U.S. Department of Transportation
Federal Aviation Administration

FILE Advisory Circular

Subject:	SPECIFICATION FOR TAXIWAY AND RUNWAY SIGNS	**Date:** 4/30/84 **Initiated by:** AAS-200	**AC No:** 150/5345-44D **Change:**

1. PURPOSE. This advisory circular (AC) contains a specification for signs to be used on taxiways and runways to provide information to aircraft pilots.

2. PRINCIPAL CHANGES. The AC has been revised to provide a second size runway distance remaining sign.

3. CANCELLATION. AC 150/5345-44C, Specification for Taxiway and Runway Signs, dated January 14, 1983, is cancelled.

4. METRIC UNITS. To promote an orderly transition to metric units, the specification includes both English and metric dimensions. The metric conversions may not be exact equivalents and, until there is an official changeover to the metric system, the English dimensions will govern.

Leonard E. Mudd
Director, Office of Airport Standards

SPECIFICATION FOR TAXIWAY AND RUNWAY SIGNS

1. SCOPE AND CLASSIFICATION.

1.1 Scope. This specification covers the requirements for signs to be used on taxiways and runways to provide information to aircraft pilots.

1.2 Classification. Three types of sign may be specified in any of five sizes, four styles, and two classes, except as noted below.

1.2.1 Types. Signs of the following types are included:

Type L-858Y	Informational sign - black legend on a yellow background
Type L-858R	Mandatory sign - white legend on a red background
Type L-858B	Runway distance remaining sign - white legend on a black blackground

1.2.2 Sizes. Signs of the following sizes are included:

Size 1	18-inch (460 mm) sign face with a 12-inch (300 mm) legend
Size 2	24-inch (610 mm) sign face with a 15-inch (380 mm) legend
Size 3	30-inch (760 mm) sign face with an 18-inch (460 mm) legend
Size 4 *	48-inch (1220 mm) sign face with a 40-inch (1020 mm) legend
Size 5 *	30-inch (760 mm) sign face with a 25-inch (640 mm) legend

* Applicable only to Type L-858B signs.

1.2.3 Styles. Signs of the following styles are included:

Style 1	Powered from a 120-volt AC power source
Style 2	Powered from a series lighting circuit (4.8 to 6.6 amperes)
Style 3	Powered from a series lighting circuit (2.8 to 6.6 amperes)
Style 4	Unlighted (Applies to Types L-858Y and L-858R only)

1.2.4 Classes. Lighted signs of the following classes are included:

Class 1	For operation down to -20° C
Class 2	For operation down to -55° C

2. APPLICABLE DOCUMENTS.

2.1 General. The following documents, of the issue in effect on date of application for qualification, are applicable to the extent specified in this AC.

2.2 Federal Aviation Administration (FAA) Advisory Circulars.

AC 150/5345-26	Specification for L-823 Plug and Receptacle, Cable Connectors
AC 150/5345-42	Specification for Airport Light Base and Transformer Housings, Junction Boxes, and Accessories
AC 150/5345-47	Isolation Transformers for Airport Lighting Systems

2.3 Federal Specification.

L-S-300	Sheeting and Tape - Reflective; Nonexposed Lens, Adhesive Backing

2.4 Military Standard.

MIL-STD-810	Environmental Test Methods

(Copies of FAA advisory circulars may be obtained from the Department of Transportation, Publications Section, M-494.3, Washington, D.C. 20590.)

(Copies of Federal specifications may be obtained from General Services Administration offices in Washington, D.C., Atlanta, Boston,Denver, Chicago, Kansas City, New York, San Francisco, and Seattle.)

(Copies of Military standards may be obtained from the Commanding Officer, Naval Supply Depot, 5801 Tabor Avenue, Philadelphia, Pennsylvania 19120, Attention: Code CDS.)

3. REQUIREMENTS.

3.1 Equipment to be Supplied. Each sign shall be complete in accordance with all specification requirements and shall include: mounting legs and hardware (3.3); electrical disconnect (3.3.3.1); any required series circuit adapter unit (3.3.3.2) for Style 2 and 3 signs; and an instruction booklet (3.8).

3.2 Environmental Requirements. The signs, including all required components, shall be designed for continuous outdoor use under the following conditions:

3.2.1 Temperature. An ambient temperature range from -20° C to +55° C for Class 1 signs and from -55° C to +55° C for Class 2 and Style 4 signs.

3.2.2 Wind. Wind velocities up to 100 mph (161 km/h).

3.2.3 Rain. Exposure to driving rains.

3.3 Sign Construction. The signs shall be constructed of lightweight, non-ferrous materials. The signs must be sufficiently rigid to withstand wind and jet blasts from aircraft. The mounting legs shall have frangible points near

the bottom which will withstand wind loads due to jet blasts of 100 mph (161 km/h) but will break before reaching an applied static load over the sign face of 2.0 psi (13.8 kPa) for the Size 1 sign, 1.3 psi (8.96 kPa) for the Size 2 sign, and 0.9 psi (6.21 kPa) for the Size 3 through Size 5 signs. The signs shall be designed for installation on a concrete pad or stakes. All required mounting hardware shall be supplied with the sign.

3.3.1 Sizes. The heights of the signs shall be in accordance with the dimensions shown in table 1. The lengths of the signs will be determined by the message to be conveyed.

Table 1. Sign dimensions

Size	Legend Height		Face Height (Minimum)		Overall Mounting Height	
	Inches	mm	Inches	mm	Inches	mm
1	12	300	18	450	24-30	610-760
2	15	380	24	610	30-36	760-910
3	18	460	30	760	36-42	910-1070
4	40	1000	48	1200	54-60	1350-1500
5	25	640	30	760	36-42	910-1070

3.3.2 Sign Faces. The signs may be either single face (message only on one side) or double face (messages on two sides). Reflective material for lighted signs shall meet the color and reflectivity requirements of Federal specification L-S-300, type 1, reflectivity 1. For this reflectivity determination, the random orientation angle cited in paragraph 4.4.7(f) of L-S-300 shall be changed to "rotate to brightest orientation angle." Reflective material for unlighted signs shall meet the color and reflectivity requirements for type 1, reflectivity 2 or 4 of L-S-300. The spacing, stroke, and shape of legend characters, numerals, and symbols shall be in accordance with appendix 1 of this specification. The sign faces of Types L-858Y and L-858R shall have a continuous border of at least 0.5 inch (12.5 mm) in width. The color of the border shall be the same as the legend. Signs made in multiple sections shall appear to the viewer as a single sign with a continuous border and legend.

3.3.3 Lighted Signs. Signs may be either internally or externally lighted. External lighting shall be attached to the sign; and shall not interfere with the sign legibility nor produce distractive glare or spill light. Style 1 signs shall be designed for operation from a 120-volt AC power source. Style 2 signs shall be designed for operation from an airport series lighting circuit with a current range of 4.8 to 6.6 amperes. Style 3 signs shall be designed for operation from an airport series lighting circuit with a current range of 2.8 to 6.6 amperes. The illumination shall be uniform over the sign face and shall be sufficient to make the type of sign readily discernible at nighttime up to a distance of 800 feet (244 m). Lamps shall be readily accessible for replacement, and lamp date--including type and rating--shall be located near the lamp socket. Lamps used to illuminate signs shall be readily available from commercial electrical supply dealers. Style 2 and 3 signs shall be compatible with all L-828 regulators, as specified in the latest edition of AC 150/5345-10 for Specification L-828 Constant Current Regulators.

3.3.3.1 Electrical Disconnect. All lighted signs shall be equipped with a power input disconnect cable terminated with a Type II plug, conforming to the requirements of AC 150/5345-26. The length of this cable shall permit the plug end to reach at least 6 inches (150 mm) below the top of the concrete pad or stake on which the sign is mounted. A cable clamp or similar restraining device shall be provided in the sign to prevent strain on the cable terminal connections when the cable plug is pulled apart.

3.3.3.2 Style 2 and Style 3 Signs. Signs designed for operation from a series lighting circuit shall be capable of being energized and operated at any current value of that system without flickering. Also, the sign illumination requirement of 3.3.3 shall be met throughout the current range of the series circuit. Power input from the series lighting circuit shall be made through an isolation transformer of the proper rating, conforming to AC 150/5345-47. This transformer is not supplied with the sign. If the design requires power adapter circuitry for installation outside the sign, the circuitry shall be enclosed in a watertight container for installation in a light base can, conforming to AC 150/5345-42. The can will not be supplied with the sign, but the adapter unit shall be. This adapter unit shall be supplied with an output cable at least 24 inches (610 mm) in length and terminated with a Type II, Class A, Style 7 receptacle, conforming to AC 150/5345-26. If the isolation transformer is integral with the adapter unit, the power input leads shall be at least 24 inches (610 mm) in length, with one lead terminating in a Type I, Class A, Style 2 plug; and the other lead shall terminate in a Type I, Class A, Style 9 receptacle, conforming to AC 150/5345-26.

3.4 Materials and Components. All materials used in fabrication of the signs and mounting hardware shall be suitable for the signs' intended purpose and adequately protected against corrosion. All sign assembly hardware, including screws, bolts, nuts, washers, and latches, shall be 18-8 stainless steel. All wiring and components shall be adequately rated and shall not be operated in excess of the component manufacturer's recommended rating.

3.5 Finish. External surfaces of the signs, excluding the mounting legs and face panel, shall be painted with a primer coat and a low luster, black, finish coat. The surface color treatment of the nonmetallic surfaces shall be equal in quality to that obtained on metal surfaces.

3.6 Nameplate. Each sign shall have a nameplate giving the Type, Size, Style, Class, manufacturer's name, address, catalog number, and the total volt-amp load and power factor of the sign, including required ballasts and/or adapter units.

3.7 Workmanship. The equipment shall be fabricated in accordance with the highest quality workmanship. All wiring shall be neatly run and laced. All sharp edges and burrs shall be removed. Painted surfaces shall be free from runs, blotches, and scratches.

3.8 Instruction Booklet. An instruction booklet shall be included with each order of signs and shall include installation instructions, maintenance procedures, and a complete parts list.

4. QUALITY ASSURANCE PROVISIONS.

4.1 Qualification Procedures. The FAA will approve the products that meet the requirements of this specification and list them in AC 150/5345-1, Approved Airport Lighting Equipment, current edition. Procedures for requesting approval are given in appendix 2 of that advisory circular.

4.2 Qualification Tests.

4.2.1 Visual Examination. The signs shall be visually inspected for conformance to dimensional requirements, component ratings, material requirements, uniform illumination, and quality of workmanship. Lighted signs shall be viewed at a distance of 800 feet (244 m) at nighttime to determine if the illumination level is sufficient to make the background colors readily discernible, or in the case of distance remaining signs to determine if the legend is readily discernible. Style 2 and Style 3 signs shall be viewed while the input current is varied throughout the range on which the sign is to operate.

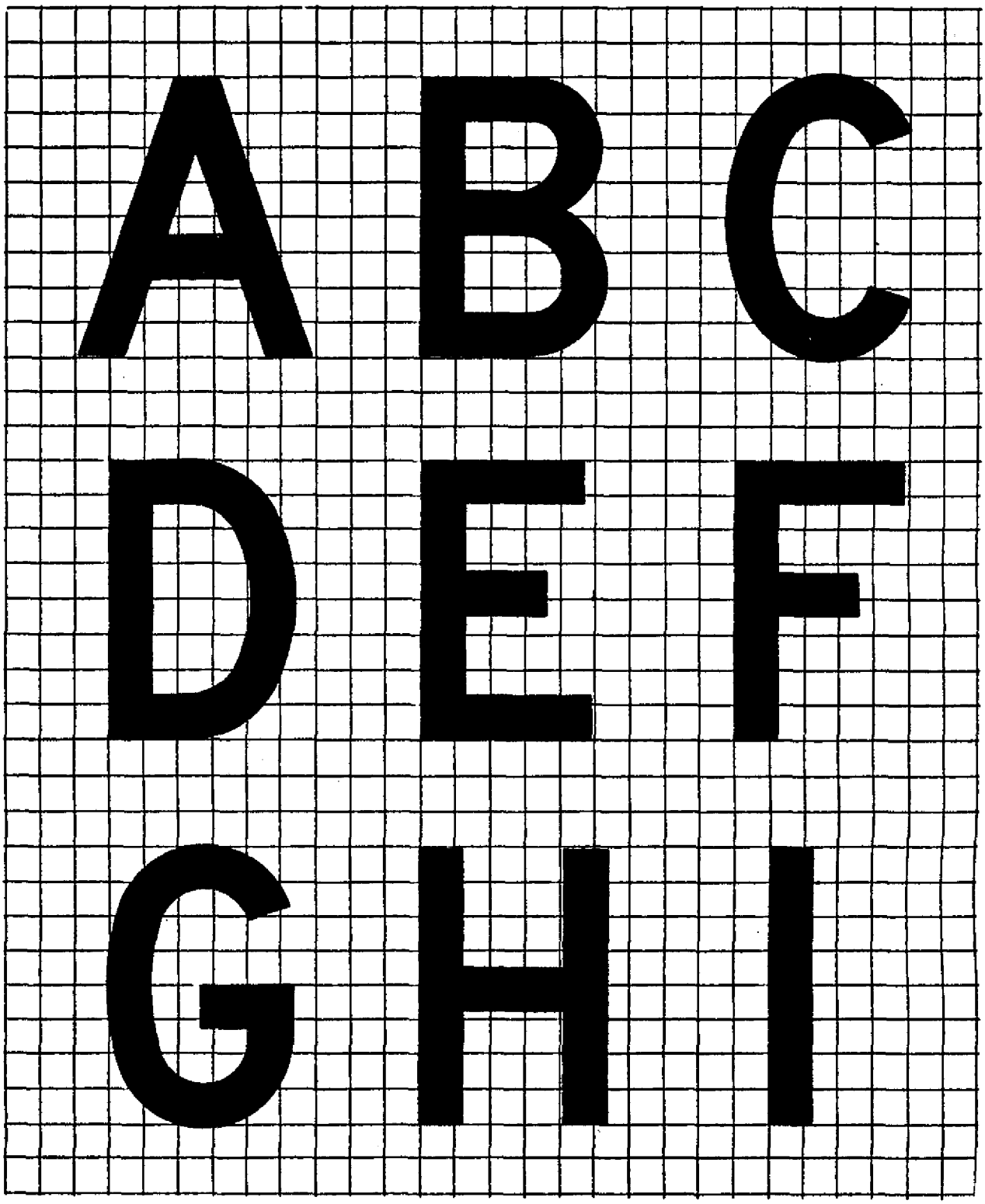
4.2.2 Wind Load and Frangibility Test. The sign shall be tested for its ability to withstand loads of 100 mph (161 km/h) without damage. The test shall be made with the sign completely assembled and mounted in position by the base assembly. A static load of 0.28 psi (1.93 kPa) shall be applied uniformly over the entire surface of the sign face for a period of 10 minutes. The sign shall not break at the frangible points nor suffer permanent distortion. The static load shall then be increased until the sign breaks at the frangible points. The breaking shall occur before the loading reaches an applied static load over the sign face of 2.0 psi (13.8 kPa) for the Size 1 sign; 1.3 psi (8.96 kPa) for the Size 2 sign; and 0.9 psi (6.21 kPa) for Size 3 through 5 signs. If the loading is applied with the sign mounted on a vertical surface, the weight of the sign shall be included as part of the total applied weight for this latter test.

4.2.3 Rain Test. A rain test shall be conducted in accordance with MIL-STD-810, Procedure I. The sign shall be operated during the last 10 minutes of the test. Failure of the sign to operate or evidence of water on circuit components shall be cause for rejection.

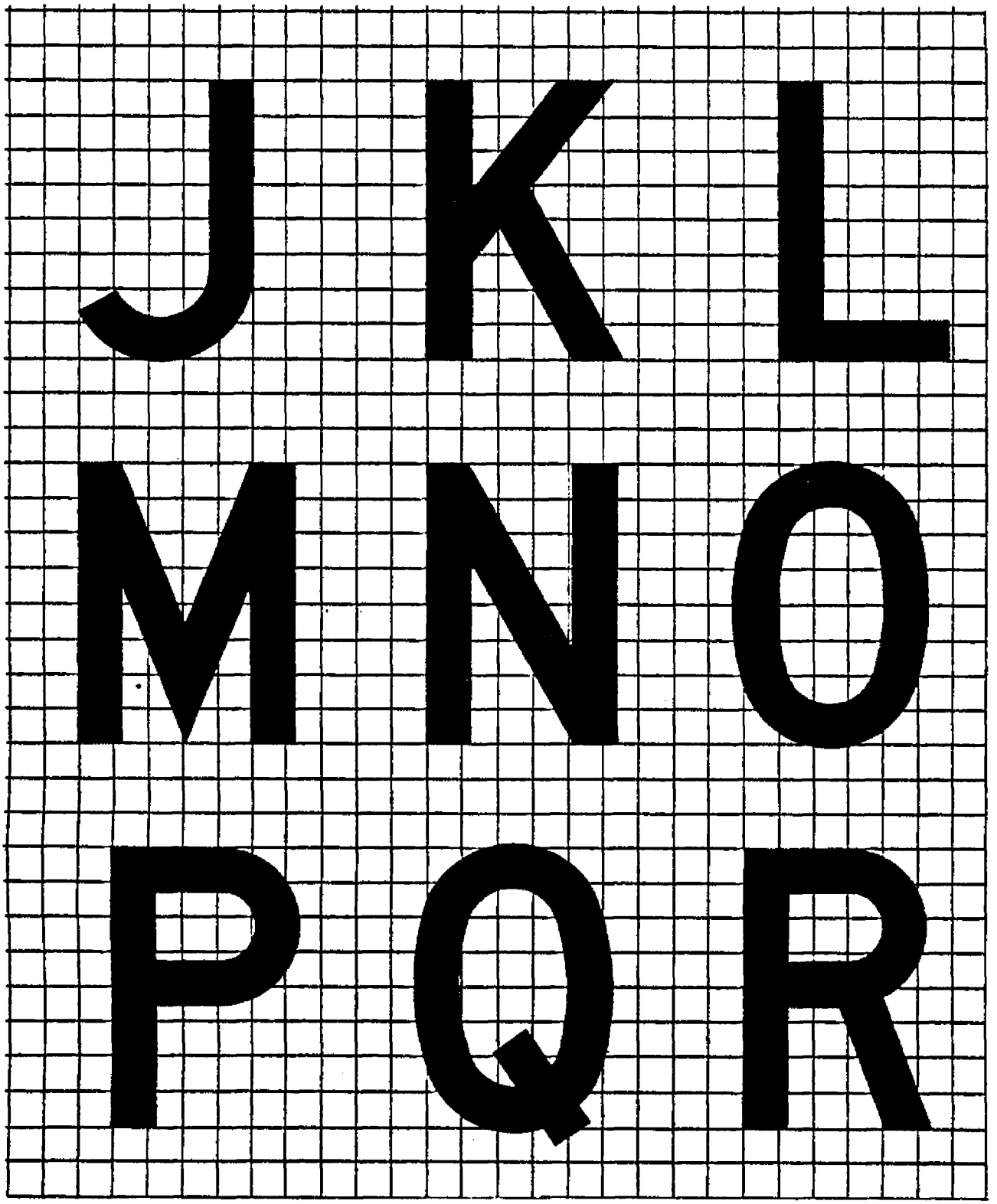
4.2.4 High Temperature Test. A high temperature test shall be conducted on the sign and adapter unit in accordance with MIL-STD-810, Procedure II. The maximum chamber temperature in Step 7 shall be 55° C. Failure of the unit to operate or evidence of damage shall be cause for rejection.

4.2.5 Immersion Test. A water immersion test shall be performed on the adapter unit in accordance with MIL-STD-810, Procedure I. Evidence of water leakage shall be cause for failure. This test shall be conducted after the unit has been subjected to the high temperature test in 4.2.4 to ensure that the efficacy of the gasket material was not impaired.

4.2.6 Low Temperature Test. A low temperature test shall be conducted on the sign and adapter unit in accordance with MIL-STD-810, Procedure I. The lowest operating temperature shall be -20° C for Class 1 signs and -55° C for Class 2 and Style 4 signs. Failure of lighted signs to operate or failure to reach normal sign illumination within 2 minutes after it is energized shall be cause for rejection. Any cracking, peeling, delaminating or structural damage of the equipment shall also be cause for rejection.



Sign legend characters



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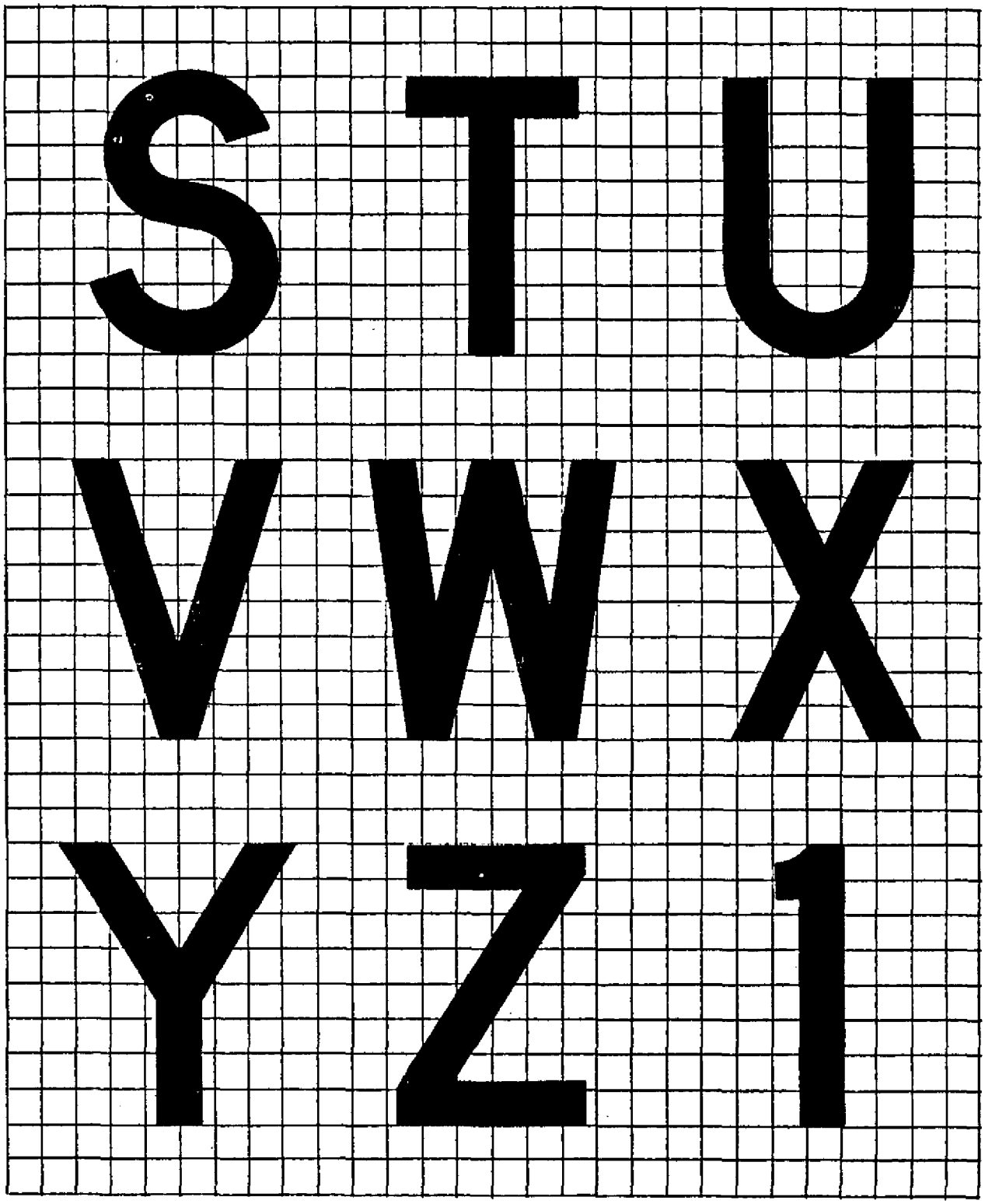
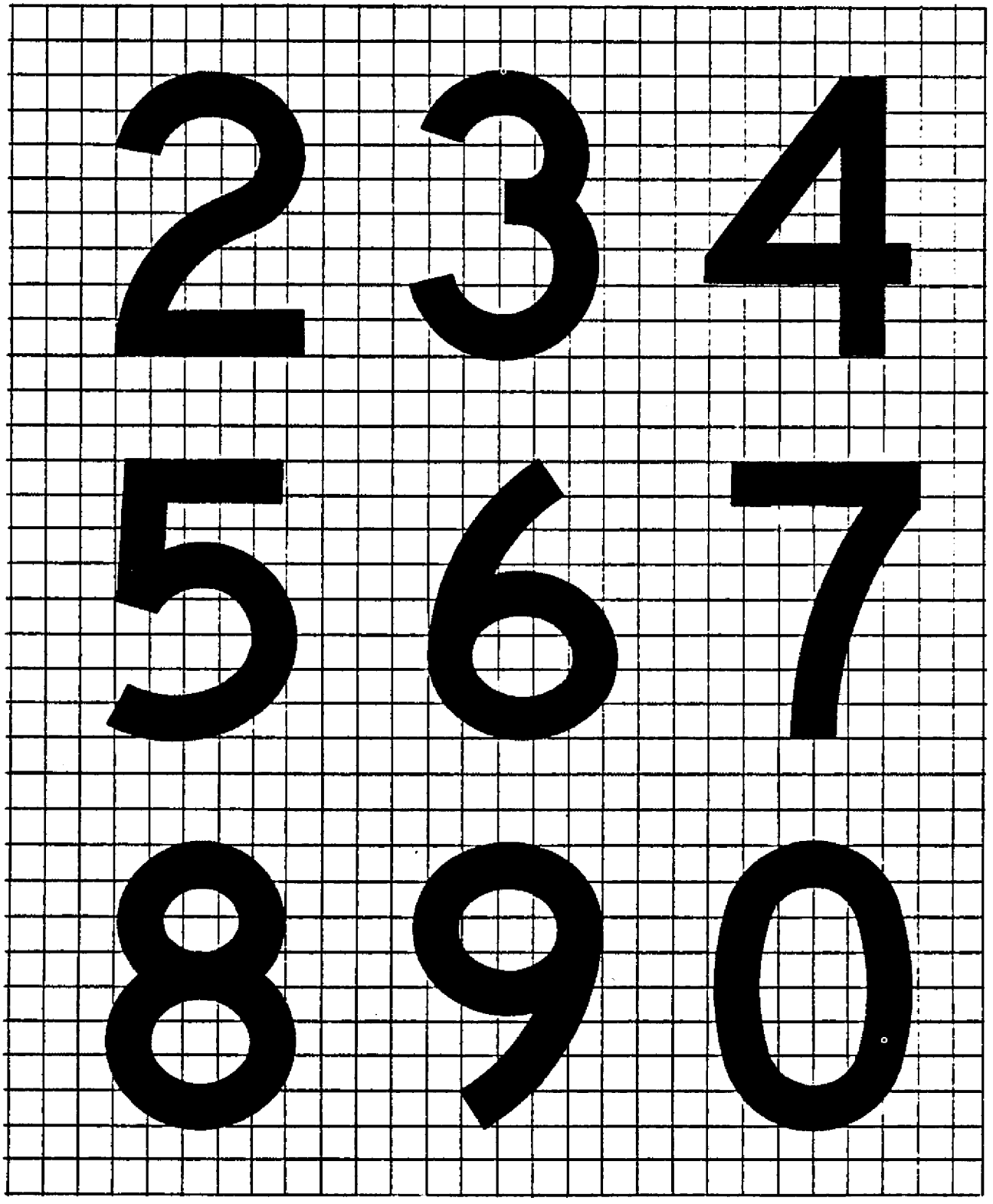
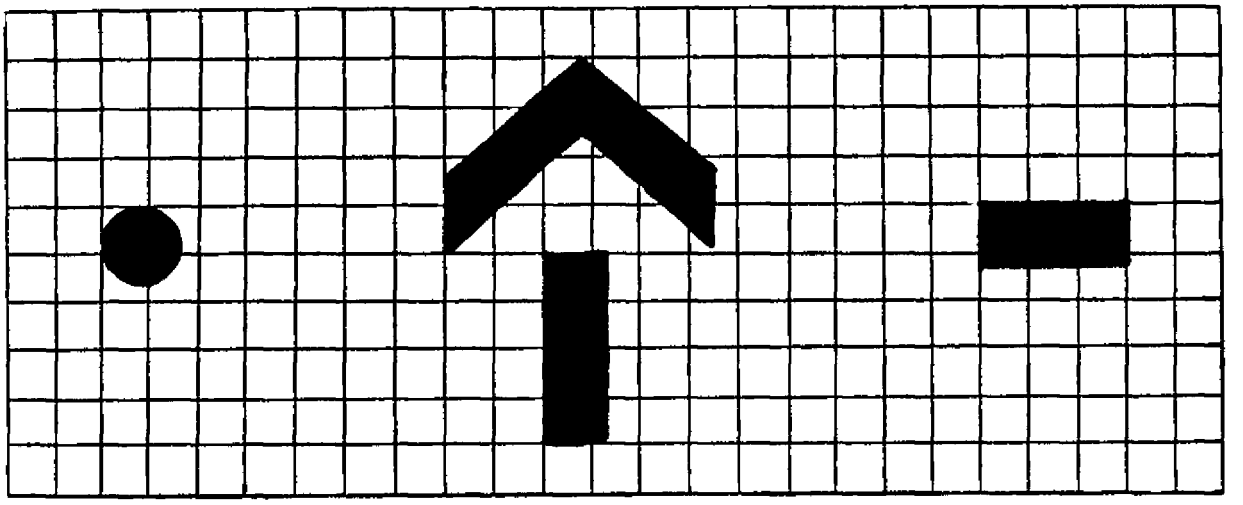


Sign legend characters and numeral 1
for Size 1, 2, and 3 signs



Numerals for Size 1, 2, and 3 signs



Characters are proportioned according to the stroke widths of Table III

TABLE I

LETTER TO LETTER CODE NUMBER

Preceding Letter	Following Letter		
	B, D, E, F, H, I, K, L, M, N, P, R, U,	C, G, O, Q, S, X, Z,	A, J. T, V, W, Y,
A	2	2	4
B	1	2	2
C	2	2	3
D	1	2	2
E	2	2	3
F	2	2	3
G	1	2	2
H	1	1	2
I	1	1	2
J	1	1	2
K	2	2	3
L	2	2	4
M	1	1	2
N	1	1	2
O	1	1	2
P	1	2	2
Q	1	2	2
R	1	2	2
S	1	2	2
T	2	2	4
U	1	1	2
V	2	2	4
W	2	2	4
X	2	2	3
Y	2	2	4
Z	2	2	3

To determine the proper space between letters or numerals, obtain the code number from Table I or II and enter Table VI for that code number to the desired letter or numeral height.

TABLE II

NUMERAL TO NUMERAL CODE NUMBER

Preceding Numeral	Following Numeral		
	1, 5,	2, 3, 6, 8, 9, 0,	4, 7,
1	1	1	2
2	1	2	2
3	1	2	2
4	2	2	4
5	1	2	2
6	1	2	2
7	2	2	4
8	1	2	2
9	1	2	2
0	1	2	2

TABLE III, WIDTH OF STROKE

Letter Height (in)	Letter Height (mm)	Stroke Width (in)	Stroke Width (mm)
12	304.8	1.88	47.8
15	381.0	2.35	59.7
18	457.2	2.81	71.4
25	635.0	3.53	89.5
40	1000.0	5.64	143.3

TABLE IV, WIDTH OF LETTERS

	Letter Height					
	12 in(300 mm)		15 in(380 mm)		18 in(460 mm)	
	(in)	(mm)	(in)	(mm)	(in)	(mm)
A	10.03	254.8	12.55	318.8	15.06	382.5
B	8.06	204.7	10.08	256.0	12.09	307.1
C	8.06	204.7	10.08	256.0	12.09	307.1
D	8.06	204.7	10.08	256.0	12.09	307.1
E	7.31	185.7	9.14	232.2	10.97	278.6
F	7.31	185.7	9.14	232.2	10.97	278.6
G	8.06	204.7	10.08	256.0	12.09	307.1
H	8.06	204.7	10.08	256.0	12.09	307.1
I	1.88	47.8	2.35	59.7	2.81	71.4
J	7.50	190.5	9.38	238.3	11.25	285.8
K	8.25	209.6	10.32	262.1	12.38	314.5
L	7.31	185.7	9.14	232.2	10.97	278.6
M	9.28	235.7	11.61	294.9	13.94	354.1
N	8.06	204.7	10.08	256.0	12.09	307.1
O	8.44	214.4	10.55	268.0	12.66	321.6
P	8.06	204.7	10.08	256.0	12.09	307.1
Q	8.44	214.4	10.55	268.0	12.66	321.6
R	8.06	204.7	10.08	256.0	12.09	307.1
S	8.06	204.7	10.08	256.0	12.09	307.1
T	7.31	185.7	9.14	232.2	10.97	278.6
U	8.06	204.7	10.08	256.0	12.09	307.1
V	9.00	228.6	11.25	285.8	13.50	342.9
W	10.50	266.7	13.13	333.5	15.75	400.1
X	8.06	204.7	10.08	256.0	12.09	307.1
Y	10.12	257.0	12.66	321.6	15.19	385.8
Z	8.06	204.7	10.08	256.0	12.09	307.1

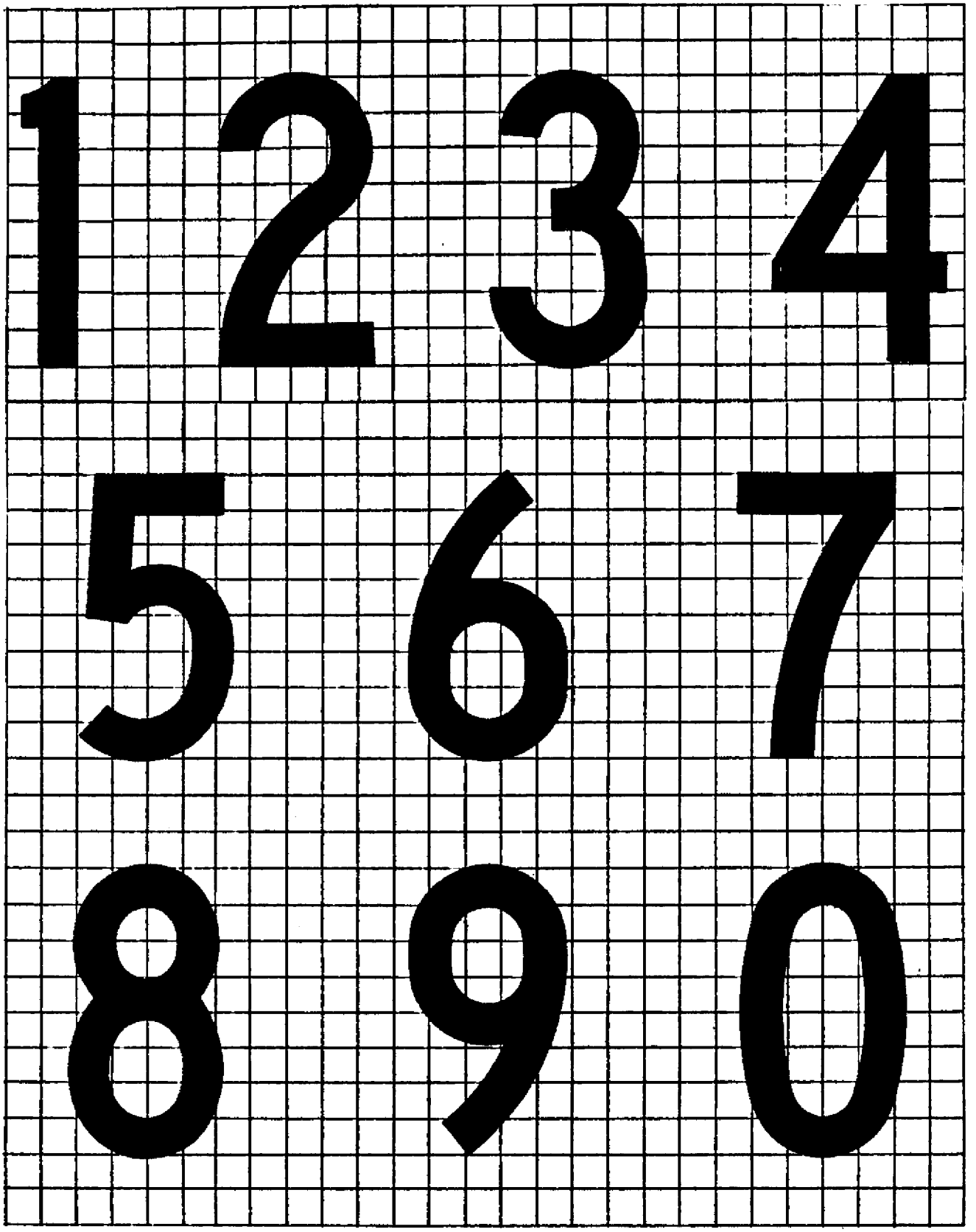
TABLE V, WIDTH OF NUMERALS

	Numeral Height									
	12 in(300 mm)		15 in(380 mm)		18 in(460 mm)		25 in(635 mm)		40 in(1000 mm)	
	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)
1	2.91	73.9	3.65	92.5	4.38	111.3	5.08	129.0	8.12	206.2
2	8.06	204.7	10.08	256.0	12.09	307.1	13.70	348.0	21.88	555.8
3	8.06	204.7	10.08	256.0	12.09	307.1	13.70	348.0	21.88	555.8
4	8.81	223.8	11.02	279.9	13.22	335.8	15.23	386.8	24.36	618.7
5	8.06	204.7	10.08	256.0	12.09	307.1	13.70	348.0	21.88	555.8
6	8.06	204.7	10.08	256.0	12.09	307.1	13.70	348.0	21.88	555.8
7	8.06	204.7	10.08	256.0	12.09	307.1	13.70	348.0	21.88	555.8
8	8.06	204.7	10.08	256.0	12.09	307.1	13.70	348.0	21.88	555.8
9	8.06	204.7	10.08	256.0	12.09	307.1	13.70	348.0	21.88	555.8
0	8.44	214.4	10.55	268.0	12.66	321.6	14.40	365.8	23.12	587.2

TABLE VI, LETTER AND NUMERAL SPACING

Space measured horizontally from the extreme right edge of the preceding letter or numeral to the extreme left edge of the following letter or numeral

Code Number (See Table I or II)	Letter or Numeral Height									
	12 in(300 mm)		15 in(380 mm)		18 in(460 mm)		25 in(635 mm)		40 in(1000 mm)	
	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	mm)	(in)	(mm)
1	2.81	71.4	3.52	89.4	4.22	107.2	5.14	130.6	8.22	208.8
2	2.25	57.2	2.82	71.6	3.38	85.9	4.23	107.4	6.76	171.7
3	1.50	38.1	1.88	47.8	2.25	57.2	3.03	77.0	4.84	122.9
4	0.75	19.1	0.94	23.9	1.12	28.4	1.40	35.6	2.24	56.9
	Minimum Spacing Between Legend or Border (or Sign Edge, if no Border)									
	1.50	38.1	2.00	50.8	2.50	63.5	3.00	76.2	4.00	101.6



Numerals for Size 4 signs

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