HARLOW CONSULTING

Home Building Skills Partnership

HBF HOME BUILDERS FEDERATION

In conjunction with citb

NHBC Raising Standards. Protecting Homeowners

Home Building Skills Partnership
Brickwork Masterclass Programme Evaluation

Final Report

May 2022

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Development of the brickwork masterclasses

About the Home Building Skills Partnership and the brickwork masterclasses

The Home Building Skills Partnership (HBSP) was set up by the Home Builders Federation in 2016 (initially funded by CITB) and is a collaboration of home builders and supply chain organisations working together to attract and develop the workforce of the future and in doing so change the culture of the home building sector.

The HBSP team leads on and supports work to help tackle skills gaps and shortages and ensure sufficient capacity within the workforce to deliver the supply of good quality new homes the country needs.

Why were the brickwork masterclasses developed?

Growing need for bricklayers, but skills shortage persists

The current level of skilled bricklayers in the UK is almost a quarter of the size needed to meet government targets for building new homes. The 2018 Letwin review estimated a need for 15,000 more trained bricklayers by 2023.[1]

In 2020, the Home Office rejected a recommendation by the Migration Advisory Committee (MAC) that bricklayers be added to the Shortage Occupation List choosing instead to wait and assess the impact of both the coronavirus and the new immigration rules.

Demand far outstrips supply, but this is not the only concern. Main contractors report difficulties finding bricklayers who are sufficiently skilled. Employers have questioned whether Further Education (FE) training equips learners with the requisite practical and work readiness skills and knowledge.

HBSP research highlighted need to tackle common site defects

HBSP research drew upon warranty provider quality data from Premier and NHBC and identified the most frequent defects year-on-year: DPCs and trays, cavities, weep holes and insulation, fire stopping and sound proofing. The brickwork masterclasses were designed specifically to tackle these issues and build learning around them into the curriculum. The intervention is funded by CITB.

The brickwork masterclass programme aims to raise awareness of common issues and defects and provide guidance as to best practice to raise standards. The dual objective is to change behaviours thus contributing to the eradication of common defects on home building sites and warranty claims arising as a result.

1 Independent review of build out: draft analysis https://www.gov.uk/government/publications/independent-review-of-build-out-draft-analysis

Background to the evaluation

Brickwork Masterclass Programme overview

HBSP, the National House Building Council (NHBC), and the Association of Brickwork Contractors (ABC) developed the brickwork masterclasses in conjunction with industry. These were delivered by NHBC inspectors both on-site to bricklayers, and at college venues for FE tutors, in the form of three main programmes:

- 90-minute upskilling programme delivered on-site to bricklayers (subsequently further developed with additional funding into a 4-hour blended learning approach that included additional video content and reading material, aiming to enable a sustainable, long-term solution
- Half-day Continuing Professional Development (CPD) for FE tutors
- 3-day and 1-day defects prevention programmes for Site Managers, Assistant Site Managers, Engineers and Quantity Surveyors (out of scope for this evaluation

About this report

This independent evaluation of the brickwork masterclass programme was commissioned to assess its impact and effectiveness. This report brings together the findings in relation to the delivery of:

- Brickwork masterclasses held in Further Education establishments, attended by college tutors and assessors and on occasions, employers
- Brickwork masterclasses held on home building sites attended by bricklayers and Site Managers, during the period November 2019 to April 2022.

Findings from all research activity has been synthesised, combined and included in this report.

The need for the brickwork masterclasses

Occupation overview

The housebuilding industry is a major employer in the UK, with an estimated 800,000 people directly or indirectly supported by the planning, design and delivery of new homes.[1] According to Nomis annual population data, there are c60,900 bricklayers working in the UK.[2]

The conservative government manifesto pledged to build 300,000 new homes each year by the mid 2020s[3] and whilst at least a proportion of these are likely to be built using Modern Methods of Construction, the demand for brick and block will inevitably increase, thereby increasing the demand for skilled bricklayers.

Skills shortages and impacts

Skills shortages within the construction industry have been well documented. In 2021, 41% of Federation of Master Builders (FMB) members stated that they are finding it difficult to hire bricklayers,[4] similarly Construction Industry Training Board (CITB) research found bricklaying vacancies among the top 5 hardest to fill.[5]

Taking on apprentices is critical to addressing these skills shortages, and recent construction employer research suggests a slight increasing trend in the number of apprentices within construction.[6] This is supported by national apprenticeship start statistics specific to bricklaying:

2018/9	2019/20	2020/21	2021/2
540	1,370	2,250	2,560*

Data source: GOV.UK Apprenticeships and traineeships data

* Provisional figure which covers the first two quarters (Aug 2021 to Jan 2022)

1 https://www.hbf.co.uk/news/planning-materials-and-labour-shortages-threaten-housing-delivery-over-next-12-months/

2 Nomis Annual Population data Jan 21-Dec 21 Available at: https://www.nomisweb.co.uk/datasets/aps168/reports/employment-by-occupation?compare=K02000001)

3 https://www.gov.uk/government/news/government-announces-new-housing-measures industry-research-reports/search-our-construction-industry-research-reports/skills-and-training-in-the-construction-industry-2021/

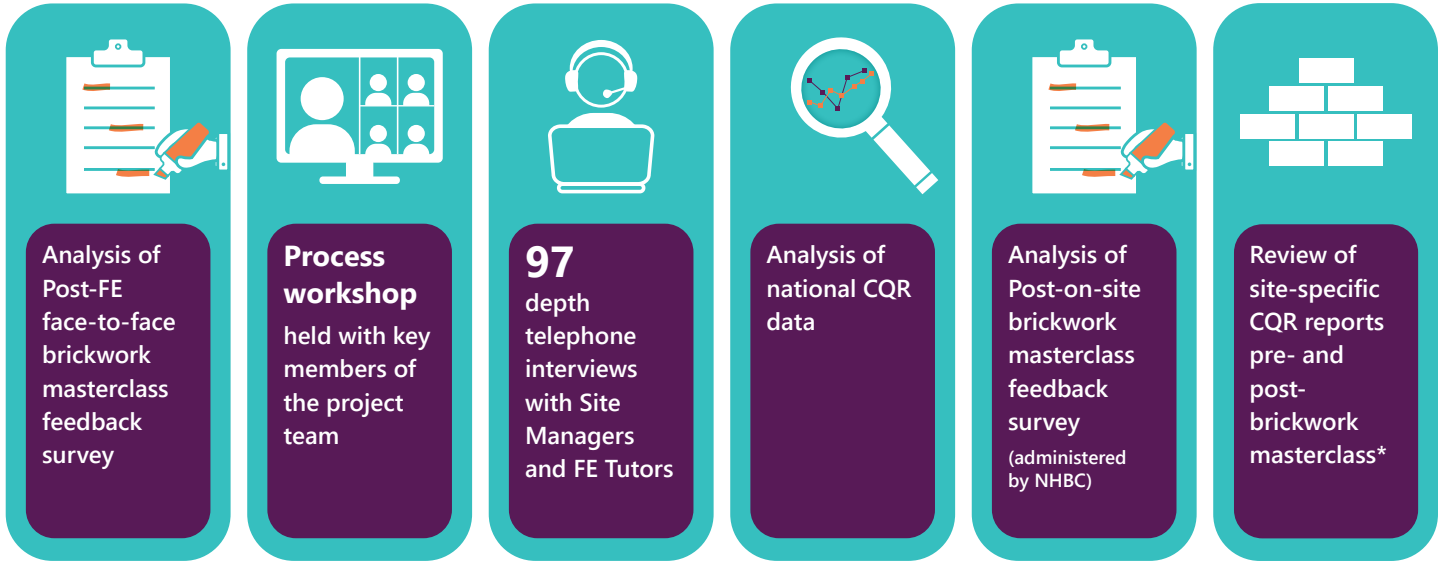
4 https://www.fmb.org.uk/resource/state-of-trade-survey-q4-2021.html

5 CITB Skills and Training Report 2021 https://www.citb.co.uk/about-citb/construction-industry-research-reports/search-our-construction-industry-research-reports/skills-and-training-in-the-construction-industry-2021/

6 CITB Skills and Training Report 2021 https://www.citb.co.uk/about-citb/construction-industry-research-reports/search-our-construction-industry-research-reports/skills-and-training-in-the-construction-industry-2021/

Evaluation methodology

Summary of the methodology



Methodological commentary

Due to the transient nature of the brickwork workforce, qualitative research focused on obtaining the views and experiences at a site manager level. Site managers were well placed to provide views of the impact of the programme on brickworkers and at a broader, organisational level.

Where it has been possible to include data in relation to longer-term impacts (i.e. where quality review data is available at site level – noting inspections have a broader purpose) this has been included in the analysis.

*Construction Quality Review reports were obtained for sites which held brickwork masterclasses with permissions from the participant organisation. Not all sites, holding brickwork masterclasses, are subject to a CQR

The impact of Covid-19 on the delivery of the brickwork masterclasses

Overview

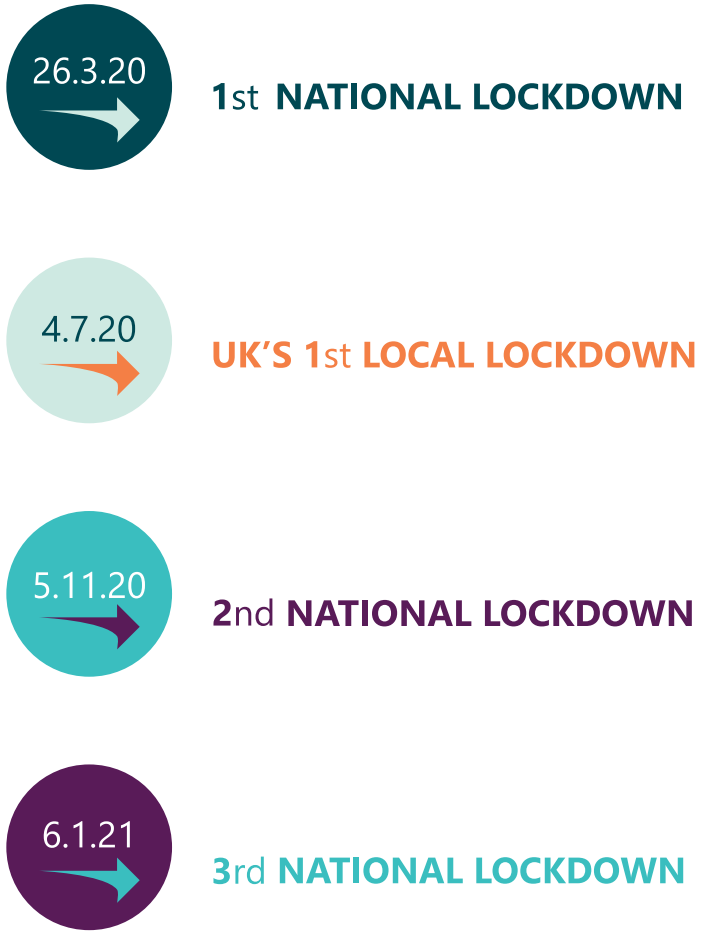
Since the project commenced, the global pandemic Covid-19 has had a severe and immediate impact on the construction sector, the wider economy and society. As of 16th March 2020, NHBC was compelled to postpone all scheduled training either on-site or at FE colleges. Shortly afterwards, the UK entered a phase of lockdown, closing colleges and many construction sites. Timescales on the project have been extended as a result and the delivery of on-site brickwork masterclasses will continue into July 2022.

On-site brickwork masterclass attendance

A proportion of the brickwork masterclasses have been held during the later stages of the Covid-19 pandemic and the emergence of numerous variants with varied, and in some cases higher, levels of transmission.

Attendance numbers have been impacted by the need to socially distance; the space available to hold the sessions in light of social distancing needs; and fluctuating attendance where people were compelled to self-isolate.

The number of delegates per session has varied, with as many as 16 delegates in attendance; the average number of delegates is nine.



Key brickwork masterclass programme statistics

Delivery aims and achievements as at end of April 2022 – NOTE at this point the contract has another three months to run

	Delivery target to 31 July 2022		Delivery achievement as at 30 April 2022		Comments
	Masterclasses	Delegates	Masterclasses	Delegates	
Brickwork masterclasses for FE Lecturers	25	250	25*	203*	In total 71 FE colleges were reached. When delivery switched to virtual, attendance reduced linked to lecturers dealing with Covid-19-related challenges in colleges and lockdown(s) imposed on the UK. At the conclusion of the evaluation of the FE element (June 2020), the masterclass target (25) had been achieved.
On-site brickwork masterclasses	928	9064	825**	7211**	Delivery target is a combined target of pre- and post-Covid-19 funding and delivery. N.B. The funding and delivery of the programme stopped in March 2020 due to Covid-19. The contract was renegotiated and delivery recommenced September 2021. Initially masterclasses were slow to get going due to continued restrictions and social distancing. Numbers attending each masterclass have continued to remain slightly lower than the predicted 10/12 in a site cabin, latterly, this has been around 8/9 due to social distancing. At the conclusion of the evaluation (with three months left of the contract to run), 825 masterclasses had been delivered.

*Delivered between June 2019 and mid-March 2020
** Delivered between January 2019 to April 2022

Findings from face-to-face Further Education brickwork masterclasses

FE face-to-face brickwork masterclass statistics

124 delegates have attended brickwork masterclasses held face-to-face at FE colleges (Table 1). 12 of these delegates were employers (site managers and bricklayers) who were unable to attend on-site brickwork masterclasses, and thus came to a college venue instead. Although this was unplanned, it had a beneficial outcome of bringing representatives from education and industry together.

Of the 124 FE face-to-face brickwork masterclass delegates, just over 50% (64 respondents) completed a survey providing feedback, and telephone depth interviews took place with a fifth of delegates (27).

Impact and effectiveness have been assessed against four main indicators:

- Increased effectiveness/quality of FE curriculum content
- Increased knowledge of FE trainers and assessors
- Number of brickwork masterclasses delivered
- Delegate satisfaction

Host College	Region	Date	Total delegates	College staff delegates	Employer delegates	# of colleges attended	# of employers attended
Bedford College	Eastern	25/06/2019	8	8		2	
Hartlepool College	North East	02/07/2019	15	15		7	
Stephenson College	East Midlands	03/07/2019	23	12	11	5	1
College Cumbria	Wales	05/09/2019	3	3		1	
Bristol	South West	16/10/2019	5	5		3	
College Gwent	Newport South Wales	17/10/2019	5	5		1	
South and City College, Birmingham	West Midlands	24/10/2019	9	9		5	
Bishop Burton College	Yorks & Humber	28/10/2019	5	5		1	
Calderdale College	Yorks & Humber	21/11/2019	9	9		2	
Walsall College	West Midlands	10/12/2019	14	13	1	6	1
Wales College	Wales	19/12/2019	5	5		1	
North Lindsey College	Yorks & Humber	16/01/2020	13	13		1	
Kingston Maurward College	South West	12/03/2020	10	10		1	
Total (to date)			**124**	**112**	**12**	**36**	**2**

Table 1: Further Education face-to-face brickwork masterclasses and attendees to mid-March 2020

Key findings – FE face-to-face brickwork masterclasses

85% Say the brickwork masterclass updated their knowledge for teaching

94% Plan to make, or have made changes to teaching as a result

83% Have already put changes in place

87% Believe changes to teaching are very or totally sustainable

100% Say the length, breadth and depth of the content was about right

96% Would recommend the brickwork masterclass to a colleague

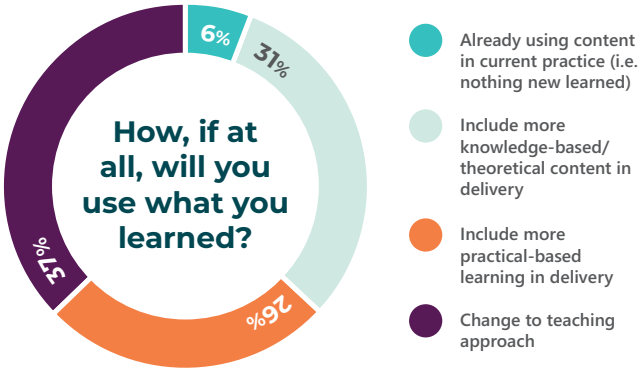
> *Very valuable content we've not seen anywhere else*

> *This wasn't 'just another course', it was genuinely useful and focused on raising standards. In FE we are years behind what industry wants. We need to get the front line (tutors) upskilled and prepared to teach what industry wants*

N.B. All statistics report survey data from 64 respondents

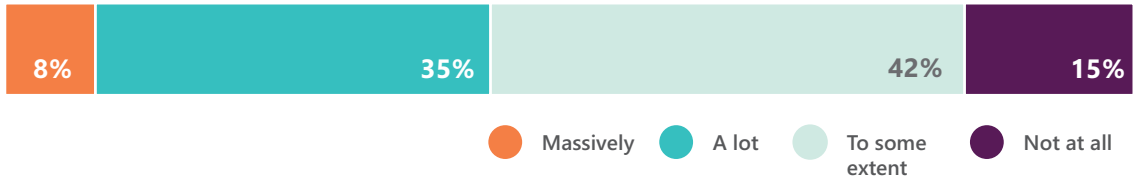
Use and impact of the FE face-to-face brickwork

How, if at all, will you use what you learned?



- 37% of delegates surveyed either plan to or already have changed their teaching approach after attending the brickwork masterclass.
- 26% will include more practical learning, such as a greater focus in the workshop on precision of measurements and quality checking.
- 31% will incorporate more knowledge and information to share with learners – notably common types of defects experienced on-site and the wide-ranging impacts: costs incurred to rectify problems, risk of reputational damage as a bricklayer, and quality concerns of consumers buying new homes.

To what extent did the training update your knowledge for teaching brickwork?



85% of delegates say the brickwork masterclass updated their knowledge. Several delegates welcomed the fact that seminars like this can be counted towards CPD hours.

The 15% of delegates who said the brickwork masterclass did not update their knowledge at all, had all been in the trade for 20 years+, had been teaching for over 10 years and have regular opportunities to engage with employers on-site. These delegates found the brickwork masterclass interesting but suggested the content would be far more useful to less experienced tutors/assessors, particularly if they do not interact regularly with industry. Some delegates acknowledged they have lengthy trade experience gained over many years, but that they still learned new information from the brickwork masterclass.

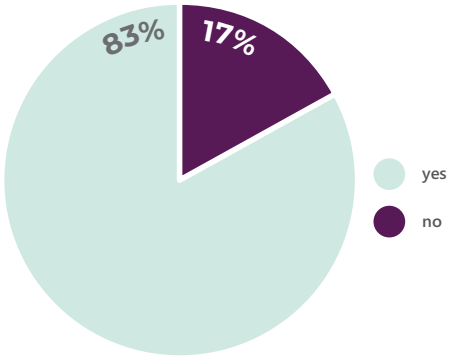
> *It did update my knowledge a lot, yes - I've been in the trade a long time and you forget things*

> *I still actively work as a joiner so keep abreast of building regs and so on - others probably learned a bit more than I did. Tutors are mainly in classrooms - for those people something like this is invaluable*

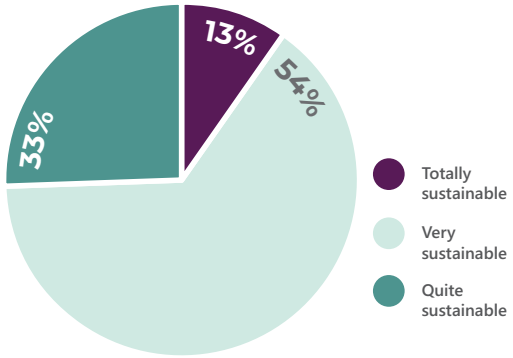
N.B. All statistics report survey data from 64 respondents

Implementing changes in FE arising from the face-to-face brickwork masterclasses

Have you already put changes in place?



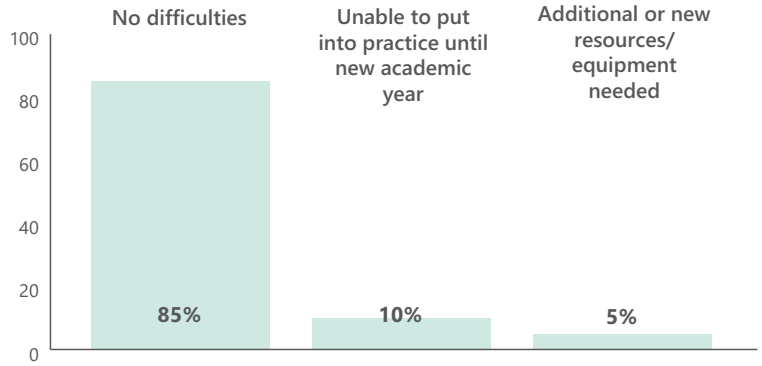
How sustainable are the changes?



We put changes in place straight away – we updated drawings and notes for the training for learners which we hadn't realised were out of date

83% of delegates surveyed have already implemented changes, and 87% consider these changes to be very or totally sustainable. Even in the context of the pandemic, only 10% say they are unable to put any changes at all into place until the new academic year. 69% of delegates have shared what they learned with colleagues and have continued to communicate good practice internally and externally.

Did you experience any difficulties putting changes in place?



I shared the information very easily with the learners, pulled resources into lessons just slotted in a slide and had a quick discussion about it. The true cost of mistakes came as a shock to them. They seem more conscious of the quality of their work now

N.B. All statistics report survey data from 64 respondents

How the impact and value of the brickwork masterclasses can be enhanced – FE

- Delegates are extremely positive about the length, content, and relevance of the brickwork masterclasses. Several suggested CPD certification could be shared at the end
- Around a third of surveyed delegates raised concerns about the core FE curriculum content after attending, stating that not everything on the syllabus appears directly relevant for what employers want on-site
- FE tutors expressed a strong desire for change in the FE curriculum for it to directly align with employer needs - otherwise a perceived disconnect between education and industry will persist - and potentially worsen
- Around a third of the delegates interviewed suggest the brickwork masterclasses should also be offered to tutors and assessors in other construction trades (notably plastering, painting & decorating and carpentry & joinery) and multi skills
- Delegates attending brickwork masterclasses where employers were present, emphasised the value of having the 'site perspective' to provide valuable context and inform the debate. Several delegates suggest future brickwork masterclasses should be attended by a mix of FE staff and employers as well as awarding bodies - in their guise as the bodies setting the standards and defining the curriculum
- Many delegates independently praised the style of delivery, and the interactive structure. Over a half-day, this is deemed an optimum length of time to keep the delivery engaging and allow time for networking with other attendees. However, several delegates pointed out that with travel time, the seminar was effectively a full day out
- Nearly all delegates interviewed strongly agree that the seminar could be delivered just as effectively online – which would eliminate travel time while still giving attendees chance to interact and ask questions via virtual platforms
- One delegate said a shift to online would be particularly welcome in the current climate, as some tutors are struggling to find fresh content to share with learners at home during lockdown

> *The content was absolutely relevant for trainers. It was interesting as an employer, to hear from the FE tutors what they are teaching learners. On the back of it, we invited the tutors to visit us on-site and get a better insight into processes and practices. They learned some of the content they teach is archaic and not relevant for industry. Some must be taught regardless, as it is in the curriculum, but tutors will give it less emphasis and focus more on the site-specific information. Tutors have been able to better prepare students for the real world. All very positive*

> *This is a great opportunity to share with other trades tutors. A lot of us teach multi skilling so we're expert in one trade, with a working knowledge of the others. It would begood for us to explain to learners how the trades interact on-site, how poor-quality work has an impact on all trades. We need more like this - and for all trades, not just brickwork. It would be good to renew the session and repeat it every year*

> *It would be good to involve awarding bodies to incorporate this best practice into future qualifications. There's a real disconnect between what we teach and what employers want on-site*

N.B. All statistics report survey data from 64 respondents

Findings from on-site brickwork masterclasses

On-site brickwork masterclass statistics

On completion of the on-site brickwork masterclasses, Site Managers (SMs) were asked to provide feedback via a survey. 290 SMs responded to the survey* and each was asked to rate four aspects of the brickwork masterclass using a rating scale of 1-5. Perceptions were highly positive, most ratings were either 5 (excellent) or 4 (very good).

Overall
4.92

Quality and Content
4.91

Trainer Effectiveness
4.94

Objectives met?
4.92

(Ratings based on survey responses from 290 site managers)

Key findings: on-site brickwork masterclasses make a difference

Quality of delivery

The delivery of the brickwork masterclasses by NHBC inspectors was felt to be a key factor in their success. SMs and attendees greatly value their knowledge and experience. In addition, an understanding of their role and influence as an inspector garners respect and a sense that the information imparted is credible, accurate and, when followed will lead to adherence to NHBC requirements.

SMs perceive the Q&A session to be of high value to attendees; such sessions were particularly useful in finding absolute guidance on specific site issues. It was felt that the Q&A session offered greater benefit to more experienced attendees who already have a strong baseline knowledge and have queries with more advanced areas of the work.

Impacts reported

SMs report improvement in the quality of work undertaken post-brickwork masterclass, specifically:

- Placement of vents
- Firestopping
- Slip ties
- Cavity ties
- Cavity step trays
- Keeping cavities clean
- Internal pointing

An increase in manager/supervisor knowledge was also reported which was thought to lead to increased competence in their role and their capability to manage the standards of bricklayers. SMs noted that in many cases the brickwork masterclass is likely to have been the only external training some bricklayers' will have received since completing their apprenticeship. As such, attendance would likely lead to an improved sense of value. Where improvements have been identified in bricklayers' attention to detail post-brickwork masterclass, SMs most commonly feel this is as a result of understanding WHY things must be done in a certain way. In the past it is likely that bricklayers are simply told to do something in a certain way, however, a lack of understanding of WHY brings complacency and an unwillingness to change.

Actions as a result of brickwork masterclasses

The nature and complexity of actions post-brickwork masterclass has varied widely. At a basic level, brickwork masterclass handouts have been included in induction information for new bricklayers arriving on-site. One site has developed and introduced a specialist checklist based on the NHBC guidelines. In some instances, there have been changes to the way supervisors and site management manage the standards of bricklayers. As a direct result of positive SM feedback, some organisations have arranged additional brickwork masterclasses on their other sites. One site has changed the specification in relation to preform lead trays, which is more costly but irradicates the issues they were previously experiencing. More generally, SMs have indicated they are more open to arranging training generally as a result of their positive experiences of the brickwork masterclasses.

> *It has helped them to improve themselves - instead of just being told to do something, they now know WHY it must be done*

> *I've seen a difference in their behaviour and quality of their work*

Site manager views of the on-site brickwork masterclasses

NHBC course trainers

Those delivering the on-site brickwork masterclasses were viewed as highly knowledgeable in terms of both quality/defect statistics and the practical aspects of brickwork. The trainers were skilful in engaging the attendees at all levels from apprentice to highly experienced. Brickwork masterclasses gained credibility through NHBC endorsement. Where brickwork masterclasses were delivered by the site's regular NHBC inspector this enabled them to tailor the content and delivery of the brickwork masterclass to the site which was felt to be highly beneficial.

Brickwork masterclasses were well received

Engagement levels were felt to be generally high. Bricklayers working on a sub-contractor basis were on occasion resistant to attending ("time is money") however, SMs felt this was largely overcome due to the knowledge of the trainer and relevance and quality of the brickwork masterclass content. Less experienced bricklayers were generally thought to better engage as a result of their more recent experience of structured learning, however, more experienced bricklayers engaged in and benefited from healthy debate with the trainer over NHBC requirements. SMs felt it was good for bricklayers to hear it from someone other than the site management.

The content was informative and backed up with statistics which helped to ensure 'buy-in' from attendees and the fact that the content included WHY something had to be done was felt to cover new ground, empowering bricklayers through this newfound knowledge and understanding.

Valuable, accessible learning opportunity

Face-to-face, interactive delivery is felt to work well. Visual examples and verbal delivery play to the strengths of the workforce. The informality of the brickwork masterclasses encouraged involvement from the workforce, enabling them to 'steer their learning' to a certain degree. The format was thought to be a good method of keeping bricklayers up to date with their craft and the standards required of them.

> *I had our apprentices on it who learnt a lot and the more established guys had a healthy debate with the trainer/inspector over NHBC requirements*

> *They started to care that they are actually building someone's home. We try internally to educate but coming from the NHBC inspector seemed to have more clout*

Delivery and structure of on-site brickwork

The process of arranging brickwork masterclasses and obtaining feedback from SMs has been refined during programme delivery. During the first lockdown period, organisations were encouraged to find out more about the brickwork masterclasses by completing a webform, enabling follow-up once the programme recommenced. Once the programme did recommence, organisations also had access to book a brickwork masterclass online via the NHBC website. This online approach has also increased the accuracy of contact information recorded and streamlined the administrative side of the process.

Initially SM feedback was gathered using a paper-based form. Latterly, feedback has been obtained through an online survey approach. At first it was challenging to obtain feedback from SMs through the online method, however, persistence of the NHBC team in pursuing this feedback made a difference, with feedback ultimately obtained from 290 SMs.

Delivery method

On-site delivery was supported by SMs who state that this minimises time lost on the tools and removes geographical barriers. Face-to-face delivery is also thought to suit any attendees with literacy issues.

Content and structure

The breadth of content of the brickwork masterclass was felt to be particularly beneficial for less experienced bricklayers. The Q&A session was perceived to add significant value, giving the opportunity for the bricklayers to fill knowledge gaps and ask site-specific questions.

> *We had a great space to hold the MC and we had bricklayers from other sites from our subcontractors*

Timings and attendance

Brickwork masterclasses ran smoothly and on schedule. Numbers of delegates attending each brickwork masterclass were largely as expected by SMs. In some instances, bricklayers from the housebuilders' other sites travelled to attend sessions and some sessions were also attended by managers and supervisors.

The length of the brickwork masterclass was felt to be right in terms of content and appropriate to hold the attention of attendees. Some suggest shortening the session slightly to improve engagement.

Attendance tracking

It is noted by SMs that there is currently no method of tracking bricklayer attendance. A few have their own method of recording this information internally.

> *The bricklayers asked loads of questions which I think they got the most from and, as the guy running it was the NHBC inspector. He had their respect attending too which was good*

> *When new [bricklayers] come onto site we don't have any way of knowing whether they have done a masterclass before*

Impacts (1)

A range of impacts were experienced and identified through the evaluation. These are contributory factors in the reduction of the number of defects occurring:

Reduction in the number of defects occurring

Management capability

Increased supervisor and manager knowledge has led to tighter management with an increased ability to identify and mitigate potential quality issues.

Knowledge sharing

Post-brickwork masterclass, the process of sharing knowledge is ad hoc. Most commonly, handouts are shared with those new to site. Knowledge is also shared verbally and spreads to other sites. Brickwork masterclass content has been included in learning and training development documentation at an organisational level.

Morale and behaviour

Bricklayers exhibit greater pride in their work and their working environment having gained awareness of the bigger picture – that they are contributing to the building of someone's home.

Quality of craft

Through new-found knowledge of requirements, an understanding of the reasoning behind those requirements and updated skills, bricklayers improved the quality of their craft.

Knowledge gained

Bricklayers gained new knowledge, particularly those who were less experienced. Management and supervisors (not from a trade background) also gained knowledge. Knowledge gained was two-fold: that of ways of working and, a broader understanding of WHY certain tasks must be done in a certain way.

Impacts (2)

ALL Site Managers surveyed reported a positive impact from the brickwork masterclass

Reportable items went down as a result of the training

It had a little bit of an impact - our CQR rating has gone up since it was held

People on-site are still talking about the masterclass [held November 2019] - the site managers were in a meeting just the other day and they were referring to info which they gained in the MC

Behaviour has improved; they take more pride in their work and in the site generally - they clean the scaffold now and turn the boards over as was suggested, to keep them dry too

Our supervisors attended and have rolled out the content to their teams and to new people as they join if it is needed. We also copied all the information and gave that to all the bricklayers who attended

Biggest reflection of its success so far I think is that they discussed it afterwards and still refer back to it now so it has stuck - the MC itself created debate during it and provided the clarity that is needed

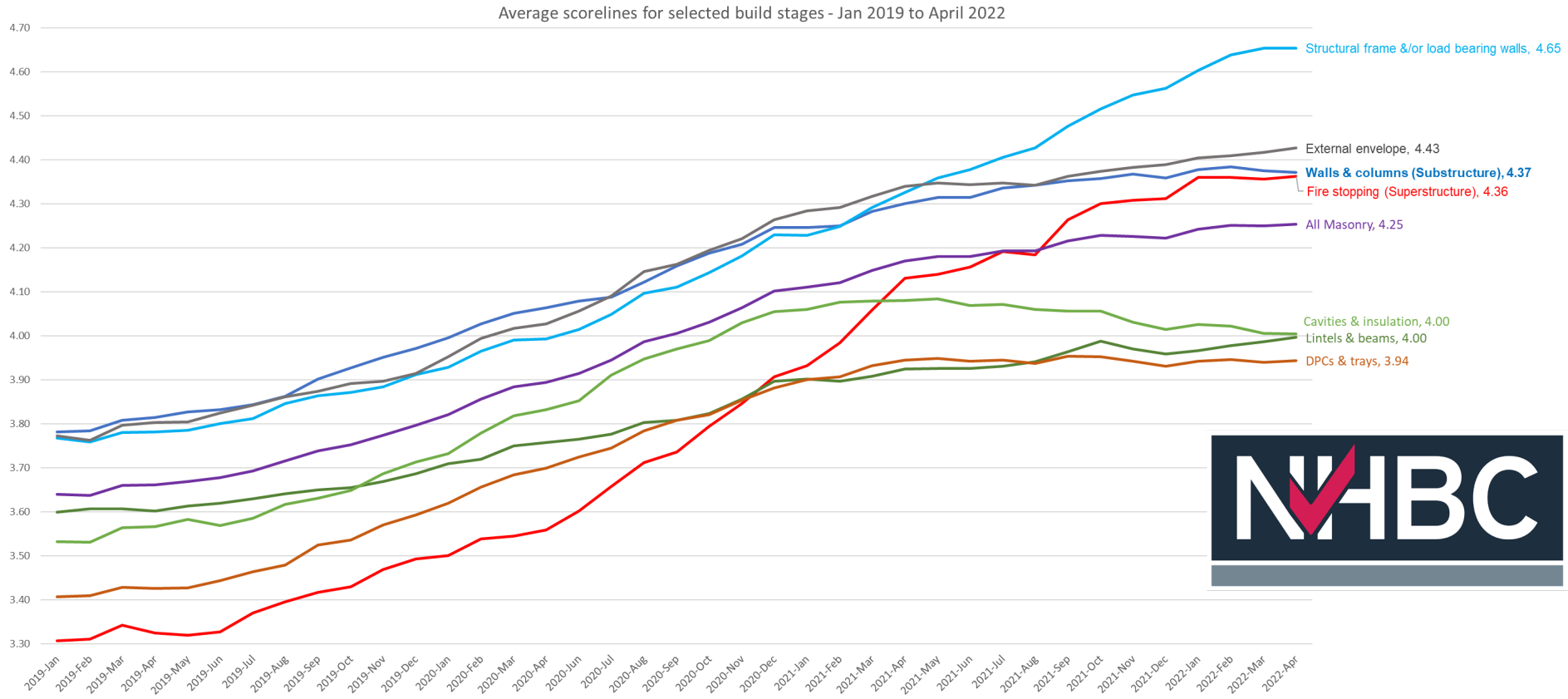
Really good, I only have positive feedback - we won an HBC award the year after we did the brickwork masterclass and I do think it was at least in part down to the masterclass

The original leaflets that were given out are still on-site and available to look at

National Construction Quality Review Data

National NHBC CQR data (1)

National NHBC CQR data indicates an upwards trend in the quality achieved in those areas most closely aligned to brickwork as can be seen in the graph below. The measurement scale is 1 to 6 with 1 being very poor and 6 being exceptional:



N.B It should be noted that the upward trend in the data cannot be solely apportioned to the brickwork masterclasses. Additional initiatives at a national, local and organisational level are likely to have also had an impact on the results.

National NHBC CQR data (2)

National CQR data indicates an upward trajectory across all areas, including brickwork, however, brickwork continues to appear in three of the top five quality issues:

Construction Quality Reviews

Industry performance		
Average score current period	4.45	
Movement on previous period	0.12	▲

Build stages

Rank	Build stage	12 Mths to Mar22 Score variance	12 Mths to Mar22 Build stages	12 Mths to Mar22 Average scores	12 Mths to Mar21 Average scores	Movement Change since last period*	Movement Trend (Left to right)
38	4.4 Ventilation, underfelt and insulation		1137	3.93	3.87	0.06	
37	3.4 DPCs and trays		1943	3.94	3.94	-0.01	
36	3.7 Lintels, beams and other structural elements		1740	3.99	3.91	0.08	
35	3.3 Cavities, insulation and soundproofing		2174	4.01	4.08	-0.07	
34	5.7 Plaster and dry lining		1211	4.04	4.07	-0.03	
33	3.8 Balconies including fixings and weather proofing		106	4.06	4.30	-0.25	

The superstructure elements of a build rank seventh out of the eight categories, just behind roofs.

*any movement of 0.1 is highlighted

Build sections

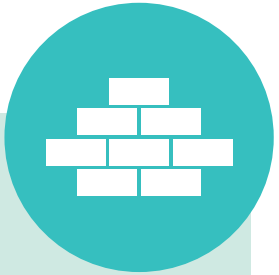
Rank	Build section	12 Mths to Mar22 Score variance	12 Mths to Mar22 Build stages	12 Mths to Mar22 Positive	12 Mths to Mar21 Positive	Movement Last period*	Movement Trend
8	4. Roofs		6049	4.20	4.11	0.09	
7	3. Superstructure		13888	4.29	4.18	0.11	
6	2. Substructure & Drainage		6481	4.29	4.17	0.13	
5	5. First Fix		12444	4.58	4.44	0.14	
4	8. External Works		1748	4.55	4.41	0.14	
3	6. Second Fix		6214	4.72	4.59	0.13	
2	1. Foundations		783	4.50	4.36	0.13	
1	7. Surface Finishes		3708	4.82	4.64	0.18	
Total			**51315**	**4.45**	**4.33**	**0.12**	

Case studies

Case studies

The following pages detail four site case studies which include extracts from site Construction Quality Reviews.

Case study 1 - overview



Context

Bricklayers on-site are a mix of subcontract gang and directly employed. All attended the brickwork masterclass and engaged which was visible through their listening and questioning. The bricklayers benefited greatly from being able to ask questions specific to the site.

Outcome and impact

The SM has seen an improvement in knowledge, especially in terms of the pointing up on ties inside (right depth and width). General behaviour has also improved; they take more pride in their work and in the site generally. They now clean the scaffold and turn the boards over, as was suggested to keep them dry.

Their increased knowledge has improved the quality of their work. This is evident as the SM has noticed a decrease in the number of issues on-site, defects are believed to have reduced. This improvement has also had an impact on the SM workload.

The SM would very much recommend the brickwork masterclasses to others as ***"it works"***.

Case study 1 – CQR (1)

NHBC Site Assessment (pre-brickwork masterclass)

3

Requires Improvement
Some minor non-compliance(s) with NHBC Standards and/or Building Regulations

3. SUPERSTRUCTURE	Rating
3.1 Structural frame and/or loadbearing walls	5
3.2 External envelope	3
3.3 Cavities and insulation	3
3.4 DPCs and trays	2
3.6 Intermediate floor structure	5
3.7 Lintels beams and other structural elements	3

NHBC Site Assessment (post-brickwork masterclass)

4

Good
Meets NHBC Standards and Building Regulations

3.SUPERSTRUCTURE	Rating	
3.1 Structural frame and/or loadbearing walls	-	
3.2 External envelope	4	+1
3.3 Cavities and insulation	-	
3.4 DPCs and trays	-	
3.5 Chimneys and flues	-	
3.6 Intermediate floor structure	4	
3.7 Lintels beams and other structural elements	5	
3.8 Balconies including fixings and weather proofing	-	
3.9 Fire stopping and sound proofing	-	

Case study 1 – CQR (2)

2019
(pre-brickwork masterclass)

3.2 External envelope	Rating	3

Comments:

Brick coursing was straight and true with reasonably good perp joint alignment. Joints were even and fully filled but some work had been heavily stained with mortar and will require cleaning. Pointing to some vertical joints at internal corners was untidy. Pointing to feature brick soldier heads and corbels was neat and cleanly finished. Air bricks to ventilation duct terminals had been neatly built in and pointed as work proceeds. Some pronounced brick shading and banding was seen and will require remedial work.

2020
(post-brickwork masterclass)

3.2 External envelope	Rating	4

Comments:

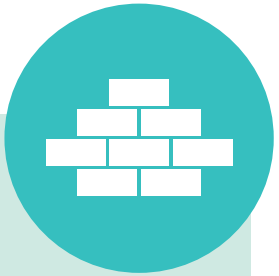
Build Overview;

• Numerous plots were available to view for this build stage on this well-established site.
•
•
•
•
•
•
• A range of materials were used for the external envelope.
• The bricks were manufactured by Ibstock and were a 'Grainger Gold', 'Rothesay Blend' and a 'Grainger Antique' brick.
• Art Stone window cills and heads were used.
• Pre-insulated brick heads were used throughout the site.
• The brick layers on site were directly employed by

Strengths;

• The art stone heads and cills observed were sufficiently bedded and were free from staining.
• Good attention to detail was observed to the corbelling detail on
• Bricks appeared to have been well mixed prior to walling, as the finish was uniform in texture and colour.
• Perp joints were in line and plumb.

Case study 2 - overview



Context

At the time the brickwork masterclass took place the brickwork team were employed through a subcontractor. Post-lockdown, the housebuilder wanted to reduce their use of subcontractors; as the bricklayers wanted to remain on the site they elected to work directly for this housebuilder on a self-employed basis. The team's productivity was good, however, there were some issues with quality of the work.

Outcome and impact

The SM felt that the session was ***"pitched just right"***. The NHBC trainer was knowledgeable and the bricklayers respected that and were highly engaged, asking many questions. The SM has seen that their knowledge has improved, and the brickwork masterclass taught them more about the impact that defects have in terms of insurance and delays which has helped them to understand the consequences of poor workmanship. Internal company inspections suggest the quality of the brickwork has improved.

While it is possible that improvements could also be in part as a result of the change to the bricklayers' employment situation, the SM doesn't think this is the case. Fundamentally, the quality of the work has improved and there are fewer issues and problems, and a lower number of defects occurring.

The SM also feels the brickwork masterclass has had an additional benefit in so far as it has made the management of the bricklayers easier due to their increased knowledge and understanding.

Case study 2 – CQR (1)

Construction Quality Review

3.SUPERSTRUCTURE	Rating
3.1 Structural frame and/or loadbearing walls	5
3.2 External envelope including chimneys and flues	5
3.3 Cavities, insulation and soundproofing	5
3.4 DPCs and trays	5
3.6 Intermediate floor structure	5
3.7 Lintels, beams and other structural elements	-
3.8 Balconies including fixings and weather proofing	5
3.10 Fire stopping (Superstructure)	5

NHBC Site Assessment (post-brickwork masterclass)

5

Very good

Meets NHBC Standards and Building Regulations PLUS some extra attention to detail over and above minimum requirements

Overview comments:

1. Quality seen was consistent on these plots
2. A good line and level to blockwork was achieved
3. Bed and perp joints were even and fully filled
4. Finish was uniform in colour, without excessive banding, and was free from unacceptable damage and mortar staining to the brickwork
5. Window and door openings were square without excessive tolerances
6. Cavities were consistent in width
7. Mortar droppings were not evident in cavity trays
8. Correctly positioned cavity trays present over all openings

Case study 2 – CQR (2)

3.SUPERSTRUCTURE

NHBC
Raising Standards. Protecting Homeowners

3.1 Structural frame and/or loadbearing walls	Rating	5

Comments:

Overview:
- 4 of 4 available plots viewed at this stage, plots 104,105,157 & 158
- Celcon aerated blocks used for external walls, light concrete blocks used for internals
- Works carried out by direct labour
- Quality seen was consistent on these plots

Strengths:
- Correct DPC had been used for blockwork to be built off
- A good line and level to blockwork was achieved.
- Materials specified within the design were used.
- Bed and perp joints were even and fully filled
- Staggered coursing and bonding were correctly achieved
- Coursing blocks were used lower down in walls to ensure lintels bear onto a full block
- Internal loadbearing walls had been bonded into external walls

3.3 Cavities, insulation and soundproofing	Rating	5

Comments:

Overview:
- 4 of 6 available plots viewed at this stage, plots 84-87
- 100mm cavity with partial fill 50mm platinum board insulation and 50mm clear cavity
- Works carried out by direct labour
- Quality seen was consistent on these plots

Strengths:
- Fully filled bed and perp joints within cavities
- Joints struck on the inside face to both the blockwork and brickwork
- Wall ties correctly installed not exceeding 900mm horizontal centres or 450mm vertical centres
- Wall ties at the reveals of window and door openings correctly installed 225mm vertical centres
- Minimum 50mm embedment was provided to all visible wall ties
- Cavities were consistent in width
- Cavity closers/window formers were built into the masonry with the correct fixing clips
- Insulation was solidly fixed to inner leaf and neatly cut and taped to avoid cold spots
- Clear cavity of minimum 50mm was maintained in front of the partial fill cavity insulation
- Insulation boards tightly butted and staggered
- Insulation boards fitted flush to the face of the blockwork
- Retention discs were securely holding the insulation boards to the face of the blockwork

3.SUPERSTRUCTURE

NHBC
Raising Standards. Protecting Homeowners

3.2 External envelope including chimneys and flues	Rating	5

Comments:

Overview:
- 2 plots viewed at this stage, plots 88 & 102 and also block 700
- Forterra, Weinerberger & Ibstock clay facing bricks used
- Works carried out by direct labour
- Quality seen was consistent on these plots

Strengths:
- Bed and perp joints were fully filled to brickwork
- Staggered coursing and bonding had been carried out to brickwork
- Good line and level to brickwork without excessive deviations from the vertical plane
- Finish was uniform in colour, without excessive banding, and was free from unacceptable damage and mortar staining to the brickwork
- Masonry didn't overhang any lintels by more than 25mm
- Corbelling to the brickwork did not overhang by more than 25mm
- Window and door openings were square without excessive tolerances

3.4 DPCs and trays	Rating	5

Comments:

Overview:
- 4 of 6 available plots viewed at this stage, plots 84-87
- Flexible DPC used to construct cavity trays
- Works carried out by direct labour
- Quality seen was consistent on these plots

Strengths:
- Minimum 140mm upstand provided to Cavity trays
- Mortar droppings were not evident in cavity trays
- Adequate turn up to trays at both ends into a full brick perp joint
- Correctly formed and shaped cavity trays to discharge water externally, without sagging within the cavity
- Gas membrane protected by adequate cavity tray
- Cavity trays extended a minimum of 150mm beyond each end of bridging item 150mm
- Correctly positioned cavity trays present over all openings

Case study 3 - overview

Context

Bricklayers on-site are subcontracted. The site provided a good space to hold the brickwork masterclass and bricklayers from the subcontractor's other sites also attended the brickwork masterclass. Attendees engaged well with the session, which was particularly noticeable during the Q&A session.

Outcome and impact

The SM believes the brickwork masterclass has had a significant impact – bricklayers' knowledge and understanding of why things are done in a certain way has increased, and as such their confidence and attention to detail have improved, as has the quality of their work.

Since the brickwork masterclass was held, the site has developed checklists based on the NHBC guidelines for all the trades and the site has achieved the highest CQR score (5.28) ever for any of the developer's sites in the country. Specific knowledge areas where the SM found improvements (as a result of attending the brickwork masterclass) spanned party wall tie spacings and the use of thermalight blocks.

CQR Site Assessment ratings pre- and post- brickwork masterclass

	Pre-brickwork masterclass	Post-brickwork masterclass
Walls and Columns	4	5
DPCs and Trays	5	6
Firestopping (superstructure)	5	6
Overall rating	4.88	5.28

Case study 3 – CQR (1)

Pre-brickwork masterclass

2.SUBSTRUCTURE & DRAINAGE

NHBC
Raising Standards. Protecting Homeowners

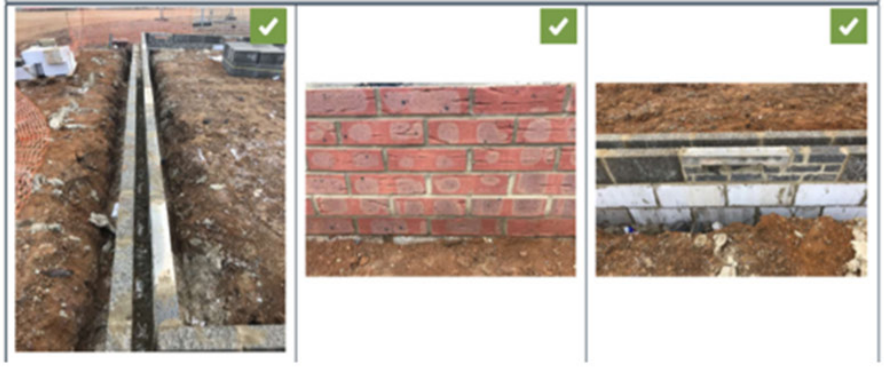
2.1 Walls and columns | **Rating** 4

Comments:

Build Overview:
- Several plots available and 6 viewed at this build stage, plots 30/31, 36, 60/61 & 69.
- Component / product / material details: Durox 7N& Concrete 7N Blocks. Forterra, Wienerberger and Bekstone.
-
-
- Quality was consistent across the plots seen.

Strengths:
- Blockwork centrally positioned on the foundation with a minimum of 50mm from each side.
- Fully filled bed and perp joints were struck off cleanly to the masonry structure.
- Lintels were bedded on mortar with adequate end bearings.
- The design cavity width had been maintained to the full length of the walls.
- Bond was correct and there were no visible signs of damage to the blocks/bricks.
- Ties were spaced at 900mm minimum on the partition wall.

Photography:



Post-brickwork masterclass

2.SUBSTRUCTURE & DRAINAGE

NHBC
Raising Standards. Protecting Homeowners

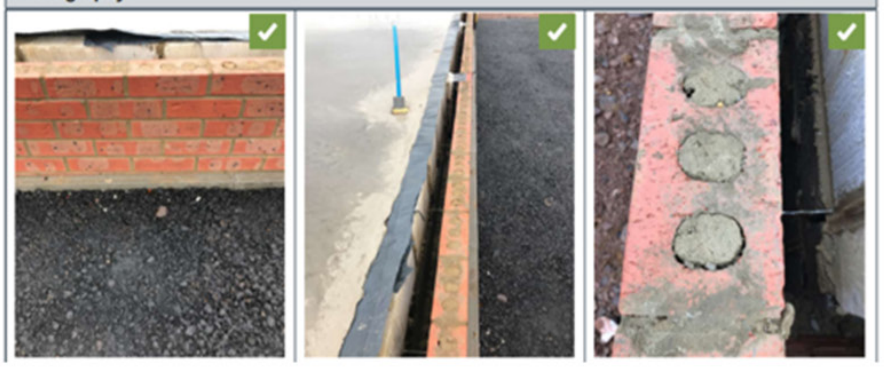
2.1 Walls and columns | **Rating** 5

Comments:

Build Overview:
- Several plots available and 4 viewed at this build stage, plots 56, 59, 62 & 63
- Component / product / material details: Durox 7N& Concrete 7N Blocks. Forterra, Wienerberger and Bekstone.
-
-
- Quality was consistent across the plots seen.

Strengths:
- Fully filled bed and perp joints were struck off cleanly to the masonry structure.
- A good line and level to the blockwork/brickwork had been achieved.
- The frogs to the brickwork were filled with mortar.
- Lintels were bedded on mortar with adequate end bearings.
- Cross-walls were tied into the perimeter walls.
- Contractor Quality Check Sheets being used.

Photography:



Case study 3 – CQR (2)

Pre-brickwork masterclass

3.SUPERSTRUCTURE

NHBC
Raising Standards. Protecting Homeowners

3.4 DPCs and trays | **Rating** 5

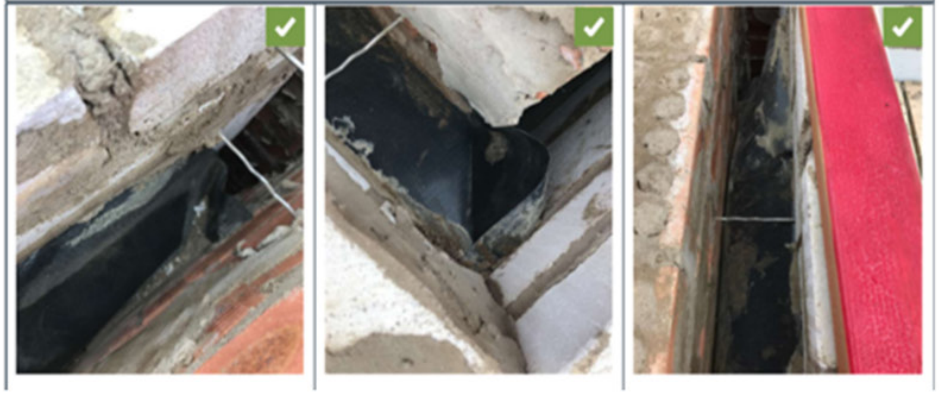
Comments:

Build Overview:
- 6 plots available and 6 viewed at this build stage, plots 78/79, 87, 90, 91 & 92.
- Component / product / material details: Flexible DPC for cavity trays. Proprietary horizontal cavity trays.

- Quality was consistent across the plots seen.

Strengths:
- Adequate turn up to trays at both ends into a full brick perp joint.
- Correctly formed and shaped cavity trays to discharge water externally, without sagging within the cavity.
- Weep holes were provided at maximum 450mm centres.
- Proprietary solid horizontal cavity trays with a vertical damp being used.
- Minimum 140mm upstand provided to Cavity trays.

Photography:



Post-brickwork masterclass

3.SUPERSTRUCTURE

NHBC
Raising Standards. Protecting Homeowners

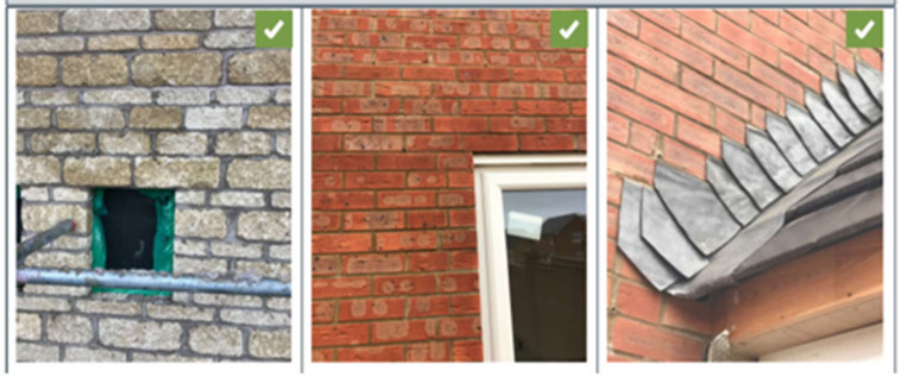
3.4 DPCs and trays | **Rating** 6

Comments:

Build Overview:
- 6 plots available and 6 viewed at this build stage, plots 24, 29, 70, 71, 89 & 91
- Component / product / material details: Flexible DPC for cavity trays. Proprietary horizontal cavity trays.
-
-
- Quality was consistent across the plots seen.

Strengths:
- Correctly positioned cavity trays present over all openings.
- Preformed stepped cavity trays were correctly installed.
- Bay window had correctly installed vertical damp proof course linked to horizontal/stepped tray.
- Adequate turn up to trays at both ends into a full brick perp joint.
- Mortar droppings were not evident in cavity trays.
- A dummy truss/template was used at the correct height and pitch line to provide heel line for stepped cavity trays.
- Company key stage construction checklist being used.

Photography:



Case study 3 – CQR (3)

Pre-brickwork masterclass

3.SUPERSTRUCTURE

NHBC
Raising Standards, Protecting Homeowners

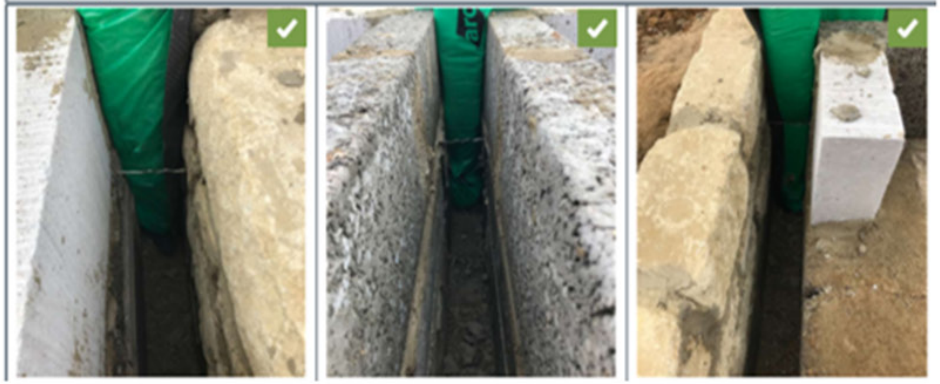
3.10 Fire stopping (Superstructure)	Rating	4

Comments:

Build Overview:
- 4 plots available and 4 viewed at this build stage, plots 30/31 & 86/87.
- Component / product / material details: ARC Cavity barriers
-
-
- Quality was consistent across the plots seen.

Strengths:
- Party wall cavity barrier extended down to the bottom of the cavity below DPC.
- Vertical cavity barriers were installed where required as work proceeds.
- Butt jointing of barriers was tight and well formed with no gaps.
- No tears or damaged fire socks were witnessed.

Photography:



Post-brickwork masterclass

3.SUPERSTRUCTURE

NHBC
Raising Standards, Protecting Homeowners

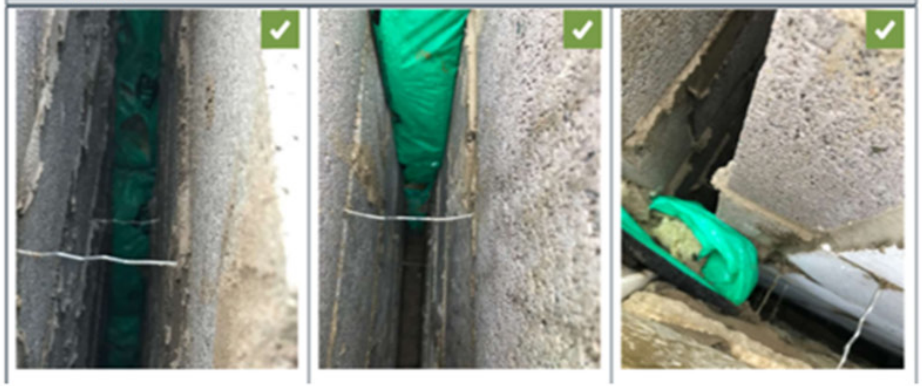
3.10 Fire stopping (Superstructure)	Rating	5

Comments:

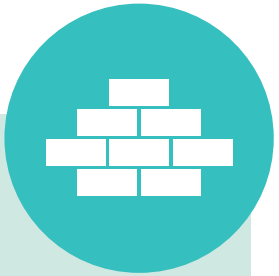
Build Overview:
- 4 plots available and 4 viewed at this build stage, plots 30, 31, 60 & 61.
- Component / product / material details: ARC Cavity barriers
-
-
- Quality was consistent across the plots seen.

Strengths:
- Butt jointing of barriers was tight and well formed with no gaps.
- Proprietary fire-stopping had been installed in correct locations in accordance with the manufacturer's instructions.
- Tight friction fit between the two leaves of masonry was seen to all cavity barriers.
- Vertical cavity barriers were installed where required as work proceeds.
- Contractor has developed their own best practice guides to teach the tradesmen working for them.

Photography:



Case study 4 - overview



Context

On-site, there are three bricklaying gangs, all are self employed and the site manager describes the team as *"**stable and settled**"*. A brickwork masterclass was held in February 2022, delivered by an NHBC Inspector from another area. After "a bit of a battle", the bricklayers engaged with the session, settled down, listened and engaged.

Standards of work on-site have historically been low in some areas, which the SM attributes to a lack of knowledge and supervision.

Outcome and impact

The NHBC inspector worked hard to engage the group and provided specific, useful guidance on lintels - an area with which the site has had issues in earlier CQRs.

After the brickwork masterclass, the SM took the bricklayers around site and identified aspects of work (including lintels) which had been discussed and how this would need to be addressed moving forward. The SM believes that this practical approach really helped with the bricklayers' level of understanding and commitment to improving quality.

Since the brickwork masterclass, the SM has increased the number of site inspections carried out and quality performance booklets have also been introduced and tightly managed.

The SM believes that the brickwork masterclass acted as the catalyst for improvements on-site – providing knowledge to both bricklayers and their supervisors to ensure standards improved. The latest CQR shows the rating for *lintels, beams and other structural elements* has risen from a rating of 3 (requires improvement) to a rating of 6 (outstanding).

Case study 4 – CQR

Pre-brickwork masterclass

3.7 Lintels, beams and other structural elements Rating 3

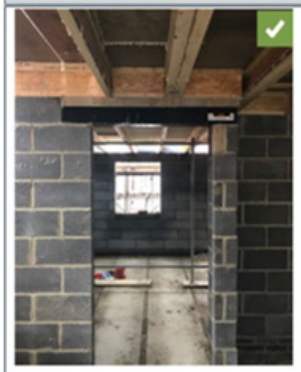
Comments:

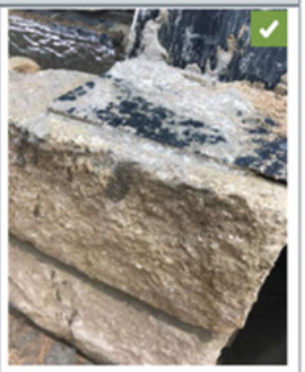
Build Overview:
- 5 plots available and 2 viewed at this build stage, plots 85 & 86
- Component / product / material details:Catnic lintels
- House type(s):
- Contractor details:
- Quality was varied across the plots with plot 86 being good, but issues were identified on plot 85

Strengths:
- End bearing of 100mm for openings up to 1.2m (150mm for lintels combined with cavity trays) and 150mm for openings over 1.2m for lintels had been achieved.
- A full bed of mortar had been provided for lintel bearings.
- Correct size and usage of lintels had been used for opening as specified.
- Padstone used under the steel lintel for the patio doors

Weaknesses:
- A full or coursing block bearing had not been provided for lintel end bearing.

Photography:





Post-brickwork masterclass

3.7 Lintels, beams and other structural elements Rating 6

Comments:

Build Overview:
- 5 plots viewed while others were available at this build stage, plots 24 + 80 - 83
- Catnic lintels
- Contractor details:
- Quality was consistent across the plots seen

Strengths:
- A good level of organisation and storage of materials was viewed in the compound.
- Lintels up to 1.2m were bearing on a minimum 100mm.
- A full bed of mortar had been provided for lintel bearings.
- A full block had been provided for lintel end bearings.

Photography:



Site Manager suggestions for the future of brickwork masterclasses

Site managers - suggestions for the future of brickwork masterclasses

Tailored examples used in the brickwork masterclasses

The examples of defects/poor practice used in the brickwork masterclass were thought to lack 'relatability' by a small proportion of SMs. It was suggested that on occasions the examples used were "too extreme" and caused bricklayers to disengage with the brickwork masterclass, thinking that as their work was of a higher standard than the examples provided, the brickwork masterclass wasn't aimed at them. SMs also call for consideration to be given to the inclusion of a site tour to identify examples of good and poor practice. This was felt to be a potentially powerful tool in engaging bricklayers and one which would overcome any question of relevance or relatability.

SMs suggest that benefit could be gained from using time-lapse videos rather than still images to show examples of good and poor work. The benefit of time-lapse videos was felt to be two-fold. Firstly, they show HOW the work was done which would likely stimulate additional learning and questions and secondly, that videos would likely increase engagement.

Content and focus of the brickwork masterclasses

A minority of SMs felt that brickwork masterclasses could be improved particularly for more experienced bricklayers by focusing on one aspect of brickwork rather than a broader range. When site construction differed from the norm (e.g. timber frame or high rise) SMs highlighted a desire for the brickwork masterclasses to be specific to the work being undertaken to both encourage engagement and knowledge acquisition in relevant areas. One SM suggested that the content should be adapted to include more about products, as NHBC are now asking more questions in relation to specifications.

> *Include a site walk to make it more relatable and relevant*

Knowledge acquisition and retention

The suggestion was made to incorporate a mini quiz at the end of the brickwork masterclass. Something simple and quick to complete (multiple choice) which would help to ensure attendee attention was held for the entire session. The quiz would also provide a measure of the level of knowledge of the bricklayers in attendance. It was also suggested that holding a reminder session after 12 or 18 months may help to ensure improved working practices are maintained in the longer-term.

Many SMs called for the brickwork masterclass handouts to be made available digitally for future use. It was suggested these could be reissued to bricklayers as necessary, displayed on-site and given to bricklayers new to the site.

Targeted brickwork masterclasses

SMs felt that brickwork masterclasses should be targeted at sites with a high level (or an increasing number) of Repairable Items (RIs) and held at regular intervals until such a time that improvements have been made.

The majority of SMs suggest expansion of the scope of the brickwork masterclasses to include other trades. Groundworks, carpentry and roofing were the trades most referred to as those where there was the greatest need.

> *Masterclasses for ground workers - it would help them to understand what is looked for re drainage, foundations and brickwork*

> *Get them looking at real examples - some of the examples used are so far out they aren't relatable - they sit there thinking well, I wouldn't do that, so this doesn't apply to me*

Conclusions and recommendations

Headline conclusions

1. On-site brickwork masterclasses make a difference to the quality of brickwork on-site and contribute to reduction of defects and an increase in confidence and skills of bricklayers.

2. FE brickwork masterclasses make a difference to the quality of brickwork teaching, leading to increased confidence and ability to tailor content directly to the needs of industry.

3. Delivery of the brickwork masterclasses by NHBC inspectors is a critical success factor, due to their knowledge of quality control, defects encountered and technical expertise.

4. Brickwork masterclasses engage and benefit bricklayers with a variety of levels of experience. More experienced bricklayers particularly benefit from the open-ended Q&A sessions.

5. Site managers have changed processes and quality control as a direct consequence of the brickwork masterclasses. However, not all organisations implement a structured action plan post-brickwork masterclass to ensure key benefits are retained over the longer-term.

6. There is clearly a strong appetite for the brickwork masterclasses to continue, and be broadened out to span other trades.

Recommendations

To further strengthen the brickwork masterclasses intervention, the following recommendations are made:

1. Increase the number of **on-site brickwork masterclasses** available to reach a greater proportion of the bricklaying workforce.
2. Revert back to running **FE brickwork masterclasses** (in addition to on-site brickwork masterclasses) to ensure brickworkers of the future have the skills required, helping to ensure defects on-site can be prevented by addressing within training. Face-to-face delivery method is preferred; however, online delivery should be considered if budget constraints are restrictive.
3. **Expand the scope** of the brickwork masterclasses to include other trades, beginning with those where quality issues and defect occurrence is most common e.g. roofing.
4. Consider **a mix of delegates** for a small sample of future brickwork masterclasses, bringing together employers, FE tutors, assessors, and awarding organisations, and assess the effectiveness of this slightly different approach.
5. Encourage **ongoing networking and sharing of best practice within FE**, for example via a dedicated LinkedIn group to maintain discussions and momentum about raising standards.
6. Make **brickwork masterclass resources available electronically** post-brickwork masterclass to enable these to be downloaded, printed, distributed and displayed.
7. Develop an on-site brickwork masterclass follow-up action plan template and suggestions for change which can be made available to SMs electronically, to help embed change over the longer-term.
8. To maintain bricklayer proficiency in the long-term, consider holding **follow up on-site brickwork masterclasses at two levels:** one covering existing core content, and one at an advanced or bespoke level, to strengthen particular techniques at a site or (large) organisation-specific level.
9. Create a **bricklayer training register** of those attending site brickwork masterclasses – benefits are two-fold: allows for attendance monitoring and creates a database of workforce contacts which can be used to feed information through directly (particularly relevant due to varied employment status of bricklayers).
10. Continue to target sites which are **underperforming and prioritise these** for brickwork masterclasses.

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