



We Dry Out Old Buildings – Guaranteed

- ✓ Affordable
- ✓ Lowers Heating and Cooling Costs
- ✓ Wireless
- ✓ Green
- ✓ Maintenance-Free
- ✓ PERMANENT (when system remains installed in building)
- ✓ Naturally Eliminates Musty Smells and Odors
- ✓ Stops Rising Damp Forever
- ✓ Uses No Electricity, No Construction or Chemicals Ever
- ✓ 1 Day to Install (on average)

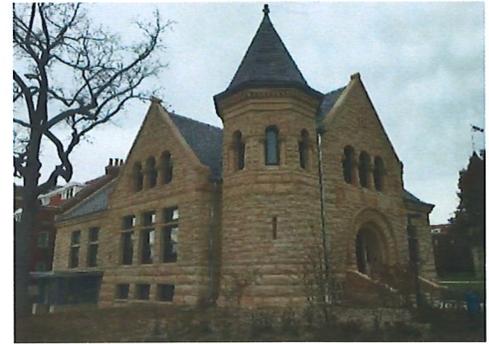
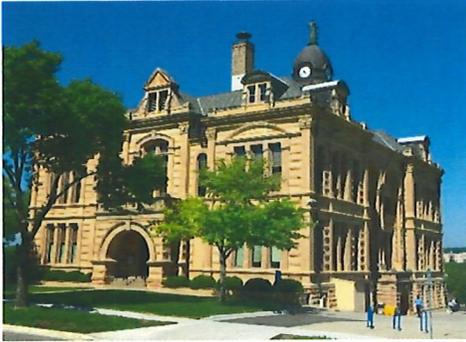
Civil War Era Historic Estate – Hastings, MN



Before

After Only 3 Months

Contact Don Brown 952-935-5640 or Michael Clancy 612-554-1863



We Dry Out Old Buildings – Guaranteed

Wet buildings are unhealthy. They can be smelly, musty and moldy.
A wet building is more expensive to heat and cool, driving up energy costs.
Maintenance expenses are higher for wet or damp buildings.



Signs of rising damp: Salt Efflorescence - Spalling Bricks - Wet Spots - Disintegrating Masonry
Musty Smells - High Humidity - Bubbling Plaster and Paint - Mold - Discoloration - Mortar Decay

Is there a solution? You betcha!

Renodry's proprietary technology permanently dehydrates buildings suffering from rising moisture, better known as rising damp. Our solution is *affordable, wireless, green, maintenance-free and PERMANANT*. It requires no electricity, construction or chemicals and takes just 1 day to install in an average-sized building.

Contact Renodry USA to discuss our dehydration solution for your building.
A veteran run company based in Minnetonka, MN
Don Brown 952-935-5640 or Michael Clancy 612-554-1863



PROJECT ESTIMATE

CLIENT: BROOKINGS COUNTY COURTHOUSE

DATE: May 26, 2020 (Revised)

ADDRESS:

314 6th Avenue South
BROOKINGS, SD
57006

RENODRY USA CONSULTANT:

Don Brown
952-935-5640
Michael Clancy
612-554-1863

PHONE: 605-691-4784 (Justin Johnson)

EMAIL: stacysteffensen@brookingscountysd.gov

PROPERTY TYPE:

The Brookings County Courthouse is 107 years old. Like so many of these magnificent courthouses more than a century old, the building's structure has a case of rising damp and salt penetrating the limestone walls. Rising damp erodes the structural integrity of the foundation causing severe damage to the fabric of the building. Using the porous limestone channels, water plus salt is rising and destroying the base of this historical property.

PROJECT ESTIMATE:

The building has a footprint of approximately 6,600 sq. feet. The Renodry Dehydration System will rid it of rising damp and the accompanying salt, halting the erosional damage being done to the foundation. Once the building is certified dry, which can take from 1-3 years, remedial work can be done to repair any damage caused by the rising damp/salt. The dehydration system will remain in the building, keeping the building free from rising damp for many, many decades. We will install one mid-sized Renodry Device and we are adding another smaller device, to ensure complete coverage. There are no ongoing operating costs nor maintenance expense once the system is installed.

Project Estimate including the two devices to dehydrate the courthouse: \$9,750.00*

*Please Note: The cost is about \$1.48 per sq. foot. Price includes a Renodry USA discount of 10% as the property is listed on the National Registry of Historical Places.

TOTAL

\$9,750.00

TERM & CONDITIONS:

- Two free follow up services are provided, one year and three years after installation, to take comparative wall moisture measurements. Complete reports are provided.
- The installed device(s) remains the property of RenoDry USA until such time as payment is received in full.



RENODRY USA – RISING DAMP REPORT

Brookings County Courthouse



2/28
2019

Rising Damp Report

INTRODUCTION:

ON FEBRUARY 26, 2019, TECHNICIANS FROM RENODRY USA CONDUCTED A VISUAL INSPECTION AND MASONRY CONDUCTIVITY TEST IN THE BASEMENT AND LOWER LEVEL AREAS OF BROOKINGS COUNTY COURTHOUSE IN BROOKINGS, SOUTH DAKOTA.

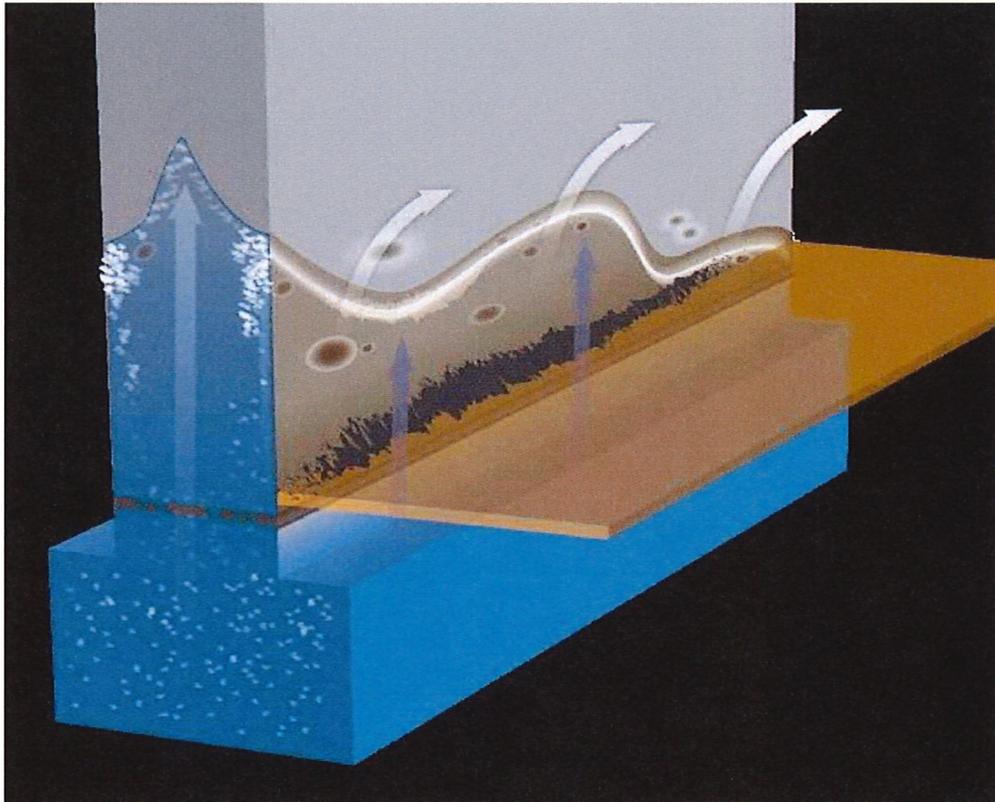
THE BROOKINGS COUNTY OFFICIAL ACCOMPANYING THE RENODRY INSPECTORS WAS JUSTIN JOHNSON – BROOKINGS COUNTY FACILITIES SUPERVISOR.

RENODRY BUILDING INSPECTORS DISCOVERED A RAPIDLY ADVANCING CASE OF RISING DAMP IN THE COUNTY COURTHOUSE. RISING DAMP IS WATER'S NATURAL TENDENCY TO RISE IN MASONRY. IT DESTROYS THE MASONRY FOUNDATION OF A BUILDING.

BUILT IN 1913, THE VERY FOUNDATION OF THIS 106 YEAR OLD COURTHOUSE BUILDING, WHICH IS ON THE NATIONAL REGISTER OF HISTORIC PLACES, IS BEING SERIOUSLY UNDERMINED. THIS REPORT WILL DEMONSTRATE THE PRELIMINARY EVIDENCE AS DISCOVERED DURING THE INSPECTION.

WHAT IS RISING DAMP AND WHY IS IT A PROBLEM?

THE FOLLOWING DIAGRAM OF A WALL CROSS-SECTION ILLUSTRATES SEVERAL EROSION INDICATORS IN THE PRESENCE OF RISING DAMP (THE DAMPNESS AND SALTS THAT MOVE UPWARDS INSIDE THE WALL, FROM THE FOUNDATION, AFFECTING THE CORE OF THE MASONRY).

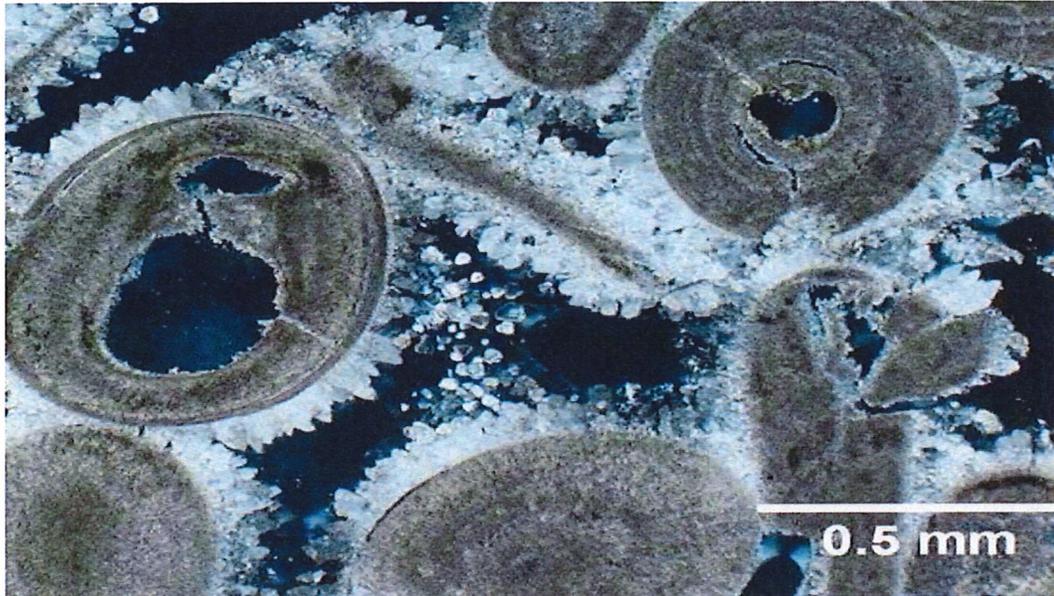


RISING DAMP IS A COMBINED PROBLEM OF DAMPNESS AND SALTS AFFECTING THE MASONRY AT DEPTH.

How Salts Destroy Masonry

The reason salts pose such a serious problem to masonry is because **they can dissolve and recrystallize.**

Changes in temperature and/or humidity cause **salt crystals to expand multiple times** within the capillary pores, which generate enough crystallization pressure – up to 2 tons per cm² - to **crack** the fine pores, irreversibly destroying the masonry. Powdering, flaking, crumbling, delamination or cracking of masonry surfaces are typical signs of a salt attack.

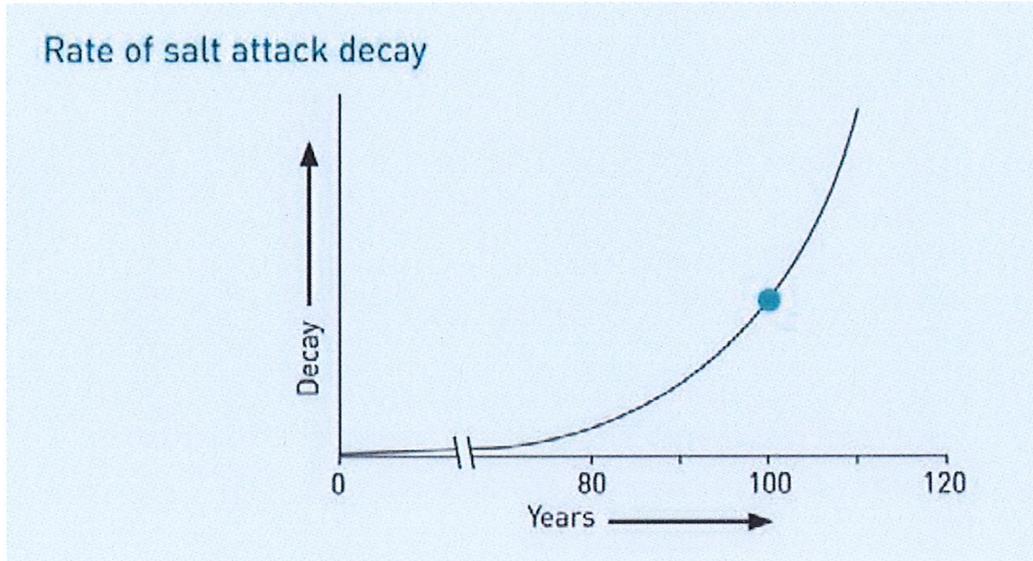


SALT DAMAGE: SALT NEST PUSHING THROUGH WALL IN COURTHOUSE

It is tempting to think that if a building has lasted for 80 years, decay will not much worsen after another 20 or 30 years. This is incorrect. According to current building research, the rate of decay is exponential₁.

There is a long initial period with almost no decay (80 years in this example) during which time salts slowly accumulate within the masonry pore structure until they reach a saturation point.

After this the **salt decay becomes accelerated**, the volume of decay over the next 10 years will be **twice as destructive** as it is has been.



Over time, once **capillary action** has drawn enough salts into the building fabric and the concentration of salts in masonry becomes higher than in the soil below, it triggers a secondary force of attraction known as **diffusion** (to spread or disperse). For example, high salinity areas from the upper part of the wall start attracting water from lower salinity areas underneath, making the masonry increasingly wetter and saltier and the capillary rise increases with the building's age. In older buildings with thick walls, 13-16 feet high capillary rise is not uncommon.

Brookings County Courthouse is now 106 years old and its foundation is into the advancing stages of decay.

- (1) Department for Environmental and Heritage, South Australia: *Salt attack and rising damp: a guide to salt damp in historic and older buildings* – Technical Guide, 2008
- (2) Bernard Feilden: *Conservation of Historic Buildings*, 3rd Edition, 2003, p. 101

RENODRY PERFORMS 2 TYPES OF TESTS:

THE FIRST TEST CONDUCTED BY THE RENODRY ENGINEER INVOLVES THE USE OF A GANN HYDROMETER B50 THAT MEASURES WALL CONDUCTIVITY (THE DEGREE TO WHICH A SPECIFIED MATERIAL CONDUCTS ELECTRICITY). A PROBE IS SET ON THE SURFACE OF THE STONE, MASONRY OR MORTAR AND GIVES A READING INDICATING THE PRESENCE OR ABSENCE OF MOISTURE. THE HIGHER THE READING, THE MORE MOISTURE IS LIKELY IN THE WALL. THIS TEST GIVES THE ENGINEER A STRONG INDICATION THAT THERE IS MOISTURE PRESENT IN THE WALLS.

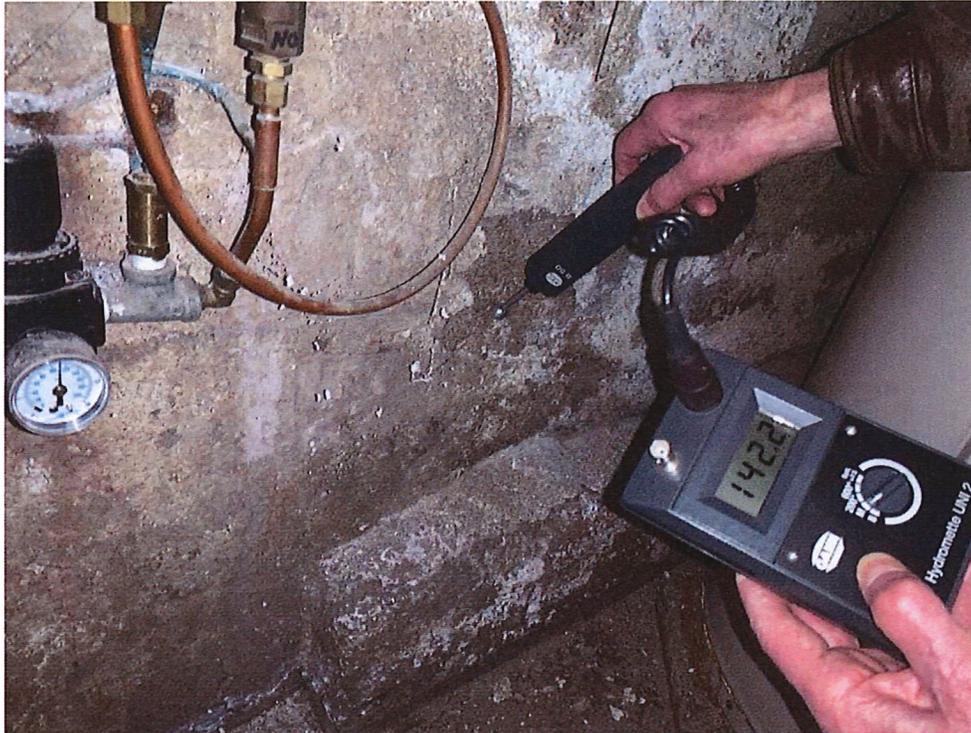


GANN HYDROMETER B50 UNI 2

READINGS ON THE GANN INSTRUMENT RANGE FROM 0, AN INDICATION OF NO MOISTURE, TO 200 THE EQUIVALENT OF TOTAL SATURATION. FOR PURPOSES OF REVEALING MASONRY WALL MOISTURE, READINGS LESS THAN 70 INDICATE NORMAL TO SLIGHTLY ABOVE NORMAL LEVELS OF MOISTURE PRESENT; READINGS ABOVE 70 DEMONSTRATE EXCESSIVE LEVELS OF MOISTURE; **READINGS IN EXCESS OF 100 INDICATE EXTREME MOISTURE LEVELS IN THE MASONRY.** AS A COMPARISON, THE HUMAN BODY, ON AVERAGE WILL READ AROUND 160.

(SEE PHOTO BELOW – COURTHOUSE)

WATER SATURATED MASONRY: MOISTURE LEVEL IN LOWER FOUNDATION WALL REACHING 142.2 – NEAR HUMAN BODY LEVELS OF MOISTURE



GANN HYDROMETER B50 UNI 2

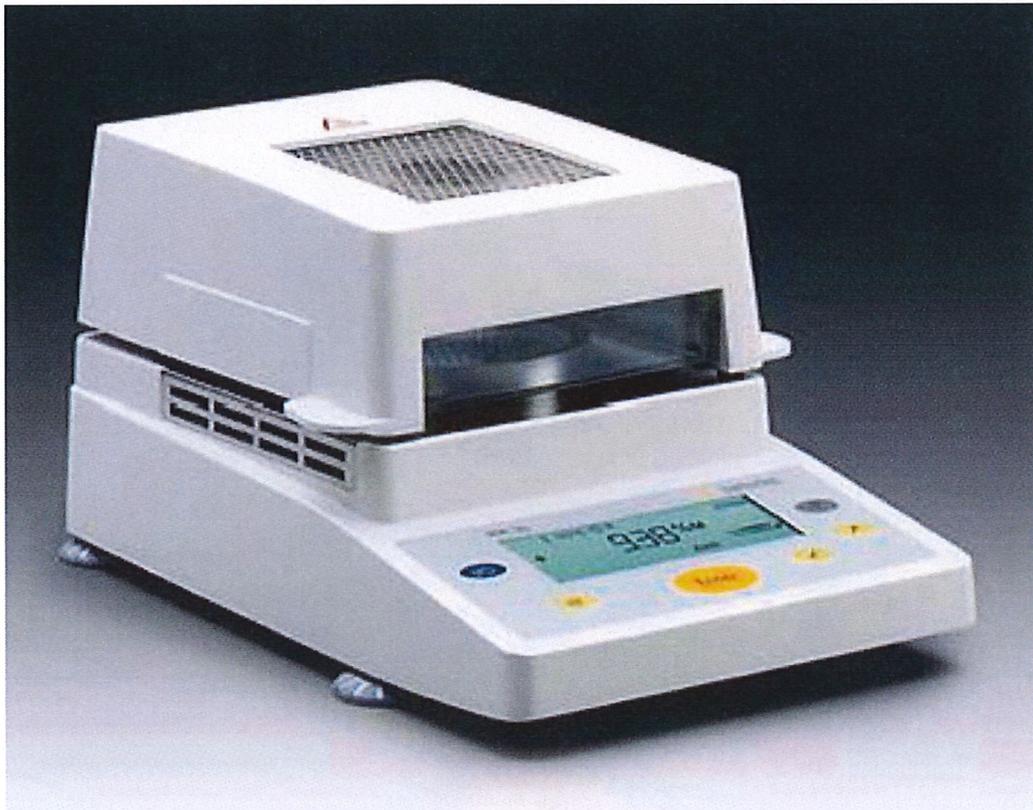
THE MASONRY WALLS OF BROOKINGS COUNTY COURTHOUSE HAVE MOISTURE TRAPPED IN THE INNER WALLS. RENODRY'S PRELIMINARY TESTS WITH THE GANN HYDROMETER INDICATED MANY OF THE EXTERIOR AND INTERIOR WALLS THAT COULD BE ACCESSED, HAD READINGS WELL OVER 100 SHOWING THE WALLS ARE BEING ERODED BY RISING DAMP.

THE SECOND SERIES OF TESTS TO BE PERFORMED AND THE MOST IMPORTANT, WILL BE MASONRY CORE SAMPLES EXTRACTED FROM LOCATIONS ON THE INTERIOR WALLS AT VARYING HEIGHTS STARTING FROM THE LOWEST POINT AND

MOVING UP THE WALL TO DETERMINE HOW HIGH THE RISING DAMP HAS REACHED AS WELL AS HOW WET THE MASONRY IS.

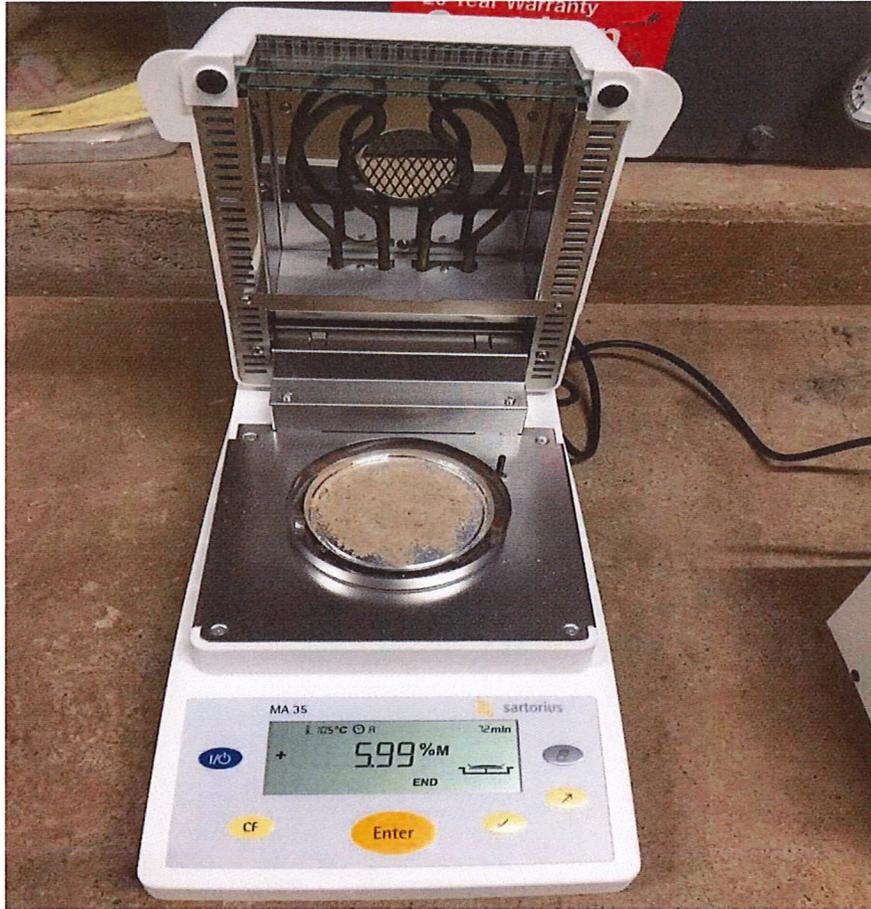
A SLOW TURNING DRILL WILL BE USED TO PENETRATE APPROXIMATELY 4 INCHES INTO THE MASONRY WALLS TO WITHDRAW A CORE SAMPLE FROM WITHIN THE WALL.

USING THE INTERNATIONAL STANDARD FOR DETERMINING MASONRY WALL MOISTURE – THE GRAVIMETRIC METHOD-- RENODRY WILL UTILIZE A SARTORIUS MA35 MOISTURE ANALYZER TO WEIGH EACH MASONRY SAMPLE, DRY IT AT 105 DEGREES C, AND THEN RE-WEIGH THE SAMPLE, THUS DETERMINING THE EXACT WEIGHT % MOISTURE OF THE MASONRY WALLS.



SARTORIUS MA35 MOISTURE ANALYZER

EXAMPLE OF MASONRY CORE SAMPLE BEING WEIGHED,
DRIED OUT AND RE-WEIGHED FOR MOISTURE ANALYSIS.



SARTORIUS MA35 MOISTURE ANALYZER

THE MEASUREMENT RECORD OF MASONRY MOISTURE AND CLIMATE REPORT WILL DEMONSTRATE THE MOISTURE FINDINGS. THE MASONRY MOISTURE MEASUREMENTS WILL VERY LIKELY CONFIRM A SERIOUS AND ADVANCED CASE OF RISING DAMP IN THE COUNTY COURTHOUSE AS INDICATED BY THE GANN HYDROMETER TESTS THAT WERE PERFORMED UPON INITIAL INSPECTION.

INDICATORS OF RISING DAMP IN THE COURTHOUSE:

The presence of salt/calcium efflorescence, crumbling mortar, disintegration of brick, masonry and mortar along with wet spots on the wall surface areas inspected accompanied by high Gann Hydrometer readings from the County Courthouse foundation, are extreme indications of the excessive penetration of rising damp. (See photos below)

Several wall structures in the lower level areas, were being eroded by the salts that have risen in the capillary systems of the masonry, brick and mortar. The salts can only rise so far up the wall, and are then pressed to the surface of the wall. This causes the paint to separate from the wall, mortar joints and masonry to crumble and disintegrate. The salt has no ability to escape; therefore it will, by high salt expansion pressures exerted, exit through the wall surface leaving ruptured paint, decayed mortar, spalling brick and disintegrated masonry on the floor.

THERE ARE SEVERAL NOTED PROBLEMS IN THE LOWER LEVELS OF THE BROOKINGS COUNTY COURTHOUSE.

- RISING DAMP SYMPTOMS VISIBLE ON EXTERNAL AND INTERNAL MASONRY WALLS THAT COULD BE SEEN TO INSPECT. WALL DISCOLORATION, SALT EFFLORESCENCE, PEELING PAINT, WET SPOTS, AND DISINTEGRATING MASONRY/ MORTAR IN THE VAULT AND MECHANICAL ROOMS.
- HIGH CONDUCTIVITY READINGS ON EXTERNAL AND INTERNAL MASONRY WALLS THAT COULD BE REACHED TO MEASURE DURING THE INSPECTION.

- HEAVY SALT/CALCIUM EFFLORESCENCE WITH AGGRESSIVE MASONRY MORTAR DECAY, CRUMBLING AND DISINTEGRATION. EVIDENCE OF SHEDDING OF BRICK AND MORTAR.
- CRACKS AND WET AREAS IN EXTERIOR BASEMENT WALLS AND FLOORS DISPLAYING LATERAL WATER INGRESS.
- RISING DAMP LEVELS 2 TO 5 FEET ABOVE BASEMENT FLOOR AND CONDUCTIVITY READINGS FAR HIGHER THAN NORMAL DUE TO HIGH WATER SATURATION LEVELS.
- MASONRY AND MORTAR DECAY EXCESSIVE IN INSPECTED BASEMENT LEVEL AREAS. INSPECTED AREAS INDICATING SIMILAR OR POSSIBLY WORSE CONDITIONS IN REST OF FOUNDATION. CRACKING AND DISINTEGRATION OF INTERNAL FREE-STANDING MASONRY WALLS AND PILLARS.
- SALT NESTS ON BRICK AREAS OF WALL SURFACES. SALT WITH RISING MOISTURE IN SEVERAL AREAS IN LOWER LEVEL AREA OF COURTHOUSE.

Conductivity Test Results with Photographic Evidence
BROOKINGS COUNTY COURTHOUSE

*MASONRY WALL DISINTEGRATING FROM EXCESSIVE SALT PENETRATION.
PAINT PEELING FROM SALT BEING PRESSED TO THE SURFACE.*



*FREE-STANDING INTERIOR WALL SHOWING BUBBLING, PEELING PAINT.
MASONRY BEGINNING TO SPALL FROM ADVANCING RISING DAMP.*



EXTREME HYDROMETER READINGS OF 139.8 FROM MOISTURE CLIMBING UP MASONRY WALL. MASONRY FOUNDATION BEING COMPROMISED BY SALTS



INTERIOR MASONRY WALL – MOISTURE RISING ABOVE GROUND LEVEL RESULTING FROM RISING DAMP. SALT NESTS THROUGHOUT WALL STRUCTURE.



A VERY HIGH MOISTURE READING 5 FEET UP FREE-STANDING WALL.
MASONRY SPALLING, PAINT PEELING, MOISTURE RISING WITH SALTS.



THE SATURATING EFFECT OF RISING DAMP WHEN IN THE ADVANCED STAGES,
NOTE DISINTEGRATED MASONRY ALONG BASE OF WALL.



INTERIOR FREE-STANDING BLOCK WALL SHOWING MOISTURE LEVELS ARE VERY HIGH FROM RISING DAMP WITH SALT NESTS FORMING.



SUPPORT COLUMN IN COUNTY RECORDS VAULT AREA WITH EXCESSIVE MOISTURE READINGS FROM RISING MOISTURE.



SUPPORT COLUMN FOUNDATION WITH NEW CONCRETE SLAB COVERING THE DISINTEGRATING FOUNDATION.



HYDROMETER READING OF COLUMN FOUNDATION IN ABOVE PHOTO. EXCESSIVE SALT AND MOISTURE COMPROMISING COLUMN FOUNDATION.



SOLUTION

A RENODRY DEHYDRATION SYSTEM SHOULD BE INSTALLED IN BROOKINGS COUNTY COURTHOUSE TO PERMANENTLY HANDLE THE RISING DAMP PROBLEM AND DRY OUT THE FOUNDATION WALLS.

(SEE RENODRY PHOTO BELOW)

THE RENODRY WILL EFFECTIVELY ELIMINATE ALL RISING DAMP FROM THE COURTHOUSE EVEN THOUGH THE STRUCTURE HAS MULTIPLE THICK WALLS TO DEHYDRATE. THE APPROXIMATE GROUND LEVEL SQUARE FOOTAGE OF THE COURTHOUSE IS 6,600.

EXAMPLE OF THE LARGEST RENODRY TAKEN AT THE OLDEST OBSERVATORY IN MINNESOTA. LOCATION: NORTHFIELD



THE RENODRY DEHYDRATION SYSTEM

Rising damp is a major concern for building owners and constitutes a high percentage of humidity and moisture issues in buildings like Brookings County Courthouse. Left unresolved it will be the cause of untold structural damage, significantly reducing the value and life span of a building. It is also a well-known fact that health risks exist for the occupants of buildings which carry wall moisture causing potential liability for building owners as well as the buildings occupants.

The RENODRY wall dehydration system is a basic passive antennae apparatus based on 1950's military communication's technology. It was further developed by Sandor Levai, a Hungarian engineer, to focus frequencies collected from the broadband of frequencies that then disrupts the electrostatic attraction between water and masonry. It is a passive (not electrically connected) system of receiving and transmitting antennas. The heart of the system is a set of spiral antennas mounted inside a resonant case.

The system powers itself by harnessing stray RF (Radio Frequency) energy from the environment (from TV and radio broadcasts, Wi-Fi or mobile signals etc.). In addition, the system utilizes the Earth's magnetic field. This or similar powering methods are widely used for wireless low energy circuits such as weather sensors located in harsh environments (e.g. for climate data collection, wildfire control and detection etc.) where other energy sources are not feasible.

Renodry USA installs this rising damp solution that eradicates rising damp from any building made out of brick, stone or other masonry materials and keeps the building dry permanently from rising damp. The system is installed with relative ease by a trained Renodry engineer, taking approximately 1 day for a building the size of the Brookings County Courthouse. No construction nor wall-cutting work is needed and is never necessary. Business can carry on as usual during installation.

*With the Renodry in place and working, gravity can now push the water back down into the ground establishing masonry moisture equilibrium. As this occurs, some of the water in the masonry is released through the wall in vapor form causing the wall to desalinate. There are no batteries nor electricity needed which makes the system both eco-friendly and cost-efficient. Because the Renodry has no moving parts, being a passive receiving/transmitting antennae, it requires no on-going maintenance and will keep working for decades during which time the building will continue to be free of rising damp and will remain dry. **Remediation and repair efforts should not take place until the building is dry.***

Once the Renodry is installed, you are entitled to two free inspections over the next 3 years. A detailed report is provided by the Renodry engineer showing precise comparative measurements from the point of installation through to the complete drying out phase.

THE DEHYDRATION OF MASONRY WALLS

As the building dries out, it will go through a 1-3 year phase of dehydration. The first year or so takes place in the area called the evaporation zone or salt band. Due to the salt content of the masonry, water will evaporate upwards and sideways. This will result in even more salts (efflorescence) and the wall surfaces may temporarily look worse (damper, saltier). However, this means the walls are drying out. Amounts of salt and water can vary greatly from one wall to the next, therefore, walls dehydrate at differing rates. This typically takes 3-36 months, depending on water saturation, salt content and wall thickness.

*Because of the wide variables of salt and water content in masonry walls suffering from rising damp, a full dehydration of the building can take 2 to 3 years. Most masonry moisture and dissolved salts gradually migrate back into the ground through the wall's capillary system (desalination), but may continue to push through the wall surface, as well. The more salt that is present in a particular wall, the longer the salt will continue to crystalize and push to the surface as the water exits the wall during dehydration. Periodic cleaning of the salts from the wall surface is recommended as the walls dry out. Once no more salts are seen exiting the surface, this will indicate the wall has completed its desalination. **At this point, walls can be remediated and repaired.***

DEHYDRATION SIGNS

Dehydration may be accompanied by one or more of the following signs:

- Wet spots and salt marks on walls may increase (and often does) during all stages of dehydration
- Elimination of any unpleasant musty odors
- Walls look lighter in color
- Flaking and crumbling of paint and/or plaster in the salty wall areas
- Walls feel warmer to the touch due to lower heat loss
- Plaster feels drier and sandier to the touch

Once the Renodry Dehydration System is installed, it should be left in place and not tampered with. Allowed to perform its function, the building will dry out and eventually be free of all rising moisture for decades.

There is a 3 year drying-out guarantee with a 25 year warranty on the Renodry. This guarantee and warranty is unmatched in this industry. With 28 years international experience in dehydrating old buildings utilizing this Hungarian technology, you can be assured your buildings will remain dry, creating a healthier environment now as well as for future generations of staff and county residents at the Brookings County Courthouse.

Report submitted by Michael Clancy of Renodry USA. For any questions, please contact Michael at 612-554-1863. Email: michael.8clancy@gmail.com



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