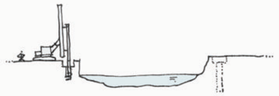
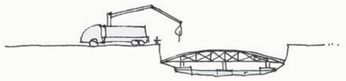
Pooley Bridge concept design
Possible construction systems

In situ construction | general sequence

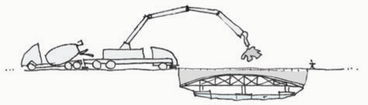


Foundation construction



Falsework and formwork installed over the river

Reinforcing bars + posttensioning duct and tendons arrangement



Concrete pouring + curing

The rest of the bridge is completed in situ

In situ construction allows full control of the geometries being built, what is, in principle, better for the structure aesthetics. In general, designs built in situ have durable and long lasting materials.

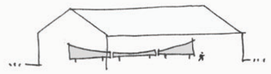
An in situ concrete bridge, allows defining any desired shape desired and being independent of the geometric tolerances and joints intrinsic to the installation of big prefabricated pieces. In situ concrete bridges are, for this reason, almost seamless structures.

In situ construction would be also needed if a stone bridge was built, or if a bridge built in a different material was cladded in stone.

It is, in general, more time consuming that off-site construction and, in principle, requires more work on the river bed, which should need to be adapted to the Environment Agency working windows.

Using in situ construction for a bridge in Pooley Bridge would benefit from having a temporary crossing in a different position to minimise affection to the village's life once the current temporary bridge is removed.

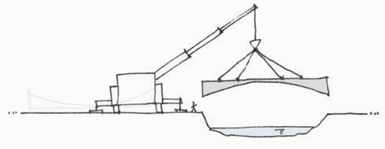
Off-site construction | general sequence



Steelwork fabrication in workshop + Foundation construction

Steelwork transported to site in pieces

Steelwork is assembled on site



Steelwork is installed

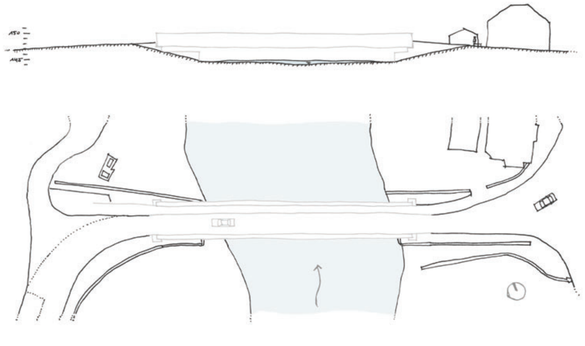
The rest of the bridge is completed in situ

Off-site construction is, in general, faster than in situ construction, as most of the structure is prefabricated in a workshop or in a comfortably accessible area close to site.

Although the quality of finishing in prefabricated structures can be really high, the geometry of what is built is limited by the material (in the case of steel and timber) and/or the weight (especially in the case of concrete). For this reason, bridges built of site rarely can achieve analogue appearances to those of bridges built in situ.

Work in the river bed for bridges mostly built off site would be more reduced than that needed for bridges built in situ, and the time needed for construction without the current temporary bridge would be shorter than in the case of the previously defined construction system, making the need of a new temporary bridge in a different location less fundamental.

Departing point > Current temporary bridge in the position of the future permanent one

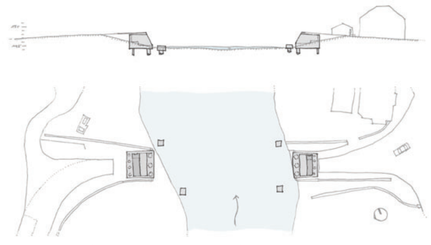


On the right part of the board, construction sequences based on the bridge layouts defined in the following boards and that are specific to project location Pooley Bridge are outlined.

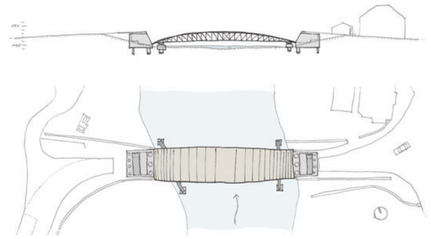
In the three cases, it has been considered that the current temporary bridge (left sketch) is removed first, although it would be possible to do some works (foundation construction, pylon erection or even falsework and formwork installation) depending on the final design being used. This will be studied further in the next work stage, once a design route is chosen.

The in situ construction sequence sketched in the first column on the left would benefit from having a temporary crossing in a different position to minimise severance time.

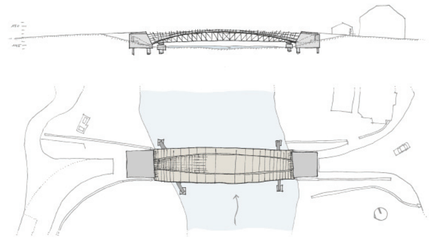
In situ construction for options B2. B3 and C1



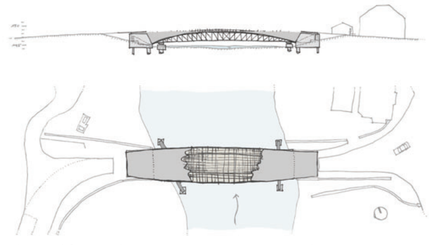
1. Foundation (temporary + permanent) construction



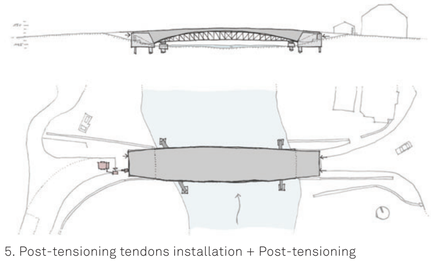
2. Falsework + formwork installation



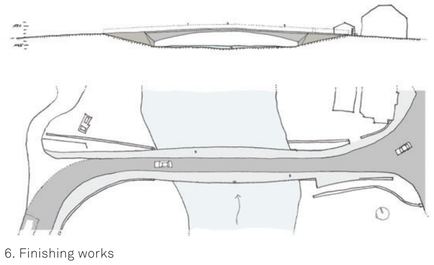
3. Side spans construction + main span rebars + ducts arrangement



4. Internal formwork arrangement + concrete pouring

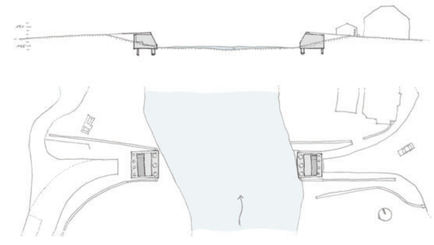


5. Post-tensioning tendons installation + Post-tensioning

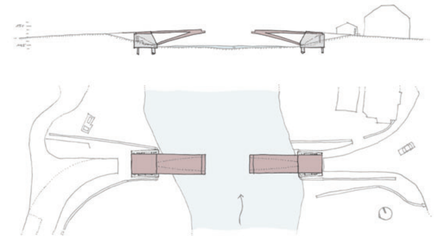


6. Finishing works

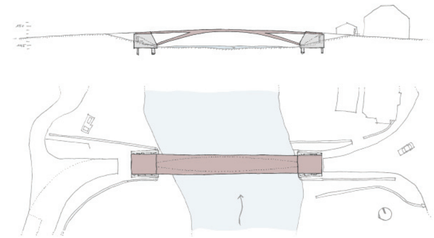
Off-site construction for options B1 and C2



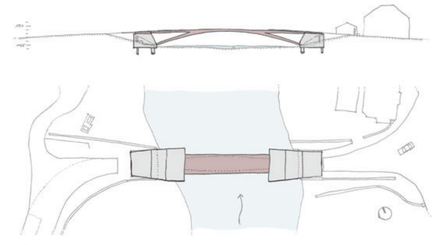
1. Foundation construction



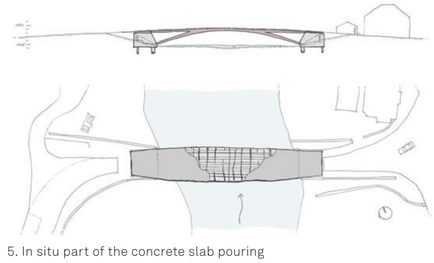
2. Side areas steelwork installation



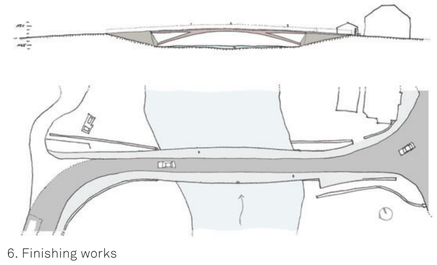
3. Finish steelwork installation



4. Precast concrete deck panels installation

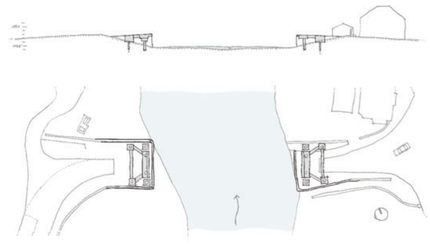


5. In situ part of the concrete slab pouring

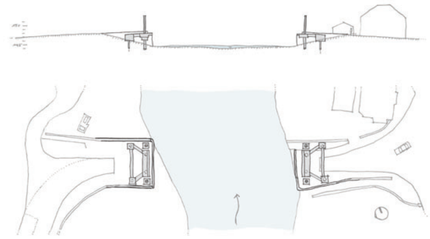


6. Finishing works

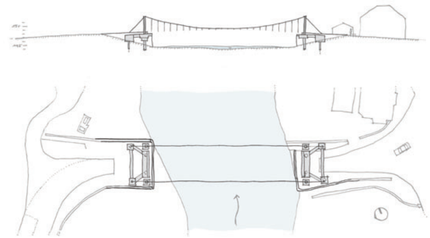
Off-site construction for option A



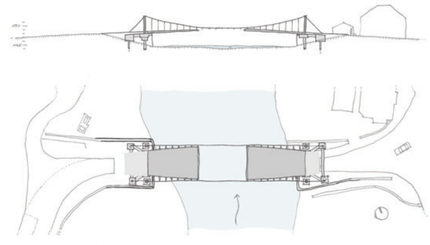
1. Foundation construction



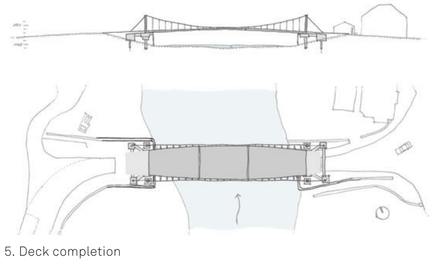
2. Pylons erection



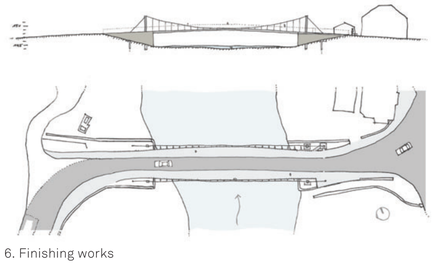
3. Main cable and hangers installation



4. Erection of side segments of the deck



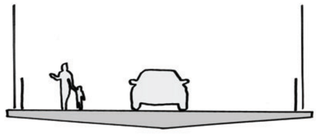
5. Deck completion

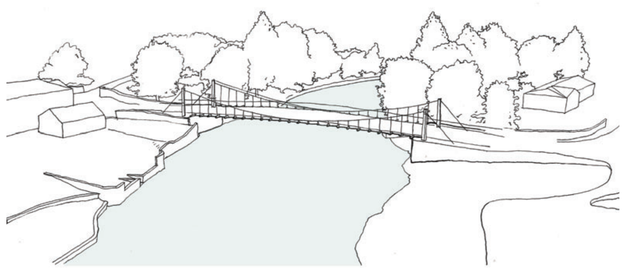


6. Finishing works

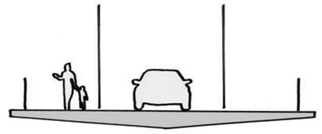
Pooley Bridge concept design| Option A
Suspension Bridge (Above deck structure)

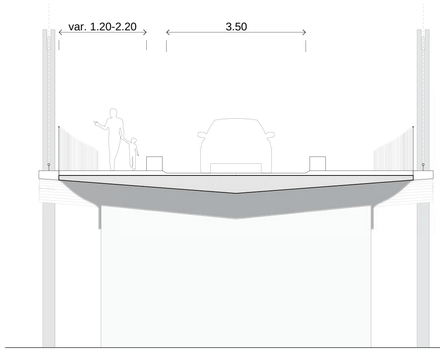
Option A | Cables plane and towers outside



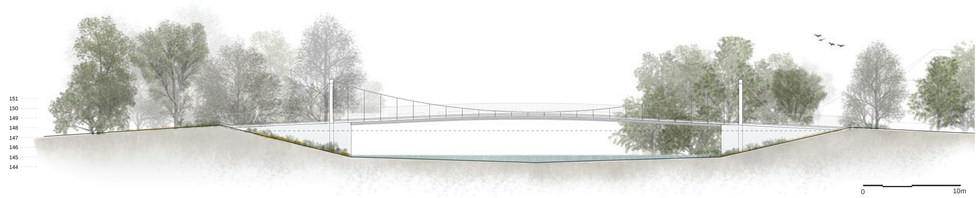


Option A' | Separated pedestrian route by the cables plane

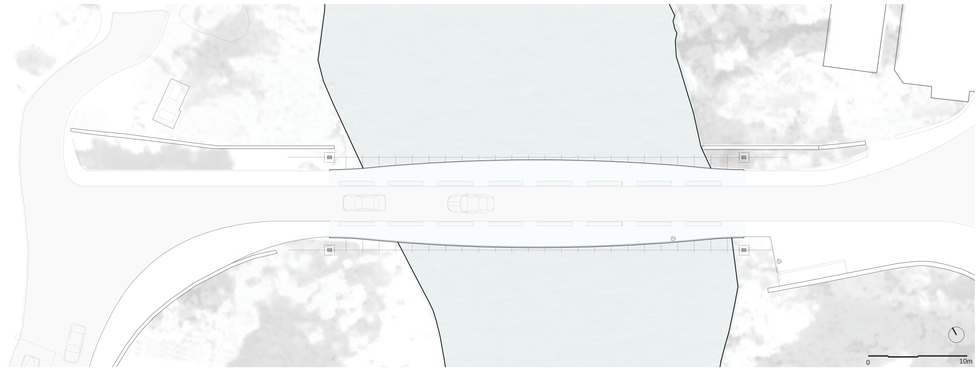




Cross Section



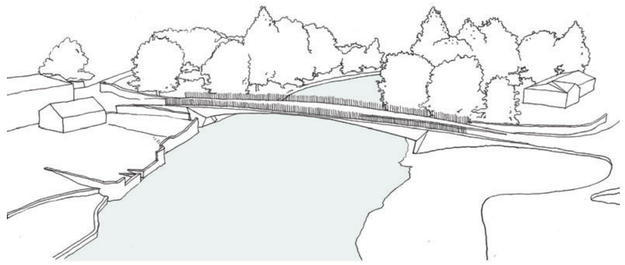
Elevation

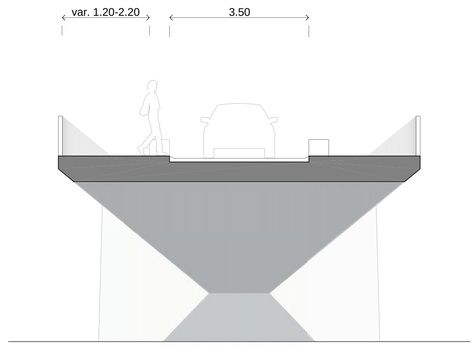


Plan

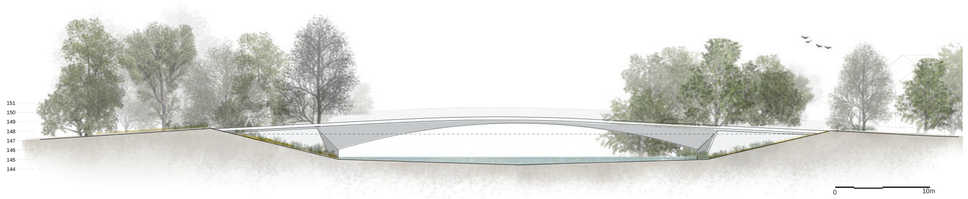
Pooley Bridge concept cesign | Option B

Arched Solid Bridge (Below deck structure)

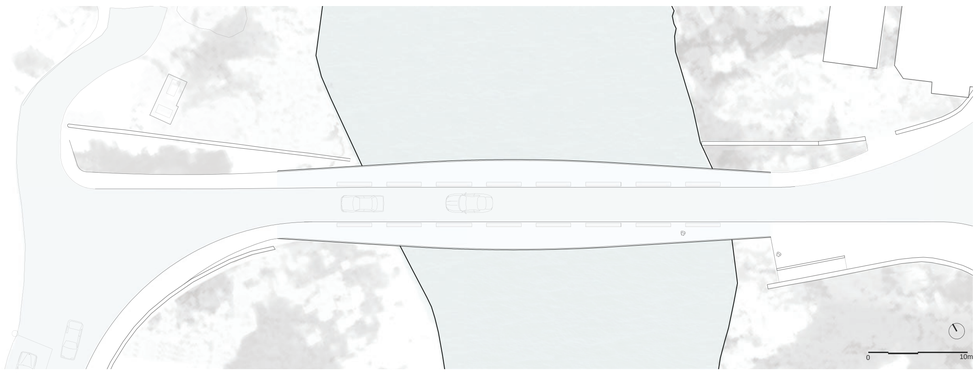




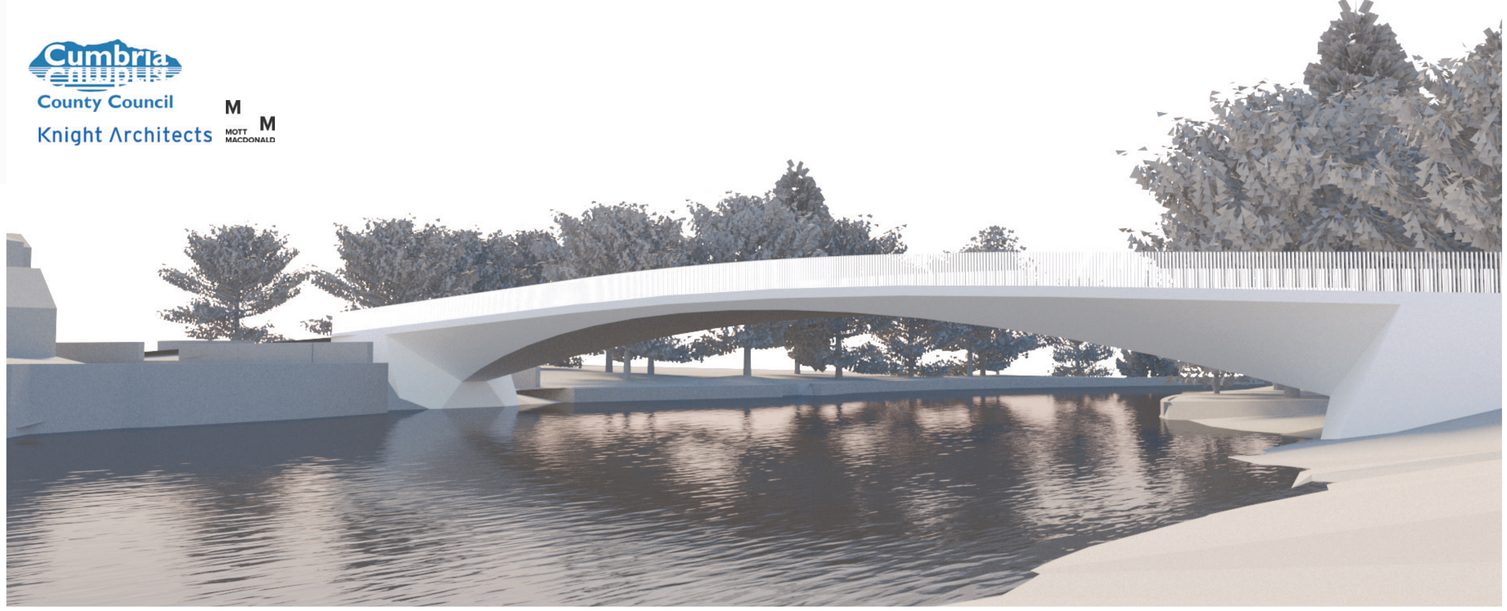
Cross Section



Elevation



Plan



Option B' | Concrete

Option B'' | Corten Steel

Option B''' | Stone

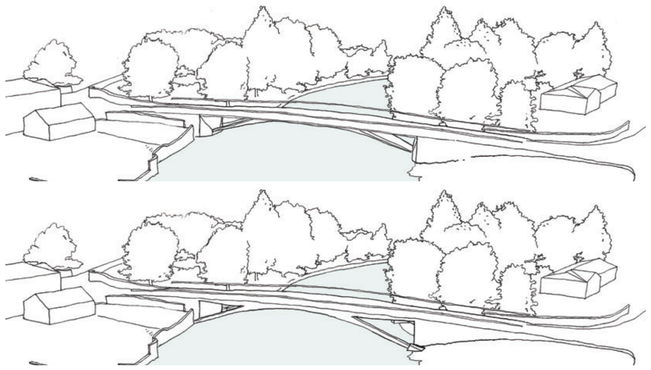
Pooley Bridge concept cesign | Option C

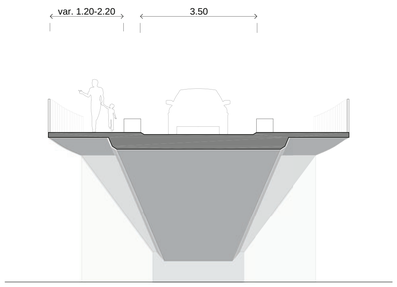
Arched Open-Spandrel Bridge (below deck structure)

County Council

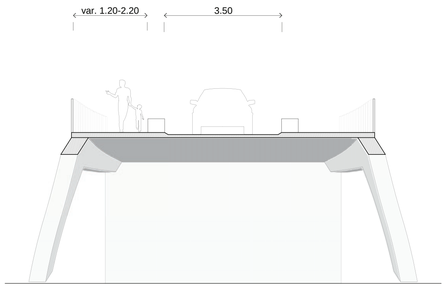
Knight Architects

MOTT MACDONALD

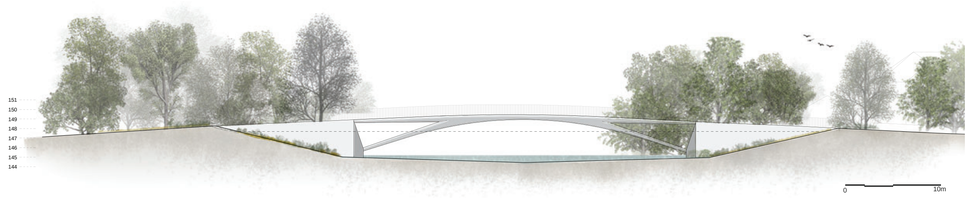




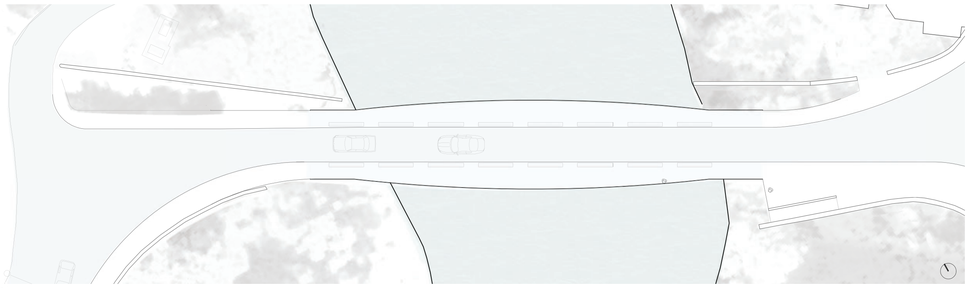
Cross Section



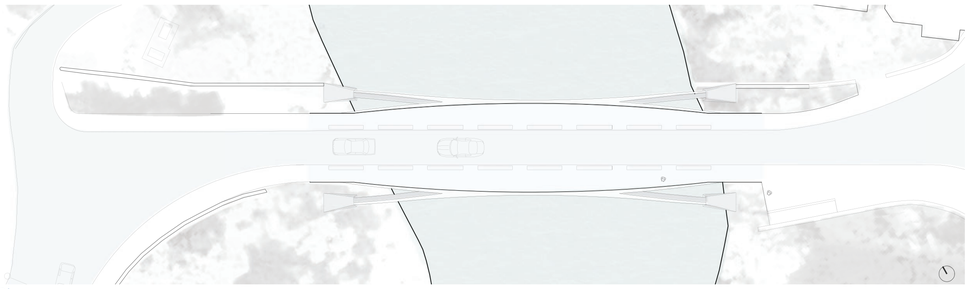
Cross Section



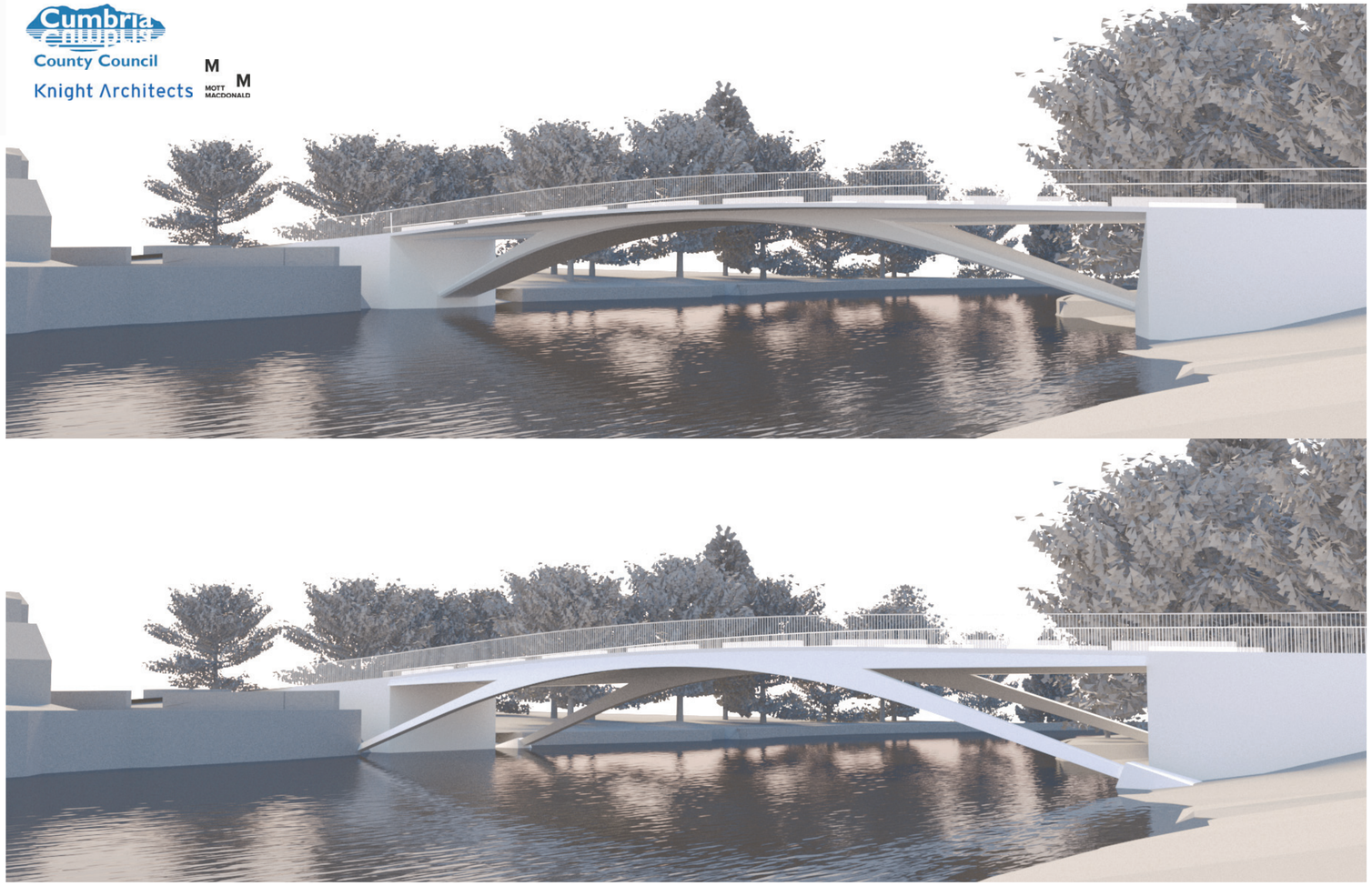
Elevation



Plan



Plan



Option C' | Arched open-spandrel bridge

Option C'' | Arched open-spandrel bridge with side structural elements