SECTION 071418

# FLUID-APPLIED WATERPROOFING DECK SYSTEM

SILCOR® 1100

PART 1 — GENERAL

1.01 RELATED DOCUMENTS

A. All of the Contract Documents, including General and Supplementary Conditions and Division 1 General Requirements, apply to the work of this section.

1.02 SUMMARY

A. The work of this section includes, but is not limited to, the following:

1. Fluid applied waterproofing system: Basis of design – ‘SILCOR® 1100’, manufactured by GCP Applied Technologies (UK) Limited

1. System Description

The fluid applied membrane shall consist of the following:

Vertical Application: Vertical applications at parapet walls, upstands, etc. shall be coated with a minimum dry film thickness of 1.5mm in single layer chrome green colour.

Horizontal Application: Horizontal applications shall be coated with a minimum dry film thickness of 1.5mm applied in single layer chrome green colour.

C. Related Sections: Other specification sections which directly relate to the work of this section include, but are not limited to, the following:

1. Section 033000 – Cast-In-Place Concrete

2. Section 042000 – Unit Masonry

3. Section 071100 – Damp proofing

4. Section 076000 – Flashing and Sheet Metal

5. Section 079200 – Joint Sealants

6. Section 079500 – Expansion Control

7. Section 334600 – Sub drainage

1.03 REFERENCE STANDARDS

A. The following standards and publications are applicable to the extent referenced in the text. The most recent version of these standards is implied unless otherwise stated.

B. American Society for Testing and Materials (ASTM)

C 836 Standard Specification for High Solids, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course

C 898 Standard Guide for Use of High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane with Separate Wearing Course

D 412 Standard Test Methods for Rubber Properties in Tension

D 4541 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers

D 624 Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers

E 96 Standard Test Method for Vapor Transmission of Materials

D 3767 Standard Practice for Rubber - Measurements of Dimensions

D 2240 Standard Test Method for Rubber Property – Durometer Hardness

1.04 SUBMITTALS

1. Product Data: Submit manufacturer’s product data sheet, installation guideline, use limitations and recommendations.
2. Shop drawings showing locations and extent of waterproofing including details for terminations and flashings, projections, penetrations, drains and treatment of substrate joints and cracks.
3. Written documentation demonstrating installer’s qualifications under the "Quality Assurance" article including reference projects of a similar scope.
4. Samples: Submit representative samples of the following for approval:
5. Fluid applied membrane free film sample
6. Warranty: Submit a manufacturer standard sample warranty

**1.05 QUALITY ASSURANCE**

1. Manufacturer: Waterproofing systems shall be manufactured and marketed by a firm with a minimum of 20 years’ experience in the production and sales of waterproofing. Manufacturers proposed for use, but not named in these specifications shall submit evidence of ability to meet all requirements specified, and include a list of projects of similar design and complexity completed within the past five years globally.
2. Installer: The installer shall demonstrate qualifications to perform the work of this Section by submitting the following:
3. Certification from the Waterproofing Manufacturer that the Installer is a trained applicator.
4. List of at least three (3) projects contracted within the past five (5) years of similar scope and complexity to this project.
5. Installer must show evidence of adequate equipment and trained field personnel to successfully complete the project in a timely manner.
6. Installer’s credentials must be approved by both the Architect and the Waterproofing Materials Manufacturer.
7. Materials: The waterproofing membrane shall be an elastomeric, chemically bonding, chrome green colour, cold sprayed liquid system based on specifically formulated ESSELAC® methyl methacrylate resins. Basis of design – ‘SILCOR® 1100’, manufactured by GCP Applied Technologies (UK) Limited

For each type of material required for the work of this section, provide primary materials that are the products of one manufacturer.

Pre-Installation Conference: A pre-installation conference shall be held prior to commencement of field operations to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work. Agenda for meeting shall include review of surface preparation, minimum curing period, installation procedures, special details and flashings, inspection, testing, protection and repair procedures.

Inspection and Testing: The fully cured surface of the waterproofing coating shall be examined and any visible defects made good in accordance with the manufacturers guidelines. Following the application, membrane will again be checked for defects and for pinholes by performing electrical holiday detection tests over the full surface area of waterproofing.

1.06 DELIVERY, STORAGE AND HANDLING

1. Deliver materials and products in the original, unopened containers with seals unbroken, labelled with the manufacturer's name, product brand name and type, date of manufacture and directions for storage and use.
2. Store and handle materials in strict compliance with manufacturer’s recommendations, material safety data sheets and technical data sheet. Protect from damage from sunlight, weather, excessive temperatures and construction operations. Remove damaged material from the site and dispose of in accordance with applicable regulations.

1. Do not double-stack pallets of waterproofing on the job site. Provide cover on top and all sides, allowing for adequate ventilation.

3. Protect waterproofing materials from freezing.

4. Sequence deliveries to avoid delays, but minimize on-site storage.

1.07 PROJECT CONDITIONS

1. Perform work only when existing and forecasted weather conditions are within the limits established by the manufacturer of the materials and products used.
2. Proceed with installation only when substrate construction and preparation work is complete and in condition to receive liquid membrane waterproofing.
3. Do not allow waste products (i.e. petroleum, grease, oil, solvents, vegetable or mineral oil, animal fat, acids, etc.) to come into contact with the waterproofing membrane. Any exposure to foreign materials or chemical discharges must be presented to the Membrane Manufacturer to determine the impact on the waterproofing assembly performance.
4. Concrete Deck Surface condition:
5. Flat roof slabs are acceptable.
6. Ensure no excessive deflection or movement of the deck or other structural problems.
7. The deck shall provide for support of the maximum anticipated dead and environmental loads and for expansion and contraction suitable for the roof system structure.
8. All projections, penetrations and openings in the deck should be completed before the waterproofing application begins.
9. General contractor shall assure adequate protection and ventilation during the application of the Waterproofing assembly.
	1. WARRANTY

Provide manufacturer's standard product warranty against manufacturing defect for a period of Ten years from date of Substantial Completion.

PART 2 - PRODUCTS

* 1. GENERAL
1. All waterproofing materials shall be manufactured by: GCP Applied Technologies (UK) Limited
2. All Laps, details and repairs shall all be chemically bonded.
3. All waterproofing material should have Unlimited over coating time, Systems that require abrasion or reactivation for over coating are not allowed.
4. Liquid applied Waterproofing membrane should be Cold applied, should have No harmful Isocyanates, should have Zero Ozone layer depletion property, should be Green VOC compliant and membrane should be Solvent free.
5. The waterproofing system will be able to be Applied all **year** round.

2.02 MATERIALS

The waterproofing system shall be an elastomeric cold spray liquid system based on specifically formulated ESSELAC® methyl methacrylate resins comprising a primer and single coat of chrome green colour to provide a homogenous 1.5mm dry film thickness, fully bonded membrane to the substrate.

The density of the applied cured membrane shall be greater than 1.10g/cm3. The physical properties and performance of all components of the waterproofing system shall not be affected by atmospheric humidity.

All waterproofing materials including primers shall be compatible with each other and shall be supplied by a single manufacturer and installer operating the BS EN ISO 9001 or similar approved quality assurance schemes.

The membrane shall have the minimum specified mechanical and physical properties as stated in Table 1 below:

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| --- | --- | --- |
| **PROPERTY** | **TYPICAL VALUE** | **TEST METHOD** |
| Wet film thickness | 1.7mm | Wet film Gauge  |
| Dry film thickness | 1.5mm |  |
| Colour | Chrome Green  |  |
| Density of cured membrane | 1.1g/cm3 | ASTM D 792 |
| Trafficable (foot traffic time), 23 degree C | 30 mins  |  |
| Typical Curing time, 23 degree C | 15 mins  |  |
| Tensile adhesion Strength of membrane, MPa | Concrete Substrate >0.7Steel Substrate >2PVC Substrate >2 | BS EN ISO 4624  |
| Intercoat overlap adhesion after 7 days without surface preparation | Same as tensile adhesion of membrane to the surface | BS EN ISO 4624 |
| Tensile strength, film | 12 MPa | BS903:A2:1995, ASTMD412  |
| Elongation, film  | 130% | BS903:A2:1995, ISO37:19 D412 94; ASTM |
| Puncture resistance | 600N | ASTM E 154 |
| Impact resistance  | 600mm | EN 12391 |
| Dynamic Crack bridging @ 0 degree C | >2mm | ASTM C 1305 |
| Static crack bridging @ 0 degree C | <2mm | BS EN ISO 4624 |
| Water vapor transmission |  | ASTM E 96 |
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PART 3 — EXECUTION

3.01 EXAMINATION

A. The installer shall examine conditions of substrates and other conditions under which this work is to be performed and notify the contractor, in writing, of circumstances detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected.

3.02 PREPARATION OF SUBSTRATES

1. The minimum age of new concrete shall be 14 days prior to application of the waterproofing system provided that all required surface preparation is completed and that the minimum tensile adhesion value of 0.7MPa of the waterproofing system to the concrete is achieved.
2. All concrete surfaces to receive the sprayed applied waterproofing shall be dry, free of all traces of loose material, laitance, and shutter oil, grease, curing compound, windblown deposits and other contaminants which could result in an adverse reaction with the protective system.
3. The concrete surfaces shall be free from surface defects including but not limited to small holes, minor cracking or defective joints. The Engineer’s approval shall be obtained for the method of repairing any surface defects. Any preparatory filling required shall normally be carried out using an approved shrinkage compensated cementitious mortar.
4. The quality of formed concrete finish to surfaces receiving the waterproofing membrane shall be:
	1. Uniform, dense and smooth surface with no grout runs, surface should be made U4 finish. Please refer CSP (Concrete Surface Profile) by ICRI (International Concrete Repair Institute) for additional guidance on acceptable surface preparation.
	2. Abrupt irregularities permitted to be <3mm for formed concrete surface after stripping of forms. However these abrupt irregularities shall be removed by grinding;
	3. Gradual irregularities permitted are <5mm in 2m:
		1. Tie bolt holes need to be repaired with an appropriate cementitious mortar;
		2. Bug holes, blowholes and the like must be broken out and then repaired to an agreed method statement with a resinous concrete repair material (not cementitious);
		3. Honeycombed concrete areas of concrete must be repaired to an agreed method statement.

3.03 INSTALLATION OF SPRAY MEMBRANE

* + - 1. To verify the quality of the concrete substrate for bonding of the membrane, a minimum of 1 tensile adhesion test is to be carried out on the substrate every 50m2 prior to the application of the primer and membrane, subject to a minimum of 6 tests for each structure being tested.
			2. The maximum ambient and substrate temperature permissible for application of any component of the waterproofing to take place is +50° Celsius. Any application restrictions due to temperature shall be sought from the manufacturer and implemented on site.
			3. The primer shall be compatible with the waterproofing membrane and will be recommended by the waterproofing manufacturer and shall meet their approval for use on this project. It shall be applied to the concrete substrate following the surface preparation and prior to the application of the waterproofing membrane.
			4. The membrane shall be cold applied using a proportioning spray pump system. Waterproofing membrane shall be applied strictly in accordance with the manufacturer’s guidelines to a minimum wet film thickness of 1.7mm in order to achieve dry film thickness of 1.5mm.
			5. Wet film thickness checks will be carried out every (two) m2 to ensure that the minimum wet film thickness is being applied.
			6. Increased wind can effect coverage rates and cause overspray. At more than 25KMPH wind speeds measures must be taken to prevent overspray. Spraying shall be suspended when it is unsafe to continue e.g. flying objects, airborne sand/and or in the opinion of the trained Applicator compliance with the manufacturer’s Quality Assurance is at risk.
			7. Any termination of the waterproofing system at day joints for subsequent lapping of the waterproofing system shall be staggered with a minimum lap of 50mm for the primer and coat of membrane.
			8. To ensure that the integrity of any day joints and lapping is assured no component of the waterproofing system shall have a critical over coating time.

**3.04 JOB COMPLETION**

1. Contractor and a Representative of the liquid Membrane Manufacturer shall inspect the waterproofing assembly and notify the Architect of any defects post the holiday integrity testing.

END OF SECTION