

# DESIGN & CONSTRUCTION POST PROJECT EVALUATION OF THE YSBYTY GWYNEDD EMERGENCY DEPARTMENT REDEVELOPMENT

October 2021





# Ysbyty Gwynedd Emergency Department Redevelopment







Photographs of the old Emergency Dept prior to the phased redevelopment

All Photographs within this publication courtesy of BCUHB & TILBURY DOUGLAS

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## **EXECUTIVE SUMMARY**

The Ysbyty Gwynedd (YG) Emergency Department (ED) Redevelopment is an extension and refurbishment project necessitated by the old department being too small to deal with the former pressures and the projected future demand. Also the old layout limited the ability to treat patients effectively, efficiently, equitably and with dignity. Modern pathways of care, including interagency and multi-disciplinary working, could not be fully implemented within the former facility. It was also a poor environment for patients, staff and visitors, which did not comply with statutory and regulatory requirements.

The YG ED project was subject to a standard business case approval process by Welsh Government namely Strategic Outline Case, Outline Business Case and Full Business Case.

The Full Busines Case (FBC) is the third and final stage in the development of the business case. The Strategic Outline Case (SOC) established the strategic context, made the case for change and provided a suggested way forward. The Outline Business Case (OBC) identified the preferred option, set out how the scheme would be procured and identified the necessary funding and management arrangements for the successful delivery of the scheme.

The FBC was first submitted to Welsh Government in 2014, and the Health Board was asked to undertake further work to confirm the strategic fit of the case, and to ensure that it met Welsh Government's investment criteria. In line with that requirement the Strategic Case has been revisited, and the fit with the Board's overall strategy for acute and community care has been confirmed. The objectives and benefits of the scheme have been reconsidered, and the fit with Welsh Government's investment criteria has been established. The scope of the project has also been revisited. This has resulted in improvements to the model of care leading to changes in the functional content and giving significantly greater benefits. The revised FBC for £13.89 million was approved in February 2017.

The project was undertaken utilising the Designed for Life Building for Wales 1 framework with the following main parties appointed:-

Supply Chain Partner: Interserve (now Tilbury Douglas)

Project Manager : Mace Cost Adviser : Arcadis

The YG ED project was ultimately successfully opened in line with approved completion dates in the FBC, within the approved FBC cost of £13.89m and to the required standard.

The key examples of best practice and lessons learnt are grouped according to the themes emerging from the PPE Questionnaires, and Workshop as follows:-

- General
- Governance
- Design
- Construction
- Commissioning

The key examples of Best Practice and Lessons Learnt have been extracted and are noted theme by theme below:-

Best Practice	<u>Lessons Learnt</u>
General	
Keeping good written records of all meetings and decision mitigated against the long timespan of SOC/OBC/FBC on this project.	Reduce time for approvals to avoid unnecessary staff change which leads to lost momentum as a new team takes time to pick up where the outgoing team left.
Allowing architectural changes at FBC stage has ensured the hospital is better aligned to a 21st Century model of Emergency care and has extended its life.	Poor quality record drawings led to issues with live services location and function and determination of the initial scope of works.  Maintenance of accurate engineering system drawings (or BIM data) is essential for management of a modern hospital.
Keep the boundary of scheme in mind at all times to prevent scope creep.	Careful record keeping of BREEAM scores at all project stages is necessary to prevent scores being adversely affected.
Governance	
The main contract works allowed for finalisation of elements of the project that could not be fully planned in advance.	A local approach was taken and having Welsh speaking team members and local labour on hand was found to be helpful in improving communication between the project team and the public and NHS staff.
Providing 3d views (in BIM system) of all spaces allowed decisions on design to be taken more easily.	
Design	
2000.	

Having a client team member who is consistently available and is able to read and understand ADB/Codebook and act as an intermediary between project and client teams is invaluable.	Flexible generic design solutions create opportunities for enhanced care solutions in changing circumstances.
	Don't accept derogations/VE that are a key project functional requirement.  Ensure there are sufficient checks in place within project governance to avoid this.
Construction	
A revised construction programme to incorporate the similar work (Extension/New Build and Refurbishment) was adopted. This simplified the works allowing a smoother construction project to proceed.	Review time of year in terms of weather for phased handovers. Allow for temporary heating/cooling if required.
The type of work required at least a month at the start of each phase for surveying.  Programme for an in-depth enabling works investigative package at the start of each phase.	
Having an experienced building services team with specialist healthcare design and handover skills will ease the transition from design stage to construction and commissioning.	
Commissioning	
Employing an in-house supervisor role on a refurbishment project will have a follow-on positive effect on project quality and ease of communication with the Health Board Estates team.  Future proofing by constructing a plant containment building in a robust construction form will aid longevity of the services installations.	The Shared Services Specialist Estates Engineering team do the witnessing but not the commissioning and the need for whom to be where and when to finalise services installations needs very clear planning.  The protection for doors and walls was found to be inadequate in use and in future comprehensive protection should be designed in and retained through to construction as additional wall guards/protection have had to be retrofitted.  Allow sufficient time for commissioning of complex components such as sliding doors.  Allow sufficient time for detailing handover
	drawings for complex medical services.

The evidence from the workshop demonstrated that the remodelling of the ED to provide fit for purpose, more modern and efficient facilities was a successful project; a scheme delivered on time, in line with the approved FBC, and to a high quality.

The evaluation has confirmed the key objectives have been achieved:-

- Deliver a new model of high-quality clinical services for patients requiring emergency and urgent care that is accessible and timely.
- Deliver closer integration of emergency and urgent care services through improved patient flows and patient pathways.
- Improve the overall patient, visitor and staff environment within the Emergency and Urgent Care Department.
- Achieve Statutory and Regulatory compliance by providing services in modern, fit for purpose accommodation.
- Support the consistent delivery of unscheduled care performance targets.

Note: The modifications to the ED have also had an unforeseen beneficial effect in allowing the Health Board to better deal with the needs of providing care for Covid-19 patients by means of separating flows of patients.

#### DESIGN & CONSTRUCTION POST PROJECT EVALUATION METHODOLOGY

This evaluation has been undertaken in an impartial, objective and blame free culture, which has involved the Health Board and other key stakeholders of the Project Delivery Team. A specially structured suite of Pro-forma & questionnaire was issued to all stakeholders to cover issues both good, and not so good, which occurred during the project journey. A workshop was then held with a select number of attendees representing Client, Supervisor, Project Manager, Cost Advisor and Supply Chain Partner, to further investigate the main themes and issues noted within the questionnaires to fully understand and highlight lessons learnt. The draft report was then circulated to all respondents for review to enable input into the final edited version, for sign off by the Health Board prior to publishing.

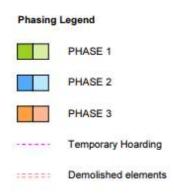
In the interest of continuous learning and to benefit future project design, planning, development and management; this Design and Construction Post-Project Evaluation will be shared with Welsh Government, all NHS bodies, Framework Members and the Service Post Project Evaluation Team Members.

The Service Post-Project Evaluation, completed in accordance with the Benefits Realisation timeframe, will be initiated by the Health Board (normally during Stage 6: Completion).



## PROJECT DETAILS

The YG ED Redevelopment project affected all of the existing Accident and Emergency area of the hospital and was constructed in three phases as below .



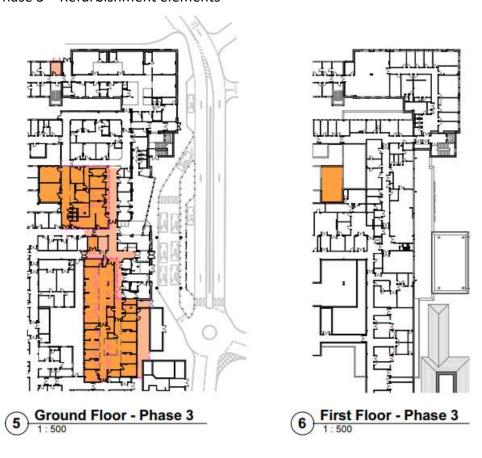
Phase 1: Main ED frontage



Phase 2 – New Build element



Phase 3 – Refurbishment elements



The approved budget of the YG ED redevelopment was £13.89m with a construction value of £9.79m ex VAT.

An overview of the main project parties and headline information is included below:-

Team Structure					
Client	Betsi Cadwaladr	Supply Chain	Interserve (Tilbury		
	University Health	Partner	Douglas)		
	Board				
Senior Responsible	Sue Hill (from 2019)	Architect	AHR		
Officer					
Health Board Project	Meinir Williams	Services Engineer	DSSR		
Director					
Health Board Project	Daniel Eyre	Civil and Structural	WSP		
Manager		Engineer			
Project Manager	Mace	Health Planner	n/a		
Cost Advisor	Arcadis	Supervisor	Betsi Cadwaladr		
			University Health		
			Board		
Key Facts					
Gross Floor Area	2773m2	Construction Cost	£9.79m		
Commencement on	April 2017	Completion	19 Sept 2019		
Site					
Clinical	three phases	Capacity Increase	20,000 to 70,000		
Accommodation					
Opened to Patients in					
multiple phases					
Accident Free	480,000 hours				
Successful decants	four				

#### New services included:-

- extended and refurbished emergency department
- new ambulance drop-off with covered entrance
- additional triage facilities
- refurbished/new hospital mechanical and electrical and medical gas services
- new assess to admit unit including trolley bays and clinical decision unit/observation unit and relatives/waiting area
- new paediatric assessment rooms and separate waiting room

- refurbished reception and waiting area facilities
- new staff change and rest areas
- new office accommodation, seminar room, library/study room facilities
- a new isolation suite
- new patient monitoring systems

The scheme involved creating a new ambulance entrance on the north side of the building and improving the entrance facilities on the west side to mirror the outpatient's area to the south along that façade. The relocation of the ambulance entrance to the north was to improve the access to and from the air ambulance.

The works were undertaken in three phases plus an enabling works phase:

- Enabling works widen the existing road and divert services ready for the new ambulance drop-off.
- Phase 1 Construct the new single storey Ambulance and Emergency Department Main entrances, to together with the internal break throughs and remodelling to create a new reception, triage, security and an Isolation bay. Along with the completion of the new ambulance drop-off externally.
- Phase 2 Construction of the new two-story extension adjacent to the old Emergency
  Department entrance, to form a CDU unit on the ground floor and offices on the first floor.
  Within this phase, remodelling works were undertaken in the adjacent existing ground floor to
  form a Paediatrics area. Along with the construction of a dedicated plantroom on the roof of
  the two-storey extension.
- Phase 3 Internal remodelling works to form two new areas: Emergency Department Majors and Minors.

The project started on site in April 2017. The original programme indicated that the works were due to be completed in May 2019 and were actually completed in September 2019.

The YG ED project was successfully opened in line with agreed project programme and within the approved budget and to the required standard.

The YG ED project achieved:-

- Local labour (<50miles) of 30% and 47% personnel were Wales based</li>
- Recycled demolition waste 87% (target 80%)
- 477,280 hours worked on site with only no reportable (RIDDOR) accidents
- Considerate Contractors Scheme certificate of compliance

The Ysbyty Gwynedd Emergency Department Redevelopment project had a final construction value of £9,168,99 and has been delivered through the Designed for Life 1 Framework Agreement.

The Hospital site has a variety of existing accommodation some of which dates back to the 1980's and some of which has been built more recently.



#### **BEST PRACTICE & LESSONS LEARNT**

## 1.0 GENERAL

- 1.1 It is essential that good written records of all meetings and decisions are kept, as this mitigated against the change of personnel and subsequent loss of memory during the long time span of the SOC/OBC/FBC stages on this project.
- 1.2 Reduce, wherever possible, the time for approvals to avoid unnecessary staff change which leads to lost momentum as a new team, or team member, takes time to pick up where the outgoing team, or team member left.
- 1.3 Allowing for architectural changes at FBC stage has ensured the hospital is better aligned to a 21st Century model of Emergency care and has extended its life.
- 1.4 Poor quality record drawings led to issues with live services location and function and determination of the initial scope of works. This was only solved by an intensive survey stage at the start of each phase of the works.
- 1.5 Maintenance of accurate engineering system drawings (or BIM/CAFM data) is essential for management of a modern hospital.
- 1.6 Keep the boundary of the scheme in mind at all times to prevent scope creep.
- 1.7 Careful record keeping of BREEAM actions and scores at all project stages is necessary to prevent the overall results being adversely affected.

## 2.0 GOVERNANCE

- 2.1 A simplified project phasing of the main contract allowed for finalisation of elements of the project that could not be fully planned in advance.
- 2.2 A local approach was necessary and having Welsh speaking team members and local labour on hand was helpful in enhancing communication between the project team and the public and NHS staff.
- 2.3 Providing 3d views (via a BIM system) of all spaces allowed decisions on design to be taken more easily.

## 3.0 DESIGN

- 3.1 Having a client team member who is consistently available and is able to read and understand ADB/Codebook and act as an intermediary between project and client teams is invaluable.
- 3.2 Flexible generic design solutions create opportunities for enhanced care solutions in changing circumstances.
- 3.3 Don't accept derogations/VE that are a key project functional requirement. Ensure there are sufficient checks in place within project governance to avoid this.

## 4.0 CONSTRUCTION

- 4.1 The programme was revised to incorporate the three types of work in three separate phases (Extension/New Build and Refurbishment). This simplified the works allowing a smoother construction project to proceed.
- 4.2 Review the time of the year in terms of weather for interim phasing handovers. Allow for temporary heating/cooling if required.
- 4.3 The type of work required allowing at least a month at the start of each phase for an indepth enabling works investigative package at the start of each phase.
- 4.4 Having an experienced building services team with specialist healthcare design and handover skills will ease the transition from design stage to construction and commissioning.



#### 5.0 COMMISSIONING

- 5.1 Employing an in-house supervisor role on a refurbishment project will have a follow-on positive effect on project quality and ease of communication with the Health Board Estates team.
- 5.2 The Shared Services Specialist Estates Engineering team do the witnessing but not the commissioning, and the need for whom to be where and when to finalise services installations needs very clear planning.
- 5.3 Future proofing by constructing a plant containment building in a robust construction form will aid future longevity of the services installations.
- The installed protection for doors and walls was found to be inadequate in use and in future extensive protection should be designed in and retained through to construction as additional wall guards/protection has had to be retrofitted which is not efficient.
- 5.5 Allow sufficient time for commissioning of complect installations such as sliding doors.
- 5.6 Allow sufficient time for detailing of handover drawings for complex medical services.

#### 6.0 PROJECT TESTIMONIALS/QUOTATION

**Sue Hill, Senior Responsible Officer**, commented in the Gateway review July 2019:

"all involved have had to manage continuing operations, and some early implementation of new care pathways (albeit in a sub-optimal environment), without deterioration in ED performance throughout the construction period.

Risks have been managed, spend controlled and appropriate resourcing maintained. This has been achieved through strong project leadership and the commitment and engagement of key clinical and nursing leads and others. Project governance has provided effective oversight and management of project performance."

#### Former Cabinet Secretary for Health and Social Services, Vaughan Gething:

"The new facility will provide patients and staff with a better experience and environment. I want to thank everyone who has continued to operate a 24-hour service whilst this vital work was carried out."

"It was important for me to have the opportunity to hear direct from front line staff about how they are managing the challenges of working around building work. "I got a clear sense of how important the work is for both staff and patients. "The previous layout limited the ability to treat patients effectively and with dignity. "The redevelopment will allow new ways of working to ensure patients receive appropriate services and care leading to a reduction in unnecessary admissions. "It will also facilitate greater integration between the GP Out of Hours Service and the Emergency Department."

#### Dr Rob Perry, Consultant in Emergency Medicine:

"I am incredibly proud of the new department and our dedicated staff. The old department was too small and designed to see a maximum of around 12,000 patients a year. We now have a more modern facility that means patients benefit from a brighter, more spacious environment and our staff find it easier to deliver high quality care."

"Here at Ysbyty Gwynedd's Emergency Department we have a fantastic team of staff who work night and day to deliver the best possible care they can to patients in a facility which is now very outdated. This new facility will give them the 21st century facility they deserve so they can continue to deliver the best possible first-class emergency care for our patients."

#### Lyn Roberts, Matron:

"The current Emergency Department is too small and is not designed to meet the requirements of modern clinical practice. The new department will provide us with a lot more facilities to help us

manage all the safeguarding needs that patients present. This will not only benefit patients but will also benefit our staff. The working environment is going to be transformed and massively improved. Part of the work includes a new staff room, shower room and changing facilities which will help the team and make them feel more valued. All of us here at the emergency department are thrilled to see the work has started, it is going to make a huge difference to our working lives as well as the patients who use it."



For Further Information contact:

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# Appendices

A Project Pro-Formas

**B Considerate Contractors Scheme Certificates** 

## A Project Pro-Formas

PF2 Cost

PF5A Local Labour

PF5B Subcontractors

PF6A Recycled Materials

PF6B Demolition Waste

PF7 Safety

PF8 Time Predictability



## Design & Construction Post Project Evaluation Proforma no.2 - Cost

July 2021 To: Cost Advisor

DfL Project No. POOx

Client: Betsi Cadwaladr LHB

Project: Ysbyty Gwynedd Emergency Dept

## Requirements/Target:

Final Account figure to be within +0% and -5% of Target Cost at FBC

Please provide an electronic copy of the last project & cost report following handover as a seperate document.

Please further provide an electronic copy of the full list of priced Compensation Events as a seperate document.

#### Achieved Capital Cost

Please provide details of the capital cost for the project:

Agreed target cost at FBC*	£	9,793,684.47	Stage 4 value incl CE'
Projected Final Account excl			
preliminary gain share	£	9,168,998.57	
Preliminary Pain/Gain Share	£	312,342.95	1

<sup>\*</sup> Target cost is the approved budget 4a together with CEs 1-5

## Revenue Cost

Please provide an electronic copy of the Energy Performance Certificate for the project as a seperate document.

N.B. A Copy of the Display Energy Certificate is required to be submitted as a seperate document 12 months after handover and beneficial occupation, or at the Service Post Project Evaluation, whichever is later.

#### PF5A Local Labour



## Design & Construction Post Project Evaluation Proforma no.5A - Local Labour

Date: July 2021 To: Supply Chain Partner

DfL Project No. POOx

Client: Betsi Cadwalladr UHB

Project: Ysbyty Gwynedd Emergency Dept

Requirements/Targets

SCP to use best endeavours to use Welsh based supply chain and the employment of local labour.

#### Achieved

Please provide a summary of the distance travelled from site to normal place of residence for all local labour employed on project

Distance Travelled	Employee Nos.
0-20 miles	58
21-50 miles	38
50+ miles (but within Wales)	55
Other	178
Total employees	329

Performance
18%
12%
17%
54%
100%

#### Comments

Please provide a brief statement with regards to your goods & services procurement strategy for the project as a separate document or inserted below:

For each subcontract package the works are tendered both to the local area/market and also our approved supply chain. There is a focus to encourage local labour, spend and suppliers wherever possible and this thefore features in our procurement processes.

A dedicated supply chain briefing and workshop was also held prior to project commencement to discuss the available works packages, trades and labour required for the project with a view to creating local interest among suppliers and subcontractors.

#### PF5B Subcontractors



### Design & Construction Post Project Evaluation Pro forma no.5B - Sub-Contractor Expenditure

Date: July 2021 To: Supply Chain Partner.

DfL Project No. POOx

Client: Betsi Cadwalladr UHB

Project: Ysbyty Gwynedd Emergency Dept

#### Requirements

Provide figures for sub-contractor expenditure on the project by utilising the Welsh Community Benefits Measurements Tool

#### Achieved

Insert the value of the contract that relates to goods, services and overheads.	£	9,793,684	This figure should include costs associated not only with suppliers and sub-contractors but also overheads associated with the project or contract, such as operational costs, for example, Finance, Insurance or IT.
From the value above, how much was spent with businesses based in Wales providing goods, services, or overheads?	£	2,722,430	Please consider businesses based in Wales to be businesses that deliver goods or services from a location in Wales. Postcodes starting with the following letters qualify as Wales: CF, CH, HR, LD, LL, NP, SA, and SY.
Percentage spent on businesses based in Wales	127	28%	Where the % is not 100%, please provide a brief summary of how you create opportunities for businesses based in Wales below.

#### Comments

For all subcontract packages and works required for the project, a concious effort is made to ensure that the local area and supply chain are contacted and given the opportunity to price the works.

#### PF6A Recycled Materials



## Design & Construction Post Project Evaluation Pro forma no.6A - Use of Recycled Material

Date: July 2021 To: Supply Chain Partner

DfL Project No. P00x

Client: Betsi Cadwalladr UHB

Project: Ysbyty Gwynedd Emergency Dept

#### Requirements/Targets

Using the WRAP Net Waste Tool, calculate the amount of recycled materials used in the project by value. The target amount is 15% minimum.

#### Achieved

Please provide percentages of the recycled content for the following items on the project

% recyc	led (from NetWaste toolkit)	Score	
1	Substructure	100%	
2	Superstructure	90%	
3	Walls, floors, ceilings	80%	
4	IT FF&E	80%	
5	Services	80%	
6	Site works	90%	

Performance summary	Score
Overall Performance	87%

N.B. Conditional formatting set at: ≥ 15% = green, <15% = red

Please attach copy of final WRAP report as a seperate document.

## Comments

Existing strata was rock so excavation was reduced, and slab was changed to ground b

Segragated skips

#### PF6B Demolition Waste



## Design & Construction Post Project Evaluation Pro forma no.6B - Recycling of Demolition Waste

Date: July 2021 To: Supply Chain Partner

DfL Project No. P00x

Client: Betsi Cadwalladr UHB

Project: Ysbyty Gwynedd Emergency Dept

#### Requirements/Targets

Estimate volumes recycled and express as percentages of total generated The target amount is 85% minimum of materials to be recycled (exc. asbestos and contaminated materials).

#### Achieved

Please provide percentages of the recycled content for the following items on the project

		Vol generated	Vol recycled	
1	Concrete	49	49	100%
2	Brick	28	28	100%
3	Glass	5	4.5	90%
4	Timber	6	5.4	90%
5	Slate	0	0	#DIV/0!
6	All metals	8	8	100%
7	Intact Architectural features	0	o	#DIV/0!
	Totals	96	94.9	

N.B. Conditional formatting set at: ≥85% = green, <85% = red

Overall Performance

99%



## Design & Construction Post Project Evaluation Pro forma no.7 - Health & Safety

Date: #REF! To: Supply Chain Partner

DfL Project No. #REF!

Client: Betsi Cadwalladr UHB

Project: Ysbyty Gwynedd Emergency Dept

#### Requirements/Targets

Target AFR & AIR to be 20% less than national average figures.

National av AFR 0.58 at 2006.

#### Achieved

Please provide the RIDDOR reportable accidents, hours worked and average numbers of employees on the project (including those to sub-contractors) as measured at Handover.

Performance Data		
No RIDDOR accidents	0	
No hours worked (own labour)	35,280	
No hours worked (sub)	442,000	
Average No of employees	7	
Average No of employees (subs)	45	
AFR	0.09	
AIR	218	

Performance	
,	
	0.0
	0.0

#### Comments

Please provide details of other undertakings by company with regards to Health & Safety (i.e Considerate Constructor Scheme) as a separate document or inserted below:



## Design & Construction Post Project Evaluation Proforma no.8 - Time Predictability

Date: Sept 2021 To: Project Manager

DfL Project No. P00x

Client: Betsi Cadwalladr UHB

Project: Ysbyty Gwynedd ED Redevelopment

Requirements/Targets

Difference between the target construction duration at OBC approval, and the actual construction duration, expressed as a percentage of the target duration. Target within 0% and -5%.

#### Achieved

Please provide a summary of the construction duration:

	Data	Performance
Planned handover date at FBC	15/05/19	
Planned weeks to h/o at FBC	234	
Agreed extensions (weeks)	19	
Actual date of handover	19/09/19	
Performance (ex extensions)	<u> </u>	7.8%
Performance (inc extensions)		-0.4%

#### Comments

Project delayed at OBC-FBC by WG approvals
Isolation suite – Delayed due to spec changes & handed over in Oct / Nov 19

