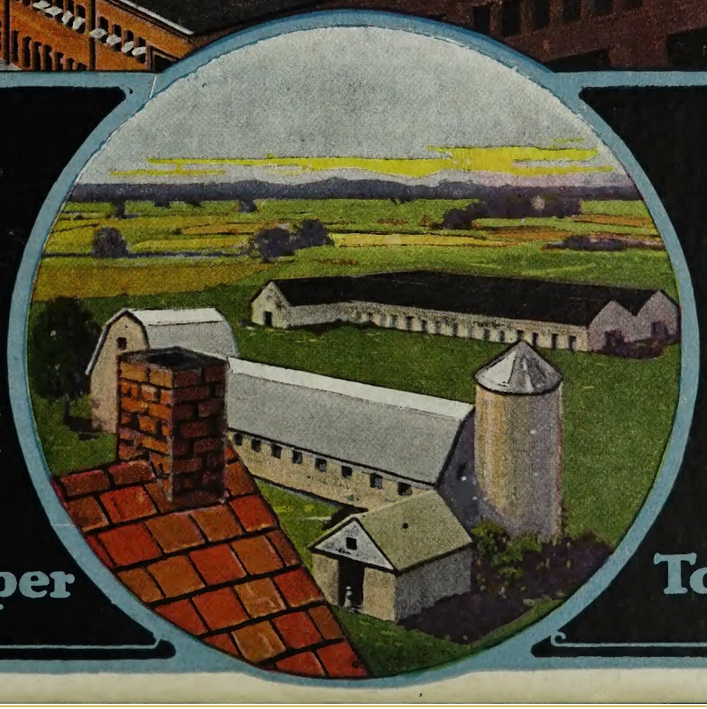
Johns-Manville Building Materials



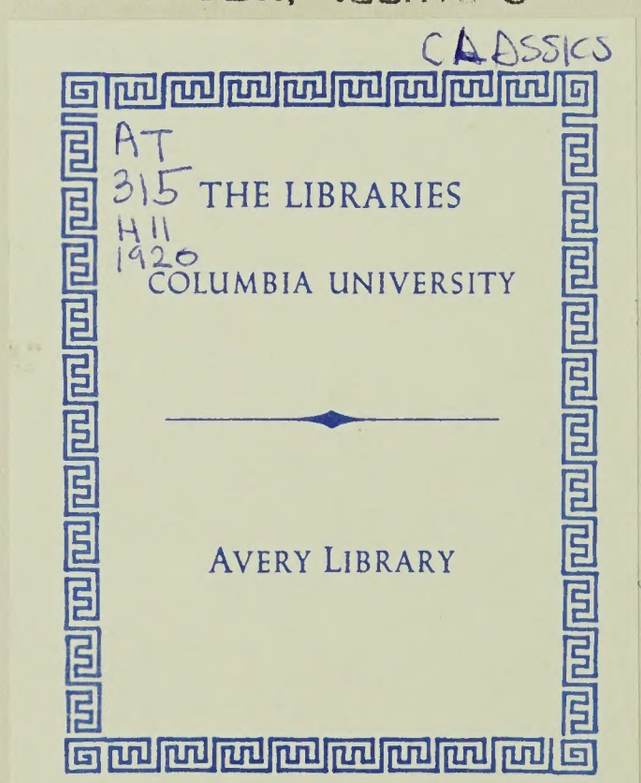


Skyscraper To Farm

JOHNS-MANVILLE SERVICE COVERS THE CONTINENT

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OTIS E, FLEMING
Apprentice Carpenter
Draftsman And Builder
ROCHESTER, ILLINOIS



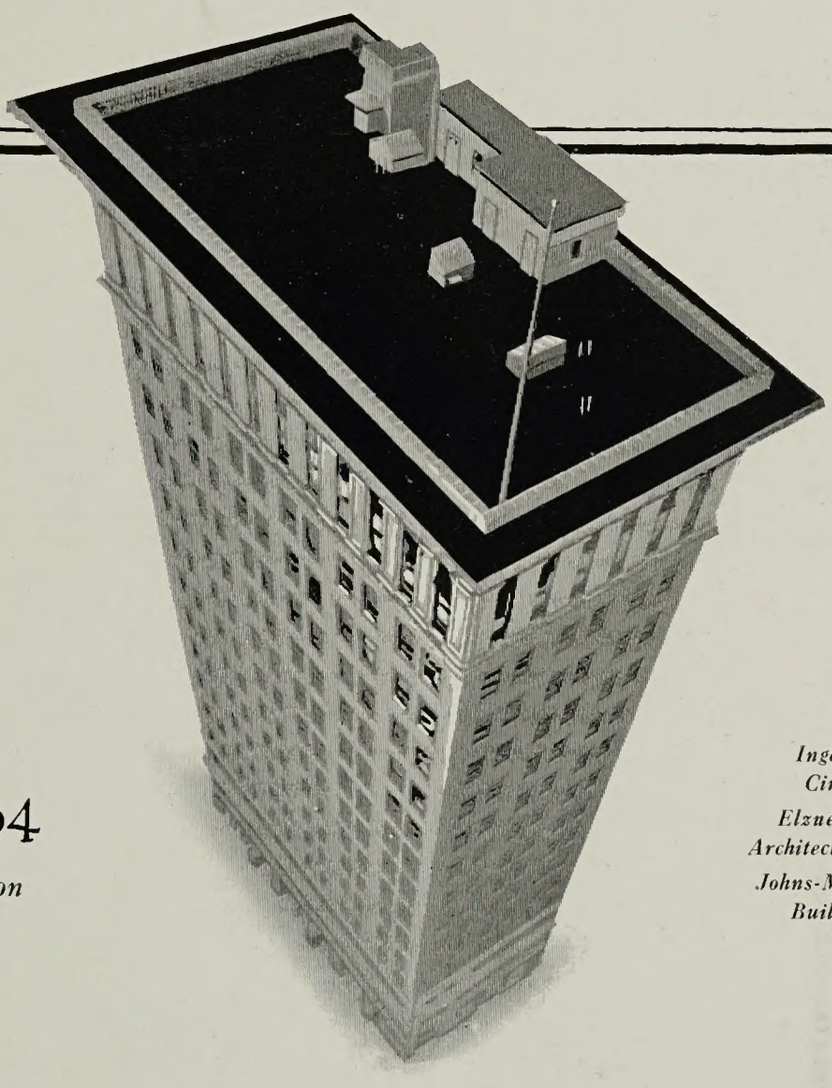
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Johns-Manville Building Materials



Ingalls Building
Cincinnati, O.
Elzner & Anderson
Architects, Cincinnati, O.
Johns-Manville Asbestos
Built-Up Roofing

Catalog No. 304

Second Edition

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No. B1-20-5.

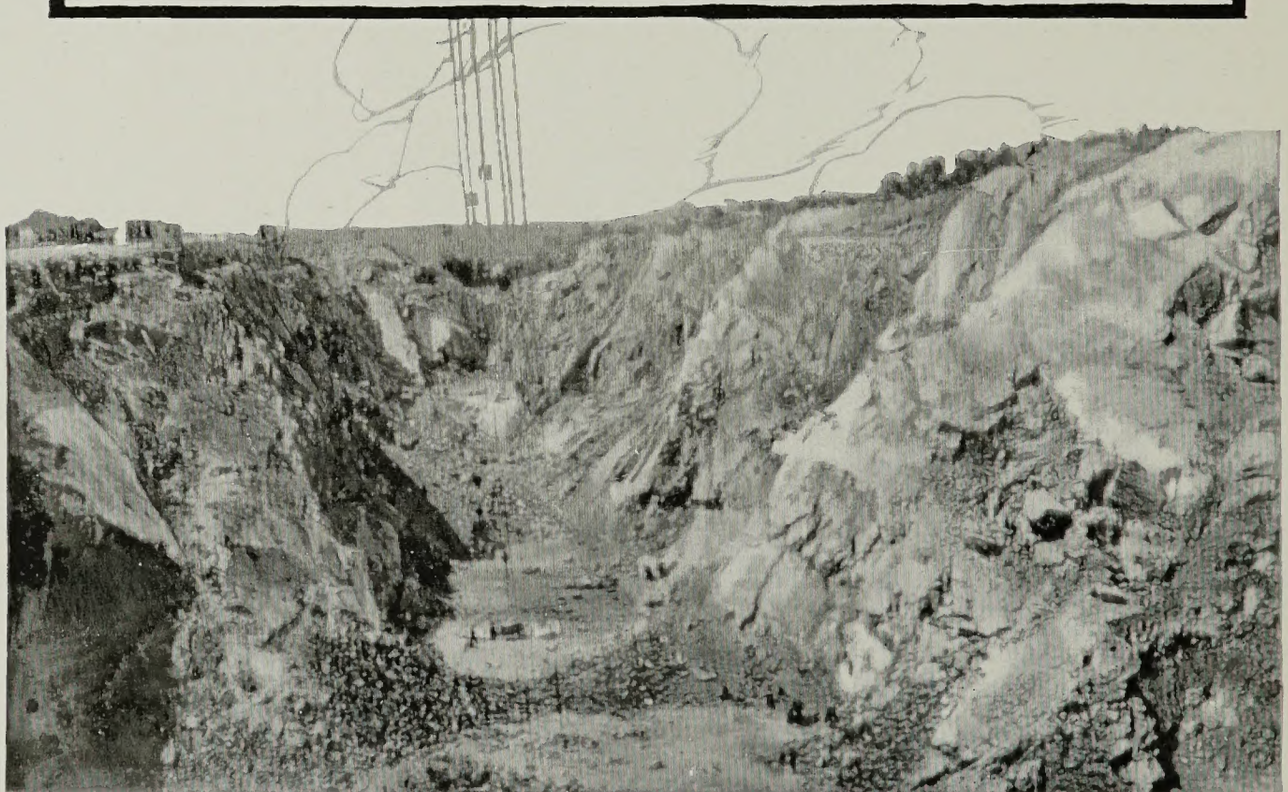
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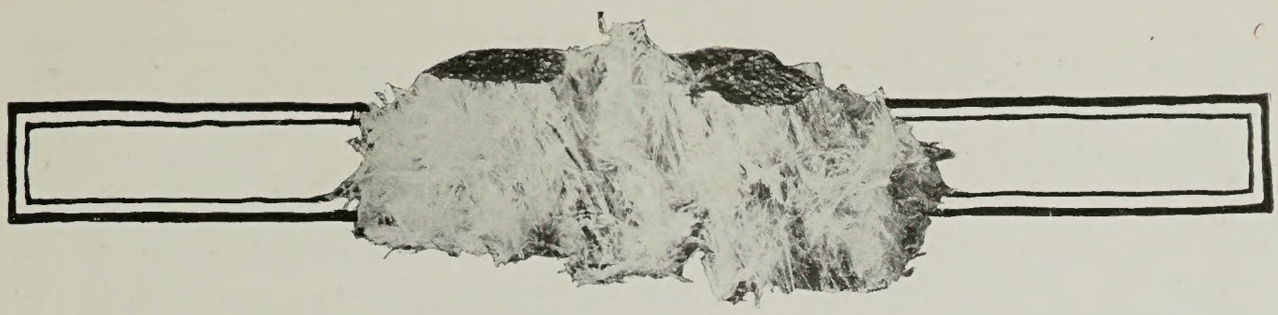
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A View in the Johns-Manville Mines Showing the "Open Quarry" Method of Mining Asbestos

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The Story of Asbestos

MILLIONS of years ago this earth went through untold ages of flame, slowly forming a marvelous mineral—as heavy and dense as marble, yet literally a nugget of silky fibre—Asbestos. Each of these fibres is so light that it floats on water, yet so rugged that the millions of years of the earth's cooling, hardening and cracking did not break its slender, silk-like thread.

Compared with other minerals, the aggregation of unique properties possessed by Asbestos is unparalleled. Wood burns—Asbestos is unchanged by flame or by temperatures of 1500 deg. F. Stone disintegrates—Asbestos defies erosion. Steel rusts—Asbestos is immune. Asbestos resists wear and the action of oxygen and acids, is a non-conductor of electricity, and insulates against heat or cold.

Today an audience sits in a crowded theatre. It faces a curtain with the word Asbestos on it—spelling to them safety—an armor against fire. Around are brilliant lights energized from distant generators through a system safeguarded by this same Asbestos. Many here live or work in buildings roofed with Asbestos. Here, too, are many housewives whose dining-tables it protects. Even the motor cars have brakes lined with this same mineral.

For centuries Asbestos was but a curiosity—the mystic mineral, the paradox of ages. But today it is a recognized necessity, developed by the efforts, the courage and the resources of a business institution which, by making this curio of ages serve man, has contributed to the world's progress and has made life safer and more complete.

Had some one championed Asbestos earlier, had some one the vision and foresight to realize the possibilities of this mineral, the world today would be farther along. The Chicago fire might never have happened—indeed it is probable that 50 years hence the community fire will be a finished page as the Asbestos Roof gains ever wider acceptance.

Asbestos is used as the basis for practically all Johns-Manville Building Materials.

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Johns-Manville Service to the Architect, Builder *and* Owner

THERE is a distinct advantage in choosing from a line of building materials on which the responsibility for service and satisfaction is concentrated in one organization, national in scope and reputation.

In this way you are assured of better service, better value and greater satisfaction all around; consequently, the best return on your purchase.

The architect, builder or owner who uses Johns-Manville Building Materials enjoys this advantage in the fullest sense.

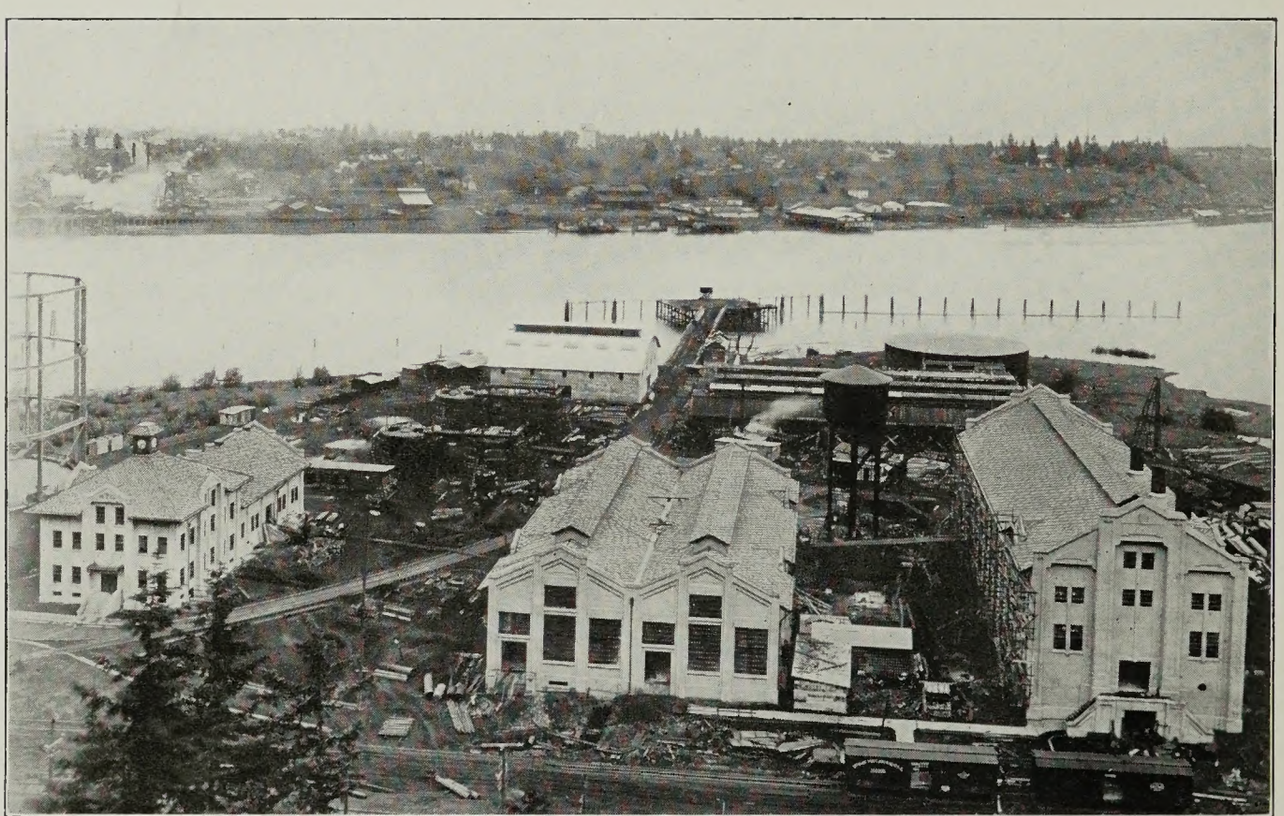
Because, whether it is a square of roofing or a bale of wall insulation, it is backed by Johns-Manville Service—a service that does vastly more than merely sell you a building material, or perfunctorily apply it.

It is a service that will advise you by mail or send a man from the nearest branch to assist you—that offers you the benefit of experience gained by over half a century in building material manufacture and application.

We like to have the most difficult problems laid before us, because we can cope with them. And we know that the sound, practical advice of our engineers can be of material assistance to you.

There is a Johns-Manville Branch in every large city in the country. This means that Johns-Manville Service is within easy reach of you at any time.

Let this service work for you.



Portland Gas & Coke Co., Linnton Plant, Portland, Oregon
Johns-Manville Asbestos Built-Up and Corrugated Roofing and Asbestos Shingles

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Johns-Manville Roof Registration



REGISTER THIS ROOFING

WITH OUR NEAREST BRANCH

This enables us to identify the roof and give you full service
Fill in this blank and send to nearest branch.

Date _____

I purchased from _____ NAME OF FIRM FROM WHOM PURCHASED

_____ *squares of* _____ NAME OF BRAND *Roofing which was*

applied _____ DATE OF APPLICATION *on building located at*

_____ DESCRIBE LOCATION _____ TOWN _____ STATE

by _____ NAME OF PERSON OR FIRM WHO APPLIED IT

_____ OWNER

H.W. JOHNS-MANVILLE CO.

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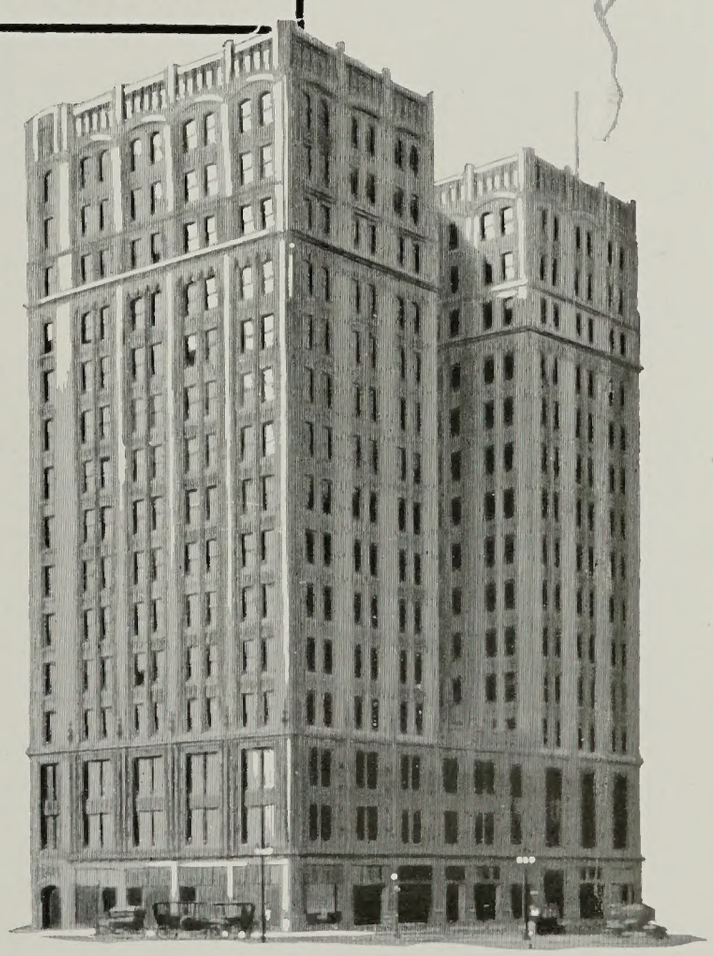
AKRON, ALBANY, ATLANTA, BALTIMORE, BIRMINGHAM, BOSTON, BUFFALO, CHICAGO, CINCINNATI, CLEVELAND, COLUMBUS, DALLAS, DAYTON, DENVER, DETROIT, DULUTH, GALVESTON, HOUSTON, INDIANAPOLIS, KANSAS CITY, LOS ANGELES, LOUISVILLE, MEMPHIS, MILWAUKEE, MINNEAPOLIS, NEWARK, N.J., NEW ORLEANS, NEW YORK, OMAHA, PHILADELPHIA, PITTSBURGH, PORTLAND, ORE., ROCHESTER, ST. LOUIS, ST. PAUL, SALT LAKE CITY, SAN FRANCISCO, SEATTLE, SYRACUSE, TOLEDO, WASHINGTON, WILKES BARRE, YOUNGSTOWN

FORM 4100 — 215-24268-110

EVERY user of Johns-Manville Roofing is privileged to register his roofing with us by means of a special registration blank furnished him.

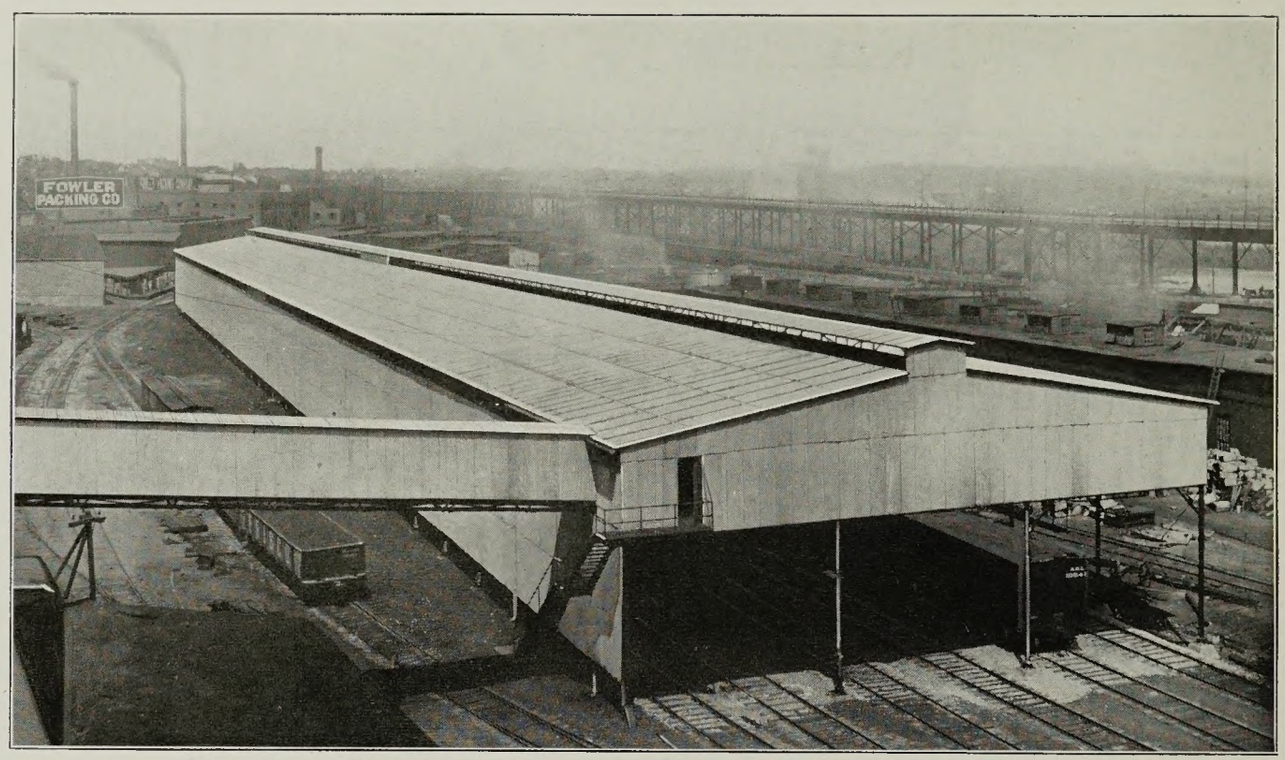
This means that we assume the entire responsibility for the performance of our materials and see that every Johns-Manville roof-owner secures the full service from his roofing that we promise for it. And this applies to every part of his roofing—because we believe that it is our duty to see that our materials in the flashings and gutters give as good service as the surface of the roof itself.

In this way the Johns-Manville System of Roof Registration is even better than a guarantee for a limited term of years on a certain part of the roof—because Johns-Manville Responsibility is behind the roofing until it has fully served up to every claim made for it.



Michigan Boulevard Building, Chicago, Ill.
Jarvis Hunt, Chicago, Architect
Geo. A. Fuller Co., Chicago, Contractors
Johns-Manville Asbestos Built-Up Roofing

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Armour Packing Company's Car Icing Plant, Kansas City, Kansas
Johns-Manville Corrugated Asbestos Roofing and Siding

The Roof's Responsibility

THE savage suffers no loss when his rude shelter is blown down. He has materials at hand for another hut, his labor has no economic value, he has no investment or accumulation of wealth at stake.

But in a great modern office building, or a factory, hotel or bank, the wealth at stake is far greater than the building's cost—for it includes not only the contents, but the loss due to interruption of business and interference with established routine.

In the heavy responsibility of protecting big investments the roof shares at least equally with side walls and foundation.

If it be regarded, then, not merely as a top covering but as an integral part of the structure—in fact the portion most dangerously exposed to every attack of the elements—the importance of adequately solving your roofing problems is vital.

When this responsibility of the roof is once appreciated, the selection of a suitable type becomes just as urgent as the selection of power, equipment or labor-saving machinery.

It demands the same study of economic factors—first cost in its relation to the total investment, upkeep cost, insurance rates earned, protection afforded and length of service.

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Barn of George Rundle, Danbury, Conn.
Johns-Manville (Brooks Brand) Asbestos Ready-to-lay Roofing

Johns-Manville Asbestos Roofings

THE quality of asbestos products depends not only upon the experience, skill and equipment of the manufacturer, but also upon the quality of the raw material. Since asbestos fibres vary, the correct grading and selection is absolutely necessary.

Controlling every step from mine to market, combining the facilities of the miner with the expert knowledge of the manufacturer, Johns-Manville has exceptional opportunities for discriminating in selection of asbestos fibre for Johns-Manville Asbestos Roofings.

This in itself is a definite manufacturing advantage.

The fibres extracted from the crushed asbestos rock are graded by length and strength. For roofing fabrics we select that grade of fibres which gives uniformity of texture and the highest tensile strength. For built-up and ready-to-lay roofing these fibres are fabricated by special machinery into strong compact felts, which in turn are thoroughly impregnated with natural asphalts. The felts are then cemented together with hot asphalt either on the roof (for built-up roofing) or at the factory (for ready-to-lay roofing).

There is no roof built—flat, monitor, saw-tooth, or special design—to which Johns-Manville Asbestos Roofing in one form or another cannot be applied.

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Maintenance Cost

BECAUSE of their asbestos base, Johns-Manville Asbestos Roofings will not rust, like metal roofs; will not rot like roofs of organic base; are not apt to crack or check because of summer sun or winter snow; will neither carry fire, absorb moisture, nor wear out quickly even in severe service.

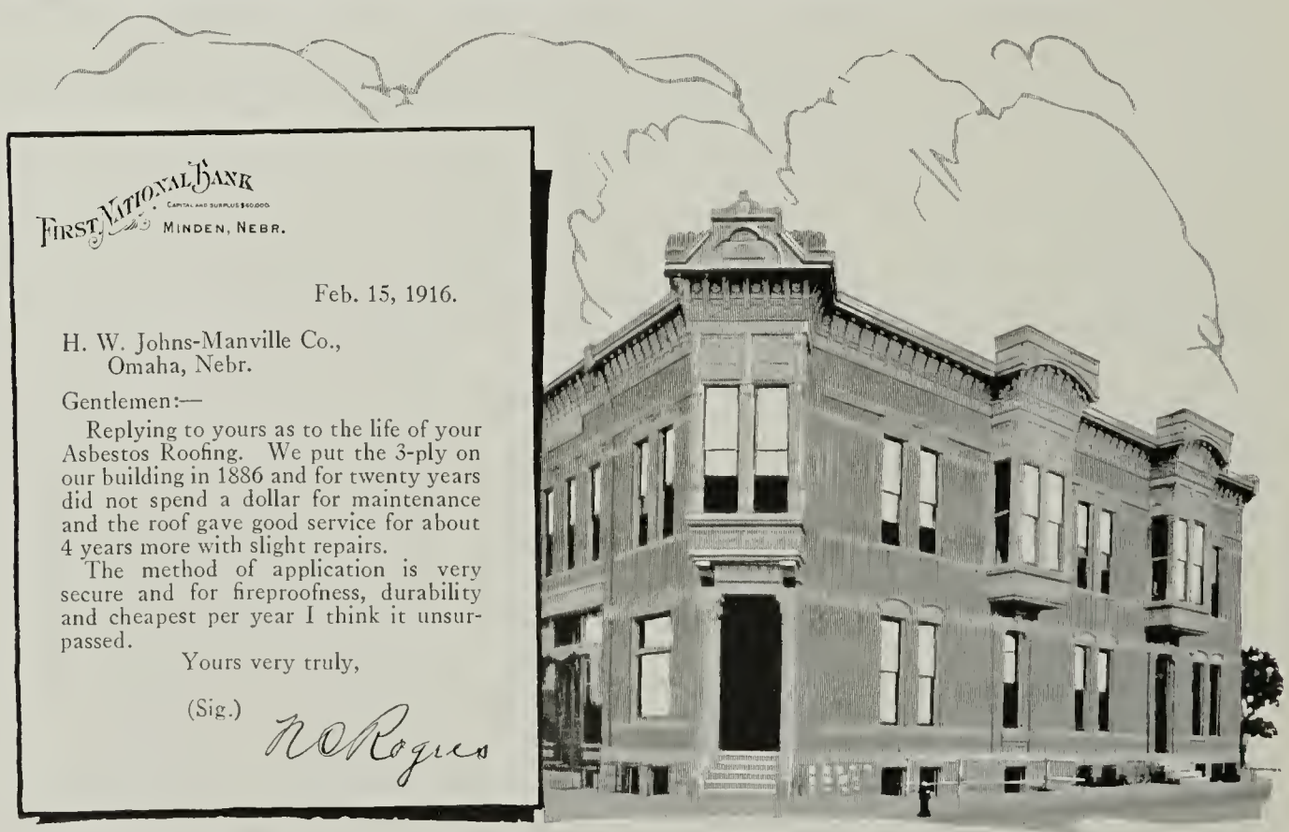
They give positive protection year after year against fire and weather at a maintenance cost so low in most cases as to be negligible.

On a comparative basis of actual total expenditure—first cost plus repair cost—Johns-Manville Asbestos Roofings effect savings which represent a handsome return on the investment.

That's why they're called the "cheapest-per-year" roofings.

This low maintenance cost is due to the unchanging properties of the raw material, ***Asbestos,*** plus proper design, honest manufacture, and correct application. These properties are subject to no variation, nor are they dependent on any coating or reinforcement which requires periodic renewal.

It is because of what is IN them—not ON them—that Johns-Manville Asbestos Roofings give such lasting protection to your property investment.



FIRST NATIONAL BANK
CAPITAL AND SURPLUS $60,000
MINDEN, NEBR.

Feb. 15, 1916.

H. W. Johns-Manville Co.,
Omaha, Nebr.

Gentlemen:—

Replying to yours as to the life of your Asbestos Roofing. We put the 3-ply on our building in 1886 and for twenty years did not spend a dollar for maintenance and the roof gave good service for about 4 years more with slight repairs.

The method of application is very secure and for fireproofness, durability and cheapest per year I think it unsurpassed.

Yours very truly,

(Sig.) N. O. Rogers

First National Bank, Minden, Neb.
Johns-Manville Asbestos Built-Up Roofing

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The Obligation to the Community

THE increasing concentration of values, whether under one roof or in restricted sections of a community, causes more than a proportionate increase in fire risks. Hence every step toward fire prevention is a potential economic saving, operating to reduce insurance rates and to avert the spread of disastrous conflagrations.

Johns-Manville Asbestos Roofings are an effective barrier to roof-communicated fire.

Flying brands or sparks from nearby fires die out harmlessly on a Johns-Manville Roof. This was shown at Paris, Texas, when our Asbestos Roofing on the City Steam Laundry stopped the spread of flames in that section.

HERE are a few notable conflagrations that have wiped out parts or all of the communities in which they occurred:

TOWN	FIRE LOSS
Salem, Mass	$13,000,000
Paris, Texas	11,000,000
Augusta, Ga	4,500,000
Houston, Texas	4,500,000
Nashville, Tenn	1,450,000
Hot Springs, Ark	2,225,000
Bangor, Maine	3,500,000
Wallace, Idaho	1,000,000
Chelsea, Mass	12,000,000
Chisholm, Minn.	1,700,000
Yazoo City, Miss.	2,000,000
Jacksonville, Fla.	10,000,000
Newport News, Va	2,000,000
Hopewell, Va.	1,100,000



HOTEL GIBRALTAR

PARIS, TEXAS. March 31st 1916

Johns-Manville Co.,
Madison Avenue, New York City.

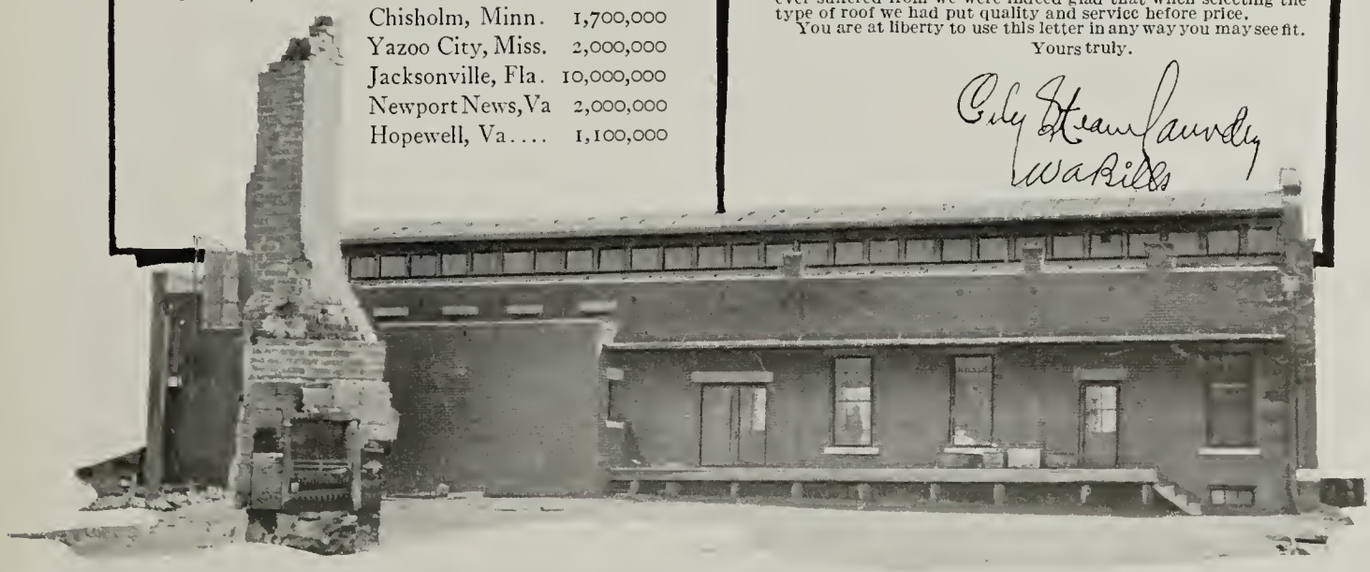
Dear Sirs:—In justice to yourselves and to the Asbestos Roof that you applied on the City Steam Laundry, Paris, Tex., I want to say that had it not been for the absolutely fireproof qualities of your roof the property loss in Paris would have been greater than it was.

Your roof checked and prevented the spread of the fire and whilst adjoining buildings were burnt to the ground the Laundry stood the severest test that any building could be put to; blazing timbers and shingles were blown on to this roof only to die out without affecting in any way the roofing material. After seeing the building emerge from the worst fire Texas ever suffered from we were indeed glad that when selecting the type of roof we had put quality and service before price.

You are at liberty to use this letter in any way you may see fit.

Yours truly.

City Steam Laundry
W. A. Bills



City Steam Laundry, Paris, Texas, after the Fire
Johns-Manville Asbestos Prepared Roofing

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Approval *by the* Underwriters

THE attitude of insurance authorities toward a building material is of special interest, both because of its effect on insurance rates, and because it serves as a reliable index to the fire-resistant properties of the material in question. For this reason the results of tests made by the Underwriters' Laboratories, Inc., are of particular importance to the prospective buyer of any building material.

The Underwriters' Laboratories are located at Chicago, Ill., and are financed by and maintained under the direction of the National Board of Fire Underwriters, the official body representing all recognized fire insurance companies of the country.

At these laboratories, roof coverings of every description are tested, examined and classified according to their resistance to fire. The tests made upon these roofings are most severe and exhaustive. They are not restricted to any time limit, but are continued as long as the roofing stands up under the severe conditions of the radiant heat, burning brand and flame exposure tests described on these pages.



Fig. 1—Making Radiant Heat Test

The temperature of the circular plate at the lowest point of the gas furnace and on the surface of the roofing sample is approximately 1200 degrees Fahrenheit. See page 13 for details of test.

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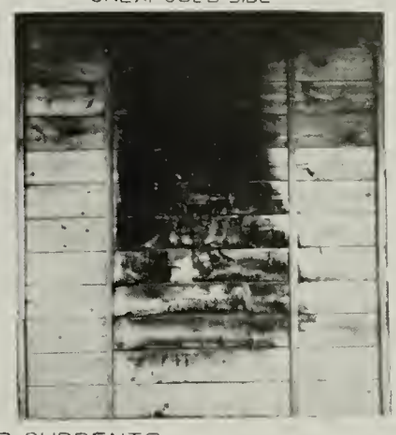
RADIANT HEAT TEST

CONDITION AFTER TEST

EXPOSED SIDE



UNEXPOSED SIDE



SAMPLE SUBJECTED TO AIR CURRENTS
OF 5 MILES PER HOUR





SAMPLE SUBJECTED TO AIR CURRENTS
OF 40 MILES PER HOUR

This test is not restricted to a time limit but is continued as long as the roofing stands up under these severe conditions.

Fig. 2.—The picture above on left shows the condition of the exposed surface of Johns-Manville Asbestos Roofing after the radiant heat test was completed. Wind velocity 5 miles per hour. The picture above on right indicates the condition of the under side of the roof deck after same test. Photograph below on left shows condition of exposed surface after same test, using wind velocity of 40 miles per hour. Photograph below on right shows under side of roofing after same test. See page 13 for details of test.

Seldom does a roofing on an average building encounter such conditions as it is called upon to withstand under the searching eyes of the impartial official investigators at the Underwriters' Laboratories. So that any roofing which meets these rigid laboratory requirements and is classified

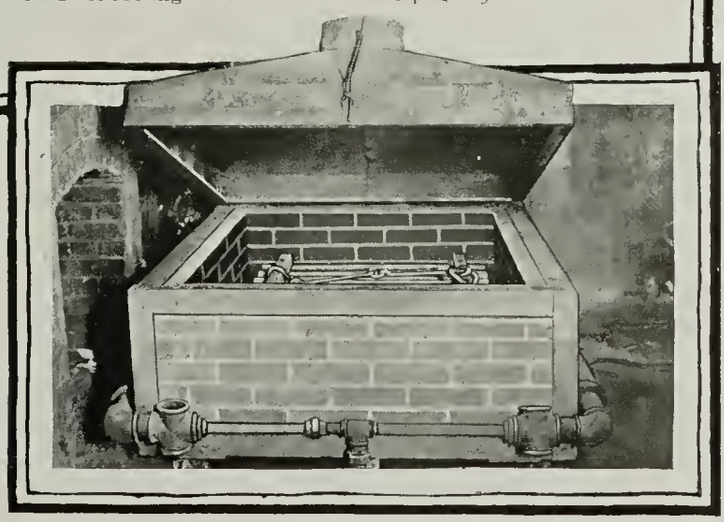


Fig. 3—Furnace for Igniting the Burning Brand
See page 13 for details

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BURNING BRAND TEST

CONDITION AFTER TEST

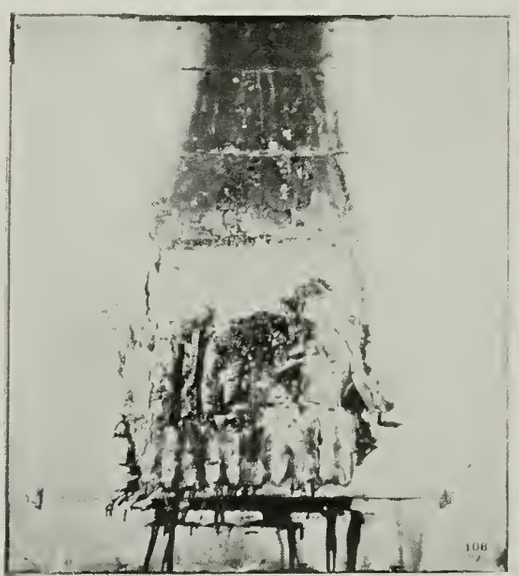
EXPOSED SIDE

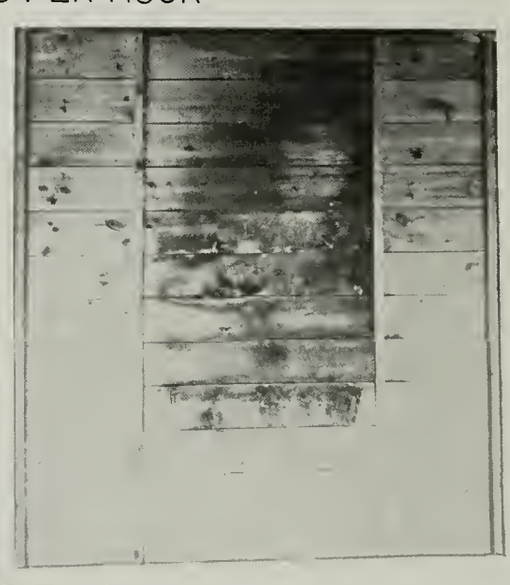
UNEXPOSED SIDE





SAMPLE SUBJECTED TO AIR CURRENTS
OF 5 MILES PER HOUR





SAMPLE SUBJECTED TO AIR CURRENTS
OF 40 MILES PER HOUR

This test is not restricted to a time limit but is continued as long as the roofing stands up under these severe conditions.

Fig. 4.—Photograph above on left shows condition of Johns-Manville Asbestos Roofing after burning brand test. Photograph above on right shows unexposed side after same test. Wind velocity 5 miles per hour. Photograph below on left shows condition of Johns-Manville Asbestos Roofing after burning brand test with wind velocity of 40 miles per hour. Photograph below on right shows unexposed side after same test. See page 13 for details of test.

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to take the base rate of insurance, may be safely put on any building with a knowledge that it is fire-safe to the highest degree.

All Johns-Manville Asbestos Roofings are put through the tests described below and are given either Class "A" or "B" rating, according to the construction of the roof deck and the type of roofing. Either Class "A" or Class "B" takes the base rate of insurance.

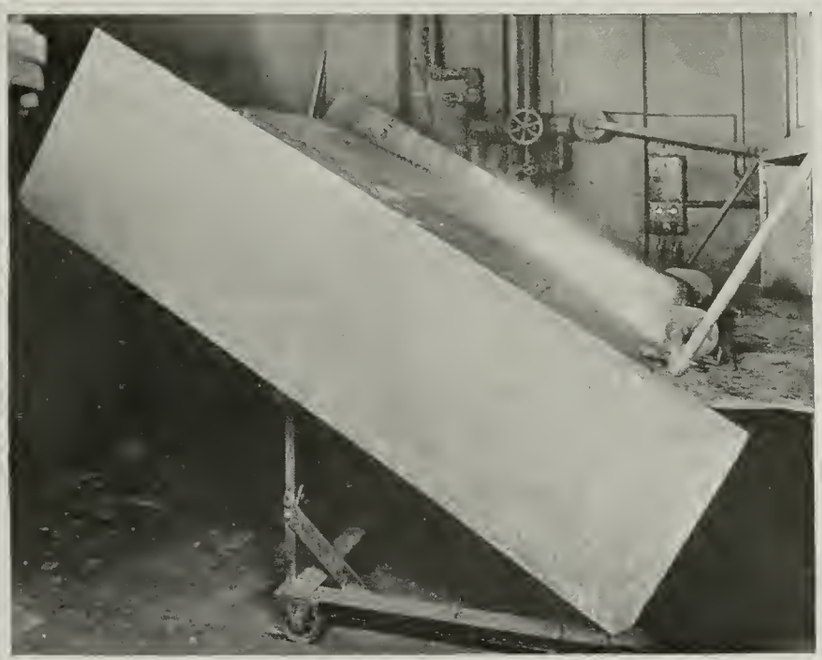


Fig. 5—Flame Exposure Test Apparatus in Action
See page 15 for details of test

Radiant Heat Test

To determine how the roofing will stand up when subjected to the radiant heat from a nearby fire fanned by a breeze, a radiant heat test is made on the roofing while it is exposed to varying air currents to simulate wind. A sample of roofing is shown undergoing such a test in Fig. 1. Fig. 2 shows Johns-Manville Asbestos Roofing after this test.

Burning Brand Test

To determine the fire resistance of a roofing when burning brands fall upon it, as is liable to happen to adjacent buildings when fire breaks out while a strong wind is blowing, each roofing examined at the Underwriters' Laboratories is subjected to the burning brand test.

In performing this test the burning brand is made up of 2 by 2-inch maple strips formed into a grid, the strips being approximately 1¾ inches apart and held together by similar strips to which they are nailed. The brand is approximately three feet square and is ignited by placing it in a gas furnace four feet square as shown in Fig. 3. This furnace is heated by a grill of gas jets which form the bottom of the furnace chamber.

The brand is supported above the jets and is exposed to the heat of the furnace for eight minutes, by which time it is all aglow and completely covered with coals. The furnace door is tilted out of the way and the glowing brand is lifted from the

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FLAME EXPOSURE TEST

EXPOSED SIDE — CONDITION AFTER TEST — UNEXPOSED SIDE



SAMPLE SUBJECTED TO AIR CURRENTS
OF 5 MILES PER HOUR



SAMPLE SUBJECTED TO AIR CURRENTS
OF 40 MILES PER HOUR

This test is not restricted to a time limit but is continued as long as the roofing stands up under these severe conditions.

Fig. 6.—Photograph above on left shows condition of Johns-Manville Asbestos Roofing after flame exposure test subjected to air currents of 5 miles per hour. Photograph above on right shows unexposed side after completion of same test. Photograph below on left shows condition of Johns-Manville Asbestos Roofing after flame exposure test subjected to air currents of 40 miles per hour. Photograph below on right shows unexposed side after completion of same test. See page 15 for details of test.

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furnace by means of grapples and tackles suspended from above and placed in the proper position on the surface of the roofing sample. The brand is permitted to burn until entirely consumed or until the roof covering has failed by permitting the ignition of the deck boards on the under side. One operator carefully notes the time of ignition and the spread of flames on the surface of the covering, also the rate at which the brand is consumed. Another operator observes the condition of the sample on the under side.

Fig. 4 shows the condition of Johns-Manville Asbestos Roofing and the unexposed roof deck after this test, at a wind velocity of 5 miles per hour and 40 miles per hour.

Flame Exposure Test

To observe the behavior of roofing under the action of flame playing directly upon it as might occur on a building roof, a direct flame contact test is made.

The apparatus used in subjecting samples of roof covering to direct flame contact is illustrated in Fig. 5. This apparatus consists of a burner with an orifice 36 inches long and ½ inch wide from which a gas flame is emitted. The flame passes over the surface of the sample directly exposing a semi-circular area about 36 inches wide by 18 to 20 inches high.

The sample is set in place before the apparatus and the burner is ignited. The sample is thus exposed until the covering fails and the deck boards are ignited. One operator observes the time of ignition of the covering and the rate of spread of flame over the surface while another operator observes the under side of the deck and notes the time in which the deck boards take fire. The effects of such a test on Johns-Manville Asbestos Roofing are evidenced in Fig. 6.

As a result of the extremely high fire-resistance afforded by all Johns-Manville Asbestos Roofings under these tests, the following classifications are given these roofings by the Underwriters' Laboratories, Inc.

Johns-Manville Asbestos Built-Up Roofing—Class "A" or "B" according to the construction of the roof deck and the type of roofing used. *Base Insurance Rates.*

Johns-Manville Asbestone Ready-to-Lay Roofing—A popular priced ready-to-lay Asbestos roofing. *Classified to take base rates of insurance.*

Johns-Manville Flexstone Asbestos Ready-to-Lay Roofing—4-ply and 3-ply *classified to take base rates of insurance.*

Johns-Manville Brooks Asbestos Ready-to-Lay Roofing—4-ply and 3-ply *classified to take base rates of insurance.*

Johns-Manville Asbestos Shingles—Laid American or straight lap method Class "A". Laid Hexagonal Method, Class "B". *Base Insurance Rates.*

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Fig. 7—Apparatus Used in Making Standard Fire Tests of Roof Covering

The cylindrical gas furnace is mounted on trunnions so it can be turned to any angle at which the roofing is tested. The air duct is of sheet metal and has a discharge opening 7 by 2½ feet.

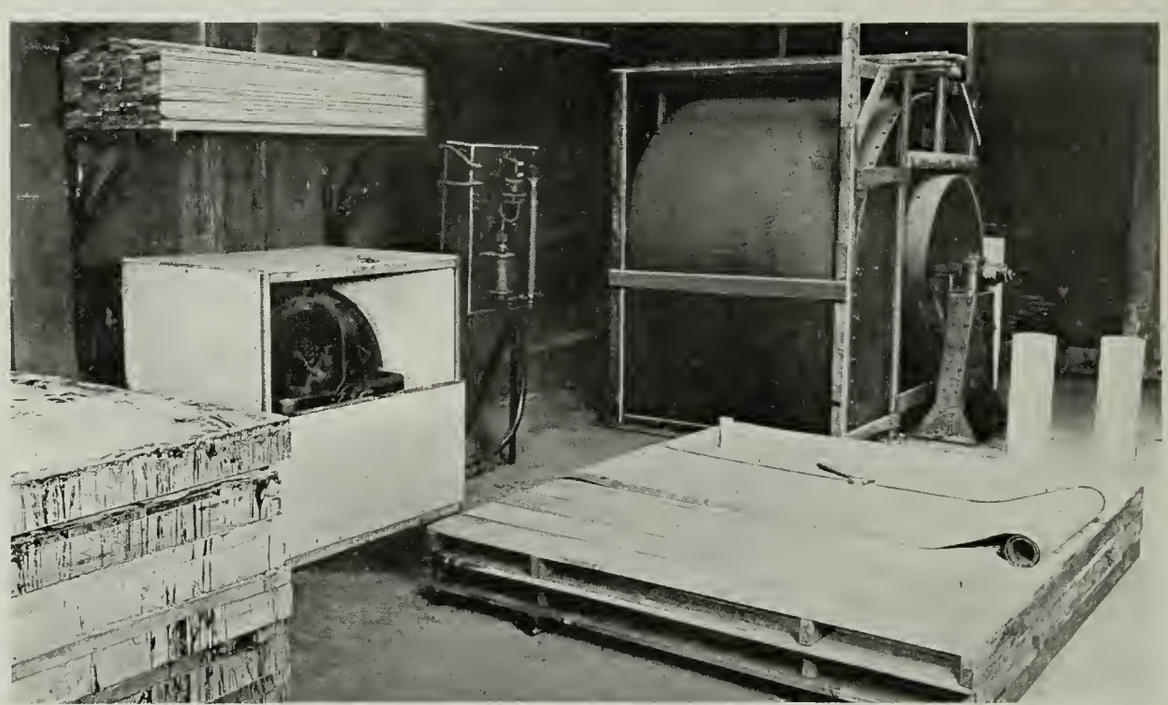
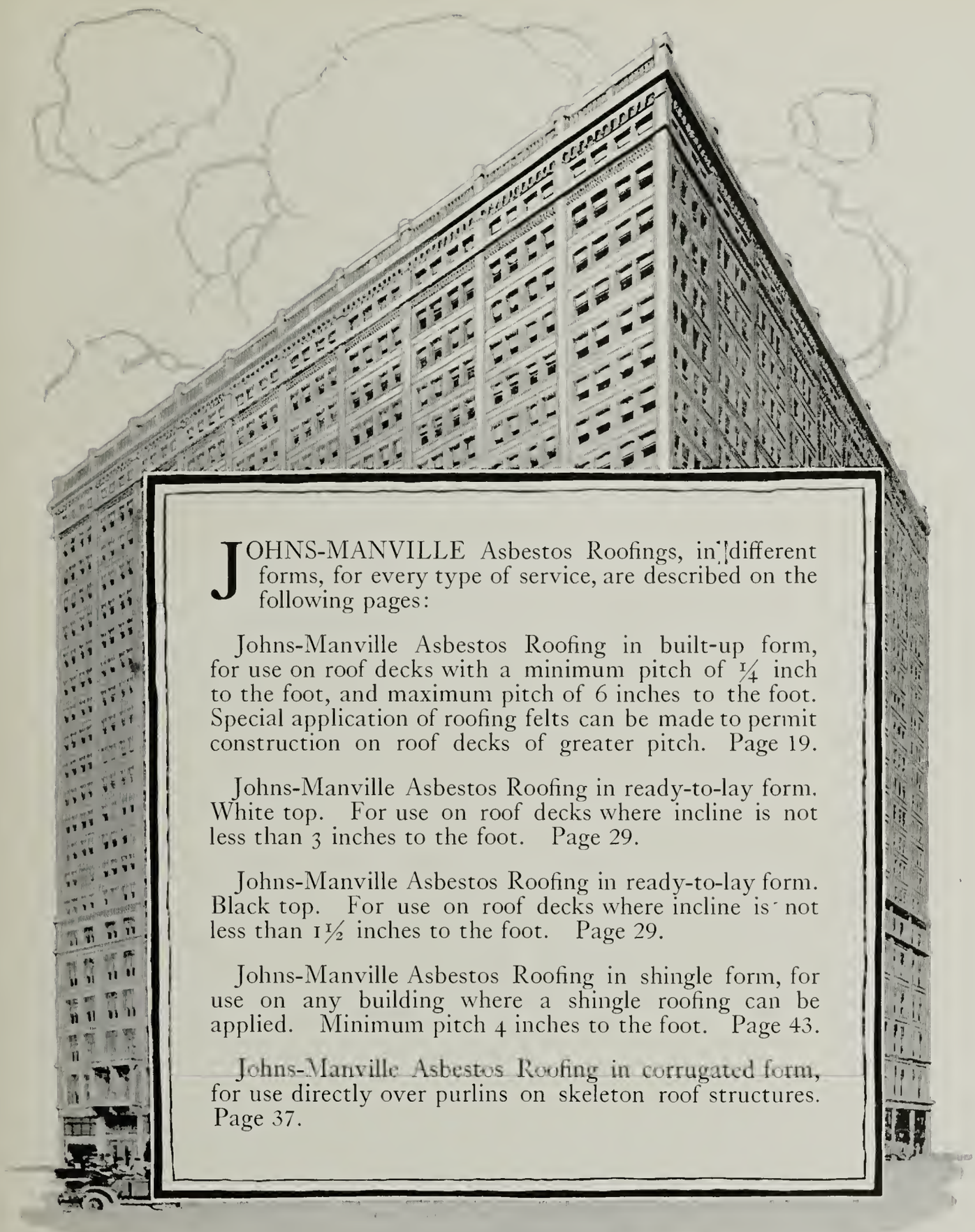


Fig. 8—Applying Sample Roofing to Standard Decks for Tests

Experienced men are employed to do this work. A pile of completed decks is shown at the left. The motor and fan for securing the wind velocities are shown in the background.

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JOHNS-MANVILLE Asbestos Roofings, in different forms, for every type of service, are described on the following pages:

Johns-Manville Asbestos Roofing in built-up form, for use on roof decks with a minimum pitch of ¼ inch to the foot, and maximum pitch of 6 inches to the foot. Special application of roofing felts can be made to permit construction on roof decks of greater pitch. Page 19.

Johns-Manville Asbestos Roofing in ready-to-lay form. White top. For use on roof decks where incline is not less than 3 inches to the foot. Page 29.

Johns-Manville Asbestos Roofing in ready-to-lay form. Black top. For use on roof decks where incline is not less than 1½ inches to the foot. Page 29.

Johns-Manville Asbestos Roofing in shingle form, for use on any building where a shingle roofing can be applied. Minimum pitch 4 inches to the foot. Page 43.

Johns-Manville Asbestos Roofing in corrugated form, for use directly over purlins on skeleton roof structures. Page 37.

Railway Exchange Building, St. Louis, Mo.
Mauran, Russell & Crowell Architects, St. Louis, Mo.
Westlake Construction Co., Contractors, St. Louis, Mo.
Johns-Manville Asbestos Built-Up Roofing

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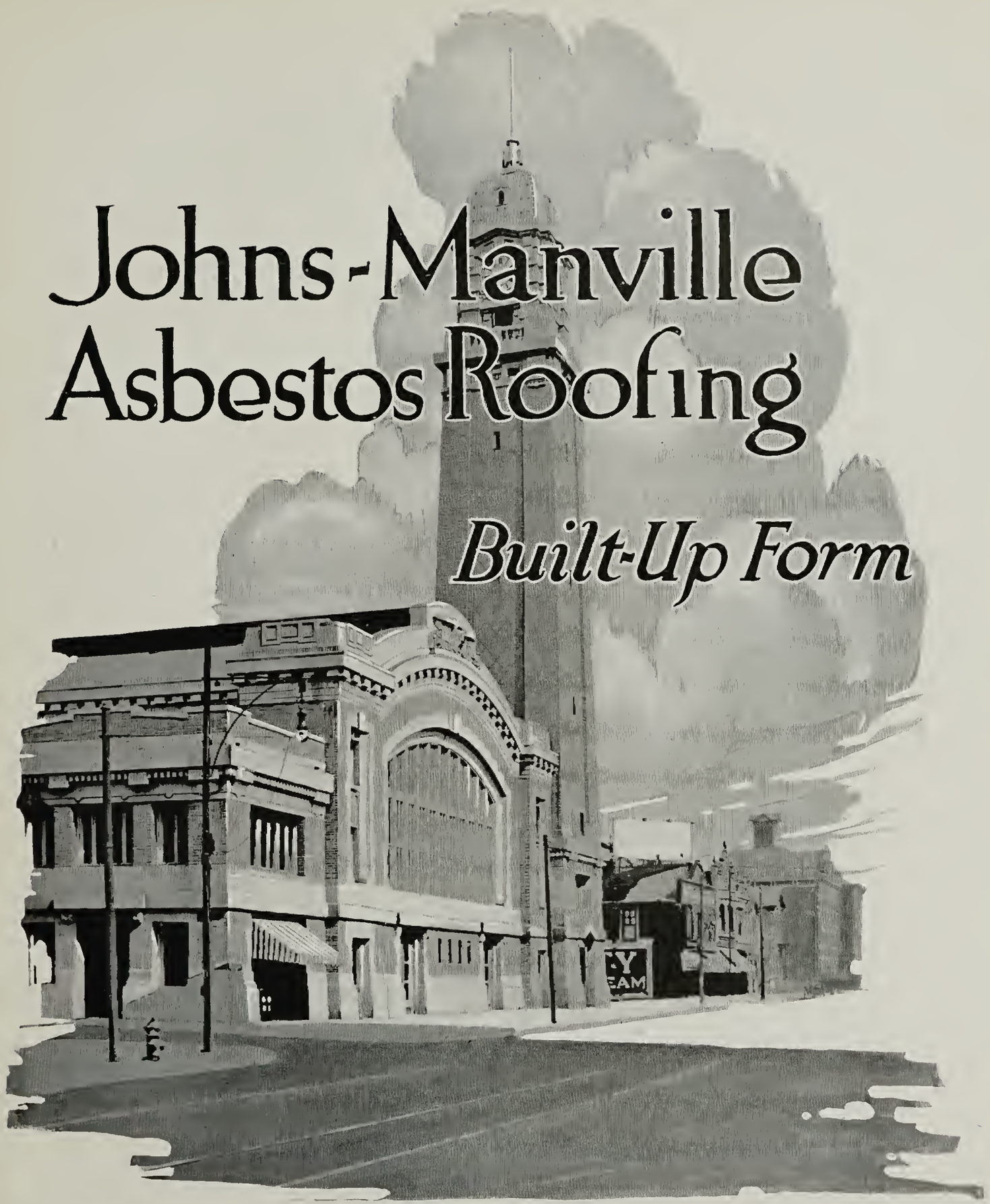


Oregon Journal Building
Portland, Oregon
Reid Bros., Architects
San Francisco
Johns-Manville Asbestos
Built-Up Roofing

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Johns-Manville Asbestos Roofing

Built-Up Form



West Side Market House, Cleveland, Ohio
Hubbell & Benes, Architects, Cleveland, Ohio
The W. B. McAllister Co., Contractors, Cleveland, Ohio
Johns-Manville Asbestos Built-Up Roofing

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Albany High School, Albany, N. Y.
Johns-Manville Asbestos Built-Up Roofing

Johns-Manville Asbestos Roofing
(*Built-Up Form*)

Hotel Vanderbilt, New York City
Warren & Wetmore, Archts., N. Y. C.
Johns-Manville Asbestos Built-Up Roofing



JOHNS-MANVILLE Asbestos Roofing in built-up form, applied by representatives of our Contract Departments, can be used on any roof deck with a minimum pitch of ¼ inch to the foot, and maximum pitch of 6 inches to the foot. Special application of roofing felts can be made to permit construction on roof decks of greater pitch.

This form of Johns-Manville Asbestos Roofing consists of several sheets of asbestos felt thoroughly saturated with natural asphalts, cemented together with hot asphalt and securely fastened to roof deck.

The number of layers of asbestos felts and asphalt used depends upon the roof-deck construction and incline. Either 3, 4 or 5-plies of asbestos felt are used depending upon the recommendation of the representative from the Johns-Manville Branch nearest you, who will personally go over your building with you and make a detailed recommendation and estimate.

Reinforced at Vital Points

Practically 90 per cent of all roofing troubles occur in the valleys or flashings, and unless these points of your roof give satisfactory service, roofing troubles and expense are bound to result.

On all Johns-Manville Asbestos Built-up Roofs, the valleys and flashings are specially reinforced. The flashings vary to meet conditions and are a combination

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of special flashing fabric, and Asbestile cement, applied according to the Johns-Manville system.

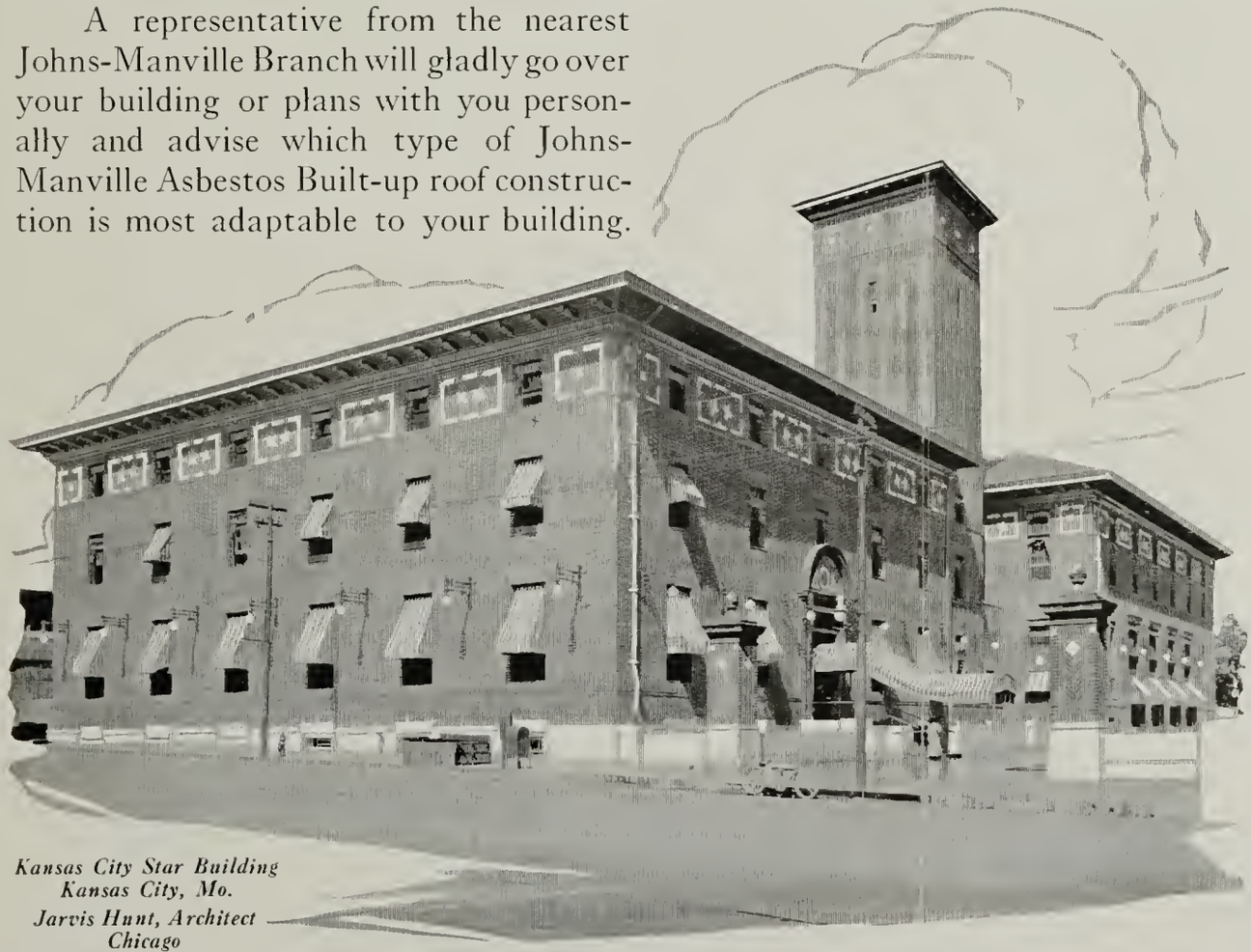
This system and the materials and specifications used on Johns-Manville Asbestos Built-up Roofing have been developed exclusively by Johns-Manville. No roofing mechanic other than a Johns-Manville representative uses them.

And it is due entirely to the strength and effectiveness of this system that we can afford to back up the performance of all of your Johns-Manville Roofing, including the flashings, with Johns-Manville Responsibility.

Johns-Manville plans the job, furnishes the material and workmanship and vouches for the performance of the roofing through Johns-Manville Responsibility. And this responsibility backs up every part of your roofing—the flashings and gutters, just as well as the surface of the roof itself.

The fact that both the material and workmanship going into your roofing are backed by one concern, works directly to your advantage, because in this way you are assured that the responsibility for the satisfactory performance of your roofing is assumed entirely by one firm of national reputation. There can be no shifting of responsibility if the Johns-Manville Roofing does not give the service promised for it.

A representative from the nearest Johns-Manville Branch will gladly go over your building or plans with you personally and advise which type of Johns-Manville Asbestos Built-up roof construction is most adaptable to your building.



Kansas City Star Building
Kansas City, Mo.
Jarvis Hunt, Architect
Chicago
Johns-Manville Asbestos Built-Up Roofing

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A Few Representative Installations of Johns-Manville Asbestos Built-Up Roofing

Canadian

British Columbia Sugar Refining Co., Vancouver, B. C.
Consolidated Mining & Smelting Co., Trail, B. C.
Canadian Pacific Railway, Montreal, Que.
American Can Company, Montreal, Que.
Canada Cycle & Motor Co., Toronto, Ont.
Ontario Pulp & Paper Co., Thorold, Ont.
King Edward School, Winnipeg, Man.
Regina Power House, Regina, Sask.
Land Title Building, Moose Jaw, Sask.
McLeod Building, Edmonton, Alberta.

Foreign

Honolulu Iron Works, Honolulu, T. H.

New England States

MerrimacChemical Co., North Woburn, Mass.
Cheney Brothers, South Manchester, Conn.
Brainard & Armstrong, New London, Conn.
General Electric Co., Lynn, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Boston & Maine Railroad, Boston, Mass.
Boston & Albany Railroad, Worcester, Mass.
Atlas Tack Corporation, Fairhaven, Mass.
Worthington Pump & Machine Co., Cambridge, Mass.
Carnegie Steel Company, Allston, Mass.

Middle Atlantic States

General Electric Company, Schenectady, N. Y.
Lehigh Valley Railroad Co., Buffalo, N. Y.
Aluminum Company of America, Massena, N.Y.
Niles, Bement & Pond, Plainfield, N. J.
Westinghouse Lamp Company, Bloomfield, N. J.
Hyatt Roller Bearing Company, Newark, N. J.
New York Central & Hudson River Railroad, Weehawken, N. J.
Worthington Pump Company, Harrison, N. J.
Rome Wire Company, Rome, N. Y.
Kalbfleish Chemical Company, Rahway, N. J.
American Can Company, Baltimore, Md.
Washington Baseball Park, Washington, D. C.
Welsbach Company, Gloucester, N. J.
American Vulcanizing Fibre Company, Wilmington, Del.
Ingersoll-Rand Company, Athens, Pa.
Hershey Chocolate Company, Hershey, Pa.
American Car & Foundry Company, Berwick, Pa.
Crucible Steel Company of America, Crescent and La Belle Works, Pittsburgh, Pa.
Du Bois Electric Company, Du Bois, Pa.
General Electric Company, Erie, Pa.
United States Glass Company, Pittsburgh, Pa.
J. T. & C. Hamilton, Pittsburgh, Pa.
Bailey High School, Pittsburgh, Pa.
Electric Power House, Warren, Pa.

Central States

Kingsport Pulp Corporation, Kingsport, Tenn.
Hume-Fogg High School, Nashville, Tenn.
Aluminum Ore Company, East St. Louis, Ill.
Goodyear Tire & Rubber Co., Akron, O.
The Standard Oil Company of Ohio, Cleveland, O.
Peerless Motor Car Company, Cleveland, O.
Willys-Overland Company, Toledo, O.
Big Four Railroad, Cincinnati, O.
Jackson Cushion Spring Company, Jackson, Mich.
The Robbins & Myers Company, Springfield, O.
The National Cash Register Company, Dayton, O.
The Trussed Concrete Steel Company, Youngstown, O.
National Tire & Rubber Company, East Palestine, O.
American Clay Machinery Co., Bucyrus, O.
Garford Motor Truck Company, Lima, O.
Ohio State University, Columbus, O.
Crane Company, Chicago, Ill.
Havana-American Tobacco Co., Chicago, Ill.
Fort Wayne Corrugated Paper Co., Fort Wayne, Ind.
Gary Theatre Building, Gary, Ind.
Goodyear Tire & Rubber Company, Indianapolis, Ind.
Kentucky Distillery Company, Louisville, Ky.
Ford Motor Company, Detroit, Mich.
Winnebago Cheese Company, Fond du Lac, Wis.
State Insane Hospital, Mendota, Wis.

Southern States

U. S. Aeronautic Station, Pensacola, Fla.
City National Bank Building, Mobile, Ala.
Battlesboro Oil Company, Battlesboro, N. C.

Southwestern States

New Municipal Building, Tulsa, Okla.
International Distillery Co., New Orleans, La.
Rogers-Wade Furniture Warehouse, Paris, Tex.
High School Building, Fulton, Mo.
Union Electric Building, 4th & Walnut Sts., St. Louis, Mo.
Little Rock Railway & Electric Co., Little Rock, Ark.
Southern Colorado Power & Railway Co., Trinidad, Col.
University of New Mexico, Albuquerque, N. M.
Utah Light & Railway Co., Salt Lake City, Utah.

Northwestern States

Oregon Short Line Railway, Pocatello, Idaho.
Quaker Oats Company, Cedar Rapids, Iowa.
United Mine Workers of America, Hocking, Iowa
Illinois Central Passenger Station, Cherokee, Iowa
Universal Portland Cement Co., Duluth, Minn.
Washburn Crosby Company, Minneapolis, Minn.
Inspiration Consolidated Mining Co., Butte, Mont.
Lincoln Highway Garage Assn., Columbus, Nebr.
Administration Building of the University of Nebraska, Lincoln, Nebr.
Union Pacific Railway, Omaha, Nebr.
State College, Brookings, South Dakota.

Pacific States

American Can Company, San Francisco, Cal.
California Pacific Building, San Francisco, Cal.
First Congregational Church, San Francisco, Cal.
Sutter Hotel, San Francisco, Cal.
University of Washington, Seattle, Wash.
West Seattle, Balland and Franklin High Schools, Seattle, Wash.
Fourteenth Street School, Bellingham, Wash.
State Normal School, Ellensburg, Wash.
Washington Water Power Company, Spokane, Wash.
Tacoma Building, Tacoma, Wash.
Journal Building, Portland, Ore.
Carnation Milk Products Co., Hillsboro, Ore.
Gyde & Taylor Building, Wallace, Idaho.

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Standard Specifications Johns-Manville Asbestos Built-Up Roofing

OVER CONCRETE OR GYPSUM

(Applied Only by the Manufacturer)

On all concrete roof decks we recommend the Johns-Manville standard built-up construction over non-combustible surfaces as follows:

JOHNS-MANVILLE 3-PLY AJAX ASBESTOS BUILT-UP ROOFING

PREPARATION OF ROOF SURFACE:

Roof surface shall be graded to properly drain all water freely into gutters and down-spouts. Roof surface shall be finished smooth and hard, containing no depressions nor projections; the concrete to be thoroughly set and air-dry and free from frost. All rubbish shall be removed and deck made and maintained perfectly clean and free of all obstructions other than tools and appliances of roofer. All drainage connections shall be set to permit free flow of water. Right angle at base of parapet wall shall be rounded into proper cove. All to be done by owner or contractor other than roofer.

Roofing materials to be applied over such surface shall be:

MATERIALS:

Asphalt Concrete Primer; to be Johns-Manville Asphalt Concrete Primer over concrete. There shall be used approximately 1 gal. per 100 sq. ft. of roof surface. Over gypsum there shall be used approximately 2 gallons per 100 sq. ft. of roof surface applied in two coats.

Asphalt Cement; to be Johns-Manville Ajax Asphalt (Combination of Trinidad Lake and other natural asphalts) Cement. There shall be used approximately 90 lbs. per 100 sq. ft. of finished roof surface.

Single-ply sheets of asphalt impregnated asbestos roofing felt, each 32″ wide and weighing approximately 14 lbs. per 100 sq. ft.; to be Johns-Manville No. 2 Ajax Asphalt Impregnated Asbestos Felt.

Flashing materials as specified hereinafter.

Liquid Asphalt Roof Coating; to be Johns-Manville Roof Coating. There shall be used approximately 1 gal. per 100 sq. ft. of finished roof surface.

Such materials shall be applied over concrete as follows:

APPLICATION OF MATERIALS:

1. Coat the concrete with cold Johns-Manville Asphalt Concrete Primer to provide a proper bond between concrete and Asphalt, allowing primer to dry.

2. Mop the surface thus primed intermittently (see page 24) with Johns-Manville Ajax Cement, heated to flow freely, and while the cement is hot, imbed into it sheets of Johns-Manville No. 2 Ajax Felt, in three-ply construction. Expose to weather 10½″ of each ply, mop the surface between plies with hot Ajax Cement and roll the felt closely behind the mop, so that no missing of asphalt can take place. Over gypsum the back edge of first ply to be nailed to roof slab with proper nails driven through flat tin caps, in addition to mopping as above.

3. After such materials have been properly applied, and the roof is otherwise complete, spread over it an even thickness of Johns-Manville Asphalt Roof Coating, and neatly finish it, to provide an even black appearance.

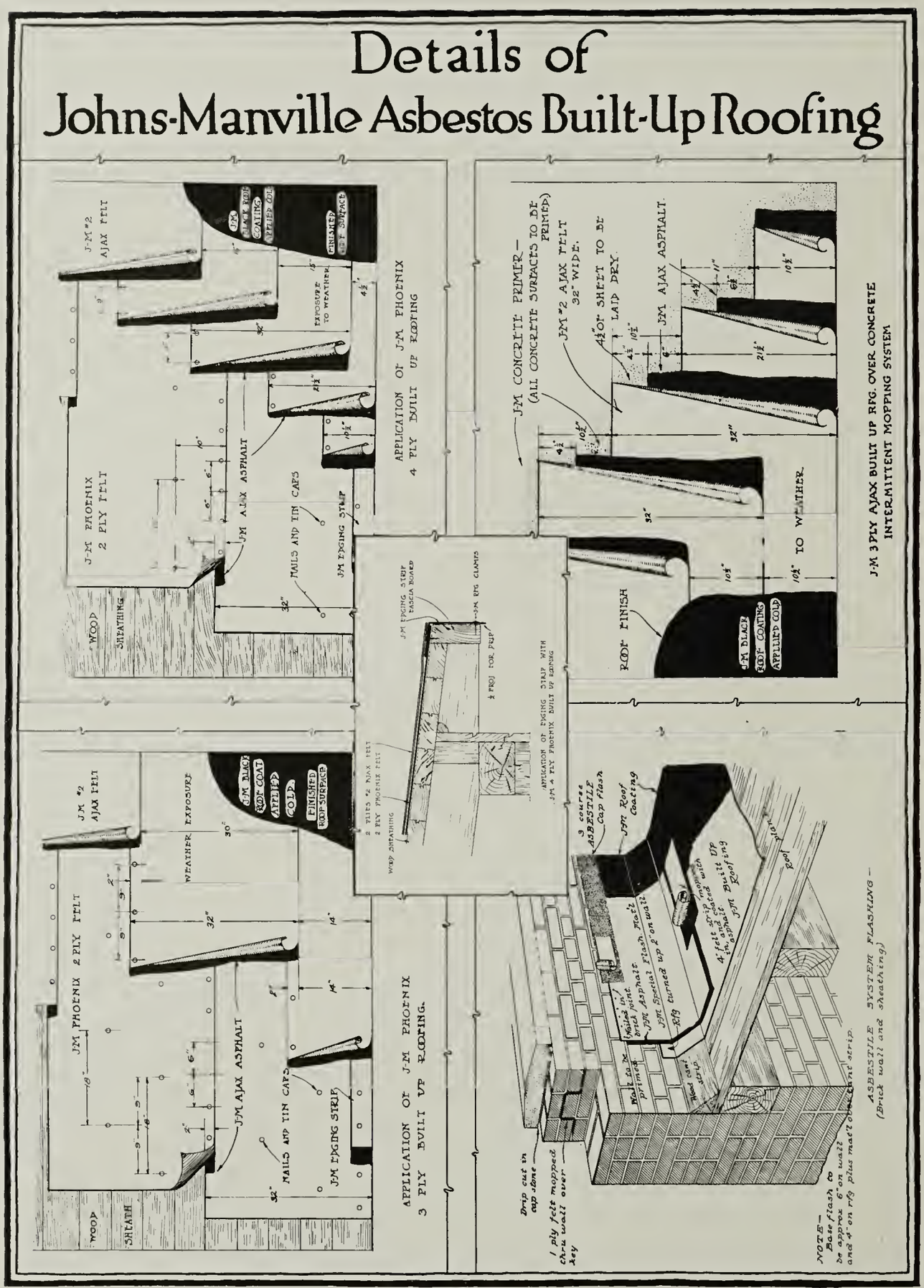
FLASHINGS:

Walls and all other elevations above roof surface shall be carried vertically at least 12″ to provide for proper flashings. If such flashings are to be constructed in accordance with Johns-Manville Asbestile System, such walls and other elevations need not extend more than 8″ to 10″ above roof surface, unless demanded by local building authorities.

Roofing materials shall be carried up on vertical surface 2″. All flashings, except those around ventilators, stand-pipes, exhausts, etc., shall be composed of base flashings of special Asbestos Flashing material, approximately 10½″ wide, cemented and nailed to vertical surface. Such flashings shall be counter-flashed with Johns-Manville Asbestile System. (See page 26.)

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Details of Johns-Manville Asbestos Built-Up Roofing



Complete working drawings, showing all details necessary for the application of Johns-Manville Asbestos Built-Up Roofing, can be inspected at any Johns-Manville Branch. These reduced fac-similes are only a guide to the drawings available.

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OVER WOOD SHEATHING

JOHNS-MANVILLE 4-PLY APPROVED SALAMANDER ASBESTOS BUILT-UP ROOFING

(Applied Only by the Manufacturer)

NOTE: Use 4-ply Approved Salamander Asbestos Built-up Roofing—approximate weight, 155 lbs. per square.

PREPARATION OF ROOF SURFACE:

Sheathing boards shall be dry, well seasoned and of uniform thickness, laid closely—tongue and grooved sheathing preferred.

Roof surface shall be graded properly to drain all water freely into gutters and down-spouts. Ends of all sheathing boards shall rest on and be properly secured with at least two nails to joists or purlins. If edges of sheathing boards are curled up, they shall be drawn down and properly secured to joists or purlins, eliminating all standing nail heads and other projections. All loose knots and other flaws shall be removed and all holes properly filled or covered. All loose nails, chips and other rubbish shall be removed and the deck made and maintained perfectly clean and free of all obstructions other than tools and appliances of roofer. All drainage connections shall be set to permit free flow of water. A 3″ x 3″ triangular wood strip will be furnished and installed (wherever base flashings are to be used) in the angle formed by roof and vertical surface. All to be done by owner or contractor other than roofer.

Roofing materials to be applied over such surface shall be:

MATERIALS:

Double-ply sheets of asbestos roofing felt, 32″ wide and weighing approximately 45 lbs. per 100 sq. ft., consisting of one white, unimpregnated ply cemented with asphalt at factory to an asphalt-impregnated ply; to be Johns-Manville Approved Salamander Asbestos Roofing.

Seven-eighths-inch barbed nails and flat tin caps; to be same as supplied by H. W. Johns-Manville Co.

Asphalt Cement; to be Johns-Manville Ajax Asphalt Cement.

Single-ply sheets of asphalt impregnated asbestos roofing felt, each 32″ wide and weighing approximately 14 lbs. per 100 sq. ft.; to be Johns-Manville No. 2 Ajax Asphalt Impregnated Asbestos Felt.

Flashing materials as specified hereinafter.

Liquid asphalt roof coating; to be Johns-Manville Asphalt Roof Coating. There shall be used approximately 1 gal. per 100 sq. ft. of finished roof surface.

Such materials shall be applied over wood sheathing as follows:

APPLICATION OF MATERIALS:

1. Lay the Johns-Manville Approved Salamander Roofing sheets next to the sheathing with the white, unimpregnated side down, lap the joints 2″ and seal them with Johns-Manville Asphalt Cement. Nail these sheets with barbed nails driven through flat tin caps, at 6″ centers along laps and at 18″ staggered centers in parallel lines 10″ apart and 10″ from the edges of each sheet.

2. Mop the entire surface of the Salamander sheets with Ajax Cement; heated to flow freely and while the cement is hot, imbed into it sheets of Johns-Manville No. 2 Ajax Felt in two-ply construction. At eaves, over base sheet of Salamander and over edging strip, start with ⅓ width sheet, then ⅔ width sheet of Ajax Felt both laid flush with eaves. Then lay full width sheets setting first full width sheet back 4½″ from eaves and then expose 15″ of each succeeding sheet to the weather. Mop the entire surface between plies with hot Ajax Cement and roll the felts closely behind the mop, so that no missing of asphalt can take place. Nail each Ajax sheet with capped nails at 9″ centers along its upper edge and approximately ¾″ therefrom, so that all nails and caps will have two plies of felt over them.

3. After such materials have been properly applied and the roof is otherwise complete, spread over it an even thickness of Johns-Manville Asphalt Roof Coating, and neatly finish it; to provide an even, black appearance.

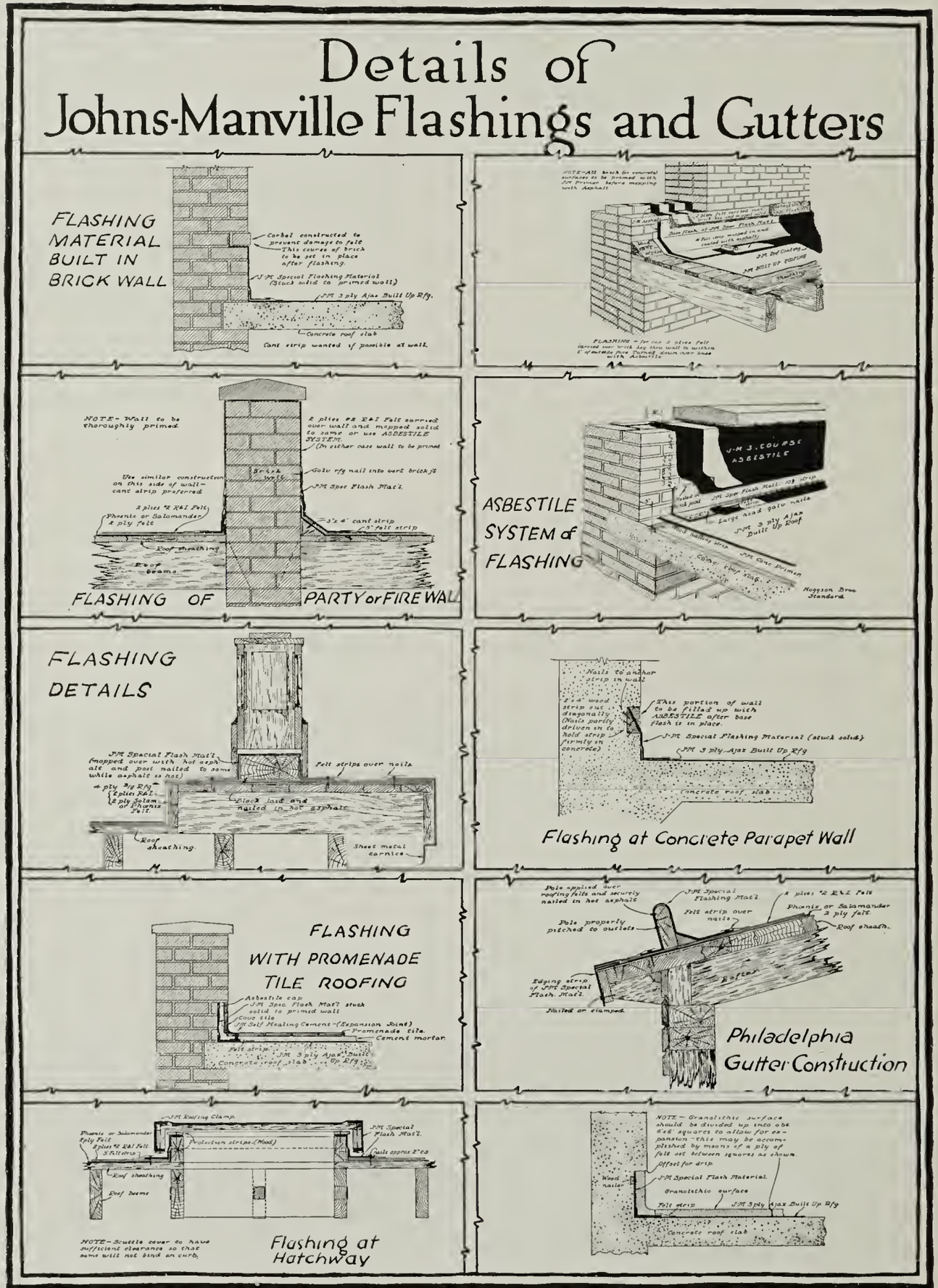
FLASHINGS:

Walls and all other elevations above roof surface shall be carried vertically at least 12″ to provide for proper flashings. If such flashings are to be constructed in accordance with Johns-Manville Asbestile System, such walls and other elevations need not extend more than 8″ to 10″ above roof surface, unless demanded by local building authorities.

Roofing materials shall be carried up on vertical surface 2″. All flashings except those around ventilators, standpipes, exhausts, etc., shall be composed of base flashings of special asbestos flashing material, approximately 10½″ wide, cemented and nailed to vertical surface. Such flashings shall be counterflashed with Johns-Manville Asbestile System. (See page 26.)

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Details of Johns-Manville Flashings and Gutters



Complete working drawings, showing all details necessary for flashing and gutter treatment, when laying Johns-Manville Asbestos Built-up Roofing, can be inspected at any Johns-Manville Branch. These reduced fac-similes are intended merely as a guide to the drawings available.

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OVER WOOD SHEATHING

JOHNS-MANVILLE 4-PLY PHOENIX ASBESTOS BUILT-UP ROOFING

(Applied Only by the Manufacturer)

PREPARATION OF ROOF SURFACE:

Sheathing boards shall be dry, well-seasoned and of uniform thickness, laid closely—tongue and grooved sheathing preferred.

Roof surface shall be graded properly to drain all water freely into gutters and down spouts. Ends of all sheathing boards shall rest on and be properly secured with at least two nails to joists or purlins. If edges of sheathing boards are curled up, they shall be drawn down and properly secured to joists or purlins, eliminating all standing nail-heads and other projections. All loose knots and other flaws shall be removed, and all holes properly filled or covered. All loose nails, chips and other rubbish shall be removed and the deck made and maintained perfectly clean and free of all obstructions other than tools and appliances of roofer. All drainage connections shall be set to permit free flow of water. A 3″ x 3″ triangular wood strip will be furnished and installed (wherever base flashings are to be used) in the angle formed by roof and vertical surface. All to be done by owner or contractor other than roofer.

Roofing materials to be applied over such surface shall be:

MATERIALS:

A double-ply sheet of asbestos roofing felt, 32″ wide, both plies to be asphalt impregnated and weighing approximately 40 pounds per 100 square feet, cemented together at factory with asphalt cement; to be Johns-Manville Phoenix Asbestos Roofing.

Seven-eighths-inch barbed nails and flat tin caps; to be same as supplied by H. W. Johns-Manville Co.

Asphalt Cement; to be Johns-Manville Ajax Asphalt Cement.

Single-ply sheets of asphalt impregnated asbestos roofing felt, each 32″ wide and weighing approximately 14 pounds per 100 square feet; to be Johns-Manville No. 2 Ajax Asphalt Impregnated Asbestos Felt.

Flashing materials as specified hereinafter.

Liquid asphalt roof coating; to be Johns-Manville Asphalt Roof Coating. There shall be used approximately 1 gal. per 100 square feet of finished roof surface.

Such materials shall be applied over wood sheathing as follows:

APPLICATION OF MATERIALS:

1. Lay the Johns-Manville Phoenix Roofing sheets next to the sheathing, lap the joints 2″ and seal them with Johns-Manville Ajax Cement. Nail these sheets with barbed nails driven through flat tin caps, at 6″ centers along laps and at 18″ staggered centers in parallel lines 10″ apart and 10″ from the edges of each sheet.

2. Mop the entire surface of the Phoenix sheets with Ajax Cement, heated to flow freely, and while the cement is hot, imbed into it sheets of Johns-Manville No. 2 Ajax Felt in two-ply construction. At eaves, over base sheet of Phœnix and over edging strip, start with ⅓ width sheet, then ⅔ width sheet of Ajax Felt both laid flush with eaves. Then lay full width sheets setting first full width sheet back 4½″ from eaves and then expose 15″ of each succeeding sheet to the weather. Mop the entire surface between plies with hot Ajax Cement and roll the felts closely behind the mop, so that no missing of asphalt can take place. Nail each Ajax sheet with capped nails at 9″ centers along its upper edge and approximately ¾″ therefrom, so that all nails and caps will have two plies of felt over them. (See page 24.)

3. After such materials have been properly applied and the roof is otherwise complete, spread over it an even thickness of Johns-Manville Asphalt Roof Coating and neatly finish it; to provide an even, black appearance.

FLASHINGS:

Walls and all other elevations above roof surface shall be carried vertically at least 12″ to provide for proper flashings. If such flashings are to be constructed in accordance with H. W. Johns-Manville Asbestile System, such walls and other elevations need not extend more than 8″ or 10″ above roof surface, unless demanded by local building authorities.

Roofing material shall be carried up on vertical surface 2″. All flashings, except those around ventilators, standpipes, exhausts, etc., shall be composed of base flashings of special asbestos flashing material, approximately 10½″ wide, cemented and nailed to vertical surface. Such flashings shall be counterflashed with Johns-Manville Asbestile System. (See page 26.)

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OVER WOOD SHEATHING

JOHNS-MANVILLE 3-PLY PHOENIX ASBESTOS BUILT-UP ROOFING

(Applied Only by the Manufacturer)

PREPARATION OF ROOF SURFACE:

Sheathing boards shall be dry, well seasoned and of uniform thickness, laid closely—tongue and grooved sheathing preferred.

Roof surface shall be graded properly to drain all water freely into gutters and down spouts. Ends of all sheathing boards shall rest on and be properly secured with at least two nails to joists or purlins. If edges of sheathing boards are curled up, they shall be drawn down and properly secured to joists or purlins, eliminating all standing nail-heads and other projections. All loose knots and other flaws shall be removed, and all holes properly filled or covered. All loose nails, chips and other rubbish shall be removed and the deck made and maintained perfectly clean and free of all obstructions other than tools and appliances of roofer. All drainage connections shall be set to permit free flow of water. A 3″ x 3″ triangular wood strip will be furnished and installed (wherever base flashings are to be used) in the angle formed by roof and vertical surface. All to be done by owner or contractor other than roofer.

Roofing materials to be applied over such surface shall be:

MATERIALS:

A double-ply sheet of asbestos roofing felt 32″ wide, both plies to be asphalt impregnated and weighing approximately 40 lbs. per 100 sq. ft.; cemented together at the factory with asphalt cement; to be Johns-Manville Phoenix Asbestos Roofing.

Seven-eighths-inch barbed nails and flat tin caps, to be same as supplied by H. W. Johns-Manville Co.

Asphalt Cement; to be Johns-Manville Ajax Asphalt Cement.

Single-ply sheets of asphalt impregnated asbestos roofing felt, each 32″ wide and weighing approximately 14 lbs. per 100 sq. ft.; to be Johns-Manville No. 2 Ajax Asphalt Impregnated Asbestos Felt.

Flashing materials as specified hereinafter.

Liquid asphalt roof coating; to be Johns-Manville Asphalt Roof Coating. There shall be used approximately 1 gal. per 100 sq. ft. of finished roof surface. Such materials shall be applied over wood sheathing as follows:

APPLICATION OF MATERIALS:

1. Lay the Johns-Manville Phoenix Roofing Sheets next to the sheathing, lap the joints 2″ and seal them with Johns-Manville Ajax Cement. Nail these sheets with barbed nails, driven through flat tin caps at 6″ centers along laps and 18″ staggered centers in parallel lines 10″ apart and 10″ from the edges of each sheet.

2. Mop the entire surface of the Phoenix Sheets with Johns-Manville Ajax Cement, heated to flow freely, and while the cement is hot, imbed into it sheets of Johns-Manville No. 2 Ajax Felt in one-ply construction, rolling the felts closely behind the mop, so that no missing of asphalt can take place. At eaves, over base sheet of Phœnix and over edging strip, start with ½ width sheet of Ajax Felt exposed 14″ to weather. Then lay full width sheets exposing 30″ to the weather. Lap the sheets 2″, nail each with capped nails at 9″ centers along its upper edge approximately ¾″ therefrom and seal the laps with hot Ajax Cement. (See page 24.)

3. After such materials have been properly applied and the roof is otherwise complete, spread over it an even thickness of Johns-Manville Asphalt Roof Coating, and neatly finish it, to provide an even black appearance.

FLASHINGS:

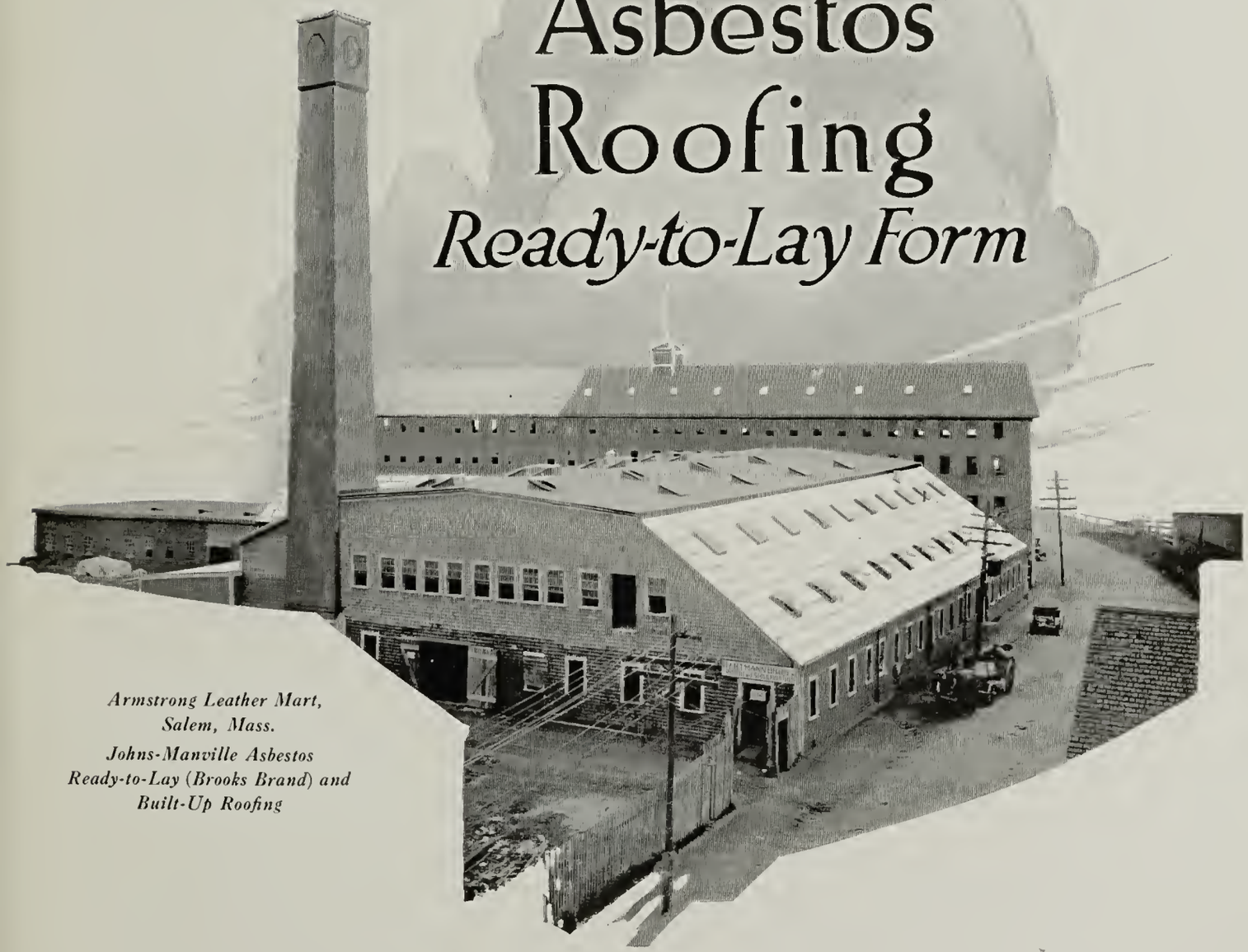
Walls and all other elevations above roof surface shall be carried vertically at least 12″ to provide for proper flashings. If such flashings are to be constructed in accordance with Johns-Manville Asbestile System, such walls and other elevations need not extend more than 8″ to 10″ above roof surface, unless demanded by local building authorities.

Roofing material shall be carried up on vertical surface 2″. All flashings except those around ventilators, standpipes, exhausts, etc., shall be composed of base flashings of special asbestos flashing materials, approximately 10½″ wide, cemented and nailed to vertical surface. Such flashings shall be counterflashed with Johns-Manville Asbestile System. (See page 26.)

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Johns-Manville Asbestos Roofing

Ready-to-Lay Form



Armstrong Leather Mart, Salem, Mass.

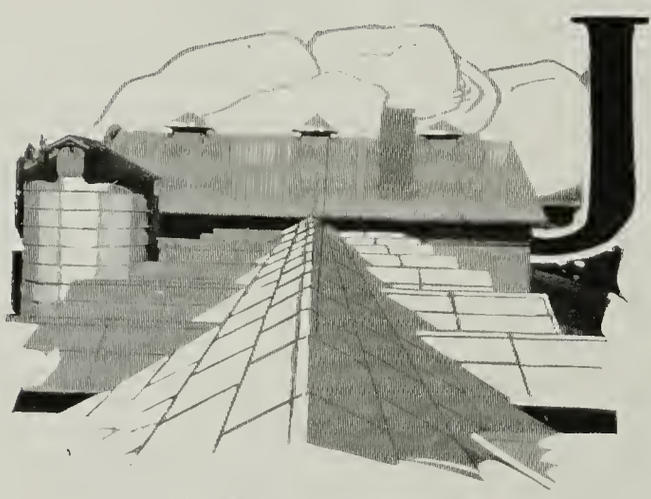
Johns-Manville Asbestos Ready-to-Lay (Brooks Brand) and Built-Up Roofing

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H. G. Fetterolf & Co., Philadelphia, Pa.
Wm. Steele & Son Co., Philadelphia, Engineers and Builders
Johns-Manville Asbestos Ready-to-Lay Roofing

Johns-Manville Asbestos Roofing
(*Ready-to-Lay Form*)



National Soldiers' Home
Johnson City, Tenn.
Johns-Manville Asbestos Ready-to-Lay Roofing

JOHNS-MANVILLE Asbestos Roofings in ready-to-lay form can be used on decks with a pitch from 1½ inches to the foot to any pitch on which a man can work. When Johns-Manville Brooks Asbestos Roofing is laid white top to weather, the minimum pitch is 3 inches to the foot.

These roofings are furnished ready for application—they include Johns-Manville Roofing Clamps and liquid cement or nails and liquid cement: full illustrated directions for applying accompany each shipment.

Johns-Manville Asbestos "Ready" Roofings are made of the same asbestos felt, impregnated with natural asphalts and cemented together with asphalt, as are used in Johns-Manville Asbestos Built-up Roofing. The plies of this "ready" roofing, however, are cemented together at the Johns-Manville factory and cut to sheets and rolls of suitable size to enable quick and easy application.

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Whether your building is a big, permanent factory with a sloping roof, or a small temporary outhouse with an inclined roof deck, there's a Johns-Manville Asbestos "Ready" Roofing for it—one which will give exactly the kind of service the building requires.

Write the Johns-Manville Branch nearest you, describing the kind of building you wish to roof, the approximate pitch of the roof deck and the type of roof deck construction.

We will base our recommendations upon this information and tell you what type of roofing to use. In this way you will benefit directly by our years of experience in the manufacture, recommendation and application of all types of roofings—and be sure that the roofing you buy is the right kind for your building.

There are three kinds of Johns-Manville Asbestos "Ready" Roofings:

Johns-Manville Flexstone Asbestos "Ready" Roofing—a black top, fire-safe, Asbestos "Ready" Roofing in 3 and 4-ply.

4-ply is supplied in flat sheets only, 32″ x 80″; 6 sheets to the square, 4 squares to the crate. It weighs from 88 to 91 lbs. per 108 square feet, crated, without completing materials.

3-ply is shipped in 1 square rolls 32″ wide or in flat sheets 32″ x 80″, 5 squares to the crate. In rolls it weighs approximately 61 lbs. per 108 square feet when packed with nails and cement, and approximately 63½ lbs. per 108 square feet when packed with Johns-Manville Roofing Clamps and cement. In flat sheets it weighs 70 lbs. per square of 108 square feet, crated, without completing materials. Approved by Underwriters' Laboratories, Inc., and takes base rates of insurance.

Johns-Manville Brooks Asbestos "Ready" Roofing—a white top, fire-safe, Asbestos "Ready" Roofing in 3 and 4-ply.

4-ply is furnished in sheets 32″ wide by 80″ long; 6 sheets to the square, 4 squares to the crate. It weighs from 88 to 91 lbs. per 108 square feet, crated, without completing materials.

3-ply is packed in 1 square rolls of 108 square feet or 2 square rolls of 216 square feet. It weighs approximately 61 lbs. per 108 square feet when packed with nails and cement, and approximately 63½ lbs. per 108 square feet when packed with Johns-Manville Roofing Clamps and cement. Approved by Underwriters' Laboratories, Inc., and takes base rates of insurance.

JOHNS-MANVILLE ASBESTOSIDE—A fireproof, waterproof, weather-tight asbestos siding. As easy to apply as sheathing, and unaffected by acids, gas, chemical fumes and all climatic conditions. *For complete description, see page 93.*

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Johns-Manville Asbestone

A Real Fire-Safe Asbestos Ready Roofing at a Popular Price

ASBESTONE is the answer to the demand for an all-asbestos roofing—within the price range of the heavier "Rag-felt" roofings ordinarily used on the less permanent type of construction. It has been designed to give the fire protection and lasting roof service of Johns-Manville Asbestos—at a popular price.

It is not a cheap roofing in the general acceptance of that expression, which seems to imply a sacrifice of quality.

Asbestone is popular priced simply because of three self-explanatory economic factors:

Increased mining facilities meaning greater quantities of raw material.

Quantity production with a consequent low manufacturing cost.

Wide distribution and a minimum sales expense.



Asbestone—What It Is

Asbestone is exactly what the name implies—a stone roofing made from asbestos fibres and natural asphalts designed by nature for waterproofing purposes—an all-mineral fabric resisting alike the disintegrating effects of the sun and the ravages of fire, time and weather.



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The asbestos felts are waterproofed with a combination of natural asphalts and the plies are united by a heavy layer of the same compound. This means a roofing of mineral fibres literally soaked in life-giving waterproofing.

Economical—Fire-Safe

First cost is the only cost because it never needs painting and will give years of satisfactory service without the need for or expense of repairs.

Asbestone defies time and repels fire. The varying degrees of heat and cold leave it unchanged, because being all-mineral there is nothing in it to disintegrate, dry out or rot.

One side of Asbestone is finished with a surfacing of crushed mineral—the other side is smooth black. It can be easily applied, each roll contains the necessary fasteners and full directions for laying.

Furnished in rolls, weighing approximately 60 pounds per square of 108 square feet, including completing materials—Johns-Manville galvanized roofing nails and cement. Johns-Manville Roofing Clamps shipped when ordered.

Asbestone is backed by Johns-Manville Responsibility and the liberal policy of Johns-Manville Registration, which assures the user the roofing service claimed for Johns-Manville Asbestone.

Approved by Underwriters' Laboratories, Inc.

"Rock or Rags"

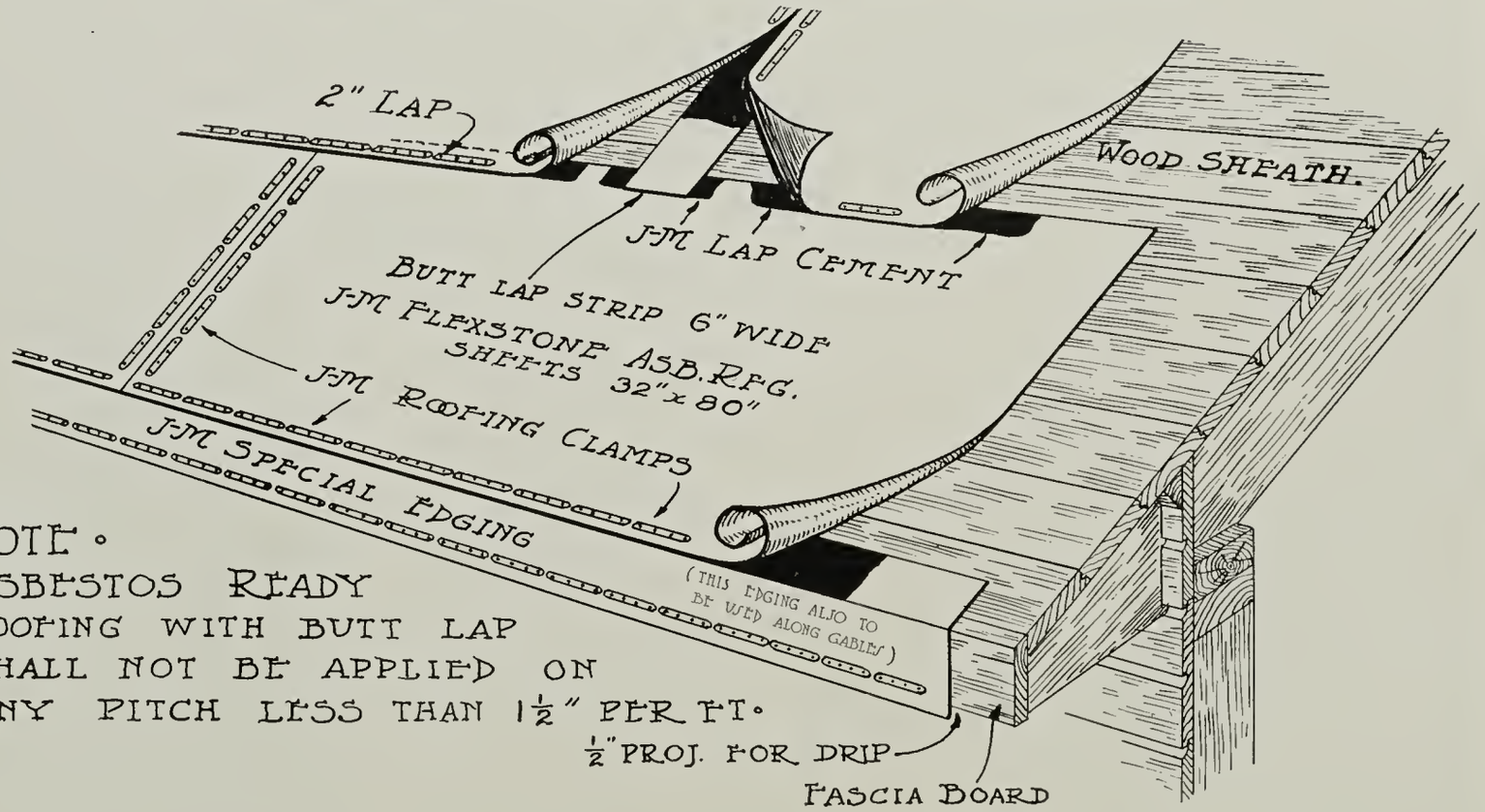
Send for the booklet "Rock or Rags", a clear, fearless discussion of the subject of roofings. Our nearest branch will mail it to you upon request.



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Details of Johns-Manville Asbestos Ready-to-Lay Roofing



APPLICATION OF J-M FLEXSTONE READY RFG.

A complete working drawing, showing all details necessary for the application of Johns-Manville Ready-to-lay Roofing, can be inspected at any Johns-Manville Branch. This reduced fac-simile is intended merely as a guide to the drawing available.

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Standard Specifications
Johns-Manville Asbestos Ready-to-Lay Roofing

For Prepared Roofing Applied Over Wood Sheathing, Monitor Type Roofs, Slow-Burning Mill Construction with Saw-Tooth Roof, Steep Surfaces

NOTE: While the following specification mentions Johns-Manville 3-ply Flexstone, it can be used for the application of 4-ply Flexstone, 3-ply and 4-ply Brooks (White Top) Asbestos Roofing and Asbestone (Asbestos) roofing, by the substitution of the name of the desired roofing throughout.

PREPARATION OF ROOF SURFACE:

Sheathing boards shall be dry, well seasoned and of uniform thickness, laid closely—tongue-and-groove sheathing preferred. Ends of all sheathing boards shall rest on and be properly secured with at least two nails to joists or purlins. If edges of sheathing boards are curled up, they shall be drawn down and properly secured to joists or purlins, eliminating all standing nail heads and other projections. All loose knots and other flaws shall be removed, and all holes properly filled or covered. The sheathing shall be made clear of all nails, chips and other rubbish or obstructions. All drainage connections shall be set to permit free flow of water. A 3″ x 3″ triangular wood strip will be furnished and installed (wherever base flashing is to be used) in the angle formed by the roof and vertical surface. All to be done by owner or contractor other than roofer.

Roofing materials to be applied over such surface shall be:

MATERIALS:

Asbestos sheet roofing ready for application, 32″ wide, weighing approximately 56 lbs. per 100 sq. ft.; to be Johns-Manville 3-ply Flexstone Asbestos Prepared Roofing.

Cement for laps of roofing sheets to be Johns-Manville Lap Cement.

Galvanized clamps and nails to be Johns-Manville Roofing Clamps and special galvanized clamp nails.

Flashing materials as specified hereinafter. Gutters and valleys treated to meet individual conditions by application of Built-up Roofing.

Such materials shall be applied over wood sheathing as follows:

APPLICATION OF MATERIALS:

1. Cut the roofing materials into sheets approximately 10 ft. in length. Commence at eaves or gutters and apply such sheets parallel with them, flush with edge and over edging strip of special flashing material, which shall have been previously applied.

2. Lap horizontal joints 2″ and apply an intermediate layer of cold Johns-Manville Lap Cement.

3. Butt the ends of the sheets at vertical joints closely together without lapping. Lay, with black side up in all cases, the 6″ wide strip of asbestos felt (furnished with all Johns-Manville Asbestos Prepared Roofing) underneath each vertical joint, extending it 3″ on each side of joint for entire width of roofing sheet. Be sure that lower end of butt lap is led out on top of sheet below. Cover each strip of felt furnished for a butt end joint with cold lap cement, and imbed the butted ends of roofing sheets into the cement. Then apply clamps vertically on each side of vertical butt end joints.

4. Secure all horizontal lap joints and vertical butted joints with Johns-Manville Galvanized Roofing Clamps and special galvanized clamp nails; butt the clamps end to end approximately ½″ from edges of sheets. On steep roofs, clamps may be spaced ½″ apart.

5. Extend both top sheets approximately 2″ over ridge; lap one sheet over the other and nail on 9″ centers.

6. Apply a capping or finishing strip of same roofing material, approximately 10½″ wide, lengthwise of ridge; extend it equally on each side of ridge and thoroughly clamp its lower edges.

FLASHINGS:

Walls and all other elevations above roof surface shall be carried vertically at least 12″, to provide for proper flashings. If such flashings are to be constructed in accordance with Johns-Manville Asbestile System, such walls and other elevations need not extend more than 8″ to 10″ above roof surface, unless demanded by local building authorities.

Roofing material shall be carried up on vertical surface approximately 2″. All flashings, except those around ventilators, standpipes, exhausts, etc., shall be composed of base flashings, of special Asbestos Flashing Material, approximately 10½″ wide, cemented and nailed to vertical surface. Such flashings shall be counterflashed with Johns-Manville Asbestile System.

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A Few Representative Installations of Johns-Manville Asbestos Ready-to-Lay Roofing

Canadian

Canadian Pacific Railway Co., Vancouver, B. C.
Shawinigan Water & Power Co., Shawinigan Falls, Que.
Dominion Textile Co., Montreal, Que.
Canadian Electro Products, Shawinigan Falls, Que.
National Iron Works, Toronto, Ont.
Glass Garden Builders, Georgetown, Ont.
Ingersoll Packing, Ingersoll, Ont.

New England States

Beggs & Cobb Tanning Co., Winchester, Mass.
New England Box Company, Greenfield, Mass.
Brown Cotton Gin Company, New London, Conn.
Atlas Tack Corp., Fairhaven, Mass.
Merrimac Chemical Co., North Woburn, Mass.

Middle Atlantic States

Morgan Steam Laundry Co., New York City.
New York Air Brake Co., Watertown, N. Y.
Morrow Mfg. Company, Elmira, N. Y.
Gas Engine & Power Co., Morris Heights, N. Y.
Sea Board By-Products Co., Bergen Junction, N. J.
Ammonium Phosphate Corp., Warner, N. J.
Babcock & Wilcox Co., Bayonne, N. J.
Mass & Wallstein, Newark, N. J.
Hamilton Rubber Company, Trenton, N. J.
American Car & Foundry Company, Wilmington, Del.
Richmond Radiator Company, Philadelphia, Pa.
Hazard Mfg. Company, Wilkes-Barre, Pa.
Carnegie Steel Company, Painter Works, Pittsburgh, Pa.
Griswold Mfg. Company, Erie, Pa.
Ball Engine Company, Erie, Pa.
Erie Forge Company, Erie, Pa.
Oliver Snyder Iron Company, Pittsburgh, Pa.
West Penn Hospital, Pittsburgh, Pa.
Hubbard & Company, Pittsburgh, Pa.
Pittsburgh Valve Co., Pittsburgh, Pa.
National Valve Company, Pittsburgh, Pa.
Spear Carbon Company, St. Marys, Pa.
State Hospital for Insane, Warren, Pa.
Aetna Explosives Co., Mount Union, Pa.

Southern States

Mobile Light & Railway Co., Mobile, Ala.
Meridian Terminal Co., Meridian, Miss.
Pitt Lumber Company, Greenville, N. C.
Richmond Union Stock Yard, Richmond, Va.
Banks Brothers Packing Co., Norfolk, Va.

Central States

Nashville Hardwood Flooring Co., Nashville, Tenn.
Federal Lead Co., Federal, Ill.
The White Company, Cleveland, O.
American Steel & Wire Co., Cleveland, O.
Grasselli Chemical Co., Cleveland, O.
Cadillac Motor Car Co., Detroit, Mich.
Diamond Match Company, Barberton, O.
Jas. E. Pepper & Co., Lexington, Ky.
The Union Rolling Mills, Cleveland, O.
Toledo Ship Building Co., Toledo, O.
Jarecki Chemical Co., Cincinnati, O.
Virginia-Carolina Chemical Co., Cincinnati, O.
Michigan Agricultural College, Lansing, Mich.
Diamond Crystal Salt Co., Pontiac, Mich.
The Barney & Smith Car Co., Dayton, O.
The Youngstown & Southern Railway Co., Youngstown, O
The Joseph Schlitz Brewing Co., Youngstown, O.
Solar Refining Company, Lima, O.
Marion Steam Shovel Co., Marion, O.
Hinde & Dauch Paper Co., Sandusky, O.
U. S. Glass Company, Tiffin, O.
International Harvester Co., Chicago, Ill.
Bucks Stock Barn, Mattoon, Ill.
Little Metal Wheel Co., J. R., Quincy, Ill.
Graham Bros. Distillery Co., Rockford, Ill.
Anderson Dressed Beef Co., Anderson, Ill.
American Radiator Company, Bremen, Ind.
Goshen Condensed Milk Co., Goshen, Ind.
Indianapolis Brass Co., Indianapolis, Ind.
Link Belt Company, Indianapolis, Ind.
Dozinger Furniture Co., Shelbyville, Ind.
Warren Company Loose Leaf Tobacco, Bowling Green, Ky.
American Tobacco Co., Owensboro, Ky.
Fisher Lime & Cement Co., Memphis, Tenn.
Beaver Dam Gray Iron Co., Beaver Dam, Wis.
Anderson Bros. & Johnson Granite Works, Granite Heights, Wis.
J. I. Case Threshing Machine Co., Racine, Wis.
Menominee River Sugar Co., Menominee, Mich.

Southwestern States

Entire Town Site of Tyrone, New Mexico.
Entire Town Site of Ajo, Arizona.
ALL principal buildings, Clarksdale, Arizona.
M. O. & G. Railway Co., Muskogee, Okla.
Prairie Oil & Gas Co., Tulsa, Okla.
Girls' Dormitory Building, A. & M. College, Stillwater, Okla.
Commercial Cotton Presses Nos. 1 and 2, New Orleans, La.
Tyler Cotton Oil Mills, Tyler, Texas.
Rogers-Wade Chair Factory, Paris, Texas.
Pittsburgh Plate Glass Co., Crystal City, Mo.
Cotton Concentration Sheds, Houston, Texas.
Colorado State Insane Asylum, Pueblo, Colorado.
Albuquerque Lumber Co., Albuquerque, N. M.
Stag Canyon Fuel Co., Dawson, N. M.
Amalgamated Sugar Co., Ogden, Utah.

Northwestern States

Idaho-Oregon Light & Power Co., Boise, Idaho.
Iowa National Guard, Clarinda, Iowa.
Iowa Dairy Separator Co., Waterloo, Iowa.
Carnegie Coal Co., Duluth, Minn.
Anaconda Smelter Co., Anaconda, Mont.
Great Northern R.R., New Rockford, N. D.
State Normal School, Madison, S. D.
Sheridan Commercial Co., Sheridan, Wyoming.

Pacific States

Armory, National Guard of Washington, Seattle, Wash.
Oregon-Washington Passenger Stations & Terminals, Seattle, Wash.
Skinner & Eddy Shipbuilding Co., Seattle, Wash.
Spokane University, Spokane, Wash.
Wenatchee Valley Fruit Exchange, Wenatchee, Wash.
C. A. Congdon Fruit Warehouse, North Yakima, Wash.
Apex Cannery, Anacortes, Wash.
Portland Union Stockyards, Portland, Ore.
Pacific Fruit Express Warehouse, North Powder, Ore.
Libby, McNeill & Libby Plant, The Dalles, Ore.

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Johns-Manville Asbestos Roofing

Corrugated Form



G. B. Markle Co.
Coal Breaker at Jeddo, Pa.
Johns-Manville Corrugated
Asbestos Roofing

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Barn on Estate of Percival Roberts, Narberth, Pa.
Johns-Manville Corrugated Asbestos
Roofing and Siding

Johns-Manville Asbestos Roofing
(*Corrugated Form*)

Monessen Foundry & Machine Co.
Monessen, Pa.
Johns-Manville Corrugated
Asbestos Roofing



THE CONSTRUCTION of efficient yet economical buildings for commercial use has created a demand for a roofing material which, in addition to being fire-resisting, weather-resisting and time-defying, permits application directly over widely spaced purlins without sheathing.

For this service, metal has met with general favor, for it possesses the necessary rigidity. But to obtain reliable service from metal roofing it must be effectively protected by some material immune to atmospheric and other corrosive influences. Otherwise, deterioration begins, rapidly progresses and in a few years your roof is eaten through and is a failure.

Armored Against Rust

Those who attempt to solve the roofing problem with corrugated iron, painted and galvanized, encounter rust, the ever-present destroyer of metal. Theoretically these coatings are rust proof, but the most casual investigation will demonstrate the failure of most of them.

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Galvanizing and paint are quick to flake, chip and wear away, leaving the metal base unprotected and allowing corrosion to begin its work.

Johns-Manville Corrugated Asbestos Roofing cannot rust, because its metal reinforcement is armored against the admittance of the moisture and oxygen in the air by an impenetrable envelope of thoroughly impregnated asbestos felt.

Its rigid metal base of steel is locked up in an impervious casing of asbestos felts, densely saturated with a combination of natural asphalts. These asphalt-impregnated sheets on both sides of the steel are securely and permanently cemented to it at the factory.

The edges are then sealed with impregnated tape which keeps moisture, air, gases or any influence that leads to the corrosion of steel from coming in contact with this reinforcing metal.

This construction insures a roofing that offers great resistance to the elements—one that cannot be affected by gases, smoke or salt air—and one that reduces cost for upkeep to a minimum.

SIZES AND WEIGHTS OF SHEETS
and
TABLE OF PURLIN SPACING

Approximate Weights per 100 Square Feet of Material (in Pounds)

(Without crates. Weight of crates approximately 25 lbs. per square extra)

Gauge	3-Ply Black Top		4-Ply Black Top		5-Ply Black Top	
	Corr.	Flat	Corr.	Flat	Corr.	Flat
28	129	114	157	131	186	151
26	143	125	172	143	200	163
24	172	144	200	168	230	188
22	200	179	230	193	257	213
20	228	191	257	218	286	238

Areas of Sheets in Square Feet. Material Measurement

*Denotes standard size sheets.

Length	Corrug.	Flat	Length	Corrug.	Flat
1′	2 1/3	2 2/3	7′*	16 1/3	18 2/3
1′-6″	3 1/2	4	7′-6″	17 1/2	20
2′	4 2/3	5 1/3	8′*	18 2/3	21 1/3
2′-6″	5 5/6	6 2/3	8′-6″	19 5/6	22 2/3
3′	7	8	9′*	21	24
3′-6″	8 1/6	9 1/3	9′-6″	22 1/6	25 1/3
4′	9 1/3	10 2/3	10′*	23 1/3	26 2/3
4′-6″	10 1/2	12	10′-6″	24 1/2	28
5′	11 2/3	13 1/3	11′*	25 2/3	29 1/3
5′-6″	12 5/6	14 2/3	11′-6″	26 5/6	30 2/3
6′*	14	16	12′*	28	32
6′-6″	15 1/6	17 1/3			

Table of Correct Spacings (†)

Gauge	Thickness of Metal	When Roof Pitch is from 3″ to 6″; Space Purlins	When Roof Pitch is 6″ or over; Space Purlins	For Siding Space Purlins
28	.016	2′-10″	3′-2″	3′-10″
26	.019	3′-9″	4′-3″	5′-4″
24	.025	5′-3″	5′-6″	5′-10″
22	.031	6′-3″	6′-6″	6′-8″
20	.038	7′-3″	7′-6″	7′-8″

†Lap all roofing 6 inches at ends; 1½ corrugations at sides. Lap all siding at least 4″ at ends; 1 corrugation at sides.

Note: Finished corrugated sheets are 28 inches wide, standard 2½ in. corrugations. Flat sheets are 32 inches wide.

The reinforcing metal is 26, 22, 24, 26 and 28 gauge, depending on the duty and construction of the building framework.

Packed in crates, in less than carload lots; uncrated in carload lots unless otherwise ordered.

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A Few Representative Installations of Johns-Manville Corrugated Asbestos Roofing

Canadian

Granby Cons. Mining, Smelting & Power Co., Anyox, B. C.
Nichols Chemical Co., Barnett, B. C.
Quebec Harbor Commission, Quebec, Que.
Montreal Light, Heat & Power Co., Montreal, Que.
Armstrong & Whitworth Co., Montreal, Que.
Standard Clay Products Co., Montreal, Que.
Canadian Locomotive Co., Kingston, Ont.
British Chemical Co., Trenton, Ont.
Winnipeg Power House, Winnipeg, Man.

New England States

Mead, Morrison & Co., East Boston, Mass.
Rumford Metal Co., Rumford, Me.
Commonwealth Acid Phosphate Co., Wellington, Mass.
General Electric Co., West Everett, Mass.

Middle Atlantic States

Edison Phonograph Works, Orange, N. J.
Standard Underground Conduit Co., Perth Amboy, N. J.
Sayre Fisher Co., Sayreville, N. J.
Public Service Elec. Co., Newark, N. J.
Nichols Copper Co., Laurel Hill, N. Y.
American Locomotive Works, Schenectady, N. Y.
Solvay Process Co., Syracuse, N. Y.
Kings Co. Iron Foundry, Brooklyn, N. Y.
Continental Iron Works, Brooklyn, N. Y.
American Express Co., 10th Ave. & 33rd St., N. Y. City.
New Process Gear Co., Syracuse, N. Y.
American Brass Co., Waterbury, Conn.
Mantua Chemical Co. (siding), E. I. DuPont DeNemours Co., Paulsboro, N. J.
Edge Moor Iron Co., Edge Moor, Del.
Quaker City Iron Co., Philadelphia, Pa.
Bethlehem Steel Co., South Bethlehem, Pa.
Bethlehem Steel Co., Steelton, Pa.
American Car & Foundry Co., Berwick, Pa.
American Sheet and Tin Plate Co., Donora Works, Donora, Pa.
Carnegie Steel Co., Farrell Works, Farrell, Pa.
Crucible Steel Company of America, Crescent Works, Pittsburgh, Pa.
Crucible Steel Company of America, La Belle Works, Pittsburgh, Pa.
Standard Sanitary Mfg. Co., Pittsburgh, Pa.
American Steel Foundries, Pittsburgh, Pa.
United Engineering Co., Pittsburgh, Pa.

Southern States

Gulf & Ship Island R.R., Gulfport, Miss.
Gulf Coast & Miss. Traction Co., Gulfport, Miss. (Powerhouse).
R. J. Reynolds Tobacco Co., Winston-Salem, N. C.
Norfolk Gas Co., Norfolk, Va.
Newport News Gas Plant, Newport News, Va.
Roanoke Gas Light Co., Roanoke, Va.
General Chemical Co., Pulaski, Va.

Central States

Nashville Ry. & Light Co., Nashville, Tenn.
St. Louis & O'Fallon Coal Co., O'Fallon, Ill.
Clarksville Gas & Elec. Co., Clarksville, Tenn.
Commercial Acid Co., East St. Louis, Ill.
Federal Dye Stuff Chemical Co., Kingsport, Tenn.
City of Detroit Asphalt Plant, Detroit, Mich.
Dodge Bros., Detroit, Mich.
Firestone Tire & Rubber Co., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Miller Rubber Co., Akron, O.
The Hydraulic Pressed Steel Co., Cleveland, O.
The Cleveland Metal Products Co., Cleveland, O.
McKinney Steel & River Furnace Co., Cleveland, O.
The Standard Parts Co., Cleveland, O.
Toledo Furnace Co., Toledo, O.
Michigan Light Co., Jackson, Mich.
Lansing Gas & Fuel Co., Lansing, Mich.
Republic Iron & Steel Co., Youngstown, O.
Youngstown Sheet & Tube Co., Youngstown, O.
Ohio Iron & Steel Co., Lowellville, O.
Jarecki Chemical Co., Sandusky, O.
Frohman Chemical Co., Sandusky, O.
Jeffrey Mfg. Co., Columbus, O.
Ohio Malleable Iron Co., Columbus, O.
The Ralston Steel Car Co., Columbus, O.
Ault & Wiborg Co., Cincinnati, O.
Hayes Wheel Co., Anderson, Ind.
Columbus Gas Light Co., Columbus, Ind.
Kleymeyer, Henry C., Evansville, Ind.
Dudlo Mfg. Co., Fort Wayne, Ind.
Ohio & Western Lime Co., Huntington, Ind.
Prescott Co., Menominee, Mich.
Kelsey, Brewer & Co., Grand Rapids and LaCrosse, Wis.

Southwestern States

Ft. Smith Couch & Bedding Co., Ft. Smith, Ark.
Sinclair Refining Co., Vinita, Okla.
Pan-American Refining Co., West Tulsa, Okla.
Home Refining Co., Oklahoma City, Okla.
Ruemmeli-Braun Ice Co., Guthrie, Okla.
Madill Oil & Cotton Co., Madill, Okla.
Pierce Fordyce Oil Assn., Texas City, Texas.
Yoakum Ice Lt. & Power Co., Yoakum, Texas.
Pierce Fordyce Oil Assn., Ft. Worth, Texas.
Busch Sulzer Bros. Diesel Engine Co., St. Louis, Mo.
Chemical Refining Co., St. Louis, Mo.
Santa Fe R.R. Co., Car Repair Sheds, Argentine, Kansas.
Armour & Co., Kansas City, Mo.
Manhattan Ice & Light Co., Manhattan, Kansas.
United Verde Copper Co., Clarkdale, Ariz.
United Verde Extension Mining Co., Jerome, Ariz.
American Smelting & Refining Co., El Paso, Texas.
Pacific Creamery Company, Tempe, Arizona.

Northwestern States

Electric Light & Power Co., Creston, Iowa.
Nelson Morris Packing Co., Omaha, Neb.

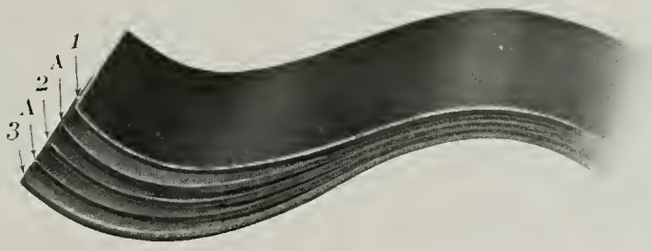
Pacific States

Granite Falls Electric Co., Granite Falls, Wash.
Shell Co., Richmond Beach, Wash.
Seattle Lighting Co., Seattle, Wash.
Tacoma Gas Co., Tacoma, Wash.
Wenatchee Valley Gas & Elec. Co., Wenatchee, Wash.
Oregon-Wash. R.R. & Nav. Co. Shops, Albina, Ore.
Portland Gas & Coke Co., Portland, Ore.
Standard Oil Co., Portland, Ore.
5 Harbor Sheds, Los Angeles Harbor, Cal.
Prince Canning Company, Oakland, Cal.
U. S. Government Warehouse, Benicia, Cal.
Pacific Electric Co., Los Angeles, Cal.
Holt Mfg. Co., Stockton, Cal.
Mammoth Smelting Co., Kennett, Cal.

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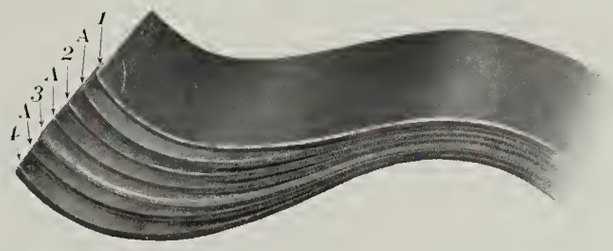
Analyzing a Johns-Manville Corrugated Asbestos Sheet

Enlarged Sectional View of 3-Ply Johns-Manville Corrugated Asbestos Roofing



1. Impregnated Asbestos Felt.
A. Asphalt Cement.
2. Metal Reinforcement.
A. Asphalt Cement.
3. Impregnated Asbestos Felt.

Enlarged Sectional View of 4-Ply Johns-Manville Corrugated Asbestos Roofing



1. Impregnated Asbestos Felt.
A. Asphalt Cement.
2. Impregnated Asbestos Felt.
A. Asphalt Cement.
3. Metal Reinforcement.
A. Asphalt Cement.
4. Impregnated Asbestos Felt.

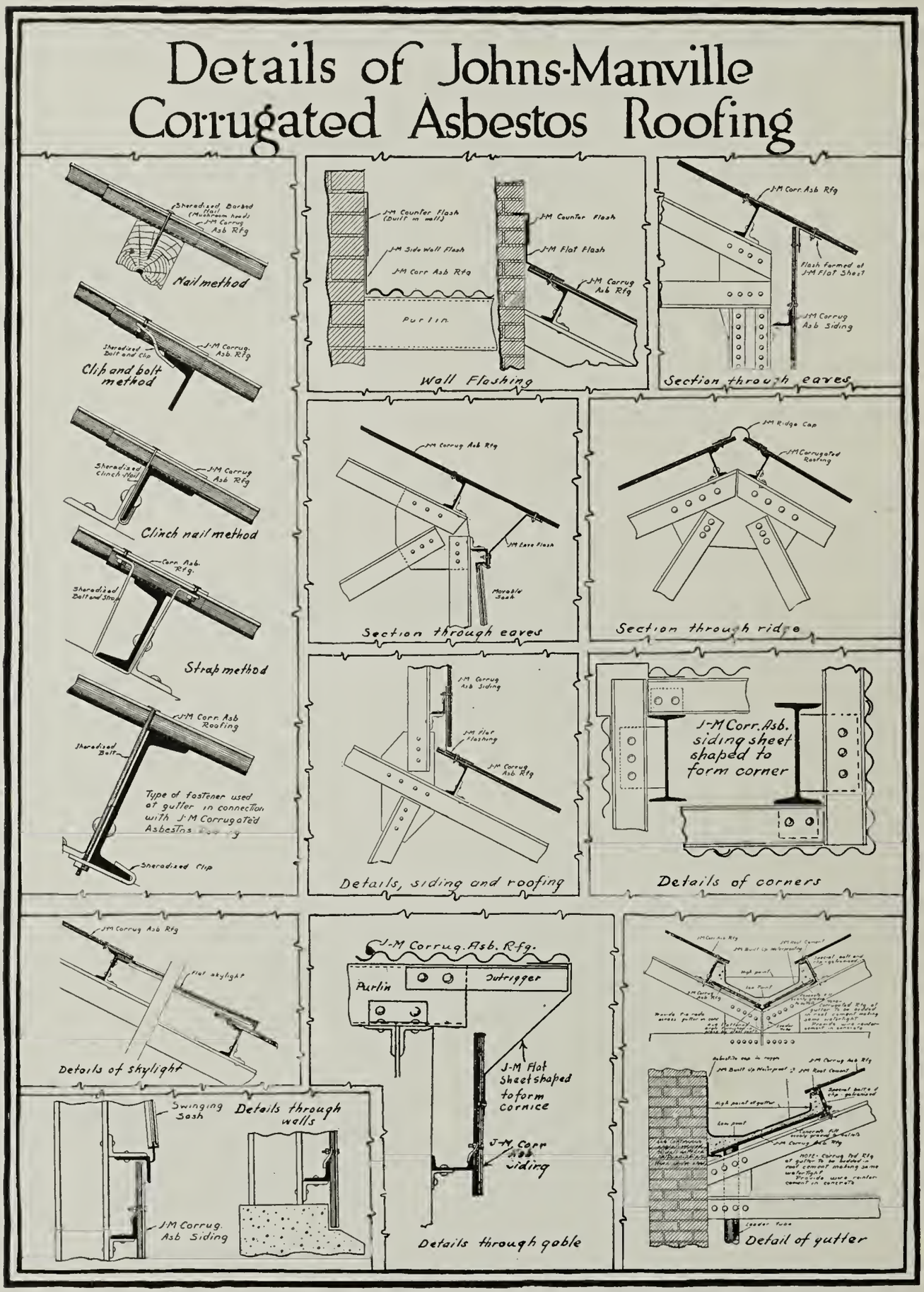
Enlarged Sectional View of 5-Ply Johns-Manville Corrugated Asbestos Roofing



1. Impregnated Asbestos Felt.
A. Asphalt Cement.
2. Impregnated Asbestos Felt.
A. Asphalt Cement.
3. Metal Reinforcement.
A. Asphalt Cement.
4. Impregnated Asbestos Felt.
A. Asphalt Cement.
5. Impregnated Asbestos Felt.

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Details of Johns-Manville Corrugated Asbestos Roofing



Complete working drawings, showing all details necessary for the application of Johns-Manville Corrugated Asbestos Roofing, can be inspected at any Johns-Manville Branch. These reduced fac-similes are intended merely as a guide to the drawings available.

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Johns-Manville Asbestos Roofing

Shingle Form



Residence of Otis H. Cutler, Suffern, N. Y.
Alfred Busselle, Architect
Johns-Manville Colorblende Asbestos Shingles

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Residence of Mrs. G. P. Barton, Altadena, Cal.
C. F. Driscoll, Architect, Pasadena
Johns-Manville Asbestos Shingles



Johns-Manville Asbestos Roofing
(*Shingle Form*)

THE graceful, free lines of a shingle roof have been so intimately associated, from pioneer days, with the architecture of American houses that this form of roof construction can almost be called the national home roof. No roof construction offers so many varied roof effects or permits such artistic roof treatments as the shingle.

To retain the attractiveness of a shingle roof and yet secure the well-known permanence and fire-protection of Asbestos, Johns-Manville has produced an *Asbestos Shingle*, made of asbestos fibre and Portland cement, united under great hydraulic pressure and cut to shingle shapes. These shingles are known as Johns-Manville Standard and Colorblende Asbestos Shingles and are made in various shapes and sizes and two thicknesses: ¼″ (rough edge), in four colors—Indian Red, Autumn Brown, Natural Gray and a composite of brown shades called Conglomerate Brown; ⅛″ (smooth edge), in Indian Red, Autumn Brown and Natural Gray only.

Mixing certain combinations of these various colors in the laying produces a roof which harmonizes with the landscape like a forest hillside in Autumn—with that same indescribable blending of reds and browns and grays of frost-tinted leaves. And yet, with all its beauty of color and line, a roof that is as durable, as everlasting as stone—and equally as fireproof.

To such a roof of Johns-Manville Asbestos Shingles of size No. 50, laid in Conglomerate Brown alone or in combination with our other standard colors, the registered trade name of "Colorblende" has been given.

The wide variety of color effects possible in these combinations allows a "Colorblende" roof to be blended to suit the individual taste of architect or owner, and to harmonize with any architectural scheme or natural environment.

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Where it is desired to have a certain color predominate—such as the red as shown in the plate on page 54—this is easily secured by adding a given proportion of Indian Red or Natural Gray shingles to the mixture, as desired.

The color plates shown on pages 49 to 56 are a few of the color combinations suitable for "Colorblende" roofs which our Architects' Service organization has worked out. While these reproductions may be slightly exaggerated owing to the limitations of any printed reproduction the effect of the soft blending colors of the shingles on the roof can be realized.

However, these pages by no means show the range of subtle color combinations possible in Johns-Manville "Colorblende" roofs and should owner or architect desire to specify other blends our service department will be glad to offer every possible assistance. The varying shades of brown making up the composite color, Conglomerate Brown, must be considered a unit color, in treatment and in ordering and when a solid color (Indian Red or Natural Gray) is ordered for use in combination with Conglomerate Brown, it must be of size No. 50 which is the only size in which Conglomerate Brown shingles are made.

The adaptability of the three solid colors of Asbestos Shingles is increased by their possibilities for contrasting color combinations and the number of free roof treatments permitted by their assortment of sizes and shapes. Thus the individuality of the building is assured, whatever its architecture.

These shingles are easily laid by any roofer, slater or carpenter according to the various regular methods: American, Diagonal (or French) and Hexagonal. They may be applied to roof decks of ordinary design and so involve no expense for alterations in the framing.

The cost for repairs to an Asbestos Shingle roof is virtually nothing, for it never needs paint. Extremes of temperature have no effect upon it. And the shingles are naturally so tough, accidental breakage is reduced to the minimum.

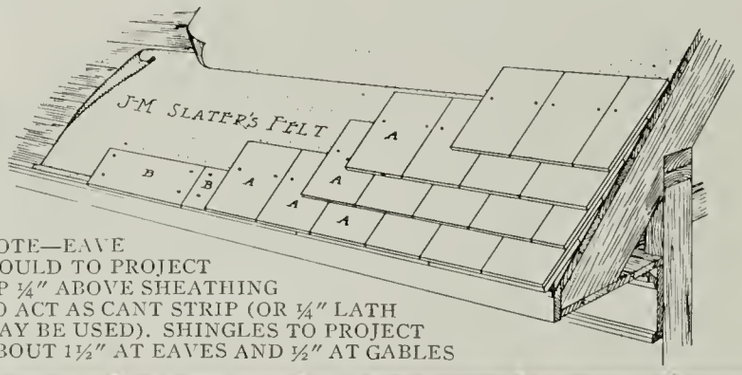
Data on Johns-Manville Asbestos Shingles

Catalog Number of Shingle	Size (inches)	Thickness	Weight per 100 Shingles (lbs.)	Weight per sq. applied (lbs.)	Number of Shingles per sq.	Surface exposed (Inches)	Galv. nails per sq. (lbs.)	No. of Storm nails required per sq.	No. of sections Ridge Roll required per 100 Lin. Ft. (3″ lap)	Catalog Number of Starters	No. of Starters required per 100 Lin. Ft.	Method of laying
*3	12 x 12	1/8″	215	515	240	5 x 12	2½	.....	93	51 (¼″)	67	American
†*4	12 x 12	1/8″	205	495	240	5 x 12	2½	.....	93	51 (¼″)	67	American
*5	8 x 16	1/8″	185	480	260	7 x 8	2½	.....	93	51 (¼″)	67	American
†*6	8 x 16	1/8″	175	455	260	7 x 8	2½	.....	93	51 (¼″)	67	American
9	16 x 16	1/8″	345	300	87	13 x 13	1	87	93	17 (¼″) 11 (⅛″)	75 67	Diagonal
12	12 x 12	1/8″	200	320	160	9½ x 9½	1½	160	93	17 (¼″) 14 (⅛″)	75 89	Diagonal
*50	9 x 18	¼″	320	650	204	8 x 9	2	.....	93	51 (¼″)	67	American
60	12 x 12	1/8″	200	320	160	9½ x 9½	1½	160	93	17 (¼″) 61 (⅛″)	75 77	Hexagonal
70	16 x 16	1/8″	345	300	87	13 x 13	1	87	93	17 (¼″) 71 (⅛″)	75 58	Hexagonal

*With this style of shingle we recommend the Boston (or "Chicago") Hip and Ridge; when used with No. 50 shingles allow 1½ squares extra of No. 50 shingles for every 100 lineal feet to be covered. When used with shingles Nos. 3, 4, 5 or 6 allow 1⅓ squares extra of No. 5 for every 100 lineal feet to be covered. See page 46 for details of laying.
†Numbers so marked have clipped corners.

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Details of Johns-Manville Asbestos Shingles



NOTE—EAVE MOULD TO PROJECT UP ¼" ABOVE SHEATHING TO ACT AS CANT STRIP (OR ¼" LATH MAY BE USED). SHINGLES TO PROJECT ABOUT 1½" AT EAVES AND ½" AT GABLES

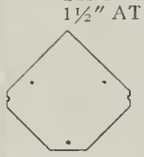
ALL SHINGLES TO HAVE A 2" HEAD LAP.
WEATHER EXPOSURE 7".

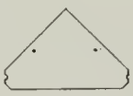

STARTER B
9"x18"x¼"

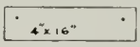

MAIN BODY A
8"x16"x⅜"

APPLICATION OF J-M ASBESTOS SHINGLES — AMERICAN METHOD — #5 — 8"x16"

SHINGLES TO PROJECT ABOUT 1½" AT EAVES AND ½" AT GABLES

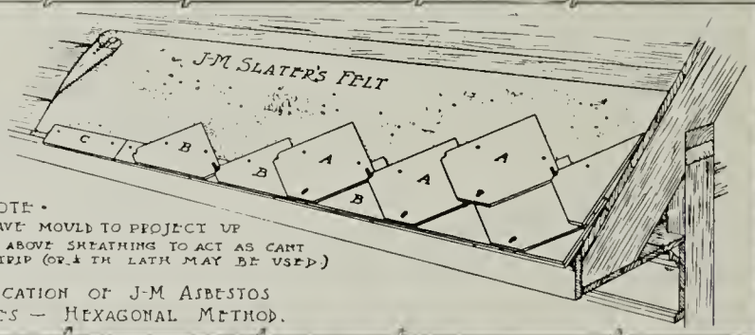

MAIN BODY SHINGLE A


STARTER B



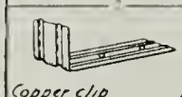
STARTER C

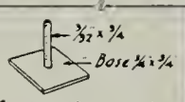

COPPER STORM NAIL



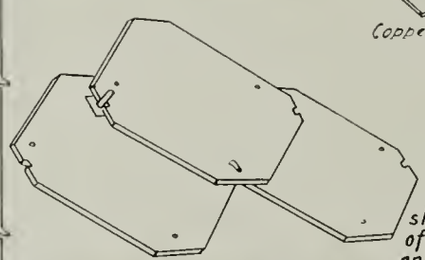
NOTE: EAVE MOULD TO PROJECT UP ¼" ABOVE SHEATHING TO ACT AS CANT STRIP (OR ¼" LATH MAY BE USED)

APPLICATION OF J-M ASBESTOS SHINGLES — HEXAGONAL METHOD.


Copper clip enlarged scale



Copper storm nail


Hexagonal Shingle showing application of storm nail. enlarged scale.

Standard Shapes


No. 3
12×12


No. 4
12 x 12


No. 5
8×16

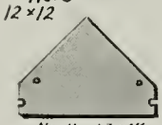

No 6
8×16

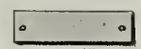

No 9-16x16
No 12-12x12

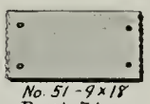

No 50
9×18×¼


No. 60-12×12
No 70-16×16

Starters


No 11-13×18
No 14-9½×13½


No 17
4×16×¼


No. 51-9×18
Rough Edge


No. 61-15⅛
No. 71-20¾

All ⅞" thick except No. 17 50 and 51

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Residence of J. A. Currey, Portland, Ore.
Johns-Manville Asbestos Shingles

A Few Representative Installations of Johns-Manville Asbestos Shingles

Canadian

Port Colbourne School, Port Colbourne, Ont.
Charles Adams, Res., Toronto, Ont.
Mimico Water Works, Mimico, Ont.
Meaford Armory, Dept. Militia & Defense, Meaford, Ont.
J. B. Tudhope, Res., Orillia, Ont.
J. F. Hollinger, Res., Toronto, Ont.
R. H. Duke, Hamils Point, Muskoka, Ont.

Alaska

U. S. Radio Station, Cordova, Alaska.

New England States

Aldrich Bros., Moosup, Conn.
Bernon Mills, Georgiaville, R. I.
Ludlow Mfg. Assoc., Ludlow, Mass.
Bosch Magneto Co., Springfield, Mass.
New Hampshire Soldiers' Home, Tilton, N. H.
Mary Hitchcock Memorial Hospital, Hanover, N. H.
Jackson Company, Nashua, N. H.

Middle Atlantic States

L. S. Thompson Res., Lincroft, N. J.
James Thompson Development Co., Res., Woodcliffe, N.J.
Orange Free Public Library, Orange, N. J.
Lindabury Dairy Barns, Bernardsville, N. J.
Ringling Residence, Milton, N. J.
Passaic Print Works, Factory, Passaic, N. J.
Sayre & Fisher Factory, Sayreville, N. J.
Walker Gordon Farms Dairy Barns, Plainsboro, N. J.
City Convention Hall, Rochester, N. Y.
Disposal Plant, Irondequoit, N. Y.
Public School No. 37, Rochester, N. Y.
Homeopathic Hospital, Rochester, N. Y.
C. W. Chapin Res., Port Washington, N. Y.
Robert Dyett Res., Rome, N. Y.
Afton Development Co., Afton, N. Y.
General Electric Co., Erie, Pa. (Employes' Homes).
The Davis Coal & Coke Company, Cumberland, Md. (Miners' Houses and Mine Buildings).
The American Zinc & Chemical Company, Langeloth, Pa. (Employes' Homes).
The American Steel & Wire Co., Donora, Pa. (Employes' Homes).
The Davis Colleries Company, Elkins, W. Va.
West Virginia Coal & Coke Co., Elkins, W. Va.
The Heppenstahl Knife & Forge Company, Pittsburgh, Pa. (Office Bldg.).
The Allegheny County Home Buildings, Woodville, Pa.

Southern States

A. Meaher Res., Mobile, Ala.

Central States

George Peabody College for Teachers, Nashville, Tenn.
Columbia High School, Columbia, Tenn.
E. C. Cook Res., Memphis, Tenn.
Dayton State Hospital Farm, Dayton, O.
First Methodist Episcopal Church, Galion, O.

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Fire Station, Lima, O.
Cleveland State Hospital, Cleveland, O.
18th Baptist Church, Detroit, Mich.
Semet-Solvay Co., Detroit, Mich.
Motor Sales Company, Huntington, W. Va.
Berea College, Berea, Ky.
First Baptist Church, Whiteburg, Ky.
St. Charles Seminary, Carthagenia, O.
United Brethren Church, Van Wert, O.
St. Agnes Church, Elyria, O.
Swedish Lutheran Church, Chicago, Ill.
W. J. Hamilton, Res., Colfax, Ill.
C. A. Davis, Res., Moweaqua, Ill.
John F. Carson, Res., Evansville, Ind.
St. Benedict's R. C. Church, Evansville, Ind.
Board of Education, South Bend, Ind.
Roman Catholic Church, Central City, Ky.
Dr. R. J. Maas, Res., Houghton, Mich.
C. & N. W. R.R., Iron River, Mich.
State of Wisconsin, Camp Douglas, Wis.
C. J. Eberman, Madison, Wis.
C. H. Meyer, Res., Platteville, Wis.
C. K. Hahn, Racine, Wis.
Galena Signal Oil Co., Superior, Wis.

Northwestern States

Oregon Short Line Railway, Pocatello, Idaho.
Iowa State School for Deaf, Council Bluffs, Iowa.
Iowa State College, Ames, Iowa.
Grace Methodist Church, Sioux City, Iowa.
Crystal Lake Club, Burlington, Iowa.
Mueller Lumber Co., Davenport, Iowa.
The Holy Name Catholic Church, Marcus, Iowa
G. G. Hartley Garage, Duluth, Minn.
E. G. Evensta Company, Minneapolis, Minn.
Asylum for Insane, Ingleside, Neb.
Penitentiary, Lincoln, Neb.
John Parker, Kimball, S. D.
Great Northern R.R., Glacier Park, Mont.
Board of Directors, Rock Springs, Wyoming.

Southwestern States

St. Theresa's Presbytery, New Orleans, La.
St. Patrick's Church, New Orleans, La.
St. Mary's Italian Church, New Orleans, La.
P. E. Elliott, Res., Tulsa, Okla.
Church of the Holy Family, Tulsa, Okla.
Pueblo Bonito Indian School, Crown Point, N. M.
Spring Caguyon Coal Co., Provo, Utah.

Pacific States

Wilmington School, San Francisco, Cal.
First Christian Church, Fresno, Cal.
Crematorium, Stockton, Cal.
J. A. Currey, Res., Portland, Ore.
Multnomah Athletic Club, Portland, Ore.
West Queen Anne School, Seattle, Wash.
Seward School, Seattle, Wash.
Concord School, Seattle, Wash.
Youngstown School, Seattle, Wash.
First Baptist Church, Walla Walla, Wash.
Swiss Club, Tacoma, Wash.



Residence of
Ernest Searing
Philadelphia, Pa.
Druckenmiller & Williams
Architects, Philadelphia, Pa.
Johns-Manville Colorblende
Asbestos Shingles

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A Colorblende Roof of Johns-Manville Asbestos Shingles



A dignified roof suggesting an air of long occupancy. Obtained by a combination of equal proportions of the four shades of Conglomerate Brown Shingles.

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A Colorblende Roof of Johns-Manville Asbestos Shingles



This soft tone of brown which blends so harmoniously with the tapestry brick sidewalls is obtained by the use of three shades of Conglomerate Brown with a small percentage of Natural Gray Shingles.

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A Colorblende Roof of Johns-Manville Asbestos Shingles



A brown roof as a pleasing contrast to the colorful sidewall treatment. Obtained by a combination of the Nos. 2, 3 and 4 shades of Conglomerate Brown Shingles.

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A Colorblende Roof of Johns-Manville Asbestos Shingles



The four shades of Conglomerate Brown Shingles in which an undertone of gray is obtained by a proportion of Natural Gray Shingles.

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A Colorblende Roof of Johns-Manville Asbestos Shingles



A roof in which solid-color Indian Red Shingles at the ridge gradually merge through the four shades of Conglomerate Brown to its darkest shade at the eaves.

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A Colorblende Roof of Johns-Manville Asbestos Shingles



A delightful effect obtained by a combination of equal proportions of Indian Red and No. 1 shade of Conglomerate Brown Shingles; a perfect harmony with the sidewall treatment.

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A Colorblende Roof of Johns-Manville Asbestos Shingles



A combination of equal proportions of Indian Red and the four shades of Conglomerate Brown Shingles. The overtone of red is pleasingly modified by the varying shades of the Conglomerate Brown mixture.

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A Roof of
Johns-Manville Asbestos Shingles



The traditional red roof generally associated with buff walls and weathered trim in stucco and half-timber houses. Obtained by the use of the Indian Red Shingles.

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Standard Specifications
Johns-Manville Asbestos Shingles

In these specifications we refer to definite sizes and styles of shingles. Where other sizes are used style numbers of the shingle may be inserted as desired.

Specifications for the Application of Johns-Manville (¼") "Colorblende" Asbestos Shingles

Lay roof boards in the usual manner, breaking joints and nailing securely in place with at least two nails at each purlin, leaving no loose ends. The roofing boards shall be well seasoned and of narrow width. Over the roofing boards lay one thickness of Johns-Manville Asbestos Slaters' Felt, laying horizontally with a 4" lap, and with 12" lap on hips and valleys.

Apply ¼" thick x 1½" wide furring strip parallel with and flush with the eaves, then apply one course of Standard Brown No. 17, 4 x 16" Starters, at eaves lengthwise and parallel to same, overhanging the eaves about 1½". Apply second course of Standard Brown No. 51, 9 x 18" Starters, at eaves lengthwise and parallel to same, breaking joints with and entirely covering the first course. Apply third course, using Conglomerate Brown No. 50, 9 x 18", and (Indian Red No. 50, 9 x 18") (Natural Gray No. 50, 9 x 18") (*mark out color not to be considered*) Johns-Manville Asbestos Shingles, breaking joints with and entirely covering the second course; after which proceed in the regular manner as with wooden shingles or slate, exposing eight inches to the weather and fastening each shingle in place with two galvanized iron (or copper) roofing nails as specified. Never drive the nails down tight; it is only necessary to drive them firmly as with slate.

The various shades of Colorblende Asbestos Shingles shall be laid at random, in approximately equal proportions.

HIPS AND RIDGES

Construct "Boston" (or "Chicago") Hip and Ridge of No. 50 Johns-Manville Asbestos Shingles—(color to be selected by architect).

FLASHINGS

Flash all chimneys and valleys with copper or other approved material.

NOTE

Where it is desired to use either Indian Red or Natural Gray, in combination with Conglomerate Brown Shingles, we recommend a proportion of approximately 80% of Conglomerate Brown to 20% Indian Red or Natural Gray, where other percentage is not specified.

Specifications for the Application of ⅛ inch thick Asbestos Shingles
American Method

Lay roof boards in the usual manner, breaking joints and nailing securely in place, with at least two nails at each purlin, leaving no loose ends. The roofing boards should be well seasoned and of narrow width. Over the roof boards lay one thickness of Johns-Manville Asbestos Slaters' Felt, described on page 58, laying horizontally with a 4-inch lap, and with 12-inch laps on hips and valleys. Apply ¼-inch thick by 1½-inch wide furring strip parallel with and flush with eaves, then apply one course of No. 51 (B), 9 x 18 inch shingles at eaves lengthwise and parallel to same, overhanging the eaves about 1½-inches. Apply the second course, using No. 5 (A) shingle, entirely covering first course, breaking joints; after which proceed in the regular manner as with wooden shingles or slate, exposing 7 inches to the weather and fastening each shingle in place with at least two galvanized iron roofing nails furnished for the purpose. Never drive nails down tight, it is only necessary to drive them firmly as with slate. Over the ridges and hips apply Johns-Manville Asbestos Ridge and Hip Roll with not less than 3-inch lap, fastened in place with special ridge roll fasteners furnished for the purpose, or construct "Boston" (or "Chicago") Hip and Ridge.

Where ridge pole does not project high enough above the roof boards to allow direct application of ridge roll, it is necessary to put in a false pole so that it is possible to get a direct fastening through top of ridge roll.

FLASHINGS

Flash all chimneys and valleys with copper or other approved material.

(See details of laying shown on page 46 for alphabetical references in specifications.)

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Hexagonal Method

NOTE—The hexagonal or "honeycomb" method of applying Johns-Manville Asbestos Shingles, in the 1/8-inch thickness, is cheaper than the American method and much more artistic than the diagonal method. The hexagonal method apparently shows six sides of the shingle, thus overcoming the objection to severely straight lines and producing a most beautiful effect.

It not only renders the roof attractive to the eye, by breaking up the regularity of the surface, but affords better protection than the diagonal method, owing to the fact that the overlap at the lower end of each shingle is almost twice as great as in the diagonal method.

We most highly recommend the hexagonal shingles, as in our estimation the French or diagonal shingles in no way compare with them, either from a construction or artistic point of view.

SPECIFICATIONS

Lay roof boards in the usual manner, breaking joints and nailing securely in place, leaving no loose ends. The roofing boards should be well seasoned and of narrow width. Over the roof boards lay one thickness of Johns-Manville Asbestos Slaters' Felt, laying horizontally with a 4-inch lap, and with 12-inch lap on hips and valleys.

Over the felt lay Johns-Manville Asbestos Shingles in the following manner: Apply a 1/4-inch thick by 1 1/2-inch wide furring strip parallel with and flush with eaves, then lay one course No. 17 (C) Johns-Manville Asbestos Shingles end to end, parallel with and overhanging the eaves 1 1/2 inches; over which apply one course of No. 61 (B) shingles, entirely covering the starter, No. 17, breaking all joints as shown in detail.

Cover balance of roof with No. 60 (A) Shingles 12 inches by 12 inches, laid as shown, exposing 9 1/2 inches by 9 1/2 inches to the weather. Securely fasten all shingles in place with galvanized, needle-pointed nails, and fasten the points of the No. 60 main body shingles with special Johns-Manville Copper Storm Nails. Never drive nails down tight, it is only necessary to drive them firmly as with slate. All the main body shingles, i. e., the No. 60, should be laid with the diagonal lines on a 45-degree angle with the eaves. Over the ridges and hips apply Johns-Manville Asbestos Ridge and Hip Roll, with not less than 3-inch lap, fastening in place with special ridge roll fasteners furnished for the purpose.

Referring to the detail illustrations, the copper storm nail is first laid head down; next, pushed half way underneath a shingle; then the next shingle in the course is laid with its cut or abutting side against the nail, the shingle of the course above is then slipped over; and finally the nail is bent down. This operation is repeated until the entire roof is covered. Flash all chimneys and valleys with copper or other approved material.

Diagonal Method

Figure the same number of shingles to the square as for the hexagonal method. The starting courses for this method will be No. 17, 4x16 inches, then No. 14, while the main body shingle will be No. 12, these numbers to apply to the 12x12 inch size. In the 16x16 inch size, use first No. 17, 4x16 inch, then No. 11 and No. 9 will be the main body shingles.

Johns-Manville Asbestos Slaters' Felt

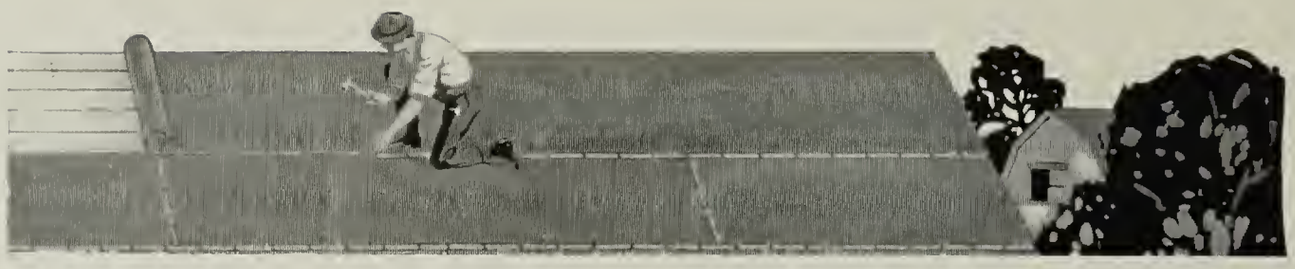
Used as an insulating and waterproofing material between roof boards and shingles or between siding and shingles. It is composed of pure Asbestos Felt, saturated with natural asphalts —both minerals. Due to total absence of vegetable, animal and organic matter, it is odorless, damp and weather-proof and will not rot. It is supplied in rolls 32 inches wide, put up in from 1 to 5 square rolls.

On comparatively low roof pitches, and where still greater insulating value is desired, a heavier felt should be used, and where the *ultimate* in protection against extreme climatic conditions is desired our Double Neptune Keystone Hair Insulator, described on page 66, will prove a double insurance against extreme heat or cold as well as providing an entirely weather-proof protection. The top rooms of houses roofed with these insulating products are as pleasantly cool in summer as they are snug and cozy in winter.

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Other Johns-Manville Roofings

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Johns-Manville Rag-Felt Roofings

JOHNS-MANVILLE Rag-felt Roofings are made of selected felt, thoroughly saturated — literally soaked — with a combination of natural asphalts. The asphalts used in this roofing are chosen and blended by men who know from long experience what combination of asphalts best resists the drawing action of the sun and the wear and tear of severe weather.

The result is a durable, weather-tight roofing, which, because of our enormous output, is sold to you at a much lower cost than many Rag-felt roofings which give shorter service.

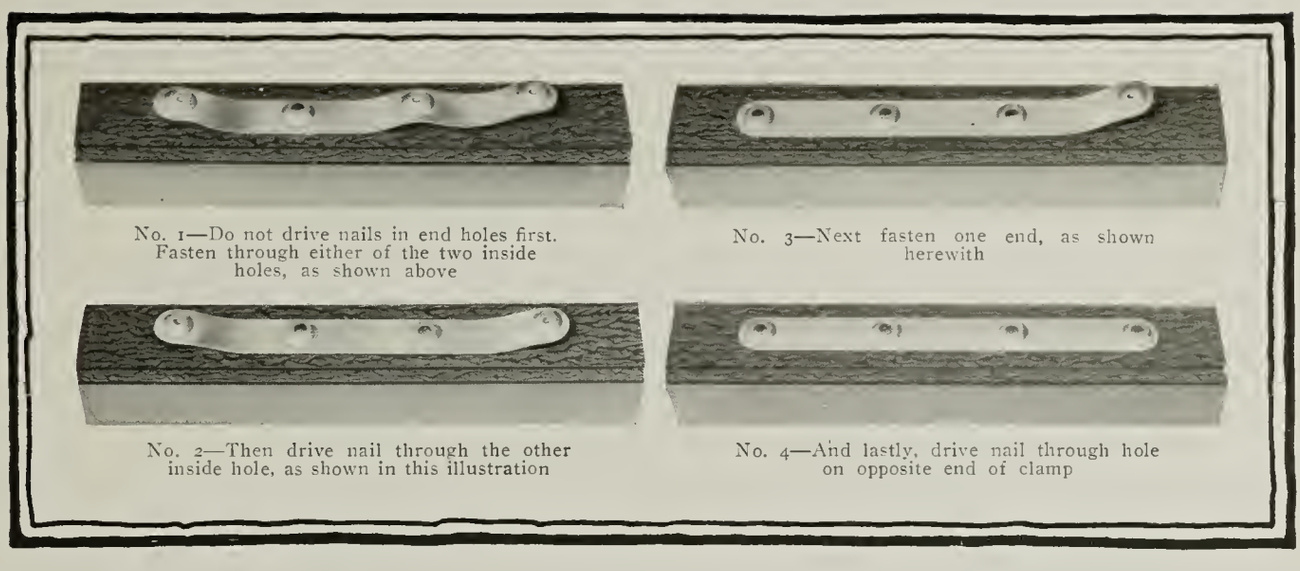
Johns-Manville Rag-felt Roofings are furnished as follows:

Johns-Manville Regal Roofing—the best grade Rag-felt and asphalt Ready-to-Lay Roofing. Furnished 32" wide in three weights, light, medium, and heavy, weighing approximately 35, 45, and 55 pounds per 108 square feet (including completing materials) respectively, in one square rolls of 108 square feet or two square rolls of 216 square feet.

Johns-Manville Pilot Roofing—a low priced roofing recommended only for temporary roofing work. Furnished 32" wide in three weights, light, medium, and heavy, weighing approximately 35, 45, and 55 pounds per square (including completing materials) respectively, in one square rolls of 108 square feet or two square rolls of 216 square feet.

Johns-Manville Slatekote Roofing — a heavy sheet of felt saturated with natural asphalts, and armored with a coating of granulated slate. Made in red and green. Comes in one square rolls, 32 inches wide, containing 108 square feet, weighing approximately 80 lbs. per square.

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No. 1—Do not drive nails in end holes first. Fasten through either of the two inside holes, as shown above

No. 3—Next fasten one end, as shown herewith

No. 2—Then drive nail through the other inside hole, as shown in this illustration

No. 4—And lastly, drive nail through hole on opposite end of clamp

Your Ready Roofing Is No Better Than Its Laps

WHEN you buy ready-to-lay roofing—whether you plan to lay it yourself or have the job done—you want it laid right.

No matter how good the roofing, it can't give weather-tight service unless the laps are made durably water-tight.

And this means vastly more than using large headed nails and cement—because this old-fashioned method of application often permits roll roofing to buckle, pucker and pull away at the laps and makes the joints the weakest part of the roof.

To do away with this disadvantage and to enable quick and easy application of ready-to-lay roll roofing, the Johns-Manville Roofing Clamp has been designed and is now furnished with all Johns-Manville Asbestos Ready-to-Lay Roofings, but only with Regal Brand in the Rag-felt group.

Johns-Manville Roofing Clamps

This roofing clamp is a strip of special alloy galvanized metal, which is nailed to the roofing as shown in the illustration.

It exerts a continuous pressure all along the seams and holds the sheets of the roofing as firmly as though clamped down under the pressure of a jack-screw.

The pull of the nails which are driven through the four holes in each clamp, draws the metal down until it clamps the sheets of the roofing together and makes the laps the strongest part of the roof.

The use of cement is unnecessary when laying Rag-felt roll roofing with these clamps and the roofing is more easily and quickly applied.

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Johns-Manville Roofing Accessories

THE following Johns-Manville Roofing Accessories are recommended for use with Johns-Manville Rag-felt Roofings. They may, however, be used with practically every type of roofing on the market.

These products are carried in stock at the Johns-Manville Branch nearest you, which will quote prices and make earliest possible shipment on any quantity you require.

Johns-Manville Regal Roof Coating

A preservative "roofing paint" the use of which enables builder or house owner to secure harmonious color effects with most types of ready-to-lay roofing. It forms a tough, elastic, durable surface not affected by contraction or expansion, gases or alkalies. Furnished in light red, maroon, brown, terra cotta, green or black. Comes in 1, 5 and 10 gal. cans; and half (20 to 35 gals.) and full (50 gal.) barrels. Black may be had in 1, 2, 3, 5 and 10 gal. cans; one half and full barrels. This coating is the best product of its kind possible to produce.

Johns-Manville Asbestos Roof Putty

A black roofing cement for stopping holes in tin, zinc, slate shingles, wood or composition roof, gutter or flashing. May be used for any job where a durable, leak-proof cement is desired. Put up in plastic form ready for application. Comes in 1, 2, 3, 5 and 10 lb., 25 and 50 lb.,100, 200 and 400 lb. containers.



Western Ohio Creamery, Greenville, Ohio
Johns-Manville Asbestos Ready-to-Lay Roofing

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Johns-Manville Keystone Hair Insulator



Apartment House at 75th St. and West End Ave., New York City
Neville & Bagge, Architects
New York City
Johns-Manville Keystone Hair Insulator

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Eggleston High School, Madison, Ind.
Elmer E. Dunlap, Architect, Indianapolis, Ind.
Johns-Manville Keystone Hair Insulator

Insulation—An Investment in Comfort, Health *and* Economy

ANY building worth living in or working in is worth insulating with the best material obtainable. It is worth the slightly higher initial cost of a comfortable, healthful wall, floor and roof insulation which makes the building warmer in winter, cooler in summer and quiet all the year.

The saving you make with such an insulation in coal bills alone during the first two winters often more than pays for the material and cost of installation.

An efficient wall, floor and roof insulation not only increases the healthful comfort of those living or working in the building, but it also actually improves the market value of the building.

Many bond and mortgage companies will not give full loan value on uninsulated buildings, because without this protection against excessive noise, they are undesirable to tenants and so bring low rentals.

Considering comfort, health and economy—isn't the building you now own, or are planning to build, worth the best insulation you can get?

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Johns-Manville Keystone Hair Insulator

JOHNS-MANVILLE Keystone Hair Insulator consists of a heavy layer of thoroughly cleansed cattle hair securely fastened between two sheets of protective paper. The style of paper depends upon the service demanded; the different brands of Johns-Manville Keystone afford a selection of damp-proof and plain building papers or fireproof Asbestos paper, which is more resistant to time and moisture than ordinary building paper.

The body of Johns-Manville Keystone is the best grade cattle hair, treated by a chemical process which renders it vermin-proof and odorless. It will not dry out, split, pack down or rot with age and lasts indefinitely. And as it merely shrivels when it comes in contact with fire, it will not carry flame.

Johns-Manville Keystone effectively insulates against dampness, preventing the condensation of moisture under tin and iron roofs thus prolonging the life of the roof.

Not only this, but Johns-Manville Keystone prevents the passage of sound just as effectively as it prevents the transmission of heat, cold and dampness. Many of the larger school buildings, sanitariums, apartment houses and private homes have been effectively sound-deadened with Johns-Manville Keystone.

Bulk for bulk, Johns-Manville Keystone Hair Insulator is much lighter in weight than any other insulating material, and therefore much easier to handle. It is uniform in thickness throughout and being flexible fits odd corners, making it easy to apply.

Johns-Manville Keystone Hair Insulator is packed in bales 3 feet wide, containing 500 square feet, with the edges bound and beveled. It spreads on surfaces as easily as paper or wool felt. The bound and beveled edges allow a 1-inch lap instead of being butted.

Johns-Manville Keystone is recommended for sound-deadening in the following:

Apartment Buildings, Schools, Hospitals, Music Studios, Hotels, Dance Halls, Theaters, Lodge Rooms, Dormitories, Bowling Alleys, Y. M. C. A.'s, etc.

And for insulating: Refrigerator Cars, Ice Boxes, Cold Storage and Refrigerating Plants, Fireless Cookers, Dwellings, Factory Roofs, Poultry Houses, Garages, Dairies, etc.

Johns-Manville Keystone Tape

Johns-Manville Keystone Tape is a ¼ inch thick by 2 inch wide strip of Hair Felt, to one side of which is attached a strip of strong paper, slightly narrower than the Hair Felt. This tape is used extensively for weather stripping around window and door frames and for placing over floor joists in sound-deadening construction.

Keystone Tape is furnished in strips 50 feet long; one strip in a box and 36 boxes in a crate or in burlap bags.

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Description of Brands of Johns-Manville Keystone Hair Insulator

Salamander—Fireproof and damp-proof Asbestos paper on both sides. For fire protection as well as insulation against heat and cold. Also for sound deadening. Packed in bales of 500 sq. ft. weighing 130 lbs.—36″ wide.

Phoenix—Fireproof and damp-proof Asbestos paper on one side, and gray building paper on the other. Packed in bales of 500 sq. ft. weighing 100 lbs. —36″ wide.

Peerless—Wool felt paper on one side and gray building paper on the other. Particularly adapted for sound deadening where furring strips are not to be used. Packed in bales of 500 sq. ft. weighing 85 lbs., 36″ wide.

Neptune—Waterproof paper on one side and gray building paper on the other. For use where protection against dampness is desired. Packed in bales of 500 sq. ft. weighing 75 lbs.—36″ wide.

Double Neptune—Waterproof paper on both sides. For weather-proofing against excessive dampness. Also for sound-deadening. The best brand for this purpose. Packed in bales of 500 sq. ft. weighing 85 lbs.—36″ wide.

Acme—Gray building paper on both sides. Can be used for all forms of general insulation and weather-proofing. Packed in bales 18 inches or 36 inches wide containing 500 sq. ft. and weighing 65 lbs.

Arctic—Arctic Brand is especially adapted for cold-storage work. Covered both sides with heavy asphalt-saturated paper; water and vermin-proof. It is also used for insulation between walls in music rooms, such as phonograph rooms in department stores where transmission of sound is annoying. Comes in bales 3 feet wide containing 150 sq. ft., ½″ thick, weighing 65 lbs. per bale and ¾″ thick, weighing 85 lbs. per bale.

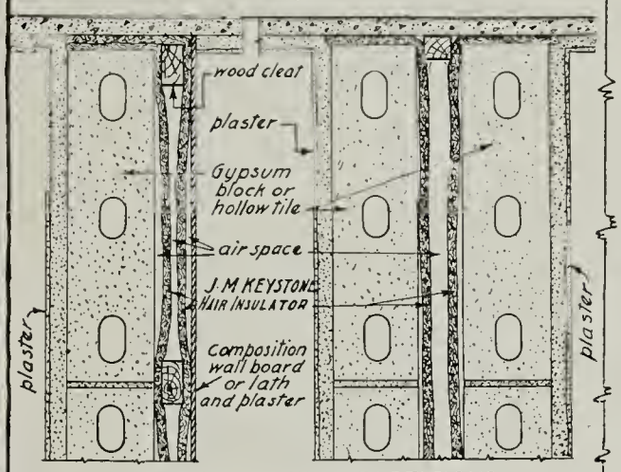


Residence of A. H. Aldinger, Winnipeg, Canada
W. C. Rugh, Architect
Johns-Manville Keystone Hair Insulator

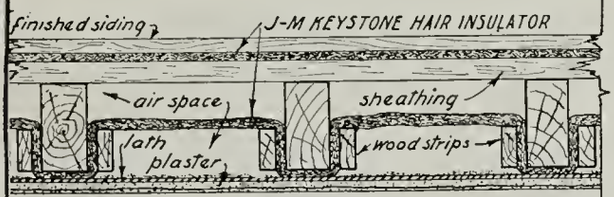
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Details of Johns-Manville Keystone Hair Insulator

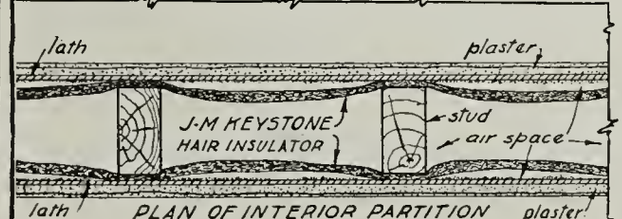
TYPES OF WALL and PARTITION INSULATION



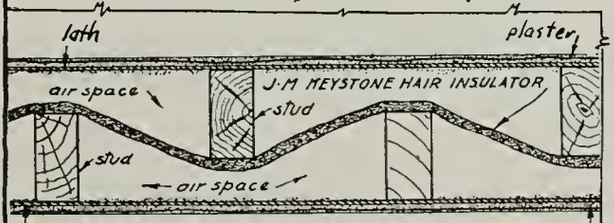
SECTIONS THRU PARTITIONS
GYPSUM BLOCKS OR HOLLOW TILE



PLAN OF EXTERIOR WALL
FRAME CONSTRUCTION

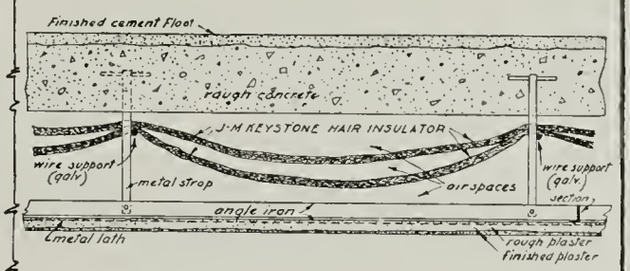


PLAN OF INTERIOR PARTITION

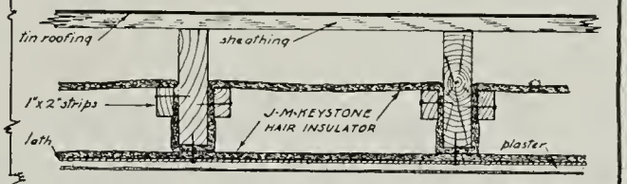


PLAN OF INTERIOR PARTITION
STAGGERED STUDDING

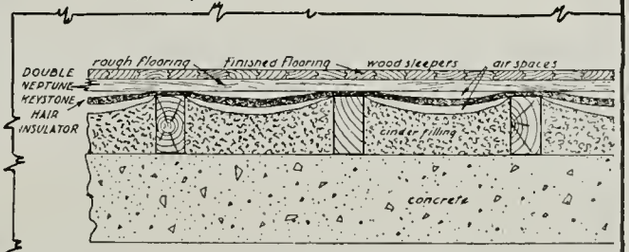
TYPES OF FLOOR and CEILING INSULATION



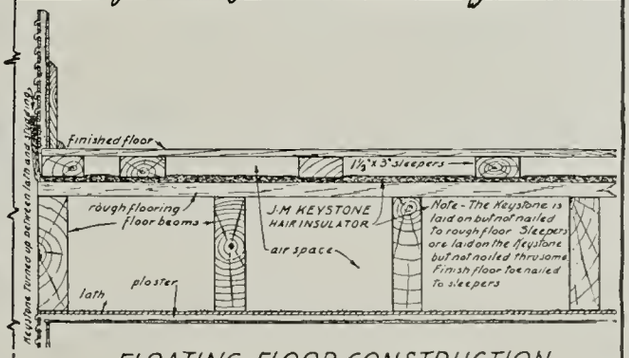
KEYSTONE HAIR INSULATOR IN SUSPENDED CEILING



KEYSTONE HAIR INSULATOR UNDER ROOF



KEYSTONE HAIR INSULATOR UNDER FLOORS
(rough and finished flooring toe-nailed at edges)



FLOATING FLOOR CONSTRUCTION

Complete working drawings, showing all details necessary for the application of Johns-Manville Keystone Hair Insulator, can be inspected at any Johns-Manville Branch. These reduced fac-similes are intended merely as a guide to the drawings available.

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A Few Representative Installations of Johns-Manville Keystone Hair Insulator

Canadian

Pacific Mills, Ocean Falls, B. C.
Normal School, Regina, Sask.
A. Weller & Company, Toronto, Ont.
Toronto & York Radial Railway, Toronto, Ont.
W. P. Levack, Toronto, Ont.
National Steel Car Company, Hamilton, Ont.
Miller Lake O'Brien Mines, Ltd., Gowganda, Ont.
Crossen Car & Foundry Co., Cobourg, Ont.
Beardmore & Company, Acton West, Ont.
Cobalt Reduction Co., Cobalt, Ont.
John Hayman & Sons, London, Ont.
North American Chemical Co., Goderich, Ont.
De Laval Dairy Supply Co., Peterboro, Ont.
Punder Bros., Stratford, Ont.
W. A. Rankin, Ottawa, Ont.
Canadian Pacific Railway, Toronto, Ont.

New England States

Cheney Bros., South Manchester, Conn.
Connecticut Tobacco Co., Hartford, Conn.
Butler Mills, New Bedford, Mass.
Maverick Mills, E. Boston, Mass.
Westfield Clay Products Co., Westfield, Mass.
Salem Laundry, Salem, Mass.
Densten Hair Co., Peabody, Mass.

Middle Atlantic States

Apartment House, 420 Park Avenue, New York City.
Apartment House, 325 West End Avenue, New York City.
Apartment House, S. W. Cor. 81st St. & Park Ave., N.Y.C.
Apartment House, 70 East 77th Street, New York City
Julius De Long, Residence, Lake Mahopac, N. Y.
Chadwick Paper Factory, Newburgh, N. Y.
Apartment House, Cor. Caton & Ocean Aves., Brooklyn, N. Y.
Apartment House, Cor. Beverly Road & Ocean Ave., Brooklyn, N. Y.
Apartment House, Cor. Franklin Ave. & Eastern Parkway, Brooklyn, N. Y.
Apartment House, Kenmore Place & Caton Ave., Brooklyn, N. Y.
Harlan & Hollingsworth Corp., Wilmington, Del.
American Car & Foundry Co., Wilmington, Del.
Baltimore & Ohio R. R. Co., Baltimore, Md.
American Car & Foundry Co., Berwick, Pa.
Geo. L. Gerhard, Reading, Pa.
General Electric Co., Erie, Pa.
Aluminum Company of America, Pittsburgh, Pa.
Central Home Co., Pittsburgh, Pa.

Southern and Central States

Carolina Wood Products Co., Asheville, N. C.
Belleville High School, Belleville, Ill.
Municipal Building, Detroit, Mich.
Towar Apartments, Detroit, Mich.
Schaffner Art Building, Cincinnati, O.
King Apartments, Cincinnati, O.
Volunteer Warehouse, Nashville, Tenn.
Eaken Apartment, Nashville, Tenn.
Cohn Apartment, Nashville, Tenn.

Southwestern States

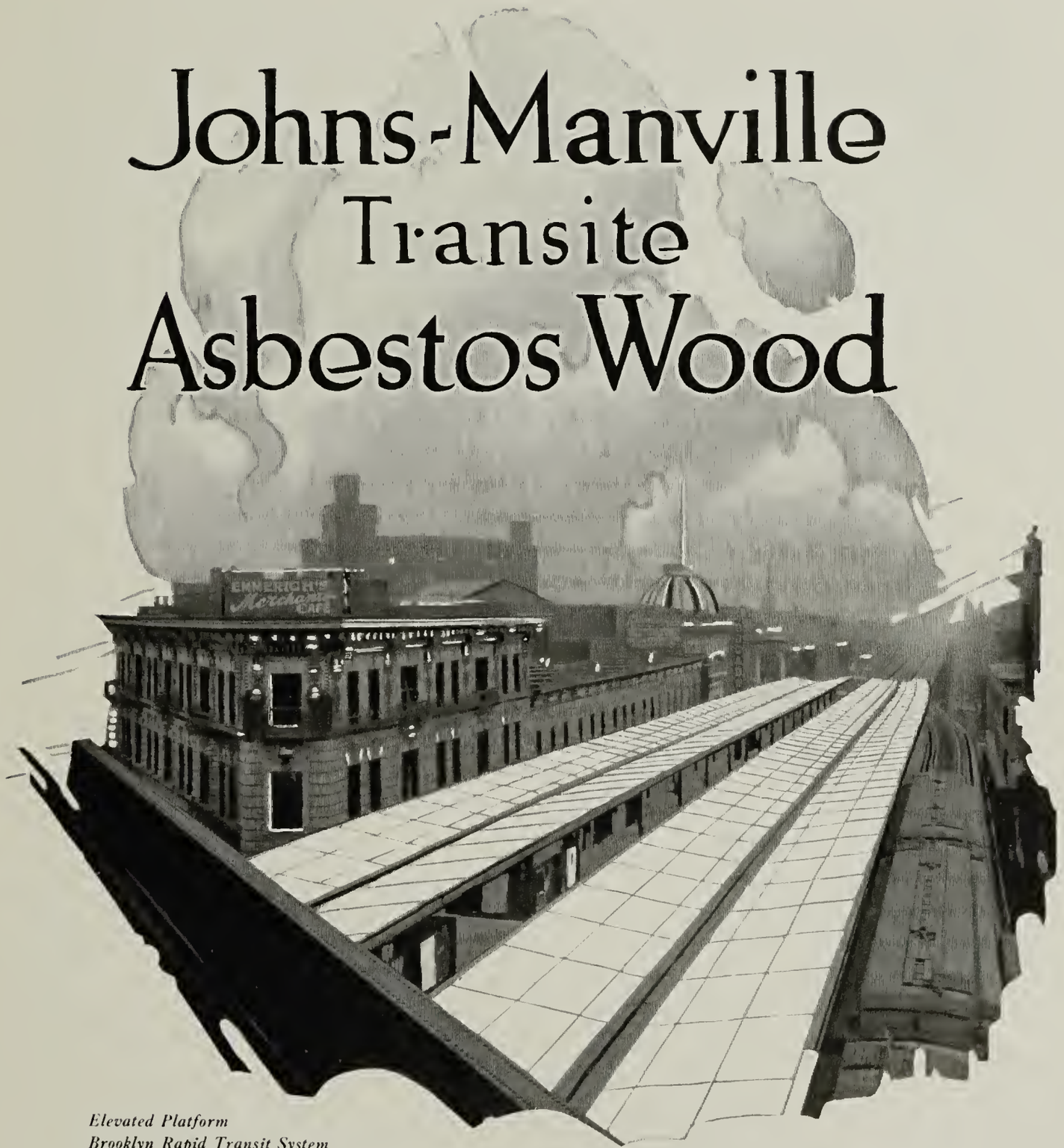
Witt Seibert & Co. (Architects), Texarkana, Ark.
Mann & Stearns (Architects), Little Rock, Ark.
Theodore R. Sanders (Architect), Little Rock, Ark.
Geo. Gibb (Architect), Little Rock, Ark.
Kahoka High School, Kahoka, Mo.
Trunk & Gordon (Architects), St. Joseph, Mo.
Helfenstellar, Hirsch & Watson (Architects), St. Louis, Mo.
Eagle Pass High School, Eagle Pass, Texas.

Pacific and Northwestern States

American Portable House Co., Seattle, Wash.
Seattle Car & Foundry Co., Seattle, Wash.
W. A. Spurrier, Jr., & Company, Des Moines, Iowa.
Francke Land & Investment Co., Mason City, Iowa.
General Western Materials Co., Waterloo, Iowa.
Burlington Basket Co., Burlington, Iowa

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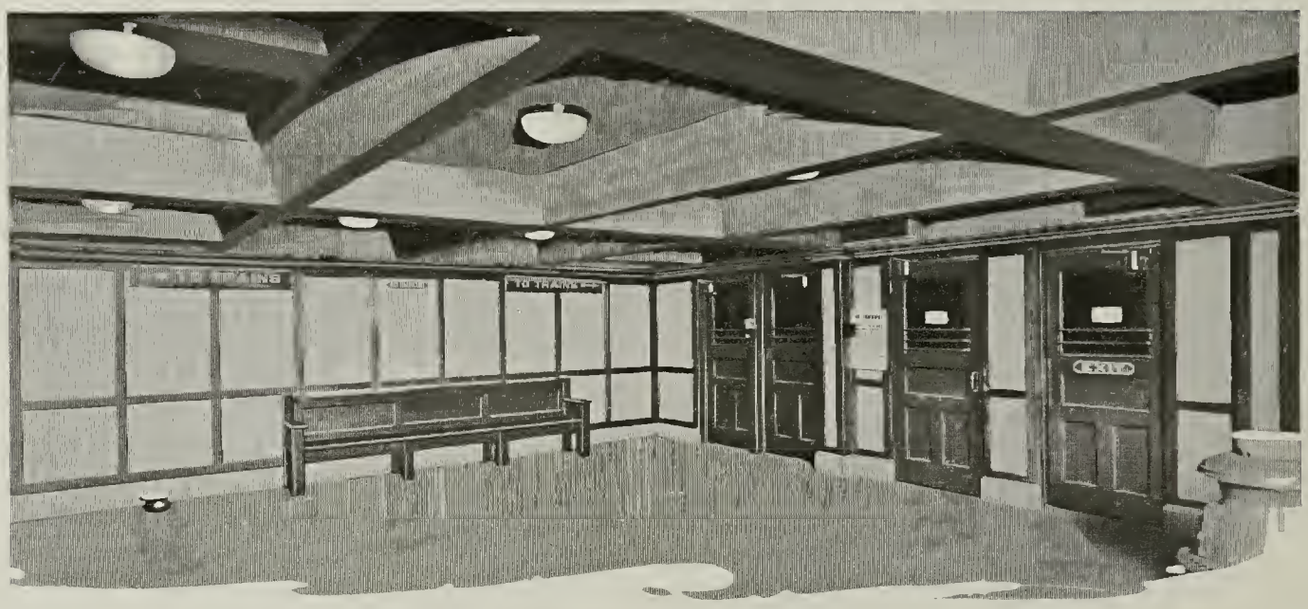
Johns-Manville Transite Asbestos Wood



Elevated Platform
Brooklyn Rapid Transit System
Johns-Manville Transite Asbestos Wood

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Fresh Pond Road Station, Brooklyn Rapid Transit System
H. J. Kolb, Engineer of Design, Brooklyn, N. Y.
Johns-Manville Transite Asbestos Wood



Johns-Manville Transite Asbestos Wood

THE owner of any type of building faces the necessity of securing absolute fire protection. He faces the problem of not only making the roof, walls, floors and ceilings fireproof—but of making every part of the building proof against any blaze.

Many wrongly suppose that fireproof roof, steel structure, concrete walls and fireproof doors alone constitute an all-fireproof building.

Such materials as these are necessary, of course—but fire in no way limits itself to these four portions of a building.

There are partitions, window casings, moldings, baseboards, boxes, receptacles, cabinets and many other places around any building which, if built of ordinary wood, offer a constant fire menace. And if metal is considered, the cost is often found to be prohibitive.

In such places there is a distinct need for a fireproof asbestos lumber which possesses all the desirable features of metal without its high cost and is comparable with wood in its ease of handling and working—Johns-Manville Transite Asbestos Wood.

Asbestos wood cannot burn, because nothing inflammable is used in its manufacture. It is an all-rock material, made of asbestos rock fibre compressed by hydraulic pressure with binding cements into homogeneous sheets of a variety of sizes.

In the rough, it presents a gray surface. Planed, it can be painted, varnished or grained where desired in remarkably true imitation of slate, marble or any hardwood.

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Johns-Manville Transite Asbestos Wood can be fastened with nails or screws and is designed so as not to warp, distort, weaken, chip or break in service. It is comparatively light in weight and has a tensile strength under transverse load of 3,500 lbs. per sq. in.

It is widely used as a fire barrier in walls, partitions, and doors and is used in hospitals, libraries, depots and all public buildings, residences, factories, foundries, warehouses, machine shops, garages and many other types of buildings, in one or more of the following forms:

- Roofing
- Sheathing
- Window casings
- Moldings
- Cabinets
- Tank linings
- Ceiling
- Flooring
- Battens
- Boxes and Receptacles
- Wainscoting
- Fire doors
- Baseboards
- Fire partitions
- Portable houses
- Counter and table tops
- Laboratory cabinets and trim
- Lining and partitions for shell-loading buildings
- Fume ventilators
- Flooring around stoves
- Enamel oven linings
- Bank vault linings
- Dental tables
- Siding sheets under steel sash
- Fire screens
- Dryer rooms in rubber and automobile plants
- Shelves for dry kiln carriers
- Film Storage Cabinets
- Gable ends of houses
- Lumber kiln linings
- Sulphur house linings
- Sleeping porches
- Office partitions
- Toilet room partitions
- Discs for fan bases
- Railway signal wire boxing
- Barriers of all sorts for fire protection from electrical apparatus

Johns-Manville Transite Asbestos Wood is examined and approved by the Underwriters' Laboratories, Inc., under the direction of the National Board of Fire Underwriters.

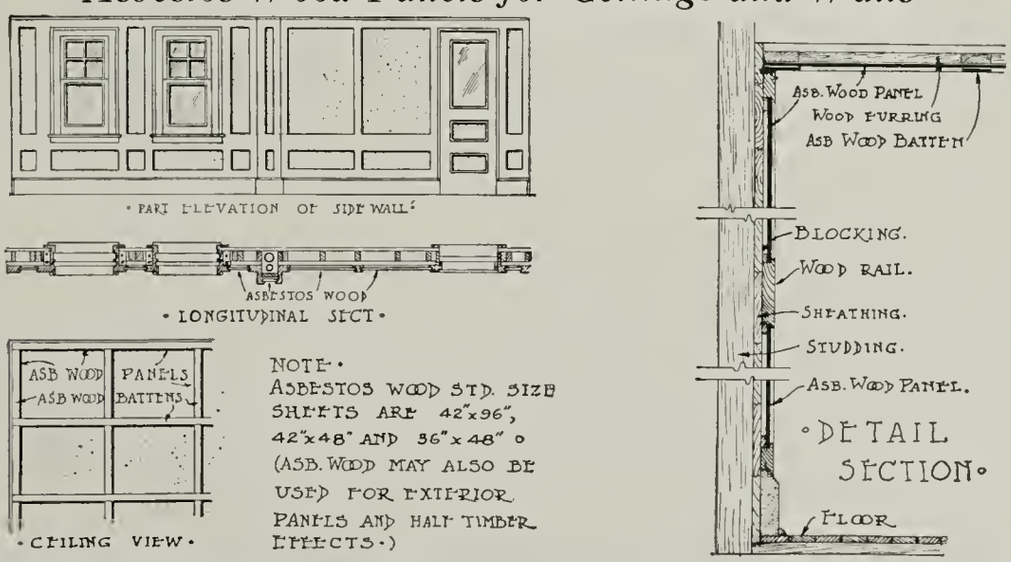
Sizes, Weights and List Prices

Johns-Manville Transite Asbestos Wood is furnished in standard sized sheets 36″ x 48″; 42″ x 48″; and 42″ x 96″. (In all thicknesses.)

Thickness	1/8″	3/16″	1/4″	5/16″	3/8″	7/16″	1/2″	9/16″	5/8″	3/4″	7/8″	1″	1 1/4″	1 1/2″	1 3/4″	2″
Weight per Sq. Ft. in Pounds	1.41	2	2.65	3.28	3.91	4.41	4.7	6	6.7	7.6	8.75	9.93	12.8	14	16.8	19.65
List Price per Sq. Ft.	$.15	.22½	.30	.38	.45	.53	.60	.70	.75	.90	1.05	1.20	1.50	1.80	2.10	2.40

All quotations are F.O.B. Factories.

Asbestos Wood Panels for Ceilings and Walls



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A Few Representative Installations of Johns-Manville Transite Asbestos Wood

Canadian

Electric Manufacturing Co., Vancouver, B. C.
Toronto Hydro-Electric System, Toronto, Ont.
Hydro-Electric Power Commission, Toronto, Ont.
Canadian Westinghouse Elec. Mfg. Co., Hamilton, Ont.
Dominion Power & Transmission Co., Hamilton, Ont.
Ontario Power Co., Niagara Falls, Ont.
Canada Cement Company, Montreal, Que.
Northern Electric Company, Montreal, Que.

Alaska

Alaska Gastineau Mining Co., Juneau, Alaska.

New England States

Edison Electric Illuminating Co., Boston, Mass.
General Electric Co., Pittsfield, Mass.
General Electric Co., Lynn, Mass.
General Electric Co., Boston, Mass.
American Steel & Wire Co., Worcester, Mass.
Charles H. Tenney & Co., Boston, Mass.
Sullivan Machinery Co., Claremont, N. H.
Trumbull Electric Mfg. Co., Plainville, Conn.

Middle Atlantic States

B. & O. R.R., Baltimore, Md.
Consolidated Gas, Elec. Lt. & Power Co., Baltimore, Md.
Thermo-Electro Instrument Co., Newark, N. J.
Westinghouse Lamp Co., Bloomfield, N. J.
Crocker-Wheeler Company, Ampere, N. J.
F. H. Lovell & Company, Arlington, N. J.
Niles Bement Pond Company, Plainfield, N. J.
Marconi Wireless Company, New York City.
Sprague Electric Works, New York City.
General Electric Company, Schenectady, N. Y.
Union Carbide Company, Niagara Falls, N. Y.
Sperry Gyroscope Company, Brooklyn, N. Y.
H. H. Franklin Mfg. Company, Syracuse, N. Y.
Interborough Rapid Transit Co., New York City.
Transit Development Company, Brooklyn, N. Y.
N. Y. & Queens Electric Light & Power Co., Long Island City.
Postal Telegraph & Cable Co., New York City.
General Electric Company, Erie, Pa.
Carnegie Steel Company, Pittsburgh, Pa.
American Sheet & Tin Plate Co., Pittsburgh, Pa.
American Bridge Company, Pittsburgh, Pa.
National Tube Company, Pittsburgh, Pa.
Westinghouse Air Brake Company, Pittsburgh, Pa.
Union Switch & Signal Company, Pittsburgh, Pa.
Aluminum Company of America, Pittsburgh,Pa.
H. C. Frick Coke Company, Pittsburgh, Pa.
Jones & Laughlin Steel Company, Pittsburgh, Pa.
Barrett Manufacturing Co., Philadelphia, Pa.
Pennsylvania Railroad Company, Philadelphia, Pa.
Adams Express Company, Philadelphia, Pa.
Bethlehem Steel Company, South Bethlehem, Pa.

Central States

Crane Company, Chicago, Ill.
International Harvester Company, Chicago, Ill.
American Can Company, Chicago, Ill.
Inland Steel Company, Chicago, Ill.
Illinois Steel Company, Chicago, Ill.
Indianapolis Traction & Terminal Co., Indianapolis, Ind.
Indiana & Michigan Elec. Co., South Bend, Ind.
Commonwealth Edison Co., Chicago, Ill.
Chicago Elevated Railways Co., Chicago, Ill.
Federal Dyestuff & Chemical Corp., Kingsport, Tenn.
American Gas Electric Co., Wheeling, West Va.
Cutler Hammer Manufacturing Co., Milwaukee, Wis.
Milwaukee Electric Ry. & Lt. Co., Milwaukee, Wis.
Cudahy Bros. Company, Milwaukee, Wis.
Federal Rubber Company, Milwaukee, Wis.

Southwestern States

Jefferson Hotel, St. Louis, Mo.
David R. Rankin School of Mechanical Trades, St. Louis, Mo.
Board of Education, St. Louis, Mo.
Union Elec. Lt. & Pr. Co., St. Louis, Mo.
United Railways Co., St. Louis, Mo.
Mississippi River Power Co., St. Louis, Mo.
Rutledge & Taylor Coal Co., St. Louis, Mo.
American Car Company, St. Louis, Mo.
International Smelter & Refining Co., Salt Lake City, Utah

Northwestern States

Mississippi River Power Co., Keokuk, Iowa.
Rock Island & Moline Mfg. Co., Davenport, Iowa.
Des Moines City Ry. Co., Des Moines, Iowa.
United Light & Railways Co., Davenport, Iowa.
Waterloo, Cedar Falls & West Ry. Co., Waterloo, Iowa.
Iowa Railway & Light Co., Cedar Rapids, Iowa.
Anaconda Copper Mining Co., Butte, Montana.
Montana Power Co., Butte, Montana.
Minneapolis General Elec. Co., Minneapolis, Minn.
Potlatch Lumber Company, Potlatch, Idaho.
Swift & Company, So. Omaha, Neb.

Pacific States

Pacific Gas & Elec. Co., San Francisco, Cal.
Great Western Power Co., San Francisco, Cal.
So. California Edison Co., Los Angeles, Cal.
Natomas Consolidated Gold Mining Co., Marysville, Cal.
Pacific Lumber Co., Scotia, Cal.
Clear Lake Lumber Co., Clear Lake, Wash.
Mumby Lumber & Shingle Co., Bordeaux, Wash.
Tacoma Smelting Co., Tacoma, Wash.
City of Seattle Light Dept., Seattle, Wash.
Puget Sound Traction, Lt. & Power Co., Seattle, Wash.

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Johns-Manville Asphalt Mastic Floor



Laying Johns-Manville
Asphalt Mastic Floor
Southern Railway Freight Station
Mobile, Alabama

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These photographs illustrate the varied conditions under which Johns-Manville Mastic Flooring gives long and satisfactory service.

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Johns-Manville Asphalt Mastic Floor

JOHNS-MANVILLE Mastic owes its rugged resistance to the "know how" of the experienced engineers who determine the consistency of your floor before the materials leave the factory. It owes its durability to the way these materials are put together and laid by expert workmen, to withstand the hardest knocks or to meet the lightest service conditions.

It's the combination of the best materials and the brains and experience of our experts that makes Johns-Manville Mastic supreme.

This floor is in the nature of an asphaltic concrete and consists of a binder or cement made up of a combination of natural asphalts and a well-graded mineral aggregate of torpedo gravel, crushed stone and sand with particles ranging in size from those passing a ¾-inch mesh screen down to those which pass a 200-mesh screen.

Success with this type of floor demands a careful grading of the aggregate particles and their intimate mixture with the cementing materials in a manner that will insure the densest possible product in which even the finest particles are thoroughly coated with the asphaltic cement and which it is impossible to obtain in a field mixture.

Therefore, to insure this essential result in Johns-Manville Mastic Flooring, the aggregates passing an 80-screen are combined with the asphalt by heat and mechanical agitation for a period of six to seven hours at our factory rather than at the site of the work. The mass is then molded into blocks of convenient size for shipment. These blocks are broken up on the work and reheated to a temperature of 450 deg. F. and mixed with the coarser aggregate, using a pure asphaltic flux to help break down the blocks in the kettle and govern the consistency of the floor.

The resulting softened and plastic mass is transported to the work in oak buckets and is then laid down in one or two courses depending upon the required thickness and given a comparatively smooth finish by rubbing with wood floats.

By reason of its remarkable ductility, toughness, strength and enduring qualities, Johns-Manville Mastic Flooring is peculiarly adapted for the work it is called upon to perform in floor use under various conditions. It provides a surface that is waterproof and at the same time practically wear-proof. It is also highly resistant to the effect of acids, alkali, and brine.

These characteristics should appeal to architects and owners of breweries, distilleries, canning factories, packing-houses, ice-cream factories, creameries, cold storage plants, warehouses, freight houses, railroad shops, machine shops, school houses, institutions, platforms, loading docks, plating establishments, battery houses, chemical laboratories, pickling-tanks and tank rooms in smelters.

Another point of vital importance in establishments where light or accurate machinery is in operation, or where merchandise is stored, is that Johns-Manville Mastic Floors do not originate or hold dust.

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This flooring is unequaled for factory and warehouse use, even under the heaviest trucking conditions, and on account of its noiseless character is a boon to plants where there is considerable trucking. It also has a peculiar holding quality which has a tendency to prevent slipping.

Johns-Manville Mastic can be laid in any consistency between extreme hardness and softness and while always dense, possesses a certain amount of resiliency. It does not cause foot-soreness and fatigue, like concrete and other non-yielding floor surfaces and where employees of machine shops, factories and other industries are compelled to stand while at work, it adds greatly to their comfort and efficiency. Furthermore, being damp-proof, it is a protection against rheumatism and other ailments common to damp conditions.

This flooring is easily laid and easily repaired if changes in the floor surface are made necessary at any time. It adds very little to the dead load, as the standard thickness of 1½ inches weighs only 18 lbs. to the square foot, in place. This thickness is sufficient for ordinary trucking requirements, but can be varied to meet conditions, ranging from 1 inch for foot traffic, where the requirements are very light, to 2 inches in thickness for loading docks where the requirements are correspondingly severe.

It can be laid over any foundation which is firm and stable and can be applied over wood, brick, concrete or tile already in place. If these surfaces are badly worn, it is preferable to level up the inequalities by the use of cement grout.

The finished surface is monolithic, without construction joints or cracks to collect or hold dirt or moisture.

The installation of this floor does not necessarily occasion any delay in the operation of a plant.

Johns-Manville Mastic Matrix

This is the asphaltic cement or binder incorporated in the mastic block as manufactured at the factory to hold the fine mineral aggregate together.

By our careful manipulation and close supervision, absolute uniformity of the consistency of the material is assured.

Johns-Manville Standard Asphalt Mastic

This product is a finely graded mineral aggregate bonded together by an asphaltic cement or binder. This mineral aggregate will pass through screens ranging from 80 to 200-mesh in fineness.

The asphaltic cement or binder is heated to a temperature that will allow the fine mineral aggregate to be thoroughly incorporated by constant agitation in a

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mechanical mixer for a sufficient length of time to assure the thorough coating of the very finest of the mineral aggregate, which result can be accomplished in no other satisfactory manner.

After the mixing process has attained the desired results, the mass is drawn from the mixer and molded into octagonal-shaped blocks and our brand J-M imprinted in each block.

Johns-Manville Asphalt Fluxes

These materials are manufactured in various consistencies ranging from extreme hardness to softness and have the same general make-up as mastic matrix. They are added to the Johns-Manville Mastic in proper proportions to produce a floor of the desired texture, which may be of a hardness to withstand extreme conditions of wear and tear or of a softness to withstand shock from temperature changes without checking or cracking.

The material is shipped in sheet iron drums containing approximately 450 lbs. each.

Mineral Aggregates

Mineral aggregate can be in the shape of washed torpedo gravel, crushed limestone or granite, trap rock or any other hard, flinty mineral substance which may be peculiar to the locality, mixed with a small percentage of torpedo sand which is entirely free from loam or dirt. Briefly, a clean, properly graded mineral is absolutely necessary to meet requirements.

It is added to the Mastic and Flux after the same have been thoroughly broken down by heat in suitable boilers and the temperature of the Mastic brought to 450 deg. F. This mineral aggregate is procured locally wherever possible.

Johns-Manville Acid-Proof Asphalt Mastic

Where acid conditions prevail and trouble is being experienced on account of tile, concrete or wood floors proving unsatisfactory, the trouble can be overcome by the use of Johns-Manville Acid-Resisting Asphalt Mastic Floors.

This mastic is manufactured in the same careful manner as our Standard Johns-Manville Asphalt Mastic, the asphalt cement or binder being the same in both products. However, in the manufacture of our Acid-Resisting Asphalt Mastic we make use of a mineral aggregate which is immune to the action of commercial acids. Acid-proof Mastic is also shipped in octagonal-shaped blocks.

The mineral aggregate which is further added to the Johns-Manville Acid-Proof Asphalt Mastic must be immune to the acids encountered. The grading of this mineral aggregate should be the same as that used in our Standard Asphalt Mastic.

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Johns-Manville Asphalt Mastic Flooring as a Fire Retardant

MODERN building practice demands that as many of the materials as possible be fire-resisting to a greater or less degree. The following facts on Johns-Manville Mastic Flooring will answer your most searching questions as to its ability to retard fire.

A few years ago the National Board of Fire Underwriters completed exhaustive tests to determine the fire-retardant qualities of Johns-Manville Asphalt Mastic Flooring.

The following excerpts from their report (dated August 21, 1917) substantiate our claims for Mastic Flooring as a fire-retardant and are vitally important to every one interested in flooring for industrial and mercantile plants, public and private institutions, shops, breweries, packing-houses, laundries, railway buildings and all floors where the service is particularly severe.

Under the heading of "Fire-Resisting Properties," the report of the Underwriters' Laboratories, Inc., says of Mastic Flooring:—

> "The top flooring is not readily flammable and does not carry or communicate fire to any material extent. It disintegrates slowly under heat, affords very considerable heat insulation to the floor structure and the progressive disintegration does not materially reduce the insulation afforded.
>
> "By comparing a sample of the Mastic top flooring with a sample of the maple flooring, it will be seen that the maple flooring was readily flammable and carried and communicated fire to a material degree, giving off flame in considerable volume and more or less smoke. By referring to the logs of tests it will be seen that flames developed on the maple sample in 1 minute and 45 seconds after which it burned readily and spread rapidly, reaching the unexposed end of the sample in 20 minutes.
>
> "In the case of the Mastic sample, flame developed in 5 minutes and 50 seconds and spread slowly, giving off short, intermittent flames. At the end of the test (1 hour and 10 minutes), it had only reached to a point 6 feet from the exposed end of the sample. At the end of the test, after the exposing flames had been extinguished and the gases of combustion given off from the wood at the edges of the sample had been quenched with water, the surface of the sample ceased to burn."

In addition to their findings concerning the fire-resisting qualities of Mastic the Underwriters' Laboratories, Inc., also incorporated in their report much interesting data on the design, construction, practicability, durability, etc., of Mastic Flooring. Quotations follow:—

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"DESIGN AND CONSTRUCTION

"The design and construction of the top flooring are suitable for the purposes intended. The materials are suitable for the purpose, forming a homogeneous mass which can be readily installed under ordinary service conditions."

"PRACTICABILITY

"It is practical to prepare the materials as furnished to the job and to apply them in the manner advocated. The flooring can be easily repaired or maintained if repairs and maintenance are required."

"DURABILITY

"All floorings examined in the field were subject to hard usage and in no case was there any apparent deterioration from the effects of wear.

"In none of the installations examined was there any evidence of deterioration in the top flooring due to expansion, contraction or settlement of the building. In only one of the installations examined was the top flooring exposed to the elements, but this installation appeared to be in good condition.

"While the investigation did not give positive evidence to the effect that the top floor has no deteriorating influence on the floor structure, a knowledge of the materials used indicates that if anything the top flooring should have a preservative effect.

"Although the floorings were carefully examined for cracks which would ordinarily indicate failure of the surfacing to conform to the expansion and contraction of the main flooring in which it rests, no cracks were discovered, indicating that the surfacing is not open to criticism in this particular. In only one of the installations examined was the flooring exposed to the elements, but no criticism developed in the case of this installation."

"ACCIDENT HAZARD

"This flooring material, by offering a relatively high resistance to slipping, should reduce the accident hazard due to this cause.

"The examination of the material indicated a structure presenting a suitable anti-slip surface both when new and worn.

"The friction tests brought out results comparing favorably with results of test on anti-slip surfaces which have proven to be effective in reducing accidents due to slipping.

"Examination made in the field, showed no marked difference in the resistance to slipping after being subject to actual service conditions."

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Standard Specifications Johns-Manville Asphalt Mastic Floor

Specification for Johns-Manville Asphalt Mastic Floor
1-Inch Thickness

After the concrete base has been placed and pitched, if necessary, to the proper grade for drainage, it shall be given a finished and floated surface free from all sharp projections or offsets of any character except those shown on the plans. The concrete shall then be allowed to set and dry out.

When necessary, on account of the condition of the foundation or base on which the mastic floor is to be laid, one ply of rosin-sized building paper shall be spread over the floor surface and lapped three inches. (The use of building paper may be called for to prevent moisture or grease working up into the mastic from the concrete or wood base, or may be necessary in order to provide independent movement in the mastic floor on account of movement in the base.)

The Mastic Blocks shall be delivered on the ground plainly marked with the name of the brand and broken up before being placed in the mastic kettles. There shall then be added the proper percentage of asphalt flux and both allowed to cook until the mastic blocks are entirely melted. The mineral aggregate in the shape of washed torpedo gravel, torpedo sand, crushed limestone or granite, in the proper percentage to give the required consistency or hardness, shall then be added and thoroughly mixed into the mass by the use of iron stirring rods and the temperature of the mix brought to 450 degrees Fahrenheit. The material shall be constantly stirred to prevent burning and then removed from the kettles in oak buckets or all iron wheelbarrows and taken to the work as required.

The mineral aggregate must be thoroughly dry before being introduced into the mastic, and shall be a clean, properly graded material, satisfactory to the engineer or architect, and of such size and grading as will meet the peculiar service conditions.

The asphalt mastic shall be laid in one layer of one inch thickness, spread with wooden floats and sufficient pressure applied to eliminate all voids and blow-holes; making a homogeneous mass throughout.

When the joints are made, the hot mastic shall be laid over the cold edge of the joint already on the floor, and allowed to remain until the same is thoroughly heated. The surplus material shall then be cut off and the joints made compact and tight by rubbing with wood floats.

The top shall be given a sand or cement finish in the following manner: In case of a sand finish, the top surface, while hot, shall be sprinkled and rubbed with fine, dry, sharp sand, which shall be thoroughly rubbed into the surface of the mastic and the surplus sand left on the floor until the same is put in use. In case of a cement finish, the top surface shall first be sprinkled and rubbed with fine, sharp sand, which shall then be swept off while the material is still warm. The surface shall then be dusted with Portland Cement and the same thoroughly rubbed in.

Specification for Johns-Manville Asphalt Mastic Floor
1¼-Inch Thickness

After the concrete base has been placed and pitched, if necessary, to the proper grade for drainage, it shall be given a finished and floated surface free from all sharp projections or offsets of any character except those shown on the plans. The concrete shall then be allowed to set and dry out.

When necessary, on account of the condition of the foundation or base on which the mastic floor is to be laid, one-ply of rosin-sized building paper shall be spread over the floor surface and lapped three inches. (The use of building paper may be called for to prevent moisture or grease working up into the mastic from the concrete or wood base, or may be necessary in order to provide independent movement in the mastic floor on account of movement in the base.)

The Mastic Blocks shall be delivered on the ground plainly marked with the name of the brand and broken up before being placed in the mastic kettles. There shall then be added the proper percentage of asphalt flux and both allowed to cook until the mastic blocks are entirely

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melted. The proper percentage of mineral aggregate in the shape of washed torpedo gravel, torpedo sand, crushed limestone or granite, shall then be added and thoroughly mixed into the mass by the use of iron stirring rods and the temperature of the mix brought to 450 degrees Fahrenheit. The material shall be constantly stirred to prevent burning and then removed from the kettles in oak buckets or all iron wheelbarrows and taken to the work as required.

The mineral aggregate must be thoroughly dry before being introduced into the mastic, and shall be a clean, properly graded material, satisfactory to the engineer or architect, and of such size and grading as will meet the peculiar service conditions.

The asphalt mastic shall be laid in one layer of one and one-quarter inch thickness, spread with wood floats and sufficient pressure applied to eliminate all voids and blow-holes; making a homogeneous mass throughout.

When the joints are made, the hot mastic shall be laid over the cold edge of the joint already on the floor, and allowed to remain until the same is thoroughly heated. The surplus material shall then be cut off and the joints made compact and tight by rubbing with wood floats.

The top shall be given a sand or cement finish in the following manner: In case of a sand finish, the top surface, while hot, shall be sprinkled and rubbed with fine, dry, sharp sand, which shall be thoroughly rubbed into the surface of the mastic, and the surplus sand left on the floor until the same is put in use. In case of a cement finish, the top surface shall first be sprinkled and rubbed with fine, sharp sand, which shall then be swept off while the material is still warm. The surface shall then be dusted with Portland Cement and the same thoroughly rubbed in.

Specification for Johns-Manville Asphalt Mastic Floor
1½-Inch Thickness

After the concrete base has been placed and pitched, if necessary, to the proper grade for drainage, it shall be given a finished and floated surface free from all sharp projections or offsets of any character except those on the plans. The concrete shall then be allowed to set and dry out.

When necessary, on account of the condition of the foundation or base on which the mastic floor is to be laid, one-ply of rosin-sized building paper shall be spread over the floor surface and lapped three inches. (The use of building paper may be called for to prevent moisture or grease working up into the mastic from the concrete or wood base, or may be necessary in order to provide independent movement in the mastic floor on account of movement in the base.)

The Mastic Blocks shall be delivered on the ground plainly marked with the name of the brand and broken up before being placed in the mastic kettles. There shall then be added the proper percentage of asphalt flux and both allowed to cook until the mastic blocks are entirely melted. The mineral aggregate in the shape of washed torpedo gravel, torpedo sand, crushed limestone or granite, in the proper percentage to give the required consistency or hardness, shall then be added and thoroughly mixed into the mass by the use of iron stirring rods and the temperature of the mix brought to 450 degrees Fahrenheit. The material shall be constantly stirred to prevent burning and then removed from the kettles in oak buckets or all iron wheelbarrows and taken to the work as required.

The mineral aggregate must be thoroughly dry before being introduced into the mastic and shall be a clean, properly graded material, satisfactory to the engineer or architect, and of such size and grading as will meet the peculiar service conditions.

The asphalt mastic shall be laid in two courses, each layer being ¾ inch in thickness, making a total thickness of 1½ inches. It shall be spread with wood floats in such a manner as to avoid bringing the joints in the two courses of mastic directly over each other and these joints shall be lapped at least 12 inches. Sufficient pressure shall be applied at all times to eliminate all voids and blow-holes, making a homogeneous mass throughout.

When the joints are made, the hot mastic shall be laid over the cold edge of the joint already on the floor and allowed to remain until the same is thoroughly heated. The surplus material shall then be cut off and the joints made compact and tight by rubbing with wood floats.

The top shall be given a sand or cement finish in the following manner: In case of a sand finish, the top surface, while hot, shall be sprinkled and rubbed with fine, dry, sharp sand, which shall be thoroughly rubbed into the surface of the mastic and the surplus sand left on the floor until the same is put in use. In case of a cement finish, the top surface shall first be sprinkled and rubbed with fine, sharp sand, which shall then be swept off while the material is still warm. The surface shall then be dusted with Portland Cement and the same thoroughly rubbed in.

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A Few Representative Installations of Johns-Manville Asphalt Mastic Floor

Canadian

Canadian Pacific Ry. Shops (10 acres), Calgary, Alberta.
Canadian Club Distillery, Walkerville, Ont.
Montreal Dairy Co., Montreal, Que.
Great Northern Railway Dock, Vancouver, B. C.
North End Drill Hall, Winnipeg, Man.
North Battleford Asylum, Winnipeg, Man.
Children's Hospital, Winnipeg, Man.
St. Boniface School, Winnipeg, Man.
Regina College, Regina, Sask.
Wm. Davies Co. Cold Storage Plants, Toronto, Ont.

New England States

Squirrel Brand Company (Cannery), Cambridge, Mass.
Hood Rubber Co., Watertown, Mass.
Worcester Market Co., Worcester, Mass.
Thompson Chemical Laboratory, Williams College, Williamstown, Mass.
Cliquot Club (laboratory), Millis, Mass.
Electric Storage Battery Co., Boston, Mass.
The Three Millers (candy mfrs.), Boston, Mass.
Swift & Co. (stables), Salem, Mass.
American Locomotive Co. (Machine Shops), Woonsocket, R. I.; Providence, R. I.
Bridgeport Brass Co. (Machine Shops), Bridgeport, Conn.
Old Colony Brewery, Fall River, Mass.
Brockton Sausage Mfg. Co., Brockton, Mass.
Chatham Fish Freezer Co., Chatham, Mass.
Neapolitan Ice Cream Co., Cambridge, Mass.
Winchester Repeating Arms Co., New Haven, Conn.
U. S. Naval Training Station, Newport, R. I.

Middle Atlantic States

Loading Platform, Post Office Bldg., N. Y. City.
Pier 8, N. Y. City.
U. S. Light & Heat Corp., Buffalo, N. Y.
Eastman Kodak Co., Rochester, N. Y.
Armour & Co., Watertown, N. Y.
Consolidated Gas & Electric Co. (Stable), Baltimore, Md.
New Process Gear Corp., Syracuse, N. Y.
B. & O. R. R. (train shed), Pittsburgh, Pa.
*Endicott-Johnson Tannery, Endicott, N. Y.
*Pullman Company (Battery House), Wilmington, Del.
*Oneida Community, Sherrill, N. Y.
*Maryland Steel Co., Sparrows Point, Md.
Orange County Brewery, Middletown, N. Y.
*Nixon Nitration Wks., New Brunswick, N. J.
Electric Storage Battery Co., Philadelphia, Pa.
Harrison Bros., Paints, Philadelphia, Pa.
Sulzberger & Sons Co., Philadelphia, Pa.
Philadelphia Electric Storage Battery Co., Philadelphia, Pa.
Dill & Collins Paper Factory, Philadelphia, Pa.

Central States

Cincinnati Car Barns, Cincinnati, Ohio.
L. S. & M. S. Ry. (Express Rooms), Chicago, Ill.
Wacker & Birk Brewery, Chicago, Ill.
Franz-Barth Brewing Co., La Crosse, Wis.
Randolph Canning Co., Randolph, Wis.
Cloverdale Creamery Co., Chicago, Ill.
U. S. Appraisers Warehouse, Milwaukee, Wis.
High School Gymnasium, La Crosse, Wis.
Arctic Ice Cream Factory, Detroit, Mich.
Haberman Provision Co., Cleveland, Ohio.
Cleveland Punch & Shear Co., Cleveland, O.
Hammond Standish Co., Detroit, Mich.
Y. M. C. A. (Roof), Youngstown, Ohio.
Corlett School, Cleveland, Ohio.
Spaulding & Merrick, Chicago, Ill.
Southern Cotton Oil Co., Chicago, Ill.
Illinois Central Freight House, Mattoon, Ill.
*Philadelphia Storage Battery Co., Chicago, Ill.
*L. S. & M. S. Ry., So. Chicago, Ill.
*Willard Storage Battery Co., Cleveland, Ohio.
*U. S. Metals Refining Co., Grasselli, Ind.
Davidson County Asylum, Nashville, Tenn.
Memphis Steam Laundry, Memphis, Tenn.
C. R. I. & P. Ry., Memphis, Tenn.
Illinois Central Terminal, Memphis, Tenn.

Southern States

American Tobacco Co., Reidsville, N. C.
Liggett & Myers, Durham, N. C.
Reynolds Tobacco Co., Winston-Salem, N. C.
Southern Ry. Freight House, Mobile, Ala.
Southern Ry. Freight House, Richmond, Va.
V. S. Forbes & Co., Packing Co., Richmond, Va.
U. S. Naval Training Station, Hampton Roads, Va.
Penna. R.R. Freight House, Washington, D. C.

Southwestern States

King Candy Co., Fort Worth, Texas.
Liggett & Myers, St. Louis, Mo.
Heil Packing Co., St. Louis, Mo.
International Shoe Co., St. Louis, Mo.
Dallas Union Terminal, Dallas, Texas.

Northwestern States

High School Gymnasium, Lake Mills, Ia.
Mayo Sanitarium Roof, Rochester, Minn.
C. R. I. & P. Ry. Freight House, Davenport, Ia.
*American Smelting & Refining Co., Omaha, Neb.
G. N. Freight House, Great Falls, Mont.
D. & R. G. R.R. Freight House, Salt Lake City, Utah.

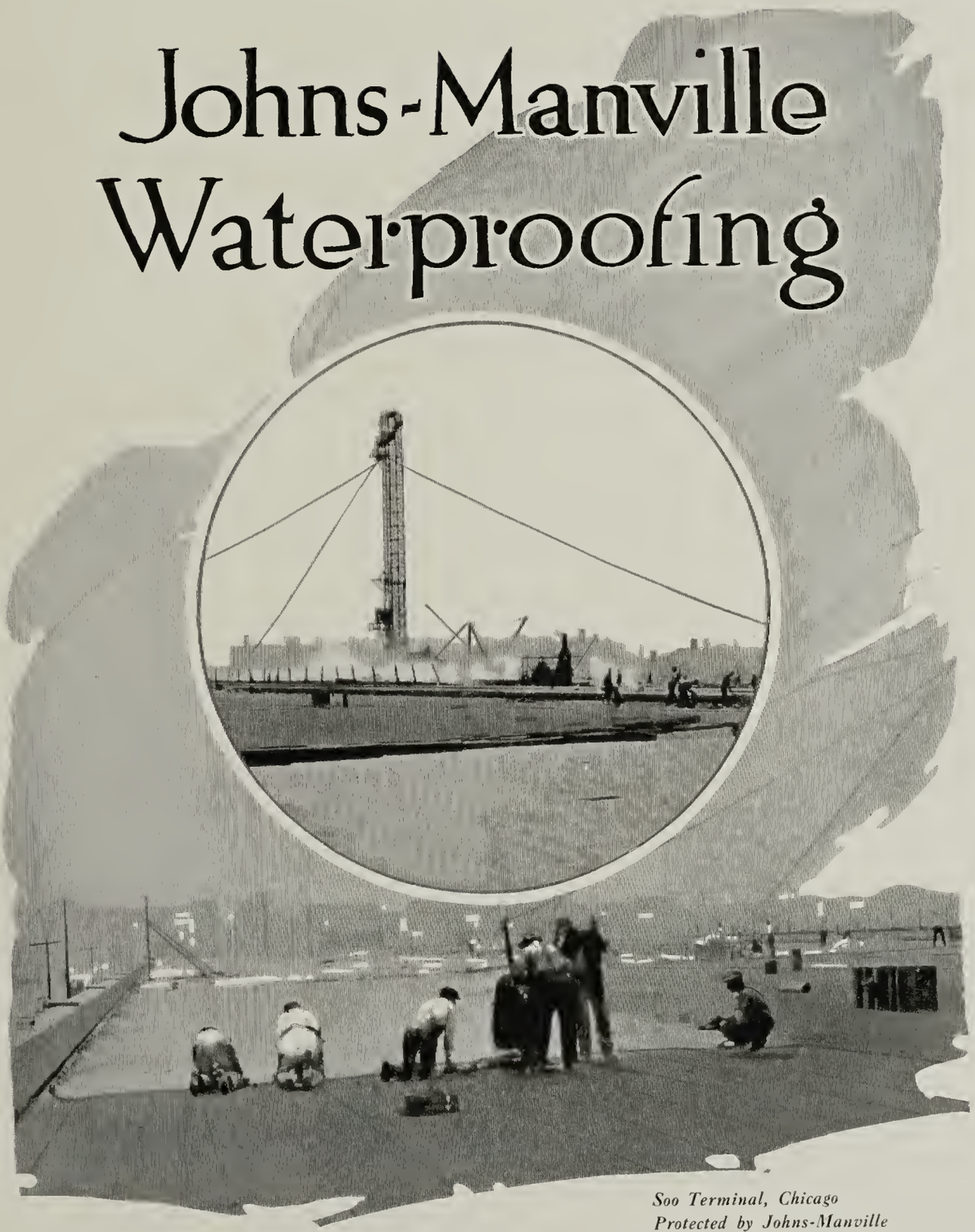
Pacific States

O. W. R. R. & N. Baggage Room, Seattle, Wash.
Damascus Creamery, Seattle, Wash.

*Acidproof Mastic.

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Johns-Manville Waterproofing



Soo Terminal, Chicago
Protected by Johns-Manville Waterproofing — the Largest Job of Waterproofing Ever Executed Under One Contract

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Johns-Manville Waterproofing

Why It Makes Good

THE quality of a product depends not only on the experience, skill and equipment of the manufacturer, but also on the care taken in the choice of the materials from which it is made.

One reason why Johns-Manville Waterproofing makes good is because the various products are selected and manufactured under such high and rigorous standards. Another factor, equally important, is that the Johns-Manville Method of Waterproofing is the result of years of actual service experience and laboratory research, plus proper design and honest manufacture of the very materials which nature itself intended for waterproofing purposes. Therefore, Johns-Manville Waterproofing is the best that human brains and hands can produce.

Johns-Manville service is your safeguard. We are specialists in this field and would be glad to have you take advantage of our experience from the specification and design right through to the application of the materials.

Waterproofing—What It Is

Waterproofing is a broad term often misapplied and misunderstood. In reality *waterproofing* should only be thought of when moisture and seepage is present, *i. e.*, where there is actual water pressure arising from surface seepage or hydrostatic pressure. Every other case of waterproofing properly comes under the head of DAMP-PROOFING.

Damp-proofing—What It Is

Damp-proofing is protection against moisture where no actual water pressure is encountered. It is simply the prevention of condensation or dampness appearing on the surface of walls or floors.

Two Methods of Waterproofing—Integral and Membrane

It is an accepted fact among engineers and architects that there are but two methods of waterproofing. But it has been proven that only one of them is capable of giving positive results.

The Integral Method—Why It Fails

This method provides for the incorporation of a powder or paste into the concrete during its construction. It is mixed with the cement, becomes part of the

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mass and is supposed to add to the density of the concrete to such an extent as to prevent the seepage of water. The incorporated material from its very nature, tends to destroy the integrity of the concrete and for that reason, if no other, cannot be successful. Experiments have proven this method is non-uniform and totally unreliable, even under laboratory conditions. It is an absolute failure when pin or hair cracks or large openings develop in the concrete, due entirely to expansion and contraction or unequal settlement in the structure.

The Membrane Method—Why It Succeeds

This method provides for the application of a protected bituminous skin or coat over the surface to be waterproofed. The membranous covering of waterproofing cement, reinforced with fabric or felt or both, is strong and flexible and has the necessary characteristics to resist water pressure and enough give to bridge over hair cracks in the concrete due to temperature changes. The membrane is built up in as many plies of reinforcing material as are necessary to meet the conditions.

Johns-Manville Membrane Waterproofing

Johns-Manville Membrane Waterproofing is the result of years of experience in the successful waterproofing of every conceivable type of construction. It has been proven by actual experience to be the most economical, not in the first but in the last cost and the most satisfactory, because it is waterproof—not approximately, but absolutely waterproof.

Why No Specifications Are Possible

Unlike every other product used in building construction, a definite specification for Johns-Manville Waterproofing cannot be written to meet efficiently every character of waterproofing. Each construction presents a different problem, involving local conditions and individual requirements which must be viewed from every angle. Then and only then will we be able to give a definite specification.

Materials Used in Johns-Manville Waterproofing

Johns-Manville Concrete Primer

This is the first coating applied to the concrete, brick or stone surfaces which are to be waterproofed. It penetrates the surface to such an extent as to form an anchorage for the subsequent waterproofing. It also acts as a cleanser for the surface, preparing it for the asphaltic coatings to follow. The covering capacity of this material should run about 100 square feet to the gallon on comparatively smooth surfaces.

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Johns-Manville Asphalt Waterproofing Cement

This is applied while hot over the Primer and is used to cement the various fabrics together into one composite sheet. Owing to great care exercised during the process of manufacture, this bituminous material is absolutely uniform in character. It is 99.5 per cent. pure and contains no matter that will disintegrate or decay. Proof against the action of cold acid, alkali, brine and water, very slightly affected by a wide range of temperatures, between melting and brittle points. To apply this Waterproofing Cement it is heated to 450 deg. F. and mopped on while hot. One ton of this material should cover 3000 square feet of surface 1/8" thick.

Johns-Manville Waterproofing Asbestos Felt

Used as a reinforcement and to give substantiability and strength to the membrane. Cemented together and bonded to the concrete by the waterproofing cement. It is made of pure asbestos (rock fibre), thoroughly impregnated with pure asphalt. This is the only all-mineral felt made, therefore, the only material of its kind that is proof against water, cold acid, mold and decay, for all time. Virtually a pliable bituminized stone sheet.

Johns-Manville Asphalt Saturated Fabric

Used not only as a reinforcement for the membrane but to give added tensile strength. This is an especially strong cotton or hemp fabric used in connection with Waterproofing Asbestos Felt in as many plies as are required to meet the conditions. Being an open-mesh material, the waterproofing cement, which is mopped on hot, thoroughly saturates, cements and bonds together the several plies of the reinforcement.

Johns-Manville Asbestos Duck

This is applied in the same manner as the other materials which make up the membrane, but only where unusual strength is desired. It is a composite sheet of asbestos felt and cotton duck thoroughly saturated with waterproofing cement. This material is largely used when working under wall footings or column bases.

Johns-Manville Self-Healing Waterproofing Cement

This is an asphaltic compound which carries a very low congealing point and a melting point of 125 deg. F., although we can furnish it with a melting point of 90 deg. F. when a softer material is desired. The use of this product is naturally limited for waterproofing purposes on account of its tendency to move readily under comparatively high temperatures and also its extremely viscous nature. For brine decks in packing-house hog-coolers and for waterproofing work between

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wooden floors, this material is ideal. We have also found that on account of its adhesiveness at low temperatures it makes an excellent expansion-joint filler and we are using it largely for that purpose, especially on mastic roof work. It is shipped in wooden barrels weighing approximately 500 pounds and half barrels weighing approximately 250 pounds.

Johns-Manville Pickling Tank Cement

This is an asphaltic compound evolved principally for use in lining the inside of wood or concrete tanks where an acid-proof coating is a necessity. It is mopped on the surface in a heated condition and carries a melting point of 212 deg. F., although a softer material can be furnished if desired with a melting point of 175 deg. F. In lining wooden tanks it is sometimes used to coat the tongue and grooves of the boards when the tank is being built, the boards being drawn tightly together and held in place permanently by the use of wooden dowels. After the tank is erected the inside is primed and given from two to four coats of the Pickling Tank Cement. It is immune to all the cold commercial acids, including hydrofluoric. It is shipped in iron drums weighing approximately 450 pounds.

Johns-Manville Pipe Dip

This is an asphaltic compound used for coating iron pipes. It is first melted down in a large iron tank and the pipes heated to the same temperature as the Pipe Dip, after which the pipes are dipped in the coating and then drawn out and the material allowed to set and harden. It is used generally by pipe manufacturers for coating pipes that are to be placed under ground and is an excellent protection against rust and corrosion, at the same time providing high insulation against electrolysis from stray electric currents.

Johns-Manville Expansion Joint Filler

An asphaltic compound of great tenacity used for filling expansion joints. Shipped in iron drums of approximately 450 pounds. It is poured into place. Immune to the action of street acids.

Johns-Manville Bituminous Putty

This material is composed of an asphaltic compound and asbestos fibre, used as a filler to prevent the infiltration of water in recesses where a permanent seal is hard to maintain with the waterproof membrane. It forms an elastic bond but little affected by temperature change and vibration. Largely used in connection with certain types of bridge waterproofing where the waterproof membrane is sealed to the sides of the girders.

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Johns-Manville Asbestos Fibrous Enamel

Johns-Manville Asbestos Fibrous Enamel is a combination of the two materials most impervious to atmospheric conditions—asbestos and natural asphalt.

As a protective coating on any material which deteriorates under weather or climatic conditions, it is by its very nature unequalled. Recommended for preserving felt and metal roofings, gutters and flashings and for the prevention of rust and corrosion of cornices, skylights, chimneys, fire-escapes, girders, lamp-posts, trolley and telegraph poles, agricultural implements, contractor's equipment, in fact, any kind of exterior or interior iron or steel work.

The natural elastic qualities of the asphalt binder, combined with asbestos fibre, allow it to accommodate itself to the expansion and contraction stresses of the surface on which it is applied, without peeling or cracking, and hence maintain its protection. It is more economical than ordinary linseed oil paints and much more efficient.

Johns-Manville Damp-proofing—Materials Used

In the large majority of cases the application of cold surface coatings will effectively damp-proof a structure. There are, however, special cases of damp-proofing which require the membrane method of waterproofing. We firmly believe and successful installations prove, that Johns-Manville Damp-proofing is the most efficient system to keep out dampness and to prevent discoloration due to the absorption of moisture.

Johns-Manville Liquid Waterproofing Coating

This is used in connection with Johns-Manville Concrete Primer and is applied cold, in one or two coats for damp-proofing only. It is used for wall work or for other surfaces not liable to injury from abrasion and where there is no hydrostatic pressure. It will withstand seepage of surface water and prevent the discoloration or staining of the outside face of concrete walls. It has a covering capacity over smooth surfaces of about 200 square feet to the gallon when used over the Primer.

Johns-Manville Cut Stone Backing

This is used for coating the sides and back of cut stone to prevent discoloration and dampness of inside of interior walls. It should cover approximately 60 square feet per gallon over rough surfaces.

Johns-Manville Aquadam

This is applied cold over brick, stone or tile and concrete surfaces, where it is required to damp-proof the walls. In tile partitions, it prevents dampness from driving the saltpeter out of the tile, through the plaster and discoloring the decorations. After it is applied, furring and lathing is generally unnecessary. It also eliminates the air space caused by furring and lathing, thus doing away with a dangerous passage for flames in case of fire. It is applied in one or two coats, depending upon the porosity of the surface. It has a covering capacity of about 80 square feet per gallon.

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Specification for Johns-Manville Aquadam Damp-proofing

Unlike Johns-Manville Waterproofing, we are able to give a definite specification of Johns-Manville Damp-proofing. This is possible because with damp-proofing the conditions are so nearly the same in the large majority of installations.

A specification of the application of Johns-Manville Aquadam follows:—

EXTERIOR

Where so specified, the exterior surfaces of foundation walls shall be damp-proofed below grade with H. W. Johns-Manville Company's Aquadam.

The Johns-Manville Aquadam must be well stirred before using.

If the surface over which the Johns-Manville Aquadam is to be applied is wet, damp or liable to contain frost, it must be allowed to dry before the damp-proofing is applied.

If the surface is of a porous nature, it should be given two coats of Aquadam, the first coat being allowed to dry before the second is applied.

INTERIOR

Where so specified, the interior surfaces of exterior walls shall be damp-proofed with Johns-Manville Aquadam.

The Johns-Manville Aquadam must be well stirred before using. If the surface over which the Johns-Manville Aquadam is to be applied is wet, damp or liable to contain frost, it must be allowed to dry before the damp-proofing is applied.

If the surface is of a very porous nature, it should be given two coats of Aquadam, the first coat being allowed to dry before the second is applied. The final coat of damp-proofing must be allowed to take an initial set of twenty-four hours before being plastered over.



Applying Johns-Manville Waterproofing to Side Walls

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A Few Representative Installations of Johns-Manville Waterproofing and Johns-Manville Dampproofing

Canadian

Waterproofing

Grand Trunk Ry., Sunnyside Bridge, Toronto, Ont.
I. O. O. F. Orphanage Tank, Toronto, Ont.
Canadian Pacific Bridge, Regina, Sask.
Canadian Pacific Bridge, Saskatoon, Sask.
Canadian Pacific Bridge, Moose Jaw, Sask.
Canadian Pacific Bridge, Winnipeg, Man.
Law Courts Tunnel, Winnipeg, Man.
Three Rivers Boulevard, Three Rivers, Que.
C. P. Ry. Windsor St. Terminal, Montreal, Que.

Damp-proofing

Dominion Bank Bldg., Toronto, Ont.
Victoria Hospital, London, Ont.
Whitby Insane Asylum, Whitby, Ont.
Public School Buildings Erected Since 1915, London, Ont.

New England States

Waterproofing

New Orpheum, Boston, Mass.
H. P. Hood & Son, Charleston, Mass.
Essex Co., Commissioners, Salem, Mass.
Metropolitan Park Commission, Boston, Mass.
Boston & Albany R. R., Boston, Mass.
Boston & Maine R. R., Boston, Mass.
City of Springfield, Eng. Dept., Springfield, Mass.
Lever Bros., Boston, Mass.

Middle Atlantic States

Waterproofing

Harrison Bros., Philadelphia, Pa.
Hyatt Roller Bearing Co., Harrison, N. J.
Elevator Repair & Supply Co., Hoboken, N. J.
DeLaval Separator Co., Poughkeepsie, N. Y.
Pittsburgh Natatorium, Pittsburgh, Pa.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Pittsburgh Auditorium, Pittsburgh, Pa.
Charles Street Tunnel, Pittsburgh, Pa.
Hazel Atlas Glass Co., Washington, Pa.

Damp-proofing

Baker Bros. Apartments, Brooklyn, N. Y.
Fort William Henry Hotel, Lake George, N. Y.
Rialto Theatre, Brooklyn, N. Y.
Anderson & Co., Brooklyn, N. Y.
H. Moore Apartments, Brooklyn, N. Y.
Champlain Hotel, Lake Champlain, N. Y.
Liberty Theatre, Pittsburgh, Pa.

Central States

Waterproofing

Cleveland Art Museum, Cleveland, Ohio.
City of Nashville Reservoir, Nashville, Tenn.
Cleveland Athletic Club, Cleveland, Ohio.
Ford Residence, Dearborn, Mich.
Soo Terminal (M. St. P. & St. Ste. M.), Chicago, Ill.
St. Hedwig's Orphanage, Niles, Ill.
Y. M. C. A. Swimming Pool, Cleveland, Ohio.
High Level Bridge Approaches, Cleveland, Ohio.
Culver Military Academy, Culver, Ind.
Grand Trunk Ry. Track Elevation, Detroit, Mich.
Grand Trunk Ry. Track Elevation, Pontiac, Mich.
Cleveland-Youngstown Ry., Cleveland, Ohio.
Hocking Valley Ry., Sciotoville, Ohio.
Pennsylvania Ry., Akron, Ohio.
Pennsylvania Ry., Cincinnati, Ohio.
B. & O. Ry., Lorain, Ohio.
Brooklyn Brighton Bridge, Cleveland, Ohio
High Level Bridge, Cleveland, Ohio.

Damp-proofing

Oshkosh High School, Oshkosh, Wis.
Third National Bank, Greensburg, Ind.
St. Francis Hospital, Peoria, Ill.
Vernum Science Hall, Eureka College, Eureka, Ill.
Res. of W. R. England, Monticello, Ill.
Longyear Office Bldg., Marquette, Mich.
St. Joseph's College, Renssalaer, Ind.
Schultz Bakery Bldg., Chicago, Ill.
Davidson County Asylum, Nashville, Tenn.
Forest Chemical Co., Memphis, Tenn.

Southwestern States

Waterproofing

Herr, Andreas Inv. Co., Springfield, Mo.
Denver Union Terminal Ry., Denver, Colo.
Missouri Athletic Assn., St. Louis, Mo.

Damp-proofing

Odd Fellows Bldg., Brunswick, Mo.
Gallatin Trust Co. Bldg., Gallatin, Mo.
First Baptist Church, Harrisburg, Ill.
Benevolent Knights of America Bldg., New Orleans, La.
Glover Bldg., Kansas City, Mo.
Board of Trade Annex, Kansas City, Mo.

Northwestern States

Damp-proofing

Citizens Water Co., Burlington, Ia.
Penn College, Oskaloosa, Ia.
Woodbury County Courthouse, Sioux City, Ia.
Conrad Benevolent Hosp., Conrad, Mont.
Y. M. C. A., Great Falls, Mont.
Terry State Bank Bldg., Terry, Mont.
Dairy Products Co. (wholesale), Great Falls, Mont.
Tribune Bldg., Great Falls, Mont.
Ford Bldg., Great Falls, Mont.
East Waterloo High School, Waterloo, Ia.
Citizens Gas & Elec. Co., Waterloo, Ia.
Terminal Bldg., Lincoln, Nebr.
University of Omaha, Omaha, Nebr.
University of Minnesota, Minneapolis, Minn.
Minneapolis Athletic Club, Minneapolis, Minn.
Mayo Bros. Sanitarium, Rochester, Minn.

Pacific States

Waterproofing

Distilled Ice & Cold Storage Co., Los Angeles, Calif.
Verdugo Springs Water Co., Glendale, Calif.
Loring Res., Pasadena, Calif.
California Auditorium, Oakland, Calif.

Damp-proofing

Bellingham High School, Bellingham, Wash.
St. Francis Theatre, San Francisco, Calif.
Pierre Crest Apartments, San Francisco, Calif.

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Johns-Manville System of Acoustical Correction

FOR the elimination of unnecessary and disturbing sounds, reverberation, echoes and poor acoustics in Offices, Banks, Churches, Theatres, Schools, Colleges, Auditoriums, Clubs, Hotels, Legislative Chambers.



Dining Room, Harvard Club, Boston, Mass.
Parker, Thomas & Rice, Boston, Mass., Architects
Johns-Manville Acoustical Correction

THE Acoustical Department of the Johns-Manville Company is maintained for the purpose of conferring with architects and owners in the design and construction of new buildings to insure good acoustical conditions as well as to correct poor acoustics in structures already built. Through its System of Acoustical Correction the Johns-Manville Company is prepared to produce good *hearing* qualities in auditoriums of churches, theatres, court-rooms and other public buildings; also to reduce to a minimum the fatigue and loss of efficiency due to confusion and noise in offices, banks and rooms of similar character, resulting from the unavoidable concentration of employes and noisy, mechanical office appliances.

In broad terms, good acoustics requires that there shall be no confusion or blurring of speech or music due to overlapping or interference of tones and syllables and that everything shall be done to bring about that clarity of tones which

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is consistent with the maintenance of sufficient loudness and proper balance. The acoustical conditions of any room are affected partly by size and shape, and partly by the character of interior surfaces and furnishings, as well as by the distribution and size of the audience or occupants.

A certain amount of absorption is necessary in every auditorium. In some cases furniture and the clothing of persons provide all that is needed in this respect, but more often artificial treatment is required and these factors must be carefully studied in every case. The nature of the treatment, its amount and location, is a matter for expert determination. The problems involved are highly technical and for their satisfactory solution the trained knowledge of specialists is indispensable.

Through the Johns-Manville Company, the services of competent acoustical engineers are available to architects and others who have acoustical difficulties to be overcome. The methods used are based on the scientific researches of the late Professor W. C. Sabine of Harvard University and the Johns-Manville Company has developed special materials and methods of application for producing the necessary correction.

The Johns-Manville engineering experts are prepared to examine plans and specifications at any time, without fee, and to recommend suitable treatment where it may be necessary.



Transit Department, Federal Reserve Bank, New York City
Johns-Manville Acoustical Correction

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Johns-Manville Asbestoside

JOHNS-MANVILLE Asbestoside is an asbestos sheet wall siding for application directly over rough wood sheathing on barns, dairies, bungalows, factories and other types of buildings where protection against fire, water, gases, chemical fumes and all weather conditions is desired.

This siding is made of asbestos felts, thoroughly saturated with natural asphalts and cemented together with asphalts into sheets of 3 and 4-ply, 16″ x 50″. It presents an attractive white surface to the weather and may be applied either with nails or with Johns-Manville Roofing Clamps.

As it is an excellent non-conductor of heat or cold, it keeps the building warmer in winter and cooler in summer.

Asbestoside can be applied perpendicularly or horizontally. When applied perpendicularly wooden batten strips should be applied over all joints, thus giving an attractive half-timber effect. If these batten strips are eliminated, double nailing is necessary. When applied vertically 32″ wide material is used.

Brands and Weights

Star Brand (3-Ply) Furnished 1 to 5 squares to a crate, weight approximately 69 lbs. per square crated without completing materials.

Shield Brand (4-Ply) Furnished 1 to 4 squares to a crate, weight approximately 89 lbs. per square crated without completing materials.

Completing Materials—large head, thin shank, galvanized nails; Johns-Manville Roofing Clamps furnished, if ordered, at slight additional cost.

Johns-Manville Ajax Asbestos Roofing and Insulating Felts

A weather, water and acid-proof all-mineral felt made of asbestos fibre soaked in Johns-Manville Ajax Asphalt.

Owing to the absence of any vegetable, animal or organic matter Johns-Manville Ajax Felt is permanently durable. Unlike tar paper and similar materials which soon lose their essential oils (becoming dry and brittle and subject to rapid decay) Johns-Manville Ajax Felts will not rot or disintegrate when exposed to the weather.

For use under weather boards, as lining for shingle, metal and other roofings and sidings; refrigerator cars and any other place where an odorless, all-mineral protective felt is required. Furnished in rolls 32″ wide.

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The cloth cutting room of a large merchant tailor painted with Johns-Manville Interior Cold Water Paint





A Hotel Court brightened with Johns-Manville Exterior Cold Water Paint

Johns-Manville Interior Cold Water Paint

Today labor is independent—unless it is satisfied it shifts like the wind—here today—there tomorrow. To keep your men you must keep them satisfied. Making your factory or shops bright, cheery and clean is one way of keeping your men satisfied. And don't lose sight of the fact that more light means more work.

Johns-Manville Interior Cold Water Paint makes dull days bright. It is so brilliant and possesses such light-reflecting powers that it reduces artificial lighting bills materially—in some instances as much as 25%.

Furnished in powdered form. Just mix with cold water—then apply either with a spray gun or brushes. Johns-Manville Interior Cold Water Paint averages less than 1-3 the cost of lead and oil paint.

Furnished in white and sixteen tints which can be intermixed to obtain any other desired tint or can be deepened in tone by adding a small portion of ordinary tinting colors. Send for leaflet showing various colors.

Johns-Manville Interior Cold Water Paint packed in 350 pound barrels and 100 or 50 pound kegs, 25 pound boxes and 5 pound packages.

Johns-Manville Exterior Cold Water Paint

Here is an ideal paint for coating exteriors of any class of buildings, such as factories, warehouses, docks, stables, airshafts, courtyards, farm buildings, outhouses, fences, etc. Its low cost (less than one-third of oil paint) and its great durability recommend its use wherever possible.

Johns-Manville Exterior Cold Water Paint also makes a very serviceable washable surface when applied to interiors on brick, stone or concrete.

Made in white and black and fifteen tints which include every desirable shade. Our leaflet shows the various shades we can supply.

Johns-Manville Exterior Cold Water Paint packed in 350 pound barrels, 100 or 50 pound kegs and 25 pound boxes.

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Johns-Manville Iron Preservative

A rust-proof paint for preserving structural iron, iron fences, etc., against the attacks of climatic changes, gases and acid fumes.

JOHNS-MANVILLE Iron Preservative is an asphaltic compound combined with asphalt fluxing oils, in solution with naphtha. When applied, the naphtha evaporates, leaving a mineral asphaltic film which is absolutely unaffected by lime and does not flake off.

The materials in Johns-Manville Iron Preservative insure the greatest durability. They are not affected by climatic changes, gases or acid fumes.

Johns-Manville Iron Preservative is easily applied and gives a black finish. The best results are obtained by applying upon a surface that is clean, dry and free from rust scales.

A gallon of Johns-Manville Iron Preservative will give one coat to approximately 150 to 200 square feet of surface.

Furnished in 1, 2, 3, 5 and 10 gallon cans; ½ barrels (20-35 gallons) and full barrels (36-50 gallons).

Other Johns-Manville Products

Acoustics, Architectural.
Asbestos Cloth.
Asbestos Goods of Every Description.
Belting.
Boiler Wall Coating.
Booths, Asbestos Wood Moving Picture Machine.
Boxes, Service, Subway.
Brake Lining, Asbestos.
Brake Blocks, Asbesto-Metallic.
Cements, High Temperature, Insulating, Roof, Iron, Pipe-Joint.
Clothing, Asbestos, Gloves, etc.
Compounds, Iron and Splicing.
Conduit, Sectional Underground and Fibre.
Cork Covering
Curtains, Asbestos, Theatre.
Electrical Supplies.
Expander Rings—Air Brake.
Felts, Sound-Deadening and Insulating.
Fire Extinguishers.
Fuses, Enclosed and Renewable.
Gaskets, Asbestos and Rubber.
Hose, Flexible Metallic, Steam, Suction, Water, Air, Garden, Squirt, Car Heating, Air Brake, Signal and Mill, etc.
Household Specialties, Asbestos.
Insulating Materials, Electrical.
Laundry Felt.
Lining, Stove and Furnace.
Mineral Wool.
Packings, Asbestos, Rubber, for Every Purpose.
Paper, Asbestos; Fire and Damp-Proof.
Pipe and Boiler Insulations, Asbestos and Magnesia.
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Rail Bonds.
Refrigerating Machines.
Rope, Cord, Twine, Asbestos Specialties.
Service Meter Protective Devices.
Smoke Stack Lining.
Sockets, Waterproof Lamp.
Speedometers, Tachometers, Odometers, Recorders.
Stucco, Asbestos.
Table Covers and Mats, Asbestos.
Tapes, Friction and Insulating.
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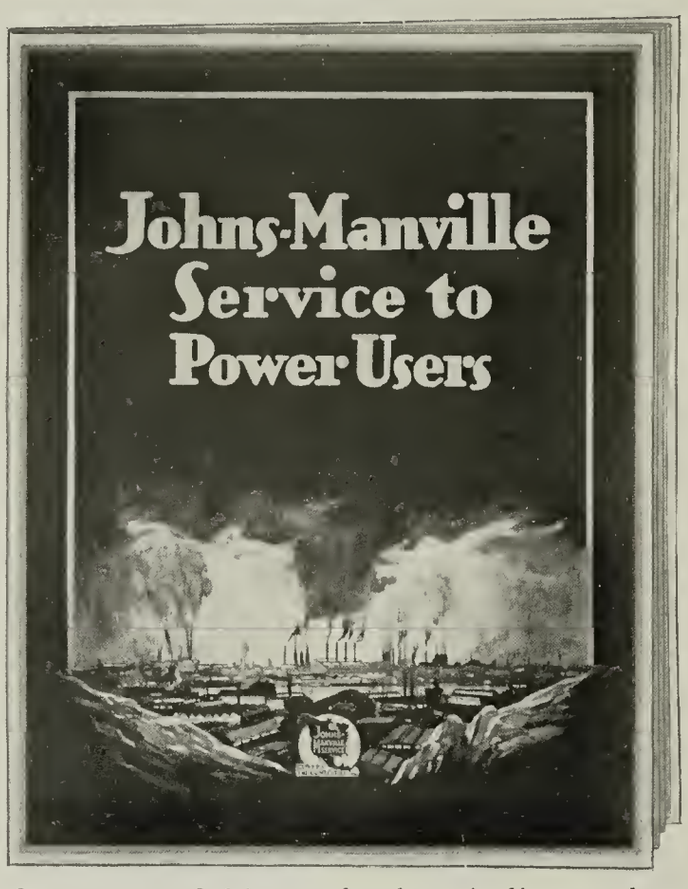
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The table of contents of this catalog best indicates the extent to which the Johns-Manville line of insulation and power plant specialties is featured in this book. Heat losses, insulation efficiency, steam tables, specifications and other data which are included in its pages make it an invaluable reference book for engineer, architect or specification man. Size 8½" x 11". Bound in stiff board covers. Sent free upon request.

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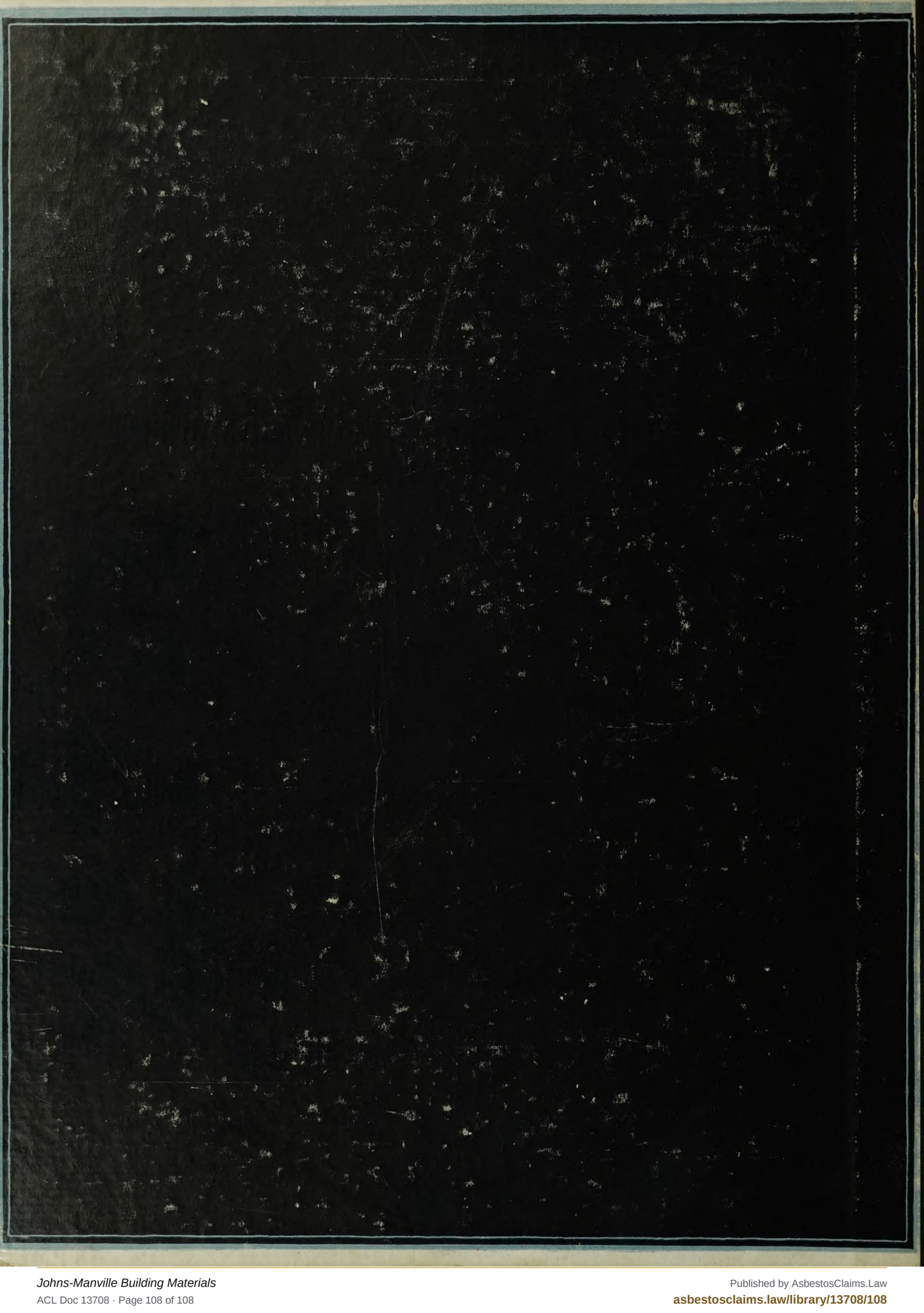
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