Section 07 14 16.02
COLD FLUID-APPLIED SINGLE COAT WATERPROOFING

SPEC NOTE: This Guide Specification includes materials and methods for the application of CM100 Single Coat System, a one coat cold applied moisture cure and solvent free elastomeric waterproofing membrane system. Typical applications include waterproofing below grade tunnels and foundation walls. This specification should be adapted to suit the requirements of individual projects. It is prepared in CSI three part format and should be included as a separate section under Division 7-Thermal and Moisture Protection.

PART 1: GENERAL

1.01 SECTION INCLUDES

A. The General Conditions, the Supplementary Conditions, the Instructions to Bidders and Division One General Requirements shall be read in conjunction with and govern this section.

B. The Specification shall be read as a whole by all parties concerned. Each Section may contain more or less than the complete work of any trade. The Contractor is solely responsible to make clear to the Subcontractors the extent of their work.

1.02 DESCRPTION

A. Supply labor, materials, tools and equipment to complete the Work as shown on the Drawings and as specified herein including, but not limited to the following:

1. Foundation Walls, Tunnels (by others),
2. 1 Coat Elastomeric Waterproofing Membrane,
3. Protection Course/Separation Sheet/Drainage Board,
4. Specified Backfill.

1.03 RELATED WORK

A.	Division 2	Site Work
B.	Division 3	Concrete Structural
C.	Division 4	Masonry
D.	Division 5	Structural Steel
E.	Division 6	Rough Carpentry Thermal
F	Division 7	Sealants & Flashings
G.	Division 15	Mechanical

1.04 REFERENCES

A. ASTM C 836: High Solid Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane.

1.05 SUBMITTALS

A. Prior to commencing the Work, submit references indicating that the materials proposed have been installed on projects of similar scope and nature.

B. Prior to commencing the Work, submit manufacturers complete set of standard details for cold applied liquid waterproofing.

1.06 QUALITY ASSURANCE

A. Perform Work in accordance with the printed requirements of the membrane manufacturer and this specification. Advise designer of any discrepancies prior to commencement of the Work.

B. Maintain one copy of manufacturer's literature on site throughout the execution of the Work.

C. At the beginning of the Work and at all times during the execution of the Work, allow access to site by the waterproofing membrane manufacturer's representative.

D. Materials used in this Section including primers, mastics and membranes, protection course, composite drainage boards and expansion joint membranes shall be fully compatible and shall be sourced and or produced by one manufacturer.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to the job site in undamaged and original packaging indicating the name of the manufacturer and product.

B. Cold applied elastomeric membrane should be stored in closed containers.

C. Store membrane at temperature of 40 degrees F and above to facilitate handling.

D. Store adhesives and primers at temperatures of 40 degrees F and above to facilitate handling.

E. Keep solvents away from open flame or excessive heat.

F. Do not store modified membranes at ambient temperatures below 20 degrees F.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Store rolls in heated location until needed on the roof.

B. Minimum working temperatures shall take into consideration a factor for wind chill. Application temperature shall be considered to be the temperature minus half of the wind speed as recommended by the National Roofing Contractors Association (NRCA).

1.09 CO-ORDINATION

A. Ensure continuity of the waterproofing membrane throughout the scope of this section.

B. Work shall be so scheduled as to provide a watertight seal at the end of each working day on the areas worked upon during the day.

1.10 SITE CONDITONS

A. Environmental Requirements

1. No installation work shall be performed during rainy or inclement weather and on frost or wet covered surfaces.

B. Protection

1. Provide adequate protection of materials and work of this section from damage by weather backfilling operations and other causes.
2. Protect work of other trades from damage resulting from work of this section. Make good such damage at own expense to satisfaction of the consultant.
3. Apply protection course as soon as possible after installation of membrane.

1.11 ALTERNATES

A. Submit requests for alternates in accordance with Section [XXXXX] - [XXXXX].

B. Alternate submission format to include:

1. Submit evidence that alternate materials meet or exceed performance characteristics of product requirements and documentation from an approved independent testing laboratory certifying the performance of the waterproofing membrane system including drain boards and transition sheets.
2. Submit references clearly indicating that the membrane manufacturer has successfully completed projects on an annual basis of similar scope and nature.
3. Submit manufacturers' complete set of standard details for the roofing membrane systems showing a continuous plane of water tightness throughout the building envelope.

C. Submit requests for alternate to this specification a minimum of ten (10) working days prior to tender closing for evaluation.

D. Acceptable alternates will be confirmed by addendum. Substitute materials not approved in writing prior to tender closing shall not be permitted for use on this project.

SPEC NOTE: This Guide Specification includes a standard contractor's 2 year warranty and manufacturer's 5 year product warranty for leak coverage against faulty materials.

1.12 WARRANTY

A. For the Work of this Section, the 12 months warranty period prescribed in subsection GC 32.1 of General Conditions "C" is extended to [24 months] [60 months].

B. Contractor hereby warrants the waterproofing membrane for leak coverage [in accordance with GC24], but for two years.

C. Waterproofing membrane manufacturer hereby warrants the waterproofing membrane for leak coverage as a result of faulty materials for a period of (5) five years. Scope of warranty shall include the supply of materials required to return the membrane to a watertight condition. Scope of work does not include the removal of overburden.

PART 2: MATERIALS

2.01 MATERIALS

A. Waterproofing membrane components and accessories must be obtained as a single-source from the membrane manufacturer to ensure total system compatibility and integrity.

1. Acceptable Manufacturer: Henry Company.
   909 N Sepulveda Blvd, Suite 650

El Segundo, CA 90245
800-523-0268
Web Site: www.Henry.com

2.02 WATERPROOFING MEMBRANE (Basis-of-Design)

A. Primary waterproofing membrane shall be Henry CM100 Cold Applied Elastomeric Membrane manufactured by Henry, a moisture cure, solvent free elastomeric waterproofing compound having the following characteristics:
   1. Conforms to ASTM C 836,
   2. Solvent content: 0%,
   3. Non Flammable, Flash point > 450 F,
   4. Elongation: >500%,
   5. V.O.C < 40 grams/ Liter,
   6. Can be applied to "green" concrete.

2.03 FABRIC REINFORCEMENT

A. Fabric reinforcement shall be Polyester Fabric with a minimum thickness of 8 mils and:
   1. Grab Tensile Strength (ASTM 5034):
      MD: 25 lbs/in
      CD: 13 lbs./in
   2. Trapezoid Tear (ASTM D1117):
      MD: 3 lbs
      CD: 6 lbs.
   3. Mullen Burst: 17 psi

2.04 FLASHING AND CRACK TREATMENT MEMBRANE

A Flashing and crack treatment membrane shall be 990-25 Elastomeric flashing sheet as supplied by Henry, a butyl/EPDM type, elastomeric membrane having a thickness of 47 mils.

2.05 PROTECTION COURSE/SEPARATION SHEET

A. Protection course/separation sheet membrane for horizontal surfaces shall be Filter Fabric GR08 as supplied by Henry, a 100% post consumer recycled polyester fabric having a minimum thickness of 120 mils.

2.06 LIQUID MEMBRANE & TERMINATION SEALANT

A. Termination Sealant shall be HE925 BES Sealant manufactured by Henry; a moisture cure, medium modulus polymer modified sealing compound having the following physical properties:
   1. Compatible with sheet air barrier, roofing and waterproofing membranes and substrate,
   2. Complies with Fed. Spec. TT-S-00230C, Type II, Class A,
   3. Complies with ASTM C 920, Type S, Grade NS, Class 25,
   4. Elongation: 450 – 550%,
   5. Remains flexible with aging,
   6. Seals construction joints up to 1 inch wide.

2.07 PREFABRICATED DRAINAGE BOARD: Drainage board shall be two part prefabricated geocomposite drainage board consisting of a formed polystyrene or PVC core covered on one side with a woven or non-woven polypropylene filter fabric supplied by Henry:

A. Henry DB 220: For vertical and horizontal installations, shallower depths with additional film attached to back side of membrane.

B. Henry DB 520: For vertical installations requiring high compressive strength and high flow capacity with additional film attached to back side of membrane.

C. Henry DB 650: For horizontal applications requiring high compressive strength, high flow capacity & woven geotextile. Suitable for use under topping slab in split slab applications.

2.10 TERMINATION BARS

A. Termination bars shall be continuous aluminum, stainless steel or galvanized metal, 1/8" x 1" in size and shall be pre-drilled for non-corrosive screw attachment on a maximum of 8" centers.

2.11 SPECIFIED BACKFILL (Division 2)

PART 3: EXECUTION

3.01 EXAMINATION

A. Acceptable substrates are cast-in-place concrete, and precast concrete.

B. Verify that surfaces and conditions are ready to accept the work of this section. Commencement of the work or any parts thereof shall mean acceptance of the substrate.

3.02 PREPARATION

A. All surfaces must be sound, dry, clean and free of oil, grease, dirt, excess mortar, frost or other contaminants. Fill spalled areas in substrate to provide an even plane and remove scaling or laitant concrete. Remove curing compounds or any foreign matter detrimental to the adhesion of the primary waterproofing membrane or membrane flashings.

B. New concrete should be cured for a minimum of 3 days and must be dry before waterproofing membranes are applied. Concrete in vented metal pan decks must be cured a minimum of seven days.

C. Concrete shall have a wood float finish. Decks with a steel float finish must be sandblasted or equivalent prior to the application of the waterproofing system.

D. Expansion joint assemblies should be in place prior to the application of the primary waterproofing assembly.

3.03 INSTALLATION OF CRACK TREATEMENT AND FLASHINGS

A. Joint Treatment For Precast Concrete Deck:

1. Reinforce joints along length of concrete deck units with a minimum 12 inch wide strip of fabric reinforcement embedded into an 18 inch wide by 55 mil thick coating of the primary membrane.
2. At joints occurring along the width of the precast units reinforce with a minimum 12 inch wide strip of elastomeric crack treatment membrane embedded into an 18 inch wide by 55 mil thick coating of the primary membrane.

B. Deck to Vertical Junctures:

1. Apply a 55 mil thick coating of the primary waterproofing membrane extending 4 inches onto horizontal and vertical faces.
2. Embed elastomeric flashing sheet flat into wet membrane extending a minimum of 3 inches out onto the horizontal and vertical surfaces, avoid wrinkles or fish mouths.
3. When height of elastomeric flashing sheet exceeds 12 inches mechanically attach the flashing sheet to vertical surface with metal termination bar. Lap flashing sheets a minimum of 3 inches on end laps and bond with 55 mils thick coating of primary membrane.

C. Crack Treatment:

1. Seal cracks and joints up to 1/8 inch in width with a 12 inch wide by 55 mil thick coating of the primary membrane and a 6 inch wide strip of fabric reinforcement centered over the joint.
2. Seal cracks and joints up to 1/4 inch in width with a 12 inch wide by 55 mil thick coating of the primary membrane and a 6 inch wide strip of elastomeric crack treatment membrane centered over joint.

D. Membrane Flashing At Drains:

1. Coat areas around the drains with a 55 mil thick coating of primary membrane.
2. Place elastomeric flashing sheet over the coated drain flange and extending a minimum 6 inches around the flange.
3. Apply a second coat of 55 mil thick elastomeric membrane over the flashing sheet.
4. Apply clamping ring exerting sufficient pressure to affect a seal between clamping ring and membrane. Temporarily block all drains during the application of ballast, or other materials that might block the drains. Remove blocking when work is not in progress and upon completion.

E. Membrane Flashing At Protrusions:

1. At mechanical vent protrusions and pipe penetrations provide elastomeric lashing sheet set into a 55 mil thick coating of primary membrane. Overcoat and seal with membrane. Install clamps as required.
2. At pitch pockets, place the pan on top of a 55 mil thick coating of primary membrane and attach into roof deck. Set flashing sheet into 55 mil thick coating of primary

membrane over top of flange. Fill pitch pocket with primary liquid waterproofing in order to shed water.

F. Expansion Joints:
   1. Elastomeric sheet membrane can be applied in a bed of primary waterproofing membrane. Place elastomeric sheet membrane into wet membrane as recommended by manufacturers' written instructions.
   2. Loop elastomeric sheet membrane down into expansion joint, embedded into a 55 mil thick layer of primary waterproofing membrane. Ensure that the depth of loop is a minimum 1-1/2".
   3. Extend elastomeric sheet membrane minimum of 3" on each side of joint. Seal end joints a minimum of 6" and seal with a 55 mil thick coat of membrane. Fill loop with membrane as required.
   4. Secure top of expansion joint membrane with continuous fixing bar at vertical wall locations.

3.04 SINGLE COAT COLD APPLIED ELASTOMERIC MEMBRANE APPLICATION

A. Application of Single Coat Vertical Layer:
   1. Ensure substrates are ready to receive primary waterproofing membrane.
   2. Apply membrane by squeegee, roller or trowel ensuring full bond of membrane to substrate.
   3. Apply single coat layer of primary membrane evenly to a minimum thickness of 55 mils to form a continuous monolithic coating over vertical surfaces including previously reinforced areas.

B. Application of Single Coat Horizontal Layer:
   1. Ensure substrates are ready to receive primary waterproofing membrane.
   2. Apply membrane by squeegee, roller or trowel ensuring full bond of membrane to substrate.
   3. Apply single coat layer of primary membrane evenly to a minimum thickness of 110 mils to form a continuous monolithic coating over vertical surfaces including previously reinforced areas.

3.05 INSTALLATION OF PROTECTION COURSE/SEPARATION SHEET (Horizontal)

A. Place specified protection course/separation sheet onto top coat layer of primary membrane while it is still wet and has not skinned over.

B. Lap protection course 2 inches on side laps and 6 inches on end laps.

C. Start at the low points or drains, lay the protection course membrane in full continuous sheets in a shingle pattern. Stager all end laps.

3.06 CURING AND PROTECTION

A. Allow membrane to dry thoroughly. Protect from rain until fully cured. Allow membrane to fully cure prior to installing drainage composite, covering material or backfilling. Patch or repair damaged areas using same material as original coating.

B. Protect cured membrane from damage caused by backfilling with drain boards prior to commencing backfill.

3.07 INSTALLATION OF FOUNDATION DRAINAGE BOARD (Vertical)

A. Align and hang drainage board up to foundation wall, position bottom edge of drainage board to be in moderate contact with weeping tile system.

B. Secure drainage board to foundation wall with specified nails and washers spaced 16 inches o/c horizontally. Install minimum of 2 rows staggered and spaced 6 inches apart and min 6 inches from top edge.

C. Align and install specified termination strip along top edge with nails spaced 12 inches o/c and seal with termination sealant.

D. Overlap end laps, pull back loose fabric to expose drain core and position core of second panel over the first panel. Bend drain board to create inside corners and cut board to create outside corners, provide 3 inches of extra fabric to wrap corner.

E. Stagger or offset joints of drain board sheets. Place all subsequent sheets in an overlapping single fashion.

F. Backfill bottom edge in conjunction with weeping tile system.

3.08 INSTALLATION OF DRAINAGE BOARD (Horizontal)

A. Loose lay boards over protection course starting at the low point of roof or drains.

B. Overlap in the direction of water flow. Pull back loose fabric to expose drain core and position core of second panel over the first panel.

C. Place all subsequent sheets in an overlapping single fashion.

3.09 INSTALLATION OF SPECIFIED BACKFILL

A. See Division 2.

3.10 FIELD QUALITY CONTROL

A. Final Inspection and Approval:

1. Final inspection of completed work shall be carried out by the owner's representative, the contractor and Henry.

3.11 CLEAN-UP

A. Promptly as the work proceeds and on completion, clean up and remove from the premises all rubbish and surplus materials resulting from the foregoing work.

B. Clean to the consultant's approval, soiled surfaces, spatters, and damage caused by work of this Section.

C. Check area drains to ensure cleanliness and proper function, and remove debris, equipment and excess material from the site.

END OF SECTION