Sandyford Brook Restoration Project

Clapper Bridge

The work shall be undertaken in two distinct sections which are the replacement bridge and the path surfacing with pitching stone.

The first of these shall be the installation of a stone slab bridge and sufficient foundations to be support this and avoid erosion of the river bank by the brook itself. It is intended that there shall be an amount of excavation where the bank has sloped due erosion and the construction of the present bridge. This bridge is to be removed as part of the construction process to allow access by hand and machine excavators to the bank edge.

Figure 1: Arrangement of stone clapper bridge

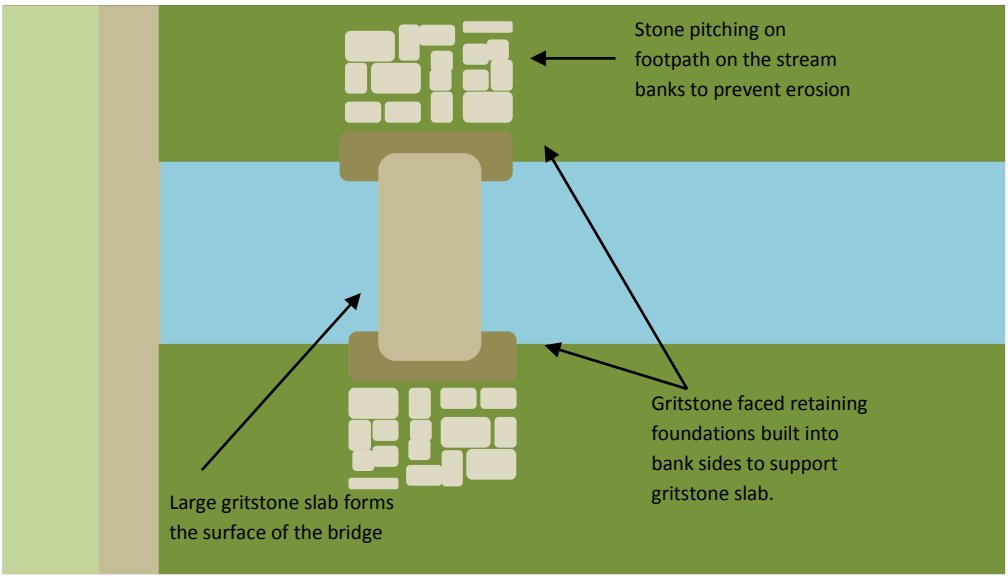
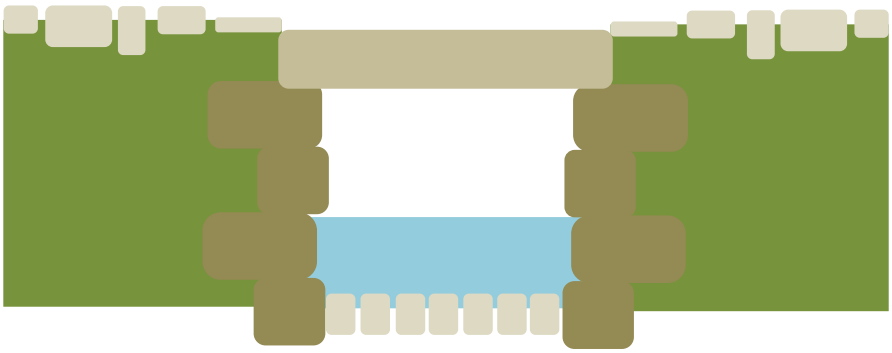
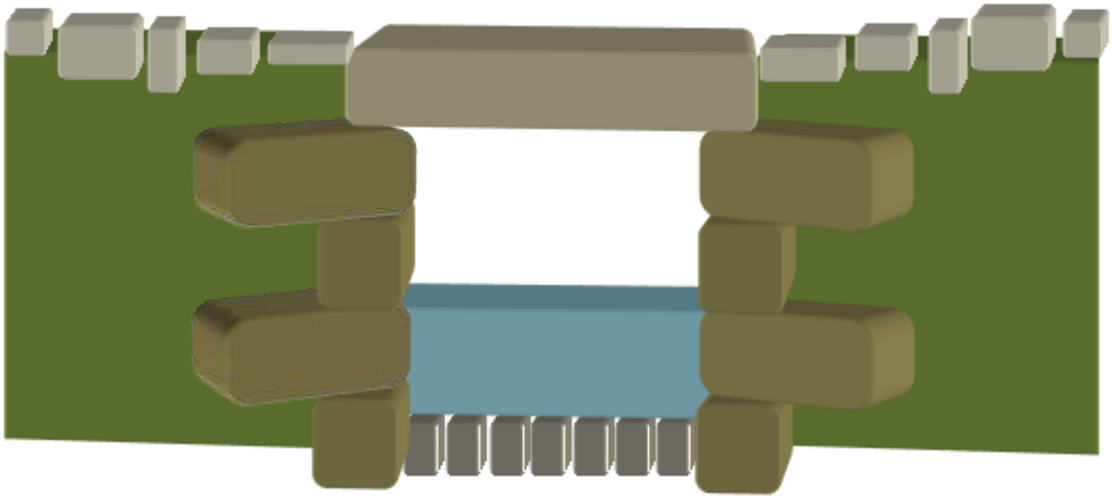


Figure 2: Stone clapper bridge section view



Minimal material shall be removed to avoid ecological disturbance and shall be retained on site to use as backfill and a retaining substrate against the back of the foundation blocks. The foundation blocks will be large gritstone pillars stacked in alternate courses with the final blocks of each foundation abutment holding one edge of a single span stone slab either with a dry joint or resin adhesive and steel pins. The orientation of the foundations will be at a moderate angle to the flow of the stream to provide added erosion resistance during times of increase flow rate, as shown in Figure 3. There shall then be a backfill of lose stone, gravel and soil to reinforce the presently eroded sections.

Figure 3: Stone clapper bridge 3D abstract view



The stone slab itself has been calculated to have sufficient strength to support its own weight and the possible imposed loads of snow or human traffic along its span. All stone items are to be lowered into position using a tractor front loader and straps. Final position of each block shall be confirmed before being prepared for the subsequent course.

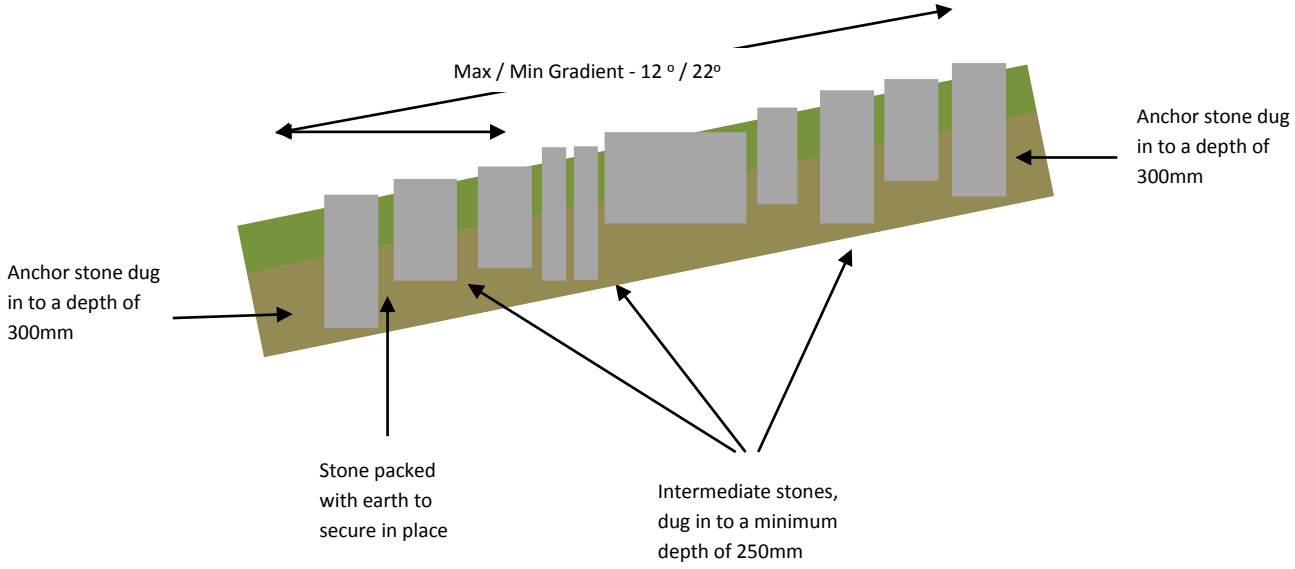
At replacement bridge will sit slightly lower in the landscape to minimize the visual impact and amount of material required to cover the span of the river. Therefore, the existing stone pitching that rises up to the current elevated bridge shall be removed and retained on site to be replaced in the same location leading down to the bridge at each end.

As the work on the foundations is undertaken, there may also be a need and opportunity to introduce a stone floor to the stream bed in the areas beneath the bridge and around the foundations. This shall be to prevent further scouring of the river bed by water flow, but shall depend on the current bed quality and depth to bedrock.

Stone Pitching

Interlocking large stones, with their flattest side up create a single, irregular track that blends into the landscape as in diagrams in Figure 4 & 5 below. Gritstone will be used to create the pitching surface but will not form a continuous covering but will be used to reinforce areas of the track that are currently eroding while retaining a natural feel. Stone will be transported to site using low ground pressure vehicles and moved into final position by hand.

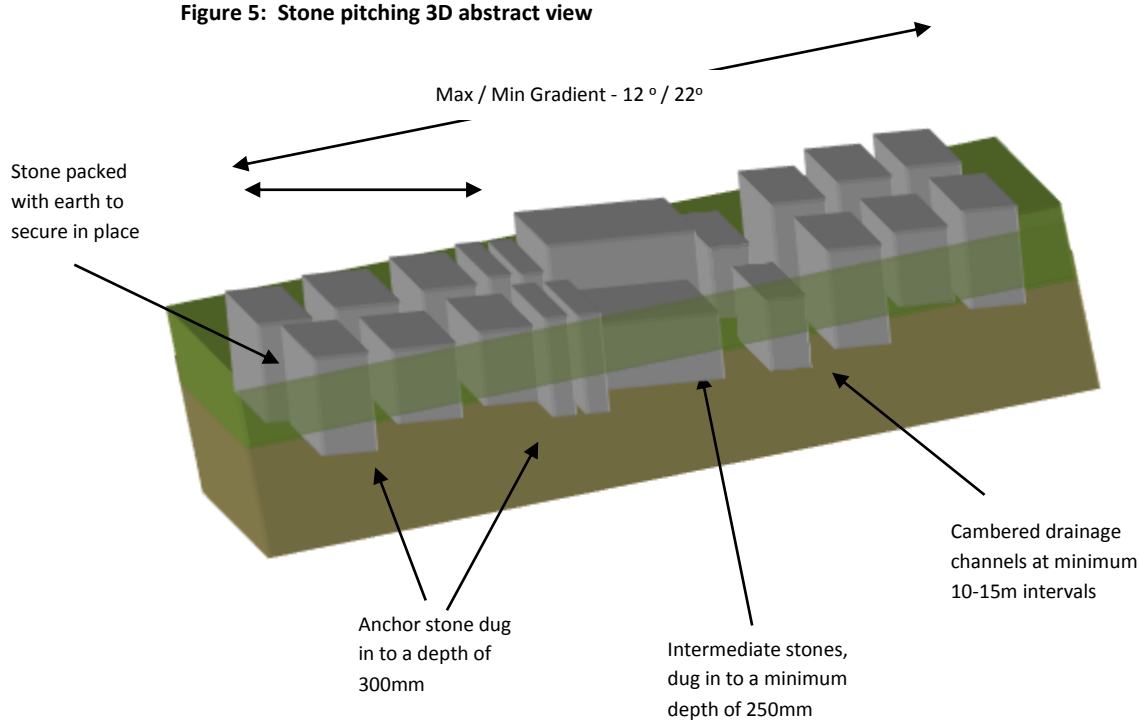
Figure 4: Section arrangement of stone pitching



Minor excavation of the top surface of track is required to provide adequate footing for stones to be placed lengthways to a sufficient minimal depth, will the majority of the blocks then being locked beneath the surface of the surround vegetation to discourage use of the sides of the track. Courses are laid and then packed with smaller stones and soil to provide a secure length of step to which the subsequent course is introduced with the same method.

Any vegetation removed is then returned to either the path edges or within the gaps of the pitching stones themselves. Larger boulders already in situ particularly to the edge of the track will be retained and integrated as much as possible during the construction to further increase the more random and less manmade appearance that typical stone pitching.

Figure 5: Stone pitching 3D abstract view



Materials for the stone bridge shall retained off-site under the proposed date for installation. This may allow for test run of the construction to be undertaken off-site to check for fit of the structure and confirm whether the proposed construction method shall still be feasible.

The pitching stone shall be transported to site over the prior weeks to reduce the number of specific movements in a short space of time, which will help minimize the impact on the track particularly as into the wetter months. The stone shall be piled in moderate sizes along the wall adjacent to the bridge where it can be sorted into suitable groups of sizing for moving to the appropriate section of track as required by a low impact all terrain power barrow. Excavated material shall be retained on site away from the watercourse and taking as much care as possible not to cover existing vegetation.

Proposed locations of these materials are shown on the map in figure X below. In addition, the vehicular access route for staff and contractors is shown on this plan.

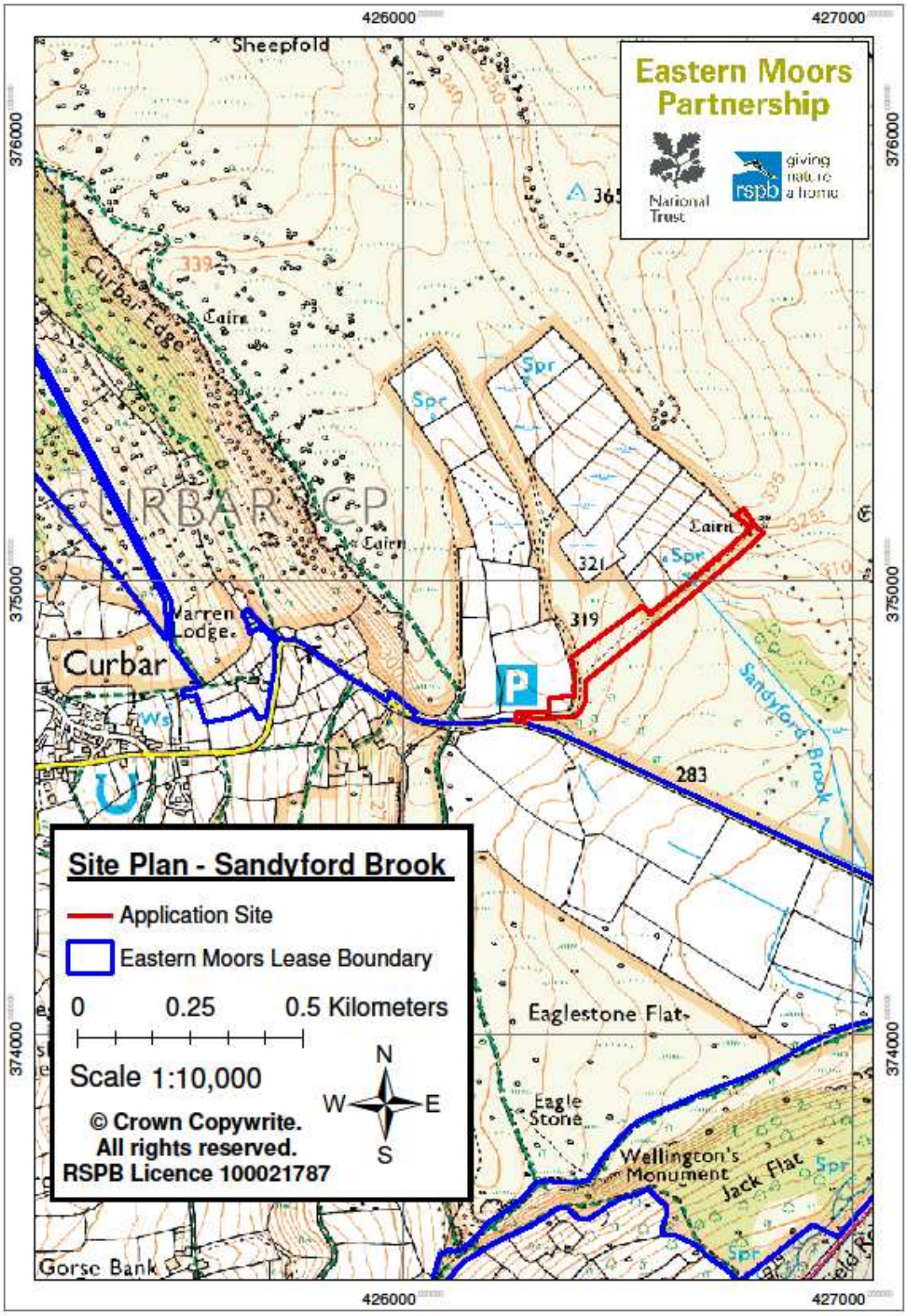
Pedestrian Access and Temporary Diversion

During the course of the works that area around the existing bridge and pitching shall become unsafe for pedestrian visitors due to the movement of vehicles and use of plant. Initially there shall be signage advising users when the bridge and track shall not be accessible and that alternative provision shall be made. It is intended that this shall be by way of a temporary crossing point in the first field adjacent to Sandyford Brook over the boggier area and a temporary informal track entering the field away from the site and existing at the top corner past the final section of pitched track.

Once the works have been undertaken and the site has been confirmed be safe all diversion signage and fencing shall be removed. New signage advising people to take care as the new works settle in shall be erected which should also help to keep users on the pitched sections rather than straying into the newly recovering vegetation adjacent. This shall remain over the winter period when visitor frequency is lower, as well as regular social media reports of the works and requests to treat the area with care.

Site access routes for safe movement of materials along existing track by trailer and tractor.

Site Plan 1:10,000



Photomontages – Before & After