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Issue	3
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Responsive Maintenance (formerly RT/LS/G/00002)

This temporary front sheet facilitates change to the new Network Rail Standards referencing nomenclature.

The Ref above will be formally allocated to this standard when it is next changed in the meantime the contents, date and issue number of this Network Rail Standard are **UNCHANGED and with immediate effect it should be referred to as “(new ref) formerly (old ref)”.**

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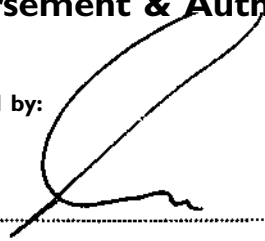
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Business Process Document

Responsive Maintenance

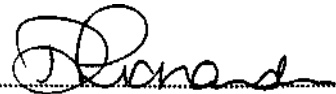
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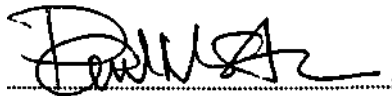
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Issue record

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1	August 2000	Document Withdrawn
2	April 2001	Revised issue
3	June 2005	Revised issue

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I Purpose

This Guidance Note has been developed to provide practical advice for use at an operational level to maximise the value for money spent on common Responsive maintenance repairs.

The Guidance Note contains guideline maintenance specifications intended to establish an indicative standard of Responsive maintenance repairs.

It is intended that the guidance should not be prescriptive about materials and/or details, which will of necessity, need to vary considerably due to existing design details, overall element condition and other location specific factors.

The guidance is intended to minimise sub-optimal maintenance activity leading to inconsistent repair standards and correction of defects without consideration of underlying causes. It will also provide a benchmark against which compliance can be assessed.

2 Scope

Template Guidance Sheets have been prepared which set out guideline maintenance specification standards for the most frequent faults reported. These sheets are included as Appendices A to K to this Guidance Note and cover the following subject areas: -

- Pitched Roof Repairs, Slates and Tiles
- Flat Roof Repairs, Built up Felt & Mastic Asphalt
- Drainage, Blocked Gullies, Manholes and Drains
- Surface Repairs Coated Macadam Paving Platform and Pedestrian Areas
- Surface Repairs Slabs/ Block Paving Platforms and Pedestrian Areas
- Surfacing Repairs Copers/ Tactiles
- Miscellaneous Painting
- Windows
- Concrete Stair Nosings and Treads

In a number of instances the Guidance Sheets make reference to alternative standards of remedial action to be taken so that suitable 'emergency only' action is taken to make elements safe when appropriate until the Asset Steward can take a decision about the long term solution to defects which are beyond the scope of a Responsive maintenance visit.

2.1 Use of Guidance Sheets

All Property Maintenance Contractors shall have procedures in place to: -

- brief-in and issue guidance sheets Appendices A-K to their mobile operational staff
- monitor use of the guidance sheets and adherence to the specification standards they establish

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- receive and pass comments about the suitability of the specifications to Network Rail
- identify areas where the sheets can be improved and other subject areas where similar guidance would be useful.

Where reference is made within guidance notes to the 'Asset Steward' the appropriate contact shall be nominated by the Employers Representative

3 Reference documentation

British Standard	Description
BS 747: 2000 Replaces BS 747: 1994	Re-enforced Bitumen sheets for roofing specifications Specification for roofing felts (withdrawn revisited)
BS 5534: 2003 Replaces BS 5534 -: 1997	Code of Practice for slating and tiling for slating & tiling (including shingles) Code of Practice for slating & tiling (design) (still current)
BS EN 12326 – 1: 2004 &	Slate & stone products for discontinuous roofing and cladding. Product specification.
BS EN 490: 1994 Replaces BS 680-2: 1971	Concrete roofing tiles and fittings. Product specifications. Specification for roofing slates. Metric units (withdrawn 23 rd July 2004)
BS 3690-2: 1989 & BS EN 12591: 2000 Replaces BS 3690-1: 1989	Bitumen's for building and civil engineering. Specifications for bitumen's for industrial purposes. Bitumen's and bituminous binders. Specification for paving grade bitumen's Bitumen for building and civil engineering specification for bitumen's for roads and other paved areas. (Current replaced, obsolescent)
BS 1202 Part 1: 2002 Part 2: 1974 Part 3: 1974	Specification for nails Steel nails Copper nails Aluminium nails
BS 434 – 1: 1984	Bitumen road emulsions (Anionic and cationic). Specification for bitumen road emulsions
BS 4987 Part 1: 2003 Part 2: 2003	Coated macadam Coated macadam (asphalt concrete) for roads and other paved areas. Specification for constituent materials and for mixtures Coated macadam (asphalt concrete) for roads and other paved areas. Specifications for transport, laying and compaction
BS EN 12620 Replaces BS 882: 1992	Aggregate for concrete Specification for aggregates from natural sources for concrete (withdrawn).
BS 6262-4: 1994 Partially replaces BS 6262: 1982	Glazing for buildings, safety related to human impact (workmanship aspects excluded). Code of practice for glazing for buildings (current, work in hand, partially replaced).
BS 544: 1969	Specification for linseed oil putty for use in wooden frames.

BS 8000	Workmanship on building sites
Part 1: 1989	Code of practice for excavation and filling
Part 2.1: 1990	Code of practice for concrete work. Mixing and transporting concrete.
Part 2.2: 1990	Code of practice for concrete work. Sitework with insitu and precast concrete.
Part 3: 2001	Code of practice for masonry.
Part 4: 1989	Code of practice for waterproofing.
Part 5: 1990	Code of practice for carpentry, joinery and general fixings
Part 6: 1990	Code of practice for slating and tiling of roofs and claddings.
Part 7: 1990	Code of practice for glazing.
Part 8: 1994	Code of practice for plasterboard partitions and dry linings.
Part 9: 2003	Workmanship on building sites. Cementitious levelling screeds and wearing screeds. Codes of practice.
Part 10: 1995	Workmanship on building sites. Code of practice for plastering and rendering.
Part 11.1: 1989	Workmanship on building sites. Code of practice for wall and floor tiling. Ceramic tiles, terrazzo tiles and mosaics.
Part 11.2: 1990	Workmanship on building sites. Code of practice for wall and floor tiling. Natural stone tiles.
Part 12: 1989	Workmanship on building sites. Code of practice for decorative wall coverings and painting.
Part 13: 1989	Workmanship on building sites. Code of practice for above ground drainage and sanitary appliances.
Part 14: 1989	Workmanship on building sites. Code of practice for below ground drainage.
Part 15: 1990	Workmanship on building sites. Code of practice for hot and cold water services (domestic scale).
Part 16: 1997	Workmanship on building sites. Code of practice for sealing joints in buildings using sealants.

4 Guidance Notes

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GUIDANCE NOTE A :PITCHED ROOF REPAIRS — SLATES AND TILES

1 Scope

This Guidance Sheet covers patch repairs to pitched slated and tile roofs, including natural slate, composite slate (Eternit or similar), clay and concrete tiles. All work shall be undertaken in accordance with the contract conditions and with due cognisance to the contractors safety case.

2 Attend Site

- a) Report to Supervisor/Manager as indicated on the order.
- b) Confirm location and nature of fault reported if possible.

3 Investigation

- a) Ascertain cause for fault reported, i.e. stained ceiling tiles may be due to roof leaks, blocked gutters, condensation problems, poor ventilation or leaking pipework.
- b) If on inspection, evidence of extensive nail rot, timber decay or fungal attack is found, the 'safety only option' should be adopted.
- c) Any possible danger to the public or railway infrastructure should be reported immediately.
- d) After rectifying the reported fault, the suspected cause should be reported to the Asset Steward.
- e) Any additional damage caused by water penetration, i.e. damage to ceilings, plasterwork or decorations should also be reported to the Asset Steward.

4 Safety Only Option

- a) Should the investigation result in major work being required, the following 'safety only option' should be adopted to make safe the reported hazard pending further instruction by the Asset Steward.
- b) Secure working area to ensure safety of public and staff.
- c) Remove all loose slates or tiles, temporarily fix any loose tile battens and sarking felt.
- d) Make watertight with tarpaulin or plastic sheeting suitably secured with timber battens.

5 Rectify fault - preparation

- a) Carefully remove broken or loose slates or tiles and set aside reusable materials for re-use.
- b) Any hip or ridge tiles to be carefully removed and cleaned of mortar.

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- c) Remove torching to slates and tiles where applicable.
- d) Cut out any decayed tile battens and counter battens.
- e) Remove torn or damaged sarking felt with suitable membrane where applicable.
- f) Examine exposed roof timbers.

6 Materials

- a) Sarking felt: Reinforced sarking felt to BS 747 type IF or proprietary plastic underlay.
- b) Battens to be sawn softwood, species type A or B to BS 5534 Pt 1 clause 2.12.1 permissible defects as annex E with CCA vacuum pressure preservative treatment. (Note: it is not advisable to use aluminium fixings with CCA preserved timber).
- c) Selected second hand slates and tiles to be used wherever possible. However, generally natural slates to be to BS 680 P2; fibre cement slates to be to BS EN 490 Type NT; concrete roof tiles to be to BS EN 490 1994; clay roof tiles to be to BS EN 538 1994.

7 Renewals - Patch repairs

- a) Replace damaged sarking felt with reinforced sarking felt or proprietary plastic underlay with minimum side and horizontal laps of 150mm. Repair splits and minor defects with adhesive tape. Fix felt with galvanised steel extra large head felt nails as required.
- b) Renew battens and/or counter battens to suit existing batten section and spacing. Battens to be fixed with 3-35mm dia. galvanised or sheradized nails giving a minimum 40mm penetration into structural timber. Battens to be spliced over rafters to maintain continuity.
- c) Replace slates and tiles using where possible undamaged materials previously set aside and selected second hand materials.
- d) Fix slates or tiles to match existing coursing and bond. Thicker end of slates as tail. Fix tiles as BS 5534, BS8000 PT6 and manufacturers recommendations, twice fix each slate through countersunk holes 20-25mm from side edges with copper nails 3.35mm shank and adequate length to ensure not less than 15mm penetration into batten.
- e) If torching has been removed, replace with 1:3 lime: sand mortar pointed internally beneath each slate.
- f) Bedding to hip and ridge tiles to be 1:4 cement: sand mortar.
- g) Check and secure the projecting hip iron if the eaves hip tile has been disturbed.

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8 Replacement of individual slates and tiles

- a) Prop adjacent slates or tiles with wedges and carefully remove damaged slate or tile using a slate ripper to cut through nails.
- b) Slide in replacement tile until nibs locate over the batten.
- c) Slates to be fixed using zinc or copper strip slate hooks fixed to batten with a 20mm copper nail. When the replacement slate has been slid into position the metal strip should be bent up and folded to secure the slate.
- d) Wedges to be removed on completion of repair.

9 Completion

- a) Clean out gutters, outlets and rainwater pipes.
- b) Remove all debris, tools and materials from site.
- c) Clear site of all barriers, scaffold and ladders, etc., ensuring area safe for public access.
- d) On manned stations, report to Station Supervisor/Manager that work is completed and the area fit for public access.
- e) Notify Asset Steward that the fault has been rectified and report any items requiring further investigation.

Any errors or inaccuracies in this guidance note, together with suggestions for improvements or additional information should be addressed to:- Policy & Planning Manager , Operational Policy, Floor 2 The Podium, 1 Eversholt St London NW1 2DN Telephone 085 76207/020 7845 8207. Facsimile 085-79114 or 020 7557 9114

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GUIDANCE NOTE B : FLAT ROOF REPAIRS, BUILT-UP FELT, MASTIC ASPHALT & PATENT ROOF COATINGS

1 Scope

This Guidance Sheet covers patch repairs to flat roofs, i.e. built-up felt, mastic asphalt and patent roof coatings. All work shall be undertaken in accordance with the contract conditions and with due cognisance to the Contractors Safety Case.

2 Attend Site

- a) Report to Supervisor/Manager as indicated on the order.
- b) Confirm location and nature of fault reported if possible.

3 Investigation

- a) Ascertain cause for fault reported, i.e. stained ceiling tiles may be due to roof leaks, blocked gutters, condensation problems, poor ventilation or leaking pipework.
- b) Particular attention should be paid to kerbs, upstands, flashing details and gutter outlets.
- c) If on inspection, evidence of extensive timber decay, fungal attack, saturated decking or saturated insulation is found, the Asset Steward should be informed and the 'safety only option' adopted.
- d) On mastic asphalt surfaces where faults other than simple splits or cracks are found, the 'safety only option' should be adopted. Examples of faults requiring renewal of the asphalt surfacing by specialist contractors are:- excessive blistering, loose, crazed or impact damaged asphalt.
- e) Any possible danger to the public or railway infrastructure should be reported immediately.
- f) After rectifying the reported fault, the suspected cause should be reported to the Asset Steward.
- g) Any additional damage caused by water penetration, i.e. damage to ceilings, plasterwork or decorations should also be reported to the Asset Steward and the area made safe.

4 Safety Only Option

- a) Should the investigation result in major work being required, the following 'safety only option' should be adopted to make safe the reported hazard pending further instruction by the Asset Steward.
- b) Remove all loose chippings, paving slabs or external insulation blocks.

- c) Carefully clean off area surrounding the damaged roofing material in accordance with the manufacturers recommendations including removal of loose reflective coating and dry out base.
- d) Locate and seal leak with proprietary mastic sealant, i.e. Ruberoid or similar.
- e) Splits may be sealed with proprietary self adhesive tape – Flashband or similar.
- f) Replace any chippings, paving slabs or insulation blocks removed to undertake repair. Leave area clearly identified for further repairs.

5 Rectify fault - preparation

- a) Carefully remove any chippings, paving slabs or external insulation blocks.
- b) Arrange temporary removal of any plant obstructing the area.
- c) Clean off area surrounding the damaged roofing material of all dust, dirt, debris, moss, grease or loose reflective coating.
- d) Star cut blisters in felt coverings, dry out and re-bond with bituminous mastic felt adhesive.
- e) Cut out defective areas of felt, dry out base and patch level with existing finish with two layers of matching felt lapped 100mm on to under layers.
- f) Cut back to base 150mm width of felt over cracks and splits, dry out and insert 150mm strip of polyester felt lapping 100mm onto existing felt at each edge.
- g) Examine any exposed roof timbers, decking or insulation.

6 Materials

- a) Roofing felt to BS 747.
- b) Bituminous mastic lap cement and felt adhesive to BS 3690 Part 2.
- c) Hot air welded single layer overlay felt.
- d) Liquid rubber or proprietary mastic coating.
- e) Reflective aluminium coating.
- f) Mineral surface coating.
- g) Mineral chippings to BS 3690 Part 1.
- h) Galvanised felt nails 20mm long with extra large head to BS 1202.
- i) Ancillary products and accessories to be types recommended for the purpose by the felt manufacturer.
- j) Store felt indoors in reasonably warm conditions until immediately before use.

7 Renewal

Select materials to be used: -

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- a) Polyester based roofing felt with cold bituminous mastic felt adhesive.
- b) Hot air welded single layer overlay felt Icopal Firesmart bonded (Single Ply refurbishment) or similar.
- c) Liquid rubber (Ruberoid, Acryflex or similar) or seamless cold liquid applied membrane (Polyroof Protec or similar).
- d) Selected materials should be used in accordance with the manufacturers recommendations.
- e) Felts should be laid to suit roof falls and any laps positioned to assist drainage.
- f) Hot bituminous applications and torch-applied felts should be avoided due to safety considerations.
- g) Area of patch repair should extend where practicable to an adjacent upstand, parapet or kerb, utilising any existing counter flashings. Area of final patch to be a minimum of 500mm beyond the damaged areas.
- h) Patch repair should be aligned with the roof slope where possible to ensure that water will drain over and not into laps.
- i) Where practicable remove, renew and waterproof each area on the same day.
- j) Adequately protect existing roof areas against damage during the execution of the work.
- k) Reflective coatings should be provided to match existing.

8 Mastic Asphalt repairs

Thin minor cracks in asphalt to be rectified using the 'hot poultice' method

Large cracks and tears in asphalt to be cut out, the area to be cleaned and patch material warmed and joined to existing

Blisters on mastic asphalt should not be disturbed.

Take all necessary hot works precautions.

9 Completion

- a) Carefully replace any chippings, paving slabs or external insulation blocks.
- b) Arrange replacement of any plant removed to undertake repairs.
- c) Clean out gutters, outlets and rainwater pipes.
- d) Remove all debris, tools and materials from site.
- e) Clear site of all barriers, scaffold and ladders, etc., ensuring area safe for public access.
- f) On manned stations, report to Station Supervisor/Manager that work is completed and the area fit for public access.

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- g) Notify Asset Steward that the fault has been rectified and report any items requiring further investigation.

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