Newsletter

BUILDING LIMES FORUM IRELAND

Comments or articles in this newsletter do not necessarily reflect the views of the board or editor.

Building Limes Forum Ireland is a community of lime practitioners, specifiers, suppliers and producers of lime. The Forum exists to encourage expertise and understanding in the appropriate use of building limes, and education in the standards of production, preparation, application and aftercare. Building Limes Forum Ireland is connected and affiliated to the Building Limes Forums across the world.

Engineers Ireland Excellence Awards 2019 - WINNER
Heritage and Conservation Award
East Tower Consolidation – Swords Castle Conservation Works Project 2013 – 20

Swords Castle is a complex of early and late medieval remains located at the north end of Main Street, Swords, Co. Dublin originally founded c 1200 as an outlying episcopal manor house for the Anglo-Norman archbishop of Dublin, John Comyn, who held the office from 1181 to 1212. It is a National Monument (RMP DU011-034001) and is on the Fingal County Council (FCC) Record of Protected Structures (RPS no. 351). This is a place – buildings and site - of national cultural significance. It has been under the care and ownership of Dublin County Council/ Fingal County Council since in 1985.

The remains today consist of a large, four-sided partly battlemented curtain wall, approximately 4m high, enclosing an area of 5730 m^2 (0.573 hectares), containing a number of mural buildings and structures, including the entrance Gatehouse, the restored Chapel and Constables Tower and the semi-ruined East Tower – the last was the particular subject of the recent Engineers Ireland award.

A multi-disciplinary team of conservation engineers, archaeologists and architects have been conducting conservation works at Swords Castle for Fingal County Council (FCC) since 2011 under National Monument Ministerial Consent 450. A Conservation Plan was commissioned and published by FCC for the site in 2014.

Vegetation removal on the East Tower and adjoining East Wall commenced in 2015 and the specific works to consolidate and preserve the East Tower structures continued under two phases of conservation works contracts in 2016-17 and 2018-19. Other completed works on the site include a 140m Wall Walk upgrade, with new access stairs, the entrance Gatehouse vault re-build and re-pointing works, using a hybrid NHL and hot lime mix, the Chapel re-pointing and roof repairs, new no-dig gravel paths, an interpretive/ reception pavilion (salvaged from existing storage and works containers) and the demolition of a terrace of empty premises between the castle façade and North Street.

One of the major conservation challenges was the consolidation of the East Tower. The overall stability of the ruin was a matter of concern, considering the pronounced lean on the tower, extensive cracking and surface erosion of the calp limestone. Following the

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East tower of Swords Castle on completion of consolidation and stabilisation works.

Featured in this issue:

Comment from the Chair

Dear members

Another year has gone by and so far, 2020 was shaping up to be busier than ever but this has been suddenly curtailed. As I write this article Ireland and the world is trying to cope with the Covid-19 pandemic. Our activities and training events have all been postponed until further notice. Our primary concern is the safety and well-being of our members, friends, and the conservation community. Listed below are the proposed events by way of information. These are also on the website, so keep in touch for further updates.

Our major training event this year is due to be held in Shankill, Co. Kilkenny. It will be a joint event with SPAB Ireland and kindly sponsored by the Heritage Council. Nigel Copsey and Alex Gibbons will be travelling from the UK as trainers along with some of our own trainers including Eoin Madigan, Tom Pollard & others.

Our AGM was due to be held in Kilkenny, partly to coincide with the training event but also to strive for a better geographic spread of our events. Our guest speaker this year will be Alex Gibbons. Alex is a SPAB fellow and runs a company 'Stick in the Mud Conservation' and is an earth buildings consultant.

Our walking tour this year is planned for Armagh City. It is a compact city with a wealth of interesting and historic structures to visit.

We also hope to have a few site visits. Keep in touch with our website and do let us know if you have a site that might be worth visiting.

The annual BLF conference is a great event and a highlight of the BLF year. It has leaders in the field speaking on all aspects of lime and historic building repair. It provides all the CPD requirements for specifiers and practitioners each year. Last year we provided a grant of £100 to any BLFI member who wanted to attend, and we had quite a positive attendance from Ireland. However, due to Covid-19 restrictions, the BLF have made the difficult decision to postpone the conference this year. It will be held instead 27th – 30th August 2021, in Exeter, UK. The theme will be '*Looking Forward, looking Back*'. So, there will be plenty of discussion on new build and upgrading existing buildings along with the focus on more traditional aspects. There are direct flights from Dublin to Exeter so do consider attending next year. All going well, we intend to offer a grant again next year to members.

This means that the Conference planned for Belfast next year has now been pushed out to early September 2022 and will be based in Queen's University. Belfast has a wealth of interesting historic buildings and industrial archaeology sites and should be a great location for the conference.

Hot mixed mortars are being used on many projects throughout the country as was evident from the presentations at this year's very successful Lime Slam. Our database on projects where hot lime mortar mixes have been used was launched on a trial basis at the Lime Slam. I would encourage you, whether practitioner or specifier or homeowner to upload information onto the database. We are looking at lime mixes, types of pozzolans used; methods of mixing; locations; type of protection used and the time period it was kept in place.

John Beattie produces and edits our newsletter. If you have anything that you would like to contribute, please contact him. If you have any interesting projects, please share them with us. Another very good publication is the annual journal published by the BLF. Keep it in mind if you have a paper or project of interest.

We are always looking for people to join the board of the BLFI. We meet bi-monthly in the City Assembly House in Dublin City centre and now use google hangouts and other technology to facilitate those who cannot make every meeting in Dublin.

Our current board is: Úna Ní Mhearáin, Chair; Grellan Rourke, Company Secretary; Oiseen Kelly, Treasurer; Shane Nolan, Membership Secretary; Lisa Edden, Training; Kevin Blackwood, Bursaries; Henry Thompson; John Beattie; Eoin Madigan; and Dermot MacRandal. Eszter Nadas is our administrator.

The strength of the BLFI is in our members and the diverse range of expertise within that membership. We are an open group and our aim is to disseminate the correct information on the use of lime in construction. Sharing knowledge is key. If anyone would like to become more involved without joining the board, there are many ways you can help; Take part in the BLFI stand at the Traditional building Skills event held by the IGS every year; Let us know about a project that you are working on. Could we visit it? Site visits are very useful and informative. Do you have a yard that could be used for training or demonstrations? Don't forget, the BLFI is non-judgmental, the aim is to help and learn from each other and to share knowledge and good practice.

Please ensure you have paid up for 2020 and encourage colleagues or people who might benefit from membership.

Unà Ní Mhearáin

Repairing Traditional Walls

Including Hot-mixed Lime & Earth mortars

Workshop by Building Limes Forum Ireland; SPAB Ireland & The Heritage Council

Shankill Castle Stable Yard, Paulstown, Co. Kilkenny

Date To Be Confirmed

SPAB IRELAND

An Chomhairle Oidhreachta
The Heritage Council

Manfredi Anello An Appreciation

It is with great sadness that we report the passing of our dear friend and colleague, Manfredi Anello. Manfredi was a member of the board of the BLFI for a long time and only stepped down when he became ill some years ago.

Manfredi was originally from Sicily and he studied architecture in the Netherlands. He came to Ireland in 1994 and after working for a number of firms including Scott Tallon Walker, he set up his own practice, Anello Architects, in 1999. He was a very active member of the BLFI and was highly-regarded as an award-winning architect. His interest and use of lime was not confined to conservation. He used it in new build projects also, including the CFAI Outpatients' Centre, Drogheda. Architecture was very much in his blood with both Manfredi and his brother having followed their father Vincenzo into the profession.

Indeed in 2015, BLFI members had the pleasure of meeting both of Manfredi's parents when Vincenzo Anello was the guest speaker after the AGM. Vincenzo gave a very interesting lecture on his work on rural rejuvenation in Sicily.

Manfredi had a great love of life and anyone who met him warmed to his personality and happy disposition. He bore his illness with incredible strength and courage. Against all odds he battled on never complaining and was designing architecture right into his final days using his ever-creative mind with passion and enthusiasm. His Love of history and people drove his creativity but foremost of all was his love for his family, Teresa and the children, Niamh, Dylan and Mobhi, his father Vincenzo and his brother Enrico. This gave him strength and enormous willpower.

He will be sadly missed by all who knew him. Our thoughts are with Manfredi's wife Teresa and their three lovely children, and his family in Italy. (His mother Elvira predeceased him).

Riposi in Pace

Ar dheis Dé go raibh a anam dílis

May he rest in Peace

Dunaree Lime Kiln

The lime kiln at Dunnaree, Drumquin was built c.1860 and was one of many found in the limestone rich countryside of West Tyrone. The kiln was last commercially used in 1952 however in recent years the local community have conserved the structure and have fired it for demonstration purposes. A interpretation plaque (right) has been erected to proclaim its significance to all who care to stop.


Dunnaree Lime Kiln

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removal of vegetation, which afforded a closer inspection of the structure by MEWP, temporary propping was installed, at the end of 2016. A permanent solution was developed then and finally implemented in the most recent works phase in 2019.

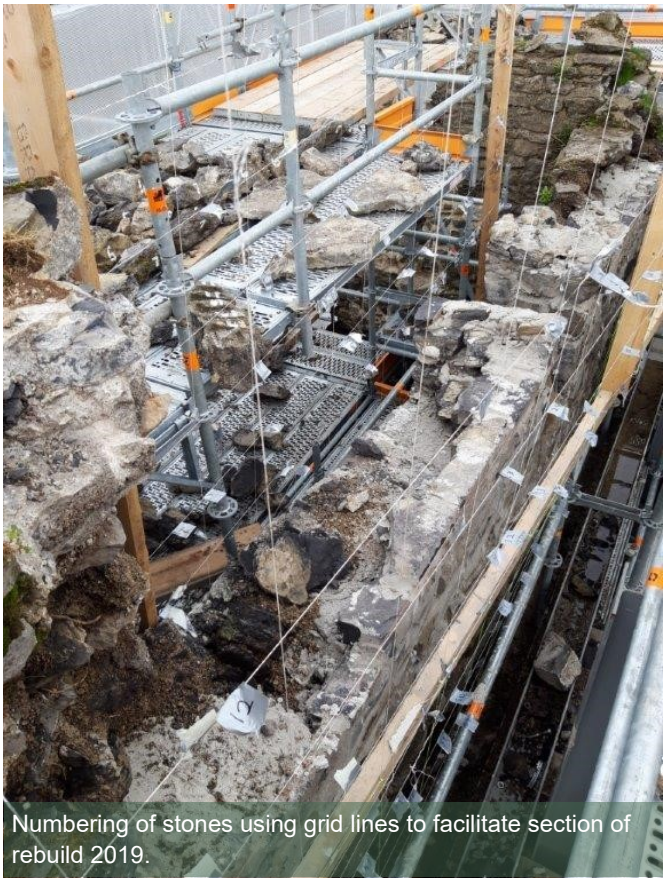
Temporary buttress to east tower 2016-218. Note the harling samples to base of wall.

The East Tower consolidation works combined modern methods alongside traditional to conserve as much of the medieval fabric as possible. An honest, functional concrete plate ties the three remaining walls together; and a traditional lime-based shelter coat application (in four coats) protects the vulnerable masonry. Seven, 60mm diameter 'sock' anchor ties – containing the steel bolts and grout fill - were drilled and set into the existing masonry along the junction with the in-situ concrete plate. The visual impact of these two key interventions is both striking and respectful of the historic setting.

It was important that works to and around the East Tower and adjoining East Wall facing North Street should reveal to public view all the incarnations and phases of building works on this side of the castle. The shelter coat, using a NHL sand mix *(Secil NHL3.5 lime, Kellys washed and dried Silica Sand 100-600micron and water in the simple ratio of 1 part lime and 1 part sand and 1 part water, mixed by volume)* preserves in relief the different styles of historic masonry repairs and consolidations. For instance, an old roof line from an informal adjoining structure can still be clearly seen along the external Southern, external face of the tower.

Most importantly, the tower has been stabilized. The upper floor lean of the east elevation taken down and re-built closer to plumb. The concrete plate on the west/ inner side tying three elevations together, along with the masonry repairs, will secure the future of the tower and provide access for maintenance into the future. The plate has been designed to draw water away from the internal walls, shedding it through two holes in the centre of the slab, away from the wall foundations. These deliberately oversized apertures also allow more of the upper levels of the original masonry to be viewed. On this side of the tower, the plate also replicates in part the original floor levels as one of the original ledges was used for the seating of the new slab, assisting an historical reading of the internal organisation of the tower.

Creative design, ingenuity and flexibility during the construction process, and clear communication between consultants, contracting teams and client, have allowed an appropriately unique solu-



Numbering of stones using grid lines to facilitate section of rebuild 2019.

tion to develop and be successfully implemented on this landmark element of the Swords Castle site.
The East Tower section of the ongoing Swords Castle Conservation Works Project 2013 – 2020 was the winner of the Engineers Ireland Excellence Award 2019 - Conservation and Heritage.

Urban Regeneration

Before the current phases of works commenced in 2015, Swords Castle was closed to the public. It is now open 7 days a week for visitors and has become a venue for concerts, civil weddings, filming and festivals as well as providing a quiet, historic focus in the heart of Swords village.
As noted above, the client motives for the Sword Castle works, including the East Tower, were informed by two strategic documents, the 'Swords Castle Conservation Plan' / published by FCC in 2014, and the 'Swords Castle Cultural Quarter Architectural Masterplan' / published by FCC in 2015. Both are designed to direct works on this historic site and quarter and to enhance the cultural amenity of the area for the benefit of all, residents and visitors.

Work has begun on the design a new public plaza at the top of North Street, with the East Wall and East Tower forming the backdrop on one side of this exciting new public space, facing a new arts centre on the other. This urban re-configuration and the ongoing access and conservation works are designed to re-position the castle as the centrepiece of the proposed Swords Cultural Quarter and provide a unique heritage amenity for the population of this rapidly-growing region of Dublin.

Brian O'Connor

DESIGN AND PROCUREMENT TEAM:

- Fingal County Council Architects Dept., RIAI Conservation Architects Grade 1 Practice
- Christine Baker, FCC Community Archaeologist
- Lisa Edden CORA Consulting Structural & Conservation Engineers
- DKP (David Kelly Partnership) Consulting Structural & Conservation Engineers


Application of shelter coat.


North/East elevation of tower after shelter coat.


Completed works.


Aspect of consolidated East tower and East wall, Swords Castle, facing site of proposed public plaza on North St, Swords.

St. Catherine's Lane West, Dublin - Boundary Wall Conservation

Carrig Conservation was commissioned by Stephen Coyne, of Dublin City Council, to carry out conservation works to the historic east boundary wall to St. Catherine's Park at St. Catherine's Lane, West Dublin. The work was a direct action of the *St. Catherine's Park Action Plan* (2009).

Boundary wall to St. Catherine's graveyard prior to re-harling.

The section of wall reflects a multi-phase construction dating from the mid-17th to early-18th century and represents the earliest surviving section of the graveyard boundary. As well as conserving the upstanding wall, it was thought the new finish would give a visual uplift to the area.

The principal challenges faced following removal of the failed and cementitious render included the phased repair of brick (avoiding collapse) and the presentation of a horizontal ledge which ran approximately 1 meter above street level. A further technical challenge presented to the contractor was how to manage the drip course which, in places was without sufficient overhand. While the above issues were all items that were discussed, and decisions were made in full consultation with the Conservation Department of Dublin City Council there were two other factors that were particularly challenging and beyond control.

Firstly, the rain was unrelenting making it impossible to work for days on end, extending the timeframe for the programme. Secondly, and new to us, were call outs from the local fire brigade. The hessian protection was set alight on 22nd May at about 9.30pm. The Fire brigade was called, and the blaze put out. The blaze resulted in the scorching and blackening of sections of the wall. It did not appear that the render had suffered but it may be that problems will arise with weathering in the future (this will require monitoring). It was decided to continue and try to finish out as quickly as possible however the hessian was set alight and the Fire Brigade called twice more before the project was completed.

Learning from our experience we would recommend that where there is evidence of anti-social behaviour meaningful engagement with the local community is crucial to ensure passive surveillance of the site outside of the working day. The use of flammable tarpaulin should be avoided and all hessian should be well dampened down at the end of the day (as is already good lime practice).

Cora Coleman

The boundary wall on completion of the works.

The Editors Voice

Welcome to the 2020 BLFI Newsletter and my first publication as editor. I want to extend a huge thank you to Oiseen Kelly who has edited the newsletter for the last number of years. Oiseen has taken on the role of BLFI Treasurer and so the gauntlet of editing has been passed into my hands. I can only aspire to the level of editorial professionalism exhibited by Oiseen over the previous many publications.

I pen this note from my spare bedroom, which was hastily converted into a home office when the Covid-19 pandemic took hold. These are challenging times we find ourselves in and for the moment the BLFI events calendar has been placed on hold but we look forward to rolling out the programme once it is safe to do so. I hope that this edition of the newsletter will provide some light distraction to our members during these unprecedented times.

Many thanks to the members who have taken the time to submit articles and make this issue possible. The newsletter allows us to share knowledge and experiences as well as highlighting some of the lighter social aspects of the BLFI. Please do consider contributing to future editions.

Please email submissions to johnhughbeattie@hotmail.com.

John Beattie

Irish Georgian Society's annual Traditional Building Skills Exhibition (TBS) 2019

As one would expect, lime, an essential material in the care and repair of traditional buildings, featured prominently at the Irish Georgian Society's annual Traditional Building Skills Exhibition (TBS). The exhibition, which took place at the OPW's Castletown House, County Kildare on Saturday 15th and Sunday 16th June 2019 and was officially launched by OPW Minister Kevin 'Boxer' Moran.

Minister Moran reviewing pointing sample with IGS Vice President Camilla McAleese, George Biros & Chris Nolan.

The exhibition, and the accompanying two-day conservation seminar and Cruinniu na nOg children's craft workshops was delivered by the IGS, in partnership with the OPW and Kildare County Council's Heritage and Conservation Officers. As with past TBS exhibitions, the success of the exhibition was its collaborative nature. A coming together of state, semi-state, independent conservation practitioners and professionals, as well as built heritage charities, such as the Buildings Limes Forum Ireland, who generously contributed their expertise.

Many BLFI members kindly agreed to share their knowledge of lime. As part of the two-day conservation seminar that runs in tandem with the exhibition, BLFI committee member, John Beattie contributed a compelling lecture, 'The Importance of Using Lime'. The lecture was full of practical information, as well as personal insights derived from his family's use of lime on their traditional farm buildings.

Wig pointing demonstration by George Biros at the Nolan's Group stand.

Stalwart TBS exhibitor, Edward Byrne of Traditional Lime Company demonstrated wet dash. In addition to demonstrating over the course of the weekend, Edward delivered a children's workshop. Entitled, 'Lime and Learn', youths had the opportunity to use a trowel and hawk, mix lime and wet dash a wall whilst Edward extolled lime's unique properties and advocated as to why it is best for old buildings.

The Nolan Group exhibited, and were represented by Shane and Chris Nolan, and George Biros who deftly demonstrated wig pointing. O'Malley Plastering displayed wonderful lime artefacts from the RIAI award winning St. Mel's Cathedral conservation project. Andrew Smith and Sean Henderson, of Smith and Henderson Stuccordes demonstrated exquisite freehand decorative plasterwork, which provided a timely reminder to those attending the exhibiton to visit the interior of Castletown house to view the La Francini plasterwork. Henry Thompson, of the Old Builders Company provided hemp and lime demonstrations, that highlighted the sustainable properties of these materials in insulating traditional buildings. SPAB Ireland provided an engaging demonstration of tile repairs undertaken using lime and brick tiles. While the OPW's own decorative plasterwork team also demonstrated the use of lime in creating plasterwork cornices.

Henry Thompson of the Old Builders Company loading up a hawk with lime mortar.

The Irish Georgian Society wishes to thank all those who gave over their weekend to promote best conservation practice and in particular highlight the critical role that lime plays in the preservation of our built heritage.

The 2020 Traditional Building Skills Exhibition is planned for September in Herbert Park, Dublin 4 (Date to be confirmed). It will be presented in partnership with Dublin City Council's Heritage and Conservation Office, and the IGS very much hopes that once more the BLFI and its members will be there in force.

Emmeline Henderson

Hot-mix mortars - A modern technology applied to an ancient methodology

Latest developments on the completion of the HLM Project Phase I

Background

Over the past four decades there has been a renewed interest in the revival of historic hot-mix lime mortars for use in conservation and restoration in Scotland as they are considered to be more authentic and compatible, replicating the features of the original mortars. The Hot Lime Mortar Project (HLM Project) of the Building Limes Forum of Ireland was initiated in 2014 to re-introduce the use of the Scottish hot-mix methodology by technology transfer making the know-how available for conservation work in Ireland.

The HLM Project was generously supported by Clogrennane Lime, a subsidiary of Cement Roadstone Holdings (CRH) and the OPW, with grants from the Department of Arts, Heritage and the Gaeltacht and The Heritage Council.

Other than the successful transfer technology component, the principal objective of Phase I of the HLM Project was to develop guidance on the use of hot-mix lime mortars as used in traditional stonemasonry. Its overall aim, however, was to make modern replica mortars available using commercially produced quicklime, avoiding the expense and environmental problems associated with individual kiln burning. It was felt that this would be more practical, have wider appeal for application within built heritage, and be more useful to the average mason doing the average job.

The HLM Project is not about boutique kiln firing for specific jobs. Other than major projects, this is not considered to be practical, economical nor realistic. It is about using commercial supplies of indigenous non-hydraulic quicklime (QL) and using it for making proximate replication authentic hot-mix lime mortars and renders, the modern equivalent of the historic mortar with compatible performance, convenience of use and cost effectiveness.

With the completion of Phase I, concluding with final 5-year tests on experimental walls and panels at Portumna Castle, a generic formulation has arisen for general use engaging a Natural Hydraulic Lime (NHL) as a gauging component for replicating feeble hydraulic features often found in historic mortars and, equally important, to aid setting. The QL-NHL hot-mix mortar is often referred to as a hybrid mortar. Although, in a sense the NHL is acting as a pozzolan.

OPW masons building test walls and applying render to test panels at Portumna.

With the issuing of the *HLM Project Report, Technology Transfer & Applied Research* in 2014-2015 (https://www.buildinglimesforumireland.com/hot-lime-mortars-project) a collaboration was entered into with Historic Environment Scotland, Historic England, Cadw of Wales and the Historic Environment Division of Northern Ireland's Department of Communities, for the sharing of ongoing research and exchange of information on the development and use of hot-mix and earth mortars. It is known as the Hot-mixed Mortars Collaboration, (HMM Collaboration). The Heritage Council and the OPW are joint signatures to the Memo of Understanding of the HMM Collaboration. Over the last five years, mainly under the auspices of the HMM Collaboration, a wealth of evidence and experience has been acquired through the ongoing work of the HLM Project Team with the welcome addition of Nigel Copsey of York and Chris Pennock of Trondheim Cathedral, Norway, both of whom are academic stonemasons. Nigel, who has often played a central role, has recently had his book published, '*Hot Mixed Lime and Traditional Mortars'*, which is recommended reading.

Chris Pennock of Trondheim Cathedral discussing additives used in Cathedral works, which span many centuries.

The work and output of the HMM Collaboration is to be found in the previous Newsletter, Volume 2 Issue No 5 May 2019, particularly Technical Papers, 27 – 31, recently published by Historic Environment Scotland, (www.historicenvironment.scot).

At the same time, and certainly not to be ignored, active Members of the BLFI, such as Pat Hickey, Tom Pollard and Eoin Madigan, and not forgetting HLM Project Team Member, Robert Howard OPW, have independently experimented with hot-mixes and contributed to our understanding of its potential. Regrettably, their input has generally been uncoordinated and has mainly gone unrecorded so, if I have inadvertently omitted other Members who have been or are still active, please accept apologies.

Mention of Pat McAfee should not be omitted, however. His work and vast knowledge contributed much to the success of the HLM Project Phase I. before he departed to pursue his other vocation, and we await his first one-man exhibition of his drawings and sketches.

So, where are we now?

Mortar formulation:

While the results arising from the final report prepared by Bill Revie, the material scientist of the HLM Team (see below), are mixed they are sufficiently positive bearing in mind that we used a prototype kibbled QL from Clogrennane and our mixing techniques were beginner's best. A lot has improved since 2014 and much practical experience gained as noted previously.

As in Scotland, the hybrid or NHL gauged mixes come out best. This is mainly due to climatic/weather conditions of relatively long protracted periods of cold temperatures accompanied with high humidity, including rain, during the carbonation process. This is fairly typical of both our climates.

Our now informed mix under the HLM Project is an air QL gauged with an NHL. The QL is in kibbled form from the sole supplier, Clogrennane. The ratios given for mixes are by volume based on their kibbled version (Agricultural trade name, Growmax). While the original tests gauged the QL with an NHL 3.5, we are now inclined to favour an NHL 5 as a general standard due to consistency and in the reduction of its hydrated lime content.

Clogrennane Growmax is available from most heritage lime stockists or the larger agricultural suppliers including the cooperatives.

The use of mixes without an NHL is not recommended, as can be successfully done in other climates as found, for example, in the southeast of England. In low humidity of reasonable duration, air limes can work perfectly and when uncertain can be twigged a little with an additive. In Scottish-Irish conditions it is a brave mason that would risk a pure air lime mix, when s/he can get reasonable assurance from an NHL hybrid.

One must be mindful that a mortar design depends on the prevailing; geology, climate, culture, historic period, time of year, application and skill available. Ireland matches those of Scotland in most respects.

Formulations will, therefore, obviously vary as to application and need, weather and time of year. A typical generic bedding mortar would be:- 1 QL: 1 NHL 5: 6 aggregate 5 mm dn. This would give a 2:1 mix on slaking, with the doubling in volume of the QL. An alternate depending on circumstances and conditions could be: 2 QL: 1 NHL 5: 10 aggregate 5 mm dn, which also gives a 2:1 mix and is a fatter lime with the increased amount free of air lime, mainly from the QL available.

St Canice's Steps and archway, Kilkenny - the first project to use prototype hot mixes of QL gauged with NHLs.

However, generic consideration withstanding, and this cannot be stressed enough, the design of a mortar for a particular application is essential. This can be best done on an analysis of the original mortar or, on occasions, empirical knowledge based on experience. The replica mortar should be designed on this knowledge and expertise, and even possibly enhanced for its changing environment.

The Report on the 'Examination, Analysis and Testing of Hot Mixed Mortar Samples. Assessment of Hot Lime Mortars placed as part of the HLM Project at Portumna Castle, County Galway, Republic of Ireland', by Bill Revie, dated the 7th January 2020 prepared for The Heritage Council is being made available to Members on the BLFI website.

Mixing Method:

An example of a pointing mortar and its preparation for Duart Castle, in the Hebrides, in extremely exposed and severe weather conditions, is given on pg.13 of this newsletter. This was in a presentation given at the BLF Gathering and Conference held in Stirling last September and highlighted at the recent BLFI Slam in February.

The performance of a mortar depends on correct slaking more than anything else. Generally masons, being craftspersons developing an empathy for the materials with which they work, develop their own techniques and methods for preparing mortars. The essential task is to ensure a complete hot slake, to a high temperature, and not drown the QL with too much water at the wrong time. Practice makes perfect, and it does, and it is much simpler than it sounds.

The mixing of mortar on a 15th century site - note the health and safety measures (the PPE footware is impressive!).

A note on aggregates:

There seems to be a growing preference for using a calcareous aggregate (sand), usually from a riverbed/bank, instead of the more common silica (quartz) sand, as used in cement mortars and plasters. Traditionally a washed quartz sand has been incorrectly transferred to common usage for lime mortars. The calcareous aggregate tends to facilitate a quicker carbonation resulting in a more robust and durable mortar, while still retaining a good flexural strength due to the abundance of free lime.

When using a silica sand consideration could be given to the addi-

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Hot-mix mortars - A modern technology applied to an ancient methodology

Latest developments on the completion of the HLM Project Phase I

(Continued from page 9)

tion of lime dust to the mix, from 5% to 10% of aggregate volume, to aid carbonation, adjusting the amount to avoid any tendency to cracking. Much more research needs to be done on the selection of aggregates.

And Additives:

The additives are generally used to accelerate the set depending on weather conditions: to reduce the young mortar's teenage years as it were. The knack is to shorten the carbonation time. In this regard the empirical usage of limestone dust, wood ash, or brick dust is giving encouraging results.

This by default improves the durability of the mortar often introducing a feeble hydraulic set.

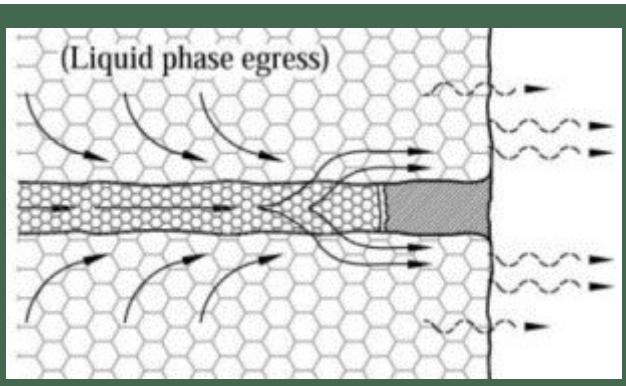
As of yesteryear, the last thing a mason wanted then as of now, was to be called back on the job. So, additives were used at the mason's discretion. In the main, additives were chosen as much for convenience as for the material itself. The notion that the mason of old had an extensive array of additives from which to choose from is false. Either brick-dust or wood-ash were reasonably handy and appear to have been popular (although the latter can be difficult enough to identify specifically in laboratory analysis). Or, if a pottery was nearby some ceramic powder would be used. As long as the additive was reasonably fresh and dry, it was acceptable as water retention was part of its purpose.

There are various formulations proposed expressed as a percentage of the lime or as a percentage of the aggregate. It really depends on the weather and the additive being used and when, where and how often it would be used. An amount in the range of 5% of aggregate is not uncommon. The percentage probably depends on the experience and judgement of the mason more than anything else. Further research and testing are required.

Nota Bene: Pore structure, porosity and permeability:

One of the key characteristics of traditional buildings is that they are constructed of solid masonry walls that are 'breathable', i.e. the building fabric allows moisture to be absorbed and released cyclically. This form of construction relies on vapour-permeable materials and higher levels of ventilation to ensure the well-being of the building fabric and the internal environment.

The Technical Paper 27: Hot-mix Lime Mortar, Microstructures etc, by Dr David Wiggins published by Historic Environment Scotland, is his thesis on the analysis and performance of the complex pore structure of lime mortars, comparing an air lime with an NHL. Much has been written on this topic already and suffice it to say that mortars produced by the air QL/NHL hot-mix method have a superior and more beneficial pore structure than those produced with pure NHLs when it comes to 'breathability' in performance. For this reason, they are being increasingly favoured over pure NHL mortar formulations for use in solid wall construction as found in dwellings and institutional work.



Typical stone or brick decay where incorrect pointing blocks egress of water. In the case of non-porous binding materials, such as granite or hard limestone, the moisture remains entrapped and appears on the interior surface with dire consequences.

They also can be designed to be more authentic with the original mortars that they are replacing. With the conservation adage of, like-for-like, this is desirable from a conservation perspective. NHLs, however, have other superior characteristics not the least of which are their renowned hydraulic properties.

What is now becoming more significant with the arrival of nZEB and Deep Energy Retrofit is that hot-mix replica lime mortars with their high porosity and permeability will have a vital role to play in the upgrading of heritage buildings (and all of solid wall construction). The importance of correct specifications will be paramount to ensure compliance with nZEB, which lays a further emphasis on the value of the hot-mix method.

In this day and age of exactitude and the need for some assurance in porosity and permeability it is best to use materials that are consistent and have a recognised standard. A hot-mix combining a manufactured QL and an NHL to accepted standards gives such assurance. After all, the revival of the hot-mix method is simply the application of a modern technology to an ancient methodology.

What next?

The discovery and revival of the hot-mix method of making lime mortars is a significant development. Much has been achieved in our understanding of what they can do and how they work. But much more needs to be done in the form of applied research and testing of various materials and combinations in the form of aggregates and additives, and in developing techniques for their application.

Surprisingly, the only testing undertaken to date on actual hot-mix lime mortars has been at the OPW's Depot in Athenry and at Portumna Castle under the HLM Project. No such testing has yet been undertaken in Scotland.
Apart from their potential nZEB contribution in the retrofitting of our heritage buildings, hot-mix mortars could have wider applications than we presently realise being environmentally friendly with a near zero carbon footprint, and also being recyclable, are desirable facilitators that could enable Climate Change.
Contained in the conclusion of the original HLM Project Report, it is proposed that consideration be given, inter alia, to the continuation of Phase I in a Phase II Project. The aforementioned Report by Bill Revie concludes with suggestions that further tests should be considered in the light of current knowledge. What's next is up to the BLFI.

Ivor McElveen

12th and 13th century St Dubhan's Church, Hook Peninsula, Co. Wexford.

Conservation and restoration of bellcote.

Mortar mix:1 QL:1NHL3.5: 6 sharp limestone sand 10mm down, balanced with fines plus crushed oyster shell at 1:3 sand.

Shell to assist carbonation.

Final mix ratio 1:2

Mason: Martin Codd

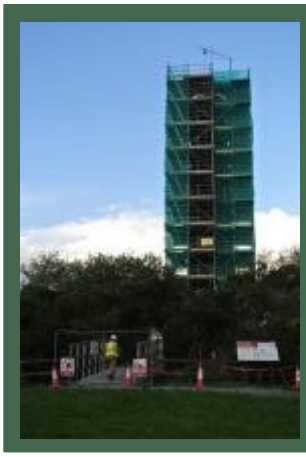
Vernacular farm building, Wexford

Restored using hot-mix mortar of:

2QL:1 NHL5: 10 quartz sand with 10% lime dust to aggregate added.

Finished with two coats of a hot-mix lime wash.

Mason: Property owner.



The Crimea War Round Tower Memorial, Ferrycarrig, Co. Wexford

Conservation repair works

Pointing mortar: 1QL: 1NHL3.5: 6 quartz sand with 10%l lime dust and 10mmm down aggregate, plus 5% wood ash on occasions depending on humidity.

Mason: Pat Hickey

Fernhill Greenway Restoration, Stepaside

This is a project which myself and the team carried out in conjunction with Dunlaoighre Rathdown County Council. It's an old right of way that cuts through the Fernhill Estate in Stepaside. It starts at the bottom of the Barnaculla Road and meanders through the estate taking you back out onto the Barnaculla Road near the famous Blue Light Pub. Our remit on the project was to create steps, rebuild the old dry-stone walls and design and build a new stile. I have been teaching dry stone wall building at Feile Na Gloch on Inis Oirr for the last 15 years, so when this opportunity came along, I was absolutely thrilled.

Stone walls and pathway at Fernhill Estate prior to works commencing.

As you can see from the images taken prior to works commencing the walls were fairly dilapidated with deer knocking them down, young lads taking the stones off the walls to make ramps for scrambler bikes and even some stones apparently growing legs and ending up in peoples gardens! The wall was in a sorry state and there was nothing for it but to take down what was left to Terra Ferma and start again. We started with the biggest stones on the base to create a solid foundation to start from, as we built the walls we packed a lot of the joints with mosses, shamrocks and small ferns creating habitats as we went .On the tops of the walls I thought it would be prudent to protect them going forward so we flaunched them with a lime mortar capping and on top of this we put sods, mosses, ferns etc . Next up was the Stile. This had been crudely assembled with sand & cement, stone and a lot of concrete, so this had to go. When we built the new stile, we used a lime mortar for stability as we knew the stile would get a lot of traffic. It may be of interest to note that the steps and the standing stones which were used had been salvaged from a farm where the Dundrum Shopping Centre currently sits. For me this project was an absolute pleasure. The flora and fauna and the absolute tranquillity is heaven. The place is a hidden gem. I urge the walker, hiker in you to check it out.

Kevin Carrigan

Reinstated walling on completion of works.

Another great BLFI workshop at Drimnagh Castle, Dublin - October 2019

The BLFI held a successful workshop on 'Mortar Mixes for our Built Heritage' at Drimnagh Castle, Dublin on 10th October 2019.

Craig Frew, author of Historic Environment Scotland's *Technical Paper 29: A Review of Hot-Mixed External Lime Coatings in Scotland 1997-2016* provided the keynote address and was on hand afterwards in the castle yard. Practical demos were carried out by our very own Lisa Edden as well as Damien Condon and Ken Curran.

Images courtesy of Neil Crimmins.

14th Century Duart Castle, Isle of Mull, Hebrides, Scotland

A typical gauged or hybrid Hot-Mix Lime mortar for severe weather conditions.
With a step-by-step mixing procedure for a Belle mixer as used by Andrew Allan of Harper & Allan, Masons.

The majestic Duart Castle on elevated exposed site, Isle of Mull, Hebrides, Scotland.

The following is the mix and mixing method for a Belle mixer, which the reader might find useful. The methodology is not intended to be prescriptive as there are many ways of doing the same thing. This method should let the mason know what type of results should be achieved.
The re-pointing mix is particularly strong, and the substrata is a very hard granite. A hard-durable mix can be selected, as long as it has adequate porosity and permeability and there is unlikely to be any further settlement in the structure being some 600 years old.

Step by step mixing procedure:

Mix: 1 QL: 2 NHL 5 :: 5 sharp 5 dn or use calcareous aggregate, giving a mix of 5:4 or approx. 1:1
It is preferable to use a calcareous aggregate, 5 mm down or larger depending on the masonry pattern and stone size. If using a quartz sand, consider adding 10% of aggregate fresh limestone dust. If cracking occurs when setting, reduce percentage of limestone dust.
Q: How to achieve a good hot slake which will dictate the character and performance of the mortar.
A: Simply avoid using too much water at the wrong time. Don't drown the slake!

- Start with 3 parts sand/aggregate.
- *Add in enough water* so sand/aggregate really damp, but not swimming.
- Addd QL and mix through.
- *Try not to add more water unless* essential as this will kill the temperature and the mix has to build back up to allow quicklime to slake properly. Be patient.
- But, don't let it dry out so *gently add water if required*.
- Once all mixed through and no QL bits left (about 20 mins or less) add 1 further sand/aggregate and allow to mix through while *adding a touch more water- if required.* Use judgement.
- Once mix is consistent add all NHL and *add enough water so as to give a sticky workable mix.*
- Last sand/aggregate to be left until everything is 'off the back' of the mixer, and then add in to bulk out the mix.
- *Add water as required to achieve a workable consistency*. This is a mason's choice.
- Ready to use straight away.

Possible reasons if a poor mix occurs:

- Water added at wrong time – drowning the mix.
- Not enough time for quicklime to slake prior to adding in further ingredients.

Ivor McElveen

Pointing mortar with good use of 'pinning' stones.

West Dean - How learning should be enjoyed!

Working with lime mortars will invariably bring your working life into conservation and restoration. From there the decision making and responsibilities become all the more important, and to provide quality results in line with so many architectural styles is of the utmost importance. When you love your work, you will always work at self-improvement and a good understanding of reading and caring for structures is a priority.

As a member of the BLFI the contacts, education events and advice available have been an essential part of my making the decision to pursue my Professional Development Diploma in Historic Building Conservation and Repair at West Dean College. The support and drive derived from actively enjoying my BLFI membership led to the next natural step in career development.

In 2019 I enrolled in the diploma course and attended four of the ten required Building Conservation Masterclasses, seven compulsory and three of your choice. In all there are eight masterclasses to choose from outside of the compulsory requirements and choosing three is tough, however all eight can be taken at your own pace and I have met some who are working through that list. West Dean has something special to give so I see the attraction to keep returning once a diploma has been gained.

The principal garden front of West Dean College.

An important point I want to make is that your BLFI membership is welcomed with a 10% discount on all courses and when travel and accommodation are factored in that discount is quite welcome. Another important point to make here is the availability of the BLFI bursary scheme. Open to all for education or research two recipients each year can be awarded €1,000. I was lucky enough to be one of these recipients in 2019 and considered it to be both a help and an honour to be considered for this bursary. West Dean and the travel involved is an expense of course and over ten separate modules this bursary is a great help.

West Dean college is a unique campus. Situated on 6,000 acres of parkland with formal gardens, the flint façade of West Dean is ornate but not as much as the interiors. All the detail and glory of this house since its last refurbishment in 1891 is intact and this all adds to a calm and studious atmosphere, you are residing in one large conservation project for your duration.

Beyond the house is the famous ruinette where all practical mortar and masonry learning is conducted with its own lab for analysis and

The ‘ruinette’ illustrating various masonry repair and construction types.

experimentation. Original structures such as stables, walled garden and dwellings are all part of the syllabus and open to inspection and learning. The Weald and Downland museum is a short trip away and was set up on land donated through West Dean and rather than attempt to describe this wonderland I would suggest this link www.wealddown.co.uk . One or the modules focuses heavily on this museum so a full walk through is just otherworldly.

Courses are pre-empted by notes and recommended reading by your tutors via email. Save these to your device as the toner bill will be huge. To be up to speed on your course notes is essential as you hit the ground running. Over the four day courses the class-

The Weald and Downland museum.

Alchemy in West Deans workshop.

work and practical exercises are fast paced and always run over time due to wonderful detailed explanation and example by the tutors. Enthusiasm is the key here and I am referring to the tutors as well as the students. Questions are encouraged and everyone has something to give. From breakfast through to dinner and a drink in the college bar with tutors the learning is nonstop. After four days the mix of tiredness and being fired up is hard to explain. Tutors at West Dean are hand picked and highly experienced and highly regarded in their field. Specifying Conservation Works with Malcolm Starr and Reece Brooks was my first course and the forensic surveying and report writing was a huge learning experience. "Every damaged element of a structure should be treated like a crime scene and you are the detective" Fantastic opening words by Malcolm Starr. Case studies, Site surveys, Report writing and critique are all part of this particular module. I cannot recommend it highly enough.

The Structural Repair of Historic Buildings with Ian Hume and Ed Morton was another masterclass delivered by two gents with a huge amount of experience.

Two courses taken were based in the ruinette, Mortars for Repair and Conservation with Colin Burns, Bill Revie and Graham Aubrey and Conservation and Repair of Stone Masonry with Nick Durnan and Tom Beattie were both fantastic and very hands on. The use of putty limes in the UK is far more common than here in Ireland, Stone and aggregate types also differ from home but offer more variables so conversation and questions are what set the pace and with a very well equipped facility all manner of mixing, chiseling and grouting can be undertaken with tools and apparatus provided for each student. The attention to detail and preparation applied make a huge impact and I have to say it makes these courses worthy of the travel and time taken to attend.

The diploma course is not mandatory, just taking on one course is also recognized here in Ireland and in the UK by IHBC,CIAT,RIBA and Historic England. View all fifteen Building Conservation Masterclasses at www.westdean.org.uk

Catherine Woolfitt is the diploma facilitator and tutor on many of these modules and can be contacted at the West Dean web page.

Tom Pollard

BLFI Bursary - Applications Welcome!!!

Did you know the BLFI offers an annual bursary to members to assist with training and education?

The application must essentially have an educational nature, practical or theoretical, and must relate to the use of lime.

Who can apply?

All individual members of the BLFI with at least 2 years paid membership.

In the case of corporate members an individual in the employment of the corporate entity may apply while in the employment or in an apprenticeship / training scheme of that firm or organisation. As in the case of the individual member, the corporate membership must be current and in place for a minimum of two years.

Application Form

Please make an application to info@blfi.netinfo@blfi.net, giving full details of the proposal and a one page CV together with a contact email, address or phone number.

For further information go to www.buildinglimesforumireland.com

BLFI Lime Slam 2020

The annual Lime Slam is one of the most eagerly anticipated events in the BLFI calendar and this year was no exception. On Tuesday 4th February, the Helen Roe Theatre, Merrion Square, Dublin was close to bursting at the seams with contractors, specifiers, homeowners and the odd self-proclaimed 'lime nerd'. The event was used to launch our new database on projects where hot lime mortar mixes have been used. The database is currently being trialled and will be rolled out to the mass membership once feedback has been received.

Henry Thompson, kicked off the 'mane' event (pun intended) with an account of his recent work on the conservation of an 18th century stable yard. Jason Bolton was next on the rostrum as he delivered a fascinating assessment of his analysis of medieval and post medieval mortars.

Next, focus turned to energy efficiency as Tom McGimpsey talked us through one option for the upgrading of our traditional building stock. The approach involved the construction of an inner insulating lining using hempcrete blocks (90mm thick). Although this did ensure the external character of the property remained unaltered, it did eat into the internal floor plan and may not be suitable for all properties, particularly where historic joinery items or decorative cornicing survives. As a modest farmhouse with little surviving historic features Tom was able to apply the hempcrete without significant impact.

The baton was passed to Tom Pollard who delivered a thoroughly enjoyable account of his works using hot mix mortars at Knockboy Church, County Waterford, famed for its distinctive double bellcote and seven ogham stones (five of which had been reused as lintels during the building of the church). Tom extolled the advantages of having a well-chosen and skilled team behind him, one of his regular crew is a trained horticulturist which comes in handy when the project appears to be more ivy than building! Works at Knockboy have been ongoing for a number of seasons, and the most recent phase addressed the reseating of an ogham stone lintel. After temporary propping of the lintel, Tom and his team set about numbering each stone to ensure accurate reconstruction. Rebuilding was carried out using a hot mix mortar, with horse hair added to the mix for areas of deep core work.

Sticking with hot lime mixes Ivor McElveen, provided an update on the very latest research and thinking (see pg.8 of this newsletter for Ivor's article on the completion of the HLM Project Phase I). Ivor talked us through the 'step-by-step' mixing of a good mortar, following current best practice, highlighting some of the common pitfalls along the way. 'Don't drown your quick lime' was a key take away message. Ivor, reflected on the work carried out on the OPW site at Portumna Castle where five years of testing demonstrated that gauged mixes do work. With the trials at Portumna concluded, Ivor recommended that further programmes of testing should be carried out.

Tom Pollard was back in the 'lime' light (I couldn't help myself!) with a brief overview of his bursary placement at West Dean (see pg.14 for Toms account).

After a well-deserved lunch in the impressive rooms of the Royal Society of Antiquaries of Ireland, Peter McNamara and Ger Edwards took us to Limericks Georgian Core where works had been carried out to stabilise the rear elevation of one of the cities early 19th century townhouses. As works on the rear elevation came to an end the team were asked to address the principal street facing elevation and a full programme of wig repointing ensued, complete with red raddle coat!

Turning to the wet trades, Andrew Smith demonstrated his deft skill in the free-hand repair of 18th and early 19th century plasterwork with case studies presented from some of the country's most prestigious addresses to include Henrietta Street and Merrion Square. Andrew noted that some ceilings in 18th century houses could be as little as 3mm at their thinnest point!

BLFI Chair, Uná Ní Mhearáin and heritage contractors Damien Condon and Noel Ryan jointly presented on the ongoing works at Cashel Palace Hotel, Co. Tipperary. Designed by Edward Lovett Pearse in 1730, the Palace was originally the residence of the archbishop of Cashel but was sold in the 1960s and later refurbished as a hotel. Repointing of the brick elevation (unusual outside of Dublin) has been executed in a hybrid mix to include brick dust (using irreparably damaged bricks from the site). Works had commenced in March but as these ran into the winter months, the design team rolled out significant protection measures on the scaffold to mitigate against frost related failure.

The day drew to a close with an engaging talk from Shane Nolan on two Dublin-based projects which focused on the repair of Roman Cement. Patented in 1796, Roman Cement is the ultimate in hydraulic lime. It was successfully promoted as an alternative to stone dressings during 18th and 19th centuries and although durable in itself, it was often used in combination with ferrous armatures which typically give rise to jacking and popping of the material. Shanes repairs at the former Harcourt Street Railway Station and at North Earl Street both used Prompt Natural Cement, the former was finished with a prompt-based wash coat and the later received a masonry paint.

John Beattie

Andrew Smith talking on his repair and reinstatement of embellished plasterwork.

The Dentist and an 800 B.C. lime mortar

While in my dentist's waiting room the other day, I delved down though the heap of gossip magazines such as Hello, Now and OK, ignoring 'what would Megan do next type articles' and other juicy gossip, and came across a recent National Geographic. Don't care for visits to the dentist and needed something sustaining to keep my mind off what was ahead.

I was rewarded. In an article about 'Extremely rare' Assyrian carvings discovered in Iraq I was to learn about an eighth century B.C. Assyrian King Sargon II, who ruled over a wealthy and powerful empire that included much of today's Middle East and inspired fear among its neighbours. Apparently, a team of archaeologists have uncovered ten stone reliefs that adorned a sophisticated canal system dug into bedrock. The surprising find of such beautifully crafted carvings, (please see photo), sheds light on the impressive public works supported by a leader better known for his military prowess.

The panels display a king—who the archaeologists believe is Sargon II—observing a procession of Assyrian gods, doing whatever gods did in the eight century B.C. Apparently all to do with earthly love and divine power. Or was it the other way around? Anyway, a good bit of PR to impress his subjects and a couple of 21st century archaeologists.

Sargon II and his son, Sennacherib, were certainly powerful with military victories across Anatolia and the western Iranian plateau, dominating the region from 911 B.C. until their Neo-Assyrian Empire was eventually destroyed by the Persians and Babylonians in 609 B.C. As the first army to use iron weapons, the Assyrians developed advanced military techniques to overwhelm their enemies.

Iron weapons were not the only things that the Assyrians developed. As a society, they seemed to have invested heavily in R & D.

Sennacherib built what may be the world's oldest aqueduct, near where the carvings were discovered. The aqueduct, part of the canal system, is a structure crossing a river that employed stone arches and, wait for it, *waterproof cement*. As the geology of the area is predominantly limestone it is easy to deduct that the mortar, not cement – save us from archaeologists – was a pozzolanic lime mortar. Will even venture to suggest that it was a hot-mix.

What's amusing, is that Sennacherib was so pleased with himself he boasted in an inscription, which he put on the aqueduct, '*Over steep-sided valleys I spanned an aqueduct of white limestone blocks; I made those waters flow over it.*'

And why not? I know a few Irish masons who would do the same. An architect? Never.

Anyway, Vitruvius (c.80–15 BC), eat your heart out, or attend my dental appointment instead.

Ivor McElveen

Building Limes Forum Gathering & Conference - The Engine Shed, Stirling, Scotland 2019

The Irish delegates outside the Engine Shed.

The Imaginatively titled 'Question Lime' inside the Engine shed.

BLFI Walking Tour Summer 2019 - Hillsborough, Co. Down

On Saturday 15th June 2019 the BFLI visited the picturesque town of Hillsborough Co. Down. BLFI board member Dermot McRandal lead the tour which took in Hillsborough Castle and grounds including the recently refurbished stable yard as well as the 17th century Hillsborough Fort.

The BFLI outside the main entrance to Hillsborough Castle.

Randal capturing the attention of the BLFI members (except Kevin) in the walled gardens.

17th century Hillsborough Fort remodelled in the 18th century as a banqueting house.

It wouldn't be a BLFI walking tour without a bit of pointing (excuse the pun)!

Calendar of Events

Due to the Covid-19 pandemic, all training events and activities of the BLFI have been postponed until further notice.

BLFI / SPAB Training Weekend
Shankill Castle, Paulstown, Co. Kilkenny
POSTPONED UNTIL FURTHER NOTICE

Annual Walking Tour
Armagh City
POSTPONED UNTIL FURTHER NOTICE

BLFI AGM
POSTPONED UNTIL FURTHER NOTICE

Annual BLF Conference
27th - 30th August 2021
Exeter, Devon, UK

We look forward to rolling out our programme of events once it is deemed safe to do so.

STAY SAFE

Training & Education

- Traditional Lime Company, Rath, Shillelagh Road, Tullow, Co Carlow **ph:**059 9151750 **fax:**059 9152113 **email:**info@traditionallime.com. Visit www.traditionallime.com/
- Stoneware Studios Ltd. Pillmore, Youghal, Co. Cork, **ph:**024 90117 · **email:**mail@stonewarestudios.com

  Visit www.stonewarestudios.com/
- The Lime Store, Unit B1 Ballymount Drive, Walkinstown, D12 **ph:01 450 8624 email:info@thelimestore.ie**

  Visit www.thelimestore.ie/

What is Building Limes Forum Ireland?

The Building Limes Forum encourages expertise and understanding in the use of building limes. It aims to achieve this goal by:

- exchanging, collating and disseminating information, through publication of a regular journal and by holding meetings and conferences;
- encouraging practical research and development through field studies, trials, monitoring and analysis;
- encouraging development of appropriate industrial and craft skills and techniques;
- educating building professionals, builders, conservators, craftsmen and women, and property owners in the appropriate use of lime in building through demonstrations, publications and courses;
- developing contacts with institutions and individuals outside the forum and in other countries that have relevant experience or knowledge.

Communicating With Your Forum

If you would like to respond to any of the topics on this or future newsletters or if you would like to get involved please contact us by post or by email on **info@blfi.net**

Membership

The BLFI is currently looking for new members. Membership of the Building Limes Forum offers:

- the opportunity to participate in conferences, courses, workshops, demonstrations and visits organised by the Forum;
- an informal network of contacts that is prepared to share information and to discuss matters of general interest to members;
- a means of supporting the stated aims.

An application form for membership of the BLFI can be downloaded on **www.buildinglimesforumireland.com**