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Our ref: C1705OshwalHouse

Oshwal House

Dear Mr Shah,

Further to my visit, I have included my report on my findings for Oshwal House.

As you know, we specialise in the repair of traditional cob and stone buildings. We produce all our own lime mortars, lime plasters and limewash using the finest quality Buxton quicklime and hence have total control over the quality of lime mortars and limewash used for rebuilding, rendering, plastering, pointing and limewashing. We rebuild and repair cob, stone and brick walls with these traditional materials and have a dedicated team tackling a variety of projects from entire rebuilds and barn conversions to specialised polished plaster finishes such as Venetian marble plaster and Moroccan tadelakt. Please visit our website for comprehensive information about our projects and products.

Prior to this century building techniques were very different to those practised today. Traditional buildings benefit in a number of ways from using lime putty based renders and plasters as opposed to hard impervious cement-rich renders and modern gypsum plasters;

- their porosity allows the structure to breathe rather than trap moisture
- their elasticity helps to accommodate general movement, reducing cracking
- their self-healing nature reduces cracking problem
- stone masonry pointed with lime mortar allows moisture to evaporate from the joints, rather than the masonry, reducing frost and salt crystallisation damage
- a limewash finish protects the render whilst allowing moisture to evaporate rather than become trapped behind a modern acrylic or impermeable skin

Technical Report

Oshwal House is a detached building dating back as early as early 1839. Formerly known as The Hook House it is a tuscan style villa, painted stucco and slate roof. The building has had a number of extensions over the years to the rear. The building sits on gently sloping ground from South to North and West to East.

The external elevations are generally a mixture of older renders which are lime based, newer lime renders and cement-rich renders, often patch repaired. Some areas of render have ashlar lines and some are a trowelled finish but all are decorated with a non breathable modern acrylic paint.

There are a number of hairline cracks and more substantial cracks in the render, with evidence that the render has lost its bond to the substrate in areas. The cracks can allow rain to ingress into the substrate and this can raise moisture levels in the adjacent areas which have effectively sealed surfaces. With any moisture ingress these external surfaces effectively act like a plastic bag around the building, increasing the risk of condensation on inner surfaces and interstitial condensation within the walls and pushing any rising moisture in a solid wall construction both inwards and upwards.

There was no evidence of any structural movement indicated by any major external or internal cracking, although the balcony renders on the East elevation looks to be unsafe and should be made safe as soon as possible.

If the external renders are removed in order to replace them with more breathable lime renders and mineral paints its possible that the underlying stone/brick walls may well be shown to be in need of some structural repairs and any timber lintels over doors and windows will tend to rot a little quicker if moisture is concentrated in them.

The main problem is that any areas of cracking that are apparent in the older renders, any piecemeal approach is impracticable. Its not good practice to have different types of render and paint on the same elevation as moisture would be trapped behind the junctions and there would be a propensity to cracking there due to differential movement. In addition the aesthetic appearance would be harmed as the newly rendered lime plasters and mineral paints would contrast with the existing. The same issue applies where an adjoining elevation can be seen of course. Contrary to what many would think, there would be no structural risks in removing the renders to all of the elevations and re-rendering at the same time. This is common practice so that the renders can be as continuous as possible without junctions at corners and it removes the risk that removing renders at different times can involve damage to any existing renders due to vibration or structural rebuilds that are required.

Of course, where the existing renders are of a thickness and composition that they may be load bearing in any given location then an appropriate risk analysis should be undertaken to ensure that any render removal is undertaken as safely and with as little risk of structural damage as possible.

Penetrating rain will generally occur where there is either a specific defect in the external envelope eg cracked render, poor leadwork, failing rainwater goods, defective pointing in bare stone or brickwork etc or where the amount of water that the wall receives in a prolonged wet spell is greater than the capacity of the wall to absorb it. It can manifest itself a little distance away from an actual defect depending on the thickness of the walls and the nature of the substrate.

In the case of Oshwal House the existing renders and paints will tend to reduce rain ingress if intact but once cracks open up the rain can/has entered the substrate and become trapped.

Internally, and especially in the main entrance there were signs of efflorescence, though some walls may be plastered in gypsum based plasters which are more vulnerable to moisture than lime plasters. The signs of dampness were in correlation to the cracked renders externally, faulty guttering and any ill fitting windows or doors.

Recommendations & Methodology.

The main questions to each elevation are:

1. How urgent are the render repairs in terms of the existing cracking and hollowness and the propensity for rain ingress ?
2. How detrimental are the existing renders/paints to the walls ?
3. Can elevations be undertaken individually as a whole or as piecemeal repairs. Will best practice and aesthetics require a more comprehensive approach, depending on budgets etc?

South Elevation (Front)

The front elevation has a mix of historical lime renders – Stucco, Ashlar lines, trowelled finish and more recent lime renders with possible cement rich piecemeal repairs. The areas of Stucco have delaminated considerably with water ingress through cracks in the renders. There is also cracking between old and new renders where differential movement has occurred. These cracks have also suffered from water ingress and frost damage delaminating the renders from the wall. The trade off is whether to apply new renders or to keep the historical renders in situ where they are sound, repairing any cracks and maintaining for years to come at considerable cost, causing further and substantial substrate damage due to the dampness trapped behind the renders.

Ultimately, the renders have been coated over the years with limewash and more recently non breathable acrylic paint. To piecemeal repair the renders on this elevation will only cause further degradation of the substrate to this building. My recommendation, not just for the health and longevity of the building but to improve aesthetics would be to completely remove the old and more recent renders on this elevation, repair any issues in the substrate caused by moisture ingress and replace with a traditional lime putty render with added pozzolans.

West Elevation

The West elevation will almost certainly see the worst of the wet weather that we are increasingly seeing in today's climate. The rear aspect of this elevation is an extension to the original building constructed of brick and is mostly unrendered. The areas that are rendered are lime based renders and show evidence of water ingress in cracks over vulnerable areas such as between the bottom of windows positioned above window lintels below.

As above, this elevation has been painted over the years with a non breathable acrylic paint which is detrimental to the health of the building and trapping any moisture behind the renders. My recommendation, would be to remove the renders and apply a seamless render to the rest of the building. The painted brickwork can either have the non breathable paint removed which may cause considerable damage to the brickwork or rendered to create a seamless render around the whole building.

North Elevation

The North elevation has a mix of historical lime renders on the mainhouse, more recent lime renders on the extension to the North West and cementitious renders to the 1950's lean to. There is a number of areas that have high levels of moisture trapped behind the non breathable renders with substantial delamination occurring. Again, this elevation is suffering from water ingress that cannot escape from behind the non breathable paints that have been applied over the years. My recommendation would be to remove the renders and apply a seamless lime putty render and breathable paint along with the other elevations.

East Elevation

Typically, due to not seeing the worst of the British wet weather the east elevation seems to be in the best condition. The plinth at the bottom of the elevation is showing signs of water ingress and

frost damage as is the balcony above. The renders are in relatively good condition with minor hairline cracks that need repairing immediately. The issue is that the same non breathable paint has been applied to this elevation over the years and the renders are no longer breathable being detrimental to the substrate of the building. My recommendation would be in order to create a seamless render over the whole of the building and of course for aesthetic reasons, is to remove the renders and apply a lime putty render and breathable paint.

Summary

It is extremely difficult to sometimes weigh up which is more important. The historical renders of a building or the health of the building that the renders are there to essentially protect. Had a maintenance program been in place over the history of the building with the correct paint applied there would be every justification to just carry out essential repairs. However, in my opinion the renders and the paint are now contributing to the degradation of the building and would justify being removed and reinstated. Removal of just the paint would prove as costly as a new render and would more than likely weaken or damage the old render to beyond repair.

I've set out below the specifications for replacing the external render for each of the main elevations

Option 1. Traditional external lime rendering specification for the work is :

1. remove the existing render - removal and waste disposal
2. apply a harled coat of Secil Consolidation mortar to get a key to the wall
3. apply sufficient scratch coats of haired lime render to achieve a suitable surface
4. apply a float coat of unhaired lime render to achieve the contours of the walls required.
This can be left as a relatively smooth floated/sponged finish

Lime putty mortars for plastering and rendering are based on mixtures of our own mature lime putty with a coarse sand. Harling coats are made to a wetter consistency to allow hand harling on the wall. All external coats apart from the harled coat typically have a pozzolan added. This is a calcined clay used to accelerate the set whilst carbonation of the lime proceeds more slowly over the months and years.

Backing coats of lime render have added horse hair. Apart from the harling coat which is usually ready in 1-2 days, the subsequent coats of lime plaster or render take at least a week between coats to cure sufficiently for the next coat to be applied.

Option 2 . EcoCORK external lime rendering specification for the work is :

1. remove the existing render – removal and waste disposal
2. apply a harled coat of Secil Consolidation mortar to get a key to the wall
3. apply a doubled up scratch coat of Secil ecoCORK with an embedded glass fibre mesh.
4. apply a float coat of Secil ecoCORK
5. apply a finishing coat of Secil finish mortar which is a sponge float finish

The harling coat is typically ready to render onto after 1-2 days.

The scratch coat of Secil ecoCORK will take 3-5 days to cure before applying the ecoCORK float coat. This is left to cure for a few days before the finishing render coat is applied.

Ideally the final render coat is left to cure for several days before being painted.

External Paint

Either limewash or a mineral silicate paint can be used. Limewash typically needs four coats to cover but is a very cheap paint. Mineral silicate paints cost more but only need three coats.

They offer a similar appearance to limewash, are only slightly less porous but considerably more water repellent and so more protective. Silicate paints typically last longer when applied to a suitable substrate. This can be important for elevations that are difficult to decorate without the expense of scaffolding. A silicate paint, although matt, would match more closely the appearance

of any retained paints as they don't mottle as much as limewash due to their greater water repellency.

Chemical Analysis

Chemical analysis of the renders is not required in my opinion unless the Conservation Officer particularly wants further analysis. The existing renders are lime renders of different periods, some applied well and more recent renders applied poorly.

Planning etc

The proposed works will require appropriate planning and listed building consents from the local council, from whom advice should be sought in advance of any work commencing and any necessary approvals given in writing.

I hope this covers everything but if I've missed something or require any questions answering, please do contact me at your convenience.

Yours sincerely

Conservation Team Manager

DEBI Awards – Sustainable and Overall Winners 2016

Build It Awards – Best Builders Merchants for Self Builders - Winner 2016

Rural Business Awards – Manufacturing Winner 2016

Federation of Small Businesses 2007 Business Champion Award Winner – Manufacturing

Peace of Mind

Both for our clients peace of mind and our own we carry comprehensive insurance cover as follows:

Public Liability - £5 million

Products Liability - £5 million

Employers Liability - £10 million

Contract Works - £480,000

As well as our enviable reputation, Mike Wye & Associates Ltd are also members of two Government certified schemes for the building industry:

Constructionline - membership shows that we have met the requisite standards for Customer Service and hold appropriate levels of insurance for Construction Work

Acclaim - membership shows that we have met the requisite standards for Health & Safety