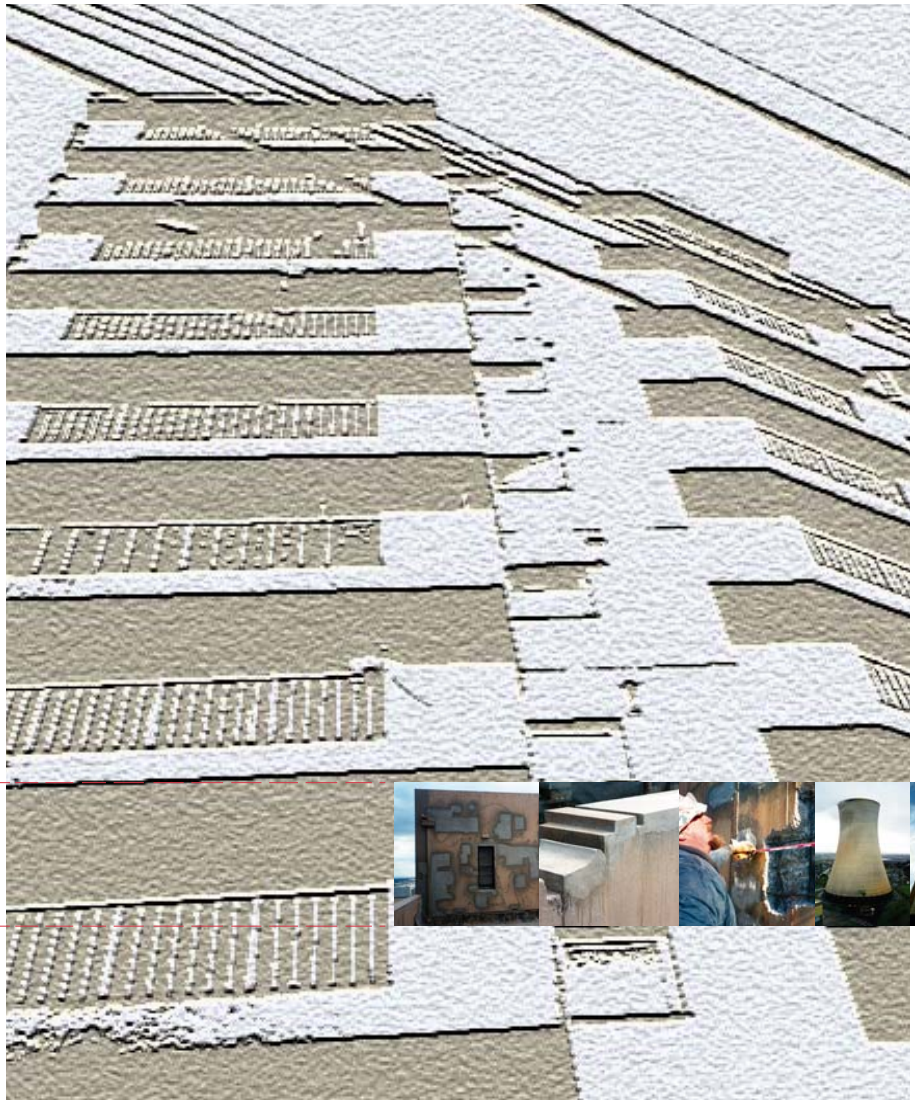


CONCRETE REPAIR AND PROTECTION SYSTEM

Concrete Repair and Protection System

Concrete and Our Environment

THE INVISIBLE ENEMY OF CONCRETE

From the moment it is poured it is under attack. It is under attack not just from industrial pollutants in the atmosphere but also from naturally occurring gases such as carbon dioxide. It is an attack which is both gradual and relentless. Worst of all, by the time it becomes apparent to the naked eye, the damage has spread to the reinforcing steel, demanding expensive repair and renovation. This attack is known as carbonation. It is this carbonation of concrete, leading to the corrosion of steel reinforcement that has led to the eventual collapse of concrete structures, causing increasing concern among Architects and Construction Engineers throughout the world.

EC 2000 Offers outstanding resistance to the environmental elements that attack masonry structures, offering massive savings when compared with the cost of repairing or rebuilding damaged concrete structures.

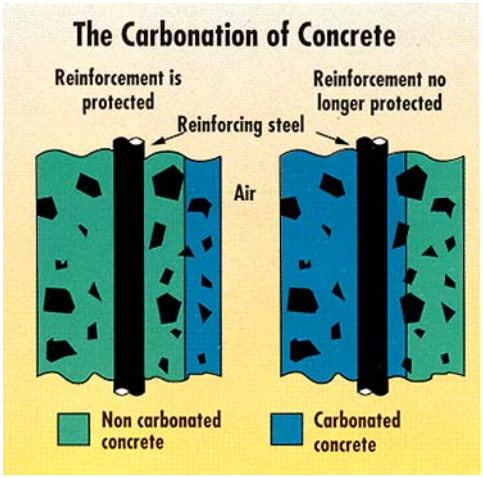
CONCRETE - THE INDISPENSABLE MATERIAL

There is no substitute for concrete. Its ability to accept high compressive stresses makes it indispensable as a building material. However, the long term durability of the concrete is dependent upon the concrete type.

Concrete is an artificial stone. Its quality and properties are dependant upon the quality of cement, the grading and choice of the aggregates and the care taken during mixing and pouring. Furthermore, although concrete can boast a high compressive strength, it needs the addition of steel to provide the necessary tensile strength. Therefore, it is not only the concrete that comes under attack, thus carbonating, but also the steel reinforcing which is vulnerable to corrosion attack.

THE ALKALINITY OF CONCRETE - PROTECTS STEEL REINFORCEMENTS

Concrete is alkaline - when new its alkalinity approaches pH-13 - and it is this alkalinity that protects any steel reinforcement from corrosion. However, over the years acid gases in the air attack the concrete reducing its alkalinity, thus its ability to protect steel.



THE INVISIBLE ENEMY

The acid gases in the air are carbon dioxide (Co^2) naturally present in all air and increased by industrially produced gases such as sulphur dioxide (So^2). These two gases combine with the moisture in the atmosphere and react with the calcium hydroxide in the concrete producing calcium carbonate and calcium sulphate (gypsum). When this happens, the natural alkalinity of the concrete is lost, leaving the way free for corrosive attack to steel reinforcements. The worlds increased levels of environmental pollutants accelerate these digressive affects to masonry.

A SIMPLE TEST FOR LOSS OF ALKALINITY

When phenolphthalein is sprayed onto concrete, only those areas with a pH value greater than 10 will turn pink. Other areas where the phenolphthalein remains colourless are therefore carbonated and should be removed during repair preparation.

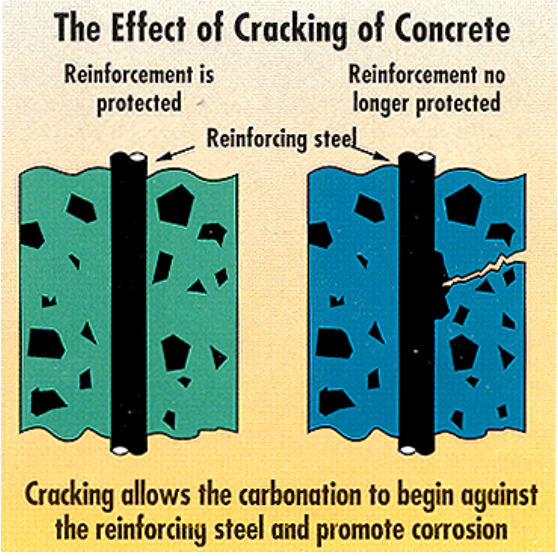
Concrete and Our Environment

THE AFFECTS OF ACID ATTACK ON CONCRETE

Acid rain places high demands on concrete structures. Corrosion starts when the pH value of the concrete falls below 10 and it is at this point that the damage to the structure becomes obvious.

Carbonation of the concrete leaves the surface friable and unsound. Where the concrete is reinforced rust occupies a greater volume than its parent steel.

The initial hair line cracks rapidly develop into major damage as corrosion products of the steel reinforcements expand with explosive effect on the surrounding concrete.



PREVENTION IS BETTER THAN CURE

During construction of masonry structures, poor on site practice can leave reinforcements closer to the surface than originally intended or specified and concrete substandard in nature.

Naturally it is impossible to reposition the reinforcing bars for greater cover. Therefore, the only solution is to prevent alkalinity loss of the concrete is by applying a surface coating which eliminates the diffusion of acid gases.

EC 2000 was designed as a sophisticated **"molecular sieve",** allowing moisture to defuse out but preventing the entry of acid gases such as Co^2 and So^2.

EC 2000 Boasts the ability to have a protective equivalent of 65 metres of air or 160 mm of pH 13 concrete.

In addition, **EC 2000's** superior crack bridging properties offer absolute confidence in long term masonry protection, by it state of the art ability to withstand forthcoming cracks 4.9 times the dry film thickness.

(350 microns dry will accommodate a forthcoming crack of 1.75mm)

COMMITMENTTO EXCELLENCE

Astec Paints ongoing commitment to the research and development of protective coatings for the construction industry, ensures you will only receive products of outstanding quality and reliability at all times.

Diagnosing The Damage

No concrete structure is immune to environmental acid attack, gases which are present in all air will eventually lower the alkalinity and destroy all unprotected concrete surfaces. All concrete must be treated, no matter how recent the concrete construction is.
The correction, and most importantly, the prevention of concrete carbonation is a process that requires little in the way of technical equipment, however the testing must be performed with care and a great deal of appreciation for its importance.

CARBONATION DEPTH

When phenolphthalein is sprayed onto concrete, only those areas with a pH value greater than 10 will turn pink. Other areas where the phenolphthalein remains colourless are therefore carbonated and should be removed during repair preparation.

CONCRETE COVERING

If the depth of the carbonation is known, then the rate at which it has occurred can be estimated for the year of construction. A cover metre will enable you to find the depth of cover over the reinforcing steel and therefore it is possible to calculate when the reinforcing steel itself will come under attack and expand through the overlaying concrete.

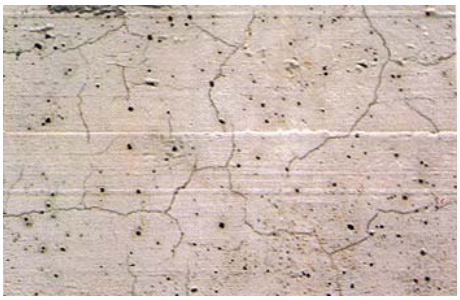
UNSOUND CONCRETE

Areas of unsound, friable or delaminating concrete emit a drummy hollow sound when they are struck with a hammer. In contrast to the higher pitched note of sound concrete. All areas of unsound concrete must be marked with chalk during initial evaluation for their complete removal during preparation.

SURFACE STRENGTH

A scratch test with a screwdriver or chisel will give good visual indications as to the surface condition of the concrete. Friable (sandy or flaky) surfaces must be removed during preparation.

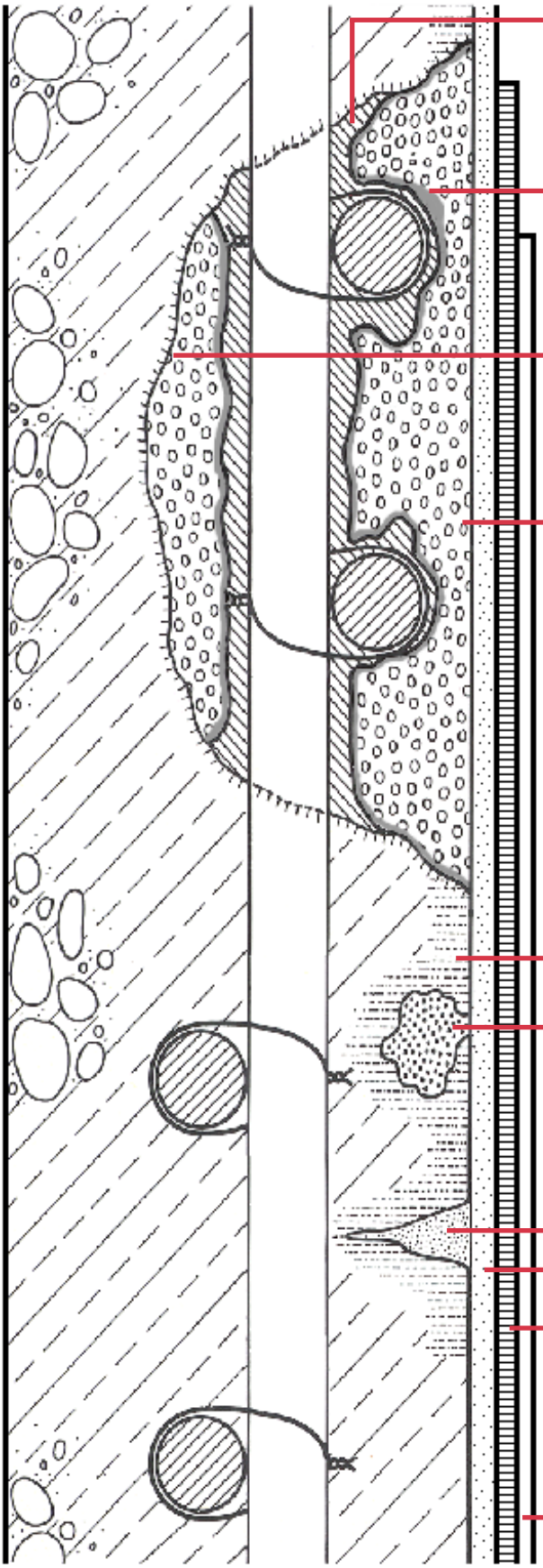
CRACKS



Wetting the surface with water will make any hairline cracks more visible. It is the presence of these first cracks that are the initial and easy pathway for the corrosive gases to enter the concrete. These cracks must be permanently cover with an anti-carbonation, crack-bridging membrane.

System Products

FROM REPAIRTO LONGTERM PROTECTION.



RUSTRAINT
A scientifically balanced blend of penetrating oils, rust inhibitors, oxygen and moisture resistant resins which are applied straight over moderately prepared rust converting the rust into a fully functional surface ready for painting.

B-16 ANTI-CORROSIVE PRIMER
A red oxide, zinc phosphate, anti corrosive primer which forms a cathodic, anti corrosive barrier. B-16 provides excellent long-term protection against corrosion and promotes tremendous inter-coat adhesion.

DEHYDROCRETE C.R. PRIMER
A water born, 100% acrylic, binder and hydrophobic sealer. Powdered or friable surfaces are locked solid, providing a stable substrate without forming a surface film. Promotes assured long-term system adhesion.

DEHYDROCRETE REPAIR MORTAR NO. 50
Dehydrocrete Repair Mortar No. 50 is a stringently formulated, acrylic modified, fibre reinforced, shrinkage compensated repair mortar for repairs of depths between 10 and 50mm.

BARRIER
An extremely effective, low toxicity, bacterial, algal and fungal wash that will kill all of the known algae and fungal species that cause under-film mould spoilage.

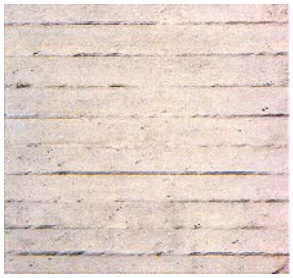
ARMATEX PRE-PATCH MEDIUM
A medium grade patching compound for filling surface imperfections between 2-3 mm. A 100% acrylic two component mix that is flexible, highly adhesive and allows feathered edge repairs to be carried out.

ARMATEX PRE-PATCH COARSE
A Coarse grade patching compound for filling surface imperfections between 2-5 mm. A 100% acrylic two component mix that is flexible, highly adhesive and allows medium feathered edge repairs to be carried out.

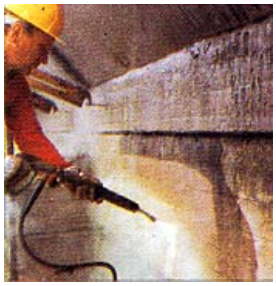
RIVETT
A solvent born, 100% acrylic, binder and hydrophobic sealer. Powdered or friable surfaces are locked solid, providing a stable substrate without forming a surface film. Promotes assured long-term system adhesion.

EC-2000 ELASTIC ANTI-CARBONATION COATING
A second generation, internally plasticised 100 % acrylic elastomeric wall coating with outstanding crack bridging, anti-carbonation properties and superior resistance to dirt pick-up. The most advanced technology available for the long-term protection, waterproofing and decoration of masonry structures. **EC-2000 possesses the ability to bridge a forthcoming crack 4.9 times its dry film thickness. 350 microns dry will accommodate a forthcoming crack of 1.75 mm.**

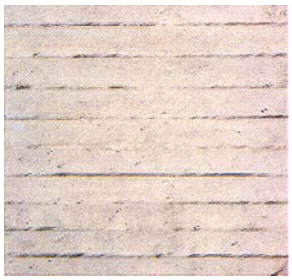
Concrete Performance Standard

DIAGNOSIS 1	· NEW CONCRETE. · NEW CONCRETE, PH VALUE 10-12.
	SUBSTRATE EVALUATION The concrete is new and free of acid damage with the pH value correct at 10-12. Some surface misalignments are present caused from the initial forming of the structure. Furthermore, the new surface has minor blow holes and hairline cracks.
1. PREPARATION	A. Clean the entire surface using a high pressure water, power buff or scraper. Carry out test to ensure the surface is free of release agent. B. Apply one coat of Astec Barrier the entire surface to kill any mould and leave a residual material that will eliminate the threat of any under-film mould re-growth at any later date. C. Apply Astec Rivett to the entire surface to seal and bind and therefore, stabilise the surface. The application of Rivett will provide both a stable substrate and will create a hydrophobic zone within the substrate.
2. REPAIR	A. Surface misalignments should be cut back and struck smooth to a feathered edge with Astec Pre-patch medium or coarse. Any misalignments should be feathered 50mm for every 1mm of surface deviation. B. Blow holes should be filled Astec Pre-patch medium or coarse. Any repair areas must be correctly feathered to a fine repair edge.
3. APPLICATION	A. Apply EC-2000 straight from the drum by brush, roller or spray. Allow the product to dry between coats. EC-2000 should be applied in multiple coats at a minimum D.F.T. of 350 microns. B. The crack bridging performance of the EC-2000 is directly related to its dry film thickness, therefore, the quantity of material applied to the substrate relates directly to the maximum crack width the material will bridge. Refer to the Crack Bridging Chart on page 7 of the EC-2000 Technical Bulletin.
4. NOTE	This application chart must be read in conjunction with Astec Performance Standard NO. 8792 and all other Astec Technical Bulletins that relate to the products that are mentioned. The above details are designed to be an accurate, although brief description of the restoration system that is required for each different substrate diagnosis. The above information must not amount to the full Technical Literature for you to conduct a thorough evaluation of the correct system for your project.

Concrete Performance Standard

DIAGNOSIS 2	· HEAVY DIRT CONTAMINATION AND GROWTHS. · AGED CONCRETE, PH VALUE IS STILL 10-12.
	SUBSTRATE EVALUATION The concrete is aged and covered with algae, moss and soot, however the pH value is still correct at 10-12. Some hairline cracks, a few cracks in excess of 2 mm and blow holes are present but generally the surface is in good condition.
1. PREPARATION 	A. Clean the entire surface using a high pressure water cleaner. B. Apply one coat of Astec Barrier the entire surface to kill any mould and leave a residual material that will eliminate the threat of any under-film mould re-growth at any later date. C. Apply Astec Rivett to the entire surface to seal and bind and therefore, stabilise the surface. The application of Rivett will provide both a stable substrate and will create a hydrophobic zone within the substrate.
2. REPAIR	A. Hairline cracks in excess if 1.5 mm should be filled with a scratch coat of Astec Pre-patch medium B. Blow holes should be filled with Astec Pre-patch medium or coarse. Any repair areas must be correctly feathered to a fine repair edge.
3. APPLICATION	A. Apply EC-2000 straight from the drum by brush, roller or spray. Allow the product to dry between coats. EC-2000 should be applied in multiple coats at a minimum D.F.T. of 350 microns. B. The crack bridging performance of the EC-2000 is directly related to its dry film thickness, therefore, the quantity of material applied to the substrate relates directly to the maximum crack width the material will bridge. Refer to the Crack Bridging Chart on page 7 of the EC-2000 Technical Bulletin.
4. NOTE	This application chart must be read in conjunction with Astec Performance Standard NO. 8792 and all other Astec Technical Bulletins that relate to the products that are mentioned. The above details are designed to be an accurate, although brief description of the restoration system that is required for each different substrate diagnosis. The above information must not amount to the full Technical Literature for you to conduct a thorough evaluation of the correct system for your project.

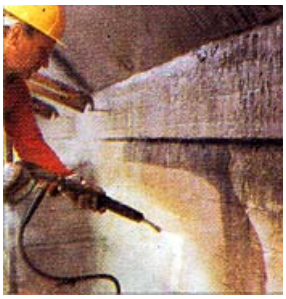
Concrete Performance Standard

DIAGNOSIS 3	· CONCRETE WITH EFFLORESCENCE. · AGED CONCRETE, PH VALUE IS STILL 10-12.
	SUBSTRATE EVALUATION The concrete is aged, however the pH value is still in the alkaline region at 10-12 protecting the reinforcing. Efflorescence is present and there are many areas of horizontal crumbling.
1. PREPARATION 	A. Dry clean the entire surface free of efflorescence, dust and loose particles using a stiff brush, no not use water as you will only dilute the soluble salts back into the wall. Chase out any crumbly masonry from the surface and re-brush the areas. B. Apply one coat of Astec Barrier the entire surface to kill any mould and leave a residual material that will eliminate the threat of any under-film mould re-growth at any later date. C. Apply Astec Rivett to the entire surface to seal and bind and therefore, stabilise the surface. The application of Rivett will provide both a stable substrate and will create a hydrophobic zone within the substrate.
2. REPAIR	A. All surface imperfection that is less than 5 mm deep should be filled with a scratch coat of Astec Pre-patch medium or coarse. B. All surface imperfection that are more than 5 mm deep should be filled with multiple coats of Astec Dehydrocrete Waterproof Render any repair areas should be brush or sponge finished.
3. APPLICATION	A. Apply EC-2000 straight from the drum by brush, roller or spray. Allow the product to dry between coats. EC-2000 should be applied in multiple coats at a minimum D.F.T. of 350 microns. B. The crack bridging performance of the EC-2000 is directly related to its dry film thickness, therefore, the quantity of material applied to the substrate relates directly to the maximum crack width the material will bridge. Refer to the Crack Bridging Chart on page 7 of the EC-2000 Technical Bulletin.
4. NOTE	This application chart must be read in conjunction with Astec Performance Standard NO. 8792 and all other Astec Technical Bulletins that relate to the products that are mentioned. The above details are designed to be an accurate, although brief description of the restoration system that is required for each different substrate diagnosis. The above information must not amount to the full Technical Literature for you to conduct a thorough evaluation of the correct system for your project.

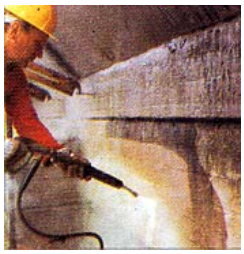
Concrete Performance Standard

DIAGNOSIS 4	· CRUMBLING CONCRETE SURFACE. · AGED CONCRETE, PH VALUE IS STILL 10-12.
	SUBSTRATE EVALUATION The concrete is aged, however the pH value is still in the alkaline region at 10-12 protecting the reinforcing. The surface is covered with a small amount of mould and algae. The dominant problem with the substrate is that the entire outer layer is very crumbly and unstable. The surface will require a great deal of care to be taken during preparation to ensure the substrate is not completely defaced, then demanding additional repairs.
1. PREPARATION 	A. Dry clean the entire surface free of, dust and loose particles using a soft brush or compressed air, no not use high pressure water as you will remove the crumbly layer and deface the substrate. B. Apply two coats of Astec Barrier to the entire surface to kill any mould and leave a residual material that will eliminate the threat of any under-film mould re-growth at any later date. C. Immediately once Barrier is dry, apply Astec Rivett to the entire surface in multiple flood coats until the entire outer crumbled layer is locked hard and therefore stable to repair and top-coat. Seal and lock the surface ***without leaving a fully glossed film***.
2. REPAIR	A. All substrate imperfection created by the loss of a crumbling surface, that are less than 5 mm deep, should be filled and feather edged with a scratch coat of Astec Pre-patch medium or coarse.
3. APPLICATION	A. Apply EC-2000 straight from the drum by brush, roller or spray. Allow the product to dry between coats. EC-2000 should be applied in multiple coats at a minimum D.F.T. of 350 microns. B. The crack bridging performance of the EC-2000 is directly related to its dry film thickness, therefore, the quantity of material applied to the substrate relates directly to the maximum crack width the material will bridge. Refer to the Crack Bridging Chart on page 7 of the EC-2000 Technical Bulletin.
4. NOTE	This application chart must be read in conjunction with Astec Performance Standard NO. 8792 and all other Astec Technical Bulletins that relate to the products that are mentioned. The above details are designed to be an accurate, although brief description of the restoration system that is required for each different substrate diagnosis. The above information must not amount to the full Technical Literature for you to conduct a thorough evaluation of the correct system for your project.

Concrete Performance Standard

DIAGNOSIS 5	· FINE NET-LIKE SURFACE CRACKS. · AGED CONCRETE, PH VALUE IS STILL 10-12.
	SUBSTRATE EVALUATION The concrete is aged, however the pH value is still in the alkaline region at 10-12 protecting the reinforcing. The entire surface is hard and therefore stable. However, the surface is covered with fine net-like surface cracks and in some areas the concrete has fallen out within the cracks leaving deeper surface cracks. Slight mould and algae growth is present.
1. PREPARATION 	A. Clean the entire surface using a high pressure water cleaner. Only use sufficient pressure to remove the dust, mould and any friable material within the cracks. B. Apply one coat of Astec Barrier to the entire surface to kill any mould and leave a residual material that will eliminate the threat of any under-film mould re-growth at any later date. C. Immediately once Barrier is dry, apply Astec Rivett to the entire surface. Seal and lock the surface ***without leaving a fully glossed film***.
2. REPAIR	A. All substrate imperfection should be filled and feathered edged with a scratch coat of Astec Pre-patch medium or coarse.
3. APPLICATION	A. Apply EC-2000 straight from the drum by brush, roller or spray. Allow the product to dry between coats. EC-2000 should be applied in multiple coats at a minimum D.F.T. of 350 microns. B. The crack bridging performance of the EC-2000 is directly related to its dry film thickness, therefore, the quantity of material applied to the substrate relates directly to the maximum crack width the material will bridge. Refer to the Crack Bridging Chart on page 7 of the EC-2000 Technical Bulletin.
4. NOTE	This application chart must be read in conjunction with Astec Performance Standard NO. 8792 and all other Astec Technical Bulletins that relate to the products that are mentioned. The above details are designed to be an accurate, although brief description of the restoration system that is required for each different substrate diagnosis. The above information must not amount to the full Technical Literature for you to conduct a thorough evaluation of the correct system for your project.

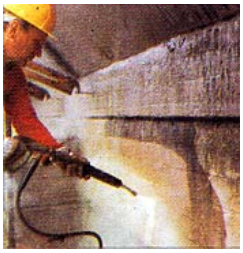
Concrete Performance Standard

DIAGNOSIS 6	· CONCRETE WITH FLAKING PAINT. AGED CONCRETE, PH VALUE IS STILL 10-12.
	SUBSTRATE EVALUATION The concrete is aged, however the pH value is still in the alkaline region at 10-12, protecting the reinforcing. The entire surface is covered with an existing paint finish that has lost adhesion to the substrate and is flaking badly. The underlying substrate is stable and in good condition other than a few areas of previously installed patching mortars.
1. PREPARATION  	A. Remove the existing paint finish using Regel 1 and a high pressure hot water cleaner or alternatively wet sand blast. Only use sufficient pressure to remove the paint. Remove previously installed patching mortars that are loose. B. Apply one coat of Astec Barrier to the entire surface to kill any mould and leave a residual material that will eliminate the threat of any under-film mould re-growth at any later date. C. Immediately once Barrier is dry, apply Astec Rivett to the entire surface. Seal and lock the surface ***without leaving a fully glossed film***.
2. REPAIR	A. All substrate imperfection should be filled and feathered edged with a scratch coat of Astec Pre-patch medium or coarse.
3. APPLICATION	A. Apply EC-2000 straight from the drum by brush, roller or spray. Allow the product to dry between coats. EC-2000 should be applied in multiple coats at a minimum D.F.T. of 350 microns. B. The crack bridging performance of the EC-2000 is directly related to its dry film thickness, therefore, the quantity of material applied to the substrate relates directly to the maximum crack width the material will bridge. Refer to the Crack Bridging Chart on page 7 of the EC-2000 Technical Bulletin.
4. NOTE	This application chart must be read in conjunction with Astec Performance Standard NO. 8792 and all other Astec Technical Bulletins that relate to the products that are mentioned. The above details are designed to be an accurate, although brief description of the restoration system that is required for each different substrate diagnosis. The above information must not amount to the full Technical Literature for you to conduct a thorough evaluation of the correct system for your project.

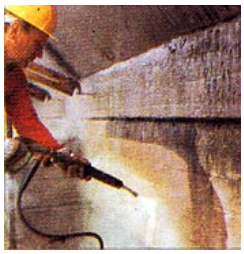
Concrete Performance Standard

DIAGNOSIS 7	· SANDY FRIABLE SURFACE. · AGED CONCRETE, PH VALUE IS STILL 10-12.
	SUBSTRATE EVALUATION The concrete is aged, however the pH value is still in the alkaline region at 10-12, protecting the reinforcing. The entire surface is weathered and sandy and free of cracks. There is very sight mould contamination.
1. PREPARATION 	A. Dry clean the entire surface free of, dust and excessively loose particles using a soft brush or compressed air, do not use high pressure water as you will remove the sandy layer and deface the substrate. B. Apply two coats of Astec Barrier to the entire surface to kill any mould and leave a residual material that will eliminate the threat of any under-film mould re-growth at any later date. C. Immediately once Barrier is dry, apply Astec Rivett to the entire surface in multiple flood coats until the entire outer sandy layer is locked hard and therefore stable to top-coat. Seal and lock the surface ***without leaving a fully glossed film***.
2. REPAIR	A. All substrate imperfection should be filled and feathered edged with a scratch coat of Astec Pre-patch medium or coarse.
3. APPLICATION	A. Apply EC-2000 straight from the drum by brush, roller or spray. Allow the product to dry between coats. EC-2000 should be applied in multiple coats at a minimum D.F.T. of 350 microns. B. The crack bridging performance of the EC-2000 is directly related to its dry film thickness, therefore, the quantity of material applied to the substrate relates directly to the maximum crack width the material will bridge. Refer to the Crack Bridging Chart on page 7 of the EC-2000 Technical Bulletin.
4. NOTE	This application chart must be read in conjunction with Astec Performance Standard NO. 8792 and all other Astec Technical Bulletins that relate to the products that are mentioned. The above details are designed to be an accurate, although brief description of the restoration system that is required for each different substrate diagnosis. The above information must not amount to the full Technical Literature for you to conduct a thorough evaluation of the correct system for your project.

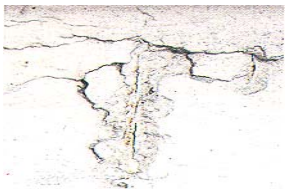
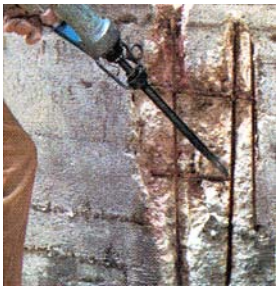
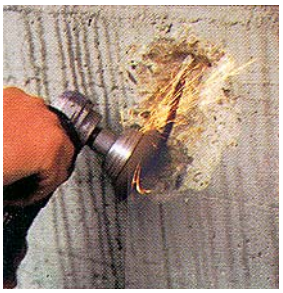
Concrete Performance Standard

DIAGNOSIS 8	· SANDY SURFACE WITH HEAVY ALGAE GROWTH · AGED CONCRETE, PH VALUE IS STILL 10-12.
	SUBSTRATE EVALUATION The concrete is aged, however the pH value is still in the alkaline region at 10-12, protecting the reinforcing. The entire surface is weathered, sandy and free of cracks. However there is heavy algae and leafy style growth.
1. PREPARATION  	A. Remove the sandy surface and algae back to solid concrete with high pressure water or by sand blasting. This process will deface the surface and demand the entire surface to be repaired. B. Apply one coat of Astec Barrier to the entire surface to kill any mould and leave a residual material that will eliminate the threat of any under-film mould re-growth at any later date. C. Immediately once Barrier is dry, apply Astec Rivett to the entire surface. Seal and lock the surface ***without leaving a fully glossed film***.
2. REPAIR	A. The entire surface will require re-leveling with Astec Pre-patch medium, coarse or high build render. The product used will depend on the amount of misalignment on the surface.
3. APPLICATION	A. Apply EC-2000 straight from the drum by brush, roller or spray. Allow the product to dry between coats. EC-2000 should be applied in multiple coats at a minimum D.F.T. of 350 microns. B. The crack bridging performance of the EC-2000 is directly related to its dry film thickness, therefore, the quantity of material applied to the substrate relates directly to the maximum crack width the material will bridge. Refer to the Crack Bridging Chart on page 7 of the EC-2000 Technical Bulletin.
4. NOTE	This application chart must be read in conjunction with Astec Performance Standard NO. 8792 and all other Astec Technical Bulletins that relate to the products that are mentioned. The above details are designed to be an accurate, although brief description of the restoration system that is required for each different substrate diagnosis. The above information must not amount to the full Technical Literature for you to conduct a thorough evaluation of the correct system for your project.

Concrete Performance Standard

DIAGNOSIS 9	· SCALING CONCRETE SURFACE. AGED CONCRETE, PH VALUE IS STILL 10-12.
	SUBSTRATE EVALUATION The concrete is aged, however the pH value is still in the alkaline region at 10-12, protecting the reinforcing. The entire outer surface of the concrete is scaling and areas of the scaling concrete have delaminated and are falling off.
1. PREPARATION  	A. Remove the scaling surface back to solid concrete with high pressure water or by sand blasting. This process will deface the surface and demand the entire surface to be repaired. B. Apply one coat of Astec Barrier to the entire surface to kill any mould and leave a residual material that will eliminate the threat of any under-film mould re-growth at any later date. C. Immediately once Barrier is dry, apply Astec Rivett to the entire surface. Seal and lock the surface ***without leaving a fully glossed film***.
2. REPAIR	A. The entire surface will require re-leveling with Astec Pre-patch medium, coarse or high build render. The product used will depend on the amount of misalignment that will become evident after sand blasting.
3. APPLICATION	A. Apply EC-2000 straight from the drum by brush, roller or spray. Allow the product to dry between coats. EC-2000 should be applied in multiple coats at a minimum D.F.T. of 350 microns. B. The crack bridging performance of the EC-2000 is directly related to its dry film thickness, therefore, the quantity of material applied to the substrate relates directly to the maximum crack width the material will bridge. Refer to the Crack Bridging Chart on page 7 of the EC-2000 Technical Bulletin.
4. NOTE	This application chart must be read in conjunction with Astec Performance Standard NO. 8792 and all other Astec Technical Bulletins that relate to the products that are mentioned. The above details are designed to be an accurate, although brief description of the restoration system that is required for each different substrate diagnosis. The above information must not amount to the full Technical Literature for you to conduct a thorough evaluation of the correct system for your project.

Concrete Performance Standard

DIAGNOSIS 10	· SEVERE DAMAGE, CONCRETE SPALLING OVER REINFORCING STEEL. · REINFORCING STEEL IN CRITICAL REGION PH VALUE BELOW PH 10.
 	SUBSTRATE EVALUATION The concrete is aged and the pH value is in the critical region of below pH 10. The low pH has allowed the reinforcing to corrode and therefore the reinforcing occupies a greater area than its parent steel. As a result of the corrosion, the concrete has spalled demanding that the concrete be completely cut back from the surrounding area. The rust must then be treated and a patching mortar use to fill the effected area.
1. PREPARATION  	A. Cut back the carbonated concrete from around the corroded reinforcing using a jack hammer. Ensure that the area is cut back far enough so as to allow repair access to the rear of the reinforcing steel. B. Power wire buff the corrode reinforcing steel and blow the area free of loose contaminants with dry compressed air. C. Apply Rustraint in multiple coats wet on wet to the prepared steel until the steel is completely encapsulated to a pore free finish. D. Apply Barrier to the cut back area of concrete. E. Apply Dehydrocrete C.R Primer to the cut back concrete area ***without leaving a fully glossed film, product runs or pools***. F. Apply B-16 Anti-corrosive Primer to the Rustraint coated steel ensuring complete and uniform cover.
2. REPAIR 	A. Apply one thin slurry coat of Dehydrocrete Repair Mortar No.50, using a stiff brush, to the B-16 coated steel and primed cut back area. B. While slurry coat is wet, immediately fill and flush smooth the entire repair area with Dehydrocrete Repair Mortar No. 50.
3. APPLICATION	The coating application system to be used for over-coating the repair area, in addition, the remaining facade, must be carried out in accordance with the appropriate Diagnosis sheet from 1 to 9.

CRACK RESISTANT *ELASTIC SKINS* FOR THE PROTECTION AND DECORATION OF MINERAL FACADES

The application of the Astec Elastomeric Wall Coating system to mineral substrates, installed in strict accordance with this performance standard will provide both the specifier and building owner peace of mind in knowing that the substrate and its reinforcing is protected with a "state of the art" internally plasticised elastic skin. The system will protect the structure from the destructive effects of environmental gases the ingress of water and most importantly cracks will remain bridged throughout the worst ravages of hot summers and cold winters from the systems low temperature flexibility down to -30º Celsius.

In combination, the materials used to form this Performance Standard will ensure a hydrophobic zone is formed on and within the substrate, that the substrate is suitably bound, that the system is protected from the destructive effects of under film mould regrowth and that correct inter-coat adhesion is achieved throughout the system.

SURFACE PREPARATION

1. All surfaces must be completely dry, structurally sound and cleaned free of all contaminants that could effect the bond of the Astec System. Surface preparation may be carried out by the use of high pressure water cleaning, power buffing or scraping. (Note. see Diagnosis sheet 3 for an example of when water should not be used).

2. New concrete must be completely cured free of water which can take up to 28 days depending on weather conditions. The fresh concrete must pass a four hour rubber matt test, no moisture on the under side of the matt is required to pass. The rubber matt must have all of its edges securely taped to the substrate during the test, highly adhesive gaffer or musicians tape is recommended.

3. Any existing paint finishes must be well adhered to the substrate, to check the adhesion, a direct tension pull off test should be carried out on numerous areas of the substrate in accordance with A.S.T.M. D.4541 using an Erichsen Direct Tension Pull-off Adhesion Tester, model 525/E or alike. Consult Astec with pull off test results for a past or fail evaluation of the test.

4. In the event that an exiting paint finish is found to be defective in adhesion, the coatings complete removal is recommended to ensure complete adhesion of the Astec System. Removal of the finish should be carried out using preferably Methylene Chloride based paint strippers such as Astec Regel or alternatively Alkaline paint removers. However, where caustic based strippers are used the surface must be completely neutralised with a 10% solution of Acetic Acid and water. Astec Paints Australia take no responsibility for lack of adhesion or leaching salts through the coating system caused by remaining caustic materials which have not been neutralised in or on the substrate.

5. Well adhered low sheen paint finishes should have a test patch of EC-2000 carried out over them after pressure washing to ensure adequate inter-coat adhesion.

6. Well adhered gloss paint finishes should have the gloss removed by means of a light abrasive blast, washed free of all contaminants and then over coated with an oil based undercoat prior to any top coat application.

7. Off form concrete and tilt up concrete panel requires extremely careful evaluation prior to any coating system application as failure to do so could result in complete delamination of the coating system. The surface must be thoroughly checked for bond breakers and or release agents used during construction. One simple method of testing for these chemicals is to wet the surface with water, if there is no immediate suction of the water to the substrate and the water beads of the surface or the surface feels slippery there is evidence that release agents are present. Complete removal of these chemical must be carried out with high pressure washing and hydrochloric acid solution, however, wet sand blasting is the only sure method to provide a clean surface that will provide good adhesion for the top-coat. Consult the builder or panel manufacturer for details of the bond breaker used. Be advised poor assumption in relation to bond breakers will result in costly adhesion failures. Check and re-check for their complete removal.

8. Steel floated high sheen concrete surfaces should be wet sand blasted to remove its gloss then pressure washed to remove any remaining contaminants.

9. Mould and fungus infested walls should have Sodium Hypochlorite applied to them prior to pressure washing. This process will kill any growths and assist in their removal.

10. Any structural defects should be saw cut and struck smooth with an exterior grade cement based low shrink grout while avoiding a shinny off steel trowel finish. Any repair areas should be lightly sponged to provide a surface that will provide good adhesion.

11. Where severe carbonation of the concrete substrate has occurred, (exposing any corroded metallic reinforcement) consult Astec Paints for technical details on the correct remedial action.

12. Any rust bleeding from the masonry must be treated, consult Astec Paints for technical details on the correct remedial action.

PRE TREATMENT FOR MOULD

13. With the surface clean and structurally sound, apply two coats of Astec Barrier and allow to dry prior to the application of any top coats or sealers. Astec Barrier will retard any under film mould spoilage. Refer to the relevant Technical Bulletin for coverage rates.

SEALING

14. With the surface clean, dry, free of any loose existing coatings and pre-treated for mould the surface must be sealed with Astec Rivett prior to any top coat application. The application of Rivett will provide both a stable substrate and will create a hydrophobic zone within the substrate.

15. **Apply Astec Rivett straight from the drum** by brush, spray or roller. Apply in multiple coats to a coverage of no more than 8 m² per Lt. allowing the product to dry between coats, (usually 1 hour). Any areas of the substrate that have proven extremely friable should have additional coats applied to that area being applied at a rate sufficient only to seal and lock the surface ***without leaving a fully glossed film***. Extreme care should be taken to focus your attention during sealer application on complete coverage and penetration of the substrate without allowing the material to run down the wall. Thorough checks must be carried out to determine that all powdery or friable surface are completely bound.

16. The application of Astec Rivett is to seal and bind the masonry surfaces to a sound condition ready for top coat application the sealer is not meant to form a surface film therefore care must be taken not to over gloss the surface. Rivett should not be applied over any existing paint work as over gloss will occur.

17. For spray applications use a 518 to 521 tip. Any air or low pressure spray will atomise this material. For roller applications, a fine foam roller is most suitable. Refer to the Rivett Technical Bulletin for additional product details.

TOP COAT QUANTITIES AND APPLICATION.

18. Astec Elastomeric wall coatings are a functional material with their ability to bridge continually moving cracks in masonry. One of the most important aspects of using these materials is the quantity of material applied to the substrate. The materials must be applied in direct proportion to the maximum crack width that is present in the substrate.

19. **The crack bridging performance of the EC-2000 is directly related to its dry film thick ness, therefore, the quantity of material applied to the substrate relates directly to the maximum crack width the material will bridge. Refer to the Crack Bridging Chart on page 7 of the EC-2000 Technical Bulletin.**

20. The dry film thickness of EC-2000 is the key to the systems long term crack bridging capabilities. Conventional coating application is specified by the number of coats to be applied and material quantities are based on a laboratory theoretical spread rate. Applying coatings on the basis of the number of coats can result in dramatic variations in the dry film thickness of a product, due to differences in applicator and their individual techniques.

20. Where circumstances arise that the substrate has little to no apparent cracks a two coat system of EC-2000 will provide a D.F.T. of approximately 300 microns. **However, Unlike convention coating specifications, to achieve the documented performance of Astec EC-2000 the product is ultimately specified on a predetermined wet volume of product that must be applied to a given area regardless of the number of coats required to do so.**
***For Example**, if the maximum crack width in a substrate is 0.3 mm, EC-2000 must be applied to the substrate at 3.12m²per Lt. Refer to the Crack Bridging Chart on page 7 of the EC-2000 Technical Bulletin.*

21. The substrate must be sectioned off into known areas and have exact quantities of EC-2000 applied to that area based upon the predetermined coverage rate for the project.
***For Example**, if the predetermined coverage rate for a project is 3.12 m² per Lt then a sectioned area of 100 m² must have 32.05 litres of EC-2000 applied to the area. Prior to any product application it is advisable for applicators to carefully separate the materials by volume to area and clearly number the drums by their section lots.*

22. All cracks in the substrate detected to exceed 1.2 mm requires the use of polyester reinforcing embedded in EC-2000.

    Apply a wet strip of EC-2000 at least 50mm either side of the crack. A 70mm wide strip of Astec Sontara Tape is embedded into the wet strip of EC-2000 centred over all joints and repair areas. A brush or roller will assist in this embedding operation. A second wet strip of EC-2000 is then applied over the polyester tape extending at least 50mm either side of the tape.

    Allow the materials to thoroughly dry and inspect that the polyester tape has completely wet up without pin holing. Any pin holing should be touched up with additional EC-2000.

23. Apply EC-2000 straight from the drum by brush, roller or spray. Allow the product to dry between coats, usually four hours. For roller application, use a medium to deep nap roller. Spray application requires a 518 to 521 tip. Avoid contact with skin and eyes. Always use a respirator during spray applications.

Note: Please read Astec Technical Bulletins on Regel, Barrier, Rivett and Astec EC-2000. Any further information that is required regarding this system is available from the Technical Staff at Astec Paints.

TECHNICAL SERVICES

Complete technical information is available from Astec. Any technical advice furnished by the company or any representative of the company concerning any use or application or any sealant is believed to be reliable, but the company makes no warranty, express or implied, of any use or application for which such advice is furnished.

WARRANTY

The technical data furnished herein is based upon data believed by Astec Paints to be true and accurate at the time of writing, however, no guarantee of accuracy is given or implied and is subject to change without notice. It is given in good faith for the assistance of users. No legal warranty expressed or implied is made as to its accuracy, completeness or otherwise. Every person dealing with this material herein does so at their own risk absolutely and must make independent determinations of suitability and completeness from all sources to ensure their proper use. We have no control over the condition under which these products are stored, handled or used, therefore our recommendations must not be regarded as a mounting to legal warranty or as involving any liability on us.

ADHESION TO SUBSTRATES (A.T.S. PROGRAM)

This program is intended to eliminate potential field problems by pre-testing Astec products with samples of building materials on which the Membrane will be applied. Astec Technical Services are available to pre-test any samples of substrate whether the specifier/purchaser/applicator may believe doubts on application suitability exists. The test will aid in determining the proper surface preparation method. Following this procedure will remove many of the unknown variables that affect field success. Test samples should be identified as to manufacturer, origin, design use. building projects, person and firm originating the request. Appropriate sketches or drawings showing intended use can be helpful.