

EX'D.

Ottawa, November 17, 1936.

Reverend Sir:

During a visit of Mr. Sutherland, of this Department, to the Shubenacadie Indian Residential School, last summer, he discussed with Rev. Sister Mary Charles the matter of supplying a hot water sterilizer for use on the third floor of the building.

The Department will approve of you arranging for the purchase of a sterilizer, No. 2411, for \$133.00, as described on the enclosed sheet. You should obtain an account, in triplicate, covering the cost, which you should certify in the usual manner and forward for payment.

Yours truly,

T.R.L. MacInnes

T. R. L. MacInnes,
Acting Secretary.

J.P.
Encl.

TAM

Rev. J. P. Mackey,
Principal,
Indian Residential School,
Shubenacadie, N. S.

WESTERN WATERPROOFING COMPANY

WATERPROOFING, WEATHERPROOFING, GUNITE
PRESTRESSED CIRCULAR STRUCTURES

ENGINEERS AND CONTRACTORS

1440 ST. CATHERINE ST. WEST
MONTREAL

Your File 51-0-5

INVOICE No. 3259

YOUR ORDER No. 1. Sept. 21 H.W. McGill \$1656.00
2. Oct. 9 R.G. Orr \$500.00
OUR CONTRACT No. M.666-36 3. Oct. 19 R.G. Orr \$150.00

DATE November 17th, 1936.

SOLD TO Department of Indian Affairs

ADDRESS Ottawa, Canada

WORK AT Indian Residential School
Shubenacadie, Nova Scotia

TERMS Net

DESCRIPTION	CONTRACT PRICE	INVOICED	CASH RECEIVED	BALANCE DUE
To Waterproofing face of front wall 184 ft. x 45' high 8280 sq.ft. authorized letter from Mr. McGill dated Sept. 21st, 1936.	20¢/sq.ft.	1656.00		
Waterproofing face of east wall 2790 sq.ft. say 2500 sq.ft. authorized letter from Mr. Orr dated October 9th, 1936.	20¢ unit	500.00		
Waterproofing parapets Chapel, and north and west walls of School, authorized letter from Mr. Orr dated October 19th, 1936		150.00		
		<u>\$2306.00</u>		

TRS/S

Indian Affairs. (RG 10, Volume 6055, file 265-5, part 4)

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TELEGRAM		CABLEGRAM	
FULL RATE		FULL RATE	
DAY LETTER	DL	CODE	CDE
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W. D. NEIL, GENERAL MANAGER OF
COMMUNICATIONS, MONTREAL.

RAA36 10 RUSH

STANDARD TIME

108
1936 NOV 18 AM 11 16

C MONTREAL QUE 18 1112A

R GUERNEY ORR

ARCHITECT DEPT OF INDIAN AFFAIRS OTTAWA

PLEASE HOLD OUR INVOICE FOR CORRECTION MAILING TODAY RE

SHUBENACADIE

WESTERN WATERPROOFING COMPANY

DK

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TELEPHONE
HARBOUR 9584

WESTERN WATERPROOFING COMPANY

WATERPROOFING CONTRACTORS

519 KEEFER BLDG.

MONTREAL

QUEBEC



M.666-36

November 18th, 1936.

Mr. R. Gurney Orr,
Architect,
Department of Indian Affairs,
Ottawa.

Re: Indian Residential School
Shubenacadie, Nova Scotia

Dear Mr. Orr:

We are sending a corrected invoice on our work completed in Shubenacadie. After all the heavy rains recently there was apparently no trouble from leakages on the walls which were not waterproofed, however, the rear of this School, also the east wall of Chapel, certainly should be waterproofed next spring. The caulking which we did in the joints of the coping has given considerable protection - there was undoubtedly a great deal of water coming through these joints.

We trust that you will be completely satisfied with our work and that we may have the pleasure of working with you in the future.

Yours very truly,

WESTERN WATERPROOFING COMPANY

T.C. Creaghan
T.C. Creaghan

TCC/TRS

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51-0-5

R

file

Ottawa.
Nov. 19, 1936.

Dear Father Mackey,-

I am enclosing herewith the account for the water-proofing of the Shubenacadie Indian Residential School recently carried out.

If the work has been satisfactorily performed I would ask you to please certify to this account and return it to me.

I would be glad to have a line from you as to the progress that is being made in the boys' recreation room and also the results of the water-proofing.

Yours very truly,

R. Gurney Orr.
Architect for the Department.

Rev. Father Mackey,
Principal, Shubenacadie Indian School,
Shubenacadie, N.S.

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TELEPHONE
HARBOUR 9584

WESTERN WATERPROOFING COMPANY

WATERPROOFING CONTRACTORS

510 KEEFER BLDG.

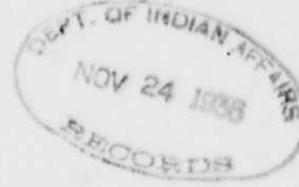
MONTREAL

QUEBEC

November 23rd, 1936.

M. 666-ex.

Mr. R. Gurney Orr,
Architect,
Department of Indian Affairs,
Parliament Buildings,
Ottawa.



Re: Indian Residential School, and Chapel
Shubenacadie, Nova Scotia

Dear Sir:

Following our letter of the 18th instant recommending waterproofing of additional areas on the above School and Chapel, we have just received our final report from our Superintendent, and he states that on the other walls the costs would not be so high due to the fact that there will not be as much repointing necessary, and only a few bricks to be replaced. We can, therefore, quote you a price of fifteen cents per square foot\$0.15 per sq.ft. for these areas.

This work could not be commenced until next spring, but we think you would be very well advised in having this work done early next summer.

Yours very truly,

WESTERN WATERPROOFING COMPANY

T.C. Creaghan
T.C. Creaghan

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CLASS OF SERVICE	SYMBOL
Full-Rate Message	
Day Letter	DL
Night Message	NM
Night Letter	NL

If none of these three symbols appears after the check (number of words) this is a full-rate message. Otherwise its character is indicated by the symbol appearing after the check.

CANADIAN NATIONAL TELEGRAM



D. E. GALLOWAY, ASSISTANT VICE-PRESIDENT, TORONTO, ONT.

Exclusive Connection
with
WESTERN UNION
TELEGRAPH CO.
Cable Service
to all the World
Money Transferred
by Telegraph

MOA168 21 COLLECT

STANDARD TIME

36 NOV 19 PM 2 33

SHUBENACADIE NS 19 301P

SECTY DEPT INDIAN AFFAIRS

OTTAWA ONT

FIRE BROKE OUT ELEVEN FORTY FIVE AM IN BOILER ROOM DAMAGE

TO FLOOR AND WALLS IN CHAPEL REPORT TO FOLLOW

REV J P MACKEY..

This is a Collect message and
will be charged to your account
unless we are notified at once to
the contrary.

*copied
12/28*

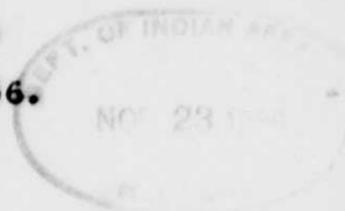
B

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57-0-5
Indian Residential School,
Shubenacadie, N.S.
November 20th, 1936.



[Handwritten signature]
Dear Sir:-

I beg to submit the following concerning the fire which we had here on November 19, 1936.

About 11.45 A.M., a Sister came to my room, at the time I was in the bath-room, and shouted to me that there was a fire in the boiler room. Within a very short time I was in the boiler room, the place was full of smoke, and I could see flames behind the boiler near the outside wall. I got the hose off the rack and ran with it to the garage to get away from the smoke. By that time, Father Brown, Stewart Cooper and some of the bigger boys were there. Asking them to get the water turned on, I left to come up to the office, telephoned to the Central Office and asked her to get us what help she could. I went back to the boiler room but they could not get water through the hose. We found out afterwards that any sharp bend in the hose would prevent the water from coming through. Seeing that we were not getting anywhere with that hose, I came back to the first floor and put the hose from that rack out the window in order to get at the fire, which was greatest in the corner made by the Chapel wall and roof of the coal bin. In the meantime, McLeod had gone to the pump house, started the second pump, and stepped up the pressure. We got very little water from the hose on the first floor - no pressure. (Found out afterwards that the bushing that the valve stem turns through was cracked and would allow stem to turn without opening plunger.

While this was going on, a great crowd had arrived from the village, including the two members of the R.C.M.P., and all the buckets in the house and other utensils were used. It was not very long before the fire in the boiler room was just smoldering. But the fire had made its way up alongside the small crack between the sheet metal covering of the boiler room, at a point where the sheet metal meets the I beam, and worked its way along the I beam into the two-by-six which rest on edge on the I beam. The only way we could get at it was from above, on account of the sheet metal being nailed to the two-by-six, and this necessitated cutting into the floor of the Chapel. By one o'clock it was a matter of locating those places between floors which were slowly burning.

The fire wood was put in the boiler room sometime during the month of June, when there was no fire in the boiler, and there is no doubt but that what was left of it, should have been removed when the

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COPY

fire was started in the boiler. Nevertheless, there has been wood in the same place year after year and no fire. There are some things which lead me to believe that the fire was not started from any spark from the boilers. It has always been a problem to prevent boys from making their way to the boiler room, in order to have a smoke, and it has happened that whatever they should be smoking, would be thrown away, should anyone come along.

As far as we can find out at this time, Gilbert Francis was told to shake up the fire about ten forty-five. At eleven o'clock, Ed McLeod, carpenter-engineer, went to the entrance of the boiler room to get the boy, but he was not there and he did not notice any fire at the time. Gilbert Francis was the only boy who was supposed to be in the boiler room that morning. There were a few boys at the barn, but as yet I have not had time to check up on them.

Before closing I wish to express my sincere thanks to the men of Shubenacadie for the ready response and for their strenuous efforts to help us out of a most serious situation.

Yours truly,

R. J. P. Mackey

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B

Indian Residential School,
Shubenacadie, N.S.
November 23rd, 1936.

Mr. E. Gurney Orr, Architect,
Dept. of Indian Affairs,
Ottawa

Dear Mr. Orr:-

As for the work on the boys' end of the building, we got the bricklayer, Addison Miller, started on the 31st of October. Mr. Thompson, the other bricklayer, was working and we could not obtain his services. With only one bricklayer at work, the progress was slow. So I got in touch with Mr. Purdy, M.P., and he told me that he would get two men for me. They did not arrive at the time they stated they would, but he telephoned to say that they would be along the first of the next week. Something must have happened for they did not come. The Western Waterproofing people had two bricklayers among their men, and as the weather was such that they could not work outside, I took the liberty of employing them at the rate of pay they were receiving from the Company, viz., fifty-five cents an hour.

With the exception of some trimming up by McLeod, the work was finished on November 19th, the day of the fire. I think we have had a good job done, although the cost will be in excess of what I thought it would be. Perhaps we here can absorb the wages and help out a little, roughly about \$150.00. I am hoping that you will come to look over the fire damage and see the other work also.

Yours very truly,

Rev. J. P. Mackay

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Indian Residential School,
Shubenacadie, N.S.
November 23, 1936.

Mr. E. Gurney Orr,
Architect,
Dept. of Indian Affairs,
Ottawa.

Dear Mr. Orr:-

I am returning the account of the Western
Waterproofing Company for the work of waterproofing
done here.

Since the work has been done, no water
has come through. I think the real test will
come during the spring months. So far it has been
satisfactory.

Yours very truly,

Prof. P. Mackay

Indian Affairs. (RG 10, Volume 6055, file 265-5, part 4)

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Vote No.

Treaty No.

DEPARTMENT OF INDIAN AFFAIRS

To..... **Western Waterproofing Co.,**

1440 St. Catherine St., West,

Montreal, Que.

DATE	SERVICE	AMOUNT
Nov. 30	To waterproofing walls at the Shubenacadie Indian Residential School, as per attached account.	\$2,456.00
<p>THIS DATE FOR FILE Voucher - duplicate attached for Accountant to pay.</p> <p>2-12-36</p> <p>3</p>		
TOTAL,		

I HEREBY CERTIFY that this Voucher is correct, that the material has been supplied, the work performed and that the charges are fair and just; also that the expenditure has been incurred legitimately and that each item of the same is a fair and just charge against the Government of Canada.

[Signature]
Architect

[Signature]

FORM No. 506

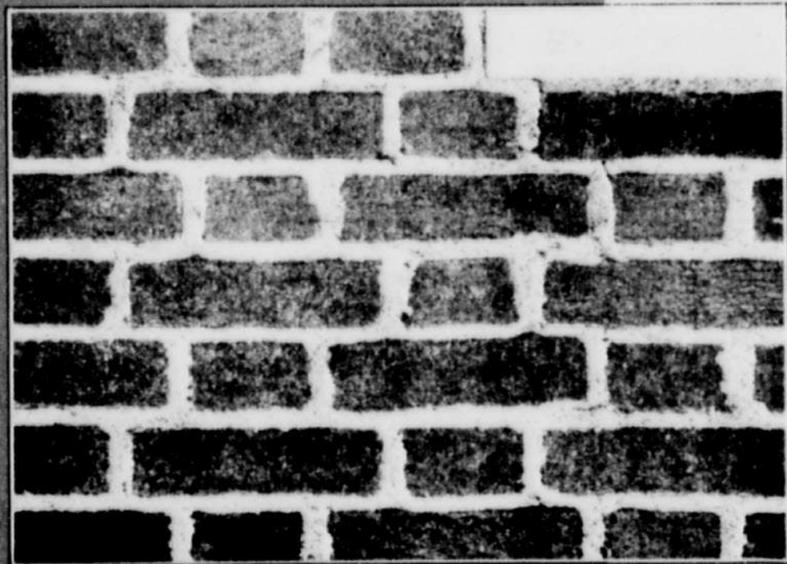
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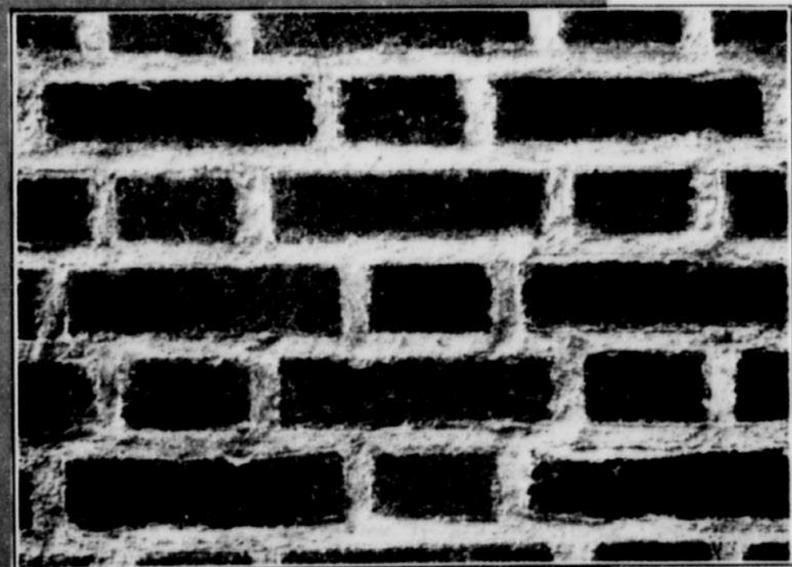
POOR
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Painted plaster wall showing results of leaks.

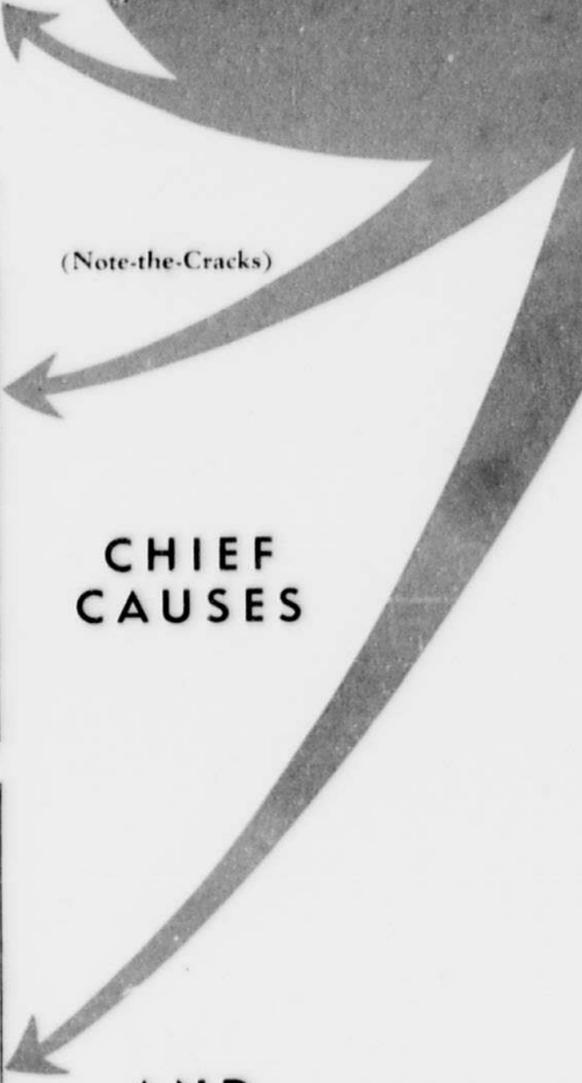


Typical Unrepaired Wall (openings estimated at 1/2 of 1% of total wall area)



Openings closed with Resto-Crete

WET WALLS



(Note-the-Cracks)

CHIEF
CAUSES

AND
THE REMEDY

RESTO-CRETE

Resto-Crete System Patented in
Canada and United States

Waterproofing Masonry Walls—A. I. A. File 7-A-3

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Leaks from Faulty Joints and Oth

The main cause of the disintegration of concrete and masonry is water penetration, which washes out the salts from the masonry and causes fracture from frost action, and corrosive action from the acids in the air. Also, in the case of reinforced concrete structures, the water corrodes the reinforcing steel resulting in swelling of the steel and consequent fracture.

18% to 20% of a brick wall surface consists of joints

It follows then that faulty workmanship, shrinkage and disintegration of mortar cause about 75% of all cases of leaky walls, and it is no wonder when as much as 20% of the surface is subject to mortar shrinkage and disintegration.

Rain finds easy entrance, for even during a gentle shower there is a measurable film of water constantly flowing over an exposed wall. But when driven by a strong wind, the flow of water into the cracks is almost as if the water flowed over a horizontal surface.

In dry cold weather the heat loss through the openings in brick joints is a very serious factor. In wet weather the walls lose a large part of their insulating value.

THE PURPOSE OF RESTO-CRETE

It is the purpose of Resto-Crete Material and Service to make walls a "uniformly dense face of masonry," impervious to the entrance of moisture, but permitting of wall "breathing," mentioned later.

If the material of the defective masonry wall is dense and highly resistant against moisture, then a treatment of the **joints only** will be necessary.

If the bricks, stone or other material are soft, porous and show noticeable signs of flaking, checking, or other evidence of water penetration and disruption by freezing or other disintegration, then an **over-all treatment** is advisable.

All concrete and masonry structures show some disintegration in the course of years. This may be very slow for a great many years, then suddenly accelerate. The location of the cause of disintegration and determination of the cure is the work of a specially trained organization.

Thorough examination is of first and vital importance.

WHAT WE DEMANDED OF RESTO-CRETE

Any material and method of restoring disintegrated masonry, to be efficient, must conform to the specifications, laid down more than 75 years ago by a group of scientists, for the requirements of waterproofing materials:

1. The material must penetrate easily into the masonry surface and remain there on drying.
2. The material must not concentrate on the surface so as to form a hard crust, but at the same time it must harden the surface sufficiently to resist erosion. (It must densify the surface by filling the holes and must subsequently become hard).
3. The material must prevent the penetration of moisture, and at the same time allow moisture to escape. This is possible because water as liquid will not penetrate where as vapor it will escape. Furthermore it is possible for a wall to absorb a proper amount of moisture without admitting seepage. This "breathing" of a wall is necessary to prevent disintegration or rotting of the material internally. This is probably the most important consideration of a waterproofing.
4. The material must not discolor or in any way alter the original appearance of the surface.
5. The material must expand and contract uniformly with the surrounding surface so as not to cause flaking.
6. The material must be non-corrosive and harmless in use.
7. The material should retain its preservation effect indefinitely.

Resto-Crete Embraces ALL the Requirements of a Satisfactory Job

When the foregoing specifications for waterproofing materials were laid down, the scientists went beyond the available materials of their day. Some materials accomplished a part of the specifications but none accomplished ALL of them. It was only by making a long study of the merits and demerits of various materials that a compound of materials was discovered that fulfilled ALL the specifications.

RESTO-CRETE MATERIAL and

Indian Affairs. (RG 10, Volume 6055, file 265-5, part 4)

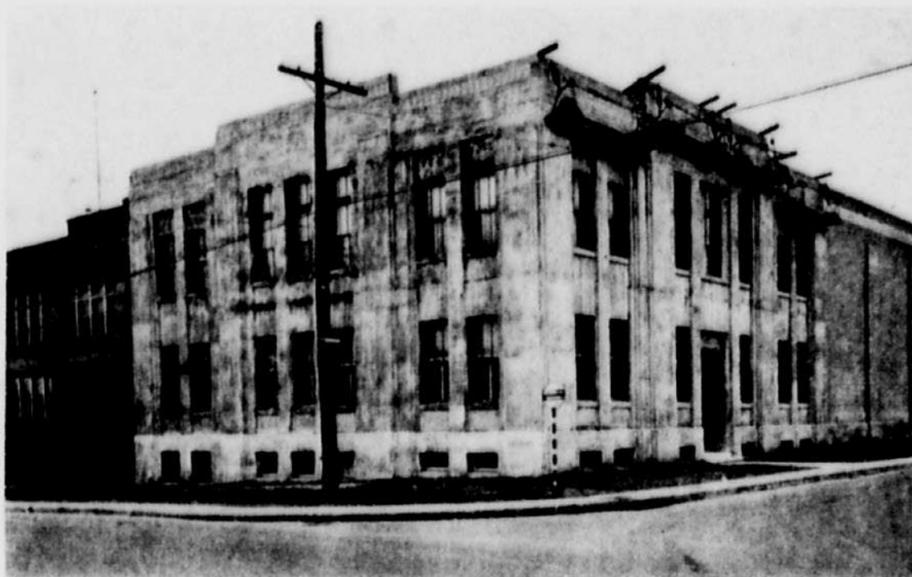
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er Causes Stopped Permanently

Resto-Crete Material is guaranteed to accomplish ALL the requirements of a satisfactory job.

Resto-Crete Material penetrates without concentrating on the surface. It is impervious to seepage but sufficiently receptive to permit the required ingress of air and egress of vapors to insure proper wall breathing. It not only will not discolor a wall, but it perfectly identifies itself with the material of the wall in color and texture, and adds density and permanence. Its coefficient of expansion is made identical with the wall in which it is incorporated, when properly handled. It forms no skin or crust to crack, no oil to dry out is used, no shrinkage of mortar. Resto-Crete does not mar but actually improves the appearance of a building.

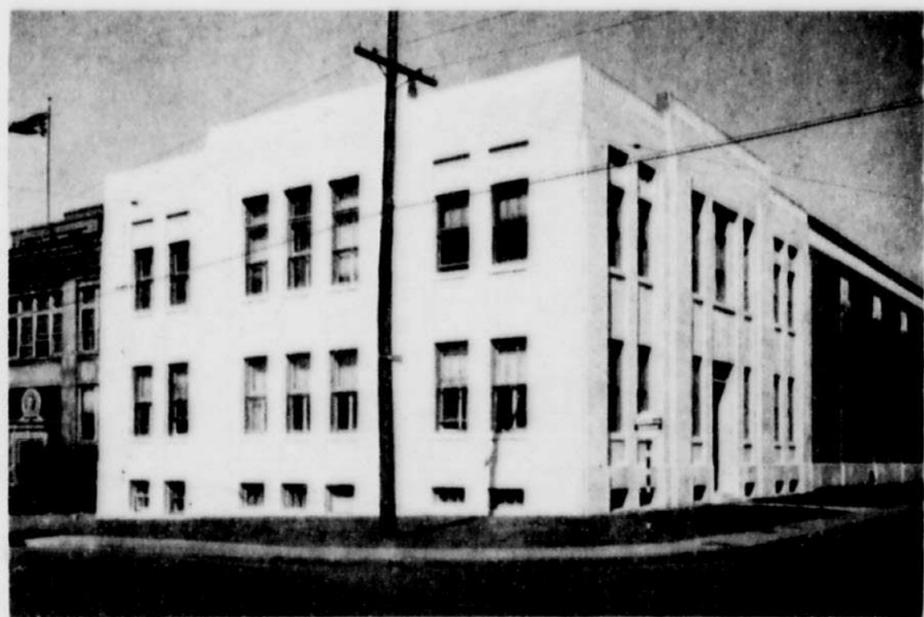


BEFORE TREATMENT — Associated Screen News Building, Montreal.

RESTO-CRETE SERVICE

The Western Waterproofing Company for twenty-one years has maintained an organization of specially trained men who have devoted their lives to the solving of all types of waterproofing problems. It was only after Resto-Crete was thoroughly time-tested that it was offered to the public.

The Western Waterproofing Company's Service is found not only in its material, but in its trained men. They are available for a thorough analysis of your water problems. They are capable of correcting the faults efficiently and permanently by the Resto-Crete Method.



AFTER TREATMENT — Beauty, protection and permanence given monolithic reinforced concrete structure without added plaster or skin coat. Building designed by the Engineering Staff of the Canadian Pacific Ry. Co.

FOR PRESERVATION AS WELL AS RESTORATION

Many architects insure themselves against water troubles that too often discredit a splendid job, by specifying Western Waterproofing Company's RESTO-CRETE treatment for the exterior walls, before the building is turned over to owners.

Efficiency is best served by using that system which meets **ALL the requirements of a perfect job.**

Kinds of Structures

Resto-Crete is applicable to brick, stone of all kinds, concrete, stucco, concrete block, Haydite block, etc., The Resto-Crete Material comes in eight standard colors and in white and black.

No temporary calking, pointing or painting can approximate the lifelong satisfaction to the owner of a building waterproofed by Resto Crete. **Once done, it is permanent.**

(See References Back Page)

SERVICE

WESTERN WATERPROOFING COMPANY

1440 St. Catherine St. West, Montreal

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REFERENCES:

Among the many Resto-Crete jobs, covering a wide field, we cite the following where we have had repeat orders:

Canadian National Railways: Express Bldg., Montreal
Hotel & Station, Halifax, N. S.
Hotel, Charlottetown, P.E.I.

Canadian International Paper Co.: Mills
Dalhousie, N.B.
Three Rivers, Que.

The Bell Telephone Co. of Canada: Exchanges
Lachine, Que.
Quebec, Que.

Neurological Building—McGill University

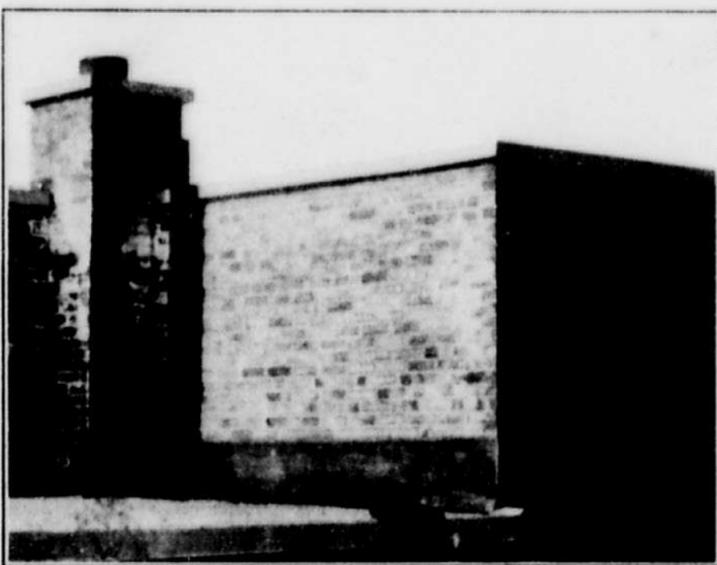
Montreal Harbour Commissioners: Elevator No 2 and many other jobs.

As an example of repeat business in the waterproofing field over a longer period, we would mention the following jobs done by three American Western Waterproofing Companies associated with us

Southwestern Bell Telephone Co.
St. Louis, Missouri, office and 50 exchanges.
Michigan Bell Telephone Co.
Detroit, Michigan, office and 35 exchanges.
Southern Bell Telephone Co.
Atlanta, Ga., office and 15 exchanges.



Complete Resto-Crete job on brick, mortar, artificial stone and concrete.



Showing improved appearance by elimination of efflorescence.



About half the complete surface shown has been weatherproofed with Resto-Crete without altering appearance.

WESTERN WATERPROOFING COMPANY

1440 St. Catherine St. West, Montreal

IRONITE WATERPROOFING, RESTO-CRETE WEATHERPROOFING,
MASONRY & CONCRETE RESTORATION, GUNITE FIREPROOFING

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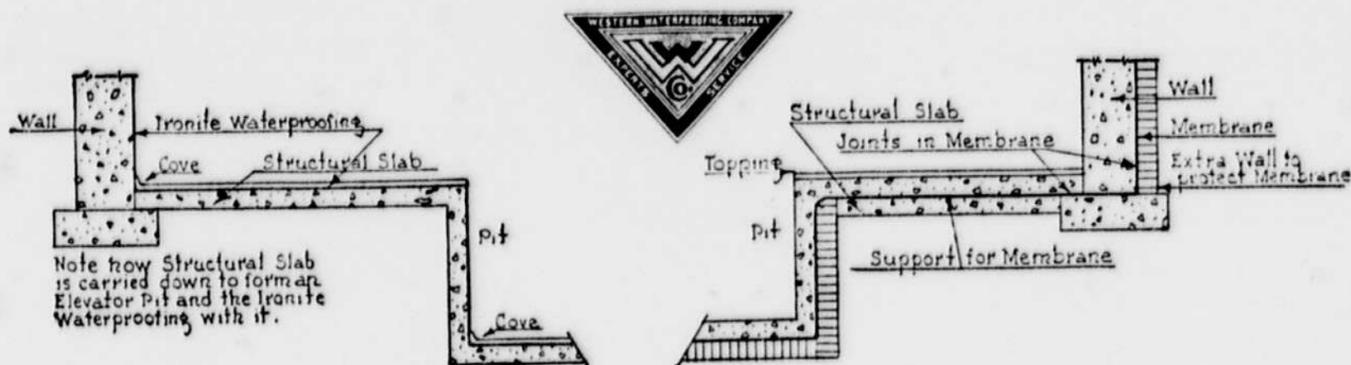
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A Comparison of Waterproofing Methods

Showing the

Real Economy of the Western Waterproofing Company's System Using Ironite



With Ironite

No Joints or Seams.

Ironite Coating Can Be Punctured and Easily Repaired.

A Leak Can Be Immediately Seen and Remedied.

No Protecting Wall Required.

No Extra Excavating or No Back Filling Required.

No Supporting Floor Slab to Carry Waterproofing Required.

Can Brace Outside Forms from Inside. This (in Some Instances) Effecting Large Economies.

Can Be Applied to Wet Surface and Under-Water Condition.

Ironite Applied in One Operation After Walls and Floors Are in Place—Thus Avoiding Any Delays in Construction. Applied Exclusively by Our Own Experienced Mechanics.

With Membrane

Many Joints Which Have to Be Carefully Made.

A Punctured Membrane Is Difficult to Repair.

If Leaks Develop There Is No Telling Where They Come From.

A Protecting Wall Is Required.

Extra Excavation and Back Filling Is Required.

Necessary to Lay Floor Slab to Support Membrane.

Impractical with Membrane System.

Impractical with Membrane System.

Membrane Applied in Three Operations: (1) Footings; (2) Walls; (3) Floors—Thus Necessitating Some Delay in Construction Applied by Any Roofer Often Inexperienced as to Waterproofing.

Are Not the Odds Greatly in Favor of Western Waterproofing Co.'s System?

Entirely Aside From Cost of Actual Waterproofing, Is There Not a Large Saving in Construction Costs?

WESTERN WATERPROOFING COMPANY

120 YORKVILLE AVE.
TORONTO
ONT.

410 KEEFER BLDG.
MONTREAL
QUE.

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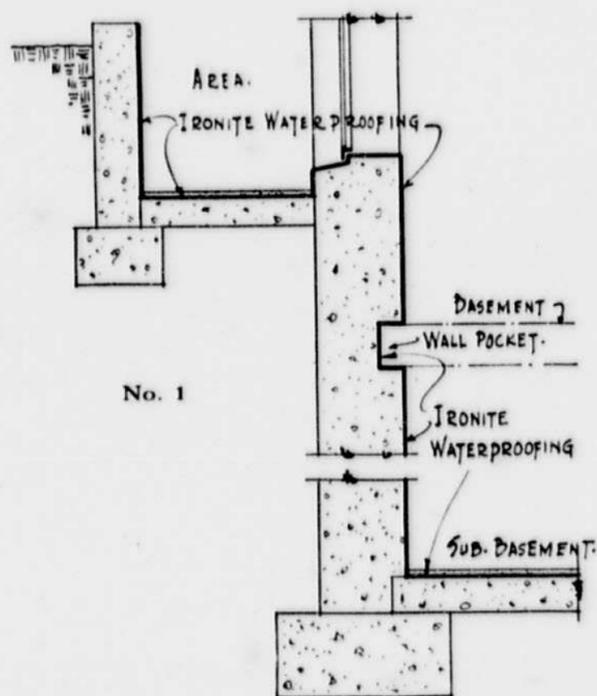
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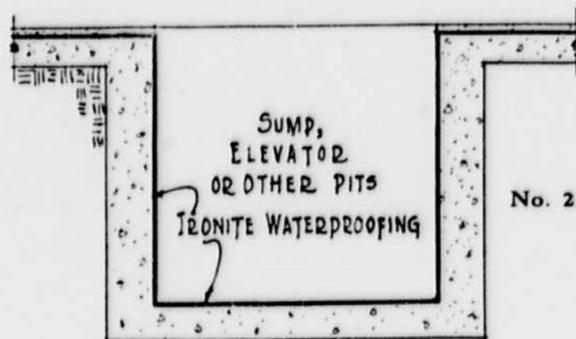
WATERPROOFING DETAILS

A few details of special problems common to waterproofing are shown here diagrammatically, but there are many others too numerous to cover: For example, waterproofing under interior columns; designing watertight vibration joints for a press foundation in a newspaper building; waterproofing cable pits with fibre ducts; suspended slabs as in sidewalks and roofs; expansion joints; these and many more. It is our hope that you will communicate with us on any problems whether more or less involved than these, that we may put our experience at your disposal. Due to the great number and variety of our installations, we have successfully overcome almost every type of waterproofing problem.

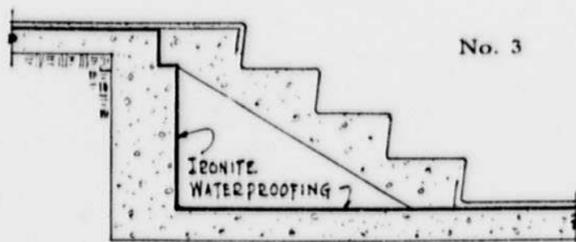
Diagram No. 1 shows the manner of carrying the waterproofing into the wall pocket for



the basement floor on a multi-basement building. It also indicates how the waterproofing is made continuous when areaways and areaway windows are encountered.



No. 2 is a typical pit waterproofed. Note here that the floor of the pit has no topping over the waterproofing, as no wearing occurs here. On the main floor level, however, the topping appears and is needed for wear.



No. 3 shows the best way for waterproofing interior stairs by carrying the treatment under and behind the stairs. If necessary the treatment could be applied to the treads and risers of the stairs, but for economy and best results we recommend doing the waterproofing as shown.

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Services

All work is done exclusively under contract and guaranteed to be and remain watertight. We sell no materials. Each office has a corps of trained mechanics working under the supervision of an engineer.

Contracts are taken for Treating Structures of Concrete, Brick or other Masonry, either old or new. Architects or engineers are invited to call our Waterproofing Engineers in for consultation to assist them in the solution of problems involving Waterproofing, Damp-proofing, Oilproofing, Restoring Disintegrated Concrete, etc.

Method Used

This system involves the use of Ironite Waterproofing, which is a finely pulverized gray iron containing chemicals. Upon brushing this on the walls with the addition of water, the particles are lodged in the surface pores. Due to the chemicals, rapid oxidation of the iron takes place with the resultant expansion of the iron particles. This swelling completely fills the surface pores and seals them against leakage. Sufficient coatings are applied to thoroughly fill all pores. The early coats make a filling or stuffing for the surface pores, and the succeeding coats form a highly oxidized iron filament. This iron oxide surface is extremely dense and impervious, not alone to the action of water, but also to oils, dilute acids, etc.

The treatment is applied on either the pressure side or the side opposite. In the latter case it is impossible to force the waterproofing away from the wall as the particles inside the surface pores have expanded therein and are an integral part of the structure.

Advantages of This Method

Our system is a positive one, requiring no assistance from integral compounds in the concrete. The bond secured between the waterproofing and the structure is so perfect that it will resist any hydrostatic pressure the structure is capable of withstanding. See comparison shown on front page and note the large saving in construction cost.

Character of Work

WATERPROOFING—Basement walls, floors, tunnels, powerhouses, subways, pits, swimming pools, reservoirs, dams, retaining walls, viaducts, etc.

TREATMENT—Fuel oil tanks, gasoline and lighter oil tanks, molasses tanks, pickling vats, unusual oil containers, etc.

ACIDPROOFING—To resist soaps, greases, fats, etc. Treating floors and walls of packing houses, soap factories, tanneries, dairies and other structures, requiring protection against dilute acids.

RESTO CRETE—A process for restoring disintegrated concrete and preserving it from further disintegration.

Is Useful for

**BASEMENTS, PITS,
TUNNELS,
SWIMMING POOLS,
WATER TANKS.**

✱
**OIL TANKS;
PROTECTING CONCRETE
from GREASE, FATS, ETC.**

✱
**RESTORING
DISINTEGRATED
CONCRETE;
FOR
PRESERVING CONCRETE
FROM DISINTEGRATION**

Specifications

It is our preference to write a separate specification for each specific job. As a general specification the following may be used:

BASEMENTS, TUNNELS, PITS, ETC.—All enclosing walls and floors and other surfaces in contact with the earth are to be waterproofed on the inside surfaces by the WESTERN WATERPROOFING COMPANY (fill in here street and town address of nearest office) according to their system of waterproofing (using Ironite), and to be covered by their written guarantee.

Indian Affairs. (RG 10, Volume 6055, file 265-5, part 4)

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SPECIFICATIONS

ALL SURFACES coming in contact with the earth shall be Waterproofed on the inside by the Western Waterproofing Company; the Waterproofing must be applied by their mechanics and under their supervision. All surfaces Waterproofed shall be guaranteed by the Western Waterproofing Company to remain waterproof and watertight for a period of five years from date of completion.

Concrete Walls

All outside walls and areas shall be waterproofed in accordance with the Western Waterproofing Company's method—on the inside surfaces from floor level to one foot above outside finished grade level. This work shall be done before partitions or other obstructions are installed.

Inside walls and column footings extending through the basement slab shall be waterproofed or damp-proofed as may be required—upon both sides from the top of the footings to the finished basement level.

Brick and Stone Walls

All outside walls and areas shall be waterproofed according to the Western Waterproofing Company's System, on the inside surface and over this shall be applied a plaster coat of thickness as required. This plaster coat shall contain no lime. All partition walls placed on top of basement floor slab shall have the waterproofing applied to this basement floor slab before walls are placed.

Floor Waterproofing

After the rough slab has been poured and sufficiently set it shall be thoroughly cleaned and waterproofed, according to the Western Waterproofing Company's

Floor Waterproofing—Continued

System and finished with a bonding coat for surface topping.

Immediately before the topping is applied wash this surface well and apply a bonding coat of two parts cement and one part IRONITE mixed to a consistency of a thin whitewash and thoroughly brushed into the slab. Apply finish under Western Waterproofing Company's supervision."

Concrete Swimming Pools, Tanks, Reservoirs, Etc.

After walls and floor have been poured and are sufficiently set, the entire surface shall be waterproofed in accordance with the Western Waterproofing Company's System of waterproofing.

Tunnels

After all forms are removed, all inside surfaces shall be waterproofed in accordance with the Western Waterproofing Company's System of waterproofing.

Pits for Elevators, Engines, Pumps, Etc.

After all forms are removed the inside surfaces shall be waterproofed in accordance with the Western Waterproofing Company's System of waterproofing.

A Few of the Installations made by the Western Waterproofing Company

MONTREAL			
JOB	MONTREAL	ARCHITECT	CONTRACTOR
Architects Building	Montreal	Ross & McDonald	G. C. Fuller & Co., Ltd.
American Presbyterian Church	"	Ross & McDonald	Traversy, Ltd.
Sherbrooke St. E. Bridge	"	City of Montreal	"
Canadian Bank of Commerce	"	Dominion Realty Co.	Anglin-Norcross, Ltd.
C.P.R. Bresley Station	"	Can. Pac. Railway	Anglin-Norcross, Ltd.
Caron Building	"	"	Octave Archambault
Girouard Ave. Subway	"	City of Montreal	"
Imperial Oil Station	"	Imperial Oil Co., Ltd.	Alban Construction Co., Ltd.
Incinerator & Loading Station	"	City of Montreal	Walter G. Hunt Co., Ltd.
Mount Royal Hotel	"	Ross & McDonald	St. George Construction Co.
Hogan Bath	"	D. J. Spence	Thompson, Starrett Co., Ltd.
Church of St. Andrew & St. Paul	"	H. L. Fetherstonhaugh	St. George Const. Co., Ltd.
Railway Exchange Building	"	"	Anglin-Norcross, Ltd.
Robt. Simpson Co. Bldg.	"	Chapman & Oxley	A. Janin Building Co., Ltd.
			Robertson Janin Co., Ltd.
TORONTO			
Art Gallery	Toronto	Darling & Pearson	Witchall & Son, Ltd.
Bank of Montreal	"	Chapman & Oxley	Robertson & Janin Co.
Bell Telephone Co. Bldg.	"	Mathers & Haldenby	Anglin-Norcross Ltd.
Canada Permanent Bldg.	"	Mr. Fuller, D.P.W.	Peter Lyall & Son, Ltd.
Custom House	"	Darling & Pearson	Yates Construction Co.
General Hospital	"	King Edward Hotel	"
King Edward Hotel	"	Ross & McDonald	Anglin-Norcross, Ltd.
Royal York Hotel	"	Mathers & Haldenby	"
School of Hygiene, U. of T.	"	Chapman & Oxley	Thompson-Starrett, Ltd.
Star Building	"	Margison & Babcock	"
Eglinton Ave. Bridge	"	"	"
Calgary Post Office	Calgary, Alta.	Kitchener Water Tower	Kitchener, Ont.
General Motors, Ltd.	Oshawa, Ont.	Prince Edward Hotel	Windsor, Ont.
Kingston Library, Queen's University	Kingston, Ont.	Trinity College	Port Hope, Ont.
Royal Bank of Canada, Vancouver	Architect, S. G. Davenport, Montreal	Contractor, Carter, Halls & Aldinger, Vancouver	

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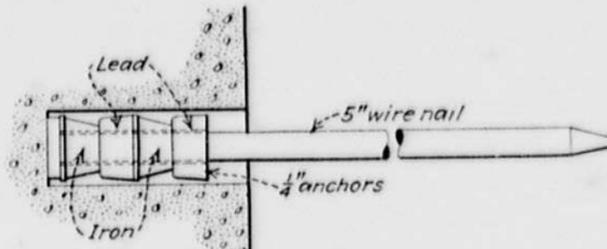
Lead Expansion Bolts for Montreal Dock Repairs

LEAD expansion bolts have been used in an interesting new way by The Western Waterproofing Co., Montreal, Canada, on work just completed for the Harbor Commissioners of Montreal. The harbor dock walls of the Bickerdike Pier had become badly cracked and broken up through years of wear and tear of shipping and action of the elements. It was decided to repair the dock by completely resurfacing with Gunite and in this operation "Cinch" Expansion Bolt-Anchors played an important part.

All soft, loose and defective concrete was first cleared from the wall face by cutting away with pneumatic hammers and wire-brushing. A clean, solid, toothed concrete surface resulted, to form a sound base for and a solid bond with the Gunite. The amount of defective material removed varied, 2 in. being the minimum. The roughened surface was then given a coating of powdered cast iron mixed with water and an oxidizing agent to prevent the rusting of wire mesh and anchor-bolts by the penetration of dampness or water from the upper dock surfaces, and to bond the Gunite to the structure.

Holes 2 in. deep and $\frac{1}{2}$ in. in diameter were then drilled in the surface 20 in. apart and staggered. A $\frac{1}{4}$ in. wire nail, secured by calking in two separate $\frac{1}{4}$ in. plain unit "Cinch" Expansion Bolt-Anchors (described in detail in LEAD, January, 1933), made and supplied by Canadian "Cinch" Anchoring Systems Limited, Montreal, was inserted in each hole with the nail ends projecting about

3 in. Steel mesh having 2 in. square mesh made of No. 10 gauge wire was placed over the nail ends which were then bent up and over, securing the mesh firmly to the wall. Gunite was then sprayed



Method of securing nails in concrete by means of lead expansion bolts.

on and before setting hard was smoothed off and corners rounded, completing a highly satisfactory and permanent repair job.

As can be seen from the sketch, lead expansion bolt-anchors utilize the principle of expanding one or more lead alloy cone rings within a hole by calking them over iron cones placed base down on the head of a bolt. The anchorage is also used to anchor the threaded end of the bolt in the hole by using the iron cone tapped with a standard machine bolt thread of any size. They are used for all types of anchorages in concrete and masonry, for installing machinery, motors, shafting, pipe lines, theatre seats, and for electrical, plumbing, heating and ventilating work.



Three steps in re-facing Montreal docks. AT LEFT, inserting nails secured by lead expansion bolts in concrete; CENTER, spraying gunite over steel mesh held by nails; RIGHT, the new finished surface.

WESTERN WATERPROOFING COMPANY
1440 St. Catherine St. West
MONTREAL

Indian Affairs. (RG 10, Volume 6055, file 265-5, part 4)

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WESTERN WATERPROOFING COMPANY REFERS YOU TO THE FOLLOWING CLIENTS

<u>NAME OF JOB</u>	<u>LOCATION</u>	<u>ARCHITECT</u>	<u>CONTRACTOR</u>
<u>BANKS</u>			
Bank of Montreal	Kingston	.....	John V. Gray Cons. Co.
" " "	Toronto	.....	.....
" " "	Owen Sound	.....	.....
" " "	Montreal	.....	.....
Bank of Toronto	Toronto	E. G. Bird	.....
Canadian Bank of Commerce	Montreal	.....	Anglin-Norcross Limited
Imperial Bank of Canada	Walkerville	.....	.....
Bank of Nova Scotia	Halifax	.....	.....
<u>BRIDGES, SUBWAYS, ETC.</u>			
Bridge - Sherbrooke St. E.	Montreal E.	City of Montreal E.	Belanger & Sicotte
Girouard Avenue Subway	Montreal	City of Montreal	Alban Cons. Limited
York County Bridge	Toronto	.....	.....
Governor Bridge	"	.....	.....
<u>CHURCHES, ETC.</u>			
American Presbyterian Ch.	Montreal	Ross & MacDonald	.....
Ch. of St. Andrew & St. Paul	"	H. L. Fetherstonhaugh	Anglin-Norcross Limited
Eglinton Church	Toronto	Darling & Pearson	.....
Margaret Rodger Church	Lachute	H. L. Fetherstonhaugh	Stewart Cons. Co. Ltd.
York Minster Church	Toronto	George, Moorhouse & King	.....
Church of St. John the Evangelist	Montreal	.....	Hyde & Miller
Papineau Memorial Church	Montebello	H. L. Fetherstonhaugh	Hyde & Miller
Chapel - Loyola College	Montreal	.....	Anglin-Norcross Que. Ltd.
<u>CLUBS</u>			
Badminton & Racquet Club	Toronto	A. Kirkland	.....
Parkdale Cance Club	"	.....	.....
Winter Club	Montreal	J. Cecil McDougall	.....
<u>HOSPITALS, ETC.</u>			
Anatomy Bldg. U. of T.	Toronto	Darling & Pearson	.....
General Hospital	"	" " "	.....
General Accident Building	"	F. S. Baker	.....
Montreal General Hospital	Montreal	.....	.....
Orangeville Hospital	Orangeville	Wm. L. Somerville	.....
Physicians & Surgeons Building	Toronto	Mr. Engholm	.....
Private Patients Pavilion	"	Darling & Pearson	.....
Pathological Building	"	" " "	.....
Neurological Building	Montreal	Ross & MacDonald	E.G.M. Cape & Company
School of Hygiene U. of T.	Toronto	Mathers & Haldenby	.....
Weston Sanitorium	Weston	R. H. Collinge	.....
Western Division, Montreal General Hospital	Montreal	J. Cecil McDougall	Anglin-Norcross Que. Ltd.
St. Mary's Memorial Hospital	Montreal	John S. Archibald) Edward J. Turcotte)	John Quinlan & Co.

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INDUSTRIAL BUILDINGS, ETC.			
Burroughs Wellcome & Co.	Ville LaSalle	-----	-----
Colgate, Palm-Olive Bldg.	Toronto	-----	-----
Canada Decalcomania Co.	"	H. J. Chown	-----
Dominion Flour Mills	Brantford	-----	Macdonald Eng.Co.Ltd.
General Motors Limited	Toronto	-----	Gay Cons. Co.
Office Specialty Co.	Newmarket	-----	-----
Robt. Simpson Dept. Store	Montreal	Chapman & Oxley	A. Janin Bldg.Co.Ltd.
Roncesvalles Car Barns	Toronto	-----	Sullivan & Fried Ltd.
Kresge Store No. 5043	Quebec	-----	C. Jobin Limitée
MISCELLANEOUS			
New Brunswick			
International Paper Co.	Dalhousie	-----	-----
Apartment House - Atwater	Montreal	Westmount Realities Company	-----
Chequers Court Apartments	Westmount	" " "	-----
Armoury - Victoria Rifles	Montreal	D. J. Spence	A.F. Byers & Co. Ltd.
Roof - Oil Storage Room	Beauharnois	Beauharnois Construction Co.	-----
Roof - Two-car Garage	Westmount	-----	The Black Cons.Co.Ltd.
Grain Elevator No. 2 Outside	Montreal	Harbour Commissioners of Montreal	-----
" " " " Inside	"	" " " "	-----
" " "B" Bins	"	" " " "	-----
C.N.R. Cinderblock Wall	"	Canadian National Railways	-----
C.N.R Express Building	"	C.N.R.	Anglin-Norcross Que. Ltd.
Incinerator Building	"	City of Montreal	St.George Cons.Co.Ltd.
OFFICE BUILDINGS, ETC.			
Architects Building	Montreal	Ross & MacDonald	Geo. A. Fuller Co. of Canada Ltd.
Cassidy Building	Toronto	-----	-----
Exchange Building	"	The Bell Telephone Co. of Canada	-----
" "	Lachine	" " " " " "	-----
Garage	Toronto	Chapman & Oxley	-----
Bloor Bay Building	"	N. A. Armstrong	-----
Caron Building	Montreal	-----	-----
Canada Permanent Building	Toronto	-----	-----
Clarkson, Gordon & Dilworth	"	George, Moorhouse & King	-----
Canada Life Building	"	-----	Anglin-Norcross Ltd.
Gibson Building	"	-----	Thomson Bros.
Mutual Life Building (old)	Ottawa	-----	Geo. A. Fuller Co. of Canada Ltd.
Railway Exchange Building	Montreal	-----	A. Janin Bldg.Co.Ltd.
Sherbrooke Trust Co. "	Sherbrooke	-----	Stewart Cons. Co.Ltd.
Star Building	Toronto	Chapman & Oxley	-----
Mutual Life Building	Waterloo	Darling & Pearson	-----

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<u>RESIDENCES</u>			
McInnis, R. A.	Quebec	Jas. Ruddick Eng. & Cons. Co. Ltd.
Gordon, S.	Montreal
Wood, E. R.	Toronto	Molesworth, West & Secord	.....
Godin, Jules	Montreal	.....	.....
Solloway, I. W.	"	Maxwell & Pitts	John Quinlan & Co.
Findlay, W. E.	"	.....	.....
McCuaig, Col. D. Rykert	"	A. T. Galt Durnford	The Black Cons. Co. Ltd.
<u>PUBLIC BUILDINGS, THEATRES, ETC.</u>			
Art Gallery	Toronto	Darling & Pearson	.....
Bowles Lunch	"	N. A. Armstrong	.....
C.P.R. Breslay Station	Montreal	C. P. Ry. Company	Anglin-Norcross Limited
Customs House	Toronto	.....	P. Lyall & Sons Cons. Co. Ltd.
Calgary Post Office	Calgary	Federal Government	.....
Federal Building	Regina	" "	.....
King Edward Hotel	Toronto	Watt & Blackwell	.....
Mount Royal Hotel	Montreal	Ross & MacDonald	Thompson & Starrett
New Public Building	Toronto	Federal Government	.....
Owen Sound Theatre	Owen Sound	Hall & Duer	.....
Prince Edward Hotel	Windsor	Watt & Blackwell	.....
Royal York Hotel	Toronto	Ross & MacDonald	Anglin-Norcross Limited
<u>SCHOOLS, COLLEGES, ETC.</u>			
Administration Building - Protestant Board of School Commissioners	Montreal	J. Cecil McDougall	L. G. Ogilvie & Co. Ltd.
Harbord Collegiate	Toronto	.....	.....
Library - Queens University	Kingston	.....	.....
Oakville School	Oakville	Molesworth, West & Secord	.....
Ont. Faculty of Education	Toronto	Darling & Pearson	.....
Ontario Research Building	"	.....	John V. Gray Cons. Co.
Reformatory	Montreal E.	.....	Dansereau Limitée
Trinity College	Port Hope	Darling & Pearson	.....
<u>TANKS, POOLS, ETC.</u>			
Army & Navy Bldg. Pits	Quebec	.....	Jas. Ruddick Eng. & Cons. Co. Ltd.
Cooling Pond, Quebec Power Co.	"	.....	" " " " "
Community Hall Pool--N.D.G.	Montreal	Gordon & Thompson	A. F. Byers & Co. Ltd.
Hogan Bath	"	D. J. Spence	St. George Cons. Co. Ltd.
Intake-Exhaust Tunnels	Walkerville	Albert Kahn, Inc.	.....
Imperial Oil Station Pits	Montreal	.....	Walter G. Hunt Co. Ltd.
Kitchener Water Tower	Kitchener	.....	.....
Tank--University of Toronto	Toronto	.....	.....
" Y.W.C.A.	"	Molesworth, West & Secord
"	Port Credit	Murray Brown
" 500,000 Gallons	Toronto	Gooderham & Worts

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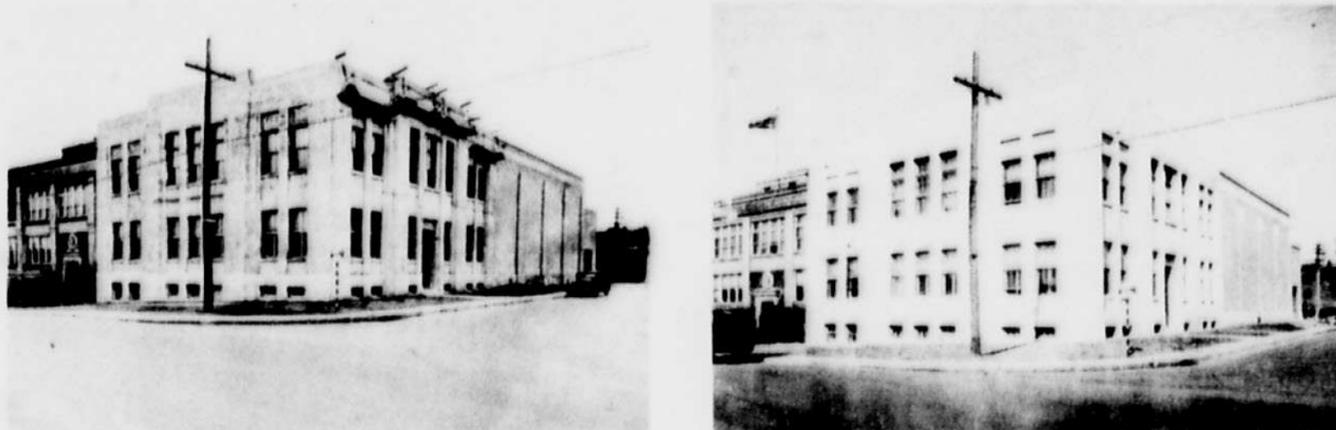
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THE RESTO-CRETER

A Message From the Research Division,
Western Waterproofing Company, Detroit

Vol. 1. No. 2
Jan. 15, 1936



At first glance the two pictures above would hardly seem to show the same building, the one having the appearance of a typical concrete structure, the other suggesting the grace of a beautiful stone building. Yet they are the same; the structure being the new addition to the Associated Screen News Building, Montreal, Quebec. The Architects were J. W. Orrock and N. B. Reardon of the Canadian Pacific Railroad, and the contractors were the A. Janin Construction Company. The office in the foreground is of monolithic concrete, and was subsequently treated with a light colored RESTO-CRETE.

Monolithic construction is relatively inexpensive; further, it is admirably suited to the modern tendency in design. However, in the past, the great difficulty has been that concrete surfaces are soon pitted and corners broken off if left exposed to the weather, even when carborundum rubbed. The disintegration is due to the penetration of water, and the subsequent freezing and leaching out of necessary strength-giving constituents of the cement. Add to this the proven impossibility of preventing the ingress of water by painting the concrete with oil and cement paints, or with the so-called "liquid waterproofings", and you have one big reason why monolithic concrete has lost some favor in the past few years.

The Resto-Crete System has superseded these makeshift treatments. By its use it is now possible to insure a permanently beautiful and hard finish, for it has been distinctly designed to permit the wall to breathe and at the same time prevent the ingress of water. This is done essentially by filling the open pores with a non-capillary, yet slightly porous, hard cement material. The method is patented and applied only by Western Waterproofing Company licensees.

An even more striking example of monolithic concrete construction, with the RESTO-CRETE after treatment, is the new Court House built at Alpena, Michigan, last year. Prior to the Resto-Crete application, an Ironite bonded slush coat was applied to true up corner lines and fill surface holes. This is in contrast to the Montreal building on which the characteristic board marks were retained.

From such signs as these we are lead to prophecy renewed activity for monolithic concrete.

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Indian Affairs. (RG 10, Volume 6055, file 265-5, part 4)

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THE RESTO-CRETER

A Message From the Research Division,
Western Waterproofing Company, Detroit

Vol. 1 · No. 3
March 15, 1936



This picture shows the wall with cracks cut down to a solid base preparatory to repointing.

NO, THIS BUILDING did not go through an earthquake! It wasn't even improperly built or designed, according to our modern view, and no settling occurred. The condition is only an exaggerated case of what Mother Nature is doing to all buildings, starting at the time of building and continuing until the wrecker comes to haul them away, as our experience with thousands of similar failures proves.

How long is your brick building going to last? Probably not as long as you anticipated when you originally figured its depreciation at five per cent per year. For not only is it going to be preyed upon by such elemental forces as the freezing and thawing of accumulated water, and the actual dissolving out of necessary components of the masonry by water, and by atmospheric acids from coal soot but the view now commonly held is that it will crumble to pieces by unequal expansion of mortar and brick units. The building shown above has clearly encountered the force of volume expansion.

Volume expansion, as here referred to, means the actual increase in dimensions of mortar and brick from their taking up water, rather than from temperature variation. For instance, it has been shown that a rich Portland cement mortar will expand as much under a rain of a few hours' duration as it will under a temperature change of 100 degrees Fahrenheit!

Since brick won't expand this much, a shearing force results between brick and mortar, and something must give way. The bond in the above building was so good that it held and the brick broke in places. If a weaker mortar had been used, a poorer bond would have resulted and the mor-

tar would have crumbled. But, in any event, the degree of this volume expansion would have increased during the years with the continued inflow of water.

But, you may ask, what of the numerous brick buildings built a century or two ago which are still in good condition?

Here, we answer that they were built with a mortar which did not permit the actual flow of water through the joint. They were fat mortars. As soon as their capillarity was satisfied, no more water penetrated. Again, the old lime mortars have gradually hardened by a natural chemical process which has made them more impervious.

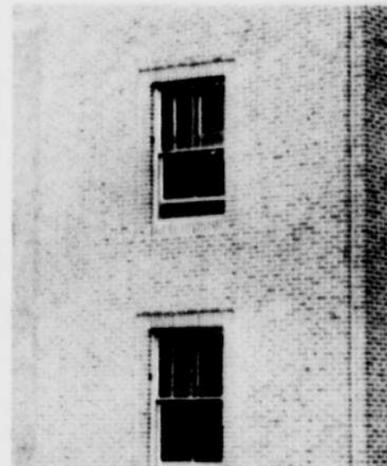
Our ancestors knew their materials by long years of working experience with them. Today, we all are suffering from the misuse of many valuable new materials.

Now look at the picture below, showing the above structure after a year's exposure following the application of the Resto-Crete restorative treatment. Notice that it looks as clean and neat as the day it was built.

What's more, the treatment is preventing ninety-nine per cent of the water that would normally enter from doing so, the other one per cent being atmospheric moisture which must be allowed to enter and leave at will for the good of the building. The masonry in this building is not going to expand further, because the protective treatment is noncapillary to water.

Years of continuous research and practice have proved to us that the Resto-Crete treatment is the answer to the perplexing disintegration problems of today. Applied to a building when first built, it will prevent the development of conditions like the above.

The same building after one year's exposure, following Resto-Crete application.



The Western Waterproofing Company and licensees apply Resto-Crete to all types of masonry structures, under a substantial guarantee. Application is made in the U.S.A. and in Canada, and is fully patented.

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Indian Affairs. (RG 10, Volume 6055, file 265-5, part 4)

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THE RESTO-CRETER

A Message From the Research Division,
Western Waterproofing Company, Detroit

Vol. I · No. 4
April 15, 1936

INTELLIGENT TREATMENT RESTORES REINFORCED CONCRETE

FOURTEEN THOUSAND pounds per square inch! No wonder concrete spalls when this great force is liberated within it by the rusting of reinforcing bars. Concrete is good for only a few hundred pounds in tension. Since steel expands in volume by at least two hundred per cent when it rusts, a tension is produced greater than concrete can withstand.

This is what happened to the concrete column shown at the left. Moreover, it happens to a greater or less degree to all reinforced concrete structures. Most concrete structures over a few years old show some spalling on the surface, and at least ninety per cent of these marks of disintegration are due to the rusting of the reinforcing steel.

Steel rusts only because a combination of water and carbon dioxide from the air comes into contact with it; and these agencies can reach the imbedded steel only by passing directly through the concrete.

In other words, the disintegration of concrete from the rusting of reinforcing steel is merely another indication of the great need for adequately weatherproofing all masonry surfaces. We often fail to recognize this need because the extent of the damage does not appear on the surface until the condition becomes acute. As an example, the only visible indication of the serious condition of the column at the left was a few surface cracks.

We wish you could look through our microscope in the laboratory and watch the disintegrating forces of nature at work. You would see a drop of water placed on a masonry surface rapidly work its way through fine capillary tubes into the densest concrete. You would see water causing steel to rust; and would be amazed as you saw the fine rust tentacles pushing out from the main body, filling every crevice, and finally breaking the weaker structure and pushing it out of the way. You would see water dissolving out some of the softer structures. Or, again, you would see a water solution of the common atmospheric acid gas (sulphuric acid) rapidly eating up even the strongest crystal structures. We know that even the



Badly Spalled

Water which entered the concrete by capillarity and rusted the reinforcing bars caused this serious damage



Restored by Resto-Crete

Here is the same column restored to its original strength and permanently protected against further ravages

most nontechnical observer of these sights would conclude:

1. That the presence of water in the masonry is essential to the operation of these disintegration processes.
2. That the deep penetration of water, whether rain or dew, depends upon the capillarity of the surface through which it must enter.
3. That the successful weatherproofing of a masonry surface requires the balancing of many more forces than are usually considered.

We have discussed in other places the important disintegrating effect of volume expansion of concrete materials as they take up water,* and also the necessity for preserving an evaporating surface on the exterior of all masonry structures.** Many other forces are involved at different times. In fact, there is no single procedure that will work successfully in treating every structure of concrete or of stone or of brick.

Particularly is it true that a job of repairing spalled and broken concrete calls for special handling. It is essential in such a case that a trained engineer be on hand, for steel that is badly rusted must be replaced, the concrete surface must be properly prepared to secure a strong bond between old and new concrete, and strong concrete must be placed. A good job of patching not only gives a good appearance but also restores the original balance of stresses and strains between concrete and steel.

A glance at the right-hand picture shows the vast improvement achieved here by the Resto-Crete system. Moreover, our mechanics used a technique developed by our engineers in the restoration of this column. It is now good looking on the outside. It is solid and strong all the way through on the inside. And it is permanently protected by the Resto-Crete treatment from further ravages by excess water.

Our years of experience and all the resources of our well-equipped laboratory are available for meeting similar conditions in your buildings. Ask for our suggestions.

* The Resto-Creter, March 15, 1936.

** Technical Bulletin, No. 2, Western Waterproofing Company, 1935

The Western Waterproofing Company and licensees apply Resto-Crete to all types of masonry structures, under a substantial guarantee. Application is made in the U.S.A. and in Canada, and is fully patented.

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THE BESTO-CRETER

A Message from the Research Division.
Western Waterproofing Company, Detroit

Vol. 1 · No. 5
JUNE 15, 1936

HOW PERMANENT IS LIMESTONE?

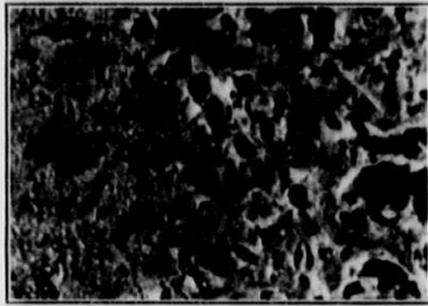


FIG. 1.
Indiana Limestone Surface, Mag. 20x.
Left half treated by Resto-Crete System.

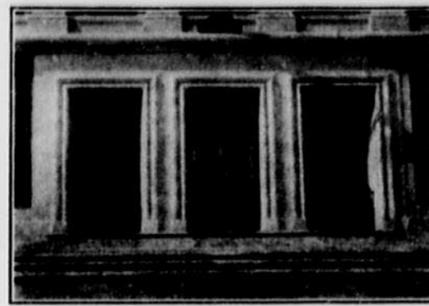


FIG. 2.
Old Limestone Entrance weatherproofed
and decorated by Resto-Crete.

HOW WOULD YOU like to stand under a shower bath of sulphuric acid for your whole life? Sounds silly, doesn't it? Yet your building, and every other structure, road, and sidewalk, literally lives just this life.

For chemical analysis of the air in New York City alone has shown that approximately 1,000 tons of sulphuric acid gas is discharged into the air every twenty-four hours from the combustion of coal. This gas, in combination with the water vapor in the air, forms sulphuric acid, which in turn is deposited along with soot and other dirt on every square inch of exposed masonry.

Every non-ceramic building material—limestone in particular—is readily attacked by sulphuric acid. The result of this attack is quite obvious on buildings located in cities having high smoke densities as compared with those having low smoke densities. A striking example is to be observed in the numerous old world art objects of limestone, which endured for ages in their native climes, but when subjected to a few years' exposure in our city squares showed an amazingly accelerated rate of disintegration.

Sulphuric acid disintegration, like other types of disintegration in masonry, is due mainly to the penetration of water; for rain water carries acid in, then brings the dissolved salts of the acid back out, where rain washes them away. As a result the masonry becomes progressively more porous and capillary to water. Then, under proper conditions, ice crystals and crystals from dissolved salts form in the exterior surface layers and the familiar exfoliation or spalling of the surface occurs.*

Besides disintegration specifically due to sulphuric acid, a greater destructive agency is the continued inflow and outflow of water—from any source; for water itself, in large quantities, is capable of dissolving out important constituents of limestone. Fortunately, however, in the case of limestone, nature has provided a protective counterbalance: if not over-exposed to water and sulphuric acid it will gradually build up a hard, dense surface layer which becomes increasingly resistant to natural disintegrating forces. Such surfaces can be found in well-protected areas on most limestone buildings. In fact, there are many com-

plete limestone buildings in existence today which show no disintegration whatever.

A better picture of this may be gained from the right half of Fig. 1. This section of the magnified limestone surface shows the dense, hard particles of "limestone sand" cemented together by smaller calcite particles, forming a porous, sponge-like mass. In newly quarried limestone most of these pores are filled with a loosely packed lime material, which is the basic material employed by nature in building up a resistant surface. This material, if unchanged by nature (as is the case behind the surface layers), is the most easily attacked by excess water and sulphuric acid.

Now if sandblast is used for cleaning, this protective surface is removed and many years may be required to restore it. The disintegration occurring in the meantime alone is enough to condemn it.

Since we can seldom locate our buildings under the most favorable weathering conditions, we are faced with these facts: (1) Acids in the air and water dissolve out valuable salts from the limestone; (2) Alternate wetting and drying causes volume changes in the individual stones, which tend to break down the mortar bond, thus permitting the easier entrance of moisture. Therefore, to preserve our buildings, we must apply the fundamental principles of weatherproofing by synthetically building a dense, hard, non-capillary surface, which retains breathing ability, inertness and strength.**

In the left-hand side of Fig. 1, and in Fig. 2, these principles are clearly illustrated. Note that the surface characteristics are in no way altered, but that the open pores are completely filled. No wax or paraffin has been applied to melt and collect dust, or to prevent breathing. No hard glaze has been created to invite surface spalling by the formation of interior salt crystals. The surface performs in accordance with *Natural Laws*, at the same time giving protection against the ravages of water and sulphuric acid.

These characteristics make the Resto-Crete System the only one of its kind in the field for the protection and decoration of limestone.

* "Indiana Limestone," Purdue U. Eng. Exp. Sta. Bull. No. 33.
** Bull. No. A-3, W.W.Co., 1936.

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Indian Affairs. (RG 10, Volume 6055, file 265-5, part 4)

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THE RESTO-CRETER

A Message from the Research Division.
Western Waterproofing Company, Detroit

Vol. 1 · No. 6
JULY 15, 1936

“....., AND TUCK-POINT WHERE NECESSARY.”

HOW MUCH MONEY has the above specification cost owners without their having received one penny's worth of permanent protection for their buildings?

Granted that the material and workmanship that go into a good tuck-pointing job are the best (they are still no better than the original materials), and that apparently all of the work required is done, what permanent good has been accomplished?



FIG. 1.
Some joints tuck-pointed. Note the extensive disintegration in untreated joint areas which should be repaired. This wall leaks.

From our knowledge of buildings and their life-expectancy, we are safe in assuming that the depreciation of exterior wall surfaces is at least three per cent. per year. This depreciation usually takes place in the mortar material, rather than in the masonry units, and it does not mean that on a building five years old, fifteen per cent. of the mortar material has fallen out. It does mean, however, that the alternate wetting and drying of the wall surfaces, with the carrying into the walls of acids from the air, cause soluble parts of the mortar to be dissolved out and washed away at an accelerating rate. Thus, the mortar is left very much depleted in strength and much more porous than it was originally.

In a tuck-pointing job, only the holes where mortar has fallen out, or is loose, are repaired. The extent of the repairs is left to the good judgment of the man on the scaffold in deciding “—where necessary.” Suppose excellent judgment is used and all visible defects are repaired, the only advantage gained is that depreciation of the repaired parts must start from the beginning again, while unrepaired parts will continue to cause trouble and will require periodic repair. It would seem, therefore,

that to say “—and tuck-point where necessary” means the beginning of a more or less continuous repair job.

The cost of a tuck-pointing job is mostly labor, because of the small amount of inexpensive material used. Tuck-pointing requires complete examination of all surfaces; therefore, to tuck-point repeatedly a part of the joints in a surface adds very materially to the cost of maintenance over a long period. Would it not be better to make all joints and surfaces permanently impervious to moisture in one operation, even though the first cost were slightly higher?

In previous issues of the RESTO-CRETER and in Technical Bulletin No. 3-A, we have discussed the fundamentals of weatherproofing, stressed the use of a non-capillary material, and have cited typical jobs. These ideas are useless unless they are read with understanding and so acted upon.



FIG. 2.
Same area as above, but every crack and hole in joints and surfaces completely weatherproofed. Wall doesn't leak.

Let us suppose you are going to have your building repaired. Are you going to write a specification for the work contemplated which leaves the determination of what you want done to the judgment of the laborer on the scaffold in permitting him to “—tuck-point where necessary?” Or are you going to be sure that the money you spend will accomplish some lasting good? This you can do by providing that every square inch of the entire exterior surface of your building is weatherproofed according to the fundamental laws for such work; that it is guaranteed to stay weatherproofed; and that the work is to be done by an organization with enough understanding of your problem to insure you an intelligently executed job.

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MONOLITHIC CONCRETE

AIDED BY

RESTOCRETE FINISH



New building of Associated Screen News in Montreal provides a striking example of the way in which Architectural Monolithic Concrete is given added beauty and permanence by Restocrete Treatment.



WESTERN WATERPROOFING COMPANY

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