CGP | MEP

FREE WHARF

As-Built Energy Report Review

DOCUMENT DETAILS

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NAME	ORGANISATION
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SECTION A – EXECUTIVE SUMMARY

A.1 Executive Summary

Section 12 of the Planning Permission document for the Free Wharf development at Shoreham-By-Sea outlines the sustainability and energy requirements. Phase 1 of the development is to be completed in accordance with the Couch Perry Wilkes Revised Permitted Energy Strategy Revision 2 dated 13th November 2020 ("CPW Energy Strategy"). Item iii) within Section 12 states the following:

"iii) Written confirmation, including independent professional verification, shall be submitted to and approved in writing by the Local Planning Authority, within 3 months of the first occupation of each phase of the development, (or such other time as shall first be agreed in writing by the Local Planning Authority), to confirm that these measures have achieved the target CO_2 reduction below the baseline model including renewable energy, as identified in the respective Revised Permitted Energy Strategy and Energy Statement. Each verification document shall include any proposed and timetabled remedial measures if these targets have not been met in a phase, in which event the remedial measures thereby approved shall then be implemented in accordance with that timetable."

Whilst the Phase 1 development (Blocks H and G) comprises of ground floor commercial accommodation and retail spaces as well as residential dwellings, the CPW Energy Strategy provides an assessment for the dwellings only. Section 5.0 of the CPW Energy Strategy outlines the proposed energy strategy requirements for the dwellings in Blocks G and H as follows:

- To meet Building Regulations Part L1A minimum requirements
- Reduction in carbon emissions by a minimum of 10% produced by low carbon and renewable energy sources as stated in the Supplementary Planning Document as opposed to the Local Plan requirement for low and zero carbon technologies to meet 10% of the predicted energy requirement
- Energy Hierarchy to be adhered to but with an emphasis on the use of renewable technologies being utilised as opposed to further improvements to the building fabric due to the stage of design of the amendment

The CPW Energy Strategy demonstrates how a 10% reduction of the carbon emissions produced through regulated energy consumption at design stage can be achieved by renewable technologies through the implementation of PV panels.

The Calford Seaden L210178 Free Wharf Phase 1, Shoreham-By-Sea As-Built Energy Report Rev 01, dated July 2025 ("As-Built Energy Report") and the supportive SAP calculations for the dwellings demonstrates in construction that:

- Building Regulations Part L1A minimum requirements have been achieved
- Energy Hierarchy adhered to:
    - 'Be Lean' – performance of the building fabric greater than the minimum Building Regulations
    - 'Be Clean' – means to allow for future connection to a district heating mains
    - 'Be Green' – a 49.7kWp PV array achieving a 13% reduction in carbon emissions produced by regulated energy consumption

The Calford Seaden Free Wharf L210230 Response to Planning Condition 12 ("Response to Planning Condition 12") outlines the means for connection of Phase 1 to a future district heating network. Information on the means of how the development can be served by a district heating system is provided in the As-Built Report, the Calford Seaden M&E site wide layout and the additional information provided by HG Construction. The point of connection of a district heating main to the thermal substation in Block H is demonstrated as well as the location of the future thermal substation and the below ground mains connecting Block H to Block G. To facilitate the connection to the district heating mains if it was to be distributed along Brighton Road, a new below ground mains would have be installed to route from the highway to the point of connection in Block H in accordance with Planning Condition 12.

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SECTION B – INTRODUCTION

B.1 Introduction

B.1.1 Purpose of Report

CGP MEP Ltd have been appointed by HG Construction to undertake a review of the Calford Seaden L210178 Free Wharf Phase 1, Shoreham-By-Sea As-Built Energy Report Rev 01, dated July 2025 ("As-Built Energy Report").

The Free Wharf Phase 1 is a new build development comprising of residential dwellings, commercial and retail spaces. Phase 1 of the development are Blocks G and H only on the site.

The As-Built Energy Report has been developed and produced against the requirements of the Shoreham Freewharf Revision to Permitted Energy Strategy 13th November 2020 that was produced by Couch Perry Wilkes ("CPW Energy Strategy"). The As-Built Energy Report provides an overview of the residential dwellings only and does not include energy analysis on the commercial spaces in Blocks G and H, the retail shell-and-core in Block H or the landlords spaces in accordance with the CPW Energy Strategy. The CPW Energy Strategy forms the basis of Section 12 of the Planning Permission for Free Wharf Phase 1.

This review looks at the energy analysis provided in the As-Built Energy Report, which is based on residential dwellings only in Phase 1 and against the energy requirements set out in the CPW Energy Strategy. As part of the review, the Calford Seaden Free Wharf L210230 Response to Planning Condition 12 ("Response to Planning Condition 12") document has also been reviewed with regards to the future connection to a district heating network if one becomes a viable heat source in the future.

B.1.2 The Development

The development is located on Brighton Road, Shoreham-by-Sea, BN43 6RE (refer to Figure 1). From the CPW Energy Strategy, the development comprises of eight blocks referenced A to H with residential accommodation totalling 548 individual dwellings which are to be delivered in a phased approach. Phase 1 of the development is for two of the blocks, referenced G and H, which provide 137 dwellings as well as ground floor commercial accommodation and retail spaces.

The following images show the location and the visualisations of the development, extracted from the CPW Energy Strategy.

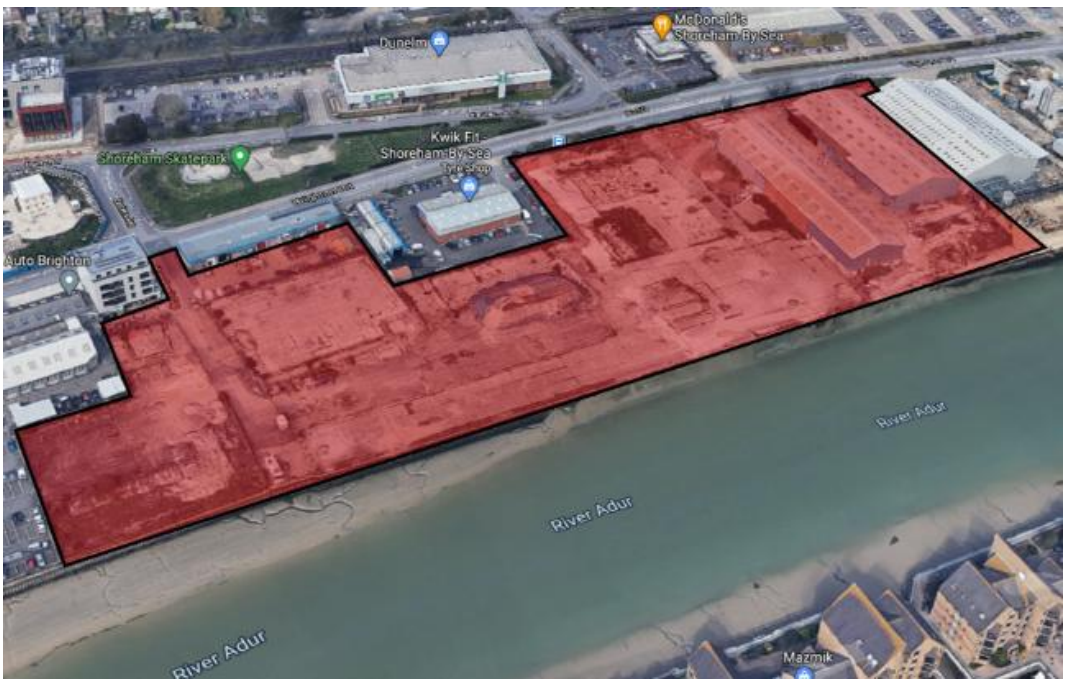

Figure 1: The location of the development, image extracted from the CPW Energy Strategy



Figure 2:Visualisation of the development showing all phases with Blocks G and H highlighted in red, image extracted from the CPW Energy Strategy



Figure 3: Site plant of the development for al phases with Blocks G and H highlighted in red, image extracted from the CPW Energy Strategy

The As-Built Energy Report lists this accommodation within Blocks G and H as office and retail space at ground floor level and dwellings within six and seven floors as follows:

Block G

- 46 one bedroom, two person flats
- 22 two bedroom, three person flats
- 29 two bedroom, four person flats
- A total of 97 flats

Block H

- 14 one bedroom, two person flats

- 12 two bedroom, three person flats
- 14 two bedroom, four person flats
- A total of 40 flats

SECTION C – PLANNING AND LOCAL POLICY REQUIREMENTS AND THE REVISION TO THE PREMITTED ENERGY STRATEGY

C.1 Planning and Local Policy Requirements

This section of the report looks at the planning and local policy requirements that were current at the design stage for Phase 1 of the Free Wharf development.

Section 12 of the Planning Permission document ("Planning Permission") from Adur District Council for the varied condition to the planning application (application number AWDM/1315/22) states:

"The Phase 1 development shall be completed in accordance with the Revised Permitted Energy Strategy Revision 2, dated 13 November 2020 by Couch Perry Wilkes, as updated by the Calford Seaden Document Titled: Response to Condition 12 Document REV 00 Dated 04.07.21 prior to its occupation."

It is stated in the Planning Permission that later phases of the development shall be completed in accordance with the Energy and Sustainability Statement Revision 02 (L220039) by Calford Seaden, dated 27th July 2022.

Section 12 also states:

"iii) Written confirmation, including independent professional verification, shall be submitted to and approved in writing by the Local Planning Authority, within 3 months of the first occupation of each phase of the development, (or such other time as shall first be agreed in writing by the Local Planning Authority), to confirm that these measures have achieved the target CO_2 reduction below the baseline model including renewable energy, as identified in the respective Revised Permitted Energy Strategy and Energy Statement. Each verification document shall include any proposed and timetabled remedial measures if these targets have not been met in a phase, in which event the remedial measures thereby approved shall then be implemented in accordance with that timetable.

"Reason: In accordance with the submitted application, to ensure that the development is sustainable and makes efficient use of energy, water and materials to achieve CO_2 reductions having regard to the National Planning Policy Framework and policies 18 & 19 of the Adur Local Plan and SH1 of the Shoreham Harbour Joint Area Action Plan 2019."

C.1.1 Adur District Council Local Plan 2017

Policy 18 of the Adur Local Plan 2017 ("Local Plan") for the Adur District Council is in reference to water efficiency standards, with a maximum of 110litres/person/day for residential properties.

Policy 19 of the Adur Local Plan 2017 ("Local Plan") for the Adur District Council outlines that the heating and cooling for both domestic and non-domestic developments must provide an assessment of the opportunities to use low and zero carbon technologies ("LZC"), including creating or connecting to district heating networks. Reference is made to the connection to the Shoreham Harbour Heat Network ("SHN").

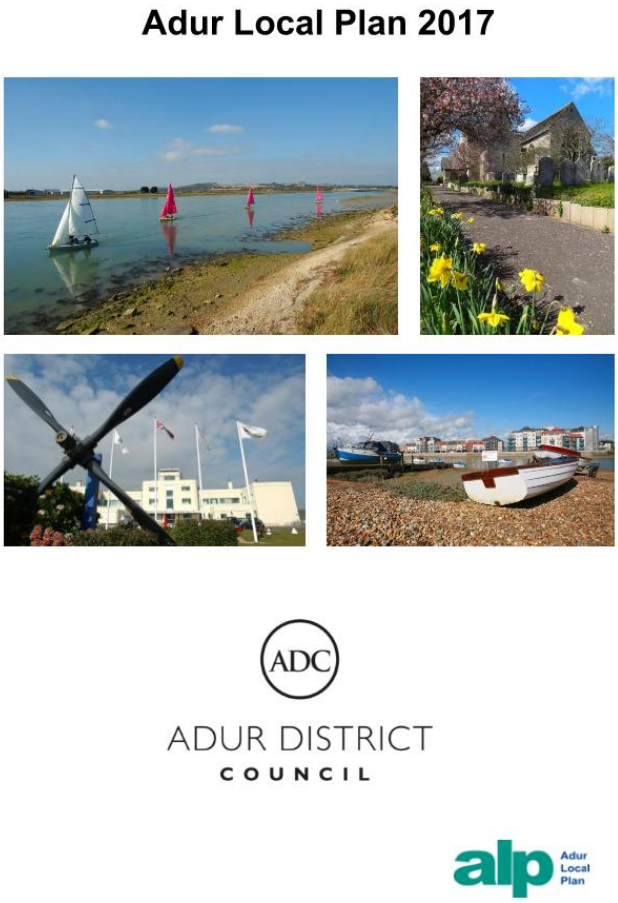

Figure 4: Adur Local Plan 2017

Section 4.22 of the Adur Local Plan 2017 ("Local Plan") for the Adur District Council states:

"Therefore, in order to help reduce carbon emissions all major development should incorporate renewable and low carbon energy production equipment to meet at least 10% of predicted energy requirements."

It is also stated in Policy 19 that all new major developments are to have 10% of the predicted energy requirements met by LZC technologies. The Policy does not outline that the predicted energy consumption is exclusive of unregulated energy, with the Adur District Council Supplementary Planning Document Sustainable Energy August 2019 stating that best practice is to total the energy requirements of regulated and unregulated consumption.

C.1.2 Adur District Council Supplementary Planning Document Sustainable Energy August 2019

The Adur District Council Supplementary Planning Document Sustainable Energy August 2019 ("SPD") provides further detail on the Local Plan energy and low carbon policies for new developments. The SPD has been replaced with the August 2024 edition but for Phase 1 it is the August 2019 version that is applicable.

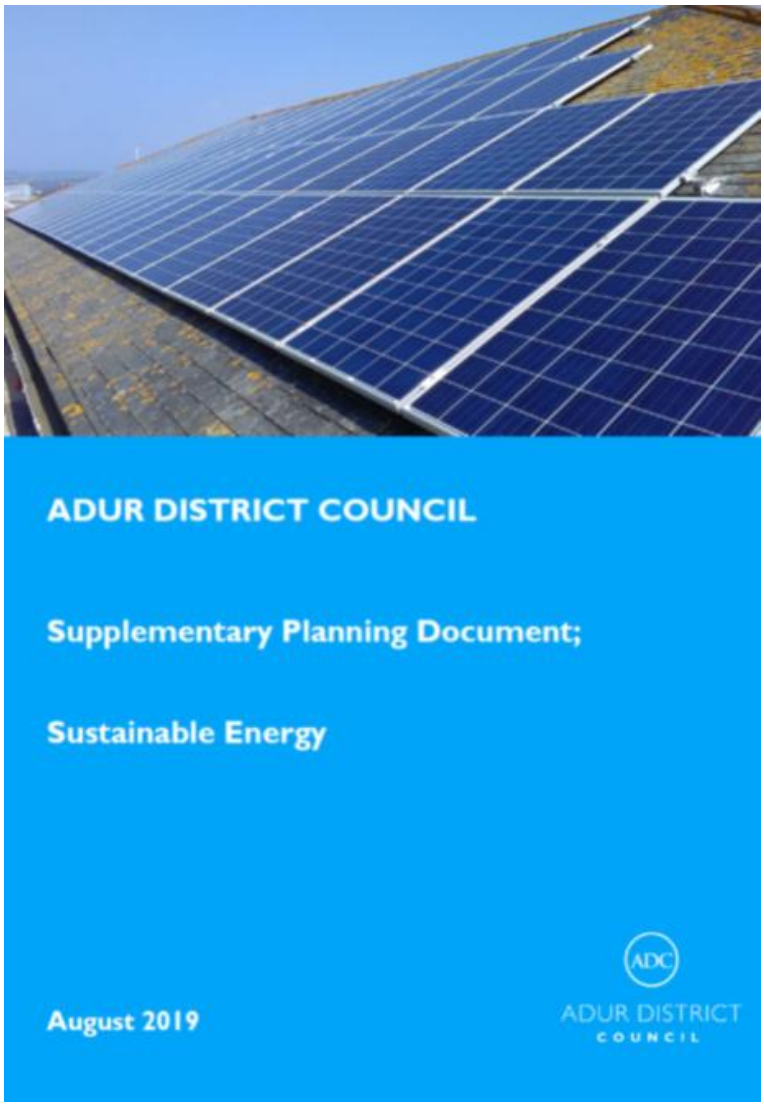

Figure 5: Adur District Council Supplementary Planning Document Sustainable Energy August 2019

The SPD includes the following requirements:

1) The Energy Statement should demonstrate the proposal's contribution to radical reductions in greenhouse gas emissions in accordance with the following hierarchy:
    a. Be lean – use less energy.
    b. Be clean – supply energy efficiently.
    c. Be green – use renewable energy.
2) Applicants are encouraged to use the updated SAP 10 carbon emission factors for grid electricity in lieu of the very outdated factors embedded in SAP 2012.
3) Clarified renewable energy targets – the energy statement must demonstrate a 10% saving in CO_2 emissions from onsite renewable energy generation in line with the methodology outlined in the template energy statement.

C.1.3 Shoreham Harbour Joint Area Action Plan (JAAP) 2019

The Shoreham Harbour Joint Area Action Plan ("JAAP") adopted in 2019 sets out the energy and sustainable policies for the site (section 3). The JAAP looks for all new developments to apply energy efficiency measures and to generate energy from renewable technologies.



Figure 6: Shoreham Harbour Joint Area Action Plan ("JAAP") adopted in 2019

Paragraph 3.1.16 of the JAAP states that all new developments will be required to either connect to a suitable heating and cooling network where available or that the design of the systems are compatible to allow for the future connection to a district heat network.

C.1.4 Summary of Planning and Local Policy Requirements

The planning and local plan policies detailed in section B that were current for the Phase 1 design are summarised as follows:

1. The energy strategy should follow the energy hierarchy of be lean, be clean, be green. – SPD
2. LZC technologies, including creating or connecting to district heating networks, to be utilised - Policy 19 of the Local Plan and the JAAP
3. The updated SAP 10 carbon emission factors should be used in lieu of those within SAP - SPD
4. 10% of the predicted energy requirements met by LZC technologies - Policy 19 of the Local Plan
5. 10% saving in CO_2 emissions from onsite renewable energy generation – SPD and Section 12 of the Planning Permission

C.2 Revision to the Permitted Energy Strategy (13th November 2020)

Section 5.0 of the CPW Energy Strategy address the specific policy requirements summarised in section B.1.4 of this document and outlines the proposed energy strategy requirements for Blocks G and H as follows:

- To meet Building Regulations Part L1A minimum requirements
- Reduction in carbon emissions by a minimum of 10% produced by low carbon and renewable energy sources as stated in the SPD as opposed to the Local Plan requirement for LZC to meet 10% of the predicted energy requirement

- Energy hierarchy to be adhered to but with an emphasis on the use of renewable technologies being utilised as opposed to further improvements to the building fabric due to the stage of design of the amendment

Whilst the development comprises of ground floor commercial accommodation and retail spaces as well as residential dwellings, the CPW Energy Strategy assesses the dwellings only.

This report assesses these requirements only in accordance with Section 12 item iii) of the Planning Permission as well as providing an overview against the Response to Planning Condition 12 with regards to the potential future connection to a district heating network (the “Be Clean” approach of the energy hierarchy).

SECTION D – AS-BUILT ENERGY REPORT REVIEW

D.1 As-Built Energy Report Review

The As-Built Energy Report has been reviewed against the CPW Energy Strategy to determine whether compliance has been achieved in construction against the following requirements:

- Energy Hierarchy methodology applied
- Compliance with Building Regulations Part L1A
- A 10% reduction in carbon emissions by low carbon and renewable energy sources

D.1.1 Energy Hierarchy – "Be Lean"

In accordance with the Be Lean approach in the energy hierarchy, the As-Built Energy Report demonstrates that the energy consumption of the building has been reduced initially through the implementation of a fabric first approach where the U-values of the building and the air permeability are of a higher performance than the Building Regulation limiting values.

The energy calculations have been measured against the Approved Document Part L1A 2013 edition. The U-values and air permeability used for the design development and those achieved in construction are an improvement against the minimum values within Part L1A, as shown in Table 1.

Element	Building Regulations Part L1A 2013 Edition Limiting Fabric Performance (W/m²K)	Fabric U-Value within CPW Energy Report November 2020 (W/m²K)	Average Fabric U-Value within As-Built SAP calculation (W/m²K)	Highest Fabric U-Value within As-Built SAP calculation (W/m²K)
External Wall	0.30	0.20	Ranges between 0.17 – 0.22	Ranges between 0.22 to 0.30
Party Wall	0.20	0.00	0.00	-
Floor	0.25	0.15	0.12	0.12
Roof	0.20	0.17	0.16	0.16
Windows	2.00	1.34	1.10	1.10
Air Permeability	10.0	3.0	Up to 2.9	-

Table 1 – U-values and air permeability within Building Regulations, design development and as-built SAP calculations

D.1.2 Energy Hierarchy – "Be Clean"

It is detailed within the CPW Energy Strategy and the Calford Seaden Response to Planning Condition 12 that the development will allow for the future connection to the Shoreham Heat Network ("SHN").

The Response to Planning Condition 12 states that the following space allocation or equipment is to be provided in construction of Phase 1 to allow for the future connection to the SHN:

- A plant space within Block H for a thermal substation to allow for the installation of future plant and equipment.
- Dedicated riser space to allow for vertical pipework distribution to serve the utility room in each flat.
- Below ground pipework routed from the proposed thermal substation to the site boundary adjacent Brighton Road, capped with isolation valves within an accessible manhole to allow for future connection to the SHN.
- Below ground pipework linking the thermal substation in Block H to Block G.

The Calford Seaden site wide services drawing is provided in appendix A (referenced 'P605-CAL-BG-00-DR-ME-1000-M&E Site Wide Services') with additional notes highlighting the point of connection to the district heating main in Block H, the location of the thermal substation for the future installation of district heating plant and equipment and the below ground mains connecting Block H to Block G. Figure 7 to Figure 12 and information have been provided by HG Construction and Calford Seaden.

To facilitate the connection to the district heating mains if they were to be distributed along Brighton Road, a new below ground mains would have to be installed to route from the highway to the point of connection in Block H in accordance with Planning Condition 12.



Figure 7 – District heating mains connection within Block H Thermal Sub-station rising from below ground

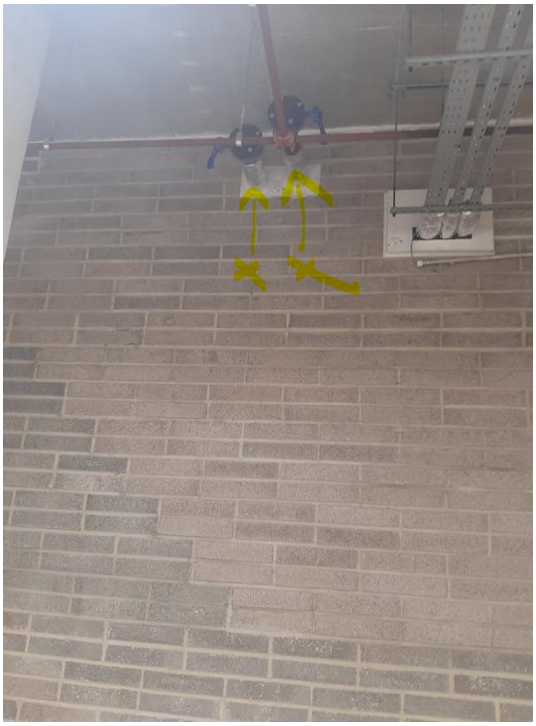

Figure 8 – District heating mains connection within Block H Thermal Sub-station at high-level to serve the Block H risers

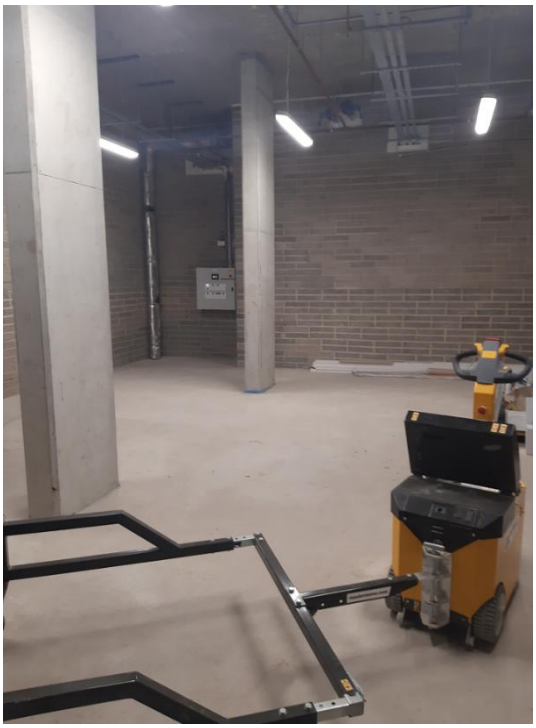

Figure 9 – Space allocation within Block H Thermal Sub-station for the district heating plant and equipment

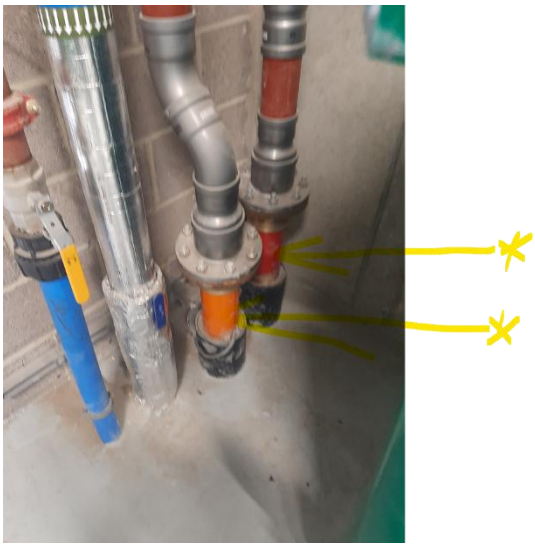

Figure 10 – Removable pipework section within Block G to allow for thermal storage connectivity



Figure 11 – Pipework section in Block G plant area to be served by future district heating network fed supply



Figure 12 – Incoming water main and heating flow and return pipework rising through the slab of the Block G plant area

D.1.3 Energy Hierarchy – "Be Green"

The Be Green technology utilised in construction for Phase 1 of the development are photovoltaic ("PV") panels. The PV outputs provided in the Calford Seaden Stage 4 Energy Strategy ("Stage 4 Energy Strategy") and those installed are provided in Table 2, extracted from the As-Built Energy Report.

Block Reference	Electricity output from the PV array used in the Stage 4 Energy Strategy	Electricity output from the installed PV arrary
Block G	174 x 380W panels 66.00kWp	163 x 410W panels 66.83kWp
Block H	80 x 380W panels 30.36kWp	75 x 410W panels 30.75kWp
Total	**96.36kWp**	**97.58kWp**

Table 2 – Electricity output from the PV array at Stage 4 and as-built, extracted from the As-Built Energy Report

D.1.4 Carbon Emission Factors

The carbon emission factors used within the calculations as outlined in the As-Built Energy Report are based on the SAP 10 values as opposed to the SAP 2012, which take into account the decarbonisation of the electricity grid. The carbon emission ratings used in the energy analysis are stated in the report as:

- Natural gas 0.210kgCO_2/kWh
- Grid electricity 0.233kgCO_2/kWh

D.1.5 Carbon Emission Savings

From table 3.3 of the As-Built Energy Report, the calculated as-built Be Lean and Be Clean regulated CO_2 emissions is stated as being 114.0 tonnes CO_2 per annum. The calculated as-built Be Green regulated CO_2 emissions, where PV panels have been applied to the SAP calculations is stated as being 96.7 tonnes CO_2 per annum.

This is shown as a 13% saving of the regulated carbon emissions for the residential dwellings being achieved by the 97.58kWp PV array. This is supported by the SAP calculations provided within the appendices of the As-Built Report.

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SECTION E – CONCULSION

E.1 Conclusion

This review is based on the construction information provided in the Calford Seaden As-Built Energy Report for the carbon emissions reduction for the residential dwellings only in Phase 1 of the Free Wharf development, in accordance with the CPW Energy Strategy.

The use of the SAP 10 carbon emissions has been used in the analysis during design and against the as-built information in compliance with the SPD.

The requirement within the CPW Energy Strategy which forms part of the conditions within the Planning Permission (section 12 item iii) is for a 10% reduction in carbon emissions to be achieved by the low and renewable energy technologies. This is demonstrated at design in the CPW Energy Strategy as being achieved by a PV array which would reduce by more than 10% of the carbon emissions produced by the regulated energy consumption.

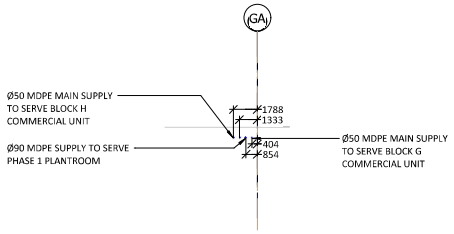
The As-Built Energy Report and the supportive SAP calculations show a carbon emissions savings in regulated energy of 29% against the baseline, with 13% of this savings achieved by the 'Be Green' stage through the application of PV panels.

The Response to Planning Condition 12 states that space allocation and mains pipework are to be allowed for as part of the development works to allow for the future connection to a district heating network. The Calford Seaden site wide services drawing provided in appendix A (referenced 'P605-CAL-BG-00-DR-ME-1000-M&E Site Wide Services') highlights the point of connection to the district heating main in Block H, the location of the future thermal substation and the below ground mains connecting Block H to Block G. Figure 7 to Figure 12 and the supportive information have been provided by HG Construction and Calford Seaden.

To facilitate the connection to the district heating mains if they were to be distributed along Brighton Road, a new below ground mains would have be installed to route from the highway to the point of connection in Block H in accordance with Planning Condition 12.

APPENDICIES

Appendix A – Calford Seaden M&E Site Wide Services



2 SECTION DETAILS
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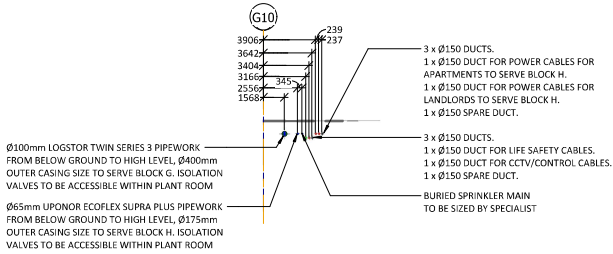

3 SECTIONAL DETAILS
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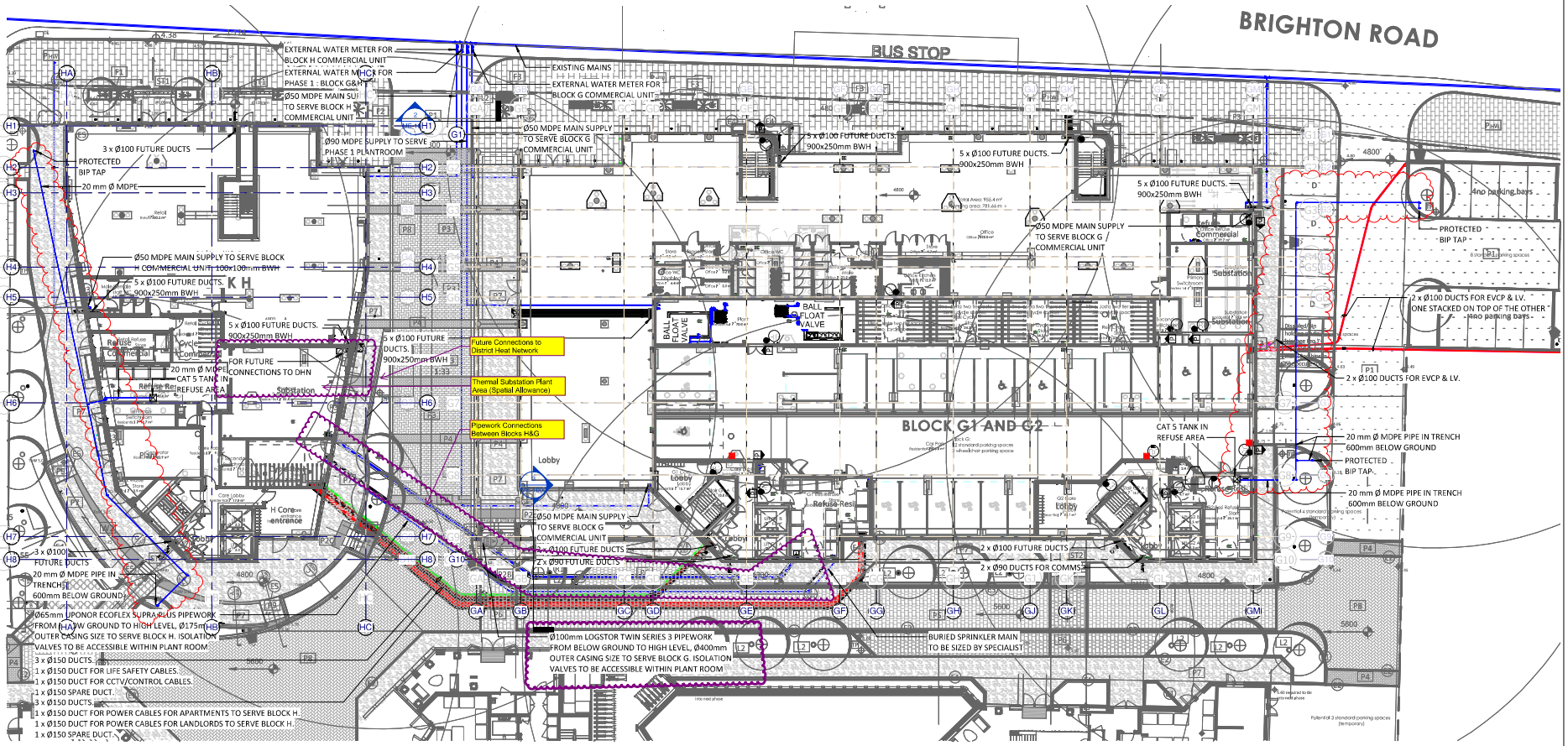

1 00 M&E Site Wide Services Layout
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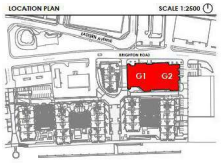
Notes
DO NOT SCALE FROM THIS DRAWING. ALL DIMENSIONS TO BE VERIFIED BY THE CONTRACTOR ON SITE.

1. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED.
2. THIS DRAWINGS TO BE READ IN CONJUNCTION WITH SPECIFICATION AND ALL OTHER CONTRACT DRAWINGS.
3. THIS DRAWING DEMONSTRATES DESIGN ONLY, THIS DRAWING IS NOT INTENDED TO BE USED FOR INSTALLATION PURPOSES
4. MCWS & GAS PIPE SIZES AS PER LATEST WATER AND GAS QUOTATIONS.
5. SERVICES TO CONSIDER TREE PITS IN THE PRODUCTION OF CONTRACTORS INSTALLATION DRAWINGS.
6. SERVICES PASSING THROUGH & PILE CAPS SHALL BE INSTALLED IN STEEL PIPE/DUCT OR BE SLEEVED THROUGHOUT IN STEEL DUCTS APPROVED BY THE STRUCTURAL ENGINEER.
7. ALL SERVICES PASSING THROUGH STRUCTURAL ELEMENTS TO BE PROVIDED WITH SLEEVES.
8. CHAMBERS TO BE CONSTRUCTED WITH CONCRETE/BRICK WITH REMOVABLE LID CO-ORDINATE WITH PROPOSED LANDSCAPE FINISH & APPROVED BY CIVAL & STRUCTURAL ENGINEER.
9. DUCTS TO BE LAID DURING ENABLING WORKS WITH INSTALLATION AND ADDITIONAL DRAW PITS REQUIRED DURING MAIN WORKS.
10. THRUST BLOCKS TO BE INSTALLED IF REQUIRED BY DESIGN.
11. WASH OUT & TEMPORARY WASH OUT POINT NUMBER, LOCATION & MANHOLE REQUIREMENTS TBC WITH THE UTILITY PROVIDER.
12. ALL DUCT SIZES ARE GIVE AS INTERNAL DIAMETER.
13. ALL ELECTRICAL DUCTS TO BE COMPLETED WITH DRAW ROPES.

HG CONSTRUCTION

Key Plan



1 : 200@A1 North Point

C04	Construction Issue - Revised as Indicated	21.08.23	RN	PH
C03	Construction Issue - Revised as Indicated	25.11.22	SD	CS
C02	Construction Issue - Buried Sprinkler Main Added	21.07.22	GS	VK
C01	Construction Issue	12.11.21	JB	JT
Rev	Description	Date	Init	Chkd

Project
Free Wharf - Shoreham-by-Sea

Title
P605-CAL-BG-00-DR-ME-1000-M&E Site Wide Services Layout

Client
HG Construction Ltd.

Status

Date	Drawn By	Checked By
21.08.21	SD	VK/JT

Project No.	Drawing No.	Revision
L210178	ME-1000-	C04

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