

Environmental Impact Assessment Report

Appendix 16.6

Volume 3 Part 8



Specifications and Method Statement



**For Conservation and restoration of the Great South Wall parapets
At
Dublin Port 3 FM**

**For
Dubin Port Company**

*Prepared by: Southgate Associates
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Lime Pointing, re building and Grouting Masonry

Lime Pointing / Masonry Conservation

The pointing specification applies to all areas where walls are to be repointed, rebuilt or the memory. of the wall is reflected in the surface by a stone band

Reviewing scope of existing parapets to be conserved:

- Inspect each relevant area of masonry with Conservation Professional to confirm the type and extent of the work.
- Mark clearly on face any masonry any areas to be repaired.
- Identify each masonry unit that is to be repaired with a code number cross-referenced to drawings/photographs.
- Adequately record the characteristics of existing masonry in areas affected by repair works. Use measurements and photographs as appropriate to record bonding patterns, joint widths, special features, etc.

Removal of vegetation:

- Carefully remove plants, root systems and associated soil/debris from joints, voids and facework if present.
- Use dampened temporary timber wedges or other approved method to assist removal of roots. Where growths cannot be removed completely without disturbing masonry seek instructions.
- This operation involves carefully removing loose vegetation allowing roots to project during the preliminary stage, which should be carried out under supervision of the Conservation Professional.

Lime Mortar Specification

- NHL 3.5 Cecil lime obtained from Traditional Lime Company is proposed to be used for all areas of repointing. It is hoped that the consistency of a particular mortar mix can extend beyond the areas to be undertaken in 3 FM in the future.
- Fine to medium aggregate: Graded and washed sharp Wexford sand kept off the ground and dry obtained from the Traditional Lime Company
- Coarse aggregate: 10-30mm washed grits to match existing historic mortar samples with No fines based on historic mortar analysis by Jason Bolton or similar prior to works.
- Pinning's: Where mortar joints are larger than 2 thumb widths generally pinning's will be required.

Mix proportions

Use 1 :2 lime: fine to medium aggregate for general work with coarse aggregate added as required to match the surrounding masonry increasing the proportion of lime to aggregate to around 2.8. Add pinning stones to match surrounding masonry,

Sample panel

Provide a sample panel of pointed masonry 3mx height of the wall for approval at the start of the contract.

Workmanship Generally

Raking out:

- Rake out joints by hand to a depth twice the width of the joint opening. Remove loose debris from the joints using a dry brush.
- Power tools for the removal of mortar is generally not permitted.

Pointing:

- Dampen the masonry prior to pointing.
- Neatly point to the specified flush profile in a continuous operation from the top of the wall. If the joints are very deep, it may be necessary to leave out the larger aggregate in the first few passes to ensure mortar is packed right to the back of the joint and to push the finer mortar into joints with a timber rammer.
- The pointing operation may involve removing loose stones and resetting. This will allow remaining vegetation roots to be removed from the area, but it is not wise to remove the root structure completely because it may be desirable to apply a root killer such as **root out** to any vegetation in the wall, allowing the full absorption of the poison into the root structure.
- The trial mix for pointing will be: -1-part NHL3.5: 2 parts Wexford sand The sand must be dry, sharp, and well-washed. To maintain the sharpness of the sand and accurately use the correct volume of sand it is vital that it is stored correctly – ensure storage conditions at the suppliers are adequate in addition to ensuring appropriate storage conditions are available on-site, i.e., as a minimum, on a pallet off the ground and covered.
- It is recommended on the Great South Wall parapets that the original lime mortar mix be replicated – a sample will be sent to Dr. Jason Bolton to ascertain the original mix through mortar analysis. Records shall be kept and placed in the Port Archive.

Rebuilding masonry

Where masonry is to be rebuilt preference will be made to using salvaged material from areas which have had to be carefully dismantled as part of the 3 FM project. Similar stone should be sourced where this source has been exhausted.

The original capping material contains a mix of Basalt stone, and it is suggested that where the wall is to be rebuilt that basalt stone (which maybe difficult to source) is not included in the mix. The subtle variation in stone texture in the parapet capping will allow new work to be discernible and very subtly different from the original in accordance with good conservation practice.

- Dampen stones to control suction as necessary and lay on their natural bed on a full even bed of NHL3.5 lime mortar with all joints filled and between 12–18 mm wide.
- Accurately construct wall faces to original batter and profile. Set out carefully to ensure satisfactory alignment and levels.
- Keep stonework clean during construction and until Practical Completion. Ensure that no mortar encroaches on face when laying. Turn back scaffolding boards at night and during heavy rain. Rubbing to remove marks or stains will not be permitted.

Adverse Weather:

- Do not use frozen materials or work in freezing conditions.
- Do not lay masonry when the air temperature is at or below 3 degC unless mortar has a minimum temperature of 4 degC when laid and walling is protected. Do not lay mortar on frozen surfaces.
- Maintain temperature of the work above freezing until mortar has fully hardened.
- Rake out and replace mortar damaged by frost. When instructed, rebuild damage work.
- Protect newly erected walling against rain and snow by covering when precipitation occurs, and always when the work is not proceeding.

Aftercare of Limework

- To prevent from drying out too rapidly allow each pass to dry out thoroughly to ensure that drying shrinkage is substantially complete before applying the next pass.
- Adequately protect newly applied lime work against drying out too quickly using hessian or against frost and rain for the first 48 hours using polythene sheeting hanging clear of the work.

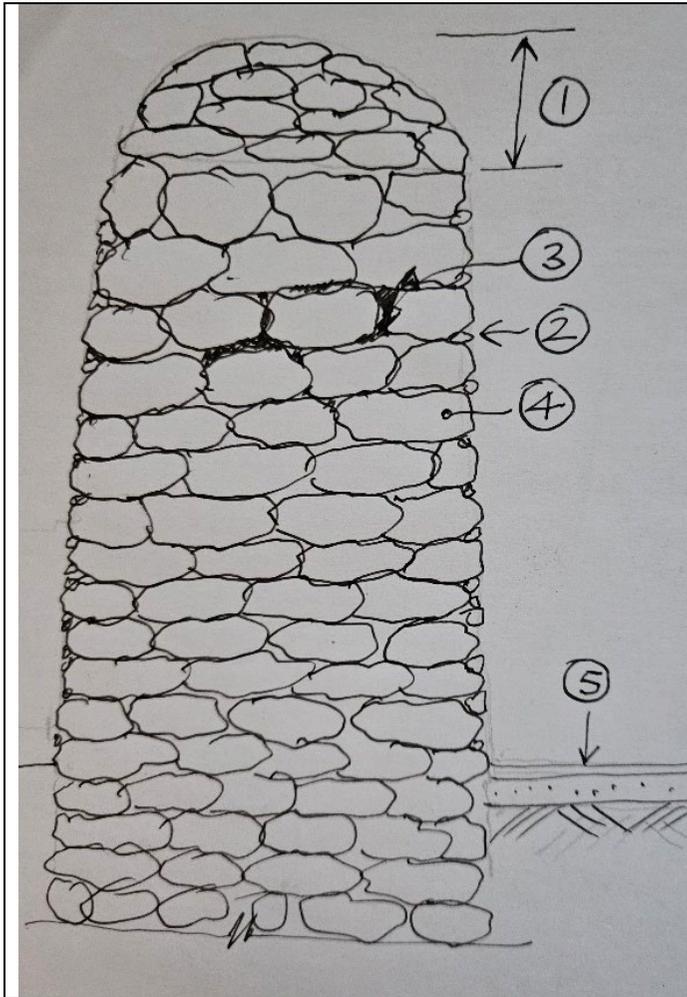
Crack Tying

Structural cracks

- It is likely minor cracks may exist in the surface elevations of the Great South Wall they can be approached as follows:
- Any void should be pointed up making use of pinning stones to cross vertical joints if required.
- A suitable joint should be raked out across the crack to be repaired at 450 centres
- M6, 600mm long Stainless Steel Helibars should be placed into the raked out joint 30mm wide and 70mm deep
- The Helibar should be set into Helibond grout accompanying with at least 50mm cover.
- The Helibar should then be pointed in NHL3.5 and the joint filled to match the surrounding masonry and pointing profile.

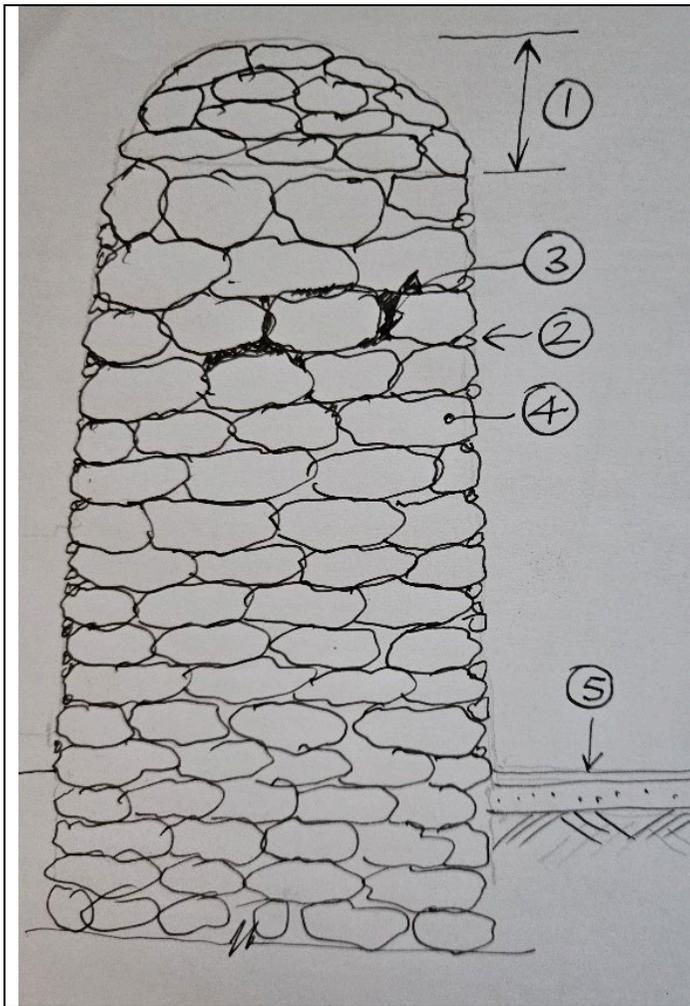
Grouting

- If voids are encountered in the core of the wall due to mortar dissolution the following method of grouting is preferred rather than resorting to re-building: -
- The area to be grouted is to be carefully cleaned and inspected and a decision needs to be taken as to which method and type of grout is to be employed.
- Coulinex NHL 3.5 Lime Grout is the most suitable product for this project.
- Generally, the term 'low pressure' means, when used on mass masonry, approximately six hundred millimetres in height, through a twenty-two to twenty-five millimetres in diameter pipe. Clean down and inspect, drill through the joints into the core of the wall with a twenty-five-millimetre masonry drill to attempt to connect with the voids within the walling at four hundred to five hundred millimetres along the crack five number holes per square meter.
- To aid the application of grout on lower areas of masonry holes may need to be drilled or useful voids or other entrance areas found which would be useful entry points for the grout.
- Once all the holes are drilled, they can be tested to see which ones will take grout by washing out with a hosepipe of water.
- At this stage, mark up drill holes which take water i.e., connected to the void, then re-point the wall as necessary and fill unusable holes. In some cases, re-pointing can be carried out after the grouting operation, especially when the core is remote from the face of the walling.
- Check that no grout enters service ducts, cable conduits, etc.
- Mixing should ideally be done using a mechanical, slow turning plasterers' whisk. The consistency required will vary; in simple terms, thicker than good quality emulsion paint and thinner than porridge. Wetting the holes immediately before grouting is most effective (from grouting terms!) Continual mixing whilst pouring is usually required.
- When grouting walling it is preferable to work horizontally along the structure
- Good practices of manual handling should be applied throughout the operation as often the bags of grout will exceed twenty kilograms.



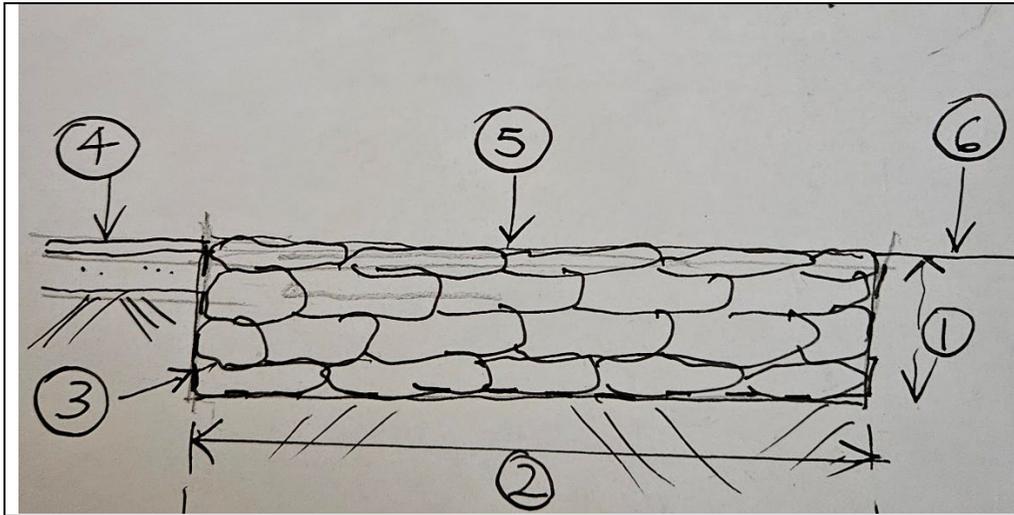
1. The domed coping is to be carefully dismantled and rebuilt on a like for like basis to ensure adequate weathering and removal of vegetation. It is composed of limestone and basalt which is to be reused.
2. Rake out to specification and use coarse aggregate and pinning stones to match surrounding masonry.
3. Where voids are found in core masonry grout with Coulinex NHL 3,5 ass per this specification
4. Original stonework to be conserved in situ.
5. Area between parapet walls to be finished in tarmac with rolled in granite chip,

Conservation of Great South Wall Parapet



1. The new parapet is to be reconstructed to the profile of the original using limestone.
2. The pointing is to match that of the conserved masonry.
3. Ensure masonry is thoroughly bedded in mortar.
4. Stone for rebuilding is to be salvaged material from carefully dismantled masonry as part of 3 FM or appropriate matched rubble limestone where this is not available.
5. Area between parapet walls to be finished in tarmac with rolled in granite chip

Restoration of Great South Wall Parapet



1. Construct rubble masonry in NHL 3,5 to reflect position of GSW approx. 200mm deep.
2. Width of GSW reflected below.
3. Polythene sheet
4. Area between parapet walls to be finished in tarmac with rolled in granite chip,
5. Surface of masonry to be pointed in accordance with specification

Treatment of Great South Wall where parapet has been removed and stone treatment of the surface is specified.