SITE MADE RENDERS

SPECIFICATION AND QUALITY ASSURANCE

INTRODUCTION

As identified in the Technical Update article 'Rendering on substrates' to determine if a site made render meets our Warranty requirements the developer/ builder should provide a specification and quality control process document to the Warranty surveyor. The following document is to provide guidance on this and is divided up into two sections;

- Specification of site made render
- Quality assurance of site made renders

This is followed by Appendix A which provides a pro forma for the render specification to be completed and returned to the Warranty surveyor.

SECTION 1: SPECIFICATION OF SITE MADE RENDERS

This section provides general information to be provided to the Warranty surveyor. This is not an exhaustive list of criteria and reference should be made to BS EN 13914– 1:2016.

In addition to the specification, a full set of drawings should be provided indicating the areas to be rendered and construction details.

Site made renders are only suitable on masonry substrates. The masonry substrate should be a thickness which should resist damp ingress to the internal finishes based on the recommendations of PD 6697 or BS 5628 Part 3 2005.

The exposure zone of the site and proposed build up should be included in the specification. BS 8014 can be used to help identify the exposure zone more accurately.

The specification of the render should be in accordance with BS EN 13914– 1:2016.

The specific render mix should be;

- Appropriate for the intended purpose
- Be compatible with the background
- Designed to minimise the risk of de-bonding, cracking and crazing.

The following mixes identified in BS EN 13914-1:2016 maybe acceptable for Warranty purposes.

Note: Ensure the render being used is suitable for the substrate and is not too strong. Avoid applying a thin base coat and a thicker top coat application, as this could cause the render to delaminate from the base coat.

Information from Table NA.2 in BS EN 13914 – 1:2016 (2) gives designation of mixes.

TABLE NA.2 - MIXES SUITABLE FOR RENDERING					
Mix	Mix proportions by volume based on damp sand				
Designation	Cement:lime:sand[a]	Cement:ready-mixed lime:sand[a]		Cement:sand[a] (Using plastisizer)	Masonry cement:sand[a]
		ready-mixed: lime:sand	Cement:ready-mixed material		
I	1 : ¼ : 3	1 : 12	1 : 3	-	-
II	1 : ½ 4 to 4½	1 : 9	1 : 4 to 4½	1 : 3 to 4	1 : 2½ to 3½
III	1 : 1 : 5 to 6	1 : 6	1 : 5 to 6	1 : 5 to 6	1 : 4 to 5
IV	1 : 2 : 8 to 9	1 : 4½	1 : 8 to 9	1 : 7 to 8	1 : 5½ to 6½
V	1 : 3 : 10 to 12	1 : 4	1 : 10 to 12	-	-

Note: In special circumstances, e.g. where soluble salts in the background are likely to cause problems, mixes based on sulphate-resting Portland cement should be employed.

[a] With fine or poorly graded sands, the lower volume of sand should be used.

Table NA.3 in BS EN 13914 – 1:2016 (2) gives suitable mixes in Severe and severe Exposure zones, as described below.

TABLE NA.3 - Severe (see note 1) and very severe exposure: recommended rendering specifications (see note 2)						
Background	First undercoat		Second undercoat[a]		Final undercoat (see **6.18.5** and note 3)	
	Designation (see table NA.2)	Thickness (see 6.18.4)	Designation (see table NA.2)	Thickness (see 6.18.5)	Type	Mix proportions by volume[b] or designation (see table NA.2)
		mm		mm		
Strong to moderate	II	8 to 12	II	6 to 10	Roughcast Buttercoat Drydash Tyrolean	1 : ½ : 3 : 1½ } II
Metal lathing	I	3 to 6[c]	II	10 to 14	Roughcast Buttercoat Drydash Tyrolean	1 : ½ : 3 : 1½ } II
Moderate to weak	III	8 to 12	III	6 to 10	Roughcast Buttercoat Drydash Tyrolean	1 : 1 : 4 : 2 III II

Note 1: For individual sites that are sheltered but which lie within a severe catagory zone, providing that there is sufficient satisfactory local experience, then mixes relating to moderate conditions may be used. See Table NA.4.
Note 2: The nominal overall thickness (excluding texture) is not normally less than 20mm.
Note 3: For severe and very severe exposure, it is prefered that the finish be thrown or rough textured.

[a] For severe and very severe exposure, the use of two undercoats is preferred.
[b] Cement:lime:sand:coarse aggregate.
[c] Render thickness given is from the outer face of the lath.

Finally, Table NA.4 in BS EN 13914 – 1:2016 (2) gives suitable mixes in Moderate and sheltered exposure zones, as illustrated below

TABLE NA.4 - Moderate and sheltered exposure: recommended rendering specifications (see note)

Background (see section 4)	Undercoat[a]		Final coat (see **32.5)**		
	Designation (see Table 1)	Thickness mm (see **32.4**)	Finish	Type	Mix proportions by volume[b] or designation (see Table 1)
Strong to moderate	II	8 to 12	Thrown	Roughcast Buttercoat for drydash Tyrolean	1 : 1 : 3 : 2 III II
	III	8 to 12	Trowel applied	Woodfloat Scraped Patterned Tooled	} IV
Moderate to weak	III	8 to 12	Thrown	Roughcast Buttercoat for drydash Tyrolean	1 : 1 : 3 : 2 III II
	IV	8 to 12	Trowel applied	Woodfloat Scraped Patterned Tooled	} IV
Weak (in sheltered positions only)	IV or V	8 to 12	Trowel applied	Woodfloat Patterned	} V
Metal lathing	Two undercoats as for severe exposure (see Table 2)		Thrown	Roughcast Buttercoat for drydash Tyrolean	1 : 1 : 3 : 2 III II
			Trowel applied	Woodfloat Scraped Patterned Tooled	} IV

Note: The nominal overall thickness (excluding texture) is not normally less than 16mm.

[a] For moderate and sheltered exposure, the use of one undercoat is acceptable for all backgrounds except metal lathing.
[b] Cement:lime:sand:coarse aggregate.

Render thickness

The render coat thickness should be identified within the specification and should be suitable for the exposure zone of the site. Increased thicknesses maybe required in higher exposure zones. This is generally a minimum depth of 16mm for sheltered and moderate exposure zones, or 20mm for severe and very severe exposure zones.

Suitability of the background

The specification should also identify the suitability of the background to support the rendering. The background should provide adequate support for the render and uniform key/suction for adhesion of the rendering.

- Render on an external leaf of clay bricks (F2, S1 or F1, S1 designation bricks BS EN 771) in severe or very severe exposures is not permitted where the cavity is to be fully filled with insulation.
- For high absorption e.g. lightweight blockwork, common bricks etc. and smooth dense substrates (such as engineering bricks); direct rendering is not acceptable.

Movement control within the background

The specification should identify the measures taking to control movement within the back ground and clearly identify the provision of movement joints and any additional reinforcements. Any movement joints within the background should be carried through to the face of the render.

The specification should identify any abutments between the render and other cladding materials or components. Any joints should be weather tight and allow for differential movement. These details should be provided to the Warranty Surveyor before rendering commences.

Note: Where recommend by the blockwork manufacturer, cracking of the substrate could be significantly reduced by introducing a specialist proprietary bed joint reinforcement within the mortar joints. This should be provided in accordance with the structural engineer's specification.

Ensure that the reinforcement is continuous and joints lapped in accordance with the manufacturer's requirements (generally 450 - 500mm laps and continued around corners). Specialist corner units are likely to be required, check with the manufacturer.

Introducing reinforcement at weak points such as above and below window and doors openings will greatly assist in minimising cracking to these areas. Where possible, the reinforcement should project 600mm beyond the opening.

Render beads type and fixing

The specification should identify the type and fixing of the render beads to be used. Note: For bellcasts, other beads and stops; UPVC or stainless steel beads are acceptable. Angles, stop beads and jointing sections should be secured with drilled or shot-fired fixings, and not with gypsum plaster.

In coastal location uPVC beads are recommended.

Render below DPC, backs of parapets or chimneys

The specification should identify if any areas below the DPC level, backs of parapets or chimneys are to be rendered.

Note: Rendering below DPC, backs of parapets or chimneys should only be carried out using a specialist render manufacturer's specification. No render system should bridge the DPC and a proprietary uPVC bead or stainless steel bead should be used above and below where the renders meet at the DPC.

Detailing of the render system

The specification should identify the areas of the build which may interact with the render e.g. eaves, verge, parapets, cills etc. In order to ensure the durability of the render system particular attention should be given to the correct detailing of architectural features which can afford a high degree of protection.

All throating's/ drips should provide a minimum of 40mm overhang of the render system.

Parapets should be provided with a suitable capping/ DPC to protect the render system and a minimum of 40mm overhang should be maintained.

SECTION 2: QUALITY ASSURANCE OF SITE MADE RENDERS

The onsite quality control of site made renders is an important aspect to prevent premature failure of the render system. This section identifies areas that should be included within the quality assurance (QA) process document provided to the Risk management Surveyor upon request.

The QA process should identify the following

- The suitable storage of the materials on site;
  - Cement should be stored in a dry location and should be in date at the time of use.
  - Sand should be stored on boards to prevent contamination from the ground.
  - Sand should be adequately protected from external elements – wet sand should not be used.
  - Sand should be separated from other aggregates on site to prevent contamination.

- The control of the mixing process on site;
  - Only potable water should be used for mixing render.
  - Identification of a suitable water source on site, where possible water should be drawn directly from the source on site. Storage of the water should be avoided as this increases the risk of contamination.
  - Mix ratio should be controlled by volume or weight – Relying on shovels of sand and cement is not acceptable.
  - Mechanical mixing only is acceptable, renders should not be hand mixed.
  - Renders should be suitably mixed before use.
  - Additives should not be used unless specified – additives should be appropriately measured in accordance with the specification and manufacturer's instructions.
  - Only products specifically designed as mortar additives will be acceptable.

- Working with the render on site;
  - All tools should be clean and wetted before use to prevent the render mix sticking to the tools.
  - Methods of transporting the render from the mixer to the spot for use e.g. wheel barrow/ buckets should be clean and free from debris.
  - The spot should be wetted before use.
  - Additional water should not be added to the mix to prevent drying out once leaving the mixer.

APPENDIX A:

Render specification: Pro forma

Please fill this in and provide this to your Warranty surveyor where site mixed renders are proposed.

Area	Description
Have a full set of construction details been provided detailing the areas to be rendered including any construction details and details between interfaces?	
Please provide details of the masonry substrate/ background	
Please provide details of the site exposure (if a site specific BS 8104 calculation has been produced or requested by the site surveyor this should also be provided)	
Please provide details of the site exposure (if a site specific BS 8104 calculation has been produced or requested by the site surveyor this should also be provided)	
Please provide details of the movement control within the background including provision of bed reinforcement within the masonry and details of the position of movement joints and how these are formed.	
Please provide details of the type of render beads and fixing method.	
Please identify if areas of render below DPC, back of parapets or chimneys are to be rendered. If so please provide details of the specialist render system to be specified.	
Please provide details of the render thickness and justification e.g. exposure/ finish.	
Please provide details of the mix proportions, number of coats and curing times, including justification based on site exposure, background etc. Including details of any additives provided.	

ACKNOWLEDGEMENT

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REFERENCES

(1) Premier Guarantee Technical manual Section 6 External walls.

(2) BS EN 13914-1:2016 Design, preparation and application of external rendering and internal plastering. External rendering (Incorporating corrigendum April 2017) (online) available from https://www.ihsti.com/CIS/search?f=All&t=BS+EN+13914-1%3A2016&sqm=AllTerms accessed 03/09/2020

(3) Technical Update: Rendering onto substrates