Appendix 4 - Render Technical Submittal Document

# SPECIFICATION

PROJECT: High Point Village, Station Approach,
Hayes, UB3 4BH
REF: OPP008615-S1
AUTHOR: Tarvinder Katavada
DATE ISSUED: 27 October 2022

K Systems
Insulated Façades

# Draft Specification


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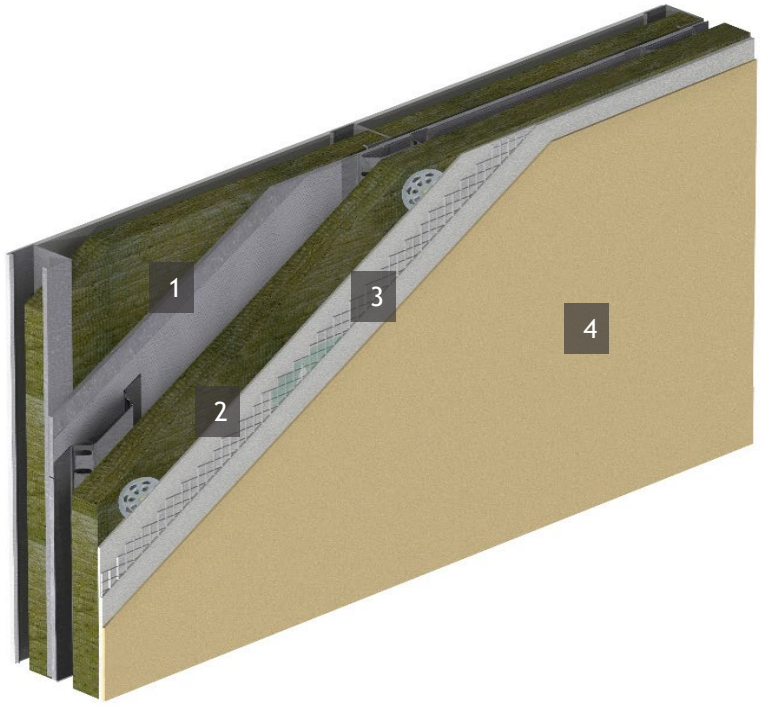
| Project No: | OPP008615-S1 |
| Project: | High Point Village, Station Approach, Hayes, UB3 4BH |
| System: | Exicco M Silkolitt+ |
| Email: | technical@k.systems |
| Submitted By: | K Systems<br>Unit 203, Mere Grange, St Helens, Merseyside, WA9 5GG |
| Date Issued: | 27 October 2022 |

# K SYSTEMS OVERVIEW

| | | |
|---|---|---|
| SURVEY INFORMATION | PROJECT NAME | **MAIN WALL AREAS** |
| | PROJECT SIZE *(m2)* | 1000m2 |
| | HEIGHT *(Storeys)* | ABOVE 18M / HIGH RISE |
| | SUBSTRATE TYPE | EXISTING STEEL FRAME |
| **PROPOSED BUILD - UP** | | **SYSTEM – K SYSTEMS EXICCO M SILKOLITT+** |
| MAIN AREA PROPOSED MATERIALS | PREPARATION (1) | CLEAN DOWN |
| | RAILS (2) | EXICCO RAILS |
| | INSULATION (2) | K SYSTEMS DUAL DENSITY MINERAL WOOL |
| | THICKNESS (mm) | 170mm |
| | BASECOAT (3) | K SYSTEMS ABC BASE COAT |
| | REINFORCEMENT (3) | K SYSTEMS REINFORCING MESH |
| | PRIMER (4) | K SYSTEMS SILICONE PRIMER (colour TBC) |
| | FINISH COAT (4) | SILKOLITT+ 1.5mm SILICONE RENDER (colour TBC) |

- System reference: **K Systems Exicco M Silkolitt+ (BBA 20/5756 PS3)**




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

# M21 INSULATION WITH RENDERED FINISH – DRAFT SPECIFICATION

**Prior to commencement on site, a K Systems representative must produce a full proposed, non-draft K Systems Exicco M Silkolitt+ specification.**

**The fixing pattern, highlighted in clause 221B, will be confirmed in our Proposed Specification which must be issued before the project commences, following K Systems analysis and acceptance of a 3rd party Structural Engineer's wind load report. Please allow for up to 12 fixings per m2* initially in the Draft Specification with a until the pattern has been confirmed by K Systems.**

*** Note. This is a preliminary assessment of fixings which will likely change through the wind load report analysis.**

## GENERAL

120 SURVEY OF STRUCTURAL SUBSTRATE (STEEL)

- Timing: Before starting work covered in this specification.
- Responsibility: Client / Contracts Administrator / Registered Contractor
- Objective: To confirm suitability of steel frame and sheathing board for application of specified EWI system and to coincide with recommendations and allowable system tolerances as stated in specification 430 suite of clauses, BS 5950-7:1992 and frame system manufacturers recommendations.
- Survey report: Submit, covering:
  - The form and condition of the structural substrate.
  - Check line and level. The system can only deal with localised variations.
  - The framed walls are adequately weathertight in relation to the relevant exposure zone and wind driven rain index as per BS 8104: 1992.
  - 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.
  - A copy of The Survey Report should be sent to K Systems for evaluation before commencement of the project.

150 WIND LOADING

- On high rise projects, wind load calculations are required in order to establish the minimum number of fixings required per m² to resist the maximum wind loads acting on the building. In order to do this, wind loads must be calculated by a suitably qualified and experienced 3rd party Structural Engineer in accordance with BS EN 1991-1-4:2005. The fixing pattern, highlighted in clause 221B, will be confirmed in our Proposed Specification which should be issued before the project commences, following K Systems analysis and acceptance of a 3rd party Structural Engineer's wind load report. On site pull out tests by fixing suppliers or K Systems will also be required before commencement of the project. (see clauses 340, 341 & 440).

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)

180D STRUCTURAL SUBSTRATE

- Description: **Existing Steel Frame**
- Preparation: All preparation to follow 430 suite of clauses and as follows:
  Remove any friable or wet, material, algae or lichen, residue resin or oil, and any deleterious materials to provide a good surface 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.
  - Remove all existing cladding materials from timber/steel framed panels and replace with suitable sheathing board.

- Pre-Treatments:
  - **Clean Down** – Clean down to remove any friable and/or deleterious material, and to provide a good key for K Systems products.
  - 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

220B EXTERNAL WALL INSULATION SYSTEM:

- Supplier: K Systems, Unit 203, Mere Grange, St Helens, Merseyside, WA9 5GG.
  - System reference: **K Systems Exicco M Silkolitt+**
- Insulation Support Rails: 0.8mm Galvanised Steel Exicco Rails (Clause 222G)
  - Cavity width: 25mm (minimum)
  - Method of fixing: Self drilling galvanised/zinc coated screws
- Insulation: **K Systems Dual Density Mineral Wool Insulation** (Clause 221E)
  - Thickness: 170mm
  - Method of fixing: Mechanical
- Reinforcement render: **K Systems ABC Base Coat** (Clause 223B)
  - Thickness: 5mm
  - Reinforcement: **K Systems Reinforcing Mesh**
- Decorative finish: **Silkolitt+** (Clause 226F)
  - Thickness: 1.5mm
  - Primer: **K Systems Silicone Primer** (Clause 225A)
  - Colour: TBC

- System certification: BBA Approved (20/5756 PS3) & NHBC accepted
- System performance:
  - General testing: ETAG004 Guideline for European Technical Approval of EWI Systems
    An assessment of wind driven rain test in accordance with BS EN 12865
    Dynamic wind uplift test in accordance with section 5.1.4.3.3 of ETAG 004
  - Fire: Class 0
    A2-s1, d0 reaction to fire classification to BS 13501-1
    Approved above 18m
  - Effective Life: > 30 years
  - U-Value: TBC By Calculation
  - Impact resistance: Category II to ETAG 004

  - **Dynamic wind uplift: 1.52kPa Design Wind Uplift**
- Accessories:
  - Beads/Trim/Profiles: as per Clause 222G
  - Additional protection: **K Pro** (Clause 227)

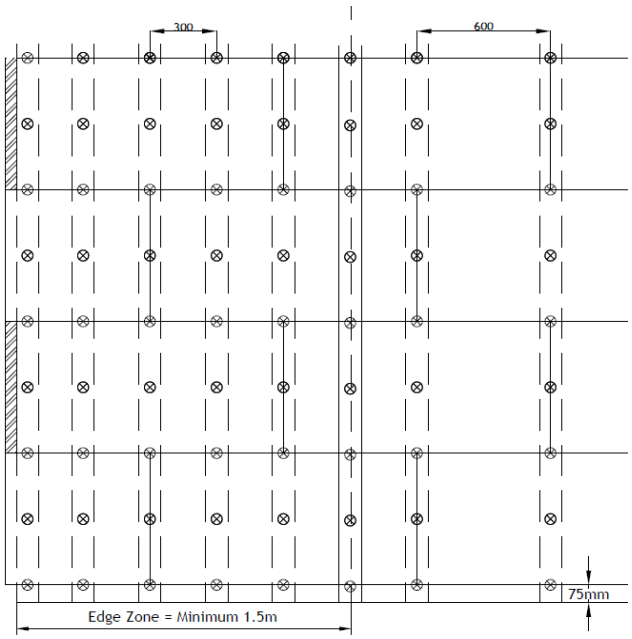
221E INSULATION

- Insulation reference: **K Systems Dual Density Mineral Wool Insulation (see clause 412)**
- Supplier: K Systems, Unit 203, Mere Grange, St Helens, Merseyside, WA9 5GG.
  - Dimensions: 1200 x 600 x 170mm
  - Density (nominal): 100 - 140 kg/m-3 (approx.)
  - Minimum compressive strength: 20kNm-2 (at 10% compression)
  - Lamba value (l): 0.036 W/m$^2$K
  - Water vapour resistance factor (μ): ~ 1
  - Reaction to fire: A1
- Method of fixing:
- Insulation Fixing: **KWX58T105** with **KCX-105 Tubular Washer** & **KWL90 Oversized Washer**
  - Insulation Fixing Pattern: refer to detail KS-EXICCO-101 [ ] & clause 412B.
- Scrim Fixing: **KWX58T105** with **KCX-105 Tubular Washer**
  - Scrim Fixing Centres: refer to detail KS-EXICCO-102 [ ] & clause 412C.
- Reveal Fixings: **KWX58T065** with **KC Washer**
  - Centres: 300mm maximum
- Fire Fixing: **KWX58T200** with **KHV36 Washer** (refer to clause 412D)
  - Fire Fixing Pattern: required above 2 storeys at minimum of 1 per meter squared.
- Fire Barrier: See clause 510C

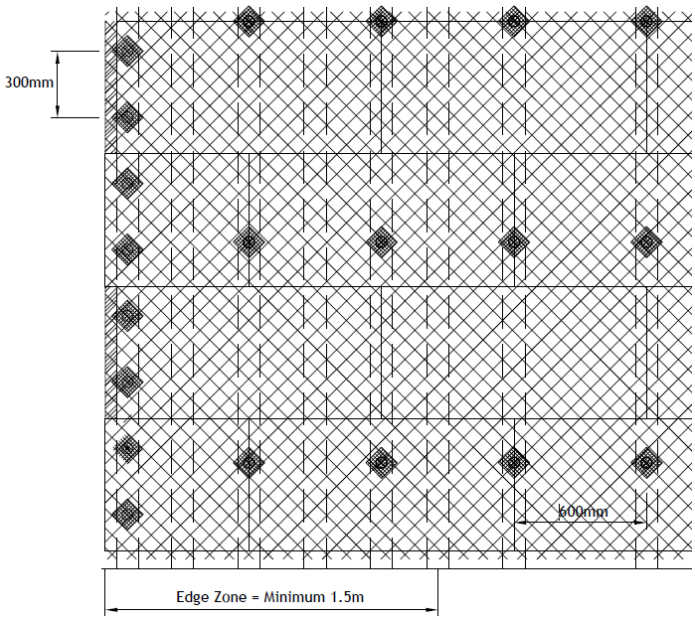
**Note: The proposed fixing pattern will generate a maximum design negative wind load of 1.52kN/m2 only. If the project wind load is greater than this, a revised fixing pattern will be required. Contact K Systems Technical Services for further guidance.**

*Fig.1 – Exicco Fixing Pattern*

*1. Insulation fixings*




*2. Scrim fixings*




222G BEADS/TRIMS/PROFILES/RAILS

- Description: Exicco Rails (see clause 411)
- Supplier: K Systems, Unit 203, Mere Grange, St Helens, Merseyside, WA9 5GG.
- Material: 0.8mm galvanised steel grade Dx51-Z275 to BS EN 10327
- Length: 3.0m
  - Exicco Spacer rail ref: **EXSR-25-3M**
  - Exicco Frame rail ref: **EXFR-25-3M**
  - Exicco Deflection rail: **EXDR-25-3M**
  - Exicco Corner spacer rail: **EXDR-25-3M**
- Method of fixing: **RLS-55038 / RLS-55050** (subject to clause 440)
  **RLS-55070-FR** (additional fixings for frame rail) (subject to clause 440)

- Description: Full System Beads (see clause 413)
- Supplier: K Systems, Unit 203, Mere Grange, St Helens, Merseyside, WA9 5GG.
- Material: PVC & Aluminium
- Length: 2.5m
  - Starter track ref: **EXST25/170/SF** with **K37404** clip on drop profile
  - Vertical movement bead ref: **K8575-ISPO / K8576-ISPO** (Internal Corner)
  - Horizontal movement bead ref: **K9181FS/170** with **K9182 & K90817 s**tarter track
- Method of fixing:
  - Mechanical fixing Ref: **RLS-55038 / RLS-55050**

- Description: Surface Mounted Beads (see clause 413)
- Supplier: K Systems, Unit 203, Mere Grange, St Helens, Merseyside, WA9 5GG.
- Material: PVC
- Length: 2.5m
  - 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 ABC Base Coat** (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: **KWEC741220**

IMPORTANT NOTES:
- The above specified starter track must be isolated from the spacer rail using isolation tape. This is to prevent cross metallic corrosion.
- Movement Joints are required to replicate the movement accommodated in the substrate.
- If project is within 4 miles of costal location and or estuary the all the above bead references must be stainless steel or PVC (all references to be followed by Ref: SS or PVC)
- All bead references to be agreed prior to commencement on site.

223B REINFORCEMENT
- Product ref: **K Systems ABC Base Coat (refer to clause 414B)**
- Supplier: K Systems, Unit 203, Mere Grange, St Helens, Merseyside, WA9 5GG.
- Description: Polymer modified reinforcement render
  - Size: 25kg bag
  - Thickness: 5-6mm
  - Liquid Water Absorption W24 [kg/m²_h]: < 0.06 to ETAG004 Clause 5.1.3.1.
  - Vapour Permeability (Sd[m]): ,0.09 to ETAG 004 and EN ISO 7783-3.
  - Compressive Strength: 8-10 N/mm2 to EN 1015-11
  - Flexural Strength: 3-4 N/mm2 EN 1015-11
  - Tensile Adhesive Bond Strength on Insulant: >80kN/m2 to ETAG 004
  - Fire Rating: A1 to BS13501-1
  - Coverage: 5.25m2 per 25kg bag (EPS) or 4m2 per 25kg bag (Mineral Wool)
  - Colour: Grey

- Product ref: **K Systems Reinforcing Mesh (refer to clause 414B)**
- 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 **K Systems ABC Base Coat**

- 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 1.1m

225A PRIMER
- Product ref: **K Systems Silicone Primer (refer to clause 416A)**
- Supplier: K Systems, Unit 203, Mere Grange, St Helens, Merseyside, WA9 5GG.
- Description: Silicone based primer
  - Size: 23kg drum
  - Water vapour diffusion resistance factor (D-value): 2800
  - Coverage: 80m2 per drum
  - Colour: TBC (to match decorative finish)

226F DECORATIVE FINISH: SILKOLITT+ SILICONE TOPCOAT
- Product reference: **Silkolitt+ (refer to clause 417F)**
- Supplier: K Systems, Unit 203, Mere Grange, St Helens, Merseyside, WA9 5GG.
- Description: Textured silicone render
  - Size: 25kg drum
  - Grain Size: 1.5mm
  - Vapour Permeability (Sd[m]): < 0.14
  - Capillary Water Absorption: < 0.08 kg/m² √h
  - Adhesive Strength: 1N/mm2 to EN 1542
  - Coverage: 12.5m2
  - 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

**KILWAUGHTER IS committed to ensuring best practice and accreditation as a quality product and service provider. Our High-Rise Policy and procedures are firmly embedded in our Quality Management System.**

- 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 on the project is by the National Technical & Operations 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.

411 INSTALLATION OF EXICCO RAILS & SUPPORT SYSTEM:

- All Exicco Rails associated with K Systems Exicco System must be installed directly to the sheathing board in a plane line and level manner, as per normal good site practise and in accordance with K Systems standard requirements.
- All Exicco Rails must be mechanically fixed with K Systems approved fixings at 300mm centres, fixed into each flange up the length of the rail using the specified self-drilling screws.
- Centres of the Exicco Rail support system are typically 600mm centres in the main and 300mm centres at the edge zones, typically 1.5m from all corners of the building, refer to standard details for guidance.
- Exicco Rail centres are always dependent upon the project conditions and requirements, rail centres may be subject to subsequent change upon a wind loading evaluation (refer to K Systems Structural Engineers Report where applicable). All Exicco Rails and Exicco Starter Tracks are to be installed and fixed at project specific centres to be agreed before commencing with installation of the K Systems Exicco System.
- Any minor undulations within substrate must be packed off with packing shims to prevent deformation of buckling of support system. Packing shims must be A1 fire rated material.
- Refer to K Systems installation guide for further guidance in relation to the installation of the K Systems Exicco System.

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.

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 & 150mm x 150mm 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 & 150mm x 150mm 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**.

414B INSTALLATION: REINFORCEMENT COAT

- Mix K Systems ABC Base Coat as per K Systems Product Data Sheet with clean water and apply at an even thickness of 4-5mm to the insulation board.
- Vertically notch with 10mm stainless steel trowel to achieve an overall thickness of between 4-5mm.
- While the K Systems ABC Base Coat is still wet, trowel in the K Systems Reinforcing Mesh into the top face leaving the K Systems Reinforcing Mesh. The ABC should be approx. 4mm thick at this stage.
- Use scrim angle beads to external corners, reveals and heads.
- 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 ABC 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 ABC and 150x150mm K Systems Reinforcing Mesh patch – as per fixing pattern, allow to pick up / cure.
- Apply a slurry coat, 1-2mm, of ABC, smooth over the ensuring no scrim is visible leave to cure slightly. A spatula or sponge float should be used to remove trowel lines and achieve a smooth consistent finish.
- Additional rasping of the ABC 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.

416A INSTALLATION: PRIMER

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

417F INSTALLATION: SILKOLITT+ TOPCOAT

- Mix K Systems Silkolitt+ with a clean paddle mixer prior to application.
- Apply K Systems Silkolitt+ 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 Silkolitt+ 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.

430A LINE AND LEVEL OF BUILDING: (FRAMED CONSTRUCTION)

- The terms "line and level" used in conjunction with this specification refers 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.
- 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 substrate and include for any remedial measures 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.
- Any excessive irregularities, i.e. over plus or minus 5mm, must be made good prior to the installation to ensure that the system is installed correctly.

- Where tolerances of the supporting frame are outside of frame manufacturer's recommendations and cannot be rectified within works associated to the sheathing panel or the EWI system, suitable remedial action must be carried out in agreement with main contractor and nominated subcontractor.
- It is essential that any variations and/or remedial works within the substrate and sheathing board do not have a detrimental effect on the system. Attention must be given to ensure that all fixings specified achieve minimum embedment and thickness into the substrate, ensuring the performance of the mechanical fixing and subsequent the EWI system performance.

430C SHEATHING BOARD (INSTALLATION AND PROTECTION)

- Installation of sheathing board must be installed and designed in conjunction with sheathing board manufacturers written recommendations. Including joints and junctions within sheathing panels to be sealed as per manufacturers recommendations, ensuring weathertightness as per the guidance given in BRE Report BR 262: 2002, prior to application of the EWI system.
- The EWI system is to be installed and sealed as soon as possible to give weather tight protection to the structure.

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 170mm
  - Minimum Distance: 225mm from perimeter of flue-pipe
  - Fire rating: A1 euroclass
  - Method of fixing:
  - Mechanical Fixing: **KWX58T200** with **KHV36 Washer** @ 300mm centres
  - Adhesive: **N/A**

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).

510 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).
- When using Mineral Wool additional fire barriers are not required within the insulation layer. Refer to K Systems Technical services for relevant test documentation.

510C FIRE BARRIERS (CAVITY FIRE BARRIER):

- Intumescent cavity fire barriers are to be installed as per the requirements of Building Regulations, so as not to infringe the drained cavity and to manufacturer guidelines. BR135 can be referred to for further guidance in relation to fire barrier location requirements.
- The information supplied in this clause is based upon general construction scenarios and limited to the specific information made available to K Systems. All information regarding fire stopping needs to be approved by a building designer or building control professional, who will have a wider understanding of the overall project prior to implementation of this information.
- Description: **TENMAT** FF102/50 Fire Barrier. Pre-formed intumescent strip suitable for drained not ventilated cavities up to 50mm width.
- Method of fixing: As per Table 1
  Mechanical fixing Ref: As per Table 1

**Table 1**

| Fire Barrier | Cavity Width (mm) | Fire Rating E Integrity (mins) | Fire Rating EI (mins) | Seal Size (mm) | | | Mechanical Fixings | |
|---|---|---|---|---|---|---|---|---|
| | | Horizontal | | Thickness | Height | Length | Type | Centres (mm) |
| **FF102/50** | 0-50 | 120** | 90** | 6 | 75 | 1000 | Screw* | 250 |
| | | | | | | | | |

*Mechanical fixing ref. **KWX58T040** (Sheathing Board)
*Mechanical fixing ref. **RLX-05X050-CS-ZF** (Concrete)
**Depending on build type.

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 reques

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