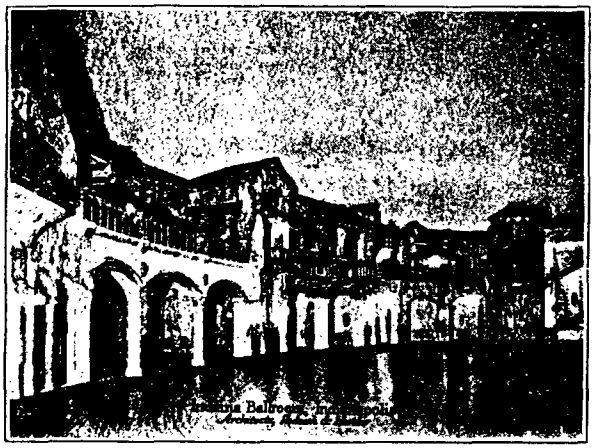
PLAINTIFF'S EXHIBIT
USG-1359

Sabinite Acoustical Pla

THE PRACTICAL SOUND ABSORBENT

The problem of acoustical control in any room has long been a puzzle to architects and builders. It is now possible to obtain correct acoustics by adherence to certain fundamental principles of design and the use of sound absorbent materials for finishing walls and ceilings.

The fundamentals of design are the result of years of experimental and research work by Professor Wallace C. Sabine at Harvard



Indiana Ballroom, Indianapolis, Indiana
Rubush & Hunter, Architects

University and Dr. Paul E. Sabine of the Riverbank Laboratories at Geneva, Illinois, who has carried on the work since Professor Sabine's death.

The United States Gypsum Company has recognized for many years the need for a fireproof, hard, decoratable plaster that would be sound absorbent. But a material porous enough to absorb an effective amount of sound and still possessing the durability and workability of gypsum plaster seemed a paradox.

The seemingly impossible has been accomplished in the production of Sabinite Acoustical Plaster. Its sound absorption is not due to softness or elasticity, but is due to the great multitude of minute, tortuous passages, which have their start in tiny openings at the surface of the plaster. These passages are inherent in the material. No skill or art unknown to the plasterer is needed to secure them.

Advantages of Sabinite

Completely fireproof.

Possesses a high percentage of sound absorption.

Developed by an authority on sound after years of research.

Costs less per unit of absorption than any other acoustical material.

The only hard, robust material available that has a real coefficient of absorption.

Absorption increases as pitch increases.

Made completely of inorganic materials (stone).

Is sanitary—will not harbor vermin.

May be frequently disinfected with any gas treatment.

Does not present any unusual appearance or pattern.

Does not attract curiosity.

No large holes to become nesting places for flies.

Applied by plasterers at no loss of time on the job. No waiting for other trades.

Nationally distributed—made at four mills—New Brighton, Fort Dodge, Gypsum and Arden.

Packed in 80-lb. double-ply paper bags.

No special shapes required—fits any surface.

Plan analysis service offered free of charge to the architect.

Job service by an expert on every job.

Jobs guaranteed. We will guarantee reverberation time figures obtained as a result of our analyses in auditoriums. (Plans necessary for this guarantee.)

Uses of Sabinite

1. For the correction of excessive reverberation in auditoriums, churches, lodge halls, theatres, coliseums, ballrooms, radio broadcasting stations, phonograph record-

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ing studios, or any room which is used for music or speaking purposes.

2. For general quieting of noises in offices, insurance buildings, hotel corridors, dining rooms, cafeterias, hospital corridors, delivery and labor rooms and in any other room where there is a desire to reduce noise to a point where it is not a nuisance.

This application yields the greatest tonnage. Sabinite has a greater sound absorption for the higher pitched office noises. It provides the lowest cost per unit of absorption available. (See Table A.)

Analysis Service

A complete service for the analysis of all sound problems is offered by the Company. This service includes the determination of reverberation time for any audience room from the plans before construction of the building; recommendation on changes in design to avoid acoustical difficulties as well as specifying the correct amount of Sabinite to use when the room requires such treatment. The Fireproofing Department renders



Savarin Restaurant, New York City
Schultze & Weaver, Architects

this service for sound insulation problems. The Acoustical Department renders it for auditorium and quieting (noise absorption) problems. Sabinite will not be sold for audience room treatment unless an analysis of conditions has been made by us or a recognized authority. This service is without cost or obligation to the Architect. It would cost him from $100.00 to $500.00 per plan if made by an independent engineer.

Directions for Applying

Mixing

Sabinite Acoustical Plaster is used just as it is delivered to the job, without the addition of any substances except water. (See Specification Sheet.)

Application

Sabinite Acoustical Plaster is applied in two ¼" coats over a gypsum basecoat in lieu of the regular finish. It can *not* be applied over old plaster. (See Specification and Direction Sheets.) Its use in a single thickness of ¼" is not recommended because the sound absorption for this thickness at C-4 pitch is reduced and the cost per unit of absorption is greater than if equivalent absorption is applied with two coats over smaller area.

Finish

Sabinite Acoustical Plaster has a gray-white finish resembling a coarse sand-float finish. The color varies with the producing mills. Sabinite from New Brighton is almost white, from Gypsum a gray-white and from Fort Dodge a steel gray. The general impression is that of a bush hammered stone face.

The surface is best obtained with a cork float. A carpet float is not recommended as it has tendency to rip the surface. Application does not demand any particular method. Work may be straightened with darby, rod or float. Finish may be accomplished using cork or wood float or edge of trowel. Loose particles on the Sabinite surface caused by improper floating may be removed by brushing with a stiff brush or rubbing with a wooden block. Sabinite properly applied and floated does not present an objectionable rough surface, but rather one of distinctive texture, much appreciated by artistic architects.

In order to get a reasonably flat-smooth surface the finish coat may be troweled, holding the trowel flat. This is a final operation and should be done after floating and before the material has set.

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Decoration

Sabinite can *not* be painted with any of the ordinary brush paints without reducing absorption and making application of little or no value.

Integral Coloring

Sabinite Acoustical Plaster may be integrally tinted by the addition of dry pigments. The dry pigment color added should not exceed 25 pounds to the ton of Sabinite, or 1 pound to the bag. If desired, the material may be colored at our mill. (See General Sales Bulletin for price.)

Brush Painting

By painting with Phon-O-Lite. This is a brush paint designed solely for application over Sabinite, and is manufactured by the United States Gypsum Company. It differs from all other paints on the market, in that it coats the surface without filling the pores. For this reason it decorates without materially affecting the sound absorption qualities of the plaster. It comes in white, but may be tinted as desired with colors ground in oil. In applying Phon-O-Lite the Sabinite surface is first rubbed lightly with a wood block to remove projecting particles. The surface is then brushed lightly to remove any loose dust. Phon-O-Lite is then applied with a brush in one coat. After applying about one square yard, the surface should be stippled vigorously with a long bristle stippling brush. This will give a uniform job without laps and not affect the porosity. (See Current Bulletin for prices.)

Spray Painting

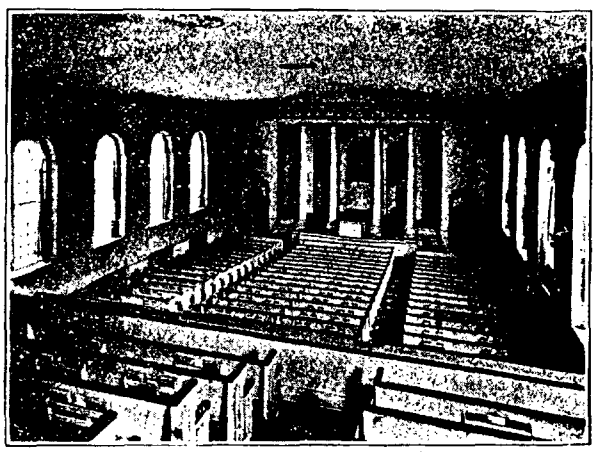
Sabinite may also be spray painted after it has dried. We especially recommend the use of the United States Gutta Percha Company Flow-On paste. This material may be tinted to any desired color. Calcimine spraying, lacquers and dyes in alcohol or water may be sprayed on with excellent results and no appreciable reduction of absorption. Full directions for paint treatment will be sent on request.

Cleaning

Sabinite Acoustical Plaster may be cleaned with a wire brush or a vacuum cleaner. If the material is sprayed with a coat of clear or colored lacquer, it presents a surface which may be washed with soap and water at will. Sabinite offers the architect the only sanitary sound absorbent for hospital use.

Paint Protection

Any of the paint treatments described may be protected by spraying a coat of thin starch on the work after the paint has set. When it becomes necessary to clean the work the starch coat is washed off with water, taking the dirt with it. Respraying with starch, saves the cost of successive paintings.



First Church of Christ, Scientist, Montclair, New Jersey
Faulkner & Wands, Architects

Absorption

Sabinite Acoustical Plaster has the following absorption coefficients at various pitches:

Pitch	Sabinite	Ordinary Plaster	
		On Tile	Metal Lath
C-4	21%	1.7%	3.0%
C-5	29%	2.0%	3.5%
C-6	34%	2.3%	3.5%

When used for the correction of auditoriums or any room where music or speaking takes place, C-4 absorption is used as the criterion.

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When used for general quieting, the pitch criterion varies from C-5 to C-6.

Cost

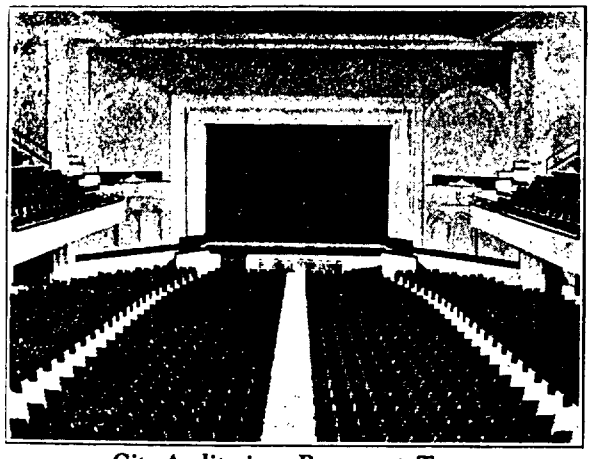
Any plastering contractor can quote on Sabinite Acoustical Plaster by estimating his cost with the units below. These quantities give the cost to him for 100 yards of Sabinite applied in two ¼" coats. These figures do not include the base coat:

1.67 tons Sabinite @ $..... per ton	$
25 Hours Labor application @ $..... per hr.	$
6 Hours Labor mixing @ $..... per hr.	$
Total net cost	
Profit (usually 20%)	
Total cost per hundred yards	$

Below is a representative cost figure worked out under average conditions:

1.67 tons Sabinite plaster @ $100.00 a ton, deld.	$167.00
25 Hours Labor application @ $1.50 per hour	37.50
6 Hours Labor mixing @ $1.00 per hour	6.00
Total net cost	$210.50
Profit—20%	42.10
Total cost	$252.60
Less credit for ordinary finish	15.00
Total bid price for Sabinite applied ½" thick as an extra over cost of regular plaster per hundred yds.	$237.60

The above tabulation represents average conditions. The cost of Sabinite will be governed entirely by the price of the material in your district and the wage scale paid for Plasterers and Laborers.



City Auditorium, Beaumont, Texas
F. Steinman & Son, Architects

Competitive Materials

(A) *Plasters*

AKOUSTOLITH: Manufactured by the R. Guastavino Company, at Woburn, Massachusetts. This is a lime base material having no definite set and no tensile strength. It cannot be applied over a gypsum base but requires a preparatory coat of lime and sand before application. It is difficult to apply. It cannot be spread under a trowel. It burns the mechanic's hands. It costs twice as much as Sabinite. Absorption about the same as Sabinite. Cost on the wall is from $1.00 to $2.00 per yard more. This is the only plaster material manufactured which begins to approach Sabinite Acoustical Plaster in any respect. It is handicapped by lack of distribution and high freight rates west of the Alleghany Mountains. Has only 30 lbs. per square inch tensile strength. It is easily rubbed off the wall with the bare hand.

MACOUSTIC: Manufactured by the Macoustic Engineering Company, Cleveland, Ohio. A gypsum base material with asbestos fibre. Very weak in structure. Never gets hard. Absorption about 4% for a ¼" coat and about 8% for a ½" coat. Yardage about the same as Sabinite for ½" coat and slightly greater on the ¼" coat. They claim 100 yards per ton but seldom get more than 65. Color is a dirty cement gray. Firm has no standing as acoustical engineers nor financial ability to furnish a real guarantee.

AMBLER: Asbestos plaster manufactured by the Keasby and Mattison Company, Ambler, Pennsylvania. A magnesite material. Difficult to apply and difficult to obtain a good finish surface. Absorption is claimed to be 14%. Covering capacity approximately 85 yards to ton and cost slightly less than Macoustic.

CALACOUSTIC: Manufactured and distributed by the Calacoustic Corporation and Standard Gypsum Company, Los Angeles. A high consistency plaster which

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depends upon evaporation for porosity. Covering capacity greater than Sabinite and the absorption factor slightly less. This material sells for less than Sabinite in far west.

BLUE DIAMOND: Manufactured by the Blue Diamond Company, Los Angeles. This material is similar to Akoustolith plaster except in absorption, which is less than Sabinite. Not offered east of Missouri River.

Competitive Materials

(B) *Non-Plasters*

ACOUSTI CELOTEX: Manufactured by the Celotex Company, Chicago. Made in four types:

Type "A". A ½" board with perforations concealed.

It is combustible, and does not present a desirable surface. Painting will seriously affect this type.

Type "C". A ⅜" board with perforations extending from face to back. The cost is approximately two to two and a half times as much as Sabinite. Absorption at C-4, is 30%.

Type "B". A ½" board with perforations exposed. It costs from two to three times as much as Sabinite. Its absorption factors are slightly greater (Sabinite rapidly approaching its efficiency at higher frequencies).

Type "BB". A 1¼" board with perforations exposed. It costs from three to three and a half times as much as Sabinite. Its absorption is greater. All Celotex products are combustible. There are some cities where they cannot be used as acoustical treatment because of fire ordinances. Plastering contractors usually add from 10c to 15c a yard more for preparation of the base coat when Celotex is used. Celotex has a tendency to warp, expand and shrink with varying radical humidity changes.

JOHNS-MANVILLE TREATMENTS:

Nashcote-A. A hair felt treatment with a muslin cloth finish. Costs approximately two to two and a half times as much as Sabinite. Absorption slightly greater at C-4, but at higher frequencies is not any more efficient. Recent tests indicate absorption is over-rated. It will probably prove less efficient than Sabinite. The absorption seriously affected by painting. If not painted it does not present a desirable surface. It has been found to harbor vermin. Does not last well in service.

Nashcote-B. A hair felt treatment with an oil kribble cloth finish. The finish is perforated oil cloth covering for the hair felt. It may be painted without seriously affecting the absorption. It costs about two and a half times as much as Sabinite. The absorption is slightly greater. Flies take refuge in the holes of this material. The appearance of the ceiling excites the curiosity of the office employees who shoot rubber bands, pins, wads of paper, etc., at the ceiling, which stick there, giving it an unsightly appearance. Oil cloth soon becomes very brittle and then can not be satisfactorily decorated.

GUASTAVINO TILE: A precast tile possessing an absorption slightly greater than Sabinite but having a cost approximately ten times as great. This acoustic tile is worked in with the Guastavino arch construction on churches and monumental buildings.

INSULITE: Manufactured by the Insulite Company, Minneapolis. The commercial Insulite board is being sold at present for acoustical treatment. It has a sized surface for appearance sake. It is seriously affected by painting. It costs slightly less than Sabinite but also the absorption is inconsiderable when painted.

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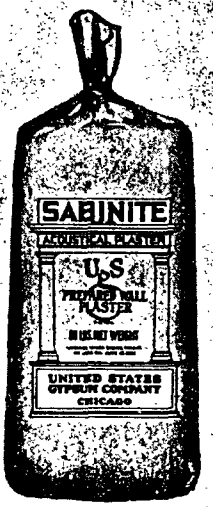
Package

Shipped in 80-lb. paper bags from New Brighton, Gypsum, Fort Dodge and Arden mills.

Price

Mill base, plus freight from shipping point to destination. (See Price Bulletin.)



Covering Capacity

60 yds. per ton when applied in two ¼" coats to a total thickness of ½ inch.

Tensile Strength

80 lbs. per sq. in.—by far the strongest acoustical plaster made.

Table A

Comparative Absorption Costs and Cost Per Unit of Absorption of Acoustical Materials

MATERIAL	AB C-4	AB C-6	AB 100 Yds. C-4	AB 100 Yds. C-6	Cost per Sq. Ft. Ins.	Cost per 100 Yds. Installed	Cost per Unit of AB-C-4	Cost Unit of AB-C-6
Celotex A W	.25	.26	225	234	$0.65	$585.00	$2.60	$2.50
Celotex A R	.19	.16	171	144	.65	585.00	3.42	4.06
Celotex C W	.30	.55	270	495	.60	540.00	2.00	1.00
Celotex B W	.47	.60	423	540	.75	675.00	1.59	1.25
Celotex B R	.36	.41	324	369	.75	675.00	2.08	1.83
Celotex BB W	.70	.76	630	684	.85	765.00	1.21	1.12
Celotex BB R	.52	.57	468	513	.85	765.00	1.63	1.49
Nashkote A-½"-S	.31	.39	279	351	.80	720.00	2.58	2.05
Nashkote A-¾"-S	.41	.39	369	351	1.00	900.00	2.44	2.56
Nashkote B-½"-S	.37	.63	333	567	.80	720.00	2.16	1.27
Balsam Wool 1"-W	.44	.66	396	594	.65	585.00	1.47	.98 ½
Acoustibloc	.43		387		.42	378.00	.98	
Flaxlinum	.27	.51	243	459	.65	585.00	2.40	1.27
Fibrofelt	.40		360		.65	585.00	1.62	
PLASTERS								
Akoustolith-½"-S	.29	.37	261	333	$0.55	$495.00	$1.89	$1.48
Ambler W	.14	.19	126	171	.22	198.00	1.57	1.16
Ambler ¼" R	.08	.17	72	153	.15	135.00	1.87	.88
Ambler ½" R	.10	.15	90	135	.22	198.00	2.20	1.46
Macoustic ¼" BS	.03	.06	27	54	.15	135.00	5.00	2.50
Macoustic ½" BS	.08	.14	72	126	.22	198.00	2.75	1.57
Sabinite ½" R	.21	.34	189	306	.26	237.60	1.25	.775

W—from test by F. R. Watson R—from test by Riverbank Lab. S—from test by C. M. Swan
BS—from test by Bureau of Standards K—from test by V. O. Knudsen

Costs from quotations as of February 1st, 1928 C-4 Auditorium Correction C-6 Office Noises

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Some SABINITE Installations

List as of April 10, 1928

Location	Building	Architect
ARIZONA		
Globe	U. S. Postoffice	James A. Wetmore Washington, D. C.
CALIFORNIA		
Compton	Masonic Bldg.	Wright & Gentry Long Beach
Laguna Beach	Presbyterian Church	L. F. Hartley
La Jolla	Presbyterian Church	G. S. Walker
San Bernardino	Junior College Library	Howard E. Jones
San Francisco	Galideo High School	John Ried, Jr.
Whittier	Public Library	Hunt & Chambers
CANADA		
London	Ealing School	L. E. Carrothers
London	London Life Ins. Co.	John Moore & Co.
London	City Hall	Thornton McBride
London	Technical High School	L. E. Carrothers
Toronto	Yorkminster Baptist Church	George, Moorhouse & King
DISTRICT OF COLUMBIA		
Washington	McKinley High School	A. L. Harris
Washington	Petworth School	A. L. Harris
FLORIDA		
Coral Gables	City Hall	Phineas E. Paist
Jacksonville	Riverside Presbyterian Church	Mark & Sheftall
Jacksonville	St. Vincent's Hospital	Gerald A. Barry
Marianna	U. S. Postoffice	James A. Wetmore Washington, D. C.
St. Petersburg	St. Joseph Church	Henry L. Taylor
ILLINOIS		
Chicago	Calumet State Bank	John Eberson
Chicago	Chicago Stock Exchange, State Bank Building	Graham, Anderson, Probst & White
Chicago	Savoy Ballroom	Levy & Klein
Chicago	Jackson Storage Warehouse	Hall, Bisbee & Rhenisch
Chicago	Northwestern University Law School McKinlock Campus	James Gamble Rogers, Childs & Smith, Associate Arch.
Chicago	Olivet Institute	Perkins, Fellows & Hamilton
Chicago	Roosevelt High School	J. C. Christensen
Chicago	Shore Theatre	Z. Erol Smith
Chicago	300 W. Adams St. Bldg.	Jens J. Jensen
Chicago	Wieboldt Hall, University of Chicago	Coolidge & Hodgdon
Chicago	University of Chicago Chapel	Bertram Grosvenor Goodhue Associates New York City
Chicago	Englewood Masonic Temple	Dean & Dean
Chicago	Consumers Whse.	Robert S. Smith
Chicago	American Spiral Pipe Works	Weiss & Niestadt
Evanston	First Congregational Church	Talmadge & Watson Chicago
Evanston	State Bank & Trust Company	Childs & Smith Chicago
Glencoe	Glencoe High School	Armstrong, Furst & Tilton, Chicago
Glencoe	Synagogue, No. Shore Congregation Israel	Alfred S. Alschuler Chicago
Glen Ellyn	Masonic Temple	Betts & Holcomb Chicago
Glen Ellyn	Glenbard High School	Coolidge & Hodgdon, Chicago
Hinsdale	Hinsdale State Bank	W. G. Barfield Chicago
Naperville	E. E. Sargent Ins. Co.	Carl J. Horn Logansport, Ind.
Rockford	Rockford Theatre	F. G. Klein
INDIANA		
Fort Wayne	Chamber of Commerce Building	Guy Mahurin
Indianapolis	Indiana Theatre Ballroom	Rubush & Hunter
KENTUCKY		
Louisville	Phoenix Cafeteria	D. X. Murphy & Bros.
LOUISIANA		
LaFayette	Court House	Wm. T. Nolan New Orleans
New Orleans	Sinai Temple	Emile Weil, Weiss, Dreyfous & Seiforth, Moise H. Goldstein
MAINE		
Belfast	City Nat. Bank	Thos. M. James Co.
MASSACHUSETTS		
Boston	Massachusetts Maternity Hospital	Andrews, Jones, Biscoe & Whitmore
Boston	John Hancock Mutual Life Ins. Co.	Parker, Thomas & Rice
Worcester	Worcester Electric Light Company	Frost, Chamberlain & Edwards
MICHIGAN		
Detroit	M. C. R. R. Fruit Auction Bldg.	A. B. Nies
Grand Rapids	East Grand Rapids High School	Robinson & Campeau
Grand Rapids	Godwin School	J. & G. Daverman
Grand Rapids	Kellogsville School	J. & G. Daverman
Kalamazoo	Vegetable Parchment Paper Co.	Billingham & Cobb
Mt. Pleasant	Normal School	Malcolmson & Higginbotham, Detroit

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Location	Building	Architect
MINNESOTA		
Fergus Falls	St. Luke's Hospital	J. V. Vanderbilt Minneapolis
Mankato	St. Joseph's Hospital	E. Breilmaier & Sons Co., Milwaukee
Minneapolis	Physics Building Univ. of Minn.	C. H. Johnston & Son St. Paul
St. Paul	Federal Building	James A. Wetmore Washington, D. C.
NEBRASKA		
Omaha	Holy Name Church and School	E. J. Sessinghaus
Steinauer	St. Anthony Parish Church	Lahr & Stangel Omaha
NEW JERSEY		
Camden	Victor Talking Mach. Co. Auditorium	Eng. Dept., Victor Talking Mach. Co.
Elizabeth	Union Co. Court House	Oakley & Son
Hackensack	Y. M. C. A.	Louis E. Jallad New York
Montclair	First Church of Christ, Scientist	Charles D. Faulkner Chicago C. Willard Wands Assoc., Caldwell, New Jersey
Ogdensburg	Ogdensburg School	Rasmussen & Wayland, New York
NEW YORK		
Alfred	Alfred High School	A. W. E. Schoenberg Olean, N. Y.
Brentwood, L. I.	St. Joseph Academy	Robert J. Reiley New York
Bronx	Court House	Max Hausle, N. Y.
Buffalo	Gethsemane Lutheran Church	James Walker
New Rochelle	Nat'l City Bank	Townsend, Steinle & Haskell, New York
New York City	Fox Film Company	Owners' Eng. Dept.
New York City	St. Bartholomews Church	Bertram Grosvenor Goodhue Associates
New York City	Savarin Restaurant	Schultze & Weaver
New York City	No. 2 Park Ave. C. A. Auffmordt & Co. (Importers)	Goodwillie & Moran
Niagara Falls	Mount Saint Mary's Nurses Home	Kirkpatrick & Cannon
Poughkeepsie	Friends Meeting House	Alfred Busselle New York
Saranac Lake	Harrietstown Town Hall	Scopes & Feustmann
Syracuse	St. Paul's Church	Paul Wolter
White Plains	Court House	Theodore Richards
NORTH CAROLINA		
Asheville	Asheville High School	D. D. Ellington
Greensboro	Pilot Life Ins. Co.	Zantzinger, Borie & Medary, Phila.
NORTH DAKOTA		
Crosby	High School	Ira Rush, Minot
Valley City	Sisters of Mercy Hospital	G. P. Stauduhar Rock Island, Ill.

Location	Building	Architect
OHIO		
Akron	St. Thomas Hospital	Warner & McCornack, Cleveland
Cincinnati	Kahn Packing Co.	Henschien & McLaren, Chicago
Cincinnati	Gibson Hotel Roof	Joseph Urban, N. Y., G. W. Drach, Inc. Cincinnati, Assoc.
OKLAHOMA		
Ada	First Christian Church	Albert S. Ross
Buffalo	Court House	Maurice Jayne Oklahoma City
PENNSYLVANIA		
Bradford	Presbyterian Church	Hendryx & Benton
E. Stroudsburg	Normal School	Davis & Lewis Scranton
Ellwood City	Lincoln High School	W. G. Eckles Co. New Castle
Gettysburg	Gettysburg Nat'l Bk.	Simons, Brittain & English, Pittsburgh
Knoxville	St. Canice Church	W. P. Hutchins Pittsburgh
Latrobe	Citizens Bank	Bartholomew & Smith, Pittsburgh
New Castle	New Castle Junior High School	Albert S. Thayer
Pittsburgh	Peoples Bank Bldg.	Press C. Dowler
Pottstown	Masonic Temple	A. S. Kepner
Sharon	First Presbyterian Church	Nicklas & Rodrick Cleveland
Washington	Washington Hospital	Schmidt, Garden & Erikson, Chicago
SOUTH CAROLINA		
Florence	Circle Grade School	Wilkins & Hopkins
SOUTH DAKOTA		
Vermilion	Masonic Hall	Walter J. Dixon Mitchell
Yankton	City Auditorium	Walter J. Dixon Mitchell
TEXAS		
Beaumont	City Auditorium	F. W. Steinman & Son
Dallas	Dallas Nat'l Bank	Coburn, Smith & Evans
San Antonio	Bexar County Court House	Phelps & Dewees
VIRGINIA		
Richmond	First Baptist Church	Herbert L. Cain
WISCONSIN		
Green Bay	High School	Foeller & Schober
LaCrosse	Logan Junior High School	Merman & Skogstad
Madison	Medical School U. of Wisconsin	Arthur Peabody
Milwaukee	St. Roberts School	Herbst & Kuenzli
Oshkosh	Normal School	Arthur Peabody
Racine	Horlick High School	J. Mandor Matson
Wausau	Y. W. C. A.	Oppenhamer & Obel
Whitewater	High School	E. J. Hancock Eau Claire

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