Company Logo	Company Name

Society of Façade Engineering

Application for membership

Candidate's Report on Technical Experience

The Candidate	
Full name:	[redacted]
Position at Company Name:	Project Manager
Email address submission application:	[redacted]
Contact number:	[redacted]

The Employee responsible for endorsement and countersign	
Full name:	[redacted]
Position at Company Name:	Project Office Director
Email address submission application:	[redacted]
Contact number:	[redacted]

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Introduction

I joined Company Name in February 2018, and I worked as Project Manager for the past 3 and a half years. Since the moment I joined the specialist façade contractor I have been responsible for the execution of a mixed-use project in London named The Project. Throughout this period of time I was responsible for a wide range of project phases, including PCSA, Pre-Construction, and Construction.

Before joining Company Name family, I worked for Previous Company Name, between January 2014 and December 2017. During this four-year period, I covered a number of positions, spanning from façade designer, design manager, project manager. I worked on a number of complex and bespoke façade projects at different stages.

The two employments combined account for more than 7 years of experience in the façade industry, without conserving further previous experience gained abroad before moving to the UK at the end of 2013. Additional information can be found in the CV attached to my application.

The Project is a mixed-use development in central London, located between Harvey Nicholson and Harrods in Brompton Road. The project, developed by The Architect, comprises a suite of residential apartments, office spaces, retail units, a rooftop restaurant, and a renewed underground entrance. The original buildings were partly demolished and partly refurbished, depending on their listed grade. The majority of the original facades were maintained, and new built glazed shopfronts were erected within the existing openings at ground and first level.

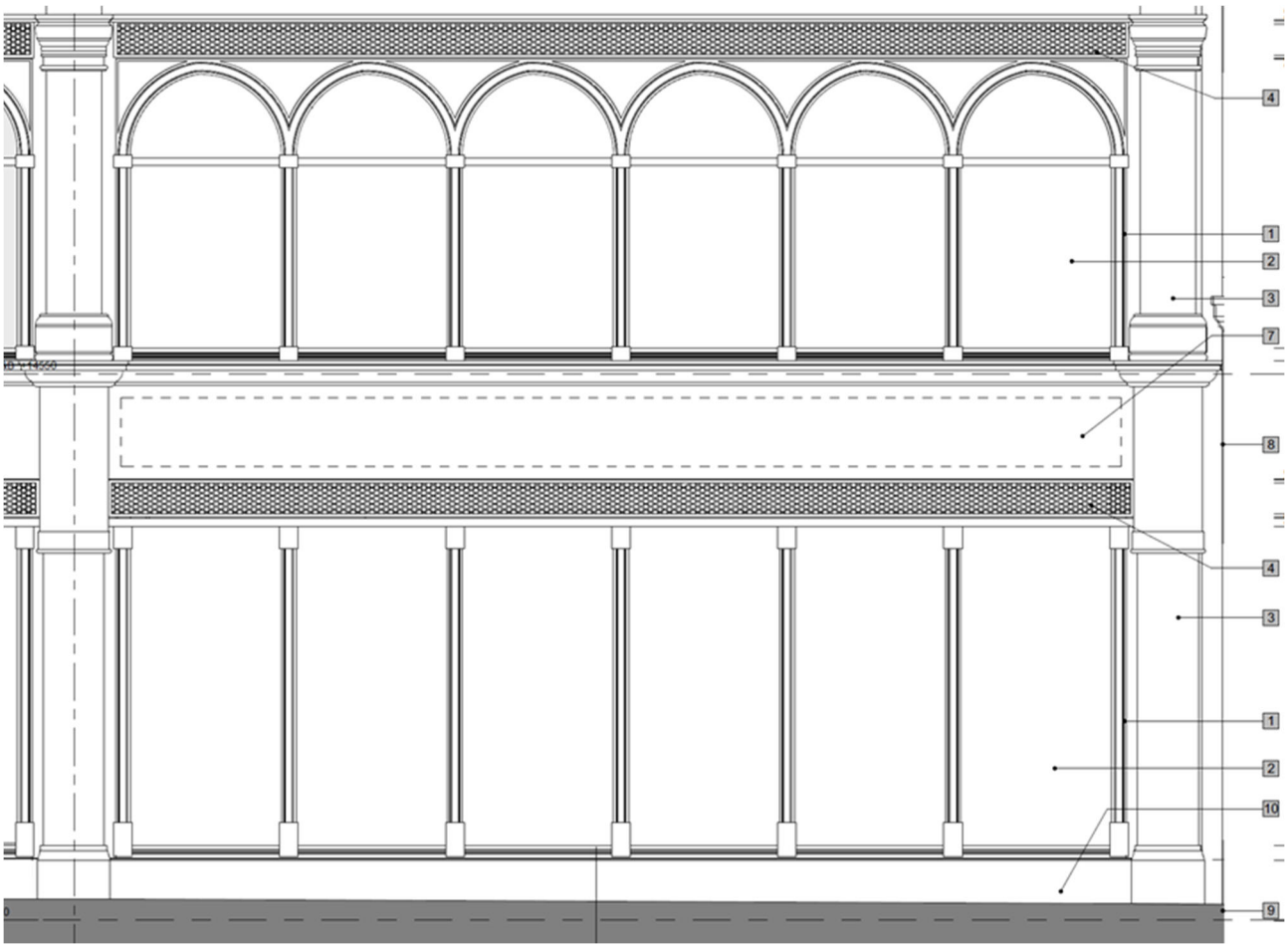
IMG01 – CGI representing The Project viewed from the corner between Brompton Rd and Sloane St

Working as Project Manager for The Façade Specialist Contractor, I was responsible for two different packages (Cladding & Shopfronts), constituting the main reference contact for the Principal Contractor, and The Employer. The overall size for both façade packages combined is circa 4,500 square meters, for a contract value of £14M approximately.

This report is focused on one of the most difficult technical challenges I had to manage across the whole project execution, and it is related to the coating of the external shopfront cladding for the retail unit assigned to the international luxury brand The Tenant. The development of a suitable solution for this specific application required a long and complex façade engineering process, which I had to lead on behalf of The Façade Specialist Contractor. The process involved colleagues from our sister company in Italy, but also external experts, suppliers and applicators.

Project requirements

As mentioned previously, the glazed shopfronts located at ground and first floor were designed so that they could be installed within existing openings. The Architect developed an architectural design based on glazed windows cladded externally and internally with metal components, to match the visual appearance of other high-end shopfronts in Brompton Road and Basil Street, Such as Harrods.



IMG02 – Elevation developed by The Architect for The Tenant shopfront

IMG03 – Shopfront of the department store Harrods in Brompton Road

The Tenant branding required a shopfront cladding to be realized made of real, aged. The Architect explored this option but found that a solid bronze cladding presented too many technical challenges (weight of the components, fabrication tolerances, availability of raw material, etc.) and could not meet the developer's budget allocated to the project.

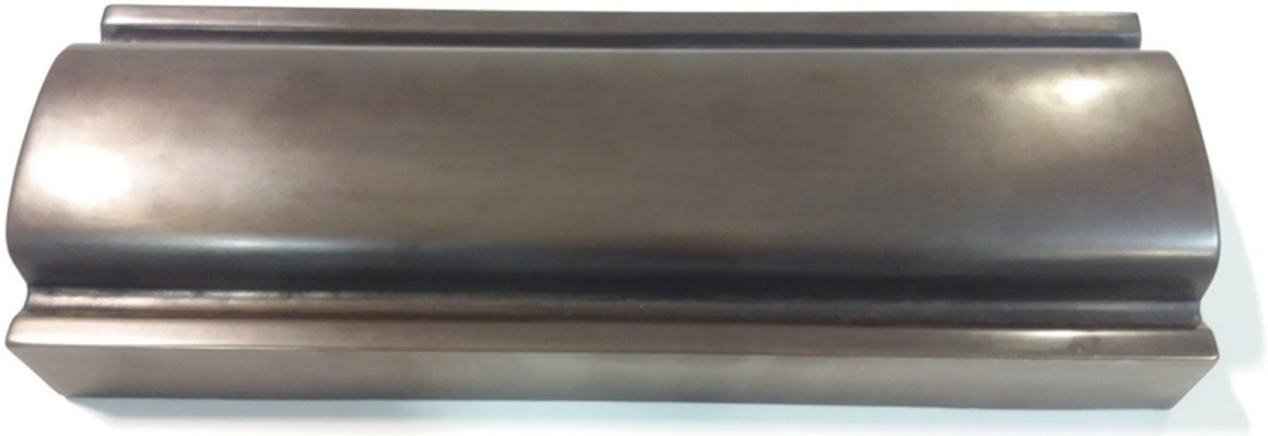
The Architect worked with The Façade Speicalist Consultant and developed an alternative solution, based on an aluminium cladding to be coated with a real bronze paint finish, processed to achieve a distressed appearance. At the end of their research process, The Architect and The Façade Speicalist Consultant specified the following product:

- **Metalite BRAD MX-AC Bronze External Aluminium Chromate**
- **Manufacturer and applicator: The Supplier**

It is important to note that, as part of The Employer's requirements, the specified finish should have complied with the 12-year warranty applied to the shopfront system as a whole.

Initial design approach

During the design phase I led the discussion with the manufacturer of the aluminium cladding and also the supplier of the real bronze finish, as both items would have been procured in the UK. We obtained samples of the most typical cladding components, and we free issued those to the applicator of the specified finish so that they could be coated. Once this process was completed we offered the samples to the project team for review and approval.



IMG04 – Aluminium component coated with a real bronze paint finish

In parallel with the production of the control samples for the specified finish, we also carried out a due diligence process with regard to the durability of the product to be used, particularly in an external polluted environment such as the Knightsbridge area. Conversations were held with the manufacturer/applicator of the finish, in order to determine the level of warranty provided, and to obtain testing evidences that could support a review of the paint durability.

After months of intense exchanges, I came to the conclusion that the manufacturer/applicator was unable to provide any sort of warranty for the product specified by the project team. More importantly, I found that no testing evidence was available to demonstrate scientifically the durability of the specified product in an external environment. At this point in time there was no evidence that the specified product could maintain its performance throughout the 12-year warranty period required by The Employer.

I concluded that the specified product was just a finish, not a component in a fully developed paint system (sequenced as pre-treatment, primer, paint finish, and topcoat).

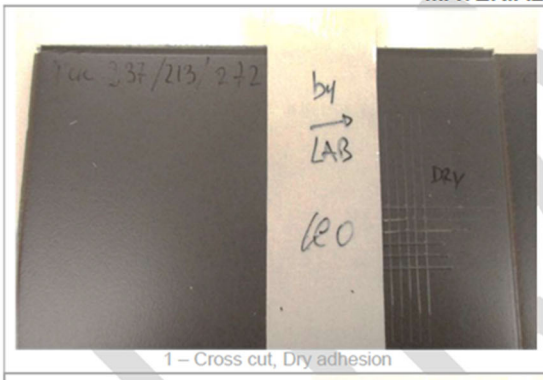
With the support of the Quality Department of The Façade Specialist Contractor, led by The Head of Quality, we completed an initial testing campaign to better understand the performance offered by the specified finish. The tests completed by the Quality Lab of The Façade Specialist Contractor, under the direction of The Quality Manager, followed the Qualicoat protocol for Polyester Powder Coating finished (PPC). This protocol was selected in absence of a more specific testing regime for the specified product.

MATERIAL 1 - LIST OF TEST FOR ALUMINUM SHEET

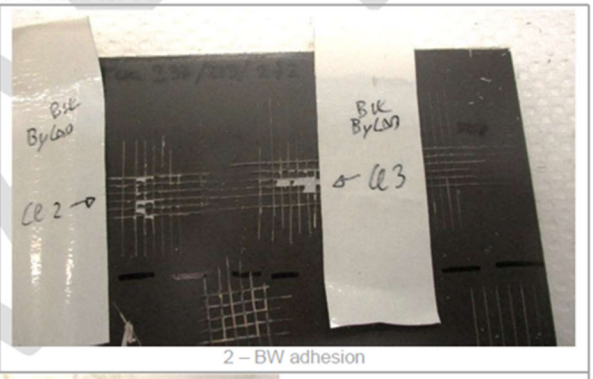
Test Type	IO LAB	Test Standard	Requirements	Results	C/NC
Gloss	IO LAB 06	UNI 2813	Not specified	15.5	-
Coating thickness	IO LAB 05	UNI EN ISO 2360	Not specified	237 to 270 µm	-
Cross cut Dry Adhesion	IO LAB 03 a	EN ISO 2409	Cl 0	Cl 0	C
Boiling water Method 1	IO LAB 09 a	EN ISO 2409	No blistering or detachment Cl 0	Cl 3	NC
AASS Acetic Acid Salt Spray	IO LAB 02	ISO 9227	Penetration of corrosion @ 1000 h 16 mm² / max. length 4mm	After 200 h A relevant detachment of paint start from protected edge	NC
		ISO 4628	Blister @ 1000 h = 2(S2)	Presence of micro blistering on surface.	NC

Note: test requirements as per Qualicoat
Legenda: C=Conform; NC:Not Conform; N/A=Not Applied-Not Applicable

MATERIAL 1 - PICTURES



1 – Cross cut, Dry adhesion



2 – BW adhesion


1 – After 7 days @ AASS

IMG05 – Table of Qualicoat tests completed on the specified finish and results obtained after the initial testing campaign

The results of the initial testing campaign completed by The Façade Specialist Contractor provided us with the evidence that the specified finish was not suitable for an external use, as it did not confirm to the Qualicoat standards. Based on this new evidence we decided to inform The Employer, and to commence the process that led us to identify a suitable solution.

Research of suitable paint system

After receiving the test results on the specified finish, and in absence of a full paint system detailed in the Project Specification, it became apparent that a new, performative paint system was needed in order to meet the project requirements. This conclusion was further substantiated by the results of an independent performance test completed by the paint manufacturer/applicator, which confirmed negative results, and showed a severe degradation of the finish far earlier in the test than the 1000 hours of Qualicoat water testing process (Acetic Acid Salt Spray testing).

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IMG06 – Finish degradation after only 456 hours of the AASS test completed by an independent laboratory

To improve the performance of the specified paint, whilst maintaining a visual appearance compatible with The Employer's requirements, we decided to focus our development on two different areas of the process:

1. **Improving the pre-treatment of the aluminium substrate, ensuring a better adhesion of the liquid paint product and mitigating the risk of corrosion;**

2. **Identifying a top coat layer that could constitute a first layer of defence for the liquid paint system, constituting a barrier against UV degradation, and protecting against the negative effect of pollution and environmental agents.**

I worked with the project team to identify a combination of options and products that could be sampled and tested aiming at finding a bespoke paint system that could meet both The Employer's requirements (visual appearance and longevity). After extensive market research, and discussions held with expert colleagues within The Façade Specialist Contractor, we identified six options that could be explored and tested. These were also discussed and reviewed by The Paint Specialist, which I appointed as independent consultant to assist us throughout this R&D process.

Option No	Option Keyword	Country sampling	Cleaning & Preparing	Primer	Abrasion	InnoMetal product	ClearCoat	Recommended by
Option 1	Lechler	UK	Sanding machines with 240/320 grit sanding paper + UPOL degreaser	Lechler S107 epoxy primer	Abrasion with grit 240/320 to smooth surface	YES	Lechler Clearcoat 0448-GB (09890 – MACROFAN HS 2000 MATT) - Acrylic	Lechler
Option 2	Jaytees	UK	Sanding machines with 240/320 grit sanding paper + UPOL degreaser	Lechler S107 epoxy primer	Abrasion with grit 240/320 to smooth surface	YES	CS0055 - Acrylic resin with UV protection component	InnoMetal
Option 3	Dacrylate	UK	Sanding machines with 240/320 grit sanding paper + UPOL degreaser	Lechler S107 epoxy primer	Abrasion with grit 240/320 to smooth surface	YES	Dacrylate Dacsil 200 - Polysiloxane	Dacrylate
Option 4	FEVE	UK	Sanding machines with 240/320 grit sanding paper + UPOL degreaser	Lechler S107 epoxy primer	Abrasion with grit 240/320 to smooth surface	YES	Monpol Vernidur - FEVE	Clive Plant (procured via Rovac)
Option 5	PVDF	UK	Sanding machines with 240/320 grit sanding paper + UPOL degreaser	Lechler S107 epoxy primer	Abrasion with grit 240/320 to smooth surface	YES	Arkema Kynar Acquatec FMA - PVDF	Clive Plant (procured via NewPaintCo)

IMG07 – Six options of top coat samples in order to a find a suitable product in terms of UV protection

Option No	Option Keyword	Country sampling	Adhesion Promoter	Chromate free?	Adhesion Promoter applied by	Cleaning & Preparing	Primer	Abrasion	InnoMetal product	ClearCoat
Reference	Original	UK	n/a	YES	n/a	Sanding machines with 240/320 grit sanding paper + UPOL degreaser	Lechler S107 epoxy primer	Abrasion with grit 240/320 to smooth surface	YES	Lechler Clearcoat 0448-GB (09890 – MACROFAN HS 2000 MATT)
Option 1	PPC finish A	UK	PPC Tiger finish 068/60306	YES	Specialist Coatings Ltd	Abrasion with grit 120 to smooth surface + UPOL degreaser	Lechler S107 epoxy primer	Abrasion with grit 240/320 to smooth surface	YES	Lechler Clearcoat 0448-GB (09890 – MACROFAN HS 2000 MATT)
Option 2	PPC finish B	UK	PPC Tiger finish 068/60306	YES	Specialist Coatings Ltd	Abrasion with grit 120 to smooth surface + UPOL degreaser	n/a	n/a	YES	Lechler Clearcoat 0448-GB (09890 – MACROFAN HS 2000 MATT)
Option 3	Pre-ox	UK	Anodic pretreatment + Lechler S107 epoxy primer applied soon after	YES	Specialist Coatings Ltd	n/a	n/a	Abrasion with grit 240/320 to smooth surface	YES	Lechler Clearcoat 0448-GB (09890 – MACROFAN HS 2000 MATT)
Option 4	Chrome VI	UK	Chrome VI	YES	Specialist Coatings Ltd	Apply UPOL degreaser without wiping or touching the surface	Lechler S107 epoxy primer	Abrasion with grit 240/320 to smooth surface	YES	Lechler Clearcoat 0448-GB (09890 – MACROFAN HS 2000 MATT)
Option 5	Dacrylate	UK	Dacrylate Adhesion Promoter 150-462	YES	Rovac Group Ltd	n/a	Epidac 115 Aluminium Epoxy Primer	Abrasion with grit 180/240 to smooth surface	YES	Lechler Clearcoat 0448-GB (09890 – MACROFAN HS 2000 MATT)
Option 6	PTI	UK	PT-402 acid etching primer + PT-500KIC2 epoxy primer	NO	PTI	n/a	n/a	Abrasion with grit 240/320 to smooth surface	YES	Lechler Clearcoat 0448-GB (09890 – MACROFAN HS 2000 MATT)

IMG08 – Six pre-treatments tested in order to identify a suitable solution in terms of corrosion protection

With regard to the selection of top coatings, and after reviewing all the five samples provided by different manufacturers, I decided to proceed with one single product (Option 1 of the table in IMG07), as all other alternatives could not achieve the level of visual appearance required by The Employer. Streamlining the process in such a way certainly constituted a risk for the project, as it allowed us to test only one option for the top coat. At the same time, it allowed us to limit the amount of testing activities to be completed, and expedited the whole

process. When the team moved to the next step of testing activities, only six options had to be processed rather than 30 (combining five top coat solutions with six pre-treatment options). This decision explains why the table in IMG08 only features one top coat product for all samples tested.

IMG09 – Comparison between different options of top coats for the liquid paint coating

At the end of the Qualicoat testing process, The Façade Specialist Contractor put forward a set of reports covering the whole list of options for a bespoke paint system. Surprisingly, we found that the worst result was Option 3, where the sample was processed with an anodic pre-treatment, prior to the application of the specified finish. Also Option 6 did not perform well, which led us to exclude acid etching as a pre-treatment solution. We found that the best results in terms of resistance to corrosion could be found in Option 1 and 2, both comprising a Polyester Powder Coating (PPC) pre-treatment. The only difference between these two options could be found in the application (or not application) of a primer between the PPC finish and the liquid metal paint. At this point in time, we had to make a decision as to which option should prevail and be used in the main application process.

Being the project leader, I had again to step up and decide which option should be adopted moving forward. In comparing Option 1 and Option 2, I considered that reducing the amount of products and applications processed used to finish the components would have resulted in a more limited risk in terms of compatibility issues between layers. Furthermore, I considered that the Lechler primer used for Option 1 would have been manually applied by the applicator, with a higher potential for human errors during the main application process. Finally, being aware of the time constraints imposed by the project, I considered that Option 2 would have benefit from a faster application process, without affecting the level of performance.

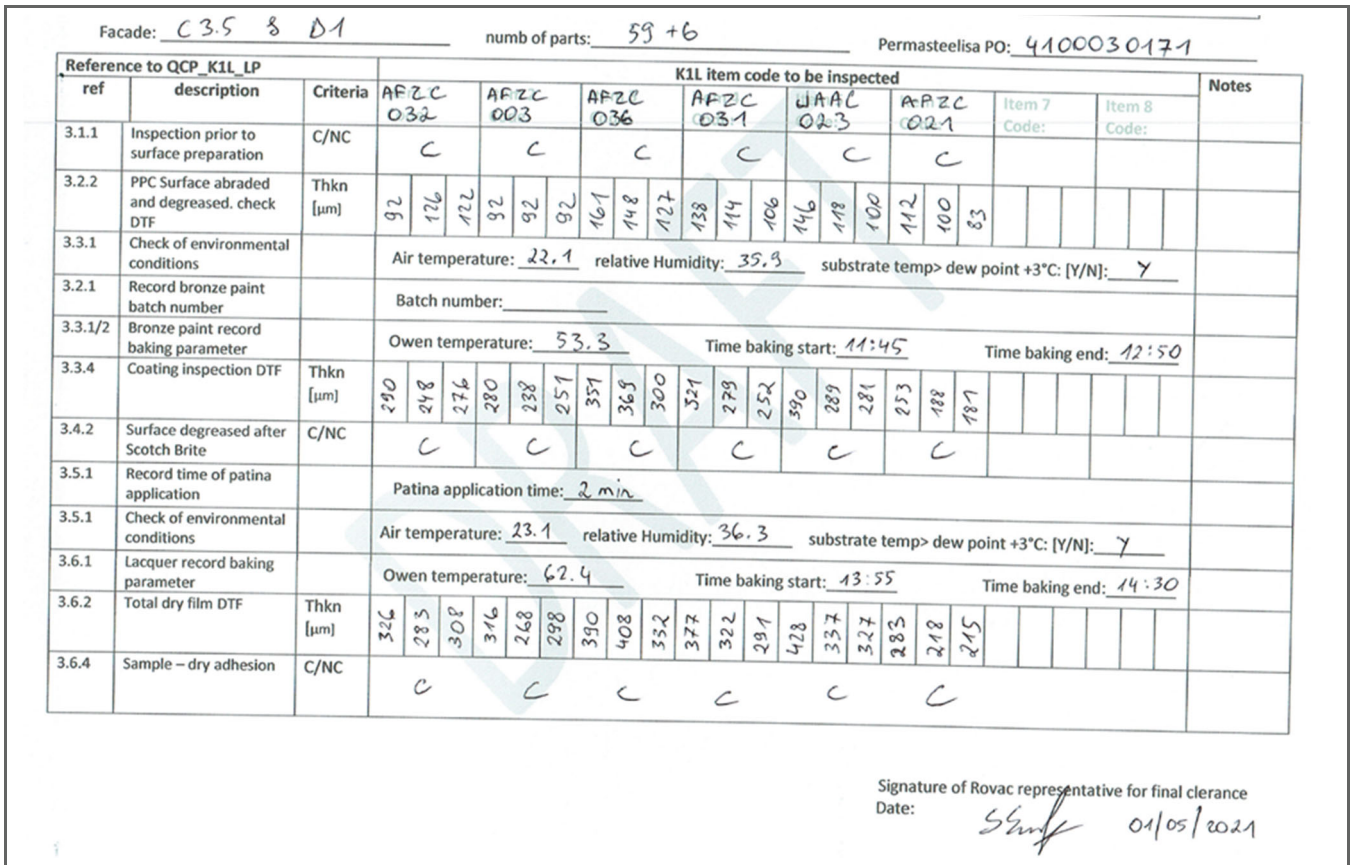
Based on these principles, I decided to move forward with Option 2 described in the table in IMG08, and I therefore made all the arrangements required to commence the application process of the preferred bespoke paint system. In parallel with this procurement activity, the Quality Department of The Façade Specialist Contractor prepared an Inspection and Test Plan (ITP) that was specific to the application of the paint system selected, under the direction of The Quality Manager. The document developed by the QA/QC team contained

a description of the paint system, a fully detailed method statement of the application process for all phases and layers, and a test plan to be followed throughout the whole process. It should be noted that, for the PPC pre-treatment, the team selected the Qualicoat quality control standard, and therefore the selection of an applicator was oriented towards those UK businesses that were certified with Qualicoat. This led us to appoint two different applicators, one for the pre-treatment process, and one for the liquid paint & top coat finish. This option was only pursuable due to the stability of the pre-treatment process, and could have not been achieved with other pre-treatments, such as the anodic pre-treatment or Chrome VI (Options 3 and 4 in the table of IMG08).

In addition to the ITP to be followed by the applicator, I appointed The Paint Specialist as independent inspector to obtain third party assurance that the quality plan established by our organization was suitable for the specific application and adopted correctly by the supply chain. A number of independent inspections were held during the production process, both at the pre-treatment plant and the facility where the liquid paint finish was applied.

IMG10 – Third party inspection for the first batch of aluminium cladding components completed by The Paint Specialist

Part of the ITP was focused on obtaining reliable data on the thickness of the finish applied to the different components, and part was focused on carrying out Qualicoat testing activities on samples coated in parallel with the different production batches. The applicator processed seven different batches of cladding components, and for each component the testing lab of The Façade Specialist Contractor received one flat plate and one portion of the aluminum cladding. At the end of the production campaign, the applicator also provided the full set of QA check sheets compiled with all relevant data.



Facade: C3.5 & D1 numb of parts: 59 +6 Permasteelisa PO: 4100030171

Reference to QCP_K1L_LP ref	description	Criteria	K1L item code to be inspected AFZC 032	AFZC 003	AFZC 036	AFZC 031	UAAL 023	AFZC 021	Item 7 Code:	Item 8 Code:	Notes
3.1.1	Inspection prior to surface preparation	C/NC	C	C	C	C	C	C			
3.2.2	PPC Surface abraded and degreased. check DTF	Thkn [µm]	92 126 122	92 92 92	161 148 127	138 114 106	146 118 100	112 100 83			
3.3.1	Check of environmental conditions		Air temperature: 22.1 relative Humidity: 35.9 substrate temp> dew point +3°C: [Y/N]: Y								
3.2.1	Record bronze paint batch number		Batch number:								
3.3.1/2	Bronze paint record baking parameter		Owen temperature: 53.3 Time baking start: 11:45 Time baking end: 12:50								
3.3.4	Coating inspection DTF	Thkn [µm]	290 248 276	280 238 251	351 368 300	321 279 252	390 289 281	253 188 181			
3.4.2	Surface degreased after Scotch Brite	C/NC	C	C	C	C	C	C			
3.5.1	Record time of patina application		Patina application time: 2 min								
3.5.1	Check of environmental conditions		Air temperature: 23.1 relative Humidity: 36.3 substrate temp> dew point +3°C: [Y/N]: Y								
3.6.1	Lacquer record baking parameter		Owen temperature: 62.4 Time baking start: 13:55 Time baking end: 14:30								
3.6.2	Total dry film DTF	Thkn [µm]	326 283 308	316 268 298	390 408 352	377 322 291	428 337 327	283 218 215			
3.6.4	Sample – dry adhesion	C/NC	C	C	C	C	C	C			

Signature of Rovac representative for final clearance
Date: 01/05/2021

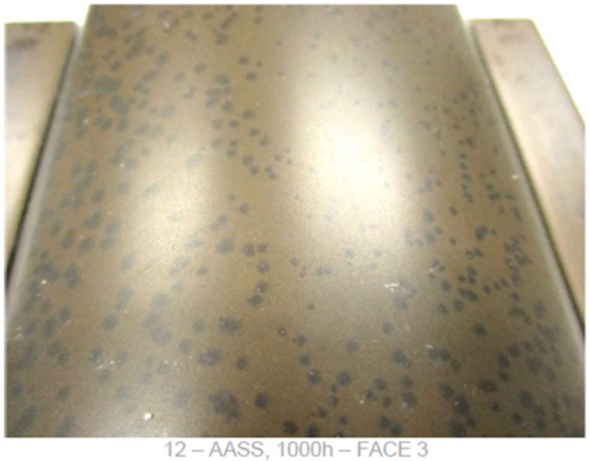
IMG11 – Quality check sheet provided by the applicator at the end of the production process

The Qualicoat testing process completed by The Façade Specialist Contractor was extensive, due to the large number of batches to be analysed, and the 1000-hour duration per every AASS to be completed. It required four months of activities in total, at the end of which the Quality Department issued a final report drawing the final conclusion with regard to the predicted performance of the external aluminium cladding of the shopfronts, exposed to an external environment. The report highlighted that all the batches tested during the main production process behaved in the same manner as per the original sample of Option 2, and it was therefore indicative of an acceptable behavior in terms of performance. It should be noted that, according to the strict Qualicoat standard, all the AASS test results for the different batches were classed as Not Conform, however the results observed at the end of the testing process were deemed as acceptable, subject to the definition of an appropriate maintenance regime.

9 – AASS, 480h – FACE 1

10 – AASS, 480h – FACE 3

11 – AASS, 1000h – FACE 1



12 – AASS, 1000h – FACE 3

IMG12 – Improved finish degradation observed after 1000 hours of AASS testing with no signs of corrosion

Definition of an adequate maintenance regime

At the end of the testing campaigned of the production samples, and while the installation process of the aluminium cladding was ongoing on site, I worked with the colleagues of the Quality Department of The Façade Specialist Contractor and with the applicator to define a maintenance regime in line with the results of the AASS testing.

Whilst the risk of corrosion was limited due to the PPC pre-treatment applied to the components, it was paramount to limit the amount of degradation caused by potential damages occurring during the life cycle of the cladding, in particular at ground floor where the components would have been more accessible. Furthermore, a regular and adequate correct cleaning process was important in order to protect the top coat from the buildup of pollutants.

Based on these principles, we developed a maintenance regime structured on six steps:

1. **Each component of the external cladding shall be cleaned at least once a month, but not more often than once every two weeks. This requirement shall apply to both ground floor and first floor levels.**

2. **The cleaning activities shall be carried out in accordance with the recommendations made by the paint applicator, using a mixture of mild detergent with warm clean water mix. The paint surfaces shall not be scrubbed nor abraded in any manner. At the end of the cleaning activity, the paint surfaces shall be rinsed with clean water, then dried thoroughly using soft cloths.**

3. **At no point in time the use of adhesive tapes, sealants, mastics, jig points, or fixings shall be allowed on the external cladding.**

4. **In case damages of any size are found during the regular cleaning activity to the cladding, these shall be notified within two weeks, so that these can be reviewed on site and repaired promptly.**

5. **The entire cladding shall be fully inspected once a year by a specialist contractor. The results of this full inspection shall be reviewed within two weeks, and remedial works completed where required.**

6. **After a period of four years, a new top coat of clear lacquer will have to be applied to the external cladding, at ground floor and first floor. The application process shall be completed on site using the same clear lacquer currently applied to the components. Any applicator appointed to complete the works must be suitably experienced and qualified to ensure that these will be carried out in accordance with the quality standards required for the warranty to be maintained.**

The maintenance regime was presented to the project team, and it formed part of the O&M documentation handed over to The Principal Contractor and The Employer upon Practical Completion.

Conclusions and critical reflections

As mentioned previously, the topic covered in this report only represents one of the several technical challenges I had to face and manage throughout the execution of The Project over the past three and a half years. I chose this subject because, among others, it presented the highest level of innovation, and allowed us to step forward by developing a solution that was not readily available on the market when the project began. In this sense I believe that my contribution to the project was beneficial.

IMG13 – The Tenant shopfront open to the public featuring our bespoke bronze paint system

In addition to these considerations, I would like to offer some critical reflections:

- **What did I learn in the process?**

Facing and managing this technical challenge over a long period of time helped me understand the importance of carrying out an in depth analysis of the requirements as early as possible in the process. Reviewing and understanding the challenges linked with to the performance to be achieved, and investigating the limits of the options available on the market is very important to streamline the development of a technical solution that can satisfy the client, in particular if such solution needs to be achieved by combining existing products and techniques following a non-standard approach. I found at the end of this experience that a lot of time could have been saved should I had approached this issue more aggressively from the very beginning of the design phase.

- **If I was to do the project again, how would I do it better?**

Communicating with The Employer and the project represented an important part of the process that led us to identify a suitable finish for the external cladding of this shopfront. In this case I could have better communicate the difficulties we encountered at the beginning while we were trying to comply at the same time with the original paint specification and the warranty requirements. I should have been clearer in highlighting the limitations of the specified product and stimulate a much earlier debate regarding the alternative solutions that would have been required to meet The Employer's priorities in terms of warranty and longevity. This is a lesson learned that I will certainly bring with me in the next project.

- **How did I benefit from working on this project as part of a team?**

The Project has been very beneficial for my professional development, as I had the opportunity to benefit from the experience and the support of talented and knowledgeable members of the industry, without losing the opportunity to provide my personal contribution. Working with the colleagues from the Quality Department of The Façade Specialist Contractor, as well as The Paint Specialist in the UK, helped me to gain a much deeper understanding of the behavior of the finishes applied to aluminium alloys and exposed to an external environment. I learned the importance of developing a rigorous quality control process in order to achieve the level of quality required in order to meet the highest standards. I have also learned that a scientific approach, based on hypotheses and testing activities, is fundamental in order to identify valid technical solutions.

- **Did I gain an understanding of contractual and commercial implications?**

Over the past three and a half years I gained a deep understanding of contractual and commercial implications associated to the execution of a sub-contract, in particular with regard to the JCT standard. The Project proved to be particularly challenging in both contractual and commercial terms, and I had to take the lead in representing our organization in the day-to-day business, supported by our team and supervised by senior managers in our organization. The topic described in this report instigated long discussions regarding the compliance with the subcontract requirements. Also, the development of a bespoke paint system constituted a real challenge for the budget allocated to this portion of the project, and required careful considerations in terms of commercial management.

- **Did I understand the importance of Professional conduct and ethics?**

Taking part to The Project helped me better understand the importance of acting in The Employer's best interest, particularly in situations where The Employer is not entirely aware that the solutions specified are not compatible with his/her expectations in terms of warranty and longevity. Being open and transparent with the project stakeholders helped the team while working together towards a workable solution. Despite all the difficulties faced during several months of development, I was pleased to perceive The Employer's satisfaction when we delivered the final product.

Company Logo	Company Name

Signatures

In accordance with the requirements of SFE, the report is signed by the candidate and countersigned by a person of authority for the project concerned, endorsing it as being an accurate account of the candidate's role.

London, 12th August 2021

For the candidate

Name: [redacted]

Signature:

Countersigned by

Name: [redacted]

Signature: