



WRG

Registered Charity No. 212342

www.wrg.org.uk

Waterway Recovery Group
Island House, Moor Road
Chesham, HP5 1WA
01494 783453 ext 604
enquiries@wrg.org.uk

Waterway Recovery Group

in conjunction with

***The Derby and Sandiacre Canal Trust
(DSCT)***

Method Statement

**Site: Borrowash East Sub-
Section**

Task Name: Lock Restoration

Version: v3

Date: 27th June 2019

Name: Mikk Bradley

Position: IWA Technical Support Officer

Site	Borrowwash East Sub-Section	MS Title	Lock Restoration	Ref	CC201910
Work Area	Borrowwash Bottom Lock				
Camp Dates	20 th – 27 th July 2019				
Assessor	M Bradley	Date Assessed	27 th June & 9/10 th July 2019		

METHOD STATEMENT

- 1. Work Task 1: Continuation of dig out and rebuild of the original stone walls to the canal both above and below the lock chamber.**



Bottom end of lock



Top end of lock

- Where required the canal channel will be excavated to bed level in front of the wall using the excavator. The arisings will be placed adjacent to the locksides for backfilling around the lock chamber.
- All work to the walls will be carried out from the canal channel. At the top end of the lock a ladder access will be established into the forebay. The top cill will be provided with a barrier using two Heras fencing panels secured into the quoins and fixed at the mitre point.
- The existing stonework will be inspected. The joints will be raked out. Any loose stones will be taken down and cleaned for reuse using wire brushes and scutch hammers. Any tree roots

will be removed, this may necessitate the removal of some stones to completely remove the root.

- A level survey will be carried out to establish if the walls need building higher.
- Joints will be bedded / pointed using lime mortar mixed in the proportions of 3:1 sharp sand : Lime. Instruction on using the mixer will be given using the relevant toolbox talks.
- There are a number of stones around the lock chamber. Any stones that need moving will be lifted using the excavator and moved close to where they are needed. Final lifting into position will be carried out using the kerb lifter. Training in the use of the kerb lifter will be given to volunteers involved in that activity.
- When pointing stonework, lime mortar will be loaded onto a hawk and pressed into the joint using the appropriate finger trowel to refusal.

2. Work Task 2: Installation of coping stones to the lower wing walls.



Offside wing wall

- Work will be carried out from a purpose built scaffold at the bottom of the lock.
- Coping stones are located around the lock chamber and will be moved close to the work area using the excavator. Final positioning will be made using a kerb lifter. Training in the use of the kerb lifter will be given to all volunteers involved in that activity.
- Some coping stones will need to be cut using the brick saw. Cutting will be carried out in a designated area away from public footpaths and other work activities by volunteers trained in the use of the brick saw.
- Drill the underside and ends of the stone to receive a stainless steel tie. Measure the top of the parapet and drill to accept the stainless steel tie. The ties are to be fixed into the stones using cement grout made by mixing cement with water to create a runny paste.
- Coping stones will be bedded using lime mortar mixed in the proportions of 3:1 sharp sand : Lime. Instruction on using the mixer will be given using the relevant toolbox talks.
- When pointing stonework, lime mortar will be loaded onto a hawk and pressed into the joint using the appropriate finger trowel to refusal.

3. Work Task 3: Dig out of the side wall and rebuild stone side walls to towpath between the lock and Station Road and the north side between the path and Ockbrook, including weir.



Photo of weir after 2018 canal camp

- Bulk excavation will be carried out using the excavator. The arisings will be used to landscape the lockside. The excavator will work from within the canal channel.
- Some hand digging will be required close to the stone wall to prevent damaging the wall.
- All work to the walls will be carried out from the canal channel.
- The existing stonework will be inspected. The joints will be raked out. Any loose stones will be taken down and cleaned for reuse using wire brushes and scutch hammers. Any tree roots will be removed, this may necessitate the removal of some stones to completely remove the root.
- A level survey will be carried out to establish if the walls need building higher.
- Joints will be bedded / pointed using lime mortar mixed in the proportions of 3:1 sharp sand : Lime. Instruction on using the mixer will be given using the relevant toolbox talks.
- Loose stones are located at the lockside and along the towpath and in the canal channel. Where possible these will be lifted using the excavator and moved close to the work area. Where use of the excavator, such as along the towpath, the stones will be loaded into wheel barrows and transported to the work area. Lifting will be made using the kerb lifter. Training in the use of the kerb lifter will be given to all volunteers involved in that activity.
- When pointing stonework, lime mortar will be loaded onto a hawk and pressed into the joint using the appropriate finger trowel to refusal.

4. Work Task 4: Repair coping stones with concrete where sections of stones are missing.

A technique for casting missing coping stones using in-situ cast concrete was developed on the Inglesham Lock refurbishment project. An article on the method was published in issue 285 of Navvies. The article is presented in a separate document and should be used where new coping stones are to be cast (the concrete mix detailed may need to be adapted to suit the colour of the stones at Borrowash lock. The description below is an edited version of the Navvies article.



Anchor block in need of repair.

- Working from a scaffold tower erected in the lock chamber;
 - Wire brush the surface of the stone that will be in contact with the concrete.
 - Stainless steel ties will be fixed to the face of the stone. A **8mm dia** hole will be drilled in the stone to a depth of 75mm. The hole will be filled with a cement paste grout (cement mixed with water to a runny consistency) and the tie inserted while the grout is wet.
 - Erect ply timber shutter to the face of the stone to be repaired and prop from the opposite side of the lock chamber. Apply release agent to the face of the shutter.
 - Any gaps in between the shutter and the wall can be plugged with hessian stuffed into the gaps.
 - Fix a 25 x 25 batten to the side of the shutter on the stone face to install a pointed joint when the shutter is removed.
 - Apply a bonding agent (such as Wickes PVA) to the surface of the stone to be in contact with the concrete.
 - The existing stone look to be a grey coloured granite. Mix concrete in the ratio 5 parts sharp sand to 1 part Portland cement. Add a cupful of the bonding agent to the concrete mix in the mixer.
 - Cast the concrete and tamp into place making sure to fully compact the concrete into all corners. Smooth the top surface with a wooden float and create a 'mortar joint' by running a gloved finger along the horizontal joint between concrete and existing stone.
 - Once the concrete has cured (allow overnight curing as a minimum), strike the shutter and remove any battens and packing. Using a scutch hammer, distress the faces of the concrete to produce a stippled effect. The sooner this is done after casting the easier it will be. However take care when distressing the bottom corners of the concrete where it is likely to be thinnest.
 - Point up the joints using lime mortar as described above.
- 5. Work Task 5: Landscape top of lock chamber, material from the bed of the canal.**



General view of offside lockside

This task can be carried out once the walls and coping has been brought up to full height. Material excavated from the bed of the canal will be used for filling.

- The lock quadrants will be marked out so that they can be filled with hardcore and the rest of the filling is brought up to level.
- Excavated material will be loaded into wheel barrows for transport to the lockside and tipped.
- The excavated material will be spread using rakes and shovels and tamped in place by foot traffic.
- Generally the locksidess will be levelled with the landscape material and any voids filled in.
- Final compaction will be provide using the excavator working under the direction of a banksman.
- Grass seed will be sown on finished surfaces.

6. Work Task 5: Repair towpath damaged by tree roots and rotten timber sleeper copings.



Existing towpath near Station Road

The towpath wall adjacent to Station Road has a timber sleeper coping that has decayed and been affected by tree toots. Trees have been cut down, but timber sleepers need replacing and the towpath surface made good.

- A temporary access ramp will be formed from the towpath into the canal bed. All work will be carried out from the bed of the canal.
- Decayed and damaged timber sleepers will be removed using picks and shovels. The top of the stone wall will be swept clear of loose stone and timber debris.
- New timber sleepers will be placed on the stone wall and secured in place using coach screws fitted into joints in the stone wall. The position of the joint will be marked on the sleeper and the sleeper drilled using a battery powered drill. The sleeper will be removed and the joints filled with lime mortar packed into place. The sleeper will be repositioned and the coach screws driven into place.

- The towpath will be made good using type 1 stone.

7. Work Task 6: Vegetation clearance of path between Station Road and Spondon.

The section of the towpath between Station Road and Spondon is overgrown. Vegetation will be cleared using brush cutters by suitably trained volunteers. Warning signs and banksmen will be in position to warn members of the public and to stop brushcutting to allow members of the public to pass.

Scheduling

Tasks 1, 2, 4 and 5 are the highest priority and the camp will concentrate on completing these. Task 3 will be undertaken as volunteers become available or are on rotation from tasks 1, 2, 4 and 5. Tasks 6 and 7 will be undertaken when other tasks are complete.

Morning Checks

Erect WRG gazebo
Set up first aid point and signs.
Set up warning signs.
Set up and turn on Burco.
Plant to be checked by authorised operator. Any apparent defects to be reported to camp leader.
Visual inspection of scaffolding before use.

Tools, Equipment and Plant

Normal WRG kit to be supplied.
All volunteers inexperienced in the use of any equipment will be given a toolbox talk by the camp leader/designated experienced person, and supervised until they have demonstrated appropriate competence.
DSCT will provide a JCB 8026 excavator.

Materials

Coping stones (stored on site) COSHH assessment 20
Lime mortar, using sharp sand COSHH assessments 3, 7, 10
Concrete, using sharp sand COSHH assessments 4, 7, 10
Plywood and soft wood for shuttering COSHH assessments 16, 24
Shutter release oil COSHH assessment 18
Petrol and diesel for fuelling plant and equipment COSHH assessments 1, 2
Hydraulic oil for plant COSHH assessment 15
Butane gas for Burco COSHH assessment 5
PVA bonding agent (non hazardous)

End of the day

All WRG equipment will be loaded into the van.
Gazebo taken down and packed away.
The Burco is emptied, taking care when disposing hot water, and packed away, again taking care to avoid hot surfaces.
Clean mixer and all tools. Wash water to be disposed as instructed by DSCT.
Site is left tidy and rubbish free.
Site will be fenced and secured.

If work plan changes please add details here:

RISK ASSESSMENT		
<p>Think about all the things which could go wrong while this job is being carried out, which could cause injury or damage to people or things or affect how and whether the task can be completed. In addition to this you will need to complete a risk assessment.</p>		
Key Task Risks (these should relate to items in your risk assessment)	For the following sub headings (and other site specific risks you come across) consider the following – What could go wrong? What effect will this have? How serious are the consequences? How will you mitigate the risk?	Risk assessment no: (This is your risk assessment that covers the risks in more detail)
The Public	The work site is fenced to keep the public out. Banksmen will be used when working along the towpath. No tools or equipment will be left on the towpath. All plant and equipment will be secured at the end of the day.	3, 5
Hand Tools	Instruction will be given in the use of the tools. The right tools will be used for the task. Tools will be properly maintained and sharpened.	12, 14
Manual Handling	Instruction will be given in manual handling techniques. Lifting equipment will be provided where mechanical handling cannot be carried out. Job rotation and rest periods will be used to avoid fatigue.	2, 6, 7, 8, 11, 13, 20, 21, 22
Ground Conditions	Clearly defined access routes will be used. During the landscaping work, volunteers will be made aware of uneven ground. Suitable footwear will be used at all times.	4, 24
Plant Operation	Only trained drivers will be used to operate plant. Hi-viz vests to be worn at all times. Banksmen will be used to guide plant operations.	15, 16
Hazardous Materials	Instruction will be given in the use of materials. COSHH assessments are available in the flight case.	7, 11, 13, 16, 18, 19, 20, 21, 22, 23
Working near water	Training given to volunteers. Only shallow water is likely to be encountered.	9
Working at height	Work will be carried out from scaffolding or from the bed of the channel. Locksides will have edge protection.	10, 22, 23



CC201910
Method Statement
Volunteers must also refer to site wide Project Plan
Version: v3 Date: 9th July 2019

PPE (Tick appropriate boxes)		
<i>Safety helmet</i>	Y	<i>At all times</i>
<i>Hi-viz vest</i>	Y	<i>At all times</i>
<i>Safety footwear</i>	Y	<i>At all times</i>
<i>Gloves</i>	Y	<i>At all times</i>
<i>Eye protection</i>	Y	<i>At all times</i>
<i>Ear protection</i>	Y	<i>When using mixer</i>
<i>Face protection</i>	Y	<i>Dust mask when mixing mortar and concrete</i>
<i>Clothing</i>	Y	<i>Long sleeves when mixing</i>
<i>Other</i>		

SUPERVISION
Camp Leader: ██████████ Task Leader: To be advised during cmp

Approved by		Signed		Date	
Retired by		Signed		Date	
REVIEWED					
Date	Nature of Review	Changes Required		Reviewer	
	Internal Review				
	Trust Review				
	Approved by Insurers/ HO				

