



Project: Redcross Village Paving Scheme, Redcross,
Co Wicklow

**SPECIFICATION FOR COBBLE DRAINAGE
CHANNEL LAYING**

Client: Wicklow County Council

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Revision Schedule

Specification for Cobble Drainage Channel Laying, Redcross Village, Co Wicklow

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1.0 INTRODUCTION

There is a requirement to improve pedestrian and parking facilities in Redcross Village whilst retaining the remaining sections of an existing historic cobble drainage channel. The proposal is to retain and re-lay with some reinstatement as much of the historic cobble drainage channel as possible.

It is envisaged that there will be four main aspects to the works.

- A. Re-use cobbles from the existing drainage channel by lifting and resetting two main runs on either side of the main street in Redcross Village.



- B. New concrete footpath
C. New block paving footpath
D. New pedestrian paved ramp across the road

This specification will deal with Type A only.

Existing Channels either side of the main street in Redcross will be formed in cobbles as de-lined on TWCE drawing 20-13-01. The cobbles in the existing channels will need to be carefully lifted and laid out for inspection and selection in conjunction with the Conservation Engineer.

It is assumed for this project that there may not be sufficient cobbles available from within the zone of the reinstating of the cobble drainage channel and that some new cobbles will be required to be sourced. The existing cobbles are typically 75-150mm long x 50-100mm thick, but some are as much as 300mm across

Note areas where cobbles currently laid in earth or loose mortar - full salvage should be possible but where currently laid in concrete assume 10% maximum salvage.

Any new cobbles should be sourced from pit screenings, size ranges to match original and samples agreed with Conservation Engineer.

2.0 GENERAL – BEFORE LAYING

Clean all of area to be repaired including immediately surrounding area using power hoses / stiff brushes such that general pattern and lay of cobbles can be seen including the dish shape to the drainage channels and alignment of cobbled drainage channel.

The Cobbles have been laid in patterns and it is important to recognise this before repairing / re-laying

In this instance there is evidence of coursed work - cobbles sorted into similar sizes and then laid in true straight lines that are either longitudinal or transverse. A straight-edge or taut string line would be used to guide the alignment and the final level of individual courses.



Pull / lever out loose cobbles and cobbles riding more than 20mm higher or 20mm lower than adjacent cobbles.

Retain all cobbles for reuse in area from which extracted.

Excavate original sub-base to approximately 70mm below depth of cobbles, rising sides of excavation to base of good sound existing perimeter cobbles. If centre of excavation soft remove more bedding material until firmer material found.

If excavation reveals distinct location of previous structures mark this out by measurement back to adjoining walls and record dimensions of structure. In these locations a square set will be inserted to mark the location of the previous structure.

3.0 MATERIALS

3.1 Sharp sand

(paving sand) consisting of a mixture of grains measuring from dust / 0mm to 5mm to produce a bed capable of compaction. Note Soft 'bricklaying' sand is not to be used as it does not compact easily and therefore does not form a good base.

3.2 Soft sand

(builders sand) 3mm down for the pointing mix

3.3 Cobble bedding and pointing mortar

Lime works are best carried out on dry moderate days with a high level of relative humidity. Excessive wind, rain or sun can all effect the quality of the work and if these conditions prevail the working areas must be kept moist by spraying and protection using polythene or hessian sheets sprayed with water at regular intervals.

A bottle spray, sprayer back pack or similar is equally important, spray hoses can be used for large areas or for damping down hessian sheets but should be used with caution to avoid jet action of water washing out mortar or over saturating a wall.

No works to be carried out if below 5-degree Celsius temperatures forecast within 48 hours unless temperature control methods such as tented enclosures deployed

The use of Portland Cement **shall not be permitted** for this work. All mortars for repairs to the historic cobble drainage channel will be lime and sand mixes as specified in this section.

Lime should be Naturally Hydraulic Lime NHL.

Metastar 501 pozzolan will also be used to provided increased durability for the cobbled drainage channel.

Gauged Hot Mixed Lime mortars using NHLs and indigenous quick lime as manufactured by Clogrennane, Co. Carlow will also be considered for resetting of the cobble drainage channel as it can prove to be a much quicker more robust way of reconstructing such works.

Naturally Hydraulic Lime: Metastar and quick lime for hot mixing are all supplied by the following (not exclusive list);

- Stoneware Studios, Youghal www.stonewarestudios.com
- Traditional Lime Co., Carlow www.traditionallime.com

All lime and natural cements should be prepared and mixed as recommended in manufacturer's printed guidelines. Bags of lime hydrate, natural cement etc must be stored off the ground in a clean dry place and not used outside the dates recommended on the bags. Quick lime should be stored in weatherproof airtight bags / containers.

3.3.1 Sand

Shall be clean, coarse, well-graded sharp sand.

Particle sizes should range from 5mm to fine dust.

3.3.2 Mixing

Lime and sand should be carefully measured by volume, using batching boxes (shovels are not sufficiently accurate to be used.) A conventional cement mixer may be used.

Add lime and sand dry and mix thoroughly. Lime hydrate and sand must be mixed dry in a mixer for a minimum of 20 minutes prior to the addition of water, to encourage air entrainment and improved workability.

Add water carefully until mixture starts to run. It should be a little dryer than a cement sand mix. After water is added allow a full twenty minutes further mixing. The long mixing period helps improve workability.

The mortar should be damp but not too wet. Mortar for re-pointing needs to be dryer than that used for original bedding because it is being placed in small quantities in a vertical situation.

Use mixed mortar within a few hours and do not moisten to extend the working life. Mortar when mixed must be used within the time scale recommended by the manufacturer.

3.3.3 Mix proportions

Mix proportions for the works may need to vary depending on the lime and sand but are to be in the range:

Cobble bedding and pointing 1-part NHL 5 lime to 2.0 – 3.0 parts graded sharp sand and Metastar according to manufacturer's instructions.

Typical acceptable Gauged Hot Mix Mortar would be.
1-part Hydraulic lime (NHL5 St Astier or NHL5 Roundtower grey)
1-part quicklime (Clogrennane kibbled or powder)
5 parts coarse sand (If a silica sand as opposed to calcareous sand is to be used then add 5 parts limestone dust). Gauging by (level) bucket.

4.0 LAYING COBBLE DRAINAGE CHANNEL

The area to be worked on should be contained within a suitable temporary retaining restraint such as 150x75 mm timber up on edge set in the bedding mortar to hold the sides of the working area. This perimeter should be laid to the levels and falls required in the finished cobbling. Where the work is a repair to an existing area of cobbles the original cobbles will generally form the containment and level references unless the area is of significant size when temporary timbers should be introduced as above.

The cobble drainage channel should be laid in the following manner. lay in loose depth of bedding material approximately 75-100mm thick but no higher than finished level minus 35mm.

Place the cobbles into a bucket of water. Take each individual cobble from the water and shake off excess water. Place the cobble into the semi- dry sand/lime bed and push into the mix, without disturbing the bed too much. If necessary, excavate a pocket for the cobble by trowel or gloved hand to make a nest for the stone. Lay each cobble hard against the others, neighbour touching neighbour.

Check cross falls and levels on a regular basis back to the restraining timber / adjacent pavement / road levels to achieve as uniform fall and dished appearance as possible to the cobble drainage channel.

Allow approximately 3 days when temperatures above 12 degrees centigrade and longer when cooler to permit the sand/lime base to harden before working the area again with the pointing. Note small exemplars where there is no need to travel the work area can be pointed straight away.

4.1 Pointing Cobble Drainage Channel

Damp down (do not flood) the area of cobble drainage channel to be pointed, and pour the fairly wet mix onto the cobbles, and work the mixture into the gaps ensuring that no air or water is trapped. Use a small nylon kitchen bottle washing style brush to work the mortar into the joints. Immediately wipe off any excess mortar.

For where cars access parking bays on the west side of the road, the jointing may be left fairly high.

On the non-trafficked eastern side and a more decorative appearance leave more cobble showing. Note for most of the cobble drainage channel at least 60mm or more should be held captive by the bedding material and the jointing mix.

Keep on cleaning with brushes, including with a yard or patio broom, until the cobbles are clean of mortar. Any slight 'bloom' will wash off over a short period of time as the drainage channel operates under normal conditions as a conduit to road gullies for rainwater.

To accelerate the cleaning process, scrub the area with kiln dried (block paving jointing sand) and a stiff brush. All cleaning operations will depend on the temperature at the time. Try to avoid too much water (rainfall) onto the finished surface immediately after pointing, otherwise the finish of the mortar may be compromised visually and structurally.

5.0 REFERENCES

- 1 <http://www.buildingconservation.com/articles/setts/setts.htm>
- 2 <http://www.allandscapers.org/forum/index.php?topic=20.0>
- 3 PAVING – THE CONSERVATION OF HISTORIC GROUND SURFACES –
ARCHITECTURAL ADVICE SERIES
- 4 [http://www.ahg.gov.ie/en/Publications/HeritagePublications/BuiltHeritagePolicy
Publications/](http://www.ahg.gov.ie/en/Publications/HeritagePublications/BuiltHeritagePolicyPublications/)