

NBSIR 76-1064

# Existing Architectural Information Indexing Systems

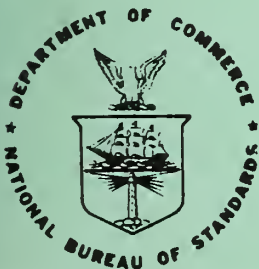
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Robert J. Kapsch

Office of Building Standards and Codes Services  
Center for Building Technology  
Institute for Applied Technology  
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March 1976

Final Report



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U. S. DEPARTMENT OF COMMERCE  
NATIONAL BUREAU OF STANDARDS



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**U.S. DEPARTMENT OF COMMERCE, Elliot L. Richardson, *Secretary***  
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## ABSTRACT

Architectural indexing systems are those mechanisms which we use to organize information concerning how and what to build. Architectural indexing systems are a means of organizing available information in a manner that can readily be grasped by the user. As such, architectural indexing systems are an important component part of architectural information systems. This report reviews and summarizes existing architectural indexing systems presently used in the United States and overseas. Indexing systems reviewed are classified into (1) one way divisions, (2) two way divisions, (3) thesauri and other indexing systems.

Key Words: Architecture; architectural indexing systems; building; construction; design; information; information retrieval system

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## ARCHITECTURAL INFORMATION INDEXING SYSTEMS

Architectural information indexing systems are those mechanisms which are used to organize information concerning how and what to build. Architectural information indexing systems are used for a variety of purposes in the building community. These uses include mechanisms for organizing information for use in the design process (such as organizing product literature in some comprehensible manner), for organizing building regulation provisions (such as in building codes and other regulations), for organizing information to bear upon building research investigations (such as organizing pertinent information from a literature search) and organizing information for retrieval (such as those used in architectural information systems<sup>1/</sup>). In all of these applications, the architectural information indexing systems function is to provide a mechanism or framework for organizing a great mass of available information. Architectural indexing systems, thus, provide a subdivision of information to allow ready application by the user.

Architectural information indexing systems vary from simple tables of contents, used in building codes and similar documents, to sophisticated thesauri that relate terms used to each other in a manner that permits precise definition. This report provides summaries of some currently used existing architectural information indexing systems for such purposes as organizing building regulatory information, organizing architectural and engineering information in sophisticated information retrieval systems, organizing design and construction criteria and other applications.

<sup>1/</sup>Architectural information systems utilize architectural information indexing systems as a tool for providing access to architectural information. For a survey of existing architectural information systems, see Lane, N.D., "An Evaluation of Architectural Information Systems," Construction Engineering Research Laboratory, Champaign, Illinois, October 1974.

Architectural information indexing systems, not a usual subject for study, are an extremely important topic for consideration. At the very least, a poorly conceived architectural indexing system can cause lost time for the user attempting to retrieve building product information or ascertaining applicable building regulations to a given design problem. But the use of improperly conceptualized architectural indexing can provide even more serious consequences. Such consequences include the exclusion of innovative building products from use by improperly drawn categories (subsets) and boundaries and incurring of large processing costs for information systems that rarely provide pertinent information when and where needed. The basis of architectural indexing system is the subdivision of the total set of information into smaller, readily grasped, subsets. The process of subdivision results in the development and definition of boundaries to separate these subsets. Incorrectly developed and defined subsets can cause large costs and inefficient allocation of labor and material in the building process.

The purpose of this report is to emphasize the role of architectural information indexing systems by summarizing and providing ready comparisons between the existing architectural information indexing mechanisms.

The simplest of the existing architectural information indexing systems is referred to in this report as a one way division. A one way division is the definition of the body of architecture and building information under consideration and the subsequent subdivision of that set into subsets. Ideally these subsets would be mutually exclusive, roughly equivalent in scope and based on a uniform method of division. Rarely, can this be achieved in practice. For example, building regulations frequently contain



provisions applicable to both what is to be built (the building product) and how it is to be built (the building process). When these are combined in a single one way division, they result in a dual method of division with a resultant loss of mutually exclusivity of subsets. Although one way divisions contain this deficiency, they tend to be the most common method of architectural indexing. The reason for this is that many, if not most, of our information storage media for architectural information is linear in nature. That is, page follows page or card follows card. Because of this linearity, they are readily adapted to a one way division. In addition, one way divisions are the easiest in information indexing systems to develop, use and apply. Examples of this one way information storage media include files, books, reports, card files, and other storage media that are physically arranged in a sequential manner.

Examples of one way divisions include the American National Standards Institute (ANSI) divides their standards into nineteen categories (see page 10), of which a few are directly applicable to architecture and building. However, this ANSI categorization well illustrates a one way division of information.

Building codes always use one way division for organizing their information. The one way divisions used by the four American "model" building codes have been included in the appendix. Included are the BOCA Basic Building Code (see page 13), the National Building Code (see page 14), the Southern Standard Building Code (see page 17), and the Uniform Building Code (see page 19). In addition, the index system for the National Building Code of Canada is also described (see page 16).

One way indexing systems are also used to provide access to information concerning available building products. For example, the American Institute of Architects' produced a Building Product Register in 1962 (see page 22).

The most commonly used one way index system in the United States is the Uniform Construction Index, jointly sponsored by a number of American and Canadian architectural and building organizations (see page 23). The Uniform Construction Index provides categories for specifications, data filing, cost analysis and project filing.

A second category of architectural indexing system is the two way division. A two way division is the definition of the body of architecture and building under consideration and the subsequent division of that set into two series of subsets. Ideally these two series of subsets would be mutually exclusive and each based on a uniform method of division. These two series would be arranged at right angles to form a matrix. Intercepts are formed between the rows and columns within which information bits may be stored and retrieved. The two way division has been used to provide a mechanism for organization of information for a number of projects. These are shown in the Appendix. The advantage of this approach is that it provides a greater number of subdivisions than a simple one way division, and hence greater selectivity. The disadvantage is that most information storage media are not arranged in a sequential physical arrangement and thus not physically compatible with a two way division. Although no known applications have been utilized, three way, four way divisions. . . n way divisions are feasible.

An example of two way divisions of building information is the Performance Specification for Office Buildings (see page 27). The two way division was formed by dividing the set of information on building requirements first by what those requirements affected (building elements and subsystems) and second by what those requirements were attempting to achieve (attributes). The built elements or subsystems were arranged at right angles to the attributes to form the matrix. A similar two way division is contained in the Guide Criteria for Operation Breakthrough (see page 30).

Where the above two indexing systems dealt solely with the set of information dealing with building requirements (i.e., describing the product), the report, "Literature Search: Hospital Bedrooms and Nursing Units," (see page 33) added a second matrix for the set of information on planning, design and construction (i.e., describing the process).

A third category of architectural information indexing systems are thesauri and modified thesauri. Thesauri indicate the relationship of one word to another. Modified thesauri are those indexing systems which contain a partial thesauries with a classification one or two way division in information systems.

Thesauri, books defining relationships between words, have been developed for architecture and building. Thesauri are used in information systems as a list of authorized words for cataloguing for later, more accurate retrieval of the catalogued information. In this respect, thesauri act as input/output devices so as to provide a higher degree of quality control than can be achieved in information retrieval using an open-ended system of key words.

The RIBA/SfB system (see page 38) and the BSAB system (see page 45) are not true thesauri but contain enough similar features as to be described in conjunction with thesauri. In contrast, the EJC Thesaurus (see page 55) and the IF Thesaurus (see page 58) are true thesauri.

The advantage of the simple one way division is that it is easy and inexpensive. The disadvantages of this type is that it is rarely adequate for large or sophisticated information systems or for the application where fine distinctions must be made. Although the process of one way division is simple; in theory defining the body of information under consideration as a set and subdividing that set into subsets that would be mutually exclusive, roughly equivalent in scope and based on a uniform method of division; it is difficult to achieve this in practice. What is usually used in practice, then, is a one way division based on custom. For example, the ANSI division shown on pages 10-12 could not be considered mutually exclusive, equivalent in scope, based on a uniform method of division, or exhaustive. Similarly, with the building codes shown on pages 13-18. Clearly these classifications have grown through the years. Although these one way divisions don't adhere to the theoretical set-subset concept described above, they do have the advantage of having been in-use for a long time and therefore have achieved familiarity with the users.

Two way divisions share many of the advantages and disadvantages of one way divisions. They are not particularly difficult or expensive to develop and use but, like one way divisions, are difficult to rigorously construct. An example of this difficulty is shown on page 32 the Operation Breakthrough Guide Criteria Matrix. This two way division was developed to assist researchers

in developing criteria for the Department of Housing and Urban Development's program to achieve a "breakthrough" in the production and marketing of industrialized buildings. The vertical subdivision, Built Elements, is meant to be the definition of the completed building as the set, with subdivisions of that set into building subsystems. The horizontal subdivision, Attributes, is meant to be the definition of the total needs of the building user as the set, with subdivisions of that set into related performance attributes. However, an examination of these subdivisions would indicate that these subsets are not on a uniform method of division (i.e., an "apples" and "oranges" list), overlap considerably, and are not equivalent in scope. For example, the first two divisions are related to the building subsystem (structures), the third subdivision, health and safety, is much broader than the other subdivisions, etc. Such "unevenness" and lack of mutual exclusibility is typical of these matrices. In reality, it is difficult to construct satisfactory mutually exclusive subsets.

Thesauri and thesauri-like mechanisms tend to be larger, more difficult to construct, more difficult to use, and more expensive than one and two way divisions. However, they have the advantage of being able to provide close comparisons and very narrow compartmentalization. By narrow compartmentalization, it is meant that a thesaurus used as an indexing mechanism can provide thousands of compartments in which information or data may be stored for later retrieval. Using each thesaurus term as a set and using combinations of these terms to define new compartments (such as the new compartment formed by set A union B, etc.), hundreds of thousands or even millions of compartments can be formed. This degree of compartmentalization should be compared with a 10 X 10 two way division resulting 100 compartments.

A second major advantage of thesauri information indexing mechanisms is that they allow the expression of relationships between concepts, terms and other information categories. One example of this is scale. Rarely shown in one and two way divisions, thesauri information indexing mechanisms allow the distinction of scale to be made between set, subsets, subsets of subsets, etc. In building information, for example, the use of such a mechanisms allows the distinction of information related to buildings from information related to building subsystems (e.g., Building Environment Subsystem) for information related to building assemblies (e.g., furnaces, air conditioning units, etc.) for information related to building components (e.g., pipes, ducts, etc.) for information related to building materials (e.g., copper, cast iron, aluminum, etc.).

But development of new thesauri mechanisms is a lengthy, arduous, exacting and expensive task. Even the review of existing thesauri mechanisms to assess suitability for a proposed application can be lengthy, arduous, exacting and expensive. A complication for assessment of suitability for a proposed application is that these mechanisms are rarely or never accompanied by a list of definitions used. Ambiguities and narrow culture-bound uses are thus inevitably included in these existing thesauri information indexing methods.

In the absolute sense, there is no one best architectural information indexing system. Rather, the merit of alternative existing architectural information indexing systems should be assessed against the specific goals and objectives to be achieved by the larger program of which the information

indexing system is to be a part. These program goals and objectives could include the delivery of pertinent architectural information in a timely manner, the organization of building regulatory provisions, the organization of building cost information and similar applications. Assessment of the suitability of these existing architectural information indexing systems should be based on explicit statements of goals and objective, assessment of ease of use, development and maintenance, assessment of costs incurred and similar concerns. Similarly, the development of new architectural information indexing systems should be preceded by the development of explicit program goals and objective statements and an indepth analysis of factors that bear on its intended use.

# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

## AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

Type : One Way Division  
Purpose : To facilitate reference to one or more standards dealing with a select subject.  
Description: All ANSI standards are given a unique alpha numeric code. The first character of the number is alphabetic. This alphabetic character identifies the category to which a particular standard belongs. Twenty-one categories are used, two of which are indicated by two alphabetic characters, MH and PH. The letters E, F, I, Q, R, T, U and V are not presently used by ANSI to denote categories of standards. Categories presently in use by ANSI are shown below:

### ANSI CATEGORIES

|    |   |
|----|---|
| A  | Construction  |
| B  | Mechanical  |
| C  | Electrical and Electronics                                    |
| D  | Highway Traffic Safety  |
| G  | Ferrous Materials and Metallurgy                              |
| H  | Nonferrous Materials and Metallurgy                           |
| J  | Rubber  |
| K  | Chemical  |
| L  | Textile   |
| M  | Mining  |
| MH | Materials Handling  |
| N  | Nuclear   |
| O  | Wood  |
| P  | Pulp and Paper  |
| PH | Photography and Motion Pictures                               |
| S  | Acoustics, Vibration, Mechanical Shock and<br>Sound Recording |
| SE | Security Systems  |
| W  | Welding   |
| X  | Information Systems   |
| Y  | Drawings, Symbols, and Abbreviations                          |
| Z  | Miscellaneous   |

Each of the larger categories is subdivided by subcategories. These subcategories are indicated by numeric characters. Major subcategories used for construction, mechanical and electrical are shown below.

### ANSI CATEGORIES AND SUBCATEGORIES

|     |                                      |
|-----|--------------------------------------|
| A   | Construction                         |
| A10 | Safety Requirements for Construction |



# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)(cont'd)

- A21 Cast Iron Pipe and Fittings
- A37 Road and Paving Materials
- A62 Modular Coordination
- A88 Oxychloride Cements
- All Refractories
  
- B Mechanical Engineering
  - B1 Screw Threads
  - B3 Ball and Roller Bearings
  - B5 Machine Tools and Components
  - B6 Gears
  - B16 Pipe Flanges and Fittings
  - B18 Bolts and Nuts
  - B29 Transmission Chains
  - B31 Pressure Piping
  - B36 Iron and Steel Pipe
  - B72 Plastic Pipe
  - B74 Abrasives
  - B93 Fluid Power Systems and Components
  - B94 Cutting Tools, Holders, Drivers, and Bushings
  - B125 Iron and Steel Pipe
  - B141 Aerospace
  
- C Electrical Engineering
  - C7 Bare Electrical Conductors
  - C8 Insulated Wire
  - C16 Radio
  - C29 Wet-Process Porcelain Insulators
  - C33 Electrical Devices and Materials
  - C37 Power Switchgear
  - C39 Electrical Measuring Instruments
  - C50 Rotating Electrical Machinery
  - C57 Transformers, Regulators, and Reactors
  - C59 Electrical Insulation Materials
  - C60 Electron Tubes Attachment
  - C73 Dimensions of Attachment Plugs and Receptacles
  - C78 Incandescent Lamps
  - C78 Electric Discharge Lamps (Fluorescent),  
Dimensional and Electrical Characteristics of
  - C78 Bactericidal Lamps
  - C78 Electrical Discharge Lamps (Mercury),  
Physical and Electrical Characteristics of:
  - C78 Fluorescent Lamp Auxiliaries
  - C80 Conduits
  - C81 Electric Lamp Bases and Holders
  - C82 Lamp Ballasts
  - C83 Components for Electronic Equipment

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# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

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AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)(cont'd)

Other categories are similarly subcategorized. The remainder of each ANSI number uniquely identifies that standard and the date it was adopted. For example:

"A10.8-1969 Scaffolding, Safety Requirements for belongs in category A, "Construction," subcategory A10, "Safety Requirements for Construction," and was adopted by ANSI in 1969.

Ref: American National Standards Institute, "Catalog 1974."

# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

## THE BOCA BASIC BUILDING CODE

Type : One Way Division  
Purpose : To facilitate reference to one or more provisions contained in the BOCA.  
Description: Related provisions of the BOCA are grouped together in twenty articles. These are shown below:

| <u>Article</u> | <u>Subject</u>  |
|----------------|---|
| 1              | Administration and Enforcement  |
| 2              | Definitions and Classifications   |
| 3              | General Building Limitations  |
| 4              | Special Use and Occupancy Requirements                                    |
| 5              | Light and Ventilation   |
| 6              | Means of Egress   |
| 7              | Structural and Foundation Loads and Stresses                              |
| 8 Part A       | Materials and Tests   |
| 8 Part B       | Steel, Masonry, Concrete, Gypsum and Lumber Construction                  |
| 8 Part C       | Building Enclosures, Walls and Wall Thickness                             |
| 9              | Fireresistive Construction Requirements                                   |
| 10             | Chimneys, Flues and Vent Pipes  |
| 11             | Heating Equipment and Appliances - Mountings, Clearances and Connections  |
| 12             | Fire Protection and Systems   |
| 13             | Precautions During Building Operations                                    |
| 14             | Signs and Outdoor Display Structures                                      |
| 15             | Electric Wiring and Equipment   |
| 16             | Elevator, Dumbwaiter and Conveyor Equipment, Installation and Maintenance |
| 17             | Plumbing, Drainage and Gas Piping   |
| 18             | Air Conditioning, Refrigeration and Mechanical Ventilation                |
| 19             | Prefabricated Construction  |
| 20             | Light-Transmitting Plastic Construction                                   |

Each section in the BOCA has a number relating it back to the appropriate part. Thus Section 621.0, "Fire Escapes" is contained in Article 6, "Means of Egress."

Ref: Building Officials and Code Administrators International, Inc., "The BOCA Basic Building Code, 1975," Sixth Edition, 1975.

# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

## THE NATIONAL BUILDING CODE (NBC)

Type : One Way Division

Purpose : To facilitate reference to one or more provisions contained in the NBC.

Description: Related provisions of the NBC are grouped together eighteen articles. These are shown below.

| <u>Article</u> | <u>Subject</u>   |
|----------------|--|
| I              | Administration   |
| II             | Definitions  |
| III            | Classification of Occupancies<br>and Special Occupancy Require-<br>ments                               |
| IV             | Restrictions Within the Fire<br>Limits, Height and Area<br>Restrictions and Street<br>Encroachments    |
| V              | Light and Ventilation  |
| VI             | Means of Egress  |
| VII            | Requirements for Types of Con-<br>struction  |
| VIII           | Fire Protection Requirements   |
| IX             | Design Loads and General Building<br>Requirements  |
| X              | Chimneys, Fireplaces and Venting<br>Systems  |
| XI             | Heat Producing Appliances,<br>Heating, Ventilating, Air<br>Conditioning, Blower and<br>Exhaust Systems |
| XII            | Safeguards During Construction   |
| XIII           | Elevators, Dumbwaiters, Esca-<br>lators and Amusement Devices  |
| XIV            | Gas Piping and Plumbing  |
| XV             | Electrical Installations   |
| XVI            | Signs and Outdoor Display<br>Structures  |
| XVII           | Safety to Life Requirements for<br>Existing Buildings  |
| XVIII          | List of Standards and Publications   |

# **EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS**

## THE NATIONAL BUILDING CODE (NBC)(cont'd)

Each section in the NBS has a number relating it back to the appropriate article. Thus Section 1003, "Masonry Chimneys for Industrial Type Medium Heat Appliances," is contained in article X, "Chimneys, Fireplaces and Venting Systems."

Ref: American Insurance Association, "The National Building Code: 1967 Edition," 1967.

# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

## NATIONAL BUILDING CODE OF CANADA 1970

Type : One Way Division  
Purpose : To facilitate reference to one or more provisions contained in the National Building Code of Canada.  
Description: Related provisions of the National Building Code of Canada are grouped together in nine parts. These are shown below:

| <u>Part</u> | <u>Subject</u>               |
|-------------|------------------------------|
| 1           | Scope and Definitions        |
| 2           | Administration               |
| 3           | Use and Occupancy            |
| 4           | Design                       |
| 5           | Materials                    |
| 6           | Building Services            |
| 7           | Plumbing Services            |
| 8           | Construction Safety Measures |
| 9           | Housing and Small Buildings  |

Each section in the National Building Code of Canada has a number relating it back to the appropriate part. Thus Section 6.5.2, "Elevators and Dumbwaiters," is contained in Part 6, "Building Services."

Ref: Associate Committee on the National Building Code, National Research Council of Canada, "National Building Code of Canada 1975."

# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

## SOUTHERN STANDARD BUILDING CODE (SBCC)

Type : One Way Division  
Purpose : To facilitate reference to one or more provisions contained in the SBCC.  
Description: Related provisions of the SBCC are grouped together in twenty-nine chapters. These are shown below:

| <u>Chapter</u> | <u>Subject</u>   |
|----------------|--|
| I              | Administration   |
| II             | Definitions  |
| III            | Fire District  |
| IV             | Classification of Buildings by<br>Occupancy                            |
| V              | Special Occupancy Requirements   |
| VI             | Classification of Buildings by<br>Construction                         |
| VII            | Fire Protection Requirement  |
| VIII           | Chimneys, Fireplaces and Heating<br>Equipment                          |
| IX             | Sprinklers and Standpipes  |
| X              | Fire Resistance Standards for<br>Materials and Construction            |
| XI             | Means of Egress Requirements   |
| XII            | Minimum Design Loads   |
| XIII           | Foundations, Footings and<br>Excavations                               |
| XIV            | Masonry Construction   |
| XV             | Steel Construction   |
| XVI            | Concrete Construction  |
| XVII           | Wood Construction  |
| XVIII          | Lathing, Plastering and Gypsum<br>Wallboard                            |
| XIX            | Rat-Proof Construction   |
| XX             | Light, Ventilation and Sanitation                                      |
| XXI            | Safeguards During Construction   |
| XXII           | Use of Public Property   |
| XXIII          | Signs and Outdoor Displays   |
| XXIV           | Elevators and Escalators   |
| XXV            | Prefabricated Construction and<br>Mobile Homes Over Eight Feet<br>Wide |
| XXVI           | Plastics   |
| XXVII          | Glass  |
| XXVIII         | Aluminum Construction  |
| XXIX           | Acoustical Ceiling Systems   |

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# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

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## SOUTHERN STANDARD BUILDING CODE (SBCC) (cont'd)

Each section in the SBCC has a number relating it back to the appropriate chapter. Thus Section 1124, "Illumination of Exits," is contained in Chapter 11, "Means of Egress Requirements."

Ref: Southern Building Code Congress, "Southern Standard Building Code," 1973.



# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

## UNIFORM BUILDING CODE (UBC)

Type : One Way Division  
Purpose : To facilitate reference to one or more provisions contained in the UBC.  
Description: Related provisions of the UBC are grouped together twelve parts and sixty chapters, ten chapters of which are presently not being used. These are shown below:

| <u>Part</u> | <u>Chapter</u>                  | <u>Subject</u>   |
|-------------|---------------------------------|--|
| I           | ADMINISTRATIVE                  |  |
|             | 1                               | Title and Scope  |
|             | 2                               | Organization and Enforcement   |
|             | 3                               | Permits and Inspections  |
| II          | DEFINITIONS AND ABBREVIATIONS   |  |
|             | 4                               | Definitions and Abbreviations  |
| III         | REQUIREMENTS BASED ON OCCUPANCY |  |
|             | 5                               | Classification of all Buildings by Use or Occupancy and General Requirements for all Occupancies |
|             | 6                               | Requirements for Group A Occupancies   |
|             | 7                               | Requirements for Group B Occupancies   |
|             | 8                               | Requirements for Group C Occupancies   |
|             | 9                               | Requirements for Group D Occupancies   |
|             | 10                              | Requirements for Group E Occupancies   |
|             | 11                              | Requirements for Group F Occupancies   |
|             | 12                              | Requirements for Group G Occupancies   |
|             | 13                              | Requirements for Group H Occupancies   |
|             | 14                              | Requirements for Group I Occupancies   |
|             | 15                              | Requirements for Group J Occupancies   |

# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

## UNIFORM BUILDING CODE (UBC)(cont'd)

| <u>Part</u> | <u>Chapter</u>   | <u>Subject</u>  |
|-------------|--|---|
| IV          | REQUIREMENTS BASED ON LOCATION IN FIRE ZONES                                     |   |
|             | 16   | Restrictions in Fire Zones  |
| V           | REQUIREMENTS BASED ON TYPES OF CONSTRUCTION                                      |   |
|             | 17   | Classification of all Buildings<br>by Types of Construction and<br>General Requirements |
|             | 18   | Type I Buildings  |
|             | 19   | Type II Buildings   |
|             | 20   | Type III Buildings  |
|             | 21   | Type IV Buildings   |
|             | 22   | Type V Buildings  |
| VI          | ENGINEERING REGULATIONS - QUALITY AND DESIGN OF THE<br>MATERIALS OF CONSTRUCTION |   |
|             | 23   | General Design Requirements   |
|             | 24   | Masonry   |
|             | 25   | Wood  |
|             | 26   | Concrete  |
|             | 27   | Steel and Iron  |
|             | 28   | Aluminum  |
| VII         | DETAILED REGULATIONS   |   |
|             | 29   | Excavations, Foundations and<br>Retaining Walls   |
|             | 30   | Veneer  |
|             | 31   | (No Requirements)   |
|             | 32   | Roof Construction and Covering  |
|             | 33   | Stairs, Exits, and Occupant Loads   |
|             | 34   | Skylights   |
|             | 35   | (No Requirements)   |
|             | 36   | Penthouses and Roof Structures  |
|             | 37   | Masonry or Concrete Chimneys, Fireplaces<br>and Barbecues                               |
|             | 38   | Fire-Extinguishing Systems  |
|             | 39   | Stages and Platforms  |
|             | 40   | Motion Picture Projection Rooms   |
|             | 41   | (No Requirements)   |
| VIII        | FIRE RESISTIVE STANDARDS FOR FIRE PROTECTION                                     |   |
|             | 42   | Interior Wall and Ceiling Finish  |
|             | 43   | Fire-Resistive Standards  |

# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

## UNIFORM BUILDING CODE (UBC)(cont'd)

| <u>Part</u> | <u>Chapter</u>   | <u>Subject</u>  |
|-------------|--|---|
| IX          | REGULATIONS FOR USE OF PUBLIC STREETS AND PROJECTIONS OVER PUBLIC PROPERTY |   |
|             | 44   | Protection of Pedestrians during Construction or Demolition |
|             | 45   | Permanent Occupancy of Public Property                      |
|             | 46   | (No Requirements)   |
| X           | WALL AND CEILING COVERINGS   |   |
|             | 47   | Installation of Wall and Ceiling Coverings                  |
| XI          | SPECIAL SUBJECTS   |   |
|             | 48   | Film Storage  |
|             | 49   | (No Requirements)   |
|             | 50   | Prefabricated Construction                                  |
|             | 51   | (No Requirements)   |
|             | 52   | Plastics  |
|             | 53   | (No Requirements)   |
|             | 54   | Glass and Glazing   |
|             | 55   | (No Requirements)   |
|             | 56   | (No Requirements)   |
|             | 57   | (No Requirements)   |
|             | 58   | (No Requirements)   |
|             | 59   | (No Requirements)   |
| XII         | LEGISLATIVE  |   |
|             | 60   | Legislative   |

Each section in the UBC has a number relating it back to the appropriate chapter. Thus section 3304 "Corridors and Exterior Exit Balconies," is contained in Chapter 33, "Stairs, Exits and Occupant Loads," of Part 7, "Detailed Regulations."

Ref: International Convergence of Building Officials, "Uniform Building Code", 1973 Edition, 1973.

# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

## BUILDING PRODUCTS REGISTER

Type : One Way Division  
Purpose : To facilitate reference to commercially produced building materials.  
Description: The American Institute of Architect's Building Product Register is subdivided into twenty four (24) divisions which are, in turn, subdivided into two to fourteen sections. The divisions used in this document are shown below.

| <u>Division</u> | <u>Subject</u>                        |
|-----------------|---------------------------------------|
| 1               | Foundations                           |
| 2               | Structural Systems                    |
| 3               | Curtain Walls                         |
| 4               | Masonry                               |
| 5               | Wood                                  |
| 6               | Metals                                |
| 7               | Glass, Plastics                       |
| 8               | Roofing, Siding                       |
| 9               | Masonry & Concrete Treatments         |
| 10              | Thermal Insulation                    |
| 11              | Sound Control                         |
| 12              | Lath, Plaster & Trim                  |
| 13              | Flooring & Wall Covering              |
| 14              | Surfacing, Paneling                   |
| 15              | Paints, Finishes                      |
| 16              | Doors                                 |
| 17              | Windows                               |
| 18              | Door & Window                         |
| 19              | Hardware                              |
| 20              | Skylights, Roof Ventilators & Louvers |
| 21              | Store Fronts                          |
| 22              | Partitions & Wirework                 |
| 23              | Furnishings & Special Equipment       |
| 24              | Residential Kitchen Equipment         |

Ref: The American Institute of Architects," 1962, Building Products Register AIA."

# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

## UNIFORM CONSTRUCTION INDEX (A.I.A./C.S.I.)

Type : One Way Division  
Purpose : To facilitate reference to information pertaining to construction and construction products.  
Description: The Uniform Construction Index is sponsored by The American Institute of Architects (A.I.A.), The Construction Specifications Institute (C.S.I.), the Associated General Contractors of America (A.G.C.A.) and other organizations in the United States and Canada.

The Uniform Construction Index is composed of four parts, or formats, as shown below:

PART ONE - SPECIFICATIONS FORMAT  
PART TWO - DATA FILING FORMAT  
PART THREE - COST ANALYSIS FORMAT  
PART FOUR - PROJECT FILING FORMAT

The first three formats (i.e., specifications, data filing, and cost analysis) are each broken into sixteen (16) divisions and numerous sections. With one exception, these sixteen divisions are identical for each of these three formats. Divisions are shown in Figure 1 on page 24.

The sections within the divisions do vary between the three formats. For example, Figure 2 on page 25 shows a comparison between the three formats for Division 11, Equipment. Note that Part Two, Data Filing Format, does not exactly match with the other sections.

Part Four, Project Filing Format, is shown in Figure 3 on page 26. .

Ref: The American Institute of Architects, et al., "Uniform Construction Index," 1972.

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# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

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FIGURE 1  
UNIFORM CONSTRUCTION INDEX  
SIXTEEN DIVISIONS OF SPECIFICATIONS  
FORMAT, DATA FILING FORMAT  
AND COST ANALYSIS FORMAT

|             |                               |
|-------------|-------------------------------|
| Division 1  | GENERAL REQUIREMENTS*         |
| Division 2  | SITE WORK                     |
| Division 3  | CONCRETE                      |
| Division 4  | MASONRY                       |
| Division 5  | METALS                        |
| Division 6  | WOOD & PLASTICS               |
| Division 7  | THERMAL & MOISTURE PROTECTION |
| Division 8  | DOORS & WINDOWS               |
| Division 9  | FINISHES                      |
| Division 10 | SPECIALTIES                   |
| Division 11 | EQUIPMENT                     |
| Division 12 | FURNISHINGS                   |
| Division 13 | SPECIAL CONSTRUCTION          |
| Division 14 | CONVEYING SYSTEMS             |
| Division 15 | MECHANICAL                    |
| Division 16 | ELECTRICAL                    |

\*Titled, "Technical Aids" in Part Two, Data Filing Format.  
Part Three, Cost Analysis Format, has one additional division,  
Division 0, "Conditions of the Contract."

# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

FIGURE 2  
COMPARISON OF SECTIONS OF DIVISION 11,  
EQUIPMENT, - UNIFORM CONSTRUCTION INDEX

| PART ONE<br>SPECIFICATIONS<br>FORMAT   | PART TWO<br>DATA FILING<br>FORMAT   | PART THREE<br>COST ANALYSIS<br>FORMAT   |
|--|---|---|
| Built-in<br>Maintenance<br>Bank & Vault  | General<br>Information<br>Athletic  | Alternatives<br><br>Built-in<br>Maintenance   |
| Commercial<br>Checkroom  | Bank & Vault<br>Built-in<br>Maintenance   | Bank & Vault<br>Commmercial   |
| Darkroom<br>Ecclesiastical<br>Educational<br>Food Service<br>Vending<br>Athletic<br>Industrial<br>Laboratory<br>Laundry<br>Library<br>Medical<br>Mortuary<br>Musical<br>Parking<br>Waste Handling<br>Loading Dock<br>Detention<br>Residential<br>Theater<br>Registration | Checkroom<br>Commercial<br>Darkroom<br>Detention<br>Ecclesiastical<br>Educational<br>Food Service<br>Industrial<br>Laboratory<br>Laundry<br>Library<br>Loading Dock<br>Medical<br>Mortuary<br>Musical<br>Parking<br>Registration<br>Residential<br>Theater & Stage<br>Vending<br>Waste Handling | Checkroom<br>Darkroom<br>Ecclesiastical<br>Educational<br>Food Service<br>Vending<br>Athletic<br>Industrial<br>Laboratory<br>Laundry<br>Library<br>Medical<br>Mortuary<br>Musical<br>Parking<br>Waste Handling<br>Loading Dock<br>Detention<br>Residential<br>Theater & Stage<br>Registration |

FIGURE 3  
UNIFORM CONSTRUCTION INDEX

PART FOUR: PROJECT FILING FORMAT

| 1. Administration  | 2. Plan/Design/<br>Production  | 3. Bid/Contract  | 4. Construction   |
|--|--|--|---|
| <ul style="list-style-type: none"> <li>1.1 Client/Project Manager</li> <li>1.2 Consultants</li> <li>1.3 Construction Costs</li> <li>1.4 Internal Control</li> <li>1.5 Accounts</li> <li>1.6 General Information</li> </ul> | <ul style="list-style-type: none"> <li>2.1 Client/Project Manager</li> <li>2.2 Consultants</li> <li>2.3 Construction Costs</li> <li>2.4 Site Information</li> <li>2.5 Project Development</li> <li>2.6 Regulatory Approvals</li> </ul> | <ul style="list-style-type: none"> <li>3.1 Client/Project Manager</li> <li>3.2 Consultants</li> <li>3.3 Construction Costs</li> <li>3.4 Bid Documents &amp; Addenda</li> <li>3.5 Bidders</li> <li>3.6 Approvals</li> <li>3.7 Bids</li> <li>3.8 Contract</li> </ul> | <ul style="list-style-type: none"> <li>4.1 Client/Project Manager</li> <li>4.2 Consultants</li> <li>4.3 Construction Costs</li> <li>4.4 Changes</li> <li>4.5 Contractors</li> <li>4.6 Submittals</li> <li>4.7 Reports</li> <li>4.8 Close out</li> </ul> |



# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

## PERFORMANCE SPECIFICATION FOR OFFICE BUILDINGS (PBS)

Type : Two Way Division  
Purpose : To facilitate reference to one or more performance statements contained in the Public Building Service (PBS) Performance Specification for Office Buildings  
Description: The PBS Performance Specification for Office Buildings used a two way division or matrix, for facilitating reference to the performance statements contained in this document. This matrix was formed by dividing the material to be referenced into two lists of subsets and placing these two lists at right angles to form a matrix. Both lists have to contain a comprehensive group of subsets describing the material to be referenced.

The performance statements can be arranged into subsets based on what building subsystems these statements affect. Such a listing is shown below:

### LIST OF BUILT ELEMENTS OR SUBSYSTEMS

- 1 Structure
- 2 HVAC (Heating, Ventilating, Air Conditioning)
- 3 Electrical Distribution
- 4 Luminaires
- 5 Finished Floor
- 6 Finished Ceiling
- 7 Space Dividers

The performance statements can also be arranged into subsets based on what the building ought to provide. These are called attributes and a listing of these attributes is shown below:

### LIST OF ATTRIBUTES

- a Conditioned Air
- b Illumination
- c Acoustics
- d Stability, Durability
- e Health & Safety
- f Maintenance
- g Planning

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# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

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## PERFORMANCE SPECIFICATION FOR OFFICE BUILDINGS (PBS) (cont'd)

These two lists can then be placed at right angles to form a matrix (see figure 4 , page 29). Performance statements are thus indexed in the intercepts of these two lists. For example, the performance statement that requires, "Provide rigidity against human impact," would be indexed at the intercept of the Built Element, "Structure" and the Attribute, "Stability, Durability." This particular performance statement would then be assigned the number "ld." This number designates the location of this performance statement in the document.

Ref: Hattis, D. B. and T. E. Ware, Building Research Division, IAT, National Bureau of Standards, "The PBS Performance Specification for Office Buildings," January 1971 (revised September 1971).

FIGURE 4

PERFORMANCE SPECIFICATION FOR OFFICE BUILDINGS (PBS)

# The Matrix

## Built Elements or Subsystems

1 2 3 4 5 6 7

|            |   | STRUCTURE            | HVAC | ELECTRICAL DISTRIBUTION | LUMINAIRES | FINISHED FLOOR | FINISHED CEILING | SPACE DIVIDERS |
|------------|---|----------------------|------|-------------------------|------------|----------------|------------------|----------------|
| Attributes | a | CONDITIONED AIR      |      |                         |            |                |                  |                |
|            | b | ILLUMINATION         |      |                         |            |                |                  |                |
|            | c | ACOUSTICS            |      |                         |            |                |                  |                |
|            | d | STABILITY DURABILITY |      |                         |            |                |                  |                |
|            | e | HEALTH & SAFETY      |      |                         |            |                |                  |                |
|            | f | MAINTENANCE          |      |                         |            |                |                  |                |
|            | g | PLANNING             |      |                         |            |                |                  |                |

BUILDING IN USE<sup>TM</sup>

# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

## GUIDE CRITERIA FOR OPERATION BREAKTHROUGH

Type : Two Way Division  
Purpose : To facilitate reference to one or more performance statements contained in the Guide Criteria for the evaluation of Operation Breakthrough Housing Systems.  
Description: The Guide Criteria for Operation Breakthrough used a two way division, or matrix, for facilitating reference to the performance statements contained in this document. This matrix was formed by dividing the material to be referenced into two lists of subsets and placing these lists at right angles to form a matrix. Both lists had to contain a comprehensive group of subsets describing the material to be referenced.

The performance statements can be arranged into subsets based on what building subsystems these statements affect. Such a listing is shown below:

### LIST OF BUILT ELEMENTS

- A Structure
- B Walls and Doors, Inter-Dwelling
- C Walls and Doors, Intra-Dwelling
- D Floor-Ceiling
- E Walls, Doors and Windows
- F Roof-Ceiling, Ground-Floor
- G Fixtures and Hardware
- H Plumbing
- I Mechanical Equipment, Appliances
- J Power, Electrical Distribution, Communications
- K Lighting Elements
- L Enclosed Spaces

The performance statements can also be arranged into subsets based on what the building ought to provide. These are called attributes and a listing of these attributes is shown below:

### LIST OF ATTRIBUTES

- 1 Structural Serviceability
- 2 Structural Safety
- 3 Health and Safety
- 4 Fire Safety

# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

## GUIDE CRITERIA FOR OPERATION BREAKTHROUGH (cont'd)

- 5 Acoustic Environment
- 6 Illuminated Environment
- 7 Atmospheric Environment
- 8 Durability/Time Reliability (Function)
- 9 Spatial Characteristics and Arrangement

These two lists can then be placed at right angles to form a matrix (see Figure 5 page 32). Performance statements are thus indexed in the intercepts of these two lists. For example, the performance statement that requires, "Provision should be made for acoustical privacy between dwelling units," would be indexed at the intercept of the Built Element "Interior Space Dividers, Floor-Ceiling," and the Attribute, "Acoustic Environment." This particular performance statement would then be assigned the character, "D5". This number designates the location of this performance statement in the document.

Ref: Pfrang, E. O., Manager, The Building Research Division Team, "Guide Criteria for the Evaluation of: OPERATION BREAKTHROUGH Housing Systems," Five Volumes, National Bureau of Standards Report 10200, December 1, 1970.

FIGURE 5  
 GUIDE CRITERIA FOR OPERATION BREACH THROUGH  
 THE MATRIX

| Built Elements                                 |                                 |          | Attributes                |                   |                   |             |                      |                         |                         |  |   |  |
|--|---------------------------------|----------|---------------------------|-------------------|-------------------|-------------|----------------------|-------------------------|-------------------------|--|---|--|
|  |                                 |          | Structural Serviceability | Structural Safety | Health and Safety | Fire Safety | Acoustic Environment | Illuminated Environment | Atmospheric Environment | Durability/Time Reliability (Function) | Spatial Characteristics and Arrangement |  |
|  |                                 |          | 1                         | 2                 | 3                 | 4           | 5                    | 6                       | 7                       | 8                                      | 9                                       |  |
| Structure                                      |                                 | <b>A</b> |                           |                   |                   |             |                      |                         |                         |  |   |  |
| Interior Space Dividers                        | Walls and Doors, Inter-Dwelling | <b>B</b> |                           |                   |                   |             |                      |                         |                         |  |   |  |
|  | Walls and Doors, Intra-Dwelling | <b>C</b> |                           |                   |                   |             |                      |                         |                         |  |   |  |
|  | Floor-Ceiling                   | <b>D</b> |                           |                   |                   |             |                      |                         |                         |  |   |  |
| Exterior Envelope                              | Walls, Doors and Windows        | <b>E</b> |                           |                   |                   |             |                      |                         |                         |  |   |  |
|  | Roof-Ceiling, Ground Floor      | <b>F</b> |                           |                   |                   |             |                      |                         |                         |  |   |  |
| Fixtures and Hardware                          |                                 | <b>G</b> |                           |                   |                   |             |                      |                         |                         |  |   |  |
| Plumbing                                       |                                 | <b>H</b> |                           |                   |                   |             |                      |                         |                         |  |   |  |
| Mechanical Equipment, Appliances               |                                 | <b>I</b> |                           |                   |                   |             |                      |                         |                         |  |   |  |
| Power, Electrical Distribution, Communications |                                 | <b>J</b> |                           |                   |                   |             |                      |                         |                         |  |   |  |
| Lighting Elements                              |                                 | <b>K</b> |                           |                   |                   |             |                      |                         |                         |  |   |  |
| Enclosed Spaces                                |                                 | <b>L</b> |                           |                   |                   |             |                      |                         |                         |  |   |  |

# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

## LITERATURE SEARCH: HOSPITAL BEDROOMS AND NURSING UNITS

Type : Two Way Division  
Purpose : To facilitate reference to the literature pertaining to the planning, design and construction of hospital bedrooms and nursing units.  
Description: All the literature pertaining to this subject were divided into two sets, "Process" and "Product." The set "Process" contains all literature on how to plan, design and construct while the set "Product" contains all literature on what to plan, design and construct. The literature in both of these sets is indexed by a two way division, or matrix for facilitating reference to this literature. These matrices were formed by dividing the material to be referenced into two lists of subsets and placing these lists at right angles to form these matrices.

For the set "Process," the literature can be arranged into subsets based on the scale to which this literature is applicable. Such a listing is shown below:

### PROCESS - LIST OF SCALE

- a Worldwide
- b Nationwide
- c Areawide
- d City/Town
- e Hospital/Clinic
- f Nursing Unit
- g Patient Bedroom
- h Space

The literature can also be arranged into subsets based on what programmatic level or phase is being discussed. This listing is shown below:

### PROCESS - LIST OF PROGRAMMATIC LEVELS OR PHASES

- 1 Research
- 2 Planning
- 3 Programming
- 4 Modelling
- 5 Designing
- 6 Contracting
- 7 Constructing
- 8 Feedback

# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

LITERATURE SEARCH: HOSPITAL BEDROOMS AND NURSING UNITS (cont'd)

These two lists can then be placed at right angles to form a matrix (see Figure 6 page 36). The literature on this subject are thus indexed in the intercepts of these two lists. For example, an article dealing with the design of a nursing unit would be indexed at the intercept of the Scale, "Nursing Unit," and the Programmatic level, "Designing." This particular article would then be assigned the number "5f." This number designates the location of this article in the matrix.

Similarly, for the set "Product," the literature can be arranged into subsets based on what building subsystems these statements affect. Such a listing is shown below:

## PRODUCT - LIST OF BUILT ELEMENTS

- A Enclosure
- B Space Use
- C Transport Systems
- D Environmental Systems
- E Power Distribution Systems
- F Illumination
- G Communications
- H Equipment

A complete list of Built Elements would also include, "Site" and "Structures." However, this particular list was developed for referencing information dealing with only a portion of a building, hospital bedrooms and nursing units. Because of this the Built Elements, "Site" and "Structure" were not used in this particular matrix.

The literature can also be arranged into subsets based on what the building ought to provide. These are called performance attributes and a listing of these is shown below:

## PRODUCT - LIST OF PERFORMANCE ATTRIBUTES

### SAFETY/SECURITY

1. Fire
2. Physical
3. Chemical, Biological, Radiological
4. Electrical



# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

LITERATURE SEARCH: HOSPITAL BEDROOMS AND NURSING UNITS (cont'd)

CONVENIENCE/EFFICIENCY

5. Internal
6. External
7. Anthropometric Fit

COMFORT

8. Physiological
9. Social
10. Psychological

OTHER

11. Durability
12. Reliability
13. Controlability
14. Flexibility
15. Maintainability

These two lists can then be placed at right angles to form a matrix (see Figure 7 , page 37 ). Literature is thus indexed in the intercepts of these two lists. For example, an article dealing with various nursing unit configurations for the convenience and efficiency of the staff would be indexed at the intercept of the Built Elements, "Space Use" and the Performance Attribute, "Internal Convenience/Efficiency." This particular article would then be assigned the number, "5B". This number designates the location of this article in the document.

FIGURE 6  
LITERATURE SEARCH: HOSPITAL BEDROOMS AND NURSING UNITS  
THE PROCESS MATRIX

| Programmatic Level or Phase |   | Scale       |             |                |             |           |                |                 |             |
|-----------------------------|---|-------------|-------------|----------------|-------------|-----------|----------------|-----------------|-------------|
|                             |   | 1. Research | 2. Planning | 3. Programming | 4. Modeling | 5. Design | 6. Contracting | 7. Constructing | 8. Feedback |
| Worldwide                   | a |             |             |                |             |           |                |                 |             |
| Nationwide                  | b |             |             |                |             |           |                |                 |             |
| Areawide                    | c |             |             |                |             |           |                |                 |             |
| City/Town                   | d |             |             |                |             |           |                |                 |             |
| Hospital/Clinic             | e |             |             |                |             |           |                |                 |             |
| Nursing Unit                | f |             |             |                |             |           |                |                 |             |
| Patient Bedroom             | g |             |             |                |             |           |                |                 |             |

FIGURE 7

LITERATURE SEARCH: HOSPITAL BEDROOMS AND NURSING UNITS  
THE PRODUCT MATRIX

| <p style="text-align: center;">INTERMEDIATE CARE<br/>NURSING UNIT MATRIX</p> <p style="text-align: center;">BUILT ELEMENTS</p> |  | PERFORMANCE ATTRIBUTES |   |   |   |   |   |   |   |
|--|--|------------------------|---|---|---|---|---|---|---|
|  |  | A                      | B | C | D | E | F | G | H |
| SAFETY AND SECURITY  |  |                        |   |   |   |   |   |   |   |
| 1. FIRE  |  |                        |   |   |   |   |   |   |   |
| 2. PHYSICAL  |  |                        |   |   |   |   |   |   |   |
| 3. C. B. R.  |  |                        |   |   |   |   |   |   |   |
| 4. ELECTRICAL  |  |                        |   |   |   |   |   |   |   |
| CONVENIENCE AND EFFICIENCY   |  |                        |   |   |   |   |   |   |   |
| 5. INTERNAL  |  |                        |   |   |   |   |   |   |   |
| 6. EXTERNAL  |  |                        |   |   |   |   |   |   |   |
| 7. ANTHROPOMETRIC FIT  |  |                        |   |   |   |   |   |   |   |
| COMFORT  |  |                        |   |   |   |   |   |   |   |
| 8. PHYSIOLOGICAL   |  |                        |   |   |   |   |   |   |   |
| 9. SOCIAL  |  |                        |   |   |   |   |   |   |   |
| 10. PSYCHOLOGICAL  |  |                        |   |   |   |   |   |   |   |
| OTHER ATTRIBUTES   |  |                        |   |   |   |   |   |   |   |
| 11. DURABILITY   |  |                        |   |   |   |   |   |   |   |
| 12. RELIABILITY  |  |                        |   |   |   |   |   |   |   |
| 13. CONTROLLABILITY  |  |                        |   |   |   |   |   |   |   |
| 14. FLEXIBILITY  |  |                        |   |   |   |   |   |   |   |
| 15. MAINTAINABILITY  |  |                        |   |   |   |   |   |   |   |
| ENCLOSURE  |  |                        |   |   |   |   |   |   |   |
| SPACE USE  |  |                        |   |   |   |   |   |   |   |
| TRANSPORT SYSTEMS  |  |                        |   |   |   |   |   |   |   |
| ENVIRONMENTAL SYSTEMS  |  |                        |   |   |   |   |   |   |   |
| POWER DISTRIBUTION   |  |                        |   |   |   |   |   |   |   |
| ILLUMINATION   |  |                        |   |   |   |   |   |   |   |
| COMMUNICATIONS   |  |                        |   |   |   |   |   |   |   |
| EQUIPMENT  |  |                        |   |   |   |   |   |   |   |

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# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

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ROYAL INSTITUTE OF BRITISH ARCHITECTS AUTHORITATIVE  
UNITED KINGDOM VERSION OF THE INTERNATIONAL  
SfB CLASSIFICATION SYSTEM (RIBA/SfB)

Type : Thesaurus  
Purpose : To facilitate reference to information pertaining to building  
Description: The RIBA/SfB system is essentially an information retrieval system with a limited thesaurus used as an input/output device.

The thesaurus for this system is the construction indexing manual. This document is used for both indexing and for referencing indexed information. In indexing, when a new article, book, etc., is received, the construction indexing manual is consulted to assign a number to this article, book, etc. In referencing, the construction indexing manual is consulted to determine the number of the subject material desired. It can be seen that the construction indexing manual is therefore the input/output device of the system. This manual is essentially a thesaurus relating words pertaining to building to access numbers and vice versa.

A RIBA/SfB number is divided into four parts or tables. These are shown below:

## Material

|           |   |
|-----------|---|
| Table 0   | Built Environment                           |
| Table 1   | Different parts or elements of the building |
| Table 2/3 | Construction forms and materials            |
| Table 4   | Abstract concepts                           |

Each of these four tables has a unique notation. This is shown below:

## Notation

|                               |   |
|-------------------------------|---|
| Table 0 Built Environment     | A number, usually 2 or 3 digits long                                      |
| Table 1 Parts or Elements     | A bracketed number, usually 2 or 3 digits long                            |
| Table 2/3 Forms and Materials | A capital letter with a lower case letter, sometimes followed by a number |

# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

ROYAL INSTITUTE OF BRITISH ARCHITECTS AUTHORITATIVE  
 UNITED KINGDOM VERSION OF THE INTERNATIONAL  
 SFB CLASSIFICATION SYSTEM (RIBA/SfB)(cont'd)

|                              |  |
|------------------------------|--|
| Table 4 Abstract<br>Concepts | A bracketed capital letter,<br>sometimes followed by a<br>number and a lower case<br>letter. |
|------------------------------|--|

These notations are entered into a standard box divided into four parts and usually stamped on the book or article. Tables are read from left to right. A completed box would look as follows:

|     |      |     |     |
|-----|------|-----|-----|
| 410 | 21.1 | Fg2 | E2g |
|-----|------|-----|-----|

In actual use, it would be very unusual that a single book or article would have a notation in each of the four tables. This will be seen below.

In referencing a new book or article, the following four steps are followed:

STEP 1 The question is asked, "Does the document refer specifically to a particular building type or group of building types or the spaces within or around them?" If the answer is no, the referencer proceeds to Step 2. If the answer is yes, the referencer refers to Table 0, Built Environment, to choose a number to assign to this document. The following steps are accomplished.

STEP 1A Referring to Table 0, Built Environment, one of the following notations is assigned to the document.

| <u>Notation</u> | <u>Subject Covered</u>               |
|-----------------|--------------------------------------|
| 0               | Land, planning, landscape in general |
| 1               | Civil engineering works, transport   |
| 2               | Transport, industrial buildings      |
| 3               | Administrative, commercial buildings |

# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

ROYAL INSTITUTE OF BRITISH ARCHITECTS AUTHORITATIVE  
UNITED KINGDOM VERSION OF THE INTERNATIONAL  
SfB CLASSIFICATION SYSTEM (RIBA/SfB)(cont'd)

| <u>Notation</u> | <u>Subject Covered</u>                              |
|-----------------|---|
| 4               | Health and welfare buildings                        |
| 5               | Refreshment, entertainment,<br>recreation buildings |
| 6               | Religious buildings                                 |
| 7               | Educational, cultural,<br>scientific buildings      |
| 8               | Residential buildings in<br>general.                |

For example, if the document concerned the design of hospitals, the notation 4 would be assigned.

STEP 1B Once the first digit of the notation has been assigned, Table 0, Built Environment, is again referred to. Suppose the notation "4" was chosen in Step 1A, the following list would then be reviewed.

| <u>Notation</u> | <u>Subject Covered</u>                       |
|-----------------|--|
| 40              | Departments, internal and<br>external spaces |
| 41              | Hospitals                                    |
| 42              | Other health buildings                       |
| 43              | Vacant                                       |
| 44              | Homes  |
| 45              | Vacant                                       |
| 46              | Animal welfare buildings in<br>general       |
| 47              | Vacant                                       |
| 48              | Prison buildings                             |
| 49              | Vacant                                       |

For example, the document concerning the design of hospitals would then be assigned the notation "41."

STEP 1C Once the first two digits of the notation have been assigned, Table 0, Built Environment, is again referred to. Suppose the notation, "42," was chosen in Step 1B, the following list would then be reviewed.

# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

ROYAL INSTITUTE OF BRITISH ARCHITECTS AUTHORITATIVE  
UNITED KINGDOM VERSION OF THE INTERNATIONAL  
SfB CLASSIFICATION SYSTEM (RIBA/SfB)(cont'd)

| <u>Notation</u> | <u>Subject Covered</u>                            |
|-----------------|---|
| 410             | Departments, internal and external spaces         |
| 411             | Teaching including post-graduate teaching centres |
| 412             | General, district general hospitals, GP hospitals |
| 413             | Mental  |
| 414             | Maternity   |
| 415             | Isolation   |
| 416             | Other special hospitals                           |
| 417             | Clinical research centres                         |
| 418             | Military  |

For example, the document concerning the design of hospitals covers all of the special types of hospitals shown in the above list. Therefore, the document would not be assigned a third digit but remains indexed as "41." This completes the indexing required in Step 1.

STEP 2 The question is asked, "Does the document refer specifically to a particular building or site element or groups of elements?" If the answer is no, the referencer proceeds to Step 3. If the answer is yes, the referencer refers to Table 1, Elements, to choose a number to assign to this document. The following steps are accomplished.

STEP 2A Referring to Table 1, Elements, one of the following notations is assigned to the document.

| <u>Notation</u> | <u>Subject Covered</u> |
|-----------------|------------------------|
| (1)             | Substructure           |
| (2)             | Primary elements       |
| (3)             | Secondary elements     |
| (4)             | Finishes               |
| (5)             | Services               |
| (6)             | Installations          |
| (7)             | Fixtures               |

# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

ROYAL INSTITUTE OF BRITISH ARCHITECTS AUTHORITATIVE  
UNITED KINGDOM VERSION OF THE INTERNATIONAL  
SfB CLASSIFICATION SYSTEM (RIBA/SfB)(cont'd)

| <u>Notation</u> | <u>Subject Covered</u> |
|-----------------|------------------------|
|-----------------|------------------------|

|     |                   |
|-----|-------------------|
| (8) | Loose equipment   |
| (9) | Building and site |

The referencer then continues with Steps 2B and 2C which are similar to steps 1B and 1C described previously. The referencer then continues to Step 3.

STEP 3 The question is asked, "Does the document refer specifically to a construction form or material or to a particular group of any of these things?" If the answer is no, the referencer proceeds to Step 4. If the answer is yes, the referencer refers to Table 2/3, Construction Form, to choose a number to assign to this document. The following steps are accomplished.

STEP 3A Referring to Table 2/3, Construction Form, one of the following notations is assigned to the document.

| <u>Notation</u> | <u>Subject Covered</u> |
|-----------------|------------------------|
|-----------------|------------------------|

|   |                          |
|---|--------------------------|
| E | Cast in situ             |
| F | Bricks, blocks           |
| G | Structural units         |
| H | Sections                 |
| I | Tubes, pipes             |
| J | Wires, mesh              |
| K | Quilts                   |
| L | Foils, papers            |
| M | Foldable sheets          |
| N | Overlap sheets and tiles |
| P | Thick coatings           |
| R | Rigid sheets             |
| S | Tiles                    |
| T | Flexible sheets          |
| U | Papers, fabrics          |
| V | Thin coatings            |
| X | Components               |
| Y | Products in general.     |



# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

## ROYAL INSTITUTE OF BRITISH ARCHITECTS AUTHORITATIVE UNITED KINGDOM VERSION OF THE INTERNATIONAL SfB CLASSIFICATION SYSTEM (RIBA/SfB)(cont'd)

The referencer then continues with Steps 3B and 3C which are similar to steps 1B and 1C described previously. The referencer then continues to step 4.

STEP 4 The question is asked, "Does the document refer specifically to a particular activity, property or requirement like insulation or fire resistance or anything else which is not part of any product, element or building, but appears to be a basis for classification?" If the answer is no, the indexing of this document has been completed. If the answer is yes, the referencer refers to Table 4, Activities and Requirements, to choose a number to assign to this document. The following steps are then accomplished.

STEP 4A Referring to Table 4, Activities and Requirements, one of the following notations is assigned to the document.

| <u>Notation</u> | <u>Subject Covered</u>                 |
|-----------------|--|
| (A)             | Administration, management             |
| (B)             | Construction plant                     |
| (C)             | Vacant                                 |
| (D)             | Construction operations                |
| (E)             | Requirements in general                |
| (F)             | Layout, shape, dimensions              |
| (G)             | Appearance, aesthetics                 |
| (H)             | Physical, chemical, biological factors |
| (I)             | Air, water control                     |
| (J)             | Heat, cool in general                  |
| (K)             | Strength, statics, stability           |
| (L)             | Mechanics, dynamics                    |
| (M)             | Sound, quiet, in general               |
| (N)             | Light, dark, in general                |
| (O)             | Vacant                                 |
| (P)             | Vacant                                 |
| (Q)             | Radiation                              |
| (R)             | Fire                                   |
| (S)             | Durability, weathering                 |

# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

ROYAL INSTITUTE OF BRITISH ARCHITECTS AUTHORITATIVE  
UNITED KINGDOM VERSION OF THE INTERNATIONAL  
SfB CLASSIFICATION SYSTEM (RIBA/SfB)(cont'd)

| <u>Notation</u> | <u>Subject Covered</u>       |
|-----------------|------------------------------|
| (T)             | Vacant                       |
| (U)             | Special requirements         |
| (V)             | Building surrounds, etc.     |
| (W)             | Maintenance, alteration      |
| (X)             | Vacant                       |
| (Y)             | Economics, time requirements |
| (Z)             | Vacant                       |

The referencer then continues with steps 4B and 4C which are similar to steps 1B and 1C described previously. This then completes the indexing process. Through these four steps, access numbers are assigned to documents. To gain access to documents that have been previously referenced, the researcher goes through the same four steps that are required for referencing. Thus, the construction indexing manual acts as an input/output thesaurus for access to information pertaining to building.

Ref: Royal Institute of British Architects, "Construction Indexing Manual," 1968.

# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

## THE BSAB SYSTEM (SWEDEN)

Type : One and Two Way Division  
Purpose : To facilitate reference to building product information and for reference to construction specifications.  
Description: The BSAB System is composed of three inter-related tables. These three tables are:

Resource Table 1 - Commodities  
Product Table 1 - Assemblies  
Product Table 2 - Building Elements

Resource Table 1, Commodities, is a one way division of the basic materials that go into any given building. Commodities would include such items as reinforcing rods, mortar, concrete block, etc. The one way division of commodities is shown in Figure 8 on page 46. Information pertaining to a particular commodity or material would be filed under the appropriate category.

Product Table 1 - Assemblies, is a one way division of the components that go into any given building. Assemblies would include a block wall, a concrete slab, etc. The one way division is shown in Figure 9 on page 47. Information pertaining to assemblies or components would be filed under the appropriate category.

Product Table 2 - Building Elements is a one way division of the subsystems that go into any given building. Building Elements would include structure, site, etc. The one way division is shown in Figure 10 on page 48. Information pertaining to building elements or subsystems would be filed under the appropriate category.

# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

FIGURE 8  
THE BSAB SYSTEM  
RESOURCE TABLE 1 - COMMODITIES

|   |  |
|---|--|
| A | Vacant   |
| B | Vacant   |
| C | Vacant   |
| D | Vacant   |
| E | Cast in situ commodities                                       |
| F | Blocks for bonding with mortar or adhesive or dry stacking     |
| G | Prefabricated components, carcass                              |
| H | Sections and bars  |
| I | Pipes and tubes  |
| J | Wiring and conduits, electrical                                |
| K | Insulating commodities   |
| L | Foils and felts, etc.  |
| N | Overlapping tiles, etc.  |
| O | Sheet commodities  |
| P | Commodities for surface treatment                              |
| Q | Covering, lining and cladding commodities                      |
| R | Services components: vessels, pumps, heating and refrigeration |
| S | Services components: water and drainage                        |
| T | Services components: air treatment                             |
| U | Services components: measuring, monitoring and control         |
| V | Services components: electrical                                |
| W | Services components: lifts and other transport                 |
| X | Building components: doors, windows, etc.                      |
| Y | Building components: storage units, tables, etc.               |
| Z | Miscellaneous commodities                                      |

# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

FIGURE 9  
THE BSAB SYSTEM  
PRODUCT TABLE 1 - ASSEMBLIES

- A Vacant (Used in AMA 72 for administrative conditions)
- B Preparations, excavations, etc.
- C Fill, reinforcement, drainage, etc.
- D Groundworks: surfaces, etc.
- E In situ concrete
- F Brickwork and blockwork
- G Carcase assemblies of pre-fabricated units
- H Section and bar assemblies
- I Pipes, culverts, ducts, etc.
- J Electrical conduits and wiring
- K Thermal and sound insulation assemblies
- L Isolating assemblies, etc.
- M Flat sheet metal skin assemblies
- N Skin assemblies of tiles, slates, etc.
- O Skin assemblies of sheet materials
- P Plasterwork, painting, etc.
- Q Coverings, cladding and lining
- R Tanks, apparatus for cleaning and treatment, pumps and compressors, boilers, burners, heating and cooling equipment, refrigerating plants
- S Equipment for water and drainage installations
- T Air treatment equipment
- U Control and monitoring equipment
- V Electrical apparatus
- W Apparatus for lifts, etc.
- X Secondary assemblies - doors, windows, etc.
- Y Secondary assemblies - storage, units, tables, etc.
- Z Vacant

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# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

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FIGURE 10  
THE BSAB SYSTEM  
PRODUCT TABLE 2 - BUILDING ELEMENTS

- 0 Complex
- 1 Ground
- 2 Vacant
- 3 Building
- 4 Vacant
- 5 Installations,  
    piped and  
    ducted
- 6 Installations,  
    electrical
- 7 Transport
- 8 Vacant
- 9 Other elements

# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

## THE BSAB SYSTEM (SWEDEN)(cont'd)

Unlike Resource Table 1, Commodities, and Product Table 1, Assemblies, this table may be arranged into a two way division for use in indexing and writing specifications for buildings. These two way divisions are shown in Figures 11, 12, 13, 14, and 15, on pages 50, 51, 52, 53 and 54.

These two way divisions, or matrices, provide the opportunity to organize the same materials in two different ways. For example, referring to the matrix referring to the Building Element 3, Building, shown in Figure 12 on page 51 ; information pertaining to "Building" is assigned the number "3" identifying the appropriate matrix. Information can be indexed by either entering the matrix from the left or from the top. An example of indexing by entering the matrix from the left would be:

31/5/ Building, structure-load bearing, floor

An example of indexing by entering the matrix from the top would be:

3/5/1 Building, floor, structure-load bearing

The matrix can also index a wider or coarser categorization. For example:

3/ Building, structure-load bearing.

Ref: The Swedish Building Co-ordination Centre, "The BSAB System: A Step Towards an Information System for the Construction Industry in Sweden," 1972.

FIGURE 11  
 THE BSAB SYSTEM (SWEDEN)  
 MATRIX OF BUILDING ELEMENT 1, GROUND

|                 |                                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------|---------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| <b>1 GROUND</b> | /0/ Complex                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                 | /1/ Built areas                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                 | /2/ Services trenches           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                 | /3/ Hardsurfaced areas          |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                 | /4/ Landscaped areas            |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                 | /5/ Natural terrain             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                 | /6/                             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                 | /7/                             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                 | /8/                             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                 | /9/ Other elements              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                 | 0 Complex                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                 | 1 Site preparation and drainage |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                 | 2                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                 | 3                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                 | 4 Built elements                |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                 | 5                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                 | 6 Surface treatment             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                 | 7                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                 | 8 Secondary elements            |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                 | 9 Other elements                |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |





FIGURE 13

THE BSAB SYSTEM (SWEDEN)

MATRIX OF BUILDING ELEMENT 5, PIPED AND DUCTED

| 5 SERVICES,<br>PIPED and DUCTED | /0/ Complex | /1/ | /2/ Main centres | /3/ Distribution Centres | /4/ | /5/ Pipe systems (building) | /6/ Pipe systems (substructure and site | /7/ Controls | /8/ Local equipment | /9/ Other equipment |
|---------------------------------|-------------|-----|------------------|--------------------------|-----|-----------------------------|---|--------------|---------------------|---------------------|
| 0 Complex                       |             |     |                  |                          |     |                             |   |              |                     |                     |
| 1                               |             |     |                  |                          |     |                             |   |              |                     |                     |
| 2 Water, drainage               |             |     |                  |                          |     |                             |   |              |                     |                     |
| 3                               |             |     |                  |                          |     |                             |   |              |                     |                     |
| 4 Gas, compressed air           |             |     |                  |                          |     |                             |   |              |                     |                     |
| 5 Refrigeration                 |             |     |                  |                          |     |                             |   |              |                     |                     |
| 6 Heating                       |             |     |                  |                          |     |                             |   |              |                     |                     |
| 7 Air treatment                 |             |     |                  |                          |     |                             |   |              |                     |                     |
| 8 Control Systems               |             |     |                  |                          |     |                             |   |              |                     |                     |
| 9 Other services                |             |     |                  |                          |     |                             |   |              |                     |                     |



FIGURE 15  
 THE BSAB SYSTEM (SWEDEN)  
 MATRIX OF BUILDING ELEMENT 7, TRANSPORT

|                    |                             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--------------------|-----------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| <b>7 TRANSPORT</b> | /0/ Complex                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    | /1/ Machinery               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    | /2/ Machinery               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    | /3/ Loadbearing elements    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    | /4/ Loadcarriers            |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    | /5/ Hoisting and traction   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    | /6/ Wiring systems elements |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    | /7/ Controls                |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    | /8/ Terminal equipment      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                    | /9/ Other elements          |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

## ENGINEERS JOINT COUNCIL: THESAURUS OF ENGINEERING TERMS (EJC THESAURUS)

Type : Thesaurus  
Purpose : To facilitate reference to information pertaining to engineering.  
Description: The EJC Thesaurus is an information retrieval system with a thesaurus used as an input/output device.

The thesaurus for this system is the Engineers Joint Council (EJC) Thesaurus of Engineering Terms. This document is used as an input/output device or "gate" to indexed material. In indexing, appropriate words are chosen from the EJC Thesaurus to describe the contents of the document to be indexed. In referencing, the EJC Thesaurus is consulted to find the controlled key words most adequately identifying the material desired. These controlled key words can be used in three basic modes; (1) intersection, (2) union or (3) exclusion. These operations are detailed below.

In indexing a new document using this system, the following two steps are followed.

STEP 1 When a new document is received for inclusion in this system, the first step is to analyze the contents of this document.

STEP 2 Following analysis, controlled key words contained in the EJC Thesaurus that best describe the contents of the document are assigned to that document.

Before proceeding with a description of how to reference indexed documents using the EJC Thesaurus, it is necessary to describe the Thesaurus in more detail.

The EJC Thesaurus contains a single list in alphabetical order. An example of this listing is shown below.

HOSES

UF RUBBER HOSE  
RT CONDUITS (WATER) &  
PIPES &  
TUBES &

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# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

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## ENGINEERS JOINT COUNCIL: THESAURUS OF ENGINEERING TERMS (EJC THESAURUS)(cont'd)

### HOSPITALS

- BT PUBLIC BUILDINGS
- RT OPERATING ROOMS
- RELIGIOUS BUILDINGS
- SCHOOL BUILDINGS

### HOT BENDING

- USE HOT WORKING
- METAL BENDING #

This listing thus indicates authorized key words and non-authorized key words. In the above example, HOT WORKING is indicated as authorized as compared to HOT BENDING, not authorized. This is indicated by the term "USE." Conversely, the thesaurus indicates by the symbol "UF" (Used For), that HOSES is an authorized term for RUBBER HOSE.

The EJC Thesaurus also indicates relationships between words. In the above example, PUBLIC BUILDINGS is designated "BT" meaning that it is a broader term than HOSPITALS. For the listing of PUBLIC BUILDINGS, HOSPITALS would be designated "NT", meaning that it is a narrower term.

In the EJC Thesaurus, "RT" designates a related term. In the above example, CONDUITS (WATER), PIPES and TUBES are all shown as related terms to HOSES.

Referencing of indexed documents is accomplished then, by referring to the EJC Thesaurus. The Thesaurus leads through the use of the above relationships, to the most descriptive, authorized key words. Inquiries based on these key words may be phrased in three basic modes (1) intersection, (2) union or (3) exclusion.

In an inquiry consisting of intersections, references are obtained that are common to all of the two or more key words given. An example of an intersection inquiry would be, "What are the document numbers of all documents dealing with PLANNING of HOSPITALS?"

In an inquiry consisting of unions, references are obtained that are contained in at least one of the two or more key words. An example of

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# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

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ENGINEERS JOINT COUNCIL: THESAURUS OF ENGINEERING TERMS  
(EJC THESAURUS)(cont'd)

an union intersection would be "What are the document dealing with either HOSPITALS or OPERATING ROOMS?"

Finally, an inquiry containing exclusions references are obtained that are not common to at least one key word. An example of an exclusion inquiry would be "What are the document numbers of all documents dealing with OPERATING ROOMS but not HOSPITALS?"

Ref: Engineers Joint Council, "Thesaurus of Engineering Terms," May 1964.

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# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

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## INDUSTRIALIZATION FORUM THESAURUS OF BUILDING SCIENCES AND TECHNOLOGY (IF THESAURUS)

Type : Thesaurus  
Purpose : To facilitate reference to information pertaining to building sciences and technology  
Description: The IF Thesaurus is an information retrieval system with a thesaurus used as an input/output device.

The thesaurus for this system is the IF Thesaurus of Building Science and Technology, preliminary edition. This document is used as an input/output device or "gate" to indexed material. In indexing, a unique number is assigned to each new article, book, and other material that is received. The IF Thesaurus is used to identify this document by certain controlled words. In referencing, the IF Thesaurus is consulted to find the key controlled words most adequately identifying the material desired. These controlled key words then identify unique document numbers of documents pertaining to the subject desired. These operations are detailed below:

In indexing a new document using this system, the following three steps are followed:

STEP 1 When a new document is received for inclusion in this system, the first step is to assign this document a unique number. As presently used, new documents are assigned serial numbers. These assigned numbers are access numbers only, and by themselves do not identify the contents or the author of a given document.

STEP 2 The second step involved in indexing of a new document is the detailed review of the contents of that document and the selection of pertinent, authorized key words with the help of the IF Thesaurus. Three types of key words can be used.

- a. DESCRIPTIVE KEYWORDS - key words describing the conceptual content of the new document, i.e. what that document is about. For example, if the document concerned the design of hospitals, the key words \*DESIGN and \*HOSPITALS



# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

## INDUSTRIALIZATION FORUM THESAURUS OF BUILDING SCIENCES AND TECHNOLOGY (IF THESAURUS)(cont'd)

would be used as both of these key words appear in the IF Thesaurus as authorized terms, or descriptors.

- b. IDENTIFYING KEYWORDS - Key words identifying the physical characteristics of the new document, i.e. authored by, a collection of, etc. For example if the document was a collection of hospital floor plans authored by the American Hospital Association, the key words \*FLOOR PLANS and \*AMERICAN HOSPITAL ASSOCIATION would be used. Unlike descriptive key words; identifying key words would usually not be found in the IF Thesaurus but would be developed by each user. Descriptive key words and identifying key words are usually kept separately.
- c. PROPER NOUNS - Key words identifying proper nouns can also be used. For example, if the document concerned the design of the Ardmore Hospital, the key word \*ARDMORE HOSPITAL would be used. Like identifying key words proper nouns are not usually found in the IF Thesaurus and would also be developed by each user. Also like identifying key words, proper nouns are usually kept separately.

STEP 3 The third step in indexing a new document is entering it into the coordinate index, that is, assigning the unique number assigned in step 1 to each of the key word files. For example, if the document concerning hospital design (Step 2a above) was assigned the unique number 4184; then the number 4184 would be entered into the file \*DESIGN and into the file \*HOSPITALS. These files can be magnetic storage devices (i.e. for computer storage) or hard copy (i.e. for manual indexing cards).

# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

## INDUSTRIALIZATION FORUM THESAURUS OF BUILDING SCIENCES AND TECHNOLOGY (IF THESAURUS)(cont'd)

Before proceeding with a description of how to reference indexed documents using the IF Thesaurus it is necessary to describe the Thesaurus in more detail.

The IF Thesaurus is organized in two parts, the alpha-hierarchical list and the alpha-permuted list.

The Alpha-hierarchical list, the main part of the IF Thesaurus, is an alphabetical collection of main entries with indicators and cross references for each main term. For example, the alpha-hierarchical listing for the authorized descriptive key word \*HOSPITALS would look as follows:

```
*HOSPITALS                *6*
BT health facilities
PT hospital wards
    operating theaters
```

The designations \*6\*, BT and PT will be discussed later.

The alpha-permuted list is a alphabetical listing of all single and composite key words. For example, the alpha-permuted list starting with \*HOMES would look as follows:

```
HOMES                                ***
    . . . USE DWELLINGS (HOMES)
CONVALESCENT HOMES                    *6*
    MOBILE HOMES                        *6*
    SECONDARY HOMES                      ***
    . . . USE OCCASIONAL DWELLINGS
HOMES FOR THE HANDICAPPED              *6*
HOMES FOR THE AGED                     *6*
DWELLINGS (HOMES)                       *6*
HOMOGENEITY                             *6*
HOMOGENIZING                            *7*
```

This listing thus indicates authorized key words, called descriptors, versus non-authorized words, called non-descriptors. In the above example, HOMES and SECONDARY HOMES are both

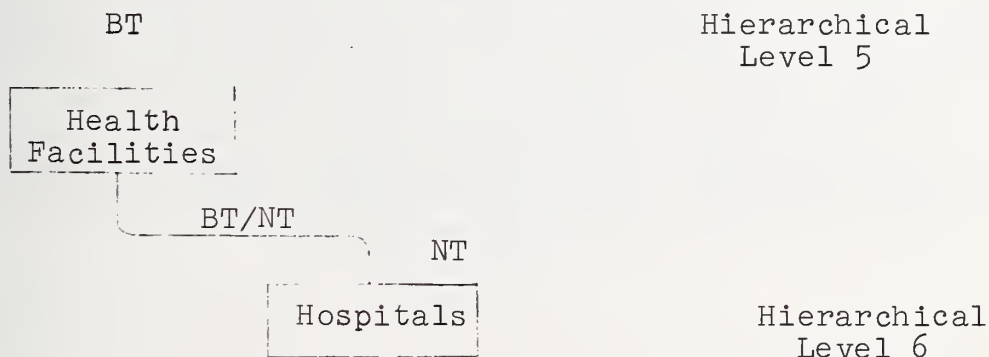
# EXISTING ARCHITECTURAL INFORMATION INDEXING SYSTEMS

## INDUSTRIALIZATION FORUM THESAURUS OF BUILDING SCIENCES AND TECHNOLOGY (IF THESAURUS)(cont'd)

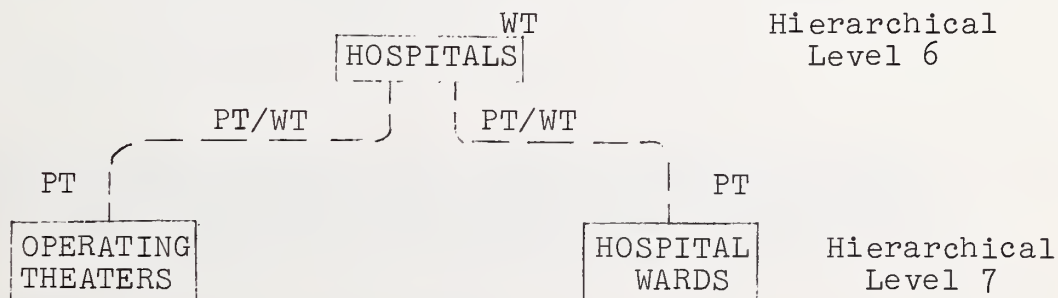
indicated as non-descriptors while DWELLINGS (HOMES) and OCCASIONAL DWELLINGS are indicated as descriptors.

The numbers indicate the hierarchical level of each descriptor from a high of 1 to a low of 9. For example, \*HOSPITALS is indicated at a hierarchical level of 6 while \*HEALTH FACILITIES is indicated at a hierarchical level of 5.

These hierarchical levels are determined by hierarchical descriptors listed in the alpha-hierarchical list described above. In the example shown above for \*HOSPITALS, two hierarchical descriptors are shown; BT and NT. BT means broader term. That is, health facilities is a broader term (BT) than hospitals. Conversely, hospitals is a narrower term (NT) than health facilities. Graphically, this relationship is shown by a solid line in the following diagram.



The second hierarchical descriptor shown for the \*HOSPITALS example is PT meaning part term. That is, hospital wards and operating theaters are part terms (PT) of the term Hospitals. Conversely, the term Hospitals is a whole term (WT) of the terms hospital wards and operating theaters. Graphically, these relationships are shown by broken lines in the following diagram.





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| 16. ABSTRACT (A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here.)<br><br>Architectural indexing systems are those mechanisms which we use to organize information concerning how and what to build. Architectural indexing systems are a means of organizing available information in a manner that can readily be grasped by the user. As such, architectural indexing systems are an important component part of architectural information systems. This report reviews and summarizes existing architectural indexing systems presently used in the United States and overseas. Indexing systems reviewed are classified into (1) one way divisions, (2) two way divisions, (3) thesauri and other indexing systems. |  |   |   |                              |
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