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CONTACT

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RE: Neville House

19th August 2016
Reference: swh-2016-053

For the attention of Alan Burd

Dear Alan Burd

Further to our visit to the above structure on the 09 August 2016, this document has been compiled for your attention by Stuart Whitmore of Sika Limited detailing the remedial work necessary to extend the life of the structure.

Our concrete repair and protection remedial specification is based upon discussions, an understanding of the requirements and site survey and testing data where applicable.

This specification is valid for a period of 12 months, after which a further site survey should be carried out to ensure the suggested proposals are still fit for purpose.

Any variations to this specification and related clauses must be confirmed by Sika Limited to ensure the suitability of the proposed changes and any impact this may have on the performance of the proposed system specified in the specification clauses.

As part of Sika Limited's continuous product development, we retain the right to alter our product specifications in accordance with relevant national and international standards without notice.

For this project, Our specification is based on a remedial system that will provide a 10 yr guarantee.

The Contractor must inform Sika Limited before commencement of work to ensure guarantee requirements are met and confirmed.

Any changes made to the recommendations in any documents or on site without being confirmed in writing by Sika Limited will invalidate the guarantee.

We trust this is of assistance to you. If we can be of further help on this, or any other project, please do not hesitate to contact me on +44 (0)7970 122240.

Yours sincerely

Stuart Whitmore

Handwritten initials 'S.W.' in a cursive style, enclosed within a hand-drawn oval.

Stuart Whitmore
Area Sales Manager - Flooring & Refurbishment

Checked by Steven Hardy
Technical Services Advisor - Refurbishment

SPECIFICATION DOCUMENT



JB SPECIALIST REFURBISHMENT - SAWTRY

PROJECT: **NEVILLE HOUSE**

PROJECT REF: **SWH-2016-053**

DATE: **19 AUGUST 2016**

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CONTACT SHEET

Prepared for: JB Specialist Refurbishment
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Date:

19 August 2016

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Project : Neville House

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1. PROJECT OVERVIEW

GENERAL COMMENTS

- **The structure is located in a City**
- **The use of the structure is Mixed Use**
- **The approximate year of construction is Unknown**

CLIENTS REQUIREMENTS

- Provide a long term concrete repair and protection solution with effective corrosion control measures to extend the service life of the structure.
- A guarantee of 10 yrs is also required for the above requirements.

PHOTOGRAPHIC OVERVIEW OF STRUCTURE



George Street elevation, typical view.

Neville House is located on George Street; it is a mixed use structure with commercial shops located at ground floor and residential apartments at upper levels.



The structure is concrete framed with exposed aggregate pre-cast panel infills.



From visual inspection there are localised areas of

- Delimitation of old coatings
- Cracked concrete
- Exposed reinforcement/spalling concrete
- Previous failed repairs



Typical view.

2. SPECIFICATION - EXTERNAL CONCRETE BEAMS, RING BEAM COPING STONES AND BALCONY SOFFITS

2.1 CONDITION REPORT

2.1.1 TESTING CARRIED OUT

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- We understand data is unavailable with regard to hammer testing, reinforcement cover depths, carbonation depths, Chloride levels, half cell potentials or corrosion rates etc.
 - Based on the location of the structure it is assumed corrosion is predominately carbonation induced.

2.1.2 BEAM-EXTERNAL

- The surface finish of the beams to be repaired are predominantly fair faced
- The beams to be repaired are predominantly coated.
- The coating on the beams is generally delaminating.
- The beams have evidence of major cracks.
- The beams have evidence of minor spalling with exposed reinforcement.

2.1.3 RING BEAM-EXTERNAL

- The surface finish of the ring beam(s) to be repaired are predominantly fair faced
- The ring beam(s) have evidence of major cracks
- The ring beam(s) have evidence of minor spalling with exposed reinforcement

2.1.4 BALCONY SOFFIT-EXTERNAL

- The surface finish of the balcony soffit(s) to be repaired are predominantly fair faced
- The balcony soffit(s) to be repaired are predominantly coated
- The coating on the balcony soffit(s) is generally delaminating
- The balcony soffit(s) have evidence of major cracks
- The balcony soffit(s) have evidence of minor spalling with exposed reinforcement

2.2 – SYSTEM SCHEDULE

AREA	MATERIAL
Main Degradation Cause	Carbonation
Guarantee required	10 Year
Total Corrosion Management?	Yes
Reinforcement Corrosion Protection Coating	Sika® MonoTop -610
Placement Method Options	Hand Placed
Repair Mortars	Sika® MonoTop-615
Corrosion Management Systems	Sika® Margel VPI 580 Sika® FerroGard® 903+
Pore filler/Sealer	Sikagard® 545W Elastofill
Protective Coating Primer System	Sikagard® 552W Aquaprimer
Protective Coating System	Sikagard® 550W Elastic

The following specification is to be read in conjunction with the project condition report, drawings and project specific documentation and all points should be considered as part of the scope of works.

2.3 – REMEDIAL PROPOSALS

The following remedial proposals are based on visual observations, investigation data (If available) and clients requirements.

Concrete repair and protection proposals are in accordance with BS EN 1504 Products and systems for the protection and repair of concrete structures- Part 9 General principles for use of products and systems.

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CONCRETE & STEEL REINFORCEMENT PREPARATION

- Clean and prepare all concrete surfaces
- Remove cracked and delaminated concrete
- Prepare repair area
- Remove corrosion from exposed reinforcement

REINFORCEMENT PROTECTION - CARBONATION

- Protect exposed reinforcement with reinforcement coating:

Sika® MonoTop -610

BONDING PRIMER FOR HAND PLACED REPAIRS

- Primer to improve bond between substrate & hand placed repair material:

Sika® MonoTop -610

CONCRETE REPAIR OPTIONS

Carry out concrete repairs using the following repair mortar options depending on concrete breakout volumes & structural requirements:

- Hand applied R3 high build structural or overhead:

Sika® MonoTop-615

CORROSION MANAGEMENT OF UNREPAIRED AREAS

Carbonated concrete.

Corrosion Management to control corrosion by delaying the start of corrosion and reducing corrosion rates, apply corrosion inhibitor to all unrepaired areas:

- Sika® Margel VPI 580

CONCRETE PROTECTION

Apply protective coating incl appropriate smoothing coat /pore sealer & primer:

- Sikagard® 550W Elastic

2.4 – GENERAL

Repair and Protective Material Selection/Compliance

In all cases the Contractor shall provide manufacturers' evidence to verify that they meet the requirements set out in BS EN1504 and as such all materials where relevant should be 'CE' marked.

All materials must be compatible and shall not have any effects on long term durability and bond. The materials must be supplied from a BS EN 1504 approved manufacturing plant and supplied from a single manufacturer to ensure compatibility and ensure long term durability.

For individual product application requirements refer to current Product data sheet.

2.5 – CONCRETE SUBSTRATE QUALITY AND PREPARATION

Coated Concrete Surfaces (Removal)

The coated concrete shall have all existing coatings removed and all blowholes and honeycombed areas exposed.

The resulting surface shall be free from dust, loose material, surface contamination, existing renders, laitance, oil and other materials which could reduce the required adhesion values of a protective coating /membrane system.

Surfaces should be cleaned and prepared using abrasive blast cleaning techniques or high pressure waterblasting (up to 18 MPa / 2700 psi) techniques.

Where smoothing mortars,pore fillers,coating / membrane systems are to be used, surfaces should be prepared to an open texture suitable for the coating system specified to achieve the following adhesion values:

BS EN 1504-2 without trafficking: adhesion test average for smoothing mortar/pore filler/coatings must be $>0.8 \text{ N/mm}^2$ (MPa) with no single value below 0.5 N/mm^2 (MPa) for crack bridging coatings and 1.0 N/mm^2 (MPa) with no single value below 0.7 N/mm^2 (MPa) for rigid coatings.

BS EN 1504-2 with trafficking: adhesion test average for coatings/membranes must be $>1.5 \text{ N/mm}^2$ (MPa) with no single value below 1.0 N/mm^2 (MPa) for crack bridging coatings and 2.0 N/mm^2 (MPa) with no single value below 1.5 N/mm^2 (MPa) for rigid coatings.

2.6 – CONCRETE REMOVAL

After removal of defective concrete, the prepared area shall be free from dust, loose material, surface contamination and materials which reduce bond or prevent suction or wetting by repair materials.

Delaminated, weak, damaged and deteriorated concrete and where necessary sound concrete shall be removed by suitable mechanical or very high pressure waterblasting (up to 110 MPa / 16500 psi) techniques.

Tying wire fragments, nails and other metal debris embedded in the concrete should be removed where possible.

The edges where concrete is removed should be cut at a minimum angle of 90° to avoid undercutting and a maximum angle of 135° to reduce the possibility of debonding with the top surface of the adjacent sound concrete and should be roughened sufficiently to provide a mechanical key between the original material and Sika concrete repair mortar.

Ensure sufficient concrete is removed from around the reinforcement to allow application of the reinforcement corrosion protection coating and compaction of the repair material.

2.7 – PREPARATION OF STEEL REINFORCEMENT

Rust, scale, mortar, concrete, dust and other loose and deleterious material which reduces bond or contributes to corrosion shall be removed to a minimum standard of SA2 or SA2½ depending on the reinforcement corrosion protection coating used.

The whole circumference of the exposed reinforcement shall be uniformly cleaned, except where structural considerations prevent it.

Unless the cleaning is carried out immediately before application of the reinforcement corrosion protection coating, the reinforcement shall be protected against further contamination.

Surfaces should be prepared using abrasive blast cleaning techniques or high pressure waterblasting techniques.

Method and choice of cleaning shall take into account bar congestion, contact between bars, proximity to concrete substrate and other factors which prevent access for cleaning.

Where exposed reinforcement is contaminated with chloride or other material which may cause corrosion, the reinforcement shall be cleaned by low pressure waterblasting techniques to wash away contaminants.

2.8 – REINFORCEMENT CORROSION PROTECTION COATING APPLICATION

(BS EN 1504-7 Classification)

Immediately after preparation to SA2 or other specified preparation standard specified in this document, apply to the whole exposed circumference of reinforcement, two coats of Sika MonoTop 610.

2.9 – CONCRETE REPAIR MORTAR APPLICATION

Structural/Non structural/overhead repairs

Hand Applied

(BS EN 1504-3 Classification R3,R2,R1)

Before applying the concrete repair mortar, apply a bonding primer of Sika® MonoTop-610.

Pre-wet the surface of the prepared repair area.

The surface should not be allowed to dry before application of the bonding primer. The pre-wetted surface should achieve a dark matt appearance without glistening and surface pores and pits should not contain water.

Apply the pre-mixed Sika® MonoTop-610 to pre-dampened repair substrate at a thickness of >1.0mm.

Apply the pre-mixed Sika® MonoTop-615 repair mortar “wet on wet” onto the bonding primer between the minimum and maximum layer thicknesses and compacted without inclusion of entrapped air pockets using a trowel or gloved hand.

Where layers are to be built up to prevent sagging or slumping, each layer should be allowed to stiffen before applying subsequent layers “wet on wet”. When layers cannot be applied “wet on wet”, or if more than 24 hours between layers elapses, apply a bonding primer of pre-mixed Sika® MonoTop-610 and apply pre-mixed Sika® MonoTop-615 “wet on wet”.

Finishing of the applied repair mortar should be carried out to the required surface texture as soon as the mortar has started to stiffen. To prevent surface cracking, do not apply water or overwork the surface with finishing tools.

Site adhesion values to comply with BS EN 1504-3:

Structural Repairs 1.2-1.5 N/mm² (MPa).

Non Structural repairs minimum value 0.7 N/mm² (MPa)

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2.10 – CURING TREATMENT

It is essential to cure the repair mortar immediately after application for a minimum of 3-7 days depending on site exposure and weather conditions, to ensure full cement hydration and to minimise cracking. Use polythene sheeting taped down at the edges or other approved method.

Curing compounds shall not be used if subsequent smoothing coats/pore filling or protective coatings are to be used.

2.11 – CORROSION MANAGEMENT – CORROSION CONTROL:VAPOUR PHASE APPLIED INHIBITOR

Uncoated Concrete

(BS EN 1504-9 principle 11 method 11.3)

SIKA® MARGEL VPI 580 VAPOUR PHASE CORROSION INHIBITOR SHALL BE APPLIED TO ALL UNREPAIRED UNCOATED CONCRETE AREAS TO REDUCE EXISTING CORROSION RATES AND DELAYS LATENT DAMAGE CORROSION IN CARBONATED CONCRETE.

Drill 20mm diameter holes, 55mm deep in a grid pattern spaced 1metre apart horizontally and 500 mm staggered vertically. Distances from edges of concrete elements to capsule positions should be ≤ 250 mm.

On beams and columns the spacing should be no greater than 500mm apart and applied to one face if section dimensions are < 500 mm. if > 500 mm insert 2nd capsule into hole at a greater depth or install additional capsules on other faces.

The drilled hole must be thoroughly cleaned with a blow pump starting from the bottom of the hole and carried out at least 2 times.

Place a Sika® Margel VPI 580 cartridge into bottom of pre- drilled hole.

After insertion of the Sika® Margel VPI 580 cartridge into pre- drilled hole, use a length of synthetic backing rod to allow correct concrete cover depth and push into hole behind the cartridge ensuring contact between them both.

The remaining space between the backing rod and concrete surface shall be filled with an R3 or R4 Class repair mortar.

Apply a smoothing coat of Sika® MonoTop®-620, thickness of 1.0- 2.0mm over filled hole covering the perimeter of the hole edges by at least 50mm and feathering down

to existing concrete surface.

Corrosion Rate Monitoring

Where it is required to monitor concrete elements of the structure for monitoring the performance of the Concrete Repair and Protection strategy, an appropriate monitoring system should be implemented. The system should be designed by an experienced Corrosion Engineer.

Note:

Sika Limited suggest the monitoring system measures corrosion rates using linear polarisation measurements from embedded probes incorporating a compatible software package.

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2.12 – PORE FILLER/SEALER APPLICATION

Surface preparation should have been carried out in accordance with concrete substrate quality & preparation clause prior to application.

Tightly trowel a pore filler/sealer of Sikagard® 545W Elastofill over the concrete surface to ensure that all blowholes and other surface imperfections are filled to provide a pore (holiday) free surface in preparation for protective coatings.

2.13 – PROTECTIVE COATING SYSTEM: PRIMER APPLICATION

Following application of Sika MonoTop® 620 smoothing coat/pore filler or Sikagard® 545W Elastofill pore filler, apply by brush or roller one coat of Sikagard® 552W Aquaprimer at a consumption rate of not less than 0.2 ltr/m².

2.14 – PROTECTIVE COATING SYSTEM: COATING APPLICATION

(BS EN 1504-2 Classification)

Following application of the Sika MonoTop® 620/Sikagard® 545W Elastofill smoothing coat/pore filler and primer where necessary, apply by brush, spray or roller 2-3 coats of Sikagard® 550W to achieve a minimum total dry film thickness of 340 microns.

Site adhesion values to comply with BS EN 1504-2 Adhesion test average for coating must be >0.8 N/mm² (MPa) with no single value below 0.5 N/mm² (MPa) for crack bridging coatings.

A coating primer may not be required if the above coating adhesion values can be achieved by the coating on the smoothing coat/pore filler finish.

To be confirmed by trials prior to full coating application.

It is recommended that samples of the coating are applied to areas of the structure as controls before application to the complete structure for adhesion tests, and agreement of colour and surface finish.

2.15 – PRODUCT DESCRIPTIONS

REINFORCEMENT CORROSION PROTECTION COATINGS

- Sika MonoTop® -610 is a one component cementitious, polymer modified reinforcement primer for reinforcement protection and also as a bonding primer for MonoTop and other Sika concrete repair mortars. Meets the requirement of BS EN 1504-7.

BONDING PRIMER

- Sika MonoTop® -610 is a one component cementitious, polymer modified reinforcement primer for reinforcement protection and also as a bonding primer for MonoTop and other Sika concrete repair mortars.Meets the requirement of BS EN 1504-7.

CONCRETE REPAIR MORTARS

- Sika® MonoTop-615 is a cement-based, one component polymer modified hand placed /wet spray high build structural repair mortar.Meets the requirements of BS EN 1504-3 Class R3 mortar

CORROSION MANAGEMENT

- Sika Margel VPI 580 is a patented vapour phase corrosion inhibitor in a solid capsule format . The vapour penetrates the concrete and forms a protective layer on the surface of the embedded steel reinforcement, both delaying the start of corrosion and reducing the corrosion rate. Can be used for coated structures or where reinforcement is at depths where Sika FerroGard 903+ cannot penetrate.

PORE FILLER/SEALERS/SMOOTHING COATS

- Sikagard 545W Elastofill is a one component, water dispersed plasto-elastic, acrylic polymer based texturing undercoat for use beneath Sikagard 550W Elastic. Can also be used as a re-profiling mortar over existing coatings when mixed with sand. Meets the requirements of BS EN1504-2

PROTECTIVE COATING PRIMERS

- Sikagard 552W Aquaprimer is a one component, water dispersed acrylic primer for use under Sikagard protective coatings.Meets the requirements of BS EN1504-2

PROTECTIVE COATINGS

- Sikagard® 550W Elastic is a one component, water based, pigmented coating and available in a wide range of colours. It prevents the ingress of carbon dioxide and moisture whilst permitting two-way water vapour diffusion. It is highly crack-bridging and elastomeric.Meets the requirements of BS EN1504-2

3. APPENDICES

DISCLAIMER

CDM REGULATIONS

Sika Limited does not fulfil the role of the Principal Designer and therefore preparation for the proposed specification and subsequent works should only commence when all parties involved with the design and execution of the works are satisfied the appropriate CDM regulations have been fulfilled.

DISCLAIMER

The information contained herein and any other advice are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. The information only applies to the application(s) and product(s) expressly referred to herein. In case of changes in the parameters of the application, such as changes in substrates etc., or in case of a different application, consult Sika's Technical Service prior to using Sika products. The information contained herein does not relieve the user of the products from testing them for the intended application and purpose. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

PRODUCT DATA SHEETS

External Concrete Beams, Ring Beam Coping Stones and Balcony Soffits

Sika® MonoTop-610 [View](#)

Sika® MonoTop-615 [View](#)

Sika® Margel VPI 580 [View](#)

Sikagard® 552W Aquaprimer [View](#)

Sikagard® 545W Elastofill [View](#)

Sikagard® 550W Elastic [View](#)