GERALDEVE
A NEWMARK COMPANY

One Fitzroy 6 Mortimer Street
London W1T 3JJ
Tel. +44 (0)20 7493 3338
geraldeve.com

Planning and Borough Development
London Borough of Camden
5 Pancras Square
London
N1C 4AG

FAO: Brendan Versluys

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Our ref: NFR/SNE/HDA/FPL/U0013257
Your ref: 2023/3870/P and 2023/3901/L

Brunswick Centre, London, WC1N 1AE
Application for Full Planning Permission and Listed Building Consent
Response Letter to Technical Consultation Comments

We write on behalf of, *Lazari Properties 2 Limited* ('the Applicant') to respond to technical consultation responses received in respect of the pending applications for Full Planning Permission and Listed Building Consent at the Brunswick Centre ('the Site').

Specifically, this response seeks to provide further clarification and resolve queries provided by the following statutory technical consultees:

- Metropolitan Police (Designing Out Crime Officer);
- Thames Water;
- Camden Sustainability Officer;
- Camden Flooding and Drainage Officer;
- Camden Transport Officer;
- Camden Environmental Health Officer (Air Quality and Noise).

Comments in respect of proposed draft conditions are made on a without prejudice basis, assuming that planning permission is granted.

Background

The Brunswick Centre is a Grade II listed building located within the Bloomsbury Conservation Area. The Centre comprises an eight-storey building with residential units located above a public mixed use retail centre and central outdoor plaza. The Site also comprises two basement levels which are currently used for residential and commercial car parking, and plant/drainage associated with the above ground uses.

As part of their continued stewardship of the Brunswick Centre, the Applicant regularly monitor the occupation and vacancy levels of the Site. Through this continued monitoring, it has been identified that the subterranean car park at the Brunswick Centre is becoming increasingly underutilised, in part, due to a general societal shift towards more sustainable forms of transportation such as walking and cycling.

In order to ensure the continued success of the Brunswick Centre, it is therefore proposed to repurpose part of the underutilised two-storey car park beneath the Brunswick Centre to deliver a sustainable, smart hotel, which will complement and provide increased footfall to support the existing uses at the Site.

Pending Applications

An application for Full Planning Permission (ref. 2023/3870/P) was validated on 25 September 2023 for the following works:

"Change of use of part of basement car park and one ground floor retail unit to hotel with ancillary food and beverage use, including alteration to upper basement floor slab, installation of plant, acoustic enclosures and PV panels at roof level, and associated works."

A concurrent application for Listed Building Consent (ref. 2023/3901/L) was validated on 25 September 2023 for the following works:

"Internal and external alterations, including alterations to upper basement floor slab, strengthening of basement structural columns, installation of walls, fit-out and mechanical services at basement and ground floor levels, installation of plant and acoustic enclosures at basement and roof levels, installation of PV panels at roof level, and associated works in association with the change of use of part of the basement car park and one ground floor retail unit to a hotel."

The 21-day statutory consultation period for the application conducted by Camden Council ran from 25 September 2023 until 16 October 2023. Due to consultation responses stating that residents were not notified of the applications' submission, the Applicant requested Officers to review the number of neighbour notification notices erected around the Site and additional notices were erected, where required. The consultation period was consequently extended until 14 December 2023 to enable all interested parties an opportunity to provide a consultation response.

Consultation Responses

<u>Metropolitan Police (Designing Out Crime Officer)</u>

In a consultation response dated 24 October 2023, the Designing Out Crime Officer confirmed that they had no objection to the proposals in principle.

The Designing Out Crime Officer recommended a number of technical specifications to be incorporated into the design of the building at detailed design stage. In addition, the Designing Out Crime Officer recommended the following conditions be attached to any future permissions:

1. **Prior to construction proof that the plans can achieve secured by design accreditation must be submitted to the designing out crime officer and local planning office.**

2. **For the site to achieve a secured by design accreditation to silver award and to maintain this standard through the life of the development.**

Applicant Response: The specifications proposed by the Metropolitan Police have been reviewed against the standard safety specification of the incoming tenant (Whitbread). At this stage, and following a review by the project team, it is considered that the requirements of the aforementioned conditions can be achieved and therefore would be considered acceptable if imposed on a future permission for the proposal. The Applicant would appreciate confirmation on what details are required as proof of compliance with secured by design accreditation.

Thames Water

A consultation response from Thames Water has been received in respect of the proposals dated 3 November 2023. Thames Water recommended the following as part of the scheme, which are considered in turn by the Applicant's structural engineer, HTS, below.

1. In line with Building regulation Part H (2.36) Thames Water requests the Applicant should incorporate within their proposal, protection to the property to prevent sewage flooding, by installing a positive pumped device (or equivalent reflecting technological advances), on the assumption that the sewerage network may surcharge to ground level during storm conditions.

   Applicant Response: The proposals for the below ground drainage include pumps to protect the property from sewer surcharge.

2. If, as part of the basement development there is a proposal to discharge ground water to the public network, this would require a Groundwater Risk Management Permit from Thames Water.

   Applicant Response: The basement is existing, there are no changes proposed to the basement box, therefore no changes to groundwater are anticipated.

3. Thames Water expects the developer to demonstrate what measures will be undertaken to minimise groundwater discharges into the public sewer.

   Applicant Response: The basement is existing, there are no changes proposed to the basement box, therefore no changes to groundwater are anticipated.

4. Thames Water requests the Applicants checks that the Proposed Development does not limit repair or maintenance activities or inhibit Thames Water services as there are public sewers crossing or close to the Site.

   Applicant Response: The basement is existing, there are no changes proposed to the basement box, therefore it is not anticipated to limit activities to the existing sewers.

5. Thames Water has identified an inability of the existing water network infrastructure to accommodate the needs of this development proposal and as such, have requested that the following condition be added to any planning permission as below:

   1. No development shall be occupied until confirmation has been provided that either:

   - all water network upgrades required to accommodate the additional demand to serve the development have been completed; or
   - a development and infrastructure phasing plan has been agreed with Thames Water to allow development to be occupied. Where a development and infrastructure phasing plan is agreed no occupation shall take place other than in accordance with the agreed development and infrastructure phasing plan.

   Applicant Response: The Applicant is happy to accept the condition wording above.

Camden Sustainability Officer

The Camden Sustainability Officer provided feedback on the scheme in an email response dated 07 November 2023.

The following elements require no further action from either the Applicant or Officers and are noted for completeness:

1. Overall carbon reduction of 36% exceeds the requirement for 35% minimum on site;
2. A reduction of 27% in carbon emissions at Be Green stage meets the requirement of 20% from onsite renewable energy;
3. Overall carbon reduction of 36% does not meet the requirement for net zero carbon and therefore a carbon offset payment provisionally of £110,301 is required (£95 per tonne for 30 years);
4. The fact the hotel is being built in an existing basement space and is reusing the majority of the concrete slab means that the embodied carbon impacts of development are low at 138kg CO2e/m2, meeting GLA aspirational benchmarks of 500kg CO2e/m2; and
5. The BREEAM overall base case score is 85.45% which exceeds the requirement for BREEAM Excellent, potentially meeting BREEAM Outstanding. The development is predicted to achieve BREEAM excellent and could exceed this to achieve BREEAM Outstanding. It is proposed to secure the BREEAM Excellent level and minimum credit targets in Energy (60%), Materials (40%) and Water (60%) through the s106 agreement.

The following elements require further clarification to be provided by the Applicant, which is set out below.

1. A reduction of 9% non-domestic carbon emissions through energy efficiency measures at Be Lean stage does not meet the required 15% reduction. Further energy efficiency measures to reduce energy usage at 'Be Lean' to achieve the required 15% reduction should be investigated including an investigation of the potential for a centralised Waste Water Heat recovery co-located with greywater recycling. The Officer noted in their response that whilst this may not improve the headline 9%, it would be considered in addition to the 9% achieved.

   Applicant Response: Significant improvements are expected to be achieved in heating, cooling, auxiliary and lighting energy consumption through energy efficiency measures, achieving a 25% combined energy/carbon reduction for these end uses. However, because DHW (Domestic Hot Water) accounts for a large proportion of the total energy consumption of the proposed development, these measures would only achieve a 9% reduction when including the DHW in the calculations. To improve on this figure, measures that reduce the DHW demand would need to be considered, e.g. WWHR (Waste Water Heat Recovery).

   This development aims to minimise the energy consumption associated with domestic hot water generation by minimising the hot water usage through the specification of low-use sanitary fittings. A WWHR approach would have a number of disadvantages and would not seem to deliver substantial benefits on improving the aforementioned 9% reduction outweighing disadvantages in other instance. Such matters including, but not limited to the following:
   - *Additional foul drainage pipework (with increased embodied carbon);*
   - *Insulation of drainage pipework (with increased embodied carbon);*
   - *Industrial grade heat exchanger and pumping system energy usage and embodied carbon;*

- *The capacity of the system would be limited to the shower discharge from circa 40 bedrooms which discharge into the greywater harvesting system. The energy savings would need to be weighed against the energy consumption of this system; and*
- *Maintenance complexity and cost.*

2. The Energy Use Intensity ('EUI') of 99kWh/m2/year exceeds the target of 55kWh/m2/year. Measures should be taken to reduce EUI to within the benchmarks from Table 4 of the GLA energy assessment guidance. The Officer noted that the Applicant has previously stated that there may be further reduction in EUI at detailed design stage.

   Applicant Response: The EUI has been calculated using the information available at this stage of the design. Where detailed information was not available, assumptions were made using the guidance in CIBSE TM54. This can often result in certain energy uses being overestimated as the benchmarks in CIBSE TM54 are representative of historic typical practice rather than current good practice.

   It is also worth noting that the EUI benchmark of 55kWh/m2/year is more representative of future best practice than what would currently be considered best practice. As a reference, the lower quartile for budget hotels in the Cornell Hotel Sustainability benchmarking index is 121kWh/m2/year, with the lowest value being 65kWh/m2/year. These benchmarks are being used as a reference in the development of the UK Net Zero Carbon Building Standard to inform what current best practice looks like.

   For this reason, while measures to improve operational energy performance will be further explored at later design stages and when making equipment selections, it is unlikely that an EUI of 55kWh/m2/year or lower would be achievable for the building.

3. It is proposed to condition details of the PV panels as a 'prior to commencement of above ground works' condition as follows:

   Prior to commencement of construction other than lowering of the basement slab and preparation of the basement area, drawings and data sheets showing the location, extent and predicted energy generation of photovoltaic cells and associated equipment to be installed on the building shall have been submitted to and approved by the Local Planning Authority in writing. The measures shall include the installation of a meter to monitor the energy output from the approved renewable energy systems. A site-specific lifetime maintenance schedule for each system, including safe roof access arrangements, shall be provided. The cells shall be installed in full accordance with the details approved by the Local Planning Authority and permanently retained and maintained thereafter.

   Applicant Response: The Applicant is happy to accept the above condition.

4. Further details of the ASHP/VRF are proposed to be conditioned as a 'prior to commencement of above ground works' condition as follows:

   Prior to commencement of construction other than lowering of the basement slab and preparation of the basement area, details, drawings, and data sheets showing the location, Seasonal Performance Factor of at least 2.5 (or COP of 4 or more or SCOP of 3.4 or more) and Be Green stage carbon saving of the air source heat pumps and associated equipment to be installed on the

building, shall have been submitted to and approved by the Local Planning Authority in writing. The measures shall include the installation of a meter to monitor the energy output from the approved renewable energy systems. A site-specific lifetime maintenance schedule for each system, including safe access arrangements, shall be provided. The equipment shall be installed in full accordance with the details approved by the Local Planning Authority and permanently retained and maintained thereafter.

Applicant Response: The Applicant is happy to accept the above condition.

5. Further information should be provided on how the demolished reinforced concrete will be reused. This should be in line with the target of 95% of construction and demolition waste will be reused/recycled/recovered as stated in policy SI 7 of the London Plan 2021.

   Applicant Response: The volume of demolition waste will be minimal as the majority of the slab is being reused. Due to the nature of the building, which has no new foundations or similar, there are no appropriate uses for the demolished concrete on the Site. The concrete will therefore be removed from Site with the aim of reusing on a nearby Site as aggregate or a piling mat, thereby meeting the target for 95% landfill diversion of demolition waste.

6. The proposals include active cooling for the development. Dynamic thermal modelling should be undertaken (as requested at pre-app) to demonstrate a clear need for active cooling after all preferred measures are incorporated in line with the cooling hierarchy. The cooling hierarchy and further information about the expected modelling methodology are outlined in Section 8 of the GLA's Energy Assessment Guidance.

   Applicant Response: The Proposed Development is located underground with no openings that could be used to provide natural ventilation into the bedrooms. Because of this, it would not be appropriate to undertake an overheating assessment in line with CIBSE TM52 to assess passive ventilation options and there are not opportunities to incorporate passive ventilation into the design. Because of this, the design proposal incorporates active cooling via high-efficiency VRF system to mitigate overheating in peak summer conditions once other cooling demand reduction measures have been undertaken (e.g. high efficiency lighting and highly insulated DHW distribution pipework).

   Greengage have carried out additional thermal comfort modelling work to support the BREEAM targets of the project, in particular the thermal comfort credits in the Hea 04 section, The analysis, which is attached to this letter at Appendix A, has demonstrated that it is necessary to have an active cooling system to provide adequate comfort levels in the hotel bedrooms and the ancillary areas considering current and future weather scenarios.

   The results from the simulation show that it would not be possible to obtain adequate comfort levels as per TM52 and CIBSE Guide A standards through the mechanical ventilation system only. Additionally, the specific requirement of a hotel, where cooling needs to be provided to individual bedroom only when required and occupied, would make it difficult to be served just by controlling the flow rates of the general ventilation system. If not undertaken, the air handling units and ducts would be oversized and would negatively impact the efficiency of the system.

<u>Camden Flooding and Drainage Officer</u>

Feedback provided in respect of flooding and drainage was provided in an email dated 9 November 2023.

The following elements require no further action from either the Applicant or Officers and are noted for completeness:

1. As agreed at pre-application stage, changes externally to alter drainage and introduce SuDs at the site are not feasible due to the listed nature of the building, drainage layout and limited scope of works outside the basement level. A feasibility study for greywater/rainwater harvesting has been undertaken and Officers are supportive of the introduction of greywater harvesting within the hotel (noting that full details of the proposed greywater harvesting are yet to be brought forward). The flood risk assessment and drainage strategy adequately demonstrate that the risk of flooding is low on site, potential for groundwater ingress is mitigated by waterproofing the basement in line with BS EN 8102.

In respect of the greywater harvesting system, the following information is requested:

1. Details of the maintenance owner of drainage features and parties responsible for ongoing maintenance should be provided before a recommendation is made on the application.

   Applicant Response: Whitbread, as incoming tenant, would be responsible for the maintenance of the system.

It is also proposed to secure full details of the greywater harvesting system via condition as below:

1. **Prior to commencement of development other than site clearance & preparation, details of greywater recycling proposals should be submitted to the local planning authority and approved in writing. Submitted details should include drainage layouts, drawings, predicted reductions in water usage and a site-specific lifetime maintenance schedule for the proposed system. The development shall thereafter be constructed in accordance with the approved details.**

   Applicant Response: The Applicant notes that it has previously been agreed that rainwater harvesting is not feasible and that the above condition wording is adjusted to reflect that these details relate solely to the greywater harvesting. Notwithstanding this, the Applicant is agreeable to the principle of the condition securing the details of the greywater harvesting system put forward above. In response to this request to secure further details via a planning condition, the Applicant has prepared the following information, for reference purposes, noting that the full specification will be finalised at Stage 4:
   - *Greywater schematic (ref. E_171023_01 Rev B)- Appendix B;*
   - *Greywater On-Demand Servicing Report – Appendix C; and*
   - *Technical Proposal – Appendix D.*

<u>Camden Transport Officer</u>

Following receipt of the Camden Transport Officer comments on 14 November 2023, it is noted that the Officer is agreeable in principle to the proposal on transport grounds, subject to a number of planning obligations being agreed to as part of a future S106 Agreement.

Officers further requested an additional plan in relation to servicing, which is appended to this response letter at Appendix E.

The Applicant is agreeable to the inclusion of planning obligations within a future S106 Agreement, and will review the proposed obligations in detail over the course of the determination period to determine if they are relevant and proportional to the proposals, and discuss with the Transport Officer further if required.

Camden Environmental Health Officer – Air Quality

Following receipt of Officer comments on 21 November 2023, it is noted that the principle of the proposals is agreed, subject to the inclusion of a number of planning conditions on any future Decision Notice.

The following elements require no further action from either the Applicant or Officers and are noted for completeness:

1. The proposal is for heating through a non-combustion Air Source Heat Pump which is welcomed in this area of poor air quality. The applicant also notes that an emergency generator will be installed sized to life safety functions, at a size of <1MWth and will be tested for <50 Hours per year, the generator exhaust will be at roof level away from residential receptors. The applicant should further ensure it is away from any other air intakes.

2. The building currently passes the AQ Neutral assessment for transport and building emissions. There is no dedicated on-site parking and the impact on traffic activity is expected to be small and therefore the transport emissions are considered to be air quality neutral. It is also noted that the development will replace what is currently a car park which will more broadly discourage car trips into central London. The building also passes the AQ neutral assessment for operational impacts as it is reliant on an electric heat pump solution for heating & hot water.

3. A desk study of NO2 and PM concentrations has been undertaken for the proposed development. This predicts that at the SE and SW boundaries of the site there will be exceedances of UK National Air Quality objectives for NO_2 at between 41.7 and 42.0µg/m^3 respectively. However, the air intake location is away from the road with concentration at ground level predicted as 38.0µg/m^3, additionally the air intake is at a height of 10m meaning there will be greater dispersion at this height. In addition PM_{10} & $PM_{2.5}$ is modelled to exceed WHO air quality guidelines at most modelled receptors. As this is a hotel it is not anticipated to have the same sensitivity as residential use. **Note:** NOx filtration will not be fitted to the mechanical ventilation as this will increase the operational energy usage. Air inlets should located as far as possible from roads, heating flues or other sources of air pollution.

4. Real-time Air Quality Monitoring is not required to be conditioned as the development is underground.

As part of the response from the Environmental Health Officer, conditions were suggested to form part of a planning permission in due course. These suggested conditions are below for reference, and the applicant response provided below each.

1. **Prior to commencement of construction other than lowering of the basement slab and preparation of the basement area,details of the proposed Emergency Diesel Generator Plant and any associated abatement technologies including make, model and emission details shall have been submitted to and approved by the Local Planning Authority in writing. Generators should be appropriately sized for life saving functions only, alternatives to diesel fully considered and testing minimised. The maintenance and cleaning of the systems shall be undertaken regularly in**

accordance with manufacturer specifications and details of emission certificates by an accredited MCERTS organisation shall be provided following installation and thereafter every three years to verify compliance with regulations made by the Secretary of State.

Applicant Response: The proposed condition trigger is appropriate to the scope of works and the Applicant is happy to agree to the above planning condition.

2. **Prior to commencement of [above-ground development / development excluding demolition and site preparation works], full details of the mechanical ventilation system including air inlet locations shall be submitted to and approved by the local planning authority in writing. Air inlet locations should be located away from busy roads and the boiler or any other emission sources and as close to roof level as possible, to protect internal air quality. The development shall thereafter be constructed and maintained in accordance with the approved details.**

- *Applicant Response: Although the wording of the planning condition is considered acceptable in principle, we note that a number of these details have been provided within the supporting planning drawings, and MEP drawings that have been submitted as part of the planning and listed building consent applications, particularly drawing ref. 3608-PSH-ZZ-ZZ-DR-M-7005 which shows the relative locations of the fresh air intakes at low level and the generator exhaust at roof level as requested by Officers which is re-attached to this letter at Appendix F.We trust this submitted information is sufficient to not require this planning condition to be imposed in this instance but welcome further discussions if Officers consider otherwise.*

3. **No non-road mobile machinery (NRMM) shall be used on the site unless it is compliant with the NRMM Low Emission Zone requirements (or any superseding requirements) and until it has been registered for use on the site on the NRMM register (or any superseding register).**

Applicant Response: The Applicant is happy to accept this condition.

Further, it is proposed to secure construction mitigation measures via an informative as follows:

1. **Mitigation measures to control construction-related air quality impacts should be secured within the Construction Management Plan as per the standard CMP Pro-Forma. The Applicant will be required to complete the checklist and demonstrate that all mitigation measures relevant to the level of identified risk are being included.**

Applicant Response: This informative is considered acceptable to include on a future permission.

<u>Camden Environmental Health Officer – Noise</u>

Following receipt of the Camden Environmental Health Officer comments on 21 November 2023, it is noted that the principle of the proposals is agreed, subject to the inclusion of a number of planning conditions on any future Decision Notice.

The following elements require no further action from either the Applicant or Officers and are noted for completeness:

1. Re-radiated noise levels from underground trains were shown to be more than the hotel operator's performance standard. The initial design has, therefore, included provision for the hotel guestrooms

to be constructed on an isolated concrete slab, with internal walls and ceilings isolated from the core building structure.

2. Except for the Cinema, there are no adjacent retail uses that would be expected to generate significant levels of noise or vibration. The acoustic report states that no noise from film soundtracks could be heard nor measured on the concrete wall, over the existing background levels. Proposed guestrooms adjacent to the Cinema demise will be fully isolated from the building structure, including the already substantial separating structure.

3. A plant noise assessment in line with BS 4142 has identified the maximum acceptable noise levels which may be emitted by the proposed plant equipment during both the daytime and night-time periods. With the mitigation measures specified in Table 8.2 of the report, the noise levels identified should ensure that the likelihood of an adverse impact is low. As the proposed plant will be located on the rooftop above existing residential dwellings, spatial allowance has been incorporated into the design to site the plant items on a fully isolated plant deck. This will serve to minimise the risk of structural noise transmission.

4. Mitigation measures to address the potential noise impact from re-radiated noise from roll cages should be addressed in the Delivery and Servicing Management Plan. Modern low-noise polyurethane wheels should be used in all roll cages.

5. The noise impact from demolition and construction will be addressed as part of the Construction Management Plan. An initial discussion with the project acoustic consultant has confirmed that standard mitigation measures will not suffice due to the structural characteristics of the Brunswick Centre. The following measures have been discussed as part of the early CMP engagement process:

    A. Bespoke quiet periods (in consultation with Curzon, Waitrose and residents) for high-impact works.

    B. Acoustic trials (in advance of the start of the demolition works) to establish the best demolition methodology.

    C. Avoiding the use of percussive breakers, favouring the use of low-impact demolition technologies.

    D. Isolating the demolition area so that noise does not travel through the building.

The Applicant team is in discussion with the Environmental Health Officer at present regarding the following proposed planning condition as follows:

1. **Prior to use, the plant located at the rooftop shall be mounted with proprietary anti-vibration isolators.**

With respect to the second proposed planning condition, the Applicant's Noise Consultant, Clarke Saunders, have discussed with the Camden Environmental Health Officer to highlight that noise emissions from new plant need only be conditioned to the relative level as detailed. The following amendments to the proposed condition wording are set out below. For the avoidance of doubt, the elements highlighted in yellow are proposed to be included within the condition wording and the elements struck through are proposed to be remove. The updated wording as set out below was agreed with Officers via email on 6 December 2023:

2. **The cumulative sound level from new external building services and fixed plant shall be 10dB(A) or more below the background sound level (15dB if tonal components are present) at the nearest residential receptor window or façade at any time. Where using pre-existing ventilation systems, noise emissions from existing ventilation louvres shall be equal to or lower than the pre-existing level. The plant and equipment shall be installed and constructed to ensure compliance with the above requirements and an acoustic report submitted to provide suitable evidence prior to operation. ~~and Clark Sounders Noise Assessment Table 8.3: Predicted Noise Levels.~~**

It is further proposed to include the following condition:

3. **Camden Environmental team to confirm Condition/limits for life safety or emergency plant noise emissions (i.e. life-safety generators and smoke extract systems).**

   The Applicant understands that Officers will confirm the limits in due course.

Further, the Officer recommends the following informative is added to any future Decision Notice:

4. **We recommend that hotel bedrooms shall be designed and located such that the unoccupied noise levels do not exceed the criteria specified in *Table H.1 Airborne Sound Insulation and Table H.3 Indoor ambient noise level ranges for hotel bedrooms* of BS8233:2014.**

Conclusion

This letter has been prepared to provide a comprehensive response to matters raised by consultees during the consultation period.

Overall, it is considered that appropriate responses have been provided to respond to concerns raised, and it is requested that the scheme now be taken forward to Planning Committee for determination.

We trust that this response will be taken into consideration in the determination of the application. Please do not hesitate to contact Nia Fraser (0207 333 6299), Sam Neal (0203 486 3312) or Hannah Davies (0207 333 6221) of this office should you have any queries.

Yours faithfully,

Gerald Eve LLP

Gerald Eve LLP
Encl.

Appendix A – Overheating Risk Addendum

ENERGY STATEMENT - OVERHEATING RISK ADDENDUM

CONTEXT

Greengage have produced an Energy Statement on behalf of Lazari Properties 2 Limited in support of the planning application for the proposed hotel development at the basement of Brunswick Centre in Bloomsbury, London, WC1N 1BS.

This statement is an addendum to this Energy Statement report, dated August 2023, in response to the comment regarding the need for proving the need for active cooling in the project, included in the draft technical response from the LB Camden sustainability officer in January 2024.

The comment states the following:

6. *Active cooling must be proven to be necessary where it is introduced in any development. Due to the subterranean nature of the development, it may not be feasible to have natural ventilation but it should be shown that active cooling is necessary beyond simply having mechanical ventilation without cooling – as outlined in Camden's Local Plan and Planning Policy Guidance Dynamic Thermal Modelling should be undertaken to demonstrate the necessity of cooling.*

RESPONSE

Greengage have been carrying out additional thermal comfort modelling work to support the BREEAM targets of the project, in particular the thermal comfort credits in the Hea 04 section. This analysis has proved necessary to have an active cooling system to provide adequate comfort levels in the hotel bedrooms and ancillary areas considering current and future weather scenarios.

The results of a simulation run without active cooling is provided in the following pages. An increased ventilation flow rate of 2 air changes per hour when internal temperature exceeds 25°C has been included in this scenario to maximise the cooling capacity of the ventilation system. This exceeds the normal fresh air requirements for the spaces.

The results show that it would not be possible to obtain adequate comfort levels as per TM52 and CIBSE Guide A standards through the mechanical ventilation system only, even if the ventilation rate is increased beyond the normal ventilation requirements. TM52 requires for mechanically ventilated buildings that the operative temperature does not exceed 26°C for more than 3% of occupied hours. Whereas CIBSE Guide A recommends operative temperatures to be maintained within a specific range depending on the building and room type, as well as the Predicted Mean Vote (PMV) within the ±0.50 range.

Additionally, the specific requirement of a hotel, where cooling needs to be provided to each individual bedroom only when required and occupied, would make it difficult to be served just by controlling the flow rates of the general ventilation system. It would also require oversizing the air handling units and ducts to cover the increased flow rates, which are normally sized and optimised to supply only the required flows for air quality, and this would have a negative impact on the efficiency of the system.

THERMAL MODELLING RESULTS

Operative Temperature < 26°C criterion

Room	% hours Operative Temperature < 26°C	Pass TM52 criterion (3% limit)
Central St/Lounge Area	16.7	Fail
F&B	18.7	Fail

Room	% hours Operative Temperature < 26°C	Pass TM52 criterion (3% limit)
Office	34	Fail
Team Room	37	Fail

Room	% hours Operative Temperature < 26°C	Pass TM52 criterion (3% limit)
Reception	8.5	Fail

Room	% hours Operative Temperature < 26°C	Pass TM52 criterion (3% limit)
Ensuite Bedroom 01	8.2	Fail
Ensuite Bedroom 02	7.1	Fail
Ensuite Bedroom 03	8	Fail
Ensuite Bedroom 04	8	Fail
Ensuite Bedroom 05	9.6	Fail
Ensuite Bedroom 06	6.6	Fail
Ensuite Bedroom 07	6.9	Fail
Ensuite Bedroom 08	8.6	Fail
Ensuite Bedroom 09	7.6	Fail
Ensuite Bedroom 10	7.7	Fail
Ensuite Bedroom 11	8.5	Fail
Ensuite Bedroom 12	6.7	Fail
Ensuite Bedroom 13	8.6	Fail
Ensuite Bedroom 14	8.9	Fail
Ensuite Bedroom 15	8.1	Fail
Ensuite Bedroom 16	8	Fail

Ensuite Bedroom 17	8.3	Fail
Ensuite Bedroom 18	9.2	Fail
Ensuite Bedroom 19	7.7	Fail
Ensuite Bedroom 20	8.9	Fail
Ensuite Bedroom 21	8.2	Fail
Ensuite Bedroom 22	8.9	Fail
Ensuite Bedroom 23	9	Fail
Ensuite Bedroom 24	7.5	Fail
Ensuite Bedroom 25	7.5	Fail
Ensuite Bedroom 26	7.7	Fail
Ensuite Bedroom 27	9	Fail
Ensuite Bedroom 28	7.7	Fail
Ensuite Bedroom 29	7.7	Fail
Ensuite Bedroom 30	8.2	Fail
Ensuite Bedroom 31	9.2	Fail
Ensuite Bedroom 32	9.6	Fail
Ensuite Bedroom 33	7.6	Fail
Ensuite Bedroom 34	8.4	Fail
Ensuite Bedroom 35	5.6	Fail
Ensuite Bedroom 36	8.6	Fail
Ensuite Bedroom 37	6.7	Fail
Ensuite Bedroom 38	6.9	Fail
Ensuite Bedroom 39	7.4	Fail
Ensuite Bedroom 40	6.7	Fail
Ensuite Bedroom 41	9.3	Fail
Ensuite Bedroom 42	9	Fail
Ensuite Bedroom 43	7.8	Fail
Ensuite Bedroom 44	7.4	Fail
Ensuite Bedroom 45	7.4	Fail
Ensuite Bedroom 46	7.4	Fail
Ensuite Bedroom 47	9.2	Fail
Ensuite Bedroom 48	7.3	Fail
Ensuite Bedroom 49	9.6	Fail
Ensuite Bedroom 50	7	Fail

Ensuite Bedroom 51	7.1	Fail
Ensuite Bedroom 52	8.4	Fail
Ensuite Bedroom 53	11	Fail
Ensuite Bedroom 54	6.9	Fail
Ensuite Bedroom 55	13.1	Fail
Ensuite Bedroom 56	8.1	Fail
Ensuite Bedroom 57	8.3	Fail
Ensuite Bedroom 58	8.9	Fail
Ensuite Bedroom 59	7.7	Fail
Ensuite Bedroom 60	6.9	Fail
Ensuite Bedroom 61	7.7	Fail
Ensuite Bedroom 62	8.4	Fail
Ensuite Bedroom 63	7.7	Fail
Ensuite Bedroom 64	7.3	Fail
Ensuite Bedroom 65	8.1	Fail
Ensuite Bedroom 66	10.2	Fail
Ensuite Bedroom 67	7.3	Fail
Ensuite Bedroom 68	8	Fail
Ensuite Bedroom 69	8	Fail
Ensuite Bedroom 70	6.8	Fail
Ensuite Bedroom 71	8	Fail
Ensuite Bedroom 72	8.2	Fail
Ensuite Bedroom 73	9.2	Fail
Ensuite Bedroom 74	7.4	Fail
Ensuite Bedroom 75	8.5	Fail
Ensuite Bedroom 76	5.8	Fail
Ensuite Bedroom 77	9.1	Fail
Ensuite Bedroom 78	9	Fail
Ensuite Bedroom 79	9.3	Fail
Ensuite Bedroom 80	10.6	Fail
Ensuite Bedroom 81	6.9	Fail
Ensuite Bedroom 82	8.9	Fail
Ensuite Bedroom 83	8	Fail
Ensuite Bedroom 84	9.1	Fail

Ensuite Bedroom 85	9.1	Fail
Ensuite Bedroom 86	7	Fail
Ensuite Bedroom 87	8	Fail
Ensuite Bedroom 88	7.7	Fail
Ensuite Bedroom 89	7.5	Fail
Ensuite Bedroom 90	8.5	Fail
Ensuite Bedroom 91	7.6	Fail
Ensuite Bedroom 92	7.1	Fail
Ensuite Bedroom 93	6.9	Fail
Ensuite Bedroom 94	9.4	Fail
Ensuite Bedroom 95	8.3	Fail
Ensuite Bedroom 96	7.2	Fail
Ensuite Bedroom 97	6.7	Fail
Ensuite Bedroom 98	6.8	Fail
Ensuite Bedroom 99	7.4	Fail
Ensuite Bedroom 100	13.1	Fail
Ensuite Bedroom 101	12.8	Fail
Ensuite Bedroom 102	6.3	Fail
Ensuite Bedroom 103	8.3	Fail
Ensuite Bedroom 104	8	Fail
Ensuite Bedroom 105	8.5	Fail
Ensuite Bedroom 106	8.1	Fail
Ensuite Bedroom 107	6.9	Fail
Ensuite Bedroom 108	13.2	Fail
Ensuite Bedroom 109	13.3	Fail
Ensuite Bedroom 110	13.3	Fail
Ensuite Bedroom 111	13.3	Fail
Ensuite Bedroom 112	13.6	Fail
Ensuite Bedroom 113	14.3	Fail
Ensuite Bedroom 114	10.3	Fail
Ensuite Bedroom 115	9.9	Fail
Ensuite Bedroom 116	9.5	Fail
Ensuite Bedroom 117	11.4	Fail
Ensuite Bedroom 118	9.9	Fail

Ensuite Bedroom 119	9.8	Fail
Ensuite Bedroom 120	10	Fail
Ensuite Bedroom 121	10.5	Fail
Ensuite Bedroom 122	30.8	Fail
Ensuite Bedroom 123	11.7	Fail
Ensuite Bedroom 124	11.6	Fail
Ensuite Bedroom 125	6.1	Fail
Ensuite Bedroom 126	8.1	Fail
Ensuite Bedroom 127	27.5	Fail
Ensuite Bedroom 128	6.6	Fail
Ensuite Bedroom 129	6.3	Fail
Ensuite Bedroom 130	9.1	Fail
Ensuite Bedroom 131	8.1	Fail
Ensuite Bedroom 132	6.6	Fail
Ensuite Bedroom 133	8.1	Fail
Ensuite Bedroom 134	8	Fail
Ensuite Bedroom 135	8.4	Fail
Ensuite Bedroom 136	8.7	Fail
Ensuite Bedroom 137	7	Fail
Ensuite Bedroom 138	8.8	Fail
Ensuite Bedroom 139	9.4	Fail
Ensuite Bedroom 140	9.2	Fail
Ensuite Bedroom 141	7.3	Fail
Ensuite Bedroom 142	10.1	Fail
Ensuite Bedroom 143	9.9	Fail
Ensuite Bedroom 144	10.4	Fail
Ensuite Bedroom 145	9.7	Fail
Ensuite Bedroom 146	9.5	Fail
Ensuite Bedroom 147	9.8	Fail
Ensuite Bedroom 148	9.2	Fail
Ensuite Bedroom 149	10.4	Fail
Ensuite Bedroom 150	10.2	Fail
Ensuite Bedroom 151	10.3	Fail
Ensuite Bedroom 152	10.2	Fail

Ensuite Bedroom 153	10.4	Fail
Ensuite Bedroom 154	10.3	Fail
Ensuite Bedroom 155	11.5	Fail
Ensuite Bedroom 156	12.1	Fail
Ensuite Bedroom 157	33.1	Fail
Ensuite Bedroom 158	45.7	Fail
Ensuite Bedroom 159	30.9	Fail
Ensuite Bedroom 160	30.3	Fail
Ensuite Bedroom 161	30.4	Fail
Ensuite Bedroom 162	9.1	Fail
Ensuite Bedroom 163	10.3	Fail
Ensuite Bedroom 164	10.5	Fail
Ensuite Bedroom 165	10.5	Fail
Ensuite Bedroom 166	10.3	Fail
Ensuite Bedroom 167	10.3	Fail
Ensuite Bedroom 168	10.2	Fail
Ensuite Bedroom 169	10.2	Fail
Ensuite Bedroom 170	9.6	Fail
Ensuite Bedroom 171	10.1	Fail
Ensuite Bedroom 172	10.6	Fail
Ensuite Bedroom 173	11.7	Fail
Ensuite Bedroom 174	10.6	Fail
Ensuite Bedroom 175	10.7	Fail
Ensuite Bedroom 176	9.3	Fail
Ensuite Bedroom 177	8.9	Fail
Ensuite Bedroom 178	9.1	Fail
Ensuite Bedroom 179	10.6	Fail
Ensuite Bedroom 180	21.9	Fail
Ensuite Bedroom 181	10.7	Fail
Ensuite Bedroom 182	10.7	Fail
Ensuite Bedroom 183	9.5	Fail
Ensuite Bedroom 184	10.7	Fail
Ensuite Bedroom 185	10.7	Fail
Ensuite Bedroom 186	10.3	Fail

Ensuite Bedroom 187	9.2	Fail
Ensuite Bedroom 188	9.9	Fail
Ensuite Bedroom 189	10.3	Fail
Ensuite Bedroom 190	10.3	Fail
Ensuite Bedroom 191	9.9	Fail
Ensuite Bedroom 192	10.3	Fail
Ensuite Bedroom 193	10.5	Fail
Ensuite Bedroom 194	9	Fail
Ensuite Bedroom 195	7.6	Fail
Ensuite Bedroom 196	6.5	Fail
Ensuite Bedroom 197	7.3	Fail
Ensuite Bedroom 198	5.6	Fail
Ensuite Bedroom 199	8.5	Fail
Ensuite Bedroom 200	9	Fail
Ensuite Bedroom 201	8.6	Fail
Ensuite Bedroom 202	7.4	Fail
Ensuite Bedroom 203	6.6	Fail
Ensuite Bedroom 204	6.5	Fail
Ensuite Bedroom 205	7.7	Fail
Ensuite Bedroom 206	6.8	Fail
Ensuite Bedroom 207	7.7	Fail
Ensuite Bedroom 208	7.7	Fail
Ensuite Bedroom 209	9.3	Fail
Ensuite Bedroom 210	7.3	Fail

Predicted Mean Vote (PMV) criterion

Room	PMV (ISO 7730) - % hours in range				Pass CIBSE Guide A
	< -0.5	-0.5 to 0.0	0.0 to 0.5	> 0.5	
Lounge Area	0.0	21.0	58.3	20.7	Fail
F&B	0.0	20.1	56.7	23.2	Fail
Office	0.0	13.4	45.9	40.7	Fail
Team Room	0.0	9.0	47.4	43.5	Fail
Reception	0.0	35.7	47.1	17.2	Fail
B1_Ensuite Bedroom	0.0	25.2	57.7	17.1	Fail
B1_Ensuite Bedroom	0.0	26.2	57.8	16.0	Fail
B1_Ensuite Bedroom	0.0	25.9	57.4	16.8	Fail
B1_Ensuite Bedroom	0.0	26.3	57.1	16.6	Fail
B1_Ensuite Bedroom	0.0	23.4	56.7	19.9	Fail
B1_Ensuite Bedroom	0.0	26.5	58.2	15.3	Fail
B1_Ensuite Bedroom	0.0	25.2	59.2	15.6	Fail
B1_Ensuite Bedroom	0.0	24.3	58.2	17.5	Fail
B1_Ensuite Bedroom	0.0	24.0	58.9	17.0	Fail
B1_Ensuite Bedroom	0.0	24.8	58.6	16.5	Fail
B1_Ensuite Bedroom	0.0	23.3	58.9	17.8	Fail
B1_Ensuite Bedroom	0.0	25.3	59.4	15.3	Fail
B1_Ensuite Bedroom	0.0	23.9	58.4	17.7	Fail
B1_Ensuite Bedroom	0.0	24.5	57.5	18.0	Fail
B1_Ensuite Bedroom	0.0	24.6	58.4	17.0	Fail
B1_Ensuite Bedroom	0.0	24.6	58.6	16.8	Fail
B1_Ensuite Bedroom	0.0	24.3	57.9	17.8	Fail
B1_Ensuite Bedroom	0.0	23.1	57.9	19.0	Fail
B1_Ensuite Bedroom	0.0	24.8	58.7	16.5	Fail
B1_Ensuite Bedroom	0.0	24.2	57.7	18.1	Fail
B1_Ensuite Bedroom	0.0	24.7	58.1	17.2	Fail
B1_Ensuite Bedroom	0.0	24.5	57.6	17.8	Fail
B1_Ensuite Bedroom	0.0	24.6	57.1	18.3	Fail
B1_Ensuite Bedroom	0.0	25.2	58.0	16.7	Fail
B1_Ensuite Bedroom	0.0	25.2	58.0	16.9	Fail

B1_Ensuite Bedroom	0.0	24.8	58.1	17.1	Fail
B1_Ensuite Bedroom	0.0	24.5	57.4	18.1	Fail
B1_Ensuite Bedroom	0.0	25.0	57.9	17.2	Fail
B1_Ensuite Bedroom	0.0	25.0	57.9	17.1	Fail
B1_Ensuite Bedroom	0.0	24.8	57.5	17.8	Fail
B1_Ensuite Bedroom	0.0	24.3	57.2	18.5	Fail
B1_Ensuite Bedroom	0.0	23.4	57.2	19.3	Fail
B1_Ensuite Bedroom	0.0	25.0	58.2	16.8	Fail
B1_Ensuite Bedroom	0.0	24.4	57.8	17.7	Fail
B1_Ensuite Bedroom	0.0	26.3	60.6	13.1	Fail
B1_Ensuite Bedroom	0.0	20.4	61.2	18.4	Fail
B1_Ensuite Bedroom	0.0	24.6	59.9	15.5	Fail
B1_Ensuite Bedroom	0.0	24.4	59.6	16.0	Fail
B1_Ensuite Bedroom	0.0	25.5	57.7	16.7	Fail
B1_Ensuite Bedroom	0.0	25.6	59.1	15.3	Fail
B1_Ensuite Bedroom	0.0	23.9	57.5	18.6	Fail
B1_Ensuite Bedroom	0.0	24.6	57.3	18.1	Fail
B1_Ensuite Bedroom	0.0	25.2	57.7	17.1	Fail
B1_Ensuite Bedroom	0.0	25.7	57.7	16.7	Fail
B1_Ensuite Bedroom	0.0	25.7	57.8	16.5	Fail
B1_Ensuite Bedroom	0.0	25.7	57.9	16.4	Fail
B1_Ensuite Bedroom	0.0	24.4	57.0	18.6	Fail
B1_Ensuite Bedroom	0.0	25.4	58.3	16.4	Fail
B1_Ensuite Bedroom	0.0	22.4	58.1	19.6	Fail
B1_Ensuite Bedroom	0.0	25.5	58.5	16.0	Fail
B1_Ensuite Bedroom	0.0	24.6	59.1	16.3	Fail
B1_Ensuite Bedroom	0.0	24.6	58.1	17.3	Fail
B1_Ensuite Bedroom	0.0	20.2	58.0	21.8	Fail
B1_Ensuite Bedroom	0.0	26.7	58.4	14.9	Fail
B1_Ensuite Bedroom	0.0	18.4	55.0	26.6	Fail
B1_Ensuite Bedroom	0.0	25.5	57.4	17.1	Fail
B1_Ensuite Bedroom	0.0	24.7	58.1	17.2	Fail
B1_Ensuite Bedroom	0.0	23.1	58.2	18.7	Fail
B1_Ensuite Bedroom	0.0	26.1	57.5	16.4	Fail

B1_Ensuite Bedroom	0.0	25.2	59.2	15.6	Fail
B1_Ensuite Bedroom	0.0	24.7	58.9	16.4	Fail
B1_Ensuite Bedroom	0.0	23.3	59.2	17.6	Fail
B1_Ensuite Bedroom	0.0	25.4	57.5	17.1	Fail
B1_Ensuite Bedroom	0.0	25.3	58.1	16.6	Fail
B1_Ensuite Bedroom	0.0	24.8	57.9	17.3	Fail
B1_Ensuite Bedroom	0.0	24.1	55.1	20.8	Fail
B1_Ensuite Bedroom	0.0	25.5	58.0	16.5	Fail
B1_Ensuite Bedroom	0.0	26.3	57.1	16.6	Fail
B1_Ensuite Bedroom	0.0	26.3	57.2	16.6	Fail
B1_Ensuite Bedroom	0.0	26.4	58.1	15.5	Fail
B1_Ensuite Bedroom	0.0	26.2	57.3	16.5	Fail
B1_Ensuite Bedroom	0.0	24.1	58.4	17.5	Fail
B1_Ensuite Bedroom	0.0	24.3	57.6	18.2	Fail
B1_Ensuite Bedroom	0.0	25.2	58.2	16.6	Fail
B1_Ensuite Bedroom	0.0	20.4	61.3	18.3	Fail
B1_Ensuite Bedroom	0.0	25.4	60.9	13.6	Fail
B1_Ensuite Bedroom	0.0	23.9	57.2	18.8	Fail
B1_Ensuite Bedroom	0.0	24.0	57.6	18.4	Fail
B1_Ensuite Bedroom	0.0	23.1	57.6	19.3	Fail
B1_Ensuite Bedroom	0.0	19.3	59.4	21.3	Fail
B1_Ensuite Bedroom	0.0	21.9	62.5	15.6	Fail
B1_Ensuite Bedroom	0.0	24.4	57.2	18.4	Fail
B1_Ensuite Bedroom	0.0	23.1	59.9	17.0	Fail
B1_Ensuite Bedroom	0.0	23.3	57.6	19.1	Fail
B1_Ensuite Bedroom	0.0	24.4	57.5	18.1	Fail
B1_Ensuite Bedroom	0.0	26.5	57.8	15.7	Fail
B1_Ensuite Bedroom	0.0	24.8	57.8	17.4	Fail
B1_Ensuite Bedroom	0.0	25.0	58.1	16.9	Fail
B1_Ensuite Bedroom	0.0	24.9	58.4	16.7	Fail
B1_Ensuite Bedroom	0.0	23.8	58.7	17.6	Fail
B1_Ensuite Bedroom	0.0	24.6	59.5	15.9	Fail
B1_Ensuite Bedroom	0.0	24.9	59.6	15.5	Fail
B1_Ensuite Bedroom	0.0	27.1	57.2	15.7	Fail

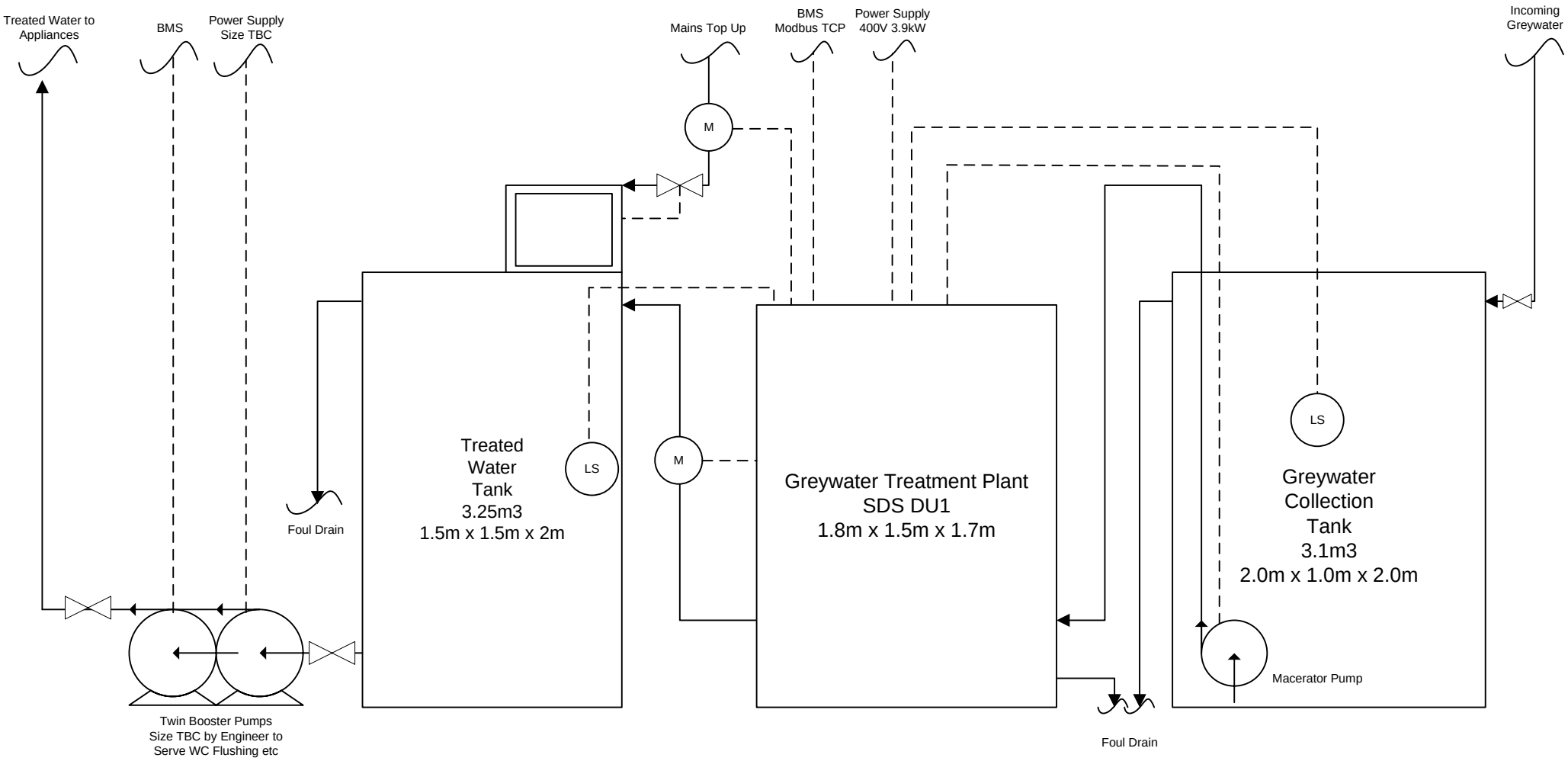
B1_Ensuite Bedroom	0.0	23.6	57.4	19.0	Fail
B1_Ensuite Bedroom	0.0	24.4	58.0	17.7	Fail
B1_Ensuite Bedroom	0.0	25.3	58.2	16.5	Fail
B1_Ensuite Bedroom	0.0	25.6	59.1	15.3	Fail
B1_Ensuite Bedroom	0.0	25.3	59.3	15.4	Fail
B1_Ensuite Bedroom	0.0	25.4	58.0	16.6	Fail
B1_Ensuite Bedroom	0.0	20.1	56.2	23.7	Fail
B1_Ensuite Bedroom	0.0	19.6	56.5	23.9	Fail
B1_Ensuite Bedroom	0.0	26.7	59.1	14.2	Fail
B1_Ensuite Bedroom	0.0	22.8	59.2	18.0	Fail
B1_Ensuite Bedroom	0.0	24.3	58.8	16.9	Fail
B1_Ensuite Bedroom	0.0	22.8	59.6	17.6	Fail
B1_Ensuite Bedroom	0.0	23.9	59.2	16.9	Fail
B1_Ensuite Bedroom	0.0	24.2	60.3	15.5	Fail
B1_Ensuite Bedroom	0.0	20.2	56.0	23.8	Fail
B1_Ensuite Bedroom	0.0	20.2	55.9	23.9	Fail
B1_Ensuite Bedroom	0.0	20.2	55.9	23.9	Fail
B1_Ensuite Bedroom	0.0	20.1	56.0	24.0	Fail
B1_Ensuite Bedroom	0.0	19.8	55.6	24.6	Fail
B1_Ensuite Bedroom	0.0	18.6	55.2	26.2	Fail
B1_Ensuite Bedroom	0.0	23.3	56.8	19.9	Fail
B1_Ensuite Bedroom	0.0	23.8	57.0	19.2	Fail
B1_Ensuite Bedroom	0.0	23.8	57.8	18.4	Fail
B1_Ensuite Bedroom	0.0	23.1	55.3	21.7	Fail
B1_Ensuite Bedroom	0.0	23.8	57.0	19.3	Fail
B1_Ensuite Bedroom	0.0	23.8	56.9	19.3	Fail
B1_Ensuite Bedroom	0.0	21.8	57.8	20.3	Fail
B1_Ensuite Bedroom	0.0	23.4	56.7	19.9	Fail
B1_Ensuite Bedroom	0.0	12.2	41.7	46.1	Fail
B1_Ensuite Bedroom	0.0	22.2	56.5	21.3	Fail
B1_Ensuite Bedroom	0.0	22.0	56.3	21.7	Fail
B1_Ensuite Bedroom	0.0	27.4	58.5	14.1	Fail
B1_Ensuite Bedroom	0.0	24.1	58.5	17.4	Fail
B1_Ensuite Bedroom	0.0	13.2	44.4	42.5	Fail

B1_Ensuite Bedroom	0.0	27.2	57.8	15.0	Fail
B1_Ensuite Bedroom	0.0	25.7	59.3	15.0	Fail
B1_Ensuite Bedroom	0.0	24.5	57.4	18.2	Fail
B1_Ensuite Bedroom	0.0	26.1	57.1	16.7	Fail
B1_Ensuite Bedroom	0.0	26.1	58.8	15.1	Fail
B1_Ensuite Bedroom	0.0	26.3	56.9	16.8	Fail
B1_Ensuite Bedroom	0.0	26.3	57.0	16.7	Fail
B1_Ensuite Bedroom	0.0	24.5	58.1	17.3	Fail
B1_Ensuite Bedroom	0.0	23.1	58.7	18.2	Fail
B1_Ensuite Bedroom	0.0	25.0	59.1	15.8	Fail
B1_Ensuite Bedroom	0.0	24.4	57.7	17.9	Fail
B1_Ensuite Bedroom	0.0	20.8	59.9	19.4	Fail
B1_Ensuite Bedroom	0.0	23.7	57.7	18.5	Fail
B1_Ensuite Bedroom	0.0	25.0	58.9	16.1	Fail
B1_Ensuite Bedroom	0.0	20.1	59.6	20.3	Fail
B1_Ensuite Bedroom	0.0	23.5	57.1	19.4	Fail
B1_Ensuite Bedroom	0.0	23.8	56.4	19.8	Fail
B1_Ensuite Bedroom	0.0	23.5	57.7	18.8	Fail
B1_Ensuite Bedroom	0.0	23.9	57.8	18.3	Fail
B1_Ensuite Bedroom	0.0	22.6	58.1	19.3	Fail
B1_Ensuite Bedroom	0.0	24.6	56.6	18.8	Fail
B1_Ensuite Bedroom	0.0	22.5	57.4	20.1	Fail
B1_Ensuite Bedroom	0.0	23.5	56.9	19.6	Fail
B1_Ensuite Bedroom	0.0	23.7	56.4	19.8	Fail
B1_Ensuite Bedroom	0.0	23.8	56.5	19.7	Fail
B1_Ensuite Bedroom	0.0	23.7	56.5	19.8	Fail
B1_Ensuite Bedroom	0.0	22.9	57.2	19.9	Fail
B1_Ensuite Bedroom	0.0	22.3	56.6	21.1	Fail
B1_Ensuite Bedroom	0.0	20.0	57.5	22.5	Fail
B1_Ensuite Bedroom	0.0	11.1	40.2	48.7	Fail
B1_Ensuite Bedroom	0.0	6.4	31.5	62.1	Fail
B1_Ensuite Bedroom	0.0	12.1	42.4	45.5	Fail
B1_Ensuite Bedroom	0.0	12.4	42.5	45.1	Fail
B1_Ensuite Bedroom	0.0	12.4	42.3	45.3	Fail

B1_Ensuite Bedroom	0.0	25.0	56.6	18.4	Fail
B1_Ensuite Bedroom	0.0	23.5	56.7	19.8	Fail
B1_Ensuite Bedroom	0.0	23.5	56.6	19.9	Fail
B1_Ensuite Bedroom	0.0	23.5	56.6	19.9	Fail
B1_Ensuite Bedroom	0.0	22.6	57.4	20.0	Fail
B1_Ensuite Bedroom	0.0	23.7	56.5	19.9	Fail
B1_Ensuite Bedroom	0.0	23.8	56.4	19.8	Fail
B1_Ensuite Bedroom	0.0	23.8	56.4	19.8	Fail
B1_Ensuite Bedroom	0.0	23.1	58.1	18.9	Fail
B1_Ensuite Bedroom	0.0	22.7	57.6	19.7	Fail
B1_Ensuite Bedroom	0.0	23.5	56.6	19.9	Fail
B1_Ensuite Bedroom	0.0	22.2	56.5	21.3	Fail
B1_Ensuite Bedroom	0.0	23.5	56.5	20.0	Fail
B1_Ensuite Bedroom	0.0	23.3	56.7	20.0	Fail
B1_Ensuite Bedroom	0.0	23.5	57.5	19.0	Fail
B1_Ensuite Bedroom	0.0	24.9	56.9	18.2	Fail
B1_Ensuite Bedroom	0.0	24.9	56.7	18.4	Fail
B1_Ensuite Bedroom	0.0	22.3	57.5	20.2	Fail
B1_Ensuite Bedroom	0.0	15.8	46.8	37.3	Fail
B1_Ensuite Bedroom	0.0	23.0	56.8	20.2	Fail
B1_Ensuite Bedroom	0.0	23.0	56.9	20.1	Fail
B1_Ensuite Bedroom	0.0	23.9	57.8	18.3	Fail
B1_Ensuite Bedroom	0.0	21.8	57.6	20.6	Fail
B1_Ensuite Bedroom	0.0	22.7	57.1	20.2	Fail
B1_Ensuite Bedroom	0.0	22.5	57.5	20.0	Fail
B1_Ensuite Bedroom	0.0	24.9	56.6	18.5	Fail
B1_Ensuite Bedroom	0.0	23.7	57.1	19.2	Fail
B1_Ensuite Bedroom	0.0	23.7	56.4	19.9	Fail
B1_Ensuite Bedroom	0.0	23.7	56.4	19.9	Fail
B1_Ensuite Bedroom	0.0	23.4	57.2	19.4	Fail
B1_Ensuite Bedroom	0.0	23.7	56.4	19.9	Fail
B1_Ensuite Bedroom	0.0	23.4	56.6	20.0	Fail
B1_Ensuite Bedroom	0.0	24.6	57.0	18.4	Fail
B1_Ensuite Bedroom	0.0	24.9	58.2	16.9	Fail

B1_Ensuite Bedroom	0.0	26.0	59.7	14.2	Fail
B1_Ensuite Bedroom	0.0	25.2	58.2	16.6	Fail
B1_Ensuite Bedroom	0.0	27.9	58.7	13.5	Fail
B1_Ensuite Bedroom	0.0	23.3	59.0	17.8	Fail
B1_Ensuite Bedroom	0.0	24.6	57.1	18.4	Fail
B1_Ensuite Bedroom	0.0	24.2	58.2	17.6	Fail
B1_Ensuite Bedroom	0.0	24	59.5	16.5	Fail
B1_Ensuite Bedroom	0.0	25.5	60.1	14.4	Fail
B1_Ensuite Bedroom	0.0	25.9	59	15.1	Fail
B1_Ensuite Bedroom	0.0	24.9	58.1	17	Fail
B1_Ensuite Bedroom	0.0	24.5	60.2	15.4	Fail
B1_Ensuite Bedroom	0.0	24.9	57.9	17.2	Fail
B1_Ensuite Bedroom	0.0	23.8	59.6	16.6	Fail
B1_Ensuite Bedroom	0.0	23.5	57.7	18.8	Fail
B1_Ensuite Bedroom	0.0	24.6	59	16.4	Fail

Appendix B – SDS Greywater Schematic



Client	PSH Consulting	Details
Project Name	Brunswick Centre – Premier Inn	Collection Tank Size Amended
Type	Greywater Schematic	
Date	27.07.2023	
Drawing no.	E_171023_01	
Revision	B	

Notes:

This Drawing is to be read in conjunction with all relevant Architect, Engineers and Specialists drawings and specifications.

Do not scale from the drawing in either paper or digital form. Use written dimensions only.

SDS Water Infrastructure Systems

Appendix C – Greywater On-Demand Servicing Report

SDS Greywater On-Demand Servicing Report

Biannual Maintenance

Task	Status	Comments/Notes
Filter maintenance including backwashing.		
Calibrate Probes.		
Clean Feed Pump.		
Check the filter at the air suction of the compressor.		
Confirmation of system functionality including disc filters, valves, sodium hypochlorite levels etc.		
Cleaning and adjustment of the equipment.		
Test all control parameters.		
Assess production volumes and adjust as required.		
Check operation of mains water back up system.		
Inspect cleanliness of collection and treated water tank.		

SDS Ltd, Clearwater House, Castlemills, Biddisham, Somerset, BS26 2RE
T: +44 (0)1934 751303
E: info@sdslimited.com

Annual Maintenance

Task	Status	Comments/Notes
All Biannual Service parameters.		
Cleaning of Tanks as required.		
Check data logger readouts against expected usage (if applicable).		
Checking of Gaskets and Springs on Disc Filters and 3 Way Valve.		
Service Inspection by professional organisation confirming correct operation of all components.		

Required Material Changes

Item	Min Advised Frequency	Yes/No	Item	Min Advised Frequency	Yes/No
Disc Filter Kit (Gaskets)	2 Years		Feed Pump Seals & O-rings	2 Years	
3 Way Valves PN10 B Kit	2 Years		Feed Pump Bearings	5 Years	
BSP FT Two Way Valves	2 Years		CM3-3 Pump Seal & O-ring	2 Years	
Dosing Pump Kit (Gaskets)	2 Years		CM3-3 Pump Bearings	5 Years	
Dosing Tank Level Switch	1 Year		Blower Kit	2 Years	
Compressor Kit	2 Years		Suction Filter for Blower	2 Years	
MAX 60 Ultrafiltration Membrane	5 Years		Sodium Hypochlorite	Site Dependant	

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E: info@sdslimited.com

Additional Comments/Recommendations

Date	
Client	
Site Name & Address	
Client Representative & Company	
Position	
SDS Representative	

SDS Ltd, Clearwater House, Castlemills,
Biddisham, Somerset, BS26 2RE
T: +44 (0)1934 751303
E: info@sdslimited.com

Appendix D – Technical Proposal

TECHNICAL PROPOSAL

CUSTOMER:	PSH Consulting
PROJECT:	Brunswick Centre, Premier Inn
ATTENTION OF:	David Jenkins
ENQUIRY NUMBER:	E/1710/23 V2
DATE:	26/09/2023
APPLICATION:	Grey water reuse
PROPOSED TREATMENT	AZUD WATERTECH GW DU1
PRODUCTION FLOW:	12 m³/day

1.0. Grey Water Collection Tank

GRP Hand Layup Pre-Insulated Tank (Nominal 25mm Thickness) and Heavy Duty Cover complete with 1nr Manhole and screened vent. True Totally Internally Flanged (True T.I.F)

Tank External Dimensions (L x W x H): 2.0m x 1.0m x 2.0m

Tank Internal Dimensions (L x W x H): TBC

Nominal Capacity: 3,100L

Items Included in Tank Specification.

- S/S Bolts Under Water
- S/S Bolts throughout
- Internally Flanged Base
- Internally Flanged Side
- 1nr Internal Ladder – GRP
- 1nr External Ladder – Aluminium incl Safety Cage
- Base Levelling Steels

2.0. GREY WATER TREATMENT PLANT

2.1. DESIGN DATA

2.1.1. RAW WATER QUALITY

ORIGIN: **GREYWATER. Greywater comes from bathtubs, showers and toilets.**

There is no analytical data on the water to be treated. The following design parameters are considered based on the water source and the information provided:

DESIGN ANALYTIC		
TSS	50.0	mg/l
Turbidity	25.0	NTU
BOD	150.0	mgO/l

Information not reflected in the design data or modifications of the raw water quality may affect the proper functioning of the system and / or cause damage to the installation.

2.1.2. TREATED WATER QUALITY

APPLICATION: **REUSE IN TOILETS**

It is required to comply with the following quality parameters in the treated water:

MAXIMUM ALLOWED LEVELS		
TSS	10.0	mg/l
Turbidity	2.0	NTU
BOD	50.0	mgO/l
Ecoli	10.0	CFU/100ml
Free chlorine	0,5 - 1,0	mg/l

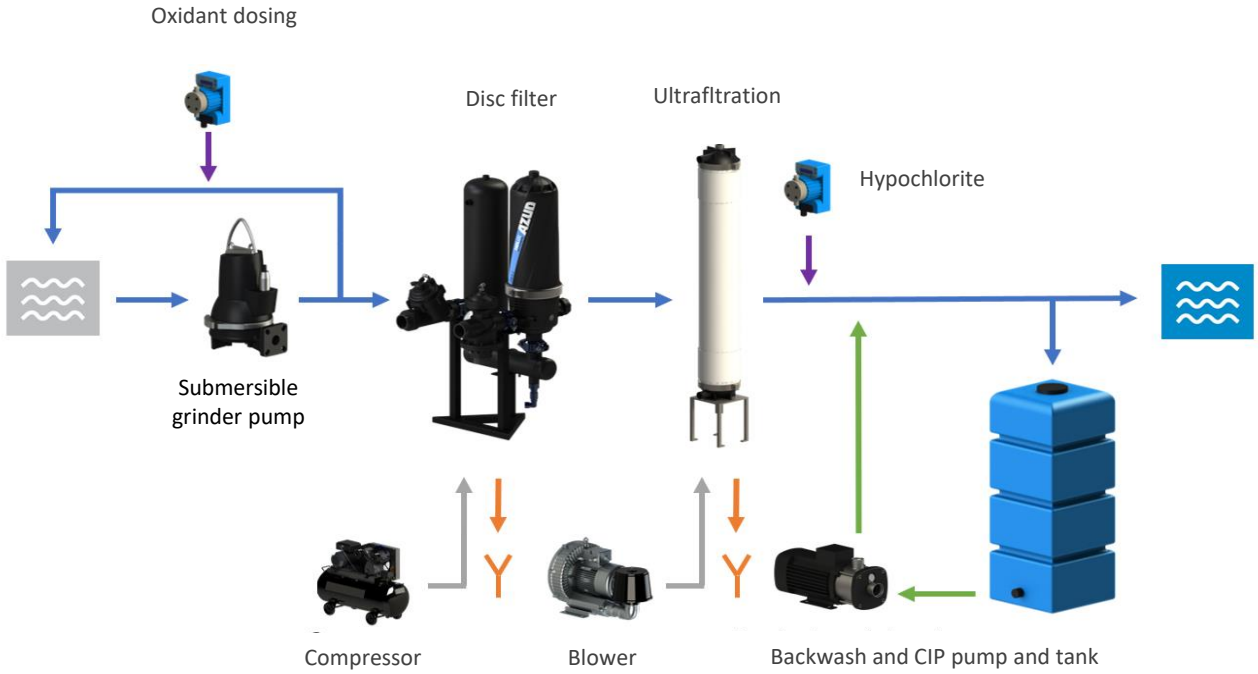
To ensure compliance with the legislation will require a complete analytical input water.

2.1.3. PRODUCTION FLOW

The plant has been designed according to the product water flow data required.

DESIGN FLOW		
Total daily flow	12.0	m^3/day
Working hours	12.0	hours/
Production flow	1.0	m^3/h
System recovery	85.8	%
Input flow	1.2	m^3/h

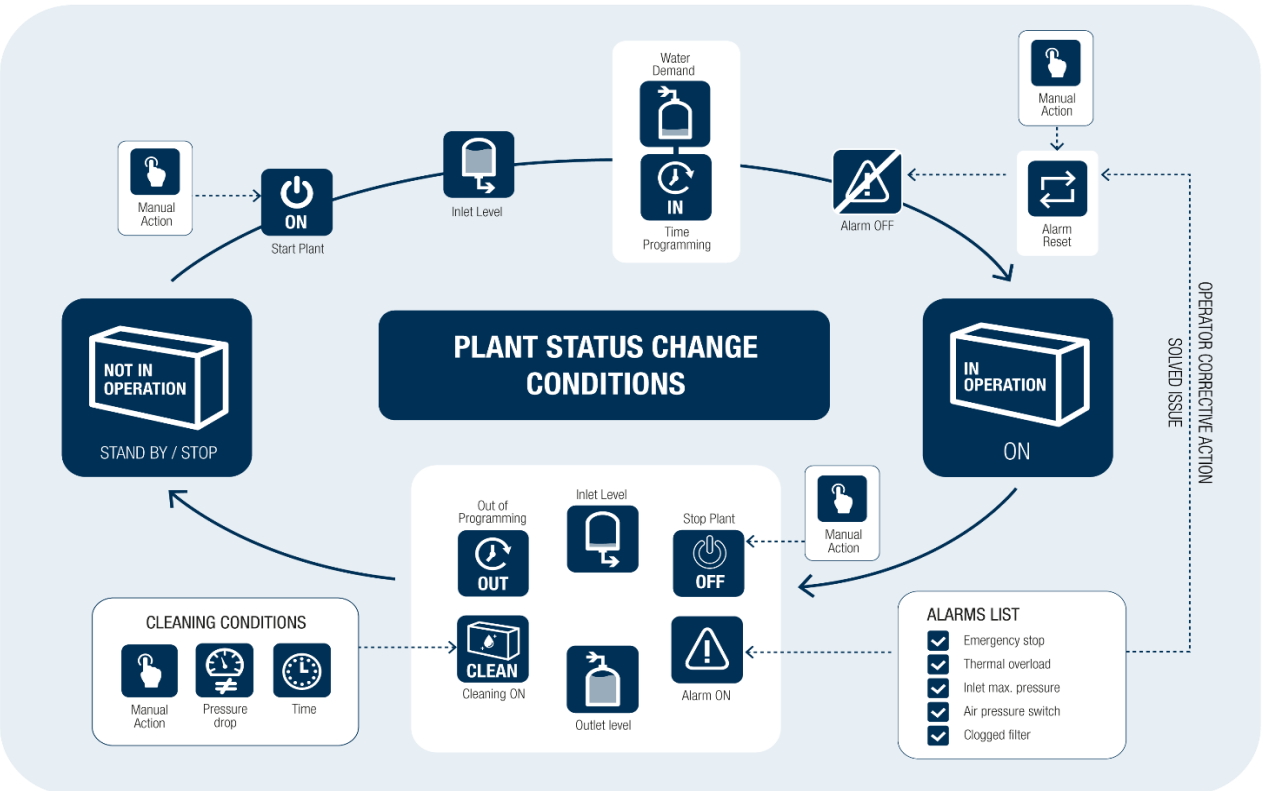
2.2 TECHNICAL INFORMATION
2.2.1. PROCESS DIAGRAM



2.3. CONTROL PHILOSOPHY

The treatment plant is fully automated and through the screen it allows to configure the operating parameters and visualize and control the status of the plant and all its equipment. It also shows the values taken by the measuring equipment for greater ease of operation.

The following scheme details the conditions that must be given so that the plant is producing water, as well as for that production to be interrupted.



The plant has a series of alarms that interrupt production and stop all equipment for safety: maximum inlet pressure, emergency button, thermal breaker, clogging of filters, ...

The water treatment plant is supplied completely assembled and tested. Its electrical panel includes all the necessary components for the operation and protection of the equipment of the plant. The operation of the plant is simple since it is equipped with a PLC and a touch screen (HMI) that allow the visualization and control of plant statuses and their components, as well as the values of the measuring equipment.

2.4. SYSTEM LIMITATIONS

OPERATING CONDITIONS	
Inlet pressure	2 - 4 bar
Room temperature	0 - 40 ˚C
Water temperature	5 - 30 ˚C
pH	6,5 - 8,5

LIMITATIONS ON THE QUALITY OF INLET WATER	
Turbidity	< 200 NTU
TSS	< 150 mg/l
Grease and oil	< 0,1 mg/l
Free chlorine	< 1 mg/l
BOD	< 150 mgO/l
COD	< 300 mgO/l
TOC	< 15 mg/l
Aluminium	< 0,5 mg/l
pH	6,5 - 8,5 _

2.5. POWER CONSUMPTION

Electrical power supply	400	V AC
Frequency	50	Hz

			Unit capacity	Simultaneity factors		Total power (kW)	
Equipment	**uts.**	**Voltage (V)**		**Production**	**Cleanning**	**Production**	**Cleanning**
Feed pump	1	3 ~ 400	2.4	1	-	2.4	-
Hypochlorite dosing system	1	1 ~ 230	0.02	1	-	0.02	-
Compressor	1	3 ~ 400	1.5	1	1	1.5	1.5
Backwash pump	1	3 ~ 400	0.5	-	1	-	0.5

*Heating element will work only during CIP cleaning, it is not considered in power consumption calculation

Power	3.9	kW
Electric consumption *	59.3	kW h/día
Daily flow produced	12.0	m^3/day
Electric consumption per m^3 produced	2.58	kW h/m^3

*Calculation performed for a frequency of 50 Hz

The consumption is estimated, may vary depending on the actual operating conditions of the plant.

NOTE: Not included in this budget neither the electrical connections nor the cabling needed to transport electricity from the transformation center, nor the attachment point to the plant electrical cabin.

2.6. REAGENTS CONSUMPTION

	OXIDANT	OXIDANT
Application	Feed water oxidation	Disinfection
Chemical reagent	Hipoclorito Sódico	Hipoclorito Sódico
Injection point	Plant inlet	Plant outlet
Flow to be treated	1.0 m³/h	1.0 m³/h
Concentration	2.0 mg/l approx.	1.2 mg/l approx.
Purity	13.0 %	13.0 %
Reactive density	1,154.0 g/l	1,154.0 g/l
Dosing flow	0.5 l/h	0.4 l/h
Operating hours	12 h/day	12 h/day
Dosage tank volume	50 l	0 l
Dose	0.013 ml/l	0.010 ml/l
Time dose	13.3 ml/h	10.0 ml/h
Daily consumption	0.3 l/day	0.0 l/day
Volume of reagent in deposit	1.3 l	0.0 l
Kg of reagent in deposit	1.5 kg	0.0 kg
Dosing tank autonomy	4 day	0 day
Daily water flow product	12.0 m³/day	12.0 m³/day
Reagent consumption	**0.013 l/m³ product water**	**0.000 l/m³ product water**

Doses values are estimated and they should be adjusted according to the realistic plant operation conditions.

3. GREY WATER TREATMENT SYSTEM SPECIFICATIONS

3.1. EQUIPMENT SPECIFICATIONS

FEED PUMPING

PUMP

Quantity	1
Manufacturer	GRUNDFOS
Type	Trituradora
Model	SEG 40.26.2
Operating point	2,2 m³/h @ 3,2 bar
Material	Pump housing and impeller: cast iron
Power	2,6 kW
Power supply	3 x 400 V AC | 50Hz
Velocity	2.860 - 2.880 rpm
Protection	IP 68
Start / Control	Direct start
Accesories	Legs for free suport

CHEMICAL PRETREATMENT

OXIDANT DOSING SYSTEM

Oxidation of organic and inorganic matter and pathogens microorganisms. Precipitation of inorganic compounds (such as iron and manganese) to be filtered and/or decanted in the next stage.

Dosing pump

Quantity	1
Manufacturer	SEKO
Type	Electromagnetic
Control	Constant
Model	SEKO KCS 632
Capacity	2,0 l/h
Maximum discharge pressure	7,0 bar
Material	Body and connection: PVDF; Membrane: PTFE; Joints: Viton
Power	20,0 W
Power supply	1x 100-240 V AC | 50-60 Hz
Protection	IP 65
Accesories	Installation kit (inyection valve, suction tube, …) and level probe

Tank

Quantity	1
Manufacturer	SEKO
Type	Cylindrical monoblock
Volume	250 L
Material	PE
Accesories	Emptying system

DISCS FILTER

Removal of suspended solids larger than grade of selected disc (5-200 µm).

Quantity	1
Manufacturer	AZUD
Type	Air assisted self-cleaning
Model	AZUD HELIX AUTOMATIC FT201/2VX AA DLP MG 100M
Filtration degree	100 µm
Filtration area	1.620 cm²
Material	Grooved discs PP made with technical thermoplatic housing
Maximum pressure	10,0 bar
Manifolds / Power	2"
Valves / Power supply	Automatic valves for backwash
Accesories	Carbon steel frame with epoxy-polyester coating

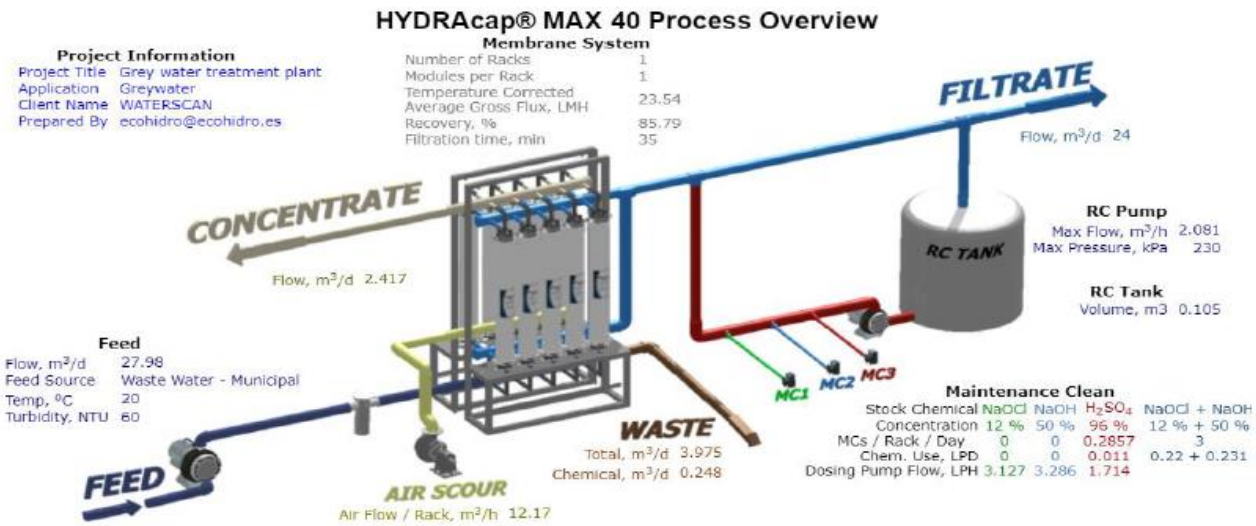
SIZING		
EQUIPMENT		
No. of equipment	1	uts.
Unitary filtration area	1,620	cm²
Total filtration area	1,620	cm²
FILTER		
No of filters per equipment	1	uts.
Filter connection	2	''
Filtration area	1,620	cm²
OPERATION		
Total flow rate	1.2	m³/h
Flow per equipment	1.2	m³/h
Filter element flow	1.2	m³/h
Backwash water by filter	10	l
Backwash time per filter	25 -30	s
Minimum operating pressure	0.8	bar

ULTRAFILTRATION

Removal of suspended solids larger than 0.08 µm, assuring the supply of completely filtrated water (< 1 NTU) and disinfected water (remotion of bacteria and viruses).

Manufacturer	HYDRANAUTICS
Type	Hollow fiber (out/in)
Model	HYDRACAP MAX60
Nº membranes	1
Flux	34 – 110 LMH
Maximum pressure	5,0 bar
Filtration degree	0,08 µm
Material	PVDF
Accesories	Automatic pneumatic valves for backwash sequences

SIZING		
SYSTEM		
No. of racks	1.0	uts.
Production flow per rack	1.0	m³/h
Total flow	1.0	m³/h
Turbidity	60.0	NTU
Ultrafiltration recovery	85.8	%
Raw flow	1.2	m³/h
OPERATION		
No. Of membranes per rack	1.0	uts.
Membrane area	52.0	m²
Filtration area per rack	52.0	m²
Operation flux	23.5	LMH
Backwash flow per rack	2.0	m³/h
Backwash air scour	12.2	m³/h
Backwash time per rack	45 - 60	s



BACKWASH ULTRAFILTRATION SYSTEM

The performance and lifetime of the membranes is optimized and the CIP cleaning frecuency is delayed. With the addition of oxidant, the effectiveness is improved, thanks to the oxidation of organic and inorganic compounds that can accelerate the clogging of the membrane.

PUMP

Quantity	1
Manufacturer	GRUNDFOS
Type	Horizontal centrifugal pump
Model	CM 5-3
Operating point	2 m³/h @ 2.5 bar
Material	Pump housing: cast iron; Impeller: SS 304
Power	0,5 kW
Power supply	3 x 400 V AC | 50 Hz
Velocity	2,730 rpm
Protection	IP55
Start / Control	Direct start
Accesories	Isolation valve and pressure gauge

TANK

Quantity	1
Manufacturer	SCHÜTZ
Type	Troncoconic
Volume	350 L
Material	PE
Accesories	Ballcock, drain valve, volume viewer and level switch

AIR COMPRESSOR

Quantity	1
Type	belt Driven
Maximum Pressure	10 bar
Volume	90 L
Power	2 CV
Power Supply	3x 380 V AC
Accesories	Pressure regulator and pressure switch for safety

DISINFECTION

RESIDUAL CHLORINE DOSING SYSTEM

Removal of pathogens microorganisms such us bacteria, protozoe and virus, due to the oxidant attack of the sodium hypochlorite.

Dosing pump

Quantity	1
Manufacturer	SEKO
Type	Electromagnetic
Control	Constant
Model	SEKO KCS 632
Capacity	2,0 l/h
Maximum discharge pressure	7,0 bar
Material	Body and connection: PVDF; Membrane: PTFE; Joints: Viton
Power	20,0 W
Power supply	1x 100-240 V AC | 50-60 Hz
Protection	IP 65
Accesories	Installation kit (inyection valve, suction tube, …) and level probe

Tank (common to oxidation dosing tank)

Quantity	1
Manufacturer	SEKO
Type	Cylindrical monoblock
Volume	50 L
Material	PE
Accesories	Emptying system

3.2. MEASUREMENT EQUIPMENT

The plant is equipped with the necessary instrumentation to monitor the operation parameters, control the different processes of the plant, protect the equipment and guarantee the safety of the personnel.

DIFFERENTIAL PRESSURE SWITCH

Quantity	2
Manufacturer	DANFOSS
Type	Differential pressure
Model	MP-55
Operating range	0 - 7,5 bar

PRESSURE SWITCH

Quantity	1
Manufacturer	DANFOSS
Type	Low pressure
Model	KP-35
Operating range	0 - 7,5 bar

ROTAMETERS

Quantity	1
Manufacturer	FIP
Type	Vertical
Connection	1 "
Material	TROGAMID
Operating range	150 - 1.600 l/h

3.3. FRAMEWORK, PIPING AND CONEXIONS

All the components of the plant and its control panel are installed on a metallic structure with anticorrosive treatment for easy transport in sea containers.

STRUCTURE 1

Quantity	1
Type	
Dimensions	0,6 x 0,7 x 0,15 m
Material	Carbon steel
Coating treatment	EPOXY coating
Technical specifications	Disc Filter support

STRUCTURE 2

Quantity	1
Type	Open Frame
Dimensions	0,6 x 1,1 x 1,7 m
Material	Carbon steel
Coating treatment	EPOXY coating
Technical specifications	Support for UF membrane, electrical cabinet, BW Pump, dosing pumps

PIPES AND CONNECTIONS

Low pressure pipe	PVC
Connection type	DIN flange
Connections	Inlet D32 (1")|Outlet D32 (1") Drain D50 (1 1/2") |Recirculation D32 (1")

3.4. AUTOMATION AND CONTROL UNIT

The water treatment plant is supplied completely assembled and tested. Its electrical panel includes all the necessary components for the operation and protection of the equipment of the plant. The operation of the plant is simple since it is equipped with a PLC and a touch screen (HMI) that allow the visualization and control of plant statuses and their components, as well as the values of the measuring equipment.

Quantity	1
Engineering and assembling	AZUD
Material	EPOXY coated carbon steel
Protection	IP66
Norm	UNE
PLC	SIEMENS S7-1200 + extension modules
HMI	SIEMENS 7" Color KTP700
Components	Transformer and all electrical components of the plant
Visual control	Operation parameters, alarms, warnings and plant status
Accesories	BÜRKERT solenoïds

4.0. TREATED WATER TANK

GRP Hand Layup Pre-Insulated Tank (Nominal 25mm Thickness) and Heavy Duty Cover complete with 1nr Manhole and screened vent. True Totally Internally Flanged (True T.I.F)

Tank External Dimensions (L x W x H): 1.5m x 1.5m x 2m

Tank Internal Dimensions (L x W x H): TBC

Nominal Capacity: 3,250L

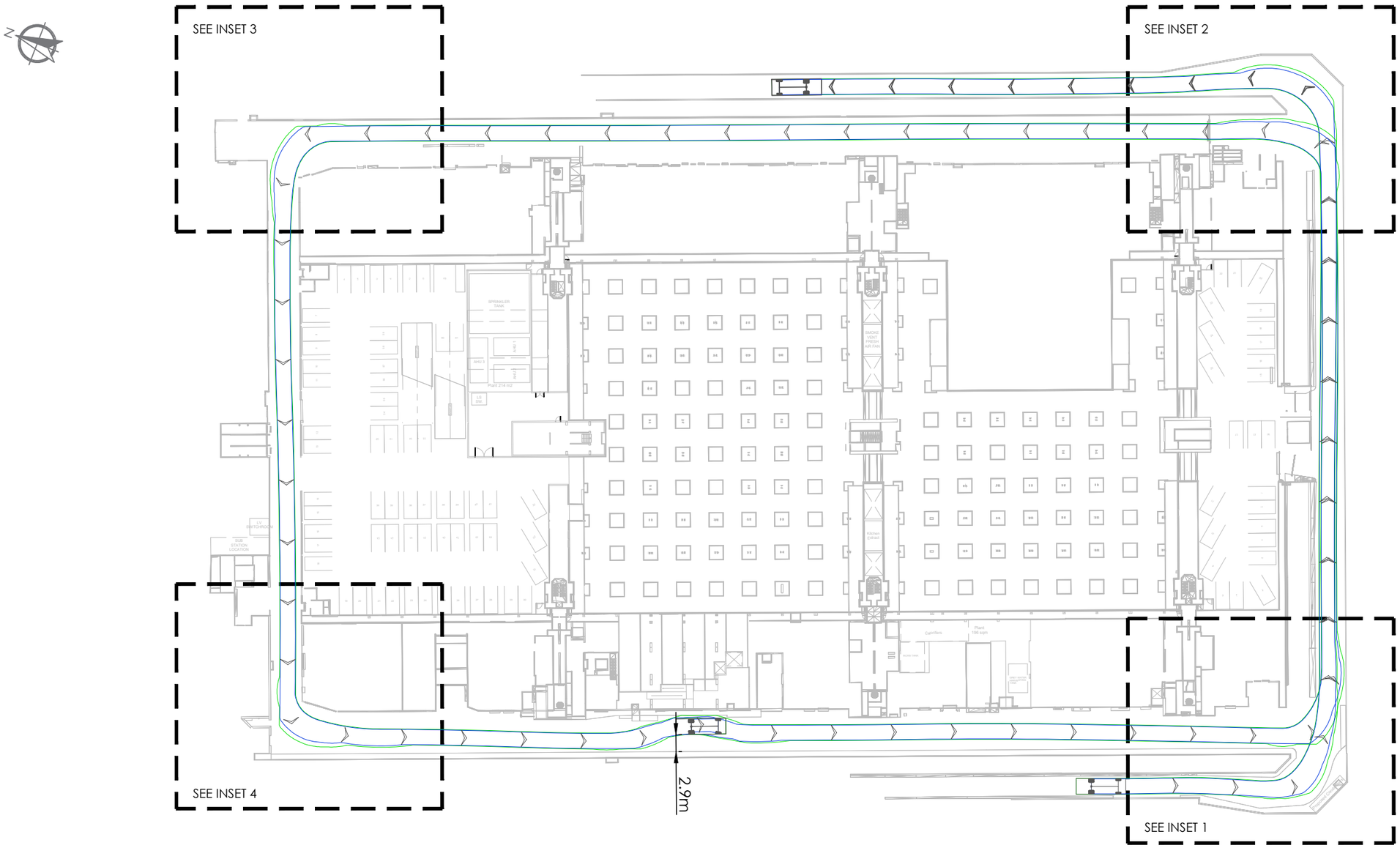
Items Included in Tank Specification.

- S/S Bolts Under Water
- S/S Bolts throughout
- Internally Flanged Base
- Internally Flanged Side
- Ball Valve Box with side access (800mm x 600mm x 500mm)
- Airgap AB Fluid Category 5
- 1nr Internal Ladder – GRP
- 1nr External Ladder – Aluminium incl Safety Cage
- Base Levelling Steels

5.0 Booster Pumpset

Size & Specificiation TBC by Engineers

Appendix E – Swept Path Analysis



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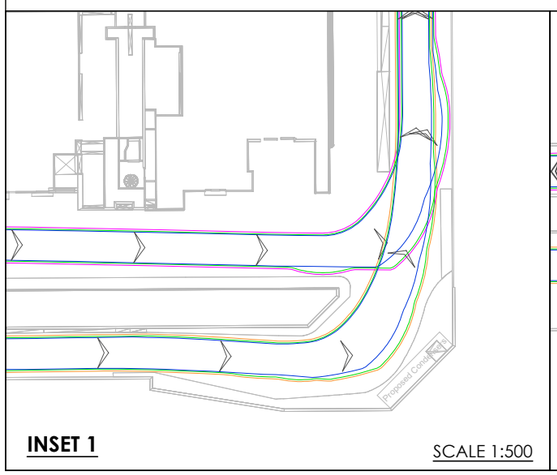
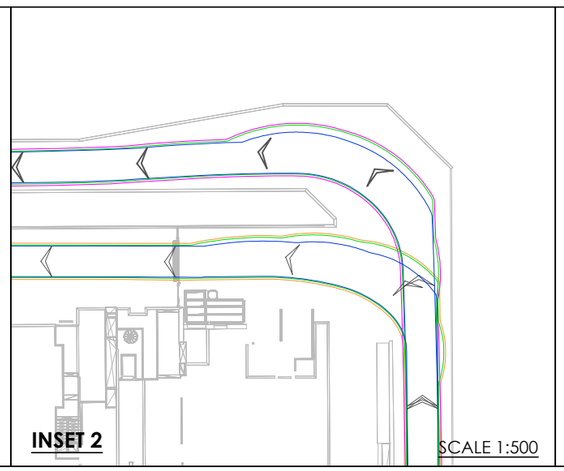


INSET 1 SCALE 1:500



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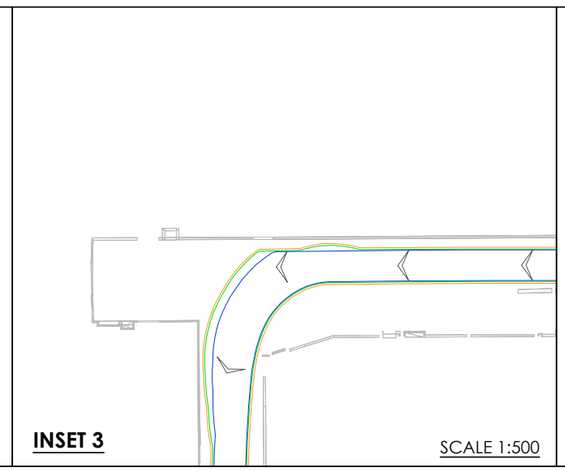

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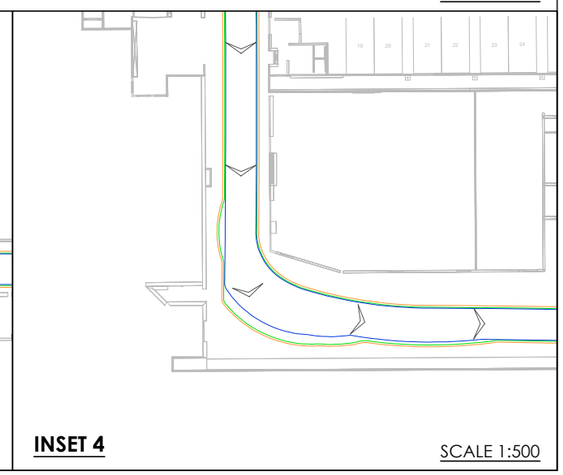
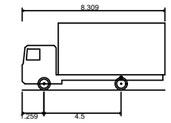


INSET 4 SCALE 1:500

NOTES

This drawing has been prepared for the purpose of planning discussions and does not constitute a detailed design drawing, or construction drawing. A Design Hazard Inventory has been prepared by RGP setting out the hazards which have been designed out. This is available upon request.

- VEHICLE WHEEL LINE
- VEHICLE CHASSIS LINE
- 0.15m OFFSET - INBOUND VEHICLE
- 0.15m OFFSET - OUTBOUND VEHICLE



Whitbread Rigid 14t	
Overall Length	8.309m
Overall Width	2.650m
Overall Body Height	3.900m
Min Body Ground Clearance	0.351m
Track Width	2.064m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	7.400m

RESIDUAL HAZARDS

In addition to the hazards/risks normally associated with the type of work detailed on this drawing, please note the following residual hazards:

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved risk assessment and method statement.

Rev.	Drawn	Comments	Date
P3	DLH	DETAIL AMENDMENT	06/12/23
P2	DLH	LAYOUT UPDATED	03/08/23
P1	DLH	FIRST ISSUE	10/02/22

RGP
Transport Planning and Infrastructure Design Consultants
Shackleford Suite, Mill Pool House, Mill Lane, Godalming, GU7 1EY
30 Stamford Street, London, SE1 9LQ
Tel: 01483 861681 / 020 7078 9662 www.rgp.co.uk

Client: Whitbread Group plc

Project: Brunswick Centre

Drawing Title: Swept Path Analysis

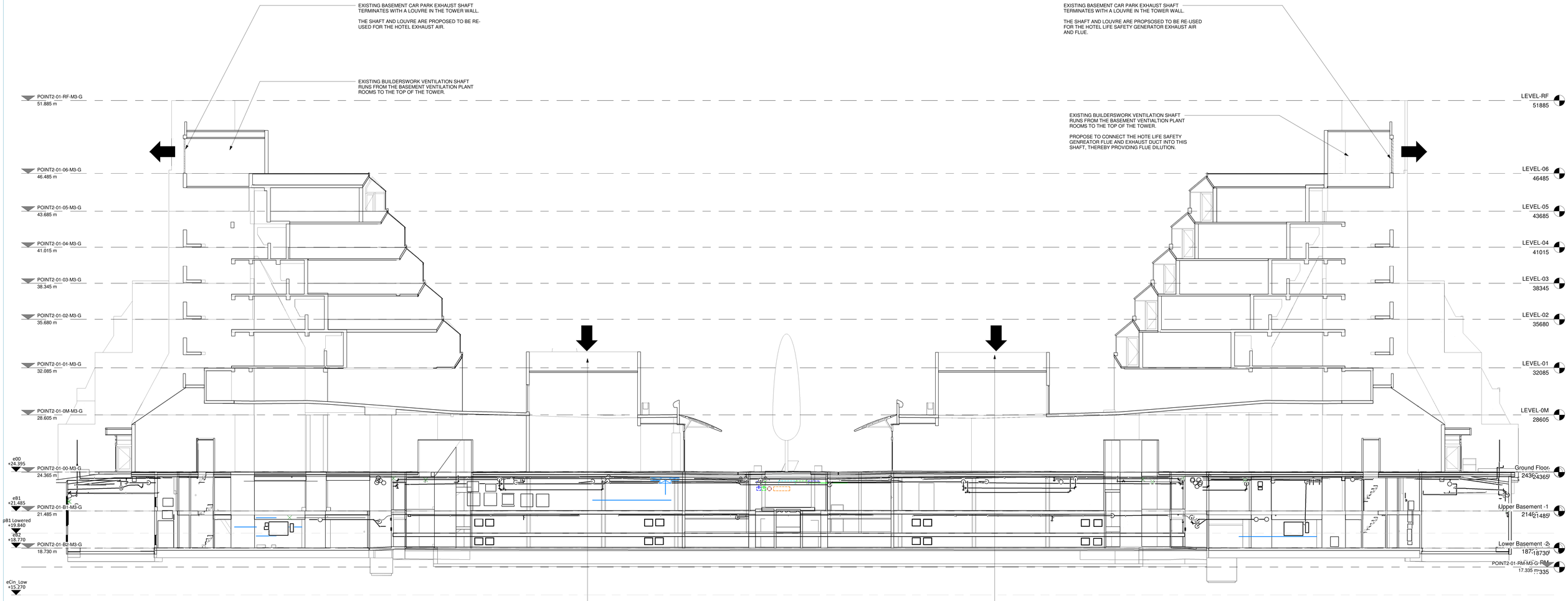
Drawing No.	Rev.
2020/5262/001	P3

Scale	Drawn By	Checked By	
As shown	DLH	NDR	A3

Appendix F – Air Intake Section

NOTES

1. THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION OR INSTALLATION PURPOSES UNLESS EXPRESSLY STATED.
2. ALL INFORMATION AND LAYOUT ON THIS DRAWING IS SUBJECT TO SITE DIMENSION CHECKS. DO NOT SCALE FROM THIS DRAWING. ALWAYS WORK TO NOTED DIMENSIONS.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
4. ALL DIMENSIONS MUST BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, STRUCTURAL ENGINEERS, MEP DRAWINGS AND SPECIFICATIONS.
5. ANY DISCREPANCIES BETWEEN DRAWINGS AND SPECIFICATION OR RELATED DOCUMENT, THE ENGINEER SHALL BE NOTIFIED IN WRITING FOR VERIFICATION OF DISCREPANCY.
6. ALL WORKS TO BE IN ACCORDANCE WITH THE RELEVANT STATUTORY REGULATIONS, BUILDING REGULATIONS, BRITISH STANDARDS, ACCEPTED CODES OF PRACTICE AND TRADE ASSOCIATION REQUIREMENTS.
7. IT IS THE CONTRACTORS RESPONSIBILITY TO LIAISE WITH THE MAIN CONTRACTOR AND ALL OTHER TRADES TO ENSURE THE CORRECT CO-ORDINATION OF THE WORKS, AND TO AVOID CLASHES.



1 Section A-A
1 : 100

Scale 1 : 100
0 1 2 5 10 m

Revision	Description	Date
P1	STAGE 2 - PRE PLANNING	19.05.23

Drawing Status: PRELIMINARY

PSH. www.pshconsulting.co.uk

London Office
10 Devonshire,Square
London
EC2M 4YP
T. 0203 039 3840
E. info@pshconsulting.co.uk

Wokingham Office
6 Alexandra Court,
Wokingham
Berkshire. RG40 2SL
T. 0118 977 4747
E. info@pshconsulting.co.uk

Architect:

Client: LAZARI INVESTMENTS LTD

Project: BRUNSWICK CENTRE

Title: SECTION A-A
MECHANICAL SERVICES LAYOUT

Drawn:	Chkd/Appd:	Date:
SF	DJ/DJ	Issue Date

Revit File:	Scale:
3608-PSH-ZZ-ZZ-DR-M-7005	1 : 100@A0

Drawing No:	Revision:
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