

Hutton + Rostron Environmental Investigations Limited

Hornsey Town Hall and Annex: Façade cleaning trials

Site note 6 for 10 and 17 September 2018, job no. 405.73

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- A Plans
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Distribution:

Regine Kandan – Make Architects
Anusha Le Vasan – Fulkers

File: 405.73

1 INTRODUCTION

1.1 AUTHORITY AND REFERENCES

Hutton + Rostron Environmental Investigations Limited carried out site visits to Hornsey Town Hall and Annex during September 2018 in accordance with instructions from Kiah Khing Tan on behalf of Crouch End (FEC) Ltd by letter, on 13 July 2018, reference Hornsey Town Hall, The Broadway, Crouch End, N8 9JJ, London, Condition Survey of Existing Buildings at Hornsey Town Hall and Broadway Annex (the “Services”). Drawings provided by MAKE, Ref 1360 were used for the identification of structures. For the purpose of orientation in this report, the main entrance was taken as facing west

1.2 AIM

The aim of these trials was to assess the feasibility of cleaning debris accumulations from the various façade materials and to give an indication of the level of cleaning which can be expected upon refurbishment. Cleaned panels can be used as a reference during the works and as part of sourcing matching materials for proposed alterations/extensions to the properties

1.3 LIMITATIONS

This survey was confined to the specified samples. Exteriors above ground level were not accessible nor investigated within this exercise. Structures were not examined in detail except as described in this report, and no liability can be accepted for defects that may exist in other parts of the building. We have not inspected or cleaned other parts of the structure which are covered, unexposed or inaccessible and we are therefore unable to report that any such part of the property is free from defect or in the event that such part of the property is not free from defect it will not contaminate and/or affect any other part of the property. Any design work carried out in conjunction with this report has taken account of available pre-construction or construction phase information to assist in the management of health and safety risks. The sample remedial details and other recommendations in this report are included to advise and inform the design team appointed by the client. The contents of this report do not imply the adoption of the role of Principal Designer by H+R for the purposes of the Construction Design and Management (CDM) Regulations 2015. No formal investigation of moisture distribution was made

2 STAFF ON SITE AND CONTACTS

2.1 H+R STAFF ON SITE

Tim Jordan
Jamie Monkman – Stonehealth

2.2 PERSONNEL CONTACTED

Site security
Jamie Monkman – Cleaning operative, Stonehealth

3 OBSERVATIONS AND RECOMMENDATIONS

3.1 SAMPLE LOCATIONS

As shown on plans, representative materials were selected for cleaning trials, including those with varying degrees of soiling. Both the Town Hall and Annex structures were included although access was confined to ground level

3.2 CLEANING SYSTEMS

3.2.1 'DOFF' (steam)

- 1 Description: This is a pressurised steam cleaning system which has the benefit of minimising water introduced to the masonry and speeding up the rate of drying (reducing risk of associated damage). High temperatures can also be effective in sterilising surfaces in order to discourage further growth of algae/moss from latent spores. 'Thermatech' is a similar system available from a different firm
- 2 Use and limitation: Trials revealed this system to be very effective in cleaning normal dust/dirt from the relatively smooth surfaces of stone and concrete. However, heavier soiling such as mineral crusts could not be effectively or efficiently dislodged

3.2.2 'TORC' (abrasive)

- 1 Description: Pressurised steam is augmented by the addition of granules to provide an abrasive action. The size and hardness of the granules can be adjusted. This system will erode/remove surface deposits (and the surface of the masonry unless very carefully controlled). 'Vortech' is a similar system available from a different firm
- 2 Use and limitation: It was not necessary to employ this system over the majority of the façades. However, the system was effective in removing hard 'crust' deposits

3.2.3 Recommendations

- 1 *A skilled contractor who is trained and familiar with these cleaning systems should be engaged to carry out the work*
- 2 *The proposed method of work for cleaning should be agreed and adhered to unless reviewed and agreed by all. For example, steam temperature, distance between lance and wall, type of abrasive granule etc.*
- 3 *It is recommended that cleaning works are carried out towards the end of the project to avoid further soiling by construction debris. If this is not feasible, a second phase of cleaning may be necessary, perhaps as part of a staged scaffold strike*
- 4 *Allow for using steam cleaning throughout all facades. Subsequently, abrasive can be used locally, where persistent soiling remains*
- 5 *New masonry works which are intended to match the original should be matched with the cleaned appearance*

4 H+R WORK ON SITE

- 4.1** H+R directed and supervised cleaning trials

5 PROPOSED ACTION BY H+R

- 5.1** H+R will advise on cleaning, repair and conservation, so as to minimise the risk of defects after refurbishment, if instructed
- 5.2** H+R will review proposals as these become available if instructed
- 5.3** H+R will liaise with conservation and historic building authorities, if instructed, so as to ensure the cost-effective conservation of original fabric

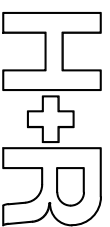
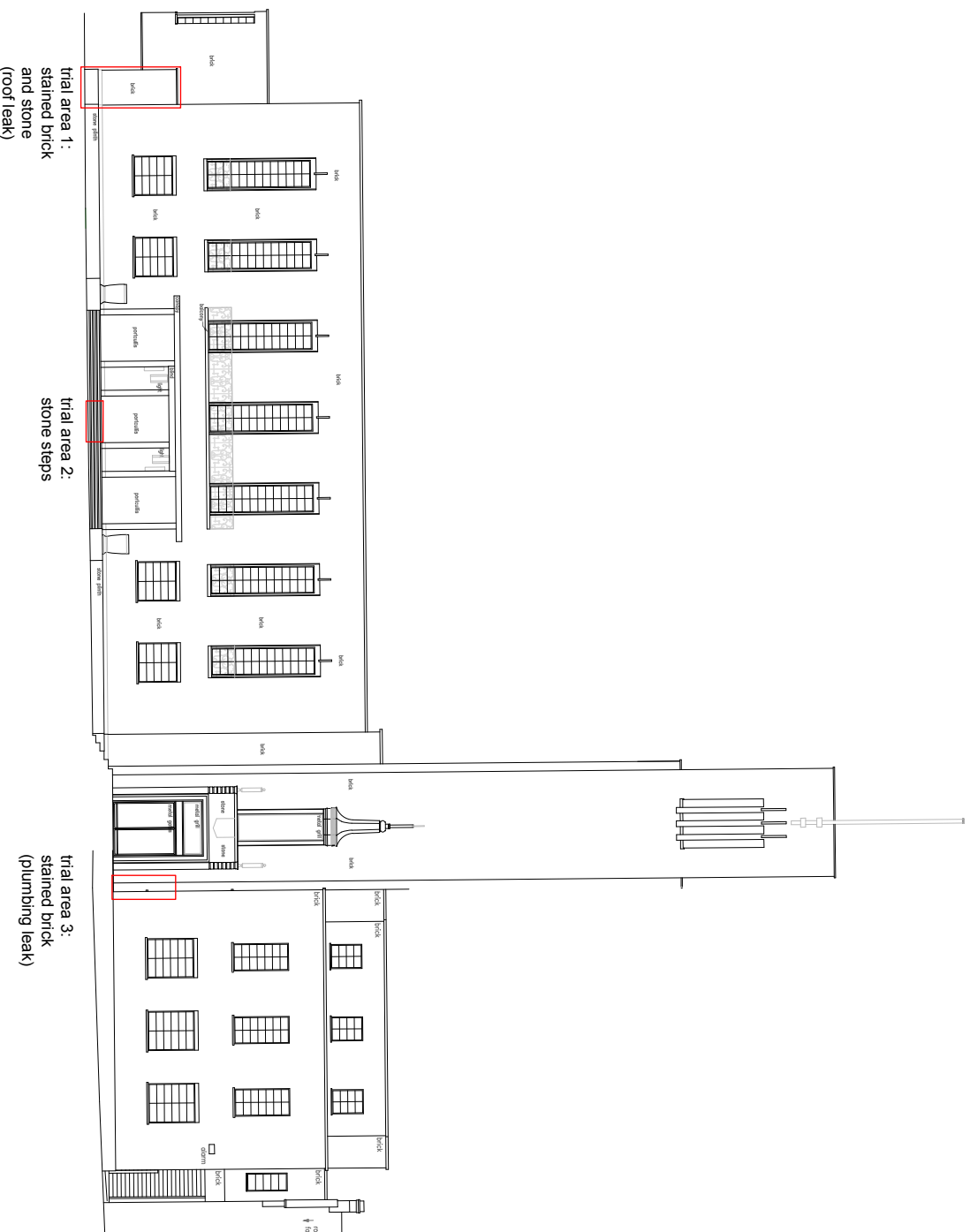
6 INFORMATION REQUIRED BY H+R

- 6.1** H+R require up-to-date copies of project programmes, as these become available
- 6.2** H+R require copies of up-to-date lists of project personnel and contact lists as these become available
- 6.3** H+R require copies of proposed remedial details for comment as these become available
- 6.4** H+R should be informed as a matter of urgency if further significant water penetration occurs onto site; so that advice can be given on cost-effective remedial measures, to minimise the risk of cost or programme overruns and so as to minimise the risk of damp or decay problems during the latent defect period

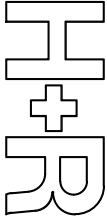
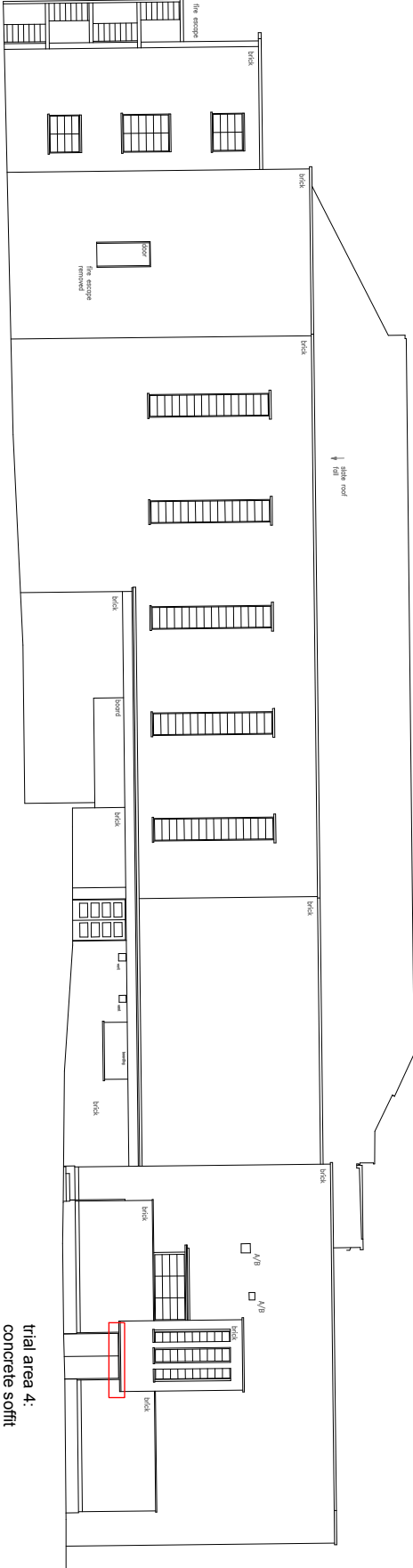
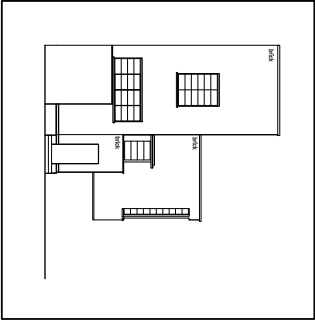
7 ADMINISTRATION REQUIREMENTS

- 7.1** H+R require formal instructions for further investigations and consultancy on this project
- 7.2** H+R require confirmation of distribution of digital and printed copies of reports and site notes

Attachment A

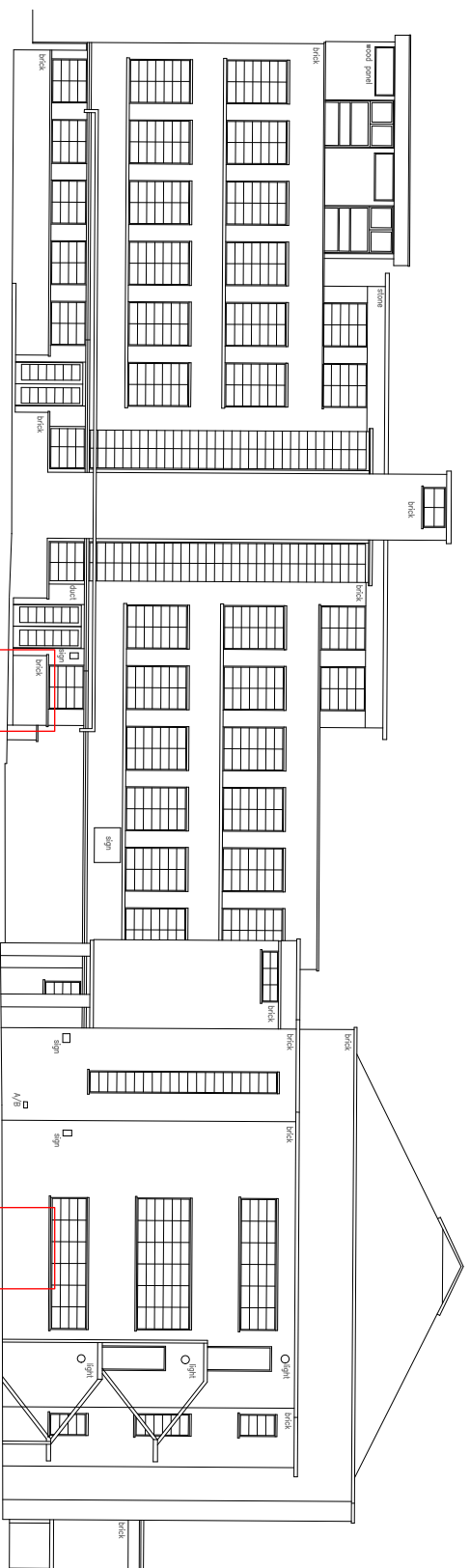


Hornsey Town Hall, Elevation 1 **Facade cleaning trials** **September 2018**



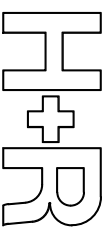
Hornsey Town Hall, Elevation 2
Facade cleaning trials
September 2018

Hutton + Roston Environmental Investigations Ltd
Netley House, Gornhall, Surrey GU5 9QA Tel: 01483 203221 Fax: 01483 202911
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trial area 5:
stained brick and
concrete coping
(planter)

trial area 6:
brick and
concrete sill

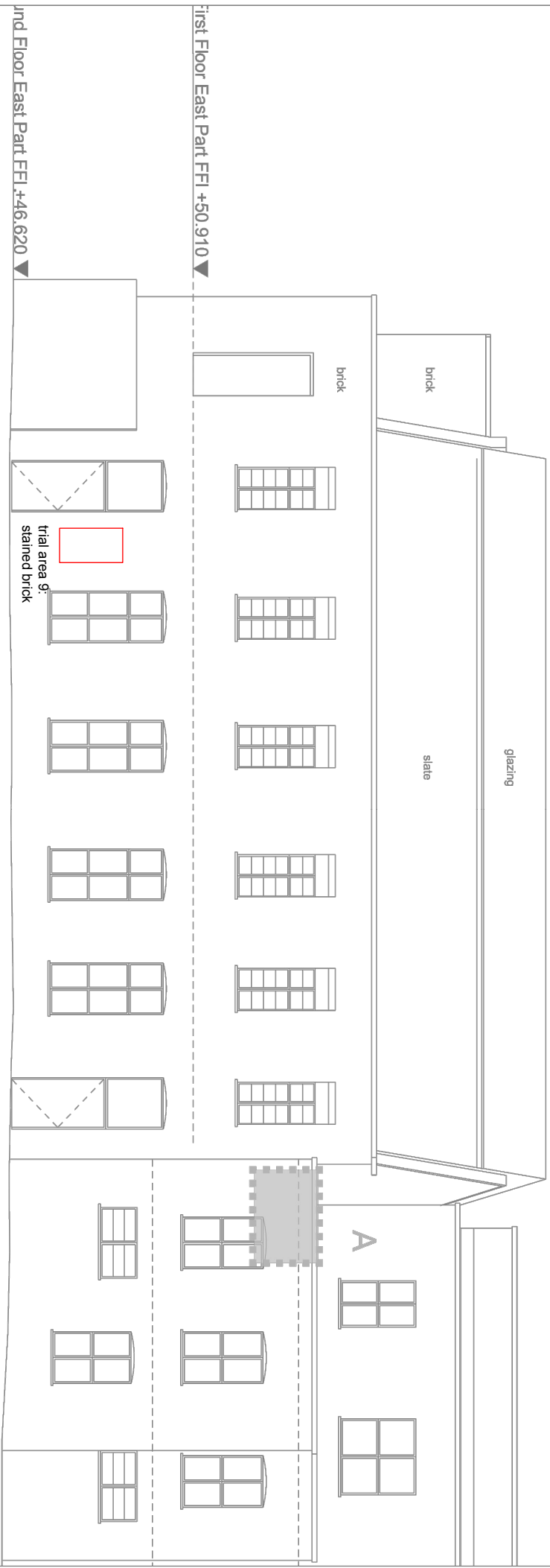


Hornsey Town Hall, Elevation 3

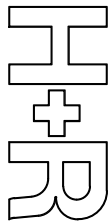
Façade cleaning trials

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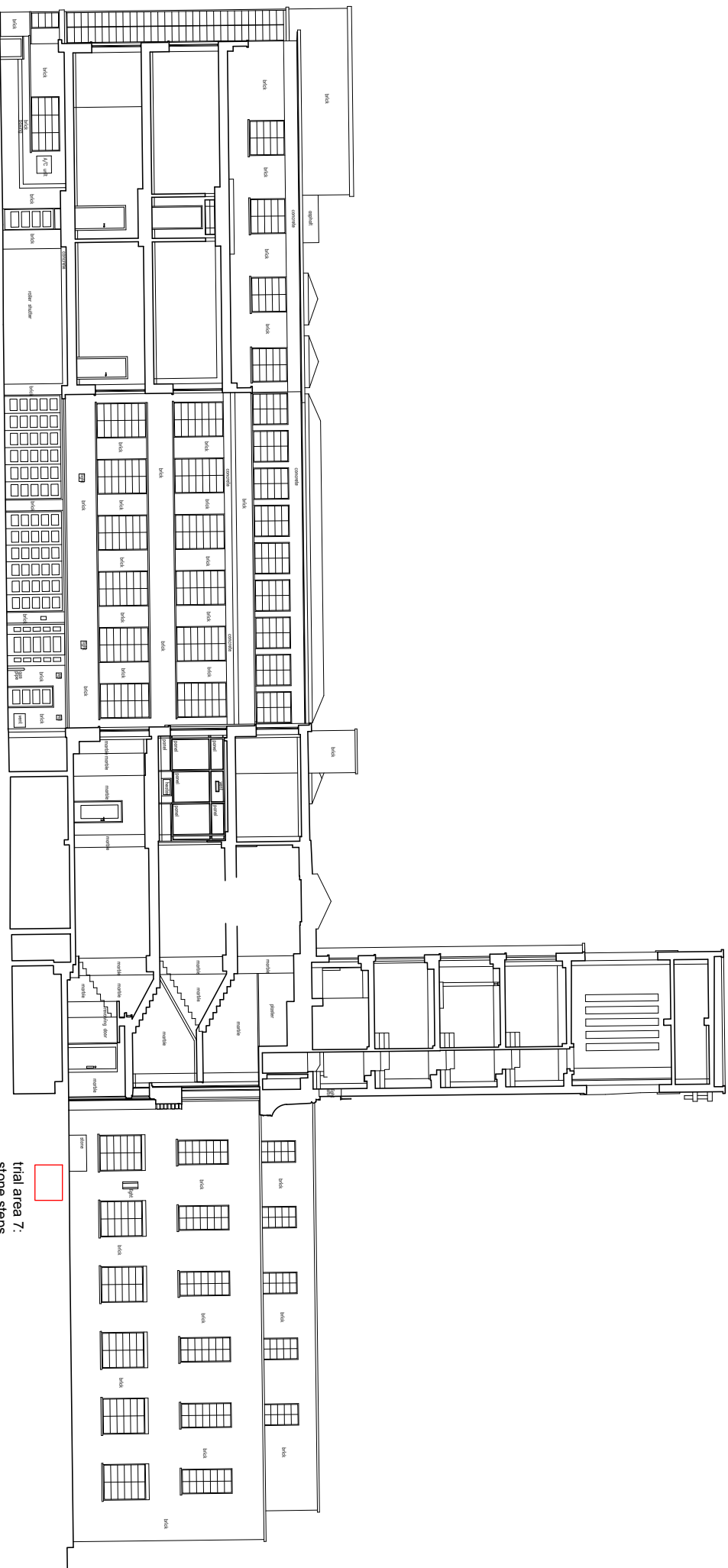


North facade

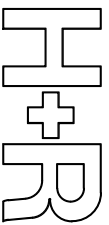


Annex Building, North (rear) elevation
Façade cleaning trials
September 2018

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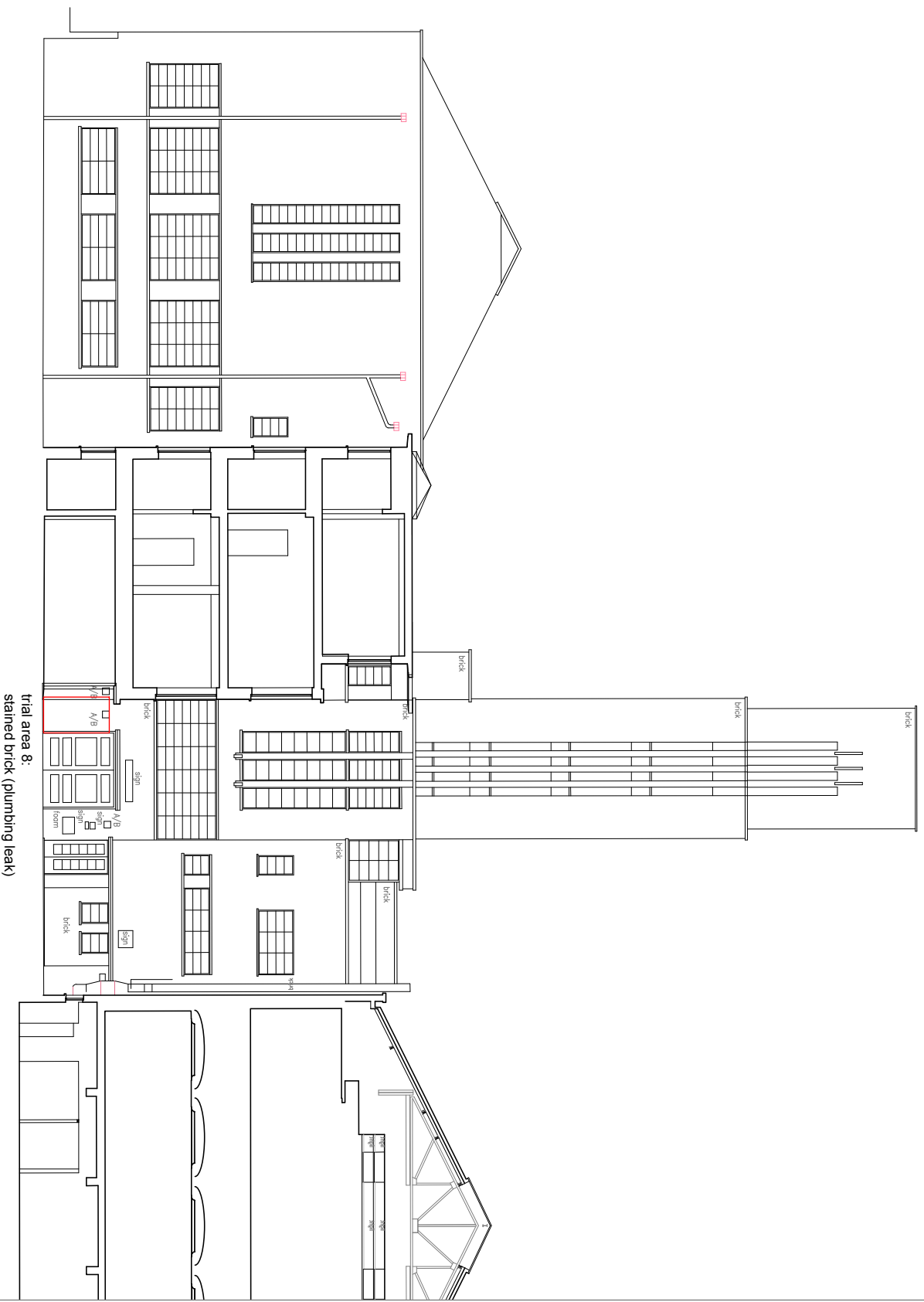


trial area 7:
stone steps
(paint residues)



Hornsey Town Hall, Section FF **Facade cleaning trials** **September 2018**

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H+R

Hornsey Town Hall, Section HH Façade cleaning trials September 2018

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Attachment B



**Report on Stonehealth Ltd's
Visit to
Hornsey Town Hall
London**

**Trial/Demonstration on
17/09/2018**

Introduction

At the request of Hutton + Rostron, Jamie Monkman & Paul Everett of Stonehealth Limited, the manufacturer/marketing organisation of Jos/Torc Vortex and Doff systems attended Hornsey town hall, London.

Purpose of the Visit

To trial/demonstrate the effectiveness of the Doff & Jos/Torc systems on the removal of soiling's around the building.

Preliminaries

In order to be able to advise which systems would be most suitable for the requirements, Jamie & Paul inspected the site.

The Doff was developed to remove many layers of thermo-plastic, oil based and masonry paints; but also heavy deposits of grease, oil and biological growth as well as chewing gum, efficiently and without damage.

This can be used in conjunction with the Doff Recovery System (DRS) for internal use.

It is complimentary to the Torc system and since its introduction has been specified for the safe removal of Carbon deposits and Lime washes for many prestigious projects such as the paint removal of the Swedish Embassy in Westminster, London. Also Kenwood House in Hampstead Heath, London, the palace of Westminster and Chatsworth House to name a few.

Demonstration

Initial tests were carried out in various areas to test the effectiveness of both the Doff & Torc systems & to set the respective temperature & pressures.

Nine test areas were selected around the location for testing with both the Doff and Torc, for cleaning.

Times given will be per square meter.

1. Brick:

Doff @ 150 degree C at 50 bar of pressure had no effect on the brickwork.

Torc @ 2 bar using 250x – total time – 9 minutes.

Plynth:

Doff @ 150 degrees C at 50 bar of pressure lightened the surface slightly, but upon closer inspection was beginning to get behind damaged face. – Total time- 2 minutes.

Torc @ 2 bar using calcite – total time – 6 minutes

Before



After DOFF



After TORC



2. Stone steps:

Doff @ 150 degrees C 50 bar – Total time - 1 minute 33 seconds

Given the result of the Doff system the Torc was not needed for this area.

Before



After



3. Doff @ 150 degrees C at 50 bar – no effect
Torc @ 2 bar using 250x – 2 minutes 45 seconds

Before



After Doff



After Torc



4. Doff @ 120 degrees C at 50 bar – total time – 1 minute 19 seconds.
Torc @ 2 bar using calcite – total time – 2 minutes 12 seconds

Before



After



5. Doff @150 degrees C at 50 bar – total time – 1 minute 17 seconds
Torc @ 2.5 bar using 250x – total time – 3 minutes 16 seconds

In regards to the cement coping, this was using Doff only to get best results, which is included in results above.

Before



After Doff



After Torc



6. Doff @ 150 degrees C at 50 bar – total time – 2 minutes 60 seconds.

Before



After



7. Doff @ 150 Degrees C at 50 bar – total time – 3 minutes 11 seconds

Before



After



8. Doff @ 150 Degrees C at 50 bar – total time – 2 minutes 4 seconds
Torc @ 2.5 bar using dolomite – total time – 3 minutes 15 seconds

Before



After Doff



After Torc



9. Torc @1 bar using calcite – total time – 4 minutes 22 seconds

Before



After



Summary

On completion of the trial it was concluded that the soiling around the property can be removed fairly easily using the Doff system at 50 bar pressure & 150°C. Cleaning rate was fairly good at around 25m² per hour. The Doff system uses approximately 5 litres of water per minute & will not saturate the surface. Followed by a pass by the Torc system across all of the brick work using 250x on the external brickwork, then calcite on the rear annex (test panel 9) All data sheets and method statements are attached.

Jamie Monkman – Customer Support Representative
For and on behalf of Stonehealth Ltd.
01/10/2018

Method Statement & Recommendation for Using the Stonehealth Steam DOFF system – Masonry & Building Fabric – Soiling & Coating Removal

The STONEHEALTH DOFF 'superheated water' system is generally appropriate for the removal of thermoplastic paints (oil based, acrylic, dispersion etc.) and oil, grease, bitumen, algae (and other biological matter including mosses, lichens & fungi etc.), chewing gum etc.

1. The objectives and scope of the project will be taken into account. This will determine the boundaries for the cleaning / removal process e.g. timescale, access, cost limitation & aesthetic requirements.
2. The areas to be worked will be examined by the Supervising Officer. The said officer will be assisted by the contractor or other participants having an understanding of the principle and possibilities of the system. Considerations will include safety, substrate condition, control of water and proximity of other works.
3. It should be normal practice before commencement of the cleaning operation that one or more sample areas are evaluated. Due merit should be given to the following;
 - a) Areas should be representative of the substrate, soiling and detail of the main works
 - b) Test panels should be positioned discreetly
 - c) Location of the test areas must be recorded and protected from further alteration
 - d) The parameters by which the result is obtained must be recorded
 - e) An acceptable test area should be retained as a control panel for the main works
 - f) Measures adopted as a result of the tests must be attainable and controllable in the main works
4. The cleaning of the building surface should be carried out by a capable operator who has received instruction from Stonehealth Ltd into the proper use of the DOFF steam cleaning system. Stonehealth Ltd maintains a record of the induction of each operator.
5. If the Test Supervisor (the Client's nominated representative) is not familiar with the DOFF system, they should seek such information from Stonehealth Ltd as to be able to correctly identify the origins of the principle components of the system (equipment serial numbers, nozzle type number).
6. Consideration should be given to protecting windows, doors, delicate features or any other areas not to be treated. For example 'Tank-Tape' and polythene to reduce water ingress through openings. Isolation of vulnerable electrical apparatus, lighting etc.
7. Gutters and down pipes leading to soakaways should be diverted in order that the removed solid matters do not impair the drainage system. The use of a geo-textile such as 'Terram' or 'Tygar' may be found useful for the control of paint or other solid residues.
8. It is advisable that work commences at the uppermost level and continues downward. This will (a) reduce the need for re-rinsing and (b) when removing a coating will reduce the exposure of surfaces to residues and water

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Page 1 of 3 Methstat 22/08/2018.*

9. In some instances it may be necessary to use supplementary techniques to expedite the process.
 - a) Chemical paint stripper / softener. This may be beneficial when used in conjunction with the DOFF to increase speed and reduce impact of water pressure. However, precautions applicable to use of such chemicals must be taken into account e.g. Do not use adjacent to watercourses.
 - b) Certain paints (e.g. lime based) and carbon deposits may require sympathetic mechanical assistance, such as the Stonehealth TORC system.
 - c) Where the paint / coating layers are thick and do not immediately peel away it may be advantageous to have an assistant with spatula or other implement to pull away such layers. Suitable PPE must be worn when such a task is undertaken.
10. Adjustment of the water volume, pressure and temperature controls should be made whilst maintaining an appropriate distance of the nozzle from the work. A balance should be achieved in order to obtain an effective cleaning result without abrading the substrate. Consideration may also be given to differing nozzle specification i.e. aperture and spray angle.
11. To maintain full temperature at the nozzle, consideration must be given keeping the high-pressure hoses as short as possible and fitting insulation (pipe lagging) if necessary. This is normally appropriate for hose lengths greater than 30m, or under cold prevailing weather conditions.
12. When progress is difficult it may be found beneficial to carry out cleaning in stages, allowing a dwell period between applications.
13. Where there is a high risk of water damage to adjacent fabric e.g. during internal usage, consideration should be given to vacuuming or channelling away unwanted matter and vapour. 'Steam' will activate smoke detectors if placed in local proximity.
14. Consideration must be given to all Health & Safety matters. These are;

a) Protective Clothing & Equipment

Normal will be: Rubber dipped cloth gloves, eye protection (visor), ear defenders (above 30 bar pressure), waterproof clothing (skin to be covered). Respiratory equipment will be advisable if toxic coatings are suspected or if bird / animal droppings are to be removed.

b) Electrical Safety

Appropriate electrical ancillaries and supply protection (see the Electrical Considerations sheet). Isolation and / or protection of electrical fittings.

c) Location of DOFF Equipment

Equipment should be placed in a well-ventilated area out of the reach of the lance or other water spray. The exhaust must not be covered or obscured. A purpose made ventilation duct can be used if required in an enclosed area. It will reassure the Operator if the unit can be observed, if only from a distance, by them self or an assistant.

d) Storage & Use of Fuel

Stonehealth Ltd now only advise the use of kerosene (28 sec heating oil) as a fuel for the Hot Box. The Hot Box will function on red or white diesel but will not burn as cleanly both for the machine and the environment. **Kerosene is not** suitable for use in engines eg diesel compressors etc. This will be stored in suitable marked containers or drums away from heat or direct sunlight. Storage will not be adjacent to the DOFF heater unit (at least 5 metres distant). Precautions should be made to avoid accidental or malicious spillage. Make use of containment / bunding as required by law. Avoid contact with skin, soil and vegetation. Transfer of fuel to the DOFF should be carried out using a 20 litre Jerry can with 'clip on' spout. If storage on site is difficult transfer to the site sufficient only to maintain continuity of working.

e) Storage & Use of Acid Descaler

In hard water areas descaling of the boiler unit will be required in accordance with the Operator Instruction. The descaler will normally be inhibited hydrochloric acid (see product Health & Safety Data Sheet). This should be stored at ambient temperature with controlled access. Preliminary transfer (in a controlled location) into 1 or 2½ litre marked containers will reduce later handling. Protective waterproof clothing, eye protection and rubber gloves / gauntlets are required. Supply of clean water should be readily accessible during usage. Do not dispose of untreated residue: neutralize with Limestone or similar. Neutralized residues may be disposed to the foul drain (not into surface water drainage or watercourse).

f) Education of Personnel

Whilst personnel working in the vicinity need not be inducted into the working of the system they should be made aware of the potential hazards – heat, ventilation, the temperature of metal / rubber components etc. A nominated person adjacent, other than the Operator, should be aware of how to safely shut down the system in circumstances unforeseen.

g) Firefighting Equipment

Maintain access of an appropriate fire extinguisher to suit liquid fire in electrical environment.

15. Following the completion of any repair work it is recommended that a final rinse be given to remove any residue.

Method Statement & Recommendations for Cleaning Mineralic Substrates Using the TORC Cleaning System

The name TORC refers to the Stonehealth 'Low Pressure Swirling Vortex' system, the earlier version of which was called JOS. For the purposes of specification the result can be regarded as comparable. Both the TORC and JOS nozzles operate with water, however only the TORC can be operated without if required.

1. The areas to be cleaned will be examined by the Supervising Officer and those of historic or delicate nature will be noted for additional precautions.
2. It should be normal practice before commencement of the cleaning operation that one or more sample areas are evaluated. Due merit should be given to the following;
 - a) Areas should be representative of the substrate, soling and detail of the main works.
 - b) Test panels should be positioned discreetly.
 - c) Location of the test areas must be recorded and protected from further alteration.
 - d) The parameters by which the result is obtained must be recorded.
 - e) An acceptable test area should be retained as a control panel for the main works.
 - f) Measures adopted as a result of the tests must be attainable and controllable in the main works.
3. The cleaning of the building surface should be carried out by a capable operator, who has received instruction from Stonehealth Limited, into the correct use of the TORC cleaning system. Stonehealth Limited maintains a record of the induction of each operator, together with subsequent monitoring information.
4. If the Test Supervisor is not familiar with the TORC system, they should seek such information from Stonehealth Limited as to be correctly identify the principle components. This is to prevent non-approved contractors making fraudulent claim to the TORC system with consequential damage to building fabric.
5. Consideration must be given to all Health & Safety matters. These are;
 - a) **Protective Clothing & Equipment**
Items specific to the use of this equipment; Eye protection (visor), ear protection (defenders / plugs), water-resistant clothing (skin to be covered), respiratory equipment (minimum shall be a disposable mask type FFP2, progressing through replacement cartridge type). If using the equipment dry or semi-dry then an air-fed helmet will be appropriate. If removing toxic or bio-hazard coatings, take this into account. Gloves (leather, cloth or rubber).
 - b) **Electrical Safety (pre 2016 version only)**
In the UK and Eire, the TORC system is normally supplied in 110 volts. Electrical ancillaries should incorporate abrasion resistant yellow arctic cable and BS4343 plugs and connectors. Power demand is 2.25 Kw.
 - c) **Location of TORC Equipment**
Equipment should be placed in a location easily accessible to the operator or their assistant. The pressure pot must prevent the ingress of water and debris. The same applies to stock of unused abrasive. Do not cover the air cooler / pump when in operation. Keep the equipment clean by placing away from the immediate vicinity of cleaning.
 - d) **Storage and Use of Fuel**
If using a diesel compressor, it may be necessary to store light gas oil (red diesel) or motor vehicle diesel on site. Ensure this is located to prevent accidental or malicious spillage. Make use of containment / bunding as required by law. Avoid contact with skin, soil and vegetation.

e) Education of Personnel

Whilst personnel working in the vicinity need not be inducted into the working of the system they should be made aware of the potential hazards – **compressed air**, dust, noise, high pressure water. It is prohibited to use compressed air against the person e.g. to aid removal of dust. A nominated person adjacent, other than the operator, should be aware of how to safely shut down the system in circumstances unforeseen.

f) Fire Fighting Equipment

The TORC equipment includes electrical items. A diesel engine compressor may present a liquid fire hazard.

6. The material to be used in the TORC system must be that supplied or approved by Stonehealth Limited. These are currently as follows:-

i	Calcite 'mos'	0.05	To	0.3 mm	3	Hardness
ii	Calcium Carbonate	0.05	To	0.4 mm	3	Hardness
iii	Dolomite 80	0.04	To	0.08 mm	4	Hardness
iv	Dolomite 'mos'	0.05	To	0.3 mm	4	Hardness
v	Unil 80 (Micro-Fein)	0.04	To	0.08 mm	6.5 - 7	Hardness
vi	Unil 180 (Ultra-Fein)	0.04	To	0.18 mm	6.5 - 7	Hardness
vii	Unil 250 (Fein)	0.1	To	0.5 mm	6.5 - 7	Hardness
viii	Unil 500	0.1	To	0.8 mm	6.5 - 7	Hardness

In general terms preference should be given to the granulates of lower hardness (i to iv) to minimise the risk of abrasion to the substrate and wear to the nozzle. However the removal of heavy soiling or paint may be best achieved by swift use of a harder granulate (v - viii) rather than prolonged use of a softer one (i to iv).

Granulates must be stored prior to use in a clean and dry environment.

Whilst these granulates are appropriate for almost all requirements other materials may be available for special applications – Please consult Stonehealth Limited.

7. If working adjacent to a watercourse, prevent contamination by solid or other residues. In preference, use natural abrasives i.e. Calcite, Dolomite and Calcium Carbonate.
8. Windows, doors, delicate features or any other areas not required of cleaning should be protected.
9. Gutters and down-pipes leading to soakaways should be diverted in order that the solid matter does not impair the drainage system. Consider the use of a geotextile such as 'Terram' or 'Tygar' to aid the separation of solid waste from water.
10. Recommended minimum ambient temperature for operation is normally 5°C. The release of compressed air at the nozzle induces a temperature drop of 2-3 degrees.
11. The standard size of TORC nozzle is 9mm. The smaller 5mm parallel is best suited to ornate and less accessible work. For very fine detail, statuary etc. the TORC Studio nozzle in sizes 2 – 4mm is recommended. 9, 5 & 3mm TORC nozzles are approximately equivalent to Jos 'Standard', 'Micro' & 'Piccolo'.
12. In practice, the maximum working pressure for the TORC system is approximately 5 bar.

13. The compressor capacity required to operate the 9mm and 5mm nozzles are 90 and 36 cfm (2500 and 1000 litres per minute) respectively. The 11 and 13mm sizes will require a larger volume of air if operated at full pressure. Please consult Stonehealth for advice.
 There may be operational reasons why a diesel compressor is not suitable. It may be appropriate to make use of an electric compressor, if the power supply is sufficient. In general, an electrically driven screw compressor will be much quieter, does not require re-fuelling (or the on-site storage of fuel), and does not require ventilation of exhaust gases.
14. Adjustment of the water and air pressure should be made whilst maintaining an appropriate distance of the nozzle from the work. A balance should be achieved in order to obtain an effective and even cleaning result without abrading the substrate.
 In the light of experience gained from producing the trial panels, it will be appropriate to specify the permitted parameters in the main works e.g. type of abrasive to be used, maximum operating pressure.
15. It is advisable that work commences at the uppermost level and continues downward.
16. In some instances it may be necessary to use supplementary techniques to expedite the process;
 - a) Pre-soaking of surface contaminants with fine mist water spray, or the DOFF system, allowing a dwell time of several hours. This may soften the unwanted deposits. Its application however should be restricted when retention of hygroscopic components such as lime mortar is required. This is especially the case internally where the stability of the surface may depend upon the low residual moisture levels.
 - b) Chemical or mechanical paint removal e.g. DOFF system, solvent gel etc. These are particularly appropriate for thick coatings. Problems may arise, however, in confined (poorly ventilated) areas or conversely in open areas where public access is difficult to control.
 - c) Use of a spatula / scraper / mason's chisel or similar tool. This may be applicable to paint but will also be to the removal of thick carbon. Moss and other algal growth, greasy or tarry deposits can be removed with DOFF before TORC work is carried out.
17. Rinsing of the surface should take place every 2-5 square metres or at least before the unrinsed surface is dry, particular care should be taken when rinsing off Calcium Carbonate based products (Calcite). This can be achieved by use of the wash-down nozzle, or by using the TORC nozzle with the granulate turned off (i.e. just air and water). The latter method uses less water.
 To avoid the use of rinse water altogether e.g. during internal usage, careful use of a light brush or vacuum to the dried surface may be sufficient.
18. Following the completion of any repair work it is recommended that a final rinse be given to remove any residue.