JUNE 1965
TR-29

OFFICE OF CIVIL DEFENSE

HIGHLIGHTS
of the
ARCHITECT & ENGINEER ACTIVITIES
in
SHELTER DEVELOPMENT

"An effective Civil Defense Program is an important element of our total defense effort. It aims at the achievement of a nationwide fallout shelter system."

Lyndon B. Johnson
President of United States

Fallout shelter, because of its life saving potential, is the central core of the Civil Defense Program.

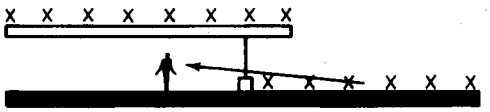
During the National Fallout Shelter Survey, in which existing buildings were examined and evaluated for fallout protection, over 134 million adequate fallout shelter spaces were found. Seventy-three million of these shelter spaces are now being marked and 32 million spaces have been stocked with emergency rations of food, water (if needed), sanitary and medical supplies, and radiation detection instruments. All buildings have shielded areas, affording some degree of protection. This basic protection can be improved in future building construction without appreciably increasing the cost or adversely affecting the esthetics and function for normal use.

Architects and engineers exert the greatest single influence on building design and construction. Thousands of new buildings are being built each year in which the life saving potential could have been increased if attention had been focused on the problem during the initial design phase. Special knowledge is required to accomplish this - knowledge of the nature of radioactive fallout and how to design structures to provide shielding against it.

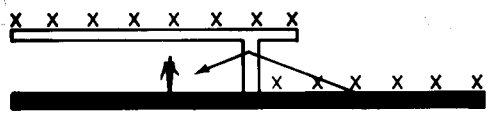
Architectural and engineering colleges and universities are playing an expanded role in disseminating the new technology of radiation shielding analysis and other related subjects to the design professions. Through this means, practicing professionals as well as new graduates can keep abreast of current developments.

For sale by the Superintendent of Documents, Government Printing Office
Washington, D.C., 20402 - Price 20 cents

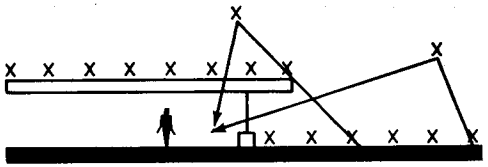
Radiation Types and Sources



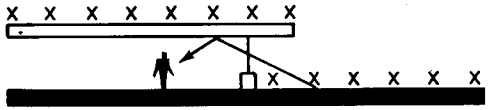
Ground Contribution—Direct
Some radiation comes directly from the ground surface.



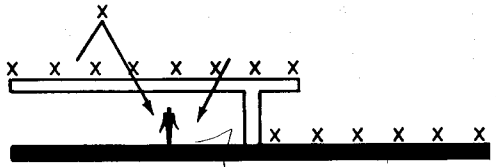
Ground Contribution—Wall Scatter
Some radiation is deflected by the wall.



Ground Contribution—Skyshine
Some radiation is reflected from particles in the air.



Ground Contribution—Ceiling Shine
Some radiation is reflected by the ceiling or other horizontal plane.



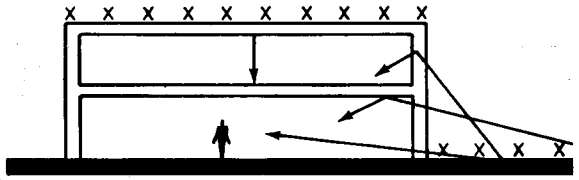
Roof Contribution
Some radiation comes directly from the roof surface.

BASIC CONCEPTS OF PROTECTION

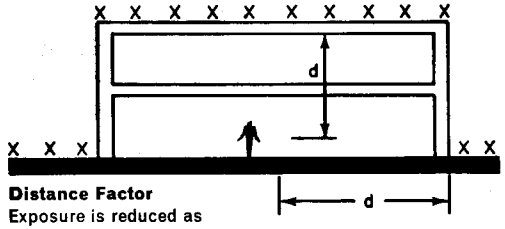
Gamma radiation reaches an individual from several sources: *the roof contribution* refers to radiation initiating from radioactive particles (dust and debris) which may accumulate on an overhead source plane; *the ground contribution* refers to all similar radiation initiating from the ground source plane. The ground contribution is further subdivided into ground direct, wall scatter, ceiling shine and skyshine.

Shelters with high protection factors are achieved by the control and planning of geometric and barrier relationships between the radioactive source and sheltered enclosure. *Geometric shielding* places people out of the direct path of radiation or at some distance from it. *Barrier shielding* places mass between the shelter occupant and the radioactive source.

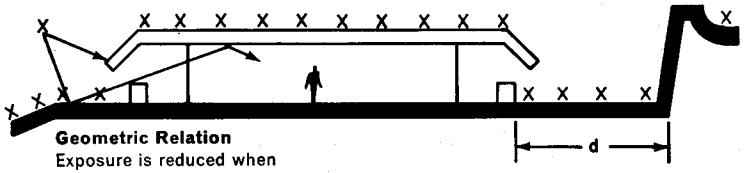
Techniques of Exposure Control



Barrier Shielding
Exposure is reduced by attenuating mass.



Distance Factor
Exposure is reduced as distance from source increases.



Geometric Relation
Exposure is reduced when the source area is limited.

PROFESSIONAL DEVELOPMENT PROGRAM

With the cooperation of architectural and engineering educational institutions and their faculty members, a unique professional development program for practicing architects and engineers was initiated in 1961.

The Office of Civil Defense sponsors continuing education courses for practicing architects and engineers.

a. Fallout Shelter Analysis Courses are offered as intensive two-week sessions, on a semester type basis (one night a week for 15 weeks) or as a correspondence course. The courses acquaint architects and engineers with nuclear weapon effects and shielding methodology and design techniques. Thirty-nine courses were conducted in 1961; 57 courses in 1962; 122 courses in 1963 and 158 courses in 1964. Architects and engineers who successfully complete the course are certified as Fallout Shelter Analysts and are periodically apprised of the latest developments including research reports.

b. Protective Construction Courses on a two-week or semester type basis are offered. These courses are primarily concerned with structural dynamics and response of structures to the immediate effects of a nuclear detonation. One course was conducted in 1962, 10 courses were conducted in 1963 and 31 courses were conducted in 1964.

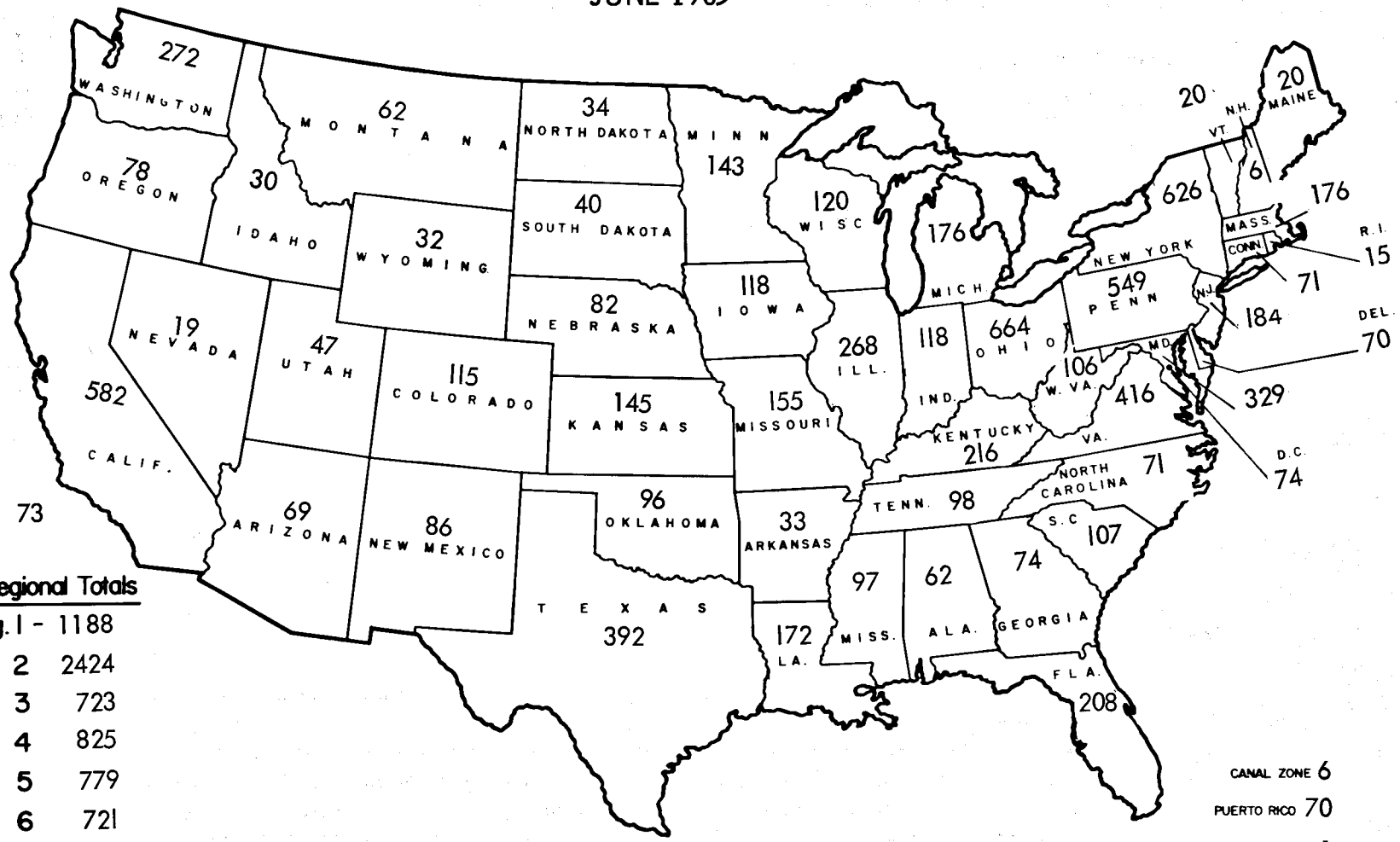
c. Environmental Engineering Courses are offered to acquaint the mechanical engineer with the unique problems associated with shelter environment control and the procedures for solving these problems. Six pilot courses were conducted in 1963 and 35 courses were conducted in 1964.

d. Other courses such as Disaster Engineering and Shelter Planning are now being developed for future presentation.

The immediate objective of this professional development program was to survey and locate potential public fallout shelter space in existing structures - a type of post-design analysis. But the program also provided, and provides today, the orientation that architects and engineers must have if fallout protection is to be considered at the critical point in the creation of a building - the design stage.

ARCHITECTS AND ENGINEERS QUALIFIED IN FALLOUT SHELTER ANALYSIS

JUNE 1965



Regional Totals

Reg. 1 -	1188
2	2424
3	723
4	825
5	779
6	721
7	791
8	470

CANAL ZONE 6

PUERTO RICO 70

GUAM 1

FOREIGN 39

FACULTY DEVELOPMENT - SUMMER INSTITUTES

The summer institute program was initiated in 1961 at the Pennsylvania State University to develop a teaching capability in radiation shielding analysis and design and protective construction, among faculty members of various schools and universities. The institutes offer a comprehensive educational program for full-time architectural and engineering faculty which prepares them to offer similar instruction at their own institutions.

Nuclear Defense Design Summer Institutes have been arranged for at the following educational institutions:

1962	1963	1964	1965
Worcester Polytechnic Institute	Worcester Polytechnic Institute	Univ. of Illinois	George Washington Univ.
Univ. of Illinois	Univ. of Michigan	Univ. of Colorado	Univ. of Hawaii
Univ. of Colorado	Univ. of Colorado	Univ. of California	Montana State College
Univ. of California	Univ. of California	Montana State College	Pennsylvania State Univ.
			Worcester Polytechnic Institute
			Aspen Inst., Colorado

At the Kansas State Univesity, a special summer institute on "Fundamental Radiation Shielding Problems as Applied to Nuclear Defense Design Planning" is conducted for faculty in Nuclear Engineering and Applied Mathematics and Physics.

The Summer Institute at the Montana State College, conducted for the first time in 1964, is designed to acquaint faculty in architecture, mechanical and agricultural engineering and city planning with the environmental considerations and ventilation requirements for shelters.

The Summer Institute at the George Washington University is designed to accommodate both architectural and engineering faculty and practicing professionals by conducting special courses in radiation shielding, environmental engineering, and protective construction.

The various activities of the Faculty Development Program have benefit of the enthusiastic cooperation of the: The Consulting Engineers Council, The American Institute of Architects, The American Society of Civil Engineers, The National Society of Professional Engineers, The American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc., The American Nuclear Society Shielding Division, The National Academy of Sciences Subcommittee on Radiation Shielding, Engineers Joint Council, The American Society of Mechanical Engineers, The American Institute of Planners, The American Society of Planning Officials, and The American Society of Agricultural Engineers.

This program is being co-sponsored by the American Society for Engineering Education, the Association of Collegiate Schools of Architecture, and the Office of Civil Defense, Office Secretary of the Army.

LIST OF QUALIFIED FSA INSTRUCTORS AND THEIR INSTITUTIONS

ALABAMA
- Auburn Univ.
  - William T. Cox
  - William A. Stewart

ALASKA
- Univ. of Alaska
  - John L. Burdick

ARIZONA
- Univ. of Arizona
  - Jerome Q. Burns
  - Terrill C. Ewbank
  - Howard P. Harrenstien
  - Ralph Richard
  - Alan R. Turk
  - S. Wayne Williams
- Arizona State Univ.
  - Jeffrey R. Cook
  - Harry R. Lundgren

CALIFORNIA
- Calif. Inst. of Tech.
  - Arthur G. Brady
- Calif. State Poly.
  - William H. Brown
  - Hans L. Mager
  - William J. Phaklides
- Fresno State College
  - Wayne Dominick
- San Jose State College
  - Franklin J. Agardy
  - Robert F. Clothier
- Stanford Univ.
  - C. Allin Corneli
- U. S. Navy Civil Engineer Corps Officers School
  - Robert L. Carter
  - George M. Gans, Jr.
  - Malcolm John MacDonald
- Sacramento State College
  - George N. Beaumariage, Jr.
- Univ. of California
  - John S. Fisher

COLORADO
- Univ. of Colorado
  - Robert W. Kindig
  - Leo C. Novak
  - Robert E. Rathburn
  - Gale K. Vetter

CONNECTICUT
- Univ. of Connecticut
  - Joseph J. Breen

DELAWARE
- Univ. of Delaware
  - Thomas W. Brockenbrough

D. C.
- George Washington Univ.
  - Raymond R. Fox

FLORIDA
- Brevard Eng'g. College
  - James A. Lasater

FLORIDA
- Univ. of Florida
  - William J. Grantham, Jr.
  - Elwyn S. Holmes
  - McMillan H. Johnson
  - King Royer
  - Donald A. Sawyer
  - Bryon D. Spangler
  - William G. Wagner
- Univ. of Miami
  - James E. Branch
  - John E. Sweet
  - James P. Sampson

GEORGIA
- Georgia Inst. of Tech.
  - James R. Fincher
  - James T. S. Wang

HAWAII
- Univ. of Hawaii
  - James Chia San Chou
  - Mateo L. P. Go

ILLINOIS
- Univ. of Illinois
  - John W. Briscoe
  - Paul H. Coy
  - Earl M. Farnham
  - William J. Hall
  - John D. Haltiwanger
  - Harold L. Hornbeak
  - Carlos T. Marfort
  - Joseph P. Murtha
  - William C. Schnobrich
  - Jerome J. Steerman
  - Richard N. Wright

INDIANA
- Indiana Inst. of Tech.
  - Ivan A. Planck
- Purdue Univ.
  - Robert E. Bailey
  - Lowell B. Jackson
  - Charles D. Sutton
- Rose Polytechnic Inst.
  - Dennis H. Sapp

IOWA
- Iowa State Univ.
  - Harvey J. Hirning
  - Ti Ta Lee
  - Benjamin M. Ma

KANSAS
- Kansas State Univ.
  - Morris H. Beckman
  - Frederick G. Bergstrud
  - Carrol D. Claycamp
  - John O. Mingle
- Univ. of Kansas
  - Walter E. George, Jr.
  - Robert F. Guenter
  - Nicolaas Willems

KENTUCKY
- Univ. of Kentucky
  - John W. Hill
  - Kermit C. Mills
  - Samuel A. Mory, Jr.

LOUISIANA
- Louisiana Polytechnic Inst.
  - James S. Tarbutton
- Louisiana State Univ.
  - Vincen W. Hatlen
  - Troy M. McQueen
  - Franklin E. Metz
- Southern Univ.
  - Henry L. Thurman, Jr.
  - Julian T. White
- Tulane Univ.
  - Robert N. Bruce
  - Hugh A. Thompson
- Univ. of Southwestern Louisiana
  - Joseph S. Olivier
  - James W. Reeves
  - Wayne P. Wallace

MAINE
- Univ. of Maine
  - Roger A. Pellerin
  - George K. Waldin, Jr.

MARYLAND
- Univ. of Maryland
  - Kenneth E. Felton

MASSACHUSETTS
- Univ. of Mass.
  - Charles R. Bissey
- Tufts Univ.
  - Arthur H. Mallon
- Wentworth Inst.
  - Stanley M. Ball
  - William C. Bassett
- Worcester Poly. Inst.
  - Ronald A. Carlson
  - A. Fattah Chalabi
  - Frank D. Defalco
  - Robert W. Fitzgerald
  - Carl H. Koontz
  - Joseph D. Sage
- Worcester Jr. College
  - David C. Bartlett

MICHIGAN
- Lansing Community College
  - Ralph B. Johnson
- Michigan College M&T
  - Donald L. Schaible
  - P. Damoder Reddy
  - Clyde E. Work
- Univ. of Michigan
  - Martin D. Gehner
  - Harold W. Himes
  - Glenn G. Mastin
  - Norbert J. Pointner

MINNESOTA
- Univ. of Minnesota
  - John Thomas Hanley
  - Richard D. Springer

MISSOURI
- Univ. of Missouri
  - John R. Salmons
  - Robert F. Davidson
- Washington University
  - Louis E. Alfeld
  - Alvin Lever
  - Kenneth E. Taylor

MONTANA
- Montana State College
  - Richard E. Alberts
  - George J. Herman
  - Owen A. Kubal
  - George S. McClure, Jr.
  - Elmira S. Smyrl

NEBRASKA
- Univ. of Omaha
  - Francis G. McLean

NEVADA
- Univ. of Nevada
  - Arnold De Angelis

NEW HAMPSHIRE
- Dartmouth College
  - Carl F. Long

NEW JERSEY
- Princeton Univ.
  - Robert J. Brungraber

NEW MEXICO
- Univ. of New Mexico
  - Bob J. Donham
  - Larry M. Younkin

NEW YORK
- Cornell Univ.
  - Francis W. Saul
  - Stanley Bemben
- Manhattan College
  - Francis X. McKelvey
- State Univ. of New York
  - David F. Conde
  - William G. Sylvester

NORTH CAROLINA
- Duke Univ.
  - Van L. Kenyon
- N. C. Agric & Tech College
  - Gerald E. Gray
  - John H. Morris
  - William A. Streat, Jr.
- N. C. State Univ.
  - Richard L. Jewett
- Univ. of North Carolina
  - Vernon F. Shagren

NORTH DAKOTA
- Univ. of North Dakota
  - C. E. Dahlgren
- North Dakota State Univ.
  - Thomas M. Sakshaug

OHIO
- Fenn College
  - Frank J. Gallo
- Miami Univ.
  - Willis W. Wertz
- Ohio State Univ.
  - Richard W. Bletzacker
  - George M. Clark
  - Ellis O. Davis
  - John F. Lindley
  - Charles F. Sepsy
- Univ. of Toledo
  - John D. Hansell

OKLAHOMA
- Univ. of Oklahoma
  - Palmer J. Boggs
  - Keun Puo Chuang
- Oklahoma State Univ.
  - W. G. Chamberlain

OREGON
- Oregon State Univ.
  - Thomas J. McClellan
  - John Peterson
  - Robert J. Schultz

PENNSYLVANIA
- Carnegie Inst. Tech.
  - Tung Au
  - Harold J. Day
  - James H. Poellot
  - Thomas E. Stelson
- Drexel Inst. Tech.
  - Richard E. Woodring
- Penn. State Univ.
  - Albert Knott
  - Joseph E. Bruno
  - Larry O. Degelman
  - Melvin Isenberg
- Univ. of Pittsburgh
  - Francis J. Bradley
- Villanova Univ.
  - Charles G. Etter, Jr.

RHODE ISLAND
- Univ. of Rhode Island
  - Philip H. Wilson
- R. I. School of Design
  - Wesley H. Randig

SOUTH CAROLINA
- Clemson College
  - Emery A. Gunnin
- Univ. of South Carolina
  - Harran Miklofsky

SOUTH DAKOTA
- South Dakota State College
  - Charles N. Hinkle
  - Emory E. Johnson

TENNESSEE
- Tenn. Poly. Inst.
  - Francis R. Toline
- Univ. of Tennessee
  - Stuart R. Daniels

TEXAS
- Southern Meth. Univ.
  - Jack W. Harkey
  - Sophus Thompson
- Texas A&M
  - William M. Lyle
  - James H. Marsh, 3rd
  - Willard Strode
- Texas Tech. College
  - Carl J. Childers, Jr.
  - Richard Duran
  - Cliff H. Keho
  - Robert L. Mason
- Univ. of Houston
  - Herman F. P. Goeters
- Univ. of Texas
  - Richard H. Gunderson
- Texas Western College
  - Paul C. Hassler

UTAH
- Univ. of Utah
  - Stanley W. Crawley
  - A. Peters Opperman
  - Delbert B. Ward

VERMONT
- Univ. of Vermont
  - Stephen C. Knight
  - James A. Root
  - Arthur F. Tuthill

VIRGINIA
- Virginia Military Inst.
  - William A. Vaughan
  - Donald K. Jamison
- Virginia Polytechnic Inst.
  - Oscar J. Blake
  - George R. Buchanan
  - John H. Hunter
- U. S. Army Engineer School
  - Richard Adler
  - Robt. P. Kennedy
- Univ. of Virginia
  - Henry L. Kinnier
  - C. N. Gaylord

WASHINGTON
- St. Martins College
  - Richard Cebula
  - Charles D. McDaniel
- Univ. of Washington
  - William M. Miller
  - T. Kenneth Tang
- Washington State Univ.
  - Loren B. Almy
  - Roger H. Nelson
  - Eric B. Wilson

WEST VIRGINIA
- Marshall Univ.
  - Samuel T. Stinson
- West Virginia Univ.
  - Za Lee Moh

WISCONSIN
- Univ. of Wisconsin
  - William C. Dries
- Wisc. State College & Inst. of Tech.
  - Marius P. Gronbeck

PUERTO RICO
- Univ. of Puerto Rico
  - Gregorio Hernandez
  - Jaime V. Zeno

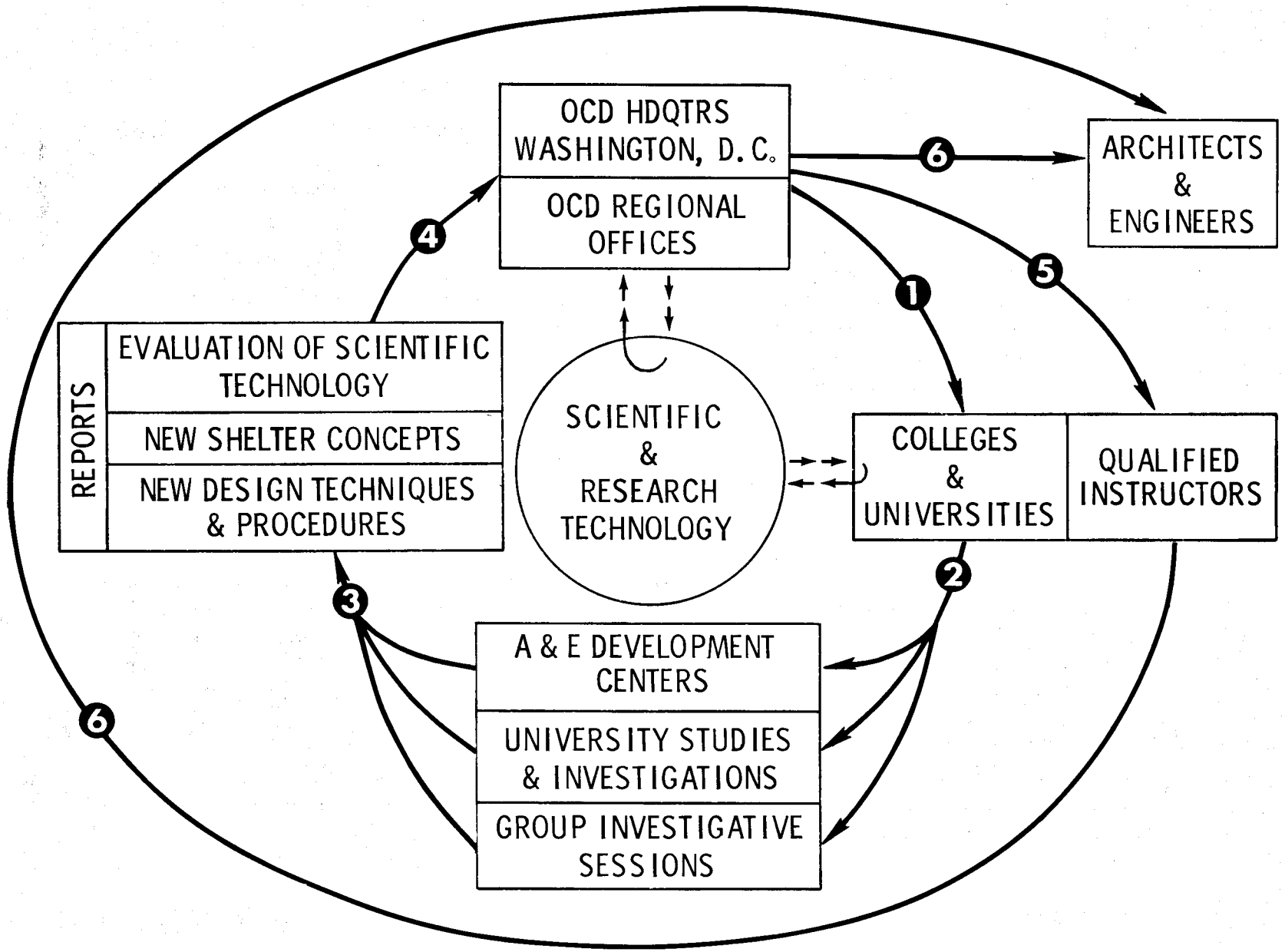
ARCHITECTURAL AND ENGINEERING DEVELOPMENT CENTERS

Eight Regional Architectural and Engineering Development Centers* (selected universities and colleges) will study, analyze, evaluate and report on available scientific and technical information as it applies to specified areas of Civil Defense. Due to the extremely rapid growth of research and scientific information pertaining to protective construction during the past few years, it is deemed necessary to place emphasis on the evaluation and publication of information from a highly scientific or theoretical presentation to a form more readily usable by a practicing architect or engineer.

Through this program, the findings of current research endeavors in many technical fields will become available to schools of architecture and engineering soon after research results are reported. All schools of architecture and engineering will be provided an opportunity to share in the benefits of this new technology.

Concurrent with the A&E Development Centers, design study investigation projects and group investigative programs are being conducted at selected universities and colleges to the mutual benefit of the institution, the design professions, and civil defense. Bonus benefits will also accrue by the university or college sharing the newly acquired information with their students in appropriate curricula.

* Worcester Polytechnic Institute
Pennsylvania State University
University of Florida
Purdue University
Texas A&M
University of Colorado
San Jose State College
University of Washington



THE SPIRAL OF SCIENTIFIC & TECHNICAL INFORMATION

DESIGN COMPETITIONS AND ACTUAL BUILDINGS

The National School Fallout Shelter Design Competition conducted by the American Institute of Architects produced excellent fallout protected school designs. These designs are now being used to demonstrate to professional architects, engineers, and educators how shelter can be incorporated into school.

The results of the competition clearly indicate that shelter can be economically incorporated into elementary schools without interfering with the educational function of the school or adversely affecting the esthetics of the building. Various types of aboveground and belowground solutions appear as winning entries. A brochure illustrating the winning school designs was prepared and distributed to emphasize that fallout protection and educational facilities are compatible in dual use space.

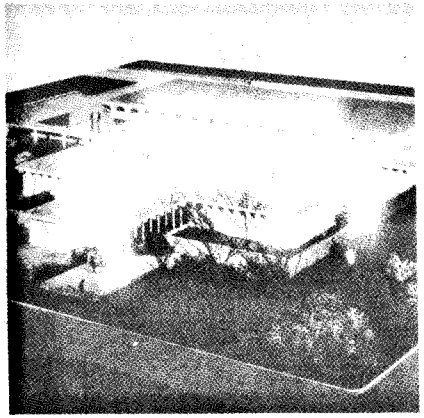
A second design competition for a community complex including a shopping center incorporating community fallout shelter facilities has produced similar results.

The Rice University, Department of Architecture conducted a design study on the subject of an industrial building with fallout protection. The results were well designed factory buildings with fallout protection included as dual use shelter space, providing once again that fallout protection can be included in buildings without adversely affecting function or esthetics and at little additional cost.

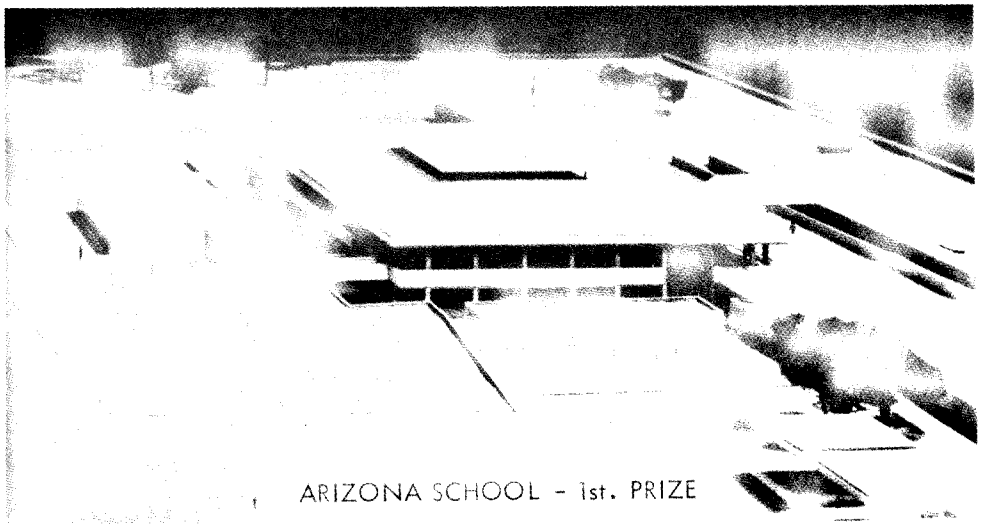
BUT THIS WAS THEORY

Recently the Office of Civil Defense collected a number of projects from Fallout Shelter Analysts involved in the design of actual structures that included dual purpose fallout protection. These projects including actual construction cost data were published in a technical report which was given widespread distribution to various architectural, engineering and educational groups.

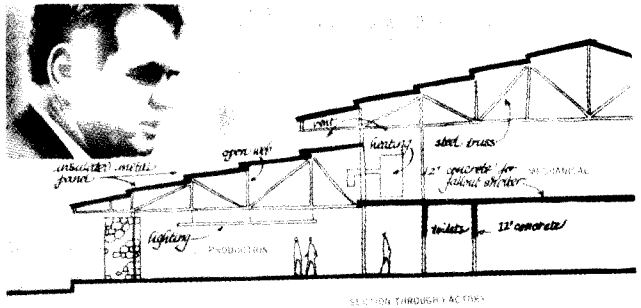
In this report "TR-27, New Buildings with Fallout Protection" the THEORY BECOMES FACT.

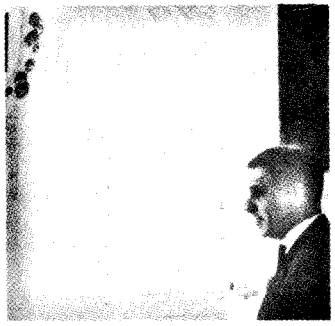


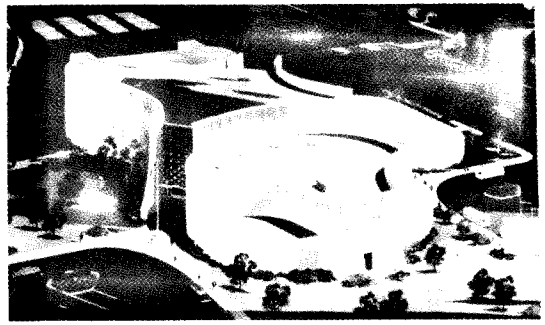
RICE UNIVERSITY DESIGN STUDY



ARIZONA SCHOOL - 1st. PRIZE







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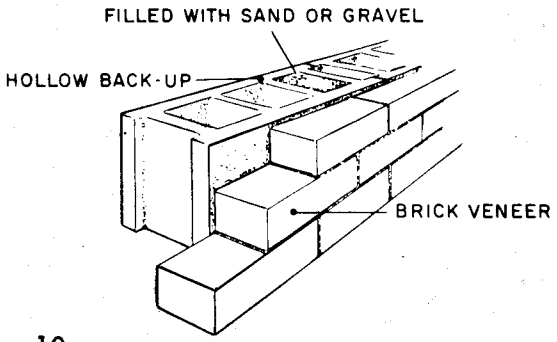
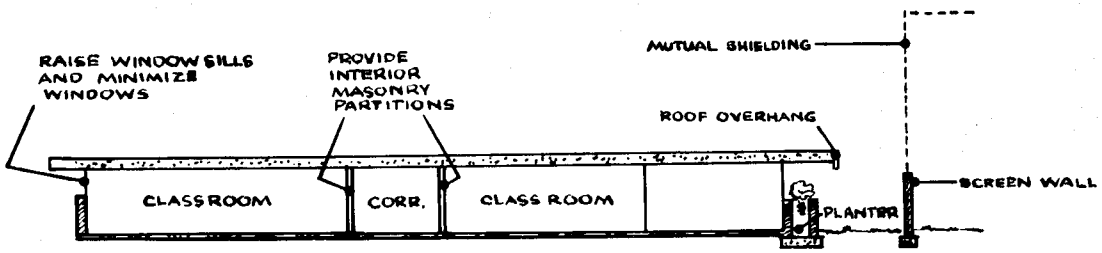
"SLANTING" IN DESIGN AND CONSTRUCTION

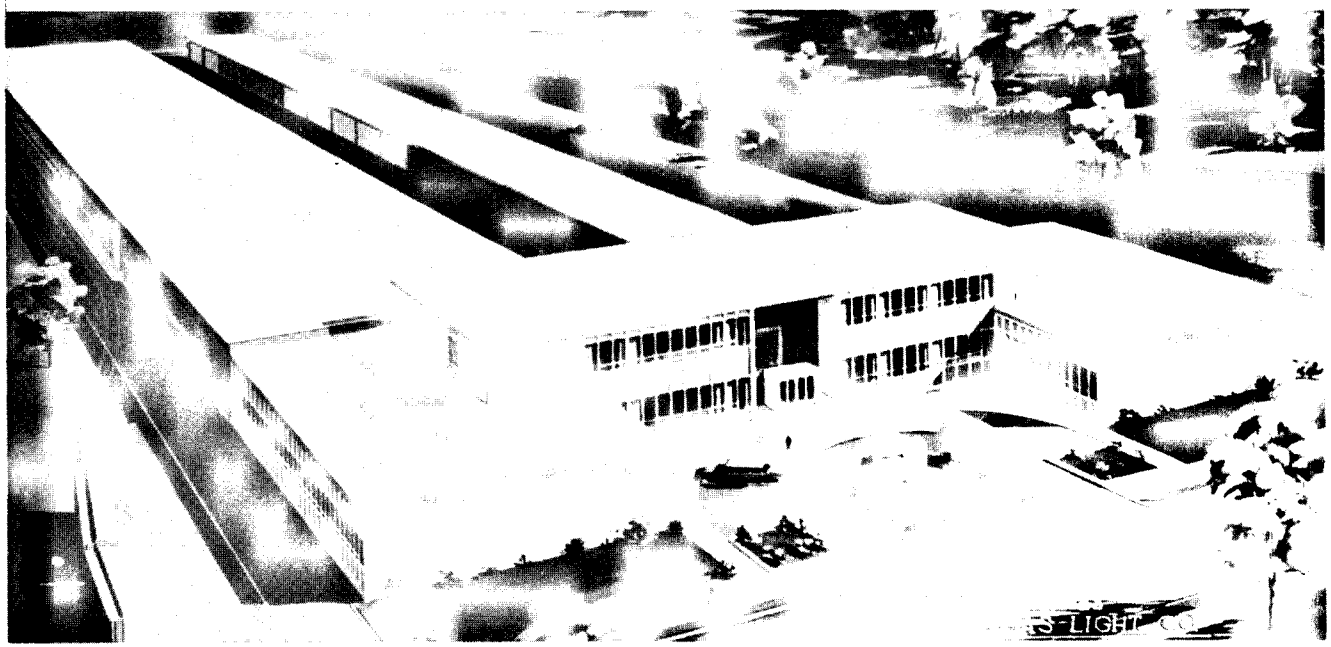
"Slanting" is defined as the incorporation, at little or no increase in cost or reduction in efficiency, of certain architectural and engineering features into all new structures, to protect personnel from fallout gamma radiation in event of an emergency. The slanting features may provide immediate improvement or may be of such nature as to facilitate later conversion of the structure for protective purposes. Thus, "Slanting" adds the protective function to the other criteria normally considered in the design of structures.

Every building is a natural shield against fallout radiation. Some buildings, however, are better than others. The National Fallout Shelter Survey located millions of shelter spaces in existing buildings where shelter was not considered in the initial design. Many other buildings would have provided reasonably adequate protection, but they had weak points which nullified otherwise good protection. If these weak points could have been detected by someone knowledgeable in radiation shielding analysis during the initial design phase of the project, then no-cost design changes could have been incorporated to maximize the protection without exceeding budget limitations.

EXAMPLES OF SLANTING & LOW COST TECHNIQUES



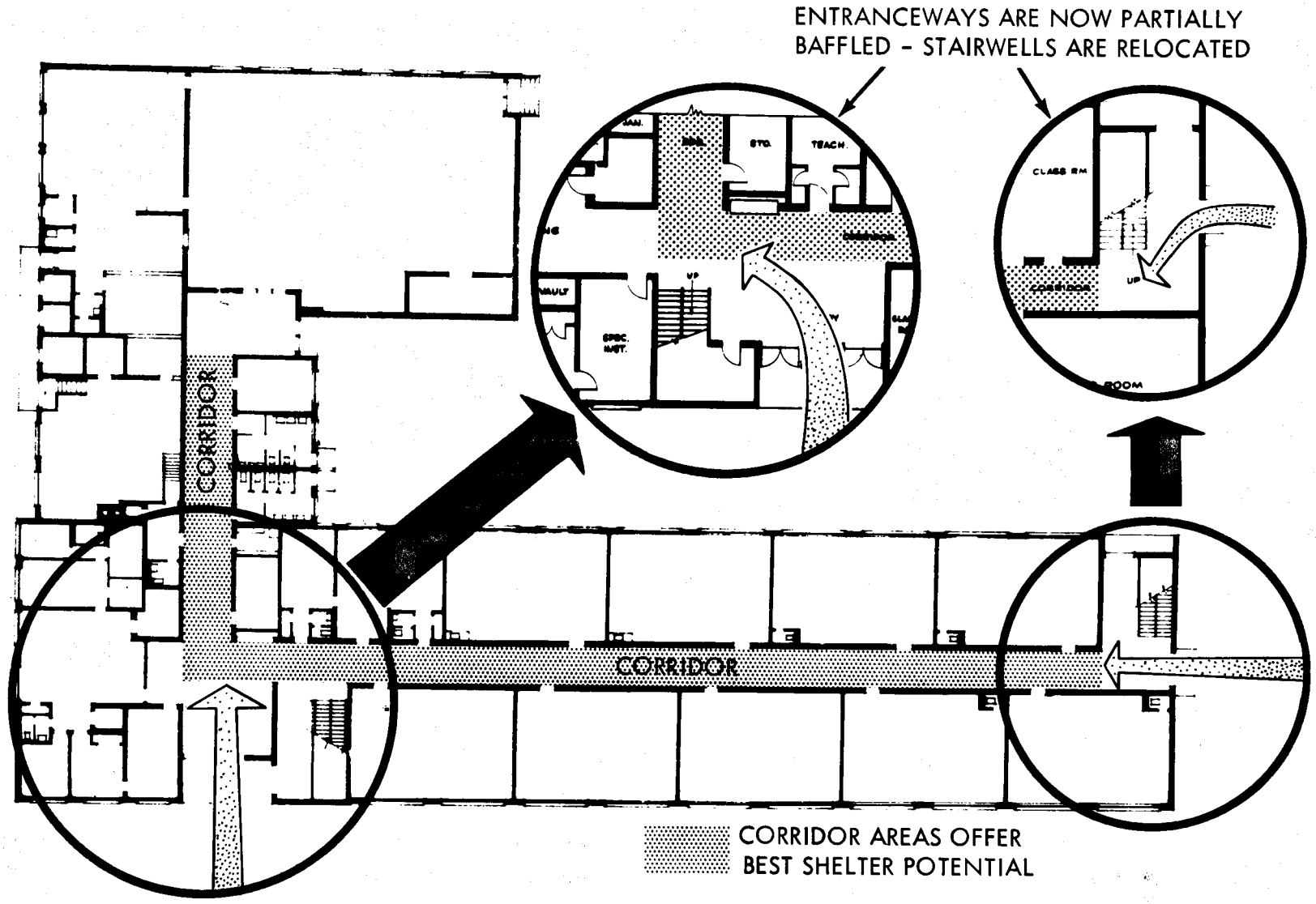




The Springfield Gas Light Co.* initiated construction on new plant facilities. A partial basement would have been necessary for record storage, etc. The company had used all available record storage space and was renting additional space. The architect persuaded the owners of practicality of incorporating full basement which would provide additional storage space and also serve as fallout shelter area. In this facility approximately 30,000 sq. ft. of shelter space was incorporated without any increase in cost since shelter features were inherent in basic design.

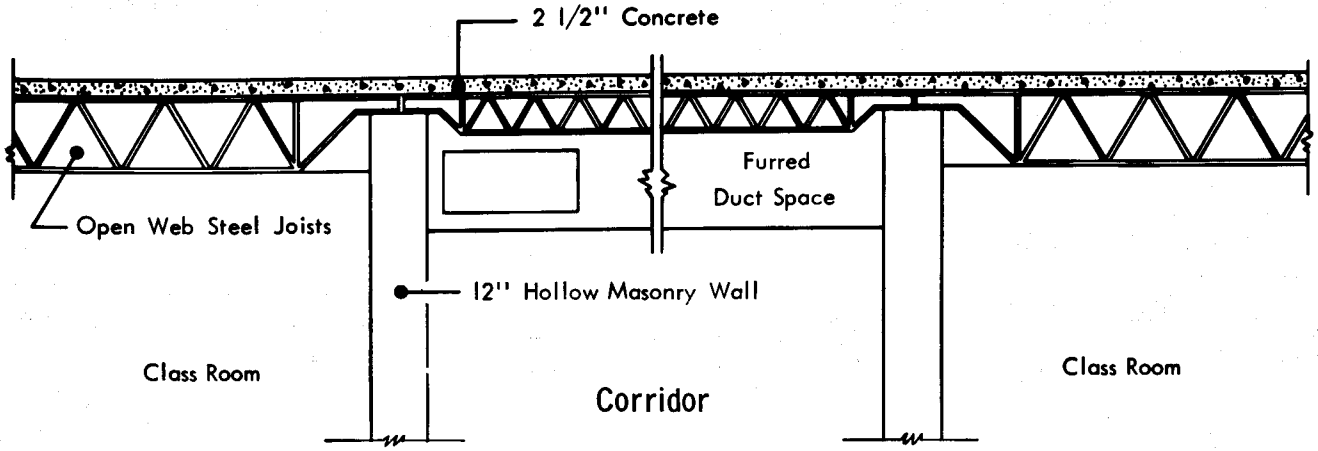
* Location: Springfield, Mass., Architect-Engineer: Munson & Mallis, Inc.

WHAT COULD BE DONE TO ENHANCE SHELTER?

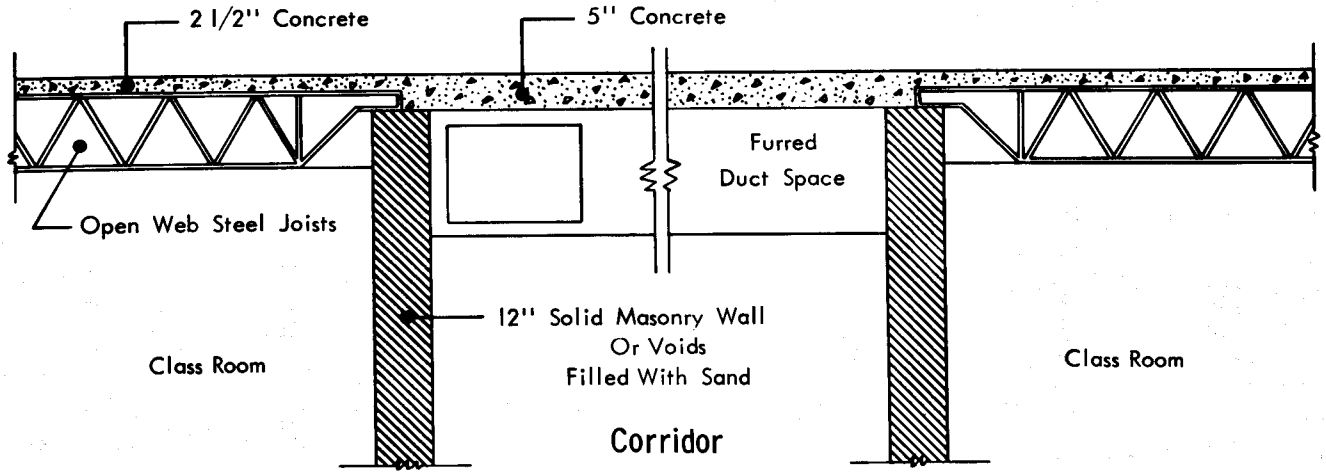


FIRST FLOOR PLAN - TYPICAL ELEMENTARY SCHOOL

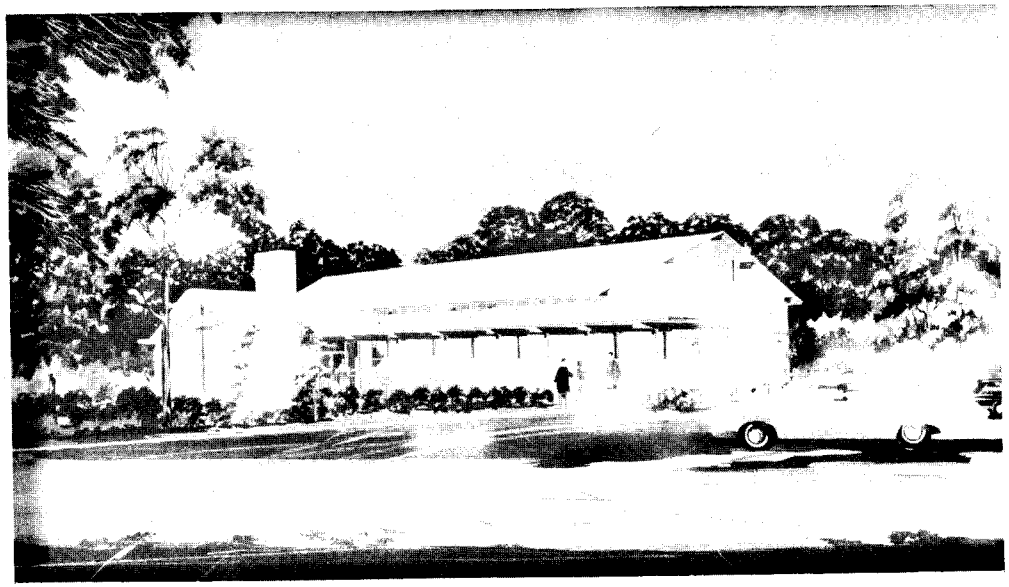
SECTION THROUGH CORRIDOR OF SCHOOL



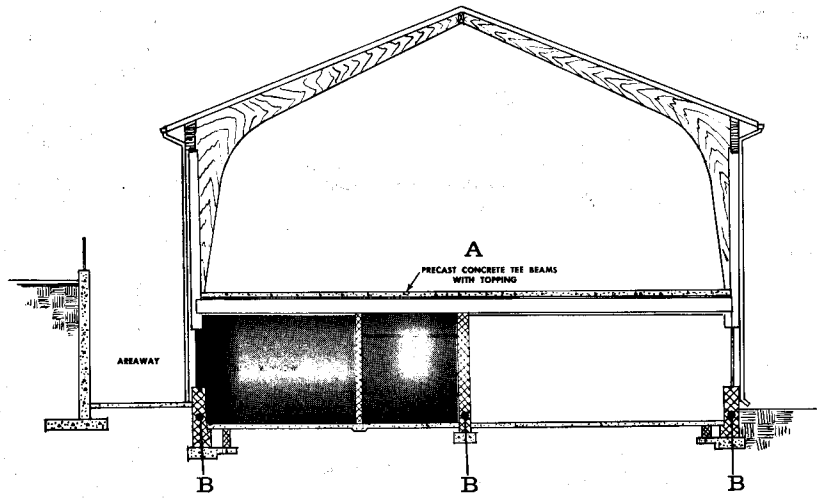
NORMAL CONSTRUCTION ROOF MASS = 31#/S.F.

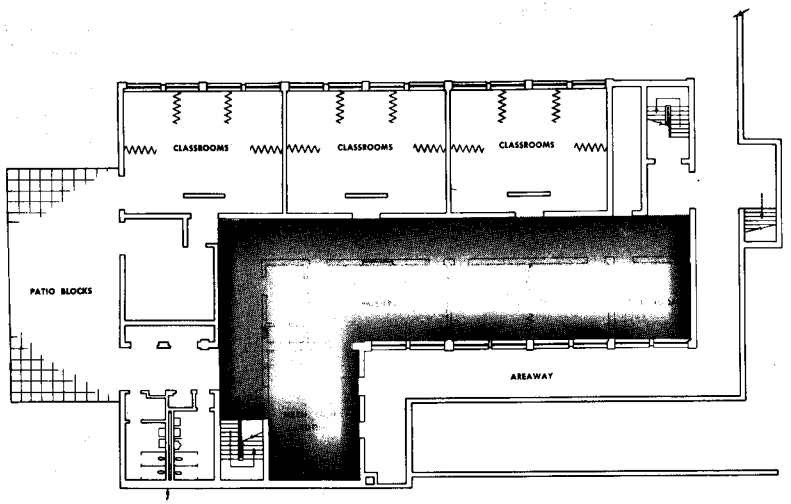


ENHANCED SHELTER IN CORRIDOR ROOF MASS = 62#/S.F.

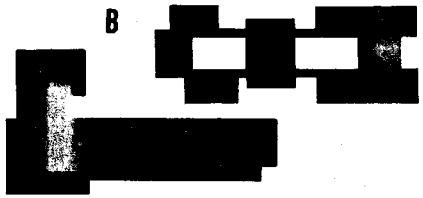
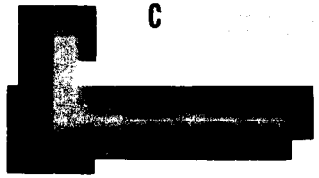


This attractive church building incorporating fallout protection was recently completed in McLean, Virginia. Shelter features were included in original design with option of eliminating these features as deductive bid items if project cost exceeded budget allocation. The three elements which enhanced shelter were increasing concrete topping over precast first floor (Mark "A"); increasing concrete block size from 8" to 12" (Mark "B") and filling cores of concrete block around shelter with sand. The contractor submitting lowest bid would allow only $900 decrease for these shelter features. Shelter capacity is 300.





SHELTER TECHNIQUES

	A	B	C
STRUCTURE	 CONVENTIONAL (No emphasis on protection)	 SLANTED (Maximize protection at no increase in cost)	 SLANTED (Maximize protection with nominal cost increase)
COST **PF**	$ 500,000 250 Spaces @ PF 10 250 Spaces @ PF 25	$ 500,000 325 Spaces @ PF 40 250 Spaces @ PF 20	$ 510,000 $\pm$ 625 Spaces @ PF 40 or More
CONSTRUCTION	Large Window Area Hollow Block Walls Entrances Directly Off Corridors Panel Walls Lightweight Partitions Lightweight Roof Construction	Increase Sill Height Offset Entrances Stagger Doors & Windows Masonry Partitions Smaller Window Areas	All Slanting Techniques Fill Hollow Blocks w/ Sand Screen Walls Roof Fill Planter Boxes Roof Overhangs Increase Wall Mass Precast Roofs Depress Building Shields for Openings

SHELTER DEVELOPMENT - ARCHITECT & ENGINEER ACTIVITIES

As evidenced by the Fallout Shelter Survey, many existing buildings afforded excellent protection from fallout gamma radiation. In future building design, it is imperative to achieve optimum protection without significantly expending additional funds. By taking this approach, construction dollars will be ultimately saved should it become necessary to modify existing buildings to overcome the anticipated shelter deficit.

Since building committees, property owners, and others initiating construction projects rely heavily on the nation's architects and engineers for design, it is of prime importance to create sound professional competence within these professions to plan for and design effective shelters.

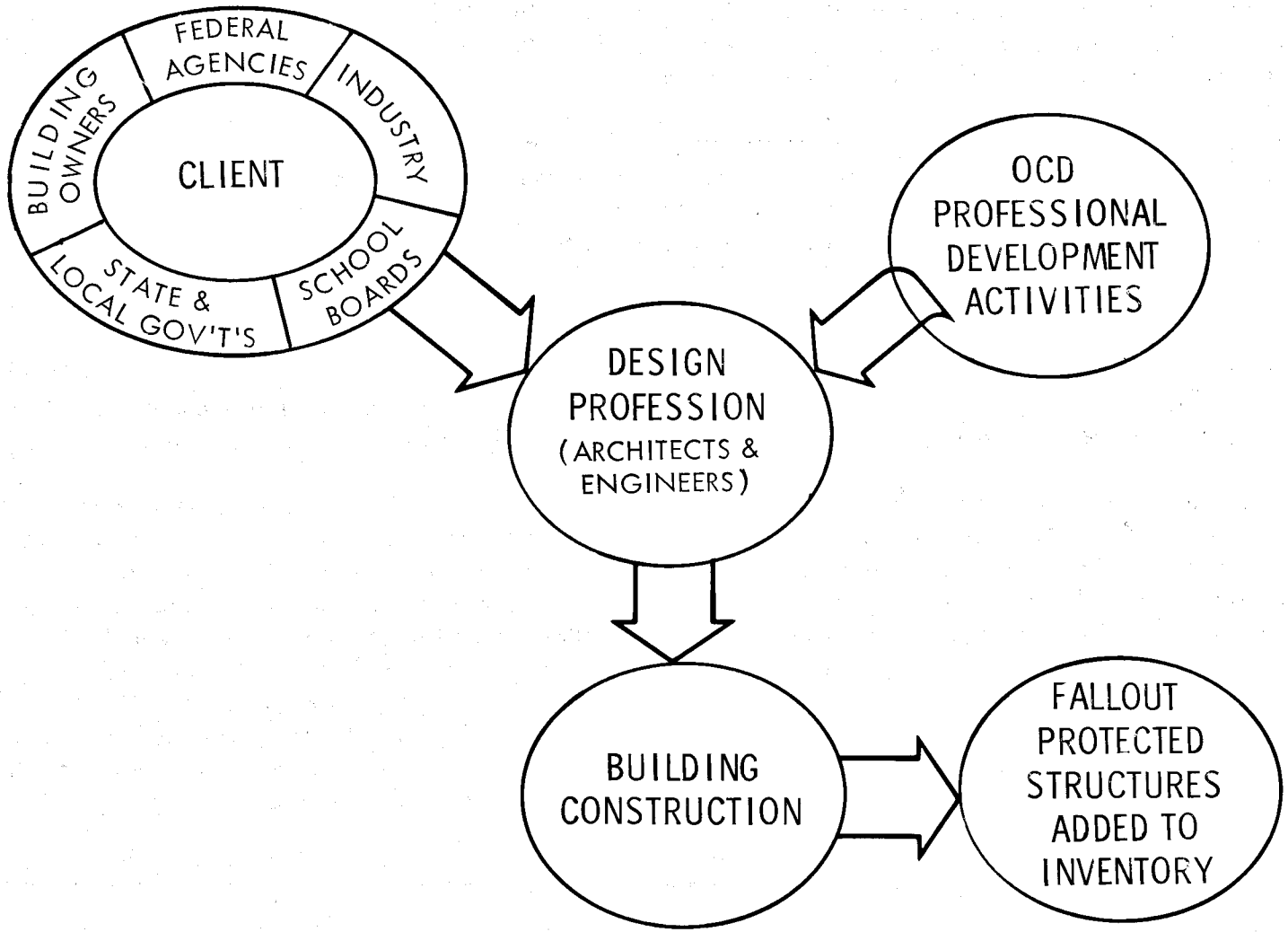
Traditionally, universities and colleges are called upon to keep practicing professionals abreast of the state-of-the-art in their respective fields. Academic institutions are being provided with the resources to study, evaluate, and promulgate scientific and technical materials related to the areas of Civil Defense interest. The institutions will thus be able to disseminate newly published information and design techniques to the design profession as well as their students through means of seminars, courses, lectures, and on-the-job training sessions.

The shelter development program is intended to:

1. provide national leadership without domination.
2. provide Federal assistance without interference.
3. fill gaps in required areas of information and services.
4. stimulate ideas and appropriate action.

These activities, while not sufficient to overcome the total shelter deficit, will do much toward alleviating the problem.

SHELTER DEVELOPMENT A & E ACTIVITIES



PROFESSIONAL DEVELOPMENT SERVICES AND CASE STUDIES

As an extension of the on-going A-E Development Program and in order to assist in obtaining a greater number of shelter spaces utilizing slanting and low cost shielding techniques, a nationwide professional development service is being established for A-E firms engaged in building design. It is anticipated that colleges and universities with appropriate technical capabilities will play a major role in the dissemination of theory and applications of these techniques.

Local and State civil defense directors upon learning of plans for a new structure will contact the building owner and designer and promote the incorporation of shelter into the design. Should the designer require additional information on how this can be accomplished, qualified Fallout Shelter Analysts and Instructors are being made available to provide the following services:

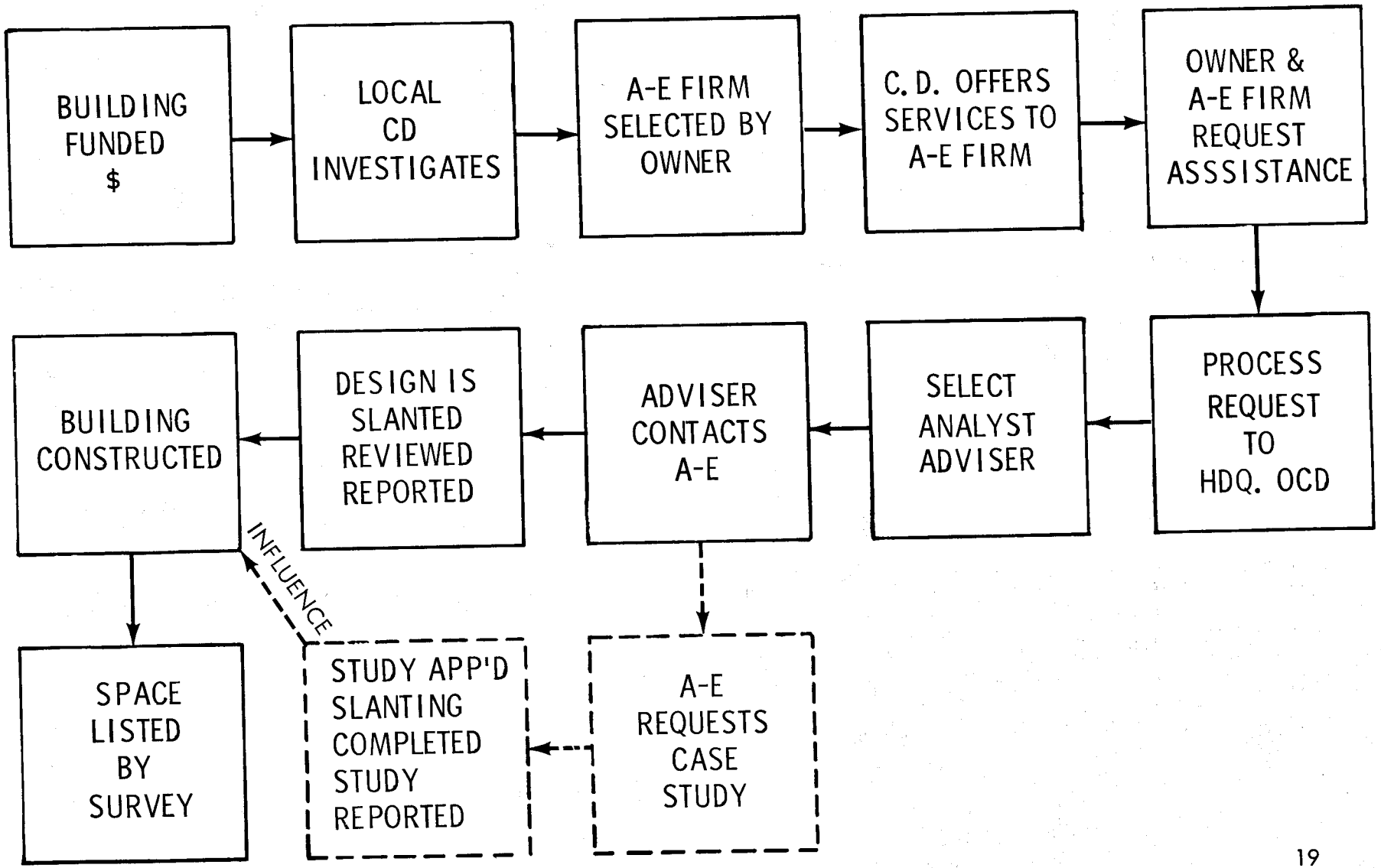
1. Conduct seminars, courses, lectures, and on-the-job training sessions in fallout shelter analysis, design, construction techniques and criteria for A-E firms.

2. Review building designs to evaluate potentials for fallout protection and recommend design techniques and other appropriate methods to integrate or improve shelter in the design.

The program will be implemented in two phases. Under Phase I, approximately 25 Qualified Instructors in Fallout Shelter Analysis will provide the professional development services. As the program expands, it is envisioned under Phase II that contracts with selected universities or colleges will provide the appropriate means of administering the activities of the expanded program. Ultimately, at least one college or university will be selected from each State to administer the professional development services program.

Those wishing to avail themselves of this service can do so by contacting their local, State, or Regional Civil Defense Office. These offices will then make the necessary arrangements to obtain the qualified Fallout Shelter Analyst or Instructor. Addresses of the State and Regional Offices are shown on page 20.

PROFESSIONAL DEVELOPMENT SERVICES & CASE STUDIES



ADDRESSES OF REGIONAL & STATE CD OFFICES

OCD Region 1

Oak Hill Road
Harvard, Massachusetts 01451

Connecticut
State Armory, 360 Broad Street
Hartford, Connecticut 06115

Maine
State House
Augusta, Maine 04330

Massachusetts
400 Worcester Road
Framingham, Massachusetts 01706

New Hampshire
New Hampshire Military Reservation
Airport Road
Concord, New Hampshire 03301

New Jersey
The Armory-Armory Drive
P.O. Box 979
Trenton, New Jersey 08625

New York
State Office Building Campus
Albany, New York 12226

Rhode Island
State House
Providence, Rhode Island 02903

Vermont
Redstone
Montpelier, Vermont 05601

Puerto Rico
P.O. Box 5125
Puerta de Tierra Station
San Juan, Puerto Rico 00906

OCD Region 2

Olney, Maryland 20832

Delaware
Delaware City, Delaware 19706

District of Columbia
4820 Howard Street, N.W.
Washington, D.C. 20016

Kentucky
The Capitol
Frankfort, Kentucky 40601

Maryland
Pikesville, Maryland 21208

Ohio
Building 101, Fort Hayes
Columbus, Ohio 43216

OCD Region 2 (con't.)

Pennsylvania
Main Capitol Building
Harrisburg, Pennsylvania 17120

Virginia
P.O. Box 9016, Forest Hill Station
Richmond, Virginia 23225

West Virginia
806 Greenbrier Street
Charleston, West Virginia 25311

OCD Region 3

Thomasville, Georgia 31792

Alabama
304 Dexter Avenue
Montgomery, Alabama 36104

Florida
1045 Riverside Avenue
Jacksonville, Florida 32204

Georgia
959 E. Confederate Avenue, S.E.
P.O. Box 4839
Atlanta, Georgia 30302

Mississippi
State Office Building
P.O. Box 1228
Jackson, Mississippi 39201

North Carolina
Jefferson & Dale Streets
P.O. Box 12347
Raleigh, North Carolina 27605

South Carolina
Rutledge Building
1429 Senate Street
Columbia, South Carolina 29201

Tennessee
National Guard Armory -- Sidco Drive
Nashville, Tennessee 37204

OCD Region 4

Federal Center
Battle Creek, Michigan 49016

Illinois
57th Street & South Shore Drive
Chicago, Illinois 60637

OCD Region 4 (con't.)

Indiana
100 North Senate Avenue
Indianapolis, Indiana 46204

Michigan
714 S. Harrison Road
East Lansing, Michigan 48824

Minnesota
Veterans Service Building
Capitol Approach
St. Paul, Minnesota 55101

Wisconsin
4802 Sheboygan Avenue
Madison, Wisconsin 53702

OCD Region 5

Federal Center
Denton, Texas 76202

Arkansas
P.O. Box 845
Conway, Arkansas 72032

Louisiana
Building 309-A, Area B
Jackson Barracks
New Orleans, Louisiana 70140

New Mexico
P.O. Box 4277
Santa Fe, New Mexico 87502

Oklahoma
Sequoyah-Will Rogers Buildings
P.O. Box 3365
Oklahoma City, Oklahoma 73105

Texas
P.O. Box 4087 - North Austin Station
Austin, Texas 78761

OCD Region 6

Denver Federal Center, Building 50
Denver, Colorado 80225

Colorado
1525 Sherman Street
Denver, Colorado 80203

Iowa
State Office Building, Room B-33
Des Moines, Iowa 50319

Kansas
State Capitol Building, Basement
Topeka, Kansas 66612

Missouri
100 East Capitol Avenue
Jefferson City, Missouri 65101

OCD Region 6 (con't.)

Nebraska
1300 Military Road
Lincoln, Nebraska 68508

North Dakota
State Capitol Building
Bismarck, North Dakota 58501

South Dakota
Camp Rapid
Rapid City, South Dakota 57701

Wyoming
P.O. Box 1709
Cheyenne, Wyoming 82001

OCD Region 7

Federal Center
Santa Rosa, California 95402

Arizona
1623 West Washington Street
Phoenix, Arizona 85007

California
P.O. Box 9577
Sacramento, California 95823

Hawaii
Building 24 -- Fort Ruger
Honolulu, Hawaii 96816

Nevada
State Capitol Building
Carson City, Nevada 89701

Utah
P.O. Box 2771
Fort Douglas, Utah 84113

OCD Region 8

Everett, Washington 98201

Alaska
1111 East Fifth Avenue
Anchorage, Alaska 99501

Idaho
Box 1098
Boise, Idaho 83701

Montana
State Arsenal Building
P.O. Box 1157
Helena, Montana 59601

Oregon
Room 5, State Capitol
Salem, Oregon 97310

Washington
P.O. Box 1519
Olympia, Washington 98501

Distribution:
OCD Regions, Staff College
State and Local CD Directors
Defense Coordinators of Federal Agencies
Qualified Fallout Shelter Analysts
CE-BuDocks Field Offices (District Engineers and Public Works Offices)
Universities Participating in CD Extension Program

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