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SPEC NOTE: **Henry® MiraSEAL Cold Fluid-Applied Waterproofing at Concrete Decks – 90 Mils.** This specification is ideally suited for the protection and waterproofing of a plaza deck, Inverted Roof Membrane Assembly (IRMA), or Protected Membrane Roof (PMR).

SPEC NOTE: This specification includes 90-mil reinforced MiraSEAL waterproofing system eligible for material, system, or workmanship warranties for 5-years and 10-years.

SPEC NOTE: Refer to the MiraSEAL 120-mil concrete deck guide specification for waterproofing systems that are eligible for a 15 or 20-year workmanship warranty.

SPEC NOTE: This document includes notes to assist the architect/specification writer. A “SPEC NOTE” immediately precedes the text to which it is referring. The section is a guideline; modify to meet project specific requirements. Delete spec notes in the final copy of the specification.

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**SECTION 07 14 16**

**COLD FLUID-APPLIED WATERPROOFING**

1. **GENERAL**
	1. SUMMARY
		1. This Section Includes
			1. Cold fluid-applied waterproofing assembly for the protection and waterproofing of a [plaza deck] [Inverted Roof Membrane Assembly (IRMA)] [Protected Membrane Roof (PMR)] at concrete decks

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SPEC NOTE: Coordinate with project specific Sections.

1. Section 03 10 00 – Concrete Forming and Accessories
	1. Waterstop must have a minimum of 3 inches (75 millimeters) of concrete coverage.
2. Section 03 15 13 – Waterstops
	1. Refer to [www.henry.com](http://www.henry.com) for Henry waterstop accessories.
3. Section 03 51 00 - Cast Roof Decks
	1. Acceptable substrates:
		1. Cast-in-place concrete, precast structural concrete, concrete composite deck, and lightweight structural concrete.
		2. Lightweight insulating concrete is not an acceptable substrate.
		3. Metal pan decks should be venting type.
	2. Physical properties:
		1. Structural concrete: minimum strength/density: 3,500 psi (24 mPa) compressive strength, 150 pcf (2402 kg/m3) density
		2. Lightweight structural concrete: minimum strength/density: 2,500 psi (17 mPa) compressive strength, 115 pcf (1842 kg/m3) density
	3. Form Release Agents: Submit technical data sheet to Henry technical services for review.
	4. Curing compounds: Submit technical data sheet to Henry technical services for review.
	5. Surface profiles should meet one of the following:
		1. International Concrete Repair Institute Concrete Surface Profiles: CSP 2-3, broom finish, or wood float
	6. Curing method: Water cure, wet coverings, paper sheets, plastic sheets, or liquid curing compound. Submit liquid curing compound technical data sheet to Henry technical services for review.
	7. Curing/drying duration:
		1. Cast-in-place, precast structural concrete, and composite decks: 3 days minimum, can be applied to green concrete 24 hours after forms are removed
		2. Lightweight structural concrete: 28 days minimum
4. Section 06 16 00 – Sheathing
	1. Contact Henry for sheathing specific requirements.
5. Section 22 14 26.13 – Roof Drains
	1. Install metal drains with 3-inch (75 millimeter) flange and integral clamping ring. Set drains at deck height to promote drainage.

SPEC NOTE: Slope deck as required per local building code requirements to promote drainage. Contact Henry for installations on flat decks.

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* + 1. Related Requirements
			1. Section 03 15 00 – Concrete Forming and Accessories
			2. Section 03 15 13 – Waterstops
			3. Section 03 51 00 – Cast Roof Decks
			4. Section 05 30 00 – Metal Decking
			5. Section 06 16 00 – Sheathing
			6. Section 07 22 16 – Roof Board Insulation
			7. Section 07 62 00 – Sheet Metal Flashing and Trim
			8. Section 07 92 00 – Joint Sealants
			9. Section 22 14 26.13 – Roof Drains
	1. REFERENCES
		1. Reference Standards
			1. American Society for Testing and Materials (ASTM)
				1. ASTM C836 – Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course
				2. ASTM D4263 - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method
				3. ASTM D5957 – Standard Guide for Flood Testing Horizontal Waterproofing Installations
				4. ASTM D7877 – Standard Guide for Electronic Methods for Detecting and Locating Leaks in Waterproof Membranes
				5. ASTM E96 **–** Water Vapor Transmission of Materials
			2. International Concrete Repair Institute (ICRI)
				1. ICRI Technical Guidelines number 310-2R-2013
	2. ADMINISTRATIVE REQUIREMENTS
		1. Coordination
			1. Do not allow access to installation areas by other trades during waterproofing installation.
			2. Do not use spark producing equipment near waterproofing until vapors dissipate.
		2. Pre-installation Meetings
			1. Review conditions, installation procedures, schedules, and coordination with other Work.
	3. SUBMITTALS
		1. Provide submittals in accordance with Section 01 33 00 Submittal Procedures.
		2. Action Submittals
			1. Product data
				1. Guide specification
				2. Safety data sheets
				3. Standard details
				4. Technical data sheets
			2. Certificates
				1. Product certification stating assembly components are supplied and warranted by a single source Manufacturer.
				2. Statement confirming Installer is authorized by Waterproofing Manufacturer to complete Work as specified.
			3. Site quality control submittals
				1. Watertightness integrity test results
		3. Closeout Submittals
			1. Warranty Documentation
				1. Final executed warranty document
	4. QUALITY ASSURANCE
		1. Qualifications
			1. Manufacturer qualifications
				1. Minimum of 20 years of experience in the production and sales of waterproofing.
			2. Installer qualifications
				1. Authorized by Waterproofing Manufacturer to complete Work as specified.
		2. Mock-ups
			1. Construct mockups at a size and location as directed by the [Engineer] [Architect] [Consultant] to verify project specific applications and set quality standards for materials and execution in accordance with Section 01 43 39 Mockups.
				1. Include tie-in of waterproofing to adjacent products as part of the mockup.
	5. DELIVERY, STORAGE, AND HANDLING
		1. Delivery and Acceptance Requirements
			1. Deliver materials in original, factory-sealed, unopened containers with intact and legible product label and manufacturer name.
		2. Storage and Handling
			1. Store materials as recommended by the Manufacturer in a protected area and out of direct sunlight. Protect materials from rain and physical damage.
	6. SITE CONDITIONS
		1. Ambient Conditions
			1. Do not perform Work during rain or inclement weather.
			2. Do not perform Work on surfaces covered in frost, snow, or are damp or wet to touch.
			3. Do not perform Work when temperatures exceed product specific limitations. Refer to product specific technical data sheet for minimum application temperature.

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* 1. WARRANTY
		1. Manufacturer Warranty
			1. Material warranty
				1. Warrants product against product defect. Provides material only for a period of [5] [10] [15] [20] years from date of purchase.
			2. System warranty
				1. Warrants system. Provides material and labor costs for repair for a period of [5] [10] [15] [20] years from the date of installation completion as a result of any of the following:

Manufacturing product defect

* + - * 1. Insulation shall retain a minimum of 80% of its thermal value for the duration of the insulation warranty when supplied by Waterproofing Manufacturer.
				2. Pavers shall not split, crack, or disintegrate prematurely due to freeze-thaw cycling for the duration of the paver warranty when supplied by Waterproofing Manufacturer.
		1. Installer's Special Warranty:
			1. Workmanship warranty
				1. Provides material and labor costs for repair for a period of 2 years from the date of installation completion as a result of any of the following:

Faulty Installer’s workmanship

1. **PRODUCTS**
	1. ASSEMBLIES
		1. Manufacturers
			1. Acceptable manufacturers
				1. Henry® a Carlisle Company

336 Cold Stream Rd.

Kimberton, PA 19442

(888) 229-2119

[www.henry.com](http://www.henry.com)

* + 1. Performance Criteria
			1. Complies with ASTM C836
			2. 95% solids, single component elastomeric waterproofing
			3. Solvent free
			4. Moisture cure
			5. Flammability wet: Non-flammable
			6. Application time over concrete:
				1. Cast-in-place, precast structural concrete, and composite decks:

3 days minimum

Can be applied to green concrete 24 hours after forms are removed

* + - * 1. Lightweight structural concrete: 28 days minimum
		1. Materials
			1. Cold Fluid-Applied Waterproofing Membrane
				1. 95%-solids, fluid-applied, single-component, moisture cure, elastomeric waterproof membrane, having the following typical properties:

Basis of design: Henry MiraSEAL Cold Fluid-Applied Waterproofing Waterproofing/Roofing Membrane

Complies with ASTM C836

95% solids, single component elastomeric waterproofing

Solvent free

Moisture cure

Flammability wet: Non-flammable

Application time over concrete:

Cast-in-place, precast structural concrete, and composite decks:

3 days minimum

Can be applied to green concrete 24 hours after forms are removed

Lightweight structural concrete: 28 days minimum

Maximum VOC: < 40 grams/liter

* + - 1. Polyester fabric reinforcement
				1. Unsaturated spun bonded polyester reinforcement sheet:

Basis of design: Henry Polyester Fabric

* + - 1. Flashing
				1. Cold fluid-applied waterproofing membrane:

95%-solids, fluid-applied, single-component, moisture cure, elastomeric waterproof membrane, having the following typical properties:

Basis of design: Henry MiraSEAL Cold Fluid-Applied Waterproofing Waterproofing/Roofing Membrane

* + - * 1. Liquid applied flashing

Polyurethane modified methyl methacrylate (PUMA) reinforced liquid flashing:

Basis of design: Pumadeq™ System

* + - 1. Protection course
				1. SBS modified bitumen glass reinforced membrane:

Basis of design: ModifiedPLUSG100s/s

* + - * 1. Heavy-duty modified bitumen protection board:

Basis of design: Protection Board-HS

* + - * 1. Polypropylene copolymer protection board:

Basis of design: Henry 990-31 Protection Board

* + - * 1. Nonwoven polypropylene protection courses

Basis of design: Henry 300HV Protection Fabric

* + - 1. Sealant
				1. Building envelope, STPE sealant:

Basis of design: Henry925 BES Sealant

* + - * 1. Liquid flashing and detail STPE sealant:

Basis of design: Barribond HP

* 1. ACCESSORIES
		1. Drainage Composite
			1. Two-part prefabricated geo-composite drain board consisting of a formed polystyrene core covered on one side with a woven or non-woven polypropylene filter fabric:
				1. Basis of design: MiraDRAIN Drain Board
		2. Expansion Joints
			1. Expansion joint system designed to accommodate three-way building movement:
				1. Basis of design: Henry EJ-500 Expansion Joint System
		3. Filter Fabric
			1. Non-woven biodegradable geotextile fabric:
				1. Basis of design: HenryFilter Fabric N04
		4. Insulation
			1. Minimum thermal resistance (R-Value): Project specific Minimum R-Value
			2. Compressive Strength: [40], [60], [100] psi.
			3. Insulation supplied by Henry® a Carlisle Company:
				1. Acceptable Manufacturers:

Expanded polystyrene (EPS)

Insulfoam® a Carlisle Company

Extruded polystyrene (XPS)

DOW®

Owens Corning®

* + 1. Pavers
			1. Paver and pedestal assembly supplied by Henry a Carlisle Company
		2. Termination bars
			1. Extruded aluminum bar designed for securing/sealing flashing terminations:
				1. Basis of design: Termination bar supplied by Henry a Carlisle Company
1. **EXECUTION**
	1. EXAMINATION
		1. Verification of Conditions
			1. Verify substrates are in accordance with Waterproofing Manufacturer requirements and as specified in this Section prior to waterproofing installation. Commencement of the Work indicates installer acceptance of the substrate.
				1. Verify surfaces are sound, clean, and free of oil, grease, dirt, excess mortar, frost, laitance, loose and flaking particles, or other contaminants.
				2. Verify substrates are not wet to touch and do not have ponding water; dry or damp to touch are acceptable.
				3. Verify substrates are continuous and secure, smooth and without large voids, spalled areas, or sharp protrusions.
				4. Verify cold joints are on the same plane.
		2. Preinstallation Testing
			1. Moisture detection survey
				1. Visual inspection
				2. ASTM D4263 - Plastic Sheet Method
			2. Adhesion/pull test
				1. Complete a waterproofing adhesion test in accordance with Waterproofing Manufacturer’s published literature prior to installation of waterproofing assembly.
		3. Evaluation and Assessment
			1. Concrete surface profiles
				1. Recommended surface profiles:

ICRI Concrete Surface Profiles: CSP 2 – 3

Light broom finish

Wood float

* 1. PREPARATION
		1. Protection of In-Place Conditions
			1. Protect areas and surfaces not included in scope of Work against damage or soiling.
			2. Post “NO SMOKING” signs near waterproofing installation until vapors dissipate.
		2. Surface Preparation
			1. Refer to Waterproofing Manufacturer for surface preparation guidelines.
			2. Repair voids, rock pockets, and rough surfaces that do not meet required concrete surface profiles with approved non-shrink grout or grind to match un-repaired areas.
			3. Remove curing compounds or foreign matter detrimental to the adhesion.
	2. INSTALLATION
		1. Detailing and Flashing
			1. Install detailing and flashings per Waterproofing Manufacturer’s details.
		2. Waterproofing
			1. Limit waterproofing installation to areas where waterproofing and protection course are installed by end of day.
			2. Horizontal surfaces
				1. 90-mil reinforced field membrane:

Install one layer of waterproofing membrane at 45 mils minimum to form a continuous, monolithic membrane.

Verify waterproofing membrane thickness with wet film gauge.

Fully embed polyester fabric into tacky waterproofing membrane.

Coat polyester fabric side and end laps with waterproofing membrane. Overlap of dry polyester fabric is not acceptable.

Overlap polyester fabric 1/4-inch (5 millimeters) minimum.

Apply second layer of waterproofing membrane at 45 mils minimum to form a continuous, monolithic membrane over previously coated areas.

* + - 1. Vertical surfaces
				1. 90 mil unreinforced field membrane:

Install one layer of waterproofing membrane at 45 mils minimum to form a continuous, monolithic membrane.

Verify waterproofing membrane thickness with wet film gauge.

Allow waterproofing to partially cure to a tacky consistency prior to subsequent applications.

Apply second layer of waterproofing membrane at 45 mils minimum to form a continuous, monolithic membrane over previously coated areas.

* + 1. Protection Course
			1. Install protection course in a shingle pattern to promote drainage while waterproofing membrane is partially cured to tacky consistency.
			2. Overlap protection course adjoining edges 2 inches (50 millimeters) minimum and splice overlap with waterproofing.
		2. Drainage Composite
			1. Refer to Waterproofing Manufacturer product specific technical data sheet for installation guidelines and exposure limitations.
		3. Insulation
			1. Refer to Insulation Manufacturer installation guidelines and exposure limitations.
		4. Filter Fabric
			1. Install filter fabric in a shingle pattern to promote drainage.
			2. Loose lay filter fabric to promote debris obstruction.
			3. Overlap filter fabric adjoining edges approximately 6 inches (150 millimeters).
		5. Pavers
			1. Install paver system in accordance with Paver Manufacturer's published literature.
	1. SITE QUALITY CONTROL
		1. Site Tests and Inspections
			1. Refer to Waterproofing Manufacturer for warranty requirements.
			2. Observe waterproofing installation during the following phases:
				1. Substrate verification
				2. Waterproofing membrane installation start
				3. Waterproofing integrity test
				4. Final inspection of waterproofing assembly prior to overburden installation
			3. Waterproofing Integrity Test
				1. Conduct waterproofing integrity test prior to overburden placement.
				2. Repair membrane breaches and retest the system.
				3. Report test results to the [Architect] [Consultant] and Waterproofing Manufacturer.
				4. Acceptable methods:

Electronic Leak Detection (ELD) in accordance with ASTM D7877 and ELD specific scanning requirements

Flood Test in accordance with ASTM D5957

* 1. CLEANING
		1. Waste Management
			1. As the Work proceeds, and upon completion, promptly clean up and remove from the premises all rubbish and surplus materials resulting from the foregoing Work.
			2. Clean soiled surfaces, spatters, and damage caused by Work of this Section.
			3. Dispose of waterproofing per local code ordinances.
	2. PROTECTION
		1. Protect waterproofing from damage by other trades.

END OF SECTION