Terranova, a Popular Stone Imitation Cladding: Strategies and Techniques for Restoration

Yves Govaerts, Ann Verdonck, Wendy Meulebroeck and Michael de Bouw

Abstract At the beginning of the 20th century, the application of innovative finishes on façades became a popular phenomenon in Belgium. Decorative renders were frequently used to hide the aesthetically imperfect structure and to imitate valuable natural stone features. In order to create the appearance of French stone, ingredients such as lime, mica and crushed natural stone were added to white cement. Afterwards, the surface was scratched or scraped to shape a rough texture. As a result, a convincing 'simili-pierre' or 'stone imitation' masonry was obtained, after drawing simulated joints into the wet render layer. Today, these imitation finishes suffer in most cases from discoloration, cracks, peeling off and other damage which has completely changed the initial perception. Since knowledge is lacking concerning their composition, properties and application techniques, many questions remain unanswered within the conservation area. As a consequence, incorrect decisions may be made during restoration campaigns, which may lead to additional damages. A remarkable example of a simili-pierre render is the former commercial product *Terranova*, which is the focus of the research. By means of literature studies, the exploration of historical patents, laboratory analysis of representative samples and a comparative research between similar claddings, this paper proposes legitimate solutions to revitalize the Terranova finishes. It is found

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J. J. Hughes et al. (eds.), *Historic Mortars*,
https://doi.org/10.1007/978-3-319-91606-4_7

that both original mortar formulas and historic application guidelines are key elements which form a fundamental contribution to restore stone imitating renderwork in a sustainable way, with respect for authenticity issues.

Keywords Terranova · Decorative render · Stone imitation · Restoration
Simili-pierre finishes

1 Introduction

One of the consequences of the Industrial Revolution in the 19th century was a tendency towards standardization of building materials. Instead of working with time consuming and expensive traditional techniques at the building site, prefabricated products such as cast iron elements and ready-mix plasters entered the trading markets. Particularly the introduction of Portland cement led to innovative compositions towards exterior decorative plasterwork. Besides the protection and conservation of the underlying structure, façade renderings had to fulfil an additional aesthetical function (Everaert sd.). For instance, to create the illusion of a perfect brickwork or stone appearance, many façades have been manipulated in the past, not only to camouflage damage or cover building traces, but chiefly to increase the status of a building with relatively cheap materials. Before the emergence of Portland cement, imitation brickwork for outdoor applications was mainly established by applying a lime mortar in which idealized brick contours were colour washed and simulated joints were oil painted (Verdonck et al. 2014). However, at the end of the 19th century, imitation mortars no longer needed paint layers; the colour and texture of the finishing mortar itself created an appearance of real natural stone after hardening.

Although the stone imitation industry is born in Germany (Danzl 2002), the material is generally accepted in Belgium from the beginning of the 20th century, where it is known as 'simili-pierre'. As a consequence of its massive application, many of these façade finishes have survived and they still have an important share in the existing Belgian building stock. Being part of the streetscape, stone imitations are encountered in two different forms: as a render layer on masonry surfaces or as a precast decorative artificial stone which is integrated into the façade. In the Belgian context, the majority of the artificial blocks and decorative plasterwork was fabricated to approach as closely as possible the appearance of "French stone", which is a collective term for light coloured rocks that were imported from France during the 19th century, such as *Euville* stone and *Savonnières* stone.

By using historic sources and characterization methods, this paper tries to formulate a repair render composition to restore the peculiar simili-pierre render *Terranova*. Although it is believed that most stone imitations were prepared on-site, this type was a ready-mixed mortar (Kapferer 1911a). Since the ingredients were already mixed in correct proportions at the factory, a uniform result of high quality was acquired. As a consequence, the composition remains the same on different façades; only the texture can differ case by case, due to variations in the original finishing technique and erosion by the test of time. Therefore, the outcome of this research can be directly employed for specific conservation issues and the methodology may be useful for characterizing other historic mortars.

2 Terranova

A remarkable Terranova application can be found on the art deco façades of *De Roma*, a cinema complex from 1928 in Borgerhout, Antwerp, Belgium (Fig. 1-left). The composition of the façades is based on a rhythm of predominantly straight lines, balconies and bay windows. Uniform shades of the simili-pierre finish generate a striking architectural effect of light and shadows. The material itself performs an important decorative function. As shown in the microscopic image (Fig. 1-right), the mortar is applied in two layers: a rendering layer and top layer, each with a different composition.

From the late twenties on, the product Terranova regularly appeared in Belgian architectural journals, and technical handbooks, where it was promoted through

Fig. 1 Historic cinema "De Roma" (1928, north façade), Antwerp (Belgium): upper floors are finished with Terranova (Picture: Y. Govaerts) [left]; Terranova sample from the west façade of "De Roma" (Picture: L. Dekeyser) [middle]; Optical microscopic image of the layered structure of the historic sample: I. Top layer, II. Rendering layer (KIK-IRPA 2011) [right]

advertisements (Becker 1932) and case studies (La Cité, 1928) or presented as '... *a modern render with a characteristic vivid colour and sustainable properties* ...' (Oosterhof 1932).

Interesting examples of similar render finishes can be found in every urban area in Flanders, including the prominent residential boroughs of Brussels (Govaerts et al. 2016). The emerging popularity was principally a result of changing fashion within the domain of architecture. This new material perfectly fit into the vision of the rational architects, but it was also loved by ordinary people, who were now able to decorate their façades with an apparently good-looking and eminent material. However, imitation renders were hardly 'new' building materials. Carl August Kapferer already developed the Terranova render in 1893 near Freihung, Germany (Garda 2003). Given the success of this ready-mixed plaster, the firm *Terranova-Industrie C. A. Kapferer&Co* was able to expand and various subsidiary companies were found over Central Europe. No manufacturing unit could be traced in Belgium, because the product was imported and distributed by the company *Pommée & Köttgen,* which was located in the German-speaking region of Belgium. Although the product received less interest after the Second World War, its manufacturing continued, though with a slightly different composition formula to reflect other properties (Garda 2003).

3 In Search of the Terranova Composition

Today, professionals often encounter difficulties when dealing with stone imitating renders from the beginning of the 20th century, since there is a lack of restoration philosophy and knowledge with regard to their conservation. Although the Belgian cities are enriched with a considerable collection of historic claddings, an elaborate inventory does not exist. As a result, most claddings are not yet identified, including Terranova finishes. However, Terranova was a frequently used material, according to descriptions in old plasterer's manuals (Oosterhof 1932; Arendzen and Vriend 1936; Poptie 1948).

The present research is based on the Terranova finish of the old cinema building *De Roma* in Antwerp. Because of the uniform fabrication of this render product, the findings of this case study are considered to be representative for other cases making use of Terranova. Unfortunately, literature search on building specifications and old handbooks did not reveal any detailed descriptions on the composition of this particular finishing material. The authentic formula to produce Terranova is never mentioned, being a well-kept trade secret. However, an extensive patent search enabled the authors to trace the original ingredients.

The first patent of Terranova, requested by Kapferer in 1893, is not available in any European patent database. Presumably this document ended up in a private collection, just like a later patent from 1896, which is preserved in the archives of Weber & Broutin (Garda 2003). The oldest accessible patent signed by Kapferer dates from September 4, 1899. The focus lies on improvements in the manufacture of cement (Kapferer and Schleuning 1899). As a reaction to the less attractive gray cement renders, which suffered from problems concerning their hardness, vapour transmission and stained aspect, an alternative for exterior plastering had to be found. The goal of the patent was to obtain a more attractive colour and to use this new cement both for decorative as well as structural purposes (for example as joint mortar for masonry). Clay (kaolin), feldspar (orthoclase), lime and pure quartz sand, the main components of the formula, were burned together to manufacture cement clinker. About 7 months later, a new patent appeared, focusing on the role of feldspar within the cement (Kapferer and Schleuning 1900). On the one hand, feldspar was necessary for the production of soluble silicic acid, which is needed for binding, and on the other hand it had to improve the flux or workability properties.

The year 1911 was a milestone in the development of Terranova. Instead of mixing the ingredients on site, Kapferer developed a ready-mix dry mortar, which only needed water to start the binding process. Through this industrialization of the production process, the quality and proportions of the plaster were easier to control. This implies that the finish of De Roma is not representative for buildings before 1911, since the early mixture was probably related to delicate fluctuations in its composition. At the time, it was also no longer recommended to paint the renderwork after application, because the mortar itself acquired aesthetic qualities.

> '… The new plastering mortars were employed where the plastering was not to be subsequently coated with paint. Very fine architectural effects were obtained by staining the mortar, by adding granular rocks and minerals to the slaked lime …' (translated by the authors, Kapferer 1911a)

In the same year another patent appeared, containing a *'Method of improving the permeability to air of dry plastering-mortar'* (Kapferer and Weber 1911b). This is considered as an important finding, since patents concerning this topic were requested in at least three countries within a few days. According to the patent, the composition comprised small powdery components, which resulted in a very compact, low vapour-permeable render. Adding oil or other fat additives would enhance the bonding capacity and at the same time a smaller amount of lime could be used in the mixture. This led to a mortar, which was considered less sensitive to rapid dehydration and therefore cracks would be reduced. The oil, however, increased the formation of micro-pores, which resulted in a volume expansion of about 10%. In addition, previous experiments indicated some problems to distribute the additives uniformly into the lime paste. The patent suggests adding a mixture of oil, acetone and starch additives. The main purpose of the starch was to increase the bonding process, without the need for more water. Immediately after the slaking process, the lime putty had to be sprinkled with the considered mixture. Because the lime paste would still possess internal heat, the acetone would evaporate quickly. As a result, the lime would be less sticky, making it easier to achieve a uniform distribution.

In 1926, one year before the construction of the case study, an 'improvement patent' refers to mortars for architectural purposes (Kapferer 1926). To create a sparkling, stone imitating effect, particles of mica, natural stone or stone-dust were added to the mixture for the top layer. However, according to Kapferer, the aesthetic aspects tend to disappear. To avoid visual complications, the lime particles may not cover other elements such as mica minerals. By adding organic additives, which envelop the individual stone aggregates, the formation of a lime blanket is prevented. Consequently, mica fragments are situated in the surface layer, ensuring a sparkling effect. An example of such organic compound is mineral oil, but also glycerines can be added.

These patents from *Terranova-Industrie C. A. Kapferer&Co* give an overview of the chemical bonding processes, but unfortunately—apart from the cement formula—they do not mention any ratios or percentages of the applied ingredients. Only a scarce number of Belgian patents with formulas for stone imitating renders provide useful details. For example, in 1908 Jean Soille publishes a patent titled '*Composition pour pierre artificielle*' (Soille 1908). The product is named 'Pierreuse' and it reveals an approximate ratio for the addition of mica: 20–125 g of mica is used for 100 kg of crushed stone. Commonly used proportions for outdoor scrubbed mineral plasterwork are found in historic technical manuals, which are expressed in volume units[1] (Oosterhof 1932; Arendzen and Vriend 1936).

Chemical examination (SEM/EDX) of a sample from the west façade of the case study (Fig. 1-middle), performed by the Royal Institute for Cultural Heritage (KIK-IRPA 2011) reveals new information on the ingredients (Figs. 2 and 3). The binder (16.5% hydraulic) consists of calcium, silicon, and a small amount of magnesium, potassium and aluminium (feldspar). Presumably, the binder is a combination of white cement and lime, because non-hydrated hydraulic residues are observed; yet it is hard to identify them by optical microscopy. Note that the composition of historic 'white cement' is different from ordinary white coloured cement. 'White cement' was known as heavy white lime mixed with about 10% of bright coloured cement (Leduc 1902).

The aggregate is composed of 50% quartz sand and 50% limestone fragments, which are derived from coarse crushed Euville stone.[2] Because of the presence of limestone both in binder and aggregates, it is not possible to identify their ratio. The sand particles are characterized as angular, average coarse units and mica particles are recognized with a size of a few millimeters. In contrast to the patent specifications, no traces of oil addition are detected.

All patents from Kapferer generally correspond to the scientific findings. Consequently, if the instructions above are properly applied, it should be possible to reproduce a good approximation of the Terranova render. Nevertheless, grain sizes and colours may be different from the reference surface, because historically, there

[1]Recommended proportions for a scrubbed top render:
1 Portland cement: 2-3 sand,
1 slaked lime: 1,25 trass: 2,5-3 sand
1 Portland cement: 0,5-1 trass: 3 sand.

[2]Euville is a limestone, containing calcite cement and crinoid fragments. The particular stone was imported from the quarry of Euville-sur-Meuse (France) and commonly used in the Belgian building industry during the 19th century.

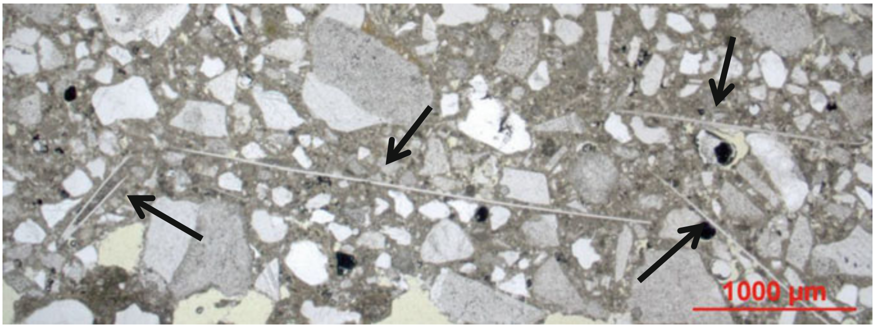

Fig. 2 Optical image of a thin sample section: the arrows indicate mica particles. (*Source* KIK-IRPA 2011)

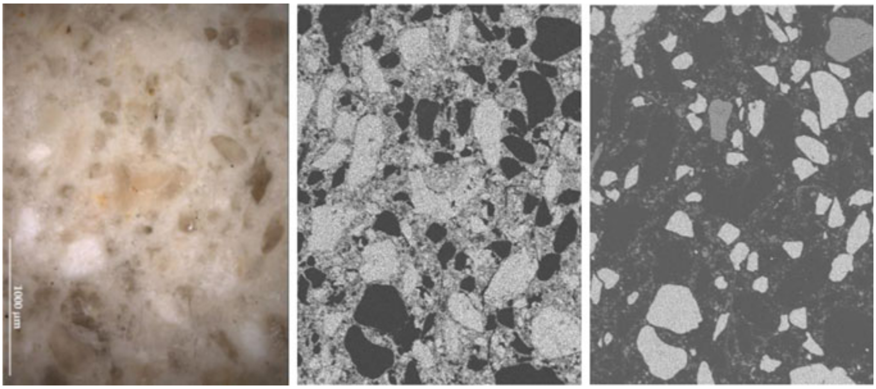

Fig. 3 Distribution of the elements in Terranova, measured with an electron microscope (SEM): sample [left], limestone fragments and the binder are highlighted as calcium [middle], quartz sand is visible through the mapping of silicon (white spots) [right]. (*Source* KIK-IRPA 2011)

were more versions of this render product (from fine to coarse). Therefore, it is always useful to perform preliminary test-strips on the façade before restoration, in order to verify the share of additives in the mixture.

4 Historic Guidelines for Application

Before spreading the rendering on the façade surface, the support has to be prepared by removing all impurities and flaking parts with a wire brush. In addition, the brick or concrete support gets a roughened texture to improve adhesion with render layers. As illustrated in Sect. 2, a stone imitation cladding is generally applied in 2 layers (in some cases even 3 layers). Building specifications and related documents rarely focus on the rendering layer, yet this is an important element. This layer has to flatten the support and to give strength to extended ornamental elements. Therefore, its compatibility with the finishing Terranova layer is essential. One historic manual (Arendzen and Vriend 1936) provides a description of its composition, which has specifically to be used in case of Terranova: 14% cement, 14% shell lime and 72% sand, mixed with an appropriate volume of clean water. Shell lime is a weak hydraulic lime, which is no longer available in its original composition in Western Europe. According to the heritage agencies, an alternative for this ingredient is air lime. Besides these historic instructions, optical analysis reveals the presence of 4 units of binder material to 5 units of aggregate. However, it must kept in mind that the rendering layer formula varies depending on the case, because this mortar was prepared on site. In case of *De Roma*, the binder can be classified between strong hydraulic lime and early cement. The aggregate is identified as quartz sand with a smaller amount of feldspar, trass and stone fragments. This preparation layer is applied with a thickness of about 5–10 mm. To improve the adhesion with the top layer, grooves are drawn randomly into the wet base layer. This preparatory action is visually confirmed by many case studies. 'Het handboek voor den stucadoor' ('The plasterer's manual') describes the preparation of the top layer:

> '… It is recommended to mix the required amount of Terranova powder at the same time; this is for coarse granular material 1 bag for 3 m^2, and for fine-grained material 1 bag for 4 m^2. Terranova has to be mixed with clean water to become a solid mass. The craftsman should pay attention to the mixing process, in order to avoid lumps …' [Translated by the author from Dutch] (Oosterhof 1932)

This excerpt proves the existence of various Terranova products, varying from a coarse to a fine-grained texture. The mixing process was done mechanically, using a mortar mill with rotating blades (Fig. 4-left). By means of a trowel and wooden float the top layer was applied to the pre-wetted surface to a sufficient thickness of 5–8 mm. Such thickness is required because the finishing treatment involves material losses.

> '… The final stage is achieved by means of a sharp steel lath, making it possible to scratch the Terranova layer: it is clear that this action can only be carried out when the top layer is hardened and dry. By doing this, grains will sprout out the façade …'. [Translated by the author from Dutch] (Oosterhof 1932)

The scratching process can only be applied when the entire façade is rendered. As well as the standard Terranova type, a coarser grained version was popular: *Terranova grana*. However, the application technique of this type is slightly different: after roughening up the rendering layer, the top layer is pressed with a wooden float to compress the grains. By doing so, binder will come to the surface and has to be wiped off with a brush before the hardening process starts. In order to obtain a regular surface, it is necessary to repeat this treatment. After 3–4 days, the remaining binder sludge needs to be removed with dilute hydrochloric acid.

Fig. 4 Vertical mortar mixer [left] (Oosterhof 1932); simulated joint [middle] (Govaerts 2012); tool used for drawing joints into a recently rendered surface [right] (Geldof et al. 1969)

Previous methodologies are in accordance with similar patents for other types of stone imitation, such as the "Procédé de fabrication d'un produit imitant la pierre" (Leclercq 1921):

> '… Applications of the render on stone, brick, wood, metal and particularly on paper requires a division in layers, the render is applied by means of a knife; subsequently the surface is brushed to absorb remaining sludge. Afterwards the surface is divided according to the rules of architecture, sanded and washed after completion …'. [Translated by the author from French]

After a short period, simulated joints can be drawn into the plasterwork by means of a small wooden instrument (Fig. 4-middle/right).

5 Damage Typologies

In order to effectuate correct conservation strategies, an assessment of damage patterns is required. After all, it is important to have a proper idea of the origins of the problems, because improper treatment may lead to recurring damage. The following paragraphs describe the most important damage typologies that were observed within the case study (Fig. 5) and concentrate on the origins.

5.1 Soiling and Discoloration

In urban context, dark contrasts are principally generated by dirt concentrations from the air pollution, which have a major impact on the building's image. Especially when the render material contains limestone fragments—which is nearly always the case when dealing with stone imitation claddings—black crusts are formed. These crusts arise when limestone fragments interact with atmospheric SO_2, forming gypsum efflorescence. Higher concentrations of sulphate are linked to

Fig. 5 Damage assessment of the north façade (Govaerts 2012)

a greater amount of gypsum, leading to thicker crusts over time (Ozga et al. 2011). Subsequently, polluted air and rainwater containing dirt particles derived from oil or coil combustion, are absorbed by the render finish and triggers the black colour. On the other hand, rainwater can also possess a cleaning function. After all, a rain shower will rinse off dust and soot from these crusts. However, surfaces beneath cornices and windowsills are covered, and therefore unreachable for rain showers, resulting in major dirt spots (Vanhellemont et al. 2008).

5.2 *Cracks*

Crack formation can have different causes. Often it is not a consequence of the render itself, but caused by thermal expansion, settlement or corrosion of the support. On the other hand, the render composition may cause micro cracks during the drying process due to shrinkage, which may grow under the influence of water infiltration. Immediately after applying the mortar on a support, the binding process starts and the strength is gradually achieved by hardening. A cement based plaster obtains its strength properties rather quickly, which implies the creation of a more brittle material in contrast to a pure lime mortar. The combination of shrinkage and a lack of elasticity lead inevitably to the appearance of small cracks. When the binder of a render consists of lime, the binding process will take longer, so the mixture has more time to correct the cracks. Since Terranova is a lime-cement mortar, hair cracks are limited because of the self-healing effect (BBRI 1998). Besides the nature of binder, also the proportions of the ingredients play a major role in shrinkage effects. A larger share of binder and a higher amount of water implies increased shrinkage. Hair cracks may seem harmless, but in case of water intrusion, there is a significant risk of frost damage in winter conditions.

5.3 Flaking and Peeling off

Due to a constant presence of moisture, ice formation will cause stresses between the render layers or at the edge between render and support. After a while, the adhesion between rendering and top layer will decrease and the mortar will peel off. Another possible cause is the presence of dissolved ions in rainwater or groundwater. After absorption of the substance by the façade and evaporation of the water, complex salts are formed. When the salts crystallize, they can also create mutual compressive stresses, resulting in salt contamination and peeling off phenomena (De Clercq 2012).

5.4 Vegetation

Vegetation, usually observed as algae, often occurs on windowsills causing green zones. Formation of algae is mainly caused by long-term high humidity levels. The architectural details and the orientation of the façade are decisive factors in their growth. Through lack of sunshine and high porosity of the finish, the cladding is not able to dry. This biological film may encourage an increase of water infiltration, making the material even more sensitive to frost damage. In addition, fluctuations in the moisture content encourage the film to swell and shrink, causing stresses in the render cladding.

6 Restoration Strategy

Before starting the conservation and rehabilitation campaign, a correct diagnosis is required. The damage assessment shows that it is essential to repair any affected support before applying a repair render. However, during restoration, attention should be paid to the preservation of a maximum amount of authentic fabric (ICOMOS 1964). Visual inspection and systematically hammering the wall surface should help to distinguish damaged from intact surfaces. Reducing future decay can initially be accomplished by handling the current issues. Usually it is not feasible or appropriate to modify the detailing and geometry of the façade without compromising the historic integrity, but small invisible interventions may result in advantageous implications, such as providing all windowsills and protruding parts with a dripline in order to avoid moisture concentration beneath windows. Also stagnation of rainwater should be avoided and vegetation has to be treated at all times. Interventions to reduce the humidity in plasterwork are encouraged to minimize the risk of frost damage.

Performing test areas with cleaning techniques and a repair mortar is indispensable to establish correct cleaning, consolidation and restoration works. Contemporary cleaning techniques generally rely on hydro pneumatic blasting technology, but because of their potentially abrasive effects, it is useful to try more traditional dry (Wishab sponge) or wet cleaning methods (purifying chemical pastes) (Fig. 6).

Vegetation can be removed by brushing off the algae, but it is strongly recommended to apply a moss and algae killer to be sure that all organisms are eliminated. After the intact authentic material is cleaned, a repair mortar is needed to fill in cracks and lacunas. This repair mortar must be physically compatible with the existing materials and should visually match the sound parts, without causing damage. To strive for authenticity and similar properties as the original materials, a repair render should be composed on the basis of the historic patent study and laboratory research. A significant problem is the fact that some materials described in historic formula are no longer commercially available. For instance, according to an Italian manufacturing unit of Terranova, the ingredient Cromocemento (a high strength Portland cement), was used as binder for the top layer. Modern Portland cement can be used as a replacement, but this will not be representative due to the

Fig. 6 Two appropriate cleaning methods: Mora cleaning gel covered with Japanese paper [left] and scrubbing with a dry Wishab sponge [right] (*Source* Govaerts 2012)

large difference in hardness and alkali level. Since the binder is composed of both cement and lime, also the latter needs to be defined. The question is whether the measured hydraulicity level is caused by mixing hydraulic cement with non-hydraulic air lime, or by using a mixture of cement and hydraulic lime. This is not specified in the historic sources and not determinable by lab analysis. A good choice for hydraulic lime is the *Saint-Astier* natural hydraulic lime. This is an impure limestone with a relative high percentage of silica (13%), which approaches the results of the lab analysis (moderately hydraulic, NHL 3.5). Choosing natural hydraulic lime instead of non-hydraulic air lime has a considerable influence on the final render appearance; while air lime has got a very bright colour, NHL is characterized by a beige colour. Combining the binder with quartz sand, crushed Euville stone fragments and mica particles in correct proportions, should provide a good approximation of the original Terranova composition. In case of poor workability, the historic patents prescribe the addition of a small amount of linseed oil to the mixture. Adding organic additives, for example glycerines, would ensure the visibility of mica fragments in the top layer.

Before applying the repair mortar in accordance with the guidelines (Sect. 4), the damaged surface has to be prepared. Where the top layer has been peeled off, it is recommended to remove also other loose edges of the Terranova layer (Fig. 7a). To restore in an aesthetical way, a rectangular geometry is carved out along the simulated joints (Fig. 7b). The rendering layer is preserved and is successively dusted, wetted and roughened (Fig. 7c/d). When large cracks are noticed they need to be cleaned and they are usually injected with elastic sealant. The sealant is able to absorb small external and thermal forces, but if the crack is still active it is recommended to renew the rendering layer and add a reinforcement mesh. Finally, the new top layer can be applied, according to the historic formula (Fig. 8). In order to repair a large area or even the entire finishing, it is recommended to add profiles on the façade as a reference to obtain a uniform layer. The profiles are traditionally fixed by means of clamp hooks and clamp strips at a certain distance, which correspond with the desired layer thickness. However, in practice the profiles are fixed by throwing a piece of wet mortar against the wall to temporarily 'glue' the elements. During the restoration process it is advisable to use external scaffolding instead of ladders, to avoid scratches in the upper layer, due to shifting of the endpoints. In general, the finishing treatment has to be performed by one craftsman.

This is because every individual has got a very different feeling with the scratching technique, which creates lots of differences in texture. Moreover, it is essential to protect the new cladding with a canvas in case of heavy rain or exposure to sun, because they may provide a profusion or lack of binding liquid. To create simulated joints, straight lines have to be drawn in the top layer, when the fabric is still fresh. Subsequently, a cement based mortar is pressed in the joints right after hardening. In some case studies, it is observed that sometimes joints were painted, or that the grooves were left empty, creating shadow effects.

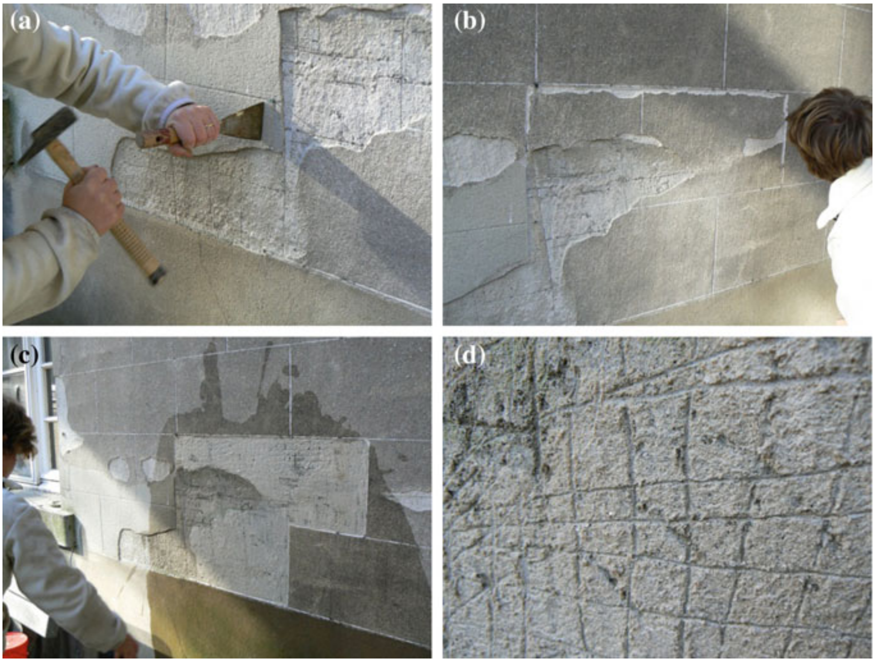

Fig. 7 **a–d** Preparations to repair a damaged stone imitation cladding. After the top layer is removed, the surface is moistened. Afterwards, a rough surface is created to improve adhesion (Govaerts 2012)

Fig. 8 Final stage to repair damaged exterior stone imitations. The stone imitation render is refabricated and spread onto the façade (Govaerts 2012)

7 Conclusions

Comparing the scientific analyses with relevant historic patents and technical literature resulted in a theoretical repair mortar formula for *Terranova*, a ready-mix stone imitating plaster used from the 1910s to the 1940s in Belgium. This research focuses on its application in Belgium and the search for a compatible repair render composition and appropriate finishing techniques, which are needed for conservation and restoration purposes. The current findings indicate that the considered Terranova cladding of the case study is in relatively good condition. A poor façade detailing and the long-term influence of weather conditions form the basis of the most commonly damage problems. With respect to the original historic fabric, the façade's integrity can be re-established by relying on a repair render which is similar to the authentic material. However, historic sources do not give detailed information with regard to the render ingredients, not mentioning any proportions concerning binder, aggregate and water content. Optical microscopy techniques and SEM/EDX analysis provide additional data, but considering this as the only source to formulate a repair mortar does not suffice. Both material characterization methods and historic literature are necessary to achieve a particular degree of authenticity. Yet, due to inaccurate mortar recipes as well as through ageing of the historic fabric, there is a chance that the repair render does not visually match with the intact material. Therefore, it is essential to perform further research towards historic stone imitation claddings, in which the outcome of mortar characterization is verified by a range of repair mixtures that are based on historic formulas. Finally, their appearance should be measured and linked to the mortar composition, and should be made accessible as a tool for conservation practitioners. This paper concentrates on the fundamentals for establishing a repair strategy during restoration of Terranova façades with respect for their heritage value.

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