

# **Carbon Pasts, Low Carbon Futures: Industrial Heritage and Low Carbon Architectural Pedagogy**

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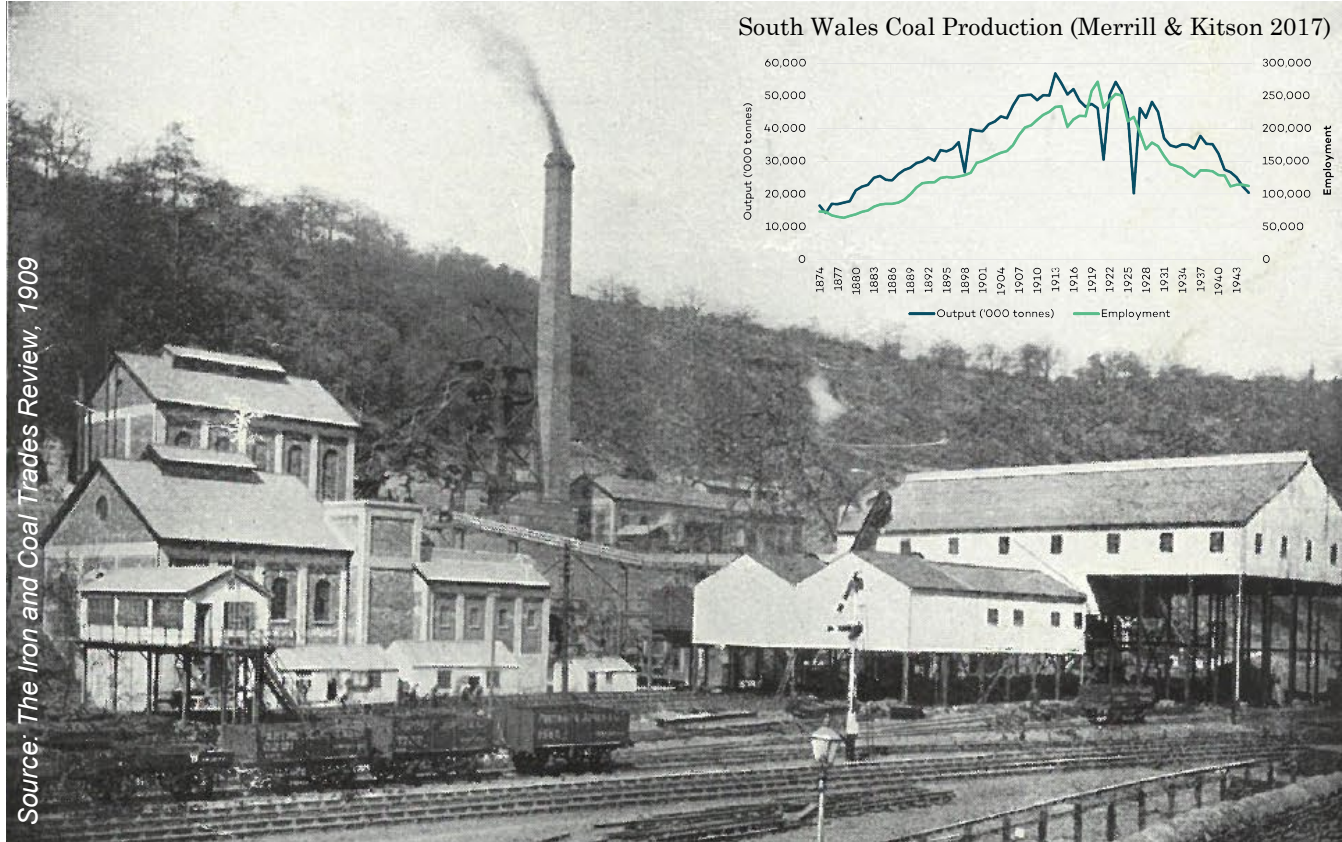
Welsh School of Architecture , Cardiff University, United Kingdom

MArch1 (4<sup>th</sup> year)  
undergraduate students'  
requests for final year  
MArch2 design theses.  
  
2020/21.



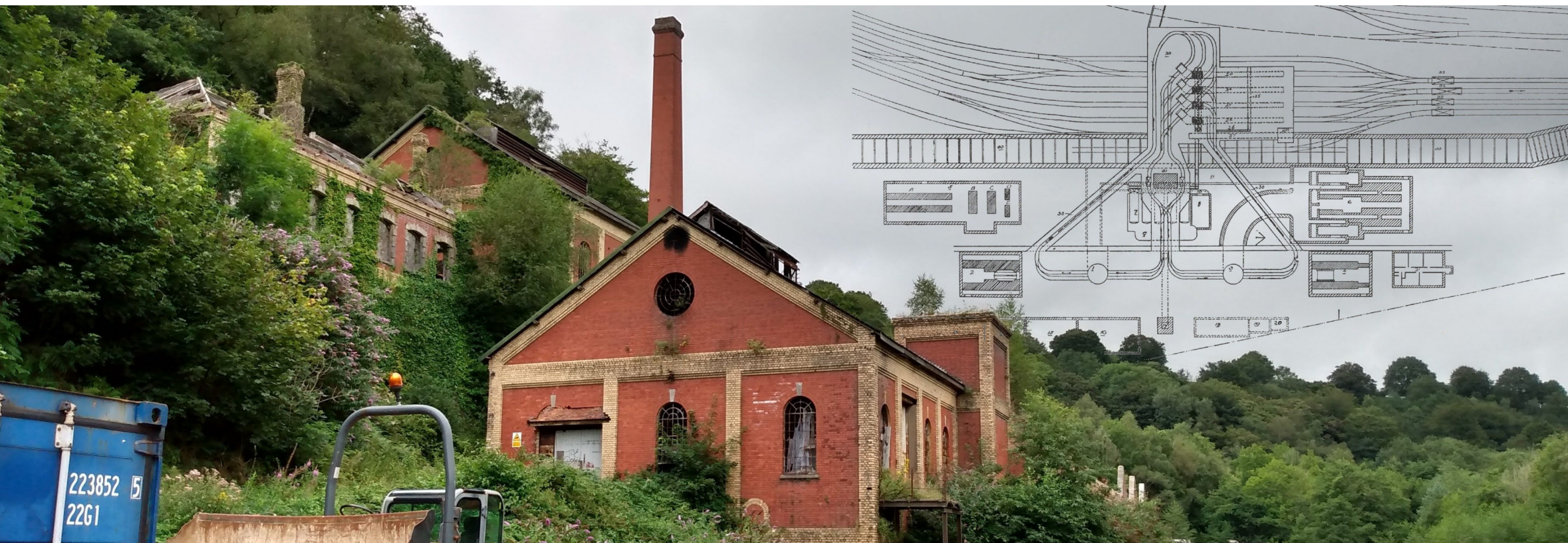
Word cloud from free-text requests from MArch students requests for final year design thesis unit topics 2019 highlighting high interest in sustainable conservation and retrofit

# Carbon Pasts, Low Carbon Futures.



Cardiff and The South Wales Valleys  
(source: Digimap 2024)





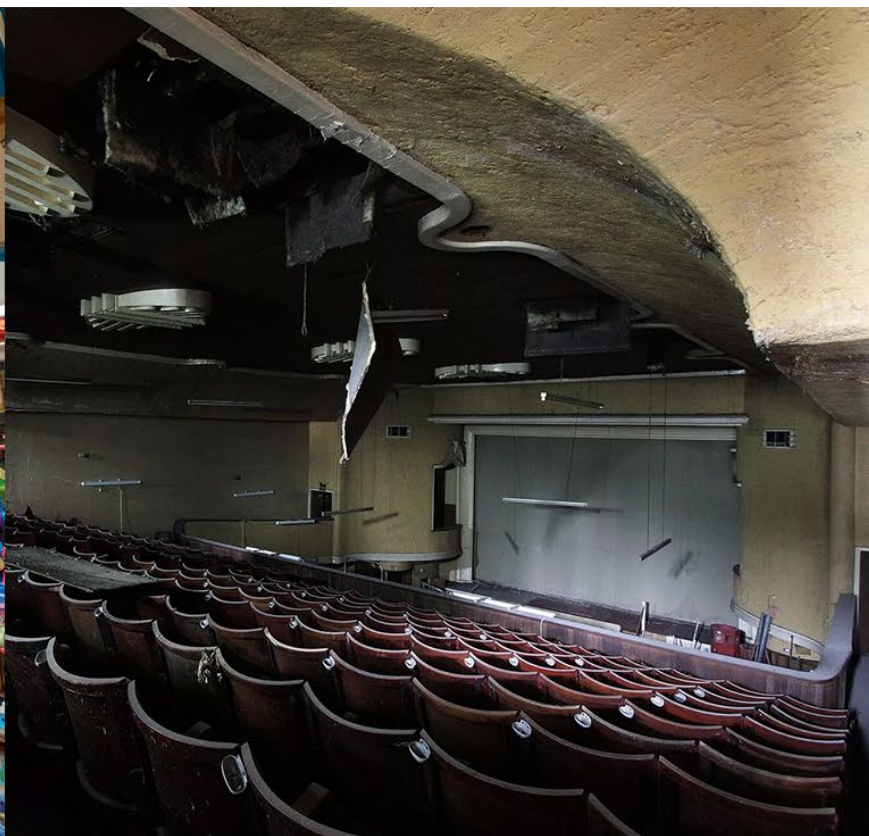
Crumlin Navigation Colliery. Academic year 2021/22 (*Whitman, 2021*)





Cefn Coed Colliery (museum until 2020). Academic year 2022/23 (*Whitman, 2022*)





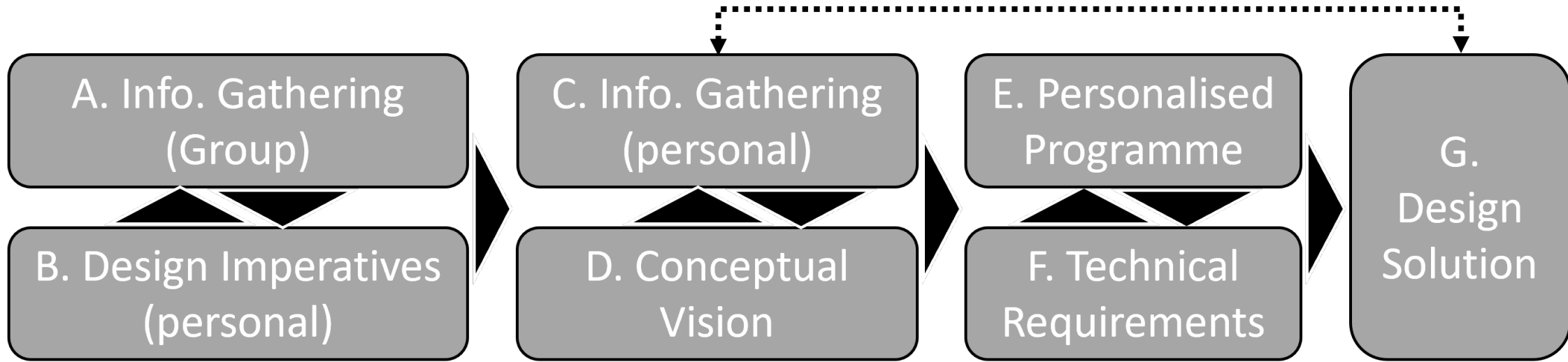
Pontypridd Market and Town Hall Theatre. Academic year 2023/24 (*Whitman, 2023*)





Penallta Colliery, Engine Hall and Pithead Baths. Academic year 2024-25 (*Whitman, 2024*)





Pedagogical approach – Parallels with the “Double-layered Asymmetrical Model” proposed by Goldschmidt (1983), as described by Salama (2015).

Goldschmidt, G., *Doing design, making architecture*. Journal of Architectural Education, 1983. 37(1): p. 8-13.

Salama, A.M.A., *Spatial design education : new directions for pedagogy in architecture and beyond*. 2015, Farnham, Surrey ; Ashgate.

“Live-Project Teaching” also bridges the gap between mainstream architectural education and professional practice.

Morrow, R., *Live Project love: building a framework for Live Projects*, in *Architecture Live Projects: Pedagogy into Practice*. 2014, Taylor and Francis. p. xviii-xxiii.

Education

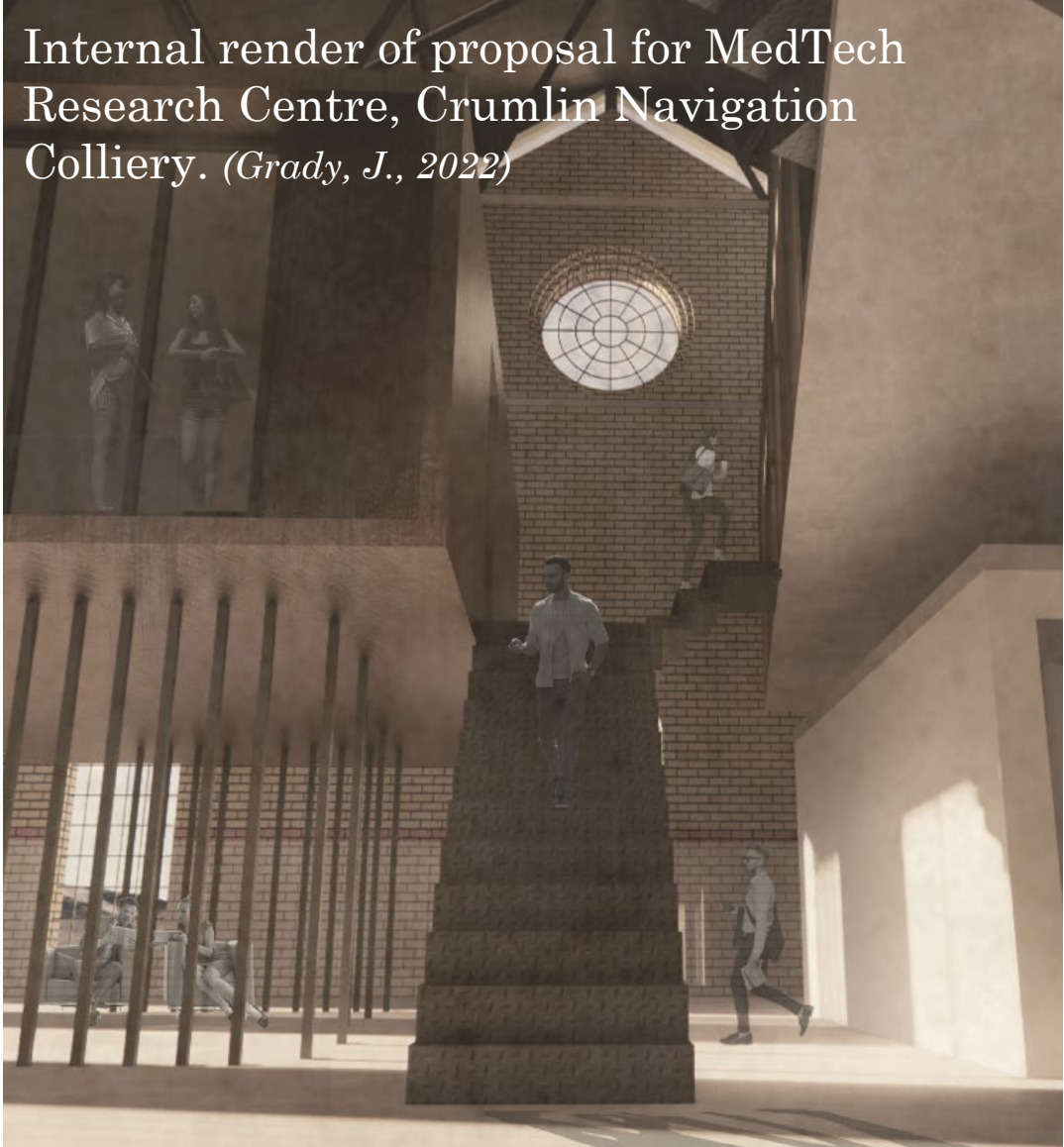
Real-life problems &  
3<sup>rd</sup> party involvement

Practice

Live Project Teaching



Internal render of proposal for MedTech Research Centre, Crumlin Navigation Colliery. (Grady, J., 2022)



**Architectural programmes have included:**

- Renewable energy production, storage and distribution
- Reuse and recycling centres
- Low carbon manufacture
- Education and knowledge sharing
- Wellbeing facilities and intergenerational living
- Nature conservation
- Innovation and research centres
- Community Governance and Support

Low Carbon Theme	% of students
Reuse	90
Bioclimatic Strategies	88
Low Energy Retrofit	74
Low Carbon Materials	69
Renewable Energy	62
Design for Disassembly	43
Biophilia	17
Phytoremediation/Rewilding	14



CARDIFF UNIVERSITY  
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Welsh School of Architecture  
Ysgol Pensaernïaeth Cymru

# CARBON PASTS, LOW CARBON FUTURES:

## VISIONS OF A SUSTAINABLE FUTURE FOR CRUMLIN NAVIGATION COLLIERY

You are invited to join us at Crumlin Navigation Colliery to view the work of final year March students from the Welsh School of Architecture.

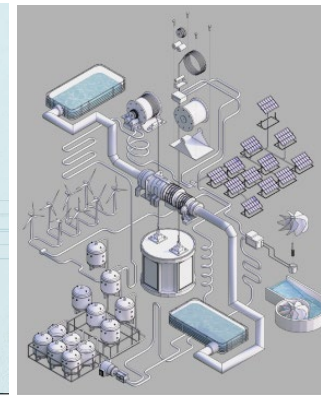
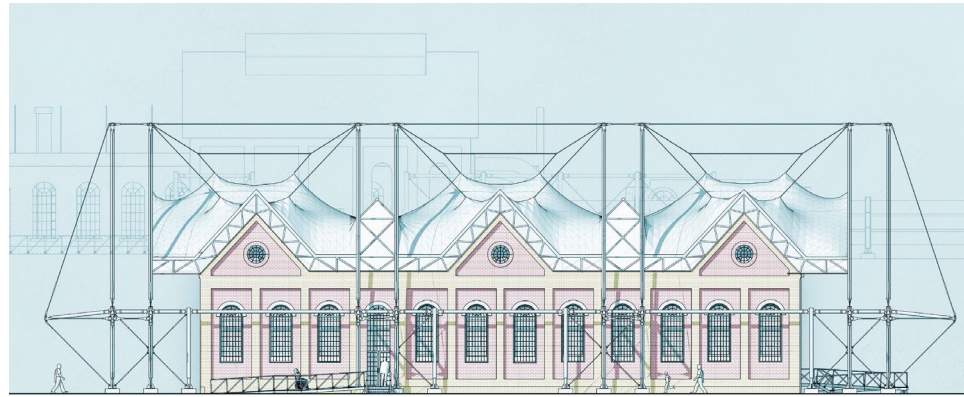
**SUNDAY | 26 JUNE | 2022**  
11:00-16:00

THE POWER HOUSE, CRUMLIN NAVIGATION COLLIERY

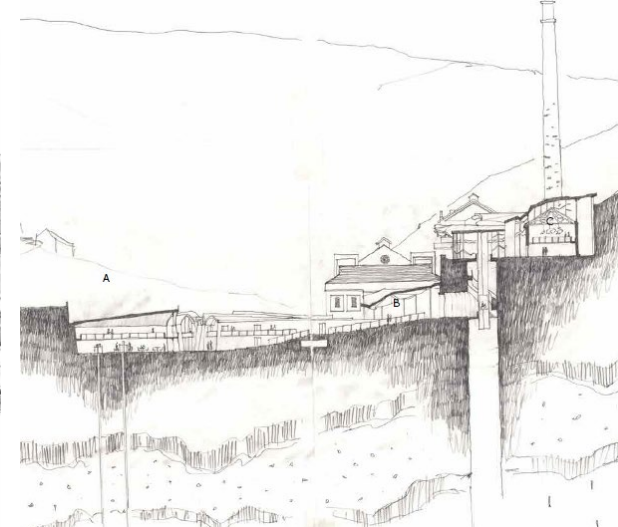
The student's designs explore their visions of how this historic site might be brought back to life and play a role in Wales's fight against climate change.

Whilst fictitious, it is hoped that their architectural proposals will inspire others to see the potential of this historic site. The exhibition will also include an update on current real initiatives, with participation from Friends of the Navigation, Cardiff Business School, Cardiff University Civic Mission Innovation for All, ARC Academy, The Coal Authority and more.

For further information, contact:  
ARCHITeachingOffice@cardiff.ac.uk @cardiff.ac.uk

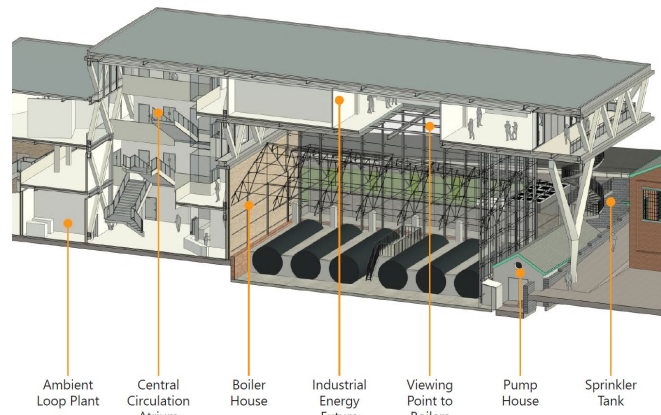



Left and right – Public Exhibition poster and photos. Above - Renewable Energy Storage Facility (*Luckman, R., 2022*). Below – Subterranean and global coal connections and Mine Water Heat Recovery Research Centre and National Coal Archives (*McCormick, A., 2022*).



March2 Design Unit – Carbon Pasts, Low Carbon Futures 2021/22 – Crumlin Navigation





Left and Above – Proposal at Cefn Coed Colliery for National Museum of Energy and Renewable Energy development Park (*Taylor, M., 2023*). Winner of University Architecture Medal 2023 and nominated for Royal Society of Architects in Wales (RSAW) Silver Medal.

Right – Meeting with Neath-Port Talbot County Borough Council and end-of-year show.



## March2 Design Unit – Carbon Pasts, Low Carbon Futures 2022/23 – Cefn Coed Colliery (former museum)



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# CARBON PASTS, LOW CARBON FUTURES:

## Visions of a Sustainable Future for Pontypridd Market Quarter

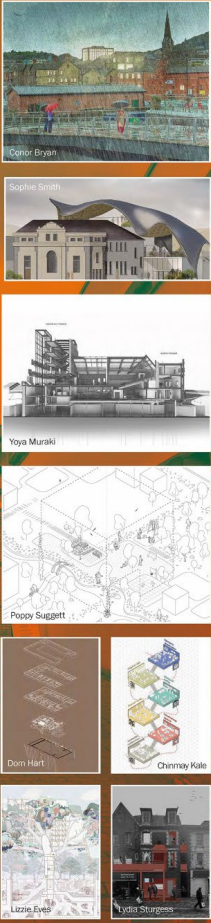
You are invited to join us to view the work of final year MARCH students from the Welsh School of Architecture.

**SATURDAY 1 JUNE | 10AM-5PM**

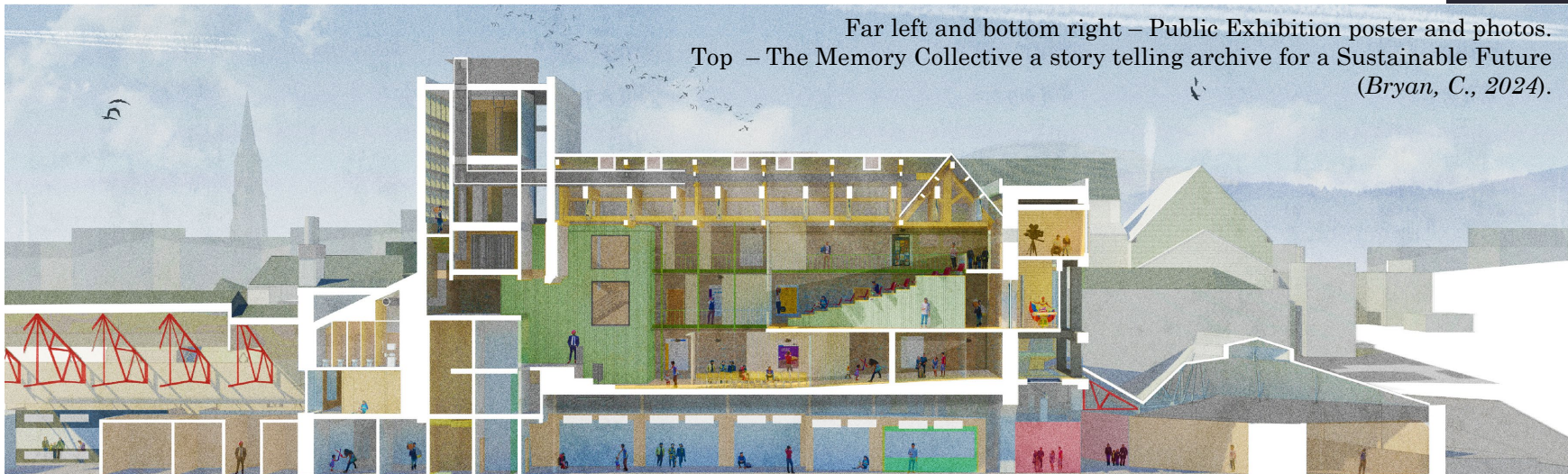
**VENUE:** Canolfan Calon Taf,  
Ynysangharad War Memorial Park  
Pontypridd CF37 4PF

The student's designs explore **eight visions** for the future of the Market Quarter and how its vacant spaces, including the Town Hall Theatre, might be brought back to life to play a role in Wales's fight against climate change. Whilst fictitious, it is hoped that their architectural proposals will inspire others to see the potential of this historic location.

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Far left and bottom right – Public Exhibition poster and photos.  
Top – The Memory Collective a story telling archive for a Sustainable Future  
(Bryan, C., 2024).



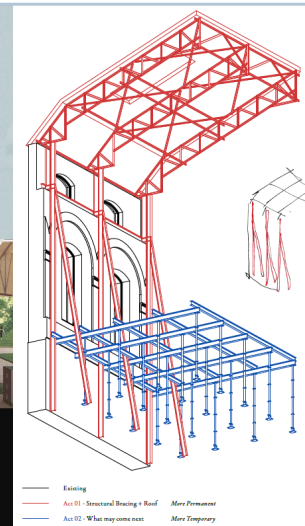
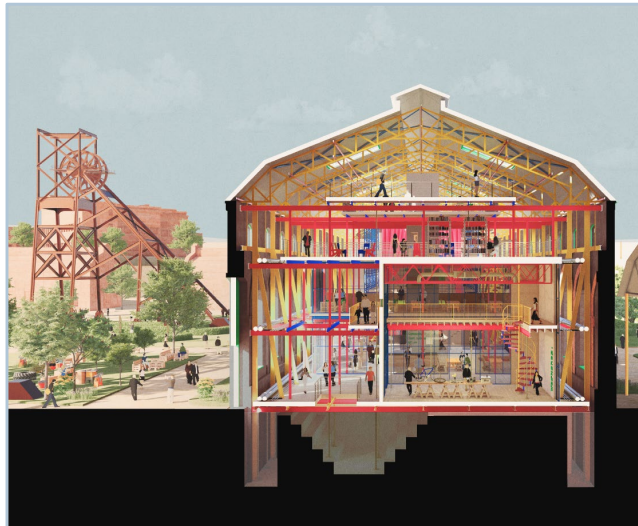
Left - Conversations with nature: (re)connecting with nature, our wasted spaces, and each other. Rewilding and Green Social Prescribing (Suggett, P., 2024)

Right – Public Exhibition, Pontypridd, Ynysangharad Park, June 2024



MARCH2 Design Unit – Carbon Pasts, Low Carbon Futures 2023/24 – Pontypridd Market Quarter

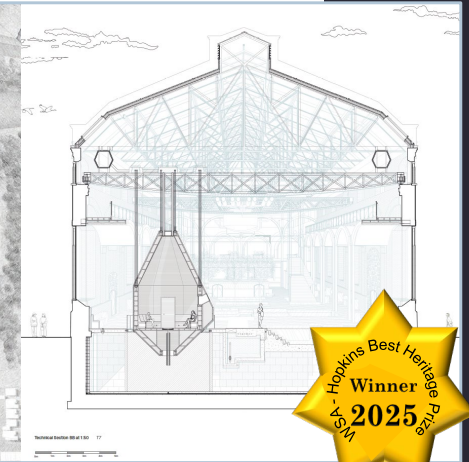
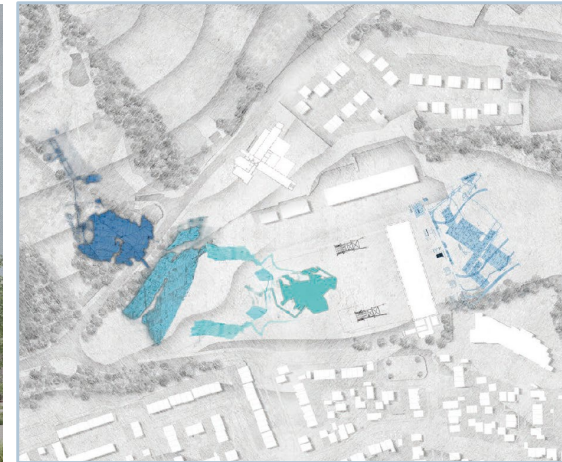
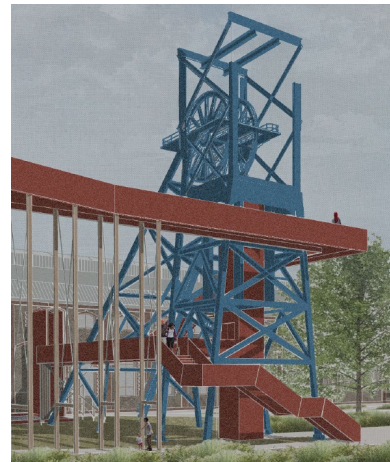




Above left– Reviving the Heart of the Community (*Davies, B., 2025*), Above centre- A Repair Society (*Worrall, M., 2025*), Above right- Penallta Energy Community (*Birch, R., 2025*).

Right – The Collective Story – storytelling for the climate crisis (*Jessop, E., 2025*). Far right– Uniting Heritage, Community and Nature Through Water (*Forrester, S., 2025*)

Left– Presentation to Caerphilly County Borough Council Planning and Regeneration Team.



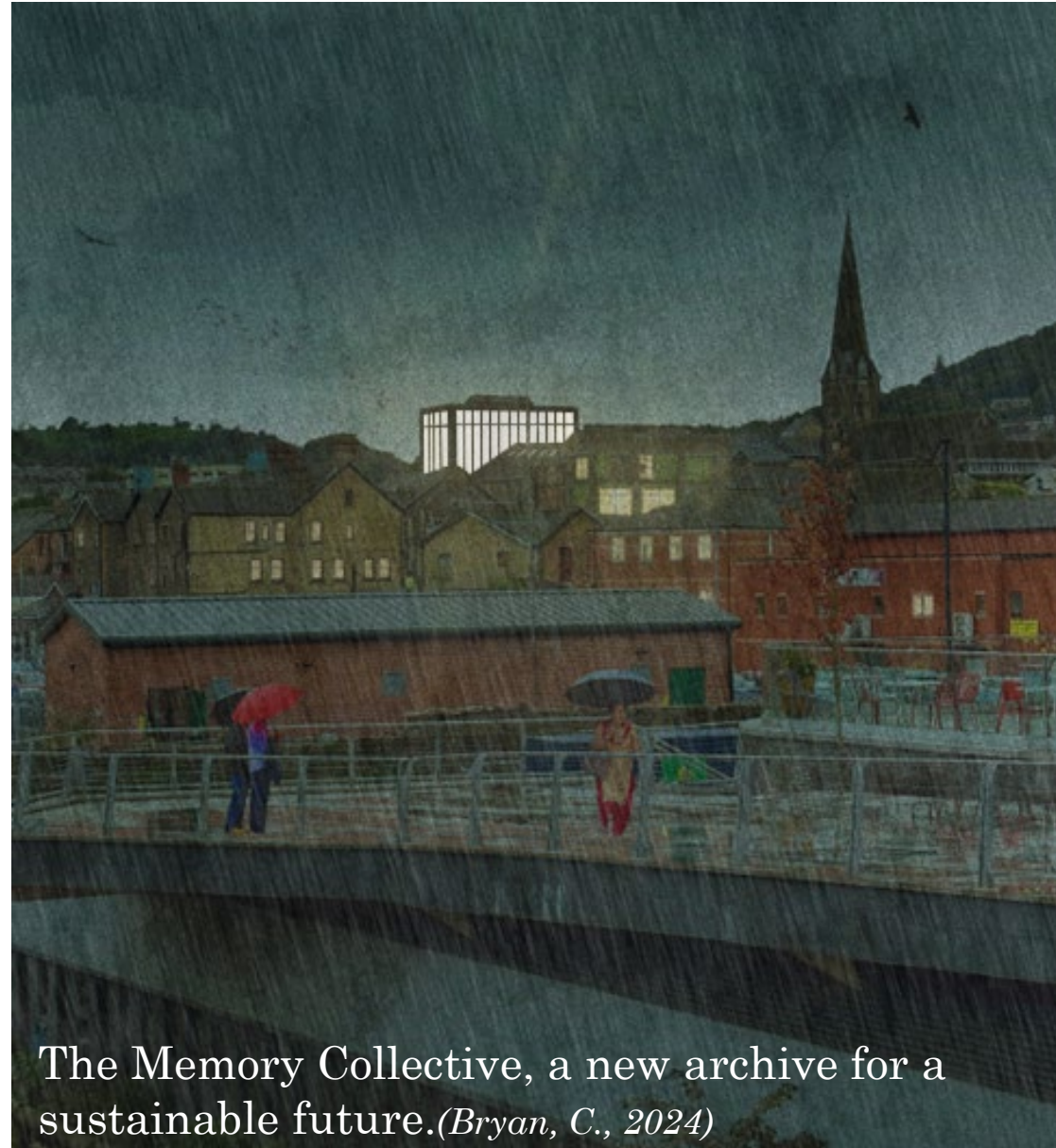
# MARCH2 Design Unit – Carbon Pasts, Low Carbon Futures 2024 – 2025

## Penallta Colliery



# Conclusions

- Sites tied to the UK's historical carbon legacy, provide inspiration to develop innovative responses to the climate and ecological crises.
- The importance of engaging architectural students with industrial heritage in the context of teaching low-energy design.
- The students demonstrate a growing interest in challenging the predominant cycle of demolition and new-build.
- Maximising the reuse of embodied carbon is paramount. Industrial heritage has an exciting part to play in achieving this goal.



The Memory Collective, a new archive for a sustainable future.(Bryan, C., 2024)



# Thank you!

