

Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

Programme - MSc Sustainable Construction

Module – Building Services & Energy Performances in Buildings

Lecturer – Paul Manley

Assignment Title – Building Services & Energy Audit – presentation

Submission Deadline - 05 April 2023

Student – Paul Davies

Student I.D. - 2203997



Julian Hodge Building
Adeilad Julian Hodge

Dolce Vita Gallery
JHB Lounge
Lecture Theatre
Study Centre

Canolfan Astudio
Darlithfa
Lolfa JHB
Oriel Dolce Vita

CARDIFF
UNIVERSITY
PRIFYSGOL
CAERDYDD

Building Services & Energy Audit for Julian Hodge Building Cardiff University

Site Visit – 15th March, Arrival 13:30, Approx 3 Hours duration

Weather – Raining,

Temperature - 10°C

My Approach to carry out an Energy Audit on said Building

Pre – Arrival Building Information

(Information gathered from research)

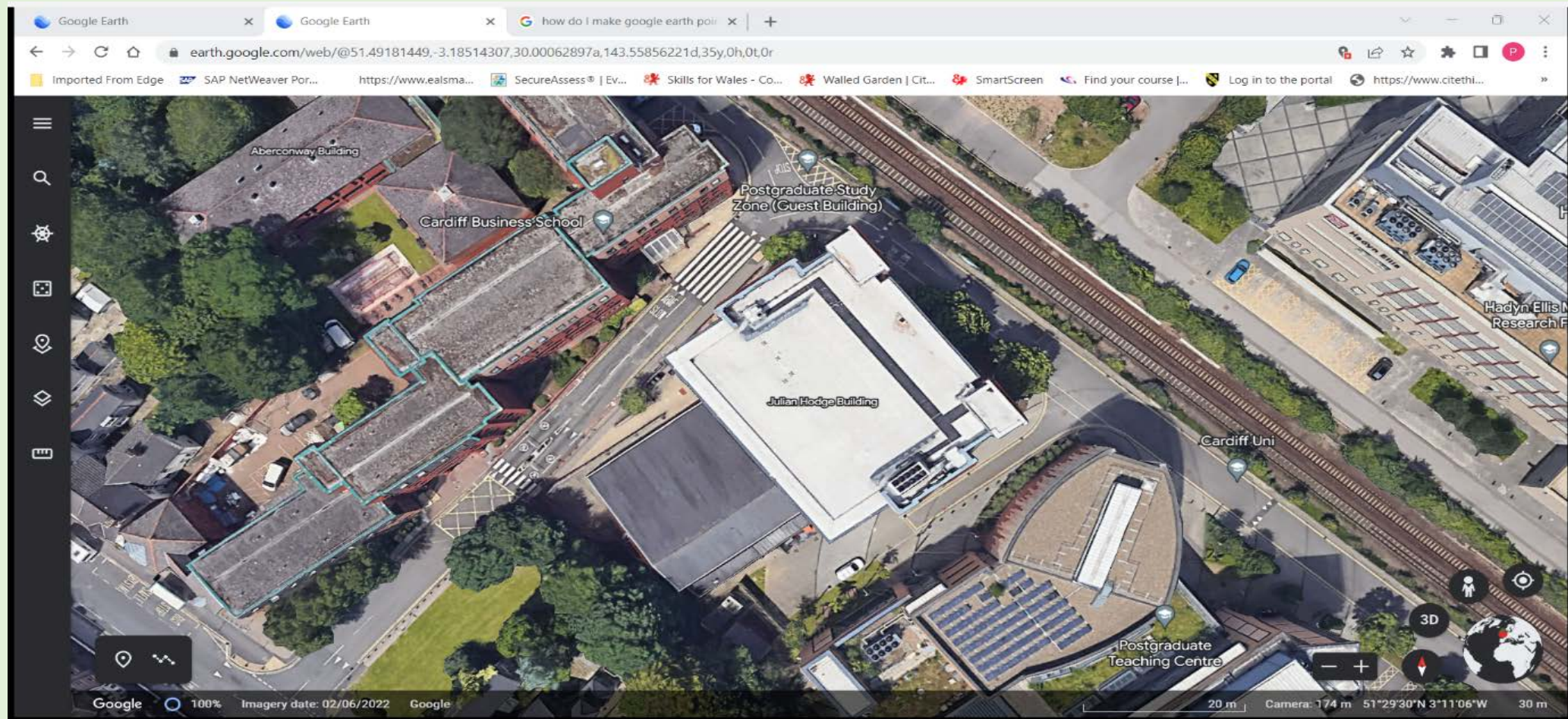
On – Site Building Information

(Information collated from observations and Questioning of Staff)

Post - Visit Building Information

(Analysed the Data to help create a judgement of the Assets Energy performance)

Pre – Arrival Building Information



Imagery Date 02 – 05 – 2022

Source - <https://earth.google.com/web/@51.49181449,-3.18514307,30.00062897a,143.55856221d,35y,0h,0t,0r>

10 – 03 - 2023

Pre – Arrival Building Information

15/03/2023, 11:17 Display energy certificate (DEC) – Find an energy certificate – GOV.UK

Display energy certificate (DEC)

! This certificate has expired.

You can get a new certificate by visiting www.gov.uk/get-new-energy-certificate

Get help with certificates for this property

If you need help getting a new certificate or if you know of other certificates for this property that are not listed here, contact the Department for Levelling Up, Housing and Communities (DLUHC).

dluhc.digital-services@levellingup.gov.uk
Telephone: 020 3829 0748

Cardiff University Julian Hodge Building Colum Drive CARDIFF CF10 3EU	Operational rating F	Certificate number: 0529-0163-2710-7100-1003
		Valid until: 24 May 2021
		Total useful floor area: 3700.48 square metres

Energy performance operational rating

The building's energy performance operational rating is based on its carbon dioxide (CO₂) emissions for the last year.

It is given a score and an operational rating on a scale from A (lowest emissions) to G (highest emissions).

The typical score for a public building is 100. This typical score gives an operational rating of D.

Previous operational ratings

Date	Operational rating
May 2020	139 F
June 2019	140 F
June 2018	91 D

Total carbon dioxide (CO₂) emissions

This tells you how much carbon dioxide the building emits. It shows tonnes per year of CO₂.

Date	Electricity	Heating	Renewables
May 2020	349	116	0
June 2019	350	119	0
June 2018	182	93	0

Assessment details

<https://find-energy-certificate.service.gov.uk/energy-certificate/0529-0163-2710-7100-1003/print#true>

1/2

15/03/2023, 11:17 Display energy certificate (DEC) – Find an energy certificate – GOV.UK

Score	Operational rating	This building	Typical
9-25	A		
26-50	B		
51-75	C		
76-100	D		
101-125	E		
126-150	F	139 F	
150+	G		

This building's energy use

Energy use	Electricity	Other fuels
Annual energy use (kWh/m ² /year)	171	162
Typical energy use (kWh/m ² /year)	81	237
Energy from renewables	0%	0%

Assessor's name: Antony Woodliss

Employer/Trading name: Energy Intelligence Centre Limited

Employer/Trading address: 3 Brooklands, Moore Moat Drive, North Moors Road, Redditch, B98 3DW

Assessor's declaration: Contractor to the occupier for EPBD services only

Accreditation scheme: Sterling Accreditation Ltd

Issue date: 10 June 2020

Nominated date: 25 May 2020

<https://find-energy-certificate.service.gov.uk/energy-certificate/0529-0163-2710-7100-1003/print#true>

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15/03/2023, 11:18 Recommendation report – Find an energy certificate – GOV.UK

Display energy certificate (DEC) recommendation report

Cardiff University Julian Hodge Building Colum Drive CARDIFF CF10 3EU	Report number 9139-2078-0182-0100-8501
Valid until 11 February 2026	

Operational rating and DEC

This building's operational rating is D.

For more information on the building's energy performance, [see the DEC for this building \(energy-certificate/0529-0163-2710-7100-1003\)](https://find-energy-certificate.service.gov.uk/energy-certificate/0529-0163-2710-7100-1003/print#true).

<https://find-energy-certificate.service.gov.uk/energy-certificate/9139-2078-0182-0100-8501/print#true>

1/5

15/03/2023, 11:18 Recommendation report – Find an energy certificate – GOV.UK

Building and report details

Building occupier	
Building type	Restaurant, University Campus
Building environment	Air Conditioning
Electricity used	330878 kWh
Gas used	481366 kWh
Total useful floor area	3700.48 square metres
Building reference	RRN-0510-0122-3129-9729-5002
Report issued on	12 February 2019
Calculation tool	DCLG, ORCAiC, v3.6.3
Type of inspection	Physical

<https://find-energy-certificate.service.gov.uk/energy-certificate/9139-2078-0182-0100-8501/print#true>

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Sourced from - <https://find-energy-certificate.service.gov.uk/energy-certificate/9139-2078-0182-0100-8501?print=true>

Sourced from - <https://find-energy-certificate.service.gov.uk/energy-certificate/0529-0163-2710-7100-1003?print=true>

Pre – Arrival Building Information

Information collated from Pre – Arrival Sources

The Asset appears to be South – Westerly facing giving Southern light to the Glazed area of the Building by day.

The Asset has a useful floor area totalling 3700.48 m²

It has a Display Energy Certificate (DEC) Operational Rating of F (139) which is now out of date (24 May 2021).

Using this information we can Benchmark against similar building types (Rating D (100)) to manage the assets performance as directed in CIBSE Guide F – Energy Efficiency 2012.

Previous operational ratings

Date	Operational rating
May 2020	139 F
June 2019	140 F
June 2018	81 D

Total carbon dioxide (CO₂) emissions

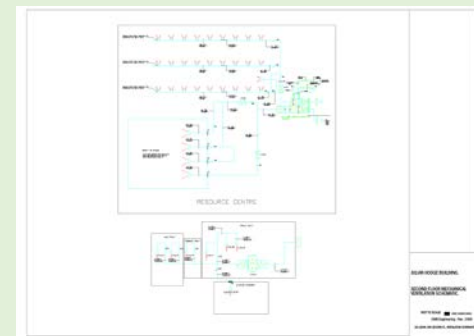
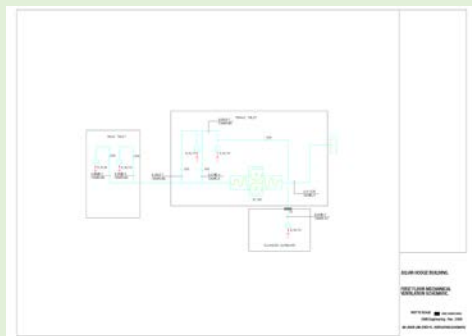
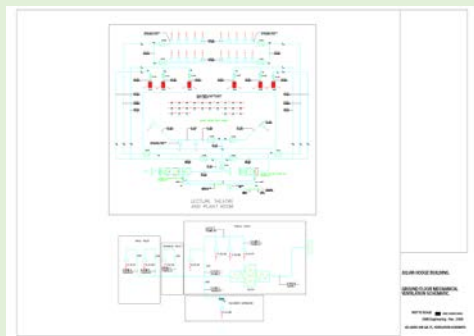
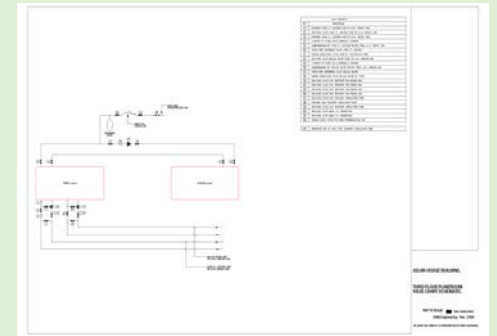
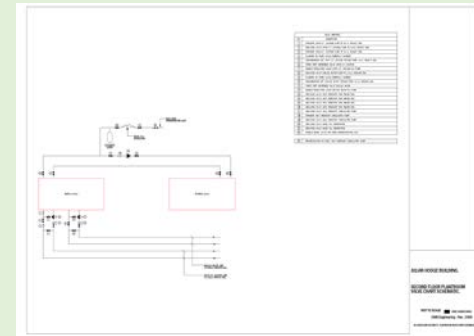
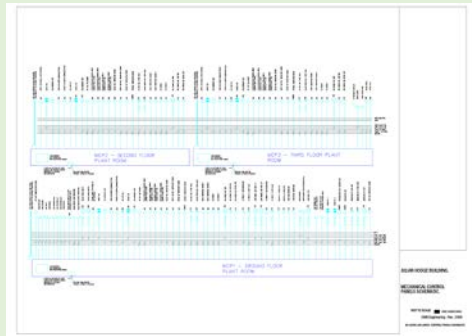
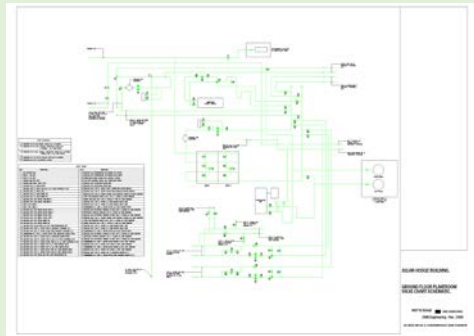
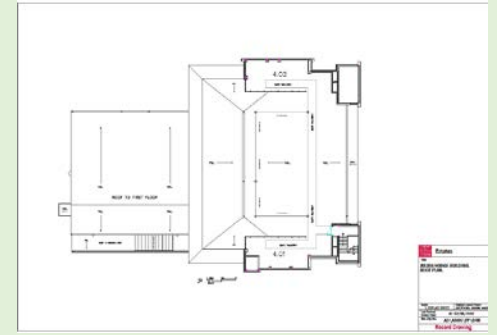
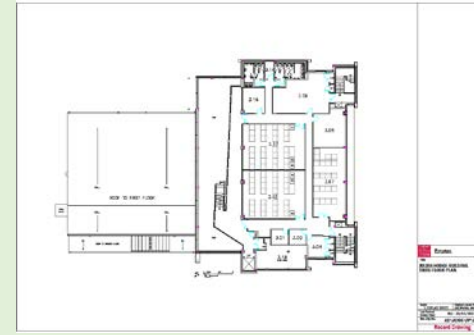
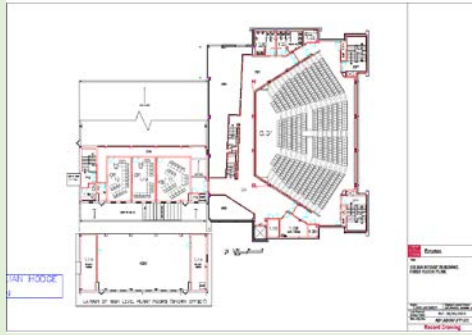
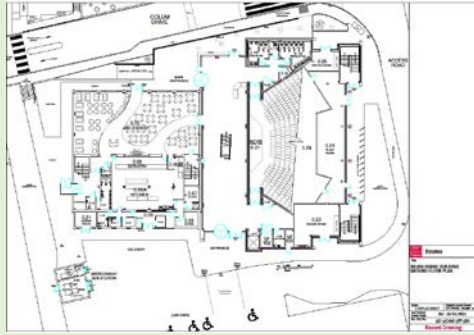
This tells you how much carbon dioxide the building emits. It shows tonnes per year of CO₂.

Date	Electricity	Heating	Renewables
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This building's energy use

Energy use	Electricity	Other fuels
Annual energy use (kWh/m ² /year)	171	162
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Energy from renewables	0%	0%

Pre – Arrival Building Information



Source from – Mark Durdin (Cardiff University FM Manager)

Pre – Arrival Building Information

From the Pdf documents supplied by Mark Durdin (Cardiff University) we can get an idea of the assets Electrical, Gas, Water, Heating and Mechanical layout from this we can see there could be areas of improvement that may be possible.

Electrical – Primary – Secondary – Tertiary Metering ?

Gas - Primary – Secondary – Tertiary Metering ?

Water – Primary – Secondary Metering – Maintenance ?

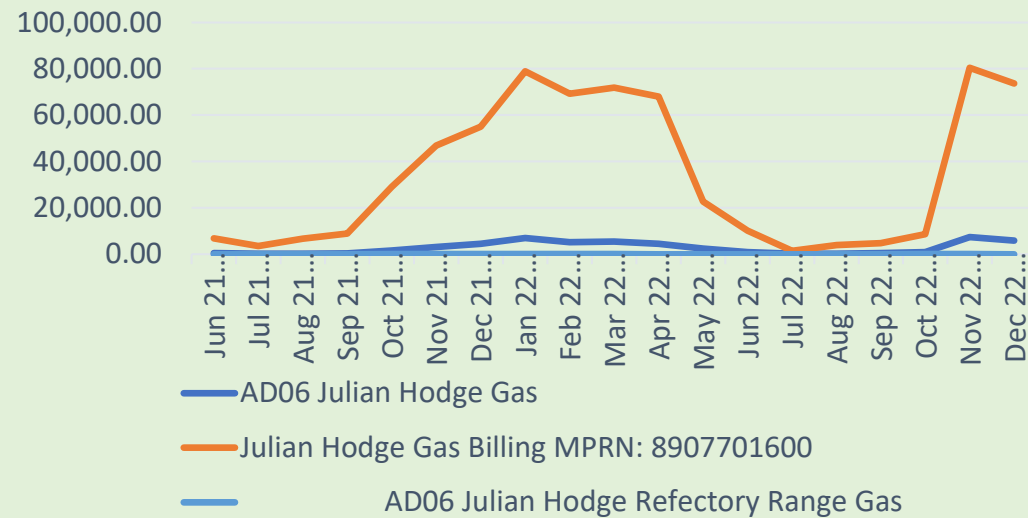
Heating – Wet Heating - Control systems - Maintenance ?

Mechanical – Types of Air Conditioning systems in place – Maintenance - ?

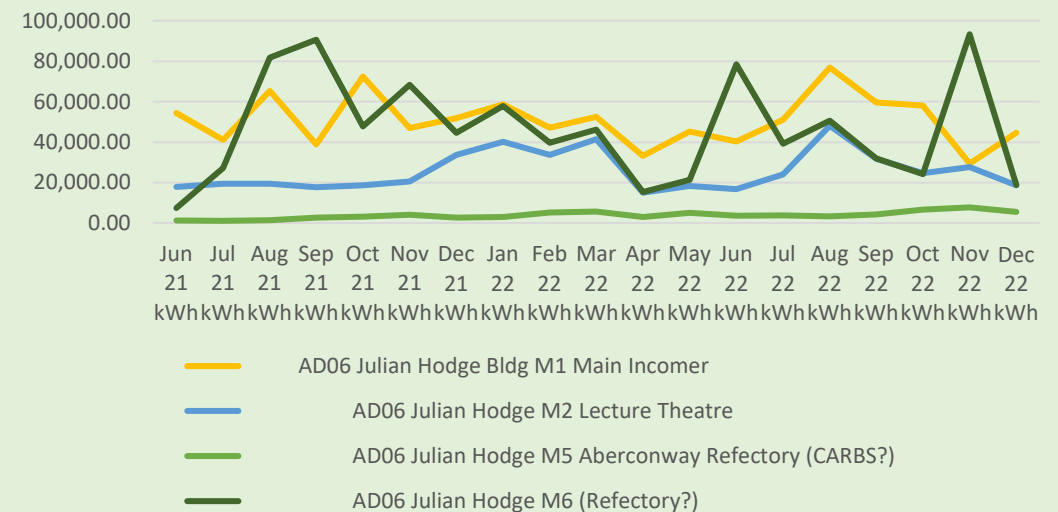
Pre – Arrival Building Information

Mark Durdin (Cardiff University) also supplied us with Data sheets for the Gas and Electrical installations from this information we could identify how much Gas and Electric has been used and when (Time of year)

AD06 Julian Hodge Gas



AD06 Julian Hodge Electricity



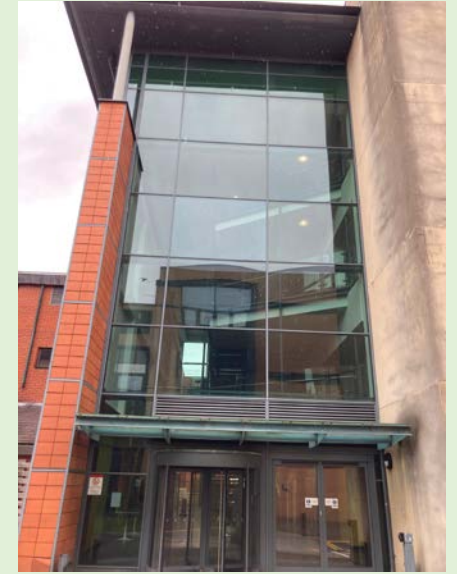
AD - Academic - Colum Road and Humanities Site Buildings Gas Meter Tree with Consumption						
Dates: Jan 21 to Dec 22						
Meter Id	Meter Name	Meter Type	Unique Meter Id	Building Name	Main Incomer?	Area m2
47177	AD06 Julian Hodge Gas	Gas	AD06G01145AD06	AD06 Julian Hodge Building	1	0.00
46793	Julian Hodge Gas Billing MPRN: 8907701600	Gas	8907701600	Julian Hodge (MI)	1	0.00
47180	AD06 Julian Hodge Refectory Range Gas	Gas	AD06G01148AD06	No Building (MI)	0	0.00
47181	AD06 Julian Hodge Refectory Boilers Gas	Gas	AD06G01149AD06	No Building (MI)	0	0.00
52460	Julian Hodge L/T Gas	Gas	8010	No Building (MI)	0	0.00
52461	Julian Hodge L/T Gas boilers - on Bems	Gas	5172	No Building (MI)	0	0.00
52462	Julian Hodge Refec Gas x100 cuft	Gas	8009	No Building (MI)	0	0.00

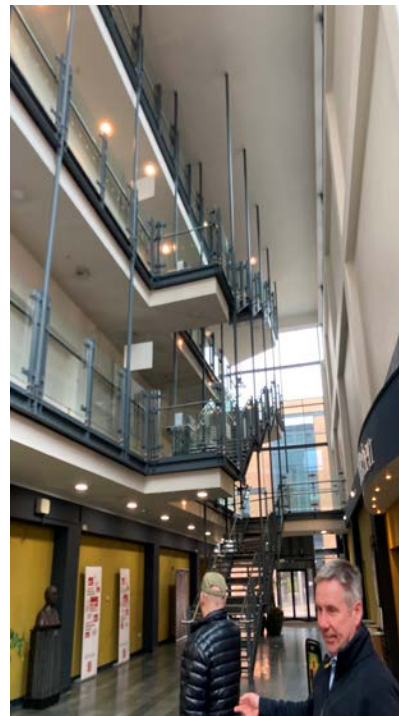
AD - Academic - Colum Road and Humanities Site Buildings Electricity Meter Tree with Consumption						
Dates: Jan 21 to Dec 22						
Meter Id	Meter Name	Meter Type	Unique Meter Id	Building Name	Main Incomer?	Area m2
44138	AD06 Julian Hodge Bldg M1 Main Incomer	Electricity	AD06E00173AD06	AD06 Julian Hodge Building	1	3585.35
35130	AD06 Julian Hodge M2 Lecture Theatre	Electricity	AD06E00174AD06	AD06 Julian Hodge Building	0	0.00
44137	AD06 Julian Hodge M5 Aberconway Refectory (CARBS?)	Electricity	AD06E00177AD06	AD06 Julian Hodge Building	1	3585.35
72085	AD06 Julian Hodge M6 (Refectory?)	Electricity	AD06E02111AD06	AD06 Julian Hodge Building	0	0.00

On – Site Building Information



Sourced from - <https://www.cardiff.ac.uk/visit/accessibility/cathays-park-campus/julian-hodge-building>





On – Site Building Information

Electrical And Lighting Systems

- Main Electricity Supply
- Circuit Breaker
- Meters for Lecture Theatre, DB Switch, Aberconway.
- Main Switch Aberconway Ref.
- Lecture Theatre Lighting
- Student Computer Room Lighting
- Main Entrance Lighting



On – Site Building Information

Gas system 1 (New Building)

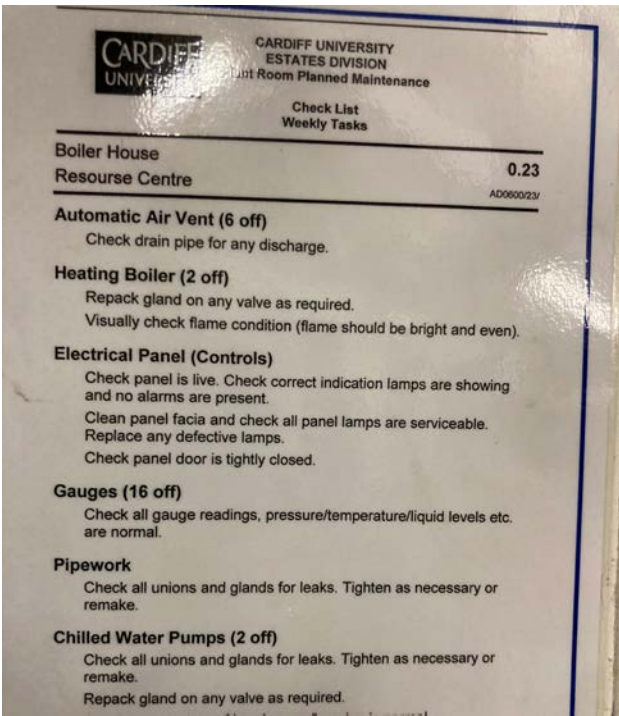
- Gas Meter
- Close up of Gas Meter G40
- Gas Meter Reader
- Gas Meter Reading
- Gas Meter BMS system Reading



On – Site Building Information

Gas system 2 (Old Building)

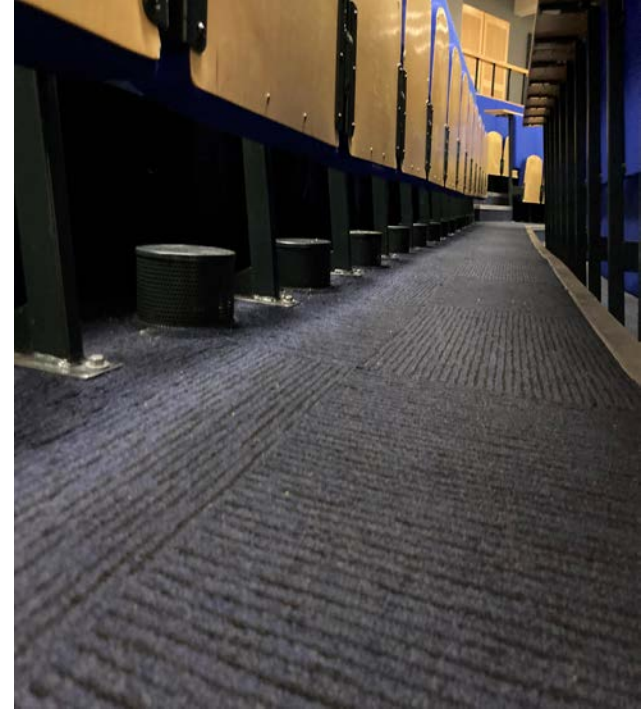
- Gas Meter
- Close up of Gas Meter G25
- Cello Meter Reader
- Gas Meter Reading
- Gas Meter BMS system Reading



On – Site Building Information

Heating (Wet) system

- Under Floor Heating
- Switch Panel for Heating Controls
- LST Fan Convactor
- Panel Radiator
- 4 inline Boilers
- Weekly task list (Maintenance)



On – Site Building Information

Mechanical (AC) Displacement Ventilation systems

- Floor Grill
- Wall Panel
- Floor Grill along Corridor
- Under seat displacement air
- Lecture area with under seat displacement
- Wall Paneling at back of Lecture theatre

Post - Visit Building Information

Taking into account Pre – Arrival and On – Site information gathered. We are now in a position to collate the Data and information, to make an accurate assessment on the performance of the asset so we can suggest some improvements that could be made to services of the building, and possibly suggest new maintenance strategies that can help with the Assets performance and costings.

It was apparent when questioning staff that recommendations for improvements have been made via the “Air conditioning inspection report” valid through 25 February 2026 and the “Display energy certificate (DEC) recommendation report” valid through 11 February 2026 both illustrate issues with the systems inspected that will improve the Energy Efficiency and running costs of the systems installed. At present the recommendations have yet to be implemented.

The Asset benefits from having an active BMS Trend system in place, if utilised correctly, the system could be used to make changes to the running of the Asset to improve Energy Efficiency and running costs. Extra training may be needed for members of the Estates team for this to be implemented, unfortunately we were unable to see a working system.

The University employs 27 staff on the FM / Estates team to cover all their Assets, 12 compliance and 25 maintenance. External contractors are used for new and replacement components and installations. Most components are changed as and when brake downs occur. A possible change to the maintenance schedule could be looked at when producing my final report – 10th May 2023.

References

Cardiff University (n.d.). Julian Hodge Building. [Online] Available at: <https://www.cardiff.ac.uk/visit/accessibility/cathays-park-campus/julian-hodge-building> [Accessed 10 March 2023].

Durbin, M. (n.d.). FM Manager. Cardiff University.

Energy Benchmarks CIBSE TM46 (London: Chartered Institution of Building Services Engineers) (2008)

Energy Efficiency in Buildings CIBSE Guide F (London: Chartered Institution of Building Services Engineers) (2012)

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GOV.UK (n.d.). View, download, and print an Energy Performance Certificate. [Online] Available at: <https://find-energy-certificate.service.gov.uk/energy-certificate/0529-0163-2710-7100-1003?print=true> [Accessed 10 March 2023].

GOV.UK (n.d.). View, download, and print an Energy Performance Certificate. [Online] Available at: <https://find-energy-certificate.service.gov.uk/energy-certificate/0221-4200-0509-2544-2404?print=true> [Accessed 10 March 2023].

GOV.UK (n.d.). View, download, and print an Energy Performance Certificate. [Online] Available at: <https://find-energy-certificate.service.gov.uk/energy-certificate/9139-2078-0182-0100-8501?print=true> [Accessed 10 March 2023].

Maintenance Engineering and Management CIBSE Guide M (London: Chartered Institution of Building Services Engineers) (2014)