



'achieving the highest standards'

**EUROPEAN SPECIFICATION
FOR
SPRAYED CONCRETE**

**CHECKLIST
FOR
SPECIFIERS AND CONTRACTORS**

2002

INTRODUCTION

The European Specification for Sprayed Concrete, published by EFNARC in 1996 (along with the revised Section 8 – Execution of Spraying) is the main contractual document. The Guidelines, published in 1999, is the first accompanying document, produced mainly for those who are new to this form of concrete construction.

This document, the Checklist for Specifiers and Contractors, is intended to complement both the other two documents in that it charts the entire process from materials selection through to completion of the spraying operations in an easily referenced format. It should be used as a living document, starting its life in the specifier's office and for use throughout the works on site. However, it is not for the exclusive use of the specifier; contractor input is essential and his practical knowledge will be invaluable in choosing some of the constituent materials, in mix design development, execution of spraying, quality control, health and safety and environmental considerations. It is strongly recommended that specifier and contractor work in partnership at all stages.

The Checklists seek to include all the essential aspects, but certain job-specific requirements may need to be added, such as in Form C: Execution of Spraying.

Use of this Checklist is strongly recommended in order to ensure that key elements are not overlooked and thereby facilitate an efficient and effective spraying operation.

Note: In this document references to clauses in the Specification are prefixed with S, as S6.4; and clauses in the Guidelines with G, as G6.4. In relation to the Execution of Spraying, references are made to the revised version of Clause 8.

Acknowledgement

EFNARC wishes to acknowledge gratefully all the contributions and comments made by members of its Sprayed Concrete Technical Committee

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Form A: Constituent Materials

Note: All Specification clauses referred to in Form A shall be read in conjunction with the advice given in the corresponding clauses of the Guidance document. Guidance clauses are given where the Specification does not give adequate information.

Material and requirements	Specifier and Contractor remarks
<p>Cement The general requirement for cement shall be in accordance with clause S4.1. For further specific requirements, refer to clause S5.2. For permanent structures, refer also to Section 6.</p> <p>Setting time tests of the cement and accelerator shall be carried out to establish the appropriate combination in accordance with Appendix 1, Section 6.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Aggregates Aggregates shall comply with S4.2 and S5.4. And for permanent structures, shall comply to Section 6.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Additions Additions such as pulverised fuel ash (PFA), ground granulated blastfurnace slag (GGBS), silica fume and pigments shall be in accordance with clauses S4.7 and S5.3, and shall not exceed the proportions given in Table 5.3.1.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Mixing water Mixing water shall comply with clause S4.3. The testing and assessment criteria are given in the Guidelines, Table 1.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Admixtures Admixtures for sprayed concrete shall comply with the general requirements detailed in clauses S4.6 and S5.5, and in more detail given in Appendix 1, Section 4.</p> <p>The performance requirements for the following categories of admixture is given in Appendix 1:</p> <p>Accelerating admixtures – Table 2 Thixotropic admixtures – Table 3 Hydration control admixtures – Table 4 Bond improving admixtures – Table 5 (continued)</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>

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Material and requirements	Specifier and Contractor remarks
<p>(continued)</p> <p>Compatibility between the accelerating admixture and the cement should be confirmed by the test outlined in Appendix 1, Section 6.</p> <p>For structures requiring durability, assessment of the admixtures should be considered with reference to S6 of the Specification and G6 of the Guidelines.</p> <p>Admixtures shall be safe in transport, storage and use in accordance with S12.</p>	
<p>Curing agents Both externally spray applied and internal curing agents shall be in accordance with clauses S4.8 and S8.3.</p> <p>Where an internal curing agent is chosen, the performance requirements given in Table 5, Appendix 1 of the Specification shall be met.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Fibres All fibre types shall comply with clauses S4.5 and S5.6.</p> <p>Fibres not previously defined shall be chosen based on their performance during site trials.</p> <p>Any products used to bundle the fibres shall have no deleterious effect on the durability in accordance with Section 6.1.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Steel reinforcement Reinforcement shall comply with clause S4.4 and the durability requirements, if required, given in Section 6.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Working temperature The working temperature of the mix prior to placing shall comply with clause S5.8.</p> <p>Guidance given in G5.8 is strongly recommended.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>

Form B: Development of mix design

Durability Assessment and Testing

Design Life of Structure: years

Durability Parameter	Durability Priority Rating (1=low, 10=high)	Required Parameter Value	Actual Parameter Test Value	Test Method	Significant Influence on Durability Parameter (Tick box with greatest influence to guide mix design)	Specifier and Contractor remarks
Requirements for durability Refer to clauses S6.1 and G6.1. The sprayed concrete shall meet the minimum requirements in Section 4 of EN206, but with the exceptions listed in S6.4.	N/a	N/a	N/a	N/a	<input type="checkbox"/> Aggregates <input type="checkbox"/> Accelerators <input type="checkbox"/> Cement <input type="checkbox"/> w/c ratio <input type="checkbox"/> Binder (incl. microsilica) <input type="checkbox"/> Fibres <input type="checkbox"/> Admixtures <input type="checkbox"/> Curing method	Responsibility: <input type="checkbox"/> Specifier <input type="checkbox"/> Contractor <input type="checkbox"/> Joint Compliance: yes <input type="checkbox"/> no <input type="checkbox"/> If no, reason below:
Compressive Strength and Density The required minimum strengths shall be in accordance with S9.1, and the clause G9.1.1, 9.1.2 and 10.2. Early strength development shall be considered on site specific requirements				EFNARC S10.1, 10.2 (EN 4012, EN 6275) Early Strength: Austrian Concrete Soc: Sprayed Concrete Guideline March 1999.	<input type="checkbox"/> Aggregates <input type="checkbox"/> Accelerators <input type="checkbox"/> Cement <input type="checkbox"/> w/c ratio <input type="checkbox"/> Binder (incl. microsilica) <input type="checkbox"/> Fibres <input type="checkbox"/> Admixtures <input type="checkbox"/> Curing method	Responsibility: <input type="checkbox"/> Specifier <input type="checkbox"/> Contractor <input type="checkbox"/> Joint Compliance: yes <input type="checkbox"/> no <input type="checkbox"/> If no, reason below:
Permeability Refer to clauses S9.7, S10.7 and G10.7. Choice of test dependant on local conditions.				EFNARC S10.7 (EN 7031, or other local tests described in EFNARC clause G10.7)	<input type="checkbox"/> Aggregates <input type="checkbox"/> Accelerators <input type="checkbox"/> Cement <input type="checkbox"/> w/c ratio <input type="checkbox"/> Binder (incl. microsilica) <input type="checkbox"/> Fibres <input type="checkbox"/> Admixtures <input type="checkbox"/> Curing method	Responsibility: <input type="checkbox"/> Specifier <input type="checkbox"/> Contractor <input type="checkbox"/> Joint Compliance: yes <input type="checkbox"/> no <input type="checkbox"/> If no, reason below:
Flexural Strength Minimum flexural strengths (if required) are specified in S9.2, with guidance given in G9.2 and 10.3.				EFNARC S10.3.2	<input type="checkbox"/> Aggregates <input type="checkbox"/> Accelerators <input type="checkbox"/> Cement <input type="checkbox"/> w/c ratio <input type="checkbox"/> Binder (incl. microsilica) <input type="checkbox"/> Fibres <input type="checkbox"/> Admixtures <input type="checkbox"/> Curing method	Responsibility: <input type="checkbox"/> Specifier <input type="checkbox"/> Contractor <input type="checkbox"/> Joint Compliance: yes <input type="checkbox"/> no <input type="checkbox"/> If no, reason below:

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<p>Toughness There are two methods to determine toughness; either by residual strength class (beam test) as described in S9.3.2, or by energy absorption class (plate test) described in S9.3.3. Refer also to G9.3 and G10.3.</p>				Residual Strength Class: EFNARC S10.3.3 Energy Absorption Class: EFNARC S10.4	<input type="checkbox"/> Aggregates <input type="checkbox"/> Accelerators <input type="checkbox"/> Cement <input type="checkbox"/> w/c ratio <input type="checkbox"/> Binder (incl. microsilica) <input type="checkbox"/> Fibres <input type="checkbox"/> Admixtures <input type="checkbox"/> Curing method	Responsibility: <input type="checkbox"/> Specifier <input type="checkbox"/> Contractor <input type="checkbox"/> Joint Compliance: yes <input type="checkbox"/> no <input type="checkbox"/> If no, reason below:
<p>Modulus of Elasticity Refer to clauses S9.4, G9.4 and G10.5.</p>				EFNARC S10.5 (EN 6784)	<input type="checkbox"/> Aggregates <input type="checkbox"/> Accelerators <input type="checkbox"/> Cement <input type="checkbox"/> w/c ratio <input type="checkbox"/> Binder (incl. microsilica) <input type="checkbox"/> Fibres <input type="checkbox"/> Admixtures <input type="checkbox"/> Curing method	Responsibility: <input type="checkbox"/> Specifier <input type="checkbox"/> Contractor <input type="checkbox"/> Joint Compliance: yes <input type="checkbox"/> no <input type="checkbox"/> If no, reason below:
<p>Bond Strength to substrate and inter-layer Refer to clauses S9.5 where minimum requirements are tabled, G9.5 and G10.6.</p>				EFNARC S10.6 (and where appropriate, EN 1542)	<input type="checkbox"/> Aggregates <input type="checkbox"/> Accelerators <input type="checkbox"/> Cement <input type="checkbox"/> w/c ratio <input type="checkbox"/> Binder (incl. microsilica) <input type="checkbox"/> Fibres <input type="checkbox"/> Admixtures <input type="checkbox"/> Curing method	Responsibility: <input type="checkbox"/> Specifier <input type="checkbox"/> Contractor <input type="checkbox"/> Joint Compliance: yes <input type="checkbox"/> no <input type="checkbox"/> If no, reason below:
<p>Frost Resistance Sprayed concrete structures exposed to aggressive environments as specified in EN 206 shall be in accordance with clauses S6.4(iii), S9.8, 10.8 and G10.8.</p>				EFNARC S10.8, see G10.8 (ASTM C672)	<input type="checkbox"/> Aggregates <input type="checkbox"/> Accelerators <input type="checkbox"/> Cement <input type="checkbox"/> w/c ratio <input type="checkbox"/> Binder (incl. microsilica) <input type="checkbox"/> Fibres <input type="checkbox"/> Admixtures <input type="checkbox"/> Curing method	Responsibility: <input type="checkbox"/> Specifier <input type="checkbox"/> Contractor <input type="checkbox"/> Joint Compliance: yes <input type="checkbox"/> no <input type="checkbox"/> If no, reason below:
<p>Resistance to environmental conditions – chemical attack Refer to clause S6.4 and G6.4</p>				ASTM C267	<input type="checkbox"/> Aggregates <input type="checkbox"/> Accelerators <input type="checkbox"/> Cement <input type="checkbox"/> w/c ratio <input type="checkbox"/> Binder (incl. microsilica) <input type="checkbox"/> Fibres <input type="checkbox"/> Admixtures <input type="checkbox"/> Curing method	Responsibility: <input type="checkbox"/> Specifier <input type="checkbox"/> Contractor <input type="checkbox"/> Joint Compliance: yes <input type="checkbox"/> no <input type="checkbox"/> If no, reason below:

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Alkali-Silica Reaction Refer to clause S6.3 and G6.3, and Table 1 of Appdx 1 of the Specification				National Standards	<input type="checkbox"/> Aggregates <input type="checkbox"/> Accelerators <input type="checkbox"/> Cement <input type="checkbox"/> w/c ratio <input type="checkbox"/> Binder (incl. microsilica) <input type="checkbox"/> Fibres <input type="checkbox"/> Admixtures <input type="checkbox"/> Curing method	Responsibility: <input type="checkbox"/> Specifier <input type="checkbox"/> Contractor <input type="checkbox"/> Joint Compliance: yes <input type="checkbox"/> no <input type="checkbox"/> If no, reason below:
Carbonation resistance Refer to clauses S8.2.5 (revised) and G6.1				National Standards – RILEM Recommendations CPC-18	<input type="checkbox"/> Aggregates <input type="checkbox"/> Accelerators <input type="checkbox"/> Cement <input type="checkbox"/> w/c ratio <input type="checkbox"/> Binder (incl. microsilica) <input type="checkbox"/> Fibres <input type="checkbox"/> Admixtures <input type="checkbox"/> Curing method	Responsibility: <input type="checkbox"/> Specifier <input type="checkbox"/> Contractor <input type="checkbox"/> Joint Compliance: yes <input type="checkbox"/> no <input type="checkbox"/> If no, reason below:
Chloride Content Refer to clause S6.2 and G6.2, and Table 1 of Appdx 1 of the Specification. This is only valid for sections with steel reinforcement.				EN 206 Section 5.1.2.6 (See G6.2 for guidance)	<input type="checkbox"/> Aggregates <input type="checkbox"/> Accelerators <input type="checkbox"/> Cement <input type="checkbox"/> w/c ratio <input type="checkbox"/> Binder (incl. microsilica) <input type="checkbox"/> Fibres <input type="checkbox"/> Admixtures <input type="checkbox"/> Curing method	Responsibility: <input type="checkbox"/> Specifier <input type="checkbox"/> Contractor <input type="checkbox"/> Joint Compliance: yes <input type="checkbox"/> no <input type="checkbox"/> If no, reason below:
Fire Resistance see local regulations valid in place Particularly relevant to new tunnel linings				Nation Standards – Tunnels: TNO Time-temperature test curves	<input type="checkbox"/> Aggregates <input type="checkbox"/> Accelerators <input type="checkbox"/> Cement <input type="checkbox"/> w/c ratio <input type="checkbox"/> Binder (incl. microsilica) <input type="checkbox"/> Fibres <input type="checkbox"/> Admixtures <input type="checkbox"/> Curing method	Responsibility: <input type="checkbox"/> Specifier <input type="checkbox"/> Contractor <input type="checkbox"/> Joint Compliance: yes <input type="checkbox"/> no <input type="checkbox"/> If no, reason below:
Other Durability Parameters to be considered; eg resistance to: abrasion or erosion temperature (hot or cold) impact loads vibration cyclic loading					<input type="checkbox"/> Aggregates <input type="checkbox"/> Accelerators <input type="checkbox"/> Cement <input type="checkbox"/> w/c ratio <input type="checkbox"/> Binder (incl. microsilica) <input type="checkbox"/> Fibres <input type="checkbox"/> Admixtures <input type="checkbox"/> Curing method	Responsibility: <input type="checkbox"/> Specifier <input type="checkbox"/> Contractor <input type="checkbox"/> Joint Compliance: yes <input type="checkbox"/> no <input type="checkbox"/> If no, reason below:

Form B: Development of mix design

Mix Composition (To be completed for Designed, Prescribed and Combined Mixes – Clause S7)

Permanent		Structural	
Temporary		Non-structural	

B.1 Sprayed Concrete Application Information

Parameter	Comments
Wet-mix or dry-mix sprayed concrete application	
Mesh or fibre reinforcement	
Dry or wet mix batching system	
Transport method to pump	
Long or short distance pumping	
Sprayed concrete pump type	
Sprayed concrete applied by hand held nozzle or spray manipulator	
Typical output of sprayed concrete pump (m ³ /h)	
Typical layer thickness per operation (mm)	
Overall design layer thickness (mm)	
Curing method	

B.2 Sprayed Concrete Mix Design

Mix Constituent	Type	kg per m ³	
		Specified	Actual
Cement			
PFA, GGBS			
Silica fume			
Minimum binder content			
Maximum ratio water:binder			
Free water content			
Aggregates			
	A		
	B		
	C		
Fibres			
(Super-) Plasticisers			
Retarders			
Hydration control admixtures			
Thixotropic admixtures)			
Bond improvers			
Accelerators			
Others:			

Form C: Execution of Spraying (e.g. Rock Support)

Material and requirements	Specifier and Contractor remarks
<p>Preparatory work Prior to the commencement of the spraying works, preparation of the substrate is required in accordance with Sections S8.1, S8.4 and G8.1.</p> <p>Prior to spraying, approval from the Engineer shall be provided in accordance with Section S8.1.5.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Pre-wetting The surface to receive concrete should be damp by pre-wetting in accordance with Sections S8.2 and G8.1.2.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Nozzle technique To produce homogeneous, dense sprayed concrete, the nozzle technique shall comply with Sections S8.2, S8.4, G8.2, 8.3.2, and 8.3.3.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Nozzlemen qualification: Proficiency of nozzlemen shall be certified in accordance with Sections S8.2.7 and G8.2.7, and shall reflect their skills with the chosen application system.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Layer build-up The build-up of layers shall be executed in accordance with Sections S8.2, G8.2.1.1 and G8.2.1.2.</p> <p>Products or processes that impair the bond between layers, (for example, curing agents as described in Section S8.3) shall be removed or not used.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Embedment of reinforcement The embedment of reinforcement shall be achieved by complying with Sections S8.2.5, S8.2.6 and G8.2.6.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Defects Treatment of defective sprayed concrete shall be in accordance with Section S8.2.2.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Finishing works Finishing works such as trowelling and screeding shall comply with Sections S8.2.3 and G8.2.6.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Rebound removal The disposal of rebound shall be in accordance with Sections S8.2.4 and G12.2.3.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>

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<p>Curing Curing systems shall be applied in accordance with Section S8.6 and the guidance given in G4.8.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Protection against frost Protection against frost shall comply with Section S8.7.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Site trials The timing, equipment, materials and production of test panels shall be in accordance with Sections S10.1 and G10.1.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Equipment – general The equipment to be used for batching, mixing and application of sprayed concrete should be in accordance with Section S8.3.1</p> <p>The delivery of the material to the substrate shall comply with Section S8.3.1</p> <p>All equipment shall be maintained and cleaned in accordance with Section S8.3.1</p> <p>Hoses and delivery pipes shall be used in accordance with Section S8.3.1</p> <p>The spraying area must be illuminated in accordance with Section S8.3.1</p> <p>Means of access shall be in accordance with Sections S8.5 and G8.5.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Wet-mix process equipment Equipment for the wet-mix process shall comply with the requirements given in Sections S8.3.2, S8.3.4, G8.3.2 and G8.4.</p> <p>Furthermore, equipment shall comply with the requirements given in Sections G12.1.3 and G12.1.4.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Dry-mix process equipment Equipment for the dry-mix process shall comply with the requirements given in Sections S8.3.3, S8.3.4 and G8.3.3.</p> <p>Furthermore, equipment shall comply with the requirements given in Sections G12.1.3 and G12.1.4.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>

Form D: Quality Control, Health & Safety and the Environment

Material and requirements	Specifier and Contractor remarks
<p>Quality control general requirements All production sprayed concrete shall be subject to quality control. The level of control shall be agreed in conjunction with the Specifier, as outlined in S11.1. and G11.1.</p> <p>The quality control of admixtures shall be in accordance with the clause S7 of Appendix1.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Pre-construction quality control To determine the mix control for pre-construction tests, refer to clauses S11.2 and frequency of testing given in S11.3.1.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Production quality control Production control shall be in accordance with EN 206, and conformity control shall be as determined by a designer risk assessment, including the control testing and frequency guide given in S11.3.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Alignment and thickness control Methods of controlling the alignment and thickness of sprayed concrete structures shall be in accordance with those detailed in S11.3.2 and the guidance given in G8.4.4.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Execution of spraying quality control Quality control procedures shall also include the routine monitoring and approval of the application of sprayed concrete, and the equipment used as detailed in S8.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Marking and Labelling With particular reference to admixtures, the requirements given in S8 of Appendix1 should be met. Additionally, other bulk storage facilities for other mix constituents should be clearly identified.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Health and safety – General The application of sprayed concrete shall meet the national requirements in the place of use.</p> <p>A risk assessment and site safety plan should be produced (clause G.12). In tunnelling projects, emergency procedures should be established from the outset of the project.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Safety of personnel – Dust concentration It is strongly advised that the guidance given in G12.1.1 is considered for all sprayed concrete projects.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>

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<p>Safety of personnel – Personal protection It is strongly advised that the guidance given in G12.1.2 is considered for all sprayed concrete projects.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Safety of personnel – Precautions with concrete line blockages It is strongly advised that the guidance given in G12.1.3 is considered for all sprayed concrete projects.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Safety of personnel – Hoses and couplings It is strongly advised that the guidance given in G12.1.4 is considered for all sprayed concrete projects.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Environment – Impact on soil Refer to clause G12.2.1 for guidance on contamination of soil through rebound. The effects of admixture spillage should also be determined.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Environment – Impact on groundwater The impact of sprayed concrete leachates and admixture spillage on local ground water sources should be assessed with reference to clause G12.2.2.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>
<p>Environment – Rebound disposal Reference to Sections S8.2.4 and G12.2.3 should be made with respect to rebound removal and landfill. Rebound contains elements of the admixtures, as well as fibres for example.</p>	<p>Compliance: yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If no, reason below:</p>