PROPOSED SPECIFICATION

PROJECT: FS Trade – Green Homes North West
REF: OPP005878-S1
AUTHOR: Stewart Taylor
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FS TRADE façade solutions

K Systems Insulated Façades

Proposed Specification

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Project No:	OPP005878-S1
Project:	FS Trade – Green Homes North West
System:	K Systems E Silicone
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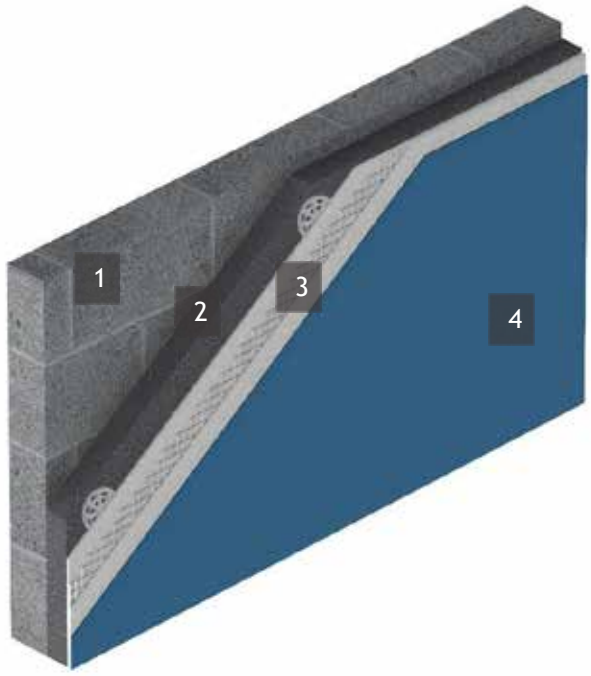
Date Issued:	05 October 2020

K SYSTEMS OVERVIEW

SURVEY INFORMATION	PROJECT NAME	**MAIN WALL AREAS**
	PROJECT SIZE *(m2)*	3000m2 – MULTIPLE GREEN HOMES GRANT PROPERTIES
	HEIGHT *(Storeys)*	LOW RISE – BELOW 18M
	SUBSTRATE TYPE	EXISTING MASONRY
PROPOSED BUILD - UP		**SYSTEM – K SYSTEMS E SILICONE**
MAIN AREA PROPOSED MATERIALS	PREPARATION (1)	ALGAE CLEAN / R7 ACRYLIC
	ADHESIVE (2)	K SYSTEMS HP14 BASE
	INSULATION (2)	K SYSTEMS ENHANCED GREY EPS
	THICKNESS (mm)	90mm
	BASECOAT (3)	K SYSTEMS HP14 BASE
	REINFORCEMENT (3)	K SYSTEMS REINFORCING MESH
	PRIMER (4)	K SYSTEMS PRIMER TC
	FINISH COAT (4)	K SYSTEMS SILICONE TC

- System reference: **K Systems E Silicone (BBA Ref: 18/5570 PS9)**



Above graphic used as illustration of the system only. Substrate and insulation may not be representative of the specification.

M21 INSULATION WITH RENDERED FINISH

To be read with Preliminaries/ General conditions.

GENERAL

120B SURVEY OF STRUCTURAL SUBSTRATE (MASONRY)
- Timing: Before starting work covered in this specification.
- Responsibility: Client / Contracts Administrator / Registered Contractor
- Objective: To confirm suitability of new/existing masonry substrate for application of specified external wall insulation system and to coincide with recommendations and allowable system tolerances as stated in 430 suite of specification clauses & BS 8000-3:2001.
- Survey report: Submit, covering:
  - The form and condition of the structural substrate.
  - Check line and level. The system can only deal with localised variations.
  - A schedule of repairs and/ or additional works necessary to render the substrate suitable to receive the system.
  - A schedule of services, fixtures and fittings requiring removal to facilitate installation of the system.
  - Proposals for treatment of cold bridges that may occur as a result of installing the system, e.g. at door and window reveals, concrete floor edges, movement joints.
  - Any other relevant information.

160 REMEDIAL WORK
- Remedial work shown to be necessary by survey (Clause 120) and to meet requirements of this specification: Contracts Administrator / Registered Contractor responsibility (see 450 suite of clauses)

180C STRUCTURAL SUBSTRATE
- Description: **Existing Masonry**
- Preparation: All preparation to follow 430 suite of clauses and as follows:
  Pressure wash substrate to remove any friable material, algae or lichen, and to provide a good key for K Systems products.
  - All necessary repairs to the structure must be carried out by suitably qualified contractors and be complete prior to the application of K Systems products and systems.

- Pre-Treatments:
  - **Clean Down** – Clean down, pressure wash or wire brush substrate to remove any friable and/or deleterious material, and to provide a good key for K Systems products.
  - **Hack Off** - All damaged and loose areas of existing render, extent of hack off to be determined by contract administrator and agreed within remedial survey.
  - **Fungicidal Wash** - Scrape off, etc, any heavy organic growths and apply one coat of Algae Clean to the entire surface by roller or knapsack spray and allow to dry.
  - **Stabilising Solution (if utilising insulation adhesive)** - Apply one coat of K Systems R7 Acrylic by roller to entire surface of wall. (For dilution details see label on drum). NB: Different dilution rates may be required on certain surfaces - consult with K Systems technical staff.
  - **Stabilising Solution (Areas of Dubbing out)** - Apply one coat of K Systems R7 Acrylic by roller to entire surface of wall. (For dilution details see label on drum). NB: Different dilution rates may be required on certain surfaces - consult with K Systems technical staff.
  - **Localised dubbing out (subject to remedial survey)** - Where applicable, apply one coat of K Systems R7 Acrylic to areas to receive dubbing render. Trowel apply K Systems Standard UF Base Coat to areas of masonry to leave line and level ready for main EWI system. All dubbing work to be carried out at the in accordance with remedial survey in agreement with Contract Administrator and K Systems recommendations.

- Surfaces must be sound, clean and free from all loose or deleterious material and to provide a good key for K Systems products.
- Any areas of concern still evident after the repairs and treatments have been implemented must be reported to the Client/Contracts Administrator and addressed prior to the application of K Systems Products

SYSTEM REQUIREMENTS/MATERIALS

210D EXTERNAL WALL INSULATION SYSTEM:

- Supplier: K Systems, Unit 203, Mere Grange, St Helens, Merseyside, WA9 5GG.
  - System reference: **K Systems E Silicone**
- Insulation: **K Systems Enhanced Grey EPS Insulation** (Clause 221A)
  - Thickness: 90mm
  - Method of fixing: Mechanical & Adhesive
- Reinforcement render: **K Systems HP14 Base** (Clause 223A)
  - Thickness: 4-6mm
  - Reinforcement: **K Systems Reinforcing Mesh**
- Decorative finish: **K Systems Silicone TC15** (Clause 226C)
  - Thickness: 1.5mm
  - Primer: **K Systems Primer TC** (Clause 225)
  - Colour: TBC
- System certification: BBA (Ref: 18/5570 PS9)
  NHBC accepted
- System performance:
  - General testing: ETAG004 Guideline for European Technical Approval of EWI Systems
  - Fire: B-s1, d0
  - Effective Life: > 30 years can be extended to 60 years
  - U-Value: TBC by calculation
  - Impact resistance: Category II to ETAG 004
- Accessories:
  - Beads/Trim/Profiles: as per Clause 222A
  - Additional protection: **K Pro** (Clause 227)

221A INSULATION

- Insulation reference: **K Systems Enhanced Grey EPS Insulation (see clause 412)**
- Supplier: K Systems, Unit 203, Mere Grange, St Helens, Merseyside, WA9 5GG.
  - Dimensions: 1200 x 600 x 90mm
  - Dimensions: 1200 x 600 x 20mm (to reveals, where required)
  - Density (nominal): 15 kg/m-3 (approx.)
  - Minimum compressive strength: 70kNm-2 (at 10% compression)
  - Lambda value (l): 0.030 – 0.032 W/m^{2}K
  - Water vapour resistance factor (μ): 20 - 40
  - Reaction to fire: Euroclass E
- Method of fixing:
- Insulation Fixing: **TFIX-8M-135** (pull out tests required, see clause 440)
  - Insulation Fixing Pattern: 'Domino 5' – refer to detail KS-EWI-100 [ ] & clause 412B
- Scrim Fixing: **N/A**
  - Scrim Fixing Centres: N/A
- Reveal Fixings: **KDIPK10406090-R**
  - Centres: 300mm maximum
- Fire Fixing: **KMBASS08140** (refer to clause 412D)
  - Fire Fixing Pattern: required above 2 storeys at minimum of 1 per meter squared.
- Adhesive: **K Systems HP14 Base** (refer to clause 412A)
- Fire Barrier: See clause 510A

222A BEADS/TRIMS/PROFILES/RAILS

- Description: Full System Beads (see clause 413)
- Supplier: K Systems, Unit 203, Mere Grange, St Helens, Merseyside, WA9 5GG.
- Material: Aluminium & PVC
- Length: 2.5m
  - Starter track ref: **K90609** with **K37404** clip on drip profile
  - Full depth stop bead ref: **K93309**
  - Vertical movement bead ref: **K3035 / K3036** (Internal Corner)
  - Horizontal movement bead ref: **K9181** with **K9182 & K90609** starter track
- Method of fixing:
  - Mechanical fixing Ref: **KR-FX-N-06K040**

- Description: Surface Mounted Beads (see clause 413)
- Supplier: K Systems, Unit 203, Mere Grange, St Helens, Merseyside, WA9 5GG.
- Material: PVC
- Length: 2.5m
  - Bellcast bead ref: **KD10W**
  - Stop bead ref: **KR6W**
  - Sealing stop profile ref: **K37806**
  - External corner bead ref: **K3797**
  - Vertical expansion bead ref: **KM6W**
  - Horizontal expansion bead ref: Refer to standard details
- Method of fixing:
  - Mechanical fixing Ref: **FIRTREE** Fixings
  - Bedded into **K Systems HP14 Base** (where applicable)

- Description: Sealing tape for around doors and windows
- Material: Hydrophobic foam
- Length: 12.5m
  - Seal tape ref: **Compriband 600 Joint Tape 10 /2**

- Description: Sealing tape to seal around boundary walls and other similar abutments
- Material: Hydrophobic foam
- Length: 8m
  - Seal tape ref: **Compriband 600 Joint Tape 10 /3-7**

- Description: Sealing tape to seal around uneven surfaces
- Material: Hydrophobic foam
- Length: 3.3m
  - Seal tape ref: **Compriband 600 Joint Tape 15 /8-15**

- Description: Additional Trims/Profiles
  - Verge profile ref: **KWEC741140**

223A REINFORCEMENT

- Product ref: **K Systems HP14 Base (refer to clause 414A)**
- Supplier: K Systems, Unit 203, Mere Grange, St Helens, Merseyside, WA9 5GG.
- Description: Polymer modified reinforcement render
  - Size: 25kg bag
  - Thickness: 4-6mm
  - Capillary Water Absorption [category]: W2 to EN 1015-18
  - Water Vapour Coefficient (μ): ≤ 15 to EN 1015-19
  - Compressive Strength: CS IV to EN1015-11

- Adhesion: 0.65N/mm2 to EN 1015-12
- Fire Rating: A1 to BS13501-1
- Colour: Grey

- Product ref: **K Systems Reinforcing Mesh (refer to clause 414A)**
- Supplier: K Systems, Unit 203, Mere Grange, St Helens, Merseyside, WA9 5GG.
- Description: Fibreglass, alkali resistant reinforcement mesh
- Areas: Standard areas
  - Method of fixing: Bedded in top third of **HP14 Base**
  - Weight: 160g/m2
  - Textile Dimensions: 6mm x 6mm or 3.5mm x 3.5mm
  - Tensile Strength (nominal): 2000/2500 N/5cm
  - Roll size: 50 x 1m

225 PRIMER
- Product ref: **K Systems Primer TC (refer to clause 416)**
- Supplier: K Systems, Unit 203, Mere Grange, St Helens, Merseyside, WA9 5GG.
- Description: Silicone based primer
  - Size: 15kg drum
  - Density: 1.2 tonne/m3
  - Coverage: 0.25 kg/m2
  - Colour: TBC (to match decorative finish)

226C DECORATIVE FINISH: SILICONE TOPCOAT
- Product reference: **K Systems Silicone TC 15 (refer to clause 417C)**
- Supplier: K Systems, Unit 203, Mere Grange, St Helens, Merseyside, WA9 5GG.
- Description: Textured silicone render
  - Size: 25kg drum
  - Grain Size: 1.5mm
  - Water Vapour Permeability (category): V2 to EN ISO 7783-2
  - Water Absorption (category): W3 to EN ISO 1062-3
  - Adhesion: 0.65N/mm2 to EN 1542
  - Coverage: 2.5 kg/m2
  - Colour: TBC

227 ADDITIONAL PROTECTION
- Product ref: **K Pro (refer to clause 418)**
- Supplier: K Systems, Unit 203, Mere Grange, St Helens, Merseyside, WA9 5GG.
- Product description: A super hydrophobic, water repellent, oil repellent and stain resistant treatment designed specifically to provide additional protection to all K Systems finishes.
  - Size: 25kg drum
  - Coverage: 125m2 per drum
  - Colour: Milky / Opaque

DESIGN

300 SPECIFICATION VARIATION
- Any variation to this specification (or any K Systems specification) must be agreed prior to commencement of works with K Systems, who will amend and reissue the specification (and warranty offer where applicable) in accordance with the agreed variation/s.
- Any other relevant or significant variations in the prevailing circumstances and construction method or build-up must also be notified in writing to K Systems prior to commencement of works.

- K Systems will not accept any liability for any costs associated with any consequential issues arising from unauthorised variations or un-notified changes in circumstances relating to the application or performance of K Systems products or systems.

310 DESIGN
- Complete the detailed design of the system and associated features shown on the drawings to meet the requirements of this specification.

320 INTEGRITY
- The installation must be weather tight under all anticipated conditions. Consult with K Systems Technical Department for specific details and relating to particular conditions. (Refer to clause 310).
- The installation must be capable of resisting all dead loads and design live loads, including impact and wind loads, and accommodate all thermal movements without damage.
- The render system may not be applied on horizontal surfaces such as parapets and wall heads, it will be necessary to install copings or cappings. (Refer to K Systems standard details as per Clause 310).
- The system should remain effective for at least 30 years provided any damage is repaired immediately in accordance with K Systems written instructions and the system is maintained in accordance with K Systems maintenance instructions.

321 STRUCTURAL REPAIRS
- All necessary repairs to the structure must be carried out by suitably qualified contractors and be complete prior to the application of K Systems products and systems. It is the sole responsibility of the Contract Administrator to satisfy itself that the repairs identified have been properly implemented.

325 ADDITIONAL LOAD
- In preparing this specification it is a requirement that the contract administrator and client (or appointed representative) have taken into account the imposed loading of the EWI system from wind pressures and associated fixings, pattern and frequency as detailed in the following specification and, therefore, the substrate of the building to which it relates is absolutely sound, free from defects in all respects and is capable of supporting the additional load, type and number of fixings associated with the system.
- K Systems have not carried out or commissioned a structural survey of the building and recommend that contracts administrator & client implement this course of action if not already done so.

335 IMPACT RESISTANCE OF NON-LOADBEARING VERTICAL SURFACES
- Standard areas: Impact resistance Category II to ETAG004 - a zone liable to impacts from thrown or kicked objects, but in public locations where the height of the system will limit the size of the impact; or at lower levels where access to the building is primarily to those with some incentive to exercise care.

340 WIND LOADING
- For design purposes assume the following wind loads:
  Refer to current BBA Certificate or K Systems structural wind loading report if the building is above 18m in height as per the K Systems High Rise Policy (Refer to Clause 341).

341 K SYSTEMS HIGH RISE POLICY
- All projects above 18m in height, must fully comply with the K Systems High Rise Policy.
- The K Systems High Rise Policy requires the following documents/actions be provided/implemented prior to the installation commencing:
  - Fixing pull out tests must be conducted as per Clause 440.

- A structural wind load report must be produced by a qualified third party engineer. The report must contain the following;
- Confirmed wind loads as per Eurocode EN 1991-1-4; 2005, Actions on structures – Part 1-4; General Actions – Wind Actions.
- A recommended fixing pattern must be provided taking into consideration the wind loads, pull out tests as per Clause 440, the specified fixings European Technical Approval, pull through resistance and any other relevant testing information.
- Final sign off of the project by National Technical Manager.

360 SAMPLES
- Procedure: Submit samples/ examples of designated items for approval. Keep approved samples on site for the duration of the contract for inspection/ comparison purposes.
- Designated items: TBC

380 UNIFORMITY OF COLOUR AND TEXTURE
- Once samples of coatings have been approved, do not change type or proportion of constituent materials unless agreed with Contract administrator and other relevant parties.
- Ensure that supplies of materials are sufficient to give consistent and uniform colour and texture. To minimise variations in colour, avoid dry jointing and continuous surfaces must be completed without breaks.
- Programming of work to coincide with elevation breaks, stoppages and weather is vital.
- K Systems VBriQ+ Slips & Corner Slips can vary slightly in colour and texture from batch to batch. It is therefore important that the total quantity required for the project is ordered and preferably delivered at one time. Delays in placing total orders or placing multiple orders may result in colour variations. It is advisable to use bricks from multiple boxes to ensure integration of colour variances as encountered with real bricks. Refer to BS8000: pt 3: Workmanship on building Sites for further guidance.

380A LIGHTNESS VALUE
- K Systems recommend that K Rend Silicone TC, Silkolitt, Silkolitt+ & Silkolitt+LT for application over insulated render backgrounds should be selected in colours with a lightness factor >30.
- Colours with lightness values ≤ 30 can be utilised but K Systems Technical Department must be consulted prior to colour selection and application.
- Shades with lightness values ≤ 20 must utilise the K Systems Heat Reflective Silicone Paint or Silkolitt+HR Silicone Render.

380B AVOIDANCE OF COLOUR SHADING
- Material with different batch numbers must be checked by the registered contractor for colour consistency prior to application. Approval of the contracts administrator or client may also be sought.

INSTALLATION

410 INSTALLATION
- Installer: The system must be installed by an K Systems registered contractor only.

410A INSTALLATION STANDARDS
- All rendering should be in accordance with the relevant recommendations of BS 13914-1: 2005, Design, Preparation & Application of External Rendering & Internal Plastering, BS 8000 : Part 10 : 1995, Code of Practice for Plastering and Rendering, K Systems's printed instructions and relevant BBA Certificate.

- All K Systems paints and decorative finishes must be applied to dry backgrounds and not during inclement weather conditions, strictly in accordance with K Systems instructions and the relevant clauses in BS 6150 : 2006, Code of Practice for painting of buildings, and BS 8000 : Part 12 : 1989, workmanship on building sites, Code of Practice for decorative wall coverings and painting.

412 INSTALLATION: INSULATION

- Boards must be applied in rows working across the façade with each row being staggered (brick bond) with the previous row a minimum of 200mm.
- Insulation board smaller than 200mm must not be used.
- Boards must be staggered at internal and external corners with no vertical joints.
- Gaps between boards should be kept to a maximum of 2mm.
- Gaps must be filled with PU Foam in all instances except Mineral Wool where slithers of Mineral Wool must be used.
- L-Shaped board must be installed around all opening corners.
- Where possible the surface of all insulation boards should be covered with the reinforcement coat and reinforcement at the end of each working day. This will provide both protection from any wet weather and reduce the risk of damage or vandalism of the boards.
- Any insulation boards that are saturated must be removed and replaced before application of any renders.
- Boards must be covered with reinforcement coat at the end of each working day to protect against potential fire & weather conditions.
- Refer to K Systems Technical Services and K Systems Installation Guides for further information.

412A INSTALLATION: INSULATION ADHESIVE

- The specified adhesive must be applied to the back of the insulation boards in one of two methods.
- Firstly, the specified adhesive can be applied by trowel to the full area of the back of the insulation board and notched with a 10mm notch trowel and placed firmly against the substrate. This method is suitable for flat substrates.
- Alternatively, a dot and dab method can be adopted. The edges of the insulation board must be coated with the specified adhesive and 3 large dabs of specified adhesive applied at even spacing to the centre of the board. The adhesive must cover at least 40% of the board. This method is suitable for undulating substrates. The insulation board is then placed firmly against the substrate.
- Refer to K Systems Technical Services and K Systems Installation Guides for further information.

412B INSTALLATION: INSULATION FIXINGS

- Fix boards to the substrate/rails using K Systems approved mechanical fixing to K Systems specified fixing pattern (see clause 221).
- Fixings must always be installed perpendicular to the substrate using the correct sized drill bit and to fixing manufacturer instructions.
- Fixings must always be installed at an embedment depth as per the recommendations of the tensile pull out test report.

412C INSTALLATION: SCRIM FIXINGS

- Whilst the specified reinforcement coat is still wet and the K Systems Scrim Reinforcement has been bedded in, drill & insert the K Systems approved mechanical fixing through the wet reinforcement coat, reinforcement scrim & insulation into the substrate/rail at the specified centres. (see clause 221).

- Whilst the specified reinforcement coat is still wet, all fixing heads must be covered with additional reinforcement coat & 100mm x 100mm K Systems Scrim Reinforcement Patches.
- Fixings must always be installed perpendicular to the substrate/rail using the correct sized drill bit and to fixing manufacturer instructions.
- Fixings must always be installed at an embedment depth as per the recommendations of the tensile pull out test report.

- Fixings must be installed around all openings and external corners at maximum 300mm centres so as to provide the system with an increased wind load capacity in these areas. These fixings must bear 75mm in from the line of the existing substrate edge.

412D INSTALLATION: FIRE FIXINGS
- Whilst the specified reinforcement coat is still wet and the K Systems Scrim Reinforcement has been bedded in, drill & insert the K Systems approved fire fixing through the wet reinforcement coat, reinforcement scrim & insulation into the substrate/rail at a minimum of 1 per metre squared. (see clause 221).
- Plastic cover caps (if applicable) must be used in conjunction with the specified fire fixings to prevent 'cold-spotting' of fixing heads upon completing the installation of the K Systems EWI system.
- Whilst the specified reinforcement coat is still wet, all fixing heads must be covered with additional reinforcement coat & 100mm x 100mm K Systems Scrim Reinforcement Patches.
- Fixings must always be installed perpendicular to the substrate/rail using the correct sized drill bit and to fixing manufacturer instructions.

413 INSTALLATION: BEADS/TRIMS/PROFILES
- Full system beads are to be installed horizontally or vertically, true to line and level, above DPC where applicable and in full lengths where possible.
- Beads must be fixed at a max of 300mm centres and at 50mm from the edges of each profile or bedded in relevant adhesive where applicable.
- Adjacent beads must be linked together with jointing clips (Ref: K3756).
- Packing shims must be used where required to maintain true line and level.
- Surface mounted beads are to be installed in one of two ways, beads with pre-adhered scrim are to be bedded into the wet reinforcing base coat, beads without pre-adhered scrim are to be fixed to insulation boards prior to application of the reinforcing base coat and fixed at 300mm centres with **K Systems Firtree Fixings**.

414A INSTALLATION: REINFORCEMENT COAT
- Mix HP14 Base as per K Systems Product Data Sheet with clean water.
- Apply the first pass to the insulation at a thickness of 3mm.
- While the HP14 is still wet, vertically notch the render and lay the K Systems Reinforcing Mesh into the top face.
- All reinforcing mesh must be wrapped around corners, reveals and heads whilst maintaining a minimum overlap with adjacent scrim of 100mm.
- All reinforcing mesh laps must be a minimum of 150mm from the line of reveals.
- Additional scrim patches of 500x250mm must be installed at corners of all openings.
- Whilst the HP14 Base is still pliable, fix through the K Systems Reinforcing Mesh with stainless steel fire pins and main wall scrim fixings, if specified, into the substrate and cover fixing heads with additional HP14 Base and 150x150mm K Systems Reinforcing Mesh Patches – as per fixing pattern. Allow to pick up / cure.
- Apply a second coat of HP14 Base, 3mm, smooth over ensuring no mesh is visible. Leave to cure slightly. A spatula or sponge float should be used to remove trowel lines and achieve a smooth consistent finish if the render is to have a silicone or acrylic finish applied.
- Additional rasping of the HP14 Base can be implemented to remove any additional trowel lines or protrusions once the product has cured.
- Allow drying time before proceeding with the installation of the EWI system. Refer to K Systems Technical Services and K Systems Installation Guides for further information.

416 INSTALLATION: TC PRIMER
- Apply K Systems Primer TC over the cured reinforcement coat with a roller or brush and leave to dry.
- Refer to K Systems Product Datasheet and K Systems Installation Guides for further information.

417C INSTALLATION: SILICONE TOPCOAT

- Mix K Systems Silicone TC with a clean paddle mixer prior to application.
- Apply K Systems Silicone TC to the thickness of the grain with a stainless-steel trowel to entire area of cured reinforcement coat / basecoat and remove excess.
- Texture K Systems Silicone TC using a plastic trowel in circular motions to give required effect and ensure even consistency.
- **DO NOT APPLY PAILS OF MATERIAL WITH DIFFERENT BATCH NUMBERS ON THE SAME ELEVATION**

418 INSTALLATION: K PRO

- The K Systems render, and finishes must be fully cured, and surfaces must be dry, clean and free from any contamination. Apply by low pressure spray or by brush/roller. Application on vertical surfaces must be to full saturation commencing at the bottom and working upwards. One application is normally required, however on highly porous substrates (>5% water absorption) a second application may be necessary to achieve desired effect.
- Apply the second application in the same manner immediately after the first application, taking care not to allow the first application to dry out. K Systems datasheets must always be referred to when using this product.

420 ADVERSE WEATHER

- Application of the system renders, finishes and paints must not be carried out in inclement weather conditions as described in BS 13914-1: 2005, Design, Preparation & Application of External Rendering & Internal Plastering & BS 6150 : 2006, Code of Practice for painting of buildings respectively.
- Do not use frozen materials and do not apply materials to frost bound surfaces.
- In sunny weather work should commence on the shady side of the building and be continued round following the sun to prevent the rendering drying out too rapidly
- K Systems materials must not be applied in rain, fog or mist, at temperatures below 5°C or above 30°C and or if exposure to frost, mist or rain is likely to occur during drying.
- Maintain temperature of the work above 5°C until adhesive/mortar/render has fully hardened.
- Protect newly rendered surfaces against rain and snow by covering when precipitation occurs.
- Replace coatings damaged by rain or frost.
- Care must be taken to programme works to avoid the use of darker render colours to reduce the risk of lime bloom in winter months or within adverse weather conditions. Refer to K Systems technical services for further assistance.
- Where extreme and or excessive weather conditions persist, provision must be given for extensions to work periods within the main contract documents.

425 SCAFFOLDING

- All scaffolding must be installed in line with current HSE publication ‘The Working at Height Regulations’.
- Wherever possible independent scaffolding should be used to avoid the need to subsequently make good putlog holes and other breaks in the work.
- Where the scaffolding is required to be tied back to the building it is normal to recommend “box-outs” to reduce the incidence of patches left by putlogs and to provide access points for future scaffolding required for maintenance inspection and repairs.
- The scaffolding must be arranged to enable good access to be obtained to the whole of the face of the building and sufficient clearance for working is to be provided between the scaffolding and the finished surface of the render.
- An allowance must be included for the thickness of the finished system on the face of the building.

426 HEALTH & SAFETY

- It is strictly the contractor's responsibility to ensure that all works are executed is in accordance with current health and safety legislation. Guidance must be taken from relevant and current HSE publications.
- Safety scaffolding, the location of rubbish skips, access ladders etc. must be agreed with the client/principal contractor/ principal designer and be in accordance with current Health and Safety regulations.
- The use of all K Systems materials must be in accordance with relevant Product Data Sheets & Safety Data Sheets.
- Product Data Sheets & Safety Data Sheets are available for all relevant products supplied by K Systems; available for download from www.k.systems

430 CONDITION OF BACKGROUNDS

- Before pre-treatment or application of coatings ensure that backgrounds are structurally sound, weathertight, adequately true and level, dry, free from contamination by dirt, dust, efflorescence or other deleterious substances, and in a suitable condition to receive specified coatings.
- The treatment of backgrounds is subject to remedial survey, clauses 160, 180 suite of clauses, 210 suite of clauses, 430 suite of clauses and full K Systems recommendations.

430D LINE AND LEVEL OF BUILDING: (MASONRY SUBSTRATE)

- The terms "line and level" used in conjunction with this specification refer only to dealing with minor localised variations in the surface to which the system is applied.
- The system cannot correct major variations in line and level over several storeys in height and over large areas of elevations, and in these cases will basically follow the line of the existing building unless these building irregularities are overcome by a treatment, prior to the application of the External Wall Insulation system.
- Any excessive irregularities, i.e. over plus or minus 10mm, must be rectified prior to the installation to ensure that the insulation boards are installed with a smooth, in-plane finished surface.
- The flatness of the surfaces must be checked, this may be achieved using a straight edge spanning the storey height. Horizontal projections, ledges etc should be removed to provide a level surface to receive the system.
- Where appropriate the contractor must inspect the existing wall and include for a bed coat of K Systems Standard UF Base Coat and/or HP14 Base to take up any variation in the flatness of the backing wall. All in accordance with agreed remedial survey as per clause reference M21, 120 and 160.
- It is essential that any variations within the substrate do not have a detrimental effect on the system; attention must be given to ensure that all fixings minimum specified embedded into the substrate, ensuring the performance of the mechanical fixing and subsequent system performance.

440 PULL OUT TEST(S) ON FIXING PINS

- Objective: Conduct pull out tests prior to the start of the project, with the specified fixings (see 211/221 suite of clauses) to prove suitability of the structural background and determine the size, type and number of fixings. Notice of 10 working days must be given.
- Tests must be conducted to ETAG 014, by suitably trained persons (fixing suppliers or K Systems) and results supplied to K Systems Technical Services within sufficient time for evaluation, typically 5 working days.
- Additional pull out tests can be conducted if instructed to do so by the client, contracts administrator or their representatives, subject to the findings in their structural report, see Clause 325. The location and frequency of the additional tests must be specified by the client, contracts administrator or their representatives.

450 PREPARATION: EXISTING SERVICES, ETC

- Disconnect, make safe and carefully remove all live or used cables etc, to be replaced on completion (Refer to K Systems standard details as per Clause 310).
- Installers are required to notify BT Openreach before commencing work on the EWI system installations so that BT Openreach have the opportunity to survey the property and identify any alterations needed to their equipment or cables; notification of works and this can be done via the following portal www.openreach.co.uk/externalwallinsulation. For further assistance see Green Deal Oversight and Registration Body guidance note ref: ORBCOMM029 - Pre-installation survey requirements for telecoms services.
- All non-treated metalwork including copper pipework, ducting, etc. to be protected against corrosion from Phenolic insulation slabs using a suitable coating system applied strictly in accordance with the manufacturer's recommendations or covered with protective sheathing.
- Remove all television aerials, brackets, lights or tenant's fittings from work surfaces and replace upon completion (Refer to K Systems standard details as per Clause 310).
- All existing rainwater and waste disposal fittings to be redirected away from the substrate and the EWI system surface whilst works proceed. Replace and refix upon completion of work taking into consideration the thickness of the EWI system. Mechanical fixing of rainwater goods to follow K Systems technical manual recommendations (Refer to K Systems standard details as per Clause 310).
- All gas and balance and mechanical flues to be extended to anticipated line of system in accordance with British Gas recommendations. (See Clause 450A).

450A PREPARATION: FLUE PIPES

- To prevent the possibility of radiated heat starting a fire, a flue-pipe should be separated from combustible material. Therefore flue-pipes must be enclosed in non-combustible insulation; refer to relevant building regulations and K Systems standard details (Refer to K Systems standard details as per Clause 310) for guidance.
  - Insulation: **K Systems Dual Density Mineral Wool**
  - Dimensions: 1200 x 600 x 90mm
  - Minimum Distance: 225mm from perimeter of flue-pipe
  - Fire rating: A1 euroclass
  - Method of fixing:
  - Mechanical Fixing: **KMBASS08140** @ 300mm centres
  - Adhesive: **K Systems HP14 Base Render**

450B WINDOW CILL PROJECTION

- Where window frames incorporating window cills are to be provided by others, then the cill projection to the drip throat must be 40mm beyond the outside line of the EWI system. Refer to K Systems standard details as per Clause 310 for guidance.

450C PREVIOUSLY PAINTED SURFACES

- Remove all existing paint, bituminous coating etc, by hacking off, needle hammering, abrasive blasting or alternative treatments to expose the entire surface to establish sufficient adhesion. Brush down to remove all loose particles, dust etc.
- Where existing surfaces have been treated with a vapour permeable coating or colourless waterproofing material it may be acceptable and necessary to provide a reinforcing mesh to support the proposed K Systems render or hack the surface thoroughly to provide an acceptable key. Advice should be sought from K Systems's technical department.
- It is essential that any NON-VAPOUR PERMEABLE coatings are removed to prevent entrapment of moisture vapour moving through the structure.

450E EXISTING WEEP HOLES

- Remove and dub out all existing weep holes, using Standard UF Base Coat, if considered redundant. Redundant weep holes to be confirmed by the Contract Administrator.

460 CURING

- Allow all coats to dry out thoroughly before applying subsequent coats, refer to relevant BBA document or K Systems installation instructions for full details.
- Sheet out system and or scaffolding with polythene or similar sheeting to allow the renders to cure and dry naturally.
- All necessary precautions must be taken to prevent newly rendered surfaces from drying out too rapidly.
- Allow each coat to dry thoroughly, with drying shrinkage substantially complete before applying next coat.
- In curing and subsequent periods protect from frost and driving rain as per normal system requirements and clauses 410 suite of clauses and 420.

460A PROTECTION

- Adequately protect newly applied external coatings against frost and rain for at least the first 48 hours using polyethylene sheet hung clear over the face, or other approved method.
- Adequate protection should be taken to prevent following trades or removal of scaffolding from soiling or damaging to finished render and insulation system.

490 CONSTRUCTION/MOVEMENT JOINTS

- Form joints accurately using K Systems beads/trims/profiles (as per Clause 222) to Architect/Designer locations shown on the drawings.
- If modifications to any joint location or design are necessary on site, agree revisions with contracts administrator and confirm in writing with K Systems before proceeding.
- All movement joints to be designed and installed in accordance with relevant BBA Certificate, as per K Systems standard details (refer to Clause 310) and with K Systems's approval.
- All movement joints are to be installed at no greater than 7m centres unless agreed in writing by K Systems.

490A DISSIMILAR SOLID BACKGROUNDS FOR RENDERING

- Where the system is to be continued over joints between dissimilar solid backgrounds which are in the same plane, all junctions must have K Systems movement joints installed over and mechanically fixed with suitable approved fixing or adhesive (refer to clauses 222 & 310).

510A FIRE BARRIERS (WITHIN INSULATION SYSTEM):

- All design and installation of the system and associated fire barriers must follow BRE guidance document 'BRE report 135', relevant K Systems BBA certificate and K Systems details (refer to Clause 310).
- Fire barriers must be applied to the structure at each floor level above two storeys and vertically where required.
- Insulation: **K Systems Dual Density Mineral Wool**
  - Dimensions: 1200 x 600 x 90mm (cut into minimum 200mm wide fire breaks)
  - Density: 100 - 140kg/m^{-3} (approx)
  - Minimum compressive strength: 20kNm-2 (at 10% compression)
  - Lambda value (l): 0.036 W/m2K
  - Water vapour resistance factor (μ): ~ 1
  - Reaction to fire: A1
- Method of fixing:
  - Mechanical Fixing: **KMBASS08140** (fixed through reinforcement scrim at maximum 300mm centres and fixing heads covered with additional reinforcement coat and reinforcement scrim)
  - Adhesive: **K Systems HP14 Base**
  - Supplier: K Systems, Unit 203, Mere Grange, St Helens, Merseyside, WA9 5GG.
  - When using Mineral Wool additional fire barriers are not required within the insulation layer. Refer to K Systems Technical services for relevant test documentation.

520 SUPPORTS FOR SERVICES/FITTINGS

- Provide secure supports for soil and rainwater pipe brackets and any additional attachments in locations shown on drawings (Refer to K Systems standard details as per Clause 310). Consult K Systems Technical Services for fixing methods/details.

530 SEALANT JOINTS

- Locations: at all interfaces (Refer to K Systems standard details as per Clause 310)
- Sealant: **K Systems Low Modulus Silicone Sealant & Compriband 600 Joint Tape**
- Joints: Formed in accordance with manufacturer's recommendations using any necessary joint fillers, backing strips, etc.

540 STORAGE OF MATERIALS

- Adequate dry weatherproof and ventilated storage shall be provided for materials.
- All materials shall be protected against frost.
- All materials & products shall be stored off the floor.
- Renders & decorative finishes to be stored in temperatures of at least 5°C.
- K Systems will not be held responsible for any damage to materials.

550 INSPECTION OF COMPLETED INSTALLATION

- As soon as possible after completion of the work and before removing scaffolding, carry out an inspection with the contract administrator to identify any defects and report immediately.

AFTERCARE & WARRANTY

560 MAINTENANCE

- It is recommended that all facades be inspected at a minimum frequency of once a year.
- Inspections should be carried out in spring accounting for the effects of annual extremes.
- Inspection should also be carried out following works on the facade by other trades, or following installation of new equipment.
- All inspections/and or maintenance actions carried out on the facade must be in full compliance with the appropriate health and safety regulations, and particularly those specifically dealing with working at height. Refer to current HSE publication ‘The Working at Height Regulations’ for further guidance.
- All maintenance must be carried out in accordance with K Systems recommended maintenance documentation.
- K Systems Facades maintenance documents can be downloaded from www.k.systems

570 WARRANTY

- The above specification shall be installed in accordance with the appropriate sections of all current relevant codes of practice, Building Regulations, and manufacturer's installation instructions for product supplied by the company. The works shall be installed by an K Systems Registered Contractor, and, as agreed in the contract, the K Systems Certificate of 10 Year Warranty shall be issued to the Building Owner from the date of final completion.
- This warranty assures the building owner that, in the event of a latent product defect in the renders, insulation, sealants or associated accessories and adhesives as supplied by K Systems, K Systems undertakes to reinstate the System, subject to the terms and conditions of warranty.
- This system warranty is conditional upon the full system being purchased from K Systems and installed in accordance with the above specification. Substitution of any products, or installation by means other than those described, will invalidate the warranty offered.
- The warranty offered is subject to the terms and conditions set out in the certificate of warranty, available upon request.

FS TRADE
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Green Homes North West