

Appraisal summary table - Entrance Lock/Brunel Dam

This template shows one way that you can present the absolute and relative impacts of each short-listed option when compared against the baseline. It also captures who was consulted, who the main beneficiaries are, areas of uncertainty and whether the impact is of local or national importance.

Project name		Bristol and Avon Flood Strategy		Options Appraisal to be considered in conjunction with sketches and summary notes						
Project description										
AST version date										
	Option name	Baseline	Option 1	Option 2	Option 3	Option 4				
	Option description	No intervention	SOC option: Encase Brunel Dam and raise Brunel Swing Bridge. Tie into off ramp.	New sheet pile wall on the river (west) side of Brunel Dam. Tie into off ramp.	New sheet pile wall on the floating harbour (east) side of Brunel Dam	Floodwall extending behind Brunel Dam and Swing Bridge into the harbour using an existing pedestrian bridge as the line of defence.				
	Present value benefits	n/a	n/a	n/a	n/a	n/a				
	Present value costs	n/a	n/a	n/a	n/a	n/a				
Critical Success Factor	Significant impact category	Baseline	Option 1	Option 2	Option 3	Option 4	Engagement and consultation	Beneficiaries and interested parties	Uncertainties and assumptions	National or local impact
CSF 1	Flood prevention of receptors and critical infrastructure, adverse impacts to other areas.	Negative : does not meet project objectives	Positive : meets project objectives	Positive : meets project objectives	Positive : protects same no. residential and commercial properties as options 1 and 2 Negative : defence line is set back so not all assets protected as per options 1 and 2	Positive : protects same no. residential and commercial properties as options 1 and 2 Negative : defence line is set back so not all assets protected as per options 1 and 2				
CSF 2	Buildability	n/a	Negative : Complex structural work as interfacing with Brunel Dam. Raising of Brunel Swing Bridge complex (using bridge parapet as line of defence so risk that not structurally sound). Existing condition of both unknown. Negative: Constructing in tidal area. Working within protected habitat.	Positive: Simple construction method, quick to construct and could potentially provide alternative access route across to the Knuckle which can aid construction. Does not rely on structural integrity of heritage assets. Negative: Constructing in tidal area. Working within protected habitat.	Positive: Does not rely on structural integrity of heritage assets. Constructing within the non-tidal area of the Floating Harbour. Negative : Very small construction zone, heavily constrained by Brunel Way Flyover and access from the Knuckle and Spike Island to construct (likely would prevent this option being feasible) . Does not improve access to the Knuckle. Existing structure would require improvement in future due to overtopping.	Positive : Does not rely on structural integrity of heritage assets. Constructing within the non-tidal area of the Floating Harbour. Negative : Very small construction zone, heavily constrained by Brunel Way Flyover and access from the Knuckle and Spike Island to construct (likely would prevent this option being feasible) . Does not improve access to the Knuckle				
CSF 2 and CSF 3	Interfaces	Negative : no intervention	Positive : potential to provide additional access if bridge is raised and strengthened (relies on Swing Bridge being structurally sound) . Raising only by 0.4m so feasible to maintain access for plant.	Positive : potential to provide additional access capacity to Knuckle. Least interaction with area likely to be developed as part of Masterplan	Negative: Interacts more closely with key infrastructure assets (Pimsoil Bridge pivot). Interaction with old hydraulic pipelines to east of Brunel Dam. Encroachment into operational harbour. Tie into to maintain access over Swing Bridge not feasible without large floodgate on both sides of Brunel Swing Bridge	Negative: Interacts more closely with key infrastructure assets (Pimsoil Bridge pivot). Interaction with old hydraulic pipelines to east of Brunel Dam. Large encroachment into operational harbour. Tie into to maintain access over Swing Bridge not feasible without large floodgate on both sides of Brunel Swing Bridge				
CSF2	Cost	Neutral: No cost to no intervention. Negative : cost of damages, and reduced economic potential of area	Negative : Relies on Swing Bridge being waterproof and structurally sound. Complex interaction with heritage assets.	Positive: Simple construction method, quick to construct.	Positive: Quick construction method if space constraints can be mitigated.	Negative: longest alignment length and most material				
CSF 2	Maintenance	Negative : repairs to existing infrastructure after flood events	Positive : protects assets behind flood defence and limits maintenance after flood event Negative: Swing Bridge may need more regular maintenance as heritage asset, condition unknown.	Positive: protects all assets behind flood defence and limits maintenance after flood event. (Minor: Heritage assets could potentially be properly maintained and protected in controlled environment)	Positive : protects assets behind flood defence and limits maintenance after flood event. Negative : Heritage assets would be flooded (already are water facing structures so not big impact)	Positive : protects assets behind flood defence and limits maintenance after flood event. Negative : Heritage assets would be flooded (already are water facing structures so not big impact)				
CSF 4	Ecology	Neutral : natural evolution of habitat maintained	Negative: encroaching on protected habitat of silt and tidal mudflat and putting a new structure into the floating harbour side. Could be restored to some degree after construction.	Negative: encroaching on protected habitat of silt and tidal mudflat and putting a new structure into the floating harbour side (probably more than option 1) and cannot be restored like in option 1)	Positive : not encroaching on protected habitat of silt and tidal mudflat Negative: cutting off area of the floating harbour and putting a new structure into the water	Positive : not encroaching on protected habitat of silt and tidal mudflat Negative: cutting off area of the floating harbour and putting a new structure into the water		Natural England		
CSF 3 and 4	Townscape	Negative : reduced accessibility of public realm/walker/cyclist route due to increasing frequency of flood event.	Positive : accessibility of public realm/walker/cyclist route maintained and protected	Positive: Potential to make a feature out of listed structures. New access route across this section of the harbour. Accessibility of public realm/walker/cyclist route maintained and protected. Negative : view from Swing Bridge disrupted partially.	Positive: Defences not obstructing key view west of Swing Bridge. Negative: accessibility of public realm/walker/cyclist route not maintained and protected during flood events. Introduction of new feature into open harbour area.	Positive: Defences not obstructing key view west of Swing Bridge. Negative: accessibility of public realm/walker/cyclist route not maintained and protected during flood events. Introduction of new feature into open harbour area.				
CSF 4	Cultural heritage	Neutral: no harm to designated assets from construction Negative : Flooding to listed buildings/assets likely	Negative : Permanent encasement of GII listed Brunel Dam, raising of listed Brunel Swing Bridge could cause damage. Interacts with listed harbour walls.	Positive : Potential to make a feature out of listed structures and protect them from flooding and damage by preserving them behind the line of defence. Negative : Change to the setting of listed structures, working in very close proximity. Interacts with listed harbour walls.	Positive : avoids construction directly adjacent or on top of listed Brunel Dam and Brunel Swing Bridge. Negative : Flooding to listed structures. Still interacts with listed harbour walls.	Positive : avoids construction directly adjacent or on top of listed Brunel Dam and Brunel Swing Bridge. Negative : Flooding to listed structures. Still interacts with listed harbour walls.	Discussed with Historic England and BCC Heritage in meeting 6th June	Historic England, BCC Heritage	National	
CSF 2	Carbon	Neutral: no intervention	Negative: carbon intensive solution using concrete over both sides of the dam and large foundations.	Negative: shortest alignment length and least construction required as only on one side of the dam but still carbon intensive solution . Preferred carbon option as likely the lowest carbon. Has more options for reducing material	Negative: longest alignment length and most material	Negative: longest alignment length and most material				
CSF 5	Navigation of river and marine activities	Neutral: no intervention	Neutral: encroachment into tidal area but no longer navigable with silt	Neutral: encroachment into tidal area	Negative: small encroachment into floating harbour area	Negative: Large encroachment into floating harbour area				

Appraisal summary table - Bonded Warehouses

This template shows one way that you can present the absolute and relative impacts of each short-listed option when compared against the baseline. It also captures who was consulted, who the main beneficiaries are, area of uncertainty and whether the impact is of local or national importance.

Project name		Bristol and Avon Flood Strategy		Options Appraisal to be considered in conjunction with sketches and summary note						
Project description										
AST version date		02/08/2023								
	Option name	Baseline	Option 1	Option 2	Option 3	Option 4				
	Option description	No intervention								
	Present value benefits	n/a	n/a	n/a	n/a	n/a				
	Present value costs	n/a	n/a	n/a	n/a	n/a				
Critical Success Factor	Significant impact category	Baseline	Option 1	Option 2	Option 3	Option 4	Engagement and consultation	Beneficiaries and interested parties	Uncertainties and assumptions	National or local impact
CSF 1	Flood prevention of receptors and critical infrastructure, adverse impacts to other areas.	Negative: does not meet project receptors and key infrastructure from flooding	Positive: protects all receptors in this area	Positive: protects all receptors in this area	Positive: protects all receptors in this area	Negative: does not protect A Bond Warehouse and some of the surrounding land	- BCC	- Assumed there will be development of the Bonded warehouses and surrounding area in future		
CSF 2	Buildability	n/a	Positive: flood gate prevents need for road raising - faster construction. Builds away from existing buildings. Negative: complex construction near riverbank and from river side. Transition to 'wet' path required.	Positive: Built away from river bank buildings. Negative: complex construction near riverbank and from river side. Transition to 'wet' path required.	Positive: Builds away from existing buildings. Negative: complex construction near riverbank and from river side. Transition to 'wet' path required.	Positive: few walls due to utilising high ground and existing structures as line of defence. Neutral: floodproofing existing walls. Negative: Builds close to existing structures in some parts, could interfere with foundations.	- Buildability workshop with BAM Nuttall, 20th June 2023	- Construction projects planned in the next 10 years in Bristol city centre?	- Material and labour supply - Concurrent projects in Bristol will not prevent timely construction. - Construction level surveys (GI, topo etc.) not completed	- Jobs creation
CSF 2 and CSF 3	Interfaces	Negative: low support for no intervention	Positive: Protects warehouse development potential and leaves most flexibility for future development options as largest protected footprint	Positive: Protects warehouse development potential but not as much as Option 1 as closer to warehouses. Negative: Restricts access to warehouses from the South - requires alternative access.	Positive: Protects warehouse development potential	Negative: Future development of receptors on 'wet' side of flood wall would require to include their own flood protection measures	- Initial discussion with BCC masterplan team	- Western Harbour masterplanners. - Local businesses near proposed defences and areas of detriment/ detriment mitigation	- Masterplan for Western Harbour is not complete	- Improve prospects of future local developments by providing flood protection. - Short term disruption to local businesses and traffic
CSF2	Cost	Neutral: No cost to no intervention. Negative: cost of damages, and reduced economic potential of area	Negative: Construction close to riverbank, higher risk. Floodgate requires maintenance and shorter lifespan than walls.	Positive: No flood gate. Negative: Construction close to buildings, higher risk. Wet path would need maintenance after flood event.	Positive: No flood gate. Negative: Construction close to river, higher risk. Areas of wet path would need maintenance after flood event.	Positive: Using existing structures requires less new construction. Neutral: unknown condition of existing walls. Negative: Cost of damages to A Bond warehouse and clean up. Small flood gate requires maintenance and shorter lifespan than walls.	- Buildability workshop with BAM Nuttall, 20th June 2023	- BCC - Funding bodies?	- Cost of materials and labour at time of construction - Unforeseen complications during design and construction	- Significant project cost - £200million+
CSF 2	Maintenance	Negative: repairs to existing infrastructure after flood events	Negative: Gate closure in flood event and maintenance of gate	Positive: No Gate Negative: Clean up after flood event	Positive: No Gate Negative: Clean up after flood event	Negative: Gate closure in flood event and maintenance of gate. Clean up after flood event		- Harbour Operations		
CSF 4	Ecology	Neutral: natural evolution of habitat maintained	Negative: Likely to lead to loss of vegetation, established trees, perhaps saltmarsh during construction. Potential impacts to riparian species / SNCI.	Negative: reduced intervention in proximity to Avon flora and fauna, however likely construction impacts to riparian species / SNCI.	Negative: Likely to lead to loss of vegetation, established trees, perhaps saltmarsh during construction. Potential impacts to riparian species / SNCI.	Neutral: low intervention in proximity to Avon flora and fauna, however depending upon construction methods impacts may be overall negative	- Western Harbour Constraints and Opportunities Workshop between Strategic Partner, BCC, EA, Harbour Operations, BAM Nuttall, 25/04/23 - Bonded warehouse meeting with BCC - 6/6/23	Natural England The EA	Limited ecology information collected at this stage.	
CSF 3 and 4	Townscape	Negative: reduced accessibility of public realm/ walker/cyclist route due to increasing frequency of flood event.	Positive: maintained accessibility of public realm. Potential opportunity for enhancement	Positive: maintained accessibility of public realm/ walker/cyclist route due to increasing frequency of flood event of wet path. Negative: Obstructed view of river due to wall on river side of path	Positive: Potential opportunity for enhancement. Negative: Obstructed view of river due to wall on river side of path. New peak of road falls near the underpass which may interfere with the footpath and make it potentially uninviting. May require steps or steep ramp to maintain head room in underpass.	Positive: Defences blend in the existing infrastructure - unintrusive design. Neutral: Riverside path remains continuous from chocolate path to end of Spike Island. Negative: reduced accessibility of public realm/ walker/cyclist route due to increasing frequency of flood event.				
CSF 4	Cultural heritage	Neutral: no harm to designated assets from construction. Negative: Flooding to listed buildings likely	Positive: Protects Grade II listed A Bond and B Bond Tobacco Warehouses Listed Buildings	Positive: Protects Grade II listed A Bond and B Bond Tobacco Warehouses Listed Buildings. Negative: Wall close to bonded warehouses. Physical interface may be required	Positive: Protects Grade II listed A Bond and B Bond Tobacco Warehouses Listed Buildings	Negative: Does not protect Grade II listed A Bond Tobacco Warehouse Listed Buildings - PFR unlikely to be acceptable	- Bonded warehouse meeting with BCC, 06/06/23 - Included in meeting with Historic England on 6/6/23	Historic England, BCC Heritage	Assumes no physical impact on GI listed Ashton Ave Road Bridge	Local
CSF 2	Carbon	Neutral: no intervention. Negative: carbon cost of increased flood damages	Negative: carbon intensive floodwalls. Operational energy requirement for flood gate closing. Maintenance cost of having large flood gates	Negative: carbon intensive floodwalls. Positive: Limited requirement for path raising. No gates and maintenance required. Passive defense.	Negative: carbon intensive floodwalls and material for road raising. Small gate outside the area at the tie in to the fly over and maintenance required for that.	Positive: Use of existing structures minimises new construction as much as possible. Lowest construction emissions. Negative: carbon intensive floodwalls and material for road raising. Sacrificing existing buildings. Maintenance and repair of buildings in front of the defenses.				
CSF 5	Navigation of river and marine activities	Neutral: no intervention	Neutral: no impact.	Neutral: no impact.	Neutral: no impact.	Neutral: no impact.				

Appraisal summary table - Netham

This template shows one way that you can present the absolute and relative impacts of each short-listed option when compared against the baseline. It also captures who was consulted, who the main beneficiaries are, areas of uncertainty and whether the impact is of local or national importance.

Project name	Bristol and Avon Flood Strategy
Project description	
AST version date	02/08/2023

Option name	Baseline	Option 1	Option 2	Option 3	Option 4	Option 5	Add further options						
Option description	No intervention	SOC option - Downstream cross-water flood gate	Raise lock gates	Upstream cross water flood gate	Protect car base car park	Protect land along lock approach channel							
Present value benefits													
Present value costs													
Critical Success Factor	Significant impact category	Baseline	Option 1	Option 2	Option 3	Option 4	Option 5	Add further options	Engagement and consultation	Beneficiaries and interested	Uncertainty and assumptions	National or local	
CSF 1	Flood prevention of receptors and critical infrastructure, adverse impacts to other areas	Negative: does not meet project receptors and key infrastructure from flooding	Positive: protects most receptors in this area Negative: does not protect lock gates and house	Positive: protects all receptors	Positive: protects all receptors	Positive: protects all receptors, potential to protect further areas and receptors if desired	Positive: protects all receptors						
CSF 2	Buildability	n/a	Positive: controlled conditions within the Feeder Canal Negative: Longest alignment and complex flood gate in canal	Positive: Shortest alignment Negative: Complex building location within lock gate area Involves working near degrading sheet piles.	Positive: Short alignment Negative: Complex in river flood gate. Involves working near degrading sheet piles.	Negative: Complex building along riverbank and in river flood gate near lock gates. Involves working near degrading sheet piles.	Negative: Complex building location within lock gate area and long alignment. Involves working near degrading sheet piles.						
CSF 2 and CSF 3	Interfaces	Negative: low support for no intervention.	Negative: flood wall intersects footpath which will require diversion One access route to South of Feeder Rd closed off by flood wall. Does not protect Netham Lock infrastructure	Negative: Likely requirement to close navigation during construction. May require raising of existing bridge structure. Positive: no impact to Feeder Road or access	Negative: Likely requirement to close navigation during construction. May require raising of existing bridge structure. Positive: no impact on Feeder Road or access	Negative: Likely requirement to close navigation during construction. May require raising of existing bridge structure. Interface with public path access on north bank Positive: no impact on Feeder Road or access	Negative: Likely requirement to close navigation during construction. May require raising of existing bridge structure. Interface with public path access on north bank Positive: no impact on Feeder Road or access						
CSF2	Cost	Neutral: No cost to no intervention. Negative: cost of damages, and reduced economic potential of area	Positive: easier construction of wall as limited interference with lock Negative: Complex in river flood gate require	Positive: Use of existing lock area (new gates would be required) Negative: May require raising existing bridge structure(s)	Negative: May require raising existing bridge structure(s)	Positive: Use of existing lock area (new gates would be required) Negative: May require raising existing bridge structure(s). Longest alignment/	Negative: Requires strengthening existing sheet piles. Increased length of defence. Cost of new flood gate structure.						
CSF 2	Maintenance	Negative: repairs to existing infrastructure after flood events. Risk of damage to lock gates puts floating harbour infrastructure at risk	Negative: New flood gate will require maintenance and testing and possible earlier replacement due to shorter life span than walls.	Positive: Same number of gates to be used as current situation.	Negative: New flood gate will require maintenance and testing	Positive: Same number of gates to be used as current situation.	Negative: New flood gate will require maintenance and testing						
CSF 4	Ecology	Neutral: natural evolution of habitat maintained	Negative: possible impact on existing habitats, species and tree removal due to flood wall near Netham Park and construction within the Feeder Canal.	Negative: possible impact on existing habitats, species and tree removal due to new wall in bankside habitat.	Negative: possible impact on existing habitats, species and tree removal due to new wall in bankside habitat. Works in-channel have potentially negative effect on habitats/species	Negative: Loss of habitat bordering River Avon. Potential impacts during construction to riparian species/habitats.	Negative: possible impact on existing habitats, species and tree removal due to new wall in bankside habitat. Works in-channel have potentially negative effect on habitats/species						
CSF 3 and 4	Townscape	Negative: reduced accessibility of public realm/ walker/cyclist route due to increasing frequency of flood event.	Negative: visual impact of flood gate. Access for walking, cycling and traffic not maintained during flood events	Positive: Lower visual impact of defences	Negative: visual impact of flood gate.	Positive: Lower visual impact of defences	Negative: Wall will surround currently green area and cuts off access for fishing. Visual impact of flood gate.						
CSF 4	Cultural heritage	Neutral: preservation in situ of heritage assets - general planning principle for designated assets Negative: Flooding to listed buildings (assets) likely - unprotected	Neutral: no harm to designated assets from construction Negative - Listed assets (lock house and gates) unprotected	Positive: Lock house (listed) protected from flood events Negative - Listed assets (lock gates and lock structures) directly impacted by works	Positive: Listed assets (lock house and gates) protected from flood events Negative: Introduction of new feature into setting of existing listed assets. NB - as option 2 in terms of impact	Positive: Lock house (listed) protected Negative - Listed assets (lock gates and lock structures) directly impacted by the works NB - as option 2 in terms of impact	Positive: Listed assets (lock house and gates) protected from flood events Negative: Introduction of new feature into setting of existing listed assets. NB - as option 3 in terms of impact		Historic England and BCC Heritage Officer attended workshop				
CSF 2	Carbon	Neutral: no intervention Negative: carbon cost of increased flood damages	Negative: Road raising involves large amount of material. Operational energy usage of flood gate. Long alignment. Also sacrifices the existing lockhouse structure.	Positive: Utilises existing infrastructure. Potentially the lowest amount of materials. Smallest gate and therefore lowest maintenance and construction. Preferred option for Carbon	Negative: Operation of new flood gate. All new flood gate = additional materials	Positive: Utilises existing infrastructure Negative: Long alignment	Negative: Operation of new flood gate.						
CSF 5	Navigation of river and marine activities	Neutral: no intervention	Negative: Potential narrowing of channel within canal to accommodate floodgate.	Negative: Likely requirement to close navigation during construction.	Negative: Likely requirement to close navigation during construction. Potential narrowing of channel outside of lock.	Negative: Likely requirement to close navigation during construction.	Negative: Likely requirement to close navigation during construction. Potential narrowing of channel outside of lock.						