

Padmount Transformers - Location Guidelines

Introduction

The primary purpose of this document is to provide guidelines for the location of oil-filled padmount transformers which protects buildings and persons from associated fire risks or oil leakage. In addition, these guidelines will provide for adequate access and working clearances for PECO Energy Personnel to service the transformers. These guidelines are intended to apply at the time of construction and deal with clearances from buildings or structures then existing or which PECO Energy has been notified are to be built. If a builder or owner later modifies a building or structure (as by later addition of a patio, window, door building addition, etc....) which may affect the required clearances, it is the responsibility of the builder or owner to notify PECO Energy and make arrangements to achieve proper clearances or barriers. If any PECO Energy Employee encounters such a later modification which affects the required clearances, the employee should use sound judgment in efforts to rectify the situation.

In the absence of industry accepted requirements it is recommended that padmount transformers be located in accordance with the following guidelines with respect to exterior building walls. These guidelines are based on insurance industry recommended practices for the location of oil-filled transformers outdoors. The building owner and/or tenants fire insurance carrier or local inspection authority may restrict the proximity of the equipment to any part of a building structure. It is the Customer's responsibility to determine the acceptability of the proposed location to those authorities outside of the Company.

The standard location for PECO Energy transformers installed on private property is adjacent to planned or existing driveways or parking areas to permit access for replacement. If situations arise that are not covered by the following guidelines, the Company's Fire Protection Services Group may be consulted.

Clearance Guidelines

I. Definitions

A. Types of Fire Resistive Building Walls

	<u>(Minimum Thickness)</u>
1. Brick	8" two courses
2. Hollow Tile	12" coated with cement plaster
3. Reinf. Concrete	4" coated with cement plaster
4. Concrete Block	8" coated with cement plaster
5. UL approved glass block	4" with 1.5 hour fire rating meeting UL 9 "Fire Test of Window Assemblies" not exceeding 100 sq. ft. in area nor 10' in height or width.

B. Types of Non-combustible Building Walls

1. Corrugated steel
2. Steel
3. Asbestos
4. Cement Board
5. Plaster on Metal Lath

C. Types of Combustible Walls

1. Materials not covered by A and B above which will support combustion.

D. Protected Area

1. The wall area to be protected is the exposed wall within the horizontal distances specified on the first floor including basement, eaves directly above, and wall areas on the second and third stories directly above the transformer location. No portion of a building or building structure shall overhang any part of the transformer.

E. Transformer Classification

Trans. Class	No. of Phases	Max. Trans. Prim. Volt.(kV)	Trans. (kVA) Nameplate
A	1	All	All
B	3	13.2 Grd. Y/7.62	500 maximum
B	3	33.3 Grd. Y/19.2	500 maximum
C	3	All	Above 500
C	3	34.4 Delta	All

Table 1

II. Distances from Buildings

The following table indicates acceptable padmount transformer distances from structures, assuming the terrain is not sloped towards a building, in which case steps shall be taken to suitably contain the oil from a tank rupture.

MINIMUM DISTANCE ¹ , IN FEET, FROM TRANSFORMERS TO:									
TYPE OF BUILDING ²	WALL			OPENING ³			PATIO		
	TRANS. CLASS			TRANS. CLASS			TRANS. CLASS		
	A	B	C	A	B	C	A	B	C
Fire resistive wall	3	3	3	10	20	30	10	10	10
Non-combustible	5	10	15	10	20	30	10	10	10
Combustible	10	20	30	10	20	30	10	10	10

Table 2

Notes:

1. In some cases, such as a patio to which an opening from the building leads, two minimum distances may be specified in this table. The greater of the two distances shall be used.
2. See Paragraph I for definitions.
3. Openings include, but are not limited to: doors, fire escapes, ventilating openings, and windows.

There are associated Figures that show acceptable padmount transformer locations. These figures are listed below:

Figure	DESCRIPTION
Figure 1	Single Residential Units - Class A Trans.
Figure 2	Apts./Condos./Townhouses - Class A Trans.
Figure 3	Apts./Condos./Townhouses - Class B Trans.
Figure 4	Apts./Condos./Townhouses - Class C Trans.
Figure 5	Commercial/Industrial - Class A Trans.
Figure 6	Commercial/Industrial - Class B Trans.
Figure 7	Commercial/Industrial - Class C Trans.
Figure 8	Protective Barriers - Examples

Table 3

III. Clearance from tanks with combustible or flammable material

Transformers shall be placed a minimum of 30 (thirty) feet from any tank or vessel containing combustible or flammable material (such as diesel fuel for an emergency generator).

IV. Barriers

If the clearances specified above cannot be adhered to, a fire resistive barrier may be constructed by the builder or developer in lieu of the separation specified.

The barrier shall extend to a projection line from the corner of the transformer to the farthest corner of the wall, opening, or patio necessary to satisfy minimum distance. In all cases, the barrier shall be a fire resistive material as outlined in Section I. A., Definitions, and shall extend a minimum of 2' above the transformer. Simplified examples of protective barriers are shown in Attachment 8.

Where it is impractical to provide the necessary minimum clearances with a simple barrier, alternate means shall be considered.

V. Minimum Distances from Highway and Vehicle Parking Areas

	Transformer Class		
	A	B	C
From curb without sidewalks*	4'	4'	4'
From curb with sidewalks	10'	10'	10'
From curb on island in, or adjacent to, a parking area**	4'	4'	4'
From edge of sidewalks	3'	3'	3'

Table 4

* Where prospect of future sidewalks exist, use 10' Minimum.

** If the above distances cannot be obtained, then vehicle protectors, as shown on the applicable Construction Standard (see references), shall be installed.

VI. Minimum Clearance in Front of Padmount Transformer

Maintain 8-feet of clear space in front of transformer to permit the use of insulated tools to perform switching.

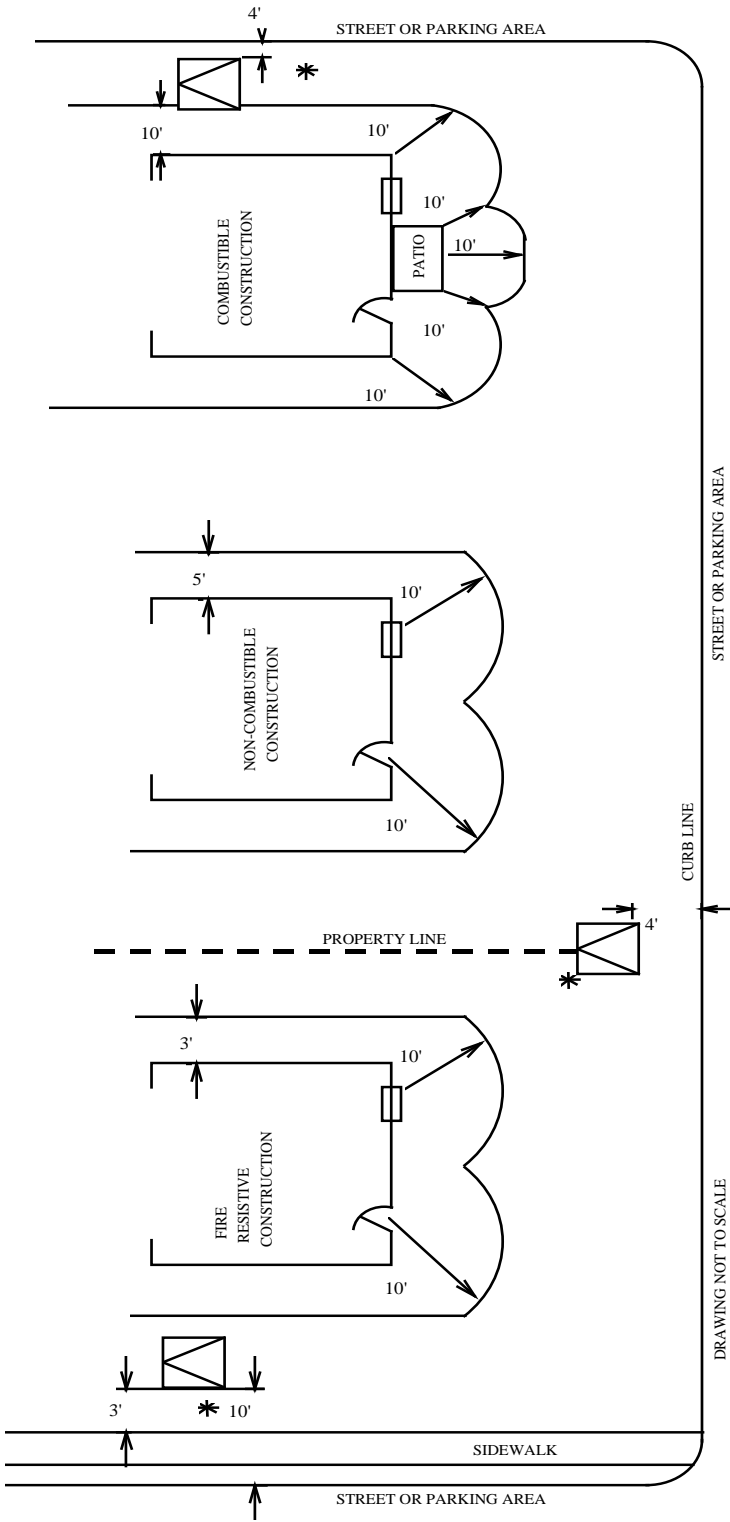
VII. Other Padmounted Equipment

- A. Oil-filled equipment - Use distances specified for padmount transformers.

- B. Other than oil-filled equipment - Maintain 3-foot minimum from all building walls.

References

1. Industrial Risk Insurers (IRI)
 - IRInformation® Section IM.5.9.2 (Latest Edition)
2. PECO Energy Construction Standards
 - S-1006/2006 "Concrete Pad and Grounding for 3 ϕ Padmounted Dist. Trans."
 - S-2231 "Precast 3 ϕ Transformer Foundation - 7'x7' Top"
 - S-2232 "Precast 3 ϕ Transformer Foundation - 8'x8' Top"



NOTES:

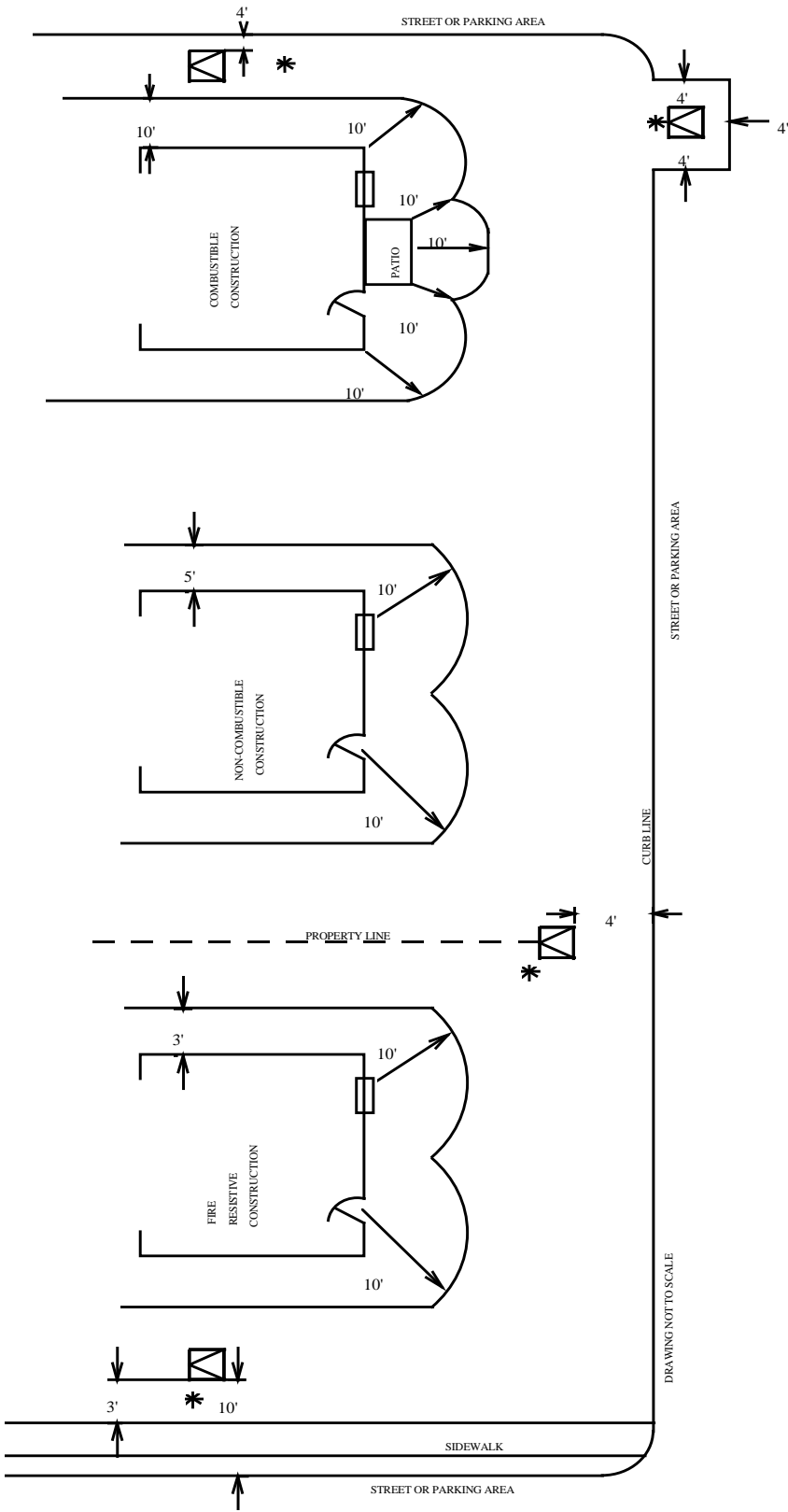
TRANSFORMER MUST BE EITHER ACCESSIBLE TO TRANSPORTATION VEHICLES OR WITHIN MAXIMUM BOOM DISTANCES.

* DENOTES PREFERRED LOCATION

FOR AREAS WHERE MINIMUM CLEARANCE FROM CURB LINES CANNOT BE MAINTAINED AND/OR TRANSFORMER IS SUBJECT TO VEHICULAR DAMAGE INSTALL GUARD POSTS IN ACCORDANCE WITH APPLICABLE CONSTRUCTION STANDARDS REFERENCED IN SECTION VII.

CLASS "A" TRANSFORMER INSTALLATION - SINGLE RESIDENTIAL DWELLINGS

Figure 1 of 8
 59-6



NOTES:

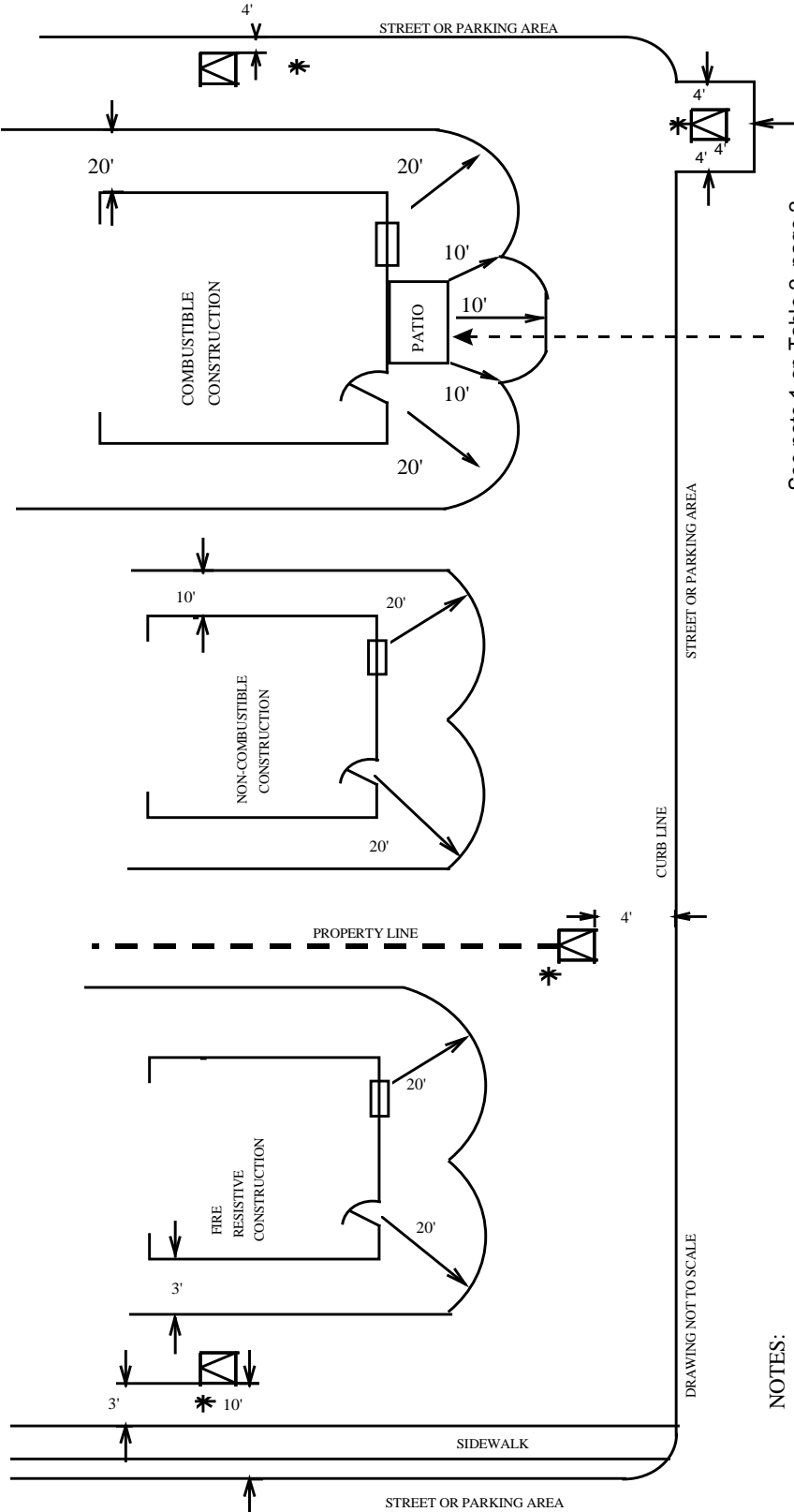
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* DENOTES PREFERRED LOCATION

CLASS "A" TRANSFORMER INSTALLATION - APTS. - CONDOMINIUM - TOWNHOUSE

Figure 2 of 8



See note 1 on Table 2, page 2

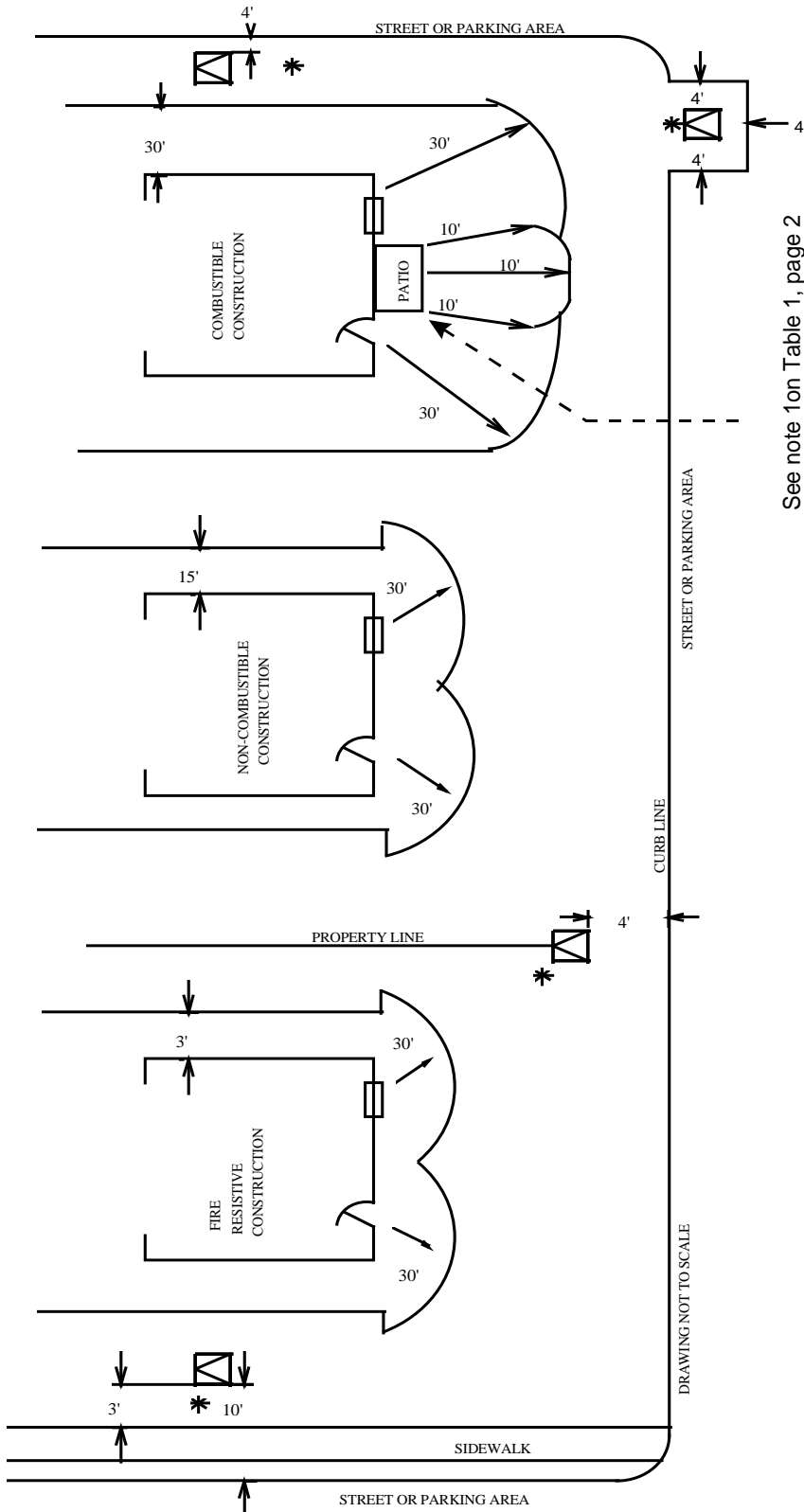
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* DENOTES PREFERRED LOCATION

FOR AREAS WHERE MINIMUM CLEARANCE FROM CURB LINES CANNOT BE MAINTAINED AND/OR TRANSFORMER IS SUBJECT TO VEHICULAR DAMAGE INSTALL GUARD POSTS IN ACCORDANCE WITH APPLICABLE CONSTRUCTION STANDARDS REFERENCED IN SECTION VII.

CLASS "B" TRANSFORMER INSTALLATION - APTS. - CONDOMINIUM - TOWNHOUSE

Figure 3 of 8



See note 1 on Table 1, page 2

NOTES:

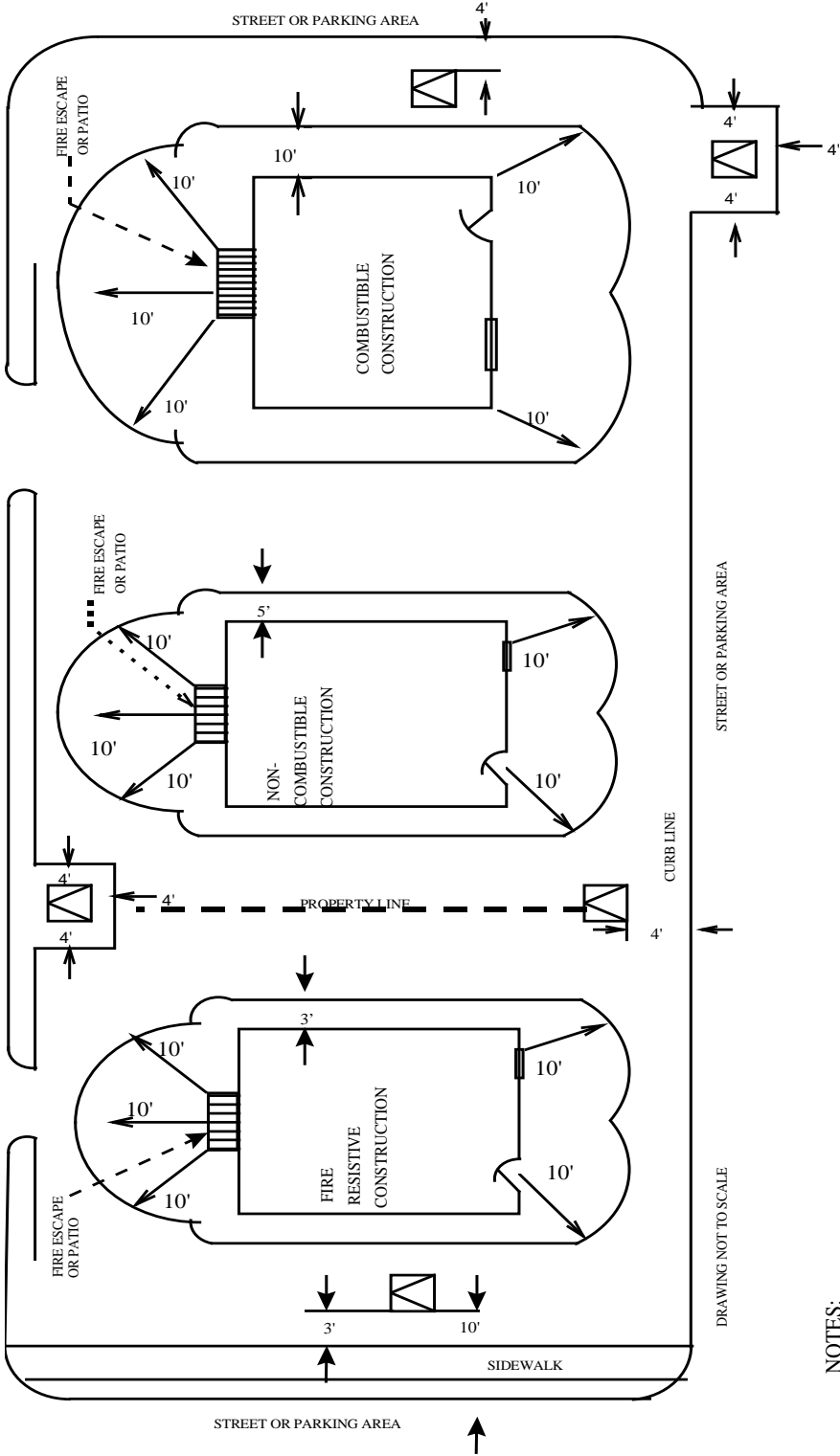
TRANSFORMER MUST BE EITHER ACCESSIBLE TO TRANSPORTATION VEHICLES OR WITHIN MAXIMUM BOOM DISTANCES.

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* DENOTES PREFERRED LOCATION

CLASS "C" TRANSFORMER INSTALLATION - APTS. - CONDOMINIUM - TOWNHOUSE

Figure 4 of 8



* DENOTES PREFERRED LOCATION

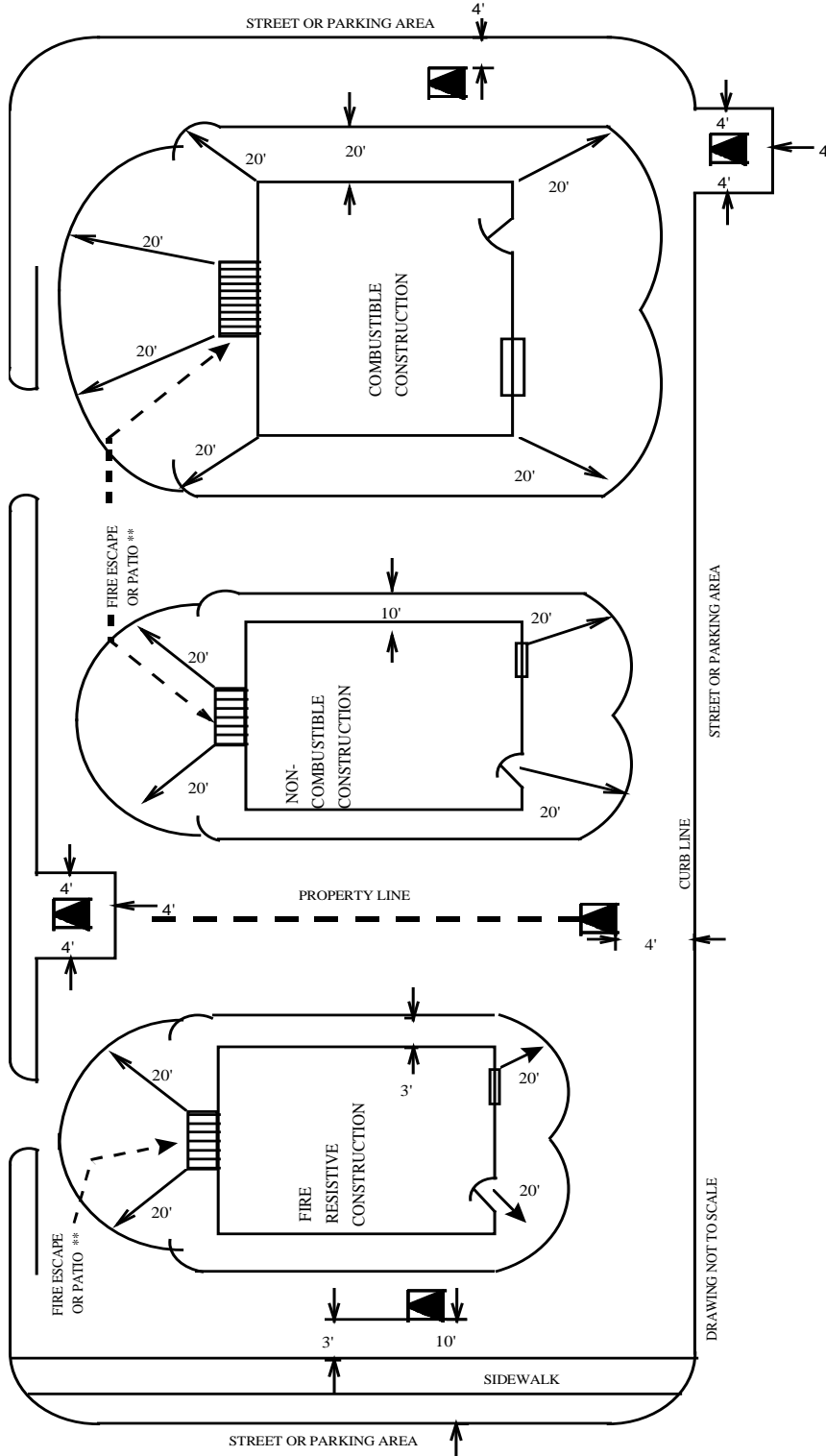
NOTES:

TRANSFORMER MUST BE EITHER ACCESSIBLE TO TRANSPORTATION VEHICLES OR WITHIN MAXIMUM BOOM DISTANCES.

FOR AREAS WHERE MINIMUM CLEARANCE FROM CURB LINES CANNOT BE MAINTAINED AND/OR TRANSFORMER IS SUBJECT TO VEHICULAR DAMAGE INSTALL GUARD POSTS IN ACCORDANCE WITH APPLICABLE CONSTRUCTION STANDARDS REFERENCED IN SECTION VII.

CLASS "A" TRANSFORMER INSTALLATION - COMMERCIAL - INDUSTRIAL

Figure 5 of 8



NOTES:

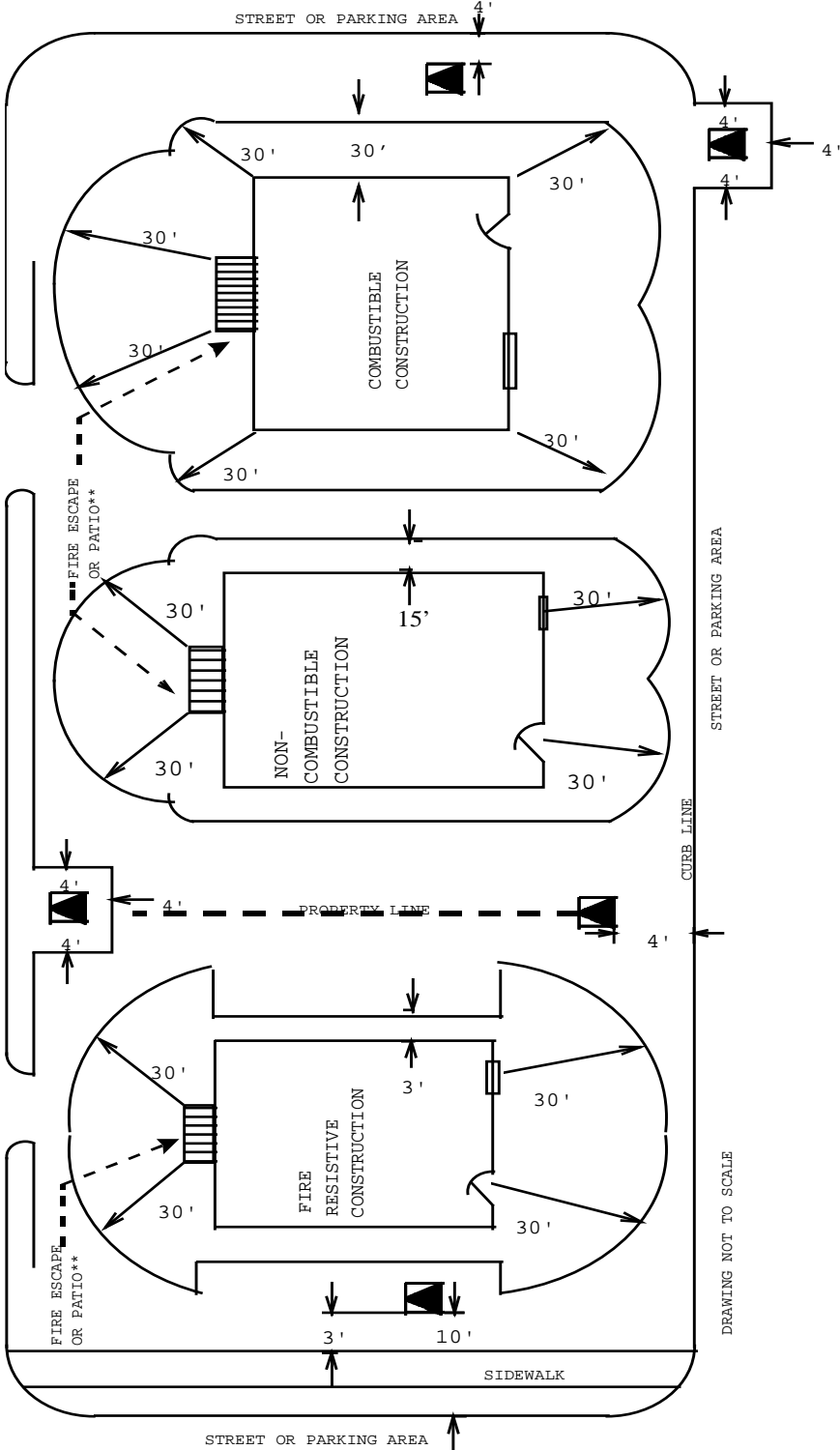
TRANSFORMER MUST BE EITHER ACCESSIBLE TO TRANSPORTATION VEHICLES OR WITHIN MAXIMUM BOOM DISTANCES.

FOR AREAS WHERE MINIMUM CLEARANCE FROM CURB LINES CANNOT BE MAINTAINED AND/OR TRANSFORMER IS SUBJECT TO VEHICULAR DAMAGE INSTALL GUARD POSTS IN ACCORDANCE WITH APPLICABLE CONSTRUCTION STANDARDS REFERENCED IN SECTION VII.

* DENOTES PREFERRED LOCATION
 ** SEE NOTE 1 ON TABLE 2, PAGE 2

CLASS "B" TRANSFORMER INSTALLATION - COMMERCIAL - INDUSTRIAL

Figure 6 of 8



NOTES:
 TRANSFORMER MUST BE EITHER ACCESSIBLE TO TRANSPORTATION VEHICLES OR WITHIN MAXIMUM BOOM DISTANCES.
 * DENOTES PREFERRED LOCATION
 ** SEE NOTE 1 ON TABLE, PAGE 2
 FOR AREAS WHERE MINIMUM CLEARANCE FROM CURB LINES CANNOT BE MAINTAINED AND/OR TRANSFORMER IS SUBJECT TO VEHICULAR DAMAGE INSTALL GUARD POSTS IN ACCORDANCE WITH APPLICABLE CONSTRUCTION STANDARDS REFERENCED IN SECTION VII.

CLASS "C" TRANSFORMER INSTALLATION - COMMERCIAL - INDUSTRIAL

Figure 7 of 8

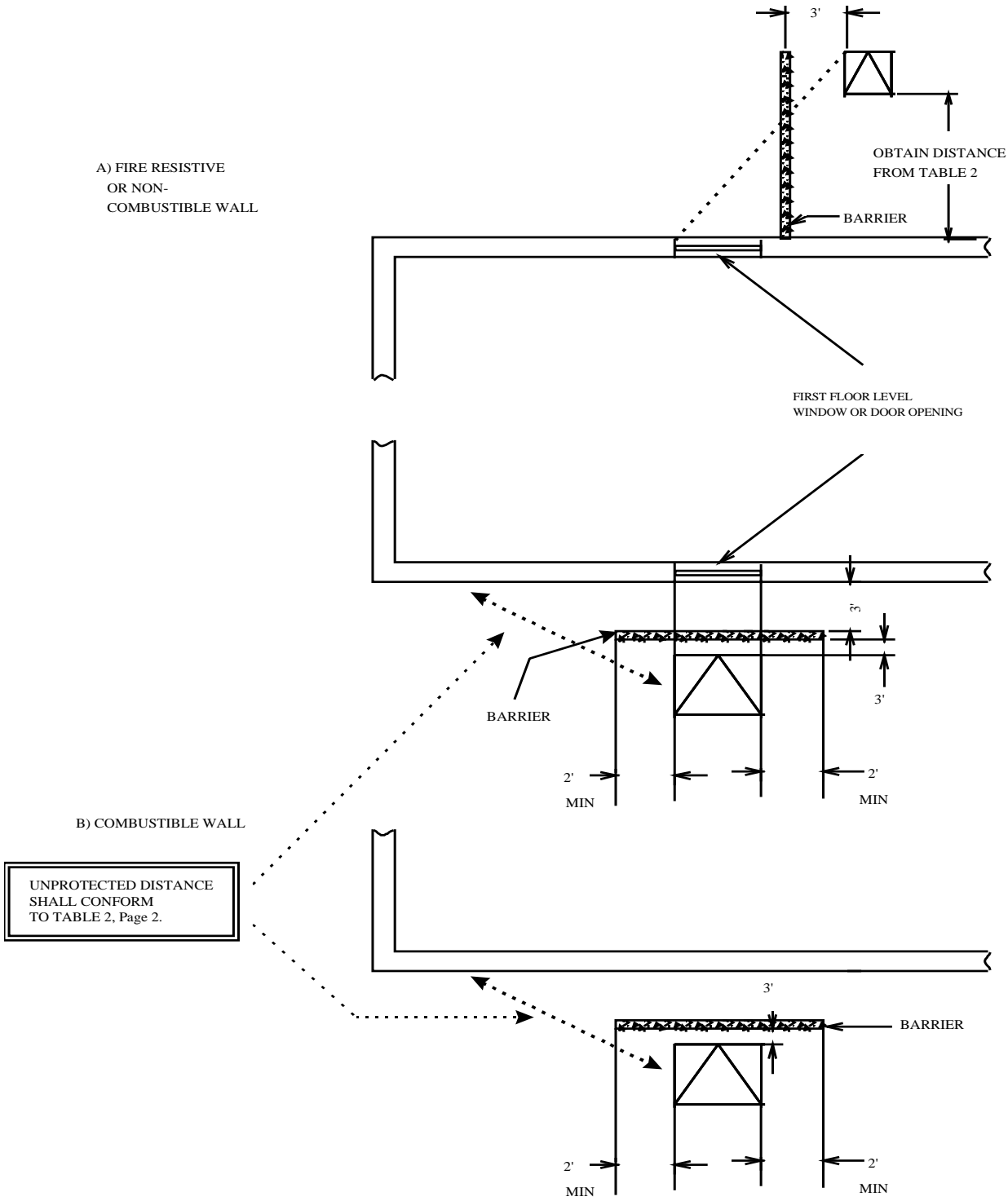


Figure 8 of 8