

Category 1 Standard

S1064 Civil Engineering - Waterproofing

Issue No.: A1

Issue date: December 2011
Review date: December 2016

MAYOR OF LONDON

 **Documents**
Document Sharing Hub



Contents

1	Purpose	3
2	Scope	3
3	Requirements	3
3.1	Inception and Design	3
3.2	Bridges and Structures	4
3.3	Bridge Abutments	6
3.4	Footbridges and platforms – Surface Stations and Railway	6
3.5	Footbridges and platforms – Sub-surface Stations	7
3.6	Sub-surface structures	7
3.7	Deep Tube Tunnels and Shafts	7
3.8	Materials	7
3.9	Finishes	7
3.10	Fixtures and Fittings	7
4	Responsibilities	8
5	Supporting information	8
5.1	Safety considerations	9
5.2	Environmental considerations	9
6	Information References	9
6.1	References	9
6.2	Abbreviations	10
6.3	Definitions	10
6.4	Technical content manager	11
6.5	Document history	11



1 Purpose

- 1.1 The purpose of this Standard is to define the waterproofing system requirements for Civil Engineering structures owned by, or being constructed for, LU.

2 Scope

- 2.1 This Standard addresses the waterproofing system requirements for:
- i. Overline bridges
 - ii. Girderings
 - iii. Covered Ways
 - iv. Underline Bridges
 - v. Bridge Abutments
 - vi. Footbridges
 - vii. Sub-surface structures
 - viii. Deep Tube Tunnels and Shafts.
- 2.2 This standard does not address waterproofing of buildings above ground, damp proof courses or damp proof membranes to ground slabs.

3 Requirements

3.1 Inception and Design

3.1.1 Inception

- 3.1.1.1 All proposals for new works, including renewal, made by Suppliers to LU shall be initiated and controlled in accordance with LU Standards 1-538 (Assurance) and 1-050 (Civil Engineering – Common Requirements).

3.1.1.2 Sub-surface structures with equipment vulnerable to water ingress

- 3.1.1.2.1 Where there is a proposal to install equipment vulnerable to water ingress (including any electrical equipment) in or adjacent to an existing sub-surface structure, the status of the existing waterproofing of the sub-surface structure shall be established and a risk/hazard assessment shall be carried out to determine the appropriateness of changing the Required Duty of the structure to house vulnerable/electrical equipment.

- 3.1.1.2.2 Installation of vulnerable/electrical equipment in or adjacent to an existing sub-surface structure shall only be permitted if the assessment demonstrates that the risk is ALARP, and the reliability of the vulnerable/electrical equipment will not be adversely affected by its location.

3.1.2 Design Process

- 3.1.2.1 The design shall be undertaken in a staged manner in accordance with LU Standard 1-538 Assurance).
- 3.1.2.2 Conceptual Design Statements (CDS) shall be completed for the waterproofing system in accordance with LU Standard 1-538 (Assurance).

3.1.3 Design Life

- 3.1.3.1 The Design Life for a waterproofing system shall be a nominal 120 years.

- 3.1.3.2** The waterproofing system shall be designed, where practicable, to minimise the requirement for maintenance interventions. To support this requirement the Designer shall provide a statement of potential degradation modes identified during design and a schedule of the expected interventions during the design life.

3.2 Bridges and Structures

3.2.1 Overline Bridges, Girderings and Covered ways

- 3.2.1.1** The waterproofing system for Overline Bridges, Girderings and Covered ways shall be selected from any of the systems defined in Design Manual for Roads and Bridges (DMRB) BD 47/99 Volume2, Section 3, Part 4 and shall comply with the requirements of DMRB BD 47/99. All waterproofing systems shall have a current BBA Roads and Bridge Agrément Certificate.

- 3.2.1.2** A protective layer shall be applied above the waterproofing system on Overline Bridges, Girderings and Covered Ways. The protective layer shall comprise red GRC tiles 300mm square and 15mm thick with the LU logo embossed into the upper surface. The tiles shall be set in an adhesive layer compatible with the waterproofing system.

3.2.2 Underline Bridges

3.2.2.1 General

- 3.2.2.1.1** A waterproofing system shall be applied to all new Underline bridges and to existing Underline bridges undergoing major refurbishment or alteration. Consideration shall be given to the waterproofing system renewal or maintenance to any underline bridge subject to ballasted track renewal.

Note: The repair of failed or damaged Underline bridge deck waterproofing is more expensive and difficult than the repair of waterproofing to Overline structures due to the necessity of lifting tracks and ballast during short possessions. Any savings on the initial cost of the waterproofing system are unlikely to be justified on a whole life cost basis if future maintenance problems are created or the waterproofing materials prove to have a short life.

3.2.2.2 Waterproofing System

- 3.2.2.2.1** A Tightly Bonded waterproofing system shall be used.

Note: Tightly Bonded systems comprise of either a liquid applied (including spray applied) membrane or a preformed sheet membrane that is bonded to the substrate with an adhesive and therefore, prevents the spread of water under the membrane from edges, imperfections and small punctures.

3.2.2.3 Waterproofing materials

- 3.2.2.3.1** Waterproofing materials shall be tolerant of adverse conditions and shall be impervious to water. Waterproofing materials that are certified as satisfying the requirements of Network Rail Standard NR/L3/CIV/041 shall be deemed to have satisfied this requirement.

- 3.2.2.3.2** All waterproofing materials shall meet the requirements of clause 3.8.

3.2.2.4 Application and Workmanship

- 3.2.2.4.1** Application and Workmanship of the waterproofing system shall be in accordance with NR/L3/CIV/041.