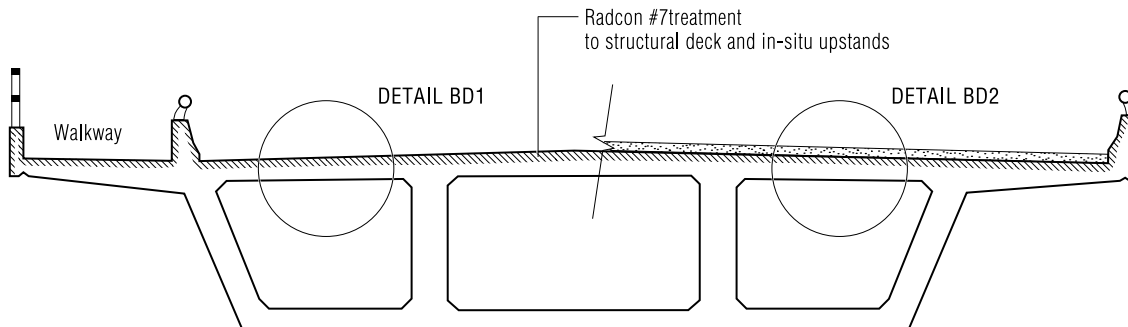


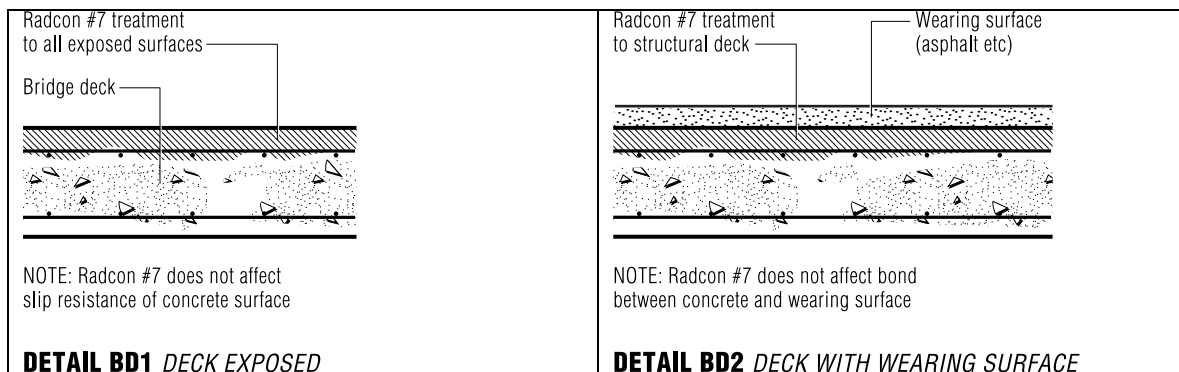
Specification:

Road Bridge Specification for

Radcon Formula #7® Waterproofing System



TYPICAL SECTION ROADWAY BRIDGE



PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings, Bill of Quantities and general provisions of the contract.

1.02 RELATED WORKS SPECIFIED ELSEWHERE

- A. Concrete mix design, placement, curing, finishing, joint preparation and detailing affect this section and are included within this specification.

1.03 QUALITY ASSURANCE

- A. Work under this section shall be performed by an applicator approved and licensed by the manufacturer or their nominated agent/distributor.
- B. A site inspection shall be made by the approved applicator prior to commencing application of the system, for purposes of reviewing related conditions affecting the performance requirements of this specification.
- C. The site specification and product datasheets are sited and understood by the site foreman/supervisor.
- D. All products described in this section must be used with adequate personal protection as recommended by the Material Safety Datasheet, which accompanies each product shipment.

1.04 SUBMITTALS

- A. A detailed statement describing the concrete waterproofing system to be applied shall be submitted for approval prior to application. Literature, details, samples, warranties etc., shall be included in the submittal as required.

- B. The manufacturer's or nominated agent/distributors written acceptance and approval of the intended system required

PART 2 – CONCRETE & RELATED DETAILING

2.01 CONCRETE MIX DESIGN

- A. The concrete mix design must be free of any pozzolans such as Fly Ash. The mix design must be sighted and approved by the manufacturer or agent/distributor

2.02 CONCRETE INSTALLATION

- A. Concrete should be well compacted, vibrated and adequately cured and be at least 28 days old prior to the application of the material.
B. Pour concrete with fall lines to drains

2.03 CONCRETE FINISH

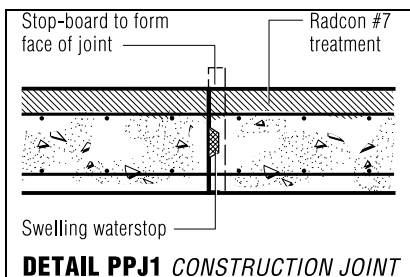
- A. Wood float or broom finish is preferred. Steel trowel or helicopter can close surface pores, which prevents penetration. In this case the surface requires acid etching, grinding or blasting to open surface pores.

2.04 CURING

- A. Water curing is always the first preference.
B. If curing compounds are used they must not inhibit any surface absorption of the concrete they will require removal prior to application by way of grit blasting or grinding.

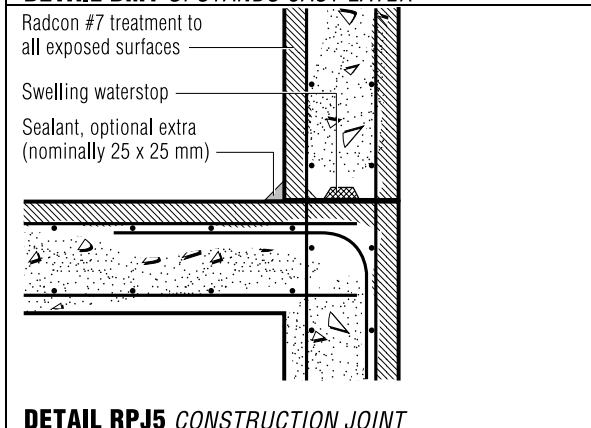
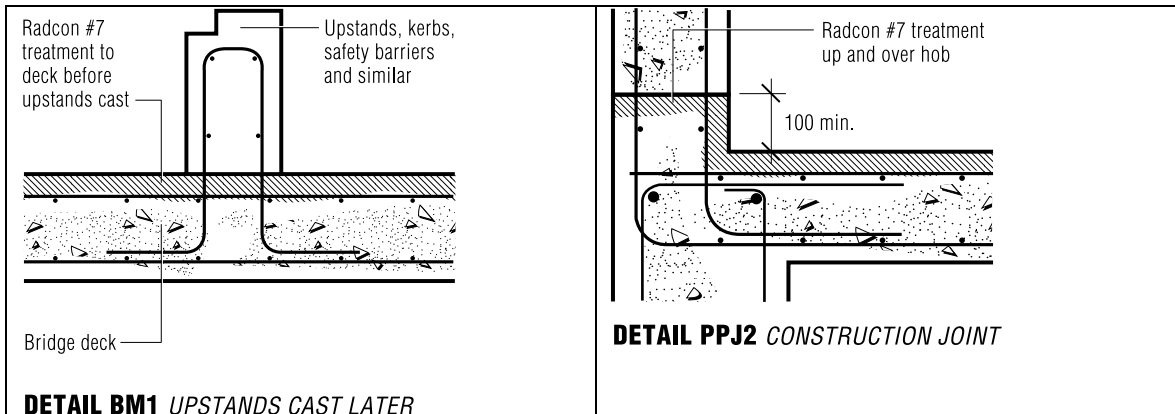
2.05 CONSTRUCTION/POUR JOINTS

- A. Construction joints/pour joints should be planned and formed with a vertical stop board.
B. Construction joint face should be roughened so as to provide an adequate key for the new concrete slab to be poured.
C. Preferably, install Volclay Waterstop RX[®] as per manufacturers recommendations to formed construction. Application to be carried out by the manufacturers Approved Applicator (refer to PPJ1 below)



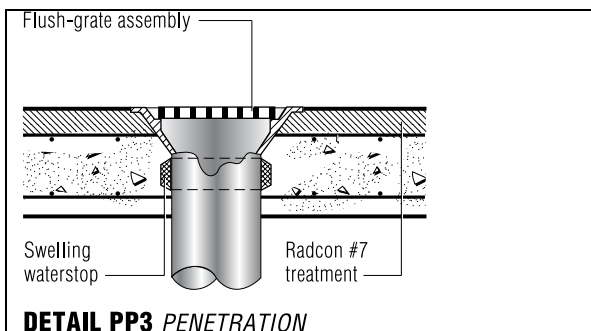
2.06 KERBS AND PARAPETS

- A. First preference is to treat slab with the material prior to pouring parapet or kerb (refer to BM1 below)
B. Second preference is to pour parapets in-situ (refer to RPJ4 below)
C. Third preference is Volclay Waterstop RX[®] installed in the parapet joint (refer to RPJ5 below)



2.07 DRAINS & PENETRATIONS

- A. Prior to concrete pour, preferably install Volclay Waterstop RX® as per manufacturers recommendations around penetrations. (refer to RP below)



PART 3 – PRODUCTS

3.01 MATERIAL SPECIFICATION

The waterproofing solution shall create a vapour permeable sub-surface barrier to prevent water leakage and ingress of contaminants into the cracks and concrete matrix.

The solution will be a non-toxic, clear, odourless silicate based material with proprietary biochemical modification such as Radcon Formula #7 supplied by Radcrete Pacific Pty Ltd.

The solution will penetrate into concrete and react with Calcium Hydroxide and water at ambient temperatures. The solution will form a non-water soluble complex calcium silicate hydrate gel, which is a chemically resistant compound in cracks pores and capillaries.

The product will seal existing leaking cracks up to 2.00mm. In the matrix, it remains reactive with water to provide autogenous healing properties to future hairline cracks.

PART 4 – CONTRACT EXECUTION

4.01 APPLICATION AND SUPERVISION

- A. All work is to be installed in accordance of the system manufacturers recommendations, employing trained applicators, utilising proper tools and equipment and working under the direct supervision of a technically competent and experienced supervisor.

4.02 SURFACE PREPARATION

- A. All dags, laitance and loose fines to be removed by scraping or grinding.
- B. Any materials that may retard penetration shall be removed such oil, grease, paints and curing compounds.
- C. All holes, areas of honeycombing, damaged sections, etc., should be hacked out, treated with material then once touch dry, patched with a suitable cementitious grout, trowelled to a smooth even finish. Allow overnight drying.
- D. Thoroughly clean down surfaces by water blaster to remove dirt, dust, or other contamination to leave sound clean surfaces free of residues.
- E. The surface must be dry.

4.03 ENVIRONMENT CONDITIONS

- A. The material is not to be applied when ambient temperatures are below +5°C or above +35°C.
- B. Do not apply when rain is imminent
- C. Do not spray apply in high wind conditions

4.04 CRACKS

- A. Locate all cracks and flood with the material ensuring they are filled with product. Allow 1 litre per 3 lineal meters.

4.05 GENERAL AREA

- A. Apply the material to the remaining area at a coverage rate of between 4-6 sq. meters per litre. When surfaces have become touch dry - (usually 2-6 hours depending on wind conditions and ambient temperatures) and no longer than 6 hours flood spray the treated areas with water
- B. Undertake a second watering on the following day
- C. Undertake a third watering on the following day. (There are 3 waterings in total)

PART 5 – QUALITY CHECK

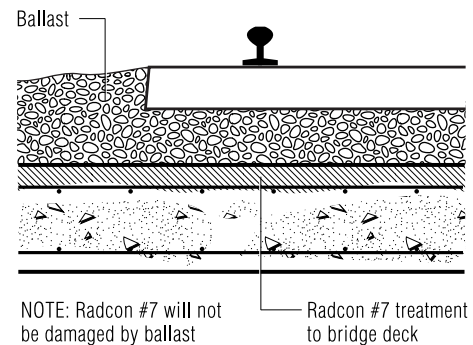
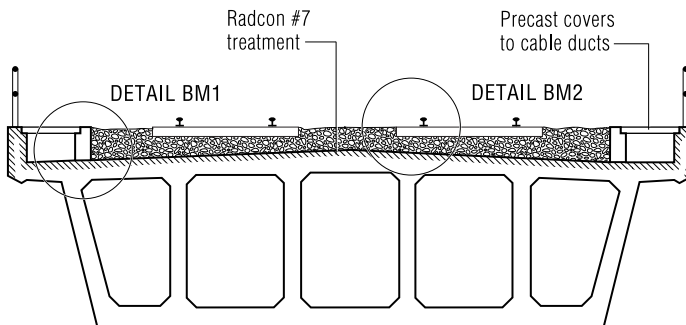
5.01 WATER TEST AND VERIFICATION

- A. After treatment and ancillary detailing has been completed, pond or water test the area for a minimum of 12 hours to verify the treated area is watertight. Watertightness be verified before a guarantee is issued
- B. For further quality control, random core samples can be taken to be analysed using SEM & EDS to determine penetration depth.

Specification:

Bridge Deck Specification for

Radcon Formula #7® Waterproofing System



TYPICAL SECTION RAILWAY BRIDGE

DETAIL BM2 BALLAST OVERLAY

1.0 Material Specification

The waterproofing solution shall create a vapour permeable sub-surface barrier to prevent water leakage and ingress of contaminants into the cracks and concrete matrix.

The solution will be a non-toxic, clear, odourless silicate based material with proprietary biochemical modification such as Radcon Formula #7 supplied by Radcrete Pacific Pty Ltd.

The solution will penetrate into concrete and react with Calcium Hydroxide and water at ambient temperatures. The solution will form a non water soluble complex calcium silicate hydrate gel which is a chemically resistant compound in cracks pores and capillaries.

The product will seal existing leaking cracks up to 2.00mm. In the matrix, it remains reactive with water to provide autogenous healing properties to future hairline cracks.

2.0 Concrete mix design

2.1 The concrete mix design must be free of any pozzolans such as Fly Ash.

3.0 Concrete installation

3.1 Concrete should be well compacted, vibrated and adequately cured.

4.0 Curing

4.1 Water curing is always the first preference.

4.2 If curing compounds are used they must not inhibit any surface absorption of the concrete they will require removal prior to application by way of grit blasting or grinding

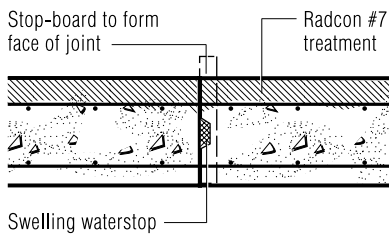
5.0 Construction/pour joints

5.1 Construction joints/pour joints should be planned and formed with a vertical stop board.

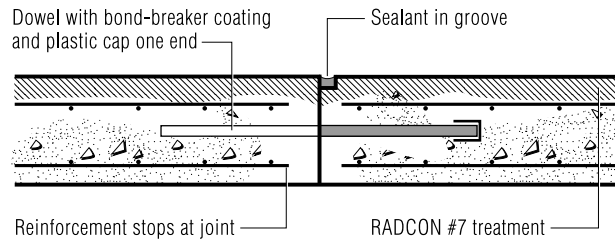
5.2 Construction joint face should be roughened so as to provide an adequate key for the new concrete slab to be poured.

5.3 Preferably, install **Volclay Waterstop RX®** as per manufacturers recommendations to formed construction joints. Application to be carried out by a Radcrete Approved Applicator (refer to RPJ1 below)

5.4 Alternatively, where construction joints do not have a waterstop or are dowelled but are of good quality and easily identified – Grind out to approx. 20mm x 12mm and use reputable polyurethane joint sealant to manufacturers recommendations and protect from ballast (refer to PCJ1 below)



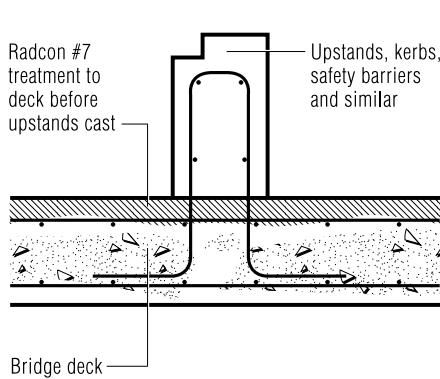
DETAIL RPJ1 CONSTRUCTION JOINT



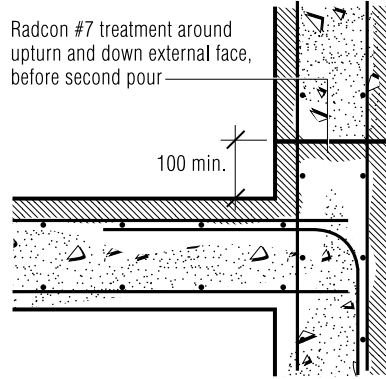
DETAIL PCJ1 CONTRACTION JOINT

6.0 Upturns and Parapets

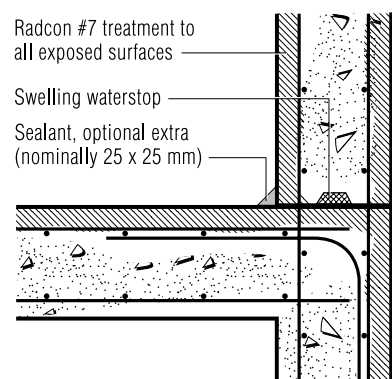
- 6.1 First preference is to Radcon #7 treat slab prior to pouring parapet (refer to BM1 below)
- 6.2 Second preference is to pour parapets insitu (refer to RPJ4 below)
- 6.3 Third preference is **Volclay Waterstop RX[®]** installed in the parapet joint (refer to RPJ5 below)
- 6.4 All detailing applications to be undertaken by a licenced Approved Applicator and be in accordance to the manufacturers instructions



DETAIL BM1 UPSTANDS CAST LATER



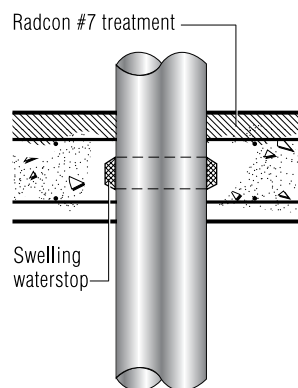
DETAIL RPJ4 CONSTRUCTION JOINT



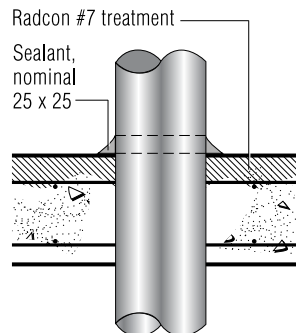
DETAIL RPJ5 CONSTRUCTION JOINT

7.0 Drains & penetrations

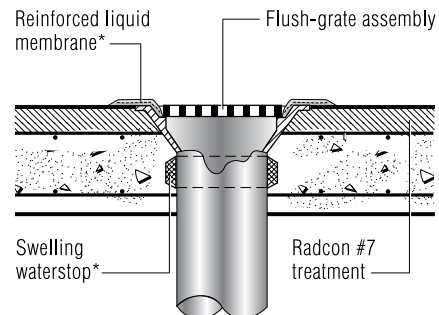
- 7.1 Prior to concrete pour, preferably install **Volclay Waterstop RX[®]** as per manufacturers recommendations around penetrations. Application to be carried out by a Radcrete Approved Applicator (refer to RP1 below)
- 7.2 Where no waterstop is installed, install a reputable polyurethane joint sealant at the penetration / slab interface (refer to RP4 below)
- 7.3 Where a drain is installed, generally a **Volclay Waterstop RX[®]** is sufficient (refer to RP3 below)



DETAIL RP1 PENETRATION



DETAIL RP4 PENETRATION



* Generally one or the other is sufficient. For extra watertightness, both may be used

DETAIL RP3 PENETRATION

8.0 Surface preparation:

- 8.1 All laitance and loose fines to be removed by scraping or grinding.
- 8.2 Preferred finish is wood float or broom finish. Where steel trowelling, helicopter or form face presents a smooth & non porous surface it must be opened by blasting, grinding or acid etching.
- 8.3 Any materials that may retard penetration shall be removed such oil, grease, paints.
- 8.4 All holes, areas of honeycombing, damaged sections, etc., should be hacked out, treated with material then once touch dry, patched with a suitable cementitious grout, trowelled to a smooth even finish. Allow overnight drying.
- 8.5 Thoroughly clean down surfaces by water blaster to remove dirt, dust, or other contamination to leave sound clean surfaces free of residues.
- 8.6 The surface must be dry.

9.0 Product application:

- 9.1 The material to be applied by a licenced Approved Applicator nominated by the manufacturer.
- 9.2 The material is not to be applied when ambient temperatures are below +5°C or above +35°C.
- 9.3 Locate all cracks and flood with the material ensuring they are filled with product. Allow 1 litre per 3 lineal metres.
- 9.4 Apply the material to the remaining area at a coverage rate of between 4-6 sq. meters per litre. When surfaces have become touch dry - (usually 2-6 hours depending on wind conditions and ambient temperatures) and no longer than 6 hours flood spray the treated areas with water
- 9.5 Undertake a second watering on the following day
- 9.6 Undertake a third watering w on the following day. (There are 3 waterings in total)

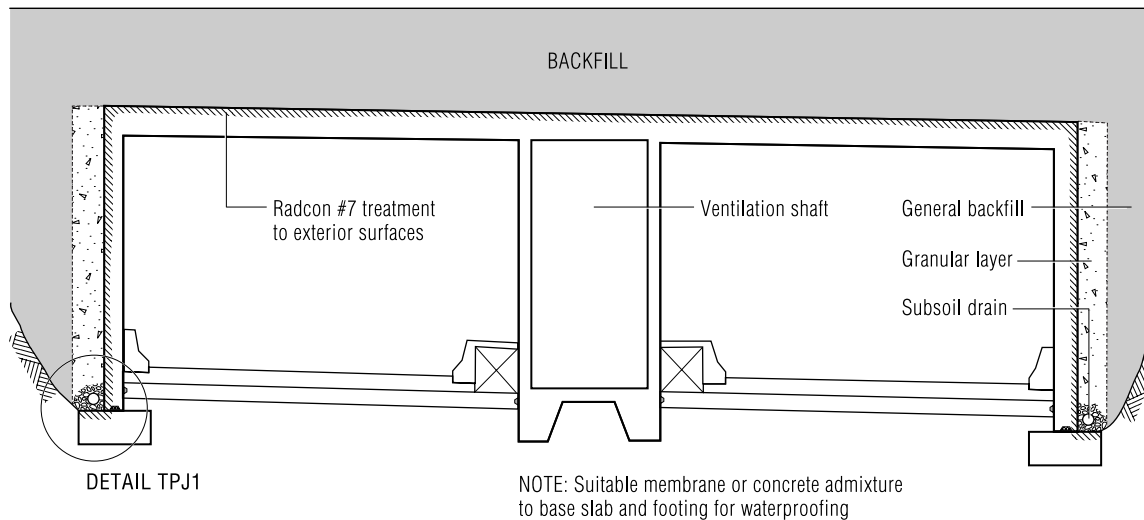
10.0 Quality Control

- 10.1 After treatment and ancillary detailing has been completed, pond the area for a minimum of 12 hours to verify the treated area is watertight. This must be verified before a guarantee is issued.
- 10.2 For further quality control, random core samples can be taken to be analysed using SEM & EDS to determine penetration
- 10.3 Once pond test confirms no leakage – ballast can be placed

Specification:

Cut & Cover Tunnel Specification

Radcon Formula #7[®] Waterproofing System



TYPICAL SECTION ROADWAY TUNNEL

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings, Bill of Quantities and general provisions of the contract.

1.02 RELATED WORKS SPECIFIED ELSEWHERE

- A. Concrete mix design, placement, curing, finishing, joint preparation and detailing affect this section and are included within this specification.

1.03 QUALITY ASSURANCE

- A. Work under this section shall be performed by an applicator approved and licensed by the manufacturer or their nominated agent/distributor.
- B. A site inspection shall be made by the approved applicator prior to commencing application of the system, for purposes of reviewing related conditions affecting the performance requirements of this specification.
- C. The site specification and product datasheets are sited and understood by the site foreman/supervisor.
- D. All products described in this section must be used with adequate personal protection as recommended by the Material Safety Datasheet, which accompanies each product shipment.

1.04 SUBMITTALS

- A. A detailed statement describing the concrete waterproofing system to be applied shall be submitted for approval prior to application. Literature, details, samples, warranties etc., shall be included in the submittal as required.
- B. The manufacturer's or nominated agent/distributors written acceptance and approval of the intended system required

PART 2 – CONCRETE & RELATED DETAILING

2.01 CONCRETE MIX DESIGN

- A. The concrete mix design must be free of any pozzolans such as Fly Ash. The mix design must be sighted and approved by the manufacturer or agent/distributor

2.02 CONCRETE INSTALLATION

- A. Concrete should be well compacted, vibrated and adequately cured and be at least 28 days old prior to the application of the material.
- B. Pour concrete with fall lines to drains

2.03 CONCRETE FINISH

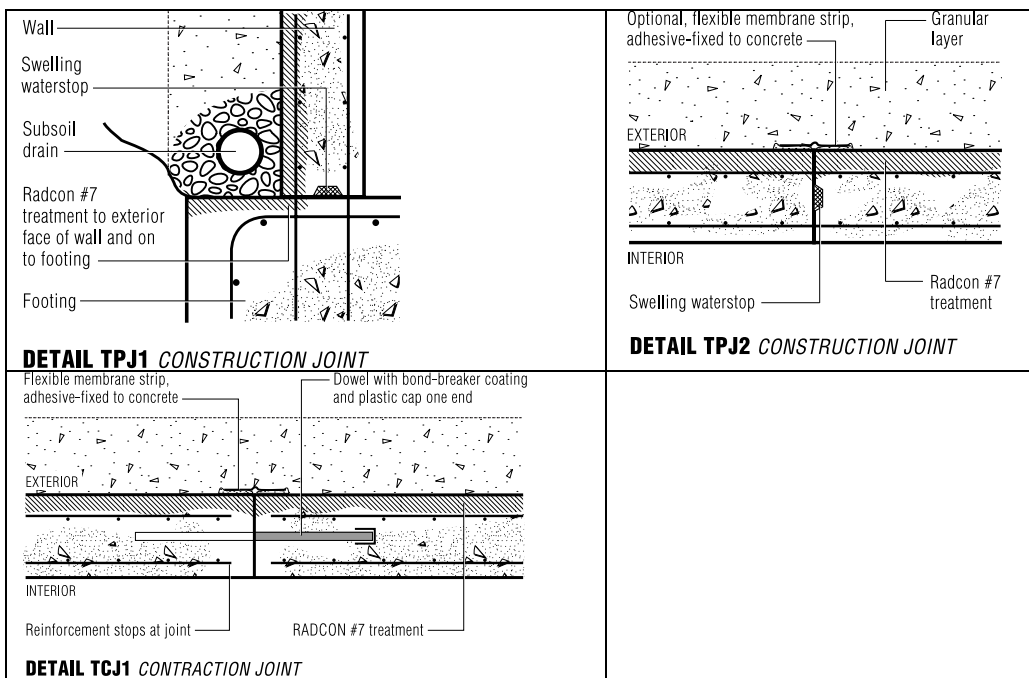
- A. Wood float or broom finish is preferred. Steel trowel or helicopter can close surface pores which prevents penetration. In this case the surface requires acid etching, grinding or blasting to open surface pores.

2.04 CURING

- A. Water curing is always the first preference.
- B. If curing compounds are used they must not inhibit any surface absorption of the concrete they will require removal prior to application by way of grit blasting or grinding.

2.05 CONSTRUCTION/POUR JOINTS

- A. Construction joints/pour joints should be planned and formed with a vertical stop board.
- B. Construction joint face should be roughened so as to provide an adequate key for the new concrete slab to be poured.
- C. Preferably, install Volclay Waterstop RX[®] as per manufacturers recommendations to formed construction. Application to be carried out by the manufacturers Approved Applicator (refer to PPJ1 below)



PART 3 – PRODUCTS

3.01 MATERIAL SPECIFICATION

The waterproofing solution shall create a vapour permeable sub-surface barrier to prevent water leakage and ingress of contaminants into the cracks and concrete matrix.

The solution will be a non-toxic, clear, odourless silicate based material with proprietary biochemical modification such as Radcon Formula #7 supplied by Radcrete Pacific Pty Ltd.

The solution will penetrate into concrete and react with Calcium Hydroxide and water at ambient temperatures. The solution will form a non water soluble complex calcium silicate hydrate gel which is a chemically resistant compound in cracks pores and capillaries.

The product will seal existing leaking cracks up to 2.00mm. In the matrix, it remains reactive with water to provide autogenous healing properties to future hairline cracks.

PART 4 – CONTRACT EXECUTION

4.01 APPLICATION AND SUPERVISION

- A. All work is to be installed in accordance of the system manufacturers recommendations, employing trained applicators, utilising proper tools and equipment and working under the direct supervision of a technically competent and experienced supervisor.

4.02 SURFACE PREPARATION

- A. All dags, laitance and loose fines to be removed by scraping or grinding.
- B. Any materials that may retard penetration shall be removed such oil, grease, paints.
- C. All holes, areas of honeycombing, damaged sections, etc., should be hacked out, treated with material then once touch dry, patched with a suitable cementitious grout, trowelled to a smooth even finish. Allow overnight drying.
- D. Thoroughly clean down surfaces by water blaster to remove dirt, dust, or other contamination to leave sound clean surfaces free of residues.
- E. The surface must be dry.

4.03 ENVIRONMENT CONDITIONS

- A. The material is not to be applied when ambient temperatures are below +5°C or above +35°C.
- B. Do not apply when rain is imminent
- C. Do not spray apply in high wind conditions

4.04 CRACKS

- A. Locate all cracks and flood with the material ensuring they are filled with product. Allow 1 litre per 3 lineal meters.

4.05 GENERAL AREA

- A. Apply the material to the remaining area at a coverage rate of between 4-6 sq. meters per litre. When surfaces have become touch dry - (usually 2-6 hours depending on wind conditions and ambient temperatures) and no longer than 6 hours flood spray the treated areas with water
- B. Undertake a second watering on the following day
- C. Undertake a third watering on the following day. (There are 3 waterings in total)

PART 5 – QUALITY CHECK

5.01 WATER TEST AND VERIFICATION

- A. After treatment and ancillary detailing has been completed, pond or water test the area for a minimum of 12 hours to verify the treated area is watertight. This must be verified before a guarantee is issued
- B. For further quality control, random core samples can be taken to be analysed using SEM & EDS to determine penetration