

Barmouth North Phase Approach Meeting 13/07/2021

Attendees

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

Notes

- More sure of costs and risks reduced – cost of scheme £22m
- Gwynedd don't think whole scheme possible as a whole due to CRMP timescales and struggling for full match funding.
- Want to agree phasing approach and how this would be approved
- Two separate issues - Sediment movement issue and overtopping issue
- Emergency works have been completed at North prom following recent collapse
- SMP2 state further works is required to refine the approach it is not explicit in requiring MR from epoch 2 Reason for policy/needs policy change
- Railway makes it difficult to move back the defence anyway
- Erosion higher in north so rock revetment proposed, beach nourishment proposed in the south
- Two set back walls are proposed, one either side of the prom
- Original wave wall is an unknown so a alternative (new) has been proposed. These could be combined following future survey (conservative for now)
- Phase 1 flood overtopping, Phase 2 coastal erosion

Preferred Option – Staged Approach delivering defined benefits

- 1) Vision, design (RIBA3 + **physical modelling**) for **whole scheme**. Includes engagement & environmental assessment.

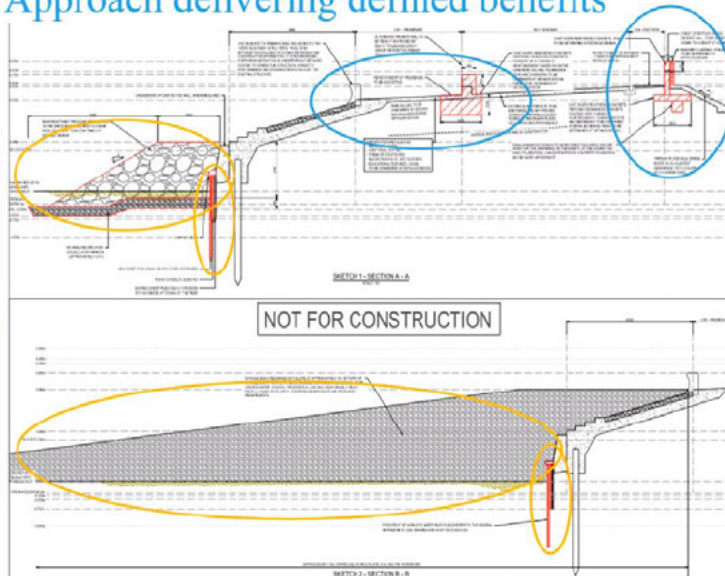
Phase 1 interim works to contain flooding

- 2) **Maintenance and void filling**. No consent implications. Benefit = avoiding collapse/breach.
- 3) **Secondary flood wall**. Detailed design (RIBA4) and consenting (planning). Benefit: short-term flood risk management to hinterland, shorter consenting period.

Phase 2 works to manage coastal risks

- 4) **Beach nourishment/ rock revetment**. Detailed design and consenting (planning and 4mth+ marine licence) informed by HRA and likely EIA. Benefits = erosion and long term flood risk reductions to hinterland.
- 5) **Toe piling works** recommend align with 4) to avoid marine consenting.

Timing of **primary/ alternative primary wall works** = Flexible recommend 1+2. - Included in phase 1 for costing



- Design and consenting to be done on the scheme as a whole
- Primary wave wall could be done in Phase 1 or 2 but recommend 1.
- Cost and benefits have been split

OBC – Preferred option costing

Table 7. Preferred Option Costing

Proposed Scheme	PV Costs (£k)	Non Discounted Costs (£k)	Comments
<i>OBC to Construction Subtotal</i>	£969	£969	<i>Assumed to occur in Year 0.</i>
Construction and Construction Support	£17,682	£17,682	PV Capital cost, based on estimate from ECI. Includes: - o Preliminaries: 36 weeks at £25,000/wks - o Material stock piling: 52 weeks at £5,000/wks. - o Profit + overheads: 10% of total direct cost + preliminaries + material stock piling - o Quantified risk assessment 95%ile Construction Period: May 2022 to December 2022
Optimism bias	£4,597	£4,597	26% applied to 'OBC to Construction' and 'Construction' costs due to uncertainty pending design development and survey. Allowance for Network Rail BAPA included as Optimism Bias.
Quantified Risk Assessment 95%ile	£5,284	£5,284	Appendix H – Quantified Risk Assessment
<i>Subtotal</i>	<i>£23,248</i>	<i>£23,248</i>	
Future costs (maintenance)	£178	£403	PV Maintenance cost to include minor concrete repair works to sea wall, promenade and reseating of the rock armour and reinstatement of shingle.
Optimism bias	£107	£242	60% applied to 'OBC to Construction' and 'Construction' costs due to uncertainty pending survey and design.
Total	£23,533	£23,533	

Costing - Work in Progress approach comparison

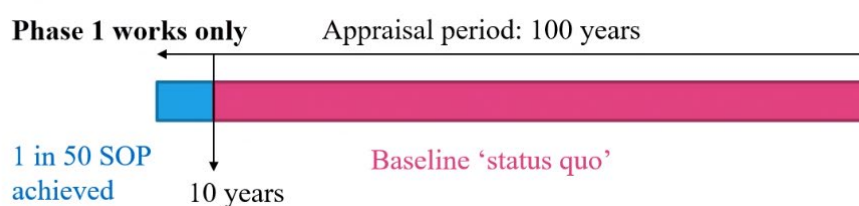
- Longer duration of works – increased material cost, inflation and preliminaries and increased disturbance
- Opportunity to build consensus with stakeholders and reducing consenting risk
- Further work on costing and risk assessment required

Approach	Construction Costs, risk and construction support (£k)	Optimism Bias (£k)	Total (£k)
Single stage (as per OBC)	£17,700	£4,600	£22,200
Staged (*)	£19,800 (*)	£5,100	£24,900
Phase 1 (2021)	£6,600	£1,700	£8,300
Phase 2 (2024)	£13,200	£3,400	£16,600
Staged (**)	£16,700	£10,000	£26,700
Phase 1 (2021)	£5,600	£3,300	£8,900
Phase 2 (2024)	£11,100	£6,700	£17,800
(*) Risk allowance for each phase is the Quantified risk assessment 95%ile (for the single stage scheme) prorated based on the construction costs. 26% optimism bias			
(**) Risk allowance is 15% construction cost and optimism bias 60%			

- Risk of second phase not happening
- Gwynedd would have to find match funding for Phase 1
- Assumed 10 year life of currently defences
- [REDACTED] suggests the more work in Phase 1 the better from a funding perspective.
- Could potentially include piling works in Phase 1 as lower risk. Class as maintenance for Marine License
- Phase 2 may have to be done over several years (this would like end in even higher costs)

Preferred Option – Staged Approach Benefits

Approach	Present Value Damages (PVD) (£k)	Present Value Benefits (£k)	Benefit/cost ratio
Baseline	£99,867	-	
Single stage (as per OBC)	£29,221	£70,304	~3.2
Staged			
Phase 1	£90,516	£9,251	~1.0
Added benefit of Phase 2		61,053	~3.4



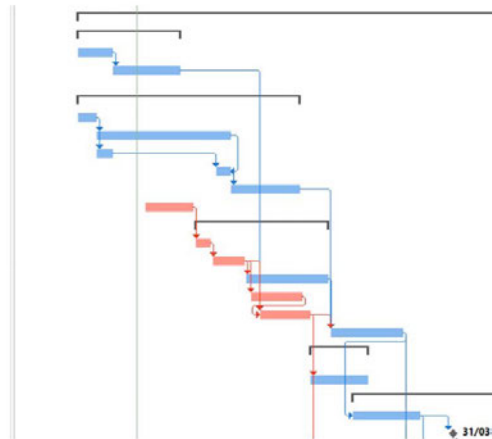
- After 10 years assume BUA (conservative approach as some residual benefit)

	Key risks	Mitigation
1	Significant flood or erosion event occurs in advance of FBC completion.	Specific funding to be available for reactive works.
2	Failing to progress with Phase 2 works	Early and continuous stakeholder engagement to identify and mitigate causes that could prevent Phase 2 from progressing.
3	Variability in material costs	Early contractor involvement throughout the project to advise on changing market conditions.
4	Project sensitivity to legislation and regulation changes	Quantified risk assessment to be revisited regularly to capture latest regulation and legislation changes.

Note: risks in addition to/ increased probability than previously identified in OBC for single stage scheme



• Barmouth North Promenade	399 days?	Mon 24/05/21	Thu 15/12/22	0 days?	
• Land-based GI	60 days	Mon 24/05/21	Mon 16/08/21	68 days	
Scope of works and spec (YGC)	20 days	Mon 24/05/21	Mon 21/06/21	68 days	
Site works (2w on site, 4w lab testing, 2w reporting)	40 days	Tue 22/06/21	Mon 16/08/21	68 days	4
• Marine GI	131 days	Mon 24/05/21	Tue 23/11/21	71 days	
Scope of works and spec (YGC?)	10 days	Mon 24/05/21	Mon 07/06/21	71 days	
Marine licence for GI (NRW)	4 mons	Tue 08/06/21	Mon 27/09/21	3.55 mons	7
GI tendering	10 days	Tue 08/06/21	Mon 21/06/21	133 days	7
GI mobilisation	8 days	Thu 16/09/21	Mon 27/09/21	71 days	9.8FF
Site works	41 days	Tue 28/09/21	Tue 23/11/21	71 days	10
Update and approval of OBC	30 days	Mon 19/07/21	Fri 27/08/21	0 days	
• RIBA 3 design entire scheme	80 days	Mon 30/08/21	Fri 17/12/21	0 days	
Scoping	10 days	Mon 30/08/21	Fri 10/09/21	0 days	12
Procure designer	20 days	Mon 13/09/21	Fri 08/10/21	0 days	14
Physical 2D Modelling	10 wks	Mon 11/10/21	Fri 17/12/21	5 wks	15
Surveys	30 days	Fri 15/10/21	Thu 25/11/21	0 days	15FS+4 days
Phase 1 works - Design for consenting	30 days	Fri 22/10/21	Thu 02/12/21	0 days	15FS+4 days, 5FS-20
Phase 1 works - Detailed design	40 days	Mon 20/12/21	Thu 17/02/22	25 days	18, 11FS-28 days, 16
• Phase 1 works - Consenting and planning application	30 days	Fri 03/12/21	Wed 19/01/22	231 days	
Consenting and planning application	30 days	Fri 03/12/21	Wed 19/01/22	231 days	18
• Phase 1 works on site	160 days	Fri 07/01/22	Thu 25/08/22	25 days	
Tendering	2 mons	Fri 07/01/22	Thu 03/03/22	1.25 mons	19FS-30 days
Contractor appointment	0 days	Thu 31/03/22	Thu 31/03/22	180 days	23,30



- If not for CRMP what would Gwynedd like to do? – this works well for them and [REDACTED] think he can get approval from cabinet.
- Phase 1 will include local repairs and void filling to help achieve the approx. 10 year design life of the proposed works.

Remain questions/key points

- Phase 1 works set back walls (flood element), phase 2 works rock revetment and beach nourishment (erosion element)
- Funding commitments from for Phase 1 Gwynedd needs to be confirmed
- Ability to fund phase 2 (both WG and Gwynedd) needs to be confirmed
- How would design and consent by split in DD/FBC to ensure Phase 1 is fully consented?
- What are NRWs thoughts on splitting marine license
- BCR is 1 for Phase 1
- BCR is 3.2 for Phase 1 and 2
- Phase 1 works would need to be complete anyway so no abortive works
- Assumed 10 year design life for phase 1. If this is shorter Phase 1 will be non-cost beneficial
- Approach is generally conservative throughout. E.g.
 - No erosion benefits included,
 - No residual benefits from Phase 1 works included after the 10 year design life.
 - Assumed a second primary wall if required, this may not be the case
- SMP policy is for managed realignment in epoch 2. This may have to be changed (to be reviewed with OBC).
- OBC has been submitted, an addendum will be prepared confirming this approach.