Building restoration

Requirements.
Methods. Products.

When the walls of old buildings become damp, this quickly leads to heavy damage to the structure of the building. There are however possibilities to restore such walls. We shall show you ours.

Problems solved.

SCHOMBURG

Problems solved. For every requirement.

The renovation of older building structures is constantly gaining meaning – and the protection of the building structure against destruction by water plays a central role here.

A building that stands in the ground will surrender to decay if it is not adequately protected against moisture. A damp wall is not only a thermal bridge but can attract further damage. In contrast, a dry wall contributes to a reduction in energy costs.

And now the good news: Based on a well-founded building condition analysis, realistic renovation recommendations can be compiled. In order to successfully convert this solution and for the long term preservation of the property, the correct building materials systems and their correct application is necessary. In particular there are frequently damp and salt laden substrates in old buildings. To professionally renovate these areas for the long term, the salt contamination arising must be analysed exactly, in order to be able to use the appropriate product systems. Also previously mouldy areas require a specific solution.

With the THERMOPAL® restoration plaster system, SCHOMBURG offers a complete sustainable and economical system, which provides the correct solution for every requirement. For the long term preservation of buildings, for a pleasant living climate and for an increase in value of the property.

Building restoration

Requirements. Methods. Products.

Contents

Building timeline features

Typical damage and impairment of the building structure

Around the turn of the century existing Wilheminian districts shaped our towns. The houses so beloved today and also older sacred buildings were built as massive masonry work constructions – unfortunately without adequate vertical and horizontal waterproofing. This resulted in moisture penetration to cellars and external walls.

Natural stone masonry work
The incorporation of a horizontal barrier in natural stone masonry is to be considered on an individual basis. According to experience, the moisture transportation in the capillaries of a natural stone wall is very low, that only allows capillary water transportation in the mortar present in the wall profile. The incorporation of a horizontal barrier in a natural stone masonry wall is always laborious due to the configuration. There are varied constructions, perhaps filled with straw or filling material.

Masonry work
With masonry brickwork, one must differentiate between baked bricks and clinker. The baked brick was "baked" up to approx. 900 °C. It is relatively open-pored and can absorb a large amount of water. This means that hydrophobic materials work well here. In contrast, clinker was "burned" at above 1,200 °C. This strong fusion ensured that they absorbed little or no water, were frost resistant and weather resistant overall.

Dependent on the stone, moisture transportation can only occur via the mortar in the vertical and horizontal joints. Until well into the 20th century, baked bricks were dense solid bricks without pores or void formers. Not to be compared with today's bricks. In the 70s with the arrival of the first porous hollow bricks, capillary water transportation increased. Assuming the waterproofing of buildings was not technically correct.

Damage through water
Water can damage the building and the building materials used in many ways at the same time:

- Capillary water absorption
- Seepage water or water running down slopes – under pressure
- Driving rain
- Gaseous (condensate)

Delamination and efflorescence
This type of damage occurs through salts detrimental to buildings. A chemical process in the building material, activated by penetrating moisture, dissolves salts and transports them with the moisture to the surface of the building component. Salts can also end up in the building component externally. De-icing salts dissolved in water can migrate into the building and take the opposite direction to the building components surface during the drying process. However not without the building component being unharmed. If there is a "dense" building material present (e.g. cement render), the salts can concentrate behind it. The render is blown off due to the increase in volume of the salts. If there is a "permeable" building material present (e.g. lime-cement render, lime render), the moisture, with the dissolved salts migrates to the surface of the building component where the salts crystallize. Here restoration plaster systems are used. They have the essential role of relocating the evaporation layer in the restoration plaster and storing the salt, without damage, in the pore volume present.

Energy implications of moisture
If the moisture content in masonry is reduced, this also influences heat loss. The thermally insulating properties of the building are returned to their original condition. In every case consult a planner/energy advisor for an effective thermal insulation concept.

The most secure solution to the renovation of a damp cellar is to renovate the side facing the ground. Only if this is not possible, should the renovation be planned from the inside.

Old buildings are especially susceptible to damp as the masonry work is rarely effectively waterproofed. Deleterious salts are formed, which makes restoration necessary.

Substrate preparation

Basis of a sustainably functioning renovation

Even the best building materials must be in harmony with the substrate upon which they are used. In order to ensure optimum bond and a long lasting function, it is necessary to thoroughly and carefully prepare the building area to be treated.

Detailed specifications on the preparation of substrates and their specific requirements are described in the WTA data sheet 4-6 "Retrospective waterproofing of buildings in contact with the ground". The optimum treatment of the substrate is based on the existing waterproofing situation of the project. Therefore different steps are taken for internal than external waterproofing. Dependent on the topic, there are different system solutions for each particular application.

The path to the right solution:
1. Building condition analysis
Before every renovation project, a professional analysis of the building condition must be carried out.
Dependent on the renovation processes and demands, obtain information on the following points:

- Type of construction
- Wall thickness
- Strength
- Cracks, voids, crevises
- Structural analysis
- Repairs already undertaken, if necessary
- Building materials used
- Circumstances of dampness
- Future use

2. Producing a competent renovation recommendation
Optimum substrates are concrete with a dense microstructure, cement-based screeds, renders P II or P III and fully pointed masonry work.

Possibilities for the preparation of the substrate

Abrasion

Cleaning

Priming

Splatterdash coat/bonding coat

Levelling

Grid float use

The substrate must be load-bearing, open pored and free form dirt. Uneven areas and ridges must be thoroughly removed. In addition the area should be free for gaping cracks and adhesion impeding substances such as oil, paint, laitance layers and loose components. Level up open butt joints and surface irregularities of up to 5 mm or uneven areas of stone (e.g. render grooves in brickwork or dense concrete blocks) with a mortar such as AQUAFIN®-1K or ASOCRET-M30. Non-sealed defects, which are deeper than 5 mm, some mortar joints, or damaged areas are also to be rectified with ASOCRET-M30. Substrates should be treated related to the project and application type before further work e.g. by pre-wetting, priming with e.g. ASO®-Unigrund or applying a bonding coat such as THERMOPAL®-SP. This achieves an even absorption and an optimum bond. A solution for non-absorbent substrates such as e.g. metal would be ASODUR®- GBM (incl. broadcasting with quartz sand) to provide a pore-free primer. Where there is rear moisture penetration, pre-waterproofing against negative water pressure is necessary. This can be a mineral-based, rigid waterproof slurry (AQUAFIN®-1K), a blocking render (ASOCRET-M30) or, dependent on the system, a reaction resin coating (ASODUR®-SG2/-SG2-thix). An additional bonding coat (splatterdash coat - THERMOPAL®-SP) is necessary beneath renders..

3. Salt conversion

Following the successful determination of the type and quantity of the salts occurring (salts analysis), the salt conversion (chlorides and sulphates from readily soluble to scarcely soluble) can be carried out (ESCO-FLUAT).

Salts	Possible causes	Conversion to low solubility salts
Sulphates	Gypsum, mineralised ground water	Yes
Chlorides	De-icing salt	Yes
Nitrates	Fertilizer, urea	No

Horizontal barriers

Injection method against capillary rising damp

Horizontal barriers reduce the transportation of capillary moisture in masonry work and can also be installed retrospectively. They can be incorporated into masonry work through different injection methods.

Use

Above the horizontal barrier, the masonry work should have the possibility to reach equilibrium moisture dependent on use. The supply of capillary moisture must not be completely prevented. Use aqueous (AQUAFIN®-F Verkieselungslösung) or paste products (AQUAFIN®-i380 Injektionscreme).

Preliminary investigation

Before starting the process, a preliminary investigation of the masonry work must be undertaken (e.g. degree of moisture penetration). If there are cracks, loose joints or missing areas, the injection material can flow out uncontrolled. A trial injection is recommended dependent on the circumstances. Later removal of a drill core and subsequent dampening can be used to prove the functionality.

Injection method

Dependent on the thickness of the masonry and the degree of moisture penetration (DFG 60%/80%/95%) there are injection methods under pressure (low pressure method < 10 bar) or pressureless method (gravity and capillary transportation of the active material). Classic aqueous horizontal barriers are applied using the pressureless method up to a degree of moisture penetration of < 60%. With a degree of moisture penetration > 60% application by low pressure methods is recommended. Here holes are drilled into the masonry at a spacing of 10–12.5 cm centres (hole centre to hole centre). With paste based injection, the drill holes are arranged horizontally in the joints, with aqueous injection with an inclination angle of up to 45°. The depth of the drilled holes is to be 5 cm less than the thickness of the masonry work. With walls thicker ≥ 60 cm, it is recommended to arrange the row of holes from both sides. The depth of hole drilled is then 2/3 of the thickness of the masonry per side. With multi-row arrangements, a height difference from joints is advisable (≤ 8 cm).

1. Levelling wall areas

2. Establishing drill holes

3. Cleaning drill holes

4. Filling voids

5. Producing horizontal barriers (paste)

5. Producing horizontal barriers (aqueous)

Mode of operation
Using pressurised methods, the injection material is injected via appropriate injection packers into the substrate. **The injection material is pressed in the pores of the building material and forms a hydrophobic (water repellent) level so that moisture can no longer be transported upwards via the capillaries.** When the degree of moisture penetration is low, injection is also possible with pressureless methods.

One of the particular advantages of an injection cream (AQUAFIN®-i380): Even with a degree of moisture penetration of up to 95%, it can be used with pressureless methods. The active ingredient it contains is very fine and highly effective due to its special composition. It does not react with water but exclusively with the substrate. AQUAFIN®-i380 is hydrophilic and disperses especially quickly in the existing water in the masonry work. Over time, this leads to 100% saturation of the pores. Using the practical 550 ml tubular bags, application is carried out with an injection gun. Using a slow squeezing action whilst extruding through the supplied injection tube, will completely fill the drill hole. Application is also possible with horizontal drill holes and where there is inhomogeneity in the masonry work. The risk of uncontrolled flow as with aqueous horizontal barriers is not applicable.

Following the reaction with the substrate, it imparts water repellency to the capillary walls. Capillary water transportation is impeded and the substrate dries out. The material is tested and certified at a degree of moisture penetration of 95% to the WTA data sheet 4-10-15/D ("injection method for certified injection materials against capillary moisture").

Sealing the drill holes
After completing the horizontal waterproofing measures, completely seal the drill holes flush with the surface using ASOCRET-M30 or project driven with ASOCRET-BM.

IMPORTANT

Accompanying measures necessary.

If there is an area with negative moisture penetration, then a complete waterproof membrane is necessary – for instance with a blocking render. With internal waterproofing, it is important that the horizontal barrier is incorporated above the area exposed to damp (e.g. floor zone). With a planar arrangement, the wall would take on the condensation and the moisture would climb further up the wall. Then areas not previously involved could be affected. The same is also true for integral interior walls.

AQUAFIN®-F
Silification solution for producing horizontal barriers

AQUAFIN®- i380
Injection cream for retrospective horizontal barriers

Blocking render

Retrospective internal waterproofing with a mineral-based mortar system

In principle an exterior waterproof membrane is preferred to an interior one. Only if waterproofing externally is impossible due to technical construction reasons, must they be replaced by interior waterproofing.

Obstacles to exterior waterproofing

- Too short a distance to neighbouring buildings
- The building stands immediately next to a heavily trafficked road
- Extending vertically (partial basement of the building)

Areas of application with water impermeable blocking renders

With interior waterproofing and the need to level the wall areas, revert to a water impermeable factory mortar such as ASOCRET-M30.

Typical areas of application are

- Levelling hollow spots, loose joints and other defects
- Establishing a coved fillet for the wall/floor transition and internal corners
- Filling a notch in the potentially existing horizontal barrier

The application of a restoration plaster can be carried out over a minimum 20 mm blocking render to regulate the climate.

ASOCRET-M30
Repair and levelling mortar
up to 30 mm

1. Preparation of the wall/floor junction

2. Possible preliminary waterproofing

3. Splatterdash coat

4. Application

5. Striking off

6. Rubbing with a grid float

Water exposure	Mineral based waterproof slurry (e.g. AQUAFIN®-RS300)		Water impermeable factory produced mortar (e.g. ASOCRET-M30)	
	Minimum dry film thickness in mm	Minimum number of coats	Minimum dry film thickness in mm	Minimum number of coats
Ground moisture/ non standing seepage water	2	2	20	2–3
Standing seepage water/ water under pressure	3	3	30	3

Source: WTA data sheet 4–6

EXPERT ADVICE

Waterproof slurry or blocking render?

If there is planar moisture exposure on a wall then the use of a mineral-based mortar system is required. There is a variation between thin applied waterproofing (mineral-based waterproof slurries) and thick layer systems (blocking renders). Note that the exposure of the wall to moisture does not decrease. The wall stays permanently damp so it must be ensured that the moisture does not climb further into the masonry work and affect the building even more. Therefore a horizontal barrier is incorporated at the floor zone and integral cross walls. A mineral-based mortar system requires a load-bearing, mineral-based substrate.

With even wall areas with the need to level, the use of a mineral-based waterproof slurry in combination with a horizontal barrier is adequate. It is recommended that a restoration plaster is applied over the waterproofed area, which can regulate the room climate due to its mode of operation (see chapter "The restoration plaster" p 12). In this way a pleasant room climate is established.

Stefan Flügge, Technical Service, SCHOMBURG GmbH & Co. KG

You can learn more about interior waterproofing with ASOCRET-M30 at **schomburg.com**

The restoration plaster system

A balanced restoration plaster system drives salts from the surface

A solution for restoring a wall exposed to salts and/or damp is always a perfectly matched restoration plaster system. A single restoration plaster is not a solution. WTA certified product systems consist of factory produced mortars. Building site mixes are not approved.

Components
(WTA certified restoration plaster system)
- Splatterdash coat
- Backing / levelling plaster (air entrained backing coat plaster)
- Restoration plaster
- Fine plaster

Why restoration plaster systems?
If masonry work exposed to moisture is coated with a "dense" render (cement-based render), the moisture is locked in or salts blow off the existing render.

If a "permeable" render (lime-cement render, lime render) is used, the moisture migrates through the wall. Moisture spots are formed or salts are transported to the surface and crystallised there.
A restoration plaster is water repellent. Water can only penetrate up to 5 mm into the restoration plaster. This lies in the low capillary conductivity. The moisture can diffuse through the plaster layer especially well, leaving as water vapour and salts can be stored in the high volume of pores without leaving damage behind.

1. Possible backing coat application

2. Restoration plaster application

EXPERT ADVICE

What to watch for

- Restoration plasters may be subjected to hydrostatic pressure (pressing and standing water). They are for internal use or, if necessary, external use and then only above ground level.
- If the masonry work is saturated with moisture, suitable water-proofing or drying measures are required beforehand.

Degree of salting	Treatment	Thickness in mm
Low	1 Splatterdash coat	≤ 5
	2 WTA restoration plaster	≥ 20
Medium or high	1 Splatterdash coat	≤ 5
	2 WTA restoration plaster	10 – 20
	3 WTA restoration plaster	10 – 20
High	1 Splatterdash coat	≤ 5
	2 Porous backing coat plaster	≥ 10
	3 WTA restoration plaster	≥ 15

Source: WTA data sheets 2–9 (restoration plaster systems)

The system components

	Purpose	Remarks
1. Splatterdash coat	• Bonding agent	• Thickness max. 0.5 cm • Half cover (<50%) • Full area application on waterproofed substrate • Not suitable for filling joints
2. Backing coat/levelling plaster (backing coat plaster with air pockets)	• Levelling large irregularities (levelling plaster) • Salt store where the substrate has particularly high levels of salts (backing coat plaster)	• Not water repellent, highly vapour permeable • To be applied at thickness from 10-30 mm • Suitable for filling joints
3. Restoration plaster	• Promotes masonry work drying through high water vapour permeability • Encases crystalline salts	• High pore volume • Inner hydrophobicity • Impedes condensation formation on the surface • Minimum thickness 20 mm • Maximum thickness 40 mm • With multi-layer applications, minimum 10 mm per layer • Climate regulation
4. Fine plaster	• Optimum design	• Highly water vapour permeable

KNOW

Everything about restoration plasters

What are restoration plasters used for?
Restoration plasters are used for producing vapour permeable and dry plaster surfaces on damp or salt laden interior and exterior walls.

At what thickness must restoration plasters be applied?
The minimum thickness of THERMOPAL® restoration plasters is 20 mm. With high to medium salting, apply the restoration plaster in two layers from a minimum thickness of between 25 and 40 mm. Waiting time between layers: one day per millimetre of thickness.

Which bonding coat is needed for a restoration plaster?
Use the splatterdash mortar THERMOPAL®-SP as a bonding coat for THERMOPAL®-ULTRA as well as THERMOPAL®-GP11. The gauging water for THERMOPAL®-SP can be modified with the hardening and adhesion medium ASOPLAST-MZ with very strongly or weakly absorbent substrates. THERMOPAL®-SP can also be used as a splatterdash coat for cement-based or cement-lime-based renders.

How can restoration plaster be coloured?
Highly vapour permeable coatings such as silicate paints can be used on restoration plaster systems.

Can I also mechanically apply THERMOPAL® restoration plaster systems?
Yes, for instance with the PFT G4. Refer to the configuration in the "THERMOPAL® equipment plan".

What are the differences of restoration plasters?
THERMOPAL®-GP11 and THERMOPAL®-ULTRA are WTA certified products (WTA data sheet 2-9-04/D). Restoration plasters to WTA guidelines have salt storing, hydrophobic properties and increased water vapour diffusion whilst at the same time having reduced capillary conductivity. THERMOPAL®-ULTRA hardens quickly and permits early treatment of the plaster surface.

Restoration systems

Protection for plinth and cellar

Old buildings are beautiful. Everybody would really like to live in one. What is easily overlooked: the art nouveau houses of the turn of the century are often hardly or not at all waterproofed against damp. Above all, the soaked walls of building components in the ground can lead to severe damage. The good news: there are various restoration systems, which provide dry walls in old buildings. For every requirement SCHOMBURG has the right solution, so that the with stucco decorated gems will stand on secure foundations in future as well.

Three systems for restoration

1. Restoration system “plinth area”
The external restoration of the walls of old buildings is still the most recommended variant. Following the salt analysis comes the horizontal barrier and then the building plinth restoration can begin. At the end comes the surface design.

2. Restoration system “hygroscopic moisture damage and the formation of condensation”
The restoration plaster plays a deciding role in the renovation. A salt analysis is also necessary here. Afterwards the substrate is prepared in order to be able to apply the restoration plaster and the surface design can take place.

3. Restoration system “internal waterproofing”
With internal waterproofing there must also be a salt analysis as well as a horizontal barrier. Subsequently the substrate is made flat, the surface waterproofed and the restoration plaster applied.

Three systems for restoration

1. Restoration system “Plinth area”

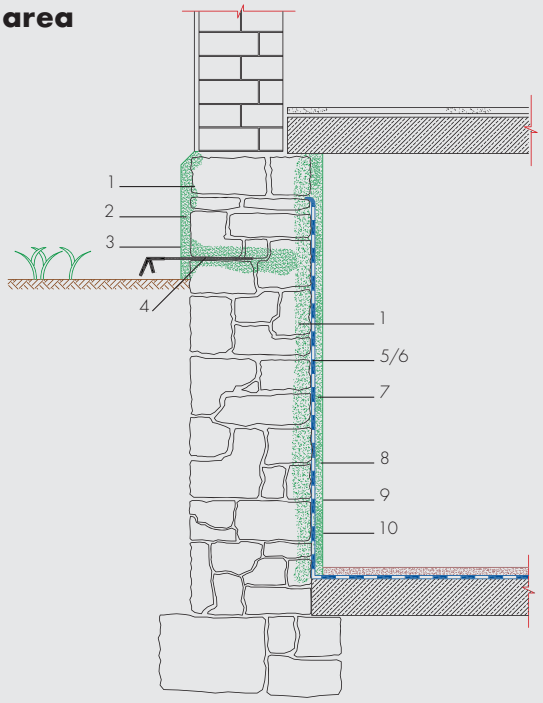
Schematic representation of the building plinth area

Contaminated with salt

1	Salt treatment with ESCO-FLUAT
2	Substrate made flat with ASOCRET-M30
3	Restoration plaster THERMOPAL®-ULTRA
4	Drill hole blocker AQUAFIN®-F
	Drill hole blocker: under pressure
	Hole depth: masonry thickness minus 5 cm
	Hole spacing: 10–12 cm
	Alternative to 4: pressureless with AQUAFIN®-i380
5	Waterproofing with AQUAFIN®-1K/AQUAFIN®- RS300
6	ASOCRET-M30 (alternative to 5)
7	Full coverage splatterdash coat in THERMOPAL®-SP (optional)
8	Restoration plaster THERMOPAL®-ULTRA
9	Fine mortar in THERMOPAL®-FS33
10	Suitable silicate paint

Exposed to damp

1	Salt treatment with ESCO-FLUAT
2+3	Level substrate and produce a blocking render with ASOCRET-M30
4–10	See above



1. Salt analysis

Determination of the type and quantity of occurring salts

Laboratory evaluation

↓

2. Horizontal barrier

Produce a horizontal barrier

AQUAFIN®-F (aqueous)/
AQUAFIN®-i380 (paste)

↓

3. Level substrate

- Restore masonry pointing
- Trowel apply ASOCRET-M30 to defects

ASOCRET-M30

↓

Contaminated with salts

↓

4. Restoration plaster

- Splatterdash coat
- Restoration plaster
  - Low levels of salts (one layer)
  - Medium to high levels of salts (two layers)

- **THERMOPAL®**-SP
- **THERMOPAL®**-ULTRA

↓

5. Surface decoration

Application of the fine mortar

THERMOPAL®-FS33

↓

Exposure to moisture e.g. splash water, puddles

↓

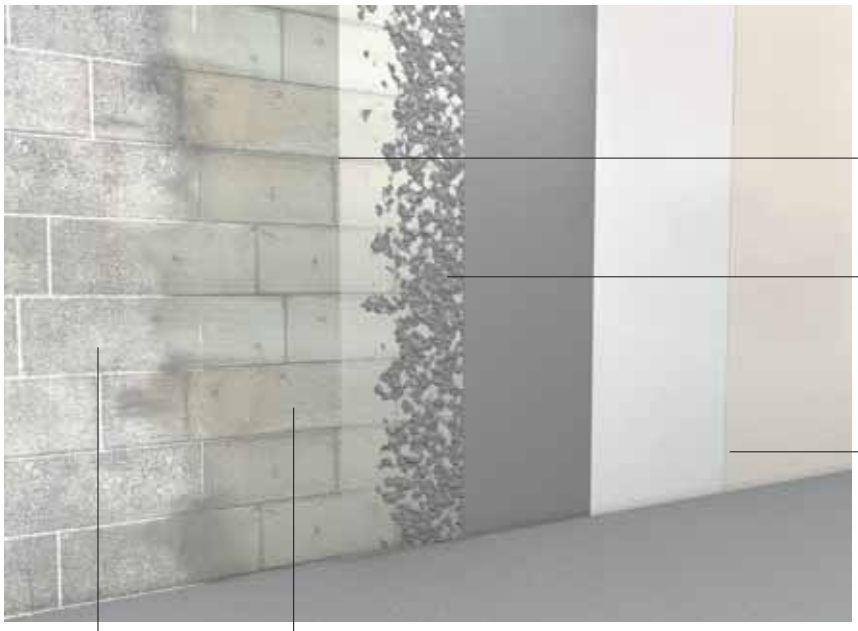
4. Blocking render

Blocking rende

ASOCRET-M30
(thickness ≥ 20 mm)

Three systems for restoration

2. Restoration system “hygroscopic moisture damage and the formation of condensation”



Fluorosilicate application: Conversion of sulphate and chloride salts from readily soluble to scarcely soluble salts

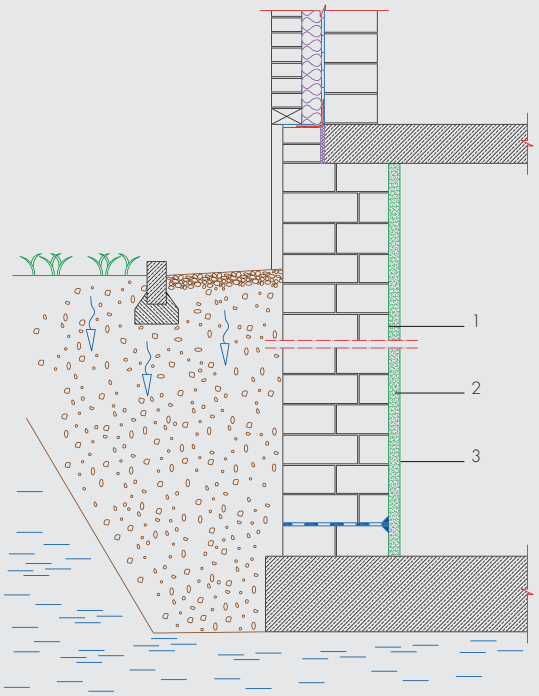
Splatterdash coat on mineral-based substrate, half coverage (≥ 50%)

Restoration plaster one or two layers + possible finishing coat (backing coat + restoration plaster or restoration plaster/restoration plaster)

Schematic representation of the restoration

Contaminated through hygroscopic moisture damage and the formation of condensation

1 Salt treatment with ESCO-FLUAT
2 Half coverage splatterdash coat in THERMOPAL®-SP
3 Restoration plaster THERMOPAL®-ULTRA if necessary + THERMOPAL®-GP11 (with higher salt contamination)



1. Salts analysis

Determination of the type and quantity of occurring salts

Laboratory evaluation

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2. Substrate preparation

- Restore masonry pointing
- Trowel repair defects

THERMOPAL®-GP11

↓

3. Restoration plaster

- Splatterdash coat
- Possible backing coat plaster
- Restoration plaster

- **THERMOPAL®**-SP
- **THERMOPAL®**-GP11
- **THERMOPAL®**-ULTRA
- One layer/two layers

↓

Salting (dependent on level of contamination)

Low

1. Splatterdash coat
   THERMOPAL®-SP
2. Restoration plaster
   THERMOPAL®-ULTRA

Medium or high

1. Splatterdash coat
   THERMOPAL®-SP
2. Restoration plaster
   THERMOPAL®-ULTRA
3. Restoration plaster
   THERMOPAL®-ULTRA

High

1. Splatterdash coat
   THERMOPAL®-SP
2. Air entraining backing coat plaster
   THERMOPAL®-GP11
3. Restoration plaster
   THERMOPAL®-ULTRA

↓

4. Surface design

Application of the fine mortar

THERMOPAL®-FS33

Three systems for restoration

3. Restoration system “Interior waterproofing“

Waterproof membrane/blocking render (AQUAFIN®-1K/AQUAFIN®-RS300/ ASOCRET-M30)

Splatterdash coat
- on mineral-based substrates, half coverage
- on waterproof membranes, full coverage

Restoration plaster, possibly plus finishing plaster

Mineral-based coved fillet

Horizontal barrier

Caulking with felt layer (horizontal barrier) and barrier channel at wall/floor transition

Moisture penetration from the ground

Schematic representation of the restoration

Exposed to water

1 Fill masonry joints and defects with ASOCRET-M30 flush with the surface, apply half or full coverage splatterdash coat of THERMOPAL®-SP on to the waterproof membrane (points 3+4)

2 Drill hole barrier with AQUAFIN®-F/AQUAFIN®-i380 (can also be carried out from inside, above the waterproof membrane)

Drill hole barrier:	pressureless method	low pressure method
Hole diameter:	30 mm	12 or 18 mm
Hole inclination:	30 °– 45 °	0 °– 30 °
Hole depth:	masonry work	./. 5 cm
Hole spacing	≤ 12.5 cm	≤ 12.5 cm

3 AQUAFIN®-1K (lower waterproofing layer)

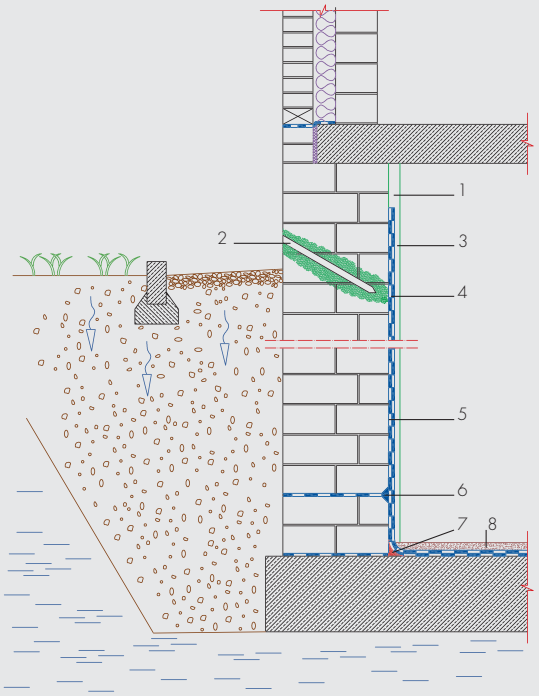
4 AQUAFIN®-RS300 (upper waterproofing layer) (Alternative to steps 3+4: produce a blocking render with ASOCRET-M30)

5 Restoration plaster THERMOPAL®-ULTRA

6 Caulking wit ASOCRET-M30

7 Coved fillet R ≥ 4 cm with ASOCRET-M30

8 Screed produced with ASO®-EZ2



1. Salts analysis

Determination of the type and quantity of occurring salts

Laboratory evaluation

↓

2. Horizontal barrier*

Produce a horizontal barrier

AQUAFIN®-F (aqueous)/
AQUAFIN®-i380 (paste)

↓

3. Substrate preparation

- Restore masonry pointing
- Trowel repair defects (planar trowel application thickness ≤ 10 mm)

ASOCRET-M30
(thickness ≤10 mm)

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Low complexity

- Flat surface
- Full joints

↓

4. Waterproofing

Planar waterproofing

AQUAFIN®-1K (two layers)
Where there is a cracking risk: additional application of AQUAFIN®-RS300 (as the second layer)

Medium high complexity

- Trowel repair defects
- Restore masonry pointing

ASOCRET-M30

↓

4. Waterproofing

Planar waterproofing

- **ASOCRET**-M30 (thickness < 20 mm)
- **AQUAFIN®**-RS300

High complexity

- Trowel repair defects
- Restore masonry pointing
- Levelling layer

ASOCRET-M30

↓

4. Waterproofing

With blocking render

ASOCRET-M30
(thickness ≥ 20 mm)

↓

5. Restoration to regulate climate

- Full coverage splatterdash coat (except with blocking renders)
- Restoration plaster
- Fine mortar

- **THERMOPAL®**-SP
- **THERMOPAL®**-ULTRA
- **THERMOPAL®**-FS33

*(accompanying measures for external walls and integral building components)

Glossary

Accompanying
The actual cause of moisture penetration of the masonry work is to be clarified and eliminated. Horizontal and vertical waterproof membranes are used.

Air pockets
The efficiency of a restoration plaster is dependent on the size of the pores, their distribution and their shape. Air pockets belong to the largest pores in the restoration plaster's profile. They act as capillary breaks and offer room for potential salt storage.

Building condition analysis
In order to be able to evaluate the building structure and to reveal the cause of damage, preliminary investigations into the building are necessary. In the foreground is the determination of e.g. the salts content (differentiated based on type of salt), the moisture content, the maximum water absorption and the hygroscopic water absorption. Only when these results are available, can a restoration system be selected.

Capillarity
This is understood to mean the absorption (rising) of water (liquids) in the capillaries of building materials.

Capillary condensation
Capillary condensation occurs below the saturation conditions with very finely pored building materials e.g. concrete, waterproofing slurries etc. The gives to rise to condensation with a relative humidity, which is considerably below 100%.

Compress render
A compress render serves to reduce the salt content in the surface area of the masonry. The application is a temporary measure. As soon as enrichment of salts in the render ceases, it must be renewed or finished with e.g. a restoration plaster. Compress renders are designed to be capillary active and hydrophilic.

Crystallisation damage
Crystallisation damage is generated during crystallisation and the volume increase behind dense renders e.g. cement-based renders. Here pressure is generated, which with frequent changes from dissolution and crystallisation processes leads to damage in the building material and leads to spalling/ delamination.

Degree of moisture penetration (DFG)
The degree of moisture penetration of a building material is described via the ratio of moisture content to saturation moisture content. DFG (%) = moisture content/ saturation moisture content.

Degree of salting
The degree of salting is a measure for the concentration of salts in the contaminated building material. This must be determined by a laboratory analysis.

Desalination
Desalination of masonry work in the sense of the complete removal of salts is practically not feasible. A reduction of the salt content at the area close to the surface is pursued. For this purpose, sacrificial renders or compresses are used for example.

Dew point, dew point temperature
The temperature at which the humidity reaches saturation (100%) through cooling. If this dew point temperature is fallen below, then moisture drops out of the air (condensation, condensation water).

Diffusion
Diffusion is understood to mean the migration of gaseous materials through solid materials.

Equilibrium moisture content (sorption moisture)
The moisture content of building materials dependent on the relative humidity in the area applied.

Horizontal barrier
Horizontal barriers prevent capillary rising damp in building materials with conductive capillaries (brickwork, natural stone, joint mortar etc.).

Hydrophilic
"Water loving"- when materials e.g. building materials strongly interact with water. The opposite of hydrophobic.

Hydrophobic
Building materials and surfaces which repel water or damp are designated as hydrophobic.

Hygroscopic salts
Hygroscopic salts draw water out of the surrounding air and bind it. Salt laden building materials can accept particularly high levels of hygroscopic moisture.

Moisture regulating layer
The moisture regulating layer stores condensation water momentarily and reduces the capillary condensation in the pore matrix of the top layer. Restoration plasters are used.

Negative waterproofing
Negative waterproofing (internal cellar waterproofing) deals with vertical waterproofing to building components within the ground on the interior side of the wall. Additional capillary rising damp must be prevented by incorporating a horizontal barrier above the ground contact area. The wall constituents are accepted as a damp area.

Pore volume
It is understood that pore volume (PV) means the portion of the pores in the total volume of the building material. Example: PV = 20% means 200 l pores in 1 m^3 building material, i.e. the maximum liquid absorption is 200 l.

Preliminary investigation
See building condition analysis.

Relative humidity
The relative humidity is the ratio of the prevailing water content in the air to the saturation moisture content. The saturation moisture content of the air and therefore also the relative humidity are temperature dependent.

Restoration plaster-WTA
Restoration plasters to WTA are produced from factory blended mortars in

accordance with DIN EN 998-1 and fulfil the requirements of the data sheet 2-9-04/D "Restoration plaster systems". They are plasters with high porosity and permeability to water vapour, whilst extensively preventing capillary conductivity. To restoration plaster systems also belong splatterdash coats, WTA base coats and WTA restoration plasters.

Sacrificial render
See compress render

Salts detrimental to buildings
Salts detrimental to buildings such as nitrates, chlorides and sulphates are mobile readily soluble salts and can lead to the appearance of corrosion on building materials. The more mobile they are, the more damaging they are to the masonry work with which they make contact. Readily soluble chlorides and sulphates can be converted to scarcely soluble salts through the addition of particular chemicals.

Saturation moisture content
The saturation moisture content is the maximum moisture, which a building material can absorb at a given temperature.

sd-value
The equivalent air layer thickness (sd) indicates how thick a stationary air layer must be in order to have the same diffusion resistance as the contemplated material layer. sd = thickness (s) x water vapour resistance factor (μ).

Sorption moisture content
See equilibrium moisture content.

Waterproofing
- Vertical waterproofing
  It is understood that vertical waterproofing means the planar waterproofing of building components in contact with the ground.

- Horizontal waterproofing
  It is understood that horizontal waterproofing means the insertion of a barrier to protect against capillary water transportation.

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SCHOMBURG GmbH & Co. KG
Aquafinstrasse 2 - 8
D-32760 Detmold (Germany)
phone +49-5231-953-00
fax +49-5231-953-108
email export@schomburg.de
www.schomburg.com

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