

THE GENERAL ASSEMBLY OF PENNSYLVANIA

HOUSE BILL

No. 552

Session of
1977

INTRODUCED BY MESSRS. ITKIN, B. F. O'BRIEN, MISCEVICH, ABRAHAM,
TRELLO, GAMBLE, McCALL, LEHR AND J. L. WRIGHT, MARCH 7, 1977

AS REPORTED FROM COMMITTEE ON MINES AND ENERGY MANAGEMENT, HOUSE
OF REPRESENTATIVES, AS AMENDED, JULY 13, 1977

AN ACT

1 ~~Providing for the regulation for energy conservation purposes~~ <—
2 ~~the construction of public industrial and commercial~~
3 ~~buildings, the establishment of an advisory committee,~~
4 ~~appeals, and for penalties.~~

1 PROVIDING FOR THE REGULATION FOR ENERGY CONSERVATION PURPOSES OF <—
2 THE CONSTRUCTION OF BUILDINGS, THE ESTABLISHMENT OF A
3 BUILDING ENERGY CONSERVATION COMMITTEE, APPEALS AND FOR
4 PENALTIES.

TABLE OF CONTENTS

CHAPTER 1. GENERAL PROVISIONS

SECTION 101. SHORT TITLE.

SECTION 102. LEGISLATIVE FINDINGS AND DECLARATION OF
PURPOSE.

SECTION 103. DEFINITIONS.

CHAPTER 2. ENERGY CONSERVATION STANDARDS

SECTION 201. PROVISIONS.

SUBCHAPTER A. PLANS AND SPECIFICATIONS

SECTION 202. SUBMISSION.

SECTION 203. CONTENTS.

SUBCHAPTER B. DEFINITIONS RELATING TO ENERGY CONSERVATION

1	STANDARDS
2	SECTION 204. DEFINITIONS RELATING TO STANDARDS.
3	SUBCHAPTER C. BUILDING ENVELOPE
4	SECTION 205. GENERAL PROVISIONS.
5	SECTION 206. CRITERIA FOR RESIDENTIAL BUILDINGS.
6	SECTION 207. OTHER BUILDINGS.
7	SECTION 208. AIR LEAKAGE.
8	SUBCHAPTER D. WARM AIR HEATING, VENTILATING AND AIR
9	CONDITIONING SYSTEMS AND EQUIPMENT
10	SECTION 209. GENERAL PROVISIONS.
11	SECTION 210. DESIGN REQUIREMENTS.
12	SECTION 211. COOLING WITH OUTDOOR AIR.
13	SECTION 212. MECHANICAL VENTILATION.
14	SECTION 213. SIMULTANEOUS HEATING AND COOLING.
15	SECTION 214. REHEAT SYSTEMS.
16	SECTION 215. DUAL DUCT AND MULTIZONE SYSTEMS.
17	SECTION 216. RECOOLING SYSTEMS.
18	SECTION 217. MULTIPLE ZONES.
19	SECTION 218. CONCURRENT OPERATION.
20	SECTION 219. EQUIPMENT PERFORMANCE REQUIREMENTS.
21	SECTION 220. DUCT INSULATION.
22	SECTION 221. SYSTEM CONTROLS.
23	SECTION 222. STEAM AND HOT WATER HEATING PIPING.
24	SUBCHAPTER E. PLUMBING SYSTEMS
25	SECTION 223. PURPOSE.
26	SECTION 224. FIXTURES.
27	SECTION 225. INSULATION.
28	SECTION 226. EQUIPMENT.
29	SECTION 227. CONTROLS.
30	SUBCHAPTER F. ELECTRICAL SYSTEMS

1 SECTION 228. SYSTEM REQUIREMENTS.
2 SUBCHAPTER G. LIGHTING
3 SECTION 229. LIGHT POWER BUDGET.
4 SECTION 230. CALCULATION METHODS.
5 SECTION 231. BUILDING INTERIORS.
6 SECTION 232. BUILDING EXTERIORS.
7 SECTION 233. EXCEPTIONS TO CRITERIA.
8 SECTION 234. CALCULATION PROCEDURE.
9 SUBCHAPTER H. ALTERNATIVE SYSTEMS
10 SECTION 235. PERFORMANCE ALTERNATIVE.
11 SECTION 236. NONDEPLETABLE SOURCES.
12 SECTION 237. DOCUMENTATION.
13 CHAPTER 3. APPLICATION OF STANDARDS: ESTABLISHMENT OF
14 COMMITTEE AND PENALTIES
15 SECTION 301. MODIFICATION OF STANDARDS; CRITERIA.
16 SECTION 302. APPLICATION OF ENERGY CONSERVATION STANDARDS.
17 SECTION 303. ENERGY CONSERVATION MANUAL FOR BUILDINGS.
18 SECTION 304. BUILDING ENERGY CONSERVATION COMMITTEE.
19 SECTION 305. CERTIFICATION.
20 SECTION 306. VARIANCES.
21 SECTION 307. BUILDING PERMITS.
22 SECTION 308. PERMITS FOR USE OR OCCUPANCY.
23 SECTION 309. FAILURE TO SUBMIT CERTIFICATION.
24 SECTION 310. INSPECTIONS.
25 SECTION 311. FAILURE TO COMPLY WITH PROVISIONS OF THIS ACT.
26 SECTION 312. APPEALS.
27 SECTION 313. PENALTIES.
28 SECTION 314. ENFORCEMENT.
29 SECTION 315. EFFECTIVE DATE.

30 The General Assembly of the Commonwealth of Pennsylvania

1 hereby enacts as follows:

2 ~~Section 1. Short title.~~

<—

3 ~~This act shall be known and may be cited as the "Building~~
4 ~~Energy Conservation Act."~~

5 ~~Section 2. Legislative findings and declaration of purpose.~~

6 ~~(a) The Legislature hereby determines that:~~

7 ~~(1) Energy shortages in the domestic supply present far~~
8 ~~reaching problems that promise to persist. These energy~~
9 ~~shortages effect the continued efficient operation of the~~
10 ~~Commonwealth's economy and social structure.~~

11 ~~(2) It is the Commonwealth's responsibility to provide~~
12 ~~for energy conservation in several classes of buildings~~
13 ~~through regulation of design and construction standards.~~

14 ~~(3) The Legislature intends, by this act, to respond to~~
15 ~~these shortages by devising a specific responsible energy~~
16 ~~conservation policy for building systems.~~

17 ~~(b) The purpose of this act is to grant to the Commonwealth~~
18 ~~of Pennsylvania and direct it to exercise specific authority in~~
19 ~~public, commercial and industrial building construction to~~
20 ~~assure that such construction is performed using materials and~~
21 ~~techniques that will provide for energy conservation in the~~
22 ~~future operation and maintenance of said structure.~~

23 ~~Section 3. Definitions.~~

24 ~~The following words and phrases when used in this act shall~~
25 ~~have, unless the context clearly indicates otherwise, the~~
26 ~~meanings given to them in this section:~~

27 ~~"Building." Any structure included in the Class I, II, III,~~
28 ~~IV building categories cited in section 2, act of April 27, 1927~~
29 ~~(P.L.465, No.299), referred to as the Fire and Panic Act, except~~
30 ~~for:~~

~~(1) structures that will not consume energy for heating or cooling for the comfort of personnel using the structure, or whose peak design rate of energy usage is less than one watt/square foot of floor area for normal purposes;~~

~~(2) structures or those portions of structures used for manufacturing or processing and whose manufacturing or processing procedures require the use of substantial heat producing energy to create their product;~~

~~(3) single and two family dwellings; and~~

~~(4) buildings in the Class I, II, III, IV building categories under 5,000 square feet of floor area.~~

~~"Constructed." The erection, fabrication, reconstructions or conversion.~~

~~"Department." The Pennsylvania Department of Labor and Industry.~~

~~"Design." Calculations and resultant drawings and specifications which are used for the construction of a building.~~

~~"Reconstruction." The rehabilitation of an existing building to reasonably place it in its original structural condition and which requires more than 50% of the entire building to be rebuilt.~~

~~Section 4. Adoption and promulgation of standards.~~

~~The department shall, after one or more public hearings, adopt and publish energy conservation standards for all new buildings. The purpose of such standards is to reduce wasteful or uneconomic consumption of energy by balancing the cost of energy procurement against the cost of energy conserving building practices. The energy conservation standards shall meet the following criteria:~~

1 ~~(1) They shall be consistent with the latest and most~~
2 ~~effective technology.~~

3 ~~(2) They shall provide adequate safeguards for public~~
4 ~~health and safety.~~

5 ~~(3) They shall be economically feasible.~~

6 ~~(4) They shall be sufficiently stringent to effect a~~
7 ~~significant savings of energy resources by both residential~~
8 ~~buildings regulated by the act and nonresidential buildings.~~

9 ~~(5) They shall include both performance and procedural~~
10 ~~standards.~~

11 ~~Section 5. Performance standards.~~

12 ~~The department shall establish standards for the design of~~
13 ~~buildings and systems within buildings to assure maximum~~
14 ~~practical conservation of energy. These standards shall~~
15 ~~establish parameters within which designers of buildings shall~~
16 ~~work. The specific practices that a designer employs shall not~~
17 ~~be prescribed, as long as the result is within the parameters~~
18 ~~established by the standards.~~

19 ~~Section 6. Procedural standards.~~

20 ~~The procedural standards shall be directed toward specific~~
21 ~~design and building practices that produce building envelopes~~
22 ~~with good thermal resistance and low air leakage and toward~~
23 ~~requiring practices in the designing of mechanical and~~
24 ~~electrical systems which conserve energy.~~

25 ~~Section 7. Residential and nonresidential structures.~~

26 ~~The construction of both nonresidential and residential~~
27 ~~structures shall be in accordance with standards developed by~~
28 ~~the department. In the development of such standards, the~~
29 ~~department shall consider building and energy standards~~
30 ~~promulgated by national and other State governmental agencies,~~

~~private organizations, and any other available energy data, as well as the total energy allocation approach. The standards shall provide for a baseline reference for normal, acceptable practices and maximum rates of allowable energy consumption in the performance standards, or procedural standards which may be used at the option of the owner and/or his architect, engineer or design builder. The department shall review the distinction between residential and nonresidential structures, locations, uses and occupancies to determine if different standards are required.~~

~~Section 8. Applicability of energy conservation standards.~~

~~The energy conservation standards shall take effect six months after their adoption and are published as regulations in the Pennsylvania Bulletin in accordance with the act of July 31, 1968 (P.L.769, No.240), known as the "Commonwealth Documents Law" and shall apply only to new buildings on which actual construction and/or design has not commenced prior to their effective date.~~

~~Section 9. Energy conservation manual for buildings.~~

~~(a) Concurrent with the adoption of the energy conservation standards required by this act, the department shall produce an energy conservation manual for use by designers, builders, and contractors of residential and nonresidential buildings. The manual shall be furnished upon request to members of the public at a price sufficient to cover the cost of printing.~~

~~(b) The manual shall be reviewed at least annually and shall be updated as significant new energy conservation information becomes available.~~

~~Section 10. Building Energy Conservation Committee.~~

~~(a) In order to further the coordinated and effective~~

1 ~~administration of this act, there shall be established a~~
2 ~~Building Energy Conservation Committee, the membership of which~~
3 ~~shall be appointed by the Secretary of Labor and Industry and~~
4 ~~shall include a representative recommended by the Department of~~
5 ~~Education, the Governor's Energy Council, Department of General~~
6 ~~Services, Department of Labor and Industry, Pennsylvania~~
7 ~~Builders Association, Pennsylvania Chamber of Commerce, General~~
8 ~~Contractors Association of Pennsylvania, Pennsylvania Society of~~
9 ~~Architects, Pennsylvania Society of Professional Engineers, and~~
10 ~~such other organizations or individuals as the secretary may~~
11 ~~find are necessary and proper to carry out the purposes of the~~
12 ~~committee.~~

13 ~~(b) Said committee shall be responsible for the regular~~
14 ~~exchange of information and plans regarding building energy~~
15 ~~conservation, for the development and review of proposed and~~
16 ~~existing standards, guidelines, regulations, and manuals, and~~
17 ~~shall make recommendations to the industrial board consistent~~
18 ~~with the provisions of this act.~~

19 ~~(c) Said committee shall also act as an advisory committee~~
20 ~~to the industrial board and/or the advisory board on building~~
21 ~~construction in matters of building energy conservation and may~~
22 ~~recommend to the board variances from standards, guidelines,~~
23 ~~regulations and manuals after consultation within the committee~~
24 ~~or with any person affected by such standards, guidelines,~~
25 ~~regulations or manuals.~~

26 ~~(d) The members of the committee shall not receive any~~
27 ~~compensation for their services but shall be reimbursed for~~
28 ~~their actual and necessary expenses incurred in the performance~~
29 ~~of their duties. Provided, however, when acting as an advisory~~
30 ~~committee to the industrial board or the advisory board on~~

~~building construction on matters concerning variances or appeals which have been referred to the industrial board, they shall receive \$50 per day plus their actual and necessary expenses.~~

~~Section 11. Approval of plans.~~

~~(a) It shall be the duty of the owner, architect, engineer, or design builder of every building or structure, as described in this act, hereafter constructed, to submit to the department for approval, drawings, specifications, and/or other data showing compliance with the provisions of this act and the rules and regulations of the said department which may be promulgated for the enforcement of the provisions of this act. No such building or structure shall be constructed until such plans have been examined and approval given by the department and a building permit obtained in municipalities where such permit is required by ordinance.~~

~~(b) For making the necessary examination for approval of drawings, specifications, and/or other data, the department shall make a charge equal to the actual cost of making such examinations. Such charges shall be consistent with the maximum fees permitted by the act of April 27, 1927 (P.L.465, No.299), referred to as the Fire and Panic Act. The approvals required by this act shall be given at the same time and under the same conditions as those approvals required to be obtained prior to construction by the Fire and Panic Act.~~

~~Section 12. Permits for use or occupancy.~~

~~Before any building or structure hereafter constructed shall be used or opened for occupancy, the owner thereof shall notify the Department of Labor and Industry of the completion of the structure. If the department finds, after proper investigation, that the building or structure complies with the requirements of~~

~~this act, and the rules and regulations promulgated for the enforcement of the provisions of this act, then the department shall issue to the owner of the building or structure a permit authorizing the occupancy or use of the building or structure.~~

~~Section 13. Failure to submit plans or obtain approval.~~

~~Whenever the owner of any building or structure to be constructed shall fail to submit plans to the department or having submitted plans, shall have failed to obtain approval of such plans, and shall nevertheless proceed with the work of constructing the building, the department shall serve notice on the said owner, or his architect, engineer or contractor to immediately cease all work on said building; and a notice shall be placed on the premises prohibiting such work being performed until the said plans have been submitted and approval given by the department.~~

~~Section 14. Failure to comply with provisions of this act.~~

~~Whenever the owner of any building, as described in this act, shall fail to comply with the provisions of this act, or the rules and regulations of the department formulated under the authority of this act, and upon whom a written order shall be served by the department to comply with the said provisions of this act and the rules and regulations of the department and who nevertheless shall have failed to comply with the said written order within the time specified in the same, the department shall be authorized to immediately order the building or structure to be vacated or placed out of service until such time as the requirements of the act and the rules and regulations of the department shall have been fully complied with.~~

~~Section 15. Prosecutions.~~

~~(a) Any person who shall violate any of the provisions of~~

~~this act, or the rules and regulations of the orders for the enforcement of the said provisions or rules and regulations issued by duly authorized officers of the department or who shall hinder, delay or interfere with any officer charged with the enforcement of this act in the performance of his duty, shall, upon conviction thereof, be punished by a fine of \$300 and costs, or not more than three months imprisonment in the county jail, or either, or both, in the discretion of the court.~~

~~(b) Any person who shall fail or refuse to vacate a building or portion of a building, or who shall fail to cease work in the constructing of a building, or who shall fail to vacate or place out of service any building, after due notice having been served upon him by an officer of the department and proper notice having been placed upon the building or structure by such officer, shall be liable for a penalty of \$100 a day for each day he shall have so failed or refused to vacate, cease work on, or place out of service the building, portion of building upon which such notice has been placed, the said penalty to be collectible in the same manner as any fine payable to the Commonwealth.~~

~~(c) Prosecutions for violations of this act, or the rules and regulations of the department may be instituted by the Secretary of Labor and Industry, or under his directions by any authorized representative of the department. Upon conviction after a hearing the sentences provided in this act shall be imposed, and shall be final unless an appeal be taken in the manner prescribed by law.~~

~~(d) All fines collected under this act shall be forwarded to the department who shall pay the same into the State Treasury for the use of the Commonwealth.~~

1 ~~Section 16. Enforcement.~~

2 ~~(a) The provisions of this act shall apply to every building~~
3 ~~enumerated in this act, except buildings owned by the Federal~~
4 ~~Government, including buildings owned in whole or in part by the~~
5 ~~Commonwealth or any political subdivision thereof, and shall be~~
6 ~~enforced by the Secretary of Labor and Industry, by and through~~
7 ~~his authorized representatives, provided, that nothing in this~~
8 ~~act shall be construed as affecting buildings in cities of the~~
9 ~~first class, second class, and second class A.~~

10 ~~(b) For the purpose of enforcing the provisions of this act,~~
11 ~~all the officers charged with its enforcement shall have the~~
12 ~~power to enter any of the buildings enumerated in this act, and~~
13 ~~no person shall hinder or delay, or interfere with any of the~~
14 ~~said officers in the performance of his duty, nor refuse any~~
15 ~~pertinent information necessary to determine whether the~~
16 ~~provisions of this act and the rules and regulations herein~~
17 ~~provided for, are or will be complied with.~~

18 ~~Section 17. Effective date.~~

19 ~~This act shall take effect immediately.~~

20 CHAPTER 1

<—

21 GENERAL PROVISIONS

22 SECTION 101. SHORT TITLE.

23 THIS ACT SHALL BE KNOWN AND MAY BE CITED AS THE "BUILDING
24 ENERGY CONSERVATION ACT."

25 SECTION 102. LEGISLATIVE FINDINGS AND DECLARATION OF PURPOSE.

26 (A) FINDINGS.--THE LEGISLATURE HEREBY DETERMINES THAT:

27 (1) ENERGY SHORTAGES IN THE DOMESTIC SUPPLY PRESENT FAR-
28 REACHING PROBLEMS THAT PROMISE TO PERSIST. THESE ENERGY
29 SHORTAGES EFFECT THE CONTINUED EFFICIENT OPERATION OF THE
30 COMMONWEALTH'S ECONOMY AND SOCIAL STRUCTURE.

1 (2) IT IS THE COMMONWEALTH'S RESPONSIBILITY TO PROVIDE
2 FOR ENERGY CONSERVATION THROUGH REGULATION OF DESIGN AND
3 CONSTRUCTION STANDARDS.

4 (3) THE LEGISLATURE INTENDS, BY THIS ACT, TO RESPOND TO
5 THESE SHORTAGES BY DEVISING A SPECIFIC RESPONSIBLE ENERGY
6 CONSERVATION POLICY FOR BUILDING SYSTEMS.

7 (B) PURPOSE.--THE PURPOSE OF THIS ACT IS TO GRANT TO THE
8 COMMONWEALTH OF PENNSYLVANIA AND DIRECT IT TO EXERCISE SPECIFIC
9 AUTHORITY IN BUILDING CONSTRUCTION TO ASSURE THAT SUCH
10 CONSTRUCTION IS PERFORMED USING MATERIALS AND TECHNIQUES THAT
11 WILL PROVIDE FOR ENERGY CONSERVATION IN THE FUTURE OPERATION AND
12 MAINTENANCE OF SAID STRUCTURE.

13 SECTION 103. DEFINITIONS.

14 THE FOLLOWING WORDS AND PHRASES WHEN USED IN THIS ACT SHALL
15 HAVE, UNLESS THE CONTEXT CLEARLY INDICATES OTHERWISE, THE
16 MEANINGS GIVEN TO THEM IN THIS SECTION:

17 "BUILDING." ANY STRUCTURE THAT PROVIDES FACILITIES OR
18 SHELTER FOR PUBLIC ASSEMBLY OR FOR EDUCATIONAL, BUSINESS,
19 MERCANTILE, INSTITUTIONAL, WAREHOUSE OR RESIDENTIAL OCCUPANCY,
20 OR INDUSTRIAL USE INCLUDING, BUT NOT LIMITED TO, THOSE PORTIONS
21 OF FACTORY AND INDUSTRIAL OCCUPANCY SUCH AS OFFICE SPACE EXCEPT
22 FOR:

23 (1) BUILDINGS AND STRUCTURES OR PORTIONS THEREOF WHOSE
24 PEAK DESIGN RATE OF ENERGY USAGE IS LESS THAN ONE WATT PER
25 SQUARE FOOT OR 3.4 BTU/HR PER SQUARE FOOT OF FLOOR AREA FOR
26 ALL PURPOSES.

27 (2) STRUCTURES OR THOSE PORTIONS OF STRUCTURES USED FOR
28 MANUFACTURING OR PROCESSING AND WHOSE MANUFACTURING OR
29 PROCESSING PROCEDURES REQUIRE THE USE OF SUBSTANTIAL HEAT
30 PRODUCING ENERGY TO CREATE THEIR PRODUCT.

EQUIPMENT REQUIRED FOR THE PURPOSE OF EFFECTIVE USE OF ENERGY
AND SHALL GOVERN THE CONSTRUCTION OF ALL BUILDINGS, OR PORTIONS
THEREOF, AS PROVIDED HEREIN.

SUBCHAPTER A

PLANS AND SPECIFICATIONS

SECTION 202. SUBMISSION.

PLANS, SPECIFICATIONS AND NECESSARY COMPUTATIONS TOGETHER
WITH THE NECESSARY CERTIFICATION REQUIRED BY SECTION 305 SHALL
BE SUBMITTED TO INDICATE CONFORMANCE WITH THIS CHAPTER AND OTHER
APPLICABLE CHAPTERS OF THIS ACT.

SECTION 203. CONTENTS.

THE PLANS AND SPECIFICATIONS SHALL SHOW IN SUFFICIENT DETAIL
ALL PERTINENT DATA AND FEATURES OF THE BUILDING AND THE
EQUIPMENT AND SYSTEMS AS HEREIN GOVERNED, INCLUDING BUT NOT
LIMITED TO: EXTERIOR ENVELOPE COMPONENT MATERIALS, U VALUES OF
ELEMENTS, R VALUES OF INSULATING MATERIALS, SIZE AND TYPE OF
APPARATUS AND EQUIPMENT, EQUIPMENT AND SYSTEM CONTROLS AND OTHER
PERTINENT DATA TO INDICATE CONFORMANCE WITH THE REQUIREMENTS
HEREIN.

SUBCHAPTER B

DEFINITIONS RELATING TO

ENERGY CONSERVATION STANDARDS

SECTION 204. DEFINITIONS RELATING TO STANDARDS.

THE FOLLOWING WORDS AND PHRASES WHEN USED IN THIS CHAPTER
SHALL HAVE, UNLESS THE CONTEXT CLEARLY INDICATES OTHERWISE, THE
MEANINGS GIVEN TO THEM IN THIS SECTION:

"COEFFICIENT OF BEAM UTILIZATION" (CBU). THE RATIO OF THE
LUMINOUS FLUX (LUMENS) REACHING A SPECIFIED AREA DIRECTLY FROM A
FLOODLIGHT OR PROJECTOR TO THE TOTAL BEAM LUMINOUS FLUX.

"COEFFICIENT OF PERFORMANCE" (COP) - COOLING: THE RATIO OF

1 THE RATE OF NET HEAT REMOVAL TO THE RATE OF TOTAL ENERGY INPUT,
2 EXPRESSED IN CONSISTENT UNITS AND UNDER DESIGNATED RATING
3 CONDITIONS.

4 "COEFFICIENT OF PERFORMANCE" (COP) - HEAT PUMP, HEATING: THE
5 RATIO OF THE RATE OF NET HEAT OUTPUT TO THE RATE OF TOTAL ENERGY
6 INPUT, EXPRESSED IN CONSISTENT UNITS AND UNDER DESIGNATED RATING
7 CONDITIONS.

8 THE RATE OF NET HEAT OUTPUT SHALL BE DEFINED AS THE CHANGE IN
9 THE TOTAL HEAT CONTENTS OF THE AIR ENTERING AND LEAVING THE
10 EQUIPMENT NOT INCLUDING SUPPLEMENTARY HEAT.

11 TOTAL ENERGY INPUT SHALL BE DETERMINED BY COMBINING THE
12 ENERGY INPUTS TO ALL ELEMENTS, EXCEPT SUPPLEMENTARY HEATERS, OF
13 THE HEAT PUMP, INCLUDING, BUT NOT LIMITED TO, COMPRESSORS,
14 PUMPS, SUPPLY AIR FANS, RETURN AIR FANS, OUTDOOR AIR FANS,
15 COOLING TOWER FANS AND THE HEATING, VENTILATING AND AIR
16 CONDITIONING SYSTEM EQUIPMENT CONTROL CIRCUIT.

17 "COEFFICIENT OF UTILIZATION" (CU). THE RATIO OF THE LUMINOUS
18 FLUX (LUMENS) FROM A LUMINAIRE RECEIVED ON THE WORK PLANE TO THE
19 LUMENS EMITTED BY THE LUMINAIRE'S LAMPS ALONE.

20 "COLOR RENDITION." GENERAL EXPRESSION FOR THE EFFECT OF A
21 LIGHT SOURCE ON THE COLOR. APPEARANCE OF OBJECTS IN CONSCIOUS OR
22 SUBCONSCIOUS COMPARISON WITH THEIR COLOR APPEARANCE UNDER A
23 REFERENCE LIGHT SOURCE.

24 "DEGREE DAY, HEATING." A UNIT, BASED UPON TEMPERATURE
25 DIFFERENCE AND TIME, USED IN ESTIMATING FUEL CONSUMPTION AND
26 SPECIFYING NOMINAL HEATING LOAD OF A BUILDING IN WINTER. FOR ANY
27 ONE DAY, WHEN THE MEAN TEMPERATURE IS LESS THAN 65 F., THERE
28 EXISTS AS MANY DEGREE DAYS AS THERE ARE FAHRENHEIT DEGREES
29 DIFFERENCE IN TEMPERATURE BETWEEN THE MEAN TEMPERATURE FOR THE
30 DAY AND 65 F.

1 "ENERGY EFFICIENCY RATIO" (EER). THE RATIO OF NET COOLING
2 CAPACITY IN BTUH TO TOTAL RATE OF ELECTRIC INPUT IN WATTS UNDER
3 DESIGNATED OPERATING CONDITIONS.

4 "EQUIVALENT SPHERE ILLUMINATION" (ESI). THE LEVEL OF SPHERE
5 ILLUMINATION WHICH WOULD PRODUCE TASK VISIBILITY EQUIVALENT TO
6 THAT PRODUCED BY A SPECIFIC LIGHTING ENVIRONMENT.

7 "EXTERIOR ENVELOPE." THE ELEMENTS OF A BUILDING WHICH
8 ENCLOSE CONDITIONED SPACES THROUGH WHICH THERMAL ENERGY MAY BE
9 TRANSFERRED TO OR FROM THE EXTERIOR.

10 "FLOODLIGHTING." A LIGHTING SYSTEM DESIGNATED TO LIGHT AN
11 AREA USING PROJECTOR TYPE LUMINAIRES USUALLY CAPABLE OF BEING
12 POINTED IN ANY DIRECTION.

13 "FLOOD AREA, GROSS." GROSS FLOOR AREA SHALL BE THE FLOOR
14 AREA WITHIN THE PERIMETER OF THE OUTSIDE WALLS OF THE BUILDING
15 UNDER CONSIDERATION, WITHOUT DEDUCTION FOR HALLWAYS, STAIRS,
16 CLOSETS, THICKNESS OF WALLS, COLUMNS OR OTHER FEATURES.

17 "ILLUMINATION." THE DENSITY OF THE LUMINOUS FLUX INCIDENT ON
18 A SURFACE, IT IS THE QUOTIENT OF THE LUMINOUS FLUX BY THE AREA
19 OF THE SURFACE WHEN THE LATTER IS UNIFORMLY ILLUMINATED.

20 "LIGHT LOSS FACTOR" (LLF). A FACTOR USED IN CALCULATING THE
21 LEVEL OF ILLUMINATION AFTER A GIVEN PERIOD OF TIME AND UNDER
22 GIVEN CONDITIONS. IT TAKES INTO ACCOUNT TEMPERATURE AND VOLTAGE
23 VARIATIONS, DIRT ACCUMULATION ON LUMINAIRE AND ROOM SURFACES,
24 LAMP DEPRECIATION, MAINTENANCE PROCEDURES AND ATMOSPHERE
25 CONDITIONS.

26 "LUMINAIRE." A COMPLETE LIGHTING UNIT CONSISTING OF A LAMP
27 OR LAMPS TOGETHER WITH THE PARTS DESIGNED TO DISTRIBUTE THE
28 LIGHT, TO POSITION AND PROTECT THE LAMPS AND TO CONNECT THE
29 LAMPS TO THE POWER SUPPLY.

30 "PACKAGED TERMINAL AIR CONDITIONER." A FACTORY SELECTED

1 COMBINATION OF HEATING AND COOLING COMPONENTS, ASSEMBLIES OR
2 SECTIONS, INTENDED TO SERVE A ROOM OR ZONE.

3 "POWER." IN CONNECTION WITH MACHINES, POWER IS THE TIME RATE
4 OF DOING WORK. IN CONNECTION WITH THE TRANSMISSION OF ENERGY OF
5 ALL TYPES, POWER REFERS TO THE RATE AT WHICH ENERGY IS
6 TRANSMITTED; IN CUSTOMARY UNITS, IT IS MEASURED IN WATTS (W) OR
7 BRITISH THERMAL UNITS PER HOUR (BTUH) AND IN SI UNITS IS
8 MEASURED IN WATTS (W).

9 "REFLECTANCE." THE RATIO OF THE LIGHT REFLECTED BY A SURFACE
10 TO THE LIGHT FALLING UPON IT.

11 "REHEAT." THE APPLICATION OF SENSIBLE HEAT TO SUPPLY AIR
12 THAT HAS BEEN PREVIOUSLY COOLED BELOW THE TEMPERATURE OF THE
13 CONDITIONED SPACE BY EITHER MECHANICAL REFRIGERATION OR THE
14 INTRODUCTION OF OUTDOOR AIR TO PROVIDE COOLING.

15 "RESIDENTIAL BUILDINGS." ALL BUILDINGS AND STRUCTURES OR
16 PARTS THEREOF SHALL BE CLASSIFIED IN THE RESIDENTIAL (R) USE
17 GROUP IN WHICH FAMILIES OR HOUSEHOLDS LIVE, OR IN WHICH SLEEPING
18 ACCOMMODATIONS ARE PROVIDED FOR INDIVIDUALS WITH OR WITHOUT
19 DINING FACILITIES, EXCLUDING THOSE THAT ARE CLASSIFIED AS
20 INSTITUTIONAL BUILDINGS.

21 USE GROUP R-1 STRUCTURES. THIS USE GROUP SHALL INCLUDE ALL
22 HOTEL AND MOTEL BUILDINGS, LODGING HOUSES, BOARDING HOUSES AND
23 DORMITORY BUILDINGS ARRANGED FOR THE SHELTER AND SLEEPING
24 ACCOMMODATION OF MORE THAN 20 INDIVIDUALS.

25 USE GROUP R-2 STRUCTURES. THIS USE GROUP SHALL INCLUDE ALL
26 MULTIPLE-FAMILY DWELLINGS HAVING MORE THAN TWO DWELLING UNITS;
27 AND SHALL ALSO INCLUDE ALL DORMITORIES, BOARDING AND LODGING
28 HOUSES ARRANGED FOR SHELTER AND SLEEPING ACCOMMODATION BY MORE
29 THAN FIVE AND NOT MORE THAN 20 INDIVIDUALS.

30 USE GROUP R-3 STRUCTURES. THIS USE GROUP SHALL INCLUDE ALL

1 BUILDINGS ARRANGED FOR THE USE OF ONE OR TWO FAMILY DWELLING
2 UNITS INCLUDING NOT MORE THAN FIVE LODGERS OR BOARDERS PER
3 FAMILY.

4 "RESISTANCE, THERMAL" (R). A MEASURE OF THE ABILITY TO
5 RETARD THE FLOW OF HEAT. THE R VALUE IS THE RECIPROCAL OF A HEAT
6 TRANSFER COEFFICIENT, AS EXPRESSED BY U. $R = 1/U$.

7 "THERMAL TRANSMITTANCE" (U). OVERALL COEFFICIENT OF HEAT
8 TRANSMISSION OR THERMAL TRANSMITTANCE (AIR TO AIR) EXPRESSED IN
9 UNITS OF BTU PER HOUR PER SQUARE FOOT PER DEGREE F. IT IS THE
10 TIME RATE OF HEAT FLOW. THE U VALUE APPLIES TO COMBINATIONS OF
11 DIFFERENT MATERIALS USED IN SERIES ALONG THE HEAT FLOW PATH AND
12 ALSO TO SINGLE MATERIALS THAT COMPRISE A BUILDING SECTION AND
13 INCLUDE CAVITY AIR SPACES AND SURFACE AIR FILMS ON BOTH SIDES.

14 "THERMAL TRANSMITTANCE" (UO). OVERALL (AVERAGE) HEAT
15 TRANSMISSION OR THERMAL TRANSMITTANCE OF A GROSS AREA OF THE
16 EXTERIOR BUILDING ENVELOPE, EXPRESSED IN UNITS OF BTU PER HOUR
17 PER SQUARE FOOT PER DEGREE F.

18 THE UO VALUE APPLIES TO THE COMBINED EFFECT OF THE TIME RATE
19 OF HEAT FLOWS THROUGH THE VARIOUS PARALLEL PATHS, SUCH AS
20 WINDOWS, DOORS AND OPAQUE CONSTRUCTION AREAS, COMPRISING THE
21 GROSS AREA OF ONE OR MORE EXTERIOR BUILDING COMPONENTS, SUCH AS
22 WALLS, FLOOR OR ROOF/CEILING.

23 "THERMOSTAT." AN INSTRUMENT WHICH MEASURES CHANGES IN
24 TEMPERATURE AND CONTROLS DEVICES FOR MAINTAINING A DESIRED
25 TEMPERATURE.

26 "VEILING REFLECTIONS." REGULAR REFLECTIONS SUPERIMPOSED UPON
27 DIFFUSE REFLECTIONS FROM AN OBJECT THAT PARTIALLY OR TOTALLY
28 OBSCURE THE DETAILS TO BE SEEN BY REDUCING THE CONTRAST. THIS
29 SOMETIMES IS CALLED "REFLECTED GLARE."

30 "WORK PLANE." THE PLANE AT WHICH WORK USUALLY IS DONE AND AT

1 WHICH THE ILLUMINATION IS SPECIFIED AND MEASURED. UNLESS
2 OTHERWISE INDICATED, THIS IS ASSUMED TO BE A HORIZONTAL PLANE 30
3 IN. (0.76 M) ABOVE THE FLOOR.

4 "ZONE." A SPACE OR GROUP OF SPACES WITHIN A BUILDING WITH
5 HEATING OR COOLING REQUIREMENTS SUFFICIENTLY SIMILAR SO THAT
6 COMFORT CONDITIONS CAN BE MAINTAINED THROUGHOUT BY A SINGLE
7 CONTROLLING DEVICE.

8 SUBCHAPTER C
9 BUILDING ENVELOPE

10 SECTION 205. GENERAL PROVISIONS.

11 (A) PURPOSE OF SUBCHAPTER.--THE INTENT OF THIS SUBCHAPTER IS
12 TO PROVIDE MINIMUM REQUIREMENTS FOR EXTERIOR ENVELOPE
13 CONSTRUCTION IN THE INTEREST OF ENERGY CONSERVATION.

14 IN ADDITION TO THE CRITERIA SET FORTH IN THIS SUBCHAPTER THE
15 PROPOSED DESIGN MAY TAKE INTO CONSIDERATION THE THERMAL MASS OF
16 THE BUILDING IN CONSIDERING ENERGY CONSERVATION.

17 (B) THERMAL PERFORMANCE.--ALL BUILDINGS AND STRUCTURES THAT
18 ARE HEATED OR MECHANICALLY COOLED SHALL BE CONSTRUCTED SO AS TO
19 PROVIDE THE REQUIRED THERMAL PERFORMANCE OF THE VARIOUS
20 COMPONENTS.

21 THE REQUIRED THERMAL TRANSMITTANCE VALUE (UO) OF ANY ONE
22 COMPONENT, SUCH AS ROOF/CEILING, WALL OR FLOOR MAY BE INCREASED
23 AND THE UO VALUE FOR OTHER COMPONENTS DECREASED PROVIDED THAT
24 THE OVERALL HEAT GAIN OR LOSS FOR THE ENTIRE BUILDING ENVELOPE
25 DOES NOT EXCEED THE TOTAL RESULTING FROM CONFORMANCE TO THE
26 REQUIRED UO VALUES.

27 (C) DIFFERENT REQUIREMENTS.--A BUILDING THAT IS DESIGNED TO
28 BE BOTH HEATED AND COOLED SHALL MEET THE MORE STRINGENT OF THE
29 HEATING OR COOLING REQUIREMENTS OF THE EXTERIOR ENVELOPE AS
30 PROVIDED IN THIS SUBCHAPTER WHEN REQUIREMENTS DIFFER.

(D) EXTERIOR WALLS.--FOR THE PURPOSE OF THIS SUBCHAPTER THE GROSS AREA OF EXTERIOR WALLS CONSISTS OF ALL OPAQUE WALL AREAS, INCLUDING FOUNDATION WALLS ABOVE GRADE, PERIPHERAL EDGES OF FLOORS, WINDOW AREAS INCLUDING SASH, AND DOOR AREAS, WHERE SUCH SURFACES ARE EXPOSED TO OUTDOOR AIR AND ENCLOSE A HEATED OR MECHANICALLY COOLED SPACE.

(E) ROOF ASSEMBLY.--FOR THE PURPOSE OF THIS SUBCHAPTER A ROOF ASSEMBLY SHALL BE CONSIDERED AS ALL COMPONENTS OF THE ROOF/CEILING ENVELOPE THROUGH WHICH HEAT FLOWS, THEREBY CREATING A BUILDING TRANSMISSION HEAT LOSS OR GAIN, WHERE SUCH ASSEMBLY IS EXPOSED TO OUTDOOR AIR AND ENCLOSSES A HEATED OR MECHANICALLY COOLED SPACE.

THE GROSS AREA OF A ROOF ASSEMBLY CONSISTS OF THE TOTAL INTERIOR SURFACE OF SUCH ASSEMBLY, INCLUDING SKYLIGHTS, EXPOSED TO THE HEATED OR MECHANICALLY COOLED SPACE.

WHERE AIR CEILING PLENUMS ARE EMPLOYED, THE ROOF OR CEILING ASSEMBLY SHALL:

(1) FOR THERMAL TRANSMITTANCE PURPOSES NOT INCLUDE THE CEILING PROPER NOR THE PLENUM SPACE AS PART OF THE ASSEMBLY.

(2) FOR GROSS AREA PURPOSES BE BASED UPON THE INTERIOR FACE OF THE UPPER PLENUM SURFACE.

SECTION 206. CRITERIA FOR RESIDENTIAL BUILDINGS.

(A) APPLICABILITY.--THE REQUIREMENTS HEREIN SHALL APPLY TO ALL BUILDINGS AND STRUCTURES OR PORTIONS THEREOF OF USE GROUPS R-1, R-2 AND R-3 THAT ARE HEATED OR MECHANICALLY COOLED WHEN NOT MORE THAN 3 STORIES OR 40 FEET IN HEIGHT.

(B) WALLS.--THE GROSS AREA OF EXTERIOR WALLS ABOVE GRADE, INCLUDING FOUNDATION WALLS, SHALL HAVE A COMBINED THERMAL TRANSMITTANCE VALUE (U_o) NOT EXCEEDING THOSE SPECIFIED IN TABLE 1, WITH THE FOLLOWING EXCEPTIONS:

(1) IN LOCATIONS WITH LESS THAN 500 HEATING DEGREE DAYS THERE SHALL NOT BE A MAXIMUM UO REQUIREMENT IF ONLY HEATING IS PROVIDED AND THE UO SHALL BE 0.30 MAXIMUM IF THE BUILDING IS MECHANICALLY COOLED.

(2) THE OPAQUE EXTERIOR WALL AREAS MAY BE CONSTRUCTED HAVING THERMAL TRANSMITTANCE (U) VALUES IN CONJUNCTION WITH GLAZED OPENING AREAS IN ACCORDANCE WITH TABLE 2.

TABLE 1			
MAXIMUM ALLOWABLE "UO" VALUES FOR			
GROSS EXTERIOR WALL ASSEMBLIES			
	DETACHED	ALL OTHER	
ANNUAL HEATING DEGREE DAYS*	ONE & TWO FAMILY	RESIDENTIAL	
500	0.30	0.38	
1000	0.29	0.37	
2000	0.28	0.35	
3000	0.26	0.33	
4000	0.25	0.31	
5000	0.23	0.29	
6000	0.22	0.27	
7000	0.20	0.26	
8000	0.19	0.24	
9000	0.17	0.22	
10,000 OR MORE	0.16	0.20	

*AS SPECIFIED IN CHAPTER 43 ASHRAE HANDBOOK-SYSTEMS.

TABLE 2			
MAXIMUM ALLOWABLE "U" VALUES FOR ABOVE-GRADE EXTERIOR			
WALL SECTIONS AND CORRESPONDING MAXIMUM ALLOWABLE			
GLAZED OPENING AREAS			
REQUIRED "U" OPAQUE WALLS			
BTUH PER SQUARE FOOT PER DEGREE F.			

1			(3 STORIES OR LESS)				
2	YEARLY	GLAZED	USE GROUP R-3				
3	DEGREE DAYS	OPENINGS	PER CENT GLAZED OPENING				
4			10 15 20 25				
5	2500 OR LESS	SINGLE	.21 .15 .09 .03				
6		DOUBLE	.26 .24 .21 .18				
7	2501 TO 4500	SINGLE	.17 .12 .06 .02				
8		DOUBLE	.23 .20 .18 .14				
9	4501 TO 6000	SINGLE	.14 .08 .02 NP				
10		DOUBLE	.19 .17 .14 .10				
11	6001 TO 8000	SINGLE	.12 .06 .01 NP				
12		DOUBLE	.17 .14 .11 .08				
13	8001 TO 10,000	SINGLE	.09 .02 NP NP				
14		DOUBLE	.14 .11 .08 .04				
15	10,000 OR MORE	SINGLE	.05 NP NP NP				
16		DOUBLE	.11 .07 .04 NP				
17	YEARLY	GLAZED	ALL OTHER RESIDENTIAL				
18	DEGREE DAYS	OPENINGS	PER CENT GLAZED OPENING				
19			15 20 25 30				
20	2500 OR LESS	SINGLE	.25 .19 .13 .07				
21		DOUBLE	.33 .31 .29 .27				
22	2501 TO 4500	SINGLE	.20 .14 .08 .03				
23		DOUBLE	.29 .26 .24 .21				
24	4501 TO 6000	SINGLE	.15 .09 .03 NP				
25		DOUBLE	.24 .21 .18 .15				
26	6001 TO 8000	SINGLE	.13 .07 .01 NP				
27		DOUBLE	.21 .19 .16 .13				
28	8001 TO 10,000	SINGLE	.08 .02 NP NP				
29		DOUBLE	.17 .14 .10 .06				
30	10,000 OR MORE	SINGLE	.04 NP NP NP				

1 INTERRUPTIONS IN THE ROOF ENVELOPE. IF SUCH INTERRUPTIONS OCCUR,
2 CALCULATIONS MUST BE MADE SHOWING CONFORMANCE TO THE REQUIRED
3 "UO" VALUES.

4 (D) FLOORS OVER UNHEATED SPACES.--THE FLOOR OF A HEATED OR
5 MECHANICALLY COOLED SPACE LOCATED OVER AN UNHEATED SPACE SHALL
6 HAVE A COMBINED THERMAL TRANSMITTANCE VALUE (UO) OR SHALL BE
7 PROVIDED WITH THERMAL INSULATION HAVING AN "R" VALUE AS
8 SPECIFIED IN TABLE 4.

9 TABLE 4

10 MAXIMUM ALLOWABLE "UO" VALUES AND ALTERNATIVE
11 MINIMUM ALLOWABLE "R" VALUES OF ADDED INSULATION
12 FOR FLOORS OVER UNHEATED SPACES

13	ANNUAL HEATING DEGREE DAYS	MAXIMUM "UO"	MINIMUM "R"
14	500*	0.36	--
15	1000	0.32	--
16	2000	0.25	4
17	3000	0.18	6
18	4000	0.11	9
19	4500 OR MORE	0.08	11

20 *TABLE VALUES MAY BE INTERPOLATED.

21 (E) SLAB-ON GRADE FLOORS.--

22 (1) FOR SLAB-ON GRADE FLOORS, THE PERIMETER OF THE FLOOR
23 SHALL BE INSULATED WITH A MATERIAL HAVING A THERMAL
24 RESISTANCE VALUE (R) NOT LESS THAN THOSE SPECIFIED IN TABLE
25 5.

26 TABLE 5

27 MINIMUM ALLOWABLE "R" VALUES OF PERIMETER
28 INSULATION FOR SLAB-ON GRADE FLOORS

29	ANNUAL HEATING DEGREE DAYS	HEATED SLAB	UNHEATED SLAB
30	500*	2.9	--

1	1000	3.3	--
2	2000	4.0	--
3	3000	4.8	2.8
4	4000	5.5	3.5
5	5000	6.3	4.2
6	6000	7.0	4.9
7	7000	7.8	5.5
8	8000	8.5	6.2
9	9000	9.3	6.8
10	10,000 OR MORE	10.0	7.5

11 *TABLE VALUES MAY BE INTERPOLATED.

12 (2) THE INSULATION SHALL EXTEND DOWNWARD FROM THE TOP OF
13 THE SLAB FOR A MINIMUM DISTANCE OF 24 INCHES OR DOWNWARD TO
14 THE BOTTOM OF THE SLAB THEN HORIZONTALLY BENEATH THE SLAB FOR
15 A MINIMUM TOTAL DISTANCE OF 24 INCHES.

16 SECTION 207. OTHER BUILDINGS.

17 (A) COVERAGE.--THE HEATING AND COOLING REQUIREMENTS HEREIN
18 SHALL GOVERN ALL BUILDINGS AND STRUCTURES OR PORTIONS THEREOF
19 OTHER THAN DEFINED BY SECTION 206.

20 (B) HEATING CRITERIA FOR WALLS.--ALL BUILDINGS AND
21 STRUCTURES THAT ARE HEATED SHALL HAVE A COMBINED THERMAL
22 TRANSMITTANCE VALUE (UO) FOR THE GROSS AREA OF EXTERIOR WALLS
23 NOT EXCEEDING THOSE SPECIFIED IN TABLE 6.

24	TABLE 6		
25	MAXIMUM ALLOWABLE "UO" VALUES		
26	FOR GROSS EXTERIOR WALL ASSEMBLIES		
27		3 STORIES OR	MORE THAN
28	ANNUAL HEATING DEGREE DAYS	40 FT. OR LESS	3 STORIES OR
29			40 FT.
30	500	0.38	0.47

1	1000	0.37	0.46
2	2000	0.35	0.43
3	3000	0.33	0.41
4	4000	0.31	0.38
5	5000	0.29	0.36
6	6000	0.27	0.33
7	7000	0.26	0.31
8	8000	0.24	0.28
9	9000	0.22	0.28
10	10,000 OR MORE	0.20	0.28

11 (C) HEATING CRITERIA FOR ROOF/CEILING.--ALL BUILDINGS AND
12 STRUCTURES THAT ARE HEATED SHALL HAVE COMBINED THERMAL
13 TRANSMITTANCE VALUE (UO) FOR ROOF/CEILING ASSEMBLIES NOT
14 EXCEEDING THOSE SPECIFIED IN TABLE 7.

15 TABLE 7
16 MAXIMUM ALLOWABLE "UO" VALUES
17 FOR ROOF/CEILING ASSEMBLIES

18	ANNUAL HEATING DEGREE DAYS	MAXIMUM UO
19	3000 AND LESS*	0.10
20	4000	0.092
21	5000	0.084
22	6000	0.076
23	7000	0.068
24	8000 AND MORE	0.06

25 *TABLE VALUES MAY BE INTERPOLATED.

26 (D) HEATING CRITERIA FOR FLOORS OVER UNHEATED SPACES.--THE
27 FLOOR OF A HEATED SPACE LOCATED OVER AN UNHEATED SPACE SHALL
28 HAVE A THERMAL TRANSMITTANCE VALUE (UO) NOT EXCEEDING THOSE
29 SPECIFIED IN TABLE 8.

30 TABLE 8

1	MAXIMUM ALLOWABLE "UO" VALUES FOR	
2	FLOOR ASSEMBLIES OVER UNHEATED SPACES	
3	ANNUAL HEATING DEGREE DAYS	MAXIMUM UO
4	500*	0.36
5	1000	0.32
6	2000	0.25
7	3000	0.18
8	4000	0.11
9	4500 OR MORE	0.08

10 *TABLE VALUES MAY BE INTERPOLATED.

11 (E) HEATING CRITERIA FOR SLAB-ON GRADE FLOORS.--FOR SLAB-ON
 12 GRADE FLOORS, THE PERIMETER OF THE FLOOR SHALL BE INSULATED WITH
 13 A MATERIAL HAVING A THERMAL RESISTANCE VALUE (R) NOT LESS THAN
 14 THOSE SPECIFIED IN TABLE 9.

15 THE INSULATION SHALL EXTEND DOWNWARD FROM THE TOP OF THE SLAB
 16 FOR A MINIMUM DISTANCE OF 24 INCHES OR DOWNWARD TO THE BOTTOM OF
 17 THE SLAB THEN HORIZONTALLY BENEATH THE SLAB FOR A MINIMUM TOTAL
 18 DISTANCE OF 24 INCHES.

19	TABLE 9		
20	MINIMUM ALLOWABLE "R" VALUES OF PERIMETER		
21	INSULATION FOR SLAB-ON GRADE FLOORS		
22	ANNUAL HEATING DEGREE DAYS	HEATED SLAB	UNHEATED SLAB
23	500*	2.9	--
24	1000	3.3	--
25	2000	4.0	--
26	3000	4.8	2.8
27	4000	5.5	3.5
28	5000	6.3	4.2
29	6000	7.0	4.9
30	7000	7.8	5.5

1	8000	8.5	6.2
2	9000	9.3	6.8
3	10,000 OR MORE	10.0	7.5

4 *TABLE VALUES MAY BE INTERPOLATED.

5 (F) COOLING CRITERIA FOR WALLS.--ALL BUILDINGS AND
6 STRUCTURES THAT ARE MECHANICALLY COOLED SHALL HAVE AN OVERALL
7 THERMAL TRANSFER VALUE FOR THE GROSS AREA OF EXTERIOR WALLS NOT
8 EXCEEDING THOSE SPECIFIED IN TABLE 10.

9	TABLE 10		
10	MAXIMUM OVERALL THERMAL TRANSFER VALUES		
11	FOR GROSS EXTERIOR WALLS		
12	MAXIMUM OVERALL THERMAL TRANSFER		
13	DEGREES NORTH LATITUDE	VALUE BTUH PER SQUARE FOOT	
14	24	29.0	
15	32	31.3	
16	40	33.5	
17	48	35.7	
18	56	38.0	

19 (G) COOLING CRITERIA FOR ROOF/CEILINGS.--ALL BUILDINGS AND
20 STRUCTURES THAT ARE MECHANICALLY COOLED SHALL HAVE A COMBINED
21 THERMAL TRANSMITTANCE VALUE (UO) FOR ROOF/CEILING ASSEMBLIES THE
22 SAME AS SPECIFIED IN TABLE 7 FOR HEATING.

23 SECTION 208. AIR LEAKAGE.

24 (A) APPLICATION.--THE REQUIREMENTS OF THIS SECTION SHALL
25 APPLY TO ALL BUILDINGS AND STRUCTURES AND APPLY ONLY TO THOSE
26 LOCATIONS SEPARATING OUTDOOR AMBIENT CONDITIONS FROM INTERIOR
27 SPACES THAT ARE HEATED OR MECHANICALLY COOLED AND ARE NOT
28 APPLICABLE TO SEPARATION OF INTERIOR SPACES FROM EACH OTHER.

29 (B) STANDARD.--COMPLIANCE WITH THE CRITERIA FOR AIR LEAKAGE
30 SHALL BE DETERMINED BY ASTM E-283, STANDARDS METHOD TEST FOR

1 RATE OF AIR LEAKAGE THROUGH EXTERIOR WINDOWS, CURTAIN WALLS AND
2 DOORS, AT A PRESSURE DIFFERENTIAL OF 1.567 LB/FT² WHICH IS
3 EQUIVALENT TO THE EFFECT OF A 25 M.P.H. WIND.

4 (C) ACCEPTANCE CRITERIA.--THE FOLLOWING CRITERIA SHALL
5 REPRESENT THE MAXIMUM ALLOWABLE AIR LEAKAGE:

6 (1) THE AIR INFILTRATION RATE FOR WINDOWS SHALL NOT
7 EXCEED 0.5 CFM PER FOOT OF SASH CRACK.

8 (2) THE AIR INFILTRATION RATE FOR SLIDING GLASS DOORS IN
9 RESIDENTIAL BUILDINGS SHALL NOT EXCEED 0.5 CFM PER SQUARE
10 FOOT OF DOOR AREA.

11 (3) THE AIR INFILTRATION RATE FOR SWINGING DOORS IN
12 RESIDENTIAL BUILDINGS SHALL NOT EXCEED 1.25 CFM PER SQUARE
13 FOOT OF DOOR AREA.

14 (4) THE AIR INFILTRATION RATE FOR SWINGING, REVOLVING OR
15 SLIDING DOORS IN OTHER THAN RESIDENTIAL BUILDINGS SHALL NOT
16 EXCEED 11 CFM PER LINEAL FOOT OF DOOR CRACK.

17 (D) CAULKING AND SEALANTS.--EXTERIOR JOINTS AROUND WINDOWS
18 AND DOOR FRAMES, BETWEEN WALL CAVITIES AND WINDOW OR DOOR
19 FRAMES, BETWEEN WALL AND FOUNDATION, BETWEEN WALL AND ROOF,
20 BETWEEN WALL PANELS, AT PENETRATIONS OR UTILITY SERVICES THROUGH
21 WALLS, FLOORS AND ROOFS, AND ALL OTHER OPENINGS IN THE EXTERIOR
22 ENVELOPE SHALL BE CAULKED, GASKETED, WEATHERSTRIPPED, OR
23 OTHERWISE SEALED.

24 SUBCHAPTER D

25 WARM AIR HEATING, VENTILATING AND AIR CONDITIONING

26 SYSTEMS AND EQUIPMENT

27 SECTION 209. GENERAL PROVISIONS.

28 THIS SUBCHAPTER APPLIES TO AIR DUCT SYSTEMS EMPLOYING
29 MECHANICAL MEANS FOR THE MOVEMENT OF AIR USED FOR WARM AIR
30 HEATING, VENTILATING, AIR CONDITIONING SYSTEMS, EXHAUST SYSTEMS

1 AND COMBINATION HEATING AND AIR CONDITIONING SYSTEMS, EXCEPT
2 THAT THIS SUBCHAPTER SHALL NOT APPLY TO SYSTEMS FOR THE REMOVAL
3 OF FLAMMABLE VAPORS OR RESIDUES OR TO SYSTEMS FOR CONVEYING
4 DUST, STOCK OR REFUSE BY MEANS OF AIR CURRENTS. HEATING,
5 VENTILATING AND AIR CONDITIONING SYSTEMS OF ALL BUILDINGS AND
6 STRUCTURES OR PORTIONS THEREOF SHALL BE DESIGNED AND INSTALLED
7 FOR EFFICIENT USE OF ENERGY AS HEREIN PROVIDED. FOR SPECIAL
8 APPLICATIONS SUCH AS HOSPITALS, LABORATORIES, THERMALLY
9 SENSITIVE EQUIPMENT, COMPUTER ROOMS, AND MANUFACTURING
10 PROCESSES, THE DESIGN CONCEPTS AND PARAMETERS SHALL CONFORM TO
11 THE REQUIREMENTS OF THE APPLICATION AT MINIMUM ENERGY LEVELS.

12 SECTION 210. DESIGN REQUIREMENTS.

13 IN DETERMINING DESIGN CONDITIONS FOR CALCULATIONS UNDER THIS
14 SECTION THE FOLLOWING DESIGN TEMPERATURES SHALL APPLY:

15 (1) OUTDOOR DESIGN TEMPERATURE SHALL BE SELECTED FOR
16 LISTED LOCATIONS IN CHAPTER 33 OF THE ASHRAE HANDBOOK OF
17 FUNDAMENTALS, FROM COLUMNS OF 97 1/2% VALUES FOR HEATING AND
18 2 1/2% VALUES FOR COOLING.

19 (2) INDOOR DESIGN TEMPERATURE SHALL BE 70 DEGREES F. FOR
20 HEATING AND 78 DEGREES F. FOR COOLING.

21 (3) INDOOR DESIGN RELATIVE HUMIDITY FOR HEATING SHALL
22 NOT EXCEED 30%. FOR COOLING THE ACTUAL DESIGN RELATIVE
23 HUMIDITY WITHIN THE COMFORT ENVELOPE AS DEFINED IN ASHRAE
24 STANDARD 55-74 "THERMAL ENVIRONMENTAL CONDITIONS FOR HUMAN
25 OCCUPANCY" SHALL BE SELECTED FOR THE MINIMUM TOTAL HEATING,
26 VENTILATING, AND AIR CONDITIONING SYSTEM ENERGY USE.

27 SECTION 211. COOLING WITH OUTDOOR AIR.

28 (A) FAN SYSTEM DESIGN.--EACH FAN SYSTEM SHALL BE DESIGNED TO
29 USE UP TO AND INCLUDING 100% OF THE FAN SYSTEM CAPACITY FOR
30 COOLING WITH OUTDOOR AIR AUTOMATICALLY WHENEVER ITS USE WILL

1 RESULT IN LOWER USAGE OF ENERGY THAN WOULD BE REQUIRED UNDER ITS
2 NORMAL OPERATION.

3 (B) EXCEPTIONS.--COOLING WITH OUTDOOR AIR IS NOT REQUIRED
4 UNDER ANY ONE OR MORE OF THE FOLLOWING CONDITIONS:

5 (1) FAN SYSTEM CAPACITY LESS THAN 5,000 CFM OR 134,000
6 BTU/HR TOTAL COOLING CAPACITY.

7 (2) THE QUALITY OF THE OUTDOOR AIR IS SO POOR AS TO
8 REQUIRE EXTENSIVE TREATMENT OF THE AIR.

9 (3) THE NEED FOR HUMIDIFICATION OR DEHUMIDIFICATION
10 REQUIRES THE USE OF MORE ENERGY THAN IS CONSERVED BY OUTDOOR
11 AIR COOLING.

12 (4) THE USE OF OUTDOOR AIR COOLING MAY AFFECT THE
13 OPERATION OF OTHER SYSTEMS (SUCH AS RETURN OR EXHAUST AIR
14 FANS OR SUPERMARKET REFRIGERATION) SO AS TO INCREASE THE
15 OVERALL ENERGY CONSUMPTION OF THE BUILDING.

16 (5) INTERNAL/EXTERNAL ZONE HEAT RECOVERY OR OTHER ENERGY
17 RECOVERY IS USED.

18 (6) ANNUAL HEATING DEGREE DAYS ARE LESS THAN 2,500.

19 (7) WHEN ALL SPACE COOLING IS ACCOMPLISHED BY A
20 CIRCULATING LIQUID WHICH TRANSFERS SPACE HEAT DIRECTLY OR
21 INDIRECTLY TO A HEAT REJECTION DEVICE SUCH AS A COOLING TOWER
22 WITHOUT THE USE OF A REFRIGERATION SYSTEM.

23 SECTION 212. MECHANICAL VENTILATION.

24 EACH MECHANICAL VENTILATION SYSTEM SHALL BE EQUIPPED WITH A
25 READILY ACCESSIBLE MEANS FOR EITHER SHUT-OFF OR VOLUME REDUCTION
26 AND SHUT-OFF WHEN VENTILATION IS NOT REQUIRED.

27 SECTION 213. SIMULTANEOUS HEATING AND COOLING.

28 SYSTEMS THAT EMPLOY BOTH HEATING AND COOLING SIMULTANEOUSLY
29 IN ORDER TO ACHIEVE COMFORT CONDITIONS WITHIN A SPACE SHALL BE
30 LIMITED TO THOSE SITUATIONS WHERE MORE EFFICIENT METHODS OF

1 HEATING AND AIR CONDITIONING CANNOT BE EFFECTIVELY UTILIZED TO
2 MEET SYSTEM OBJECTIVES. SIMULTANEOUS HEATING AND COOLING BY
3 REHEATING OR RECOOLING SUPPLY AIR OR BY CONCURRENT OPERATION OR
4 INDEPENDENT HEATING AND COOLING SYSTEMS SERVING A COMMON ZONE
5 SHALL BE RESTRICTED AS FOLLOWS:

6 (1) RECOVERED ENERGY, PROVIDED THE NEW ENERGY EXPENDED
7 IN THE RECOVERY PROCESS IS LESS THAN THE AMOUNT RECOVERED,
8 MAY BE USED FOR CONTROL OF TEMPERATURE AND HUMIDITY. NEW
9 ENERGY IS DEFINED AS ENERGY, OTHER THAN RECOVERED, UTILIZED
10 FOR THE PURPOSE OF HEATING OR COOLING.

11 (2) NEW ENERGY MAY BE USED, WHEN NECESSARY, TO PREVENT
12 RELATIVE HUMIDITY FROM RISING ABOVE 60% FOR COMFORT CONTROL
13 OR TO PREVENT CONDENSATION ON TERMINAL UNITS OR OUTLETS.

14 (3) NEW ENERGY MAY BE USED FOR CONTROL OF TEMPERATURE IF
15 MINIMIZED AS SPECIFIED IN SECTIONS 214 THROUGH 218.

16 SECTION 214. REHEAT SYSTEMS.

17 SYSTEMS EMPLOYING REHEAT AND SERVING MULTIPLE ZONES, OTHER
18 THAN THOSE EMPLOYING VARIABLE AIR VOLUME FOR TEMPERATURE
19 CONTROL, SHALL BE PROVIDED WITH CONTROL THAT WILL AUTOMATICALLY
20 RESET THE SYSTEM COLD AIR SUPPLY TO THE HIGHEST TEMPERATURE
21 LEVEL THAT WILL SATISFY THE ZONE REQUIRING THE COOLEST AIR.
22 SINGLE ZONE REHEAT SYSTEMS SHALL BE CONTROLLED TO SEQUENCE
23 REHEAT AND COOLING.

24 SECTION 215. DUAL DUCT AND MULTIZONE SYSTEMS.

25 THESE SYSTEMS SHALL BE PROVIDED WITH CONTROL THAT WILL
26 AUTOMATICALLY RESET THE COLD DECK AIR SUPPLY TO THE HIGHEST
27 TEMPERATURE THAT WILL SATISFY THE ZONE REQUIRING THE COOLEST AIR
28 AND THE HOT DECK AIR SUPPLY TO THE LOWEST TEMPERATURE THAT WILL
29 SATISFY THE ZONE REQUIRING THE WARMEST AIR.

30 SECTION 216. RECOOLING SYSTEMS.

1 SYSTEMS IN WHICH HEATED AIR IS RECOOLED DIRECTLY OR
2 INDIRECTLY, TO MAINTAIN SPACE TEMPERATURE, SHALL BE PROVIDED
3 WITH CONTROL THAT WILL AUTOMATICALLY RESET THE TEMPERATURE TO
4 WHICH THE SUPPLY AIR IS HEATED TO THE LOWEST LEVEL THAT WILL
5 SATISFY THE ZONE REQUIRING THE WARMEST AIR.

6 SECTION 217. MULTIPLE ZONES.

7 FOR SYSTEMS WITH MULTIPLE ZONES, ONE OR MORE ZONES MAY BE
8 CHOSEN TO REPRESENT A NUMBER OF ZONES WITH SIMILAR HEATING OR
9 COOLING CHARACTERISTICS. A MULTIPLE ZONE HEATING, VENTILATING
10 AND AIR CONDITIONING SYSTEM THAT EMPLOYS REHEATING OR RECOOLING
11 FOR CONTROL OF NOT MORE THAN 5,000 CFM OR 20% OF THE TOTAL
12 SUPPLY AIR OF THE SYSTEM, WHICHEVER IS LESS, SHALL BE EXEMPT
13 FROM THE SUPPLY AIR TEMPERATURE RESET REQUIREMENTS OF SECTIONS
14 214 THROUGH 216.

15 SECTION 218. CONCURRENT OPERATION.

16 CONCURRENT OPERATION OF INDEPENDENT HEATING AND COOLING
17 SYSTEMS SERVING COMMON SPACES, AND REQUIRING THE USE OF NEW
18 ENERGY FOR HEATING OR COOLING SHALL BE MINIMIZED BY ONE OR BOTH
19 OF THE FOLLOWING:

20 (1) BY PROVIDING SEQUENTIAL TEMPERATURE CONTROL OF BOTH
21 HEATING AND COOLING CAPACITY IN EACH ZONE.

22 (2) BY LIMITING THE HEATING ENERGY INPUT, THROUGH
23 AUTOMATIC RESET CONTROL OF THE HEATING MEDIUM TEMPERATURE (OR
24 ENERGY INPUT RATE), TO ONLY THAT NECESSARY TO OFFSET HEAT
25 LOSS DUE TO TRANSMISSION AND INFILTRATION AND, WHERE
26 APPLICABLE, TO HEAT THE VENTILATION AIR SUPPLY TO THE SPACE.

27 SECTION 219. EQUIPMENT PERFORMANCE REQUIREMENTS.

28 (A) APPLICATION.--THE REQUIREMENTS OF THIS SECTION APPLY TO
29 EQUIPMENT AND COMPONENT PERFORMANCE FOR HEATING, VENTILATING AND
30 AIR CONDITIONING SYSTEMS. WHERE EQUIPMENT EFFICIENCY LEVELS ARE

1 SPECIFIED, DATA FURNISHED BY THE EQUIPMENT SUPPLIER OR CERTIFIED
2 UNDER A NATIONALLY RECOGNIZED CERTIFICATION PROGRAM OR RATING
3 PROCEDURE SHALL BE USED TO SATISFY THESE REQUIREMENTS.

4 (B) ELECTRIC SYSTEM EQUIPMENT.--HEATING VENTILATING AND AIR
5 CONDITIONING SYSTEMS EQUIPMENT WHOSE ENERGY INPUT IN THE COOLING
6 MODE IS ENTIRELY ELECTRIC SHALL SHOW A COEFFICIENT OF
7 PERFORMANCE (COP) AND ENERGY EFFICIENCY RATIO (EER) NOT LESS
8 THAN THE VALUES SPECIFIED IN TABLE 11. THESE REQUIREMENTS APPLY
9 TO, BUT ARE NOT LIMITED TO, UNITARY COOLING EQUIPMENT (AIR AND
10 WATER SOURCE); PACKAGED AIR CONDITIONERS; AND ROOM AIR
11 CONDITIONERS. THESE REQUIREMENTS DO NOT APPLY TO EQUIPMENT USED
12 IN AREAS HAVING OPEN REFRIGERATED FOOD DISPLAY CASES. FOR
13 DETERMINING COEFFICIENT OF PERFORMANCE (COP), THE RATE OF NET
14 HEAT REMOVAL SHALL BE DEFINED AS THE CHANGE IN THE TOTAL HEAT
15 CONTENTS OF THE AIR ENTERING AND LEAVING THE EQUIPMENT (WITHOUT
16 REHEAT). TOTAL ENERGY INPUT SHALL BE DETERMINED BY COMBINING THE
17 ENERGY INPUTS TO ALL ELEMENTS OF THE EQUIPMENT, INCLUDING BUT
18 NOT LIMITED TO, COMPRESSORS, PUMPS, SUPPLY-AIR FANS, COOLING
19 TOWER FANS AND THE SYSTEM EQUIPMENT CONTROL CIRCUIT.

20 TABLE 11

21 MINIMUM EER AND COP FOR ELECTRIC HEATING, VENTILATING
22 AND AIR CONDITIONING SYSTEM EQUIPMENT

23 STANDARD RATING CAPACITY	EER	COP
24 UNDER 65,000 BTU/HR (19,050 WATTS)	6.1	1.8
25 65,000 BTU/HR (19,050 WATTS) AND OVER	6.8	2.0

26 (C) OTHER SYSTEM EQUIPMENT.--HEAT OPERATED COOLING EQUIPMENT
27 SHALL SHOW A COEFFICIENT OF PERFORMANCE (COP) IN THE COOLING
28 MODE NOT LESS THAN THE VALUES SPECIFIED IN TABLE 12. THESE
29 REQUIREMENTS APPLY TO, BUT ARE NOT LIMITED TO, ABSORPTION,
30 ENGINE-DRIVEN AND TURBINE-DRIVEN EQUIPMENT. THE COEFFICIENT OF

1 PERFORMANCE (COP) IS DETERMINED EXCLUDING THE ELECTRICAL
2 AUXILIARY INPUTS.

3 TABLE 12
4 MINIMUM COP FOR HEATING, VENTILATING AND AIR CONDITIONING
5 SYSTEM HEAT OPERATED COOLING EQUIPMENT

6 HEAT SOURCE	7 MINIMUM COP
8 DIRECT FIRED (GAS, OIL)	0.40
9 INDIRECT FIRED (STEAM, HOT WATER)	0.65

10 (D) SYSTEM COMPONENTS.--HEATING, VENTILATING AND AIR
11 CONDITIONING SYSTEM COMPONENTS WHOSE ENERGY INPUT IN THE COOLING
12 MODE IS ENTIRELY ELECTRIC SHALL SHOW A COEFFICIENT OF
13 PERFORMANCE (COP) AND ENERGY EFFICIENCY RATIO (EER) NOT LESS
14 THAN THE VALUES SPECIFIED IN TABLE 13. FOR DETERMINING
15 COEFFICIENT OF PERFORMANCE (COP), THE RATE OF HEAT REMOVAL IS
16 DEFINED AS THE DIFFERENCE IN TOTAL HEAT CONTENTS OF THE WATER OR
17 REFRIGERANT ENTERING OR LEAVING THE COMPONENT. TOTAL ENERGY
18 INPUT SHALL BE DETERMINED BY COMBINING THE ENERGY INPUTS TO ALL
19 ELEMENTS AND ACCESSORIES OF THE COMPONENT, INCLUDING BUT NOT
20 LIMITED TO, COMPRESSORS, INTERNAL CIRCULATING PUMPS, CONDENSER-
21 AIR FANS, EVAPORATIVE-CONDENSER COOLING HEATER PUMPS, PURGE, AND
22 THE COMPONENT CONTROL CIRCUIT.

23 TABLE 13
24 MINIMUM COP FOR ELECTRICALLY DRIVEN HEATING, VENTILATING
25 AND AIR CONDITIONING SYSTEM COMPONENTS

26 COMPONENT	27 CONDENSING MEANS	28 AIR	29 WATER	30 EVAPORATION
		EER COP	EER COP	EER COP
SELF-CONTAINED	CENTRIFUGAL	7.5 2.2	12.9 3.8	
WATER CHILLERS				
	POSITIVE			
	DISPLACEMENT	7.2 2.1	10.9 3.2	

1 CONDENSERLESS POSITIVE
2 WATER CHILLERS DISPLACEMENT 8.9 2.6 10.9 3.2
3 COMPRESSOR AND
4 CONDENSER UNITS POSITIVE
5 65,000 BTU/HR. DISPLACEMENT 7.8 2.3 11.3 3.3 11.3 3.3
6 (19.050 WATTS)
7 AND OVER
8 (E) HEAT PUMPS.--HEAT PUMPS WHOSE ENERGY INPUT IS ENTIRELY
9 ELECTRIC SHALL SHOW A COEFFICIENT OF PERFORMANCE (COP), HEATING,
10 NOT LESS THAN THE VALUES SPECIFIED IN TABLE 14.

11 TABLE 14

12 MINIMUM COP FOR HEAT PUMPS, HEATING MODE

13 SOURCE AND OUTDOOR TEMPERATURE (DEGREE F.)	14 MINIMUM COP
15 AIR SOURCE--47 DB/43 WB	2.2
16 AIR SOURCE--17 DB/15 WB	1.2
17 WATER SOURCE--60 ENTERING	2.2

18 (F) SUPPLEMENTARY HEATER.--THE HEAT PUMP SHALL BE INSTALLED
19 WITH A CONTROL TO PREVENT SUPPLEMENTARY HEATER OPERATION WHEN
20 THE HEATING LOAD CAN BE MET BY THE HEAT PUMP ALONE.
21 SUPPLEMENTARY HEATER OPERATION IS PERMITTED DURING TRANSIENT
22 PERIODS, SUCH AS START-UPS, FOLLOWING ROOM THERMOSTAT SETPOINT
23 ADVANCE, AND DURING DEFROST. A TWO-STAGE ROOM THERMOSTAT, WHICH
24 CONTROLS THE SUPPLEMENTARY HEAT ON ITS SECOND STAGE, SHALL BE
25 ACCEPTED AS MEETING THIS REQUIREMENT. THE CUT-ON TEMPERATURE FOR
26 THE COMPRESSION HEATING SHALL BE HIGHER THAN THE CUT-ON
27 TEMPERATURE FOR THE SUPPLEMENTARY HEAT, AND THE CUT-OFF
28 TEMPERATURE FOR THE COMPRESSION HEATING SHALL BE HIGHER THAN THE
29 CUT-OFF TEMPERATURE FOR THE SUPPLEMENTARY HEAT. SUPPLEMENTARY
30 HEAT MAY BE DERIVED FROM ANY SOURCE OF ELECTRIC RESISTANCE
HEATING OR COMBUSTION HEATING.

(G) COMBUSTION HEATING EQUIPMENT.--ALL GAS AND OILFIRED COMFORT HEATING EQUIPMENT SHALL SHOW A MINIMUM COMBUSTION EFFICIENCY OF 75% AT MAXIMUM RATED OUTPUT. COMBUSTION EFFICIENCY SHALL BE DETERMINED IN ACCORDANCE WITH THE ASHRAE STANDARD 90. SECTION 220. DUCT INSULATION.

(A) INSULATION.--ALL DUCT SYSTEMS, OR PORTIONS THEREOF, EXPOSED TO NONCONDITIONED SPACES SHALL BE INSULATED TO PROVIDE A THERMAL RESISTANCE, EXCLUDING FILM RESISTANCE, OF

TI - TO

$$R = \frac{15}{(TI - TO)} \text{ (HR) (SQ.FT) (F) / BTU}$$

15

WHERE TI-TO IS THE DESIGN TEMPERATURE DIFFERENTIAL (ABSOLUTE VALUE) BETWEEN THE AIR IN THE DUCT AND THE SURROUNDING AIR WITH CERTAIN EXCEPTIONS, DUCT INSULATION, EXCEPT WHEN NEEDED TO PREVENT CONDENSATION, IS NOT REQUIRED IN ANY OF THE FOLLOWING CASES:

(1) WHERE TI-TO IS 25 DEGREES F. OR LESS.

(2) WHEN THE HEAT GAIN OR LOSS OF THE DUCTS, WITHOUT INSULATION, WILL NOT INCREASE THE ENERGY REQUIREMENTS OF THE BUILDING.

(3) EXHAUST AIR DUCTS.

(4) SUPPLY OR RETURN AIR DUCTS INSTALLED IN CRAWL SPACES WITH INSULATED WALLS, BASEMENTS OR CELLARS IN ONE AND TWO-FAMILY DWELLINGS.

(B) VAPOR BARRIERS.--WHERE REQUIRED TO PREVENT CONDENSATION, INSULATION WITH VAPOR BARRIERS SHALL BE INSTALLED IN ADDITION TO INSULATION REQUIRED ABOVE.

SECTION 221. SYSTEM CONTROLS.

(A) APPLICATION.--ALL HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS SHALL BE PROVIDED CONTROLS AS SPECIFIED

1 HEREIN.

2 (B) TEMPERATURE.--EACH HEATING, VENTILATING AND AIR
3 CONDITIONING SYSTEM SHALL BE PROVIDED WITH AT LEAST ONE
4 THERMOSTAT FOR THE REGULATION OF TEMPERATURE. EACH THERMOSTAT
5 SHALL BE CAPABLE OF BEING SET FROM 55 DEGREES F. TO 75 DEGREES
6 F. WHERE USED TO CONTROL HEATING ONLY AND FROM 70 DEGREES F. TO
7 85 DEGREES F. WHERE USED TO CONTROL COOLING ONLY. WHERE USED TO
8 CONTROL BOTH HEATING AND COOLING IT SHALL BE CAPABLE OF BEING
9 SET FROM 55 DEGREES F. TO 85 DEGREES F. AND SHALL BE CAPABLE OF
10 OPERATING THE SYSTEM HEATING AND COOLING IN SEQUENCE. IT SHALL
11 BE ADJUSTABLE TO PROVIDE A TEMPERATURE RANGE OF UP TO 10 DEGREES
12 F. BETWEEN FULL HEATING AND FULL COOLING, EXCEPT AS ALLOWED IN
13 SECTION 218.

14 (C) HUMIDITY.--IF A HEATING, VENTILATING AND AIR
15 CONDITIONING SYSTEM IS EQUIPPED WITH A MEANS FOR ADDING MOISTURE
16 TO MAINTAIN SPECIFIC SELECTED RELATIVE HUMIDITIES IN SPACES OR
17 ZONES, A HUMIDISTAT SHALL BE PROVIDED. THIS DEVICE SHALL BE
18 CAPABLE OF BEING SET TO PREVENT NEW ENERGY FROM BEING USED TO
19 PRODUCE SPACE RELATIVE HUMIDITY ABOVE 30% R.H. WHERE A
20 HUMIDISTAT IS USED IN A HEATING, VENTILATING AND AIR
21 CONDITIONING SYSTEM FOR CONTROLLING MOISTURE REMOVAL TO MAINTAIN
22 SPECIFIC SELECTED RELATIVE HUMIDITIES IN SPACES OR ZONES, IT
23 SHALL BE CAPABLE OF BEING SET TO PREVENT NEW ENERGY FROM BEING
24 USED TO PRODUCE A SPACE RELATIVE HUMIDITY BELOW 60%.

25 (D) TEMPERATURE ZONING.--

26 (1) IN ALL BUILDINGS AND STRUCTURES OF USE GROUP R-3, AT
27 LEAST ONE THERMOSTAT FOR REGULATION OF SPACE TEMPERATURE
28 SHALL BE PROVIDED FOR EACH SEPARATE HEATING, VENTILATING AND
29 AIR CONDITIONING SYSTEM. IN ADDITION, A READILY ACCESSIBLE
30 MANUAL OR AUTOMATIC MEANS SHALL BE PROVIDED TO PARTIALLY

1 RESTRICT OR SHUT-OFF THE HEATING OR COOLING INPUT TO EACH
2 ZONE OR FLOOR, EXCLUDING UNHEATED OR UNCOOLED BASEMENTS AND
3 GARAGES.

4 (2) IN ALL BUILDINGS AND STRUCTURES OF USE GROUP R-2,
5 EACH INDIVIDUAL DWELLING UNIT SHALL BE CONSIDERED SEPARATELY
6 AND SHALL MEET THE REQUIREMENTS FOR ONE AND TWO-FAMILY
7 DWELLINGS ABOVE.

8 (3) IN ALL BUILDINGS AND STRUCTURES OTHER THAN USE GROUP
9 R-3 AND IN SPACES OTHER THAN DWELLING UNITS IN USE GROUP R-2,
10 AT LEAST ONE THERMOSTAT FOR REGULATION OF SPACE TEMPERATURE
11 SHALL BE PROVIDED FOR EACH SEPARATE HEATING, VENTILATING AND
12 AIR CONDITIONING SYSTEM AND FOR EACH FLOOR OF THE BUILDING.

13 (E) SET-BACK AND SHUT-OFF.--

14 (1) IN ALL BUILDINGS AND STRUCTURES, OR PORTIONS THEREOF
15 OF USE GROUP R-3, THE THERMOSTAT, OR AN ALTERNATE MEANS SUCH
16 AS A SWITCH OR A CLOCK, SHALL PROVIDE A READILY ACCESSIBLE,
17 MANUAL OR AUTOMATIC MEANS FOR REDUCING THE ENERGY REQUIRED
18 FOR HEATING AND COOLING DURING PERIODS OF NONUSE OR REDUCED
19 NEED.

20 (2) IN ALL OTHER BUILDINGS AND STRUCTURES, OR PORTIONS
21 THEREOF EACH HEATING, VENTILATING AND AIR CONDITIONING SYSTEM
22 SHALL BE EQUIPPED WITH A READILY ACCESSIBLE MEANS OF REDUCING
23 THE ENERGY USED FOR HEATING, VENTILATING AND AIR CONDITIONING
24 DURING PERIODS OF NONUSE OR ALTERNATE USES OF THE BUILDING
25 SPACES OR ZONES SERVED BY THE SYSTEM, SUCH AS WITH MANUALLY
26 ADJUSTABLE AUTOMATIC TIMING DEVICES, MANUAL DEVICES FOR USE
27 BY OPERATING PERSONNEL, OR AUTOMATIC CONTROL SYSTEMS.

28 (3) LOWERING THERMOSTAT SET POINTS TO REDUCE ENERGY
29 CONSUMPTION OF HEATING SYSTEMS SHALL NOT CAUSE ENERGY TO BE
30 EXPENDED TO REACH THE REDUCED SETTING.

1 SECTION 222. STEAM AND HOT WATER HEATING PIPING.

2 (A) PIPING INSULATION.--ALL PIPING SERVING AS PART OF A
 3 HEATING OR COOLING SYSTEM INSTALLED TO SERVE BUILDINGS AND
 4 WITHIN BUILDINGS SHALL BE THERMALLY INSULATED AS SHOWN IN TABLE
 5 15.

6 TABLE 15

7 MINIMUM PIPE INSULATION

8 INSULATION THICKNESS IN INCHES

9 FLUID

FOR PIPE SIZES

10 PIPING TEMPERATURE

11 SYSTEM RANGE, RUNOUTS 1" AND 1 1/4- 2 1/2- 5& 8" AND
 12 TYPES F. UP TO 2" LESS 2 4 6 LARGER

13 HEATING SYSTEMS

14 STEAM &

15 HOT WATER

16 HIGH PRESSURE/

17 TEMP 306-450 1 1/2 1 1/2 2 2 1/2 3 1/2 3 1/2

18 MED. PRESSURE/

19 TEMP 251-305 1 1/2 1 1/2 2 2 1/2 3 3

20 LOW PRESSURE/

21 TEMP 201-250 1 1 1 1/2 1 1/2 2 2

22 LOW TEM-

23 PERATURE 120-200 1/2 3/4 1 1 1 1 1 1 1/2

24 STEAM CON-

25 DENSATE ANY 1 1 1 1/2 1 1/2 2

26 (FOR FEED

27 WATER)

28 COOLING SYSTEMS

29 CHILLED

30 WATER, 40-55 1/2 1/2 3/4 1 1 1

1 INSULATION WITH VAPOR BARRIERS SHALL BE INSTALLED IN ADDITION TO
2 INSULATION REQUIRED ABOVE.

3 SUBCHAPTER E
4 PLUMBING SYSTEMS

5 SECTION 223. PURPOSE.

6 THIS SUBCHAPTER SETS FORTH PROVISIONS FOR DESIGN AND
7 EQUIPMENT SELECTION FOR ENERGY CONSERVATION IN SERVICE WATER
8 HEATING SYSTEMS.

9 SECTION 224. FIXTURES.

10 (A) LAVATORIES.--LAVATORIES IN RESTROOMS OF PUBLIC
11 FACILITIES SHALL BE EQUIPPED WITH SELF-CLOSING OUTLET DEVICES
12 WHICH LIMIT THE FLOW OF HOT WATER TO A MAXIMUM OF 0.5 GPM,
13 DEVICES WHICH LIMIT THE OUTLET TEMPERATURE TO A MAXIMUM OF 110
14 DEGREES F. AND SELF-CLOSING VALVES WHICH LIMIT THE QUANTITY OF
15 HOT WATER TO A MAXIMUM OF 0.25 GALLONS.

16 (B) SHOWERS.--SHOWERS USED FOR OTHER THAN SAFETY REASONS
17 SHALL BE EQUIPPED WITH FLOW CONTROL DEVICES TO LIMIT TOTAL FLOW
18 TO A MAXIMUM OF 3 GPM PER SHOWER HEAD.

19 SECTION 225. INSULATION.

20 (A) PIPING INSULATION.--PIPING IN REQUIRED RETURN
21 CIRCULATION SYSTEMS SHALL BE INSULATED SO THAT HEAT LOSS IS
22 LIMITED TO A MAXIMUM OF 25 BTUH PER SQUARE FOOT OF EXTERNAL PIPE
23 SURFACE FOR ABOVE GROUND PIPING AND A MAXIMUM OF 35 BTUH PER
24 SQUARE FOOT OF EXTERNAL PIPE SURFACE FOR UNDERGROUND PIPING.
25 MAXIMUM HEAT LOSS SHALL BE DETERMINED AT A TEMPERATURE
26 DIFFERENTIAL EQUAL TO THE MAXIMUM WATER TEMPERATURE MINUS A
27 DESIGN AMBIENT TEMPERATURE NO HIGHER THAN 65 DEGREES F. EXCEPT
28 THAT CONFORMANCE WITH TABLE 15 FOR "LOW TEMPERATURE PIPING
29 SYSTEM" SHALL BE DEEMED AS COMPLYING WITH THIS SECTION.

30 (B) TANKS.--UNFIRED HOT WATER STORAGE TANKS SHALL BE

1 INSULATED SO THAT HEAT LOSS IS LIMITED TO A MAXIMUM OF 15 BTUH
2 PER SQUARE FOOT OF EXTERNAL TANK SURFACE AREA. FOR PURPOSES OF
3 DETERMINING THIS HEAT LOSS, THE DESIGN AMBIENT TEMPERATURE SHALL
4 BE NO HIGHER THAN 65 DEGREES F.

5 SECTION 226. EQUIPMENT.

6 (A) PUMP OPERATION.--CIRCULATING HOT WATER SYSTEMS SHALL BE
7 ARRANGED SO THAT THE CIRCULATING PUMP CAN BE CONVENIENTLY TURNED
8 OFF EITHER AUTOMATICALLY OR MANUALLY WHEN THE HOT WATER SYSTEM
9 IS NOT IN OPERATION.

10 (B) ELECTRIC WATER HEATERS.--ALL AUTOMATIC ELECTRIC STORAGE
11 WATER HEATERS SHALL HAVE A STAND-BY LOSS NOT EXCEEDING 4 WATTS
12 PER SQUARE FOOT OF TANK SURFACE AREA. THE METHOD OF TEST OF
13 STAND-BY LOSS SHALL BE AS DESCRIBED IN SECTION 4.3.1 OF ANSI
14 C72.1 HOUSEHOLD AUTOMATIC ELECTRICAL STORAGE-TYPE WATER HEATERS.

15 (C) GAS AND OIL-FIRED WATER HEATERS.--ALL GAS AND OIL-FIRED
16 AUTOMATIC STORAGE HEATERS SHALL HAVE A RECOVERY EFFICIENCY, ER,
17 NOT LESS THAN 75% AND A STAND-BY LOSS PERCENTAGE S, NOT
18 EXCEEDING $S = 2.3 + 67/V$ WHERE V=RATED VOLUME IN GALLONS. THE METHOD
19 OF TEST OF ER AND S SHALL BE AS DESCRIBED IN SECTION 2.7 OF ANSI
20 Z21.10.3 CIRCULATING TANK, INSTANTANEOUS AND LARGE AUTOMATIC
21 STORAGE TYPE WATER HEATERS, APPROVAL REQUIREMENTS FOR GAS WATER
22 HEATERS.

23 SECTION 227. CONTROLS.

24 (A) TEMPERATURE CONTROLS.--ALL HOT WATER SUPPLY SYSTEMS
25 SHALL BE EQUIPPED WITH AUTOMATIC TEMPERATURE CONTROLS CAPABLE OF
26 ADJUSTMENTS FROM THE LOWEST TO THE HIGHEST ACCEPTABLE
27 TEMPERATURE SETTINGS FOR THE INTENDED USE.

28 (B) SHUT DOWN.--A SEPARATE SWITCH SHALL BE PROVIDED TO
29 TERMINATE THE ENERGY SUPPLIED TO ELECTRIC HOT WATER SUPPLY
30 SYSTEMS. A SEPARATE VALVE SHALL BE PROVIDED TO TURN OFF THE

1 ENERGY SUPPLIED TO THE MAIN BURNER OF ALL OTHER TYPES OF HOT
2 WATER SUPPLY SYSTEMS.

3 SUBCHAPTER F
4 ELECTRICAL SYSTEMS

5 SECTION 228. SYSTEM REQUIREMENTS.

6 (A) POWER FACTOR.--THE POWER FACTOR OF THE OVERALL
7 ELECTRICAL DISTRIBUTION SYSTEM IN A BUILDING SHALL BE NOT LESS
8 THAN 90% UNDER RATED DESIGN INSTALLED LOAD OF THE BUILDING,
9 EITHER BY UTILIZATION EQUIPMENT DESIGN OR BY THE USE OF POWER
10 FACTOR CORRECTIVE DEVICES. THE POWER FACTOR CORRECTIVE DEVICES
11 MAY BE INSTALLED ON INDIVIDUAL EQUIPMENT, RATED GREATER THAN
12 1,000 WATTS AND SWITCHED THEREWITH, REGIONALLY GROUPED, LOCATED
13 AT THE SERVICE EQUIPMENT OR POWER FACTOR CORRECTION ACHIEVED BY
14 OTHER EQUIVALENT MEANS. THE CHOICE AMONG THESE CORRECTIVE
15 METHODS SHOULD BE MADE BASED UPON AN ENGINEERING EVALUATION OF
16 EACH DISTRIBUTION SYSTEM.

17 (B) SERVICE VOLTAGE.--WHERE A CHOICE OF SERVICE VOLTAGE IS
18 AVAILABLE, THE VOLTAGE RESULTING IN THE LEAST ENERGY LOSS SHALL
19 BE USED.

20 (C) VOLTAGE DROP.--IN ANY BUILDING, THE MAXIMUM TOTAL
21 VOLTAGE DROP SHALL NOT EXCEED 3% IN BRANCH CIRCUITS OR FEEDERS,
22 FOR A TOTAL OF 5% TO THE FARTHEST OUTLET BASED ON STEADY STATE
23 DESIGN LOAD CONDITIONS.

24 (D) LIGHTING SWITCHING.--SWITCHING SHALL BE PROVIDED FOR
25 EACH LIGHTING CIRCUIT, OR FOR PORTIONS OF EACH CIRCUIT, SO THAT
26 THE PARTIAL LIGHTING REQUIRED FOR CUSTODIAL OR FOR EFFECTIVE
27 COMPLEMENTARY USE WITH NATURAL LIGHTING MAY BE OPERATED
28 SELECTIVELY.

29 (E) SEPARATE METERING.--IN ALL MULTI-FAMILY DWELLING
30 PROVISIONS SHALL BE MADE TO DETERMINE THE ELECTRICAL ENERGY

1 CONSUMED BY EACH TENANT.

2 SUBCHAPTER G

3 LIGHTING

4 SECTION 229. LIGHT POWER BUDGET.

5 A LIGHTING POWER BUDGET IS THE UPPER LIMIT OF THE POWER TO BE
6 AVAILABLE TO PROVIDE THE LIGHTING NEEDS IN ACCORDANCE WITH A
7 GIVEN SET OF CRITERIA AND GIVEN CALCULATION PROCEDURE.

8 SECTION 230. CALCULATION METHODS.

9 THE CRITERIA SPECIFIED BELOW SHALL BE UTILIZED FOR
10 COMPUTATION OF THE LIGHTING POWER BUDGET. ALL CALCULATIONS SHALL
11 BE IN ACCORDANCE WITH ACCEPTED ENGINEERING PRACTICE. WHEN
12 INSUFFICIENT INFORMATION IS KNOWN ABOUT THE SPECIFIC USE OF THE
13 BUILDING SPACE (E.G., NUMBER OF OCCUPANTS, SPACE FUNCTION,
14 LOCATION OF PARTITIONS), THE BUDGET SHALL BE BASED ON THE
15 APPARENT INTENDED USE OF THE BUILDING SPACE.

16 SECTION 231. BUILDING INTERIORS.

17 (A) PROCEDURE.--THE ALLOWABLE ELECTRIC POWER FOR LIGHTING
18 SHALL BE ESTABLISHED BY USING THE CRITERIA AND THE CALCULATION
19 PROCEDURES SPECIFIED IN SECTION 234. THE VALUE SHALL BE BASED ON
20 THE USE FOR WHICH THE SPACE WITHIN THE BUILDING IS INTENDED AND
21 ON EFFICIENT ENERGY UTILIZATION.

22 (B) ILLUMINATION LEVEL CRITERIA.--FOR THE PURPOSE OF
23 ESTABLISHING A BUDGET, LEVELS OF ILLUMINATION SHALL BE THOSE
24 LISTED IN FIG. 9-80 OF THE IES LIGHTING HANDBOOK, AND THOSE
25 LEVELS SHALL BE USED AS FOLLOWS:

26 (1) FOR TASK LIGHTING, THE LEVELS OF ILLUMINATION LISTED
27 ARE FOR SPECIFIC TASKS. THESE LEVELS ARE FOR THE TASK AREAS
28 DEFINED IN THE IES LIGHTING HANDBOOK OR, WHERE NOT DEFINED,
29 AT ALL USABLE PORTIONS OF TASK SURFACES. IN SOME CASES, THE
30 LEVELS OF ILLUMINATION ARE LISTED FOR LOCATIONS (E.G.,

AUDITORIUMS). THESE LEVELS ARE TO BE CONSIDERED AS AVERAGE LEVELS.

(2) FOR GENERAL LIGHTING, IN AREAS SURROUNDING TASK LOCATIONS, THE AVERAGE LEVEL OF GENERAL LIGHTING, FOR BUDGET PURPOSES ONLY, SHALL BE ONE-THIRD THE LEVEL FOR THE TASKS PERFORMED IN THE AREA BUT IN NO CASE LESS THAN 20-FOOT CANDLES. WHERE MORE THAN ONE TASK LEVEL OCCURS IN A SPACE, THE GENERAL LEVEL SHALL BE ONE-THIRD THE WEIGHTED AVERAGE OF THE SPECIFIC TASK LEVELS.

(3) FOR NONCRITICAL LIGHTING, IN CIRCULATION AND SEATING AREAS, WHERE NO SPECIFIC VISUAL TASK OCCUR, THE AVERAGE LEVEL OF ILLUMINATION SHALL BE ONE-THIRD OF THE AVERAGE GENERAL LIGHTING IN THE ADJACENT TASK SPACES BUT IN NO CASE LESS THAN TEN-FOOT CANDLES.

(4) FOR THE PURPOSE OF ESTABLISHING A POWER BUDGET, ONLY LAMP EFFICACIES AND COEFFICIENTS OF UTILIZATION (CU) SPECIFIED IN TABLE 16, SHALL BE ASSUMED.

SECTION 232. BUILDING EXTERIORS.

(A) BASIS ON USE.--IN EXTERIOR SPACES, THE LIGHTING POWER BUDGET SHALL BE BASED ON THE USE OF WHICH THE SPACE IS INTENDED (FOR TASK PERFORMANCE, SAFETY, OR SECURITY) AND ON EFFICIENT ENERGY UTILIZATION.

(B) CRITERIA.--THE SAME CRITERIA AS THOSE FOR INTERIOR SPACES APPLY FOR ILLUMINATION LEVELS AND LIGHTING SYSTEMS WITH THE ADDITION OF LUMINAIRES FOR FLOOD LIGHTING. FOR POWER BUDGET PURPOSES FLOODLIGHTING SHALL BE SELECTED WITH LUMINAIRES HAVING A GREATER PERCENTAGE OF THEIR BEAM LUMENS RESTRICTED TO THE AREA TO BE LIGHTED. SUCH LUMINAIRES ARE DEFINED AS THOSE WITH AT LEAST THE MINIMUM EFFICIENCIES LISTED IN THE IES LIGHTING HANDBOOK.

1 (C) FACADE LIGHTING.--FACADE LIGHTING FOR BUDGET PURPOSES
2 SHALL BE NO GREATER THAN 2% OF THE TOTAL INTERIOR LOAD OF THE
3 BUILDING.

4 (D) CALCULATION PROCEDURE.--IN ESTABLISHING A LIGHTING POWER
5 BUDGET THE FOLLOWING PROCEDURES SHALL BE USED:

6 (1) FOR OVERHEAD LIGHTING THE PROCEDURE SPECIFIED IN
7 SECTION 234 SHALL BE FOLLOWED, BUT USING REFLECTANCES AS
8 FOUND.

9 (2) FOR FLOOD LIGHTING THE BEAM LUMEN METHOD, AS SHOWS
10 IN THE IES LIGHTING HANDBOOK AND A COEFFICIENT OF BEAM
11 UTILIZATION (CBU) OF 0.75 SHALL BE USED FOR FLOODLIGHTING
12 CALCULATIONS.

13 SECTION 233. EXCEPTIONS TO CRITERIA.

14 (A) INTERIORS.--THE CRITERIA OF SECTION 231 SHALL NOT APPLY
15 TO THE FOLLOWING AREAS WHEN CALCULATING THE LOAD.

16 (1) PORTIONS OF RESIDENTIAL OCCUPANCIES EXCEPT FOR
17 KITCHENS, BATHROOMS, AND LAUNDRY AREAS AND PUBLIC SPACES
18 INCLUDING LOBBIES, HALLS, STAIRWAYS, BASEMENT AREAS, AND
19 UTILITY ROOMS.

20 (2) RESIDENTIAL TYPE SPACES SIMILAR TO THOSE STATED IN
21 PARAGRAPH (1) IN INSTITUTIONS, SUCH AS HOSPITALS, HOTELS,
22 FUNERAL HOMES, CHURCHES, MUSEUMS, ETC.

23 (3) THEATER AUDITORIUMS, ENTERTAINMENT AND AUDIOVISUAL
24 PRESENTATIONS WHERE THE LIGHTING IS AN ESSENTIAL TECHNICAL
25 ELEMENT FOR THE FUNCTION PERFORMED.

26 (B) EXTERIORS.--THE CRITERIA OF SECTION 232 SHALL NOT APPLY
27 TO THE FOLLOWING LAMPS AND LUMINARIES; HOWEVER, THEIR USE SHALL
28 BE ACCOUNTED FOR IN THE CALCULATION OF TASK LIGHTING LOADS FOR
29 SPECIFIC TASKS. THE ALLOWABLE LOAD SHALL BE BASED ON THE
30 LUMINARY WATTAGE TO ACHIEVE THE LEVELS OF ILLUMINATION AS

COVERED IN SECTION 231 USING A POINT CALCULATION METHOD GIVEN IN
THE IES LIGHTING HANDBOOK. THE EXCEPTED LAMPS AND LUMINARIES ARE
AS FOLLOWS:

(1) LUMINARIES FOR MEDICAL AND DENTAL PURPOSES.

(2) LUMINARIES FOR HIGHLIGHTING APPLICATIONS, SUCH AS
SCULPTURE EXHIBITS, ART EXHIBITS, AND INDIVIDUAL ITEMS OF
DISPLAY MERCHANDISE.

(3) LUMINARIES FOR SPECIALIZED LIGHTING APPLICATIONS
(COLOR MATCHING, WHERE ELECTRICAL INTERFERENCE CANNOT BE
TOLERATED, ETC.).

(C) CONTROL OF REFLECTANCES.--THE CRITERIA OF TABLE 16 SHALL
NOT APPLY IN SPACES WHERE IT IS IMPRACTICAL TO CONTROL
REFLECTANCES AND WHERE A DIRTY ATMOSPHERE CANNOT BE AVOIDED.
WHERE THIS CONDITION EXISTS, THE VALUES FOR REFLECTANCES AND
LIGHT LOSS FACTORS SHALL BE THOSE EXPECTED TO BE FOUND AND SHALL
BE APPROVED BY THE DEPARTMENT. THE CALCULATION SHALL MAKE A NOTE
OF THIS DEVIATION.

SECTION 234. CALCULATION PROCEDURE.

(A) ILLUMINATION LEVELS AND AREAS.--TO ESTABLISH
ILLUMINATION LEVELS AND AREAS, THE FOLLOWING PROCEDURE SHALL BE
USED:

(1) DETERMINE THE VISUAL TASKS THAT ARE EXPECTED TO BE
PERFORMED IN EACH SPACE AND THE NUMBER OF PLANNED WORK
LOCATIONS WHERE TASKS WILL BE PERFORMED. IF ASSUMPTIONS ARE
MADE, THEIR BASES SHALL BE INDICATED.

(2) SELECT THE ILLUMINATION LEVEL, IN FOOT-CANDLES FOR
THOSE EXPECTED TASKS IN ACCORDANCE WITH SECTION 231(B)(1).

(3) CALCULATE TOTAL TASK AREAS TO BE ILLUMINATED TO THE
SAME LEVEL BY MULTIPLYING THE NUMBER OF WORK LOCATIONS BY 50
SQUARE FEET PER WORK LOCATION. (TOTAL TASK AREAS SHALL NOT

1 EXCEED ACTUAL TOTAL SPACE AREA). IF ACTUAL TASK AREA IS
2 GREATER THAN 50 SQUARE FEET THE ACTUAL AREA SHALL BE USED. IF
3 SPECIAL TASK LIGHTING OR LOCALIZED LIGHTING IS TO BE
4 EMPLOYED, USE THE ACTUAL TASK AREAS AND POINT CALCULATION
5 PROCEDURES.

6 (4) CALCULATE THE LEVEL OF GENERAL LIGHTING BY
7 MULTIPLYING THE TASK LIGHTING LEVEL BY ONE-THIRD, WHERE THERE
8 IS ONLY ONE TASK LEVEL, OR BY TAKING ONE-THIRD OF THE SUM OF
9 THE PRODUCTS OF THE TASK LEVELS AS PROVIDED FOR IN PARAGRAPH
10 (2) AND THEIR AREAS AS PROVIDED FOR IN PARAGRAPH (3) DIVIDED
11 BY THE TOTAL TASK AREAS.

12 (5) CALCULATE THE LEVEL OF NONCRITICAL LIGHTING.

13 (B) LIGHTING SYSTEM DATA.--TO ESTABLISH LIGHTING SYSTEM
14 DATA, THE FOLLOWING SHALL BE USED:

15 (1) LIGHT SOURCE AND LUMINAIRE TYPES TO USE.

16 (2) LAMP LUMENS PER WATT AND LUMINAIRE COEFFICIENTS OF
17 UTILIZATION FOR ROOM AND LUMINAIRE MOUNTING HEIGHT
18 DIMENSIONS. LUMINAIRE CUS SHALL BE SELECTED FROM THE IES
19 LIGHTING HANDBOOK. IN ALL CASES, NO LUMINAIRE SHALL HAVE A CU
20 FOR RCR = 1 OF LESS THAN THAT GIVEN IN TABLE 16 LAMP
21 EFFICACIES FOR THE APPROPRIATE SPACE.

22 (C) ALLOWABLE WATTAGE.--TO ESTABLISH ALLOWABLE WATTAGE, THE
23 FOLLOWING SHALL BE USED:

24 (1) USING DATA FROM SUBSECTION (B), THE ILLUMINATION
25 LEVELS AND AREAS DETERMINED IN SUBSECTION (A), AND THE
26 CRITERIA OF TABLE 16 ON REFLECTANCE, CALCULATE THE ALLOWABLE
27 WATTAGES USING THE LUMEN METHOD.

28 (2) CALCULATE THE TOTAL SPACE WATTAGE BY ADDING THE
29 TASK, GENERAL AND NONCRITICAL LIGHTING LOADS.

30 (3) ADD THE WATTAGE OF LUMINARIES ALLOWED IN SECTION

233(B).

TABLE 16

(A) LAMP EFFICACIES.--THE FOLLOWING ARE INITIAL LUMEN OUTPUT
PER WATT INPUT, INCLUDING BALLAST LOSSES:

APPLICATION	LUMENS PER WATT
WHERE MODERATE COLOR RENDITION IS APPROPRIATE	55
WHERE GOOD COLOR RENDITION IS APPROPRIATE	40
WHERE HIGH COLOR RENDITION IS APPROPRIATE, SPACES ARE LESS THAN 50 SQUARE FEET OR WHERE USE OF LOW WATTAGE HIGH INTENSITY DISCHARGE (HID) LAMPS UNDER 250 W OR FLUORESCENT LAMPS UNDER 40 W IS APPROPRIATE	25

(B) LUMINARY COEFFICIENTS OF UTILIZATION (CU).--COEFFICIENTS
OF UTILIZATION (CUS) ARE TO BE FOR LUMINARIES FOR USE IN THE
TYPES OF SPACES LISTED BELOW, AND THOSE LUMINARIES SHALL HAVE A
CU OF NO LESS THAN THAT LISTED BELOW (FOR EACH TYPE SPACE) FOR A
ROOM CAVITY RATIO (RCR) OF 1 AND REFLECTANCES AS IN (C).

SPACE USE	MINIMUM CU (AT RCR - 1)
FOR SPACES WITH TASKS SUBJECTED TO VEILING REFLECTIONS WHERE DESIGN LEVELS OF ILLUMINATION ARE LISTED IN TERMS OF EQUIVALENTS SPHERE ILLUMINATION (ESI) AND WHERE VISUAL COMFORT IS IMPORTANT.	0.55
FOR SPACES WITHOUT TASKS, OR WITH TASKS NOT SUBJECTED TO VEILING REFLECTIONS, BUT WHERE VISUAL COMFORT IS IMPORTANT.	0.63
FOR SPACES WITHOUT TASKS AND WHERE VISUAL COMFORT IS NOT A CRITERION	0.70

(C) OTHER CRITERIA; REFLECTANCES.--FOR INTERIOR SPACES, THE FOLLOWING INITIAL CAVITY AND SURFACE REFLECTANCES SHALL BE ASSUMED:

CEILING CAVITY REFLECTANCE 80%

WALL REFLECTANCE 50%

FLOOR CAVITY REFLECTANCE 20%

LIGHT LOSS FACTOR. A LIGHT LOSS FACTOR (LLF) OF 0.70 SHALL BE USED.

SUBCHAPTER H

ALTERNATIVE SYSTEMS

SECTION 235. PERFORMANCE ALTERNATIVE.

ALTERNATIVE BUILDING SYSTEMS AND EQUIPMENT DESIGN MAY BE APPROVED BY THE DEPARTMENT WHEN THEY CAN BE SHOWN TO HAVE ENERGY CONSUMPTION NOT GREATER THAN THAT OF A SIMILAR BUILDING WITH SIMILAR FORMS OF ENERGY REQUIREMENTS, DESIGNED IN ACCORDANCE WITH THE PROVISIONS OF THIS ACT.

SECTION 236. NONDEPLETABLE SOURCES.

WHEN SUCH ALTERNATIVE SYSTEMS UTILIZE SOLAR, GEOTHERMAL, WIND OR OTHER NONDEPLETABLE ENERGY SOURCES FOR ALL OR PART OF ITS ENERGY SOURCES, SUCH NONDEPLETABLE ENERGY SUPPLIED TO THE BUILDING SHALL BE EXCLUDED FROM THE TOTAL ENERGY CHARGEABLE TO THE PROPOSED ALTERNATIVE DESIGN.

SECTION 237. DOCUMENTATION.

PROPOSED ALTERNATIVE DESIGNS, SUBMITTED AS REQUESTS FOR EXCEPTION TO THE STANDARD DESIGN CRITERIA, MUST BE ACCOMPANIED BY AN ENERGY ANALYSIS PREPARED IN ACCORDANCE WITH THE ASHRAE STANDARD 90.

CHAPTER 3

APPLICATION OF STANDARDS: ESTABLISHMENT

OF COMMITTEE AND PENALTIES

1 SECTION 301. MODIFICATION OF STANDARDS; CRITERIA.

2 THE DEPARTMENT, WITH THE APPROVAL OF THE BUILDING ENERGY
3 CONSERVATION COMMITTEE, ESTABLISHED PURSUANT TO SECTION 304,
4 AFTER ONE OR MORE PUBLIC HEARINGS, MAY RECOMMEND TO THE GENERAL
5 ASSEMBLY MODIFICATIONS TO THE ENERGY CONSERVATION STANDARDS. ANY
6 RECOMMENDED MODIFICATION TO THE ENERGY CONSERVATION STANDARDS
7 SHALL MEET THE FOLLOWING CRITERIA:

8 (1) IT SHALL BE CONSISTENT WITH THE LATEST AND MOST
9 EFFECTIVE TECHNOLOGY.

10 (2) IT SHALL NOT BE IN CONFLICT WITH EXISTING SAFEGUARDS
11 FOR PUBLIC HEALTH AND SAFETY.

12 (3) IT SHALL BE ECONOMICALLY FEASIBLE AS DETERMINED BY
13 LIFE-CYCLE-COST PROCEDURES.

14 (4) IT SHALL BE SUFFICIENTLY STRINGENT TO EFFECT A
15 SIGNIFICANT SAVINGS OF ENERGY RESOURCES.

16 (5) IT SHALL BE A PERFORMANCE STANDARD FOR THE DESIGN OF
17 BUILDINGS AND SYSTEMS WITHIN BUILDINGS TO ASSURE MAXIMUM
18 PRACTICAL CONSERVATION OF ENERGY.

19 (6) CONSIDERATION SHALL BE GIVEN TO BUILDING AND ENERGY
20 STANDARDS PROMULGATED BY NATIONAL AND OTHER STATE
21 GOVERNMENTAL AGENCIES, PRIVATE ORGANIZATIONS AND ANY OTHER
22 AVAILABLE ENERGY DATA, AS WELL AS THE TOTAL ENERGY ALLOCATION
23 APPROACH.

24 SECTION 302. APPLICATION OF ENERGY CONSERVATION STANDARDS.

25 THE ENERGY CONSERVATION STANDARDS CONTAINED HEREIN SHALL
26 APPLY TO NEW BUILDINGS OR TO RENOVATIONS ON WHICH ACTUAL
27 CONSTRUCTION AND/OR DESIGN HAS NOT COMMENCED PRIOR TO THEIR
28 EFFECTIVE DATE.

29 SECTION 303. ENERGY CONSERVATION MANUAL FOR BUILDINGS.

30 (A) PRODUCTION OF MANUAL.--CONCURRENT WITH THE ADOPTION OF

1 THE ENERGY CONSERVATION CODE REQUIRED BY THIS ACT, THE
2 DEPARTMENT SHALL PRODUCE AN ENERGY CONSERVATION MANUAL FOR USE
3 BY DESIGNERS, BUILDERS, AND CONTRACTORS OF RESIDENTIAL AND
4 NONRESIDENTIAL BUILDINGS. THIS MANUAL SHALL CONTAIN THE
5 ESTABLISHED STANDARDS AND ACCEPTED PRACTICES. THE MANUAL SHALL
6 BE FURNISHED UPON REQUEST TO MEMBERS OF THE PUBLIC AT A PRICE
7 SUFFICIENT TO COVER THE COST OF PRINTING.

8 (B) REVIEW OF MANUAL.--THE MANUAL SHALL BE REVIEWED BY THE
9 DEPARTMENT AND THE BUILDING ENERGY CONSERVATION COMMITTEE AT
10 LEAST ANNUALLY AND SHALL BE UPDATED AS SIGNIFICANT NEW ENERGY
11 CONSERVATION INFORMATION BECOMES AVAILABLE.

12 SECTION 304. BUILDING ENERGY CONSERVATION COMMITTEE.

13 (A) COMPOSITION OF COMMITTEE.--IN ORDER TO FURTHER THE
14 COORDINATED AND EFFECTIVE ADMINISTRATION OF THIS ACT, THERE IS
15 HEREBY ESTABLISHED A BUILDING ENERGY CONSERVATION COMMITTEE. IT
16 SHALL CONSIST OF AT LEAST 15 MEMBERS AND NO MORE THAN 25
17 MEMBERS, THE MEMBERSHIP OF WHICH SHALL BE APPOINTED BY THE
18 SECRETARY OF LABOR AND INDUSTRY AND SHALL INCLUDE A
19 REPRESENTATIVE OF EACH OF THE FOLLOWING ENTITIES OR THEIR
20 SUCCESSORS:

- 21 (1) DEPARTMENT OF EDUCATION.
- 22 (2) GOVERNOR'S ENERGY COUNCIL.
- 23 (3) DEPARTMENT OF GENERAL SERVICES.
- 24 (4) DEPARTMENT OF LABOR AND INDUSTRY.
- 25 (5) DEPARTMENT OF COMMUNITY AFFAIRS.
- 26 (6) PENNSYLVANIA BUILDERS ASSOCIATION.
- 27 (7) PENNSYLVANIA ASSOCIATED BUILDERS AND CONTRACTORS,
28 INC.
- 29 (8) PENNSYLVANIA BUILDING OFFICIALS CONFERENCE.
- 30 (9) MECHANICAL CONTRACTORS ASSOCIATION OF AMERICA.

1 (10) PENNSYLVANIA CHAMBER OF COMMERCE.

2 (11) GENERAL CONTRACTORS ASSOCIATION OF PENNSYLVANIA.

3 (12) PENNSYLVANIA SOCIETY OF ARCHITECTS.

4 (13) PENNSYLVANIA SOCIETY OF PROFESSIONAL ENGINEERS.

5 (14) REPRESENTATIVES OF SUCH OTHER AGENCIES AND

6 ORGANIZATIONS OR INDIVIDUALS AS THE SECRETARY MAY FIND ARE

7 NECESSARY AND PROPER TO CARRY OUT THE PURPOSES OF THE

8 COMMITTEE INCLUDING, BUT NOT LIMITED TO, LABOR ORGANIZATIONS,

9 FINANCIAL AND LENDING INSTITUTIONS, AND ORGANIZATIONS

10 DIRECTLY INVOLVED IN THE SUPPLY OF ENERGY THROUGHOUT THE

11 COMMONWEALTH.

12 (B) POWERS AND DUTIES.--IN ADDITION TO THE POWERS AND DUTIES

13 ENUMERATED IN THIS ACT, THE BUILDING ENERGY CONSERVATION

14 COMMITTEE SHALL PERFORM THE FOLLOWING DUTIES:

15 (1) THE COMMITTEE SHALL BE RESPONSIBLE FOR THE REGULAR

16 EXCHANGE OF INFORMATION AND PLANS REGARDING BUILDING ENERGY

17 CONSERVATION, FOR THE DEVELOPMENT AND REVIEW OF PROPOSED AND

18 EXISTING STANDARDS, GUIDELINES, REGULATIONS, AND MANUALS, AND

19 SHALL MAKE RECOMMENDATIONS TO THE INDUSTRIAL BOARD OF THE

20 DEPARTMENT OF LABOR AND INDUSTRY CONSISTENT WITH THE

21 PROVISIONS OF THIS ACT.

22 (2) SAID COMMITTEE SHALL ACT AS AN ADVISORY COMMITTEE TO

23 THE INDUSTRIAL BOARD OF THE DEPARTMENT OF LABOR AND INDUSTRY

24 AND THE ADVISORY BOARD IN THE DEPARTMENT OF LABOR AND

25 INDUSTRY IN MATTERS OF BUILDING ENERGY CONSERVATION AND MAY

26 RECOMMEND TO THE INDUSTRIAL BOARD VARIANCES FROM STANDARDS,

27 GUIDELINES, REGULATIONS AND MANUALS AFTER CONSULTATION WITHIN

28 THE COMMITTEE OR WITH ANY PERSON AFFECTED BY SUCH STANDARDS,

29 GUIDELINES, REGULATIONS OR MANUALS.

30 (C) EXPENSES.--THE MEMBERS OF THE COMMITTEE SHALL NOT

1 RECEIVE ANY COMPENSATION FOR THEIR SERVICES BUT SHALL BE
2 REIMBURSED FOR THEIR ACTUAL AND NECESSARY EXPENSES INCURRED IN
3 THE PERFORMANCE OF THEIR DUTIES. PROVIDED, HOWEVER, WHEN ACTING
4 AS AN ADVISORY COMMITTEE TO THE INDUSTRIAL BOARD OR THE ADVISORY
5 BOARD ON MATTERS CONCERNING VARIANCES WHICH HAVE BEEN REFERRED
6 TO THE INDUSTRIAL BOARD, THEY SHALL RECEIVE \$50 PER DAY PLUS
7 THEIR ACTUAL AND NECESSARY EXPENSES.

8 SECTION 305. CERTIFICATION.

9 (A) COMPLIANCE WITH ACT.--IT SHALL BE THE DUTY OF THE
10 ARCHITECT RETAINED IN CONNECTION WITH THE CONSTRUCTION OR
11 RENOVATION OF A BUILDING TO CERTIFY THE DRAWINGS, SPECIFICATIONS
12 AND OTHER DATA SHOWING COMPLIANCE WITH THE PROVISIONS OF THIS
13 ACT.

14 (B) INSPECTION.--EACH ARCHITECT OR HIS DESIGNEE SHALL MAKE
15 PERIODIC INSPECTIONS OF THE BUILDING PROGRESSION TO INSURE
16 COMPLIANCE WITH THIS ACT.

17 (C) FINAL CERTIFICATION.--EACH ARCHITECT SHALL MAKE A FINAL
18 CERTIFICATION OF EVERY COMPLETED BUILDING SHOWING COMPLIANCE
19 WITH THE PROVISIONS OF THIS ACT.

20 (D) CERTIFICATION BY BUILDER; BONDS.--IF AN ARCHITECT IS NOT
21 RETAINED IN CONNECTION WITH THE CONSTRUCTION OR RENOVATION OF A
22 BUILDING, IT SHALL BE THE RESPONSIBILITY OF THE BUILDER TO
23 PERFORM THE INSPECTIONS AND CERTIFICATION REQUIRED BY THIS
24 SECTION AND TO FILE WITH THE DEPARTMENT AN INDEMNITY BOND IN
25 SUCH AMOUNT AS THE DEPARTMENT SHALL REQUIRE INDEMNIFYING THE
26 OWNER FOR ANY COSTS SAID OWNER MAY INCUR IN BRINGING THE
27 BUILDING INTO COMPLIANCE WITH THIS ACT, SHOULD THE DEPARTMENT
28 FIND IT TO BE IN NONCOMPLIANCE. SAID INDEMNITY BOND SHALL REMAIN
29 IN FULL FORCE AND EFFECT FOR A PERIOD OF TWO YEARS FROM THE DATE
30 OF COMPLETION OF THE CONSTRUCTION OR RENOVATION OF THE BUILDING.

1 SECTION 306. VARIANCES.

2 (A) REQUESTS.--ANY REQUEST FOR A VARIANCE FROM THE ENERGY
3 CONSERVATION STANDARDS CONTAINED HEREIN SHALL BE MADE TO THE
4 INDUSTRIAL BOARD OF THE DEPARTMENT OF LABOR AND INDUSTRY.

5 (B) CRITERIA.--A VARIANCE SHALL BE GRANTED ONLY IF IT IS
6 FOUND THAT:

7 (1) COMPLIANCE WITH THE PROVISIONS OF THIS ACT WOULD
8 RESULT IN EXTREME HARDSHIP TO THE OWNER; AND

9 (2) THE GRANTING OF SUCH VARIANCE WOULD NOT RESULT IN A
10 SIGNIFICANT INCREASE IN THE ENERGY USAGE OF THE BUILDING.

11 SECTION 307. BUILDING PERMITS.

12 ANY BUILDING PERMIT ISSUED BY THE COMMONWEALTH OR ANY OF ITS
13 POLITICAL SUBDIVISIONS SHALL HAVE PRINTED UPON ITS FACE NOTICE
14 THAT THE PROVISIONS OF THIS ACT MUST BE COMPLIED WITH.

15 SECTION 308. PERMITS FOR USE OR OCCUPANCY.

16 BEFORE ANY BUILDING OR STRUCTURE HEREAFTER CONSTRUCTED OR
17 RENOVATED SHALL BE USED OR OPENED FOR OCCUPANCY, THE OWNER
18 THEREOF SHALL NOTIFY THE DEPARTMENT OF LABOR AND INDUSTRY OF THE
19 COMPLETION OF THE BUILDING AND SUBMIT THE NECESSARY
20 CERTIFICATION THEREWITH. NO PERMIT FOR USE OR OCCUPANCY SHALL BE
21 GRANTED UNTIL SUCH SUBMISSION HAS BEEN MADE. NO BUILDING
22 OFFICIAL OF THE COMMONWEALTH OR ANY OF ITS POLITICAL
23 SUBDIVISIONS SHALL ISSUE A PERMIT UNTIL HE HAS RECEIVED PROOF OF
24 COMPLIANCE.

25 SECTION 309. FAILURE TO SUBMIT CERTIFICATION.

26 WHENEVER THE OWNER OF ANY BUILDING OR STRUCTURE SHALL FAIL TO
27 NOTIFY THE DEPARTMENT OF THE COMPLETION OF THE BUILDING AND TO
28 SUBMIT THE NECESSARY CERTIFICATION AND SHALL NEVERTHELESS
29 PROCEED WITH THE USE OR OCCUPANCY OF THE BUILDING, THE
30 DEPARTMENT OR THE POLITICAL SUBDIVISION SHALL SERVE NOTICE ON

1 THE SAID OWNER TO IMMEDIATELY CEASE USING OR OCCUPYING SAID
2 BUILDING AND A NOTICE SHALL BE PLACED ON THE PREMISES
3 PROHIBITING SUCH USE OR OCCUPANCY UNTIL SUCH CERTIFICATION HAS
4 BEEN SUBMITTED.

5 SECTION 310. INSPECTIONS.

6 THE DEPARTMENT MAY INSPECT WITHIN TWO YEARS OF THE DATE OF
7 COMPLETION OF CONSTRUCTION OR RENOVATION ANY BUILDING
8 CONSTRUCTED OR RENOVATED AFTER THE EFFECTIVE DATE OF THIS ACT TO
9 DETERMINE COMPLIANCE WITH THE PROVISIONS OF THIS ACT.

10 SECTION 311. FAILURE TO COMPLY WITH PROVISIONS OF THIS ACT.

11 WHENEVER THE OWNER OF ANY BUILDING, AS DESCRIBED IN THIS ACT,
12 SHALL FAIL TO COMPLY WITH THE PROVISIONS OF THIS ACT, OR THE
13 RULES AND REGULATIONS OF THE DEPARTMENT FORMULATED UNDER THE
14 AUTHORITY OF THIS ACT, AND UPON WHOM A WRITTEN ORDER SHALL BE
15 SERVED BY THE DEPARTMENT TO COMPLY WITH THE SAID PROVISIONS OF
16 THIS ACT AND THE RULES AND REGULATIONS OF THE DEPARTMENT AND WHO
17 NEVERTHELESS SHALL HAVE FAILED TO COMPLY WITH THE SAID WRITTEN
18 ORDER WITHIN THE TIME SPECIFIED IN THE SAME, THE DEPARTMENT
19 SHALL BE AUTHORIZED TO IMMEDIATELY ORDER THE BUILDING OR
20 STRUCTURE TO BE VACATED OR PLACED OUT OF SERVICE UNTIL SUCH TIME
21 AS THE REQUIREMENTS OF THIS ACT AND THE RULES AND REGULATIONS OF
22 THE DEPARTMENT SHALL HAVE BEEN FULLY COMPLIED WITH.

23 SECTION 312. APPEALS.

24 REVIEW OF ANY DECISIONS RENDERED UNDER THE PROVISIONS OF THIS
25 ACT SHALL BE BROUGHT IN THE COURT OF COMMON PLEAS OF THE COUNTY
26 WHEREIN THE BUILDING IS SITUATED. SUCH REVIEW SHALL BE LIMITED
27 TO DETERMINING WHETHER ANY SUCH DECISION WAS ARBITRARY AND
28 CAPRICIOUS.

29 SECTION 313. PENALTIES.

30 (A) VIOLATIONS OF ACT.--ANY PERSON WHO SHALL VIOLATE ANY OF

1 THE PROVISIONS OF THIS ACT, OR THE RULES AND REGULATIONS OR THE
2 ORDERS FOR THE ENFORCEMENT OF THE SAID PROVISIONS OR RULES AND
3 REGULATIONS ISSUED BY DULY AUTHORIZED OFFICERS OF THE DEPARTMENT
4 OR WHO SHALL HINDER, DELAY OR INTERFERE WITH ANY OFFICER CHARGED
5 WITH THE ENFORCEMENT OF THIS ACT IN THE PERFORMANCE OF HIS DUTY,
6 SHALL, UPON CONVICTION THEREOF, BE PUNISHED BY A FINE OF \$300
7 AND COSTS, OR NOT MORE THAN THREE MONTHS IMPRISONMENT IN THE
8 COUNTY JAIL, OR EITHER, OR BOTH, IN THE DISCRETION OF THE COURT.

9 (B) REFUSAL TO VACATE.--ANY PERSON WHO SHALL FAIL OR REFUSE
10 TO VACATE A BUILDING OR PORTION OF A BUILDING, OR WHO SHALL FAIL
11 TO VACATE OR PLACE OUT OF SERVICE ANY BUILDING, AFTER DUE NOTICE
12 HAVING BEEN SERVED UPON HIM BY AN OFFICER OF THE DEPARTMENT AND
13 PROPER NOTICE HAVING BEEN PLACED UPON THE BUILDING OR STRUCTURE
14 BY SUCH OFFICER, SHALL BE LIABLE FOR A PENALTY OF \$100 A DAY FOR
15 EACH DAY HE SHALL HAVE SO FAILED OR REFUSED TO VACATE, OR PLACE
16 OUT OF SERVICE THE BUILDING, PORTION OF BUILDING UPON WHICH SUCH
17 NOTICE HAS BEEN PLACED, THE SAID PENALTY TO BE COLLECTIBLE IN
18 THE SAME MANNER AS ANY FINE PAYABLE TO THE COMMONWEALTH.

19 (C) INSTITUTION OF PROCEEDINGS.--PROSECUTIONS FOR VIOLATIONS
20 OF THIS ACT, OR THE RULES AND REGULATIONS OF THE DEPARTMENT MAY
21 BE INSTITUTED BY THE SECRETARY OF LABOR AND INDUSTRY, OR UNDER
22 HIS DIRECTIONS BY AN AUTHORIZED REPRESENTATIVE OF THE
23 DEPARTMENT. UPON CONVICTION AFTER A HEARING THE SENTENCES
24 PROVIDED IN THIS ACT SHALL BE IMPOSED, AND SHALL BE FINAL UNLESS
25 AN APPEAL BE TAKEN IN THE MANNER PRESCRIBED BY LAW.

26 (D) DISPOSITION OF FINES.--ALL FINES COLLECTED UNDER THIS
27 ACT SHALL BE FORWARDED TO THE DEPARTMENT WHO SHALL PAY THE SAME
28 INTO THE STATE TREASURY FOR THE USE OF THE COMMONWEALTH.

29 (E) FALSE CERTIFICATION.--ANY ARCHITECT WHO WILLFULLY
30 PROVIDES A FALSE CERTIFICATION FOR ANY BUILDING SUBJECT TO THE

1 PROVISIONS OF THIS ACT SHALL BE SUBJECT TO THE SUSPENSION OR
2 REVOCATION OF HIS LICENSE BY THE STATE BOARD OF EXAMINERS OF
3 ARCHITECTS.

4 SECTION 314. ENFORCEMENT.

5 (A) APPLICABILITY.--THE PROVISIONS OF THIS ACT SHALL APPLY
6 TO EVERY BUILDING ENUMERATED IN THIS ACT, EXCEPT BUILDINGS OWNED
7 BY THE FEDERAL GOVERNMENT, INCLUDING BUILDINGS OWNED IN WHOLE OR
8 IN PART BY THE COMMONWEALTH OR ANY POLITICAL SUBDIVISION
9 THEREOF, AND SHALL BE ENFORCED BY THE SECRETARY OF LABOR AND
10 INDUSTRY, BY AND THROUGH HIS AUTHORIZED REPRESENTATIVES.

11 (B) POWERS OF OFFICERS.--FOR THE PURPOSE OF ENFORCING THE
12 PROVISIONS OF THIS ACT, ALL THE OFFICERS CHARGED WITH ITS
13 ENFORCEMENT SHALL HAVE THE POWER TO ENTER ANY OF THE BUILDINGS
14 ENUMERATED IN THIS ACT, AND NO PERSON SHALL HINDER OR DELAY, OR
15 INTERFERE WITH ANY OF THE SAID OFFICERS IN THE PERFORMANCE OF
16 HIS DUTY, NOR REFUSE ANY PERTINENT INFORMATION NECESSARY TO
17 DETERMINE WHETHER THE PROVISIONS OF THIS ACT AND THE RULES AND
18 REGULATIONS HEREIN PROVIDED FOR, ARE OR WILL BE COMPLIED WITH.

19 SECTION 315. EFFECTIVE DATE.

20 THIS ACT SHALL TAKE EFFECT AS FOLLOWS:

21 (1) CHAPTER 2 SHALL TAKE EFFECT IN SIX MONTHS.

22 (2) ALL OTHER PROVISIONS OF THIS ACT SHALL TAKE EFFECT
23 IMMEDIATELY.