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shown in Column 17 for average connected loads per dwelling unit of over 50 KW each are hereinafter also referred to as unit loads.

B. The average connected loads shown on Line of 1 Table B are the summation of all the branch circuit loads in KW supplied by the feeder, computed as specified in Subsection (a) of this Section, divided by the number of dwelling units supplied. Average total connected loads in KW appearing as major fractions of KW are considered as the next larger whole number.

C. The unit loads shown in lines 2 and 13, Columns 2 and 16, and those computed from the demand factors given in Column 17 are basic demand loads per dwelling unit on the feeder. Those loads shall be increase where the feeder also supplies continuous loads.

D. For the purpose of this section, the following loads are classed as continuous loads:

1. Water heaters.
2. Air conditioners, heat pumps and air handling equipment.
3. Space heaters (bathroom heaters are classed as incidental heating and not continuous loads).

E. The basic unit loads as given in Table B shall be increased by:

1. One KW for each water heater.
2. The sum of the name plate ratings of all air conditioning, heat pump and air handling equipments.
3. The sum of the name plate ratings of all space heating equipment.

EXCEPTIONS:

1. See Subsection (E) 1. of this Section for omitting the smaller of heating or air conditioning loads.

2. Where more than 40 per cent of the dwelling units supplied by a feeder have space heating loads therein, that portion of connected space heating loads that is not in excess of 40 per cent of the total connected load may be computed at 40 per cent of the sum of their name plate ratings and added to the basic unit loads.

F. In no case shall a feeder or service supplying two or more dwelling units have less current-carrying capacity than that required for the largest feeder supplied.

Article XI. Sec. 9.110. Non-dwelling occupancies-branch circuits.

The provisions of this article apply to branch circuits installed for illumination, signs, outline lighting, receptacles and appliances, in non-dwelling occupancies, and to such branch circuits in public area on the premises of multiple dwelling occupancies comprised of five or more dwelling units.

Sec. 9.111. Illumination branch circuits.

The general illumination branch circuits for general lighting of a room or area are exclusive of any show window, show case, special display or other special effects lighting. The load on general illumination branch circuits shall be proportioned as equally as practicable between branch circuits and the outlets on the circuits.

Sec. 9.112. Other loads.

Branch circuits supplying lighting outlets for general illumination purposes shall not be used to supply receptacle outlets or appliances.

EXCEPTIONS:

(a) Not more than two ventilating fans, each not exceeding three amperes in rating, and receptacle outlets over 6 feet 6 inches high for clocks, may be supplied by lighting branch circuits.

(b) Branch circuits supplying only show window lighting may supply receptacle outlets located in the show window area.

Sec. 9.113. Lighting.

A. Interior Lighting—Lighting outlets or other fixed lighting shall be supplied by 15 or 20 ampere branch circuits.

B. Outdoor and Heavy Duty Lighting — Thirty, forty or fifty ampere lighting branch circuits shall only supply outdoor lighting or lighting fixtures having heavy-duty lampholders thereon, rated at not less than 750 watts.

EXCEPTION: Fixtures having admedium lampholder rated at 660 watts may be supplied from such circuits.

Sec. 9.114. Number of circuits.

Where general illumination branch circuits are provided and installed, the number of such circuits shall be not less than that required to supply the total load as computed in accordance with Table D.

Sec. 9.115. Signs.

A minimum of one branch circuit shall be provided and installed for the supply of exterior signs or outline lighting for each ground floor commercial or store occupancy. That circuit shall be extended to an accessible weatherproof fitting located at the exterior front wall of the occupancy, or to any outdoor advertising structure, statuary, or post on the premises of the occupancy involved where installed explicitly for signs or outline lighting.

Sec. 9.116. Show windows.

Branch circuits shall be provided and installed for any outlets, fixed lighting or receptacles in show window area. The circuit shall have a minimum capacity of 200 watts per lineal foot of store window frontage adjoining a pedestrian walkway as measured horizontally on a line parallel to the main path of pedestrian travel. Those circuits shall be extended to lighting or receptacle outlets in the show window area, or they shall be terminated in accessible junction boxes in that area. Where the show window area is not set off by a platform or partition, the show window area shall be computed for a line 4 feet back of, and parallel to the show window line.

A show window is defined herein as any store or mercantile window adjoining a walkway normally intended for pedestrian traffic, where that window is intended, designed or used for the display or advertising of merchandise, or to otherwise attract the pedestrian public's attention. This shall include all such windows below the second story level which adjoin any pedestrian walk-ways such as public sidewalks, or walkways in shopping center parking lots, courts, arcades, malls, shopping lobbies, and the like

EXCEPTION: Where the show window area is not set off by a platform, partition or otherwise designed to be inaccessible to the public, or where the Chief Electrical Inspector determines that merchandise is not likely to be brilliantly displayed, such as in the show window areas of automobile display rooms, barber shops, food markets, grocery stores, restaurants, and the like, receptacle outlets may be installed in lieu of the foregoing show window lighting branch circuit requirements in accordance with the following:

a. At least one receptacle outlet shall be installed in the show window area for every 12 lineal feet or major fraction thereof, of the store back of the window line and shall be controlled by an accessible wall or partitions, at least one receptacle shall be installed for each such divided section of store window frontage three feet or more in width. The receptacles shall insofar as practicable be spaced so as to divide the store window frontage into equal sections.

b. The receptacle outlets shall be located not more than four feet back of the window line and shall be controlled by an accessible wall switch or switches.

c. The receptacle outlets shall be supplied from 20 ampere, 120 volt branch circuits which supply no outlets outside the show window area.

Sec. 9.117. Guest rooms.

Lighting branch circuits supplying lighting outlets in guest rooms shall not exceed 150 volts between conductors. A guest room is defined herein as a room designed, occupied, intended or arranged for the temporary occupancy of individuals, where such rooms are not included within a dwelling unit. This includes such rooms in hotels, motels, rest homes, and sorority and fraternity houses, but does not include rooms in convents, hospitals, orphanages, sanitariums, or the like in buildings where human beings are housed and detained under legal restraint.

Sec. 9.118. Receptacle outlet branch circuits.

All receptacle outlets shall be supplied by branch circuits as follows:

(a) Receptacle outlets shall be installed wherever portable cords are used.

(b) Receptacle outlets shall be provided in all guest rooms in conformance with the requirements for dwelling receptacle outlets.

(c) Where show window wattage is not required to be provided, receptacle outlets shall be installed in the show window areas as specified in Subsection (a)-6 of this Section.

(d) Twenty ampere branch circuits shall be installed for the supply of two or more general use receptacle outlets.

Sec. 9.119. Appliance branch circuits.

Permissible loads on appliance branch circuits shall conform to the following:

(a) Twenty ampere appliance branch circuits may be used to supply receptacle outlets, display or showcase lighting, or appliances or a combination of such loads. The rating of any one portable appliance shall not exceed 80 per cent of the branch circuit rating. The total rating of fixed appliances shall not exceed 50 per cent of the branch circuit rating if portable appliances are also supplied.

(b) Twenty ampere appliances branch circuits may be used to supply a combination load of motors, appliances, motor operated appliances or receptacles complying with the following:

1. No motor, or motor-operated appliance shall exceed 7¼ amperes full-load current rating (two or more motors, arranged to start together are considered as a single motor whose rating equals the sum of the full-load currents of the group).
2. The branch circuit voltage shall not exceed 150 volts.
3. The branch circuit fuse or circuit breaker shall have a sufficient time delay to permit all motors to start and accelerate their loads.
4. The total connected load shall not exceed 16 amperes.

(c) Thirty ampere appliance branch circuits may only be used to supply receptacle outlets equipped with receptacles rated at 30 amperes, or fixed or portable appliances. The rating of any one portable appliance on such circuit shall not exceed 24 amperes.

(d) Forty and fifty ampere appliance branch circuits may only be used to supply fixed appliances, including infra-red lamp industrial heating appliances.

EXCEPTIONS:

1. A specific appliance branch circuit of 30 amperes or higher rating may supply a group of receptacles rated at not less than 30 amperes where the Chief Electrical Inspector determines that the receptacles will only be used for the explicit supply of a welder, window washing machine, X-ray unit and the like.

2. A single branch circuit may be used to supply space heating and cooling equipment providing a double throw switch is installed to prevent the simultaneous operation of the appliances and the circuit is properly rated for each.

Article XII. Sec. 9.120. Non-dwelling occupancies-calculations.

Calculation of branch circuit, feeder, and service loads for non-dwelling occupancies shall be in compliance with the provisions of this article.

Sec. 9.121. Branch circuits.

The loads on branch circuits in non-dwelling occupancies and in public areas on the premises of multiple dwelling occupancies comprised of five or more dwelling units, which are used for the supply of lighting, receptacles, signs, outline lighting and appliances, shall be computed as follows:

(a) The maximum load permissible on a branch circuit supplying continuous loads shall not exceed 80% of the branch circuit rating. Continuous loads are those where it is expected that the maximum demand will continue for periods of at least 4 hours

(b) A load of not less than the general illumination unit load given in Table D shall be included for each square foot of floor area of occupancies listed. In determining the load on the "watts per square foot" basis the floor area shall be computed from the outside dimensions of the building or area involved, and the number of floors not including open porches, attics, areas not provided with floors.

EXCEPTION: The wattage provided for general use receptacles in guest rooms may be considered as general illumination in such rooms.

(c) A minimum of 1200 watts shall be computed for the branch circuit installed for the supply of exterior signs or outline lighting for each ground floor commercial or store occupancy.

(d) The minimum load of 200 watts per lineal foot shall be computed for branch circuits supplying required show window area lighting.

(e) In no case shall the load on any outlet be computed at less than the load of the lamps, appliances or other utilization equipment supplied thereon, or less than set forth in Table C.

Sec. 9.122. Table C.

Type Of Outlet Or Appliance	Load In Watts Or Volt-Amperes
Outlets supplying non-heavy duty lampholders	180
Outlets supplying heavy-duty lampholders	600
General use receptacle outlets	180
20 or 30 ampere receptacle outlets	600
Miscellaneous heavy-duty receptacle supplied by an individual branch circuit	1,500
Refrigeration-type air conditioning receptacle	1,500
Other appliances	Name Plate Rating
Motors	125% of input rating of largest motor, plus 100% of input rating of other motors supplied

EXCEPTIONS: (a.) The total electric rating of electric discharge lighting fixtures, including ballasts, transformers, or auto-transformers, may be used in lieu of minimum outlet ratings for the following:

1. Fixtures mounted end to end forming a continuous raceway.

2. Fixtures not energized by means of a flexible cord and used only to provide general illumination in storage garages, warehouses, halls, corridors, restrooms, storage spaces, and the like.

(b.) The actual lamp wattage may be used in lieu of the minimum outlet ratings for showcase lighting, incandescent lighting utilizing approved troughs or strip fixtures, and outdoor festoon lighting or flood lights on poles.

(c.) Where fixed multi-outlet assemblies are installed, each five feet or fraction thereof, of each separate and continuous length, shall be considered as one outlet of 180 watts capacity. In locations where a number of outlets are likely to be used simultaneously, each foot or fraction thereof, shall be considered as an outlet of not less than 180 watts capacity.

(d.) Where branch circuits supply space heating or cooling equipment, the smaller of the two dissimilar loads may be omitted in computing the branch circuit load.

Sec. 9.123. Feeders and services.

The computed load on a feeder or service in non-dwelling occupancies, and in public areas on the premises of multiple dwelling occupancies comprised of five or more dwelling units, shall be the sum of all branch circuit loads supplied by the feeder.

Sec. 9.124. Continuous loads.

Where continuous branch circuit loads are supplied by a feeder the current carrying capacity of the feeder conductors shall be derated in accordance with the Electrical Safety Orders for that portion of the total load or those continuous loads shall be increased by 25% of the branch circuit loads.

Sec. 9.125. General illumination load.

The general illumination load provided for each square foot of floor area shall be not less than as set forth in Table D. General use receptacles may be considered as general illumination loads as provided for guest rooms.

Sec. 9.126. Table D.

General Illumination Unit Loads

Occupancy	Unit Load Per Sq. Ft. (Watts)
Armories and Auditoriums	1
Barber Shops and Beauty Parlors	3
Churches	1
Clubs	2
Court Rooms	2
Factories or Workshops	2
Garages—Commercial (Storage)	½
Hospitals	2
Hotels (Including Guest Rooms)	2
Industrial Commercial (Loft) Buildings	2
Lodge Rooms	1½
Manufacturing or Processing	2
Office Buildings (Including Banks)	5
Restaurants and Public Eating Places	2
Storage Rooms for Food and Utensils, in above	1
Schools	3
Stores	3
Warehouse Storage	¼
Wholesale Houses	2
Miscellaneous Non-Dwelling Occupancies not listed in the foregoing	2
Halls, Corridors, Closets, Restrooms, etc., in any Non-Dwelling Occupancy	½
Miscellaneous Storage Spaces, not listed in the foregoing	¼

Sec. 9.127. Demand factors.

The demand factors set forth in Table E may be applied to that portion of the total branch circuit load computed for general illumination and for general use convenience receptacle outlets. The number and capacity of branch circuits shall be determined before the demand factor is applied to the feeder load.

Sec. 9.128. Table E.

Feeder Demand Factors

* Type of Occupancy	Portion of Load to Which Demand Factor Applies (Watts)	Feeder Demand Factor
** Hospitals	First 50,000 or less at	40%
	Remainder over 50,000	20%
** Hotels, including Guest Rooms	First 20,000 or less at	50%
	Next 20,001 to 100,000 at	40%
	Remainder over 100,000 at	30%
Warehouses (Storage)	First 12,500 or less at	100%
	Remainder over 12,500 at	50%
All others	Total wattage	100%

* When a single building or premises is comprised of occupancies for which different requirements are set forth, the demand factors specified may be applied to each applicable portion of a building or premises in determining feeder or service loads.

** For feeders to areas in hospitals and hotels where entire lighting is likely to be used at one time, as in surgery rooms, ballrooms, dining rooms, etc., a demand factor of 100 per cent shall be used.

Article XIII, Sec. 9.130. Swimming pools.

The provisions of this Section apply to the construction and installation of electric wiring for equipment in or adjacent to swimming pools, to metallic appurtenances in or within 5 feet of the pool, and to the auxiliary equipment such as pumps, filters, and similar equipment. No electric appliances or wiring shall be installed in the water or in the enclosing walls of a swimming pool, except as provided herein.

Sec. 9.131. Approval of equipment.

All equipment shall be approved for the purpose.

Sec. 9.132. Lighting.

The following applies to lighting fixtures installed below the pool surface.

(a) No lighting fixture shall be installed for operation at more than 150 volts.

(b) A nonmetallic fixture shall not be used with a grounded power supply.

(c) All noncurrent carrying metal parts of lighting fixtures shall be grounded whether exposed or enclosed in nonconducting materials.

(d) Fixtures approved for the purpose may be installed outside the walls of the pool in closed recesses which are adequately drained and accessible for maintenance.

(e) Approved metal fixture housings (forming shells) shall be installed for the mounting of all underwater fixtures and they shall be equipped with provisions for conduit entries. Metal parts of the fixture, fixture housing, and the supply conduit below grade level shall be of brass or other suitable copper alloy. The conduit shall extend from the fixture housing (forming shell) to a suitable junction box located as provided in Subsection (c) of this Section.

(f) Transformers used for the supply of fixtures, together with the transformer enclosure, shall be approved for the purpose. The transformers shall be of an isolating type having a grounded metal barrier between the primary and secondary voltage windings.

Sec. 9.133. Junction boxes and transformer enclosures.

A. Junction boxes installed on the supply side of conduits extending to underwater pool lights shall be constructed of brass or suitable copper alloy unless located not less than four feet from the pool perimeter, and not less than eight inches above the ground or concrete surface.

B. Boxes shall be provided with means for independently terminating not less than two grounding conductors.

C. Transformer enclosures shall be approved for use in wet locations, or shall be located not less than four feet from the pool perimeter, twelve inches above the ground or concrete surface, and in no case less than twelve inches above the maximum water level.

Sec. 9.134. Attachment plug receptacles.

No attachment plug receptacle shall be installed within ten feet of the inside walls of the swimming pool.

EXCEPTION: Attachment plug receptacles of other than the standard 15 ampere parallel slot type may be installed where an integral part of the lighting fixture assembly and where used for the installation, maintenance, or servicing of the fixture.

Sec. 9.135. Grounding.

A. All metallic conduit, piping systems, pool reinforcing steel, lighting fixtures, and the like, shall be bonded together and connected to a common ground. The metal parts of ladders, diving boards, and their supports shall be grounded when practicable.

B. No pool equipment shall be grounded to an external grounding electrode that is not common to the pool ground (deck box or transformer enclosure).

1. Metallic raceways shall not be depended upon for grounding. Where exposed to pool water and in other corrosive areas such as in pump houses or adjacent to water treating and other equipment, the grounding of the noncurrent carrying parts shall be by means of an insulated copper conductor.
2. An unbroken No. 14 AWG, or larger, insulated copper wire shall be provided for a grounding conductor from the deck box to the distribution panel ground.
3. Lighting fixtures that are supplied by flexible cord or cable shall have all metal parts grounded by means of an insulated grounding conductor that is an integral part of the cord. This conductor shall be No. 14 AWG or larger.
4. Nonelectric equipment required to be grounded to a common ground in accordance with this Subsection may be bonded with a solid copper wire not less than #8 AWG and suitable clamps where not installed within conduits, and intended to be concealed.

Sec. 9.136. Clearances.

Service drop conductors and overhead wiring shall not be installed above the swimming pool or surrounding area extending 10 feet horizontally from the pool edge, or diving structure, observation stands, towers or platforms without special permission.

Article XIV. Miscellaneous.

Sec. 9.140. Fixture details.

A. Each outlet for fixtures located within reach five feet (5') horizontally or eight feet (8') vertically of conducting floors or other conducting objects shall be controlled by wall switches, by ceiling pull switches and insulated chain or cord, or by pendant switches constructed of porcelain or other suitable insulating material. All insulators in chain pulls shall be placed not more than one inch (1") from socket of fixtures. Key sockets and brass shell pendant switches will be permitted in such locations if the shells are permanently and effectively grounded.

B. Drop cord, unless of an approved portable type, shall be used only where it hangs free in th air, shall not be used for the support of more than one socket with its reflector equipment, and shall not be used for the support of sockets fitted with enclosing globes or bowls.

Sec. 9.141. Location of branch circuit protective devices.

Branch circuit protective devices shall be installed in and for each occupancy or in a location which is accessible to occupants at all times. Nothing contained in this Code shall be deemed or construed to permit the installation of any electrical device, outlet or circuit in any occupancy, the control of or the protection of which is not accessible to the occupant at all times.

No part of any circuit shall supply electrical energy to more than one occupancy.

Sec. 9.142. Gaseous tube lights.

Each fluorescent fixture, mercury vapor mixture, or high voltage gas tube light or sign shall be provided with a fixed name-plate, legible after installation, which shall correctly state the manufacturer's name or trademark, and the voltage, amperage, total watts and power factor. No such equipment shall be installed in which the power factor is less than 90 per cent. All above listed equipment shall have an Underwriters' Laboratories, Inc., label or other recognized testing laboratory label.

Sec. 9.143. Record of permits and inspections.

Said Chief Electrical Inspector shall keep complete records of all permits issued and inspection made and other official work performed under the provisions of this ordinance.

Sec. 9.144. Payments to city treasurer.

Said Chief Electrical Inspector shall pay all moneys collected by him, pursuant to the provisions of this ordinance, into the treasury daily, and such moneys shall be deposited to the credit of the General Fund.

ELECTRICAL CODE
APPENDIX
Formula For Voltage Drop Calculations:

1. Copper Conductors:

Single Phase:

$$\frac{\text{Amperes} \times \text{Feet} \times 21.6}{\text{C.M.}} = \text{Volts Drop}$$

Three Phase:

$$\frac{\text{Amperes} \times \text{Feet} \times 18.7}{\text{C.M.}} = \text{Volts Drop}$$

2. Aluminum Conductors:

Single Phase:

$$\frac{\text{Amperes} \times \text{Feet} \times 34.1}{\text{C.M.}} = \text{Volts Drop}$$

Three Phase:

$$\frac{\text{Amperes} \times \text{Feet} \times 29.6}{\text{C.M.}} = \text{Volts Drop}$$

3. Three-Wire Circuits derived from Three Phase, Four-Wire Systems:

Copper: $$\frac{\text{Amperes} \times \text{Feet} \times 18.7 \times 1.5}{\text{C.M.}} = \text{Volts Drop}$$

Aluminum: $$\frac{\text{Amperes} \times \text{Feet} \times 29.6 \times 1.5}{\text{C.M.}} = \text{Volts Drop}$$

Where:

Amperes = Amperes per terminal of load or demand load
Feet = One way distance in feet measured along conductors from the source of supply to the center of the load.
C.M. = Cross sectional area of conductor in circular mils.

Conversion Formulas
(Non-inductive Loads)

Basic Formula

Single Phase Systems:

$$\text{Amperes} = \frac{\text{Watts}}{\text{Volts}}$$

Three Phase Systems:

$$\text{Amperes} = \frac{\text{Watts}}{\text{Volts}} \times 0.58$$

Alternate Formula

Amperes = Kilowatts x Constant
1 Kilowatt = 1,000 watts

System	Voltage	Constant
Single Phase	120	8.33
	208	4.81
	240	4.17
	277	3.61
	480	2.08
Three Phase	208	2.77
	240	2.41
	480	1.20

Load Calculations

Example No. 1

A single-family dwelling or unit of a multiple dwelling occupancy with 800 sq. ft. of usable floor area and the following branch circuits:

1—Lighting outlet
1—Convenience receptacle outlet
2—Work Area receptacle oulet
1—Laundry receptacle outlet
1—Food waste disposer rated 5.6 amperes
1—Air conditioner rated at 1600 watts (240 volts)

Lighting and Receptacle Circuits
Connected load:
Lighting and convenience outlets at 3 watts per square foot (Sec. 22(a)1)
3 x 800 = 2400 watts
Work area receptacle outlets at 1500 watts per circuit (Sec. 22(a)2)
2 x 1500 = 300 watts
Laundry receptacle outlet at 1000 watts per circuit (Table A)
1 x 1000 = 1000 watts
Connected load 6400 watts
Demand load:
(Sec. 22(b)2)
1st 3000 watts at 100% 3000 watts
Remainder at 40%
6400 - 3000 = 3400
3400 x 0.40 = 1360 watts
Demand load 4360 watts
Fixed Appliances
Connected load:
Food waste disposer rated at 5.6 amperes
5.6 amperes x 120 volts = 627 watts
Connected load 627 watts
Demand load 627 watts
Space Heating and Cooling
Connected load:
Air conditioner rated at 1600 watts 1600 watts
Connected load 1600 watts
Demand load 1600 watts
SUM OF ALL DEMAND LOADS 6587 watts
6587 watts at 240 volts = 27.4 amperes
For a single family dwelling this service or feeder requires a minimum rating of 50 amperes.
(Sec. 18(f) 1)
For a dwelling unit of a multiple dwelling occupancy this service or feeder requires a minimum rating of 40 amperes.
(Sec. 18(f) 2)

Example No. 2

A single-family dwelling with 1700 sq. ft. of usable floor area and the following branch circuits:

1—Lighting outlet
1—Convenience receptacle outlet
2—Work area receptacle outlet
1—Laundry receptacle outlet
1—Food waste disposer rated 5.6 amperes
1—Dishwasher rated 1200 watts
1—Air conditioning unit rated 1600 watts (240 volts)
1—Electric air heating unit rated 4500 watts (240 volts)

Lighting and Receptacle Circuits
Connected load:
Lighting and convenience receptacle outlets at 3 watts per square foot (Sec. 22(a) 1)
3 x1700 = 5100 watts
Work area receptacle outlets at 1500 watts per circuit (Sec. 22(a) 2)
2 x 1500 = 3000 watts
Laundry receptacle outlet at 1000 watts per circuit (Table A)
1 x 1000 = 1000 watts
Connected load 9100 watts
Demand load:
(Sec. 22(b) 2)
1st 3000 watts at 100% 3000 watts
Remainder at 40%
9100 - 3000 = 6100
6100 x 0.40 = 2440 watts
Demand load 5440 watts
Fixed Appliances
Connected load:
Food waste disposer rated at 5.6 amperes
5.6 amperes x 120 volts = 627 watts
Dishwasher rated at 1200 watts Minimum (Table A) 1500 watts
Connected load 2127 watts
Demand load: 2127 watts
Space Heating and Cooling
Connected load:
Heater rated at 4500 watts 4500 watts
Air conditioner rated at 1600 watts 1600 watts
Connected load 6100 watts
Demand load:
(Sec. 22(b) 1, Exception a) 4500 watts
SUM OF ALL DEMAND LOADS 12067 watts
12067 watts at 240 volts = 50.3 amperes
This service or feeder requires a minimum rating of 100 amperes.
(Sec. 18(f) 1, Exception)

Example No. 3a (Standard Method of Calculation)

A single-family dwelling with 2000 sq. ft. of usable floor area and the following branch circuits:

2—Lighting outlet
3—Convenience receptacle outlet
3—Work area receptacle outlet
1—Laundry receptacle outlet
1—Food waste disposer rated 7.2 amperes
1—Dishwasher rated at 1200 watts
1—Electric clothes dryer rated at 5000 watts (240 volts)
1—Electric water heater rated at 4500 watts (240 volts)
1—Electric space heater rated at 7500 watts (240 volts)
1—Air conditioning unit rated at 4000 watts (240 volts)
1—Wall mounted electric oven rated at 8400 watts (240 volts)
1—Counter mounted electric cooking unit rated at 5000 watts (240 volts)

Lighting and Receptacle Circuits
Connected load:
Lighting and convenience receptacle outlets at 3 watts per square foot (Sec. 22(a) 1)
(3 x 2000= 6000 watts
Work area receptacle outlets at 1500 watts per circuit (Sec. 22(a) 2)
3 x 1500 = 4500 watts
Laundry receptacle outlet at 1000 watts per circuit (Table A)
1 x 100 = 1000 watts
Connected load 11500 watts
Demand load:
(Sec. 22(b) 2)
1st 3000 at 100% 3000 watts
Remainder at 40%
11500 - 3000 = 8500
8500 x 0.40 = 3400 watts
Demand load 6400 watts
Fixed Appliances
Connected load:
Food waste disposer rated at 7.2 amperes
7.2 amperes x 120 volts = 864 watts
Dishwasher rated at 1200 watts Minimum (Table A) 1500 watts
Electric clothes dryer rated at 5000 watts 5000 watts
Electric water heater rated at 4500 watts 4500 watts
Connected load 11864 watts
Demand load:
For four or more fixed appliances supplied by a feeder, a demand factor of 70% may be applied.
(Sec. 22(b) 3)
11864 watts x 0.70 = 8305 watts
Space Heating and Cooling
Connected load:
Heater rated at 7500 watts 7500 watts
Air conditioner rated at 4000 watts
(Sec. 22(a) 6)
4000 x 1.25 = 5000 watts
Connected load 12500 watts
Demand load:
(Sec. 22(b) 1, Exception a) 7500 watts
Cooking Appliances
Connected load:
Oven rated at 8400 watts
Counter unit rated at 5000 watts
Connected load considered as 12000 watts maximum
(Sec. 22(b) 1, Exception b)
Connected load 12000 watts
Demand load:
A demand factor of 80% may be applied to electric cooking loads
(Sec. 22(b) 4)
12000 x 0.80 = 9600 watts
SUM OF ALL DEMAND LOADS 31805 watts
31805 watts at 240 volts = 132.5 amperes
This service or feeder requires a minimum rating of 132.5 amperes.
(Sec. 18(f) 1)

Example No. 3b (Optional Method of Calculation, Sec. 22(b)5)

Same data as Example 3a
Space Heating and Cooling
Connected load:
Heater rated at 7500 watts 7500 watts
Air conditioner rated at 4000 watts
(Sec. 22(a)6)
4000 x 1.25 = 5000 watts
Connected load 12500 watts
Demand load:
(Sec. 22(b)1, Exception a) 7500 watts
Other load
Connected load:
Lighting and Receptacle Circuits
Connected load from Example 3a 11500 watts
Fixed Appliances
Connected load from Example 3a 11864 watts
Cooking Appliances
Oven unit rated 8400 watts
Counter unit rated 5000 watts
Connected load 36764 watts
Demand load:
1st 10,000 watts at 100% 10000 watts
Remainder at 40%
36764 - 10000 = 26764
26764 x 0.40 = 10706 watts
Demand load 20706 watts
SUM OF ALL DEMAND LOADS 28206 watts
28206 watts at 240 volts = 117.5 amperes
This service or feeder required a minimum rating of 117.5 amperes.
(Sec. 18(f)1)

Example No. 4

A six unit apartment building consisting of three 500 square foot units and three 800 suqare foot units and load schedules as indicated.

500 square foot units:
2—Work area receptacle circuits, 1500 watts each 3.0 KW
2—Ltg. and Conv. receptacle circuit, 500 sq. ft. at 3 watts per sq. ft. 1.5 KW
1—Garbage Disposer .9 KW
1—Bathroom Heater 1.0 KW
1—Air Conditioner 1.5 KW
7.9 KW
Less 1.0 KW for Bath Heater (Smaller of Unlike Loads) - 1.0 KW
Connected Load, each unit 6.9 KW

800 square foot units:
2—Work Area Receptacle Circuits, 1500 watts each 3.0 KW
2—Ltg. and Conv. Receptacle circuit 800 sq. ft. at 3 watts per sq. ft. 2.4 KW
1—120/240 volt Dryer 4.8 KW
1—Garbage Disposer .9 KW
1—Dishwasher 1.5 KW
1—Bathroom Heater 1.0 KW
1—Air Conditioner 2.0 KW
1—Washing Machine Receptacle 1.0 KW
16.6 KW
Less 1.0 KW for Bath Heater -1.0 KW
Connected Load, each unit 15.6 KW
TOTAL CONNECTED LOAD ON FEEDER
3 x 6.9 KW = 20.7 KW
3 x 15.6 KW = 46.8
67.5 KW

AVERAGE CONNECTED LOAD PER UNIT
67.5 KW ÷ 6 = 11.25 KW
(11.0 KW to be used for determining basic unit demand)

FROM TABLE B

The basic unit demand load is determined from Column 4 **(10-12** KW Average connected load per dwelling unit) and Line 6 **(Six dwelling** units on feeder)
Basic unit demand load per unit = 3.9 KW
Basic demand load on feeder: 6 x 3.9 KW = 23.4 KW
Summation of name plate ratings of air conditioning load:
3 x 1.5 KW = 4.5 KW
3 x 2.0 KW = 6.0 KW
25% of 2.0 KW = .5 KW (Largest motor on feeder)
Total Air Conditioning Load 11.00 KW
Basic Demand Load 23.4 KW
Total demand load on Feeder 34.4 KW
OR 143.33 Amperes at 240 Volts

Example No. 5

A six unit apartment building consisting of **six** 800 **square foot** units and load schedule as indicated.

2—Work area receptacle circuits, 1500 watts each **3.0 KW**
2—Ltg. and Conv. receptacle units, 800 sq. ft. at 3 watts per sq. ft. **2.4 KW**
12.0 KW
1—Garbage Disposer **.9 KW**
1—Bath Heater **.5 KW**
1—Air Conditioner **2.0 KW**
*Central Space Heater ***8.0 KW**
16.8 KW
Less 2.0 KW for Air Conditioner **2.0 KW**
Average and Connected Load per unit **14.8 KW**
*From Section 22 (c), Subsection 2, paragraph **f-2**
(Space Heat Load)
40% of 14.8 KW=5.92 KW
8.0 KW-5.92 KW=2.08 KW (at 100%)
40% of 5.92 KW=2.37 KW
4.45 KW
(Basic unit demand load from Table B to be increased by **4.45 KW** to compensate for Heat Load)
From Table B
Basic Unit Demand Load per unit **4.40 KW**
Space Heat Demand Load per unit **4.45 KW**
Total demand load per unit **8.85 KW**
Total demand load on feeder
6 x 8.85 KW= OR 53.1 KW
221.2 Amperes at 240 Volts.

Example No. 6

A six unit apartment building consisting **of five 500 square foot** units and one 2500 square foot unit and load schedule as **indicated.**

500 Square Foot Units
2—Work area circuits at 1500 watts each **3.0 KW**
1—Ltg. and Conv. Receptacle Circuit, 500 sq. ft. at 3 watts per sq. ft. 1.5 KW
1—Garbage Disposal
Connected Load, each 500 sq. ft. unit **.9 KW**
5.4 KW

2500 Square Foot Units
3—Work area circuits at 1500 watts each **4.5 KW**
5—Lgt. and Conv. receptacle circuits, 2500 sq. ft. at 3 watts per sq. ft. **7.5 KW**
1—Garbage Disposer **.9 KW**
2—Bathroom Heaters at 1.0 KW each **2.0 KW**
1—Dishwasher **2.0 KW**
1—Combination Washing Machine-Dryer **7.0 KW**
1—Range **12.0 KW**
6—Space Heaters at 2.0 KW each **12.0 KW**
1—Washing Machine **1.0 KW**
Total Connected Load This Unit **48.9 KW**
Total Connected Load on Feeder
5 x 5.4 KW=27.0 KW
1 x 48.9 KW=48.9 KW
75.9 KW
Average connected load per unit 75.9 KW Divided by 6=12.65 KW
(13.0 KW to be used for determining basic unit demand)
From Table B
Basic Unit Demand Load per unit=4.4 KW
Basic Demand Load on Feeder - 6 x 4.4 KW=26.4 KW
From Subsection (f-2), the space heating demand is 100%. (Less **than** 40% of the dwelling units supplied by the feeder are equipped **with** electric space heat)
Total Demand Load on Feeder.
Basic Demand Load - 26.4 KW
Space Heat Load - 12.0 KW
38.4 KW
OR **160 Amperes at 240 Volts**

Example No. 7

A multi-story fifty-unit apartment building consisting of **twenty** 900 square foot units, twenty 1100 square foot units, and ten 1800 square foot units with load schedule as indicated.

900 quare foot units:
2—Work area receptacle circuits, 1500 watts each **3.0 KW**
2—Ltg. and Conv. receptacle circuits, 900 sq. ft. at 3 watts per sq. ft. **2.7 KW**
1—Combination washing machine-dryer **5.8 KW**
1—Dishwasher **1.5 KW**
1—Garbage Disposer **.9 KW**
2—Air Handling Units at .45 KW each **.9 KW**
1—Range **12.0 KW**
Connected Load each unit **26.8 KW**
Connected Load 20 units, 20 x 26.8 KW **536 KW**

1100 square foot units:
3—Work area receptacle circuits, 1500 watts each **3.0 KW**
2—Ltg. and Conv. receptacle circuits, 1100 sq. ft. at 3 watts per sq. ft. **3.3 KW**
1—Combination Washing machine-dryer **5.8 KW**
1—Dishwasher **1.5 KW**
2—Bathroom Heaters at 1.0 KW each **2.0 KW**
1—Garbage Disposer **.9 KW**
3—Air handling units at .45 KW each **1.35 KW**
1—Range **12.0 KW**
Connected Load each unit **29.85 KW**
Connected Load 20 units, 20 x 29.85 KW = **597 KW**

1800 square foot units:
4—Work area receptacle circuits, 1500 watts each **6.0 KW**
3—Ltg. and Conv. receptacle circuits 1800 sq. ft. at 3 watts per sq. ft. **5.4 KW**
1—Dishwasher **2.0 KW**
1—Garbage Disposer **.9 KW**
1—Combination washing machine-dryer **5.8 KW**
3—Bathroom heaters, at 1.0 KW each **3.0 KW**
5—Air handling Units, at .45 KW each **2.25 KW**
1—Range **12.0 KW**
Connected Load each unit **37.35 KW**
Connected Load 10 Units, 10 x 37.35 KW **373.5 KW**
Average Connected Load per Unit,
(536 KW plus 597 KW plus 373.5 KW) divided by 50= **30.13 KW**
From Table B
Basic Unit Demand Load per Unit = **5.5 KW**
Basic Demand Load on Feeder, 50 x 5.5 KW = **275 KW**
Air handling Load on Feeder,
(20 x .9 KW) plus (20 x 1.35 KW) plus (10 x 2.25 KW) = **67.5 KW**
275.0 KW
Total demand load on feeder **342.5 KW**
OR **1428 Amperes at 240 Volts**

Example No. 8

A store building for an unspecified tenant with **2000 sq. ft. of** usable floor area and 40 lineal feet of show window space.
Minimum size feeder or service required
(Sec. 18 (f) 5)
General illumination at 3 watts per sq. ft.
(Sec. 24(a) 2)
3 x 2000 x 1.25*= **7500 watts**
Exterior sign circuit at 1200 watts each
(Sec. 24 (a)3)
1200 x 1 x 1.25* **1500 watts**
Show window lighting at 200 watts per lineal foot.
(Sec. 24 (a)4)
200 watts x 40 feet x 1.25*= **10000 watts**
Total Load **19000 watts**
19000 watts at 240 volts = 79.1 amperes
This service or feeder requires a minimum rating of **79.1 amperes**
(Sec. 24 (b)
*It is assumed that these loads will continue for at least **four hours.**
(Sec. 24 (b)1)"

SECTION 2.

Any provision of the Torrance City Code, or appendices **thereto,** inconsistent herewith, to the extent of such inconsistencies **and no** further, are hereby repealed.

SECTION 3.

Any person violating any of the provisions of this **Ordinance shall** be guilty of a misdemeanor, and upon conviction thereof, **shall be** subject to a fine not exceeding Five Hundred Dollars ($500.00), or **six** (6) months in the County Jail of Los Angeles County, or by both **such** fine and imprisonment, in the discretion of the Court.

SECTION 4.

This ordinance shall take effect thirty days after the date of **its** adoption and prior to the expiration of fifteen days from the **passage** thereof shall be published at least once in the Torrance Herald, **a** semi-weekly newspaper of general circulation, published and **circulated** in the City of Torrance.

Introduced and approved this 22nd day of March, 1966.
Adopted and passed this 5th ay of April, 1966.
Mayor of the City of Torrance
/s/ Albert Isen

ATTEST:
/s/ Vernon W. Coil
City Clerk of the City of Torrance
STATE OF CALIFORNIA)
COUNTY OF LOS ANGELES) ss
CITY OF TORRANCE)

I, VERNON W. COIL, City Clerk of the City of Torrance, **California**, do hereby certify that the foregoing ordinance was introduced and approved at a regular meeting of the City Council held on the **22nd** day of March, 1966, and adopted and passed at a regular meeting of said Council held on the 5th day of April, 1966, by the **following roll** call votes:
(SEAL)
AYES: COUNCILMEN: Beasley, Miller, Olson, Sciarrotta, **Vico and Isen.**
NOES: COUNCILMEN: None.
ABSENT: COUNCILMEN: Lyman.
City Clerk of the City of Torrance
/s/ Vernon W. Coil
APPROVED AS TO FORM:
STANLEY E. REMELMEYER, City Attorney
By /s/ Richard L. Knickerbocker
Richard L. Knickerbocker
Deputy City Attorney
W—May 11, 1966

PH—3971

CERTIFICATE OF BUSINESS, FICTITIOUS NAME

The undersigned do certify they are conducting a business at 23127 Vermont Ave., Torrance, California, under the fictitious firm name of THE VIKING and that said firm is composed of the following persons, whose names in full and places of residence are as follows:
Ronald N. Koester, 25344 Pennsylvania Ave., Lomita, Calif.
Ruby L. Koester, 22344 Pennsylvania Ave., Lomita, Calif.
Dated May 1, 1966.
Ronald N. Koester
Ruby L. Koester
State of California, Los Angeles County:
On May 1, 1966, before me, a Notary Public in and for said State, personally appeared Ronald N. Koester and Ruby L. Koester known to me to be the persons whose names are subscribed to the within instrument and acknowledged they executed the same.
(SEAL) Dorothy K. Sumowski,
Notary Public
My Commission Expires April 8, 1968
W—May 4, 11, 18, 25, 1966.

PH—3969

CERTIFICATE OF BUSINESS, FICTITIOUS NAME

The undersigned do certify **they** are conducting a business at **1923** Border Ave., Torrance, **California**, under the fictitious firm name **of** Cucbia Marine and that said **firm** is composed of the following **persons**, whose names in full **and** places of residence are as **follows:**
Donald Cucci, 1650 W. **209th** Street, Torrance, **California**.
George Williams, 1875 **220th** Street, Torrance, **California**.
Dated May 2, 1966.
Donald Cucci
George Williams
State of California, **Los Angeles** County:
On May 2, 1966, before **me, a** Notary Public in and for said **State**, personally appeared Donald **Cucci** and George Williams known **to me** to be the persons whose **names are** subscribed to the within **instrument** and acknowledged they **executed** the same.
(SEAL) **Dorothy K. Sumowski.**
Notary Public
My Commission **Expires** April 8, 1968
W—May 4, 11, 18, 25, 1966