

## **The construction point of HYDROPROOF WP-GS to concrete**

### **1. Washing**

- (1) Wash the construction side which carried out secular degradation contamination with a washing machine and it removes an adhesion thing.
- (2) Degradation is too excessive and when a brittle part is taken by the flush by the washing machine HYDROPROOF HT-SP was applied upwards and carry out cross sectional restoration with resin mortar etc.
- (3) A new concrete side washes with a washing machine in order to remove the exfoliation material of a mold.

### **2. Protection**

- (1) Although it may be somewhat moist make it dry as much as possible after a flush.
- (2) Refrain from construction in case of rainy weather snowfall and it waits for construction until surface humidity pulls after rain snowfall.

### **3. Application of HYDROPROOF WP-GS**

Although it applies until it is saturated with either of the roller brush sprays

- (1) Since suction is intense apply especially a brittle part in large quantities.
- (2) In the case of a roller as drawn through upwards from the bottom run after and apply it twice.
- (3) Run after a spray using low pressure as much as possible, and apply it twice.
- (4) The amount of applications is the 1m<sup>2</sup>/150-300cc, although based on the situation (many years past degradation and density) of a building. Apply 200cc on the average.
- (5) Please wipe off excessive HYDROPROOF collected on the surface with the clean damp towel.

### **4. attention**

When a summer and direct rays hit and the temperature of an application side is going up avoid an application and apply from a shadow portion. Please avoid winter construction at Centigrade 0 degree C or less and storage of material. Moreover please do not use the frozen material.

### **5. General Protection**

- (1) Protection planting (a garden tree, a potted plant flower bed) and glass (window and window of a car) take care a car and an aluminum sash.
- (2) An application side should recuperate itself from rain or snow for take care 24 hours.

### **6. If HYDROPROOF adheres to a glass aluminum sash,**

- (1) Please wipe with the immediately damp towel.
- (2) Attach and remove water to nylon sponge at the case which the white crystal generated on the applied surface.

### **7. Construction Examination**

Since it may discolor black under the influence of what does not change a color the thing which changes a color somewhat and a mixture agent even if HYDROPROOF permeates depending on the kind of new mortar concrete, please be sure to carry out prior inspection before construction on the spot.

# The construction point of HYDROPROOF WP-GS to concrete

## 1. Construction Preparation Adjustment

(1) Crack

(A) Do V cut of along with a crack, and repair HYDROPROOF HT-SP with the upper resin mortar of an application to a cut side.

(Structure strengthening recovery of the neutrality concrete)

(B) Pour in an epoxy resin.

the above (A) and (B) it repairs by one of methods

(2) deficit part

When there is a deficit portion, a surrounding brittle part is diminished and it repairs with resin mortar after applying HYDROPROOF HT-SP.

(3) When there is a steel rod explosion part, diminish a surrounding brittle part and a steel rod portion often rubs rust and applies a rust prevention. It repairs with the upper resin mortar of an application of HYDROPROOF HT-SP in the concrete part after dryness.

## 1. Construction Preparation Adjustment washing

The garbage of a construction side dust and dirt are fully washed with a washing machine (50-70kg/m<sup>2</sup>). (This is for improving osmosis of HYDROPROOF.)

## 3. Dryness

(1) Although it may be somewhat moist, make it dry as much as possible after a flush.

(2) Refrain from construction in case of rainy weather and snowfall and wait for after rain and snowfall until moisture of the surface pulls.

## 4. Application of HYDROPROOF WP-GS

It applies until a roller brush spray is saturated either.

(1) Since suction is intense apply especially a brittle part in large quantities.

(2) In the case of a roller as drawn through upwards from the bottom, apply twice continuously.

(3) Make a spray into low pressure as much as possible, and apply it twice continuously uniformly.

(4) The amount of applications is 1m<sup>2</sup> / 150-300cc and an average although based on the situation (many years past degradation and density) of a structure.

Carry out and apply 200cc.

(5) When especially the surface takes waterproofness apply HYDROPROOF WP-GS after HYDROPROOF HT-SP application.

## 5. Cautions Item

The place which the temperature of an application side is going up by direct rays avoids an application, and applies it from a shadow portion summer. The material which the winter season avoided work storage at Centigrade 0 degree and froze is not used.

## 6. General Protection

(1) Protection for 24 hours after a HYDROPROOF application so that rain and snow may not stick.

(2) take care so that water and HYDROPROOF of a flush may scatter neither for a garden tree, a potted plant a flower bed and a window (glass side and aluminum sash) car nor the washing.

When HYDROPROOF adheres to a car, a window, etc.

(A) If it is immediately after, wipe off strongly with the towel washed well.

(B) When it gets dry and has become a white crystal, attach water to sponge and rub it against it carefully.

## 7. Prior test

(1) It may become black if it gets dry without HYDROPROOF's permeating according to the kind of tile when a construction side is a tile. fully wipe off with cloth after an application.

## **Attention WP-MX on brick tile construction**

### **1. Washing**

An application side is washed (when dirt is excessive high-pressure washing is carried out).

### **2. take care**

Although it may be somewhat moist it is made to dry after a flush fundamentally.

### **3. HYDROPROOF WP-MX Application**

Although applied with either of the roller brush sprays

(1) Make a mortar part permeate enough.

(2) In the case of a roller apply twice continuously so that it may push upwards from the bottom.

(3) After an application the amount of surplus wipes off before the tile surface gets dry.

\* Although a spray is effective when a mortar portion is deep it is cautious of scattering to the circumference enough.

4. Avoid an application when direct rays hit and the temperature of an application side is going up, and apply from the portion of a shadow.

Work storage does not carry out construction in a winter season below Centigrade 0 degree C. Use of a frozen material is not carried out.

### **5. General Protection**

(1) Protection planting (a garden tree a potted plant, flower bed) and glass (window and window of a car) take care a car and an aluminum sash.

(2) An application side should recuperate itself from rain or snow for take care 24 hours.

### **6. If HYDROPROOF adheres to a glass aluminum sash,**

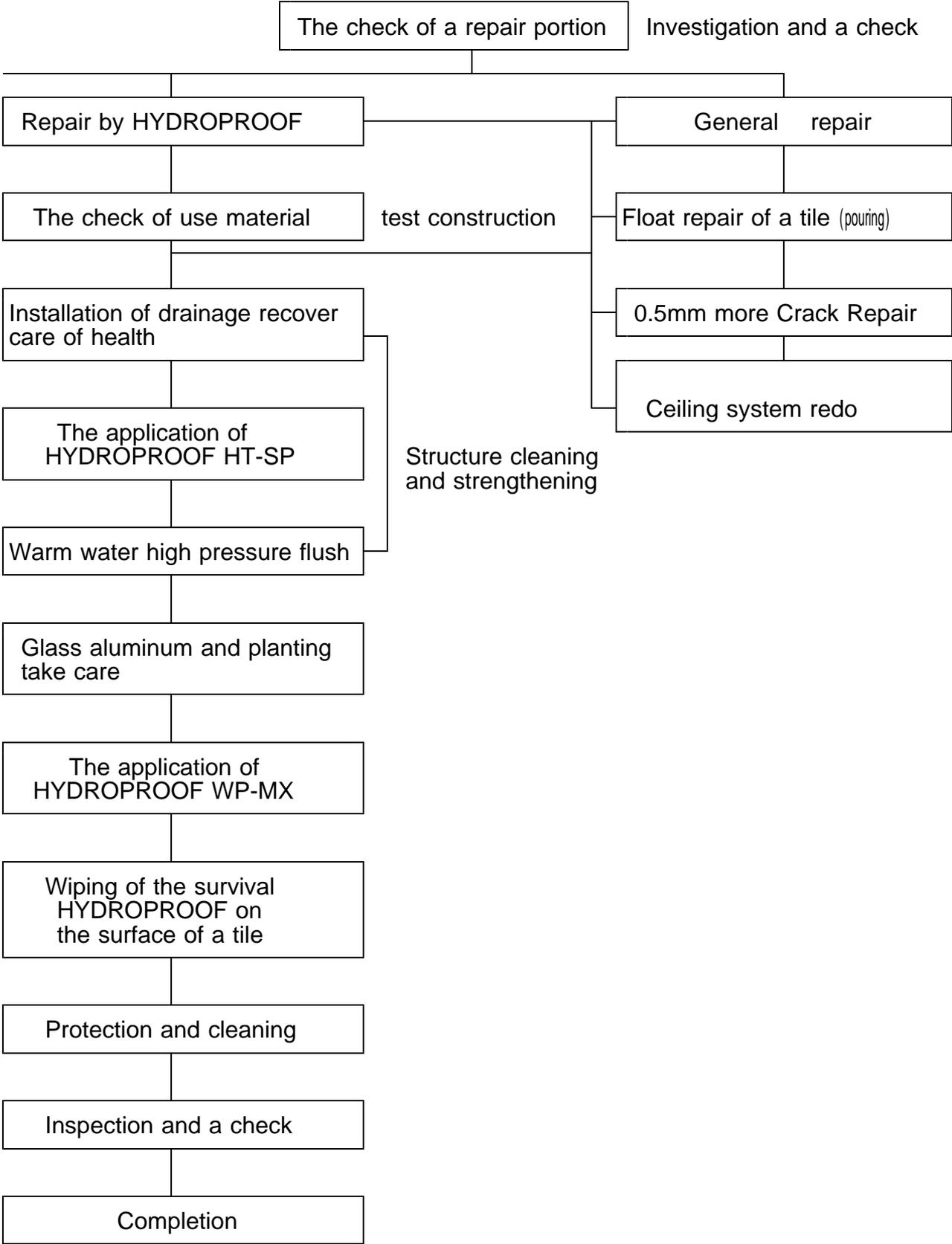
(1) Please wipe with the immediately damp towel.

(2) Attach and remove water to nylon sponge at the case which the white crystal generated on the applied surface.

### **7. Construction Examination**

Since it may discolor black under the influence of what does not change a color the thing which changes a color somewhat and a mixture agent even if HYDROPROOF permeates depending on the kind of new mortar concrete please be sure to carry out prior inspection before construction on the spot.

# The WP-MX repair method of construction of a tile side



## The WP-MX construction method of an old stone

### Washing

HYDROPROOF HT-SP with a sterilization action is fully applied to a construction side and is washed carefully the back about 5 minutes. When not becoming beautiful at a time it carries out repeatedly any number of times until it becomes beautiful.

### Dryness

It is made to dry more than the minimum "1 hour."

### Application

It applies so that HYDRPROOF WP-MX may be stuffed into the dried construction side with a roller.

If there are no worries about scattering on the outskirts the large stone of a concavo-convex field and its spray is desirable.

The construction side in which an application with a roller or a spray is impossible is fully applied with a brush.

Fully wipe off a part for a surplus.

### Dryness

It is made to fully dry.

### Dryness

Natural dryness of the WP-MX application is summer season for 3 hours carried out winter season for 6 hours or more.

Moreover you may carry out forcible dryness with a fan a ventilation drier etc.

### Finish

It is the gloss of a mirror finish portion and you may use it for business.

## The WP-MX construction method of a new stone

### Cleaning - washing

The dry towel removes the garbage dust of a construction side etc. When it washes it is made to surely dry more than "1 hour."

### Application

It applies so that HYDRPROOF WP-MX may be stuffed into the dried construction side with a roller.

If there are no worries about scattering on the outskirts the large stone of a concavo-convex field, and its spray is desirable.

The construction side in which an application with a roller or a spray is impossible is fully applied with a brush.

Fully wipe off a part for a surplus.

### Dryness

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Natural dryness of the WP-MX application is summer season for 3 hours carried out winter season for 6 hours or more.

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### Finish

It is the gloss of a mirror finish portion and you may use it for business.

The waterproofing agent for concrete finish

## The shape of generality of HYDROPROOF WP-GS

Main ingredients	Denaturant silicone + silicic acid compound	
Specific gravity	1.01	(20 C)
Pace of expansion	300%	(25 C)
PH	6.5	(Neutral)
Solvent	Water	
Viscosity	10 cps less	
Appearance	Milk white	

If HYDROPROOF WP-GS is applied to concrete and a mortar side it will permeate gradually and will demonstrate the waterproofing effect.

HYDROPROOF WP-GS Degradation of the surface in the damage which has high elasticity and freezes is prevented, and it aims at efflorescence prevention of a concrete side, and damage from salt water and surface protection.

HYDROPROOF WP-GS can mix with inorganic paints and can carry out waterproofing finish which gave change to the expression technique of concrete.

Although HYDROPROOF WP-GS can be constructed even if the subject is somewhat moist since it is water please prevent rain and snow for after construction summer 12 hour and winter 24 hours.

Since HYDROPROOF WP-GS is a water type although there is no restriction in preservation please avoid construction and preservation at Centigrade 0 degree C or less. Please do not use the material which has frozen either.

A natural stone, brick, mortar, and for cultural properties Waterproofing agent

## **The shape of generality of HYDROPROOF WP-MX**

Main ingredients	Denaturant silicone + silicic acid compound	
Specific gravity	1.01	(20 C)
Pace of expansion	250%	(25 C)
PH	6.5	(Neutral)
Solvent	Water	
Viscosity	10 cps less	
Appearance	Milk white	

If HYDROPROOF WP-MX is applied to the surface of minerals building materials at large a natural stone, brick, mortar and a cultural property it will permeate gradually and will demonstrate the waterproofing effect.

HYDROPROOF WP-MX prevents degradation of the surface in the damage which has high elasticity and freezes and unlike the prevention silane system, aims efflorescence at weathering damage from salt water and surface protection with the surface strengthening function by the Siloxane combination.

Although HYDROPROOF WP-MX can be constructed even if the subject is somewhat moist since it is water please prevent rain and snow for after construction summer 12 hour and, and winter 24 hours.

Since HYDROPROOF WP-GS is a water type, although there is no restriction in preservation please avoid construction and preservation at Centigrade 0 degree C or less. Please do not use the material which has frozen, either.

Since unlike what forms a film in the surface and takes out the waterproofing effect a building is permeated and it waterproofs, a remarkable difference comes out of HYDROPROOF WP-MX especially about durability.

For woody material Waterproofing agent

## The shape of generality of HYDROPROOF WP-GW

Main ingredients	Denaturant silicone + silicic acid compound	
Specific gravity	1.04	(20 C)
Pace of expansion	300%	(25C)
PH	6.0	(Neutral)
Solvent	Water	
Viscosity	10 cps less	
Appearance	Milk white	

The waterproofing effect is demonstrated by applying HYDRPROOF WP-GW as a waterproofing agent of a woody system at large at the time of construction and applying it to a pillar and a panel side with a brush and a roller as waterproofing processing of the roofing of new building or reconstruction the pillar in front of coating material and plywood.

The leakage of water to thermal insulation is prevented by applying especially the first stage such as a woody panel and 2x4, and it becomes the high construction work of quality and reliance of a tenant is raised, without wrapping in a roof or an outer wall while moisture had been included.

It is the optimal waterproofing protection material for the wooden portion frequently exposed to fixtures and the exterior of the store using water. After such as wood deck etc. using preservative treatment HYDROPROOF WP-GW can be applied. The waterproofing use of inorganic building materials is expanded.

Since HYDROPROOF WP-GW is a water type, although there is no restriction in preservation, please avoid construction and preservation at Centigrade 0 degree C or less. Please do not use the material which has frozen, either.

In order that unlike repellency material HYDROPROOF WP-GW may permeate and may form a waterproofing layer a remarkable difference comes out of it especially about durability.

# Concrete crack repair method of construction

(Pouring)

It is based on a blast furnace slag system  
ultrafine particle pouring method of construction.

Unification repair and structure strengthening of a concrete crack

Improvement degradation prevention of concrete neutrality degradation

Compound method of construction

HYDROPROOF HT-SP+WP-GS+ blast furnace slag system  
ultrafine particle pouring material

## 1. Outline

The big cause of degrading a concrete structure is the crack in which water originates. Adhesion hardening is not only attained like the conventional repair to this crack, but it aims at the improvement and reinforcement of a degradation part by minerals material. A building is unified by pouring in a blast furnace slag system ultrafine particle. It is the outstanding method of construction which aims at unification of a building and improvement in durability by applying HYDROPROOF by acquiring the degradation prevention effects such as water absorption prevention and isolation alkali insoluble alkali on-the-strength recovery in the surface on which the high liquid medicine of perviousness permeated more deeply than water and deteriorated. The construction range completes this method of construction by the same construction method also in a place small also in a large place.

## 2. Feature

(1) Since blast furnace slag system ultrafine particle pouring material (average particle size : 2.8  $\mu\text{m}$ ) is used detailed pouring breaking (0.05mm) is possible.

(2) Hardening (intensity) that both a dryness side and the damp field can be constructed and equivalent is obtained.

(3) While combined use of blast furnace slag system ultrafine particle pouring material and precedence pouring liquid gives alkalinity to degradation by neutrality inside concrete deter the expansion side and explosion phenomenon by rust of an internal steel rod.

As latent hydraulic property of a blast furnace slag system ultrafine particle slag builds the Kay acid calcium hydrate which combines with calcium hydroxide and does not let water pass and demonstrates and hardens hydraulic property with the stimulant of calcium hydroxide or alkali salts. This reacts strongly with the alkaline metal salt in HYDROPROOF which carried out precedence pouring. Although initial intensity is small compared with the case where Porto land cement is usually used intensity is increased over a long period of time. The intensity at the time of usually using Porto land cement in after construction 1 and three months is reached after exceeds this and hardening promotion is carried out. A building carries out unification combination and high adhesion is acquired.

(4) By carrying out application osmosis of the concrete surface processing agent HYDROPROOF, react with the isolation alkali in the concrete leading to alkali aggregate reaction, silica, etc. and it becomes a non-water solubility minerals compound. The compound generated while deterring the concrete collapse from the aggregate expansion by the reaction with water is filled up with water gap air gap and the surface of concrete itself is improved to the water absorption prevention layer excellent in breathability. Moreover since it is high alkalinity the degree of alkali of the neutrality concrete is recovered. Brittle of the explosion phenomenon by the rust of the iron near a surface generated by neutrality or concrete is suppressed and a crack is prevented.

(5) Since it is a 100% inorganic joint object and minerals liquid medicine, form the few hardening object and protection layer of expansion, contraction, and heat stress. It excels in durability and is a method of construction using a harmless and eco-friendly material.

### **3. Construction Method**

#### **【1. Large honeycomb】**

(What structure penetration and steel rod exposure are regarded as)

High on the strength mortar is poured in about comparatively big honeycomb and blast furnace slag system ultrafine particle material is poured into detailed air gap which is in the inner part of a structure further. Minerals system water supply prevention agent HYDROPROOF HT-SP is applied on the outskirts after that.

#### **【2. Medium honeycomb】**

( What is assumed to be 15% or more of thickness of concrete )

After covering a surface with high on the strength mortar about comparatively middle scale structure penetration the inside of structure penetration is filled up with blast furnace slag system ultrafine particle material and minerals system water absorption degradation prevention material HYDRPORRF HT-SP is applied to the circumference and surface.

#### **【3. Small honeycomb】**

( What is seen by only the building surface )

It fills up with high on the strength mortar about comparatively small-scale building penetration, and minerals system water absorption degradation prevention material HYDROPROOF HT-SP is applied to the circumference and surface.

#### **【4. Crack (less than 0.1mm)】**

After applying the upper polymer mortar from which surface laitance was removed, minerals system water absorption degradation prevention material HYDRPROOF HT-SP is applied to the circumference and surface.

#### **【5. Crack (Above than 0.1mm)】**

Blast furnace slag system ultrafine particle material is poured into the inside of the upper crack which applied the surface with polymer mortar and minerals system water absorption degradation prevention material HYDROPROOF HT-SP is applied to the circumference and surface.

#### **【6. Cold joint】**

The same repair method of construction as a crack of 3 and 4 is used.

#### **4. Construction Procedure**

##### **【1. Large honeycomb】**

- (1) Polish hang and remove a separation part (brittle part).
- (2) Repair of a concrete section pours in high strength mortar (simultaneously pouring plug installation).
- (3) Filler hardening protection
- (4) Precedence pouring : HYDROPROOF HT-SP pouring (rust prevention and moisturizing)
- (5) Pouring : blast furnace slag system ultrafine particle pouring material
- (6) A temporary stop and a seal : pouring material outflow part temporary stop
- (7) Pouring material hardening protection
- (8) Plug withdrawal for pouring
- (9) Seal material withdrawal
- (10) Hole restoration for pouring : fill a gap with blast furnace slag system quantity strength mortar.
- (11) Mortar finish : they are after flat and smooth finish and Protection with polymer mortar.
- (12) Degradation prevention finish : HYDRPROOF WP-GS application (surface protection waterproofing)

A steel rod exposure portion applies polymer mortar paste in advance.  
( Nitrous acid lithium 5% combination )

##### **【2. Medium honeycomb】**

- (1) Polish hang and remove a separation part (brittle part).
- (2) Hole for pouring : (diamond core drill phi13.5mm)
- (3) Pouring plug installation
- (4) Repair of a concrete section pours in high strength mortar
- (5) Filler hardening protection
- (6) Precedence pouring : HYDROPROOF HT-SP pouring (rust prevention and moisturizing)
- (7) Pouring : blast furnace slag system ultrafine particle pouring material
- (8) A temporary stop and a seal : pouring material outflow part temporary stop
- (9) Pouring material hardening protection
- (10) Plug withdrawal for pouring

- (11) Seal material withdrawal
- (12) Hole restoration for pouring : fill a gap with blast furnace slag system quantity strength mortar.
- (13) Mortar finish : they are after flat and smooth finish and take care with polymer mortar.
- (14) Degradation prevention finish : HYDRPROOF WP-GS application (surface protection waterproofing)

**【3. Small honeycomb】**

- (1) Polish hang and remove a separation part (brittle part).
- (2) primer application : polymer mortar paste application
- (3) Repair of a concrete section pours in high strength mortar
- (4) Degradation prevention finish : HYDRPROOF WP-GS application (surface protection waterproofing)

**【4. Crack (less than 0.1mm)】**

- (1) Polish hang and remove a separation part : laitance removal
- (2) Crack filling: Polymer mortar pouring
- (3) Mortar finish : they are after flat and smooth finish and take care with polymer mortar.
- (4) Degradation prevention finish : HYDRPROOF WP-GS application (surface protection waterproofing)

**【5 · Cold joint】** Same processing is performed about the part judged to be equivalent.

**【6 · Crack (Above than 0.1mm)】**

- ( 1 ) Hole for pouring : (diamond core drill phi13.5mm)
- ( 2 ) Pouring plug installation
- ( 3 ) Seal construction: Construct with polymer mortar.
- ( 4 ) Hardening take care
- ( 5 ) Precedence pouring: HYDRPROOF HT-SP pouring (rust prevention and moisturizing)
- ( 6 ) Pouring : blast furnace slag system ultrafine particle pouring material
- ( 7 ) A temporary stop and a seal : pouring material outflow part temporary stop
- ( 8 ) Pouring material hardening protection
- ( 9 ) Plug withdrawal for pouring

- (10) Seal material withdrawal
- (11) Hole restoration for pouring : fill a gap with blast furnace slag system quantity strength mortar.
- (12) Mortar finish : they are after flat and smooth finish and take care with polymer mortar.
- (13) Degradation prevention finish : HYDRPROOF WP-GS application (surface protection waterproofing)

【7・Cold joint】 Same processing is performed about the part judged to be equivalent.

#### About efflorescence removal processing

Efflorescence of slight adhesion is removed by outer wall high pressure water washing.

The detergent which carried out test washing in preparation and the spot and fitted efflorescence removal in the present condition in the detergent of several sorts of acid systems in the white flower which adheres is selected.

Since it is possible to carry out application osmosis of the HYDRPROOF in neutrality brick mortar with acid detergent the influence on brick and mortar is satisfactory.

Removal with a scraper and a steel brush is performed about a white flower unremovable even if it uses detergent.

#### About an effect

The usage of HYDRPROOF which is formed from six kinds now in accordance with HT-SP, HT-HX, the reacted type of three kinds of HT-GT, and WP-GS and surface protection material 3 kinds of WP-MX (WP-GW) according to the purpose, is made to react by the former (structure strengthening), and protects by the latter is effective.

Especially in a compound method of construction, HT-SP and WP-GS use it actively.

A crack and a degradation portion are permeated about SP, and it is the on-the-strength recovery effect (Siloxane condensation Si-o) of a circumference part.

Furthermore, since it has functions, such as an anticorrosive of the steel rod by alkaline metal salt, the degree recovery of alkali and neutrality prevention it is effective as a pretreatment of precedence pouring repair etc.

About blast furnace slag system ultrafine particle pouring material it is product under development as a compound method of construction in our company.

The product which can adjust the hardening time stabilized more is prepared.

( Commercialization is planned during 2004.)

The general feature of blast furnace slag system ultrafine particle material

- Increase of long term intensity

- Acid resistance (resistance, such as corrosion and corrosion)

- Salt proof resistance

- Heat resistance

- Non water permeability

- The efflorescence deterrence effect

- Alkali aggregate reaction deterrence characteristic

The above is the main features. Effects such as on the strength recovery in the reaction and pozzolan reaction by osmosis of the ingredients (a silicic acid compound alkaline metal salt, minerals mediation etc.) contained in these at HYDROPROOF durability and the deterrence characteristic for the strengthening efflorescence deterrence effect alkali aggregate reaction of corrosion resistance are expectable.

Furthermore WP-GS which finishes by the application of WP-GS as finish material and performs waterproofing processing of a field has a maximum of 300% of high elasticity prevents a surface wind damage and has effects such as freeze prevention and damage from salt water prevention and use of it is possible for minerals partial not only a repair portion but at large with the action of denature silicone a silicic acid compound etc.

At a present stage although the method of mixing and using HYDROPROOF various kinds and blast furnace slag system ultrafine particle material is impossible it is using it as a gradual compound method of construction and can expect grant of a new function etc. Furthermore it is thought that it is utilizable not only for repair work but establishment construction enough.

Moreover in our company the technical development in other new field which are mixture with blast furnace slag system ultrafine particle pouring material the mixed combined use with other material etc. is planned and research and development is done by recognizing environmental preservation protection, problems and importance enough aiming at the construction method of construction corresponding to the spot.