA		SCHEMATIC (LCP)		JOB No.	REV.
02							NTS		STERLING GENERATORS PVT. LTD. KHANVEL, SILVASSA		CLIENT		BD/6M21C/500/SCC420	
01							NTS		STERLING GENERATORS PVT. LTD. KHANVEL, SILVASSA		END USER			
00	FOR APPROVAL	10.01.2024	BALU	S.P.	D.K.		NTS		STERLING GENERATORS PVT. LTD. KHANVEL, SILVASSA		CONSULTANT			00
	DESCRIPTION	DATE	DRWN.	CHKD.	APPD.	SCALE	ALL DIMENSIONS ARE IN mm.		STERLING GENERATORS PVT. LTD. KHANVEL, SILVASSA		PROJECT			

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51 52 53 54 55 56 57 58

PL. ASK IF IN DOUBT





STERLING GENERATORS PVT. LTD. KHANVEL, SILVASSA

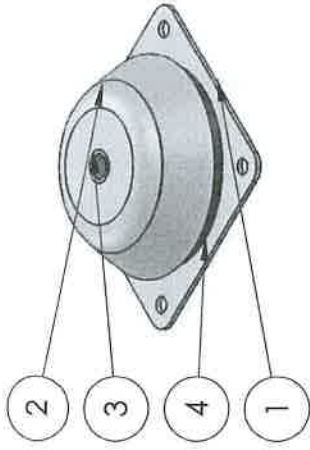
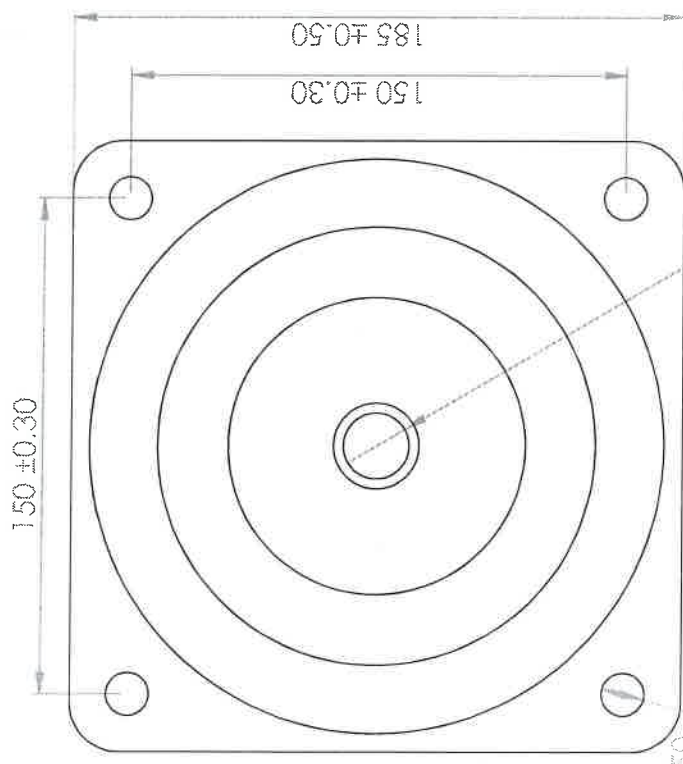
REV.	DESCRIPTION	DATE	DRWN.	CHKD.	APPD.	SCALE	ALL DIMENSIONS ARE IN mm.	TITLE	TERMINAL DETAIL (LCP)	JOB No.	REV.
03								CLIENT	---	BD/6M216/500/56C420	
02								END USER	---		
01								CONSULTANT	---		
00	FOR APPROVAL	10.01.2024	BALU	S.P.	D.I.K.			PROJECT	---		
										DRG. No. GPS-501	00
											SHEET 03 OF 03

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61 62 63 64 65 66 67 68  
 ENGINE INTERFACE ALT. INTERFACE CUSTOMER INTERFACE  
 PL. ASK IF IN DOUBT

# ANNEXURE-C

1 2 3 4 5 6



**RUBBER PROPERTIES:-**

1. HARDNESS:- 75 ± 5° SHORE A
2. APPEARANCE:- BLACK COLOR
3. HOT MOLDED WITH ITEM NO.1,2&3

**PART APPEARANCE:- BLACK PAINT**

LOAD	1600Kg
DEFELCTION	2-4mm

ITEM NO.	PART NUMBER	SPECIFICATION	QTY.
1	854-METAL-BOTTOM	IS 2062 GR.A	1
2	854-METAL-TOP	IS 2062 GR.A	1
3	854-METAL-INSERT	MILD STEEL	1
4	854-RUBBER	NATURAL RUBBER	1

UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS ARE IN MILLIMETERS

DEBUR AND  
BREAK SHARP  
EDGES

DO NOT SCALE DRAWING

REVISION

CORLI ENGINEERS (P) LTD  
79, Valmiki Street, Thiruvanniyur, Chennai-600 041, India  
Phone No.91-44-42897500 Fax:91-44-24405152  
Email:corl@vsnl.com www.corlrubber.com

NAME: PS ARUL AM  
SIGNATURE: [Signature]DATE: 13-OCT-15  
13-OCT-15  
13-OCT-15

PART NUMBER:

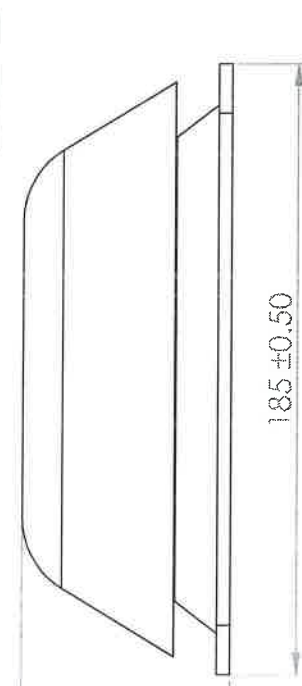
854-ORANGE

CEPL-854-ORANGE

DWG NO. A4

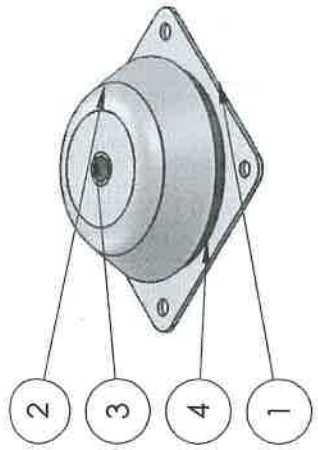
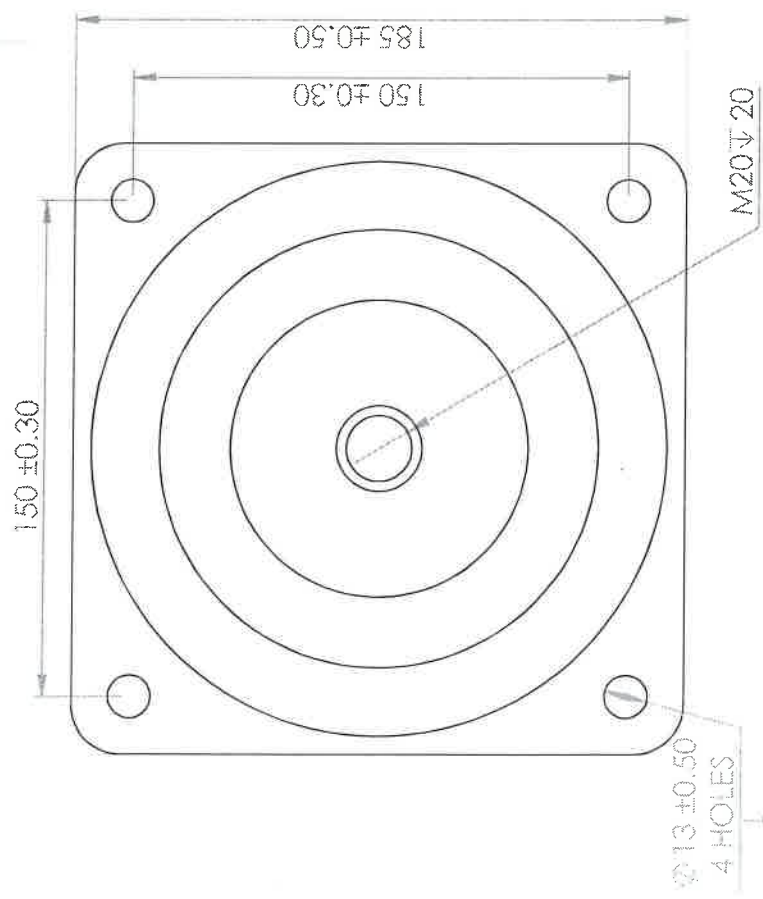
SCALE: NTS

SHEET 1 OF 1



# ANNEXURE-C

1 2 3 4 5 6



**RUBBER PROPERTIES:-**

1. HARDNESS:- 80+5° SHORE A
2. APPEARANCE:- BLACK COLOR
3. HOT MOLDED WITH ITEM NO.1,2&3

**PART APPEARANCE:- WHITE PAINT**

LOAD	2000Kg
DEFELCTION	2-4mm

ITEM NO.	PART NUMBER	SPECIFICATION	QTY.
1	854-METAL-BOTTOM	IS 2062 GR.A	1
2	854-METAL-TOP	IS 2062 GR.A	1
3	854-METAL-INSERT	MILD STEEL	1
4	854-RUBBER	NATURAL RUBBER	1

UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS ARE IN MILLIMETERS

DEBUR AND  
BREAK SHARP  
EDGES

DO NOT SCALE DRAWING

REVISION



CORI ENGINEERS (P) LTD  
79, Valmiki Street, Thiruvanniyur, Chennai-600 041, India  
Phone No.91-44-42897500 Fax:91-44-24403152  
Email:cori@vsnl.com www.corirubber.com

NAME	SIGNATURE	DATE	PART NUMBER:-
DRAWN P.S.		13-OCT-15	
CHECKED A.M.		13-OCT-15	
APPROVED A.M.		13-OCT-15	



## 854-WHITE

### CEPL-854-WHITE

DWG NO.

A4

SCALE: NTS

SHEET 1 OF 1



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# EKO TESTING LABS®

## Eko Pro Engineers Pvt. Ltd.

Competence | Quality | Service

Contact : +91 9810243870



### ANNEXURE-D

#### TEST REPORT

##### Stack Emission Analysis

Test Report No. : EKO/E-030/270724

Issue Date : 02/08/2024

Issued To

: ASSOTECH REALTY PVT. LTD.  
Plot No-22, Sector-135 Noida, U.P.

Sample Description	: Stack Emission
Sample Drawn on	: 27/07/2024
Sample Drawn by	: EPEPL (Mr. Deepak Yadav)
Sample Received on	: 27/07/2024
Time of Sampling (minutes)	: 30.0
Sampling Location	: NA
Sampling Plan & Procedure	: SOP-SE/09
Analysis Duration	: 27/07/2024 To 02/08/2024
Source of Emission	: Stack Attached To DG Set (Make-BAUDOUIN, Eng. Model No-12333G1650/5)
Capacity	: 1500 KVA
Operating Load	: Normal
Normal Operation Schedule	: As per requirement
Type of Stack	: Metal/Circular
Diameter of Stack (meter)	: 0.5X0.4
Height of Stack from Ground Level (meter)	: 62.0
Height of Stack from Roof Level (meter)	: -
Height of Sampling Location (meter)	: 2.0 From Roof Level
Type of Fuel Used	: HSD
Fuel Consumed per hour	: 270.0 lph
Ambient Temperature (°C)	: 36.0
Stack Temperature (°C)	: 288.0
Average Velocity of Flue Emission (m/sec)	: 11.3
Average Flow Rate (lpm)	: 16.0
Control Measures (if any)	: Nil
Remark (if any)	: Quantity of Emission (Nm <sup>3</sup> /hr) = 59182.51



#### RESULTS

S.No.	Parameters	Test Methods	Results	Units	Limits as per CAQM & CPCB Guidelines
1	Particulate Matter (as PM)	IS: 11255 (P-1)	44.8	mg/Nm <sup>3</sup>	50.0
2	Sulphur Dioxide (as SO <sub>2</sub> )	IS: 11255 (P-2)	28.8	mg/Nm <sup>3</sup>	Not Specified
3	Oxide of Nitrogen (as NO <sub>x</sub> )	IS: 11255 (P-7)	241.1	mg/Nm <sup>3</sup>	650.0
4	NMHC	Eko/Chem/SOP/SY-01	19.5	mg/Nm <sup>3</sup>	100.0
5	Carbon Monoxide (as CO)	IS:13270	59.8	mg/Nm <sup>3</sup>	100.0

Remark- PM, NO<sub>x</sub>, NMHC & CO at 15% O<sub>2</sub> Correction.

#### Notes :

- The results given above are related to the tested sample, for various parameters, as observed at the time of Sampling. The customer asked for the above tests only.
- This test report will not be generated again, either wholly or in part, without prior written permission of the Laboratory.
- The test samples will be disposed off after 15 days from the date of issue of test report, unless until specified by the customer.
- Responsibility of the Laboratory is limited to the invoiced amount only.

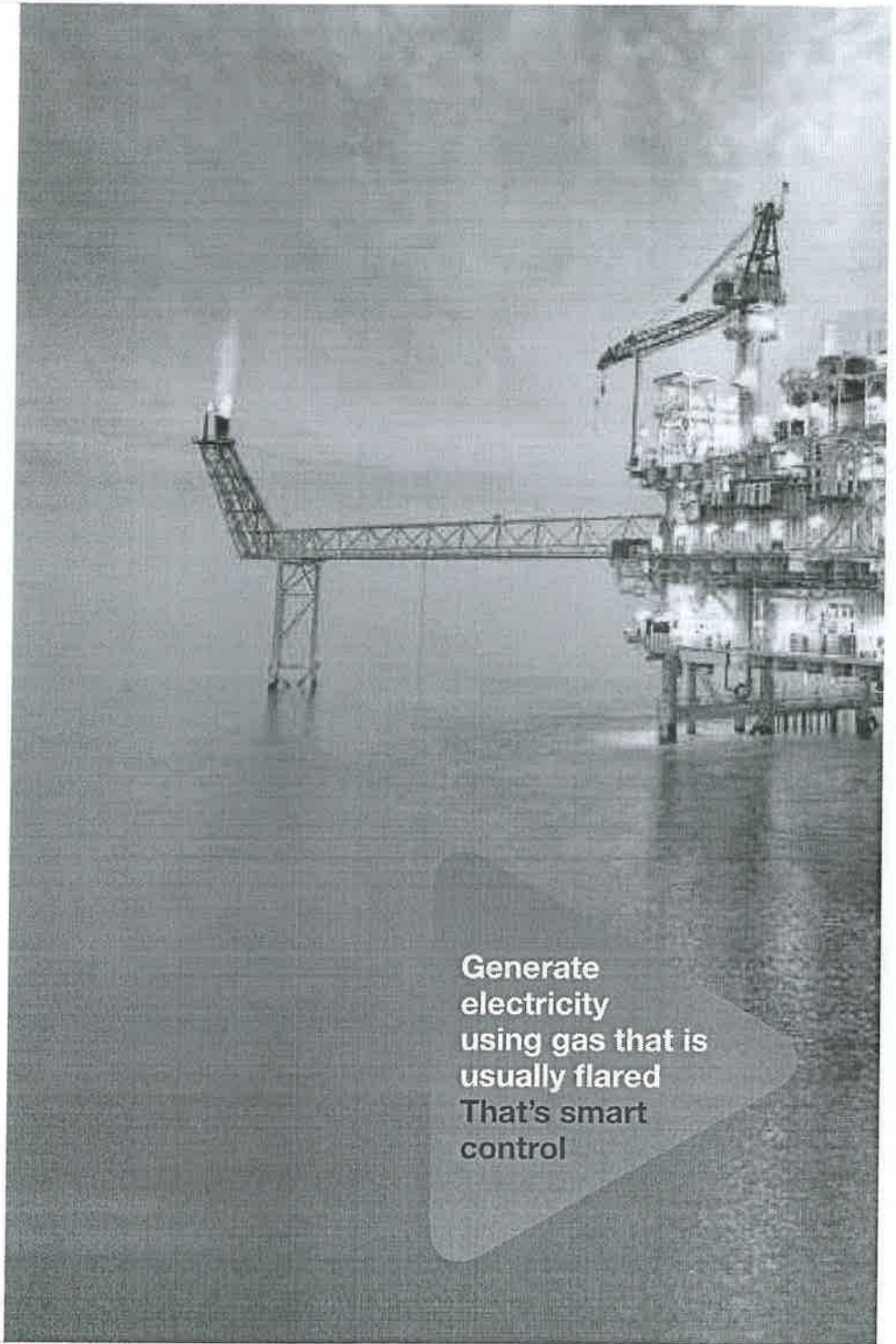


# ANNEXURE-E

**ComAp**  
The heart of smart control



**Bi-Fuel Power  
Control Solutions**

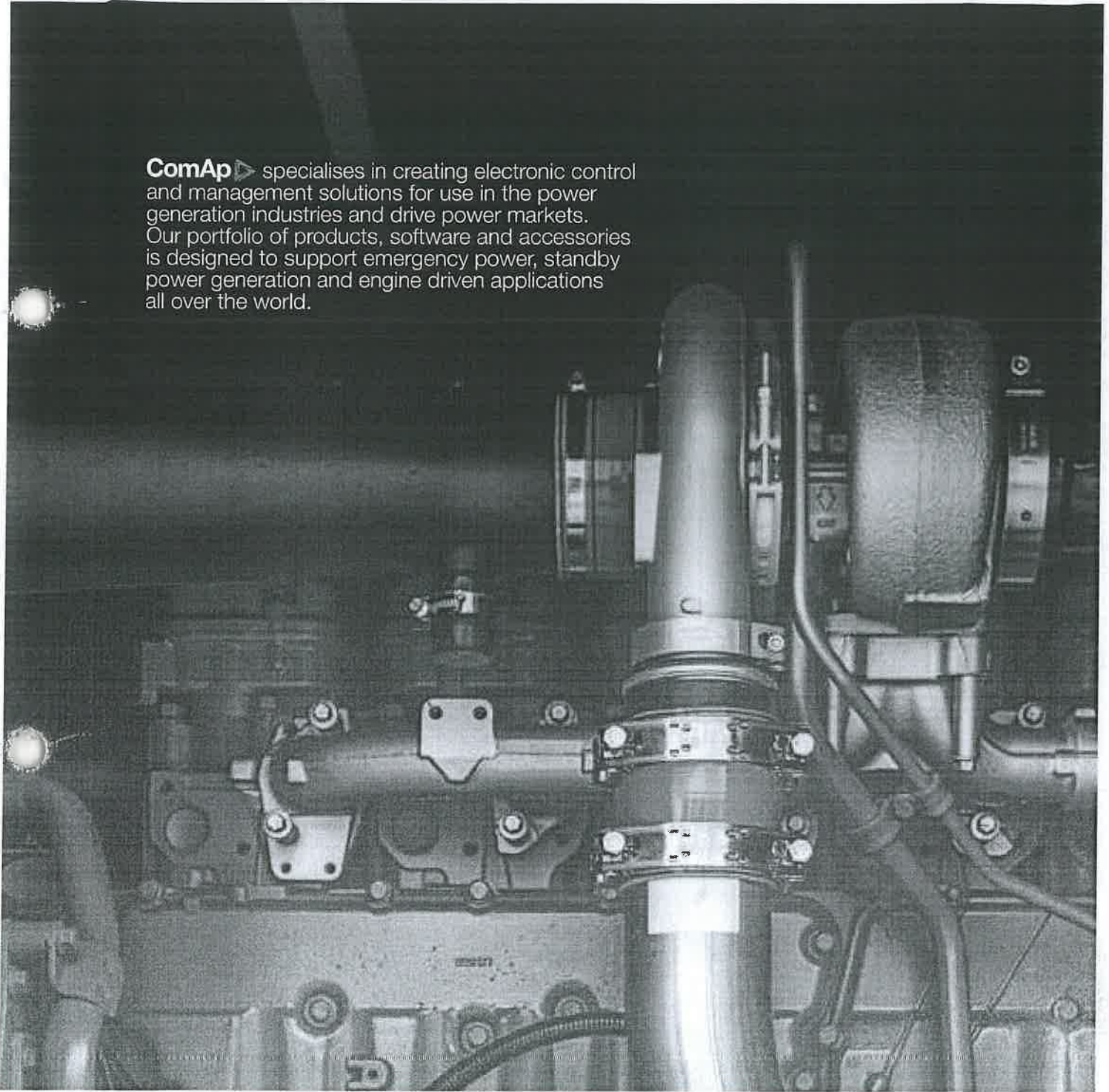


Generate  
electricity  
using gas that is  
usually flared  
That's smart  
control



# ANNEXURE-E

**ComAp** specialises in creating electronic control and management solutions for use in the power generation industries and drive power markets. Our portfolio of products, software and accessories is designed to support emergency power, standby power generation and engine driven applications all over the world.



# ANNEXURE-E

## Offices



**400+** Employees

**21** Offices

**60+** Distributors



# ANNEXURE-E

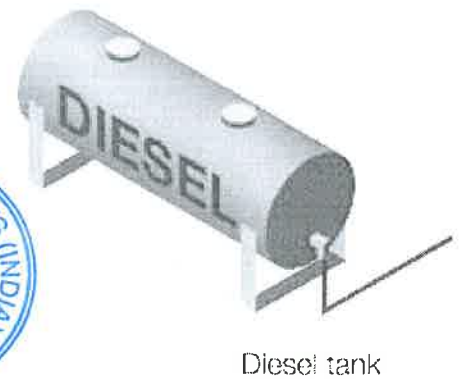
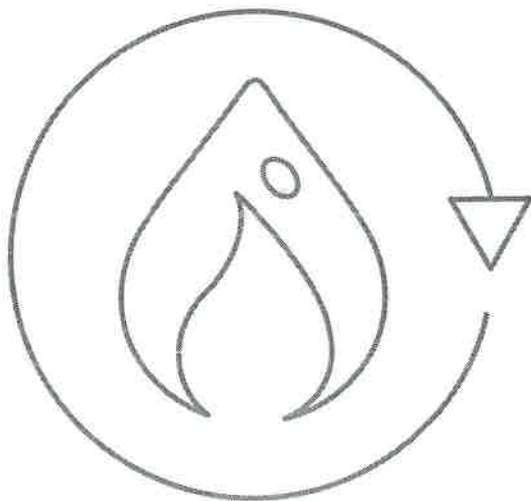
## InteliBifuel Solutions

Use Gas Instead of Diesel - Save Money and the Environment

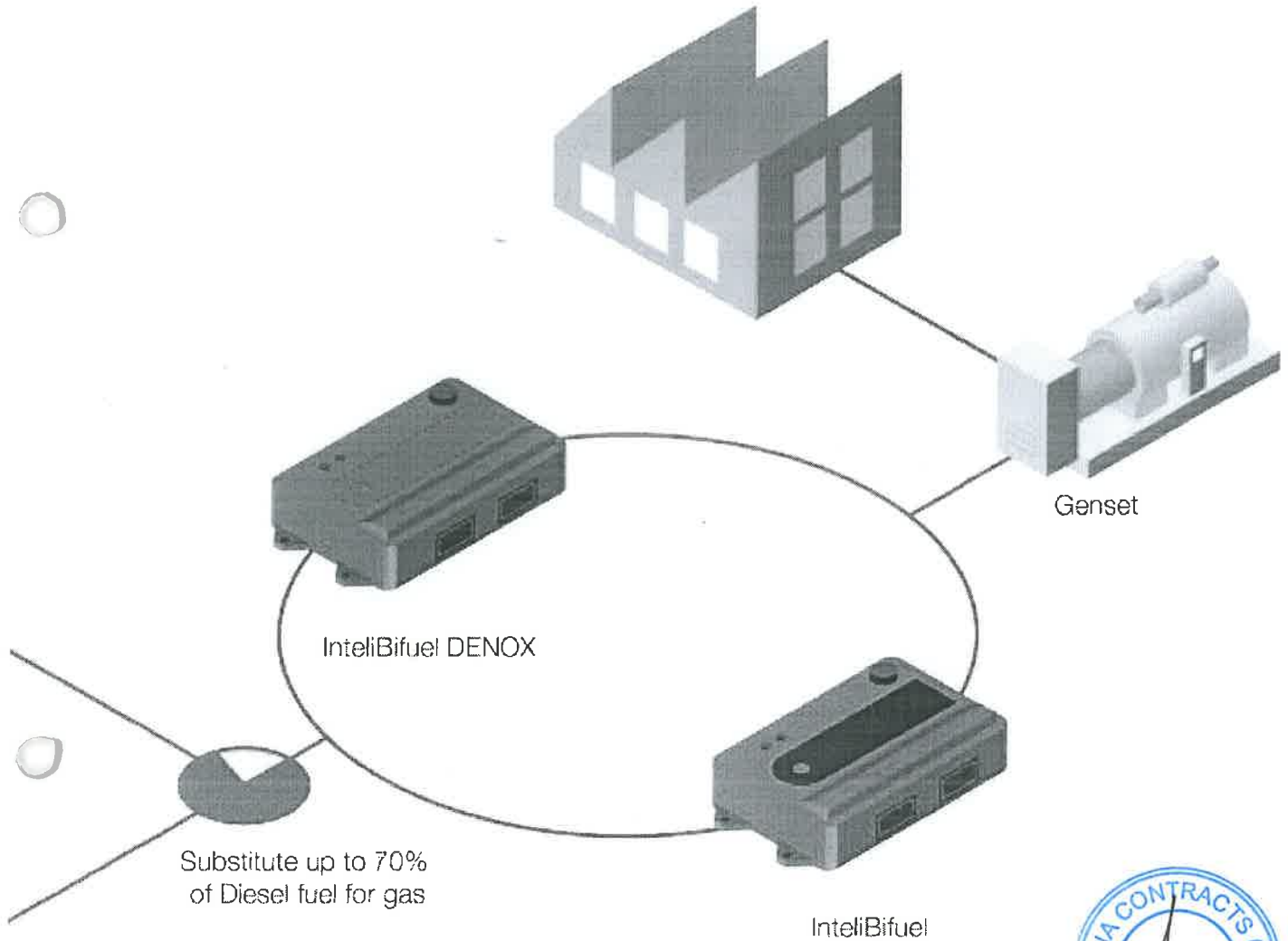
We have developed an easy to fit bi-fuel management package which converts your diesel engine to run primarily on gas.

ComAp has solutions for both stationery and mobile engines, with significant savings to be made with either solution.

ComAp's bi-fuel system is ideally suited to generator packagers and original equipment manufacturers (OEMs) looking to deliver more economically beneficial power packages.



# ANNEXURE-E



# ANNEXURE-E

## InteliBifuel Key Benefits

Save Money and the Environment

### Lower Fuel Costs

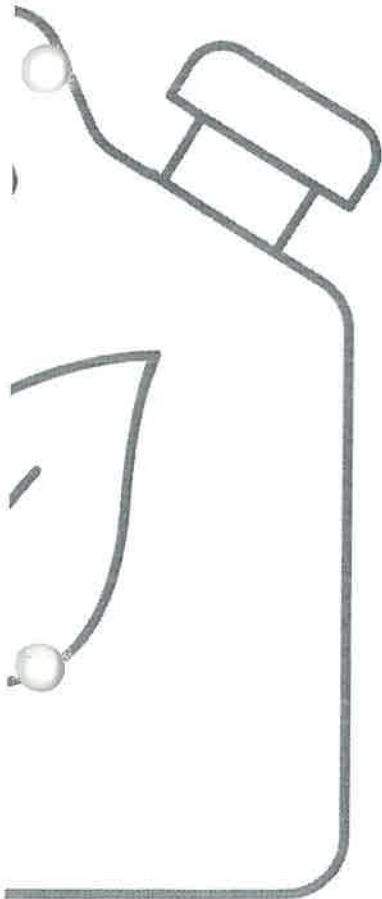
- > Up to 70% diesel consumption replaced by gas
- > Dramatically reduced operational costs
- > It enables the ongoing use of existing assets
- > Reduced maintenance costs – no ignition system
- > Seamless and automatic changeover to 100% diesel operation

### Simply Adaptive

- > Fully automatic compensation for changes in:
  - gas quality (typically Oil&Gas applications)
  - gas pressure
  - temperatures
- > InteliBifuel ensures best performance in every situation



# ANNEXURE-E



## Environmentally Friendly

- > Significant reduction in engine emissions:
  - $\text{NO}_x$ , PM
  - $\text{SO}_x$ ,  $\text{CO}_2$
- > With the use of a catalytic converter, can also reduce CO

## Fuel Flexibility

- > Extended run times without refueling
- > Smooth transition between diesel and Bi-fuel mode at any time
- > IntelliBifuel maintains the output of the diesel engine
- > IntelliBifuel maintains the transient performance of the diesel engine



# ANNEXURE-E

## Solutions

Solutions for both stationery and mobile engines

### Small Single Speed Engines (up to 500 kW)



InteliBifuel LITE packages are cost effective, compact solutions designed for single speed Bi-Fuel applications at nominal output power of up to 500 kW. They are available in two variants: InteliBifuel LITE 100 and InteliBifuel LITE 500, for engines up to 100 kW and up to 500 kW respectively. These solutions are perfect for the Rental market or any other Power Generation applications using any type of gas.

- > High or low pressure single point gas injection technology, gas injected before or after the turbocharger
- > Algorithm with automatic compensation for gas quality changes
- > Easy installation and commissioning
- > Harsh environmental design
- > IP-69 enclosure fits to any application
- > Compatible with InteliVision displays

### Single Speed Engines



InteliBifuel package is a fully programmable solution designed for any single speed Bi-fuel application, with its features perfectly suitable for Oil & Gas, Mining and Rental applications.

- > Algorithm with automatic
- > Enable factory setting of Bi-fuel system
- > Simplified installation and commissioning
- > Extended PLC logic and history
- > GPRS/GSM remote monitoring
- > IP-69 enclosure fits to any application
- > Optional high pressure single point gas injection after turbocharger
- > Compatible with InteliVision displays



# ANNEXURE-E

## Variable Speed Engines



InteliBifuel MOBILE package is a fully programmable solution designed for any mobile variable speed applications as Mine haul trucks, Frack trucks, Locomotives or Marine propulsion engines.

- > Fully configurable 3D maps
- > IP-69 Harsh environmental design allows full integration in applications with limited space
- > Remote monitoring
- > GPRS/GSM remote monitoring
- > GPS Location
- > Extended PLC logic
- > Extensive history records
- > Optional high or low pressure single point gas injection technology; gas injected before or after the turbocharger
- > Compatible with InteliVision displays

## Integrated solution for Power generation



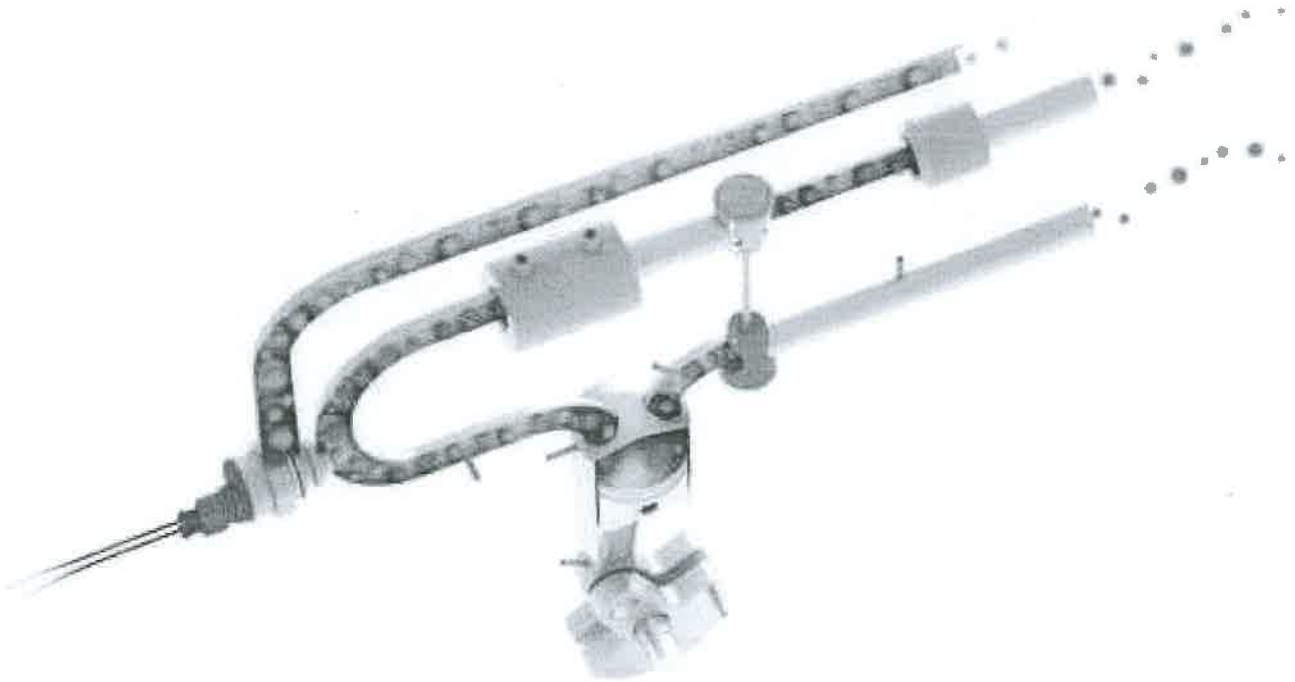
Fully integrated solution combining features of the InteliBifuel LITE or InteliBifuel controller with Antiknocking protection system InteliBifuel DENOX and the power generation controller InteliGenNT BaseBox with InteliVision 5. It offers our customers a single interface for both applications. This integrated solution is suitable for applications with limited space (such as Rental) or any other Power generation application, from stand-by power, right up to multiple engine parallel operations.

- > Integrated system allowing up to 64 generators paralleled on a single bus
- > Isochronous load sharing, DROOP or Emergency DROOP and Power management
- > Simplified installation and commissioning
- > Single and Multiple genset operation
- > Automatic priority swap and Redundant communication
- > Automatic system addressing for ease of installation and adding removing gensets from site
- > InteliVision family displays bring the controls to one HMI (InteliVision 5 – standard; InteliVision 8 – optional)
- > InteliGen and InteliBifuel share system and critical information for integrated power generation and Bi-fuel control in one package
- > Display of critical power, engine, alternator and Bi-fuel data, with customizable screens
- > Remote monitoring from WebSupervisor and remote access via AirGate
- > Ready to incorporate renewable energy sources



## ANNEXURE-E

### ComAp Bi-fuel high pressure single point injection system



Together with ComAp's new generation of IntelliBifuel controllers we have developed technology capable of delivering gas into the engine via high pressure injectors.

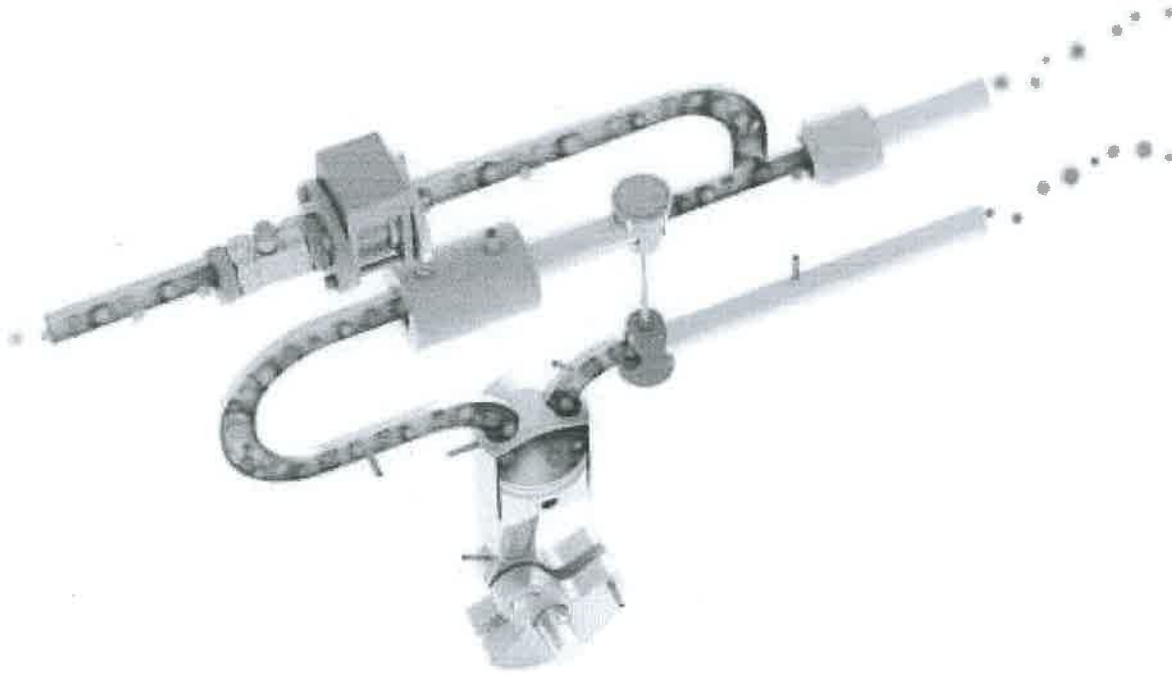
Single point injectors are placed after the turbocharger enabling the ComAp controller precise gas portion control with higher efficiency and increased safety. Simplified gas delivery into the engine air manifold offers ideal cost effective solution.

This technology is available to applications using new IntelliBifuel products.



## ANNEXURE-E

### ComAp Bi-fuel low pressure fumigation system



This system has been in use for many years and is widely used for high-speed engines. Gas is introduced into the engine before the turbocharger and controlled by a gas throttle valve.

This system is suitable for applications where the high-pressure single point injection system is not suitable.

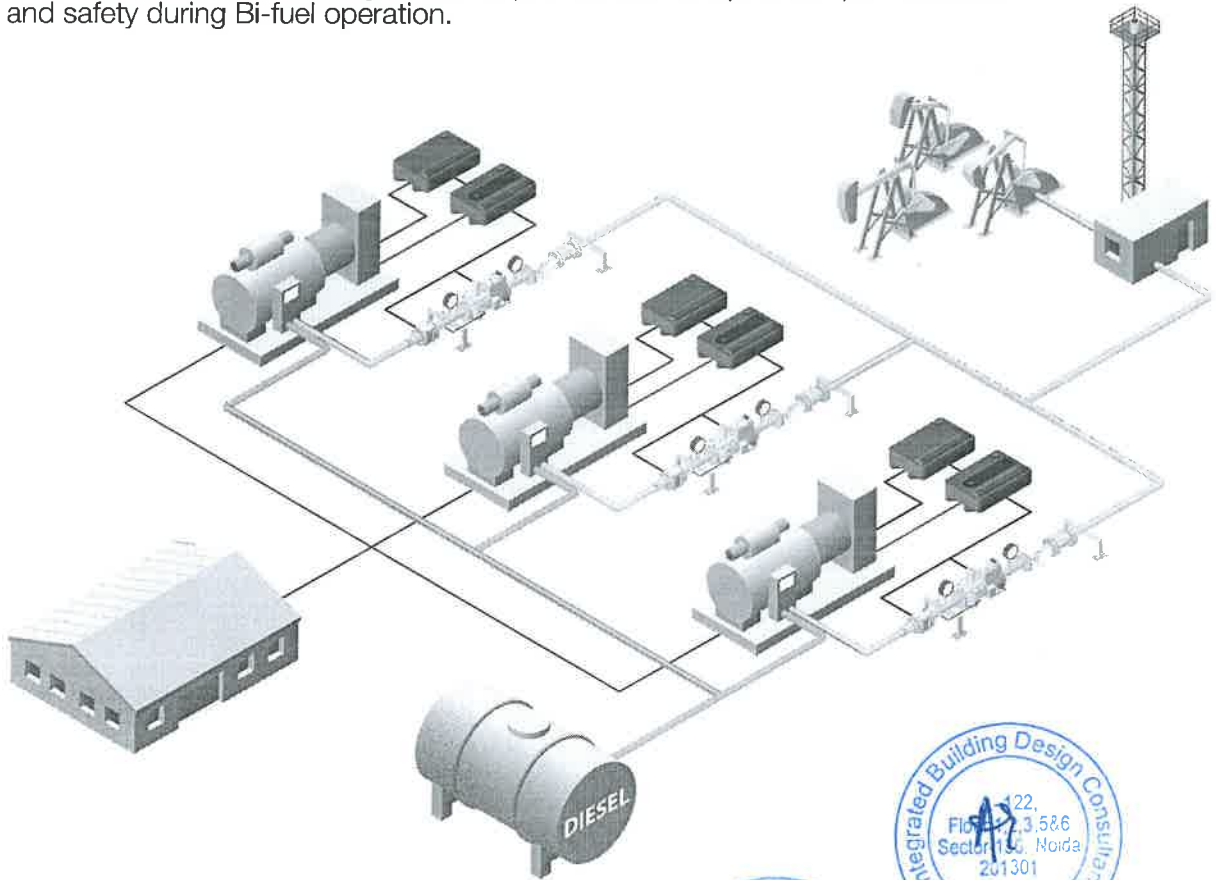


## ANNEXURE-E

### Power generation using flare gas

In this application the Bi-fuel system uses flare-gas to substitute the diesel portion of the fuel. This application is particularly efficient as it uses gas that would normally be burned as a waste product during oil production.

ComAp IntelliBifuel solution with new algorithm is able to react on various gas quality to set up the optimal diesel/gas ratio to provide the best possible performance and safety during Bi-fuel operation.

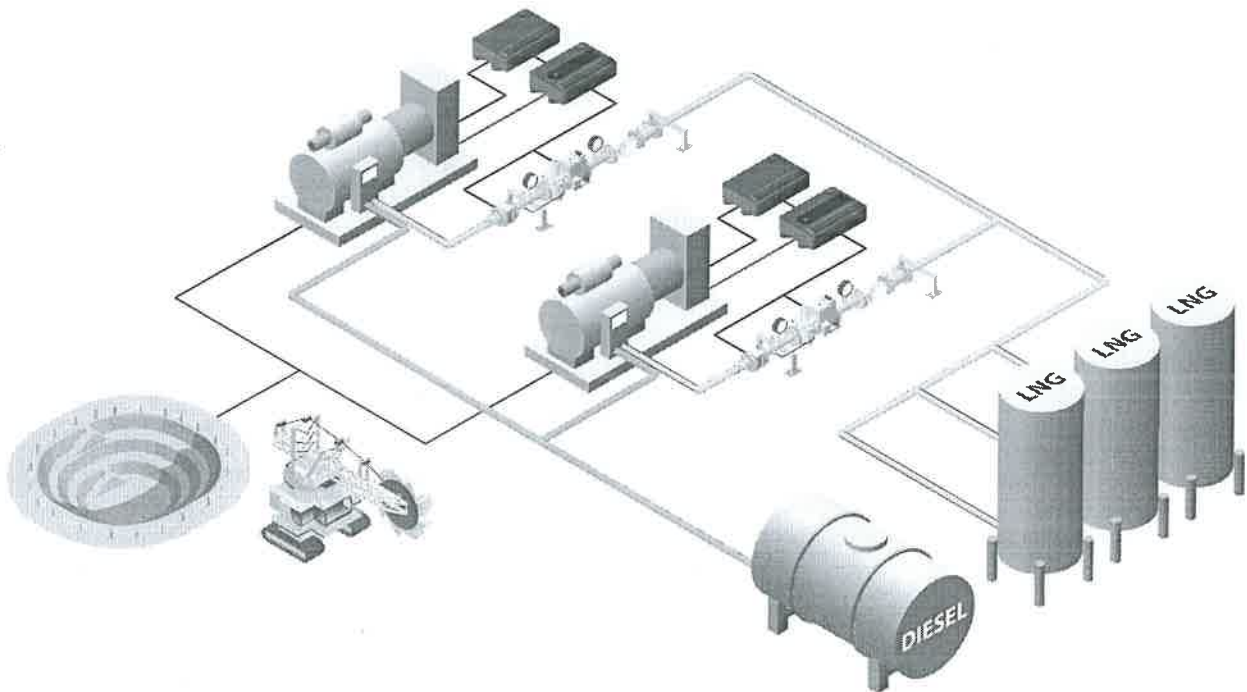


## ANNEXURE-E

### Remote mine power with stored gas

In this application natural gas is provided from on-site storage tanks, alongside the standard diesel tanks, which are refilled as normal. This is particularly useful for 'semi-permanent' or rental power generation applications such as mines, holiday resorts or long-term construction sites.

The ComAp Bi-fuel solution brings operational costs reduce as well as it is more environmentally friendly. Up to 70 % diesel fuel is replaced by LNG. There is significant reduce  $\text{NO}_x$ ,  $\text{PM}$ ,  $\text{SO}_x$  and  $\text{CO}_2$  emissions compare to 100% diesel operation.

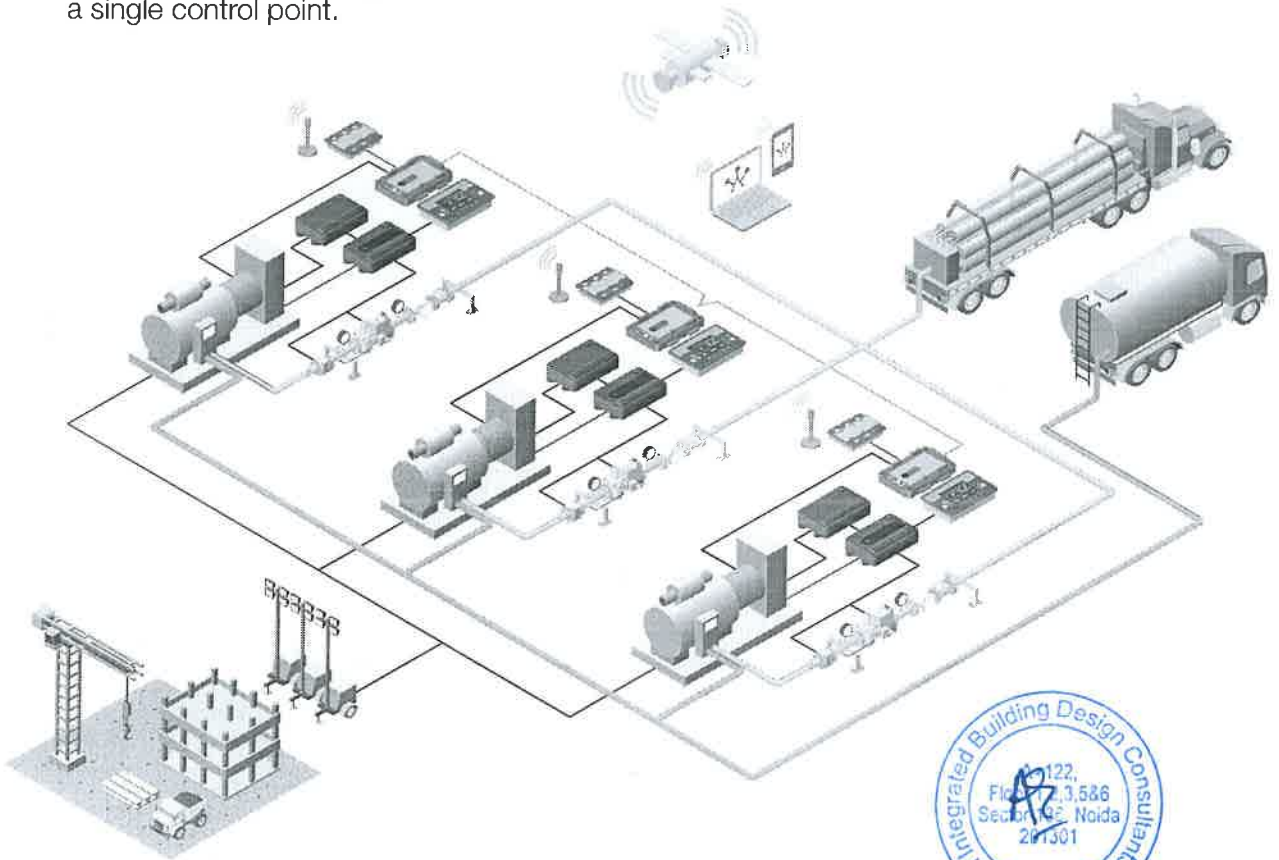


# ANNEXURE-E

## Virtual pipeline gas distribution

In many places of the world gas infrastructure is not well established yet and gas distribution is available through CNG or LNG virtual pipeline by trucks. IntelliBifuel is great option how to use gas from virtual pipelines and enable to any diesel generator to run back on 100 % diesel.

The ComAp unique integrated solution controls the diesel/gas ratio, as well as controlling the paralleling of the generators, which can all be monitored from a single control point.



# ANNEXURE-E

## IntelliBifuel

Bi-fuel/dual fuel control system  
for single speed engines



- > IntelliBifuel package is a fully programmable solution designed for any single speed Bi-fuel application, with its features perfectly suitable for Oil & Gas, Mining and Rental applications
- > New algorithm with automatic compensation for gas quality changes
- > Enable factory setting of Bi-fuel system
- > Simplified installation and commissioning
- > Extended PLC logic and history
- > Optional GPRS/GMS and GPS monitoring
- > IP-69 enclosure fits to any application
- > Optional high pressure single point gas injection after turbocharger
- > Compatible with IntelliVision 5, and IntelliVision 8 displays



## ANNEXURE-E

# InteliBifuel DENOX

Bi-fuel anti-knocking device



- > Unique anti knocking engine protection controller specifically designed for Bi-fuel applications, ensure proper detonation is always maintained during Bi-fuel operation
- > Suitable for engines up to 20 cylinders
- > Suitable for variable speed engines
- > Individual cylinder knocking detection
- > Individual cylinder misfiring detection
- > Integrated 2x Inteli AIN8TC up to 16 thermocouples
- > Harsh environmental design IP69K
- > Full communication and direct CAN interface to InteliBifuel LITE, InteliBifuel and InteliBifuel MOBILE
- > Operating temperature: -40°C to +80°C > CE, UL, CSA



# ANNEXURE-E

## InteliBifuel LITE

Bi-fuel/dual fuel control system  
for low-powered engines



- > InteliBifuel LITE package is a cost effective, compact solution designed for single speed Bi-fuel applications at nominal output power up to 100 or 500kW.
- > Perfectly suitable for the Rental market or any other Power generation applications using any type of gas
- > High or low pressure single point gas injection technology, gas injected before or after the turbocharger
- > NEW algorithm with automatic compensation for gas quality changes
- > Easy installation and commissioning
- > Harsh environmental design
- > IP-69 enclosure fits to any application
- > Compatible with InteliVision 5, and InteliVision 8 displays



## ANNEXURE-E

### InteliBifuel MOBILE

Bi-fuel/dual fuel control system  
for mobile variable speed engines



- > InteliBifuel MOBILE package is a fully programmable solution designed for any mobile variable speed applications as Mine haul trucks, Frack trucks, Locomotives or Marine propulsion engines
- > Fully configurable 3D maps
- > IP-69 Harsh environmental design allows full integration in applications with limited space
- > Remote monitoring
- > GPRS/GSM remote monitoring
- > GPS Location
- > Extended PLC logic
- > Extensive history records
- > Optional high or low pressure single point gas injection technology; gas injected before or after the turbocharger
- > Compatible with InteliVision displays



## ANNEXURE-E

# InteliDrive Mobile Logger

Data Logger for Diesel Engine Driven  
Mobile and Industrial Applications



- > Data logger – outstanding, monitoring and history tracking for diesel engines as well as peripheral equipment
- > Plug and play support of engines with ECU – access to all available values
- > Built-in Event & Performance Log
- > Remote monitoring support
- > Fleet management program with GSM/GPS localization and Geofencing
- > History log out
- > Engine measurement by sensors and actuators or via J1939
- > 8 Binary inputs
- > 11 Configurable analog inputs
- > 1x Frequency input for RPM measurement
- > 2x Impulse inputs
- > LED status indication
- > Communication Interface RS485, 2x CAN, J1939
- > Possibility to connect with external displays
- > Running-hours meter, number of starts counter, battery voltage measurement
- > Integral fuel consumption measuring



# ANNEXURE-E

## InteliDrive Mobile

Electronic Controller for Off-road  
Vehicles and Machinery



- > Diesel/gas engine control, monitoring and protection for off-road applications such as construction, quarrying and engineering equipment
- > Control of hydraulic systems and engine driven compressors and pumps
- > Designed for harsh environments – the unit construction features a fully environmentally sealed enclosure and connector
- > Plug & Play EFI (ECU) engine support (CAN/J1939)
- > Master Slave Concept Support
- > Remote monitoring support
- > Fleet management via GPRS/GPS, GeoFencing
- > Integrated PLC functions: Analog switches, Comparators with delay or hysteresis, Counters, Delay functions, Filters, Linear interpolation, Logical and Mathematical functions, PID loops, Timers
- > Built-in event & Performance Log
- > History log out – monitoring of wide range of parameters
- > 4 Binary inputs with detection of broken wire
- > 12 Binary bi-directional inputs for contacts switching
- > 8 Binary configurable switches (High-side/Low-side 3A, PWM 3A, DC motor driver)
- > 8 Binary Hi-side switches with max. current 3A and detection of broken wire



# ANNEXURE-E

## Gas Train

Low pressure gas train for HSC



- > Assembly of components necessary to reduce and control gas flow into the engine
- > Suitable for High Speed engine Conversions
- > Ended with electronic throttle valve
- > Low pressure output 10 – 30mbar
- > Inlet pressure range 150 – 350 mbar
- > According gen-set power there are several types (dimensions):
- > Code name Note
- IBF-GT25 DN25, Outlet 1x 1BSP, up to 250kWe
- IBF-GT40 DN40, Outlet 2x 1BSP, 250 – 650 kWe
- IBF-GT50 DN50, Outlet 2x 5/4BSP, 600 – 1000 kWe
- IBF-GT50A DN50, Outlet 4x 1BSP, 600 – 1000 kWe
- IBF-GT65 DN65, Outlet 4x 5/4BSP, 1000 – 1650 kWe
- IBF-GT80 DN80, Outlet 4x 5/4BSP, 1650 – 2200 kWe



# ANNEXURE-E

## InteliVision 5

5,7" Colour Display Unit



- > Colour display unit for localized visualisation
- > InteliVision 5 is compatible with the following product line of controllers: InteliGenNT, InteliSysNT and InteliMainsNT
- > 5,7" Colour TFT Display with resolution of 320 x 240 pixels
- > Local and Remote display for single controller monitoring
- > Plug & Play operation (auto configuration based on controller application)
- > Direct connection to the controller (converters are not needed)
- > Simple, fast and intuitive control Easy drag and drop screen configuration in graphical editor
- > Five active buttons – fast access to important data
- > Configurable active buttons
- > Support of Tiers 4 icons
- > Mounting screw available at the rear face of InteliVision 5 to mount a compatible controller
- > Same language support as the controller including graphic languages
- > Communication connection via RS-485 (galvanically separated)
- > Same cut out as InteliGenNT
- > Operating temperature: -30 to +70°C



# ANNEXURE-E

## InteliVision 12Touch

12,1" Colour Display Unit Touchscreen



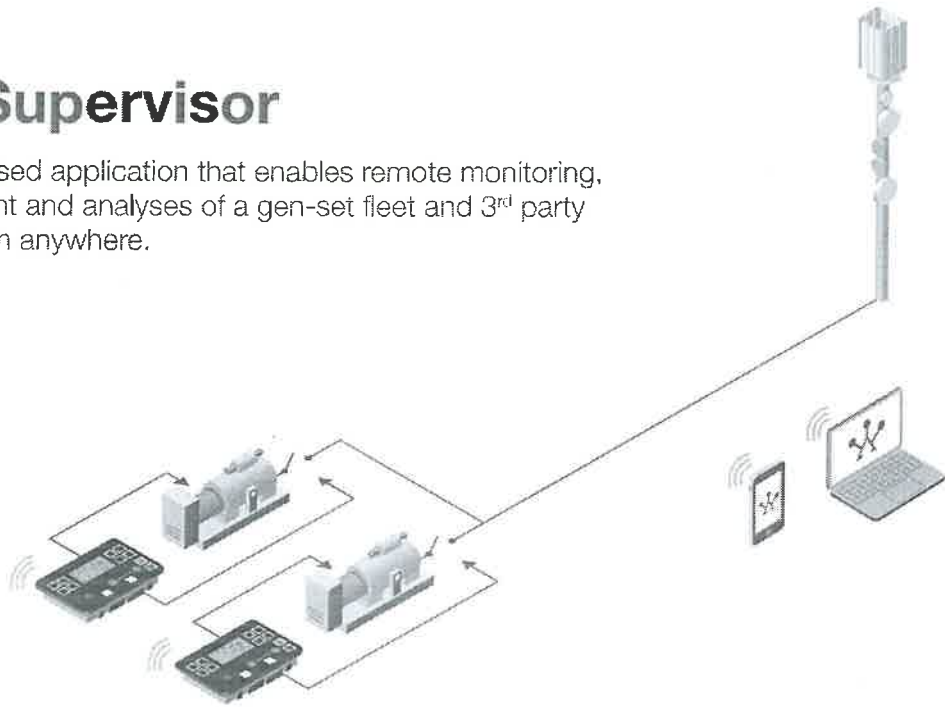
- > Industrial operator panel equipped with 12,1" colour TFT multi-touch screen with resolution of 1280 x 800 pixels
- > Touch based Graphical User Interface, support for multi-touch gestures
- > Plug & Play operation (auto configuration based on controller application)
- > Complete access to all control and monitoring functions
- > Fast and intuitive navigation
- > Extended trends monitoring screen
- > Compatible with ScreenEditor software
- > USB flash disk file storage (export/import trends, history, archive of controller and InteliVision 12Touch firmware and others to a USB stick)
- > User's pictures import
- > Adaptive and colour AlarmList
- > Large History screen
- > Adjustable setpoints help
- > Communication connection via RS-485, CAN or Ethernet
- > Multilanguage support
- > Integrated easy to use mounting system
- > Designed to be mounted in either monitoring or engine room
- > Industrial and robust design
- > Rugged housing manufactured from a single piece of aluminium alloy
- > Chemically strengthened front glass (8 times stronger than normal glass)
- > Sun-readable display (1000 cd/m2)
- > Automatic brightness control
- > Operating temperature: -30 to + 70°C
- > Face is sealed to IP65
- > EMC, climatic and mechanical tests
- > CE certification
- > Supported controllers :
  - InteliSys GAS
  - InteliGenNT BaseBox
  - InteliGenNTC BaseBox
  - InteliSysNTC BaseBox
  - InteliMainsNTC BaseBox
  - InteliSysNTC Hybrid
  - InteliDrive DCU Marine from HW version 2.0
  - InteliDrive Mobile from SW version 2.6.0



# ANNEXURE-E

## WebSupervisor

A Cloud-based application that enables remote monitoring, management and analyses of a gen-set fleet and 3<sup>rd</sup> party devices from anywhere.



### Main Features

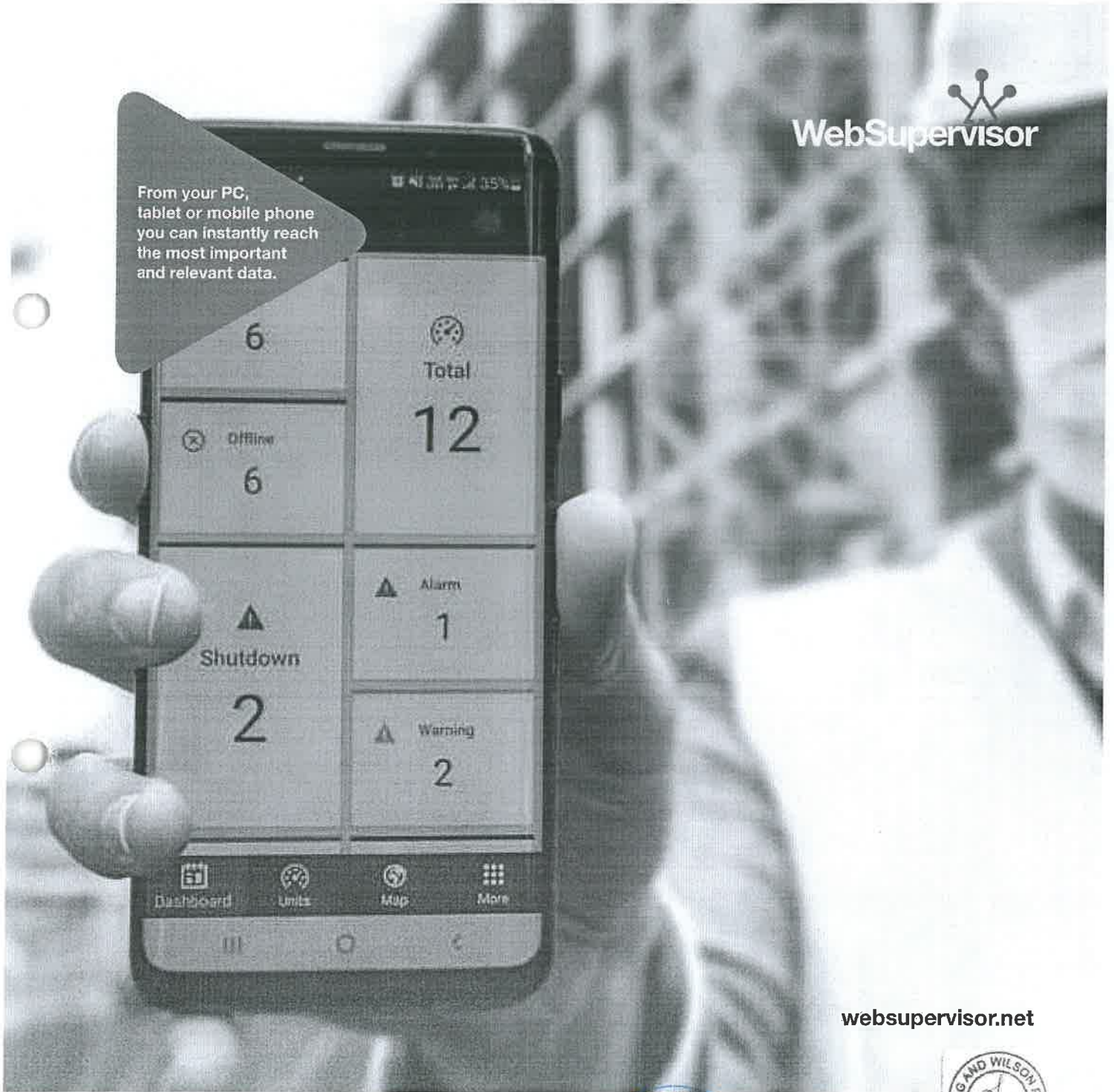
- > List and map views of devices and alerts on one screen
- > Device tracking and geofencing\*
- > Dashboard with fleet and group of devices statistics
- > Automatic reports for each device, or a group of devices, with customization options.
- > Alarm Analyser which can help reduce maintenance costs
- > Advanced trend representation (bar graphs, heat maps and more)
- > 3rd party device monitoring
- > API: able to download data and integrate in CRM, ERP, PowerBI or other third party software
- > Screen Editor: modify the data that is displayed according to your needs
- > Web camera support
- > User activity logger: logs all user activity for a device or fleet
- > Download controller's history files (event-based history)
- > Customizable look with your logo and URL
- > User management with several levels of permission



\*Tracking and geofencing requires purchasing an additional GPS card.



# ANNEXURE-E



[websupervisor.net](http://websupervisor.net)



# ANNEXURE-E

## Case Studies

We're always proud to showcase the innovative ways that our customers and staff utilize the full potential of our products, keeping ComAp at **the heart of smart control**.

98

case studies via [comap-control.com](http://comap-control.com)



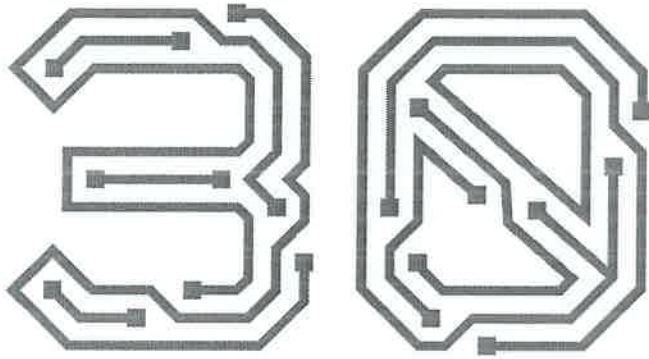
Don't forget to subscribe to our YouTube Channel to see our latest reference videos.



ANNEXURE-E



# ANNEXURE-E



**30 Years of Smart Control:**  
ComAp celebrates 3 decades of success through continuous innovation and growth.

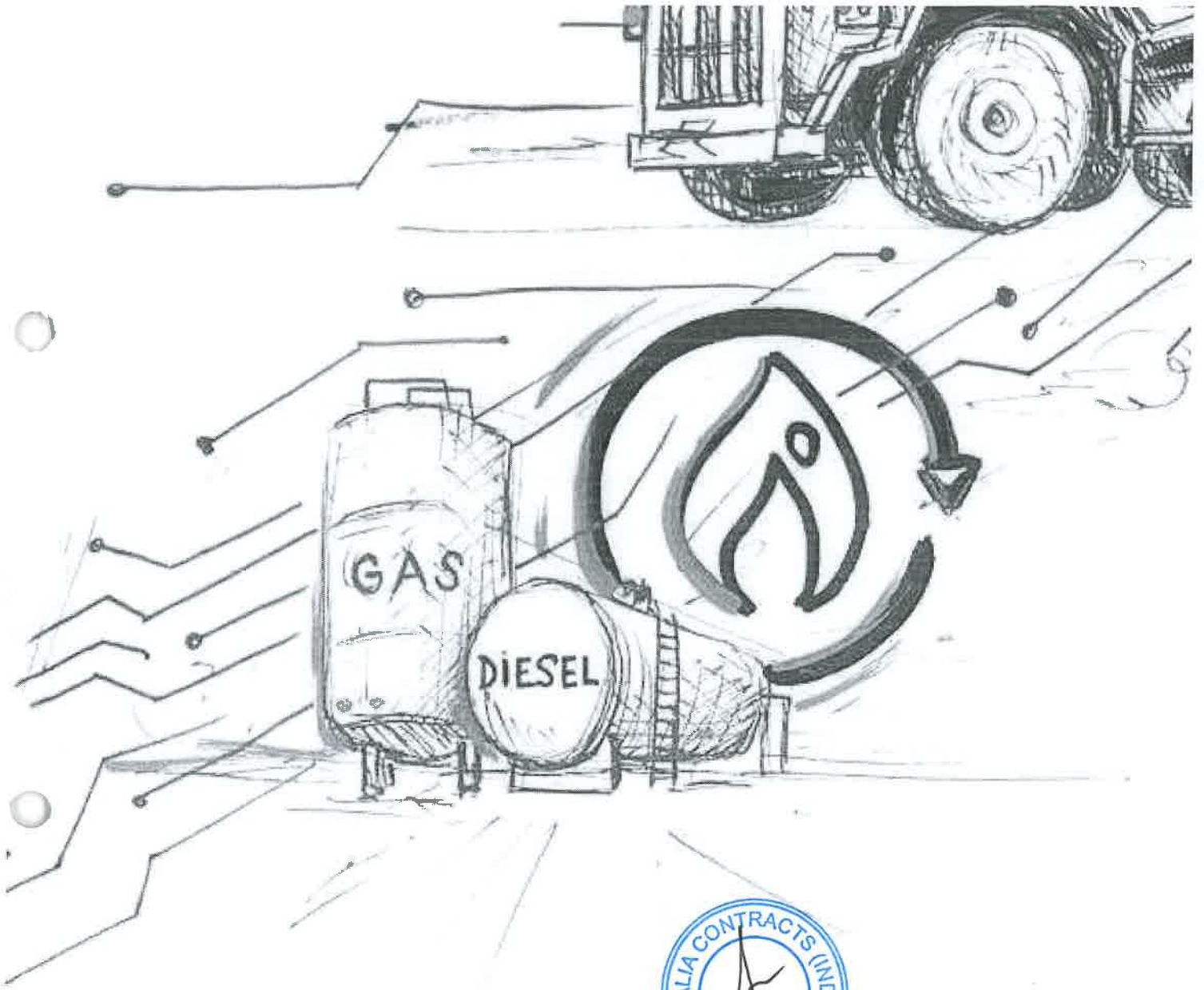
Founded in a one-room office in Prague, Czech Republic in 1991 by three friends, ComAp has since become a successful global company with a strong local presence supported by 13 subsidiaries, more than 400 employees, and a network of 60+ distributors. The company is in the hands of its founders who have an ambitious vision for further growth and investment in acquisitions and partnerships. But it is trusted relationships with customers what is the central focus of ComAp. Let's have a look at the milestones of this astonishing journey starting back in the early 1990s, in the heart of Europe, that has become known as The Heart of Smart Control in the world of independent and backup power generation.



# ANNEXURE-E



# ANNEXURE-E



[comap-control.com](http://comap-control.com)



## ANNEXURE-E

1500 KVA			
S. NO.	PART DESCRIPTION	QTY	Application
1	Gas Train (Consist of manual isoation valve, Gas filter, primary pressure regulator, slam shut off valve, line relief valve, dual shut off valve, pressure switches, zero pressure regulator, actuator throttle body)	1	For Regulation & control of gas
2	Bi-Fuel control Panel	1	
3	InteliBifuel Denox	1	Measuring unit for knocking and temperature
4	InteliBifuel Mobile	1	Dedicated controller for dual fuel solution
5	InteliVision 5 CAN - 5.7" Color Display	1	Real time display of parameters
6	Power Transducer	1	Engine Power Measurement
7	Cylinder Temperature Sensor	12	Monitoring individual cylinder temp
8	Exhaust temperature sensor	2	Monitoring exhaust gas temperature downstream turbo
9	Boost Temperature Sensor	1	Monitoring intake air temp
10	Pressure Transducer	1	Measurement of Rail Pressure
11	Cam pick-up sensor	1	TDC Sensor for knocking analysis
12	Knock sensor	12	Knocking sound detection
13	Harness WS_DEN12	1	Wiring harness for knocking and temperature sensor
14	Harness WS_GAS Harness	1	Wiring harness for gas train control
15	Harness WS_TEMP	2	Wiring harness for temp measurement downstream turbo
16	Harness WS_PWR	1	Engine power measurement
17	HarnessWS_DIESEL	1	Diesel measurement
18	Gas Mixer/ Nozzle	2	Gas Admission
19	tube flexible 8x1 blue	10 mtr	Reference line
20	Hoses	2	
21	Mechanical Fittings	1 Set	



**MAX SUPER SPECIALITY HOSPITAL, SEC-56  
COMPLIANCE STATEMENT**

Submission of Diesel Generator Set - 415V including DG Fuel Exhaust Piping & Battery Charger Make of M/s Baudouin (Engine) & Leroy Somer (Alternator) Submitted Via Transmittal on SWPL-MAX-TRANS-0017 Dated 17-07-2024

S. NO.	Reference No.	Doc/ Dwg No.	Revision	CONSULTANT COMMENTS	SGPL RESPONSE								
1				Fan Power not Specified.	Tender Requirement is HE Cooled DG Set, hence Radiator Fan Power is not applicable.								
2				Fuel consumption calculation is required at different Loading.	Please Refer the SGB 1500PH Model for 1500KVA HE Cooled DG Set. <table border="1" style="margin-left: 20px;"> <tr> <td colspan="2">Baudouin 1500 KVA (12M33GT1500/5)</td> </tr> <tr> <td>Loading</td> <td>100%      75%      50%</td> </tr> <tr> <td>Engine gphkWh</td> <td>201.6      184.3      194.3</td> </tr> <tr> <td>LP4</td> <td>203.5      204.4      130.03</td> </tr> </table> <p style="font-size: small; margin-left: 20px;">                 @ Specific Gravity 850 gms/Ltr                  Set Data Caters to ISO 3247, with 45% loading                  Recommended Part No. 1468 B3250 Part Cuts A             </p>	Baudouin 1500 KVA (12M33GT1500/5)		Loading	100%      75%      50%	Engine gphkWh	201.6      184.3      194.3	LP4	203.5      204.4      130.03
Baudouin 1500 KVA (12M33GT1500/5)													
Loading	100%      75%      50%												
Engine gphkWh	201.6      184.3      194.3												
LP4	203.5      204.4      130.03												
3				Specify BMEP (Brake mean effective pressure)	29.59 (Bar)								
4				A Note is required on :- How the after sale service will be provided and at where this model is installed?	SGPL has two offices in Delhi NCR including full fledged Service Set up with more than 100 manpower and sufficient parts inventory in Sector 32, Gurugram. Please refer the Service Level Agreement for the same. We have fairly large number of installations of same model / rating DG Set all over INDIA including Delhi NCR. Max Hospital, Mohali also using the same Gensets from last 2 Years. Customer reference list enclosed for your ready reference.								
5	ACIL Comments on Email Dated 10-09-2024 from Mr. Sanjay Tyagi	SWPL-EL-TDS-17	R0	You are providing SGC 420/421 Controller. Is it compatible for the proposed 1500KVA DG.	Yes it's compatible as We have Standardize Baudouin Engine with DIEF Make SGC-420 controller for the entire range from 250KVA to 4000KVA.								
6				Specify NFDA Capability	Need more clarity on NFDA applicability for Genset Application. From our understanding the same is not applicable on DG Sets.								
				Can We Have 16 Vee ???	Each Engine Manufacturer has it's own design in terms of engine configuration for nos. of cylinders & displacement to achieve the desired output. Offered Baudouin Engine with 12 cylinders (150 x 185 mm bore & stroke size) and 39.2 L displacement with advanced electronic fuel injection system (HPCR-High Pressure Common Rail), efficient cooling, with marine based metallurgy is developing the 1350KwM / 1810 BHP (Max compare to all other available makes in this range).								
7				Displacement-39.2 L provided, It should be at least 50 L									
8				No of valves are not specified	48 nos (4 Valves per Cylinder)								
				Average Load Factor	80% average loading compliance to ISO 8528 Part 1.								
				What's about the Synchronization Feature?	Synchronization Relay / Controller considered in Main LT cum Sync Panel								



**AHLUWALIA CONTRACTS (INDIA) LTD.**  
New Delhi-25



**Envirotech Design Pvt. Ltd.**  
New Delhi-25



**STERLING AND WILSON PVT. LTD.**



**Aam Integrated Building Design Consultants LLP.**  
Floor: 5&6 Sector: 25, Noida 201301

**GENERATOR SITE TEST SCHEDULE****Contents**

- i. Preliminary Information Required
- ii. Pre-witnessing Check
- iii. Confirm System Parameters
- iv. Failure Mode Tests
- v. Operational Tests
- vi. Load Acceptance Tests
- vii. Harmonic Tests

**PRELIMINARY INFORMATION REQUIRED**

To allow the scheduled witness tests to proceed, Owners shall require all the information as scheduled below to have been completed in order to meet the Contractual conditions of the Contract works. By conducting and preparing the attached information, Owners expect the tests to be completed expediently and successfully in line with the master Contract programme, this particular element of the project shall also be used to benchmark Contractor performance for selection upon future projects.

- Factory test schedules and results
- Record drawings for all equipment and systems
- Record drawings of the infrastructure
- Completed pre-commissioning and commissioning check lists
- Fuel system complete and certified
- All relevant snag lists complete

**Note:**

All information to be issued in bound format As an integral part of the pre-commissioning exercises, it shall also be required to confirm certain conditions and systems within the boundaries of the project are available for use and are fully serviceable. The scope of these pre-commissioning checks shall include the systems, equipment and works that are required to complete the installation and for a complete Normal and Standby system to be available to support the load upon completion of the tests.

Upon completion of the scheduled tests, it is intended that the equipment and systems relevant to the generator system shall be made available to support Owners critical load, therefore, all test documentation, sign off sheets, and O & M manuals shall be presented to OWNERS within 72 hrs following successful completion of the tests.

**PRE-WITNESSING CHECKS**

- All associated infrastructure cabling, Controls cabling to be completed
- All ancillary systems within the Generator enclosure to be completed.
- Visual checks to all system components and cabling.
- All infrastructure works to be complete or circuits isolated to allow test to commence.
- All earthing connections completed and tested
- All Builders work to be complete.
- kW & kVAr sharing proven.
- All set controls circuits checked and operational.
- All emergency shutdown circuits checked and operational
- All interlocks and padlocks are in place.
- Generator fuel oil system is complete, certified and functioning.
- All generator supplier site commissioning checks complete and certificates issued.

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DG-PC TS - 34



Note - Complied w.r.t final agreed technical clarification sheet  
with scope matrix and Page 35 of 127. CO.

- ✓ All protection devices are operational.
- ✓ All recording equipment is in place and functioning.
- ✓ All necessary fire precautions have been taken.
- ✓ Generator manufacturers to be on site.
- ✓ Check all protective devices within the electrical distribution have been set correctly
- ✓ All electrical circuit test results issued and approved.
- ✓ Confirm all Utility incomers and generator incomers in correct sequence.

Upon issue of the above information and confirmation of the itemised pre-commissioning checks, the Certification tests shall commence as detailed.

#### CONFIRM SYSTEM PARAMETERS

Following commissioning of the relevant electrical infrastructure the Generator system shall be configured as follows in readiness for the test sequence: -

- ✓ Verifying alternator star point earth resistance < 1ohm
- ✓ Check earth loop impedance on generator configured distribution system.
- ✓ Confirm fuel oil transfer rates in l/s
- ✓ Confirm battery voltages for starters
- ✓ Check alternator output voltage at No load and full load.
- ✓ Check current per phase on no load and full load.
- ✓ Check Neutral currents on No load and full load.
- ✓ Check frequency on no load and full load.
- ✓ Confirm voltages at furthest point under UPS test sequence.
- ✓ Confirm kW & KVAr load sharing at full load.
- ✓ Check engine speed
- ✓ Confirm all auto-change over time settings.

#### FAILURE MODE TESTS

The failure mode tests are to be conducted on successful completion of the system parameter checks and tests.

The tests to be conducted are as follows and shall be carried out on the each generator by the manufacturer at 50% design load.

- ✓ Conduct fail to start sequence
- ✓ While set running fail fuel oil system
- ✓ Simulate reverse power and observe set shutdown.
- ✓ Fail control power supply and observe set shut down.
- ✓ Simulate E.P.O. annunciation.
- ✓ Prove set shutdown with inlet outlet louvers failed.
- ✓ Test auto-change over system at incoming switchboards.
- ✓ Verify all phase failure relay generator start signals.
- ✓ Simulate all engine shutdown alarms and observe shutdown
- ✓ Simulate specifically, engine over speed alarm and shutdown
- ✓ When both sets synchronized, Conduct Phase to earth fault at OWNERS input switchboard via protective device and observe generator performance.



DG-PC TS - 35



Note- complied w.r.r. final agreed technical clarification  
sheet with scope matrix and Page 36 of 127. R. F. C.

**OPERATIONAL TESTS**

The function of the following test schedule is to confirm the operational abilities of the system under all possible scenarios and fault conditions, and will require the whole electrical infrastructure to be complete to enable all the auto change over system to be included within the test.

The entire test scheduled below shall be conducted with the load bank connected via the UPS and all other essential loads connected via their respective distribution switchgear.

With the complete electrical system under Normal mains supply, conduct the following tests:-

- Fail Utility input and observe generator start sequence and auto-change over then re-instate.
- Fail Utility inputs simultaneously and observe generator start sequence and auto changeover then re-instate.
- Observe priority load scheduling arrangements on mains failure
- Conduct all above tests for each individual generator with 1 No. Generator isolated as if in maintenance.

**LOAD ACCEPTANCE TESTS**

The load acceptance test shall be conducted to confirm the load acceptance of the generator system under varying load steps and in all system configurations.

These tests are required to be conducted individually and when all sets synchronized.



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DG-PCTS - 36



Note- complied w.r.t final agreed technical clarification sheet with scope matrix on Page 37 of 127

**LIST OF APPROVED MAKE**

6	COMPUTER (MONITOR, CPU, KEYBOARD & MOUSE)	IBM, HP, DELL
7	LCD MONITOR	LG, SAMSUNG
8	POWER CABLES & WIRES	RR Kable, POLYCAB, FINOLEX, KEI
9	CAT -6 FIRE / OPTICAL CABLE	AMP(commscope), Belden Molex
10	SERVERS	DELL, HP, IBM
12	SWITCH POE LAYERS	CISCO, JUNIPER, NETGEAR, HP,
14	MS CONDUITS	As per Electricals Make
15	PVC RIGID CONDUIT	As per Electricals Make
<b>DG set</b>		
	Engine	Cummins, Caterpillar, Baudouin
	Alternator	Stamford, Leroy Somer

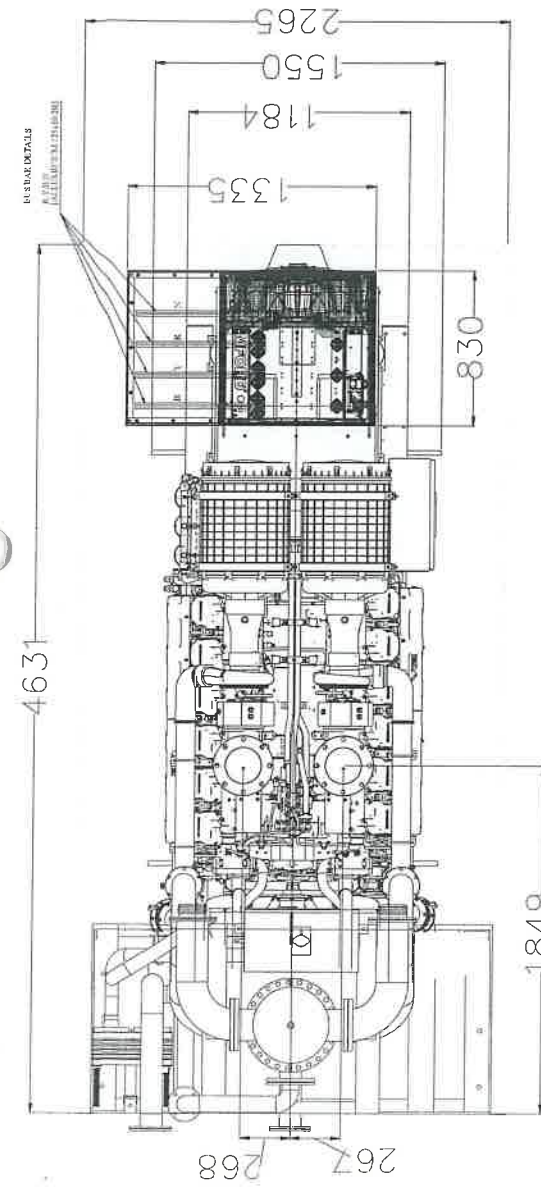
Sr No	Item	Makes
1	LED Light Fixtures & Drivers (Range as per approved sample only)	Philips
		Wipro
		Oppl
		Trilux
		Havells
2	LED Chip	Bajaj
		Cree
		Osram
		Lumileds
		Seoul
		Nichia
	Ceiling Fan / Exhaust Fan	EPI Star
		Havells
		Crompton Greaves
		Bajaj
		Usha
		Orient



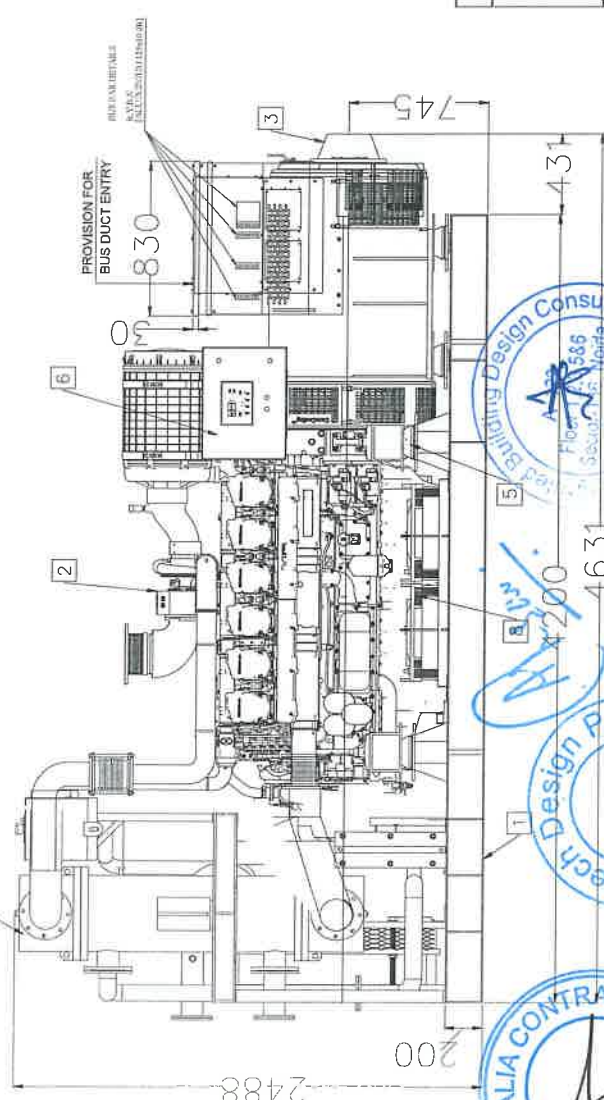
GENERAL NOTES

- A ALL DIMENSION ARE IN mm. UNLESS SPECIFIED
- B COLOR OF BASE FRAME =RAL 9005(JET BLACK)
- C REFER ENGINE, ALTERNATOR AND SGPL DG SET TECHNICAL DATA SHEET FOR DETAIL SPECIFICATION
- D SILENCER "HOSPITAL GRADE"

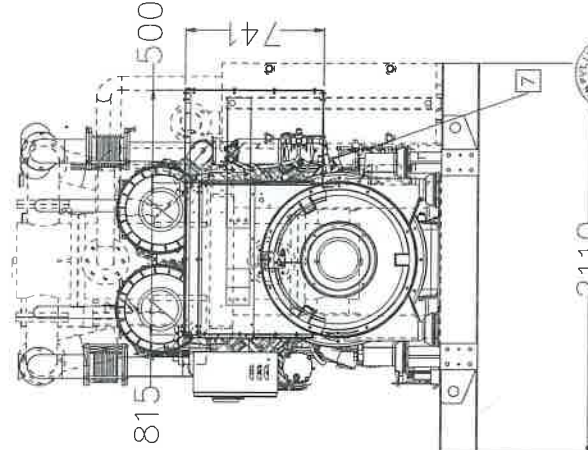
DYNAMIC WEIGHT OF DG SET [APPROX]	12359	kg		
STATIC WEIGHT OF DG SET [APPROX]	8359	kg		
09 SILENCER	SGPL (LOOSE SUPPLY)	01 NO.		
08 BATTERY	SGPL STD	01 SET.		
07 OIL DRAIN	SGPL STD	01 NO.		
06 PANEL CONTROL	SGPL	01 NO.		
05 AVI	CORI RUBBER	08 NOS		
04 COOLING SYSTEM	CAC & PHE [SGPL STD]	01 NO.		
03 ALTERNATOR	Leroy Somer [LSA 50 2 L8]	01 NO.		
02 ENGINE	BAUDOUIN [12MB3G/65W5]	01 NO.		
01 BASE FRAME	SG-1500PH-SF-CG-BP-01-02	01 NO.		
REF NO	DESCRIPTION	MAKE / MODEL	QTY	UNIT
GENERAL TOLERANCES FOR LINEAR DIMENSION AS PER IS 2025 (millimetre)				
0.5 to 6	± 0.1	400 to 1000	± 0.8	DIMENSION
6 to 30	± 0.2	1000 to 2000	± 1.2	DIMENSION
30 to 120	± 0.3	2000 to 4000	± 2	DIMENSION
120 to 400	± 0.5	4000 to 10000	± 2.5	DIMENSION
				ANGULAR TOLERANCES
				± 0.5°



TOP VIEW



FRONT VIEW



ALT. SIDE VIEW

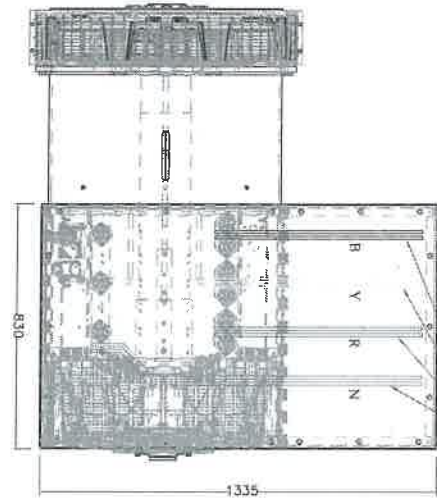
**Akhmalia Contracts (India) Ltd.**  
New Delhi-25

**Envirotech Design Pvt. Ltd.**  
Floor 306  
Sector 28, Gurgaon, Haryana  
201301

**STERLING Design Consultants LLP**  
Floor 306  
Sector 28, Gurgaon, Haryana  
201301

NO.	05-07-2024	FIRST SUBMISSION	S.S.	S.S.	R.R.C.
REV.	DATE	DESCRIPTION	DSN BY	CHECKED BY	APPROVED BY
CUSTOMER			STERLING GENERATORS		
PROJECT			PVT LTD		
CONSULTANT			K.RANVEL, SILVASSA.		
CONTRACTOR			K.RANVEL, SILVASSA.		
DWG. NO.	SG-1500PH-LSA 50 2L8 -BE-GA-05-00-01		DESCRIPTION	STERLING GENERATORS	
	GA DRAWING FOR 1500 KVA DG SET		ANGLE PROJECTION	FIRST ANGLE	
	PROJECT NO.		THIRD ANGLE	N.T.S	
	SCALE		SHEET NO.	01 OF 01	

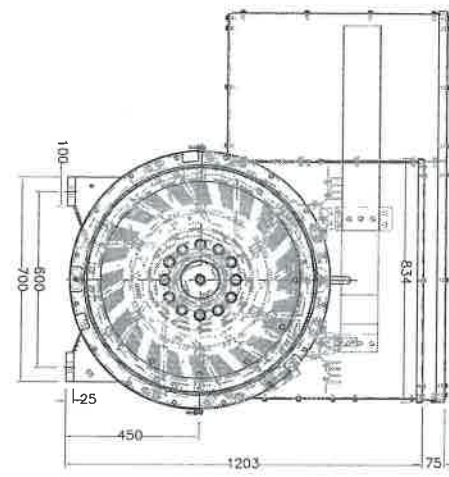
This Drawing & information or descriptive matter set out here on are the confidential property of STERLING GENERATORS PVT. LTD. & must not be disclosed, loaned, copied or used for manufacturing tendering or for any other purpose without their written permission.



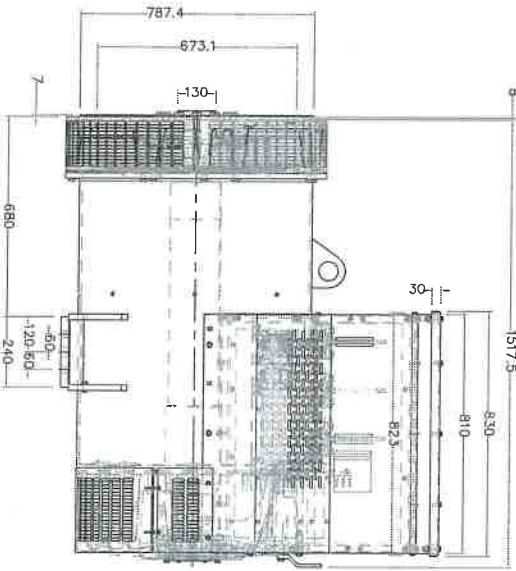
BUS BAR DETAILS:  
R.Y.B.N  
[ALUMINIUM 125x10 FR.]



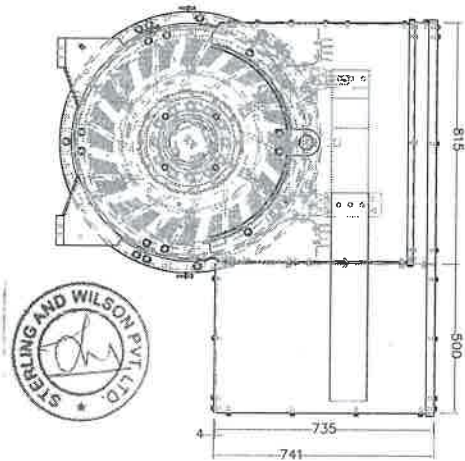
TOP VIEW



FRONT VIEW



DE SIDE VIEW



NDE SIDE VIEW



GENERAL NOTES:

- ALL DIMENSION ARE IN mm UNLESS SPECIFIED
- ALL STRUCTURE STEEL SHALL CONFORM TO IS-2062
- ALL WELDS AS PER IS-816
- REFER TO DRAWING FOR ALL DIMENSION AT SHOP/FLOOR BEFORE STARTING FABRICATION

MATERIAL OF CONSTRUCTION:

DESCRIPTION	MATERIAL (AS SHOWN)	THICKNESS	DENSITY	
T.B PARTS	CRCA	IS 513	2 mm	7850 kg/m <sup>3</sup>
T.B PARTS	CRCA	IS 513	2 mm	7850 kg/m <sup>3</sup>
BUS-BAR	ALUMINIUM	IS 513	10 mm	2700 kg/m <sup>3</sup>

INSULATION SPECIFICATION:

ATMOSPHERIC INSULATION	MATERIAL (AS SHOWN)	THICKNESS	DENSITY

PAINTING SPECIFICATIONS:

DESCRIPTION	PROCESS	MIN. COVERAGE (sq.m)	COEF. (litre/sq.m)
C-5N		300	0.241 - 0.300

GENERAL TOLERANCES FOR LINEAR DIMENSION AS PER IS 2102 (mm)

DIMENSION	TOL.	DIMENSION	TOL.	DIMENSION	TOL.
0.5 to 6	-0.1	6 to 100	-0.18	600 to 800	+0.3
6 to 30	-0.2	100 to 200	-0.3	800 to 1000	+0.5
30 to 120	-0.3	200 to 300	-0.4	1000 to 1200	+0.7
120 to 400	-0.5	400 to 600	-0.7	1500 to 1800	+1.0

STERLING GENERATORS

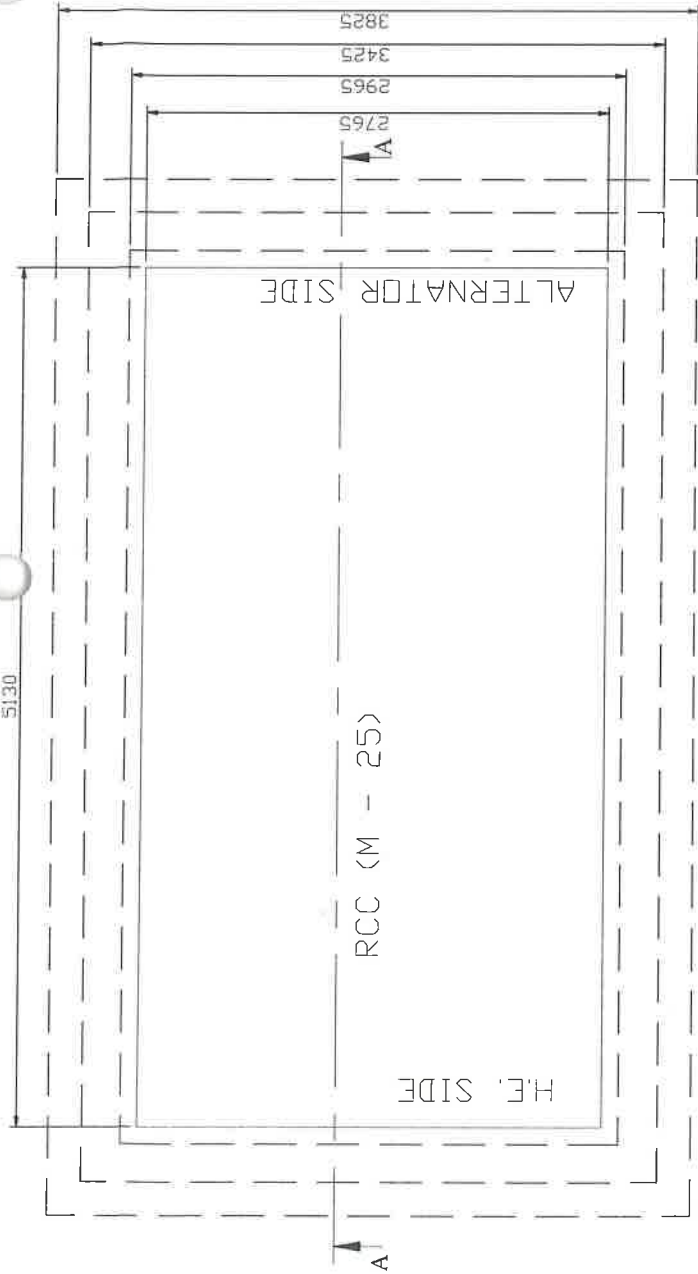
PROJECT	CUSTOMER	CONSULTANT	CONTRACTOR
STERLING GENERATORS	PVT. LTD.	KIANVEL - SILVASSA	

REV.	DATE	DESCRIPTION	DSN BY	CHKD BY	APPROVED BY
R0	18-05-2023	ISSUED FOR MANUFACTURING/ASSEMBLY	SP	BJP	DK

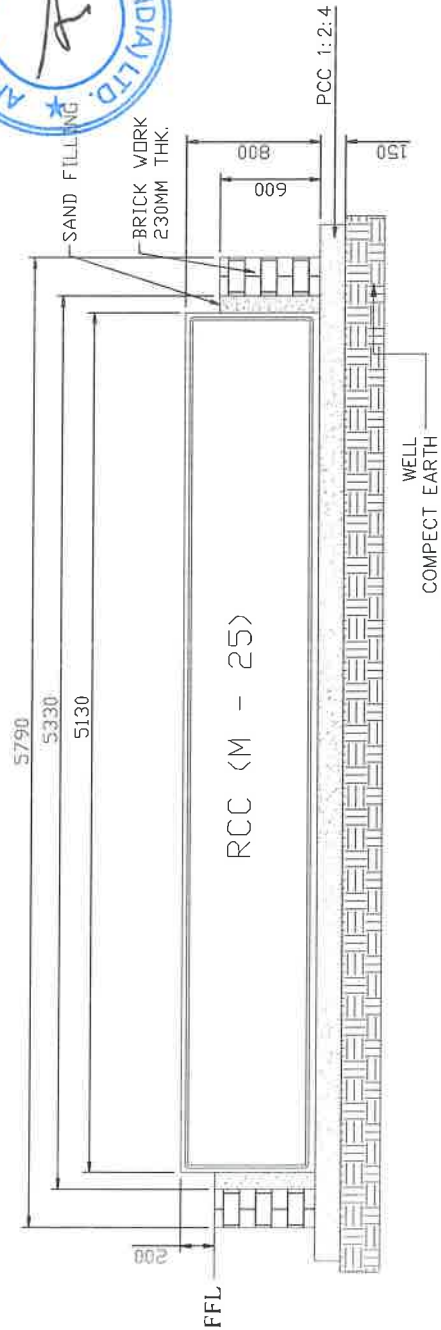
This Drawing & Information or descriptive matter set out here on are the confidential property of Sterling Generators Pvt. Ltd. & must not be disclosed, loaned, or used for manufacturing, tendering or for any other purpose without their written permission.

NOTE: —

1. STATIC WEIGHT OF DG SET 8359 Kgs. (APPROX.)
2. DY. WEIGHT OF DG SET 12539 Kgs. (APPROX.)
3. DEPTH OF FOUNDATION & RCC DETAILS IS TENTATIVE AND DEPEND ON SOIL CONDITION, IT DECIDE BY STRUCTURAL CONSULTANT.
4. CIVIL WORK NOT IN SGPL SCOPE.



PLAN OF DG FOUNDATION

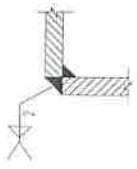


SECTION A-A



REV.	DATE	DESCRIPTION	DSN BY	S.S.	CHECKED BY	S.S.	R.C.C.	CUSTOMER	PROJECT	CONSULTANT	MAX SUPER SPECIALTY	DWG. NO.	SCALE	N.T.S.
R3								STERLING GENERATORS	PVT. LTD	STERLING GENERATORS	3x1500 KVA.DG SET	SG-1500PH-LSA 30 215 -BE-GA-OS-00-02	FOUNDATION DRAWING FOR 1500 KVA DG SET	PROJECT NO
R2								STERLING GENERATORS	PVT. LTD	STERLING GENERATORS	3x1500 KVA.DG SET	FOUNDATION DRAWING FOR 1500 KVA DG SET	FOUNDATION DRAWING FOR 1500 KVA DG SET	PROJECT NO
R1								STERLING GENERATORS	PVT. LTD	STERLING GENERATORS	3x1500 KVA.DG SET	FOUNDATION DRAWING FOR 1500 KVA DG SET	FOUNDATION DRAWING FOR 1500 KVA DG SET	PROJECT NO
R0	09.07.2024	FIRST SUBMISSION		S.S.				STERLING GENERATORS	PVT. LTD	STERLING GENERATORS	3x1500 KVA.DG SET	FOUNDATION DRAWING FOR 1500 KVA DG SET	FOUNDATION DRAWING FOR 1500 KVA DG SET	PROJECT NO
				S.S.				STERLING GENERATORS	PVT. LTD	STERLING GENERATORS	3x1500 KVA.DG SET	FOUNDATION DRAWING FOR 1500 KVA DG SET	FOUNDATION DRAWING FOR 1500 KVA DG SET	PROJECT NO
				S.S.				STERLING GENERATORS	PVT. LTD	STERLING GENERATORS	3x1500 KVA.DG SET	FOUNDATION DRAWING FOR 1500 KVA DG SET	FOUNDATION DRAWING FOR 1500 KVA DG SET	PROJECT NO
				S.S.				STERLING GENERATORS	PVT. LTD	STERLING GENERATORS	3x1500 KVA.DG SET	FOUNDATION DRAWING FOR 1500 KVA DG SET	FOUNDATION DRAWING FOR 1500 KVA DG SET	PROJECT NO
				S.S.				STERLING GENERATORS	PVT. LTD	STERLING GENERATORS	3x1500 KVA.DG SET	FOUNDATION DRAWING FOR 1500 KVA DG SET	FOUNDATION DRAWING FOR 1500 KVA DG SET	PROJECT NO
				S.S.				STERLING GENERATORS	PVT. LTD	STERLING GENERATORS	3x1500 KVA.DG SET	FOUNDATION DRAWING FOR 1500 KVA DG SET	FOUNDATION DRAWING FOR 1500 KVA DG SET	PROJECT NO
				S.S.				STERLING GENERATORS	PVT. LTD	STERLING GENERATORS	3x1500 KVA.DG SET	FOUNDATION DRAWING FOR 1500 KVA DG SET	FOUNDATION DRAWING FOR 1500 KVA DG SET	PROJECT NO

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DETAIL OF 'D'

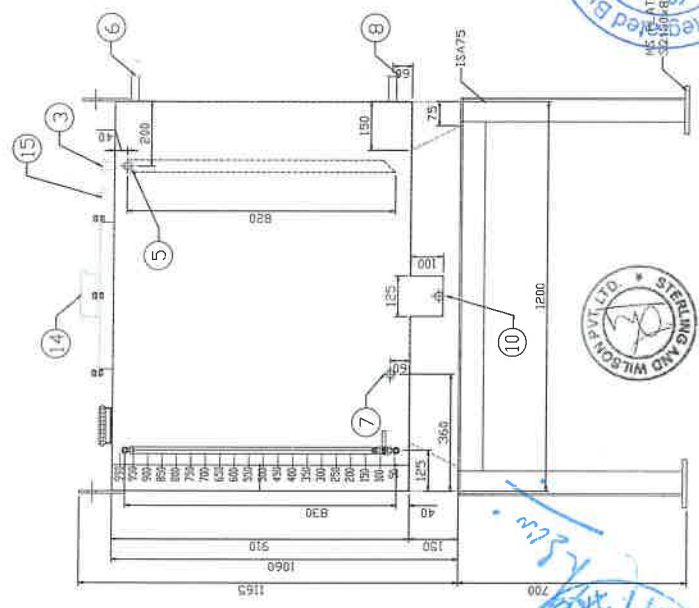
LEGENDS

ITEM	QTY.	SIZE	SERVICE	RE.
1	1	SO. 450	MAIN HOLE	
2	1	100	FILLING CAP	
3	1		AIR BREATHER	
4	1		LEVEL INDICATOR	
5	1	25	RETURN	
6	1	25	OVER FLOW	
7	1	25	SUPPLY	
8	1	25	INTER CONNECTION	
9	4		LEGS	
10	1	25	DRAIN	
11	1	40	SPARE	
12	2		LIFTING HOOK	
13	1	25	AUTOMATIC FILLING	
14	1		MAIN HOLE COVER	
15	1		LEVEL SENSOR	

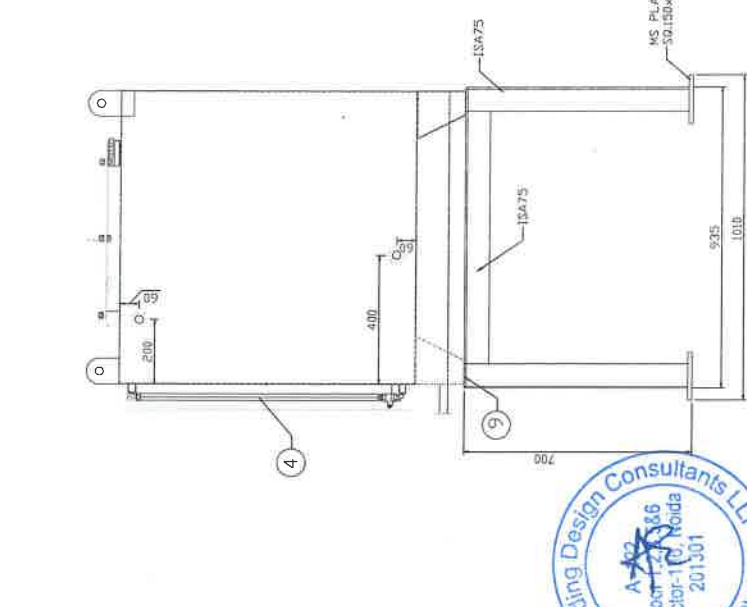
NOTES :-

- 1) ALL DIMENSIONS ARE IN mm, UNLESS OTHERWISE SPECIFIED.
- 2) ALL FILLET WELDS ARE OF 2mm FILLET UNLESS OTHERWISE SPECIFIED.
- 3) WELDING SHOULD BE DONE IN PROPER SEQUENCE TO KEEP THE DISTORTION MINIMUM.
- 4) TANK TO BE TESTED BY WATER FILL TEST.  
- MATERIAL OF CONSTRUCTION : IS 2062  
- SHEET THICKNESS IS 2.0MM
- 5) PAINTING :  
INTERNAL = 1 COAT OF UNSUIOD OIL AFTER PROPER CLEAN WITH WIRE BRUSH.  
EXTERNAL = 2 COAT OF ENAMEL PAINT

TOP VIEW



FRONT VIEW

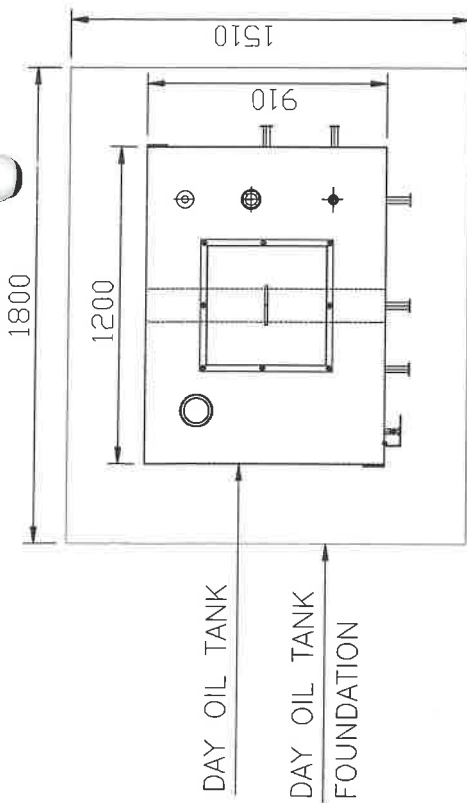


L.H.S.V

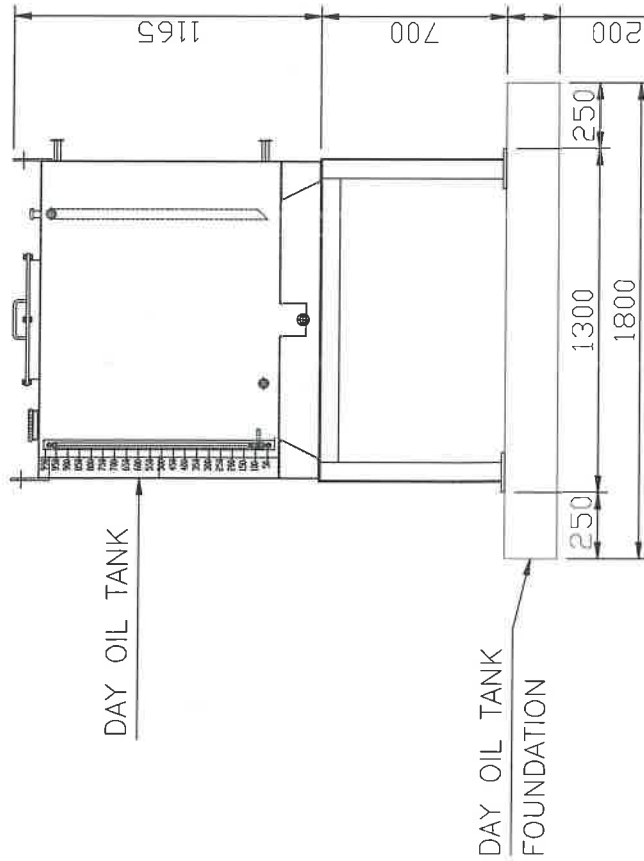
R.H.S.V

R3															
R2															
R1															
R4	07-2024	FIRST SUBMISSION													
R5	DATE	DESCRIPTION	DN BY	S.S.	CHECKED BY	APPROVED BY	R.C.C.								
<p>STERLING GENERATORS PVT. LTD. &amp; must not be disclosed, loaned, copied or used for manufacturing tendering or for any other purpose without their written permission.</p>												<p>STERLING GENERATORS PVT. LTD.</p>		<p>KHANVEL-SILVASSA.</p>	
<p>M.T. MAX SUPER SPECIALTY HOSPITAL GURUGRAM. CONSULTANT PROJECT 181500 KVA DG SET</p>												<p>STERLING GENERATORS PVT. LTD.</p>		<p>KHANVEL-SILVASSA.</p>	
<p>CUSTOMER PROJECT</p>												<p>STERLING GENERATORS PVT. LTD.</p>		<p>KHANVEL-SILVASSA.</p>	
<p>DWG. NO. SC-1500PH-LSA 50 2LR-BB-GA-OS-00-03</p>												<p>STERLING GENERATORS PVT. LTD.</p>		<p>KHANVEL-SILVASSA.</p>	
<p>DESCRIPTION DA FOLL TANK</p>												<p>STERLING GENERATORS PVT. LTD.</p>		<p>KHANVEL-SILVASSA.</p>	
<p>ANGLE PROJECTION</p>												<p>STERLING GENERATORS PVT. LTD.</p>		<p>KHANVEL-SILVASSA.</p>	
<p>TOLERANCES AS PER IS 2102 (medium)</p>												<p>STERLING GENERATORS PVT. LTD.</p>		<p>KHANVEL-SILVASSA.</p>	
<p>ALL DIMENSION ARE IN mm.</p>												<p>STERLING GENERATORS PVT. LTD.</p>		<p>KHANVEL-SILVASSA.</p>	

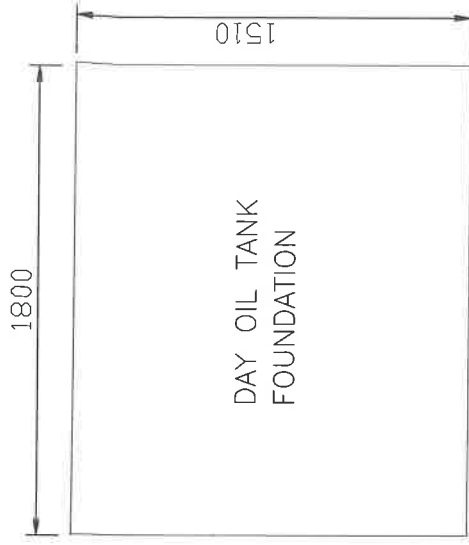




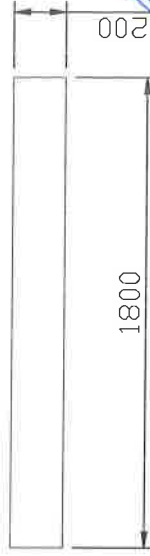
**TOP VIEW**



**FRONT VIEW**



**TOP VIEW**



**FRONT VIEW**

**NOTE :-**

1) ALL DIMENSIONS ARE IN mm, UNLESS OTHERWISE SPECIFIED.



REV	DATE	DESCRIPTION	SS	SS	SS	RCC
R1	09-07-2024	FIRST SUBMISSION				
R2						
R3						

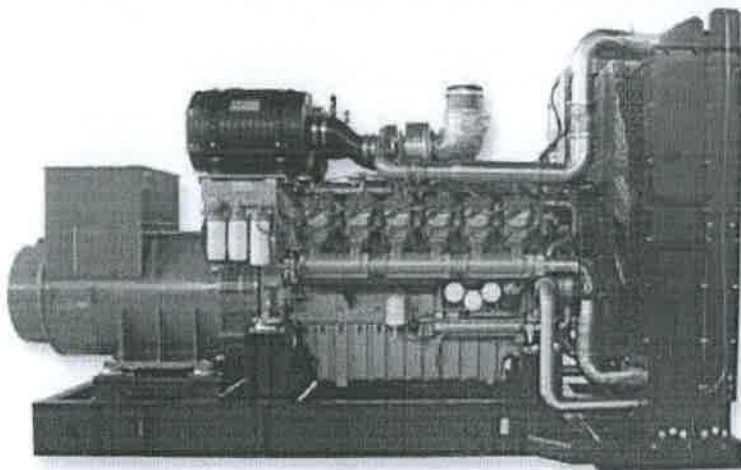
  

CUSTOMER	STERLING GENERATORS PVT. LTD	DWG. NO.	SG-1500PH+LSA 30 2LP-BE-GA-OS-04-04	ALL DIMENSION ARE IN mm.
CONSULTANT PROJECT	KHANVEL-SILVASSA	DESCRIPTION	FOUNDATION DRAWING FOR 990 LTRS DAY OIL TANK	PROJECT NO.
TOLERANCES	AS PER IS:1102 (minimum)	ANGLE PROJECTION		SCALE
PROJECT	3x1500 KVA DG SET	THIRD ANGLE		SHEET NO.
CLIENT	M/S. MAX SUPER SPECIALITY HOSPITAL GURUGRAM			01 OF 01

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# DIESEL GENSET MODEL SGB 1500 PH



## PRODUCT HIGHLIGHTS

### Diesel Gen Set Package

- Genset Designed to comply with ISO 8528.
- Excellent performance under most demanding environmental conditions
- Near zero down time for continuous power supply
- Sturdy base frame
- Efficient anti-vibration mounts
- Stringent shop floor testing to ensure class leading, hassle-free performance
- Testing carried out using state-of-the-art PLC based, resistive load bank

### Engine Features

- Cooling System Designed for 50°C ambient
- Cast iron cylinder block with rugged body construction designed to minimize vibration & noise level
- High carbon steel forged crankshaft with induction hardening
- Full flow oil filter along with lube oil cooling to maintain optimum temperature
- Cast iron dry liners, lube oil cooled aluminium alloy piston with high performance piston rings
- High power to weight ratio with low life cycle cost
- Air intake, exhaust manifold and turbocharger provided with shield to isolate heat
- HPCR pump with ECU control providing efficient performance in terms of power & fuel consumption
- Full flow multi level type oil filters
- Electronic governing
- Fast load response
- Stable frequency
- Excellent fuel and lube oil consumption
- Engine complying to ISO 3046-1/1, ISO 15550 standard reference conditions.

### Alternator Features

- Brushless type, screen protected, self-excited alternator complying to IS:13364/IEC 60034 – 1
- Excellent motor start capability
- Excellent alternator efficiency across the load range
- Compact design with sealed bearings for longer life and lower maintenance
- Optimised engine compatibility

Optional equipment and finishing shown. Standard may vary.

Rating	1500 kVA / 1200 kWe
Voltage	415 Volts
Frequency	50 Hz
Speed	1500 RPM



## APPLICATION DATA



### ► Engine

Engine Make	Baudouin, India
Engine Model	12M33G1650/5
Distribution	4 Strokes
Aspiration	Turbocharged
No. of Cylinders	12
Type of Construction	Vee type
Displacement	39.2 L
Bore / Stroke	150x185 mm
Mean Piston Speed	9.25 m/s
Compression ratio	15:1
Gross Engine Power @ 100% PRP	1350 kWm/1810 bhp
Gross Engine Power @ 110%	1450 kWm/1945 bhp
Rated Speed	1500 RPM
Frequency	50 Hz

### ► Cooling System

Method of Cooling	PHE Cooled
Coolant Capacity	210 L
Radiator Fan Power	NA
Thermostat Operating Range	80 - 92 °C
Coolant Alarm (Shutdown) Temperature	103 °C

### ► Fuel System

Governor	ECU
Governing Class	G3 as per ISO:8528-5
Fuel Injection type	High Pressure Common Rail (HPCR)
Recommended Fuel	IS 1460/ BS2869 Part1 Class A1

### Fuel Consumption: L/hr @ Specific Gravity 850 gms/Litre

100% Load	283.5
75% Load	204.4

\*Note: Fuel Data Confirms to ISO 3046 with +5% tolerance

### ► Lubrication System

Recommended Lube Oil	CI4+SAE15W-40
Lube Oil System Capacity	155 L
Lube Oil Consumption	<0.2 % of FC

### ► Exhaust System

Silencer Type	Residential-grade
Number of Silencers	2 No.
Max Back Pressure Total System	7.5 kPa
Exhaust outlet pipe size (min)	220 mm
Exhaust Gas Temperature	≤ 550 °C

### ► Induction System

Air Filter Type	Paper Element
Air Intake Restriction (Dirty element)	6.5 kPa

### ► Electrical System

Electrical System Voltage	24 V DC
Starter Motor Power	2x8.5 kW
Battery Size	2x12V, 200 Ah

### ► Alternator

Make***	Leroy Somer
Frame	LSA 50.2 L8
Power Factor	0.8
No. of Phase	3
Frequency	50 Hz
Rated Voltage (L-L)	415 V
Rated Current	2087 Amps
Voltage Regulation	±0.25%
Insulation System	H Class
Temperature Rise Limit	H Class
Winding Pitch	2/3
Over Load	10 % Over Load for 1 hour once in 12 hours
Waveform Distortion	No-Load < 3.5%
Design Ambient for Alternator	40 °C
Altitude	1000 m
Protection	IP23
Cooling	Air Cooled
Air flow	1.8 m3/sec
Coupling	Single bearing
Maximum Over Speed	1650 RPM
Stator Winding	Double layer concentric
Control System	Self Regulated and Self Excited
Excitation System	Brushless (AREP)
AVR Type	Digital
AVR Model	D350
Performance: Efficiency @0.8 p.f	
	100% 95.40%
	75% 95.80%
Short Circuit Ratio	0.31
Xd Dir Axis Reactance	3.226
X'd Dir Axis Transient Reactance	0.174
X''d Dir Axis Sub Transient Reactance	0.148
Xq Quad Axis Reactance	1.9295
X''q Quad Axis Subtransient Reactance	0.154
Xl Leakage Reactance	0.081
X2 Negative Sequence Reactance	0.151
X0 Zero Sequence Reactance	0.028

\*\*\*Alternator Options available with CG & Stamford.



## DC CONTROL PANEL

### ► Operating Features

- Microprocessor based digital controller
- Accurate LCD display
- Local Start/Stop
- Remote Start/Stop
- Generator breaker control
- Easily Accessible through Fascia
- Flexibility for selecting Manual, Auto operations
- Easily Convertible AMF by giving Mains Fail Signal

### ► Metering

#### Engine Parameters:

- Engine Speed
- Lub Oil pressure
- Coolant temperature
- Engine Running Hour
- Engine Battery voltage
- Running status
- Fuel level in Percentage
- Event Log with date and time

#### Electrical Parameter

- Generator Voltage (Ph-Ph)
- Generator Voltage (Ph-N)
- Generator Current (R,Y,B)
- Generator Apparent power (kVA)
- Generator active power (kW)
- Generator reactive power (kVAR)
- Generator Power Factor
- Generator Frequency (Hz)
- Cumulative Power Consumption in kWh
- Cumulative Power Consumption in KVAh
- Cumulative Power Consumption in KVArh
- Control Supply Voltage

### ► Protection

#### Engine

- High Water Temperature
- Low oil pressure
- Low Fuel Level
- Over Speed
- Engine Fails to Start

#### Electrical

- Generator under Voltage (ANSI-27)
- Generator over Voltage (ANSI-59)
- Generator under Frequency (ANSI-81L)
- Generator over Frequency (ANSI-81H)
- Generator over Current (ANSI-51)
- Control Supply under Voltage
- Control Supply over Voltage
- Phase Reversal
- Unbalanced Load

### ► Controller

DEIF, Denmark make SGC 420 controllers are modern genset controllers for AMF applications with an electronically controlled engine (CANbus) and AMF applications with electronic governor.



### ► Controller Feature

- User-friendly interface and backlite full graphics LCD
- Battery voltage monitoring & reverse protection to aux supply
- 7/9 configurable analogue/digital inputs
- Auto, Manual and Remote Start/Stop Operation
- Island Operation
- Automatic Mains Failure Function
- CANbus Engine interface for communication
- Log with latest 100 events
- Fully configurable via PC using USB, RS485 communication
- DC Battery supply voltage range 8 to 28V
- -20 to 65 °C operating temperature range
- IP65 Protection class with gasket
- LCD alarm indication
- Power save mode
- 7 configurable Digital output

### ► Electrical Specification

- Supply Voltage Range: Nominal Voltage - 12/24 V DC
- Cranking drop out period: 50 ms
- Maximum reverse voltage protection: -32 V DC
- Measurement accuracy (battery voltage): ±1 % Full scale
- Resolution: 0.1 V
- Maximum current consumption ~200 mA
- Deep sleep current: 20 mA, 12/24 V DC

### ► Environmental Specification

- Operating Temp: -20 to 65°C in compliance with IEC60068
- Vibration: 2G in X, Y and Z axes for 8 to 500Hz in compliance with IEC 60068-2-6
- Shock: 15 g for 11 ms in compliance with IEC 60068-2-27
- Humidity: 0 to 95% RH in compliance with IEC 60068-2-78
- Protection Degree: IP65 Protection class with gasket in compliance with IEC60529
- EMI/EMC in compliance with IEC 61000-6-2, 4

### ► Approvals

- CE Compliant
- Comply to the EU Low Voltage Directive: EN 61010-1
- Comply to the EU EMC directive EN 61000-6-2,4



### STANDARD SCOPE OF SUPPLY

- Water cooled DIESEL engine
- PHI Cooling System
- Electric starter & charging alternator
- Electronic governor
- Microprocessor based genset controller
- Dry Type air filter
- Single bearing IP 23 Alternator
- Space Heater, RTD & BTD sensor (w/o scanner) in alternator
- Base frame with anti vibration mounts
- Flexible fuel lines & lube oil drain pump
- Fuel water separator filter (engine mounted)
- Exhaust outlet with Flexible and flanges
- DG Control Panel
- Battery, Battery Lead & Battery stand
- 990 litres. Standard fuel tank with High / Low level switch
- First Fill lube oil
- First Fill Coolant
- 1 Set Of Documents

### Output Rating & Definition

DG Set Rating @ 415V - 50 Hz | 1500 KVA | 1200 kW

Note: Ratings at 0.8 power factor.

#### ► Definition

Prime Power: Applicable for supplying power for varying electrical load for unlimited hours. Prime power (PRP) is in accordance with ISO 8528. A 10% overload capability is available in accordance with ISO 3046.

### Salient Features of Sterling Generators

- Sterling provides a range of Baudouin engine powered generating sets which are recognized for reliability.
- Global technology available in India.
- Most energy efficient D. G. set.
- Microprocessor based control panels.
- Wider maintenance intervals.
- Pre tested at factory with PLC test bench.
- Well experienced and trained engineers for after sales support.
- Designed to meet the latest environmental norms
- Seamless 24 x 7 service support
- Energetic team with highly experience in troubleshooting.

### General Information

#### ► Documentation

A full set of operation and maintenance manuals and circuit wiring diagrams.

#### ► Warranty

Please refer warranty policy.

#### ► Factory

**Sterling Generators Pvt Ltd**

Survey No: 59, 343/1, Village Kala, Kherdi,

Khanvel, Silvassa, UT of Dadra & Nagar Haveli - 396 230.

### Optional Supply

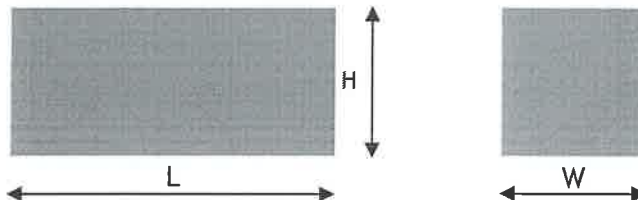
- Engine
  - Coolant heater
  - Oversize batteries
  - Extra fuel pre-filter water separator
- Alternator
  - HT Alternator of 3.3kV, 6.6kV & 11kV
  - Permanent magnet generator (PMG)
  - Upgrade to 3 phase sensing AVR
  - Air inlet filters
- Cooling System
  - Engine driven radiator
  - Remote Radiator
- General
  - Synchronisation module
  - Isolator panel
  - Automatic transfer switch
  - Fuel transfer pump Automatic / Manual



### Dimensions & Weights

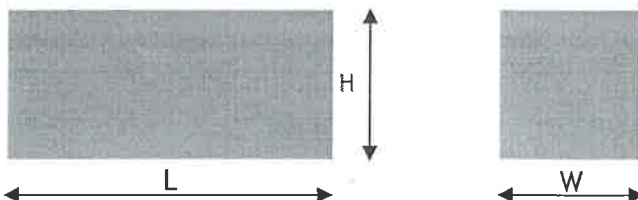
#### ► Open Set

Length = L	mm	4564
Width = W	mm	2207
Height = H	mm	2455
Weight, Dry	kg	8359
Standard Fuel tank (Litres)		990



#### ► Acoustic Set

Length = L	mm	7200
Width = W	mm	2500
Height = H	mm	2836
Weight, Dry	kg	14146
Standard Fuel tank (Litres)		990



Note: Dimensions are without silencer and for reference only.

### Special Condition

For specific site conditions of installation, please refer to application engineering.

The Data Mentioned in this Data Sheet are Subject to Change without Prior Notice . Due To Continuous Improvement & Research



**ALTERNATOR TECHNICAL DATASHEET**  
**LSA 50.2 L8**

Reference : TDS/ACG/2969

Nidec Industrial Automation India Private Ltd.  
#45, Nagarur, Huskur Road, Off Tumkur Road  
Bangalore - 562162. India

**General Characteristics**

Alternator Frame		<b>LSA 50.2 L8</b>	
Rating	1500.0	kVA	1200 kW
Phase	3		
Pole	4		
Rated Speed	1500	RPM	
Rated Voltage [L-L] (V)	415	V	
Rated Current	2086.8	A	
Frequency	50	Hz	
Rated Power Factor	0.8	Lag	
Voltage Regulation	±0.5%	With 4 % Engine Governing.	
Insulation System	H	Class	
Temperature Rise Limit	H	Class	
Winding Pitch	2/3		
Over Load	10 % Over Load for 1 hour once in 12 hours		
Waveform Distortion	No-Load < 3.5%		
Temperature Ambient	40	° C	
Altitude	1000	m	

**Electrical Parameters**

Stator Wdg Res(L-L) @20°C	0.002	Ω
Rotor Wdg Res @20°C	0.506	Ω
Excn. Current At No Load	1.00	A
Excn. Current At Full Load	3.90	A

**Connection & Controls**

Stator Winding	Double layer concentric winding
Control System	Self-regulated and self-excited
Excitation System	Brushless ( AREP )
AVR Type	Digital
AVR Model	D 350

**Performance: Efficiency @0.8 p.f**

100% Load	95.4	%
75% Load	95.8	%
50% Load	95.8	%
25% Load	94.3	%



**ALTERNATOR TECHNICAL DATASHEET**  
**LSA 50.2 L8**

Reference : TDS/ACG/2969

**Reactance & Time constant**

Reactances are Saturated & Per Unit at Rating and Voltage Indicated. Time Constant are In Seconds

**Reactances**

Short Circuit Ratio	0.310
$X_d$ Dir Axis Reactance	3.226
$X'_d$ Dir Axis Transient Reactance	0.174
$X''_d$ Dir Axis Sub Transient Reactance	0.148
$X_q$ Quad Axis Reactance	1.9295
$X''_q$ Quad Axis Subtransient Reactance	0.154
$X_l$ Leakage Reactance	0.081
$X_2$ Negative Sequence Reactance	0.151
$X_0$ Zero Sequence Reactance	0.028

**Time Constant**

$T'_d$ Transient Time Constant	0.180
$T''_d$ Sub Transient Time Constant	0.018
$T'_{do}$ O.C Field Time Constant	3.910
$T_a$ Armature Time Constant	0.027

**Mechanical Parameters**

Protection	IP 23
Cooling	IC01
Air flow	1.8 m <sup>3</sup> /sec
$WR^2$ kg-m <sup>2</sup>	24.6
Bearing Drive End	NA
Bearing Non-Drive End	BALL 6320 C3
Coupling	Single bearing
Maximum Over Speed	120% for 2 mins
Dimensional Drawing	AG315072
Machine Dim. L x B x H (mm)	Refer Dimension Drawing
Alternator Weight	2980 kg

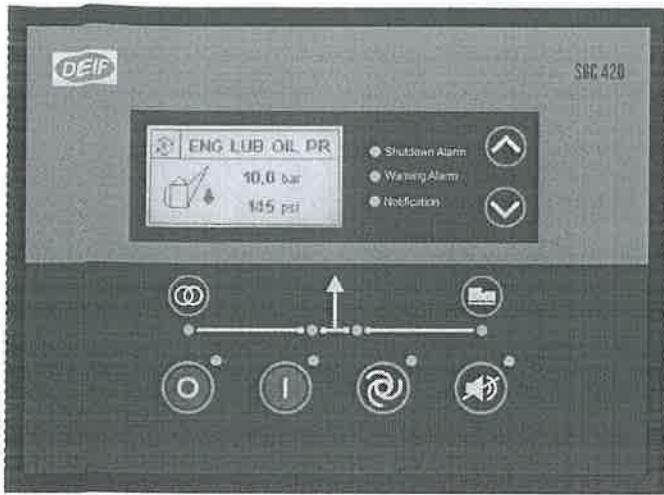


Note: The rating is industrial and conforms to IS:13364 and IS/IEC: 60034-1

Continuous development of our products entitles us to change specification details without notice



# Single Genset Controllers, SGC 420/421



SGC 420

## General description

The SGC 420/421 controllers are modern AMF genset controllers with a user-friendly HMI and full graphics LCD.

They include voltage and frequency measurement for mains and gensets, and electrical load measurement (true RMS).

Configurable analogue and digital inputs/outputs are provided for various features.

Modbus over RS-485 and CAN ports is available for remote communication.

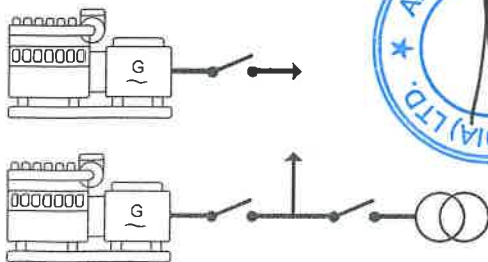
Start and stop gensets remotely using the Remote start/stop function.

Deep sleep mode is a useful feature that extends the battery lifetime by suspending the normal controller functions of when the genset is off.

Monitoring engine safety, electrical load, site battery backup voltage and shelter temperature (to reduce fuel consumption).

Configure parameters from a PC using DEIF Smart Connect utility software. Connect to the PC through the controller's USB Type B port.

In addition, the SGC 421 controller also includes an integrated electronic governing function.



## Main features

- **Auto, manual and remote start/stop modes** with night restriction option
- **17 inputs**, configurable
  - 5 resistive
  - 2 analogue I/V
  - 1 differential
  - 9 digital
- **7 digital outputs**, configurable
- **Modbus over RS-485**
- **Manually configurable** from the controller front buttons or from a PC using DEIF Smart Connect utility software
- **Backlit full graphics LCD** with power saving feature for extended battery lifetime
- Supports the **battery charging alternator I/O** interface
- **Supports Auto mode** (site battery monitoring, AMF, remote start/stop, auto exercise and cyclic) and manual running modes
- **Magnetic Pickup Unit (MPU)** interface for engine speed measurement
- **Auto exercise mode** (2 events) to start and stop the genset for a preconfigured time
- **Monitors 1-phase/3-phase** voltage, frequency, load current and power factor for generator
- **Monitors engine safety parameters** like lube oil pressure, engine temperature, fuel level and more
- **Monitors telecom site battery backup level and shelter temperature** to reduce engine running and fuel consumption at telecom tower sites
- Controls **start relay, fuel relay, alarm horn** and more as digital outputs
- **Event log** for 100 events with real time clock (RTC) stamps and engine running hours information
- **Counters** for engine starts, engine trips, engine running hours, genset and Mains kWh, kVAh, kvarh
- **Measures** mains kW, kVA
- **CANbus** for engine communication with support for Stage 5/ Tier 4 Final
- **Built-in electronic governing** function with the help of a rotary actuator (SGC 421 only)



**Technical specifications****Power supply**

- Nominal voltage: 12/24 V DC
- Operating range: 8 to 32 V DC
- Power transients, in compliance with ISO 7637-2

**Operating conditions**

- Operation: -20 to 65 °C
- Storage: -30 to 75 °C
- In compliance with IEC 60068-2-1, 2

**Environment**

- Vibration: 2G in X,Y and Z axes, in compliance with IEC 60068-2-6
- Shock: 15 g for 11 ms, in compliance with IEC 60068-2-27
- Humidity: 0 to 95 % RH, in compliance with IEC 60068-2-78
- Protection degree: IP65 for front face with gasket, in compliance with IEC 60529
- EMI/EMC: In compliance with IEC 61000-6-2, 4

**Approvals**

- CE approved:
  - Comply to the EU Low Voltage Directive: EN 61010-1 Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements
  - Comply to the EU EMC directive EN 61000-6-2, 4

**Technical specifications****Maximum standby current:**

- 180 mA, 12 V DC
- 140 mA, 24 V DC
- 1 A (additional) for the actuator

**Crank-start dropout survival period**

- 50 ms for a drop from 12/24 V DC

**Charging alternator interface**

- 0.25 A, 12 V DC
- 0.125 A, 24 V DC
- Diagnostic voltage measurement

**Digital outputs**

- 5 x 1 A, configurable for pre-heat, horn and more
- 2 x 5 A, configurable for start relay, stop solenoid, fuel relay, contactors and more

**Digital inputs**

- 9 x switch-to-ground inputs for lube oil, temp, fuel level and more

**Analogue inputs**

- 5 x resistive inputs (10 to 5000  $\Omega$ ), configurable
- 1 x 4 to 20 mA (LOP) / 0 to 5 V input
- 1 x 0 to 5 V input
- 1 x differential input ( $\pm$  60 V DC) for site battery voltage

**Mains/genset voltage measurement**

- 32 to 300 V AC RMS, 5 to 75 Hz for phase-to neutral

**Load current measurement**

- Nominal:  $\pm$ 5 A for current transformer (CT) secondary
- 4 CT inputs

**CANbus for engine interface**

- Baud rate: 250 kbps
- Packet size: 8 bytes
- Termination resistor of 120  $\Omega$ , internally mounted

**E-governor module interface (SGC 421 only)**

- 1 A, 2-phase output for rotary actuators
- $2.5 \pm 2$  V input for target speed bias
- 2.5 V for zero bias

**Dimensions**

- External dimensions: 233 mm x 173 mm x 38.5 mm
- Mounting panel cut-out: 219 mm x 158 mm

**For more information, please contact:**

DEIF A/S • Frisenborgvej 33 • DK-7800 Skive • Denmark  
Tel.: +45 9614 9614 • Fax: +45 9614 9615 • info@deif.com • www.deif.com

<b>PROJECT</b>	: 3x1500 KVA DG SET.
<b>CUSTOMER</b>	: M/s. MAX SUPER SPECIALTY HOSPITAL GURUGRAM
<b>CONTRACTOR</b>	: STERLING GENERATORS PVT LTD.
<b>TITLE</b>	: DG SET ASSOCIATED MATERIALS DATA SHEET
<b>DOCUMENT NO.</b>	: SGPL101
<b>1.00</b>	<b>DG Set Exhaust Pipe System</b>
1.01	MS PIPE : DIA. 400 mm (4.85 mm thick/ 5.2 mm thick) JINDAL IS MAKE 3589/ 1239 (FOR EXHAUST PIPING)
1.02	Make of pipe : Jindal/TATA
1.03	Make for structural Steel. : IS MAKE, SAIL / JINDAL
1.04	Make of insulation : Sriram
1.05	Insulation thickness and density : rockwool (50 mm THICK)
1.06	Aluminum cladding : BALCO/HINDALCO (thickness 26 Gauge)
1.07	Stainless steel flexible bellows : (Make Of ALFA)
1.08	Fasteners : Hilti/fisher



About us:

Jindal Pipes Limited, a pioneer with many innovative projects in the pipe industry, is synonymous with India's best ERW, Galvanized and Black Steel Pipes. Since inception in 1970, the company has brought drastic developments in pipe manufacturing through many innovative measures. Induction of sophisticated state-of-the-art technical know-how and highly motivated skilled work force have made possible for the company to augment its production capacity to 250,000 TPA. A wide range of products that comprises of 1/2" to 14" NB and 2.00 mm to 10.00mm in wall thickness give Jindal Pipes a commendable advantage in the market. Further, pipes upto 20" NB can be supplied from the sister concern-Maharashtra Seamless Limited.

Quality is the hallmark of Jindal Pipe. Strict adherence to the policy of "No compromise on Quality" is demonstrated in its stringent control over procurement of raw materials, production process, streamlined distribution channels and fast delivery of finished products. ISO 9001:2008, API and BIS certifications stand as an unequivocal testimony to Jindal Pipe's quality.

Jindal Pipe has been constantly executing need based and demanding orders for pipes to meet the requirement of sectors like: agriculture, oil & gas, public health, housing, irrigation, engineering etc.



## QUALITY CREDENTIALS

Jindal Pipes's idea of Total Quality is demonstrated in its stringent controls on raw materials, production process and on the speed at which the product reaches the customer. It's "No compromises on Quality" policy has brought in an ISO 9001:2008, API and BIS certifications.

Jindal Pipes Limited has accreditation of API Q1 System and has been awarded ISO 9001, on Quality Assurance. In addition to these, our products have the approval of international inspection agencies, such as Lloyd's, DNV, BVIS, IIL, PDIL, SGS etc.

Jindal Pipes Limited has in-house laboratory to undertake various testings and inspections during the stages of manufacturing.

## QUALITY POLICY

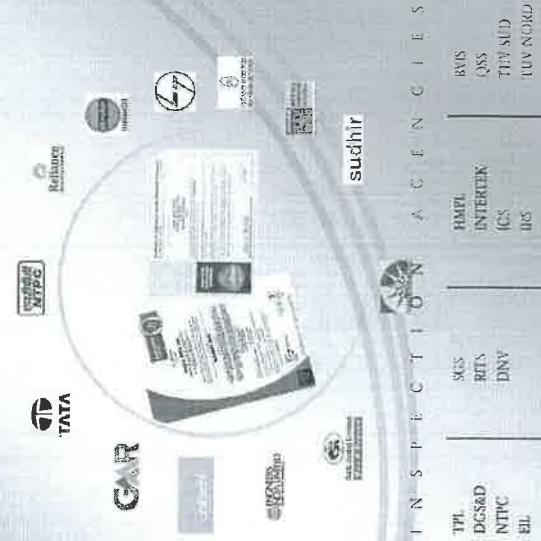
Consistent with the group purpose, we are committed to create value for all our stakeholders by continuously improving the effectiveness of Quality System and Process through innovations, involving all our employees.

We shall constantly strive to improve the quality of lives of the communities it serve through excellence in all facets of its activities. Our objectives shall be to:

- A) Produce and deliver products as per customer's expectations, conforming to national / international standards.
- B) Enhance the knowledge and skills of employees for effective implementation of Quality Management System (QMS).

Rev. No. 3.28-09-07

Rajhvir Jindal  
Managing Director



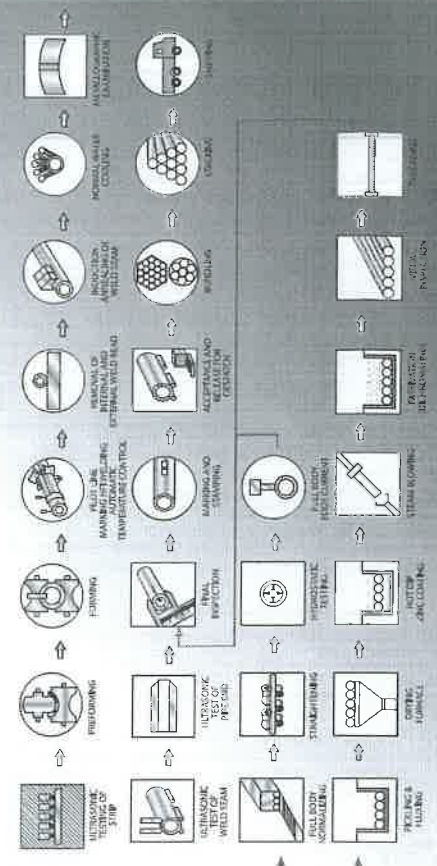
# Application & Specifications

Oil & Gas Sector	API : 5L 5CT ISO : 3185
Automotive Industry	IS : 6323 (P-V) IS : 3601, 3074
Hydrocarbon & Process Industry	ASTM : A-53 BS : 3603 IS : 0288
Boiler Heat Exchanger, Superheater, Air Heater & Condenser	ASTM : A-178, A-214, A-333, A-334 BS : 3039 (P-I), P-II, 0323 (P-V) IS : 2416 (P-V)
Railways	IS : 1239 (P-I), 1161 RDSO : FTV, OHE-11
Mechanical, Structural & General Engineering	IS : 1161, 3601, 4923, 4295 BS : 6323 (P-V)
Water, Gas & Sewage	IS : 3589, 1239 (P-I) BS : 1387 DIN : 2440, 2441 ISO : 65
Water Well	IS : 4270



## OF HIGH FREQUENCY INDUCTION WELDED / AND GALVANIZED PIPES / TUBES

## MANUFACTURING AND TESTING, FLOW DIAGRAM





# ERW Line Pipes conforming to API 5L, IS/ISO : 3183 & ASTM A 53

Dimensions, Weights and Test Pressures for Sizes 3 1/2" through 14" (SI Units)

Size	Specified Outside Diameter	Specified Thickness	Flange/End Joint Diameter	Minimum Test Pressure (kbar) (100)											
				Grade A25	Grade A	Grade B	Grade K-43	Grade K-46	Grade K-52	Grade K-56	Grade K-60	Grade K-65	Grade K-70		
2 1/2"	73.0	3.2	5.51	66.6	110	120	153	210	237	180	205	218	237	205	
	73.0	3.6	6.16	65.8	104	124	145	172	237	213	231	246	266	205	
	73.0	4	6.81	65.0	115	138	161	191	263	237	256	273	296	205	
	73.0	4.4	7.44	64.2	127	152	177	210	289	260	282	300	325	205	
	73.0	4.8	8.07	63.4	138	166	193	229	316	284	308	327	355	205	
	73.0	5.2	8.69	62.6	150	180	209	248	342	308	333	355	385	205	
	73.0	5.5	9.16	62.0	159	190	222	262	362	325	353	375	407	205	
	88.9	3.2	6.76	82.5	69	91	106	125	138	156	168	179	194	205	
	88.9	3.6	7.37	81.7	69	92	107	125	138	156	168	179	194	205	
	88.9	4.0	8.17	80.9	69	113	132	157	173	194	205	205	205	205	
	88.9	4.4	9.17	80.1	69	125	146	172	190	205	205	205	205	205	
	88.9	4.8	9.95	79.3	69	136	159	188	205	205	205	205	205	205	
88.9	5.5	11.31	77.0	69	156	170	205	205	205	205	205	205	205		
3 1/2"	101.6	3.2	7.26	95.2	-	79	93	110	121	136	147	157	170	183	
	101.6	3.6	8.20	94.4	55	89	104	123	136	153	166	177	191	205	
	101.6	4.0	9.63	93.6	-	99	116	137	151	170	184	196	205	205	
	101.6	4.4	10.55	92.8	69	109	127	151	166	187	202	205	205	205	
	101.6	4.8	11.46	92	83	119	139	164	181	204	205	205	205	205	
	101.6	5.7	13.48	90.2	83	141	165	195	205	205	205	205	205	205	
	101.6	6.4	15.02	88.8	-	159	185	205	205	205	205	205	205	205	
	114.3	3.2	8.77	107.9	55	71	82	97	108	121	131	139	151	163	
	114.3	3.6	9.83	107.1	-	79	93	110	121	136	147	157	170	183	
	114.3	4.0	10.88	106.3	69	80	103	122	134	151	164	174	189	204	
	114.3	4.4	11.92	105.5	-	97	113	134	148	166	180	192	205	205	
	114.3	4.8	12.96	104.7	83	106	124	146	161	181	197	205	205	205	
4 1/2"	114.3	5.2	13.99	103.9	-	115	134	158	175	197	205	205	205	205	
	114.3	5.6	15.01	103.1	83	123	141	170	188	205	205	205	205	205	
	114.3	6.0	16.02	102.3	83	132	154	183	202	205	205	205	205	205	
	114.3	6.4	17.03	101.5	-	141	165	195	205	205	205	205	205	205	
	114.3	7.1	18.77	100.1	130	157	183	216	205	205	205	205	205	205	
	141.3	3.2	10.90	134.9	46	57	67	79	87	98	108	113	122	132	
	141.3	4.0	13.54	133.3	58	71	83	99	109	122	132	141	153	165	
	141.3	4.8	16.16	131.7	70	86	100	118	130	147	159	169	189	198	
	141.3	5.6	18.74	130.1	81	100	117	138	152	171	186	197	205	205	
	141.3	6.6	21.92	128.1	83	118	137	163	179	202	205	205	205	205	
	141.3	6.98	23.12	127.3	104	124	145	172	190	205	205	205	205	205	
	141.3	7.72	25.43	125.9	115	138	161	190	205	205	205	205	205	205	
168.3	3.2	13.03	161.9	48	48	56	63	91	103	111	118	138	138		
168.3	3.6	14.62	161.1	45	54	63	93	103	116	125	133	144	156		
168.3	4.0	16.21	160.3	50	60	70	103	114	128	139	146	160	173		
168.3	4.4	17.78	159.5	55	66	77	114	125	141	153	163	176	190		
168.3	4.8	19.35	158.7	60	72	84	124	137	154	167	178	193	205		
168.3	5.2	20.91	157.9	65	78	91	134	148	167	181	192	205	205		
168.3	5.6	22.47	157.1	70	84	98	145	160	180	195	205	205	205		
168.3	6.4	25.55	155.5	80	96	112	165	183	205	205	205	205	205		
168.3	7.1	28.22	154.1	89	106	124	184	202	205	205	205	205	205		
168.3	8	31.63	152.3	100	120	140	205	205	205	205	205	205	205		

# ERW STEEL TUBES CONFORMING TO IS:1239(Pt-I) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161

SERIES	LIGHT						MEDIUM						HEAVY					
	WALL THICKNESS (mm)	W.T. (kg/m)	W.T. (kg/m)	W.T. (kg/m)	W.T. (kg/m)	W.T. (kg/m)	W.T. (kg/m)	W.T. (kg/m)	W.T. (kg/m)	W.T. (kg/m)	W.T. (kg/m)	W.T. (kg/m)	W.T. (kg/m)	W.T. (kg/m)	W.T. (kg/m)	W.T. (kg/m)	W.T. (kg/m)	W.T. (kg/m)
1/2"	3.0	0.892	0.956	1.020	1.084	1.148	1.212	1.276	1.340	1.404	1.468	1.532	1.596	1.660	1.724	1.788	1.852	1.916
	3.2	0.956	1.020	1.084	1.148	1.212	1.276	1.340	1.404	1.468	1.532	1.596	1.660	1.724	1.788	1.852	1.916	1.980
	3.6	1.020	1.084	1.148	1.212	1.276	1.340	1.404	1.468	1.532	1.596	1.660	1.724	1.788	1.852	1.916	1.980	2.044
	4.0	1.084	1.148	1.212	1.276	1.340	1.404	1.468	1.532	1.596	1.660	1.724	1.788	1.852	1.916	1.980	2.044	2.108
	4.4	1.148	1.212	1.276	1.340	1.404	1.468	1.532	1.596	1.660	1.724	1.788	1.852	1.916	1.980	2.044	2.108	2.172
	4.8	1.212	1.276	1.340	1.404	1.468	1.532	1.596	1.660	1.724	1.788	1.852	1.916	1.980	2.044	2.108	2.172	2.236
	5.2	1.276	1.340	1.404	1.468	1.532	1.596	1.660	1.724	1.788	1.852	1.916	1.980	2.044	2.108	2.172	2.236	2.300
	5.6	1.340	1.404	1.468	1.532	1.596	1.660	1.724	1.788	1.852	1.916	1.980	2.044	2.108	2.172	2.236	2.300	2.364
	6.0	1.404	1.468	1.532	1.596	1.660	1.724	1.788	1.852	1.916	1.980	2.044	2.108	2.172	2.236	2.300	2.364	2.428
	6.4	1.468	1.532	1.596	1.660	1.724	1.788	1.852	1.916	1.980	2.044	2.108	2.172	2.236	2.300	2.364	2.428	2.492
	6.8	1.532	1.596	1.660	1.724	1.788	1.852	1.916	1.980	2.044	2.108	2.172	2.236	2.300	2.364	2.428	2.492	2.556
	7.2	1.596	1.660	1.724	1.788	1.852	1.916	1.980	2.044	2.108	2.172	2.236	2.300	2.364	2.428	2.492	2.556	2.620

NOTE: I. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-I) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. II. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-II) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. III. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-III) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. IV. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-IV) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. V. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-V) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. VI. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-VI) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. VII. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-VII) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. VIII. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-VIII) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. IX. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-IX) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. X. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-X) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. XI. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-XI) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. XII. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-XII) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. XIII. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-XIII) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. XIV. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-XIV) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. XV. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-XV) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. XVI. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-XVI) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. XVII. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-XVII) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. XVIII. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-XVIII) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. XIX. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-XIX) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. XX. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-XX) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. XXI. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-XXI) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. XXII. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-XXII) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. XXIII. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-XXIII) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. XXIV. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-XXIV) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. XXV. 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ERW STEEL TUBES CONFORMING TO IS:1239(Pt-XLI) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. XLII. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-XLII) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. XLIII. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-XLIII) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. XLIV. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-XLIV) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. XLV. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-XLV) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. XLVI. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-XLVI) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. XLVII. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-XLVII) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS:1161. XLVIII. ERW STEEL TUBES CONFORMING TO IS:1239(Pt-XLVIII) EQUIVALENT TO BS:1387 & STRUCTURAL TUBES CONFORMING TO IS

**API CASING**

Dimensions, Weights and End Finish

In.	Outside Diameter	Nom. Wt. lb/ft	Wall Thickness		Type of finish		COUPLING OD	THREAD TYPES	
			in	mm	K-55	H-50		8TC	8
4 1/2	114.30	9.50	0.205	5.21	PS	-	127.00	8TC	8
4 1/2	114.30	10.50	0.224	5.69	PSB	-	127.00	LTC	8
4 1/2	114.30	11.60	0.250	6.35	PSLB	PLB	127.00	8	5
5	127.00	11.50	0.22	5.59	PS	-	141.3	8	5
5 1/2	139.70	14.00	0.244	6.20	PS	-	153.67	8	5
5 1/2	139.70	15.50	0.275	6.98	PSLB	PLB	153.67	8	5
5 1/2	139.70	17.00	0.304	7.72	PSLB	PLB	153.67	8	5
6 5/8	168.28	20.00	0.288	7.32	PSLB	-	187.71	8	5
6 5/8	168.28	24.00	0.352	8.94	PSLB	PLB	187.71	8	5
7 5/8	193.68	24.00	0.300	7.62	-	-	215.90	8	5
7 5/8	193.68	26.40	0.328	8.33	PLB	PLB	215.90	8	5
7 5/8	193.68	28.70	0.375	9.52	-	-	215.90	8	5
8 5/8	219.08	24.00	0.264	6.71	PS	-	244.48	8	5
8 5/8	219.08	28.00	0.304	7.72	-	-	244.48	8	5
8 5/8	219.08	32.00	0.352	8.94	PSLB	-	244.48	8	5
10	273.05	32.75	0.279	7.09	-	-	298.45	8	5
10	273.05	40.5	0.35	8.89	PSB	-	298.45	8	5

REMARK : P = Plain End, S = Short Round Thread, L = Long Round Thread,  
B = Buttress Thread

**ERW Line Pipes conforming to API 5L,  
IS/ISO : 3183 & ASTM A 53**

Dimensions, Weights and Test Pressures for Sizes 3 1/2" through 14" (SI Units)

Size	Specified Outside Diameter	t (mm)	Woa (kg/m)	Minimum Test Pressure (MPa x 100)	Minimum Test Pressure (PSI x 100)																	
					Grade A	Grade B	Grade X-42	Grade X-46	Grade X-52	Grade X-55	Grade X-60	Grade X-65	Grade X-70	Grade X-80	Grade X-90	Grade X-100	Grade X-110	Grade X-120	Grade X-130			
6 5/8"	219.1	4.0	21.22	211.1	38	46	54	79	88	99	107	114	123	133	143	153	163	173	186	205		
	219.1	4.8	26.37	209.5	46	55	64	95	103	118	128	136	148	160	173	186	199	205	205	205	205	
	219.1	5.2	27.43	208.7	30	60	70	103	114	128	139	148	160	173	186	199	205	205	205	205	205	
	219.1	5.6	29.48	207.9	54	64	75	111	123	138	150	159	173	186	199	205	205	205	205	205	205	
	219.1	6.4	33.57	206.3	61	74	86	127	140	153	171	182	197	205	205	205	205	205	205	205	205	
	219.1	7.0	36.61	205.1	67	81	94	139	153	173	187	199	205	205	205	205	205	205	205	205	205	205
	219.1	7.9	41.14	203.3	76	91	106	157	173	195	205	205	205	205	205	205	205	205	205	205	205	205
	219.1	8.2	42.65	202.7	79	94	110	163	180	202	205	205	205	205	205	205	205	205	205	205	205	205
	219.1	9.5	49.10	200.1	91	109	127	189	205	205	205	205	205	205	205	205	205	205	205	205	205	205
	219.1	10.8	56.54	201.7	83	100	117	173	191	205	205	205	205	205	205	205	205	205	205	205	205	205
10 3/4"	273.1	4.0	26.54	265.1	31	37	43	72	80	90	97	103	112	121	134	146	157	169	181	199		
	273.1	4.8	31.76	263.5	37	44	52	87	96	108	117	124	134	145	157	169	181	199	205	205		
	273.1	5.2	34.35	262.7	40	48	56	94	104	117	126	134	146	157	169	181	199	205	205	205		
	273.1	5.6	36.94	261.9	43	52	60	101	112	125	136	145	157	169	181	199	205	205	205	205		
	273.1	6.4	42.09	260.3	49	59	69	116	127	143	155	165	179	191	205	205	205	205	205	205		
	273.1	7.1	46.57	258.9	55	66	76	128	141	159	172	183	199	205	205	205	205	205	205	205		
	273.1	7.8	51.03	257.5	60	72	84	141	155	175	189	202	205	205	205	205	205	205	205	205		
	273.1	8.7	56.72	255.7	67	80	94	157	173	195	205	205	205	205	205	205	205	205	205	205		
	273.1	9.3	60.50	254.5	72	86	100	168	185	205	205	205	205	205	205	205	205	205	205	205		
	273.1	10.8	74.47	251.1	83	100	117	173	191	205	205	205	205	205	205	205	205	205	205	205		
12 3/4"	323.9	4.4	34.07	315.1	29	34	40	67	74	83	90	96	104	112	122	132	143	153	163	173		
	323.9	4.8	37.77	314.3	31	37	44	73	81	91	96	105	113	123	133	143	153	163	173	183		
	323.9	5.2	40.87	313.5	34	40	47	79	87	96	106	113	123	133	143	153	163	173	183	193		
	323.9	5.6	43.96	312.7	36	44	51	85	94	106	115	122	132	143	153	163	173	183	193	203		
	323.9	6.4	50.11	311.1	41	50	58	97	107	121	131	139	151	163	173	183	193	203	203	203		
	323.9	7.1	55.47	309.7	46	55	64	108	119	134	145	155	168	181	193	203	203	203	203	203		
	323.9	7.9	61.56	308.1	51	61	72	120	133	149	162	172	187	201	203	203	203	203	203	203		
	323.9	8.4	65.35	307.1	54	65	76	128	141	159	172	183	198	205	205	205	205	205	205	205		
	323.9	8.7	67.62	306.5	56	68	79	132	146	164	178	189	205	205	205	205	205	205	205	205		
	323.9	9.5	73.65	304.9	62	74	86	145	160	179	194	205	205	205	205	205	205	205	205	205		
14"	355.6	4.8	40.87	346.0	28	34	40	67	73	83	89	95	103	111	121	131	141	151	161	171		
	355.6	5.2	43.96	345.2	31	37	43	72	80	89	97	103	112	121	131	141	151	161	171	181		
	355.6	5.6	46.33	344.4	33	40	46	74	81	91	99	105	114	123	133	143	153	163	173	183		
	355.6	6.4	55.11	342.8	38	45	53	89	96	110	119	127	136	146	156	166	176	186	196	206		
	355.6	7.1	61.02	341.4	42	50	59	98	109	122	132	141	151	161	171	181	191	201	201	201		
	355.6	7.9	67.74	339.8	47	56	65	110	121	136	147	156	166	176	186	196	206	206	206	206		
	355.6	8.7	74.42	338.2	51	62	72	121	133	150	162	173	187	202	202	202	202	202	202	202		
	355.6	9.5	81.08	336.6	56	67	79	132	145	163	177	188	205	205	205	205	205	205	205	205		



REMARK : P = Plain End, N/NUUE = Upset T & C, U/EUE = External upset T & C

ERW Boiler, Super Heater, Heat Exchanger, Condenser & Air Heater Tubes & Pipes

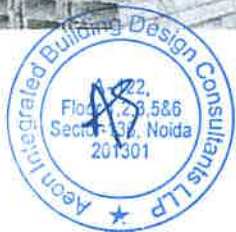
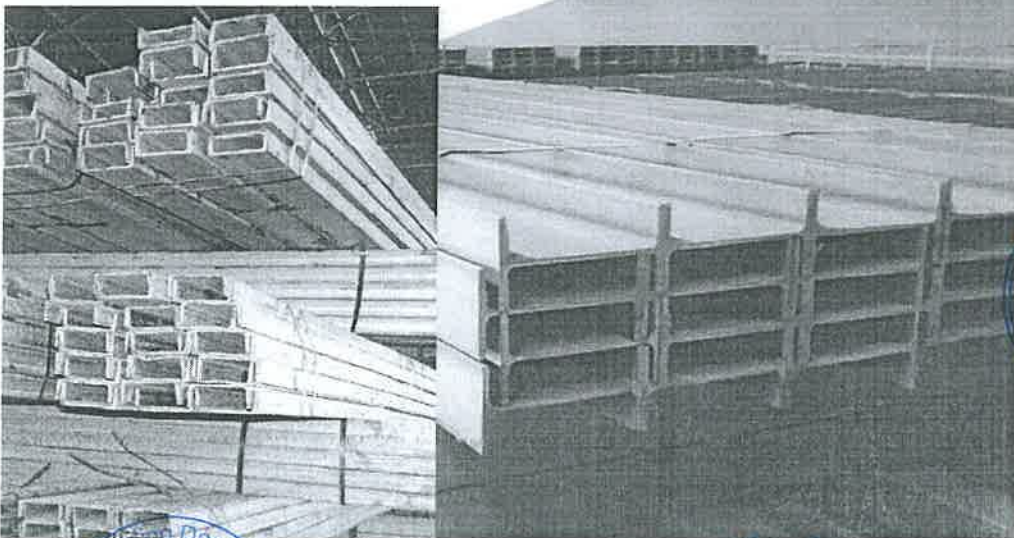
Conforming to BS 3059(Pt-1 & II), BS 6323 (Pt-1 & II), ASTM, A-178, A-214, A-333, A-334, A-334, BS 2416 (Pt-1 & II).

Outside Diameter (mm)	159	219	273	323	377	427	478	529	580	635	688	741	795	848	902	957	1012	1067	1122	1177	1232	1287	1342	1397	1452	1507	1562	1617	1672	1727	1782	1837	1892	1947	2002	2057	2112	2167	2222	2277	2332	2387	2442	2497	2552	2607	2662	2717	2772	2827	2882	2937	2992	3047	3102	3157	3212	3267	3322	3377	3432	3487	3542	3597	3652	3707	3762	3817	3872	3927	3982	4037	4092	4147	4202	4257	4312	4367	4422	4477	4532	4587	4642	4697	4752	4807	4862	4917	4972	5027	5082	5137	5192	5247	5302	5357	5412	5467	5522	5577	5632	5687	5742	5797	5852	5907	5962	6017	6072	6127	6182	6237	6292	6347	6402	6457	6512	6567	6622	6677	6732	6787	6842	6897	6952	7007	7062	7117	7172	7227	7282	7337	7392	7447	7502	7557	7612	7667	7722	7777	7832	7887	7942	7997	8052	8107	8162	8217	8272	8327	8382	8437	8492	8547	8602	8657	8712	8767	8822	8877	8932	8987	9042	9097	9152	9207	9262	9317	9372	9427	9482	9537	9592	9647	9702	9757	9812	9867	9922	9977	10032	10087	10142	10197	10252	10307	10362	10417	10472	10527	10582	10637	10692	10747	10802	10857	10912	10967	11022	11077	11132	11187	11242	11297	11352	11407	11462	11517	11572	11627	11682	11737	11792	11847	11902	11957	12012	12067	12122	12177	12232	12287	12342	12397	12452	12507	12562	12617	12672	12727	12782	12837	12892	12947	13002	13057	13112	13167	13222	13277	13332	13387	13442	13497	13552	13607	13662	13717	13772	13827	13882	13937	13992	14047	14102	14157	14212	14267	14322	14377	14432	14487	14542	14597	14652	14707	14762	14817	14872	14927	14982	15037	15092	15147	15202	15257	15312	15367	15422	15477	15532	15587	15642	15697	15752	15807	15862	15917	15972	16027	16082	16137	16192	16247	16302	16357	16412	16467	16522	16577	16632	16687	16742	16797	16852	16907	16962	17017	17072	17127	17182	17237	17292	17347	17402	17457	17512	17567	17622	17677	17732	17787	17842	17897	17952	18007	18062	18117	18172	18227	18282	18337	18392	18447	18502	18557	18612	18667	18722	18777	18832	18887	18942	18997	19052	19107	19162	19217	19272	19327	19382	19437	19492	19547	19602	19657	19712	19767	19822	19877	19932	19987	20042	20097	20152	20207	20262	20317	20372	20427	20482	20537	20592	20647	20702	20757	20812	20867	20922	20977	21032	21087	21142	21197	21252	21307	21362	21417	21472	21527	21582	21637	21692	21747	21802	21857	21912	21967	22022	22077	22132	22187	22242	22297	22352	22407	22462	22517	22572	22627	22682	22737	22792	22847	22902	22957	23012	23067	23122	23177	23232	23287	23342	23397	23452	23507	23562	23617	23672	23727	23782	23837	23892	23947	24002	24057	24112	24167	24222	24277	24332	24387	24442	24497	24552	24607	24662	24717	24772	24827	24882	24937	24992	25047	25102	25157	25212	25267	25322	25377	25432	25487	25542	25597	25652	25707	25762	25817	25872	25927	25982	26037	26092	26147	26202	26257	26312	26367	26422	26477	26532	26587	26642	26697	26752	26807	26862	26917	26972	27027	27082	27137	27192	27247	27302	27357	27412	27467	27522	27577	27632	27687	27742	27797	27852	27907	27962	28017	28072	28127	28182	28237	28292	28347	28402	28457	28512	28567	28622	28677	28732	28787	28842	28897	28952	29007	29062	29117	29172	29227	29282	29337	29392	29447	29502	29557	29612	29667	29722	29777	29832	29887	29942	29997	30052	30107	30162	30217	30272	30327	30382	30437	30492	30547	30602	30657	30712	30767	30822	30877	30932	30987	31042	31097	31152	31207	31262	31317	31372	31427	31482	31537	31592	31647	31702	31757	31812	31867	31922	31977	32032	32087	32142	32197	32252	32307	32362	32417	32472	32527	32582	32637	32692	32747	32802	32857	32912	32967	33022	33077	33132	33187	33242	33297	33352	33407	33462	33517	33572	33627	33682	33737	33792	33847	33902	33957	34012	34067	34122	34177	34232	34287	34342	34397	34452	34507	34562	34617	34672	34727	34782	34837	34892	34947	35002	35057	35112	35167	35222	35277	35332	35387	35442	35497	35552	35607	35662	35717	35772	35827	35882	35937	35992	36047	36102	36157	36212	36267	36322	36377	36432	36487	36542	36597	36652	36707	36762	36817	36872	36927	36982	37037	37092	37147	37202	37257	37312	37367	37422	37477	37532	37587	37642	37697	37752	37807	37862	37917	37972	38027	38082	38137	38192	38247	38302	38357	38412	38467	38522	38577	38632	38687	38742	38797	38852	38907	38962	39017	39072	39127	39182	39237	39292	39347	39402	39457	39512	39567	39622	39677	39732	39787	39842	39897	39952	40007	40062	40117	40172	40227	40282	40337	40392	40447	40502	40557	40612	40667	40722	40777	40832	40887	40942	40997	41052	41107	41162	41217	41272	41327	41382	41437	41492	41547	41602	41657	41712	41767	41822	41877	41932	41987	42042	42097	42152	42207	42262	42317	42372	42427	42482	42537	42592	42647	42702	42757	42812	42867	42922	42977	43032	43087	43142	43197	43252	43307	43362	43417	43472	43527	43582	43637	43692	43747	43802	43857	43912	43967	44022	44077	44132	44187	44242	44297	44352	44407	44462	44517	44572	44627	44682	44737	44792	44847	44902	44957	45012	45067	45122	45177	45232	45287	45342	45397	45452	45507	45562	45617	45672	45727	45782	45837	45892	45947	46002	46057	46112	46167	46222	46277	46332	46387	46442	46497	46552	46607	46662	46717	46772	46827	46882	46937	46992	47047	47102	47157	47212	47267	47322	47377	47432	47487	47542	47597	47652	47707	47762	47817	47872	47927	47982	48037	48092	48147	48202	48257	48312	48367	48422	48477	48532	48587	48642	48697	48752	48807	48862	48917	48972	49027	49082	49137	49192	49247	49302	49357	49412	49467	49522	49577	49632	49687	49742	49797	49852	49907	49962	50017	50072	50127	50182	50237	50292	50347	50402	50457	50512	50567	50622	50677	50732	50787	50842	50897	50952	51007	51062	51117	51172	51227	51282	51337	51392	51447	51502	51557	51612	51667	51722	51777	51832	51887	51942	51997	52052	52107	52162	52217	52272	52327	52382	52437	52492	52547	52602	52657	52712	52767	52822	52877	52932	52987	53042	53097	53152	53207	53262	53317	53372	53427	53482	53537	53592	53647	53702	53757	53812	53867	53922	53977	54032	54087	54142	54197	54252	54307	54362	54417	54472	54527	54582	54637	54692	54747	54802	54857	54912	54967	55022	55077	55132	55187	55242	55297	55352	55407	55462	55517	55572	55627	55682	55737	55792	55847	55902	55957	56012	56067	56122	56177	56232	56287	56342	56397	56452	56507	56562	56617	56672	56727	56782	56837	56892	56947	57002	57057	57112	57167	57222	57277	57332	57387	57442	57497	57552	57607	57662	57717	57772	57827	57882	57937	57992	58047	58102	58157	58212	58267	58322	58377	58432	58487	58542	58597	58652	58707	58762	58817	58872	58927	58982	59037	59092	59147	59202	59257	59312	59367	59422	59477	59532	59587	59642	59697	59752	59807	59862	59917	59972	60027	60082	60137	60192	60247	60302	60357	60412	60467	60522	60577	60632	60687	60742	60797	60852	60907	60962	61017	61072	61127	61182	61237	61292	61347	61402	61457	61512	61567	61622	61677	61732	61787	61842	61897	61952	62007	62062	62117	62172	62227	62282	62337	62392	62447	62502	62557	62612	62667	62722	62777	62832	62887	62942	62997	63052	63107	63162	63217	63272	63327	63382	63437	63492	63547	63602	63657	63712	63767	63822	63877	63932	63987	64042	64097	64152	64207	64262	64317	64372	64427	64482	64537	64592	64647	64702	64757	64812	64867	64922	64977	65032	65087	65142	65197	65252	65307	65362	65417	65472	65527	65582	65637	65692	65747	65802	65857	65912	65967	66022	66077	66132	66187	66242	66297	66352	66407	66462	66517	66572	66627	66682	66737	66792	66847	66902	66957	67012	67067	67122	67177	67232	67287	67342	67397	67452	67507	67562	67617	67672	67727	67782	67837	67892	67947	68002
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**STRUCTURALS**



# Structural Steel Sections



## Rationalised sizes of Beams/Joists, Channels and Angles

Section	Dimensions mm	Sectional Weight kg/m	Length m
<b>Beams/Joists</b>	<b>Durgapur Steel Plant</b>		
	200 x 100 x 5.7	25.4	Standard length 11 & above
	<b>Bhilai Steel Plant</b>		
	250 x 125 x 6.9	37.3	12 - 13.5 for all dimensions
	300 x 140 x 7.7	46.1	
	350 x 140 x 8.1	52.4	
	400 x 140 x 8.9	61.6	
	450 x 150 x 9.4	72.4	
	500 x 180 x 10.2	86.9	
	600 x 210 x 12	123.0	
<b>Channels</b>	<b>Bhilai Steel Plant</b>		
	75 x 40 x 4.8	7.14	12 & above
	100 x 50 x 5	9.56	
	<b>Durgapur Steel Plant</b>		
	150 x 75 x 5.7	16.8	Standard length
	150 x 76 x 6.5	17.7	11 & above
	200 x 75 x 6.2	22.3	
	200 x 76 x 7.5	24.3	
	<b>Bhilai Steel Plant</b>		
	250 x 82 x 9	34.2	12 - 13.5
	300 x 90 x 7.8	36.3	
	400 x 100 x 8.8	50.1	



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Section	Dimensions mm	Sectional Weight kg/m	Length m	
Angles	Bhilai Steel Plant			
	50 x 50 x 5*	3.8	12 & above	
	50 x 50 x 6	4.5		
	60 x 60 x 5/6/8*	4.5/5.4/7.0		
	65 x 65 x 5*	4.9		
	65 x 65 x 6/8/10	5.8/7.7/9.4		
	70 x 70 x 5/6*	5.3/6.3		
	75 x 75 x 5/6/8/10	5.7/6.8/8.9/11.0		
	80 x 80 x 6/8/10	7.3/9.6/11.8		
	90 x 90 x 6/8/10	8.2/10.8/13.4		
	150 x 150 x 16/20*	35.8/44.1		
	Durgapur Steel Plant			
	110 x 110 x 10/12	16.6/19.7		11 & above
130 x 130 x 10/12	19.7/23.5	for all		
150 x 150 x 12/16	27.3/35.8	dimensions		

\* Can be produced, if sufficient orders are available.

Below 10m/11.5m length can also be supplied

While standard lengths are mentioned in tables above, BSP can supply material in any fixed length in the range 6-13 m and DSP can supply in any fixed length in the range 5.5-11.5 m

**Common grades :** IS 2062/2011 and SAILMA

Copper bearing structurals are also rolled as per customer's specifications. High strength light structurals are also available as per the needs of TLT manufacturers.

**Structurals** are also available in the following **foreign specifications :**

**ASTM-A-36, JIS-G-3101-SS400, BS-4360 Grades 40A, 43A, 43B, 43C, 50B, 50C, EN-10025, Grades S-275 JO, JR, S-355 JO, JR, DIN-17100 ST 37.2/44.2** (all in semi-killed quality), if sufficient orders are available.



3





### Rolling tolerance for Structural Steel sections as per IS:1852

Beams			
Depth	Tolerance	Width of flange	Tolerance
Up to 200 mm	± 2.0 mm	Up to 100 mm	± 2.0 mm
>200 to 400 mm	± 3.0 mm	>100 to 125 mm	± 2.5 mm
>400 to 600 mm	± 4.0 mm	>125 to 250 mm	± 4.0 mm

Tolerance on weight per metre shall be ± 2.5% or alternatively +4, -1% of the weight per metre. The permissible limits for camber and sweep shall be 0.2% of the length.

Channels			
Depth	Tolerance	Width of flange	Tolerance
Up to 200 mm	± 2.5 mm	Up to 100 mm	± 2 mm
> 200 to 400 mm	± 3.0 mm		

Tolerance on weight per metre shall be ± 2.5% or alternatively +4, -1% of the standard weight per metre. The permissible limits for camber and sweep shall be 0.2% of the length.

Angles			
Leg length	Tolerance	Leg length	Camber
Up to 45 mm	± 1.5 mm	< 100 mm	As per agreement
>45 mm to 100 mm	± 2.0 mm	≥ 100 mm	0.2% of length
> 100 mm	± 2%		

Tolerance on Sectional Weight	
Thickness	Tolerance
Up to 3 mm	± 5%
Over 3 mm	+ 5%, -3%

Structurals with closer tolerance can be supplied by mutual agreement.





### Chemical Composition IS: 2062/2011

Grade	Quality	Ladle Analysis, wt % Max					Carbon Equivalent, Max	Mode of Deoxidation
		C	Mn	S	P	Si		
E 250	A	0.23	1.50	0.045	0.045	0.40	0.42	Semi Killed/Killed
	BR, BO	0.22	1.50	0.045	0.045	0.40	0.41	Semi Killed/Killed
	C	0.20	1.50	0.040	0.040	0.40	0.39	Killed
E 275	A	0.23	1.50	0.045	0.045	0.40	0.43	Semi Killed/Killed
	BR, BO	0.22	1.50	0.045	0.045	0.40	0.42	Semi Killed/Killed
	C	0.20	1.50	0.040	0.040	0.40	0.41	Killed
E 300	A, BR, BO	0.20	1.50	0.045	0.045	0.45	0.44	Semi Killed/Killed
	C	0.20	1.50	0.040	0.040	0.45	0.44	Killed
E 350	A, BR, BO	0.20	1.55	0.045	0.045	0.45	0.47	Semi Killed/Killed
	C	0.20	1.55	0.040	0.040	0.45	0.45	Killed
E 410	A, BR, BO	0.20	1.60	0.045	0.045	0.45	0.50	Semi Killed/Killed
	C	0.20	1.60	0.040	0.040	0.45	0.50	Killed
E 450	A, BR	0.22	1.65	0.045	0.045	0.45	0.52	Semi Killed/Killed
E 550	A, BR	0.22	1.65	0.020	0.025	0.50	0.54	Semi Killed/Killed
E 600	A, BR	0.22	1.70	0.020	0.025	0.50	0.54	Semi Killed/Killed

**Notes:**

1. New grade designation system based on minimum yield stress has been adopted.
2. For semi-killed steel, silicon shall be less than 0.10 percent. For killed steel, when the steel is killed by aluminium alone, the total aluminium content shall not be less than 0.02 percent. When the steel is killed by silicon alone, the silicon content shall not be less than 0.10 percent. When the steel is silicon-aluminium killed, the silicon content shall not be less than 0.03 percent and total aluminium content shall not be less than 0.01 percent.
3. Steels of qualities A, BR, BO and C are generally suitable for welding processes. The weldability increases from quality A to C for grade designation E 250 and E 275.
4. Carbon equivalent (CE) would be calculated based on ladle analysis, only
 
$$CE = C + \frac{Mn}{6} + \frac{(C + Mo + V)}{5} + \frac{(Ni + Cu)}{15}$$
5. Micro-alloying elements like Nb, V and Ti may be added singly or in combination. Total micro-alloying elements shall not be more than 0.25 percent.



5



**LIST OF APPROVED MAKE**

6	COMPUTER (MONITOR, CPU, KEYBOARD& MOUSE)	IBM, HP, DELL
7	LCD MONITOR	LG, SAMSUNG
8	POWER CABLES & WIRES	RR Kable, POLYCAB, FINOLEX, KEI
9	CAT -6 FIRE / OPTICAL CABLE	AMP(commscope), Belden Molex
10	SERVERS	DELL, HP, IBM
12	SWITCH POE LAYERS	CISCO, JUNIPER, NETGEAR, HP,
14	MS CONDUITS	As per Electricals Make
15	PVC RIGID CONDUIT	As per Electricals Make
<b>DG set</b>		
	Engine	Cummins, Caterpillar, Baudouin
	Alternator	Stamford, Leroy Somer

Sr No	Item	Makes
1	LED Light Fixtures & Drivers (Range as per approved sample only)	Philips Wipro Oppl Trilux Havells Bajaj
2	LED Chip	Cree Osram Lumileds Seoul Nichia EPI Star
	Ceiling Fan / Exhaust Fan	Havells Crompton Greaves Bajaj Usha Orient



## SERVICE LEVEL AGREEMENT

We herewith assure you that offered "STERLING GENERATORS" make D.G. Set will be warranted against defective material & workmanship for a period of **2YEARS** from date of dispatch from factory Or **18MONTH** from the Date of commissioning, which ever is earlier.

Sterling Warranty is applicable for DG sold in India only. Sterling Warrants that during the Warranty Period Specified above, it will repair or replace, free of charge, any part that is defective due to Material or manufacturing or poor workmanship, provided maintenance of the DG set is adhered as per maintenance Matrix strictly. SGPL is not liable for any loss or damage, direct or consequential labour charges or the effect or any accident from defective material, faulty workmanship or otherwise. Sterling decision will be the final assessing the extent of repair / replacement.

### SGPL components warranty:

Components like Electrical- Canopy Fan Motor, Controller, AVR, CT, PT, Fuses, Diodes, Battery Chargers, Isolation Transformer, Temperature sensor, Pressure sensor, Relays, Contactors, MCCB etc. the standard Warranty of 01 Year from the date of invoice from the factory. Components like Bellows, the standard warranty of 01 Year from the date of invoice from the factory.

Components like rubber components, hoses, Belts, AVM Pads, Door locks, Rubber inserts, the standard warranty of 06 Months from the date of invoice from the factory.

Battery – Standard Warranty as per Battery Manufacturer.

### This Warranty does not apply for the following:

Routine Maintenance, Tune-ups, Adjustments or normal wear & tear are not covered under warranty. Similarly, Warranty is not applicable if the engine/alternator has been altered or modified or if the serial number has been defaced or removed.

The Genset failure due to misuse including improper shutdown, Improper handling and adjustments, negligence, Over-speeding, alteration of specification, accidents and due to natural calamities and improper Installation.

### Not followed the maintenance schedules

Damage due to replacement / Fitment of parts and accessories during repair carried out by unauthorized person. Damage due to use of NON GENIUNE Spares, Improper Oil, Coolant and Fuel. The use of contaminated or stale fuel or use of alternative fuels. Dirt which enter the engine because of improper Air cleaner maintenance or re-assembly.

In the event of accessories failures- lubricants and coolants shall not cover under warranty.

Improper tools and equipment are utilized at any stage during commissioning and maintenance.





**GENERAL TERMS**

Warranty Services are available only through our Regional / Branch offices / Authorised dealer. This warranty is effective for and is subjected to the time period & conditions stated above.

If Sterling repairs or replaces a component OR engine under this limited warranty, the repaired or replaced component or engine assumes the unexpired warranty period of the original part of the engine. Repair or replacement will not extend the term of the original warranty period.

All goods are supplied on the condition that under no circumstances we undertake liability for the indirect or consequential loss or damage of any nature.

In case of any disputes on warranty; it is subjected to Mumbai jurisdiction only.

Replaced or repaired components under warranty will be taken by Sterling and it will be the property of Sterling.

Yours faithfully,  
for **STERLING GENERATORS PVT. LTD.**

**SIVASAKTHI MURUGAN**  
**HEAD - SERVICE DIVISION**  
[sivasakthi@sterlingwilson.com](mailto:sivasakthi@sterlingwilson.com)



## SERVICE SET UP - PAN INDIA

Endeavour: Effective logistic and technical support through a team of experienced support team.

Mother Depot & Workshop : Silvassa

**REGIONAL OFFICE : 4 NOS. (SALES & AFTER SALES SUPPORT)**

EAST : KOLKATA  
WEST : MUMBAI  
NORTH : NOIDA & GURUGRAM (NCR)  
SOUTH : BANGALORE

**BRANCH OFFICES : 32 NOS.**

EAST: 7NOS. GUWAHATI, RAIPUR, PATNA, BHUBANESWAR, RANCHI, KOLKATA, DHANBAD  
WEST: 9NOS. VADODARA, MUMBAI, PUNE, BHOPAL, INDORE, NAGPUR, SURAT, AHMEDABAD, SILVASSA  
NORTH: 11NOS. DELHI, NOIDA, GURGAON, LUCKNOW, JAIPUR, AGRA, CHANDIGARH, MOHALI, SOLAN, LUDHIANA, DEHRADUN  
SOUTH: 5NOS. CHENNAI, COIMBATORE, VIZAG, HYDERABAD, BANGALORE

### SERVICE LEVEL COMMITMENT

#### A) TURN AROUND TIME

- a. REGULAR MAINTENANCE - 02 to 06 hours from lodging the complaint
- b. MINOR REPAIRS - 04 to 24 hours from lodging the complaint
- c. MAJOR REPAIRS - 07-14 days on availability of spares

#### B) LOGISTIC & SPARES SUPPORT:

Round the clock support for all logistic and spares requirement through our Stores / depot.

All consumables for undertaking preventive maintenance and breakdown repairs available.

All electrical sensors / alternator spares.

All special/diagnostic tools required for attending the necessary maintenance / Breakdown.



**C) SUPPORT FROM MOTHER DEPOT AT SILVASSA**

Apart from the above all major subassemblies, major engine and alternator components available at Mother Depot.

**D) SINGLE WINDOW CONCEPT**

Offer Single Window genuine Engine spares, Spares for LT Generators / HT Generators, Spares for Radiator & Heat Exchanger, Control Panel Spares and Acoustics Enclosure.

24 x 7. Escalation MATRIX available with each customer.

**F) SERVICES & SUPPORT OFFERS TO END USER**

- Installation & Commissioning
- Warranty Services
- Preventive & schedule maintenances, attending breakdown complaints of supplied equipment
- AMC services
- O&M Contracts
- Fluids and lubricants testing through approved test labs.

Yours faithfully,  
for **STERLING GENERATORS PVT. LTD.**

**SIVASAKTHI MURUGAN**  
**HEAD - SERVICE DIVISION**  
[sivasakthi@sterlingwilson.com](mailto:sivasakthi@sterlingwilson.com)



## **SERVICE SET UP - NORTH**

**REGIONAL OFFICE :** STERLING AND WILSON HOUSE,  
C-56 / 38, INSTITUTIONAL AREA,  
SECTOR – 62, NOIDA (U.P) – 201307

**NORTH SERVICE OFFICE:** STERLING VIKING POWER PVT LTD.  
BATRA HOUSE, PLOT NO. 52,  
SECTOR 32, GURGAON

**SERVICE SETUPS :** DELHI, NOIDA, GURGAON, LUCKNOW, JAIPUR, AGRA, CHANDIGARH,  
MOHALI, SOLAN, LUDHIANA, DEHRADUN

### **NORTH SERVICE SET UP AT GURUGRAM OFFICE: -**

North Head (Service)	- 01
Dy. General Manager	- 02
Service Manager	- 04
Electrical Engineers	- 15
Mechanical Engineers	- 15
Technicians/Field Service Staff	- 50
Manager Logistics and Spares	- 02
Executives Spares & Logistic Support	- 04

Spare Parts Inventory maintained in Regional store (approx. value) **Rs. 20 Cr.**

### **THE REGIONAL STORES INVENTORY CATERS ALL REQUIREMENTS UP TO 10,000 OPERATING HRS.**

The mother depot at Silvassa caters for requirement of Regional stores plus all majors Subassemblies.

Any technical and logistics support may also be requested from our Principals' offices located in India and their stores, if any required.



## ESCALATION CHART

The following will be the escalation levels followed to ensure support on technical and parts issues arising out of the operations at Customer premises

ESCALATION	AUTHORITY	CONTACT NO.	E-MAIL
1 <sup>st</sup> Level	MR. VIKAS MISHRA	+91-9568099807	<a href="mailto:vikasmishra@sterlingwilson.com">vikasmishra@sterlingwilson.com</a>
	MR. LALIT MITTAL	+91-7217749478 +91-8130594458	<a href="mailto:lalitmittal@sterlingwilson.com">lalitmittal@sterlingwilson.com</a>
	MR. VIVEKANAND JHA	+91- 9871102159	<a href="mailto:vivekanand.jha@sterlingwilson.com">vivekanand.jha@sterlingwilson.com</a>
2 <sup>nd</sup> Level	MR. T. L. GANESH	+91- 9818751113	<a href="mailto:tlg@sterlingwilson.com">tlg@sterlingwilson.com</a>
	MR. D. K. BANGA	+91- 9971992797	<a href="mailto:dkbanga@sterlingwilson.com">dkbanga@sterlingwilson.com</a>
3 <sup>rd</sup> Level	MR. VIPIN GUPTA	+91-9910486277	<a href="mailto:vipingupta@sterlingwilson.com">vipingupta@sterlingwilson.com</a>
4 <sup>th</sup> Level	MR. S. S. MURUGAN	+91-9374054347	<a href="mailto:shivashakthi@sterlinggenerators.com">shivashakthi@sterlinggenerators.com</a>

Yours faithfully,  
for **STERLING VIKING POWER PVT LTD.,**  
(Associate of Sterling Generators Pvt. Ltd.)

**MR. VIPIN GUPTA**  
SERVICE HEAD  
NORTH



## SGPL SERVICE CENTRE AT SILVASSA

To meet the growing demand for specialist maintenance, our customers can be reassured that we are completely equipped to undertake all service and modification work with ease. Complete and partial overhauls can be carried out in our service centre, where major components or entire engines can be removed for refurbishment. Our overhaul and load testing facilities are second to none. Highly trained, dedicated and experienced SGPL service teams is always geared up to carry out extensive maintenance or repair work on all aspects of Diesel generators.

Spare parts back up and immediate delivery times are integral parts of our support. These, along with short and long-term service contracts, ensure our customers receive the service support, when they need it.

We operate a 24hours call out system for customers, where skilled technicians and engineers are available on a fast response basis. SGPL also offers a remote monitoring service, whereby our experts can be contacted automatically when problems arise. This ensures that our customers can be confident that their requirements are addressed with the minimum of delay. For this reason, we are recognized today as a premier service provider, giving back up not only to our own installed plants but also to many others.

With our portable load banks, which can be used both individually and in parallel, we can provide capacity load testing at full power.

### Service & Facilities for Diesel Generators Repair:

- ✓ Workshop facilities for Engine Major / Top Overhauling.
- ✓ Engine Cylinder Head Testing & Reconditioning Equipments.
- ✓ Calibration Equipments for Injectors, Pumps, etc...
- ✓ Testing & Repair equipments for Charging Alternator, Starter Motor, etc...
- ✓ Radiator Fills & Top Tank Re-Fixing & servicing facilities.
- ✓ Crankshaft, Cylinder Block, Grinding Facilities..
- ✓ Alternator Rewinding & Repair, Balancing & Alignment Facilities.
- ✓ Engine Performance Test & Trouble Shooting equipments.



We have the proficiency in overhauling / repairing the engines of different capacities and brands.





## Spares

SGPL maintains an extensive inventory of engine spare parts. As an authorized parts distributor for most major manufacturers, we have access to original manufacturer drawings and data. This enables us to quickly and precisely identify needed spare parts and make critical deliveries on time. In conjunction with our integrated freight forwarding service, we are able to execute both domestic & international shipments 24/7.

Yours faithfully,  
for **STERLING GENERATORS PVT. LTD.**

**SIVASAKTHI MURUGAN**  
**HEAD - SERVICE DIVISION**  
[sivasakthi@sterlingwilson.com](mailto:sivasakthi@sterlingwilson.com)



## TECHNICAL SUBMITTAL DETAILS

END USER	MAX HEALTHCARE
PROJECT NAME	MAX SUPER SPECIALITY HOSPITAL SEC-56, GURGAON, HARYANA
CLIENT	AHLUWALIA CONTRACT INDIA LTD
CONSULTANT	AEON INTEGRATED BUILDING DESIGN CONSULTANTS LLP A-122, SECTOR 136, NOIDA, UP - 201305, INDIA
SUBMITTAL REFERENCE NO.	SWPL-EL-TDS-17      R02      DATE : 08-10-2024
TECHNICAL SUBMITTAL NAME	DIESEL GENERATOR SET - 415V INCLUDING DG FUEL EXHAUST PIPING & BATTERY CHARGER MAKE OF M/S BAUDOUIIN (ENGINE) & LEROY SOMER (ALTERNATOR)
PROPOSED MAKE	ENGINE :-BAUDOUIIN ALTERNATOR :- LEROY SOMER MS PIPE :-JINDAL STRUCTURAL STEEL :-SAIL / JINDAL INSULATION :-SRIRAM ALUMINUM CLADDING :-BALCO / HINDALCO STAINLESS STEEL FLEXIBLE BELLOWS :-ALFA FASTENERS :-HILTI / FISHER BATTERY AND BATTERY CHARGER :- MMAX POWER (BATTERY CHARGER) & EXIDE (BATTERY)
ENCLOSURE	TECHNICAL DATA SHEET GA DRAWING CALCULATION TYPE TEST REPORT
ELECTRICAL CONTRACTOR	M/s. STERLING & WILSON LTD. SECTOR 62, NOIDA
SIGNATURE	DATE: 08-10-2024
APPROVAL AUTHORITY	M/s ACIL
	M/s AEON
	M/s MAX
SIGNATURE	DATE:



## PARTICULAR CONDITIONS OF CONTRACT

These Particular Conditions are to be read in conjunction with other documents issued along with tender. In case of any discrepancy between Design drawings, General conditions or Technical specifications, more stringent of the same shall be applicable.

The contractor shall refer the Electrical drawings while bidding and will read them in conjunction with specifications. A part list of applicable codes & standards is mentioned as Annexure – II and the compliance will be ensured.

Annexure I : List of approved makes  
Annexure II : List of Codes & Standards

## 1. WORK DESCRIPTION

The work shall be strictly carried out as per the scope listed in this document and in accordance with the specifications. The equipment & material supplied at site will also be selected out of the list of approved makes. All documents provided is for contractor guidance. It is expected that after award of work, contractor shall prepare shop drawings for approval by the Consultant & Client representative and also submit technical documentation duly identifying shortlisted make of material/equipment along with its data sheets. Actual ordering shall be based on approved shop drawings & documents.

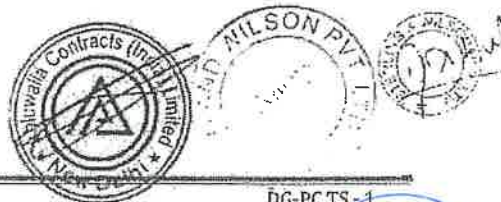
The work at site shall comply with the approved shop drawings and will meet the satisfaction of Client representative. The contractor shall be required to demonstrate satisfactory operation of entire system (including client supplied equipment installed by contractor) and furnish the required labour, material & tools to install & commission the system.

The broad scope of work for proposed DG system covered under this contract shall include supply, installation, testing & commissioning of the following:

- DG Set & Associated accessories
- Exhaust system, piping, controls etc
- Busways
- LT Cables & Cable trays
- Earthing System
- Bulk Oil Storage and distribution system
- Testing Adjusting & commissioning of the entire DG installation.

Besides above, contractor shall also be required to undertake following:

- Obtain approval from Local Authorities prior & post installation for operation of system.
- Minor civil works which include making openings in walls & slabs and making good of the same.
- Commissioning of the plant including test reports to demonstrate satisfactory working prior to handing over.
- Provide as-built drawings and handing over document comprising of list of recommended spares, catalogues and service schedule for each equipment/material.
- Training of Client's staff.



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DG-PC TS - 1



Note - Complied w.r.t final agreed Technical Clarification sheet with scope matrix and R.F.Q.  
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2. SITE MANAGEMENT

The Contractor shall be required to provide following staffing for the project:

- a. Design Engineer who will work with consultant for getting shop drawings, technical submittal and variation in quantity statement approved.
- b. Procurement team.
- c. Full time dedicated Engineer (minimum 10-year experience) & one supervisor posted at site.

The contractor shall submit organization chart and CV prior to starting work at site.

The Contractor shall have required stores, tools & plant, security and facility to transport materials to place of installation for speedy execution of work.

3. REGULATIONS & PERMITS

Prior to starting work at site, the contractor shall obtain required permits/ licenses required for satisfactory execution and operation of the installation. All receipted amounts shall be reimbursed by Client on production of proof of payment by the contractor.

The executed work shall strictly confirm to applicable laws, regulations and Indian Standards which become applicable. In case the specifications and drawings contained in this document call for higher standard than those required by prevailing regulations, then these specifications & drawings shall become applicable. However, in case of any conflict or violation between the document/drawings and prevailing laws, then the applicable laws & regulations shall be governing & binding.

4. SHOP DRAWINGS

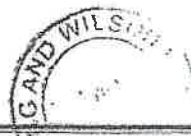
A set of design drawings listed in this document are available at Consultant office and may be issued with the tender document. These design drawings are for reference of the contractor and indicate proposed arrangement and the extent of work covered in the contract. The data given in the drawings and specifications is as exact as could be procured, but its accuracy is not guaranteed. The contractor cannot execute work or scale these drawings for reference.

Following shall be the procedure followed by contractor while preparation of shop drawings:

- The contractor shall refer the design drawings for understanding the scope and proposed routes to be followed during execution.
- Collate latest architectural backgrounds from the Client representative/Architect/Consultant.
- Examine all related services drawings but not limited to structural, plumbing, electrical, HVAC, Interior, landscape and others including as-built works before starting the work. Any discrepancy must be report to the Client's site representative in writing and obtain approval for go-ahead.



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Note - compiled w.r.t final agreed technical clarification sheet with scope matrix and RFQ  
Page 3 of 12

- Within one week of award of work, the Contractor shall prepare a list of shop drawing along with submission schedule for approval of Client representative/Consultant. The list of drawings must include layouts for DG sets, Panel rooms, Cooling towers, detailed exhaust/water piping routing with exact location of supports, flanges, bends, tee connections, fittings etc; electrical panels inside/outside views, power and control wiring schematics, cable trays, supports and terminations.

Maximum headroom shall be maintained at all points and in case the same is inadequate, then written approval from Client representative must be obtained prior to execution at site.

These shop drawings shall depict information required to complete the Project as per specifications and as required by the Consultant/Client representative. These Drawings shall contain details of construction, size, arrangement, operating clearances, performance characteristics and capacity of all items of equipment, also the details of all related items of work by other contractors. Each shop drawing shall contain tabulation of all measurable items of equipment/materials/works and progressive cumulative totals from other related drawings to arrive at a variation-in-quantity statement at the completion of all shop drawings.

Where the work under this contract is proposed to be installed in close proximity or is interfering with other trades, then based on client representative/consultant directions, the contractor shall prepare all services coordinated working drawings and sections at a suitable scale (not less than 1:50), clearly showing proposed installed in relation to the work of other trades.

- The contractor shall thereafter furnish six sets of detailed shop drawings to Client representative/Consultant for obtaining comments/approval. The Contractor will make unlimited number of re-submissions of shop drawings unless Client representative/Consultant/Architect approval is obtained.
- The Contractor will thereafter submit six sets of final shop drawings to the Client representative for their exclusive use and all other agencies.
- No material or equipment may be delivered or installed at the job site until the contractor has in his possession, the approved shop drawing for the particular material/equipment/installation.
- In case installation is carried out without following above process or obtaining a waiver to follow the procedure from Client representative, the work shall be rejected and contractor shall rectify the same at their own cost.
- Shop drawings shall be submitted for approval minimum four weeks in advance of planned delivery and installation of any material to allow Client representative/Consultant ample time for scrutiny. No claims for extension of time shall be entertained because of any delay in the work due to his failure to produce shop drawings at the right time, in accordance with the approved program.

Approval of shop drawings shall not be considered as a guarantee of measurements or of building dimensions. Where drawings are approved, said approval does not mean that the drawings supersede the contract requirements, nor does it in any way relieve the contractor of the responsibility or requirement to furnish material and perform work as required by the contract.



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Note - compiled w.r.t final agreed Technical Clomification sheet with scope matrix and R.F.D. Page 4 of 127

5. TECHNICAL DOCUMENTATION

The contractor prior to supplying material at site, will submit the following documentation to Consultant/Client representative for approval:

- Manufacturer's drawings, catalogues, pamphlets and other documents in triplicate. Each item shall be properly labeled, indicating the specific services for which material or equipment is to be used, giving reference to the governing section and clause number and clearly identifying in ink the items and the operating characteristics. Data of general nature shall not be accepted.
- Samples of all materials shall be submitted to the Client's site representative prior to procurement. These will be submitted in two sets for approval and retention by Client's representative and shall be kept in their site office for reference and verification till the completion of the Project. Wherever directed, a mockup or sample installation shall be carried out for approval before proceeding for further installation.
- Where the contractor proposes to use an alternate make or model of equipment other than that specified, all new drawings and detailing required thereafter shall be prepared by the contractor at his own expense including any re-design required for other discipline/trade. Any delay on such account shall also be at the cost of and consequence of the Contractor.

Contractor to refer Annexure – I for list of approved makes & materials for this project.

6. VARIATION

No variation in the contract shall be acceptable.

7. QUALITY ASSURANCE

The contractor to ensure that all materials and equipment supplied shall be new and of best available quality conforming to the relevant Indian Standard Specifications and to these specifications. Makes shall be strictly in conformity with list of approved manufacturers as per Annexure - I. Owners reserve the right to reject any item which in their assessment is second hand

Any deviations from above shall be clearly highlighted prior to supply and shall be brought to the notice of the Client representative/Consultant for further instructions in the matter.

Prior to starting execution work at site, the Contractor shall verify the sufficiency of the size of the shaft openings, clearances and ceiling spaces for proper installation. Failure to communicate insufficiency of any of the above, shall constitute Contractor acceptance of the same. The Contractor shall locate all equipment in fully accessible locations which can be easily serviced, operated or maintained. The exact location and size of access panels, required for each concealed, valve or other devices requiring attendance shall be finalized and communicated in sufficient time. Failing this, the Contractor shall make all the necessary repairs and changes at own expense. Access panel shall be marked.

8. WORKS NOT COVERED UNDER THIS CONTRACT

NA



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Note - Complied w. R.T Final agreed Technical clarification sheet with scope matrix and R.I.T. Page 5 of 127

**9. INTEGRATION WITH BUILDING AUTOMATION SYSTEM**

The scope shall include providing following for the interface to Building Automation System.

- Space in electrical panel for running of LV cables.
- RS 485/Modbus in DG Controller & Potential free taps in Electrical Panels.
- Auto/manual changeover switch with potential free contact at manual position.
- Installation of current transformer & Transducer along with wiring between Current Transformer & Transducer up to the terminal block

It is to be clearly understood that the final responsibility for the sufficiency, adequacy and conformity to the contract requirements lies solely with the contractor.

**10. TESTING, ADJUSTING AND BALANCING**

Entire Electrical System shall be carried out by the contractor through a specialist team (different than erection team) as per Specifications and IS codes. Performance test shall consist of three days of 10 hour each operation of system for each season. The results for each season shall be submitted to Client representative/Consultant. The submittal shall include operational parameters marked on performance curves for each equipment along with test certificates and safety/control settings.

The installation shall be tested again after removal of defects and shall be commissioned only after approval by the Client's site representative. All tests shall be carried out in the presence of the representatives of the Construction Manager / Architect /Consultant and Client's site representative. After commissioning, the results shall be submitted for scrutiny in quadruplicate.

The installation shall operate under all conditions of load without any sound or vibration which is objectionable in the opinion of the Client's site representative. In case of rotating machinery sound or vibration noticeable outside the room in which it is installed, or annoyingly noticeable inside its own room, shall be considered objectionable. Such conditions shall be corrected by the Contractor at his own expense. The contractor shall guarantee that the equipment installed shall maintain the specified Noise Control levels.

**11. PRE-COMMISSIONING CHECKS**

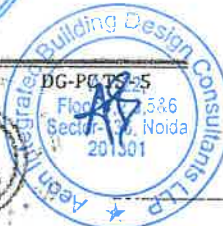
The contractor shall submit written test procedures for each item/ equipment, training manuals and final pre checklist to Commissioning agency for their review prior to commissioning. The Commissioning agent shall approve the pre-functional testing checklist and supervising/ witness the entire commissioning and testing process.

All standards check including the ones elaborated in the specifications to ensure that the installation of the DG sets and associated systems has been carried out satisfactorily shall be done on completion of installation. These shall include.

**11.1 DG Sets**

- Checking of piping interconnections
- Checking electrical interconnections
- Checking of insulation resistance
- Checking of earthing
- Checking of instruments and controls.
- Checking of alignment
- Checking of vibration transmission to building structure.
- Checking of expansion joints.

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Note - Compiled w.r.t final agreed technical clarification sheet  
with scope matrix and Page 6 of 127

11.2 Exhaust System

- Checking of silencer operation
- Checking of surface temperature of exhaust piping

11.3 Fuel System

- Checking of automatic operation of fuel transfer pumps.

11.4 General

Upon completion of work the performance test shall demonstrate the following among other things:

- i. Equipment installed complies with specification in all respects and is of the correct rating for the duty and site conditions.
- ii. All items operate efficiently and quietly to meet the specified requirements.
- iii. All circuits are correctly protected and protective devices are properly coordinated.
- iv. All non-current carrying metal parts are properly and safely grounded in accordance with the specifications and appropriate codes of practice.

12. PERFORMANCE TESTING

DG sets shall be tested at varying loads at manufacturer's works/ site prior to dispatch of the sets to site. The performance tests at the works shall be carried out in presence of authorized representative from the Clients side (two persons). Due notice for the programme of performance testing at works shall be given to the Clients to enable them to arrange for their representatives for this inspection to be at manufacturers works/ site for this inspection and testing.

The performance test on each DG sets shall be of minimum 4 hours duration or as per client requirement (Refer Annexure). It should also include measurement of noise and emission as per standards and CPCB II guidelines. Vibration measurement shall also be done as per engine manufacturer's recommendation and ISO - 8528 Part - 9.

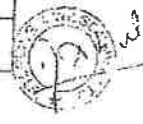
All instruments, materials, consumables (fuel oil, lube oil etc.) load and labour required for carrying out of the test shall be provided by the Contractor. Following test acceptance criteria shall be applicable.

a.	Fuel consumption at 50%, 75%, 100% and 110% load.	± 5% of guaranteed performance. Actual alternator efficiencies as determined in the manufacturer's works tests shall be used as the basis of calculation of specific fuel consumption ratio.
b.	Voltage regulation from no load to full load	± 1%
c.	Frequency regulation from no load to full load	± 0.5%
d.	Maximum lube oil temperature	± 5% of guaranteed performance
e.	Minimum lube oil pressure	± 5% of guaranteed performance
f.	Lube Oil consumption	± 5% of guaranteed performance

Also, following technical data shall be provided to Commissioning agent:

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DG-PC TS - 6



NOTE - Complied w.r.t. Final agreed technical clarification sheet with scope matrix and R.D. Page 7 of 127

- a. Minimum thermal efficiency of DG set.
- b. Auxillary Power Consumption, kW or Watt.
- c. Fuel Consumption (Lt/ Hr) at 100%, 75% and 50% load.
- d. Fuel consumption tolerance (shall not exceed by 5%).
- e. Specific Fuel Consumption (LU kWh generated)

### 13. COMPLETION CERTIFICATE

On completion of the installation, a certificate shall be furnished by the contractor, counter signed by the licensed supervisor, under whose direct supervision the installation was carried out. This certificate shall be in the prescribed form as required by the local authority.

The contractor shall be responsible for getting the entire installation duly approved by the local authorities concerned, and shall bear expenses if any, in connection with the same.

### 14. AS-BUILT DRAWINGS

Contractor shall submit following as-built drawings as and when work is completed:

- Six set of hard copies of all as-built drawings duly corrected and incorporating any modifications during execution.
- Two set of pen drive containing the drawings.

The drawings shall provide all layouts with DG Set, Panels, exhaust piping, fuel piping, Cable / bus ducts layouts, earthing, cable trays, location of all concealed accessories, wiring diagram, control diagram, Single line diagram, control schematic with detailed bill of materials, showing makes, types & description of all components & accessories and sequencing of automatic controls and other services.

### 15. MAINTENANCE MANUAL

Upon completion and commissioning of works, the contractor shall submit a draft copy of comprehensive operating instructions, maintenance schedule and log sheets for all systems and equipment included in this contract. This shall be supplementary to manufacturer's operating and maintenance manuals. Upon approval of the draft, the contractor shall submit four (4) complete bound sets of typewritten operating instructions and maintenance manuals; one each for retention by Consultant and Client's site representative and two for Clients Operating Personnel. These manuals shall also include basis of design, detailed technical data for each piece of equipment as installed, spare parts manual and recommended spares for 4-year period of maintenance of each equipment.

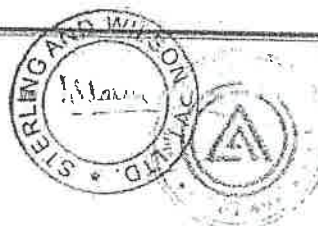
The manuals shall include:

- i. Description of the work carried out / installed.
- ii. Operating instructions.
- iii. Maintenance instructions including procedures for preventive maintenance.
- iv. Manufacturers catalogues.
- v. Spare parts list.
- vi. Trouble shooting charts.
- vii. Drawings
- viii. Type and routine test certificates of major items.

Details of all bought out item should be part of this maintenance manual.

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DG-PTS-7



Note - Complied w.r.t. Final agreed Technical Specification sheet with scope matrix and R.F.C.  
Page 8 of 127

**16. ON SITE TRAINING**

Upon completion of all work and all tests, the Contractor shall furnish necessary operators, labor and helpers for operating the entire installation for such periods so as to enable the Client's staff to get acquainted with the operation of the system. During this period, the contractor shall train the Client's personnel in the operation, adjustment and maintenance of all equipment installed.

**17. DEFECTS LIABILITY PERIOD**

**Complaints**

The Contractor shall receive calls for any and all problems experienced in the operation of the system under this contract, attend to these within 10 hours of receiving the complaints and shall take steps to immediately correct any deficiencies that may exist.

**Repairs**

All equipment that requires repairing shall be immediately serviced and repaired. Since the period of Mechanical Maintenance runs concurrently with the defect's liability period, all replacement parts and labour shall be supplied promptly free-of-charge to the Client.

**18. UPTIME GUARANTEE**

The contractor shall guarantee for the installed system an uptime of 98%. In case of shortfall in any month during the defect's liability period, the Defects Liability period shall get extended by a month for every month having shortfall and no reimbursement shall be made for the extended period.

**19. GREEN BUILDING COMPLIANCE**

Following actions shall be required by Contractor:

Contractor will provide full support in complying to Green Building requirements for the desired level of Green Building Rating in the project.

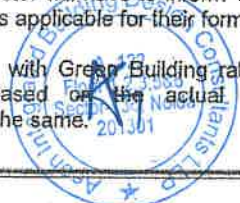
Contractor shall implement the recommendations provided by Green Building Consultant and provide support during the site inspections.

Contractor shall provide respective documentation including but not limited to specification sheets, manufacturer cutsheets, Test Certificates, Brochures, purchase records, manufacturer declarations, calculations, site photographs, commissioning reports.

Contractor is encouraged to designate an individual in their existing team who will be responsible for regular coordination with respective site people to ensure implementation of required green building measures and ultimately provide the required documentation for aspired Green Building Rating.

In case of any deviations in implementing recommended green building measures and/or using specified material/equipment/system, contractor will have to inform Owners/ Services Consultant/ Green Building Consultant/ Architect as applicable for their formal approval.

In case of any additional requirement to comply with Green Building rating as identified during construction/installation/commissioning based on the actual site conditions/ construction activities, Contractor shall implement the same.



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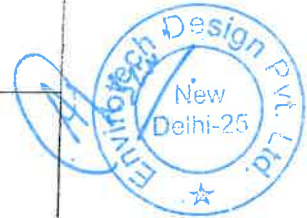
DG-PTS - 8



Note - Completed w.r.t. Final agreed Technical Specification sheet with scope matrix and Page 9 of 27

**ANNEXURE - I**  
**List of Approved Makes**

S. No	Equipment/Material	Approved Manufacturer Name
1.	DG Sets	Cummins MTU  Perkins CAT <b>Baudouin Engine</b>
2.	Alternator	AVK/Stamford CAT Leroy Somer
3.	MS Pipes	UPTO 300 mm - TATA JINDAL STAR ABOVE 300 mm- SAIL JINDAL STAR MSL
4.	Noise Control Silencer / Muffler (Residential Type Silencer)	Intertec Sound Control India
5.	Earthing System	Erico Dehn Obo Belterman Cape Electric JMV
6.	Air Circuit Breakers / Moulded Case Circuit Breaker / MPCB / Contactors	ABB Mitsubishi Siemens Schneider Electric Legrand
7.	Control Transformer / Potential Transformers (Epoxy Cast Resin)	Automatic Electric Gilbert & Maxwell Matrix
8.	Indicating Lamps LED type and Push Button	Schneider Electric Siemens ESBEE ABB
9.	Digital Meters	Siemens Schneider Electric ABB Secure Neptune
10.	Terminal Blocks	Connect well Wago Elmex



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DG-PC TS - 9



Note - Complied w.r.t. Final agreed technical specification sheet with score matrix Page 10 of 127 @.

S. No	Equipment/Material	Approved Manufacturer Name
11.	Batteries	Exide Standard Furukawa Amaron Cummins Pulselite
12.	Battery Charger	Exide Nelco Amaraja Cadalyne
13.	LT Panels & Distribution Boards	Adlec Control System Ambit Switchgears SPC Electrotech Neptune Shivalic Power
14.	Sandwich Busduct	Schneider Legrand L&T EAE C&S
15.	PVC Insulated FRLS Wires	RR Kabel KEI Finolex Batra Henlay Polycab
16.	Cable Trays & Raceways	SMC Needx Indlana Gratings Rmcon
17.	Accessories for Supporting system	Hilti Fisher Hira
18.	Exhaust Pipe Insulation	Rockwool UP Twiga
19.	Acoustic Insulation	Mikron - Mikasha International Rockwool
20.	SS bellows	Alfa flex Kanwal
21.	Flexible coupling with SS guard	Kanwal Advani Resistoflex
22.	FS Cables	Bonton Fusion Polymer Frtek Batra Henley Leoni
23.	LT Cables	Polycab KEI Grandlay CMI Rallison Bonton
23.	Double Compression Cable Glands with earthing links	Dowells Comet

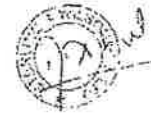


MOTP - Complied w. R.T. Final agreed technical clarification sheet with score. Page 11 of 127 R. F. @

Max Hospital

DG SYSTEM  
CONDITIONS OF CONTRACT & TECHNICAL SPECIFICATIONS

S. No	Equipment/Material	Approved Manufacturer Name
24.	Termination kits	3M Raychem
25.	Butterfly valves	Audco Advance Zoloto
26.	Balancing Valves	Audco Advance
27.	Ball valves	Audco Advance CIM Zoloto
28.	Strainer	Sant Rapid cool Emerald Betalflo
29.	NRV	Audco Advance
30.	Pressure / temperature gauge	Fiebig H Guru Zepson
31.	HSD tank / Day oil tank / Buffer tank / Overflow tank	Rapid cool Indo Asiatic Raunag
32.	Rotary gear oil pump	Roto Rotadel PEC
33.	Oil Flow Meter	Kent
	Oil level indicator	Forbe Marshall
34.	Anti-corrosion tape	Pypekote Mak Polykote Coatek
35.	Foot Valve	Gurco Kriloskar
36.	Flexible Hose	Minerva (ISI marked) / Equivalent



DG-PC TS - 11



NOTE - Complied w.r.t final agreed technical clarification sheet with scope of work and R.F.C.

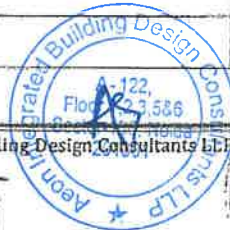
ANNEXURE - II  
PART LIST OF CODES & STANDARDS

The installation in entirety shall comply with latest codes/standards published by National Building Code of India, IEEE, Bureau of Indian Standards (BIS) as well as local regulations from departments like Pollution Control Board, Electrical inspectorate, Fire Authorities, Airport Authority of India (AAI), High rise committee, Indian Electricity rules etc. Some of the standards are mentioned here below for reference:

IS 398 (part-1 7 2)	Aluminium stranded conductors
IS 694	PVC insulated cables for working voltage up to 1100V
IS 732	Code of practice for electrical wiring installation
IS 1248	Electrical measuring meters : Part 1,2,3,4,5,6,7,8,9
	Code of practice for installation and maintenance of power cables up to 33 kV rating
IS 1293	Three pin plugs and socket outlets
IS 1554 (Part 1 & 2)	Specification for PVC insulated (heavy duty) electric cables
IS 1646	Electrical installation fire safety of buildings (general) Code of practice
IS 1777	Industrial luminaire with metal reflectors
IS 1885	Glossary of items for electrical cables and conductors
IS 1913	General and safety requirements for fluorescent lamps luminaries Tubular
IS 1944 (Part 1 & 2)	Code of practice for lighting of public through fares
IS 2026 (Part 1 to 4)	Specification for power transformers
IS 2071 (Part 1 to 3)	Method of high voltage testing
IS 2147	Degree of protection provided by enclosures for low voltage switchgears and control gears
IS 2148	Specification for double compression cable glands
IS 2309	Protection of building and allied structure against lightning
IS 2544	Porcelain post insulators for systems with nominal voltages greater than 1000V
IS 2551	Danger Notice Boards
IS-2705(Parts 1 to 4)	Specification for Current transformer
IS 3043	Code of practice for earthing
IS 3070	Lightning arrester for alternating current system
IS 3427	Metal enclosed switchgear and control gear for voltages above 1000V but not exceeding 11000V
IS 3639	Fittings and accessories for power transformers
IS 3961	Current ratings for cables
IS 4004	Application guide for surge arrestors for AC system
IS 4012 & 4013	Specification for dust proof electric light fittings
IS 4146	Application guide for voltage transformers
IS 5133	Boxes for enclosure of electrical accessories Part-1 : Steel & cast iron boxes
IS 5077	Decorative lighting outfits
IS 5216	Recommendation on safety procedures and practices in electrical works



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DG-PC TS - 12



Note - Complied w.r.t. Final agreed technical clarification sheet with score Part 13 of 13rd R.F.O.

IS 5578	Marking and arrangement of bus bars
IS 5819	Recommended short circuit rating of high voltage PVC cables
IS 6600	Guide for loading oil immersed transformers
IS 6616	Ballast for HP MV lamps
IS 7098	Cross-linked Polyethylene (XLPE) insulated PVC sheathed cables for working voltages from 3.3 KV up to and including 33 KV
IS 7987	Guide for selection of HT AC circuit breakers
IS 8623	Specification for Low voltage switchgear and control gear assemblies
IS 8828	Circuit breakers for household applications – MCB
IS 10028	Code of practice for selection, installation and maintenance of transformer
IS 10118	Code of practice for selection, installation and maintenance of switchgear and control gear
IS 10322	Luminaries
IS 10810	Methods of test for cables
IS 11171	Specification for dry type transformer
IS 12360	Voltage bands for electrical installation including preferred voltages and frequency
IS 12640	Specification for RCCB
IS 12729	Switchgear and control gear for voltage exceeding 1000V
IS 12943	Specification single compression cable gland
IS 13021	Electronic Ballasts
IS 13118	Specification for high voltage AC circuit breakers
IS 13703	Specification for low voltage fuses upto 1000V
IS 13947	Specification for low voltage switchgear and control gear
IS 15652	Specification for rubber mats for electrical purposes
IS 1651 & 1652	Stationary cells and batteries lead acid type
IEC 60034	Rotating Electrical machines
ISO 8528	Reciprocating Internal Combustion Engine Driven Alternating current Generating Set
IS 1001	Performance of constant speed IC engines for General purposes
IS 2253	Designation for type of construction and mounting arrangement of rotating electrical machine
IS 4691	Degree of protection provided by enclosures of Rotating Electrical Machinery
IS 4728	Terminal marking of rotating electrical machines
IS 7132	Guide for testing 3 ph. Synchronous machines
IS 4722	Specification for rotating electrical machines
IS 1822	Motor starters AC, of voltage not exceeding 1000 Volts
IS 7816	Guide for testing of insulation, resistance of rotating machines
BS 5514 / ISO 3046	Reciprocating Internal Combustion Engine



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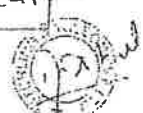
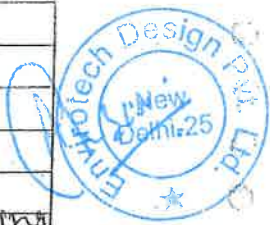
DG-PC TS - 13



NOTE - Complied w.r.t final agreed technical specification sheet with score Page 14 of 123 and w.r.o.

**ANNEXURE – III  
SCHEDULE OF TECHNICAL DATA**

S. No.	Description	Unit	Desirable Values / parameters	D&B Vendor Proposal / compliance.
I.	<b>DIESEL ENGINE</b>			
1.	General			1500 KVA
1.1	Manufacturer		To be confirmed by vendor – Refer approved list	Baudouin, India
1.2	Model no.		To be confirmed by vendor	12 m33 G1650/5
1.3	Type of Engine		Diesel Engine	Diesel Engine
1.4	Engine rating – Prime (minimum)	KWe		Gross Engine Power @ 100% PRP 1350 kW m/1870 bhp Gross Engine Power @ 110% 1450 kW m/1945 bhp. Prime Power conforming to ISO 8528
1.5	Operating Duty		Prime Power (conforming to ISO 8528 11- Duty condition 3B)	
1.6	Operating speed	RPM	1500	1500 RPM
1.7	Over speed trip	RPM	1650	1650 RPM
1.8	Design life	Hours	To be confirmed by vendor	15-20 years / 15000-2000 hours subject to regular maintenance and health check up on sets.
2.	Engine Details			
2.1	No. of cylinders and arrangement	No.	To be confirmed by vendor	12 V type
2.2	Cylinder bore x stroke	mm x mm	To be confirmed by vendor	150 x 185 mm
2.3	Total piston displacement volume	m <sup>3</sup>	To be confirmed by vendor	mean piston speed 9.25 m/s
2.4	No. of stroke per cycle		To be confirmed by vendor	4 strokes
2.5	Compression ratio	ratio	To be confirmed by vendor	15:1
3.	Starting System		Electronic Starter	Electric start
4.	Fuel Consumption			
4.1	Fuel grade		High speed Diesel	IS 1460 / BS 2869 Part 1 Class A HSD type
4.2	Fuel Consumption at NTP			
a	100% loading (Ltrs/hr)	Ltrs \ hr	To be confirmed by vendor	283.5 L/hr
b	75% loading (Ltrs/hr)	Ltrs \ hr	To be confirmed by vendor	204.4 L/hr
c	50% loading (Ltrs/hr)	Ltrs \ hr	To be confirmed by vendor	
4.3	Day oil tank capacity	Litre	990 ltrs	990 Ltrs.
5.	Bearing			
5.1	No. of bearing		To be confirmed by vendor	single bearing
5.2	Method of lubrication		Forced feed lubrication	self lubricated



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Note - compiled w.r.t. Final agreed technical clarification sheet with score matrix and R.F.O. Page 15 of 127

S. No.	Description	Unit	Desirable Values / parameters	D&B Vendor Proposal / compliance.
6.	Engine Lubrication			155L
6.1	Oil grade		To be confirmed by vendor	CLHSAE15W-40
6.2	Oil consumption at rated output	Ltrs \ hr	To be confirmed by vendor	60.21 OF FC
7.	Fuel oil System			
7.1	Fuel oil storage tank capacity	Litre		990Ltrs
7.2	Fuel oil transfer pump			
	a. Type and number			
	b. Capacity	LPM	To be confirmed by vendor	Internal part of Engine for
	c. Head	MLC	To be confirmed by vendor	Filling from HSD Bulk Oil
	d. Drive motor power	KW	To be confirmed by vendor	Tank, Please refer to HSD Fuel P&ID
7.3	Is the system complete with strainer, valves, fittings, unloading hoses etc.		To be confirmed by vendor	
8.	Engine Cooling			
8.1	Method of cooling provided		Engine driven/electrically operated Radiators or Heat exchanger with cooling towers or Remote radiators	Heat exchanger with cooling Towers
8.2	Details of cooling system provided		To be confirmed by vendor	HE cooling thru cooling Towers
8.3	Heat Rejection to Cooling System	KW	To be confirmed by vendor	Heat Rejection to Jacket water @ ESPCK115) SUB-3 Heat Rejection to After cooler @ ESPCK315) 326.7
9.	Exhaust System			
9.1	Silencer		Residential Silencer	Residential silencer
9.2	Piping construction detail		To be confirmed by vendor	MS B Class conforming to IS 3589
9.3	Exhaust piping diameter	mm	To be confirmed by vendor	As per Vendor requirement
9.4	Back pressure	KPA	To be confirmed by vendor	7.5 KPA
9.5	Exhaust gas flow rate	CFM	To be confirmed by vendor	350.4 m <sup>3</sup> /min
9.6	Heat rejected to exhaust system	KW	To be confirmed by vendor	Heat Rejected to Exhaust @ ESP CK115/190.3
9.7	Exhaust temperature (Max)	Deg C	To be confirmed by vendor	Exhaust Gas temperatures 550C
II	<b>RADIATORS</b>			Heat Exchanger with cooling towers
1	Entering coolant temperature	Deg C	To be confirmed by vendor	Thermostat Operating Range 80-90
2	Leaving coolant temperature	Deg C	To be confirmed by vendor	Coolant Alarm (shutdown) Temperature 103C
3	Fan capacity & Static pressure	CFM	To be confirmed by vendor	N/A



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Note - Complied with R.T. Final agreed technical specification sheet with scope of work and R.F.O.  
Page 16 of 127

S. No.	Description	Unit	Desirable Values / parameters	D&B Vendor Proposal / compliance.
III	<b>ALTERNATOR</b>			
1	Manufacturer		To be confirmed by vendor	Leroy-somer (LSM502LP)
2	Protection class		IP 23	IP 23
3	Rated apparent Power	KVA		1500 KVA
4	Rated power factor	Cos phi	0.8	0.8
5	Rated active power	KW		1200 kW
6	Rated voltage	KV		415 V
7	Rated frequency	Hz	50	50 Hz
8	Number of phases		3 PH & N	3 PH & N
9	Rated speed	Rpm	1500	1500 RPM
10	Voltage variation range	%	+/- 0.5 %	As per IEC 60034, IS 5000 MEMA m/h 1-23
11	Frequency variation range	%	+/- 0.1 %	As per IEC 60034, IS 5000 MEMA m/h 1-32
12.	Generator Performances			
12.1	Regulation under condition of rated speed, voltage and output			± 0.5% with 4% engine hovering
	a. At 0.8 p.f. lag (guaranteed)	%	To be confirmed by vendor	
	b. At 1.0 p.f	%	To be confirmed by vendor	
12.2	Reactance			
	a. Direct axis transient, saturated	%	To be confirmed by vendor	X1 Direct Axis Reactance 3.226
	Direct axis transient, unsaturated	%	To be confirmed by vendor	X2 Direct Axis Transient Reactance 0.174
	Direct axis sub-transient, saturated	%	To be confirmed by vendor	X3 Direct Axis Sub-transient Reactance 0.148
	Direct axis sub-transient, unsaturated	%	To be confirmed by vendor	X4 Quad Axis Sub-transient Reactance 0.154
	Negative sequence reactance	%	To be confirmed by vendor	X5 Negative sequence Reactance 0.151
	Zero sequence reactance	%	To be confirmed by vendor	X6 Zero sequence Reactance 0.228
	Synchronous reactance	%	To be confirmed by vendor	
	Capacitance of generator stator wdg to ground		To be confirmed by vendor	As per IEC 60034, IS 5000 MEMA m/h 1-32
	Vibration limits (on shaft rated speed)		To be confirmed by vendor	As per IEC 60034, IS 5000, MEMA m/h 1-32
	Maximum permissible short time unbalanced load (load and time)	% & Sec.	To be confirmed by vendor	maximum over speed 120% for 2 mins



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Note - Complied w.r.t final agreed technical clarification sheet with S.C.O.R.O. Page 17 of 127 dated 12/01/2018 R.F. Co.

S. No.	Description	Unit	Desirable Values / parameters	D&B Vendor Proposal / compliance.
12.3	Insulation (Rotor winding)			
	a. Type of insulation		To be confirmed by vendor	CLASS H
	b. Class of insulation		Class H	CLASS H
12.4	Automatic Voltage Regulator			Provided
	Make		To be confirmed by vendor	As per Alternator manufacturer design
	Type		To be confirmed by vendor	Digital (D350)
	Voltage Regulator Range		+/- 0.5 %	As per IEC 60034, BS, 5000 MEMA m4.1-32
12.5	Control & Relay Panel			
	Make		To be confirmed by vendor	As per OEM
	Type		To be confirmed by vendor	Engine mounted
	Dimension		To be confirmed by vendor	TBA
	Degree of protection		IP 52	Suitable for indoor application
12.6	PLC Scheme provided.	Yes/No	YES	Part of Dhsync Panel
IV	<b>DG SET OVER ALL DETAILS</b>			
1	DG set overall dimension (L x W x H)	mm	To be confirmed by vendor	4631x2110x2488 mm APPROX OPENTYPE
2	DG set overall weight			
	Static weight	KG	To be confirmed by vendor	8359 kg APPROX OPENTYPE
	Dynamic weight	KG	To be confirmed by vendor	1.5 TIMES OF STATIC WEIGHT I.E. 12539 kg APPROX OPENTYPE
3	Max. noise level at a distance of 1.0 m	dB(A)	As per CPCB norms	25dB insertion loss at 1mt as per CPCB norms after proper Room acoustic
4	Efficiencies at rated voltage frequency and power factor - Min			
	a. At 100 % loading	%	To be confirmed by vendor	95.4% @ 0.8 PF
	b. At 75% loading	%	To be confirmed by vendor	95.8% @ 0.8 PF
	c. At 50% loading	%	To be confirmed by vendor	95.8% @ 0.8 PF
5	Total Harmonic Distortion (THD) - Max			No Load 3.5%
	At 100 % load	%	3	As per IEC 60034, BS, 5000 MEMA m4.1-32
	At 50 % load	%	5	As per IEC 60034, BS, 5000, MEMA m4.1-32



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NOTE - Complied w. R.T. Final agreed Technical clarification sheet with scope material and R.F.O.  
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**DG SETS – COST OF GENERATION**

ITEM	UNIT	DATA SHALL BE FURNISHED BY TENDERER AGAINST EACH ITEM
Make of Engine		Boudouin, India
Make of DG set		M/S Sterling Generators Pvt Ltd
Engine Model		12 m 33 G 1650/5
DG set rating	KVA	1500 KVA
DG set rating	kW	1200
Average Load factor	%	75%
Units generated per hour	kwh/ hour	900
Number of hours per year	hours/ annum	500
Number of units generated per year	kwh/ annum	337500
Fuel Cost		89.82
Fuel rate	Rs per litre	204.4
Fuel consumption	Litres/ hour	4.40
Number of units per litre of Diesel	kwh/ litre	
Fuel cost	Rs per kwh	26.40
Lube Oil Consumption Cost		
Lube oil consumption	litres/ hour	0.3066
Cost of Lube oil	Rs per litre	265
Lube Oil consumption cost	Rs per hour	81.249
Lube Oil consumption cost	Rs per kwh	0.09
Lube Oil Replacement Cost	Rs per litre	265
Lube Oil replacement period	Hours	500
Lube Oil replacement quantity	Litres	155
Lube oil replacement	litres/ hour	0.31
Lube oil replacement cost	Rs/ hour	82.15
Lube Oil replacement cost	Rs per kwh	0.09
Maintenance Cost		
"B Check" maintenance period	Hours	500
"B check" maintenance kit cost	Rs	56000
"B Check" maintenance cost	Rs per kwh	0.12
"C Check:" maintenance period	Hours	N.R.
"C Check:" maintenance kit cost	Rs.	N.R.
"C Check" maintenance cost	Rs per kwh	
"D Check:" maintenance period	Hours	N.R.
"D Check:" maintenance kit cost	Rs.	N.R.
"D Check" maintenance cost	Rs per kwh	
Air Cleaner element change period	Hours	1000
Air Cleaner Element cost	Rs	36000
Air Cleaner Element replacement cost	Rs per kwh	0.040
Total Cost per kwh generated		20.75



Signature of Tenderer



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DG-PC 7S - 18



Note- complied w.r.t. final agreed Technical Specifications sheet with score matrix and R.F. ce  
Page 19 of 127

## DG SETS – TEST PROCEDURE

DG Set shall be duly tested at factory as per manufacturer's standards and procedures detailed as under: -

1) Before testing, following details shall be recorded on test report: -

- i) Engine S. No.
- ii) Alternator S. No.
- iii) Engine Model and Make
- iv) Alternator Model and Make
- v) Engine and Alternator Rating
- vi) Date of Testing
- vii) Cooling System Type
- viii) Rated Speed, Voltage & KW Rating

2) Check the tightness of all bolts and necessary connections before starting the DG sets.

3) Start the DG set and run at idle for few minutes. If any leakage occurs, rectify them and note down the parameters on test report.

4) Raise the load gradually and allow the performance parameters to reach steady state conditions and note down the following parameters on test report:

- i) Speed in RPM
- ii) Load in KW
- iii) Current in Amps
- iv) Voltage
- v) Frequency (Hz)
- vi) Lube Oil Pressure
- vii) Lube Oil Temperature
- viii) Regulation of Voltage & Speed

Above parameters shall be recorded at following loads and duration:

Idle Run	-	05 mins
25% Load	-	15 mins
50% Load	-	30 mins
75% Load	-	30 mins
100% Load	-	60 mins
110% Load	-	60 mins

The DG sets shall be tested with standard test bench facilities as per ISO-8528-6.

During testing all controls/operating safeties will be checked and proper record will be maintained.

Any defect / abnormality noticed during testing shall be rectified. The testing shall be declared successful only when no abnormality / failure are noticed during testing.

Cost of all Fuel, lubricants etc. required for performance testing as per above at Vendors works shall be borne by Vendor. However, all cost of travel and lodging of client's representative shall be borne by client. Load for testing at site shall be arranged by bidder at their own cost.



NOTE - Complied w. R.I Final agreed Technical Clarification sheet with score Page 20 of 127 and R.P.C.

MAX HOSPITAL AT MOHALI

CONDITIONS OF CONTRACT & TECHNICAL SPECIFICATIONS  
 DG SYSTEM

**TEST REPORT**

Description	Engine	Alternator	DG Set	Panel
Make				
Model				
Rating				
S. No.				

Rated Voltage:  
 Rated Speed:

Load built up test on resistive load bank (unity power factor)

Load %	Time Min.	Start Time	Stop Time	Volt (Line to Line)	Current (Amps)	Load (kW)	Frequency (Hz)	Lube Oil Pr. Bar	Lube Oil Temp (°C)	Speed RPM
0										
25										
50										
75										
100										
110										

Volt & RPM at no load  
 Volt & RPM at full load  
 Notes:  
 Date: Tested By: Witnessed By:



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DG-PCTS - 21



Note-Complied w.r.t. Final agreed Technical/Classification sheet with scope matrix and R.P. Co.  
 Page 21 of 127

TECHNICAL SPECIFICATIONS

1. SCOPE

The scope of this section consists of but not necessarily limited to the following:

- a. The contractor shall supply, deliver to site, hoisting into position, install, test and commission the generating sets together with the necessary controls and switchboards as specified and indicated in the Drawings. Protection circuits, control wiring and interlock circuits not specified or indicated in the Drawings, but deemed necessary for the safe operation of the generating system shall be provided without any additional cost to complete the system.
- b. Provide manufacturer's factory representative's services, including coordination, start-up and testing supervision at site.
- c. Testing (factory and field), start-up supervision, training and providing necessary documentation and tools for operation.
- d. Carry out performance test run at site.

2. SUBMISSION

For bidding

The bidder shall submit offer with the following documents in two sets.

- Schedule of deviations from technical specifications.
- List of proposed makes, for the items listed in the tender.
- Technical datasheets indicating overall dimensions & Catalogues of major items, highlighting the offered models.
- Design drawing of residential silencer.
- Day oil tank detailed design drawing.
- Structural support drawings.
- To submit power controller (Synchronization module) drawings along with operation logic.
- Supporting structure details of chimney e.t.c.
- Other documents and comments, if any.

For approval before construction/ erection



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DG-PC TS - 22



NOTE- complied w.r.t final agreed technical clarification sheet with scope Page 22 of 127 R. P. C.

5) Routine Tests

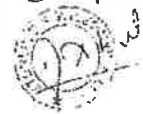
The engine and alternator and other major components shall undergo routine tests as per relevant IS/IEC Specifications and to be conducted at respective manufacturers works. The same shall be recorded and the Test Certificates duly approved by the Inspection team shall form part of the supply of equipment.

Vendor and their Suppliers shall carry out routine tests at the manufacturing unit, cost for which shall be borne by Supplier - *Type test report certificate shall be submitted along with DG sets for engine and Alternator*

6) Site Tests

Bidder is required to provide first fill of lube oil and Fuel (Full day tank) with the DG sets. Load and Fuel required for site Tests shall be borne by OEM. Duration of test shall be 4 hour or 8 hours can then be decided later by client. The costs of man power and arrangement of staff for trial run/running in period will be borne by the bidder.

*Diesel and Load will be provided By Customer*



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*NOTE - Complied w.r.t. Final agreed Technical Clarification sheet with scope matrix and Page 23 of 127*

The Sub-contractor shall submit the following documents.

- a. For all the supplies, the sub-contractor shall submit the following documents in 4 sets for approval.
  - General arrangement drawings, with all dimensions, showing: space-requirements, weights (for transport and service conditions), requirements of civil works/ foundation, fixing and mounting facilities, connection devices, etc.
  - Electrical drawings, showing: power and control single line and functional/ control multi line diagrams, terminal blocks, components' list with make, type, quantity, etc.
  - Quality assurance plan and bar-chart showing manufacturing schedule.

The sub-contractor shall incorporate all comments and submit revised drawings in stipulated time till all drawings are finally approved for manufacturing.

Final

The sub-contractor shall submit the following documents, reflecting the true final as built situation, in 6 sets, and one soft copy in CD.

- a) The drawings including wiring diagrams as revised and "as built".
- b) Inspection and preliminary testing certificates and reports and shipping release.
- c) Test certificates of kWh meters from Government approved Lab or Electric Supply Co. of concerned area.
- d) Guarantee certificates.
- e) Instruction & maintenance manuals, Catalogues etc.
- f) Any other certificate/ report as called for by the Client/ Consultant.

### 3. PRODUCT

DG set shall conform to following standards: -

IS: 4722  
BS: 5000  
IS: 1460  
ISO: 8528  
BS: 5514  
ISO: 3046

#### 3.1 Capacity

Actual power output shall be as shown in drawings and in schedule of quantities.

Diesel Engine

The diesel engine shall be of the 4-stroke cycle, prime rating (as specified in SOQ), multi-cylinder direct injection, compression ignition type operating at a speed of 1500 rpm and shall be silent, vibration free while in operation and comply Center/ State Pollution Control Board and shall conform to BS: 649/ 5514.



Note- Complied w.r.t final agreed Technical Specification sheet with  
-scope matrix and R. Page 24 of 127

The engine shall be complete with Heat exchanger body jacket, lubricating oil pump, lubrication oil pressure gauge, tachometer, electronic type governor, integrated hours-run recorder, over-speed trip and all other necessary auxiliaries.

The brake horse power of the engine with all attached accessories as specified shall not be less than that which is required by the full load rating of the alternator at site operating conditions taking into consideration losses, plus a reserve factor of at least 10%.

**3.2 Starting**

Starting system of the generator shall be of a heavy-duty electric motor complete with a 24 V D.C. heavy-duty battery of 300 AH or as recommended by manufacturer. The electric motor shall be capable of cranking the engine to achieve the rated speed in less than 10 seconds from the initiation of the starting process. The electric start battery shall be of adequate capacity for 3 successive starts. Time delay relays shall be incorporated to provide a rest period of 1-5 seconds (adjustable) before each successive start and a time lag period of 19-100 seconds (adjustable) before the system lock out due to failure of the 3rd start to crank up the engine.

The generator set shall be provided with a micro-processor-based control system which is manufactured to provide automatic starting, monitoring, synchronization, load management, DG protection relay and control functions for the generator set.

The control system shall include an engine electronic governor control, which shall function to provide steady state frequency regulation. The governor control shall include adjustments for gain, damping, and a ramping function to control engine speed and limit exhaust smoke while the unit is starting. The governor control shall be suitable for use in paralleling applications without component changes.

**3.3 Speed Regulation**

The governor shall be capable of regulating the speed of the engine within the limits approximately 10% of the rated speed within 4 seconds due to a sudden application or removal of a full load. The steady load speed shall vary within the limits of approximately 1% of the rated speed.

**3.4 Cooling**

The engine cooling system shall be of heat exchanger type with separate Cooling Towers system to cool the engine as well as the body to minimize heat radiated into the enclosure.

**3.5 Lubricator**

The lubricating system shall be by a positive displacement oil pump providing a positive force feed to all lubricating points.

**3.6 Exhaust System**

Adequate sized piping and fittings shall be installed to carry the engine exhaust discharge into the atmosphere at a height as indicated in the drawings & as per the requirement of Center/ State Pollution Control Board or Pollution Control Committee as the case may be.

Galvanized <sup>M.S.</sup> structural support and vibration arrestors for D.G. set chimney to specify along with drawing for statutory clearance.

Mufflers shall be installed to reduce the engine exhaust noise to a maximum of 5 dBA above ambient noise level at nearest area accessible to the public within 3m from Generator Room

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Note - Complied w.r.t Final agreed Technical clarification sheet with scope matrix and R.C. Page 25 of 127

and at least 2m above floor level). Flexible connection shall be provided between the engine and the fixed piping.

### 3.7 Fuel Piping and Fuel Tank Installation

The complete system shall include engineering, supply, installation, testing and commissioning of tank for storage of fuel, pumps, piping, valves and control system.

### 3.8 Instruments

An instrument panel mounted on the engine shall be provided and shall comprise the following flush-mounted instruments and gauges:

Lubricating oil inlet and outlet temperature  
Lubricating oil pressure gauge  
Tachometer, positive driven  
Hour counter.

### 3.9 Protection Devices

Warning indication and automatic shut-down shall be provided for the following:

Low oil pressure shutdown and alarm  
Low and high coolant temperature alarm  
High coolant temperature shutdown  
Fail to crank shutdown  
Over cranking shutdown  
Over speed shutdown  
Low & high DC voltage alarm  
Low battery alarm  
Low fuel-day tank alarm  
High and Low AC voltage shutdown  
Under frequency shutdown  
Over current and alarm and shutdown  
Short circuit shutdown  
Ground fault alarm  
Overload alarm  
Emergency stop

Failure indication lights and alarm for all fault conditions shall be provided on control panel for restoring the operation to normal.

The starting circuit shall be disconnected in the event of any of the above shutdowns.



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DG-PC TS - 25



Note - complied w.r.t final agreed technical specification sheet with scope matrix and R.P. Page 26 of 127

**3.10 Alternator**

The alternator shall be brushing less synchronous drip proof, self-ventilated and screen-protected and directly coupled on to the diesel engine by flexible coupling and shall be rated for site operating conditions and conform to BS 5000 (part99) or IS 4722.

The full load output voltage shall be 415 volts, 3 phase, 4 wire, 50 Hz at 0.8 power factor with neutral solidly earth with the frequency maintained at 50 Hertz at all time under any load condition including transient overload due to motor starting etc.

The rotor shall consist of the main alternator field poles the brushless exciter and its rectifier module, all bolted on a common alternator shaft. The rotor shall be mechanically and electrically balance up to 135% of the rated speed. The insulation of the alternator shall be non-hygroscopic, Class "H" on the exciter, Class "H" on the stator and Class H on the rotating pole pieces.

The rectifier module of the exciter shall be impregnated with epoxy resin and shall be capable of withstanding without damage or deterioration of the thermal, centrifugal and other stresses that is experienced during normal or short circuit conditions. Rectifiers shall be of silicon type.

The voltage build up shall be of self-excitation using the residual voltage of the alternator through a solid-state voltage regulator. The voltage regulator shall be capable of maintaining the voltage regulation to  $\pm 1\%$  independent of power factor, heating and 5% of speed variation. The voltage output of the alternator shall also be capable of manual adjustable to  $\pm 5\%$  of the rated voltage.

The response of the voltage regulator shall be less than 10 milli second. The voltage dip shall not exceed 15% when a rated continuous load is supplied to the unloaded alternator and the correction time shall not exceed 200 milli second. When the rated load is withdrawn, the voltage overshoot shall not exceed 20%.

The automatic voltage regulator and the exciter shall be manufactured to withstand 50% overload at a constant terminal voltage.

A permanent magnet generator (PMG) or equivalent system shall be included to provide a reliable source of excitation power for optimum motor starting and short circuit performance. The PMG and controls shall be capable of sustaining and regulating current supplied to a single phase or three phase faults at approximately 300% of motor current for not more than 10 seconds.

**3.11 Generator Control Panel**

The generator control panel shall have all necessary instruments and accessories for operation and control of the generating set. On sensing the utility mains voltage dip to below said voltage, the control panel shall send a signal to start the generator. After 3 successive start and if the diesel generator is not started up, the alarm signal shall be activated.

The generator control panel shall consist of all AMF system, Auto-transfer switch, circuit breakers, protective relays if applicable and accessories required to control the generator operation and shall include but not limited to the following:

- Voltmeters
- Ammeter
- Frequency Meter
- Power factor meter
- Kilowatt meter with maximum demand indicator

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Note - Compiled w.r.t. final agreed technical clarification sheet with scope matrix and R.F. @

- Kilowatt hour meter
- Hour run meter
- Start-stop and automatic mains monitoring system
- Emergency off push button
- Manual speed adjusting control reset for overload, alarm muting.
- Fully automatic trickle battery charger with voltmeter
- Indicating lamps for 'Mains Available', 'Mains on Load', 'Standby Available', 'Standby on Load', 'Alarm', 'Mains Fail', etc.
- Audio and visual (flasher) alarm.

The start-stop and automatic mains monitoring system shall be equipped with the following:

- Duty selector switch for 'off-automatic-test-manual' operation
- Manual start-stop push button switch
- Manual alternator circuit breaker 'On-Off' switch
- Cancel alarm switch
- Reset switch
- Indicating lamps
- Battery Status

**3.12 Testing and Commissioning**

All the necessary comprehensive tests shall be performed to the approval and satisfaction of the Project Manager at the completion of installation. Before the commencement of acceptance testing, the installation shall be in a state of practical completion and shall have completed all of the preliminary testing and adjusted the equipment to its proper running order.

A full ten (10) days' notice of his readiness for carrying out acceptance tests shall be given to the Project Manager.

Prior to the date of giving such notice a complete details schedule of the tests to be carried out shall be submitted to the Project Manager for his approval and alterations and additions to the schedule are required to be made.

Notwithstanding his approval of the testing schedule the Project Manager may at any time before or during the testing period direct further tests to be carried out that he considers necessary.

Any variation to the programme for the testing period shall be at the discretion of the Project Manager.

Upon completion of all above tests, four (4) sets of the test results shall be submitted for the approval of Project Manager. All test reports submitted shall be endorsed by all parties witnessing the test including the contractor's and manufacturer's Qualified Personnel.

No acceptance tests shall be carried out except in the presence of the Project Manager or their authorised representatives appointed for the purpose.

The Contractor shall provide at his own cost all materials, including electric power, instrument test set, fuel, lubricants and other consumable, Load Bank required for the tests and adjustments of the equipment and for carrying out the acceptance tests and any re-tests that may be necessitated by failure of the installation or by any other causes within his control.



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The Contractor shall ensure that the fuel supplied for use in acceptance tests is part of a batch for which certified test data is available. Two copies of the test certificate shall be supplied to the Project Manager prior to the commencement of tests.

During the testing period the Contractor shall appoint a qualified personal to carry out the checking and testing the testing instrument (equipment which are to be used for the test) including accurately calibrated test equipment for checking the accuracy of gauges and instruments forming part of or supplied with the installation.

Prior to commencement of testing a detailed list of the equipment shall be submitted to the Project Manager for his approval and no item on the list shall be removed from the site without his consent until the completion of testing.

**3.13 Battery Charger**

General

The battery charger shall be Float cum Boost type SCR controlled. The charger shall have selector switch for Auto Float – Boost / Manual Float / Manual Boost Mode of operation. During Auto Float – Boost Mode, Automatic Changeover shall take place from Float Mode to Boost mode and Vice-Versa. This means that when the Batteries are fully charged the charging shall automatically change from Boost charge to trickle charge.

Construction Feature

The battery charger shall be housed in sheet steel cubicle of Angle Iron frame work with sheet steel panels of 1.6 mm thickness. Louvers shall be provided in the cabinet for the ventilation. The cubicle shall be painted in Siemens Grey shade RAL7032 of IS-5. Four wheels shall be provided at the base.

Performance

The D.C output voltage of Float / Boost charger shall be stabilized within  $\pm 2\%$  for AC input variation of  $230\text{ V} \pm 10\%$ , frequency variation of  $50\text{ Hz} \pm 5\%$  and DC load variation of 0-100%. The voltage regulation shall be achieved by a constant voltage regulator having fast response SCR control. The ripple content will be within 3% of DC output nominal voltage.

There shall be provision to select Auto Float / Manual Float / Manual Boost modes. During Auto Float Mode the battery charging shall automatically changeover from Boost Mode to Float Mode and Vice Versa. During Manual Float / Boost modes it shall be possible to set the output volts by separate potentiometers.

The battery charger shall have automatic output current limiting feature.

Components

The battery charger shall essentially comprise of the following

- 1 No. double pole ON/ OFF MCB at AC input.
- 1 No. pilot lamp to indicate charger ON.
- 1 No. Main Transformer: Double wound, naturally air cooled, having copper winding.
- 1 set single phase full wave bridge rectifier consisting of 4 Nos. SCRs, liberally rated, mounted on heat sinks and complete with resistor / condenser network for surge suppression.



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Note- Complied w.R.T Final agreed Technical specification sheet with score matrix and R.F.G.  
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- 1 No. rotary switch to select auto float/ manual float/ manual boost. During auto float mode automatic changeover shall take place from float mode to boost mode and vice versa.
- 1 set solid state constant potential controller to stabilize the DC output voltage of the float cum boost charger at  $\pm 2\%$  of time set value for AC input voltage variation of 230 V  $\pm 10\%$ , frequency variation of  $\pm 5\%$  from 50 Hz and simultaneous load variation of 0-100% and also complete with Current Limiting Circuit to drop the Float Charger output voltage upon overloads to enable the battery to take over.
- 1 No. electronic controller to automatically changeover battery charging from boost to float and vice versa.
- 1 No. DC ammeter and toggle switch to read charger output current and battery charge/ discharge current.
- 1 No. moving coil DC voltmeter to read the DC output voltage.
- 2 set potentiometer to adjust the output voltage during manual/ auto float and boost modes.
- 2 No. double pole ON/ OFF MCB at DC output, 1 No. at charger output and the other at load.
- 2 set DC output terminals. 1 set for the load and the other set for the battery.
- Alarm Annunciation: Visual and audible alarm with manual accept reset facility shall be provided for the following
  - a. AC mains fail
  - b. Charger Fail
  - c. Load/ Output overvolt

Rating

AC Input	: 230 V + 10% AC 50 Hz single phase.
DC Output	: To float/ boost charge batteries and also supply a continuous load.
Current Rating	: 30.0 Amps
Float Mode	: 27.0 V nominal (Adjustable) between 24-28.0 V.
Boost Mode	: 29.0 V nominal (Adjustable) between 24-32.0 V.
Voltage Regulation	: $\pm 2\%$ for AC input variation of 230 V $\pm 10\%$ , Frequency Variation of 50 Hz $\pm 5\%$ and DC load variation 0-100%

Painting of Pipe Work

All pipe work, other than buried pipes, shall be painted immediately after installation with at least one coat of red primer and two (2) finishing coats of best quality aluminum paint. The colour will be determined by the Project Manager on site.

Vibration Control

The complete generator assembly shall be isolated on static deflection unhooused spring-neoprene in series isolator with non-skid neoprene pads. Start-up and shut down rocking restraint snuffers shall be provided at four corners of base frame.



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total - completed w.r.t final agreed technical specification sheet with scope matrix and R.F.C.

All fuel line pipes shall be cushioned with a layer of harness and neoprene pad at attached points.

All pipe work and engine silencers shall be suspended on static deflection spring-neoprene in-series hangers.

Detail calculation and proposal for justifying the size and provision shall be provided for Project Manager review prior to the installation.



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Note - Complied with Final agreed Technical Specification sheet with scope matrix and -R.F.@.

**3.14. TESTING**

**FACTORY TEST SCHEDULE**

- i. Introduction
- ii. Preliminary Information Required
- iii. Pre-witnessing Check list
- iv. Confirmation of System Parameters
- iv. System Failure Mode Tests
- v. Equipment and System Operational Tests
- vi. System Load Acceptance Tests

**INTRODUCTION**

The primary purpose of the tests scheduled within this document, represents the need for the installed system on site to meet the full expectations of the Specification.

The performed tests shall prove the synchronization of the sets and the safe reliable operation of the equipment under Normal site operating conditions: -

- Automatic and Manual start of the sets
- Verification of all safety shutdown circuits and alarms

**Note:** All tests conducted shall be conducted using a reactive load bank arrangement at 0.8 lagging p.f.

The programming of these tests becomes an integral and critical feature for the successful completion of the project; therefore Owners shall require a detailed programme of tests to be submitted in line with the project completion programme.

The co-ordination, documentation & management of the scheduled tests shall be undertaken by the selected suppliers.

**PRELIMINARY INFORMATION REQUIRED**

To allow the scheduled witness tests to proceed, Owners shall require all the information as scheduled below to have been completed in order to meet the Contractual conditions of the Contract works. By conducting and preparing the attached information, Owners expect the tests to be completed expediently and successfully in line with the master Contract programme, this particular element of the project shall also be used to benchmark Contractor performance for selection upon future projects

Owners expect all the scheduled information to be issued prior to the witnessing team attending the factory.

- Factory test schedules and results
- Record drawings for all equipment and systems
- Completed pre-commissioning and commissioning check lists
- Load bank completion certificate
- Specification compliance sheet to be issued

**Note:** All information to be issued in bound format



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Note- complied w.r.t Final agreed technical clarification sheet with score matrix and R.P. & Page 32 of 127.

**PRE-WITNESSING CHECKS**

- All associated test cabling to be complete
- All ancillary systems within the Generator enclosure to be completed.
- Visual checks to all system components and cabling.
- kW & kVAr sharing proven.
- All set controls circuits checked and operational.
- All emergency shutdown circuits checked and operational
- All interlocks and padlocks are in place.
- All protection devices are operational.
- All recording equipment is in place and functioning.

The tests shall be conducted at the full rating of each respective Generator set (i.e. full rating), at design load of each set with sets synchronized and under transient step load conditions, all as indicated within this document.

Various recording instruments i.e. Dranetz and multi-meter devices shall be connected into the system at the following locations: -

- Generator Test Synchronization switchboard : Dranetz multi meter c/w suitable C.T arrangements.

On completion of each test the corresponding signatory shall be included within the test sheets in order to confirm the acceptance of the tests.

**CONFIRM SYSTEM PARAMETERS**

The Generator equipment shall be confirmed as follows in readiness for the test sequence:

- Confirm fuel oil transfer rates in l/s
- Confirm battery voltages for starters
- Check alternator output voltage at No load and full load.
- Check current per phase on no load and full load.
- Check Neutral currents on No load and full load.
- Check frequency on no load and full load.
- Confirm kW & kVAr load sharing at full load.
- Check engine speed



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Note- Complied w.r.t final agreed technical clarification sheet with scope matrix and R.P.C.  
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**FAILURE MODE TESTS**

The failure mode tests are to be conducted on successful completion of the system parameter checks and tests.

The tests to be conducted are as follows and shall be carried out on each generator by the manufacturer at 50% rated load of each set.

- Conduct fail to start test sequence by disabling fuel rack
- While set running fail fuel oil system
- Simulate reverse power and observe set shutdown.
- Fail control power supply and observe set shut down.
- Simulate E.P.O annunciation.
- Prove set shutdown with inlet outlet louvers failed.
- Repeat for all permutations of generators
- Verify all phase failure relay generator start signals.
- Simulate all engine shutdown alarms and observe shutdown
- Simulate specifically, engine over speed alarm and shutdown
- Fail one set of starters for each set during start sequence and observe transfer to alternate starter equipment in each case.

**OPERATIONAL TESTS**

The function of the following test schedule is to confirm the operational abilities of the equipment under all possible scenarios and fault conditions.

The entire test scheduled below shall be conducted on each set

- With the complete equipment stationary conduct phase failure signals initiation.
- Conduct run down sequence upon reset of phase failure signals.
- Conduct manual start of the sets.
- On completion of heat run, load to be increased to 110% for 1 hr.
- During heat run check all enclosure temperatures
- Check all engine temperatures and alternator readings.

**LOAD ACCEPTANCE TESTS**

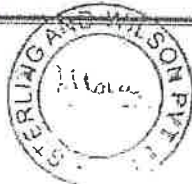
The load acceptance test shall be conducted to confirm the load acceptance of the generator system under varying load steps and in all system configurations.

- Connect generator to load bank and increase load in stages, as the load bank will allow.
- Load the generator/s to 100 % rated load and run for 1 hour.
- Reduce load by 50%.
- Reduce load by a further 50%.
- Apply remaining 25% load step.
- Reduce load by 100%.
- Apply 50% load step.
- Apply remaining 50% load step and run for 1 hour.
- Apply a further 10% load and run for 1 hr.



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Note - Complied w.r.t. final agreed technical clarification sheet with scope margin and R.F - Q. Page 34 of 127



### Chemical Composition : SAILMA Grades

Grade	C max.	Mn max.	S max.	P max.	Al min.	Si max.	CE max.	MAE (Nb+V+Ti) max.
SAILMA 300	0.20	1.50	0.045	0.045	0.02	0.45	0.44	0.25
SAILMA 300 HI	0.20	1.50	0.040	0.040	0.02	0.45	0.43	0.25
SAILMA 350	0.20	1.55	0.045	0.045	0.02	0.45	0.46	0.25
SAILMA 350 HI	0.20	1.55	0.040	0.040	0.02	0.45	0.45	0.25
SAILMA 410	0.20	1.60	0.045	0.045	0.02	0.45	0.48	0.25
SAILMA 410 HI	0.20	1.60	0.040	0.040	0.02	0.45	0.48	0.25
SAILMA 450	0.20	1.65	0.045	0.045	0.02	0.45	0.50	0.25
SAILMA 450 HI	0.20	1.65	0.040	0.040	0.02	0.45	0.50	0.25
SAILMA 550	0.20	1.65	0.020	0.025	0.02	0.50	0.54	0.25
SAILMA 550 HI	0.20	1.65	0.015	0.025	0.02	0.50	0.54	0.25
SAILMA 600	0.22	1.70	0.015	0.025	0.02	0.50	0.54	0.25

For Hot Rolled coils, S is maintained below 0.030%

### Chemical Composition : HCRS

Grade	C max.	Mn	S max.	P	Si	Cu min.
HCRS (Cu-P)	0.15	0.25 - 0.8	0.03	0.07 - 0.15	0.28 - 0.50	0.2



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**Mechanical Properties : 2062,2011**

Grade Designation	Quality	Tensile Strength R <sub>m</sub> Min MPa	Yield Stress Min MPa			Percentage Elongation A <sub>5</sub> at Gauge Length, L=5.65 √S <sub>0</sub> Min	Internal Bend Diameter Min		Charpy Impact Test			
			≤ 20	20-40	> 40		<25	>25	Temp °C	J, Min		
E-250	A	410	250	240	230	23	2t	3t	RT	27		
	BO										0	27
	C										(-) 20	27
E-275	A	430	275	265	256	22	2t	3t	RT	27		
	BO										0	27
	C										(-) 20	27
E-300	A	440	300	290	280	22	2t	-	RT	27		
	BO										0	27
	C										(-) 20	27
E-350	A	490	350	330	320	22	2t	-	RT	27		
	BO										0	27
	C										(-) 20	27
E-410	A	540	410	390	380	20	2t	-	RT	25		
	BO										0	25
	C										(-) 20	25
E-450	A	570	450	430	420	20	2.5t	-	RT	20		
	BO										0	20
E-550	A	650	550	530	520	12	3.0t	-	RT	15		
	BO										0	15
E-600	A	730	600	580	570	12	3.5t	-	RT	15		
	BO										0	15

1. In case of product thickness/diameter more than 100 mm, lower minimum limit of tensile strength may be mutually agreed to between the purchaser and the manufacturer/supplier



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### Mechanical Properties : SAILMA Grades

Grade	YS, MPa min			UTS MPa min	% El min Std GL	Internal Bend Diameter, min		Charpy Impact Test	
	<25 mm	25-40 mm	>40 mm			≤25mm	>25 mm	Temp <sup>o</sup> C	
								J, min	J, min
SAILMA 300	300	290	280	440	24	2t	-	-	-
SAILMA 300 HI	300	290	280	440	24	2t	-	0	40
SAILMA 350	350	330	320	490	24	2t	-	-	-
SAILMA 350 HI	350	330	320	490	24	2t	-	0	40
								-20	30
SAILMA 410	410	390	380	540	22	2t	-	-	-
SAILMA 410 HI	410	390	380	540	22	2t	-	0	35
								-20	25
SAILMA 450	450	430	420	570	22	2.5t	-	-	-
SAILMA 450 HI	450	430	420	570	22	2.5t	-	0	30
								-20	20
SAILMA 550	550	530	520	650	14	3t	-	-	-
SAILMA 450 HI	550	530	520	650	14	3t	-	0	25
								-20	15
SAILMA 600	600	580	570	730	14	3.5t	-	-	-

Impact will be given for any one temperature. For 450 HI & above impact is for < 10 mm. For < 12 mm impact to be given only if specified.

### Mechanical Properties : HCRS

Grade	YS, MPa, min	UTS, MPa, min	% El in GL 5.65 √S <sub>0</sub> min	Bend Test
HCRS (Cu-P)	340	480	21	1T

### Straightening and Despatch

At BSP's Merchant Mill and Rail & Structural Mill every piece of each section is straightened through a straightening machine. Heavy structurals from R&S Mill are despatched piece wise while light structurals from Merchant Mill are clubbed in bundles of 8-12 tonnes in fixed length.

Angles from Merchant Mill for TLT manufacturers can be nested and packeted, after piece by piece inspection. Customers are requested to specify this, if required.

At DSP's Section Mill 100% products are straightened.





## Crane Rails

Profile	Sectional Wt, kg/m	Standard Length, m	Mill
CR - 80*	64.2	13	Rail & Structural Mill, Bhilai
CR - 100*	89.0	13	Rail & Structural Mill, Bhilai
CR - 120*	118.0	13	Rail & Structural Mill, Bhilai

\* Denotes head width in mm.

### Chemical Composition

Specification	Ladle Analysis %					
	C	Mn	P Max	S Max	Si	Hydrogen
Crane Rails	0.65-0.75	1.0 to 1.3	0.040	0.040	0.10 to 0.50	Less than 3 ppm

### Properties

UTS	: 850 MPa min
Elongation	: 8% min
Hardness	: 250 BHN min
Micro Structure	: Pearlitic
Inclusion rating Supply condition	: 3.0 max (worst field) Sulphide, Alumina, Silicate & Globular oxide individually
CR 80, 100	: Straightened
CR 120	: Unstraightened



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## Structural Steel Sections from new Universal Section Mill of ISP

Beams (IS 12778)	Mass (kg/m)	Equivalent (DIN 1025)
NPB 240x120	30.71	IPE 240
NPB 270x135	36.07	IPE 270
NPB 300x150	36.52, 42.24, 49.32	IPE 300
NPB 300x200	59.56, 66.75, 75.37	--
NPB 330x160	49.15	IPE 330
NPB 350x170	57.09	IPE 360
NPB 350x250	79.18	--
NPB 400x180	57.38, 66.3, 75.66	IPE 400
NPB 400x200	67.28	--
NPB 450x190	67.15, 77.57, 92.36	IPE 450
NPB 500x200	79.36, 90.68, 107.31	IPE 500
NPB 550x210	105.52	IPE 550
NPB 600x220	107.56, 122.45, 154.46	IPE 600
NPB 750x270	145.29, 174.54, 202.48	IPE 750

Channels (DIN 1026)	Mass (kg/m)	Angles (IS 808)	Mass (kg/m)
UPN 200	25.3	150x150x10	22.9
UPN 220	29.4	150x150x12	27.3
UPN 240	33.2	150x150x16	35.8
UPN 260	37.9	150x150x20	44.1
UPN 280	41.8	160x160x15	36.2
UPN 300	46.2	180x180x16	43.5
UPN 320	59.5	200x200x12	36.9
UPN 350	60.6	200x200x16	48.5
UPN 400	71.8	200x200x20	60
		200x200x25	73.9

Beams (IS 12778)	Mass (kg/m)	Equivalent (DIN 1025)
WPB 200X200	42.26	HE 200 A
	61.30	HE 200 B
WPB 220X220	50.51	HE 220 A
	71.47	HE 220 B
WPB 240X240	60.32	HE 240 A
	83.20	HE 240 B
WPB 260X260	68.16	HE 260 A
	92.99	HE 260 B
WPB 280X280	76.36	HE 280 A
	103.13	HE 280 B
WPB 300X300	88.34	HE 300 A
	100.84	--
	117.04	HE 300 B
	237.92	--
WPB 320X300	97.64	HE 320 A
	126.66	HE 320 B
WPB 340X300	104.79	HE 340 A
	134.16	HE 340 B
WPB 360X300	112.07	HE 360 A
	141.81	HE 360 B
WPB 400X300	124.81	HE 400 A
	155.26	HE 400 B
WPB 450X300	139.76	HE 450 A
	171.12	HE 450 B

Channels (IS 808)	Mass (kg/m)
MC 200	22.3, 24.3
MC 250	30.6, 34.2, 38.1
MC 300	36.3, 41.5, 46.2
MC 350	42.7

IPE/NPB - Narrow Flange Parallel Beams

HE/WPB - Wide Flange Parallel Beams

UPN - Channel (U Section) as per DIN

MC - Indian Standard Medium Channel

\* Product Availability to be checked prior to order booking



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## Structural Steel Sections from new Medium Structural Mill of DSP

Dimension IS 12778 (mm)	Mass (kg/m)
NPB 100 x 55	8.10
NPB 120 x 60	10.37
NPB 140 x 70	12.89
NPB 160 x 80	15.77
NPB 180 x 90	15.37, 18.80, 21.27
NPB 200 x 100	18.47, 22.36, 25.09
NPB 200 x 130	27.37, 31.55
NPB 200 x 150	30.45
NPB 200 x 165	35.68, 42.47, 48
NPB 220 x 110	22.18, 26.20, 29.35
NPB 240 x 120	26.15, 30.71, 34.31
NPB 250 x 125	30.11
NPB 250 x 150	34.03, 39.78, 46.49
NPB 250 x 175	43.94
NPB 270 x 135	30.73, 42.26
NPB 300 x 150	36.52, 42.24, 49.32
NPB 300 x 165	39.88, 45.76, 53.46
NPB 300 x 200	59.56, 66.75, 75.37

Dimension IS 808 (mm)	Mass (kg/m)
ISA 90 x 6, 8, 10, 12	8.2, 10.8, 13.4, 15.8
ISA 100 x 6, 8, 10, 12	9.2, 12.1, 14.9, 17.7
ISA 110 x 8, 10, 12, 16	13.4, 16.6, 19.7, 25.7
ISA 130 x 8, 10, 12, 16	15.9, 19.7, 23.5, 30.7
ISA 150 x 10, 12, 16, 20	22.9, 27.3, 35.8, 44.1
ISA 200 x 12, 16, 20, 25	36.8, 48.5, 60.0, 73.9

Dimension IS 12778 (mm)	Mass (kg/m)
WPB 100 x 100	12.24, 16.67, 20.44, 41.79
WPB 120 x 120	14.56, 19.89, 26.69, 52.13
WPB 140 x 140	18.07, 24.66, 33.72, 63.24
WPB 150 x 150	22.96, 30.04, 36.98
WPB 160 x 160	23.83, 30.44, 42.59, 76.19

Dimension ASTM A6 (mm)	Mass (kg/m)
W 100 x 100	19.3
W 130 x 130	23.8, 28.1
W 150 x 150	13, 13.5, 18.0, 22.5, 24, 29.8, 37.1

Dimension IS 808 (mm)	Mass (kg/m)
MC 100	9.6
MC 125	13.1, 13.7
MC 150	16.8, 17.7
MC 175	19.6, 22.7
MC 200	22.3, 24.3
MC 225	26.1, 30.7
MC 250	30.6, 34.2, 38.1
MC 300	36.3, 41.5, 46.2

Dimension IS 808 (mm)	Mass (kg/m)
MB 100	8.9
MB 124	13.3
MB 150	15.0
MB 175	19.6
MB 200	24.2
MB 225	31.1
MB 250	37.3
MB 300	46.0

NPB - Narrow flange parallel beams.

WPB - Wide flange parallel beams.

W - Wide flange beam (ASTM)

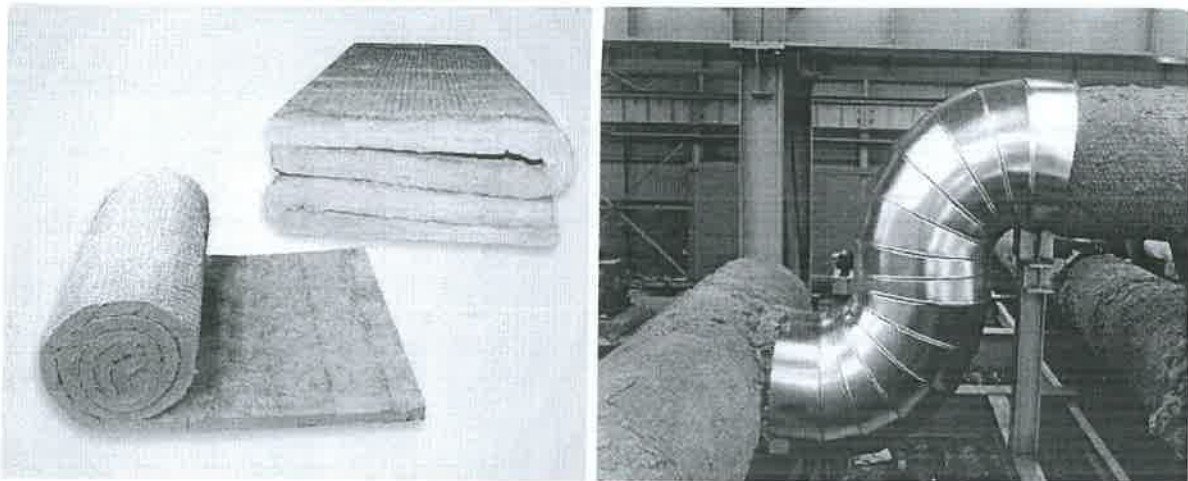
BM - Indian standard medium Beam.

MC - Indian standard medium channel.

ISA - Indian standard equal angles.



## Shreerock wool Mattress



Shreeram Equitech Pvt. Ltd. is leading Shreerock Wool Mattresses manufacturers in India. Our products are manufactured in complete adherence to industry quality standards. These products are supplied to our clients within the periods mentioned by them. Our products are known for their unbeatable quality, durability, and resistance to damage. The qualities of these products are tested by our professional before dispatches.

Shreerock products are specially manufactured to attain the highest quality standards. We have a team of quality inspectors to ensure that the quality of our products is meeting international standards. Apart from this, our quality controllers systematically examine the quality of our products on various stringent parameters such as high insulation resistance and low dissipation factor. Our transparency in our business has enabled us to attain the utmost position in the industry as the best Shreerock Wool Mattresses manufacturers in India.

Details

Specifications

Features

### Standard Compliance

Shreerock products comply with standard requirements of IS 8183, ASTM-C-592, BS3958PART:3

### Standard Dimension

Product Type	Length (M)	Width (M)
Fold Form	1.64-1.52	1.22
Roll Form	4.00	0.80

### Standard Density & Thickness



Density (kg/M <sup>3</sup> )	Thickness (mm)
80	50-100
100-160	25-100

Note: Thicknesses are supplied in range of every 5mm

### Thermal Performance (K value)

Thermal conductivity in W/mK when tested as per IS: 3466/ASTMC177

Mean Temp. °C	Density Kg/M <sup>3</sup>			
	80	100	128	150
50	0.038	0.037	0.036	0.036
100	0.046	0.042	0.046	0.046
200	0.064	0.062	0.065	0.065

### Working Performance

Maximum temperature up to 750°C

### Our Products

[Shreerock Wool Mattress](#)

[Shreerock Wool Slabs](#)

[Shreerock Loose Wool](#)

[Shreerock Wool Building Roll](#)

[Shreerock Wool Pipe Cover](#)

[Shreerock Wool Lamella](#)

### Shreerock Wool Mattress Packing



Related links

- ◆ Quality Management
- ◆ Risk Management
- ◆ Environmental Management
- ◆ Health, Safety & Environment
- ◆ Energy & Sustainability
- ◆ Corporate Governance

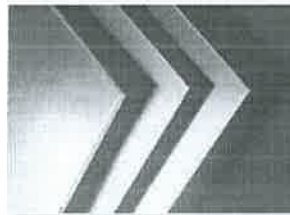
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## Cold rolled sheets

Hindalco's cold rolled sheets are precision-finished to meet the international standards for tight thickness, tolerance, flatness and dimensional accuracy. Sound metallurgical properties for further fabrication, anodising characteristics and a blemish-free surface make it useful in both commercial and general engineering applications.



Application search

Select product

Select applications

Go

### Common alloys

#### Dimensions

Parameter	Range	Standard	Tolerance
Thickness (mm)	0.16 – 5.99	-	for 0.16 to 0.29 +/-0.01 for 0.30 to 0.71 +/-0.05 for 0.72 to 1.40 +/-0.08 for 1.41 to 2.00 +/-0.11 for 2.01 to 4.00 +/-0.12 for 4.01 to 5.99 +/-0.15
Width (mm)	500 – 1600	914, 1219	+/-3 for width <=1000 +/-4 for width >1000 +/-10 for thickness >1.63
Length (mm)	2438 for thickness < 0.7, 3658 max for > 0.7	2438, 3048	+/-3 for length <=1000 +/-4 for length 1000 – 2000 +/-5 for length 2000 – 3000 +/-7 for length >3000
Diagonal difference	<=6 when length <=1000 <=8 when length 1000 – 2000 <=10 when length 2000 – 3000 <=14 when length > 3000	-	-

#### Did you know?

Aluminium recycling has been a common practice since the early 1900s. The process does not damage the metal's structure. Recycling aluminium cans, foil and foil containers helps in conserving energy.

Interleaved sheets can be supplied in > 0.7 mm with polythene or self-adhesive film.  
Stucco embossed sheets are also available in the thickness range of 0.30 – 1.10mm.  
Stretched sheets in the thickness range of 2 – 5.99 mm can also be offered.

### Mechanical properties

Alloy (AA)	Temper	UTS (mpa)		%E (min) (50mm gauge length)			
		Min	Max	0.5 – 0.8 mm	0.81 – 1.3 mm	1.31 – 2.6 mm	2.61 – 5.99 mm
1050	O	55	95	22	25	29	30
1050	H14	95	125	4	5	6	6
1050	H18	125	-	3	3	4	4
1070	O	-	95	27	27	29	34
1070	H14	95	120	4	5	6	7
1070	H18	120	-	3	3	4	4
1200,1100	O	70	110	20	25	29	30
1200,1100	H14	105	140	3	4	5	



1200,1100	H16	125	150	2	3	4	4
1200,1100	H18	140	-	2	2	3	3
3103,3003	O	90	130	20	23	24	24
3103,3003	H14	130	180	3	4	5	5
3103,3003	H16	150	195	2	3	4	4
3103,3003	H18	170	-	2	2	3	3
3105	O	95	145	14	14	15	16
3105	H14	150	200	4	4	5	5
3105	H16	175	215	2	2	3	4
3105	H18	195	-	1	1	1	2
8011	O	85	120	20	23	25	30
8011	H14	125	160	3	4	5	5
8011	H16	150	180	2	3	4	4
8011	H18	175	-	2	2	3	3

### Chemical composition

Alloy (%)	AA 1050	AA 1070	AA 1100	AA 1200	AA 3003	AA 3103	AA 3105	AA 8011
Fe	0.40	0.25	0.95	1.00	0.70	0.70	0.70	0.60 – 1.00
Si	0.25	0.20	(Fe + Si)	(Fe + Si)	0.60	0.50	0.60	0.50 – 0.90
Mg	0.05	0.03	-	-	-	0.30	0.20 – 0.80	0.05
Mn	0.05	0.03	0.05	0.05	1.00 – 1.50	0.90 – 1.50	0.30 – 0.80	0.20
Cu	0.05	0.04	0.05 – 0.20	0.05	0.05 – 0.20	0.10	0.30	0.10
Zn	0.05	0.04	0.10	0.10	0.10	0.20	0.25	0.20
Ti	0.03	0.03	-	0.05	0.1(Ti + Zn)	0.1(Ti + Zn)	0.10	0.08
Cr	-	-	-	-	-	0.10	0.10	0.05
Each (Others)	0.03	0.03	0.05	0.05	0.05	0.05	0.05	0.05
Total (Others)	-	-	0.15	0.125	0.15	0.15	0.15	0.15
Al	99.50	99.70	99	99	Remainder	Remainder	Remainder	Remainder

Single number indicates maximum content

### Strong alloys

#### Dimensions

Parameter	Range	Tolerance
Thickness (mm)	0.30 – 5.99	for 0.30 to 0.56 $\pm 0.05$ for 0.57 to 0.71 $\pm 0.05, -0.08$ for 0.72 to 1.21 $\pm 0.08$ for 1.22 to 4.00 $\pm 0.13$ for 4.10 to 5.99 $\pm 0.15$
Width (mm)	650 – 1220	$\pm 3$ for width $\leq 1000$ $\pm 4$ for width $> 1000$
Length (mm)	600 – 3200	$\pm 3$ for width $\leq 1000$ $\pm 4$ for width 1000 – 2000 $\pm 5$ for width $> 2000 - 3000$ $\pm 7$ for width $> 3000$

### Mechanical properties

Alloy (AA)	Temper	UTS (mpa)		%E (min) (50mm gauge length)
		Min	Max	
3004	O	150	200	10
3004	H32	193	240	1
3004	H34	220	260	1
3004	H36	240	280	1
3004	H38	260	-	1
5005	O	103	144	12
5005	H32	117	158	3
5005	H34	137	180	2
5005	H36	158	200	1
5005	H38	180	-	1



5052	O	170	210	14
5052	H32	210	260	4
5052	H34	230	280	3
5052	H36	255	300	2
5052	H38	268	-	2
5251	O	160	200	13
5251	H32	190	230	3
5251	H34	210	250	3
5251	H36	230	270	3
5251	H38	255	-	2

### Chemical composition

Alloy (%)	AA 3004	AA 5005	AA 5052	AA 5251
Fe	0.70	0.70	0.40	0.50
Si	0.30	0.30	0.25	0.40
Mg	0.80 – 1.30	0.50 – 1.10	2.20 – 2.80	1.80 – 2.40
Mn	1.00 – 1.50	0.20	0.10	0.10 – 0.50
Cu	0.25	0.2	0.10	0.15
Zn	0.25	0.25	0.10	0.15
Ti	-	-	-	0.15
Cr	-	0.10	0.15 – 0.35	0.15
Each (Others)	0.05	0.05	0.05	0.05
Total (Others)	0.15	0.15	0.15	0.15
Al	Remainder	Remainder	Remainder	Remainder

Single number indicates maximum content.

### Applicable standards

ASTM - B -209M, Aluminium association – aluminium standards and data, Hindako manufacturing limits (as applicable).

### Packing

Cold rolled sheets are wrapped in HDPE and placed on wooden pallets which have runners along and across the length of the sheet. An angle board is attached to the edges for edge protection, plyboard is placed on the top and bottom of the stack and the package is strapped with hoop iron straps. Silica gel packets are used for moisture protection.

### Enquiry

Rolled products

[TOP](#)

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# Alfa - An Insight

30 countries  
25 years experience  
250 people dedicated  
Over 100 products  
ISO / TS 16949:2009 Certificate



**ALFA BELLOWS** has been engaged in design and manufacturing of Bellows and Expansion Joints for more than 25 years and have supplied many thousands of Bellows, Expansion Joints and components to customers in hundreds of countries across the globe.

Many Expansion Joints are installed in pipe lines that are subjected to high temperature and pressure. They are used in a wide range of applications.

ALFA BELLOWS has a wide range of products in single or multi-ply bellows and expansion joints. They are used in a wide range of applications. They are used in a wide range of applications.

## Movements



## Design Capability

ALFA BELLOWS is a leading manufacturer of Bellows and Expansion Joints. They are used in a wide range of applications. They are used in a wide range of applications.

Alfa has been supplying large variety of Bellows in sizes 40mm to 1500mm to most of most projects for D.G. Set, Gas Based etc., Air, Steam and Gas Turbines, hot and cold air pipe lines, pump and compressor and various other piping systems in Lake care of vibrations, thermal expansion and contraction.

**Multiple Bellows**  
For high pressure and critical applications, we recommend multiple bellows. Multiple bellows are recommended. They are more durable, reliable and give better results in high pressure.



**Expansion Joints are made in various types but most commonly used are:**



All these type of Expansion Joints are made from single ply or 2 ply Bellows for D.G. set and General Industrial application with inner Liner or without Liner.

## Alfa Metal Bellows

- Averts liner expansion and contraction in a pipeline.
- Helps in minimizing the misalignment in pipelines.
- Pressure stable and Vacuum tight.
- Temperature resistant.
- Reliable and economical.
- Single end Multiple design.
- Manufactured using modern form ing & welding techniques.

## End Connections

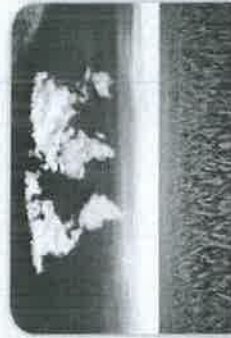


Steel Bellows are best suited over Rubber Bellows in temperature above 60°C and give longer life even if exposed to pure atmosphere. Stainless Steel Bellows should not be used for acid pipe lines, low water having high chloride contents or alkaline.

## Environmental Policy

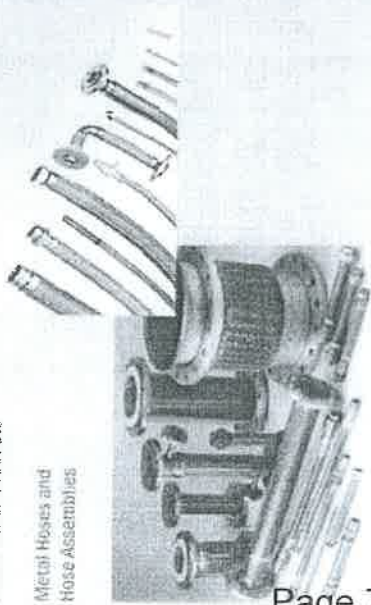
We at Alfa Bellows (P) Ltd. works with a philosophy to carry out environmental friendly business activities, taking environmental conservation into consideration.

We will achieve this by, design, manufacture and marketing of energy efficient products, increased use of ecofriendly process and materials, reduction of waste generation, recycle, proper disposal and tree plantation.

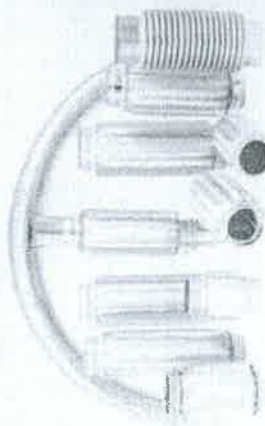


Alfa's other Products

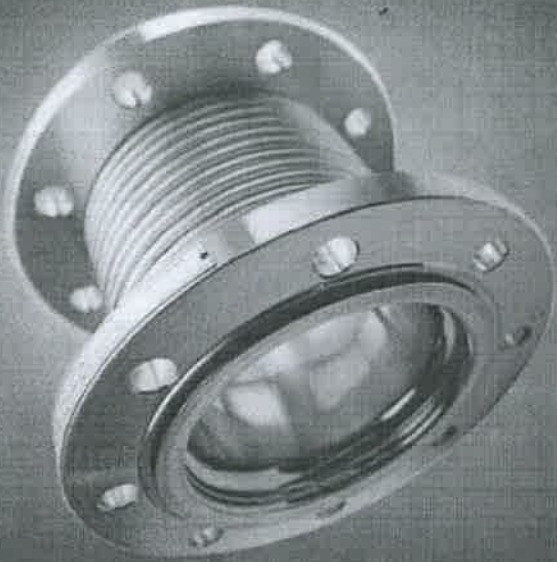
Metal Hoses and Hose Assemblies



Automotive Exhaust Flex Pipes



Metal Bellows & Expansion Joints



Industries Served



- Power Generation
- Chemical Processing
- Pulp & Paper
- Hot Metal Industries
- Ship Building
- HVAC
- Water Treatment
- OEM



ALFA HIGH-TECH METALLIC (STAINLESS STEEL) PIPING COMPENSATORS - BELLOWS EXPANSION JOINTS



**ALFA HOSES & BELLOWS MFG. CO.**  
 68-17, Ground Floor, Janesh Nagar, New Delhi-110015  
 Email : [alfahoses@rediffmail.com](mailto:alfahoses@rediffmail.com)  
 Mob. 09810542000, 9810942481





## HSV-R2 Stud anchor

### Anchor versions



**HSV – R2**  
Stainless Steel 304  
with DIN 125 Washer

### Benefits

- torque-controlled mechanical expansion allows immediate load application
- setting mark
- cold-formed to prevent breaking during installation
- raised impact section prevents thread damage during installation
- drill bit size is same as anchor size for easy installation.

### Base material



Concrete  
(non-cracked)

### Basic loading data (for a single anchor)

#### All data in this section applies to

- Correct setting (See setting instruction)
- No edge distance and spacing influence
- Concrete as specified in the table
- Steel failure
- Minimum base material thickness
- Concrete C 20/25,  $f_{ck,cube} = 25 \text{ N/mm}^2$



#### Effective anchorage depth

Anchor size		M8		M10		M12		M16	
Eff. anchorage depth $h_{ef} \geq$	[mm]	30	40	40	50	50	65	65	80

#### Mean ultimate resistance

Anchor size		M8		M10		M12		M16	
Tensile $N_{Ru,m}$	HSV-R2 [kN]	9,3	13,3	13,2	18,6	19,2	26,6	29,3	42,6
Shear $V_{Ru,m}$	HSV-R2 [kN]	8,1	8,1	15,1	23,7	23,7	28,3	53,1	53,1

#### Characteristic resistance

Anchor size		M8		M10		M12		M16	
Tensile $N_{Rk}$	HSV-R2 [kN]	7,0	10,0	10,0	14,0	14,5	20,0	22,0	32,0
Shear $V_{Rk}$	HSV-R2 [kN]	7,7	7,7	12,8	17,9	17,9	26,9	50,4	50,4

#### Design resistance

Anchor size		M8		M10		M12		M16	
Tensile $N_{Rd}$	HSV-R2 [kN]	3,9	4,8	6,7	9,3	9,7	13,3	12,2	17,8
Shear $V_{Rd}$	HSV-R2 [kN]	4,9	4,9	8,5	11,9	11,9	17,3	32,4	32,4

**Recommended loads <sup>a)</sup>**

Anchor size			M8		M10		M12		M16	
Tensile $N_{rec}$	HSV-R2	[kN]	2,8	3,4	4,8	6,7	6,9	9,5	8,7	12,7
Shear $V_{rec}$	HSV-R2	[kN]	3,5	3,5	6,1	8,5	8,5	12,4	23,2	23,2

a) With overall partial safety factor for action  $\gamma = 1,4$ . The partial safety factors for action depend on the type of loading and shall be taken from national regulations.

**Materials**

**Mechanical properties**

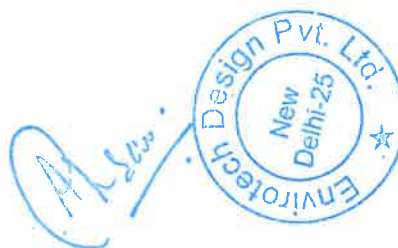
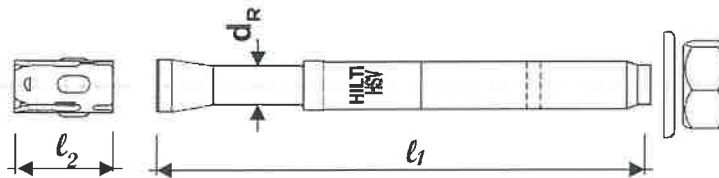
Anchor size			M8	M10	M12	M16
Nominal tensile strength	$f_{uk}$	[N/mm <sup>2</sup> ]	700	700	700	700
Yield strength	$f_{yk}$	[N/mm <sup>2</sup> ]	450	450	450	450
Stressed cross-section thread	$A_s$	[mm <sup>2</sup> ]	36.6	58,0	84,3	157
Stressed cross-section neck	$A_{s,neck}$	[mm <sup>2</sup> ]	26.9	40.5	61,5	105.3
Moment of resistance	$W$	[mm <sup>3</sup> ]	31.2	62,3	109,2	277,5
Char. bending resistance	$M^{0}_{RK,s}$	[Nm]	26.2	52,3	91,7	233,1

**Material quality**

Part	Material
Bolt	Stainless Steel 304

**Anchor dimension**

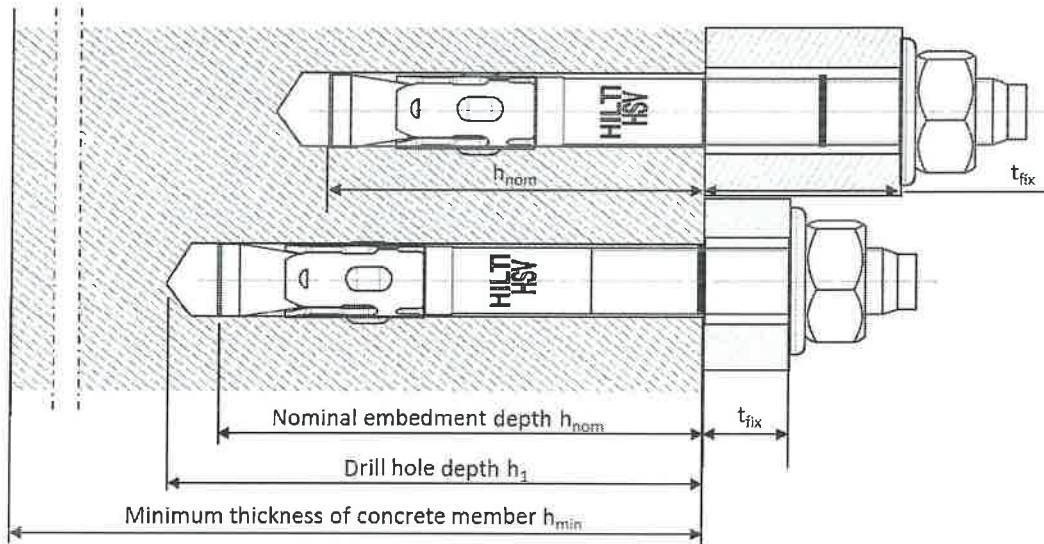
Anchor size			M8	M10	M12	M16
Shaft diameter at the cone	$d_R$	[mm]	5,9	7,2	8,9	11,6
Maximum length of the anchor	$l_1$	[mm]	75	100	150	140
Length of expansion sleeve	$l_2$	[mm]	12	16	19,3	23,5



## Setting information

### Setting details

Anchor size			M8		M10		M12		M16	
Effective anchorage depth	$h_{ef}$	[mm]	30	40	40	50	50	65	65	80
Nominal embedment depth	$h_{nom}$	[mm]	40	50	51	61	62	77	81	96
Nominal Diameter of drill bit	$d_o$	[mm]	8		10		12		16	
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	8.45		10.45		12.5		16.5	
Depth of drill hole	$h_1 \geq$	[mm]	45	55	60	70	70	85	90	105
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	9		12		14		18	
Min. thickness of fixture <sup>a)</sup>	$t_{fix,min}$	[mm]	5	0	5	0	5	0	5	0
Max. thickness of fixture <sup>a)</sup>	$t_{fix,max}$	[mm]	20	10	30	22	65	55	32	18
Torque moment	$T_{inst}$	[Nm]	15		30		50		100	
Width across nut flats	SW	[mm]	13		17		19		24	



### Installation equipment

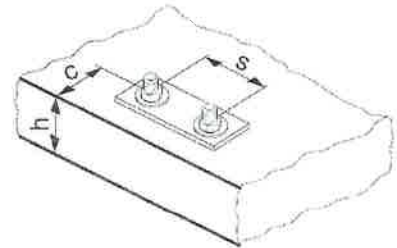
Anchor size	M8	M10	M12	M16
Rotary hammer	TE1 – TE30			
Other tools	blow out pump, hammer, torque wrench			



**Setting parameters <sup>a)</sup>**

An anchor size		M8		M10		M12		M16	
Effective anchorage depth	$h_{ef}$ [mm]	30	40	40	50	50	65	65	80
Minimum base material thickness	$h_{min} \geq$ [mm]	100	100	100	120	140	140	130	170
Minimum spacing	$s_{min} \geq$ [mm]	60	60	70	70	80	80	120	100
Minimum edge distance	$c_{min} \geq$ [mm]	60	60	70	70	90	90	120	100
Critical spacing for splitting failure	$s_{cr,sp}$ [mm]	180	240	240	300	300	390	390	480
Critical edge distance for splitting failure	$c_{cr,sp}$ [mm]	90	120	120	150	150	195	195	240
Critical spacing for concrete cone failure	$s_{cr,N}$ [mm]	90	120	120	150	150	195	195	240
Critical edge distance for concrete cone failure	$c_{cr,N}$ [mm]	45	60	60	75	75	97,5	97,5	120

a) In case of smaller edge distance and spacing than  $c_{cr,sp}$ ,  $s_{cr,sp}$ ,  $c_{cr,N}$  and  $s_{cr,N}$  the load values shall be reduced according ETAG 001, Annex C



**Setting instruction**

\*For detailed information on installation see instruction for use given with the package of the product.

**Setting instruction for HSV-R2**

- 1. Drilling**
- 2. Cleaning**
- 3. Inserting the anchor**
- 4. Checking**
- 5. Checking**
- 6. Applying setting tool**



### Simplified design method

Simplified version of the design method according ETAG 001, Annex C.

- Influence of concrete strength
- Influence of edge distance
- Influence of spacing
- Valid for a group of two anchors. The method may also be applied for anchor groups with more than two anchors or more than one edge. The influencing factors must then be considered for each edge distance and spacing. The calculated design loads are then on the safe side: They will be lower than the exact values according ETAG 001, Annex C.

The design method is based on the following simplification:

- No different loads are acting on individual anchors (no eccentricity)

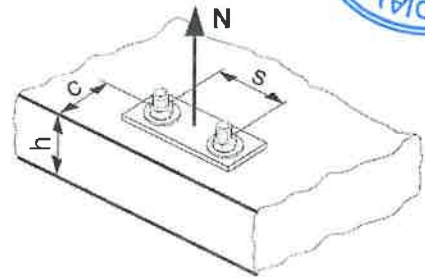
The values are valid for one anchor.



### Tension loading

The design tensile resistance is the lower value of

- Steel resistance:  $N_{Rd,s}$
- Concrete pull-out resistance:  $N_{Rd,p} = N^0_{Rd,p} \cdot f_B$
- Concrete cone resistance:  $N_{Rd,c} = N^0_{Rd,c} \cdot f_B \cdot f_{1,N} \cdot f_{2,N} \cdot f_{3,N} \cdot f_{re,N}$
- Concrete splitting resistance (only non-cracked concrete):  
 $N_{Rd,sp} = N^0_{Rd,c} \cdot f_B \cdot f_{1,sp} \cdot f_{2,sp} \cdot f_{3,sp} \cdot f_{h,sp} \cdot f_{re,N}$



### Basic design tensile resistance

Design steel resistance  $N_{Rd,s}$

Anchor size		M8		M10		M12		M16	
Effective anchorage depth	$h_{ef}$ [mm]	30	40	40	50	50	65	65	80
$N_{Rd,s}$	[kN]	10,1		15,2		23,1		39,5	

Design pull-out resistance  $N_{Rd,p} = N^0_{Rd,p} \cdot f_B$

Anchor size		M8		M10		M12		M16	
Effective anchorage depth	$h_{ef}$ [mm]	30	40	40	50	50	65	65	80
$N^0_{Rd,p}$	[kN]	3,9	4,8	6,7	9,3	9,7	13,3	12,2	17,8

Design concrete cone resistance  $N_{Rd,c} = N^0_{Rd,c} \cdot f_B \cdot f_{1,N} \cdot f_{2,N} \cdot f_{3,N} \cdot f_{re,N}$

Design splitting resistance <sup>a)</sup>  $N_{Rd,sp} = N^0_{Rd,c} \cdot f_B \cdot f_{1,sp} \cdot f_{2,sp} \cdot f_{3,sp} \cdot f_{h,sp} \cdot f_{re,N}$

Anchor size		M8		M10		M12		M16	
Effective anchorage depth	$h_{ef}$ [mm]	30	40	40	50	50	65	65	80
$N^0_{Rd,c}$	[kN]	4,6	6,1	8,5	11,9	11,9	17,6	14,7	20,1

### Influencing factors



#### Influence of concrete strength

Concrete strength designation (ENV 206)	C 20/25	C 25/30	C 30/37	C 35/45	C 40/50	C 45/55	C 50/60
Pull-out resistance							
$f_B$			1				
Concrete cone and splitting resistance							
$f_B = (f_{ck,cube}/25N/mm^2)^{1/2}$ <sup>a)</sup>	1	1,1	1,22	1,34	1,41	1,48	1,55

a)  $f_{ck,cube}$  = concrete compressive strength, measured on cubes with 150 mm side length



### Influence of edge distance <sup>a)</sup>

$c/C_{cr,N}$	0,1	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1
$c/C_{cr,sp}$										
$f_{1,N} = 0,7 + 0,3 \cdot c/C_{cr,N} \leq 1$	0,73	0,76	0,79	0,82	0,85	0,88	0,91	0,94	0,97	1
$f_{1,sp} = 0,7 + 0,3 \cdot c/C_{cr,sp} \leq 1$										
$f_{2,N} = 0,5 \cdot (1 + c/C_{cr,N}) \leq 1$	0,55	0,60	0,65	0,70	0,75	0,80	0,85	0,90	0,95	1
$f_{2,sp} = 0,5 \cdot (1 + c/C_{cr,sp}) \leq 1$										

a) The edge distance shall not be smaller than the minimum edge distance  $c_{min}$  given in the table with the setting details. These influencing factors must be considered for every edge distance.

### Influence of anchor spacing <sup>a)</sup>

$s/s_{cr,N}$	0,1	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1
$s/s_{cr,sp}$										
$f_{3,N} = 0,5 \cdot (1 + s/s_{cr,N}) \leq 1$	0,55	0,60	0,65	0,70	0,75	0,80	0,85	0,90	0,95	1
$f_{3,sp} = 0,5 \cdot (1 + s/s_{cr,sp}) \leq 1$										

a) The anchor spacing shall not be smaller than the minimum anchor spacing  $s_{min}$  given in the table with the setting details. This influencing factor must be considered for every anchor spacing.

### Influence of base material thickness

$h/h_{ef}$	2,0	2,2	2,4	2,6	2,8	3,0	3,2	3,4	3,6	$\geq 3,68$
$f_{h,sp} = [h/(2 \cdot h_{ef})]^{2/3}$	1	1,07	1,13	1,19	1,25	1,31	1,37	1,42	1,48	1,5

### Influence of reinforcement

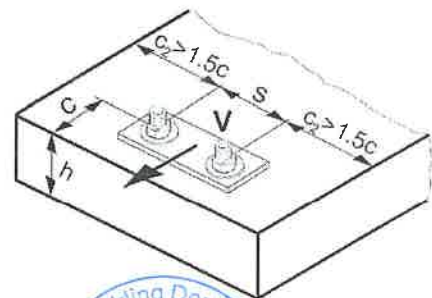
Anchor size	M8		M10		M12		M16	
Effective anchorage depth $h_{ef}$ [mm]	30	40	40	50	50	65	65	80
$f_{re,N} = 0,5 + h_{ef}/200mm \leq 1$	0,65 <sup>a)</sup>	0,7 <sup>a)</sup>	0,7 <sup>a)</sup>	0,75 <sup>a)</sup>	0,75 <sup>a)</sup>	0,825 <sup>a)</sup>	0,825 <sup>a)</sup>	0,9 <sup>a)</sup>

a) This factor applies only for dense reinforcement. If in the area of anchorage there is reinforcement with a spacing  $\geq 150$  mm (any diameter) or with a diameter  $\leq 10$  mm and a spacing  $\geq 100$  mm, then a factor  $f_{re,N} = 1$  may be applied.

### Shear loading

The design shear resistance is the lower value of

- Steel resistance:  $V_{Rd,s}$
- Concrete pryout resistance:  $V_{Rd,cp} = k \cdot N_{Rd,c}$
- Concrete edge resistance:  $V_{Rd,c} = V_{Rd,c}^0 \cdot f_b \cdot f_{h,sp} \cdot f_{h,sp} \cdot f_{h,sp} \cdot f_{h,sp} \cdot f_c$





## Basic design shear resistance

### Design steel resistance $V_{Rd,s}$

Anchor size		M8		M10		M12		M16	
Effective anchorage depth	$h_{ef}$ [mm]	30	40	40	50	50	65	65	80
$V_{Rd,s}$	[kN]	4,9	4,9	13,2		17,3		32,4	

### Design concrete pryout resistance $V_{Rd,cp} = k \cdot N_{Rd,c}^{a)}$

Anchor size		M8		M10		M12		M16	
Effective anchorage depth	$h_{ef}$ [mm]	30	40	40	50	50	65	65	80
k	[kN]	1				2			

a)  $N_{Rd,c}$ : Design concrete cone resistance

### Design concrete edge resistance ${}^a)V_{Rd,c} = V_{Rd,c}^0 \cdot f_B \cdot f_{\beta} \cdot f_h \cdot f_4 \cdot f_{hef} \cdot f_c$

Anchor size		M8		M10		M12		M16	
Effective anchorage depth	$h_{ef}$ [mm]	30	40	40	50	50	65	65	80
$V_{Rd,c}^0$	[kN]	9,1	9,0	13,0	13,0	17,6	17,6	28,3	28,2

a) For anchor groups only the anchors close to the edge must be considered.

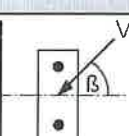
## Influencing factors

### Influence of concrete strength

Concrete strength designation (ENV 206)	C 20/25	C 25/30	C 30/37	C 35/45	C 40/50	C 45/55	C 50/60
$f_B = (f_{ck,cube}/25N/mm^2)^{1/2}$ a)	1	1,1	1,22	1,34	1,41	1,48	1,55

a)  $f_{ck,cube}$  = concrete compressive strength, measured on cubes with 150 mm side length

### Influence of angle between load applied and the direction perpendicular to the free edge

Angle $\beta$	0°	10°	20°	30°	40°	50°	60°	70°	80°	≥ 90°
$f_{\beta} = \sqrt{\frac{1}{(\cos \alpha_r)^2 + \left(\frac{\sin \alpha_r}{2,5}\right)^2}}$ 	1	1,01	1,05	1,13	1,24	1,40	1,64	1,97	2,32	2,50

### Influence of base material thickness

h/c	0,15	0,3	0,45	0,6	0,75	0,9	1,05	1,2	1,35	≥ 1,5
$f_h = \{h/(1,5 \cdot c)\}^{1/2} \leq 1$	0,32	0,45	0,55	0,63	0,71	0,77	0,84	0,89	0,95	1,00



**Influence of anchor spacing and edge distance <sup>a)</sup> for concrete edge resistance:  $f_4$**

$$f_4 = (c/h_{ef})^{1,5} \cdot (1 + s / [3 \cdot c]) \cdot 0,5$$

$c/h_{ef}$	Single anchor	Group of two anchors $s/h_{ef}$														
		0,75	1,50	2,25	3,00	3,75	4,50	5,25	6,00	6,75	7,50	8,25	9,00	9,75	10,50	11,25
0,50	0,35	0,27	0,35	0,35	0,35	0,35	0,35	0,35	0,35	0,35	0,35	0,35	0,35	0,35	0,35	0,35
0,75	0,65	0,43	0,54	0,65	0,65	0,65	0,65	0,65	0,65	0,65	0,65	0,65	0,65	0,65	0,65	0,65
1,00	1,00	0,63	0,75	0,88	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
1,25	1,40	0,84	0,98	1,12	1,26	1,40	1,40	1,40	1,40	1,40	1,40	1,40	1,40	1,40	1,40	1,40
1,50	1,84	1,07	1,22	1,38	1,53	1,68	1,84	1,84	1,84	1,84	1,84	1,84	1,84	1,84	1,84	1,84
1,75	2,32	1,32	1,49	1,65	1,82	1,98	2,15	2,32	2,32	2,32	2,32	2,32	2,32	2,32	2,32	2,32
2,00	2,83	1,59	1,77	1,94	2,12	2,30	2,47	2,65	2,83	2,83	2,83	2,83	2,83	2,83	2,83	2,83
2,25	3,38	1,88	2,06	2,25	2,44	2,63	2,81	3,00	3,19	3,38	3,38	3,38	3,38	3,38	3,38	3,38
2,50	3,95	2,17	2,37	2,57	2,77	2,96	3,16	3,36	3,56	3,76	3,95	3,95	3,95	3,95	3,95	3,95
2,75	4,56	2,49	2,69	2,90	3,11	3,32	3,52	3,73	3,94	4,15	4,35	4,56	4,56	4,56	4,56	4,56
3,00	5,20	2,81	3,03	3,25	3,46	3,68	3,90	4,11	4,33	4,55	4,76	4,98	5,20	5,20	5,20	5,20
3,25	5,86	3,15	3,38	3,61	3,83	4,06	4,28	4,51	4,73	4,96	5,18	5,41	5,63	5,86	5,86	5,86
3,50	6,55	3,51	3,74	3,98	4,21	4,44	4,68	4,91	5,14	5,38	5,61	5,85	6,08	6,31	6,55	6,55
3,75	7,26	3,87	4,12	4,36	4,60	4,84	5,08	5,33	5,57	5,81	6,05	6,29	6,54	6,78	7,02	7,26
4,00	8,00	4,25	4,50	4,75	5,00	5,25	5,50	5,75	6,00	6,25	6,50	6,75	7,00	7,25	7,50	7,75
4,25	8,76	4,64	4,90	5,15	5,41	5,67	5,93	6,18	6,44	6,70	6,96	7,22	7,47	7,73	7,99	8,25
4,50	9,55	5,04	5,30	5,57	5,83	6,10	6,36	6,63	6,89	7,16	7,42	7,69	7,95	8,22	8,49	8,75
4,75	10,35	5,45	5,72	5,99	6,27	6,54	6,81	7,08	7,36	7,63	7,90	8,17	8,45	8,72	8,99	9,26
5,00	11,18	5,87	6,15	6,43	6,71	6,99	7,27	7,55	7,83	8,11	8,39	8,66	8,94	9,22	9,50	9,78
5,25	12,03	6,30	6,59	6,87	7,16	7,45	7,73	8,02	8,31	8,59	8,88	9,17	9,45	9,74	10,02	10,31
5,50	12,90	6,74	7,04	7,33	7,62	7,92	8,21	8,50	8,79	9,09	9,38	9,67	9,97	10,26	10,55	10,85

a) The anchor spacing and the edge distance shall not be smaller than the minimum anchor spacing  $s_{min}$  and the minimum edge distance  $c_{min}$ .

**Influence of embedment depth**

Anchor size		M8		M10		M12		M16	
Effective anchorage depth	$h_{ef}$ [mm]	30	40	40	50	50	65	65	80
$f_{ef} = 0,05 \cdot (h_{ef} / d)^{1,68}$	[kN]	0,46	0,75	0,51	0,75	0,55	0,85	0,53	0,75

**Influence of edge distance <sup>a)</sup>**

$c/d$	4	6	8	10	15	20	30	40
$f_c = (d / c)^{0,19}$	0,77	0,71	0,67	0,65	0,60	0,57	0,52	0,50

a) The edge distance shall not be smaller than the minimum edge distance  $c_{min}$ .

**Combined tension and shear loading**

For combined tension and shear loading see section "Anchor Design".



## INDEX SHEET

1. Technical Data Sheet for Battery and Battery Charger.



# DESCRIPTION DRAWING FOR APPROVAL

MANUFACTURER : MAHA MAI ENGINEERS  
 MAKE : MMAX POWER  
 CLIENT : STERLING GENERATORS PVT. LTD.  
 PROJECT :  
 P.O. NO. :  
 PRODUCT : 24V-30A, 1Ø, FLOAT CUM BOOST CHARGER  
 DRAWING NO. : JMD/AK/VE/17A

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CABLE ENTRY	FRONT	NO	PAINT SHADE	RAL-7035	SHEET STEEL THICKNESS	16 SWG.	CHARGER SIZE	HEIGHT	DRAWING FOR APPROVAL
	BOTTOM	YES				50 MM			
CLIENT	TOP	NO	MANUFACTURER:	MAHA MAI ENGINEERS	BASE FRAME	MANUFACTURER:	TITLE:	DESCRIPTION FOR 24V/30A, F0BC BATTERY CHARGER	SCALE
	STERLING GENERATORS PVT. LTD.	www.mmaxpower.com							www.mmaxpower.com
PROJECT									DATE
									17-05-2022
P.O. NO.									REV.
								DRAWING NO.	
								JMD/AK/VE/17A	
								SHEET NO.	
								01 OF 08	

## GENERAL NOTES

- 1) ALL DIMENSIONS ARE IN MM. (OVERALL DIMENSION OF FRAME ONLY ARE MENTIONED)
- 2) CONSTRUCTION: -
  - i.) PANEL SHALL BE INDOOR, FLOOR MOUNTING PANEL.
  - ii) PANEL SHALL BE FABRICATED OUT OF SHEET STEEL HAVING THICKNESS AS FOLLOWS:
    - a) LOAD BEARING MEMBERS : 16SWG. CRCA with TOLERANCE.
    - b) DOORS & OTHER COMPONENTS : 16SWG. CRCA with TOLERANCE.
- 3) CABLE ENTRY FROM BOTTOM (FRONT) WITH REMOVABLE CABLE GLAND PLATE.
- 4) PANEL SHALL HAVE DEGREE OF PROTECTION : IP-30
- 5) PANEL PAINT SHADE POWDER COATED : RAL-7035
- 6) PANEL PAINT THICKNESS : 50 MICRON (MINIMUM)
- 7) WIRING SHALL BE DONE USING 1.1KV GRADE PVC INSULATED MULTISTRAND 1CORE CU. WIRE.
  - a) CONTROL WIRING (ELECTRONICS) : 0.5 Sq. mm.
  - b) AC WIRING : 2.5 Sq. mm.
  - c) DC WIRING : 10.0 Sq. mm. (DC wiring shall be done with +VE & -VE marking on ferrule)
- 8) COOLING FAN WILL BE PROVIDED ON BACK SIDE DOOR OF PANEL.

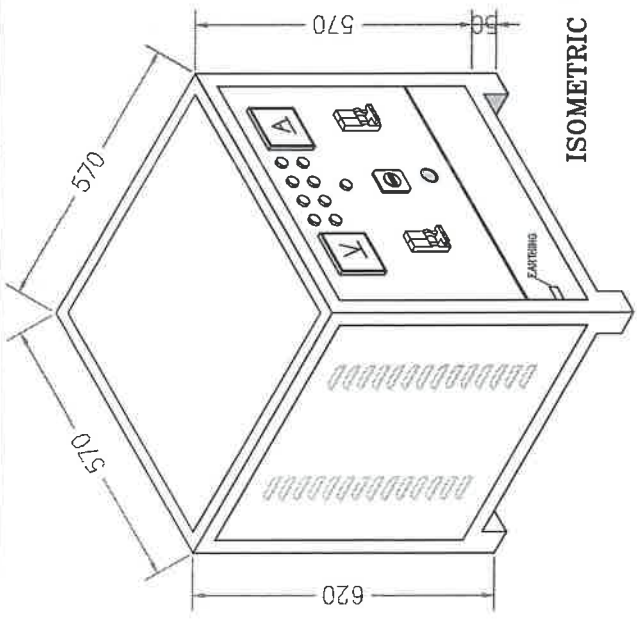
NOTES: - COMPONENTS MAY CHANGE AS PER ARRANGEMENT OF PANEL.

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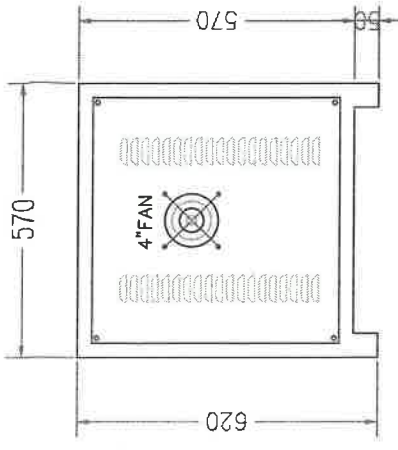


CABLE ENTRY	FRONT	NO	PAINT SHADE	16 SWG.	CHARGER SIZE	HEIGHT	DRAWING FOR APPROVAL	
	BOTTOM	YES	RAL-7035	50 MM		DEPTH	MOUNTING : FLOOR	
CLIENT	TOP	NO				WIDTH	SCALE	
	STERLING GENERATORS PVT. LTD.			MANUFACTURER:	MAHA MAI ENGINEERS	TITLE:	GENERAL NOTES	
PROJECT				www.mmaxpower.com	MAHA MAI ENGINEERS	GENERAL NOTES FOR 240V/110V, F0BC BATTERY CHARGER		DETAIL
				Email: mmax@mmmaxpower.com	www.mmaxpower.com	CHECKED	APPROVED	DRAWING NO.
P.C. NO.						DRAWN	DATE	SHEET NO.
						SANJAY	17-05-2022	02 OF 08

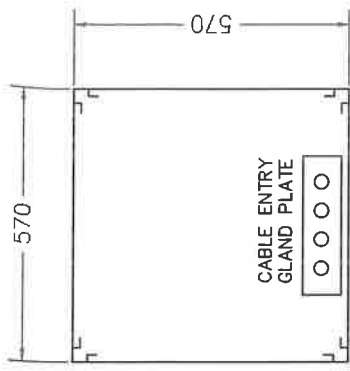
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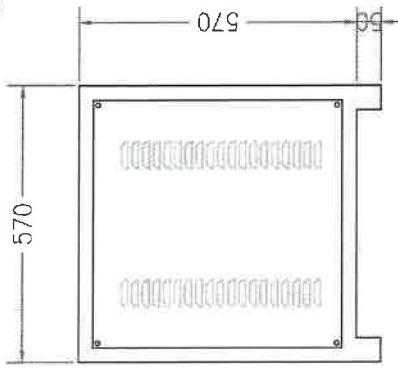
ISOMETRIC VIEW



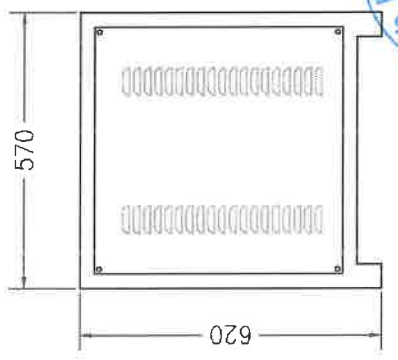
BACK SIDE VIEW



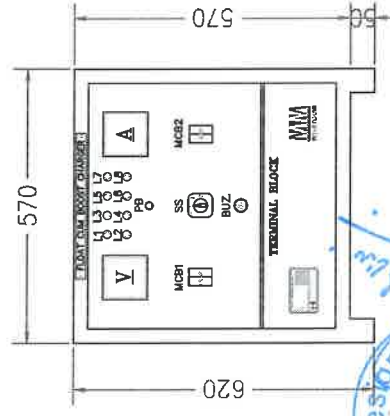
BOTTOM VIEW



LEFT SIDE VIEW



RIGHT SIDE VIEW



FRONT VIEW

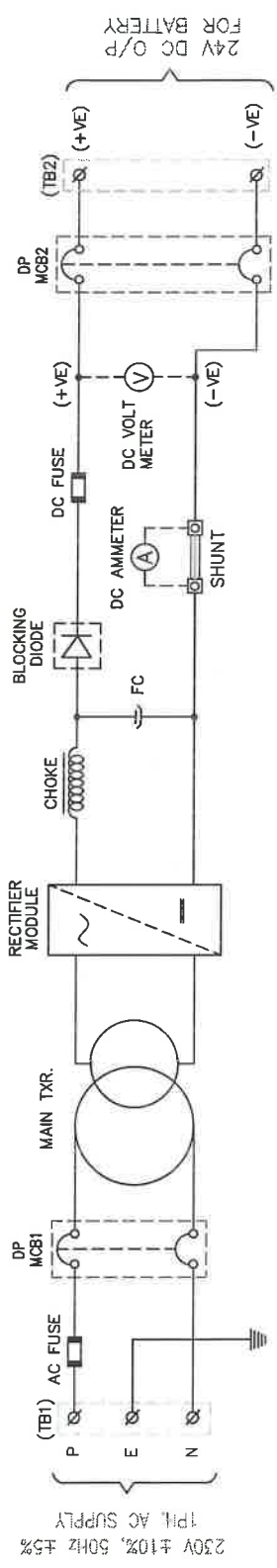
- LEGENDS: -
- L1 - MAINS ON
  - L2 - MAINS FAIL
  - L3 - CHARGER FAIL
  - L4 - CHARGER FAIL
  - L5 - AUTO
  - L6 - FLOAT
  - L7 - BOOST
  - L8 - DC HIGH VOLT. TRIP
  - V - DC VOLTMETER
  - A - DC AMMETER
  - SS - AUTO/MANUAL SELECTOR SWITCH (AUTO/FLOAT/BOOST)
  - PB - HOOTER ACCEPT
  - BUZ - BUZZER
  - MCB1 - DP MCB for AC INCOMER BREAKER
  - MCB2 - DP MCB for BATTERY BREAKER
- INDICATION (LED)

CABLE ENTRY	FRONT	NO	YES	PAINT SHADE	RAL-7035	SHEET STEEL THICKNESS	16 SWG.		HEIGHT	620 MM ± 10MM	DEPTH	570 MM ± 10MM	WIDTH	570 MM ± 10MM	TITLE:	G.A. DIAGRAM FOR 24V/30A, FCBC BATTERY CHARGER		DATE	17-05-2022	APPROVED	N. SHARMA		CHECKED	VINOOD SHARMA		DRAWN	SANJAY		REV.			SCALE	1:1		DRAWING NO.	JMD/JAK/VE/17A		SHEET NO.	03 OF 08	
	BOTTOM	NO	NO				MANUFACTURER:	MAHA MAI ENGINEERS		www.mmmaxpower.com		Email: mmmax@mmmaxpower.com		DRAWING FOR APPROVAL		MOUNTING - FLOOR			N.T.S.		G.A. DIAGRAM			JMD/JAK/VE/17A			03 OF 08													



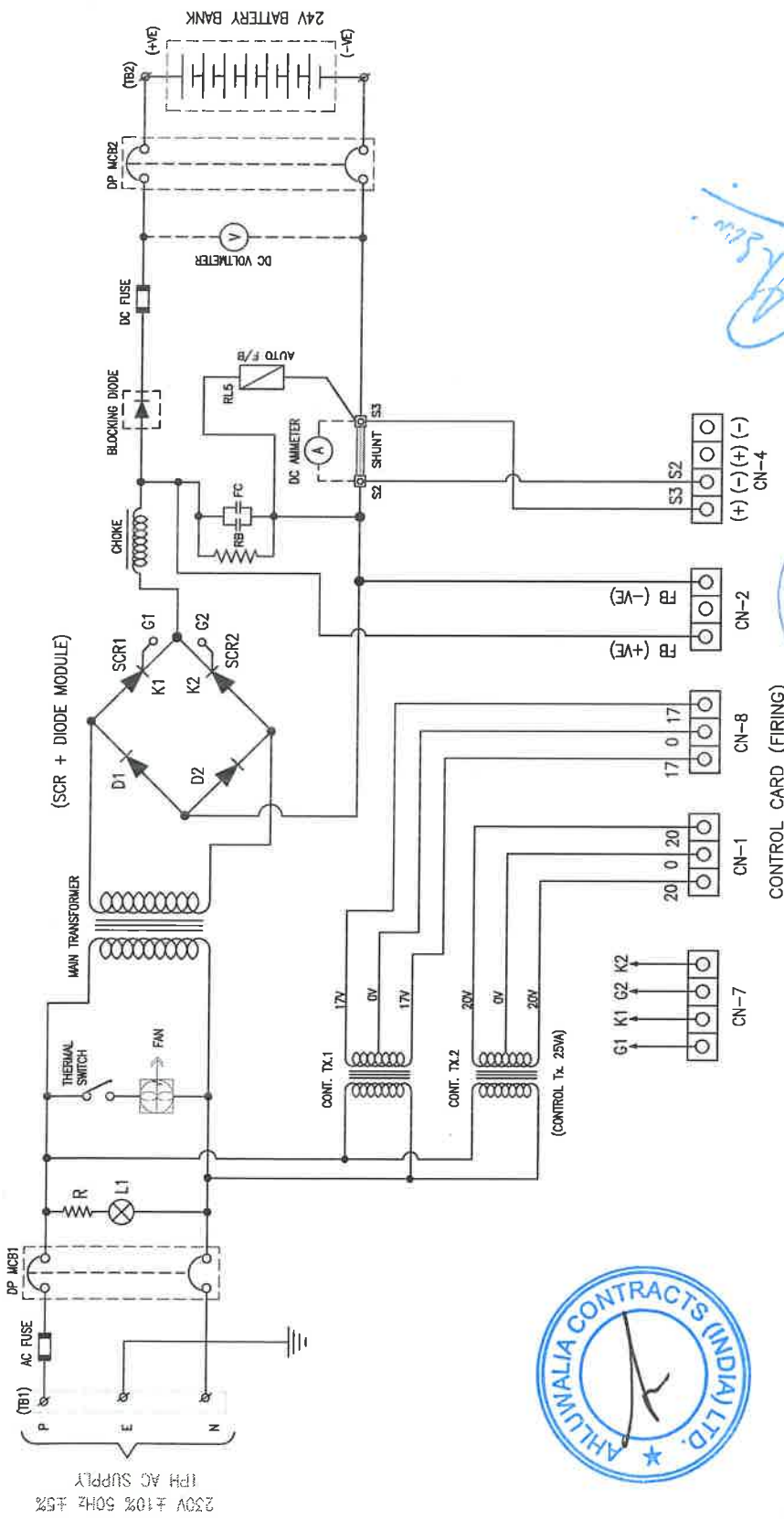
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# SLD OF FLOAT CUM BOOST CHARGER



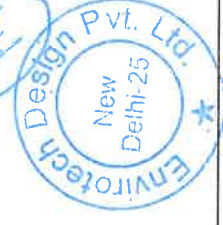
CABLE ENTRY	FRONT	NO	YES	PAINT SHADE	RAL-7035	SHEET STEEL THICKNESS	CHARGER SIZE		HEIGHT	DEPTH	WIDTH	DRAWING FOR APPROVAL
	BOTTOM						16 SWG.	50 MM				
CLIENT	STERLING GENERATORS PVT. LTD.											
PROJECT	MAHA MAI ENGINEERS www.mmaxpower.com Emell: mmax@mmxpower.com											
P.C. NO.	MANUFACTURER: MHA MAI ENGINEERS											
	NO		YES		TITLE:		SINGLE LINE DIAGRAM FOR 24V/30A, FBBC BATTERY CHARGER		SCALE		DRAWING NO.	
					DRAWN		CHECKED		DATE		SHEET NO.	
					SANJAY		VINOD SHARMA		17-05-2022		04 OF 08	
					REV.		APPROVED		DETAIL		DRAWING NO.	
							N. SHARMA		N.T.S		JMD/AN/VE/TA	

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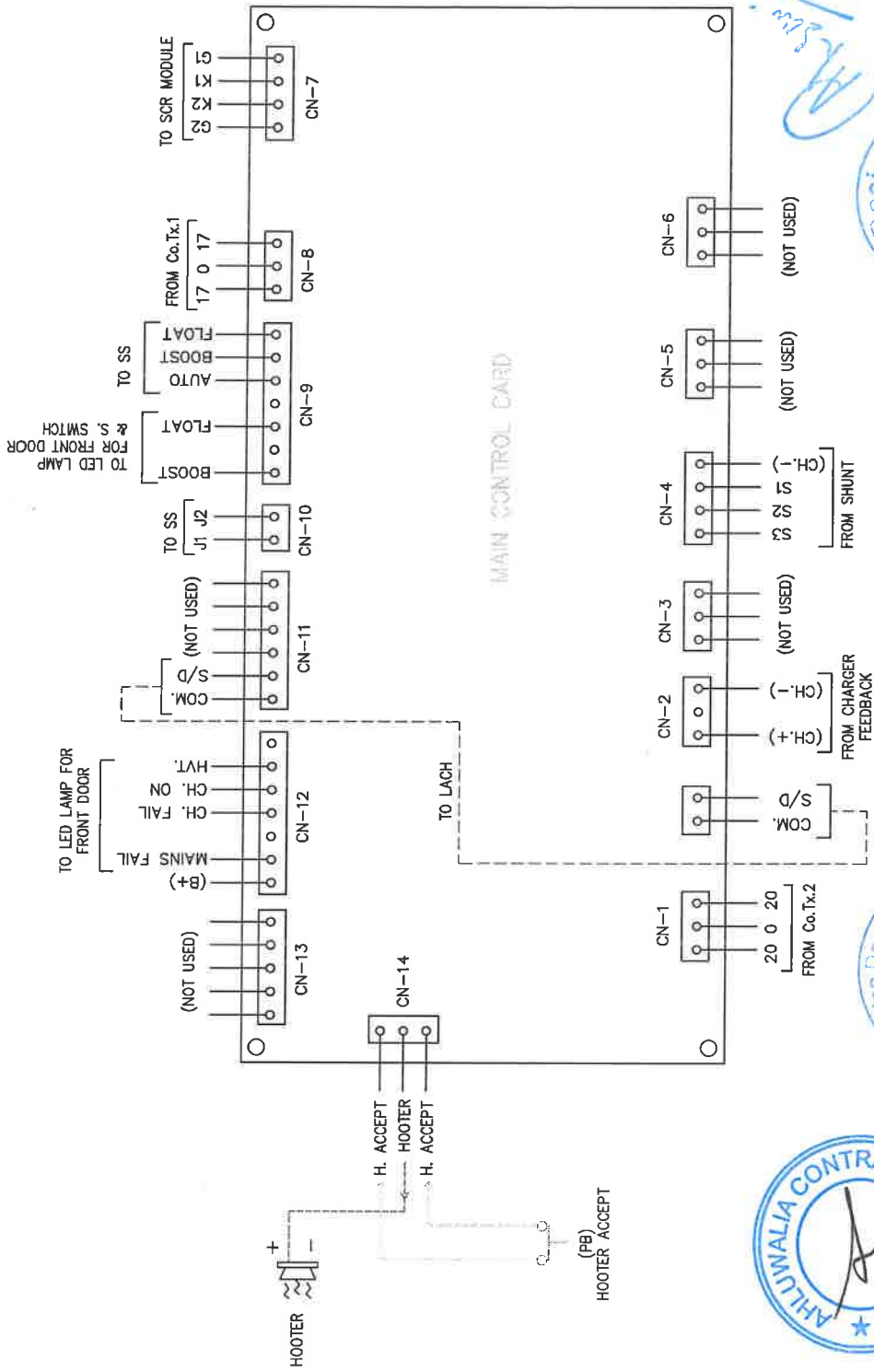
**NOTES:**

- 1) ELECTRONIC AND CONTROL CIRCUITRY AND VALUE AND SIZE OF THE COMPONENTS ARE SUBJECT TO CHANGE WITHOUT NOTICE WITHOUT AFFECTING THE FUNCTION.
- 2) THERMAL SWITCH IS MOUNTED ON THE HEAT SINK OF THE BLOCKING DIODE DEVICE
- 3) FOR BILL OF MATERIAL REF. BOM SHEET



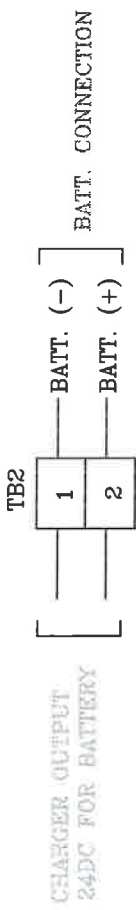
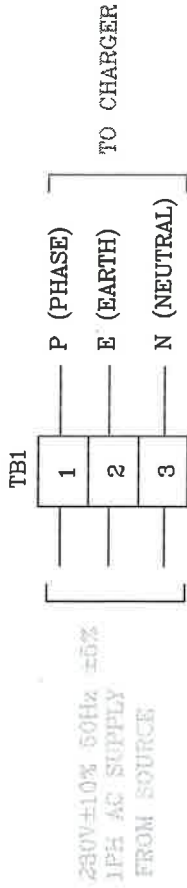
CABLE ENTRY	FRONT	NO		SHEET STEEL THICKNESS	16 SWG.	CHARGER SIZE	HEIGHT		DRAWING FOR APPROVAL	
	BOTTOM	YES			BASE FRAME		50 MM	DEPTH		
CLIENT	STERLING GENERATORS PVT. LTD.	NO		MANUFACTURER:		TITLE:	WIRING DIAGRAM FOR 24V/30A, FCBG BATTERY CHARGER	SCALE	N.T.S.	
				<b>MAHA MAI ENGINEERS</b> www.mmaxpower.com Email: mmax@mmmaxpower.com		DRAWN	VINOD SHARMA	CHECKED	N. SHARMA	WIRING DIAGRAM
PROJECT						DATE	17.05.2022	REVISION		
						DRAWING NO.	JMDJAKVETA	SHEET NO.	05 OF 08	
P.C. NO.										

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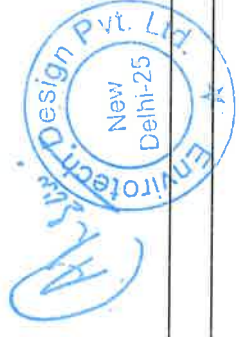
CABLE ENTRY	FRONT	NO	YES	PAINT SHADE	RAL-7035	DRAWING FOR APPROVAL
	BOTTOM					
U. IENT	TOP	NO	NO	SCALE		N.T.S.
	STERLING GENERATORS PVT. LTD.				DETAIL	MAIN CONTROL CARD
PROJECT					DATE	REV.
					17-05-2022	
P.D. NO.					CHECKED	VINOD SHARMA
					APPROVED	N. SHARMA
				TITLE:	MAIN CONTROL CARD FOR 24V/30A, F08C BATTERY CHARGER	
				DRAWN	SANJAY	
				SHEET NO.		JMD/JAK/VE/17A
				CHARGER SIZE		06 OF 08
				HEIGHT		
				DEPTH		
				WIDTH		
				SHEET/STEEL THICKNESS	16 SWG.	
				BASE FRAME	50 MM	
				MANUFACTURER:	<b>MAHA MAI ENGINEERS</b> <a href="http://www.mmaxpower.com">www.mmaxpower.com</a> <b>MMAIPOWER</b> Email: <a href="mailto:mmax@mmaxpower.com">mmax@mmaxpower.com</a>	

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CABLE ENTRY	FRONT	NO	YES	PAINT SHADE	RAL-7035	SHEET STEEL THICKNESS	16 SWG.	CHARGER SIZE	HEIGHT	DEPTH	WIDTH	DRAWING FOR APPROVAL			
	BOTTOM	NO	NO				MOUNTING - FLOOR								
CLIENT	STERLING GENERATORS PVT. LTD.														
	<p>MANUFACTURER: <b>MAHA MAI ENGINEERS</b>  <a href="http://www.mmaxpower.com">www.mmaxpower.com</a>          Email: <a href="mailto:mmax@mmaxpower.com">mmax@mmaxpower.com</a></p>														
PROJECT	TITLE: TERMINAL BLOCK FOR 24V/30A. F08C BATTERY CHARGER														
	DRAWN			CHECKED			APPROVED			DATE			SCALE		
P.O. NO.	SANJAY			VINOD SHARMA			N. SHARMA			17-05-2022			DETAIL		
	DRAWING NO.			DRAWING NO.			DRAWING NO.			SHEET NO.			TERMINAL BLOCK		
												JMD/JAK/VE/TA			
												07 OF 08			

# BILL OF MATERIAL



PROPERTY NOTICE: This document is the property of MAHA MAI ENGINEERS & contains material proprietary to MAHA MAI ENGINEERS. The contents are for confidential use only and are not to be reproduced or disclosed to any other in any manner, in whole or in part, except with written approval of MAHA MAI ENGINEERS.

Sl. No.	ITEM DESCRIPTION	MAKE	QTY.
1.	CUBICLE DIMENSION (H=620xW=570xL=570 MM)	MMAX POWER	1NO.
2.	DRIVER/MAIN CONTROL CARD	MMAX POWER	1NO.
3.	MAIN TRANSFORMER-230V/24V/30A (Cu. Insulation CLASS-F)	MMAX POWER	1NO.
4.	L.F. CHOKE (30A)	MMAX POWER	1NO.
5.	CONTROL TRIGGER-1, 230/17V-0-17V/25VA	MMAX POWER	1NO.
6.	CONTROL TRIGGER-2, 230/20V-0-20V/25VA	MMAX POWER	1NO.
7.	SCR + DIODE MODULE (Silicon Controlled) (BKW-75/16)	ELESEMI/NSL/SEMICRON	1SET.
8.	BLOCKING DIODE (70/120)	ELESEMI/NSL/SEMICRON	1NO.
9.	FILTER CAPACITOR (22000 Micro Farad/50VDC) Test Selected	ALCON/SHARDA/RESCON	1NO.
10.	DC SHUNT-50A/75mV	AE/YOKINS	1NO.
11.	DC VOLTMETER (0-50V) Analog-Acc. Cl-1.5, 96x96mm.	AE/YOKINS/REPUTED	1NO.
12.	DC AMMETER (0-50A) Analog-Acc. Cl-1.5, 96x96mm	AE/YOKINS/REPUTED	1NO.
13.	BUZZER (12/24VDC)	MMAX POWER	1NO.
14.	MCB1, 32A DP MCB for AC INCOMER	C&S/SCHNEIDER/L&T	1NO.
15.	MCB2, 40A DP MCB for BATTERY	C&S/SCHNEIDER/L&T	1NO.
16.	ROTARY SWITCH (2W,3P) for Selection (AUTO/FLOAT/BOOST)	KAYCEE/SALZER/VAISHNO/L&T	1NO.
17.	PUSH BUTTON (16mm. Dia)	GILARD/SOYNIA/REPUTED	1NO.
18.	INDICATING LIGHTS (16mm. Dia)	STRONGER/REPUTED	8NOS.
19.	ALL Control/Electronic WIRING BY : 0.5 Sq.mm 1Core Cu. Wire	ESC/POLY/CAB/FINOLEX	AS REQ.
20.	ALL POWER (AC) WIRING BY : 2.5 Sq.mm 1Core Cu. Wire	ESC/POLY/CAB/FINOLEX	AS REQ.
21.	ALL POWER (DC) WIRING BY : 10.0 Sq.mm 1Core Cu. Wire	ESC/POLY/CAB/FINOLEX	AS REQ.
22.	RESISTANCE (300Ω/50W)	CRC/STEAD	2NOS.
23.	HEAT SINK (SCR MODULE) As Required	MAHAVIR ALUMINIUM/REPUTED	1NO.
24.	HEAT SINK (BLOCKING DIODE) As Required	MAHAVIR ALUMINIUM/REPUTED	1NO.
25.	HRC FUSE AC (BASE-32A & LINK-20A)	C&S/L&T/HAVELLS	1NO.
26.	HRC FUSE DC (BASE-63A & LINK-50A)	C&S/L&T/HAVELLS	1NO.
27.	THERMAL SWITCH (60°C)	CQC/ANCO	1NO.
28.	COOLING FAN (230V AC 4" Dia)	REXNORD/HICOOL/SUPAFLEX	1NO.
29.	TERMINAL BLOCK (HT-3) INPUT	MELTEK/UNION	1NO.
30.	TERMINAL BLOCK (HT-2) BATTERY	MELTEK/UNION	1NO.

NOTES: - MAKE AND RATING OF COMPONENTS MAY CHANGE AS PER AVAILABILITY.

CABLE ENTRY	FRONT	NO	YES	PAINT SHADE	RAL-7035	SHEET STEEL THICKNESS	16 SWG.	CHARGER SIZE	HEIGHT	DRAWING FOR APPROVAL
	BOTTOM	NO	NO				50 MM		DEPTH	
CLIENT	STERLING GENERATORS PVT. LTD.		MANUFACTURER		MAHA MAI ENGINEERS		www.mmaxpower.com		TITLE: BILL OF MATERIAL FOR 24V/30A, F0BC BATTERY CHARGER	
PROJECT			PROJECT		SANJAY		APPROVED		DATE	
P.O. NO.			Email: mmax@mmmaxpower.com		VINOD SHARMA		N. SHARMA		17-05-2022	
			REVISION		REV.		SCALE		N.T.S.	
			DRAWING NO.		JMP/AAK/VERTA		SHEET NO.		06 OF 06	

Leaflet size: 5.5" X 8"

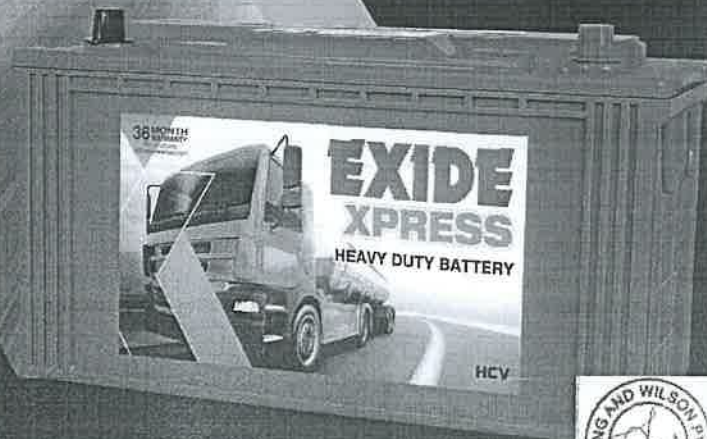
www.exidereachout.com

**EXIDEcare**  
1800 103 5454



# INDIA'S NO.1 TRUCK BATTERY

**36-MONTH  
WARRANTY\***



INDIA MOVES ON **EXIDE**

\*For conditions, visit [exidereachout.com](http://exidereachout.com)



# EXIDE XPRESS



- Withstands bumps and vibrations: Special polypropylene container with strengthening ribs makes the battery strong enough to withstand severe operating conditions and arduous vibrations in service
- Made for Indian environment: Use of special Hybrid Alloy System ensures that the battery can withstand the Indian environment and high under-bonnet temperatures
- Improved cycle life: Double-clad separation in the form of a unique rib-free separator profile, reinforced with textured glass mat, provides surface support to the active material, thereby improving cycle life and resistance to bumps and vibrations
- Quick recharge: Unique tree radial grid design, lower internal resistance and a special paste chemistry enhance recharging capability of the battery during use
- Magic eye: Easy to ascertain the state of the charge as well as electrolyte level of the battery
- Enhanced safety: Micro-porous filter disc in vent openings help arrest acid fumes and restrict spark propagation inside the battery
- Leak-resistant design: Side vented lid with electrolyte flow back system reduces chance of electrolyte leakage during handling
- Maintenance-free: Requires topping up only once in 6 months. Special alloy ensures low water loss during high temperature operations
- Ready-to-use: Batteries delivered factory-charged in ready-to-use condition

### TECHNICAL SPECIFICATIONS OF EXIDE XPRESS RANGE OF BATTERIES

BATTERY TYPE	PART NUMBER	REF C20 CAPACITY (Ah)	MAXIMUM OVERALL DIMENSIONS			NOMINAL FILLED WEIGHT (KG)	ELECTROLYTE VOLUME (LITRE)	CHARGING CURRENT (A)	CCA AT -18°C AS PER		ACID LEVEL INDICATOR	BATTERY LAYOUT
			L (MM)	W (MM)	H (MM)				IEC	SAE		
XP800	FXP0-XP800	80	305	173	225	23.0	4.9	5.0	420	530	Present	
XP800L	FXP0-XP800L	80	305	173	225	23.0	4.9	5.0	420	530	Present	
XP880	FXP0-XP880	88	410	176	233	26.6	6.8	5.5	430	550	Present	
XP1000	FXP0-XP1000	100	410	176	233	28.1	6.3	6.5	475	580	Present	
XP1100	FXP0-XP1100	110	410	176	233	29.6	6.0	7.0	550	700	Present	
XP1300	FXP0-XP1300	130	505	182	257	35.1	8.3	9.0	560	720	Present	
XP1500	FXP0-XP1500	150	508	222	257	42.0	10.4	9.0	640	785	Present	
XP1700	FXP0-XP1700	170	508	222	257	44.0	10.56	17.0	720	900	Present	
XP1800	FXP0-XP1800	180	521	278	270	55.1	15.9	13.0	830	1050	Present	
XP2000	FXP0-XP2000	200	521	278	270	56.8	15.5	14.0	910	1150	Present	

XP1300 & XP1500 are available at 24-month warranty.

Authorised EXIDE Dealer



This catalogue is issued to provide outline information only and is not deemed to form part of an offer or contract. Our policy is one of continuous improvement and we reserve the right to change details without prior notice.





Sterling Generators Pvt. Ltd.  
(A Shapoorji & Pallonji Company)

Back - Pressure Calculation for Baudouin Powered D. G. Set  
Max. Backpressure

Engine Rating 1500kVA  
Engine Model 12M33G1650/5

784.83	mm WC
7500.69	Pa
7.60	kPa
75.01	mBar
2.21	in Hg

The following formula is used to calculate the Back Pressure of the Exhaust System  
Back Pressure  $P = CLRQ^2/D^5$

Where,	P	Back Pressure in inches of Mercury			
	C	Conversion Factor to be considered as;			
		0.00059 For Engine Combustion Air flow of 100 to 400 CFM			
		0.00056 For Engine Combustion Air flow of 400 to 700 CFM			
		0.00049 For Engine Combustion Air flow of 700 to 2000 CFM			
		0.00044 For Engine Combustion Air flow of 2000 to 6000 CFM			
Note:	L	Length of Exhaust Pipe in Feet			
		For 45 Degree Bends, Equivalent Length L1	=	0.75 x Diameter of Pipe in Inches	
		For 90 Degree Bends, Equivalent Length L2	=	1.33 x Diameter of Pipe in Inches	
	R	Exhaust Density In Pounds Per Cubic Feet	=	41.1/(Exhaust Temp. in Deg. F + 460 Deg. F)	
	Q	Exhaust Gas Flow in Cubic Feet Per Minute			
	D	Inside Diameter of Exhaust Pipe in Inches			
Data	P	To Be Calculated			
	C	Conversion Factor for Combustion Air Flow			
		Here,			
		Combustion Air Flow Is	=	31.90	Cu. M/Min
			=	3302.61	CFM
			=	0.00044	
	L	Total Length of Exhaust Piping in Feet			
	Level 1	From Engine to Exhaust Silencer Exhaust Piping	=	2000.00	mm
			=	78.74	inches
			=	6.56	Feet
	R	Exhaust Density in Pounds Per Cubic Feet			
		For Exhaust Density, exhaust temperature Is required Converting Deg. C to Deg. F	=	560.00	Deg. C
			=	528.00	Deg. F
			=	0.03	lbs/Cu. Ft.
	D	Diameter of Exhaust Pipe in inches	=	253.00	mm.
	Q	Exhaust Gas Flow in Cubic Feet Per Minute	=	311.50	Cu. M/Min
			=	11445.93	CFM
			=	9.96	inches
			=	0.11	in Hg
		Therefore, Back Pressure of Level 1	=		
		But, Flexible Connections are also used			
		Therefore, Total Exhaust Back Pressure is 1.5 Times of Actual	=	0.17	in Hg
	Level 2	Exhaust Silencer			
		Exhaust Silencer has its own backpressure	=	2.00	kPa
		From Exhaust Silencer to Exhaust Outlet	=	20.00	mBar
			=	0.50	in Hg
Data	P	To Be Calculated			
	C	Conversion Factor for Combustion Air Flow			
		Here,			
		Combustion Air Flow Is	=	31.90	Cu. M/Min
			=	3302.61	CFM
			=	0.00044	
	L	Total Length of Exhaust Piping in Feet			
		Exhaust Piping	=	135000.00	mm
			=	5314.96	inches
			=	442.91	Feet
		No. of 90 Deg. Bends	=	7.00	Nos.
		Equivalent Length L1	=	400.00	mm.
		1.33 x Diameter of Pipe in Inches	=	15.75	inches
		Diameter of Pipe	=	20.94	Inches
		Final Equivalent Length L1	=	146.61	inches
			=	12.22	Feet
		No. of 45 Deg. Bends	=	4.00	Nos.
		Equivalent Length L2	=	400.00	mm.
		0.75 x Diameter of Pipe in Inches	=	15.75	inches
		Diameter of Pipe	=	11.81	inches
		Final Equivalent Length L2	=	47.24	inches
			=	3.94	Feet
		Total Length of Piping	=	459.07	Feet
		Equivalent Length+ Straight Length			
	R	Exhaust Density in Pounds Per Cubic Feet			
		For Exhaust Density, exhaust temperature is required Converting Deg. C to Deg. F	=	560.00	Deg. C
			=	528.00	Deg. F
			=	0.03	lbs/Cu. Ft.
	D	Diameter of Exhaust Pipe in inches	=	400.00	mm.
	Q	Exhaust Gas Flow in Cubic Feet Per Minute	=	311.50	Cu. M/Min
			=	11445.93	CFM
			=	15.75	inches
			=	0.81	in Hg
		Therefore, Back Pressure of Level 3	=	1.57	in Hg
		Total Backpressure on the system	=		
		But this is a Vee Engine with 2 Banks	=		
		Therefore, the calculated Back Pressure is Per Bank	=		
		Thus Total Back Pressure on the System	=	1.57	in Hg
		Whereas Maximum Allowable Backpressure	=	2.21	in Hg
Note:		Data to be filled only in the following colored boxes			
		Site requirement Data			
		Engine manufacturer declared data			
		All other data shall remain fixed.			





Sterling Generators Pvt. Ltd.  
Village Kala, Kherdi, Khanvel, Silvassa

**AIR REQUIREMENT CALCULATION FOR 1500KVA DG SET  
(COUPLED WITH 1500 KVA ALTERNATOR)**

DATA:	Description	Values	Unit	Remarks / Reference data Sheets
Engine	BAUDOUIIN-12M33G1650/5			
Alternator	LEROY - SOMER -LSA-50.2 L8 (1500KVA)			
Heat Load of Engine		110	kW	from Engine data sheet
Heat Load of Alternator		69	kW	Heat Load = Alternator Rating - (Alternator Rating * Alternator Efficiency)
Efficiency of Alternator		95.4	%	from Alternator data sheet
Total Heat Load of the system		179	kW	
Considered Temperature Rise	$\Delta T$	5	Deg. Celsius	
Specific Heat of Air at 50 Deg. Celsius		1.009	KJ/Kg Deg C	Referred from Engineeringtoolbox.com
Density of Air at 50 Deg. Celsius		1.067	kg/cu. M	Referred from Engineeringtoolbox.com
<b>Calculations:</b>				
Total Heat Load in KJ	= KW x sec.	10740	KJ	
Heat Load	= Mass of Air x $\Delta T$ x Specific Heat of Air		KJ	
Therefore, Mass of Air	= Heat Load/ $\Delta T$ x Specific Heat of Air	2128.84	Kg	
Therefore, Volume of Air	= Mass of Air/Density of Air	1995.16	Cu.m/Min	
Converting to CFM		70458.43	CFM	(Air required for cooling of radiated heat )
Adding Combustion Air to the Engine Requirement	= 125 m <sup>3</sup> /min	4414.33	CFM	
Therefore, Total Air Requirement of the System	=	74872.76	CFM	Air required for cooling of radiated heat + Air required for Engine Combustion



Doc. No: IMS-P-29  
Rev.No:07  
Rev. Date: 09/01/2023  
Prepared By: MR  
Approved By: Plant Head

**STERLING GENERATORS PVT.LTD.  
Silvassa.**

**INTEGRATED MANAGEMENT SYSTEM -  
IMS PROCEDURES MANUAL FOR**



**D.G.SET ROUTINE TEST PROCEDURE**

D.G. Set will be tested at our test bench as per SGPL standard procedures detailed as under.

- 1) Before testing, the following details shall be recorded on test report:
  - i) Engine Sr. No.
  - ii) Alternator Sr. No.
  - iii) Engine Model and Make.
  - iv) Alternate Model and Make.
  - v) Engine & Alternator Rating.
  - vi) Date of Testing.
  - vii) Cooling System Type.
  - viii) Rated Speed, Voltage & KW rating.
- 2) Check the tightness of all bolts and necessary connections before starting the DG set.
- 3) Start the DG set and run at Idle for 05 minutes. If any leakages occur, rectify them and note down the parameters on test report.
- 4) Raise the load gradually and allow the performance parameters to reach steady state conditions and note down the following parameters on test report:
  - i) Speed in RPM.
  - ii) Load in KW.
  - iii) Current in AMPS.
  - iv) Voltage.
  - v) Frequency (HZ).
  - vi) Lube Oil Pressure.
  - vii) Water Temperature.
  - viii) Vibration.
  - ix) Regulation ( Speed & Voltage )

Above parameters will be recorded @ following loads and duration:

Idle run - 05 mins  
100% load - 30 mins  
110% load - 10 mins

The DG set will be tested on standard test bench facilities as per ISO 8528- 6.


The above test will be conducted through 415 AC volts PLC based RESISTIVE LOAD BANK at unity power factor.



Page No. 1 of 1



**STERLING GENERATORS PRIVATE LIMITED**  
**QUALITY ASSURANCE PLAN**

MANUFACTURING QUALITY PLAN											
Q.P. No: IMS-QEHS-WI-36		ITEM : DG SET		CUSTOMER: M/s. MAX SUPER SPECIALTY HOSPITAL							
Rev.No: 07		DG SET RATING : 3x1500 KVA DG SET		GURUGRAM							
Date:09/01/2023		OPEN TYPE DG SET		PROJECT: 3x1500 KVA DG SET							
Prepared By: MR				Type of check		Quantum of check		Ref. Document		Format of Records	
Approved By: Plant Head		Characteristics		Class	E	M	F	G	H	I	J
SR. NO	Components & Operation	C	D:								
1	Base Frame	Dimensions	Major	Steel Tape	100%	100%		SGPL	Drawing	Internal Inspection Report	P V
		Foundation Holes	Major	Measurement	100%	100%		Approved Drawing	Drawing		
2	Fuel Tank	Component Mounting Holes	Major	Refer drwg. & Steel tape/ Gauge	100%	100%			Drawing		
		Weld joints	Major	DP Test	100%	100%					
		Capacity Checking	Major	Measurement	100%	100%		SGPL	Drawing		
		Leakage	Major	Diesel filling test	100%	100%		Approved Drawing	Work Inst.		
		Fittings	Major	Visual	100%	100%			Drawing		
3	Alternator	Damage during transit.	Major	Visual	100%	100%		OEM -TC	OEM -TC		P V
4	Engine	Damage during transit	Major	Visual	100%	100%		OEM -TC	OEM -TC		
5	Alignment	Radial and Axial (Applicable only for double bearing Alternator)	Major	By Dial gauge	100%	100%		As per Mfr. Standard.	As per Mfr. Standard.		P V









	Accessories Fitting, Fuel Water & Lub oil hose connection, Leakages	Loose Fitting Completeness Leakages	Major	Visual each set is run for 5 minutes to verify leaks	100%	Random	Test format	Engine Manual	Inspection report	P	W
6											
7	Operational Check on Load for 45 Minutes	RPM, Water Temp, Lub oil Pressure, voltage, Current Etc	Major	Visual	100%	100%	ITP	As per Mfr. Standard.	Inspection report	P	W
8	Vibration Check	Displacement at microns	Major	Vibration meter	100%	100%	Test format	As per Mfr. Standard.	Inspection report	P	W
9	Documents	1.Engine Test Certificate 2.Alternator test certificates	Major	Visual	100%	100%	As per Mfr. Standard.	As per Mfr. Standard.		P	V
M Manufacture C: Customer /Nominated inspection agency U: End user P: Perform W: Witness V: Verification/Review											
MANUFACTURER(QC) SIGNATURE											
Review by name , Sign of approving authority.											



Doc. No. : IMSF-DG-25

Rev No:05

Rev Date 07/04/2020

Prepared By : HOD

Approved By:PLANT HEAD

STERLING GENERATORS PVT. LTD.

Silvassa

TEST REPORT

sterling

Customer Name :- M/s MAX MOHALI

Description	Engine	Alternator	Controller	DG Set
Make	BAUDOUIN	STAMFORD	DEIF	SGPL
Model	12M33G1650/5	STL1D-D41	SGG 420	SGB1500PR
Rating	1450KW	1650KVA	-	1500KVA
Sr.No.	M3922H00054	N22J415310	-	-

Rated Voltage : 415 V

Rated Speed : 1500RPM

Cooling System : RADIATOR

Load build up test on resistive load bank (Unity power factor)

Load %	Duration (Min)	VOLTAGE (L TO L)			CURRENT			Frequency HZ	Lube oil Pr, bar	Coolant Temp. °C	Speed RPM	Load KW
		R <sub>V</sub>	Y <sub>B</sub>	BR	R	Y	B					
0	5	415	415	415	0	0	0	50.0	6.6	46	1500	0
25	10	415	416	415	410	420	429	50.0	6.1	68	1500	302
100	15	415	414	414	1680	1675	1664	50.0	5.4	78	1500	1205
110	60	414	414	414	1858	1840	1856	50.0	5.3	81	1500	1320
		414	413	414	1858	1840	1856	50.0	5.2	82	1500	1320

Start Time : 14.00  
 Stop Time : 15.30  
 No Load Voltage : 415  
 Full Load Voltage : 414

No Load RPM :1500  
 Full Load RPM:1500

Tested by

Kamlesh Gavit  
SGPL



Witnessed by:-

Mr. Vijay Kumar Tyagi  
Deputy General Manager  
Project



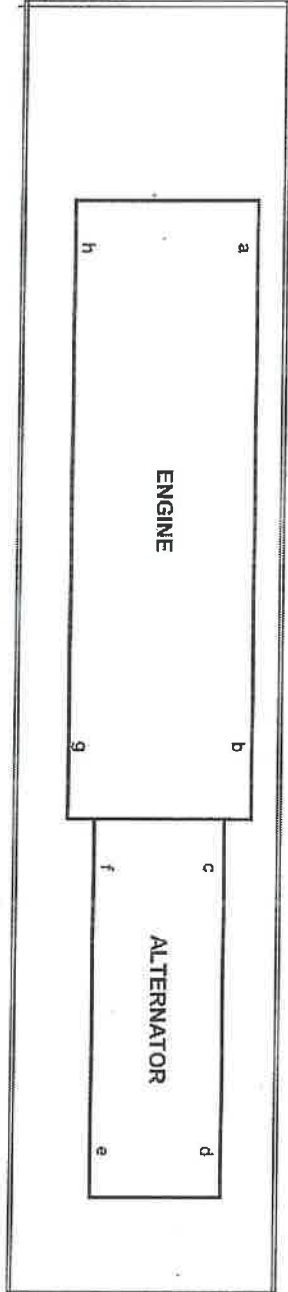
Date of Testing/Inspection : 08.11.2022

Doc. No.: MSF-DG-27  
 Rev. No.: 05  
 Rev. Date: 01/04/20  
 Prepared By: HOD  
 Approved By: PLANT HEAD  
 Customer Name :- M/s MAX MOHALI  
 Engine Sr No : M3922H00064  
 Alternator Sr No : N22J415310

STERLING GENERATORS PVT. LTD.  
 SILVASSA  
 Vibration Report



Vibration Readings Displacement in Velocity mm/sec



Load	a	b	c	d	e	f	g	h
0%	40	30	25	12	60	58	45	18
25%	58	42	35	18	80	78	65	21
100%	74	78	67	21	88	85	78	35

Tested By:

Kamlesh Gawli  
 SGPL



Witnessed By:

Mr. Vijay Kumar Tyagi  
 Deputy General Manager  
 Project

*(Signature)*



*(Signature)*

Date of Testing/Inspection : 08.11.2022



## Engine Test Certificate

THIS IS TO CERTIFY THAT

BAUDOUIN ENGINE MODEL. : **12M33G1650/5**

S.O. NUMBER. : **SOM33D0016**

ENGINE SR. NUMBER. : **M3922S00054**

HAS BEEN TESTED AS PER BS 5514 / IS 10000/ ISO 3046 AND CONFIRMS TO CENTRAL POLLUTION CONTROL BOARD NORMS NOTIFICATION GSR NO. 771 (E) DTD. 11.12.2013 AND GSR NO., 232 (E) DTD. 31.03.2014, ISSUED BY MINISTRY OF ENVIRONMENT AND FORESTS, GOVERNMENT OF INDIA.

THE CORRECTED POWER OUTPUT AS PER REFERENCE CONDITION:

WITHOUT AUXILIARIES IS **1450 kW AT 1500 RPM**

THE ENGINE IS PASSED FOR THE FITMENT IN GENERATING SET APPLICATION OF SUITABLE RATING.

Date: **13/09/2022**



**STAMFORD**

**Test Certificate**

FOR  
SALIENT POLE, SELF EXCITED / PMG EXCITED AND SELF REGULATED AC GENERATOR  
Machine No. **N22J415310**

Type Test has been conducted on similar design machine  
STANDARDS: Generator generally conforms to BS 5000 : Part 3,  
Tested in accordance with BS EN 60034-1/IS/IEC 60034-1  
Rotor dynamically balanced to BS ISO 1940 - 1

**ROUTINE TEST CERTIFICATE FOR BRUSHLESS AC GENERATOR:**

FRAME: S7L1D-D41	AVR: MX322	AVR NO: 223206150045	ENCLOSURE: IP23	
RATED KVA: 1650	RATED VOLTS: 415	RATED AMPS: 2295.5	FREQUENCY: 50	PHASE: 3
POWER FACTOR: 0.8	STR CONN: Star	STR WINDING: 312	DUTY: Base Continuous	WIRE: 4-Wire
EXC. VOLTS: 63	EXC.AMPS: 2.7	AMB TEMP: 40		

FOR 3 PHASE SEQUENCE LOOKING FROM DRIVE END FOR CLOCKWISE ROTATION :U-V-W

WINDING	COLD RESISTANCE IN Ohm(+/- 10 %) AT 22°C (MAX VALUES)	INSULATION RESISTANCE (M- Ohm)	HV TEST 2KV FOR 1 MIN	INSULATION CLASS
STATOR (Phase to Phase)	0.0012	2+	OK	H
ROTOR	1.82	2+	OK	H

**REGULATION TEST**

FREQ.	VOLTS	AMPS	KVA	PF	KW	EXC.VOLT	EXC.AMP	% LOAD
52	416.4	0.00	0.00	0.00	0.00	15.6	0.7	0.00
50	415	2295.5	1650	0.8	1320	63	2.7	100.00

REGULATION = (N.L.VOLTAGE-F.L.VOLTAGE / RATED VOLTAGE)\*100 = 0.34 %

Item Description: AC Generator.S7L1D.4.D.1.312.,0,,18,,MX322.Black - RAL9011  
Remarks:

Date: 16-OCT-22



Job No: 4461695-001

AUTHORISED BY

**Manoj K Upadhyaya**  
Quality Assurance

**Certificate Of Conformity**

Quality System Certification  
ISO 9001:2015

Frame Size : **S7L1D-D41**

Serial Number : **N22J415310**

Manufactured Date : 16-OCT-22

KVA: **1650**

Authorized By Quality Assurance: **Manoj K Upadhyaya**



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Print Date: 16-OCT-22



Doc. No.: MASF-DG-27

Rev. No.: 05

Rev. Date: 01/04/20

Prepared By: HOD

Approved By: Plant Head

Customer Name : - M/s. GOLDEN TOWER INFRA TECH PVT.LTD

Engine Sr No : M3922S00061

Alternator Sr No : N22J415166

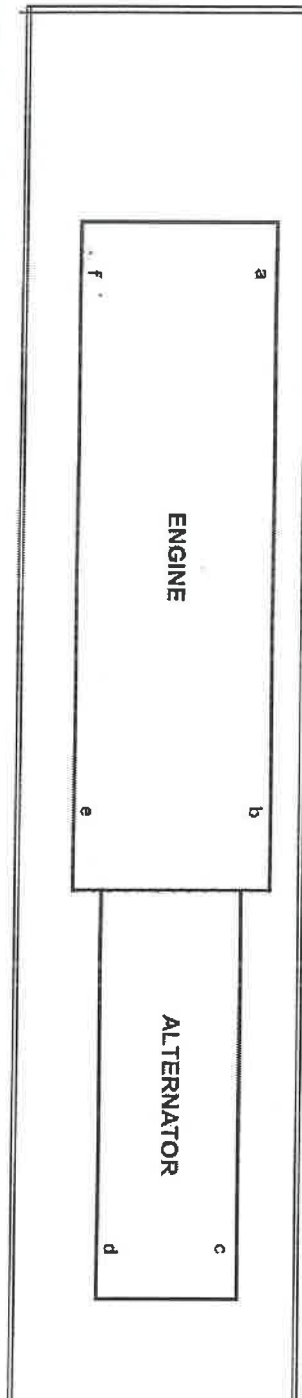
# STERLING GENERATORS PVT. LTD.

Silvassa

## Vibration Report



Vibration Readings Displacement in Microns



Note: As per ISO 8528 Part 9, Vibration max Limit 5320 Microns

Load	a	b	c	d	e	f
0%	14	22	14	15	29	16
25%	18	33	20	17	28	16
50%	17	41	27	17	35	16
75%	18	52	33	25	58	18
100%	20	58	38	27	56	22

Tested By:



Witness By:

Mr. J. Praveen Kumar  
NSL Infracore

*J. Praveen Kumar*  
29/11/2022





STERLING GENERATORS PVT. LTD.



FUEL CONSUMPTION REPORT

Customer Name :- M/s. GOLDEN TOWER INFRATECH PVT.LTD  
 Engine Sr No : M3922S00061  
 Alternator Sr No : N22J415166

TESTING FUEL TANK SPECIFICATION

L =1200 mm  
 W =910 mm  
 H = 910mm  
 Tank sheet thickness 2 mm

Tank capacity = 981.7

Volume :- Length X width X Height  
 :- 1.196 x 0.906 x0.906 = 0.98172 m3  
 :- 0.98172 x 1000 = 981.7 ltr  
 :- 906 mm = 981.7 ltr  
 :- 1 mm = 1.08 ltr

Load %	Load Value in KW	Duration in min	Fuel measured in mm	Fuel consumed mm X 1.08 ltr	Fuel consumed Ltr/ hr
100	1201	60	278	300.24	300.2

Tested By:

Sangram Singh  
 SGPL



Witness by :

Mr. J.Praveen Kumar  
 NSL Infratech

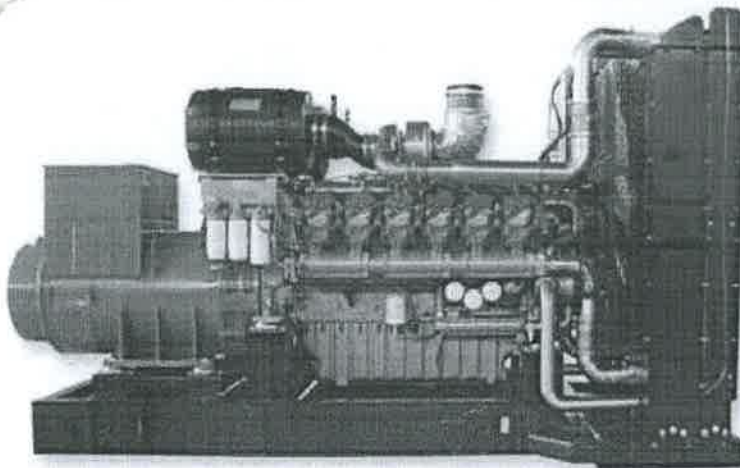
*J Praveen Kumar*  
 29/11/2022

Date of Testing/Inspection : 28.11.2022 & 29.11.2022





# DIESEL GENSET MODEL SGB 1500 PH



## PRODUCT HIGHLIGHTS

### Diesel Gen Set Package

- GenSet Designed to comply with ISO 8528.
- Excellent performance under most demanding environmental conditions
- Near zero down time for continuous power supply
- Sturdy base frame
- Efficient anti-vibration mounts
- Stringent shop floor testing to ensure class leading, hassle-free performance
- Testing carried out using state-of-the-art PLC based, resistive load bank

### Engine Features

- Cooling System Designed for 50°C ambient
- Cast iron cylinder block with rugged body construction designed to minimize vibration & noise level
- High carbon steel forged crankshaft with induction hardening
- Full flow oil filter along with lube oil cooling to maintain optimum temperature
- Cast iron dry liners, lube oil cooled aluminium alloy piston with high performance piston rings
- High power to weight ratio with low life cycle cost
- Air intake, exhaust manifold and turbocharger provided with shield to isolate heat
- HPCR pump with ECU control providing efficient performance in terms of power & fuel consumption
- Full flow multi level type oil filters
- Electronic governing
- Fast load response
- Stable frequency
- Excellent fuel and lube oil consumption
- Engine complying to ISO 3046-1/1, ISO 15550 standard reference conditions.

### Alternator Features

- Brushless type, screen protected, self-excited alternator complying to IS:13364/IEC 60034 – 1
- Excellent motor start capability
- Excellent alternator efficiency across the load range
- Compact design with sealed bearings for longer life
- Low maintenance
- Full engine compatibility

Final equipment and finishing shown. Standard may vary.

Rating	1500 kVA / 1200 kW
Voltage	415 Volts
Frequency	50 Hz
Speed	1500 RPM



## APPLICATION DATA

### ► Engine

Engine Make	Baudouin, India
Engine Model	12M33G1650/5
Distribution	4 Strokes
Aspiration	Turbocharged
No. of Cylinders	12
Type of Construction	Vee type
Displacement	39.2 L
Bore / Stroke	150x185 mm
Mean Piston Speed	9.25 m/s
Compression ratio	15:1
Gross Engine Power @ 100% PRP	1350 kWm/1810 bhp
Gross Engine Power @ 110%	1450 kWm/1945 bhp
Rated Speed	1500 RPM
Frequency	50 Hz

### ► Cooling System

Method of Cooling	PHE Cooled
Coolant Capacity	210 L
Radiator Fan Power	NA
Thermostat Operating Range	80 - 92 °C
Coolant Alarm (Shutdown) Temperature	103 °C

### ► Fuel System

Governor	ECU
Governing Class	G3 as per ISO:8528-5
Fuel Injection type	High Pressure Common Rail (HPCR)
Recommended Fuel	IS 1460/ BS2869 Part1 Class A1

### Fuel Consumption: L/hr @ Specific Gravity 850 gms/Litre

100% Load	283.5
75% Load	204.4

\*Note: Fuel Data Confirms to ISO 3046 with +5% tolerance

### ► Lubrication System

Recommended Lube Oil	CI4+SAE15W-40
Lube Oil System Capacity	155 L
Lube Oil Consumption	<0.2 % of FC

### ► Exhaust System

Silencer Type	Residential-grade
Number of Silencers	1 No.
Max Back Pressure Total System	7.5 kPa
Exhaust outlet pipe size (min)	220 mm
Exhaust Gas Temperature	≤ 550 °C

### ► Induction System

Air Filter Type	Paper Element
Air Intake Restriction (Dirty element)	6.5 kPa

### ► Electrical System

Electrical System Voltage	24 V DC
Starter Motor Power	2x8.5 kW
Battery Size	4x12V, 180 Ah

### ► Alternator

Make***	Leroy Somer	
Frame	LSA 50.2 L8	
Power Factor	0.8	
No. of Phase	3	
Frequency	50 Hz	
Rated Voltage (L-L)	415 V	
Rated Current	2087 Amps	
Voltage Regulation	±0.25%	
Insulation System	H Class	
Temperature Rise Limit	H Class	
Winding Pitch	2/3	
Over Load	10 % Over Load for 1 hour once in 12 hours	
Waveform Distortion	No-Load < 3.5%	
Design Ambient for Alternator	40 °C	
Altitude	1000 m	
Protection	IP23	
Cooling	Air Cooled	
Air flow	1.8 m3/sec	
Coupling	Single bearing	
Maximum Over Speed	1650 RPM	
Stator Winding	Double layer concentric	
Control System	Self Regulated and Self Excited	
Excitation System	Brushless (AREP)	
AVR Type	Digital	
AVR Model	D350	
Performance: Efficiency @0.8 p.f		
	100%	95.40%
	75%	95.80%
Short Circuit Ratio		0.31
Xd Dir Axis Reactance		3.226
X'd Dir Axis Transient Reactance		0.174
X''d Dir Axis Sub Transient Reactance		0.148
Xq Quad Axis Reactance		1.9295
X''q Quad Axis Subtransient Reactance		0.154
Xl Leakage Reactance		0.081
X2 Negative Sequence Reactance		0.151
X0 Zero Sequence Reactance		0.028

\*\*\*Alternator Options available with CG & Stamford.



## DG CONTROL PANEL

### ► Operating Features

- Microprocessor based digital controller
- Accurate LCD display
- Local Start/Stop
- Remote Start/Stop
- Generator breaker control
- Easily Accessible through Fascia
- Flexibility for selecting Manual, Auto operations
- Easily Convertible AMF by giving Mains Fail Signal

### ► Metering

#### Engine Parameters:

- Engine Speed
- Lube Oil pressure
- Coolant temperature
- Engine Running Hour
- Engine Battery voltage
- Running status
- Fuel level in Percentage
- Event Log with date and time

#### Electrical Parameter

- Generator Voltage (Ph-Ph)
- Generator Voltage (Ph-N)
- Generator Current (R,Y,B)
- Generator Apparent power (kVA)
- Generator active power(kW)
- Generator reactive power (kVAr)
- Generator Power Factor
- Generator Frequency (Hz)
- Cumulative Power Consumption in kWh
- Cumulative Power Consumption in kVAh
- Cumulative Power Consumption in kVArh
- Control Supply Voltage

### ► Protection

#### Engine

- High Water Temperature
- Low oil pressure
- Low Fuel Level
- Over Speed
- Engine Fails to Start

#### Electrical

- Generator under Voltage (ANSI-27)
- Generator over Voltage (ANSI-59)
- Generator under Frequency (ANSI-81L)
- Generator over Frequency (ANSI-81H)
- Generator over Current (ANSI-51)
- Control Supply under Voltage
- Control Supply over Voltage
- Phase Reversal
- Unbalanced Load

### ► Controller

DEIF, Denmark make SGC 420 controllers are modern genset controllers for AMF applications with an electronically controlled engine (CANbus) and AMF applications with electronic governor.



### ► Controller Feature

- User-friendly interface and backlite full graphics LCD
- Battery voltage monitoring & reverse protection to aux supply
- 7/9 configurable analogue/digital inputs
- Auto, Manual and Remote Start/Stop Operation
- Island Operation
- Automatic Mains Failure Function
- CANbus Engine interface for communication
- Log with latest 100 events
- Fully configurable via PC using USB, RS485 communication
- DC Battery supply voltage range 8 to 28V
- -20 to 65 °C operating temperature range
- IP65 Protection class with gasket
- LCD alarm indication
- Power save mode
- 7 configurable Digital output

### ► Electrical Specification

- Supply Voltage Range: Nominal Voltage - 12/24 V DC
- Cranking drop out period: 50 ms
- Maximum reverse voltage protection: -32 V DC
- Measurement accuracy (battery voltage):  $\pm 1$  % Full scale
- Resolution: 0.1 V
- Maximum current consumption ~200 mA
- Deep sleep current: 20 mA, 12/24 V DC

### ► Environmental Specification

- Operating Temp: -20 to 65°C in compliance with IEC60068
- Vibration: 2G in X, Y and Z axes for 8 to 500Hz in compliance with IEC 60068-2-6
- Shock: 15 g for 11 ms in compliance with IEC 60068-2-27
- Humidity: 0 to 95% RH in compliance with IEC 60068-2-78
- Protection Degree: IP65 Protection class with gasket in compliance with IEC60529
- EMI/EMC in compliance with IEC 61000-6-2, 4

### ► Approvals

- CE Compliant
- Comply to the EU Low Voltage Directive: EN 61010-1
- Comply to the EU EMC directive EN 61000-6-2, 4



### STANDARD SCOPE OF SUPPLY

- Water cooled DIESEL engine
- PHE Cooling System
- Electric starter & charging alternator
- Electronic governor
- Microprocessor based genset controller
- Dry Type air filter
- Single bearing IP 23 Alternator
- Space Heater, RTD & BTD sensor (w/o scanner) in alternator
- Base frame with anti vibration mounts
- Flexible fuel lines & lube oil drain pump
- Fuel water separator filter (engine mounted)
- Exhaust outlet with Flexible and flanges
- DG Control Panel
- Battery, Battery Lead & Battery stand
- 990 litres. Standard fuel tank with High / Low level switch
- First Fill lube oil
- First Fill Coolant
- 1 Set Of Documents

### Output Rating & Definition

DG Set Rating @ 415V - 50 Hz | 1500 KVA | 1200 kW

Note: Ratings at 0.8 power factor.

#### ► Definition

Prime Power: Applicable for supplying power for varying electrical load for unlimited hours. Prime power (PRP) is in accordance with ISO 8528. A 10% overload capability is available in accordance with ISO 3046.

### Salient Features of Sterling Generators

- Sterling provides a range of Baudouin engine powered generating sets which are recognized for reliability.
- Global technology available in India.
- Most energy efficient D. G. set.
- Microprocessor based control panels.
- Wider maintenance intervals.
- Pre tested at factory with PLC test bench.
- Well experienced and trained engineers for after sales support.
- Designed to meet the latest environmental norms
- Seamless 24 x 7 service support
- Energetic team with highly experience in troubleshooting.

### General Information

#### ► Documentation

A full set of operation and maintenance manuals and circuit wiring diagrams.

#### ► Warranty

Please refer warranty policy.

#### ► Factory

**Sterling Generators Pvt Ltd**

Survey No: 59, 343/1, Village Kala, Kherdi, Khanvel, Silvassa, UT of Dadra & Nagar Haveli - 396 230

### Optional Supply

#### Engine

- Coolant heater
- Oversize batteries
- Extra fuel pre-filter water separator

#### Alternator

- HT Alternator of 3.3kV, 6.6kV & 11kV
- Permanent magnet generator (PMG)
- Upgrade to 3 phase sensing AVR
- Air inlet filters

#### Cooling System

- Engine driven radiator
- Remote Radiator

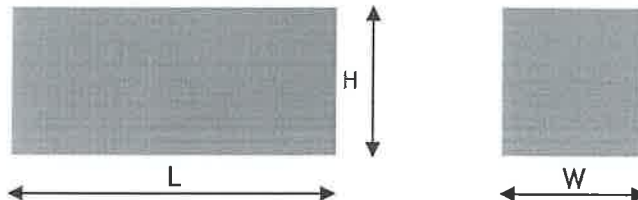
#### General

- Synchronisation module
- Isolator panel
- Automatic transfer switch
- Fuel transfer pump Automatic / Manual

### Dimensions & Weights

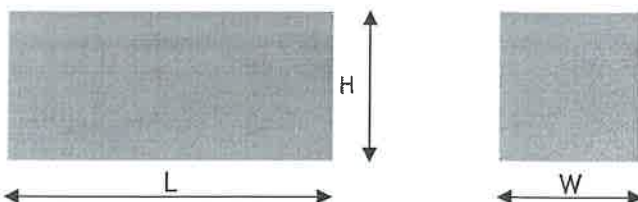
#### ► Open Set

Length = L	mm	4564
Width = W	mm	2207
Height = H	mm	2455
Weight, Dry	kg	8359
Standard Fuel tank (Litres)		990



#### ► Acoustic Set

Length = L	mm	7200
Width = W	mm	2500
Height = H	mm	2836
Weight, Dry	kg	14146
Standard Fuel tank (Litres)		990



Note: Dimensions are without silencer and for reference only.

### Special Condition

For specific site conditions of installation, please refer to application engineering.



The Data Mentioned in this Data Sheet are Subject to Change without Prior Notice, Due To





Sterling Generators Pvt. Ltd.  
Village Kala, Kherdi, Khanvel, Silvassa

**AIR REQUIREMENT CALCULATION FOR 1500KVA DG SET  
(COUPLED WITH 1500 KVA ALTERNATOR)**

DATA:	Description	Values	Unit	Remarks / Reference data Sheets
Engine	BAUDOUIIN-12M33G1650/5			
Alternator	LEROY - SOMER -LSA-50.2 L8 (1500KVA)			
Heat Load of Engine		110	kW	from Engine data sheet
Heat Load of Alternator		69	kW	Heat Load = Alternator Rating - (Alternator Rating * Alternator Efficiency)
Efficiency of Alternator		95.4	%	from Alternator data sheet
Total Heat Load of the system		179	kW	
Considered Temperature Rise	$\Delta T$	5	Deg. Celsius	
Specific Heat of Air at 50 Deg. Celsius		1.009	KJ/Kg Deg C	Referred from Engineeringtoolbox.com
Density of Air at 50 Deg. Celsius		1.067	kg/cu. M	Referred from Engineeringtoolbox.com
<b>Calculations:</b>				
Total Heat Load in KJ	= KW x sec.	10740	KJ	
Heat Load	= Mass of Air x $\Delta T$ x Specific Heat of Air		KJ	
Therefore, Mass of Air	= Heat Load/ $\Delta T$ x Specific Heat of Air	2128.84	Kg	
Therefore, Volume of Air	= Mass of Air/Density of Air	1995.16	Cu.m/Min	
Converting to CFM	=	70458.43	CFM	(Air required for cooling of radiated heat )
Adding Combustion Air to the Engine Requirement	= 125 m <sup>3</sup> /min	4414.33	CFM	
Therefore, Total Air Requirement of the System	=	74872.76	CFM	Air required for cooling of radiated heat + Air required for Engine Combustion





# TYPE TEST REPORT

NIDEC/TEST/FR/016

## SELF REGULATING BRUSHLESS ALTERNATOR

M/c Sr. No. : LGS3L817G215619  
kVA Rating : 1500

### TEST REPORT FOR SELF REGULATING BRUSHLESS ALTERNATOR

Frame	: LSA 50.2 L8	Frequency	: 50 Hz	Protection	: IP 23	Droop CT	: 500 / 1
Voltage	: 415 Volt	Phase	: 3	Rotation	: CW from DE	Module Type	: NA
Current (I <sub>n</sub> )	: 2086.8 Amp	Speed	: 1500 rpm	Mounting	: B 3	Module Sr.	: NA
Output	: 1500 kVA	P.F.	: 0.8 lag	AVR Sr.No.	: 21707W00210	Space Heater	: 1 NO.
Excitation	: 42 Vdc / 3.9 Idc	Ambient	: 40 ° C	AVR Type	: R450	Winding RTD	: PT100,6NO'S
Insulation	: 'H'	Duty	: S1	Ref. Std.	: IS 13364 & IEC34.1	Bearing BTD	: PT100, 1NO.

Winding (Cold Condition)	Resist. in ohms At 29 °C	IR in MΩ (500 Vdc)		High Voltage 1 min	Check for Accessory (Cold Condition)	Resistance In ohms At 29 °C	Insulation Resistance 500 Vdc	High Voltage 1 min	
		Before HV	After HV						
Stator winding (RC)	U - V	0.00274	>1000	>1000	2.5kV	A1, A2, A3	111.8	>1000	NA
	V - W	0.00264	>1000	>1000	2.5kV	A4, A5, A6	111.7	>1000	NA
	W - U	0.00279	>1000	>1000	2.5kV	A7, A8, A9	111.5	>1000	NA
Exciter Rotor	u - v	0.090	>1000	>1000	1.5kV	PT-100	111.8	>1000	NA
	v - w	0.090	>1000	>1000	1.5kV	RTDs	111.6	>1000	NA
	w - u	0.090	>1000	>1000	1.5kV	RTDs	112.0	>1000	NA
Main field (rc)	J - K	0.540	>1000	>1000	1.5kV	Bearing	112.4	>1000	NA
Exciter stator	E+ - E-	12.73	>1000	>1000	1.5kV	PT-100 BTD	NA	NA	NA
AREP Wdg.	X1-X2	0.102	>1000	>1000	1.5kV	Heater	268.5	NA	NA
	Z1-Z2	0.144	>1000	>1000	1.5kV	DroopCT	NA	NA	NA
Remarks : HV & IR Found Ok									

### MEASUREMENT OF RESIDUAL VOLTAGE TEST:

Measured Residual Voltage between lines at rated speed(1500rpm) = 39.16 Volts

### PHASE SEQUENCE TEST:

Direction of Rotation : Clock wise from Drive End Side  
Phase Sequence : U V W - Ok

### AVR ADJUSTMENT :

Under Frequency : NA Voltage : 415V Droop : 3%

### TERMINAL VOLTAGE SYMMETRY TEST:

U-V = 415.2 V : V-W = 415.2 V : U-W = 415.0V

### VOLTAGE REGULATION TEST (With 0.8pf Load) :

Load	Terminal Voltage	Line Current	Frequency	Excitation Voltage	Excitation Current	AREP Winding Voltage	
I / In	U - V (Vac)	Aac	Hz	E+ - E- (Vdc)	E+ - E- (Adc)	X1 - X2 (Vac)	Z1 - Z2 (Vac)
NL	415.1	0	50.0	12.06	0.86	105.1	03.9
29.3%	412.6	618	50.0	19.00	2.15	104.0	20.0

Result :-ON LOAD VOLTAGE REGULATION AT 29.3% LOAD = 0.60 %

DATE : 01.07.2017

Tested by: Sanjeev kumar

Checked by : H G Dinakar

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LEROY-SOMER

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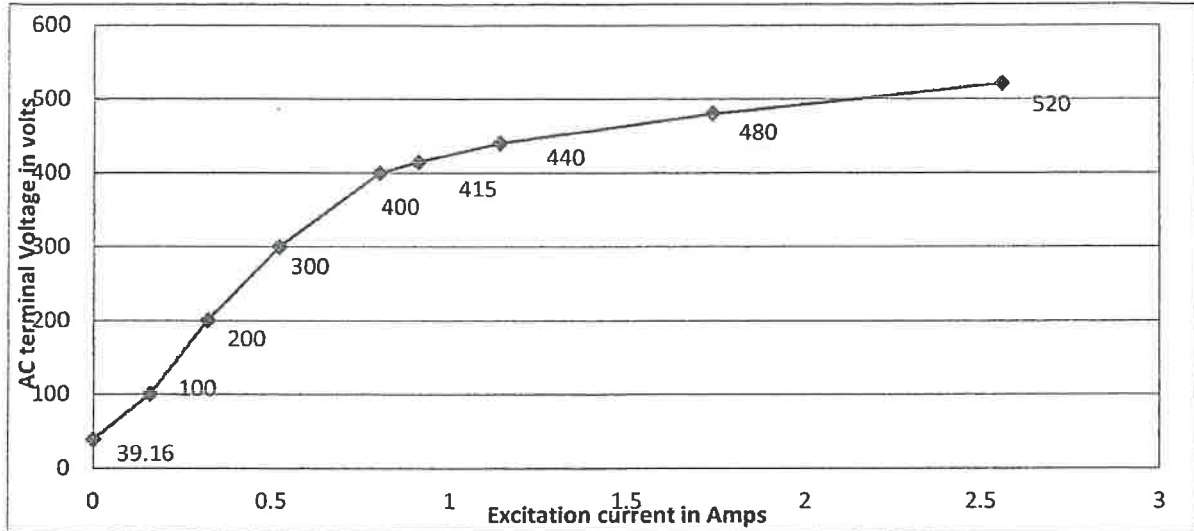
# TYPE TEST REPORT

NIDEC/TEST/FR/016

## SELF REGULATING BRUSHLESS ALTERNATOR

M/c Sr. No. : LGS3L817G215619  
kVA Rating : 1500

### Open Circuit Characteristics test :



### OPEN CIRCUIT CHARACTERISTIC TEST at Rated Speed 1500 RPM

Terminal Voltage U - V (Vac)	Excitation Current I <sub>ex</sub> (A <sub>dc</sub> )
39.16	0
100	0.16
200	0.32
300	0.52
400	0.80
415	0.91
440	1.14
480	1.74
520	2.56



### Momentary Over Speed Test

Speed = 1800RPM, Frequency = 60Hz, Duration = 2min - Found OK

DATE : 01.07.2017

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Checked by : H G Dinakar

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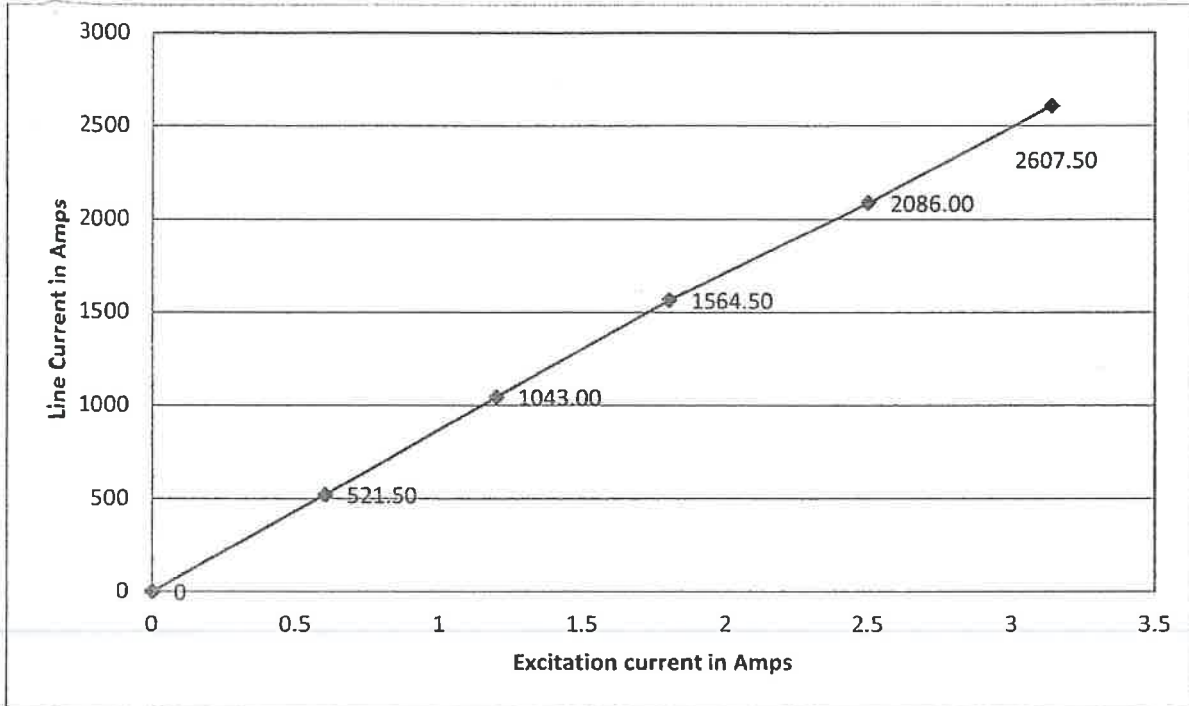
**LEROY-SOMER**



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**TEST REPORT FOR SELF REGULATING BRUSHLESS ALTERNATOR**

**SHORT CIRCUIT CHARACTERISTICS :**



**SHORT CIRCUIT CHARACTERISTIC TEST at Rated Speed 1500 RPM**

Short circuit current Ish (Aac)	Excitation Current Iex (Adc)
0	0
521.50	0.60
1043.00	1.21
1564.50	1.80
2086.00	2.51
2607.50	3.14

**Momentary excess current 3130 A (150% overload) – Iex = 3.5 A**



DATE : 01.07.2017

Tested by: Sanjeev kumar

Checked by : H G Dinakar

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# TYPE TEST REPORT

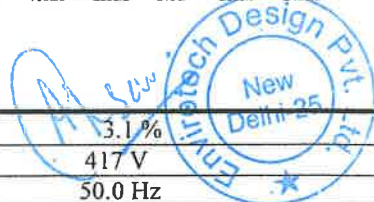
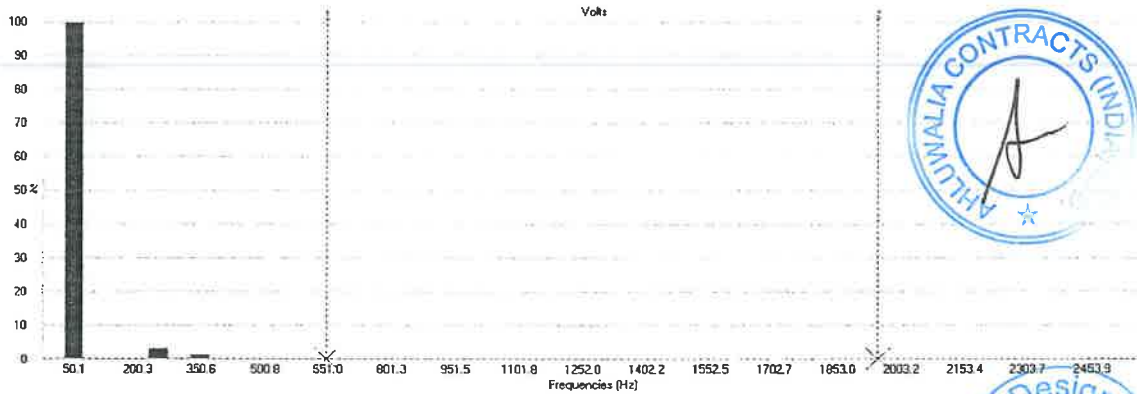
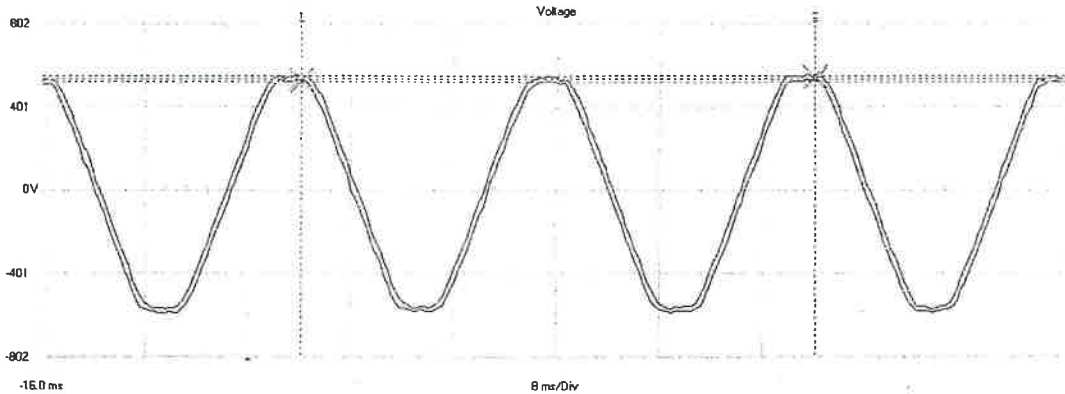
## SELF REGULATING BRUSHLESS ALTERNATOR

NIDEC/TEST/FR/016

M/c Sr. No. : LGS3L817G215619  
kVA Rating : 1500

### TEST REPORT FOR SELF REGULATING BRUSHLESS ALTERNATOR

#### WAVE FORM ANALYSIS (At no Load) :



THDr				3.1%			
RMS Voltage				417 V			
Frequency				50.0 Hz			
TIF				14.5			
H3	0.0	H17	0.0	H31	0.0	H45	0.0
H5	2.9	H19	0.1	H33	0.0	H47	0.0
H7	1.2	H21	0.0	H35	0.0	H49	0.0
H9	0.0	H23	0.0	H37	0.0	H51	0.0
H11	0.2	H25	0.0	H39	0.0		
H13	0.3	H27	0.0	H41	0.0		
H15	0.0	H29	0.0	H43	0.0		

DATE : 01.07.2017

Tested by: Sanjeev kumar

Checked by : Dinakar H.G.

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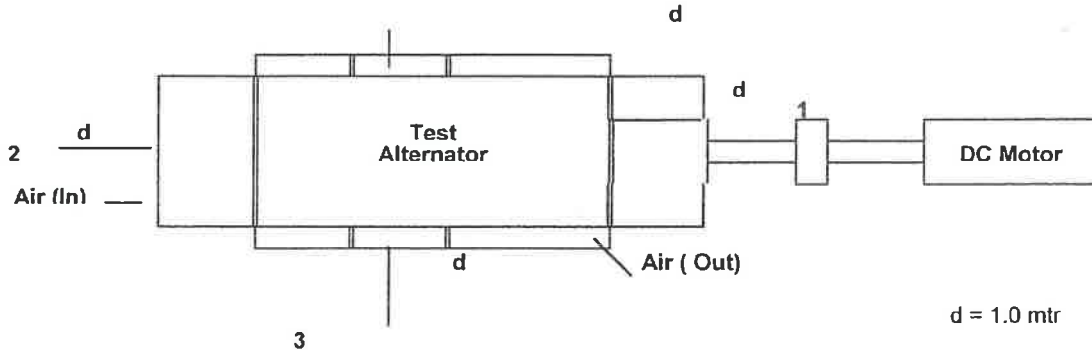
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**TEST REPORT FOR SELF REGULATING BRUSHLESS ALTERNATOR**

**VIBRATION & NOISE LEVEL MEASUREMENT AT NO LOAD:**



Location		Before over speed test at No-Load & UV-415V		After over speed test at No-Load & UV-415V		Noise Level Measurement
		Displacement	Velocity (mm/sec)	Displacement	Velocity	
1. ⇒ NDE Bearing	Vertical	55	4.1	55	4.1	99
	Horizontal	42	3.0	42	3.0	
	Axial	20	2.0	20	2.0	
2. ⇒ Body Feet	Vertical	75	4.5	75	4.5	93
	Horizontal	65	3.8	65	3.8	
	Axial	45	2.4	45	2.4	
3. ⇒ Body Feet	Vertical	85	5.1	85	5.1	96
	Horizontal	85	4.5	85	4.5	
	Axial	52	4.0	52	4.0	

**HIGH VOLTAGE TEST (Hot Condition)**

**INSULATION RESISTANCE TEST(Hot Condition)**

Winding (Phase to earth)	Voltage in kV	Duration	Remarks	Winding (Phase to earth)	Insulation Resistance in MΩ
Main Stator	2.5	1 Min.	OK	Main Stator	>1000
Main Rotor	1.5	1 Min.	OK	Main Rotor	>1000
Exciter Stator	1.5	1 Min.	OK	Exciter Stator	>1000

DATE : 01.07.2017

Tested by: Sanjeev kumar

Checked by : H G Dinakar

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**LEROY SOMER**

Nidec Industrial Automation India Private Ltd.

#45, Nagarur, Huskur Road, Off Tumkur Road, Bengaluru – 562 162, India



# TYPE TEST REPORT

NIDEC/TEST/FR/016

## SELF REGULATING BRUSHLESS ALTERNATOR

M/c Sr. No: LGS3L817G215619  
kVA Rating : 1500

### HEAT RUN TEST (as per clause no. number 5.5 of IEC 60034-29)

#### OPEN CIRCUIT HEAT RUN TEST (OCC) .T1:

Time, Hrs	Line Voltage,V			Frequency ,Hz	Winding temperature(deg.C)						Bearing temperature (deg.C) NDE	Amb deg.C	Air in deg.C	Air out deg.C	Difference
	UV	VW	UW		RTD U1	RTD V1	RTD W1	RTD U2	RTD V2	RTD W2					
10.00	52.2	52.4	52.2	50	27.2	27.1	27.0	26.9	27.2	27.0	30.5	26.3	26.3	30.0	3.7
10.30	52.2	52.3	52.2	50	27.4	27.4	27.4	27.1	27.4	27.1	32.1	26.5	26.5	31.2	4.7
11.00	52.1	52.3	52.1	50	27.6	27.5	27.5	27.2	27.7	27.3	34.0	26.9	26.9	31.3	4.4
11.30	52.1	52.3	52.1	50	27.9	27.6	27.5	27.3	27.8	27.5	35.1	27.0	27.0	31.3	4.3
12.00	52.1	52.3	52.1	50	28.0	27.7	27.5	27.3	27.8	27.5	35.3	27.0	27.0	31.4	4.4

Stator winding temperature rise under residual HRT by RTD method,

= (Maximum winding RTD temperature – Ambient temperature )

= (28.0 – 27.0 ) = 1.0 deg.C

Stator winding temperature rise under residual HRT by RTD method ( T1 ) = 1.0 deg.C



DATE : 01.07.2017

Tested by: Sanjeev kumar

Checked by : H G Dinakar

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**LEROY-SOMER**

Nidec Industrial Automation India Private Ltd.  
#45, Nagarur, Huskur Road, Off Tumkur Road, Bengaluru – 562 162, India



# TYPE TEST REPORT

NIDEC/TEST/FR/016

## SELF REGULATING BRUSHLESS ALTERNATOR

M/c Sr. No : LGS3L817G215619  
kVA Rating : 1500

### RESIDUAL HRT .T2 :

Time, Hrs	Line Voltage,V			Frequency ,Hz	Excitation		Winding temperature(deg.C)						Bearing temperature (deg.C) NDE	Amb deg.C	Air in deg.C	Air out deg.C	Difference
	UV	VW	UW		I <sub>ex</sub>	V <sub>ex</sub>	RTD U1	RTD V1	RTD W1	RTD U2	RTD V2	RTD W2					
12.15	415.1	415.0	415.1	50	0.78	10.00	32.2	32.0	31.5	31.0	31.9	32.0	36.6	27.2	27.2	31.2	4.0
12.45	415.1	415.0	415.1	50	0.80	10.13	44.8	43.9	42.2	43.0	42.8	43.0	37.5	27.3	27.3	32.0	4.7
1.15	415.1	415.0	415.1	50	0.80	10.15	48.8	49.0	47.1	47.6	48.6	47.1	38.0	27.4	27.4	32.6	5.2
1.45	415.0	415.0	415.0	50	0.80	10.15	50.2	51.0	49.3	51.6	51.5	49.1	38.4	27.5	27.5	32.8	5.3
2.15	415.0	415.1	415.0	50	0.80	10.15	52.7	52.3	50.2	51.7	52.3	50.0	38.9	27.5	27.5	33.2	5.7
2.45	415.0	415.0	415.0	50	0.80	10.15	52.8	52.6	50.8	51.8	52.5	50.9	39.0	27.5	27.5	33.2	5.7

Stator winding temperature rise under rated voltage by RTD method,

= (Maximum winding RTD temperature – Ambient temperature)

= (52.8 – 27.5) = 25.3 deg.C

Stator winding temperature rise under rated voltage HRT by RTD method ( T2 ) = 25.3 deg.C



DATE : 01.07.2017

Tested by: Sanjeev kumar

Checked by : H G Dinakar

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**LEROY-SOMER™**

Nidec Industrial Automation India Private Ltd.  
#45, Nagarur, Huskur Road, Off Tumkur Road, Bengaluru – 562 162, India

**SHORT CIRCUIT HRT(SCC), T3:**

Time, Hrs	Line Current,A			Frequency, Hz	Excitation		Winding temperature(deg.C)						Bearing temperature (deg.C) NDE	Amb deg.C	Air in deg.C	Air out deg.C	Difference
	U	V	W		Iex,A	Vex,V	RTD U1	RTD V1	RTD W1	RTD U2	RTD V2	RTD W2					
3.00	2087.0	2087.2	2086.9	50	2.30	31.0	76.3	76.8	72.9	72.7	78.2	76.8	35.6	27.4	27.4	37.6	10.20
3.30	2886.9	2087.1	2086.8	50	2.33	31.8	90.9	89.3	86.5	88.4	88.3	89.3	37.3	27.9	27.9	40.6	12.7
4.00	2886.9	2087.0	2086.8	50	2.35	31.9	102.3	102.7	98.4	100.8	102.0	102.7	40.5	28.0	28.0	42.8	14.8
4.30	2886.9	2087.0	2086.8	50	2.35	31.9	112.4	111.0	108.0	106.1	104.2	105.3	42.8	28.4	28.4	44.5	16.1
5.00	2886.9	2087.0	2086.8	50	2.35	31.9	112.5	111.2	109.5	107.3	105.0	108.6	42.9	28.5	28.5	44.6	16.1
5.30	2886.9	2087.0	2086.8	50	2.35	31.9	112.6	114.4	109.7	107.8	106.8	109.5	43.0	28.5	28.5	44.6	16.1
6.00	2886.9	2087.0	2086.8	50	2.35	31.9	112.6	111.9	109.8	107.8	106.9	110.0	43.1	28.5	28.5	44.6	16.1

Stator winding temperature rise under SCC by RTD method,  
= (Maximum winding RTD temperature – Ambient temperature )  
= (112.6 – 28.5) = 84.1 deg.C

Stator winding temperature rise under rated voltage HRT by RTD method ( T3 ) = 84.1 deg.C

Final Stator winding temperature rise by RTD method = (T3+T2) – T1  
= (84.1 + 25.3) – 1.0 = 108.4 deg.C

Final Stator winding temperature rise by RTD method = 108.4 deg.C

Rotor winding temperature rise by resistance method @ 0.8 PF :

Excitation current during SCC = 2.35 A

Excitation current at rated full load = 3.15 A

Rotor temperature rise during SCC = ((Rh-Rc)/(Rc)) x (235 +Tc) - (Ta-Tc)  
= ((0.660 – 0.540)/(0.540)) x(235+29) – (28.5-29.0) = 59.16 deg.C

Rotor temperature rise during SCC = 59.3 deg.C

Extra Polated rotor field winding temperature rise by resistance method = 59.16 x(3.15/2.35)<sup>2</sup> = 106.29 deg.C

Extra polated rotor field winding temperature rise by resistance method = 106.29 deg.C

DATE : 01.07.2017

Tested by: Sanjeev kumar

Checked by : H G Dinakar

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**TEST REPORT**

NIDEC/TEST/FR/016

**SELF REGULATING  
BRUSHLESS ALTERNATOR**

M/c Sr. No. : LGS3L817G215619  
kVA Rating : 1500

**TEST REPORT FOR SELF REGULATING BRUSHLESS ALTERNATOR**

**EFFICIENCY TEST :**

**Efficiency Calculation**

1	FRAME	LSA 50.2 L8		100%	75%	50%	25%
2	RATED VOLTAGE	415					
3	RATING IN KVA	1500		1500.00	1125.00	750.00	375.00
4	RATED CURRENT in Amps	2086.81		2086.81	1565.11	1043.40	521.70
5	NO. OF PHASES	3					
6	FREQUENCY in Hz	50					
7	WINDING RESISTANCE AT AMBIENT TEMPERATURE IN Deg C	29					
8	ARMATURE WINDING RES. / Ph IN OHMS	0.00137					
9	MAIN FIELD WINDING RES. IN OHMS	0.54					
10	WINDING RESISTANCE @135 Deg C	135					
11	ARMATURE WINDING RES. / Ph IN OHMS	0.0019		100%	75%	50%	25%
12	MAIN FIELD WINDING RES. IN OHMS	0.757					
13	MAIN FIELD CURRENT IN AMPS			101.00	81.00	61.00	42.00
14		P.M. Voltage	P.M. Current	P.M Power	P.M Power	P.M Power	P.M Power
15	Prime Mover input - Uncoupled	800	18.50	14800	14800	14800	14800
16	Input to Prime Mover Coupled to AC Gen Unexcited at rated speed	800	22.00	17600	17600	17600	17600
17	Input to Prime Mover Coupled to AC Gen Excited to rated Voltage at rated speed	800	34.00	27200	27200	27200	27200
18	Main field current in amps			101.00	81.00	61.00	42.00
19	Friction & Windage loss in watts (16 - 15)			2800	2800	2800	2800
20	Core loss in watts(17 - 16)			9600	9600	9600	9600
21	Armature Cu loss in watts ( 4 sq. X 11) x 3			25084	14110	6271	1568
22	Rotor copper loss in watts (13 Sq X 12 )			7720	4965	2816	1335
23	Exciter loss in watts ( 0.1X 22 )			772	497	282	134
24	Stray loss in watts (0.005 X 26)			6000	4500	3000	1500
25	Total losses in watts			51977	36472	24769	16936
26	ACG output in watts			1200000	900000	600000	300000
27	ACG Input in watts			1251977	936472	624769	316936
28	% Efficiency (26/27 X 100)			95.8	96.1	96.0	94.7
29	Subject to Top ((100-Effy) x 0.1) + Effy			96.3	96.5	96.4	95.2

DATE : 01.07.2017 Tested by: Sanjeev kumar

Checked by : H G Dinakar

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**LEROY-SOMER**



Nidec Industrial Automation India Private Ltd.  
#45, Nagarur, Huskur Road, Off Tumkur Road, Bengaluru - 562 162, India

*[A large, diagonal blue line is drawn across the page, likely indicating a signature or a mark.]*



Date: 3<sup>rd</sup> Feb 2021

### SELF CERTIFICATION OF TYPE (RATING) TEST

This is to certify that the product identified below was found to be in compliance with relevant hereunder stated reference standards.

***12M33G1650/5 Reciprocating Internal Combustion Water Cooled Engine.***

Manufactured by: Shandong Heavy Industry India Pvt. Ltd. (Baudouin India), Pune, India.

Reference Standard: BS-5514 / ISO 3046



*Smart*

Ashutosh A. Smart  
AGM-Technical department  
SHIG India Limited  
Plot no. 280,281, Phase -II, Hinjawadi, Pune-411057



1	Product Description	Engine Make-Baudouin Model-12M33G1650/5 Rating-1810 BHP@1500(1350kWm@1500) Features-12 Cylinder "V" type, Turbocharged, Aftercooled water cooled
2	Self-Certification Details	Testing of Engine for 11 hours on 100% Load and 1 hour on 10% Overload Fuel Consumption: 149.3 gm/bhp/hr Lub Oil Consumption: 0.018 Lit/hr
3	Reference Standard	Engine testing conducted with reference to following standards: BS5514/ISO3046
4	Test Conducted At	SHIG India (Baudouin India), Pune
5	Test Date	3 feb 2021
6	Application	Generating Sets
7	Remarks	The engine running trials with the Engine coupled to Dynamometer. The test found satisfactory in accordance with above reference standards

For



Ashutosh A.Smart  
AGM-Technical department  
SHIG India Limited  
Plot no. 280,281, Phase -II, Hinjawadi, Pune-411057



Doc. No. : IMSF-DG-25  
 Rev No:05  
 Rev Date 01/04/2020  
 Prepared By : HOD  
 Approved By: Plant Head

STERLING GENERATORS PVT. LTD.

Silvassa

TEST REPORT



Customer Name :- M/s. GOLDEN TOWER INFRATECH PVT.LTD

Description	Engine	Alternator	DG Controller	DG Set
Make	Baudouin	Stamford	DSE	SGPL
Model	12M33G1650/5	STL1D -C41	8610	SGB1500PR
Rating	1450KW	1500 KVA		1500 KVA
Sr.No.	M3922S00061	N22J415166		-

Ambient Temp. : 35.4 C  
 Rated Voltage : 415 V  
 Rated Speed : 1500RPM  
 Cooling System : Heat Exchanger

Load build up test on resistive load bank (Unity power factor)

Load %	Duration (Min)	VOLTAGE (L TO L)			CURRENT			Frequency HZ	Lube oil Pressure (bar)	Coolant Temp. °C	Speed RPM	Load KW
		RY	YB	BR	R	Y	B					
0	5	417	417	418	0	0	0	50.0	6.10	66	1500	0
30	15	417	417	418	520	540	510	50.0	5.88	77	1500	374
50	15	417	416	417	830	820	850	50.0	5.68	77	1500	602
75	30	417	418	417	1250	1250	1280	50.0	5.60	77	1500	904
100	660	417	417	417	1660	1640	1700	50.0	5.44	78	1500	1201
		417	417	417	1660	1640	1700	50.0	5.44	78	1500	1201
		416	417	416	1660	1640	1700	50.0	5.28	78	1500	1201
		416	416	416	1660	1640	1700	50.0	5.24	78	1500	1203
		417	417	417	1660	1640	1700	50.0	5.24	78	1500	1201
		416	416	416	1660	1640	1700	50.0	5.24	78	1500	1203
		416	416	416	1660	1640	1700	50.0	5.24	78	1500	1203
		416	416	416	1660	1640	1700	50.0	5.24	78	1500	1203
		416	416	416	1660	1640	1700	50.0	5.24	78	1500	1203
		416	416	416	1660	1640	1700	50.0	5.24	78	1500	1203
110	60	416	417	418	1860	1810	1840	50.0	5.2	79	1500	1322

Start Time : 14.00  
 Stop Time : 3.05

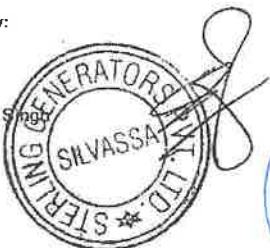
No Load Voltage : 417  
 Full Load Voltage : 416

No Load RPM : 1500  
 Full Load RPM : 1500

Note: DG set technically cleared for dispatch

Tested By:

Sangram Singh  
 SGPL



Witness By:

Mr. J.Praveen Kumar  
 NSL Infratech

*J. Praveen Kumar*  
 21/11/2022



Date of Testing/Inspection : 28.11.2022 & 29.11.2022



TRAFFIC STUDY  
PROPOSED MAX HOSPITAL  
SECTOR 56 GURUGRAM

Environment Clearance Traffic Report

07.06.2024

*“What is good for our customers is also, in the long run good for us”  
- Ingvar Kamprad*

---

**Document Control Sheet**

<b>Submission Stage</b>	Environment Clearance Traffic Report
<b>Status</b>	Final
<b>Date of Submission</b>	07.06.2024
<b>Submission Version</b>	R1
<b>Prepared By</b>	SA
<b>Reviewed By</b>	SM

---



357 SFS Flats Phase-IV Ashok Vihar  
Delhi-110052  
Ph: 9818685823, 011-40523681  
Email: [sharad@unitrans.in](mailto:sharad@unitrans.in) , [info@unitrans.in](mailto:info@unitrans.in)  
w: [www.unitrans.in](http://www.unitrans.in)

# Contents

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1

Study Background

2

Proposed  
Infrastructure

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Existing Situation  
Analysis

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Proposed Site  
Details

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Demand  
Estimation

6

Key Issues/concerns  
and traffic  
management

7

Conclusion and  
Recommendations

# Section 1

## Study Background

- 1 Key Site Facts
- 2 Study Area & Surroundings
- 3 Existing Public Transport near the Site

# Study Background | Key Site Facts

Total Plot Area

**5.25** Acres (21,245.54 Sq. m)

**Total Hospital Beds** – 531

**Earlier Hospital Beds** – 289

**Increase in Beds** – 242

**Parking Required** – 712 ECS

**Parking Provided** – 783\* ECS

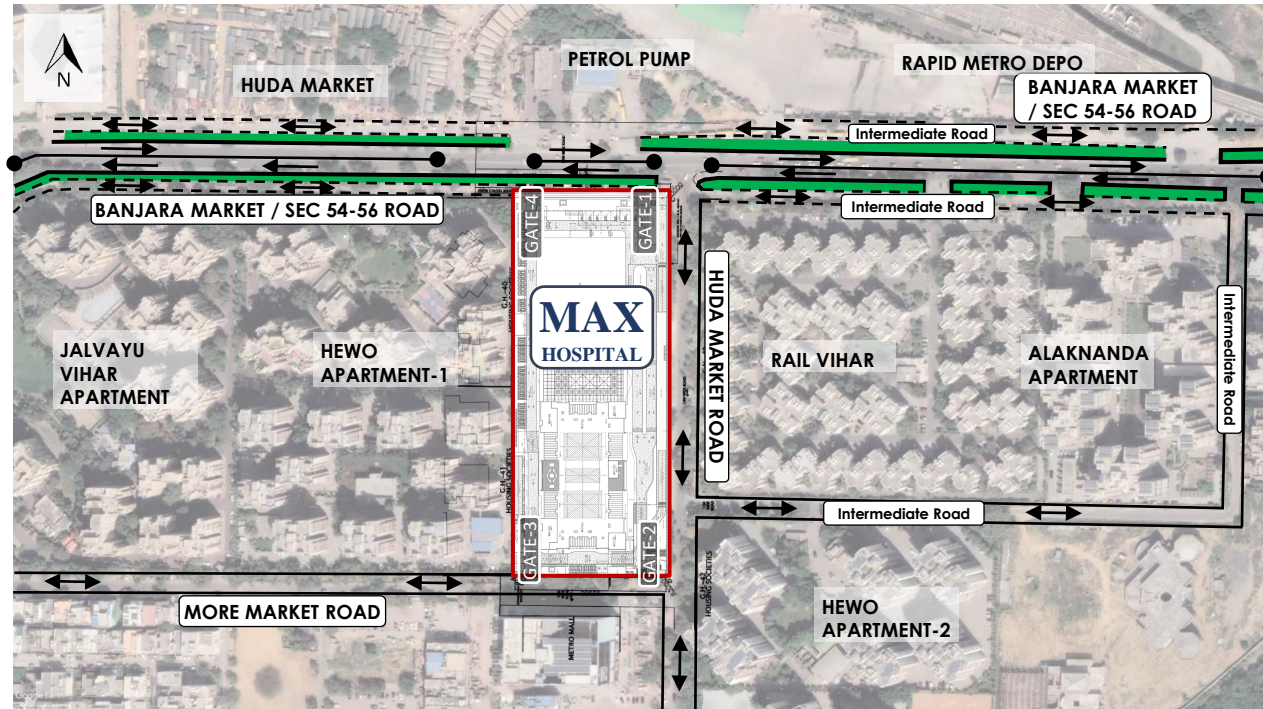
**Parking Provision** for Buses, Cars, TW

**Metro Station**

Sector 54 Metro Station (Rapid Metro) | 620 m

**Existing Project Site Access** –

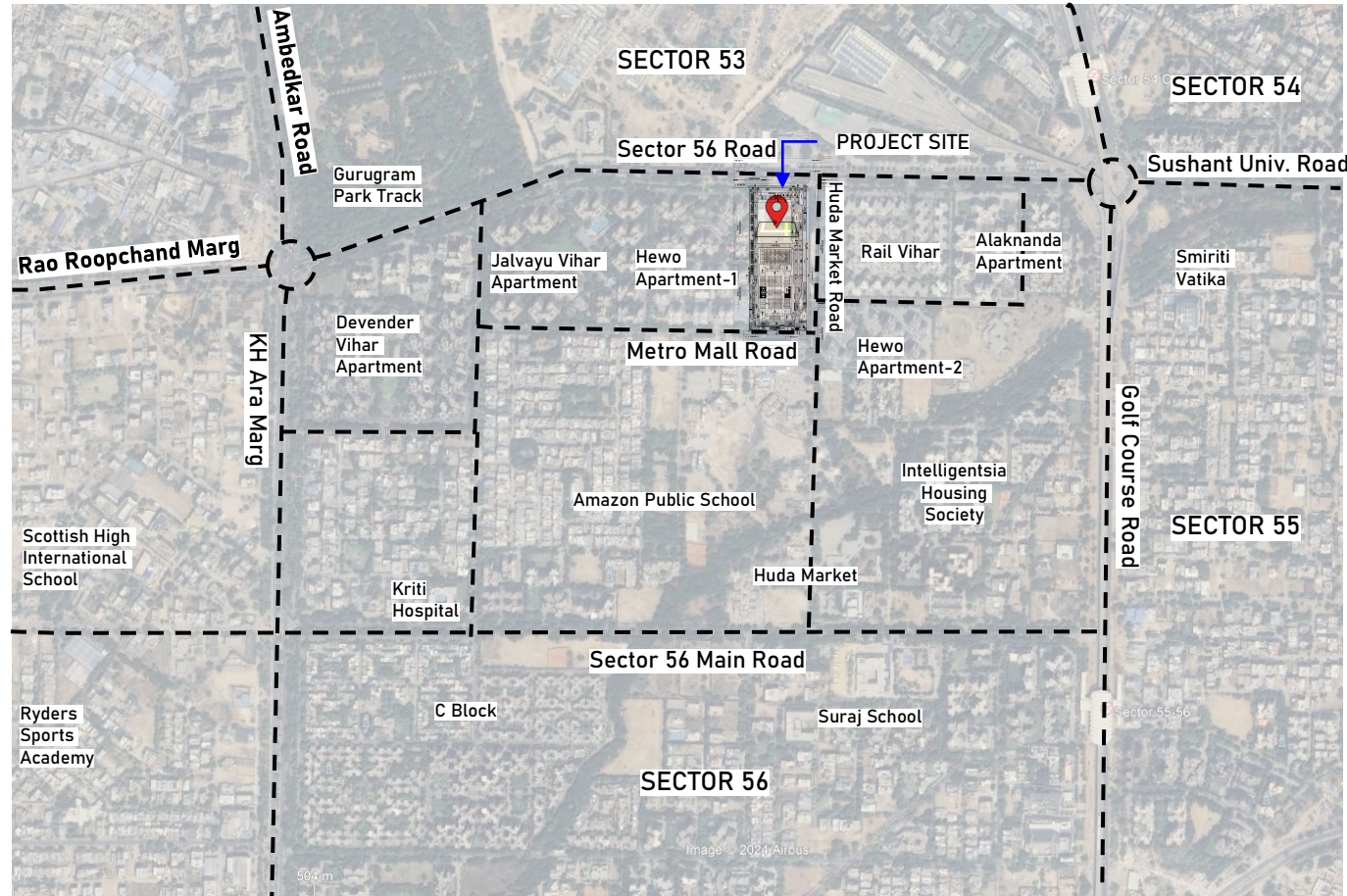
Sector 56 Road, Huda Market Road and More Market Road .



\*EV Parking – 142 ECS

# Study Area and Site Surroundings





- The proposed Max Hospital is located in Sector 56, Gurugram at a distance of 0.62 km from Rapid Metro Station Sector 54.
- The Site area is about 5.25 Acres (21245.56 sq. m)
- The Site can be accessed from 30 m wide Sector 56 Road and 18 m wide Huda Market Road.

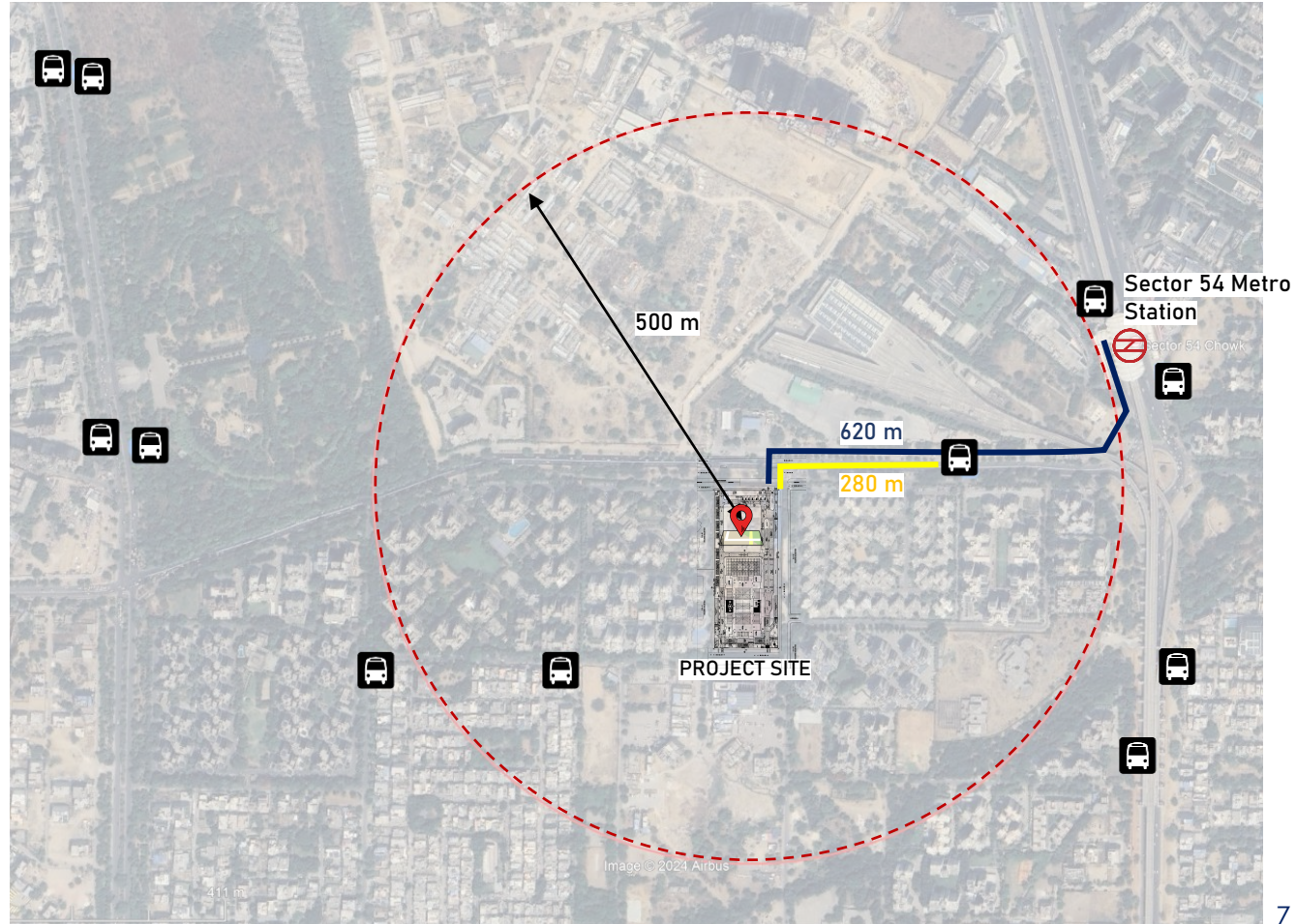


# Public Transport | Bus Stops and Metro Station



- The figure illustrates the public transport facilities in the 500 m radius of the project site.
- The Nearest bus stop lies at a distance of 280 m as highlighted in the figure.
- The Nearest Metro Station (Sector 54 Metro) lies at a distance of 620 m.

-  Bus Stops
-  Metro Station
-  Metro walking distance
-  Bus stop walking distance



## Section 2

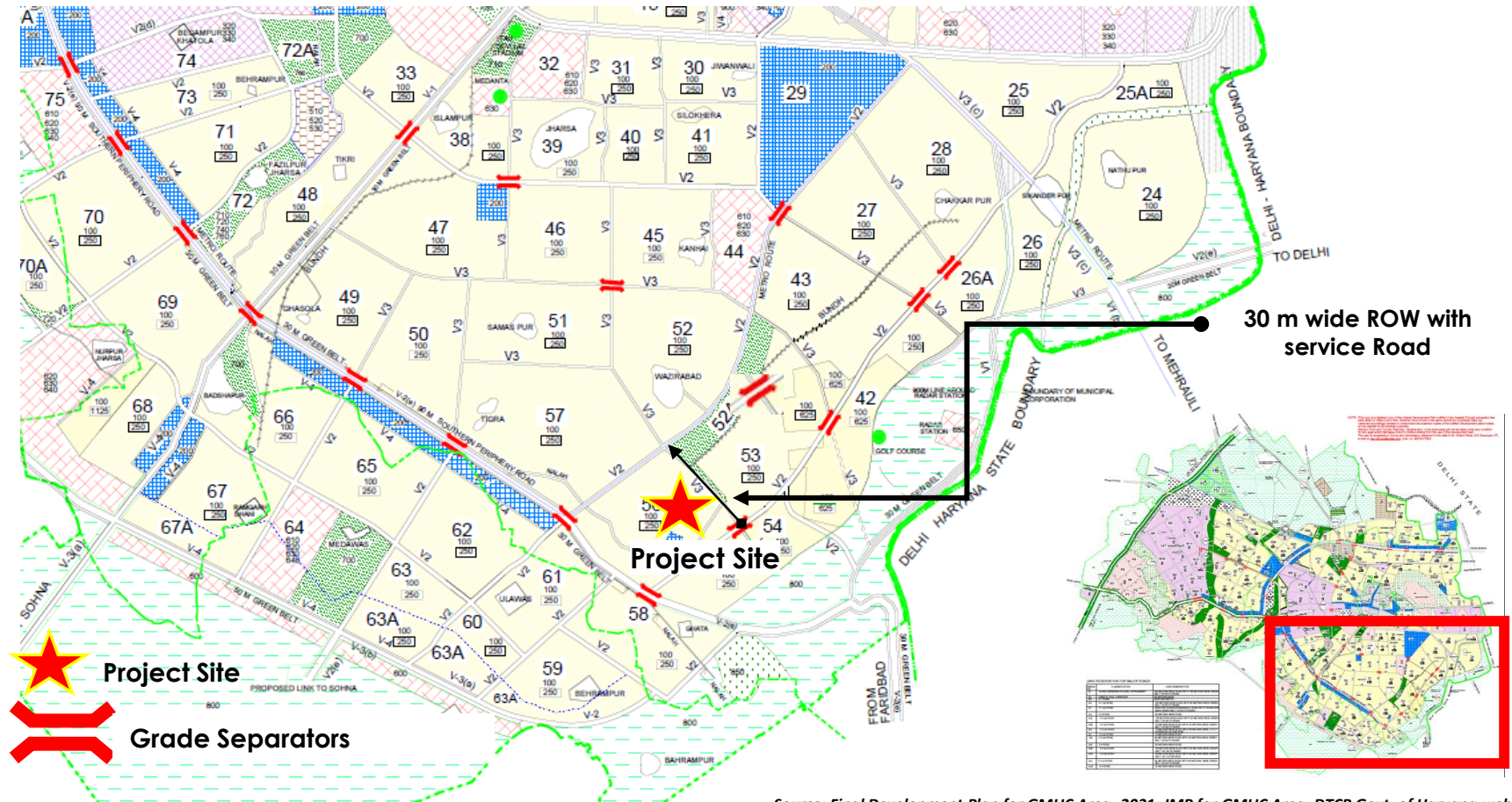
### Proposed Infrastructure



Grade Separators as per GMUC



# Site Location on GMUC Master Plan



## Section 3

### Existing Situation Analysis

1

Existing Access Roads

2

Existing Road Cross-sections

3

Primary Survey & Analysis

4

Existing LOS

# Existing Access Roads



1 SERVICE ROAD ADJACENT TO MAX HOSPITAL



2 BANJARA MARKET / SECTOR 54-56 ROAD



3 HEWOI APARTMENT ROAD



4 HUDA MARKET ROAD



5 MORE MARKET ROAD

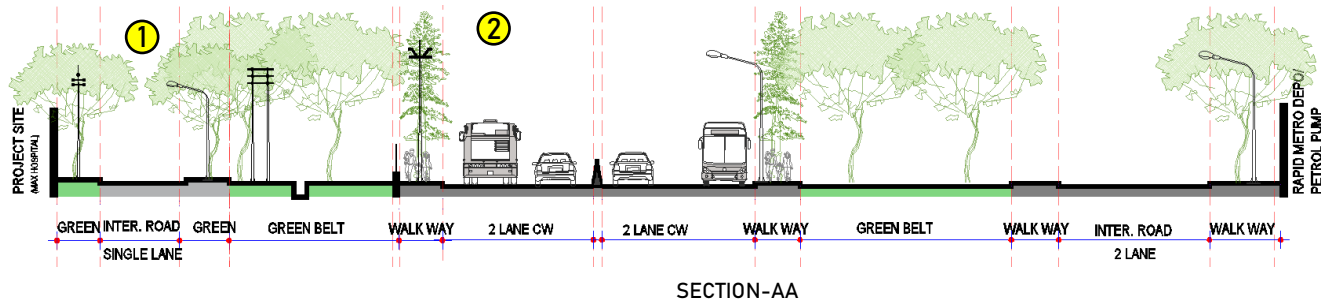
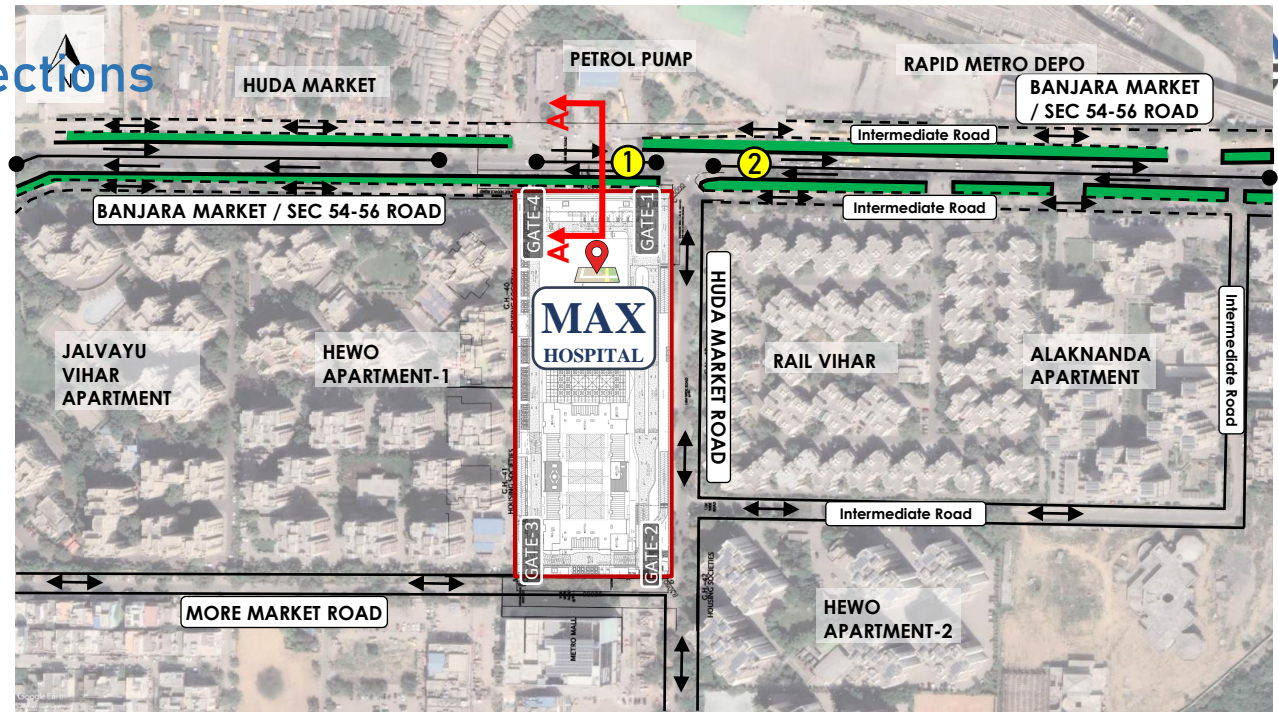
# Existing Road Cross-sections



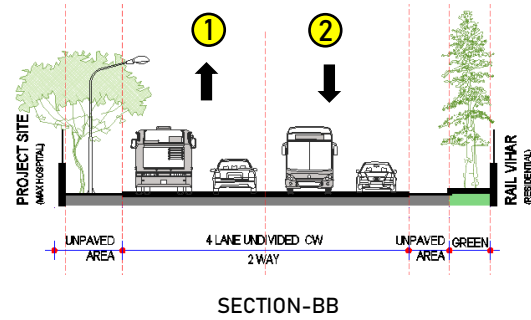
SERVICE ROAD ADJACENT TO MAX HOSPITAL



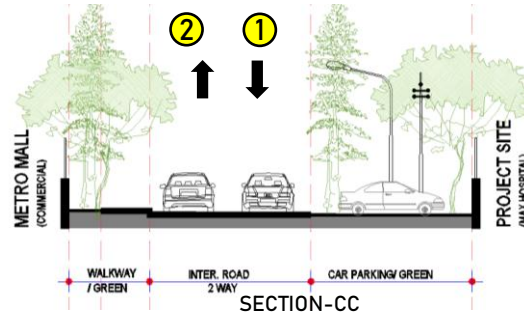
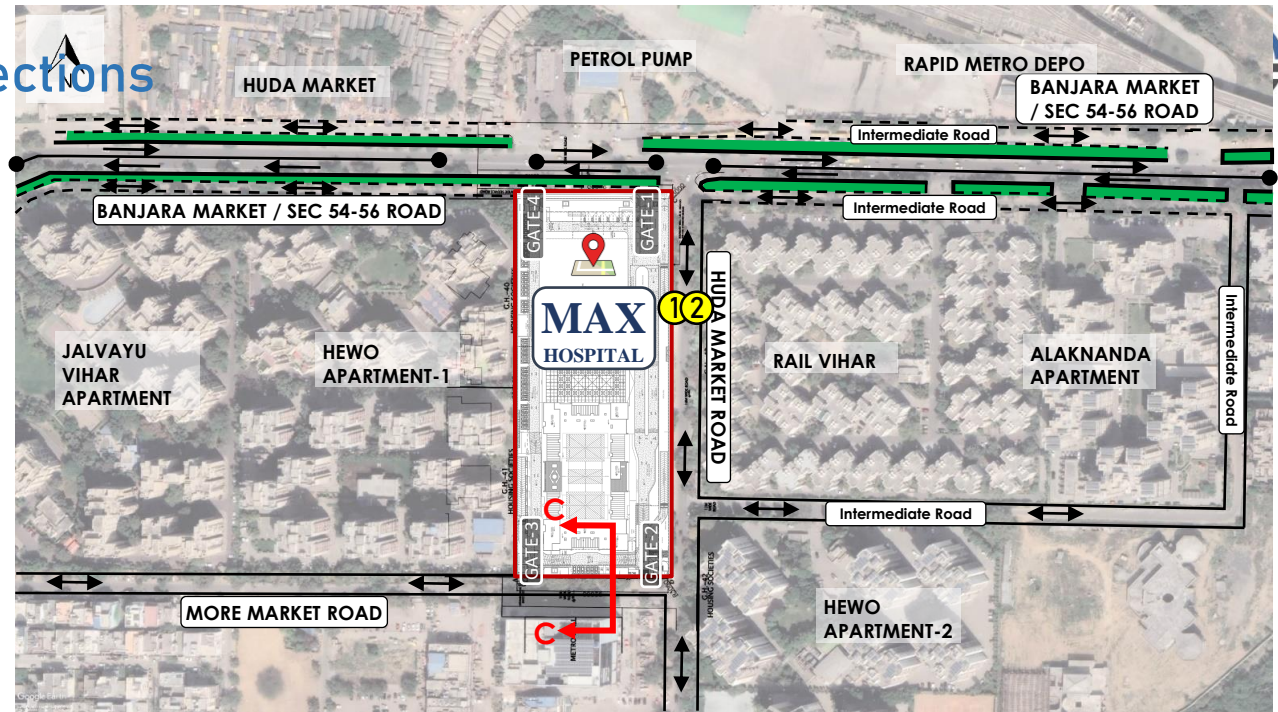
BANJARA MARKET / SECTOR 54-56 ROAD



# Existing Road Cross-sections



# Existing Road Cross-sections



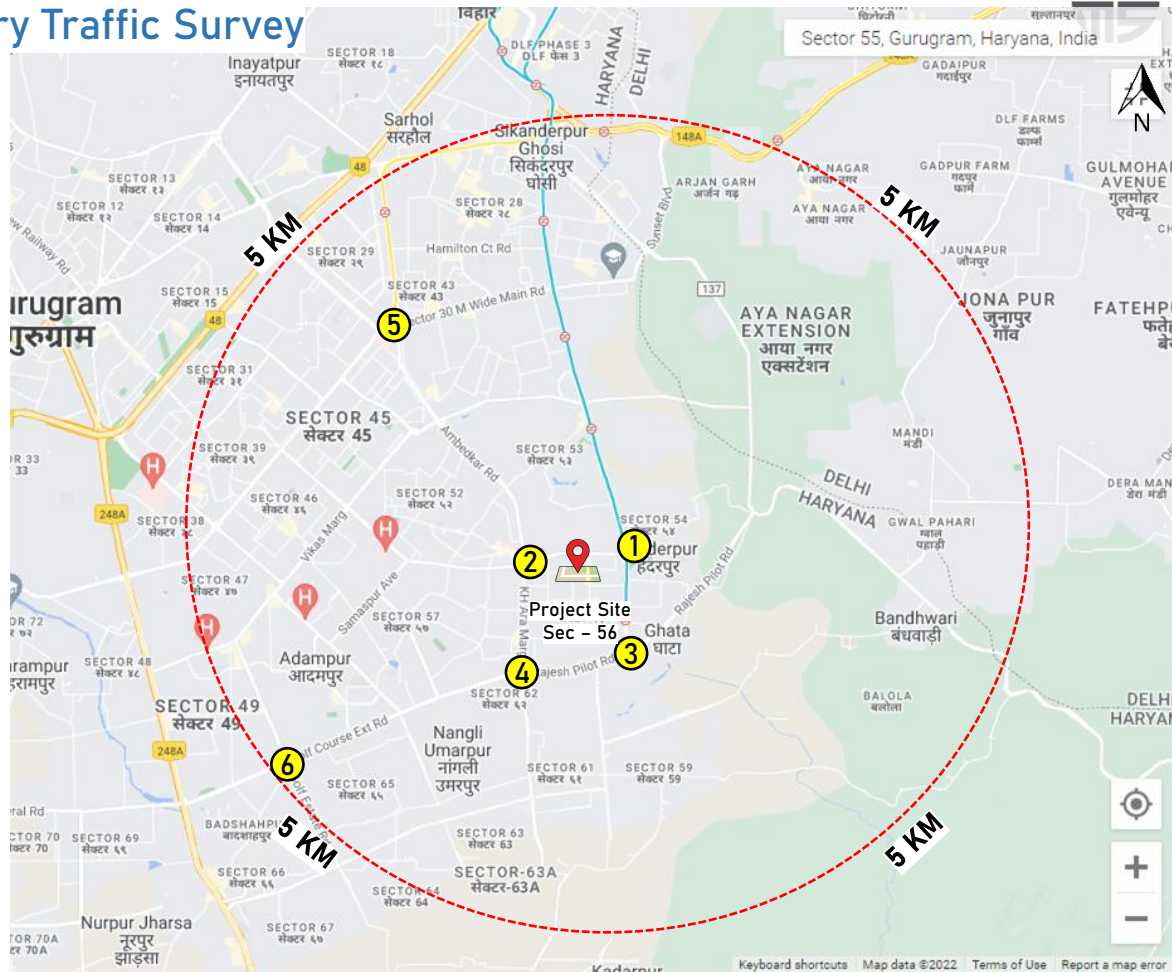
# Primary Traffic Detail | Primary Traffic Survey

Traffic surveys i.e. Turning movement count (TMC) and Traffic volume count (TVC) were conducted for the period of 16 hours at the identified locations, during weekend and weekday in the month of April 2024

Number	Location	Survey
1	AIT Chowk	Turning Count
2	Brigadier Osman Chowk	Turning Count
3	Ghata Road Junction	Turning Count
4	Rajesh Pilot Chowk	Turning Count
5	Huda CC Chowk	Turning Count
6	Sachin Chowk	Turning Count



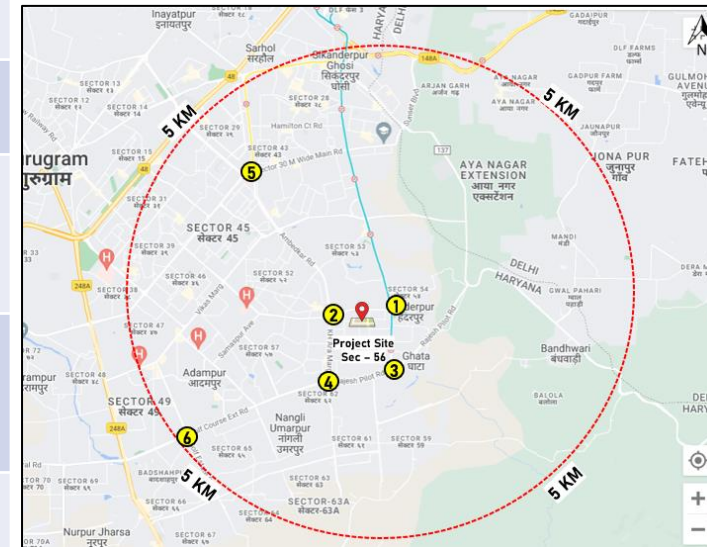
Project Site Sec - 56



# Primary Traffic Detail | Primary Traffic Survey

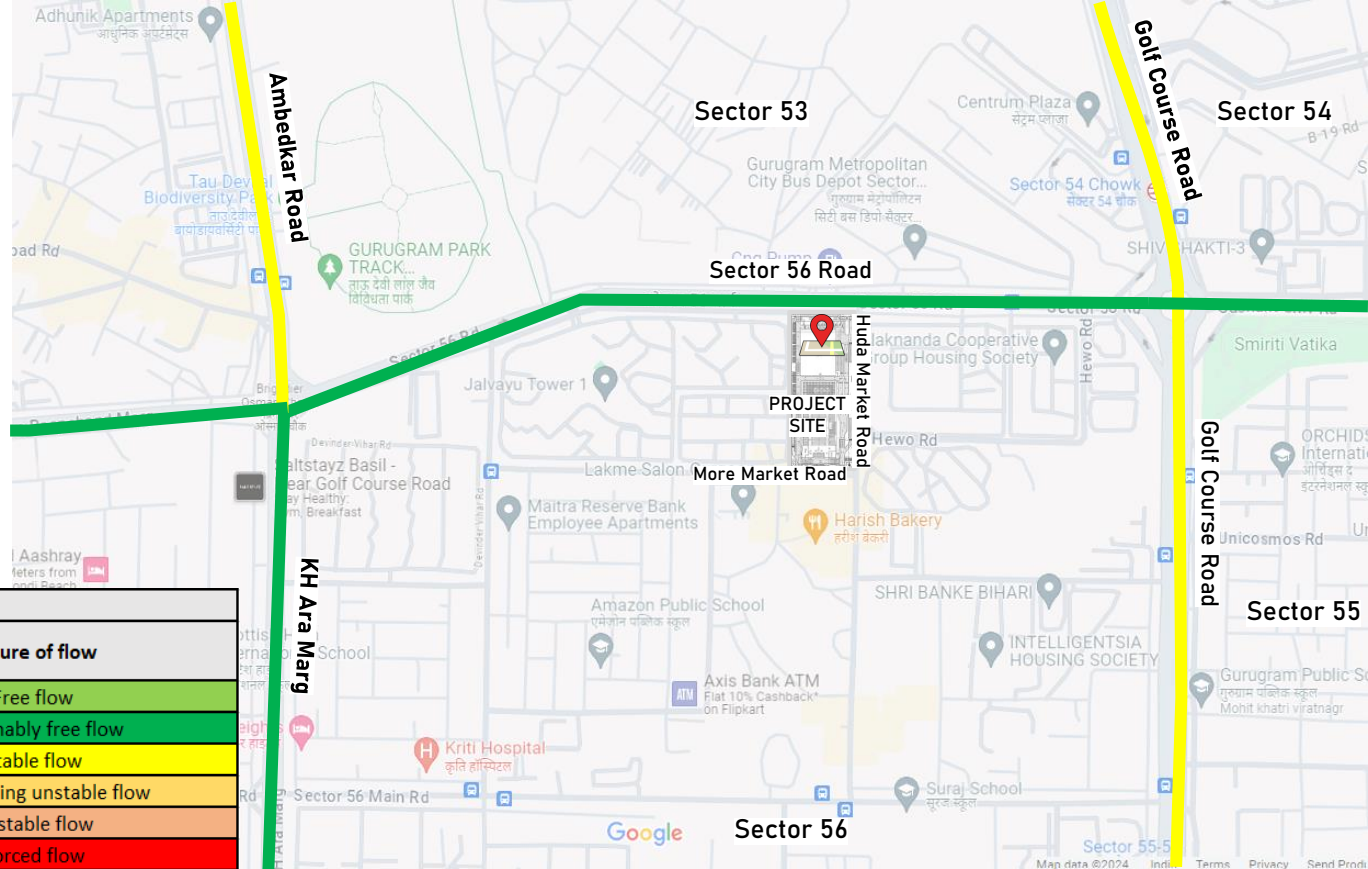
S. No.	Location	Morning Peak (PCU)	Evening Peak (PCU)
1	AIT Chowk	7187	7906
2	Brigadier Osman Chowk	11,237	12361
3	Ghata Road Junction	5675	5469
4	Rajesh Pilot Chowk	2610	2520
5	Huda CC Chowk	6377	6155
6	Sachin Chowk	5675	5469

- Share of Cars is maximum followed by two wheelers & taxi
- The PHF varies from 7.5% to 9.8%.
- The Morning Peak – 10 AM to 11 AM.
- The Evening Peak – 7 PM to 8 PM



# Level of Service I 2024

The project site main access road (Sector 56 Road) is presently operational at LOS 'B'.



Distinction of LOS		
Level of service	Volume/ Capacity Ratio	Nature of flow
A	<0.30	Free flow
B	0.30-0.50	Reasonably free flow
C	0.50-0.70	Stable flow
D	0.70-0.90	Approaching unstable flow
E	1	Unstable flow
F	>1.00	Forced flow

## Section 4

### Proposed Site Details

1

Site plan and proposed  
circulation

2

Key highlights of planned  
circulation

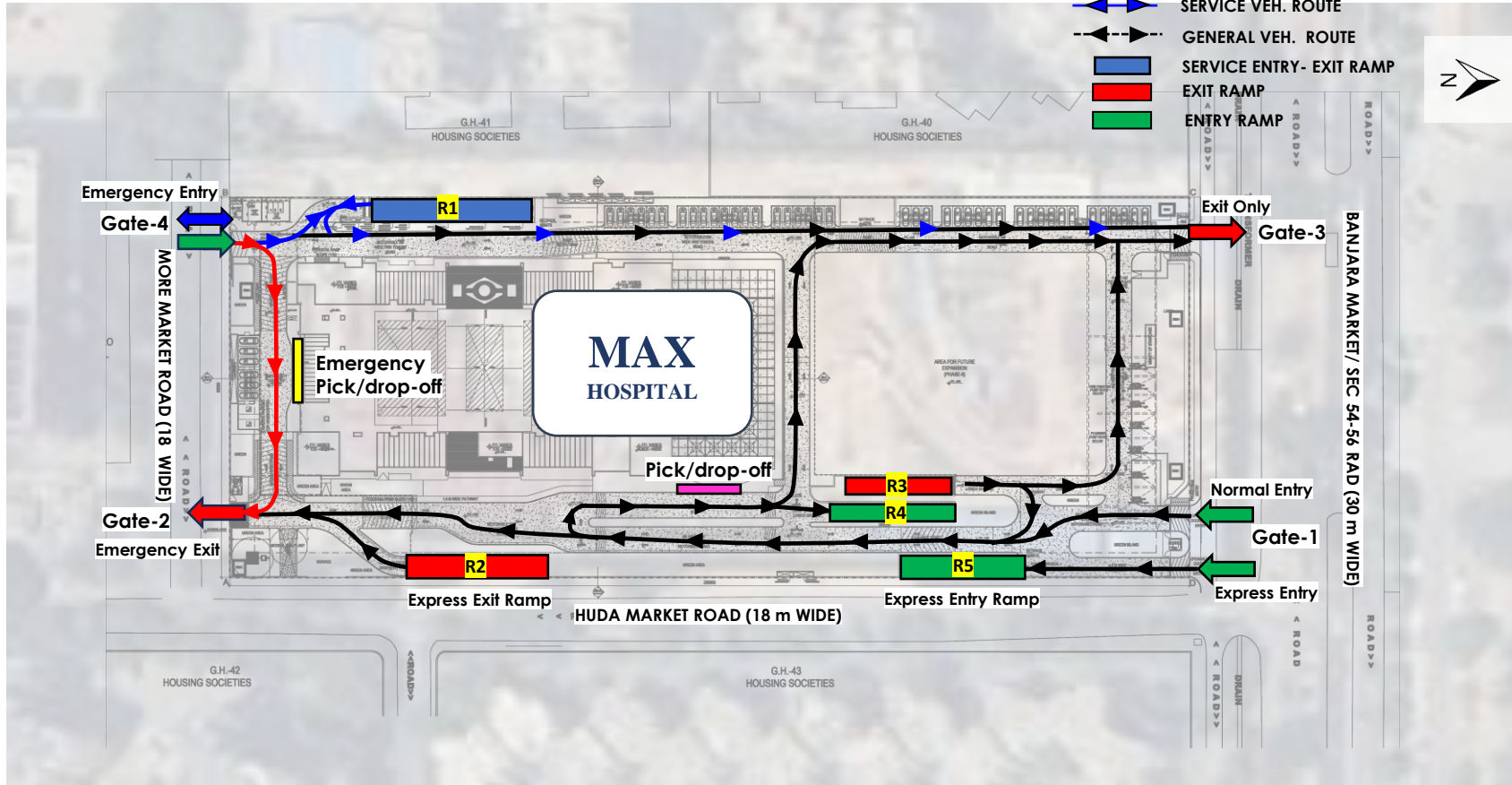
3

Inbound & Outbound Routing

# Site Plan and Site Circulation

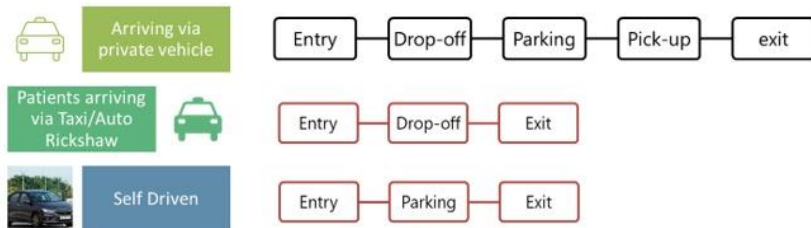


- ENTRY GATE
- EXIT GATE
- SERVICE ENTRY- EXIT GATE
- EMERGENCY VEH. ENTRY- EXIT
- SERVICE VEH. ROUTE
- GENERAL VEH. ROUTE
- SERVICE ENTRY- EXIT RAMP
- EXIT RAMP
- ENTRY RAMP

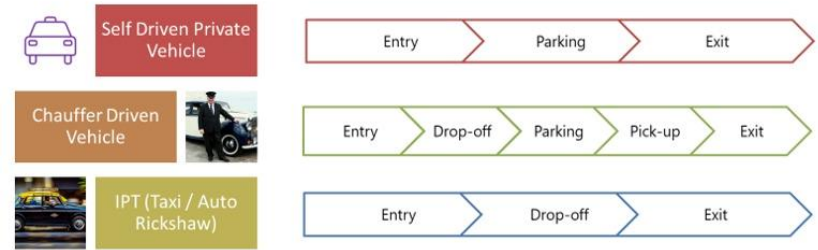


# Key Highlights of the Planned Circulation

- The traffic movement suffice the primary circulation nodes (entry > drop > parking / exit and parking exit > pickup > site exit)
- The pick and drop area usually experience congestion during OPD hours due to vehicle stop and patients / visitors spillover in the porch.
- The uni-directional movement of vehicular circulation to have channelized and smoother movement within the campus.
- The reduction in delay / congestion would improve the local site environment and reduce emissions.
- The planned circulation distributes the traffic to different gates but this might create congestion internally / at the access gates during the peak OPD hours.
- The express entry gate provided for users who directly want to go to basement parking. Express exit provided straight to go outside on the More Market Road.



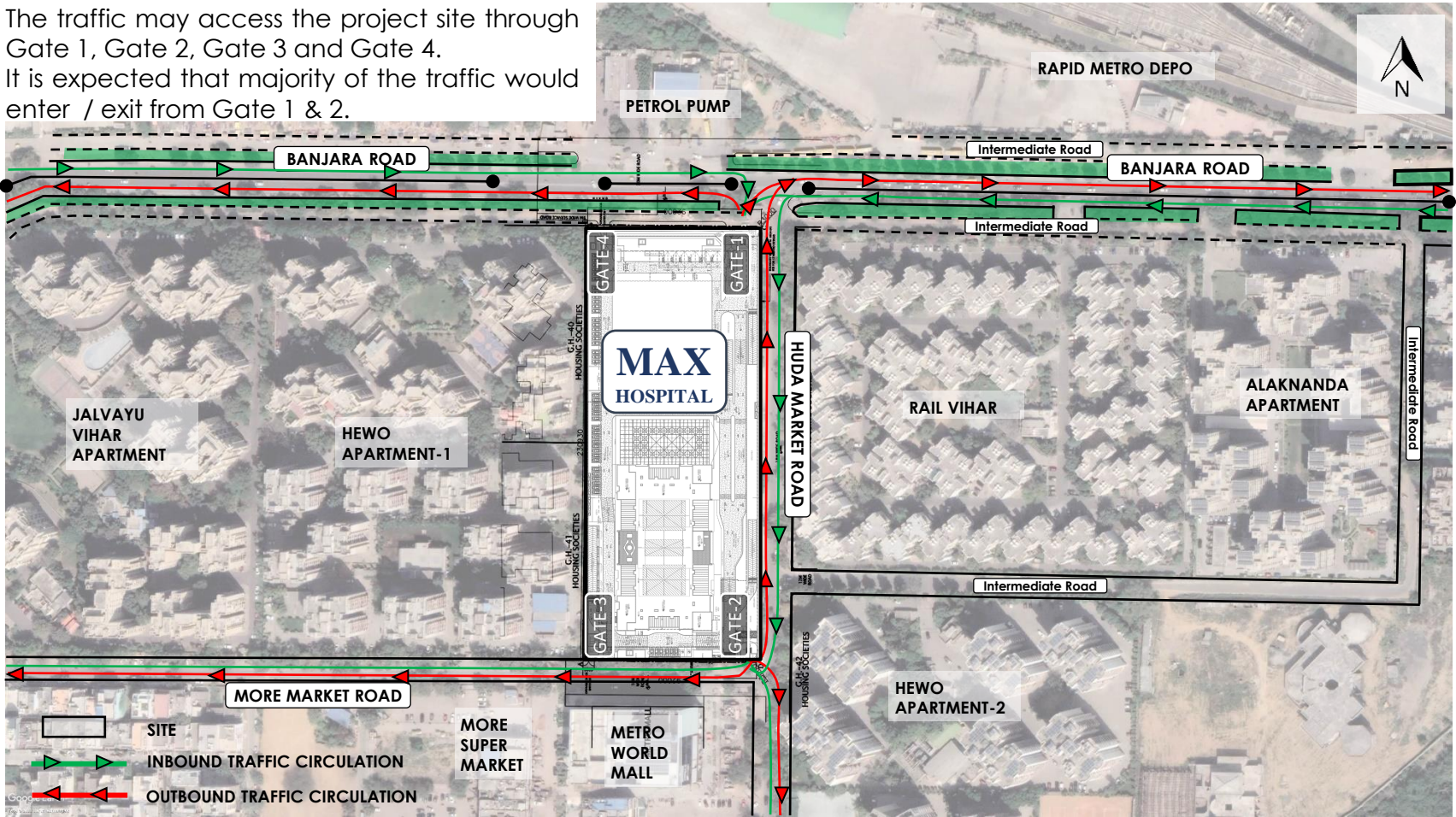
**Primary Circulation Nodes | Patients and Visitors**



**Primary Circulation Nodes | Doctors / Staff / Students**

# Inbound/Outbound Traffic Movement

- The traffic may access the project site through Gate 1, Gate 2, Gate 3 and Gate 4.
- It is expected that majority of the traffic would enter / exit from Gate 1 & 2.



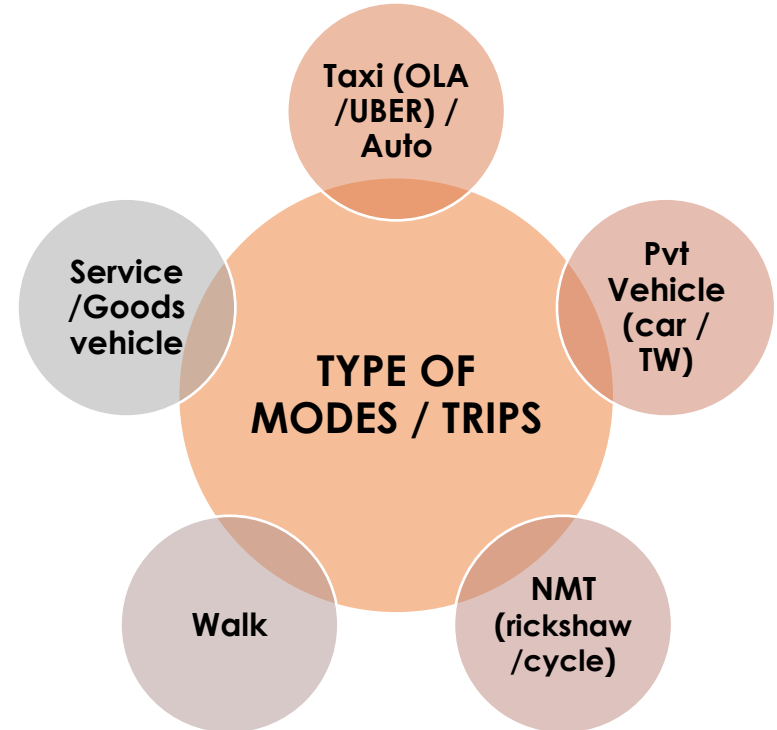
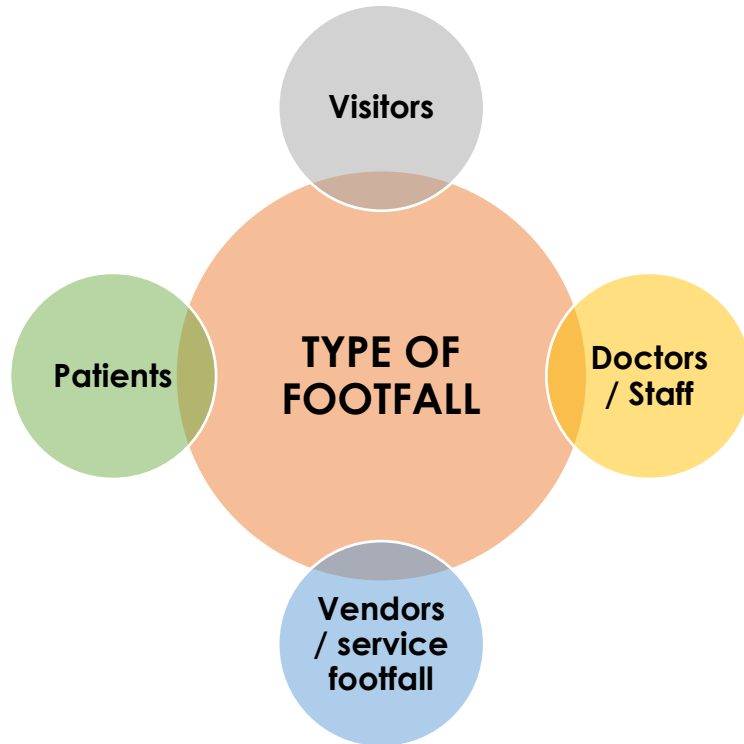
# Section 5

## Demand Estimation

- 1 Type of Footfall / Modes
- 2 Demand Estimation Methodology
- 3 Trip Rates based on similar studies
- 4 Peak hour Trips
- 5 LOS-2030

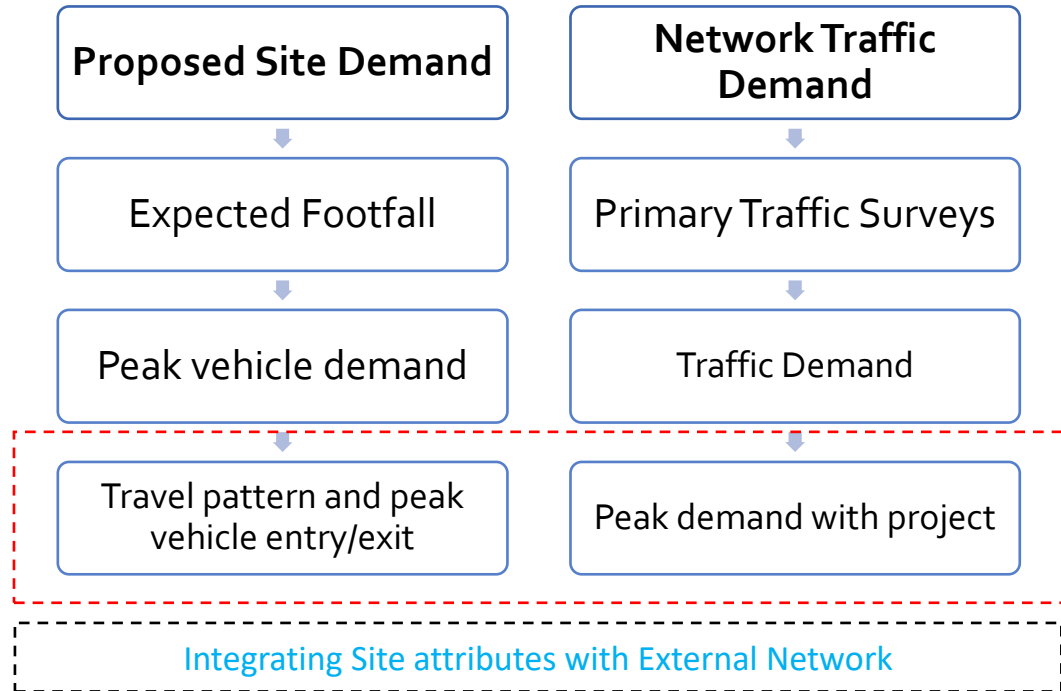
## Type of Footfall | Modes

Various type of footfall within the campus is expected. These would use different modes which would require channelised flow from the access gate, parking (basement / surface) and surface level external road configuration.



# Demand Estimation

It is important to understand the existing site /network level issues, limitations and opportunities to prepare the improvement schemes. The figure below shows the overall broad approach to the project.





## Trip Rates based on previous similar studies

Trip rates have been derived from the similar studies as shown in the table below. For the present site, the trip rate has been taken as an average rate derived from similar studies.

Hospital	Peak hour pax trips/bed	no. of beds	remarks
GTB Hospital	4.9	1500+	6000+ avg OPD footfall/day. High Trip rate. The sample has been excluded.
BLK Hospital	3.1	650+	similar nature of services and hospital
Gangaram Hospital	3.4	675+	similar nature of services and hospital
Fortis Shalimar Bagh	2.7	260+	similar nature of services and hospital
Fortis Huda City Centre	3.1	530+	similar nature of services and hospital

Source: Primary surveys Unitrans

**Average peak hour Trip rate/bed is 3.07** (excluded GTB Hospital)

# Demand Estimation | Peak Hour Trips

## Peak Hour Traffic Rate

Trip rate has been adopted considering the services offered by the proposed MAX hospital. The average peak hour Trip rate / bed has been **increased by 10%** with an assumption of increase in induced traffic.

**Peak hour trip rate / bed for the proposed hospital = 3.07**  
**Estimated peak hour trips @ 531 beds = 1630**

## Modal Share

The modal share has been estimated considering:

1. Case studies learnings and outputs
2. footfall typology,
3. catchment area,
4. mode available and
5. hospital services

Mode	% Share	Peak vehicular Trips
car	50%	326
TW	20%	217
taxi	14%	72
Auto	10%	82
E-rickshaw	5%	26
<b>Total</b>	<b>100%</b>	<b>723</b>

## Additional Traffic on Network | Peak Hour

**Additional Traffic in Peak Hour (entry + exit) Hospital = 723 vehicles**

**Total Peak Hour Entry Vehicles = 470 vehicles**

The estimated vehicle volumes has been distributed on network as per the access gates circulation.

Accordingly the planned circulation will be evaluated.

Mitigation measures considering the internal circulation and immediate access road shall be suggested (in case required.)

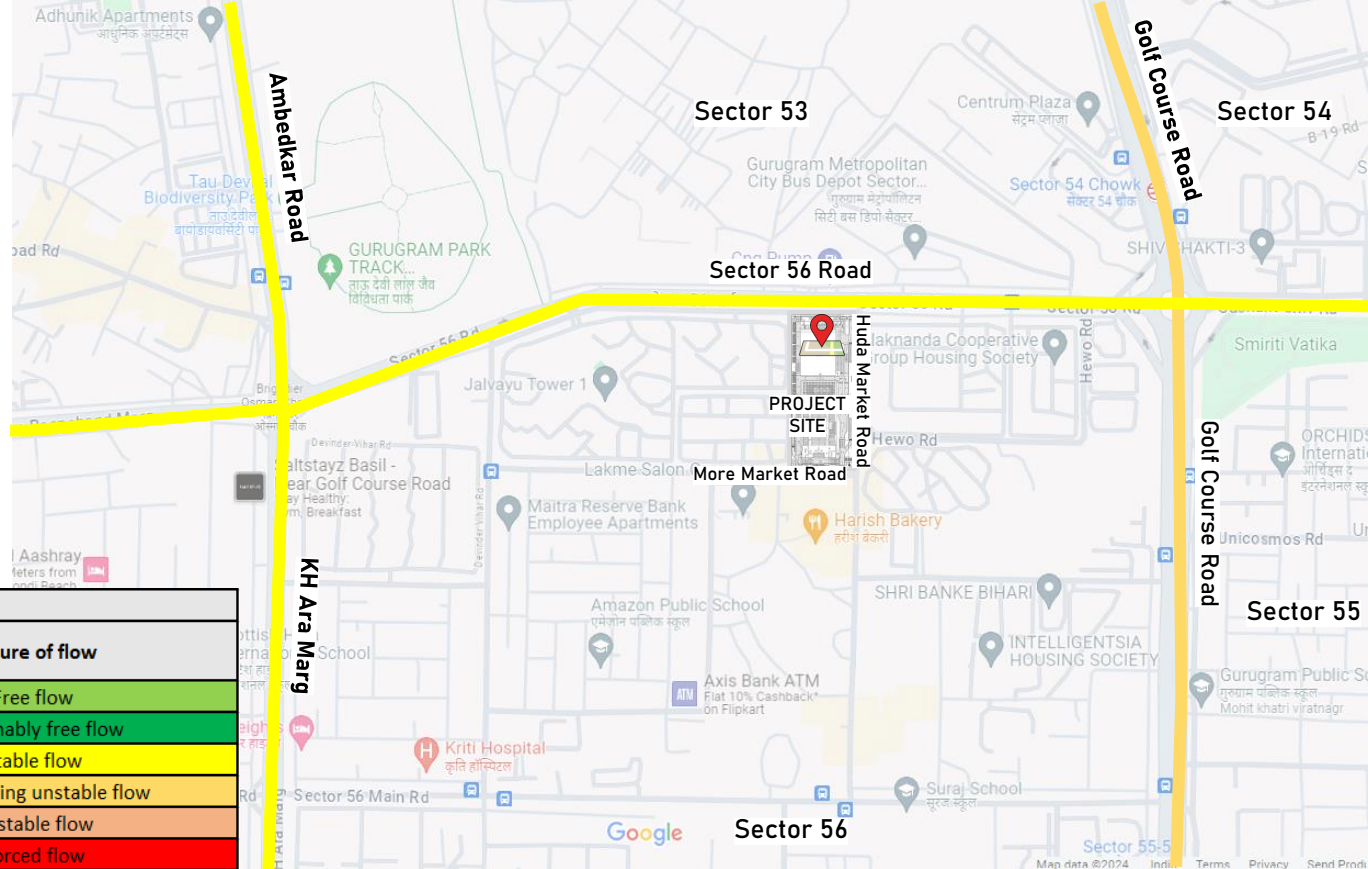
Mode	Peak Entry Traffic
Car	212
TW	141
Taxi	47
Auto	53
E-rickshaw	17
<b>Total</b>	<b>470</b>

} **247 ECS**

**NB):** The peak hour trips are expected during the OPD hours.

# Level of Service | 2030

The project site main access road (Sector 56 Road) would be operational at LOS 'C' in future, Which is considered as a stable traffic flow.



Distinction of LOS		
Level of service	Volume/ Capacity Ratio	Nature of flow
A	<0.30	Free flow
B	0.30-0.50	Reasonably free flow
C	0.50-0.70	Stable flow
D	0.70-0.90	Approaching unstable flow
E	1	Unstable flow
F	>1.00	Forced flow

## Section 6

### Key Issues / concerns

1

Key concerns, issues and  
suggestions

# Key Issues & Concerns | Traffic Management Plan

Sl. no.	Key concerns	Issues	Suggestions
1	Pedestrian access	Pedestrian access to site gates and within the site	Safe – convenient – continuous path from the main road / bus stop till the site gates. For safe pedestrian movement around and within the site, road markings / signages to be provided at/near the crossings.
2	Boom barrier / security check point / parking slip	Sufficient holding length would be required within the site to avoid any spillover on service road.	Security check to be done at entry gate and boom-barrier to be installed at basement level at a suitable location depending on the proper space. The boom barrier to be RFID / FasTag enabled for quick entries.
3	Valet Operations for Patients / visitors and doctors / staff	The Valet points to be strategically located near the pick/drop area.	The valet p/d point to be located on the main driveway / pick-drop porch for the doctors and patients / visitors.
4	Pick drop bays on service road for IPT	It is expected that the p/d activity would happen on the service road and proper facilities would be required to have designated spaces	The p/d bays can be planned in the service road area having parallel bay configuration depending on the space and suitability.
5	Median opening and geometric improvements	Conflict movements, bottlenecks and un-channelised flow	The divider and earthen portion in front of planned site access gate to be improved considering the geometrics and turnings.

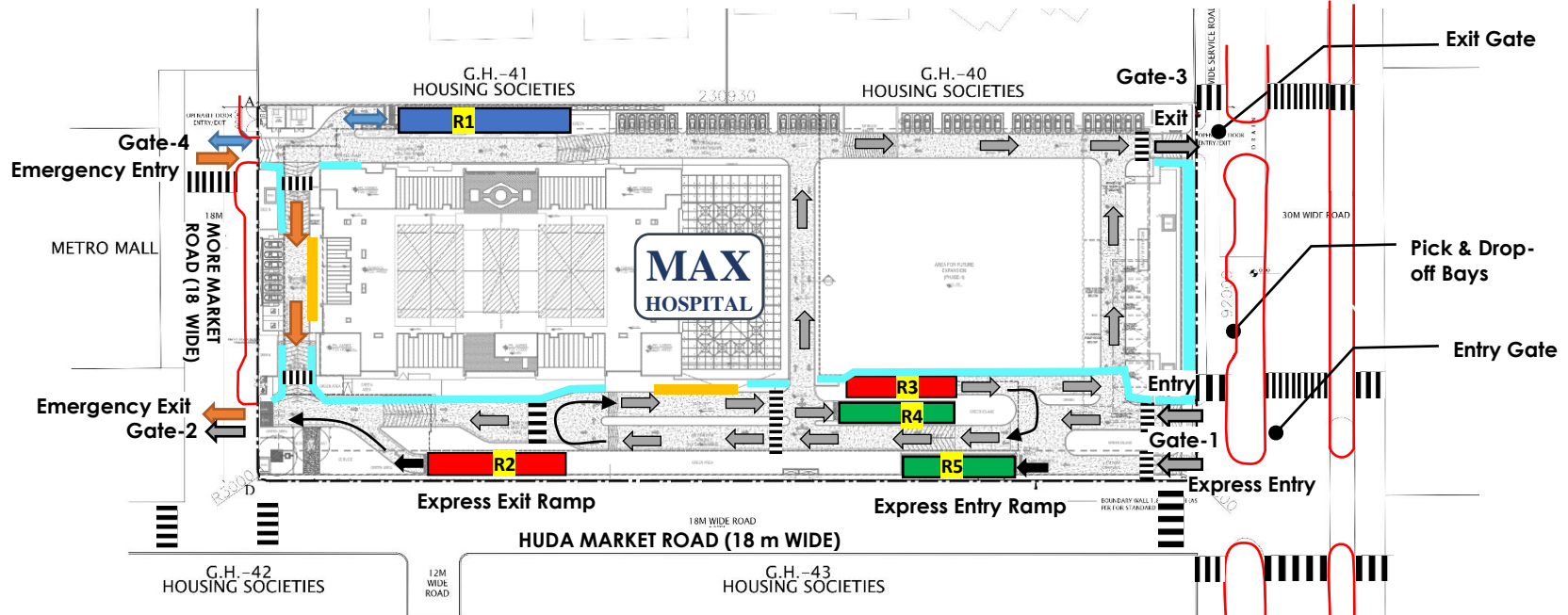
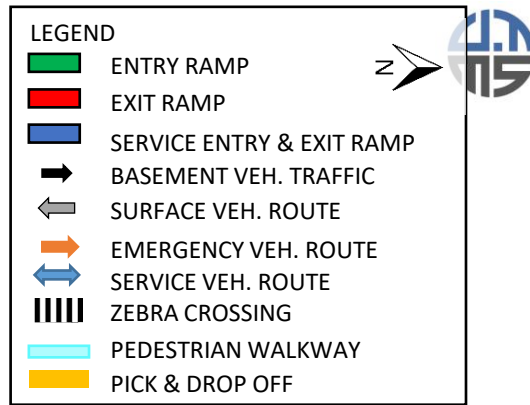
# Section 7

## Conclusions and Recommendations

- 1 Site circulation with suggested infrastructure
- 2 Site plan integrated with external network

# Site circulation with suggested infrastructure

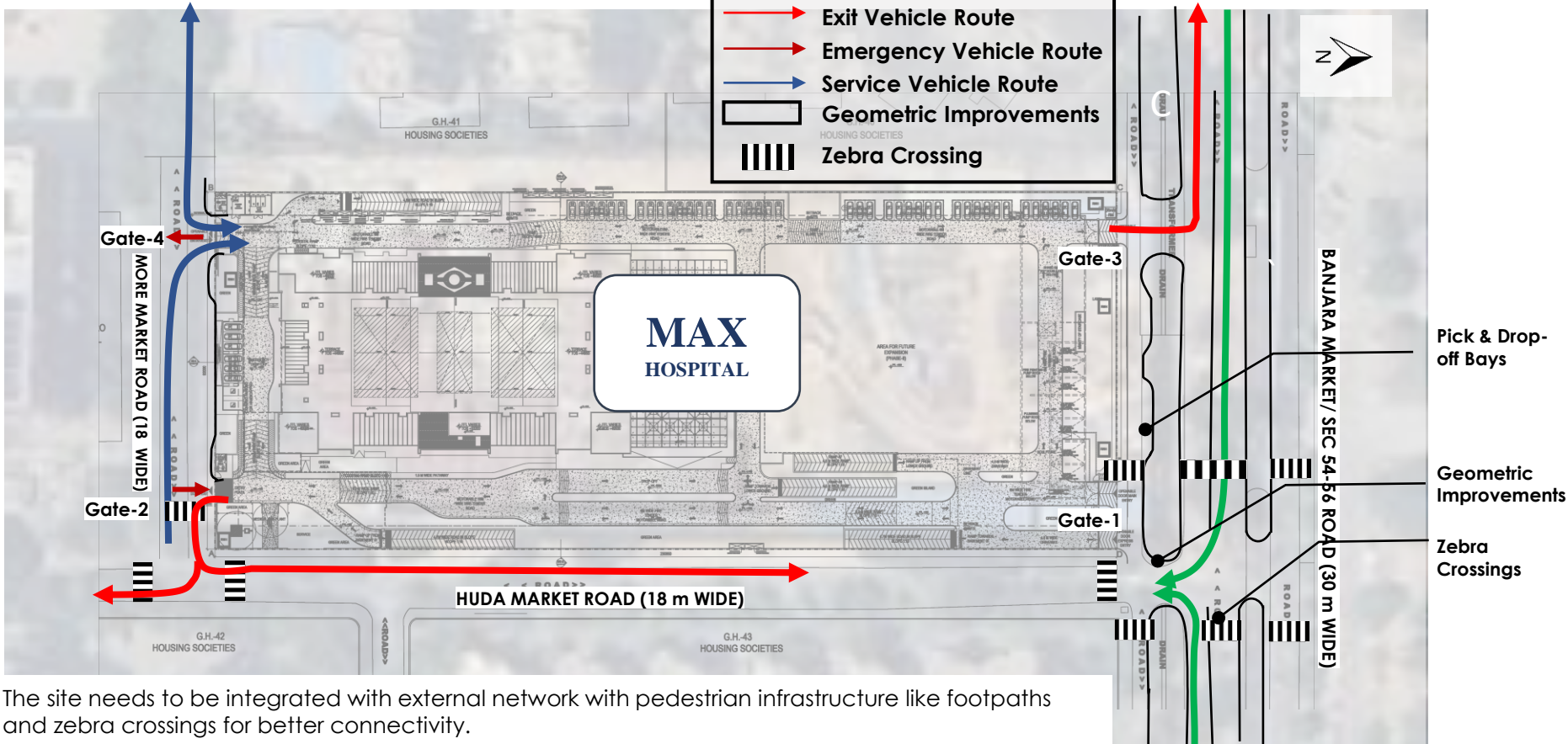
1. Geometric improvements are required at the entry and exit gates for smooth traffic movement.
2. Zebra crossings are to be provided for safety of pedestrians and road users.
3. Pick-up and drop-off bays are required for proper pick-up and drop-off facilities.
4. Speed to be controlled inside the site premises for safety purposes.



# Site Integrated with External N/W

**LEGEND**

- Entry Vehicle Route
- Exit Vehicle Route
- Emergency Vehicle Route
- Service Vehicle Route
- Geometric Improvements
- Zebra Crossing



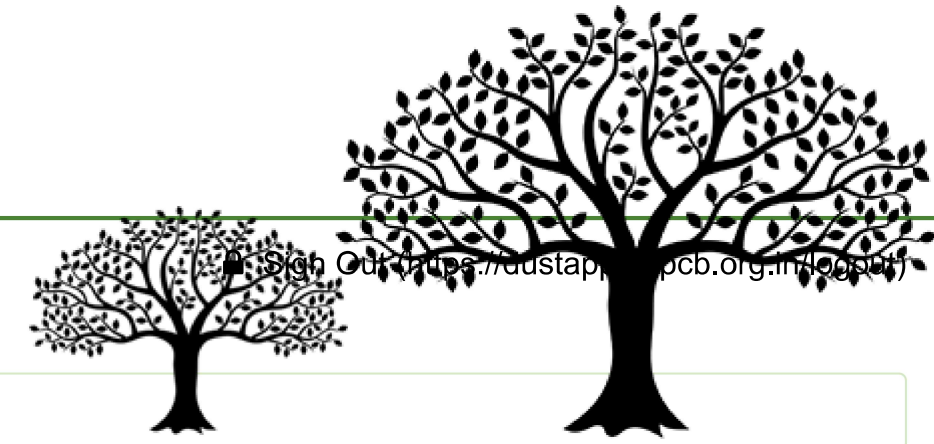
The site needs to be integrated with external network with pedestrian infrastructure like footpaths and zebra crossings for better connectivity.



**Dashboard**  
(<https://dustapp.hspcb.org>)



# Dust Pollution Control Self Assessment, HSPCB



Welcome User Id: AHLUWALIA CONTRACTS (INDIA) LTD.

Submit Successfully

Sr.No	Field	Select	Status of Compliance	Attach document and Photo	Mandatory / Desired
1	2	3	4	5	6
1	Whether PM2.5& PM10.0 sensors installed at project site?	Yes ▾	An Outdoor Ambient Air Quality Monitoring System has been	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760534050.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760534050.jpg</a> )	Mandatory
2	Whether continuous dust/wind breaking walls, tarpaulin or green-net, wind-fencing or scaffolding sheet of appropriate height have been provided around the periphery of the construction site and also tarpaulin or green-net on scaffolding around the area under-construction and the building?	Yes ▾	Barricading have been installed around the project site periphery and	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760534061.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760534061.jpg</a> )	Mandatory
3	Whether building material is covered during transportation?	Yes ▾	To comply with this point the loose construction materials have	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760534070.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760534070.jpg</a> )	Mandatory
4	Whether Anti-Smog Gun(s) has been installed at the construction site?	Yes ▾	Loose soil sand construction and demolition waste or any other	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760534085.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760534085.jpg</a> )	Mandatory



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Sr.No	Field	Select	Status of Compliance	Attach document and Photo	Mandatory / Desired
5	Whether wind fences/screens and/or enclosures/coverings for storage piles being utilized? No loose soil or sand or construction & Demolition Waste or any other construction material that causes dust shall be left uncovered.	Yes ▾	Loose soil sand construction and demolition waste or any other	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760534095.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760534095.jpg</a> )	Mandatory
6	Whether no grinding and cutting of building materials in open area and wet-jet is being used ?	Yes ▾	To comply this point Grinding and cutting of building materials not	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760534111.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760534111.jpg</a> )	Mandatory
7	Whether unpaved surfaces and areas with loose soil are adequately sprinkled with water to suppress dust? Ideally site to be fitted with fine water spraying nozzle system?	Yes ▾	Unpaved surfaces are being sprinkled with a tanker supply	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760534124.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760534124.jpg</a> )	Mandatory
8	Whether all vehicles including carrying construction material and construction debris of any kind cleaned and wheels / under body washed before leaving the construction site?	Yes ▾	We have provided the wheel wash facility at the project site during	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760534139.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760534139.jpg</a> )	Mandatory
9	Whether DG set installed (with acoustic enclosure & stack height)?	Yes ▾	Electricity connection has been already been obtained from	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760534158.pdf">https://dustapp.hspcb.org.in/storage/app/file/File-1760534158.pdf</a> )	Mandatory

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Sr.No	Field	Select	Status of Compliance	Attach document and Photo	Mandatory / Desired
10	Whether video-fencing with remote connectivity installed at project site?	Yes ▾	A video camera has been installed at the site We are also in the	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760534166.jpeg">https://dustapp.hspcb.org.in/storage/app/file/File-1760534166.jpeg</a> )	Mandatory
11	Whether proper collection, segregation, disposal& recycling of C&D Waste is ensured and due log book of the same is maintained?	Yes ▾	We have done the tie up with the C and D waste processing facility	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760534275.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760534275.jpg</a> )	Mandatory
12	Whether mixing processes is carried out in enclosures?	Yes ▾	Mixing activity is not required in our case we are bringing	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760534186.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760534186.jpg</a> )	Mandatory
13	Whether steps have been taken to ensure that debris/ construction material is not dumped in public roads/ undesignated sites?	Yes ▾	No loose construction material and debris is being	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760534196.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760534196.jpg</a> )	Mandatory
14	Whether dust mitigation measures be displayed prominently at the construction site for easy public viewing?	Yes ▾	We have displayed the dust mitigation measures on	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760534213.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760534213.jpg</a> )	Mandatory

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Sr.No	Field	Select	Status of Compliance	Attach document and Photo	Mandatory / Desired
15	Whether roads leading to or at construction sites are paved and blacktopped i.e., metallic roads?	Yes ▾	Roads leading to or at construction site are blacktopped and	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760535373.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760535373.jpg</a> )	Mandatory
16	Whether options employed for C&D waste recycling?	Yes ▾	We have done the tie up with the C and D waste processing facility	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760535387.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760535387.jpg</a> )	Desired
17	Whether every worker working on the construction site and involved in loading, unloading and carriage of construction material and construction debris are provided with dust-mask to prevent inhalation of dust particles?	Yes ▾	We are complying this point and every worker working on the	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760535451.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760535451.jpg</a> )	Desired
18	Whether arrangement provided for medical help, investigation and treatment to workers involved in the construction of building and carry of construction material and debris relatable to dust emission?	Yes ▾	We have established a medical facility at the project site to	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760535492.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760535492.jpg</a> )	Desired
19	Whether material drop height is minimized at the transfer point and enclosure around transfer point provided?	Yes ▾	To comply this point we are utilizing a tower crane to minimize	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760535923.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760535923.jpg</a> )	Desired

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Sr.No	Field	Select	Status of Compliance	Attach document and Photo	Mandatory / Desired
20	Whether designing layout of the construction site to minimize fugitive dust generation potential, including access roads, entrances and exits, storage piles, vehicle staging areas, and other potential sources of dust emissions.	Yes ▾	The logistic layout plan has been exhibited at the project site	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760535928.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760535928.jpg</a> )	Desired
21	Whether pre-fabricated materials and modular construction units are being used?	Yes ▾	We are using AAC blocks in construction work	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760535938.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760535938.jpg</a> )	Desired
22	Whether proper shape storage piles provided so that they do not have steep sides or faces?	Yes ▾	We are complying with this requirement and we are provided	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760538569.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760538569.jpg</a> )	Desired
23	Whether stabilized earthworks with stone / soil / geotextiles / Vegetation / compacting?	Yes ▾	We are conducting soil compacting and have installed D	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760538579.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760538579.jpg</a> )	Desired
24	Whether Anti-Smog Gun has been installed at the construction site?	Yes ▾	Our site has a builtup area of over 20000 square meters	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760538596.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760538596.jpg</a> )	Desired

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Sr.No	Field	Select	Status of Compliance	Attach document and Photo	Mandatory / Desired
25	Whether roads leading to or at construction sites are paved and blacktopped i.e. metallic roads?	Yes ▾	Roads leading to the project site or at construction site has been	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760538605.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760538605.jpg</a> )	Desired
26	Whether treated water is used to mitigate dust & wet process for Sand and grit blasting and facade cleaning generation on construction site?	Yes ▾	We are utilizing treated water at the construction site to mitigate	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760538639.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760538639.jpg</a> )	Desired
27	Whether dust suppressants are being used?	No ▾	At present we are using only treated water as a dust suppressant	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760538649.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760538649.jpg</a> )	Desired
28	Whether distances travelled for delivery of materials minimized?	Yes ▾	The most of the Raw Material is being purchased from the nearby	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760538957.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760538957.jpg</a> )	Desired
29	Whether vehicles used for transport of materials have valid PUC certificate?	Yes ▾	We are ensuring at the gate entry that vehicle carrying	Choose File No file chosen... Upload ✓ View ( <a href="https://dustapp.hspcb.org.in/storage/app/file/File-1760538990.jpg">https://dustapp.hspcb.org.in/storage/app/file/File-1760538990.jpg</a> )	Desired

DDO Code: 0362		E - CHALLAN Government of Haryana		Candidate Copy
Valid Upto:	15-05-2025 (Cash)	*0132027551*		
	09-05-2025 (Chq./DD)			
GRN No.:	0132027551	Date:	08 May 2025 16:19:09	
Office Name:	0362-TEHSILDAR PATAUDI			
Treasury:	Pataudi			
Period:	(2025-26) One Time			
Head of Account		Amount ₹		
0030-03-104-97-51 Pasting Fees		5		
0030-03-104-99-51 Fees for Registration		25000		
PD AcNo	0			
Deduction Amount:	₹	0		
Total/Net Amount:	₹	25005		
₹ Twenty Five Thousands Five Rupees				
Tenderer's Detail				
GPF/PRAN/TIN/Actt. no./VehicleNo/TaxId:-				
PAN No: AADCM0815B				
Tenderer's Name: Max Healthcare Institute Limi				
Address: 2ND FLOOR CAPITAL CYBERSCAPE SECTOR 59 GURGAON 122002 - 122002				
Particulars: Registration Fee for sale deed				
Cheque-DD- Detail: Depositor's Signature				
FOR USE IN RECEIVING BANK				
Bank CIN/Ref No:		000150907955908052025		
Payment Date:		08/05/2025		
Bank:	SBI Aggregator			
Status:	Success			

DDO Code: 0362		E - CHALLAN Government of Haryana		AG/ Dept Copy
Valid Upto:	15-05-2025 (Cash)	*0132027551*		
	09-05-2025 (Chq./DD)			
GRN No.:	0132027551	Date:	08 May 2025 16:19:09	
Office Name:	0362-TEHSILDAR PATAUDI			
Treasury:	Pataudi			
Period:	(2025-26) One Time			
Head of Account		Amount ₹		
0030-03-104-97-51 Pasting Fees		5		
0030-03-104-99-51 Fees for Registration		25000		
PD AcNo	0			
Deduction Amount:	₹	0		
Total/Net Amount:	₹	25005		
₹ Twenty Five Thousands Five only				
Tenderer's Detail				
GPF/PRAN/TIN/Actt. no./VehicleNo/TaxId:-				
PAN No: AADCM0815B				
Tenderer's Name: Max Healthcare Institute Limi				
Address: 2ND FLOOR CAPITAL CYBERSCAPE SECTOR 59 GURGAON 122002 - 122002				
Particulars: Registration Fee for sale deed				
Cheque-DD- Detail: Depositor's Signature				
FOR USE IN RECEIVING BANK				
Bank CIN/Ref No:		000150907955908052025		
Payment Date:		08/05/2025		
Bank:	SBI Aggregator			
Status:	Success			

\* Note :-> Depositor should approach treasury for judicial stamps etc. after verifying successful/ Account Prepared status of this challan at 'Verify Challan' on e-Gras website. This status become available after 24 hrs of deposit of cash or clearance of cheque / DD



Certificate No. GDH2025E86



Stamp Duty Paid : ₹ 332600  
(Rs. Only)

GRN No. 132018818



Penalty : ₹ 0

(Rs. Zero Only)

**Seller / First Party Detail**

Name: Ashok Kumar

H.No/Floor : 353

Sector/Ward : 12

LandMark : Hailymandi pataudi

City/Village : Todapur

District : Gurgaon

State : Haryana

Phone: 98\*\*\*\*\*09



**Buyer / Second Party Detail**

Name : Max healthcare institute ltd

H.No/Floor : 2

Sector/Ward : 59

LandMark : Capital cyberscape

City/Village: Guugram

District : Gurugram

State : Haryana

Phone : 98\*\*\*\*\*09

Purpose : SALE DEED REGISTRATION FOR LAND

525  
09-05-25

The authenticity of this document can be verified by scanning this QrCode Through smart phone or on the website <https://egrashry.nic.in>

किस्म वसीका	:	बयनामा जरई
मालयत	:	47,50,000/- रूपया
स्टाम्प	:	3,32,600/-रूपया
सर्टिफिकेट नम्बर	:	GDH2025E86, दिनांक: 07-05-2025
Fee GRN No.	:	132027551
वाका	:	हालियाकी
रकबा	:	4 कनाल 4 मरला (कृषि भूमि)
	:	



मैं जो कि अशोक कुमार (आधार न0 2469 6342 7185, पैन न0 AOPPK1214F) पुत्र बाल किशन,

पुत्र सुरजन सिंह, निवासी मकान नम्बर 353, वार्ड नम्बर 02, टोडापुर हेलीमण्डी, तहसील पटौदी, जिला

गुरुग्राम का हूँ जो कि आराजी जरई खेवट नम्बर 61/11 खाता नम्बर 61/10 मुस्तील नम्बर 18 किला

*Handwritten signature*

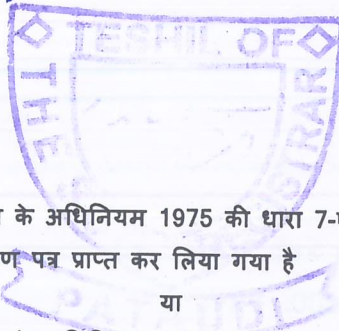


<b>वसीका संबंधी विवरण</b>		
<b>वसीका का नाम SALE URBAN AREA OUTSIDE MC</b>		
तहसील/सब-तहसील- पटौदी	गांव/शहर- Haliyaki	स्थित- Haliyaki
शहरी - म्युनिसिपल क्षेत्र सीमा के बाहर		अन्य क्षेत्र
पता : HALYAKI		
<b>धन संबंधी विवरण</b>		
राशि- 4750000 रुपये		कुल स्टाम्प शुल्क- 332500 रुपये
स्टाम्प नं- GDH2025E86		स्टाम्प का मूल्य- 332600 रुपये
रजिस्ट्रेशन फीस- 25000 रुपये	EChallan:132027551	पेस्टिंग शुल्क- 3 रुपये
द्वारा तैयार किया गया- deepak yadav adv		सेवा शुल्क- 200
<b>भूमि का विवरण</b>		
कृषि चाही		4 Kanal 4 Marla
खेवट नम्बर :- 61/11		

यह प्रलेख आज दिनांक 09-05-2025 दिन शुक्रवार समय 1:55:00 PM बजे श्री/श्रीमती/कुमारी अशोक कुमार पुत्र बाल किशन निवास द्वारा पंजीकरण हेतु प्रस्तुत किया गया।

हस्ताक्षर प्रस्तुतकर्ता

अशोक कुमार



संयुक्त उप पंजीयन अधिकारी Pataudi  
संयुक्त सब रजिस्ट्रार  
पटौदी

प्रलेख में वर्णित क्षेत्र नगर एवं ग्रामीण आयोजना विभाग के अधिनियम 1975 की धारा 7-ए के अंतर्गत अधिसूचित है इसलिए दस्तावेज को पंजीकृत करने से पूर्व संबंधित विभाग से अनापत्ति प्रमाण पत्र प्राप्त कर लिया गया है

या

प्रलेख में वर्णित क्षेत्र नगर एवं ग्रामीण आयोजना विभाग के अधिनियम 1975 की धारा 7-ए के अंतर्गत अधिसूचित नहीं है इसलिए दस्तावेज को पंजीकृत करने से पूर्व संबंधित विभाग से अनापत्ति प्रमाण पत्र की आवश्यकता नहीं है।

दिनांक 09-05-2025

अशोक कुमार

संयुक्त उप पंजीयन अधिकारी Pataudi  
संयुक्त सब रजिस्ट्रार  
पटौदी

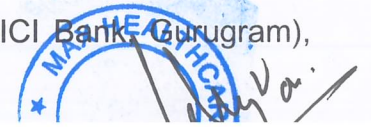
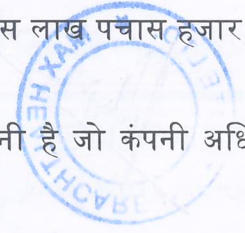
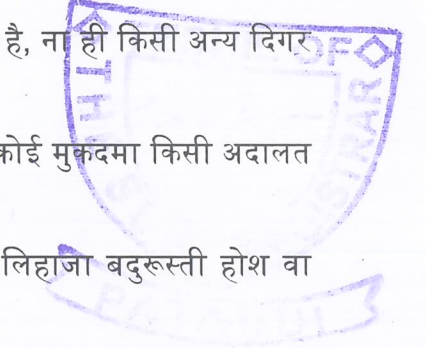
उपरोक्त क्रेता व श्री/श्रीमती/कुमारी MAX HEALTHCARE INSTITUTE LTD thru KAMAL VIJARAIOOTHER हाजिर है। प्रस्तुत प्रलेख के तथ्यों को दोनों पक्षों ने सुनकर तथा समझकर स्वीकार किया। प्रलेख के अनुसार 0 रुपये की राशि क्रेता ने मेरे समक्ष विक्रेता को अदा की तथा प्रलेख में वर्णित अग्रिम अदा की गई राशि के लेन देन को स्वीकार किया। दोनों पक्षों की पहचान श्री/श्रीमती/कुमारी AJIT SINGH NAMBERDAR पिता . निवासी JATAULI व श्री/श्रीमती/कुमारी SUDHIR THAKRAN पिता VEDPARKASH निवासी KHOR ने की। साक्षी सं. 1 को हम नम्बरदार/अधिवक्ता के रूप में जानते हैं तथा वह साक्षी सं. 2 की पहचान करता है।

दिनांक 09-05-2025

संयुक्त उप पंजीयन अधिकारी Pataudi  
संयुक्त सब रजिस्ट्रार  
पटौदी



नम्बर 17/3 (2-11) 18/1 (4-16) 24/2/1 (1-1) चाही किता 3 तादादी 8 कनाल 8 मरला का 1/2 भाग  
बकदर 4 कनाल 4 मरला वाका रकबा हालियाकी तहसील पटौदी जिला गुरुग्राम बमुजिब जमाबन्दी साल  
2022-23 वा बरूए इन्तकाल तकसीम नम्बर 830 मन्जूर शुद्धा दिनांक 27-03-2025 द्वारा मिलकियती  
वा मकबूजयती मेरी है। जो ताहाल हर किस्म के भार से पाक वा साफ है। इस पर किसी प्रकार का सरकारी  
वा गैरसरकारी कर्जा ना लिया हुआ है, ना ही रहन बय हिब्य व पट्टे आदि पर है, ना ही किसी अन्य दिगर  
शख्स के साथ सौदा बय तय किया हुआ है, ना ही उपरोक्त आराजी की बाबत कोई मुकदमा किसी अदालत  
में विचाराधिन है। वास्ते खर्चा वा दिगर तरक्की कार्य रूपया की जरूरत है। लिहाजा बदुरुस्ती होश वा  
हवांश बरजामन्दी खुद अब मैने आराजी तादादी 4 कनाल 4 मरला को मय हक हकूक हर किस्मी बम्य  
मालकाना वा सर्व अधिकार के बदले मुबलिंग 47,50,000/- रूपया (सैंतालीस लाख पचास हजार रूपया)  
बाहक मैक्स हेल्थकेयर इंस्टीट्यूट लिमिटेड, एक सार्वजनिक लिमिटेड कंपनी है जो कंपनी अधिनियम,  
1956 के तहत शामिल और वैध रूप से विद्यमान है, जिसका CIN: L72200MH2001PLC322854 है  
और इसका कार्यालय 2nd Floor, कैपिटल साइबरस्केप, सेक्टर 59, गुरुग्राम, हरियाणा, 122002, को  
इसके अधिकृत हस्ताक्षरकर्ता श्री कमल विजराय, उप महाप्रबंधक, प्रोजैक्ट के माध्यम से कतई बय वा  
फिरोखत कर दी है तथा जरे समन तमाम का तमाम मुबलिंग 47,50,000/- रूपया (सैंतालीस लाख पचास  
हजार रूपया) मे से मुबलिंग 15,00,000/- रूपया (पंद्रह लाख रूपया) बजरिये बैंक ड्राफ्ट नंबर 510387  
(ICICI Bank, Gurugram), दिनांक 29/03/2025 वा बाकी राशी मुबलिंग 32,50,000/- रूपया  
(बत्तीस लाख पचास हजार रूपया) बजरिये बैंक ड्राफ्ट नंबर 510494, (ICICI Bank Gurugram),



Reg. No.

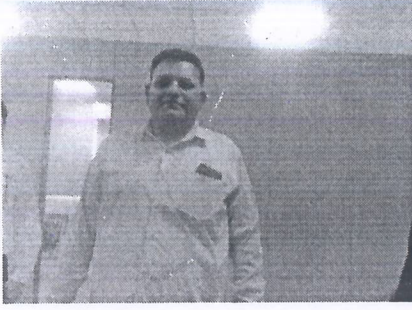
Reg. Year

Book No.

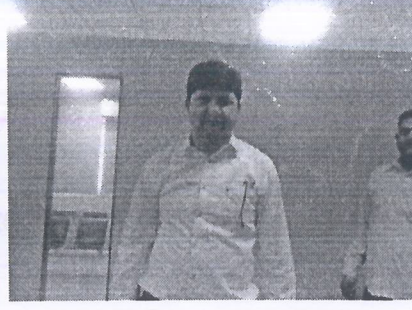
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2025-2026

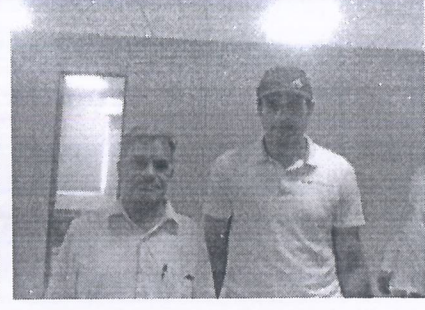
1



विक्रेता



क्रेता



गवाह

उप/सयुक्त पंजीयन अधिकारी

विक्रेता :- अशोक कुमार Ashok Kumar

क्रेता :- thru KAMAL VIJAYA IOTHERMAX HEALTHCARE INSTITUTE LTD

गवाह 1 :- AJIT SINGH NAMBERDAR Ajit Singh Nambardar

गवाह 2 :- SUDHIR THAKRAN Sudhir Thakran

प्रमाण पत्र



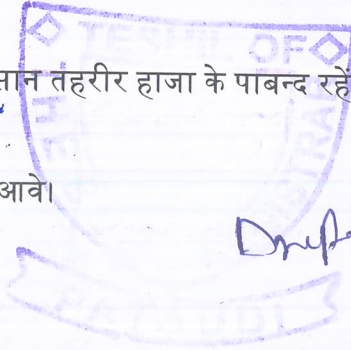
प्रमाणित किया जाता है कि यह प्रलेख क्रमांक 525 आज दिनांक 09-05-2025 को बही नं 1 जिल्द नं 214 के पृष्ठ नं 58.25 पर किया गया तथा इसकी एक प्रति अतिरिक्त बही संख्या 1 जिल्द नं 2095 के पृष्ठ संख्या 1 से 5 पर चिपकाई गयी। यह भी प्रमाणित किया जाता है कि इस दस्तावेज के प्रस्तुतकर्ता और गवाहों ने अपने हस्ताक्षर/निशान अंगूठा मेरे सामने किये हैं।

दिनांक 09-05-2025

उप/सयुक्त पंजीयन अधिकारी पटौदी  
सयुक्त सब रजिस्ट्रार  
पटौदी

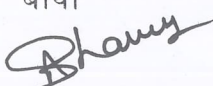


दिनांक 06/05/2025 मैं बाया अपने खाते में प्राप्त कर चुका हूँ। अब तस्दीक बयनामा के समय मेरा एक दाम लेना बाकी नहीं रहा है तथा कब्जा आराजी मुबैया पर खरीदार का करा दिया है। खरीदार अब पूर्ण मालिक वा काबिज अराजी मुबैया का हो गया है। यदि किसी नूक्स कानूनी वा वाकाती के कब्जा आराजी मुबैया मुशत्ररी से निकल जावे तो वापिस कुल जरे बय वा निज कुल हर्जा वा खर्चा मुकदमा मुशत्ररी की जिम्मेदार जात खास मेरी या जायदाद दिगर मनकुला वा गैर मनकुला होगी। खर्चा रजिस्टरी तमाम का तमाम खरीदार ने अपने पास से किया है। दाखिल खारिज खरीदार कागजात माल मे अपने नाम करा लेवे एतराज ना होगा। मैं वा मेरे वारसान तहरीर हाजा के पाबन्द रहेगो। लिहाजा यह बयनामा जरई लिख दिया कि सनद रहे और समय पर काम आवे।



Drift by Deepu Yadav  
08/05/25

दिनांक: 08-05-2025, शुक्रवार


बाया  
  
अशोक कुमार

खरीदार

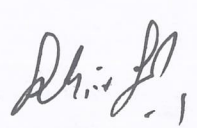


मैक्स हेल्थकेयर इस्टीट्यूट लिमिटेड

साक्षी:

  
अर्जीत सिंह नम्बरदार  
जाटोली-हेलीपणडी (पटीदी)  
जिला गुरुग्राम (हरि०)

साक्षी:

  
सुखवीर ठाकराज जी.  
वेदपुष्पाश्रम निकासी  
गांधी एवोड, गुरुग्राम

# IMA threatens to halt Ayushman Bharat services over dues

## Retired teachers seek action on pending issues

**SUMEDHA SHARMA**  
TRIBUNE NEWS SERVICE

**GURUGRAM, JANUARY 28**  
The Haryana chapter of the Indian Medical Association (IMA) has issued a warning to halt treatment under the Ayushman Bharat Scheme starting February 3, citing delayed reimbursement of around Rs 400 crore. This decision could potentially disrupt healthcare services for approximately 1.2 crore beneficiaries in the state. Around 600 private hospitals, part of the 1,300 hospitals empanelled under the

**₹400 CRORE OUTSTANDING**  
Payments should be released immediately as it is difficult to run hospitals without funds. Around Rs 400 crore is pending. Every empanelled private hospital has received just 10-15% of reimbursement bills.  
— Dr Mahavir Jain, president, IMA (Haryana)

scheme in Haryana, have alleged that financial constraints caused by prolonged delays in payment have made it unfeasible to continue offering treatment. "Our payments should be released immediately as it is exceedingly difficult for doc-

tors to operate hospitals without funds. Around Rs 400 crore is pending. These medical bills are already discounted by the hospitals. The government and patients expect world-class treatment, but how will the hospitals even survive if they do not get the

bare minimum to sustain themselves? Every empanelled private hospital in Haryana has received just 10-15% of the reimbursement bills raised with the government," said Dr Mahavir Jain, president of IMA (Haryana). The IMA has already submitted a warning letter to the state health authorities. In response, Health Minister Arti Rao assured that the government is addressing the issue. "Yes, they have approached us and we are clearing the legitimate reimbursements soon. We are in touch with the association and

treatment will not be disrupted. Any discrepancies between the department and hospitals over payment will be resolved soon," she told *The Tribune*. However, association members expressed dissatisfaction, stating that despite raising the issue with CM Nayab Singh Saini earlier this month and receiving assurances of immediate fund release, hospitals have only received a fraction of their dues. The Ayushman Bharat Scheme, which offers coverage for everything from routine tests to surgeries, is designed

to support families with annual incomes below Rs 2.5 lakh and senior citizens. Hospitals file reimbursement claims for treated patients through an online portal, with payments supposed to be cleared by the state government. Private hospitals, especially smaller facilities, are feeling the brunt of the crisis. "The majority of beneficiaries under this scheme, who would normally visit government hospitals for regular ailments, now come to private hospitals. We are expected to provide the best treatment and run all tests, but

our bills are pending for months. It's impossible to run hospitals without funds. For small facilities like ours, with just 70 beds, the situation is even worse. We've incurred debts because we only receive a fraction of our claims," said an IMA member from Gurugram. The 60 private hospitals in Gurugram, considered Haryana's medical hub, are among those severely impacted. The association has reiterated its demand for immediate release of pending payments to prevent disruption in services for millions of beneficiaries.

**TRIBUNE NEWS SERVICE**

**CHANDIGARH, JANUARY 28**

A delegation of the Retired College Principals and Teachers Federation, Haryana met Director General of Higher Education RS Hooda in Panchkula today to present their charter of demands. The delegation comprised DR Chaudhary, PR Tyagi, SK Sharma and KV Sharma. They raised key issues affecting retired college principals and teachers, including the timely release of interim budgets for monthly pensions, provision of pensions through the treasury, access to medical facilities and grant of promotion benefits from Associate Professor to

**Timely release of interim budgets for pension key issue**

Professor for retirees. Another significant demand was the extension of the 28-year service benefit to those with 20 years of service, aligning them with government college professors.

"We highlighted the need for a streamlined system to address the financial and professional concerns of retired educators. These issues have been pending for a long time and their resolution is critical," said Chaudhary.

The Director General assured the delegation that their concerns would be addressed promptly. "We are committed to the timely fulfillment and implementation of these demands," Hooda said.

## 13 vehicles seized for illegal transport of mining mineral in Yamunanagar district

**SHIV KUMAR SHARMA**  
TRIBUNE NEWS SERVICE

**YAMUNANAGAR, JANUARY 28**  
In a major crackdown, three teams of the Haryana State Enforcement Bureau seized 13 vehicles in Yamunanagar district for illegally transporting mining minerals such as sand, bajri and boulders without valid e-transit passes or rawanas.

Inspector Shyam Sunder of the Haryana State Enforcement Bureau, Yamunanagar unit, confirmed the action, stating, "Our teams recently caught 13 vehicles indulging in illegal transport of mining minerals. A fine of Rs 55.38 lakh has been imposed on these vehicles."

The seized vehicles were handed over to the Mines and Geology Department, which impounded them and parked them in a vehicle yard in Kharwan village and other designated locations.

The bureau's efforts are part of a sustained campaign against illegal mining



A truck carrying mining mineral illegally in Yamunanagar district. FILE

Mining Inspector Rohit Singh Rana elaborated on the legal framework governing the seizures, stating, "All vehicles have been impounded under Sub-rule numbers 102 and 104 of the State Mining Rules 2012, read with Section 21(4) of the MMDR Act 1957, and as per NGT orders dated April 23, 2019, and February 19, 2020."

The Mines and Geology Department has been tasked with recovering fines, royalties and the price of the illegally transported minerals. Additionally, environmental compensation is being levied as per National Green Tribunal (NGT) directives.

"If the vehicle owners fail to pay the imposed fines, an FIR will be lodged against them," warned Rana.

This intensified action by the authorities underscores their commitment to tackling illegal mining and ensuring compliance with environmental and mining laws.

## CISF gets over 100 acres to house 2 battalions in Nuh

**NEW DELHI, JANUARY 28**

Two land parcels measuring more than 100 acres have been sanctioned for housing two battalions, including a soon-to-be-raised first all-women unit, of the Central Industrial Security Force (CISF) in the communally sensitive Nuh district of Haryana.

While 50 acres of land has been allocated for the Mahila battalion, 69 acres earmarked for the relocation of the force's first battalion currently based at Barwaha in Khargone district of Madhya Pradesh.

"The government of Haryana has allocated a 50-acre land parcel in Nuh, which was assessed by CISF and deemed suitable for the establishment of the Mahila Battalion," a CISF spokesperson said in a statement on Tuesday.

The Ministry of Home Affairs (MHA) gave its clearance for the proposal on January 24, he said.

The establishment of the all-women battalion in Nuh, about 80 kms from Delhi, will help the force "promptly" deploy these personnel for CISF's Delhi-NCR based units during "high alert" situations, the spokesperson added.

Some important CISF units in this region are the Parliament House Complex, central government ministries and departments, Delhi international airport, Delhi Metro and the upcoming Jewar airport in Greater Noida.

The first women battalion comprising 1,025 personnel was sanctioned by the MHA in November last year. It is expected to be raised in about a year or so.

"The establishment of the Mahila battalion in Nuh is both cost-effective and operationally viable, ensuring that CISF can deploy trained personnel promptly to meet the requirements of its NCR-based units," the spokesperson said.

A separate land parcel at Indri village of Nuh, he said, has been allotted to the force for the relocation of its Barwaha battalion that was "temporarily" based there.

"The establishment of the two battalions at adjacent locations in Nuh will not only streamline operations but also enhance the readiness and efficiency of CISF in securing vital installations across the region," he said.

Apart from securing 68 civil airports of the country, the 1969-raised CISF provides counter-terrorist security cover to a number of facilities in the nuclear and aerospace domain and historical monuments like the Taj Mahal and Red Fort.

It also secures facilities in the private sector like Infosys offices in Bengaluru and Pune, and Reliance refinery in Jamnagar (Gujarat), among others. — PTI

## Hisar admin orders probe into crop insurance

**DEEPENDER DESWAL**  
TRIBUNE NEWS SERVICE

**HISAR, JANUARY 28**  
Following *The Tribune's* report on suspected fraud under the Pradhan Mantri Fasal Bima Yojana (PMFBY) involving farmers from Kirtan village, the Hisar district administration has instructed the insurance firm responsible for the scheme to scrutinise all rabi crop insurance policies across the district.

Deputy Director of Agriculture (DDA) Dr Rajbir Singh said letters had been sent to the Directorate of Agriculture at the state headquarters and the contracted insurance firm, urging them to investigate all insurance policies issued in Hisar district.

"A number of farmers from Kirtan village visited our office today and submitted affidavits claiming their farmlands were insured under PMFBY without their knowledge. In several instances, unknown individuals, who are not even residents of Hisar district, insured land owned by others," said Dr Singh.

Initially, the Agriculture Department had asked the insurance firm to investigate the alleged fraud in Kirtan village. However, the scope has now been expanded to examine all farmlands insured during the ongoing rabi season across the district.

State investigation agencies have also initiated inquiries after the media report. Officials from the intelligence wing have visited Kirtan village to collect information from affected farmers, sources confirmed.

The PMFBY has witnessed several cases of fraud, where cybercriminals exploited the scheme. They fraudulently insured crops using fake registrations and substituted their own bank account and mobile numbers to claim compensation for crop losses.

## Urea shortage in some districts, surplus in others

**DEEPENDER DESWAL**  
TRIBUNE NEWS SERVICE

**HISAR, JANUARY 28**  
The overconsumption of urea fertiliser in some districts and shortage in other regions indicates an uneven supply of fertilisers in the state.

While districts like Yamunanagar, Jind, Sonapat, and Faridabad have resorted to the overuse of the urea, districts including Bhiwani and Panchkula were supplied less than the demand, creating shortage of fertilisers for farmers.

During the ongoing rabi season, the farmers have

**Kiran Chaudhary raises issue of uneven supply**

been spraying the urea on wheat, mustard and other crops. However, after reporting short supply of urea, Rajya Sabha MP Kiran Chaudhary had written to Union Agriculture Minister Shivraj Singh Chouhan, urging him to address the issue in Bhiwani district.

She said the supply of urea had fallen short by 1,066 metric tonnes com-

pared to the demand in Bhiwani district. The timely availability of sufficient urea was crucial for maintaining yield, and any delay or shortage could severely impact it, she said.

She also raised the issue of uneven supply of urea, asking for a balanced distribution system across districts. According to statewide data, there has been a total consumption of 1,098,111 MT in the state till January 22, which is 1,51,942 MT more than the previous year during the corresponding period. Significantly,

there has been 43.5% more consumption in Yamunanagar district. Charkhi Dadri district, too, reported urea overuse by 33%; while for Jind it was 30%, Sonapat 22% and Faridabad 26%.

Sources said the imbalance supply indicated illegal supply of the urea to industrial use or in adjoining states. The plywood industry in Yamunanagar had high demand for urea.

"The farmers are getting urea bags at a subsidised rate of Rs 266.50 per bag after a subsidy of Rs 1,000. If the urea is going to the industry

or in adjoining states, it is an injustice to Haryana farmers," said an official.

Dr Om Prakash Bishnoi, wheat scientist at Chaudhary Charan Singh Haryana Agricultural University, said farmers should not use urea more than the recommended dose of a total of 130 kg for wheat during the rabi season, which should be divided into three parts.

The Centre supplies urea fertilisers while the state agriculture department allocates the districts for the distribution of fertilisers.

### Public Notice

We, **Eldeco Green Park Infrastructure Limited**, a Company registered under the Companies Act, 1956, and having its registered office at 201-212, 2nd Floor, Splendor Forum, District Centre, Jasola, Delhi-110025, hereby inform the General Public at large that for the better management of traffic, administrative purposes and in the interest of enhancing safety, security, and overall convenience for the community, an entrance gate ("Gate") has been set up in the residential plotted colony developed by us namely **'Eldeco Paradiso' ("Colony")** at its entrance adjacent to the Asian Highway 1 (G.T. Road), over an area admeasuring 13.65625 acres, situated at Sector 40, Panipat, falling under Licence No. 04 of 2020 dated 17.01.2020, granted by the Director General, Town & Country Planning, Haryana.

Any person/entity having any objection with respect to the installation of the Gate is requested to make the same known in writing along with valid grounds in respect thereof, to the undersigned having their office as mentioned hereinbelow, within a period of 7 (seven) days from the date of publication hereof, failing which, the objection, if any, will be deemed to have been waived and/or abandoned for all intents and purposes.

Issued by:

**Eldeco Green Park Infrastructure Limited**

Registered Address: 201-212, 2nd Floor, Splendor Forum, Jasola District Centre, Delhi-110025

Date: 29.01.2025

## Vacancies burden Education Dept's senior officials with multiple roles

**NITISH SHARMA**  
TRIBUNE NEWS SERVICE

**AMBALA, JANUARY 28**  
With nearly half of the Class-1 Haryana Education Services (HES) posts lying vacant, officials in the Education Department are struggling to manage additional responsibilities, leaving them overburdened.

Out of 84 sanctioned posts of Class-1 officers, including Joint Directors and Additional Directors, only 45 are currently filled. The remaining posts are being managed through additional charges assigned to existing officers. Sources reveal that around 20 of the 45 officials are set to retire this year, further exacerbating the issue.

Each district is supposed to have designated Class-1 officers, such as the District Education Officer (DEO), District Elementary Education Officer (DEEO) and District Institute of Education and Training (DIET) Principal. However, in many districts, one or more of these posts remain vacant, forcing offi-

84 sanctioned Class-1 posts, 45 filled; 20 to retire this year



A view of the Shiksha Sadan in Ambala. FILE PHOTO

cial to take on multiple roles. For example, in Ambala, while the DEO and DEEO posts are filled, the DIET Principal's position is vacant and the DEEO has been given the additional charge of DIET Principal. The DEEO also handles the duties of District Project Coordinator (DPC) Samagra Shiksha due to the absence of a Deputy DEO. Similarly, in Palwal, the DEO also manages the roles

of DEEO, DIET Principal and DPC. In Yamunanagar, the DEEO is responsible for the roles of DEO and DIET Principal, while in Kaithal, the DIET Principal holds the additional charge of DEO. The department's Joint Director oversees not only the DEO, DEEO and DIET Principal roles but also manages additional responsibilities for Nuh district. A senior official expressed

concerns over the mounting workload, saying, "Due to additional charges, we cannot focus on school monitoring. We are occupied with Samadhan Shivir, RTI responses, CM Window complaints, court cases, video conferences and district-level meetings. Implementing year-round departmental schemes and programmes effectively becomes a major challenge amid staff shortages."

Another official, speaking on the condition of anonymity, highlighted that the delay in filling vacancies is due to a legal hurdle. "There is no lapse on the government's part. A case related to the seniority of principals is pending in the Punjab and Haryana High Court. Promotions cannot proceed until the stay is vacated. The Departmental Promotion Committee is ready and once the court clears the matter, promotions will be finalised. The next hearing is scheduled for February," the official explained.



### MAX HEALTHCARE INSTITUTE LTD

#### Public Notice - Environmental Clearance

It is for the information of general public that MAX HEALTHCARE INSTITUTE LTD has been granted Environmental Clearance by Ministry of Environment, Forest and Climate Change for the proposed expansion of Max Super Speciality Hospital at Sector 56, Gurgaon, Haryana by M/s Max Healthcare Institute Ltd vide. EC identification No. EC24C3804HR5265005N dated 24.01.2025.

The copy of environmental clearance is available on Parivesh Portal of Ministry of Environment, Forest and Climate Change and the website of Max Healthcare Institute Ltd.

Link are appended below;

<https://parivesh.nic.in/newupgrade/#/trackYourProposal> (Proposal no. SIA/HR/INFRA2/482176/2024)

<https://www.maxhealthcare.in/environmental-clearances>

The interested person can also contact the following;

**Max Super Speciality Hospital at Sector 56, Gurgaon, Haryana**

Phone No.: 0124-260 7777

Email id: Sustainability@maxhealthcare.com