U.S. Department
of Transportation
Federal Aviation
Administration

Advisory Circular

Subject: Specification for Runway and Taxiway Signs	**Date:** Draft **Initiated By:** AAS-100	**AC No:** 150/5345-44L **Change:**

1 Purpose.

This advisory circular (AC) contains the Federal Aviation Administration (FAA) specifications for unlighted and lighted signs to be used on taxiways and runways.

2 Effective Date.

Effective six months after the issue date of this AC, only equipment qualified per the specifications in this AC will be listed per AC 150/5345-53, *Airport Lighting Equipment Certification Program*.

3 Cancellation.

This AC cancels AC 150/5345-44K, *Specification for Runway and Taxiway Signs,* dated October 8, 2015.

4 Applicability.

The FAA recommends the guidance and specifications in this Advisory Circular for runway and taxiway signs. In general, use of this AC is not mandatory. However, use of the specifications in this AC is mandatory for runway and taxiway signage projects funded under the Airport Improvement Program (AIP) or with revenue from the Passenger Facility Charges (PFC) program. All sign designs contained in this AC are acceptable to the Administrator to meet the signage requirements under 14 CFR Section 139.311, *Marking, Signs and Lighting*. Retrofitting of existing signs is not required to meet the changed specifications in this version of this AC until the signs are replaced with applicable new signs as described above.

5 Related Documents.

ACs and Orders referenced in the text of this AC do not include a revision letter, as they refer to the latest version. See Chapter 2 for a list of related documents.

6 Principal Changes.

The AC incorporates the following principal changes:

1. Provided clarification of requirements for Lighted Sign Sizes in paragraph 3.2.5.2.
2. Added circuit stabilization requirement for Lighted Sign Light Source Failure Test in paragraph 4.1.1.3.5.
3. Provided definition to "pure sine wave source" and expectation of test in paragraph 4.1.1.9.
4. Updated figures notes in Appendix A, Appendix B, and Appendix E.
5. Changed radii dimensions to diameter dimensions in Table B-3 for ease of measurement and inspection.
6. Updated the format of the document in this version and made minor editorial changes throughout.

7 Using this Document.

Hyperlinks (allowing the reader to access documents located on the internet and to maneuver within this document) are provided throughout this document and are identified with underlined text. When navigating within this document, return to the previously viewed page by pressing the "ALT" and " ←" (left arrow) keys simultaneously.

Figures in this document are schematic representations and are not to scale.

8 Use of Metrics.

Throughout this AC, U.S. customary units are used followed with "soft" (rounded) conversion to metric units. The U.S. customary units govern.

9 Where to Find this AC.

You can view a list of all ACs at http://www.faa.gov/regulations_policies/advisory_circulars/. You can view the Federal Aviation Regulations at http://www.faa.gov/regulations_policies/faa_regulations/.

10 Feedback on this AC.

If you have suggestions for improving this AC, you may use the Advisory Circular Feedback form at the end of this AC.

John R. Dermody

Director of Airport Safety and Standards

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CHAPTER 1. SCOPE AND CLASSIFICATION

1.1 Scope.

This AC presents the requirements for both lighted and unlighted signs used on airport taxiways and runways.

1.2 Classification.

Six types of signs are specified in any of five sizes, five styles, and two classes, with any exceptions noted.

1.2.1 Types of Signs.

The following types of signs are part of this specification:

1. Type L-858Y Taxiway Direction, Destination, and Boundary signs - black legend on a yellow background. See Figure C-1, Figure C-2, and Figure D-1 for examples of typical signs.
2. Type L-858R Mandatory Instruction sign (Holding Position sign) – 3/4-inch (19 mm) ± 1/8-inch (3.2 mm) black outline on outside edge of white legend on a red background (see Figure C-3, Figure C-4, and Figure D-2 for examples of typical lighted signs).

Note: The black outline is considered as background and does not add to the spacing to the next character or border (see Appendix I, Figure I-1).

3. Type L-858L Taxiway Location signs - yellow legend and border on a black background. The yellow border is inset from the inner edge of the sign to provide a continuous black margin. See Appendix C, Figure C-3, Figure C-4, Figure D-1, and Figure D-2, for examples of typical signs.
4. Type L-858B Runway Distance Remaining sign - white legend on a black background. See Appendix F, Figure F-1.

Note: The L-858B, Size 4, sign is also used as a basis for Arresting Gear Markers (AGM) per AC 150/5220-9, *Aircraft Arresting Systems*. See AC 150/5220-9 for additional information about the sign.

5. Type L-858C Taxiway Ending Marker sign, yellow 45-degree diagonal stripes on a black background. See Appendix G, Figure G-1 and Figure G-2.
6. Type L-858H One-Half Distance Remaining Sign – white legend on a black background. See Appendix E, Figure E-1.

Note: Type L-858H signs must not be used in combination with L-858B signs.

1.2.2 Sizes of Sign Legend Panels.

The following sign legend panel sizes are part of this AC:

The sign size is dependent on the vertical dimensions of the viewable legend panel and is not an overall dimension for the sign. A manufacturing tolerance of ± 1 inch (25.4

mm) applies to all sign panel sizes except Size 4. A manufacturing tolerance of ± 2 inches (50.8 mm) applies to Size 4. See Table 3-1 for overall sign dimensions.

1. Size 1 [1,4] 18-inch (in.) (457 millimeters (mm)) legend panel with a 12 in. (305 mm) legend.
2. Size 2 [1,4] 24 in. (610 mm) legend panel with a 15 in. (381 mm) legend.
3. Size 3 [1,4] 30 in. (762 mm) legend panel with an 18 in. (457 mm) legend.
4. Size 4 [2] 48 in. (1219 mm) legend panel with a 40 in. (1016 mm) legend.
5. Size 5 [2,3] 30 in. (762 mm) legend panel with a 25 in. (635 mm) legend.

Note 1: Applicable only to Types L-858R, L-858Y, and L-858L.

Note 2: Applicable to Types L-858B.

Note 3: L-858H, One-Half Distance Remaining Sign, is Size 5 only.

Note 4: L-858C, Taxiway Ending Marker, is size 1, 2, and 3 with a 48 inch (1219 mm) or 72.0 inch (1829 mm) overall length (see Appendix G for examples).

1.2.3 Styles of Signs.

Signs of the following styles are part of this AC:

1. Style 1 – powered from a 120-volt AC power source.
2. Style 2 – powered from a series lighting circuit of 4.8 to 6.6 amperes (A).
3. Style 3 – powered from a series lighting circuit of 2.8 to 6.6 A or 8.5 to 20 A.
4. Style 4 – unlighted signs - applicable only to Type L-858C, L-858R, L-858Y, L-858L, and L 858H.
5. Style 5 – powered from a series lighting circuit of 5.5 A.

1.2.4 Classes of Signs.

Lighted signs of the following classes are part of this AC:

1. Class 1 – operation from -4 degrees Fahrenheit (F) (-20 degrees Celsius (C)) to 131 degrees F (55 degrees C) environment.
2. Class 2 – operation from -40 degrees F (-40 degrees C) to 131 degrees F (55 degrees C) environment.

1.2.5 Modes of Signs.

Signs of the following modes are part of this specification:

1. Mode 1 – must withstand wind loads of 100 miles per hour (mph) (161 kilometers per hour (kph)) and is only applicable to unlighted signs, Style 4.
2. Mode 2 – must withstand wind loads of 200 mph (322 kph).
3. Mode 3 – must withstand wind loads of 300 mph (483 kph).

Note: Mode 3 is applicable only to special circumstances where the sign location poses an increased safety risk arising from jet blast. See paragraph 4.1.1.2, Lighted Sign Wind Load and Frangibility Test and paragraph 4.2.1.2, Unlighted Sign Wind Load and Frangibility Test.

1.2.6 Definitions.

The following definitions are used throughout this AC (see Appendix H, Figure H-1 for an illustration of a typical sign and its parts).

1. **Message element** – the use of characters, symbols, or a combination of characters and symbols in its simplest form used to communicate a location, direction, or action where aircraft operate. For example, see Figure D-1: the three taxiway direction signs and a taxiway location sign consist of four message elements. For the L-858R mandatory instruction sign, the runway "18-36" is a complete message element.
2. **Message array** – message elements that are contained in one sign housing.
3. **Sign face** – the viewable portion of a sign consisting of three parts:
    a. **Legend** – the inscription on the sign panel that conveys information to the viewer. All legend heights must be measured in a straight vertical plane.
    b. **Viewable Legend Panel** – the viewable retroreflective background portion of the sign used for presenting information via the legend. The black margin on a Type L-858L legend must be considered retroreflective for the purpose of the "viewable" area.
    c. **Sign Frame** – the viewable portion of the frame when the sign is viewed from the front.
        i. While the standard convention is to stop/start spacing measurements at the inner edge of the sign, the outside edge must be used as the start/stop point only in situations where using the outside edge in the measurement prevents the sign from increasing an additional module length.
        ii. The viewable portion of the sign face does not include any portion of the sign panel that is obscured by the sign frame.
4. **Proportionality** – all characters, numerals, and other graphics used in a sign are uniform in size and spaced per requirements in Appendix A and Appendix B.
5. **Readability** – a measure of how well the viewer can interpret the intended message of a sign. Both the legibility and proportionality of characters and numerals play an important role. See paragraph 4.1.1.1 for visual sign requirements.
6. **Sign** – refers to a complete assembly that includes the sign housing, the retroreflective panel, the legend, the associated electrical components, and the sign mounting components.
7. **Sign face** – refers to the entire projected area of the sign, including the viewable legend panel and the sign frame.

8. **Sign border** – for L-858L (taxiway location signs), the sign border is the yellow square that encloses the yellow legend character(s). For signs with no border (L-858Y, L-858R, L-858B, and L-858Ba) the border is the portion of the sign panel that excludes the legend.
9. **Sign margin** – only applicable to L-858L signs. The margin is a black square that is outside the yellow sign border. See 3.2.5.4.1 for dimensions.
10. **Sign edge** – the portion of the sign frame that retains the sign panel that is part of the sign face. See Figure H-1. For example, the sign may be designed so that the inner edge of the sign functions as a retaining lip for the sign panel.
11. **Sign array** – message elements that may be within multiple individual housings (see Appendix C, Figure C-3 and Figure C-4).

CHAPTER 2. APPLICABLE DOCUMENTS

2.1 Referenced Documents.

The following documents are referenced in this Advisory Circular (AC).

2.1.1 FAA ACs and Engineering Briefs.

1. AC 150/5220-9, *Aircraft Arresting Systems on Civil Airports*.
2. AC 150/5340-18, *Standards for Airport Sign Systems*.
3. AC 150/5345-10, *Specification L-828 Constant Current Regulator*.
4. AC 150/5345-26, *Specification for L-823 Plug and Receptacle, Cable Connectors*.
5. AC 150/5340-30, *Design and Installation Details for Airport Visual Aids*.
6. AC 150/5345-42, *Specification for Airport Light Base and Transformer Housings, Junction Boxes, and Accessories*.
7. AC 150/5345-47, *Isolation Transformers for Airport Lighting Systems*.
8. AC 150/5345-53, *Airport Lighting Equipment Certification Program*.
9. Engineering Brief #67, *Light Sources Other Than Incandescent and Xenon for Airport and Obstruction Lighting Fixtures.*

Electronic copies of FAA ACs and Engineering Briefs may be obtained from:
www.faa.gov/airports/engineering

2.1.2 Federal Communications Commission (FCC) Code of Federal Regulation (CFR).

Part 15, Subpart B, Unintentional Radiators, of Title 47, CFR

Copies of FCC documents may be obtained from:

Government Printing Office (GPO) website: www.gpo.gov

2.1.3 American Society for Testing and Material (ASTM) Standard.

D 4956, Specification for Retroreflective Sheeting for Traffic Control

Copies of ASTM standards may be obtained from:

American Society for Testing and Materials
1916 Race Street
Philadelphia, PA 19103
www.astm.org

2.1.4 Military Standards (MIL-STD).

MIL-STD-810F, 1 January 2000, Environmental Test Methods

Copies of Military Standards may be obtained from:

quicksearch.dla.mil

2.1.5 Illuminating Engineering Society (IES).

LM-52, Calibration

Copies of IES standards may be obtained from:

Illuminating Engineering Society
120 Wall Street
17th Floor
New York, New York 10002
www.iesna.org/

2.1.6 Society of Automotive Engineers (SAE).

AS25050, General Requirements for Color, Aeronautical Lights, and Lighting Equipment

SAE World Headquarters
400 Commonwealth Drive
Warrendale, PA 15096-0001
www.sae.org

2.1.7 Institute of Electrical and Electronics Engineers (IEEE) Publications.

IEEE C62.41-1991 IEEE Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits

IEEE C62.45 IEEE Recommended Practice on Surge Testing for Equipment Connected to Low-Voltage (1000 V and Less) AC Power Circuits

Copies of IEEE standards may be obtained from:

IEEE Customer Service Center
445 Hoes Lane
P.O. Box 1331
Piscataway, NJ 08855-1331
Tel: (800) 678-4333

FAX: (732) 981-0060 (Worldwide)

FAX: (732) 981-9667

shop.ieee.org/ieeestore

CHAPTER 3. EQUIPMENT REQUIREMENTS

3.1 Equipment Supplied with Sign.

Each sign, including the mounting legs and hardware, must meet all the specification requirements in this document. Lighted signs must include:

1. An electrical disconnect (paragraph 3.2.5.8).
2. Any series lighting circuit adapter units (see paragraph 3.2.5.9, subparagraph 3) for Style 2, 3, and 5 signs.
3. Two instruction booklets (see paragraph 3.2.5.15).

3.2 Sign Environmental Requirements.

Signs and all their required components must be designed for continuous outdoor use under the following conditions:

3.2.1 Sign Temperature Requirements.

Signs must withstand the following operating temperature ranges (paragraphs 4.1.1.5, and 4.1.1.6):

1. Class 1 signs: -4° to +131° F (-20° to +55° C).
2. Class 2 signs: -40° to +131° F (-40° to +55° C).
3. Shipping and storage temperature ranges for Class 1 and 2 signs are from -67° F (-55° C) to 131° F (55° C).

3.2.2 Wind.

Signs must withstand the following wind velocities (see paragraph 4.1.1.2):

1. Mode 1 signs must withstand exposure to a wind speed of 100 mph (161 kph); this is only applicable to Style 4 signs.
2. Mode 2 signs must withstand exposure to a wind speed of 200 mph (322 kph).
3. Mode 3 signs must withstand exposure to a wind speed of 300 mph (483 kph). See paragraph 1.2.5 for additional information.

3.2.3 Rain.

All signs must withstand exposure to wind driven rain (paragraph 4.1.1.4).

3.2.4 Sunlight.

All signs must withstand exposure to direct sunlight (paragraph 4.1.1.7)

3.2.5 Lighted Signs Requirements.

3.2.5.1 **Lighted Sign Construction.**

1. Signs must be constructed of lightweight, nonferrous materials for installation on a concrete pad.
2. All the required mounting hardware, except anchor bolts, must be supplied with each sign.
3. Signs must be designed so lamps are easily accessible for replacement with common hand tools.
4. Lighted signs are not mounted on stakes.

3.2.5.2 **Lighted Sign Sizes.**

The dimensions of lighted signs must be per Table 3-1. Sign lengths must be chosen to show only complete message elements and be the shortest possible length. If a sign is 2-sided, the side with the longest legend will determine the length of the sign housing used. When required, a sign array may contain multiple sign housings of the same size (mounting and face height) installed end-to-end on a straight line.

1. When multiple sign housings are used, the separation distance between individual sign housings must be 3 to 12 inches (76 to 305 mm). Internally and externally lighted signs may not be installed in the same message array. See Appendix C for examples of message arrays.
2. The horizontal spacing/separation distance between message elements in a sign array within a common continuous housing (See Figure C-3 and Figure C-4 for examples of sign arrays) must be between at least the applicable minimum in Table A-9 and must not exceed 12 inches (305mm) for a Size 1, 14 inches (356 mm) for a Size 2 and 16 inches (406 mm) for a Size 3 sign.
    a. The spacing/separation distance is defined as the message element character's closest horizontal point to the adjacent message element character's closest horizontal point.
    b. If an L-858Y message element is adjacent to an L-858L message element, then the horizontal spacing/separation distance is measured from L-858Y character's adjacent edge to the L-858L's adjacent margin.
    c. If the sign panel viewable horizontal length exceeds the maximum spacing allowable for the message elements, then the overage on the panel must be blanked out (black) at the outboard end of the legend in relation to its mounting (left or right side) adjacent to the Taxiway/Runway.

    Example: replacement sign panels are designed that incorrectly use increased spacing between message elements to accommodate

the horizontal length of an existing sign frame. The sign message appears to be stretched. In this case, the specified spacing must be used for message elements and the resulting overage must be blanked out (black) at the outboard end of the message.

d. Symbols. These are a specific length and are not to be doubled or half-sized in length to fit a sign housing.

e. "ILS" message element is understood to fit a one-module sign.

Note: The blanks may extend to the full width of the underlying lighted panel section in the housing, provided the message element spacing complies with item 2 above.

3. Separating a message element on a destination sign (L-858Y) should be avoided. If a destination sign message element is separated into separate sign housings, an arrow should be included with each sign.

4. The space between words or groups of characters forming an abbreviation or symbol should be equal to 0.5 to 0.75 of the height of the character used. Sign example "DEICE PAD B."

Table 3-1. Sign Dimensions

Sign Size	Legend Height		Viewable Legend Panel Height		Overall Mounting Height		Maximum Overall Length	
	inches	mm	inches	mm	inches	mm	inches	mm
1	12	305	18	457	24-30	610-762	120	3048
2	15	381	24	610	30-36	762-914	145	3683
3	18	457	30	762	36-42	914-1067	170	4318
4	40	1016	48	1219	54-60	1372-1524		
5	25	635	30	762	36-42	914-1067		

Note 1: The required legend heights for the following signs are in Appendix B.
Note 2: Runway Safety Area (RSA)/Obstacle Free Zone (OFZ)/Runway Approach Boundary Sign (Table B-1).
Note 3: Instrument landing systems (ILS) Critical Area Boundary sign (Table B-2).
Note 4: No Entry signs (Table B-3).
Note 5: For unlighted signs minimum sign length dimensions, see paragraph 3.2.6.3, Unlighted Sign Sizes.

3.2.5.3 **Lighted Sign Mounting Legs.**

1. The frangible groove in the mounting legs for each sign must be located 3 inches (76 mm) or less above the concrete base pad or stake.

2. Mode 2 sign frangible points must withstand wind loads from jet blasts up to 200 mph (322 kph) but must break before reaching an applied static load distributed over the legend panel surface of 1.3 pounds per square inch (psi) (9 kilo Pascals (kPa)).

3. Mode 3 sign frangible points must withstand wind loads from jet blasts up to 300 mph (483 kph) but must break before reaching an applied static load distributed over the legend panel surface of 2.8 psi (19.3 kPa).

4. Legend panels and panel supports must withstand, at a minimum, the same pressure at which the frangible points are designed to break.

5. Sign tether anchor hard points must be provided on one sign mounting leg or sign structure above the frangible breaking point. Tether anchor hard points must be provided so that one end of the tether attaches to the sign structure, and the other end attaches below the frangible point on the coupling to either one of the leg mounting bolts or an independent bolt in the sign concrete mounting pad.

6. Signs that consist of multiple separate housings (not connected in a continuous frame) must have a minimum of one tether per housing. Install a minimum of one tether per sign structure and on each sign in a sign array.

7. Signs that use multiple modules connected in a continuous frame must use a tether at both ends.

3.2.5.4 **Lighted Sign Faces.**

1. Signs must be either single face with a message on one side or double face with a message on two sides.

2. The sign faces must use retroreflective material(s) and meet the requirements of ASTM D4956 (current version as of the issue date of this AC), for Type I Sheeting, Retroreflective Material, when installed.

3. The retroreflective material must not be warped or wrinkled.

4. The spacing, stroke, and shape of legend characters, numerals, and symbols must be per Appendix A and Appendix B.

5. Type L-858L sign faces must have a margin and a border per paragraph 3.2.5.4.1 and be per Appendix C, Figure C-3 and Figure C-4.

6. Panel joints must be the same color as the sign background so as not to give the appearance of a message divider.

3.2.5.4.1 Margin and Border for Type L-858L Signs.

The sign faces of sign Type L-858L must have the following characteristics (manufacturing tolerance is ± 1/8 inches (3.2 mm) for sizes listed below):

1. A continuous yellow border 13/16 inches (21 mm) wide for size 1 signs.
2. A continuous yellow border 1-1/16 inches (27 mm) wide for size 2 signs.
3. A continuous yellow border 1-1/4 inches (32 mm) wide for size 3 signs.
4. Both the border and legend must be yellow.
5. The border must be set in from the inner edge of the sign to yield a continuous black margin of 11/16 inches (17 mm) for Size 1 signs (manufacturing tolerance is ± 1/4 inches (6.4 mm)).

Note: See Appendix C, Figure C-3 and Figure C-4, and Appendix H, Figure H-1, for sign inner edge locations.

6. The border must be set in from the inner edge of the sign to yield a continuous black margin of 1-7/16 inches (37 mm) for Size 2 signs (manufacturing tolerance is ± 1/4 inches (6.4 mm)).
7. The border must be set in from the inner edge of the sign to yield a continuous black margin of 2.0 inches (51 mm) for Size 3 signs (manufacturing tolerance is ± 1/4 inches (6.4 mm)).
8. The horizontal distance from the edge of a sign character or numeral to the inside edge of the sign border must conform to the dimensions in Appendix A, Table A-9.

3.2.5.4.2 Lighted Sign Message Dividers.

1. Vertical message dividers must be used to separate the message elements of a sign array (e.g., "C →", "←T →", "15 - APCH") per Appendix C, Figure C-3 and Figure C-4.
2. Message dividers must not be used to separate Type L-858L signs from Type L-858Y or Type L-858R signs when they are co-located. See Figure C-3 and Figure C-4. Message dividers must be:
   a. 1-5/16 inches (33 mm) in width for size 1 signs.
   b. 1-11/16 inches (43 mm) in width for size 2 signs.
   c. 2 inches (51 mm) in width for size 3 signs.
3. The manufacturing tolerance is ± 1/8 inches (3.2 mm) for dimensions in paragraph 2 above.
4. Sign message dividers must extend from the top to the bottom of the legend panel.
5. The sign message divider color must be the same as the legend color. A black outline is required for Type L-858R message dividers (see Figure D-1 and Figure D-2).

3.2.5.5 **Lighted Sign Power.**

1. Style 1, 2, 3, and 5 signs must be internally lighted.
2. Style 1 signs must operate from a 120-volt AC power source.
3. Style 2 signs must operate from an airport series lighting circuit with a current range of 4.8 to 6.6 amperes (A).
4. Style 3 signs must operate from an airport series lighting circuit with a current range of 2.8 to 6.6 A or 8.5 to 20 A.
5. Signs installed on a 20 A circuit should use an appropriate isolation transformer with a 6.6 A secondary.
6. For Style 2 and Style 3 signs, there must be no noticeable variance of luminance throughout the range of constant current regulator brightness steps viewed under the conditions in paragraph 4.1.1.1, subparagraphs 8 through 11. The signs must meet the luminance requirements in paragraph 3.2.5.6 throughout the current ranges of the associated series circuit.

Note: See AC 150/5340-30, Appendix 6, Application Notes, for additional information about the possible adverse effects of sign power supply loading on a constant current regulator.

7. Style 5 signs must be designed for operation from an airport series lighting circuit with a current of 5.5 A.
8. Style 5 signs must be installed on a dedicated circuit (other styles of signs are prohibited) and powered from a three-step regulator that is preset to 5.5 A output.
9. The regulator control system must be designed to meet the "Sign Operation" requirements in AC 150/5340-18, *Standards for Airport Sign Systems*.
10. Intensity control must not be provided for Style 5 sign circuits.
11. Style 2, 3, and 5 sign power factor, when measured at the isolation transformer primary winding power leads, must be not less than 0.7 when operated at all current step settings per AC 150/5345-10.

3.2.5.6 **Sign Luminance.**

1. The background of Type L-858Y signs and the legends of Type L-858R and L-858L signs must have an average luminance of 10 to 30 foot lamberts (fL).
2. The sign type must be readily identifiable up to 800 feet (ft.) (244 meters (m)) when it is viewed during the day or lighted at night.
3. Style 2, 3, and 5 signs must be compatible with all L-828 regulators specified in AC 150/5345-10 (current revision as of the issue date of this AC).

3.2.5.7 **Sign Internal Lamp Failure.**

The failure of any light source within a sign must not result in a potential miscommunication of the intended message to a pilot. If the failure of an internal lamp(s) in a sign causes a panel or any section of a panel to be dark or have an average luminance less than the minimum required in paragraph 3.2.5.6 subparagraph 1, sign operation must be automatically discontinued.

3.2.5.8 **Electrical Disconnect.**

1. All lighted signs must be equipped with a power input disconnect cable terminated with a Type II plug under the requirements of AC 150/5345-26.
2. The length of power disconnect cable must be at least 6 inches (152 mm) longer than required to permit the plug end to reach the top of the concrete pad on which the sign is mounted.
3. A cable clamp or similar restraining device must be provided in the sign to prevent strain on the cable terminal connections when the cable plug is pulled apart.
4. There must be no above ground power cable connections to signs. Power to a sign or sign array must be provided through breakaway cable connectors installed within the frangible point portion of the sign's mounting legs.
5. There must be no external above ground electrical connection between signs in a sign array.
6. The sign manufacturer must offer an optional ON/OFF power switch that is appropriate for the style of lighted signs.

3.2.5.9 **Style 2, Style 3 and Style 5 Signs.**

1. Signs operated in a series lighting circuit must work at any current value within the circuit current range and must not flicker after stabilization of the selected current setting step per the time specified in AC 150/5345-10.
2. Power input to lighted signs from the series lighting circuit must be made through an isolation transformer of the proper rating per AC 150/5345-47.
3. Isolation transformers are separate equipment items and are not supplied or integral to the sign unit.
4. If the design requires external power adapter circuitry, all circuitry must be enclosed in a watertight container for installation in a transformer housing, per AC 150/5345-42. All external power adapter units must be provided with the sign. The transformer housing is not supplied with the sign.

Note: Do not attempt to power any signs that are not specifically recommended by the power adapter manufacturer. Be aware that the sign and/or power adapter power factor can affect requirements relevant to the power capacity of the constant current regulator.

5. The external power adapter unit must be delivered with an output cable at least 24 inches (610 mm) long and terminated with a Type II, Class A, Style 7 receptacle, per AC 150/5345-26.

6. If an isolation transformer is integral with the external power adapter unit, the power input leads must be at least 24 inches (610 mm) long, with one lead terminating in a Type I, Class A, Style 9 receptacle, per AC 150/5345-26.

3.2.5.10 **Lighted Sign Materials and Components.**

1. All materials used in fabrication of the signs and mounting hardware must be suitable for their purpose and protected against corrosion.

2. All sign assembly hardware and latches must be Society of Automotive Engineers (SAE) 304, 316, or 18-8 stainless steel.

3. All wiring and components must be properly rated and not operated in excess of the component manufacturer's recommended ratings.

4. At the time of certification, sign lamps used are listed and inclusive.

Note: Lamp manufacturers and distributors as independent sources are not required at this time to either test or burn-in lamps to FAA specifications. This is especially true for pre-focused lamps. Only the original equipment manufacturer (OEM) of the sign assures that appropriate testing and burn-in of lamps is done to meet the requirements of this AC.

5. When replacing sign panels due to damage or taxiway/runway re-designation, the entire message element must be replaced. This will avoid panel-to-panel color changes that may be distracting to pilots.

3.2.5.11 **Lighted Sign Finish.**

1. External surfaces of signs, excluding the mounting legs and face panel, must be a low luster black finish.

2. Paint coatings or surface treatments on nonmetallic surfaces must be equal in quality to those on metal surfaces.

3. Paint coatings and surface treatments must be free from any runs, blotches, and scratches.

3.2.5.12 **Nameplate.**

1. Each sign must have a nameplate showing:

   a. Type

   b. Size

c. Style

d. Class

e. Manufacturer's name and address

f. Date of manufacture

g. Catalog number

h. Lamp data including the lamp type and rating.

2. The nameplate on Style 1 signs must show the total volt-ampere (VA) load and power factor of the sign, including any required ballasts or adapter units.

3. The nameplate on Style 2, 3 and 5 signs must show the total maximum VA load and power factor measured on the primary side of the isolation transformer. The load indicated must represent the worst-case VA loading anticipated on the lighting circuit regulator including any ballasts and/or adapter units required for sign operation.

4. Nameplates must be fabricated from materials that will resist fading and cracking arising from exposure to weather, salt laden air, and sunshine.

5. The material for the nameplate should be of the same or better durability than the sign frame material.

3.2.5.13 **Frangible Couplings.**

Each frangible coupling must be permanently marked with the manufacturer's name (may be abbreviated) and the size of sign for which the coupling is rated.

3.2.5.14 **Workmanship.**

1. All signs must be fabricated under the highest quality commercial assembly standards and workmanship.

2. All wiring must be neatly run and laced.

3. All sharp edges and burrs must be removed.

3.2.5.15 **Instruction Booklet.**

1. Two instruction booklets must be included with each order of signs.

2. The instruction booklets must include:

a. Sign installation instructions.

b. Sign maintenance procedures.

c. Troubleshooting procedures (including operating voltages and point readings).

d. Complete parts list.

e. The lamp voltage or current necessary to meet the luminance levels in paragraph 3.2.5.6 of this document.

3.2.6 Unlighted Sign Requirements.

3.2.6.1 **Unlighted Sign Construction.**

1. The sign panel must be designed for installation on stakes or a concrete pad.
2. All required mounting hardware, except the anchor bolts, must be supplied with the sign.
3. Style 4 signs must be designed not to swing.

3.2.6.2 **Unlighted Sign Materials and Components.**

1. Sign panels must be made from aluminum, except when a tested lighted sign is used as an unlighted sign.
2. The aluminum sheet must be free from any laminations, blisters, open seams, pits, holes, or other defects.
3. The aluminum sheet thickness must be uniform and the fabricated sign blank flat to commercial standards.
4. All sign mounting hardware must be suitable for its intended purpose and protected from corrosion.
5. All sign screws, bolts, nuts, and washers must be alloy SAE 304, 316, or 18-8 stainless steel.
6. An insulating material must be used between any aluminum and steel material in direct contact to prevent galvanic corrosion.
7. Retroreflective material(s) used must meet the requirements of ASTM D4956 (current version as of the issue date of this AC), Specification for Retroreflective Sheeting for Traffic Control, for Type III or Type IV sheeting.

3.2.6.3 **Unlighted Sign Sizes.**

1. The sign dimensions given in Table 3-1 must be used for all unlighted signs, with the addition of the following minimum sign length dimensions:
   a. Size 1 - 30 inches (762 mm)
   b. Size 2 - 36 inches (914 mm)
   c. Size 3 - 42 inches (1067 mm)
2. Sign lengths must be selected to fit only complete message elements.

3. When required, a sign array may contain multiple signs of the same size (mounting height and face height) installed end-to-end in a straight line.

4. When multiple signs are used, the separation between signs must be 3 to 6 inches (76 to 152 mm). See Appendix D, Figure D-1 and Figure D-2, for examples of unlighted multiple sign arrays.

3.2.6.4 **Unlighted Sign Mounting Legs.**

All requirements in paragraph 3.2.5.3 apply with the following additions:

1. Sign support legs must be mounted to the back surface of the sign so there is no obstruction to any portion of the sign front.

2. The frangible points for Mode 1 signs must withstand wind loads from jet blasts of 100 mph (161 kph) but must break before reaching an applied static load over the legend panel of 0.9 psi (6.2 kPa).

3. Mode 1 signs must withstand 100 mph (161 kph) winds and jet blast/prop wash from aircraft without bending or changing shape.

3.2.6.5 **Unlighted Sign Faces.**

1. Non-black letters, numerals, symbols and location borders must use retroreflective sheeting applied per the material manufacturer's recommendation. The sign panel and sheeting must have a smooth surface of uniform color, free of cracks, wrinkles, blisters, and warps.

2. Sign messages must be formed to provide a continuous stroke width with smooth edges and present a flat surface free from warps, blisters, wrinkles, and burrs.

3. The background and legend color must meet the requirements in this AC for each type of sign.

4. Sign faces must be constructed by the direct applied characters process or the screen process per paragraphs 3.2.6.5.1 and 3.2.6.5.2.

5. The spacing, stroke, and shape of legend characters, numerals, and symbols must be per Appendix A and Appendix B.

6. Type L-858L sign faces must have a margin and a border per paragraph 3.2.6.6 and as illustrated in Appendix D, Figure E-1.

7. Message dividers must be per paragraph 3.2.6.7.

8. Corners of sign faces must be rounded to a radius of 1-1/2-inches ± 1/8 inches (38-mm ± 3 mm). See Appendix D and Appendix G for examples.

Note: An approved lighted console sign may be used as an unlighted sign. A separate part number may be required when a lighted sign is furnished without electrical components.

3.2.6.5.1 Direct Applied Character Process.

Letters, numerals, symbols and the border of signs must be cut from retroreflective sheeting and applied per the manufacturer's recommendations.

3.2.6.5.2 Screen Process.

1. Letters, numerals, symbols, and the border of signs must be applied to the retroreflective sheeting or opaque background of sign by direct or reverse screening.
2. Messages for Type L-858Y signs must be applied to retroreflective sheeting by a direct screening process.
3. Sign messages for Types L-858L and L-858R signs must be produced by the reverse screening process.

3.2.6.6 **Margin and Border for Type L-858L Unlighted Signs.**

See paragraph 3.2.5.4.1; all requirements apply to unlighted signs.

3.2.6.7 **Unlighted Sign Message Dividers.**

See paragraph 3.2.5.4.2; all requirements apply to unlighted signs.

3.2.6.8 **Unlighted Sign Finish.**

The back panel of the sign must be painted with a primer coat and low luster, flat black, finish coat or equivalent.

3.2.6.9 **Unlighted Sign Frangible Couplings.**

See paragraph 3.2.5.13; all requirements must apply to unlighted signs.

3.2.6.10 **Workmanship.**

All signs must be fabricated under the highest quality commercial assembly standards and workmanship. The sign must be fabricated so all sharp edges and burrs are removed. Painted surfaces must be free from any runs, blotches, and scratches.

3.2.6.11 **Instruction Booklet.**

1. Two instruction booklets must be included with each order of signs.
2. The instruction booklets must include:
   a. Sign installation instructions.
   b. Sign maintenance procedures.
   c. Complete parts list.

CHAPTER 4. CERTIFICATION PROCEDURES

Procedures for qualifying equipment furnished under the Federal grant assistance program for airports are in AC 150/5345-53 and all the detailed testing procedures and requirements in this AC.

4.1 Lighted Sign Qualification Tests.

All tests contained in paragraphs 4.1.1 and 4.2 apply for any product certification of taxiway and runway signs.

4.1.1 General Qualification Tests.

4.1.1.1 Lighted Sign Visual Examination.

For this test:

1. Type L-858Y signs must have at least two message elements separated by a message divider.
2. Type L-858R signs must have a legend that shows the designator for each runway approach end. For example: "18-36".
3. Type L-858L signs must have a legend that reads as a taxiway designation. For example, "B".
4. All signs must be examined for the following under the requirements of this AC for:
   a. Dimensions
   b. Materials
   c. Component ratings
   d. Finish
   e. Quality of workmanship
5. Signs must be viewed in daylight from 800 ft. (244 m). The sign type, defined in paragraph 1.2.1 of this document, must be easily identifiable.
6. The sign face and retroreflective material must be smooth in appearance and free of any visual irregularities (except at the panel joints of modular signs). Retroreflective sheeting type must be per paragraph 3.2.5.4.
7. Both the legend and background colors on modular signs must be continuous across panel joints.
8. Signs must be viewed from 800 ft. (244 m) at night to determine if the luminance level is sufficient to make the Type L-858Y and L-858R

background colors and Type L-858L legend and border colors readily discernible.

9. Type L-858B, Runway Distance Remaining signs, must be viewed from 800 ft. (244 m) at night to determine if the legend is readily discernible.

10. Style 2 and Style 3 signs must be viewed while the input current is varied throughout the range on which the sign is to operate. Compliance with paragraph 3.2.5.5, subparagraph 6, must be verified. Compliance with paragraph 3.2.5.5, subparagraph 6, is based on the constant current regulator having a continuous output at all current steps with no zero current conditions between switching. This will allow for independent acceptance of the sign with no constraints from the design of the constant current regulator. See AC 150/5340-30 for additional information.

11. Modular signs must be viewed from 200 ft. (61 m) at full brightness.

12. Panel joints must not interfere with the legibility of the sign or leak light to create a color discontinuity across the joint.

13. Signs must be evenly illuminated with no dark areas or banding that interferes with legibility.

4.1.1.2 **Lighted Sign Wind Load and Frangibility Test.**

1. Mode 2 signs must be tested to withstand wind loads of 200 mph (322 kph) without damage.

2. Mode 3 signs must be tested to withstand wind loads of 300 mph (483 kph) without damage.

3. All testing must be performed with the sign fully assembled and mounted on its base.

Note: If wind loading is applied with the sign mounted on a vertical surface, the weight of the sign must be included as part of the total applied weight.

4. Wind loading tests must be designed to ensure the sign face receives the full wind load.

5. To simulate wind loading, a static force equivalent to the specified wind velocity (0.9 psi (6.2 kPa) for a Mode 2 flat panel sign and 2.0 psi (13.8 kPa) for a Mode 3 flat panel sign) must be uniformly applied to the entire surface of the sign face for 10 minutes.

   a. The sign must not break at the frangible points.

   b. Both the sign face and its supports must be inspected for damage. If there is any breakage or permanent deformation, it is considered as a test failure and a cause for rejection.

6. The static force (equivalent to the specified wind velocity) applied in paragraph 4.1.1.2, subparagraph 5, must be increased until the sign breaks at the frangible points. Frangible point failure must occur before the sign face loading reaches a maximum equivalent static force of 1.3 psi (8.9 kPa) for a Mode 2 flat panel sign and 2.8 psi (19.3 kPa) for a Mode 3 flat panel sign.

Note 1: Mode 1 is only applicable to unlighted signs, refer to paragraph 4.2.1.2.

Note 2: When the loading test is complete, both the sign face and its supports must be inspected for damage.

Note 3: If there is any breakage or permanent deformation, it is considered a test failure and a cause for rejection.

Note 4: If equivalent pressures are used for non-flat-panel signs (example: a curved panel), then they must be verified by wind tunnel testing.

4.1.1.3 **Lighted Sign Photometric Testing.**

4.1.1.3.1 Photometer Parameters.

1. A photometer or telephotometer must be used for this test.
2. IES, LM-52-98, (provides test procedures and methods of obtaining and reporting data) must be used for guidance for all sign photometric testing.
3. The photometric equipment calibration must be verified before performing any tests, and, if necessary, calibrated, under the most current National Institute of Standards (NIST) traceable standards.
4. Meters must measure luminance expressed in fL and be color corrected.
5. Meters must measure a "spot" on the sign face that is 1.5 inches (38.1 mm) diameter.
6. Only light emitted from the sign must be permitted to reach either meter type.
7. If using a photometer, a 6-inch (152 mm) collimated adapter tube must be placed between the meter and the sign to limit the measurement field to 1.5 inches (38.1 mm) diameter circle. In addition, the adapter tube must be calibrated with the instrument.
8. If using a telephotometer, the meter aperture and distance from the sign must be selected as closely as possible to evaluate a 1.5-inch (38.1 mm) diameter circle.
9. Style 2 and 3 signs must be tested at the high and low input currents within the range of the series lighting circuit power.

4.1.1.3.2 Lighted Sign Types and Sizes Testing.

1. Photometric testing must be conducted on sizes 1, 2, and 3 for each of Type L-858Y, L-858R, and L-858L signs.
2. If a luminaire design of a double face sign is symmetrical for both faces, then only one face is required to be tested.
3. The length of Types L-858Y and L-858R signs tested must be 45 inches (1143 mm) minimum.
4. Signs using modular construction must contain at least two modules for photometric testing.

4.1.1.3.3 Lighted Sign Faces.

1. Type L-858Y and L-858L signs must have an entirely yellow sign face fabricated from the same material used to create the background on production L-858Y signs or the legend and border on production L-858L signs.
2. Type L-858R signs must have an entirely white face fabricated from the same material used to create the legend on production L-858R signs.
3. Photometry tests must be done on a sign with one or more white panels installed on one side and one or more yellow panels installed on the other side.

4.1.1.3.4 Measurements.

1. Measurements must be made on a 3 inches (76 mm) grid over the entire face of the sign, with no measurement closer than 3 inches (76 mm) to the inside edge of the sign frame (see Figure H-1).
2. The average of all measurements must be between 10 and 30 fL with no measurement lower than 7 fL.
3. The ratio between maximum and minimum luminance over the whole sign face must not exceed 5:1.
4. Adjacent grid measurements must not exceed a 1.5:1 luminance ratio.

4.1.1.3.5 Lighted Sign Light Source Failure Test.

1. Simulate a failure of a light source within the sign.
2. Check that the sign meets the requirements in paragraph 3.2.5.7.
3. Only test this after allowing airfield regulator and underground circuits to stabilize (> 2 minutes)

4.1.1.4 **Lighted Sign Rain Test.**

1. A rain test for Style 1, 2, 3, and 5 signs must be conducted using MIL STD-810F, 1 January 2000, Method 506, paragraph 4.4.2, Procedure I, Rain and blowing rain.

Note: The design must be checked for gaps between the sign face and frame that could allow the entry of windblown snow or rain into the sign interior.

   a. Signs must be designed to quickly drain any accumulated water.

   b. Sign circuit components must not be mounted in areas where water will accumulate.

2. The presence of any water inside the sign must not change the electrical load of the sign.

3. The sign must be operated during the last 10 minutes of the test. Failure of the sign to operate is considered a failed test.

4.1.1.5 **Lighted Sign Low Temperature Test.**

1. A low temperature test must be conducted under MIL-STD-810F, 1 January 2000, Method 502.4, Procedure II.

2. Any required power adapter units (see paragraph 3.2.5.9, subparagraph 3) must be included in the test.

3. The lowest operating temperature for Class 1 signs is -4° F (-20° C).

4. The lowest operating temperature for Class 2 signs is -40° F (-40° C).

5. With the sign temperature stabilized at the lowest temperature, inspect the sign face for any damage, such as cracking, peeling, delaminating, and flaking.

6. Any damage, including paragraph 3.2.5.9, subparagraph 3, to the sign face or structure, is considered as a failed test and a cause for rejection. Failure to operate or failure to reach the luminance levels specified in paragraph 3.2.5.6 within 2 minutes after it is energized is also cause for rejection.

7. The sign must be re-stabilized at the lowest test temperature after an examination.

4.1.1.6 **Lighted Sign High Temperature Test.**

1. A temperature shock test must be conducted for lighted signs using MIL-STD-810F, 1 January 2000, Method 503.4, Procedure II, Shock to/from Cyclic High Temperatures and include any required adapter units.

2. The maximum environmental chamber temperature must be 131° F (+55° C). This test must immediately follow the low temperature test in paragraph 4.1.1.5.
3. The high temperature chamber must be preheated and stabilized at the maximum temperature before performing the test.
   a. The sign must be transferred within 5 minutes or less from the low temperature chamber to the high temperature chamber.
   b. When the sign temperature is stabilized at the maximum chamber hot temperature, inspect the sign face for any cracking, peeling, bubbling, delaminating, and flaking. If any structural damage is evident, it is considered as a failed test and cause for rejection. In addition, if a sign fails to operate, it is also considered as a test failure and a cause for rejection.
4. After the sign cools to ambient temperature, re-inspect the sign face. Any damage is considered as a failed test.

4.1.1.7 **Solar Radiation Test.**

1. A solar radiation test must be conducted using MIL-STD-810F, 1 January 2000, Method 505.4, paragraph 4.4.2, Procedure II.
2. The sign must be subjected to a minimum of 56 cycles.
3. Sign legend panels are not required for this test. All other external non-metallic parts must be tested.
4. At the end of the test, any evidence of structural damage, cracking, peeling, bubbling, flaking, delaminating or corrosion is considered as a failed test and a cause for rejection.

4.1.1.8 **External Sign Power Adapter Immersion Test.**

1. A water immersion test must be conducted using MIL-STD-810F, 1 January 2000, Method 512.4, Procedure I, on the external sign power adapter unit after it is subjected to the high temperature testing in paragraph 4.1.1.6.

Note: The immersion test confirms whether or not the adapter gasket material was adversely affected after its exposure to high temperatures.

2. Any evidence of water in the adapter unit is considered a failed test and cause for rejection.

4.1.1.9 **Lighted Sign Power Factor Test.**

Style 2, 3, and 5 lighted signs must be tested for a power factor of not less than 0.7 per the requirements in paragraph 3.2.5.5.

1. All power factor measurements must be conducted at the primary winding of the isolation transformer.

2. The true power factor for all fixtures powered by a constant current regulator must not be less than 0.7 when measured at the isolation transformer primary input power leads of the fixture on all constant current regulator current steps.

3. The true power factor measurement must be done over the frequency bandwidth range of at least 100 kHz. The power factor measurement must not be displacement power factor (cos φ). Testing will be conducted using a pure sine wave source. This establishes repeatability in the measurement. Visually verify the sine wave by using an oscilloscope. Define the pure sine wave by setting a limit on the crest factor of the waveform. A pure sine wave has a crest factor of 1.414, so a maximum variation from that needs to be determined.

4.1.1.10 Sign Surge Voltage Test.

Note: The equipment may be damaged by this test. Perform this test only after photometric testing in paragraph 4.1.1.3 is complete.

1. Apply 2 pulses at 15 second intervals per the descriptions in IEEE C62.41, Table 4, Location Category C2, to the ALD sign power input (sign AC power off).

2. See IEEE C62.41-1991 Section 9.3 for test condition and test generator information.

3. See IEEE C62.41-1991 Section 9.4 for a detailed combination pulse generation and parameters discussion.

4. See IEEE C62.45, IEEE Recommended Practice on Surge Testing for Equipment connected to Low-Voltage (1,000 volts (V) and Less) AC Power Circuits, for guidance about equipment test methods.

5. The equipment under test must operate normally at the conclusion of the test.

4.2 Unlighted Sign Qualification Procedures.

Procedures for qualifying equipment to be furnished under the Federal grant assistance program for airports are in AC 150/5345-53, *Airport Lighting Equipment Certification Program*.

4.2.1 Unlighted Sign Conformance Tests.

4.2.1.1 Unlighted Sign Visual Inspection.

For this test:

1. Type L-858Y signs must have at least two message elements separated by a message divider. Type L-858R signs must have a legend, that, for example, reads, "18-36."

2. Type L-858L signs must have a legend that, for example, reads "B."

3. All signs must be examined for adherence to the requirements of this AC for:
   a. Dimensions,
   b. Materials,
   c. Finish,
   d. Quality of workmanship.
4. All signs must be viewed in daylight and at night from 800 ft. (244 m). The sign types, described in paragraph 1.2.1 of this document, must be readily identifiable.
5. Both the sign face and retroreflective material must have a smooth appearance and be free of any irregularities (except minor seams between retroreflective sheets) and sharp edges. Unlighted sign retroreflective sheeting types must be per paragraph 3.2.6.2.

4.2.1.2 **Unlighted Sign Wind Load and Frangibility Test.**

See paragraph 4.1.1.2; all requirements apply with the following exceptions for Mode 1:

1. Mode 1 unlighted signs or substitute lighted signs must be tested to withstand wind loads of 100 mph (161 kph).
2. A static force (equivalent to the specified wind velocity) of 0.23 psi (1.59 kPa) for mode 1 unlighted sign flat panel designs must be uniformly applied over the full surface of the legend panel for 10 minutes. The sign must not break at the frangible points or suffer any permanent distortion.
3. The frangible points must break before the static force (equivalent to the specified wind velocity) applied to the legend panel reaches 0.9 psi (6.2 kPa) for Mode 1 unlighted flat panel designs.

4.2.1.3 **Unlighted Sign Low Temperature Test.**

See paragraph 4.1.1.5; all requirements apply to unlighted signs.

4.2.1.4 **Unlighted Sign High Temperature Test.**

See paragraph 4.1.1.6; all requirements apply to unlighted signs.

4.2.1.5 **Unlighted Sign Solar Radiation Test.**

See paragraph 4.1.1.7; all requirements apply to unlighted signs including aluminum panels.

CHAPTER 5. PRODUCTION

All production sign panels must be inspected for compliance to the requirements of this AC for:

1. dimensions,
2. materials,
3. finish,
4. quality of workmanship,
5. visual presentation (data must be acceptable to 3rd party certification body).

Panels using retroreflective material must also be inspected to ensure that it is smooth and free from irregularities with the exception of the panel joints in modular signs.

All the panel joints of modular signs must be inspected to ensure they do not interfere with the legibility of the sign.

5.1 Operational Production Test.

Lighted signs must be subjected to an operational production test. Testing should include operation at all applicable constant current regulator steps and verification of proper light output.

5.2 Warranty.

The manufacturer must agree to provide each customer with the following guarantee:

This sign is manufactured under AC 150/5345-44, *Specification for Runway and Taxiway Signs*, and warranted for 2 years after the installation date. Any defects in material or workmanship will be corrected or the sign replaced by the manufacturer at no cost to the airport owner.

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APPENDIX A. INSCRIPTIONS FOR SIGN FACES

A.1 Letters, Numbers, and Symbols.

This Appendix shows the shapes of the letters, numbers, and symbols used in inscriptions for sign faces. Letters and Numerals for the Type L-858Y, L-858R and L-858L signs are based on the U.S. Department of Transportation Federal Highway Administration Office of Traffic Operations (originally printed when office was part of the Department of Commerce) 1966 Edition Standard Alphabets for Highway Signs, Series D upper case. These characters are shown in exact detail for a two-inch letter height. A one-quarter inch grid superimposed on the letters facilitates the enlarging process.

Numerals for the Type L-858B and L-858Ba signs are based upon the U.S. Department of Transportation Federal Highway Administration Office of Traffic Operations 1966 Edition Standard Alphabets for Highway Signs, Series C upper case. These characters are shown in exact detail for a two-inch letter height. A one-quarter inch grid superimposed on the letters facilitates the enlarging process. All characters with an arc at the top or bottom are extended slightly above or below the grid lines. This is a currently accepted practice for rounded letters. All symbols developed by the FAA and are shown with an accompanying table for dimensions.

Example of scaling:

To obtain a twelve-inch letter grid, enlarge the grid squares to one and one-half inches by simple ratio:

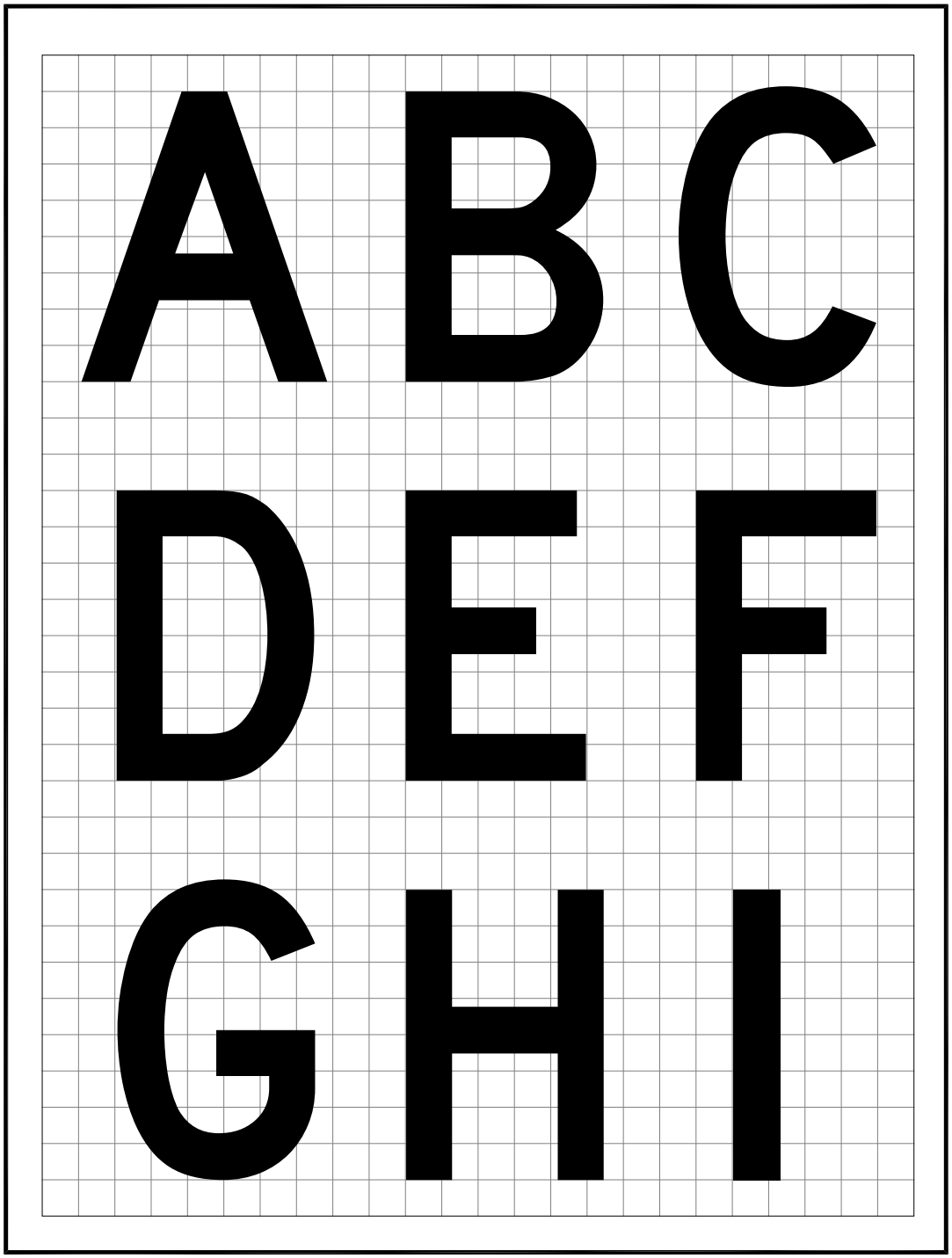
$$\frac{0.25}{2} = \frac{X}{12}$$

X = the new grid square dimension.

Solve for X

X = 1.5 inches

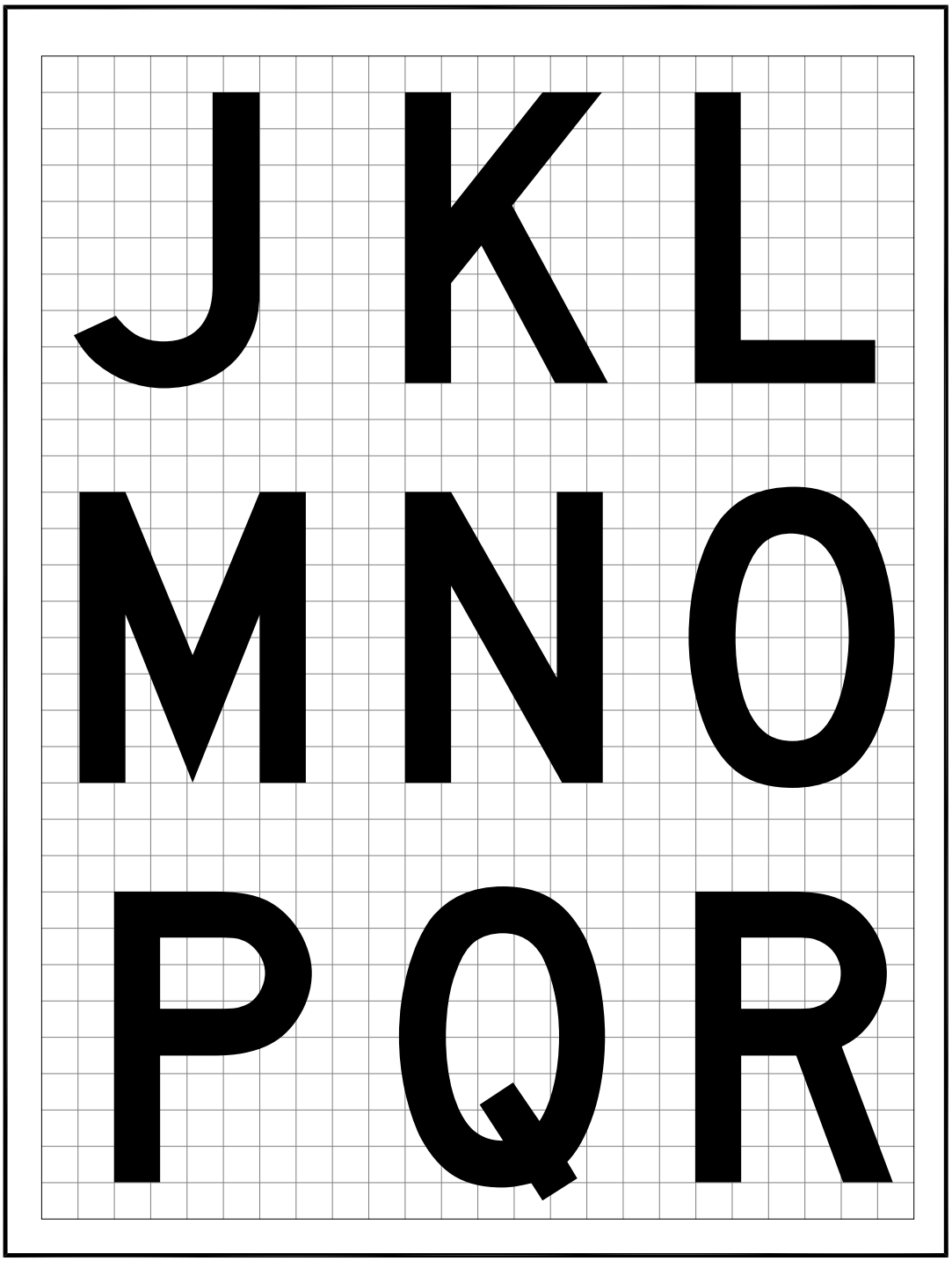
Figure A-1. Sign Legend Characters for Size 1, 2, and 3 Signs, Types L-858Y, L-858R and L-858L



Note 1: Add black outline to letters and numerals for Type L-858R legends per paragraph 1.2.1, subparagraph 1.

Note 2: Do not use numbers by themselves or the letters "I" and "O" because they could be mistaken for a runway number.

Figure A-2. Sign Legend Characters for Size 1, 2, and 3 Signs, Types L-858Y, L-858R and L-858L

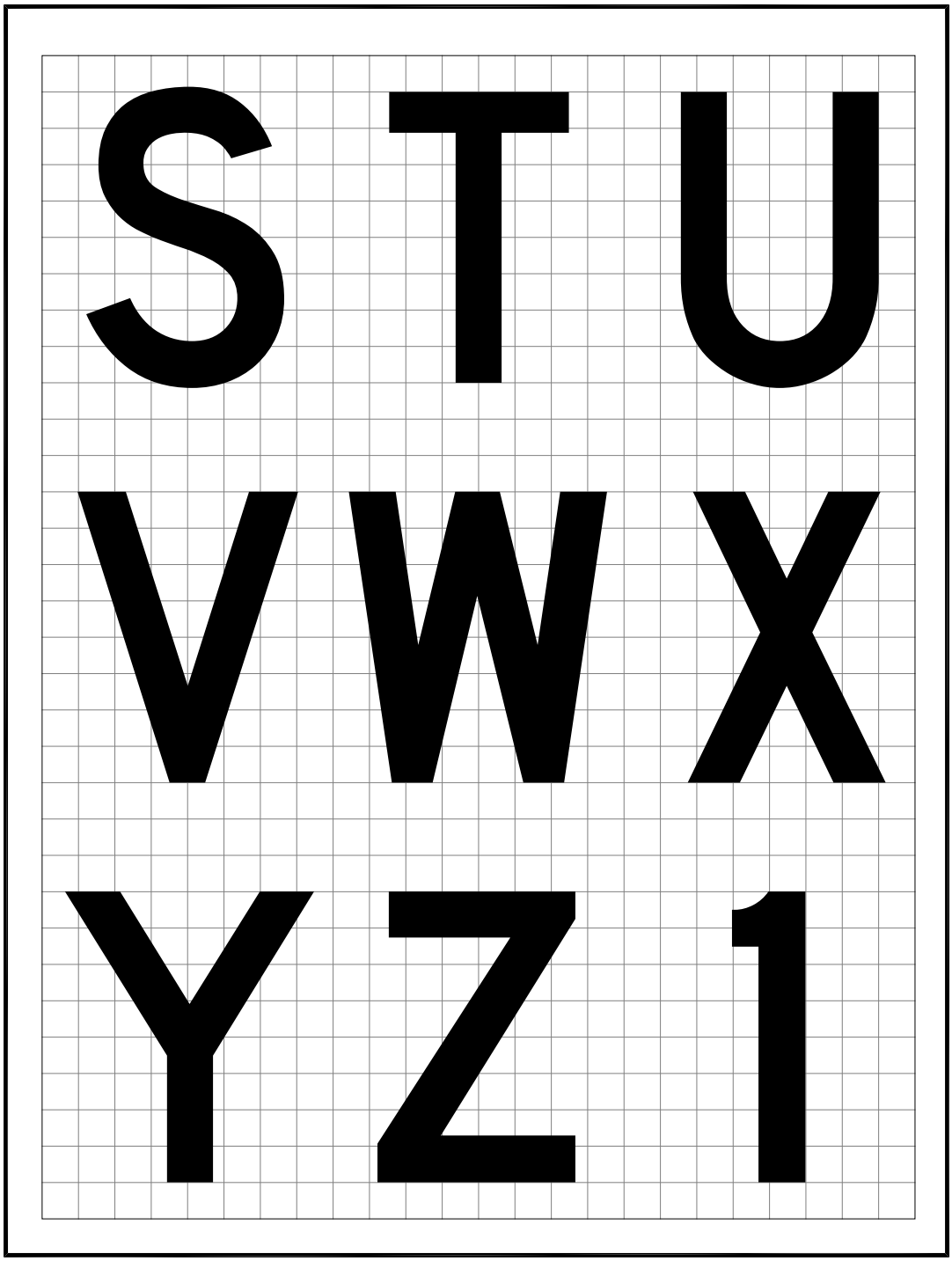


Note 1: Add black outline to letters and numerals for Type L-858R legends per paragraph 1.2.1, subparagraph 1.

Note 2: The round portion of the letter Q will be used for vertical position and height measurements.

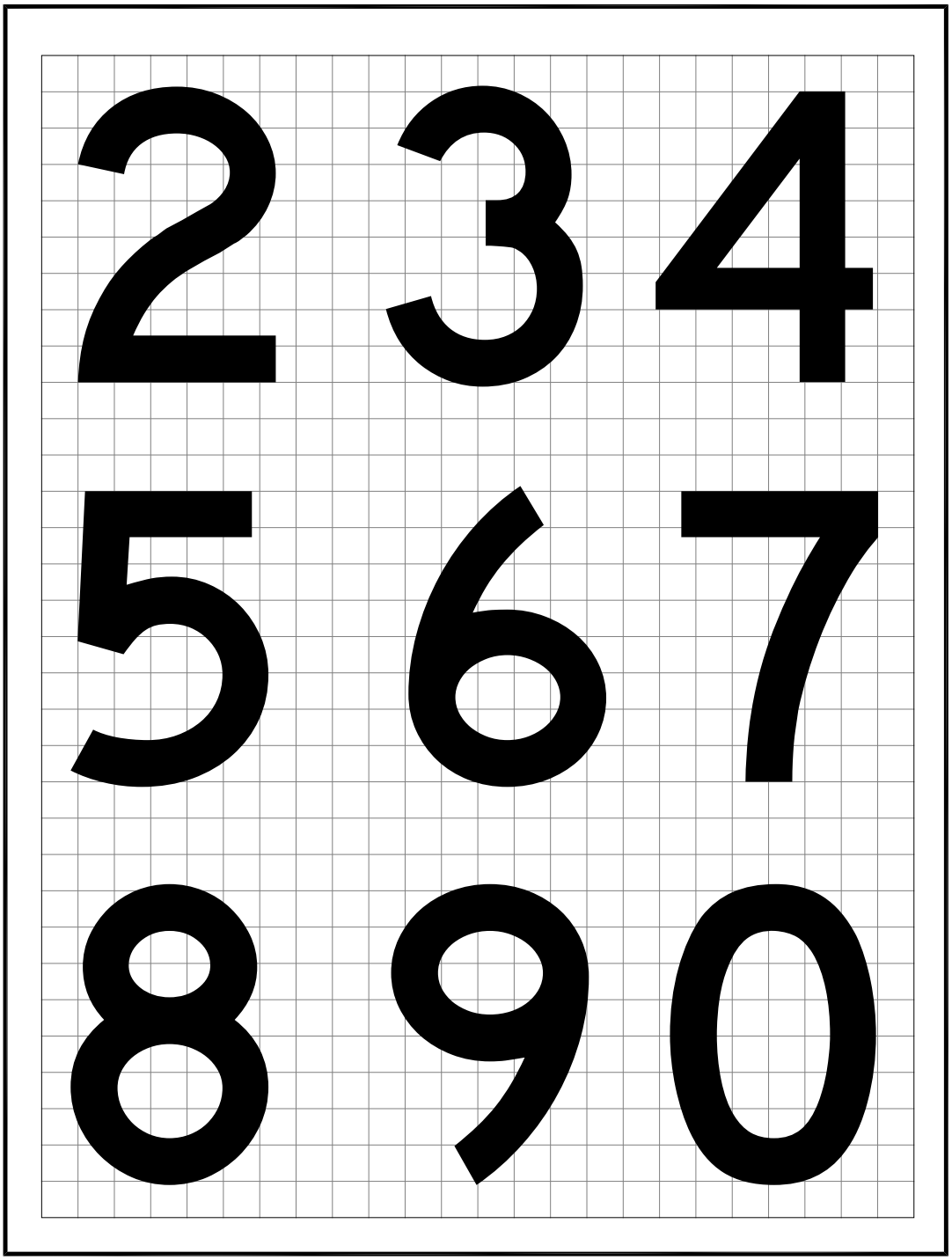
Note 3: Do not use numbers by themselves or the letters "I" and "O" because they could be mistaken for a runway number.

Figure A-3. Sign Legend Characters and Numeral 1 for Size 1, 2, and 3 Signs, Types L-858Y, L-858R and L-858L



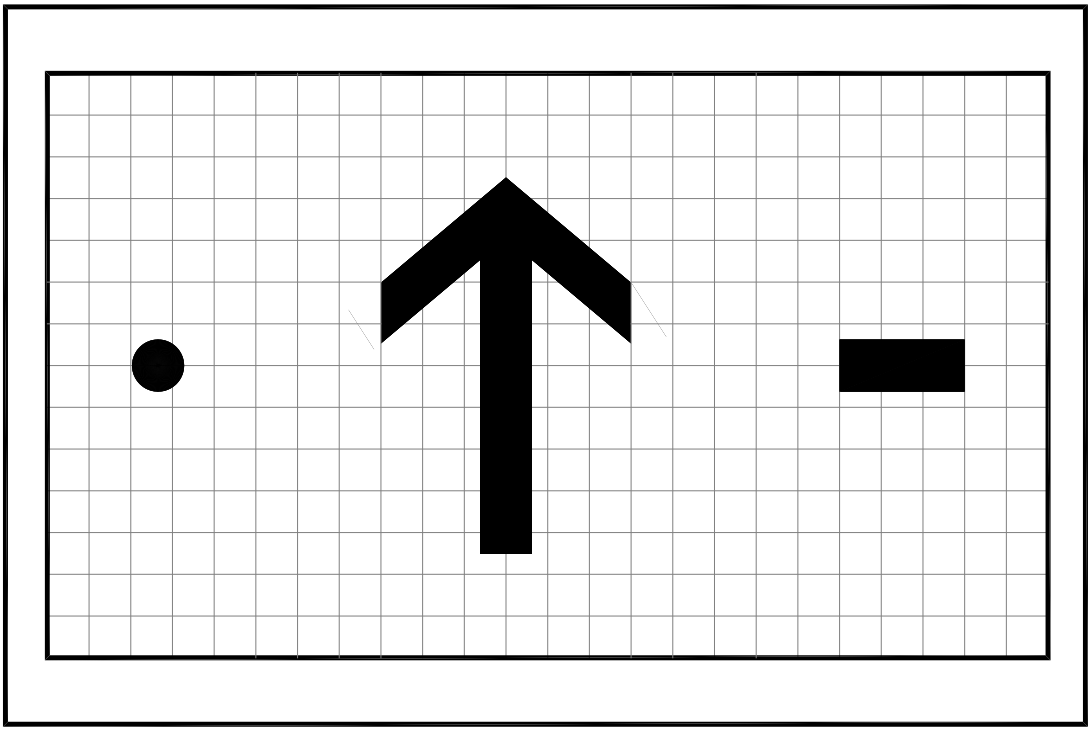
Note 1: Add black outline to letters and numerals for Type L-858R legends per paragraph 1.2.1, subparagraph 1.

Figure A-4. Numerals for Size 1, 2, and 3 Signs, Types L-858Y, L-858R and L-858



Note 1: Add black outline to numerals for Type L-858R legends per paragraph 1.2.1, subparagraph 1.
Note 2: Do not use numbers by themselves or the letters "I" and "O" because they could be mistaken for a runway number.

Figure A-5. Dot, Arrow, and Dash



Note 1: The arrow stroke width, diameter of the dot, and both the width and length of the dash must be proportional to the character stroke width defined in Table A-6, Appendix A.

Note 2: The dimensions of the arrow, without regard to its orientation, must remain the same for all sign types.

Note 3: The minimum spacing between a letter or numeral and a dash or dot, or arrow must be 4 inches (102 mm) for a Size 3 sign, 3.375 inches (86 mm) for a Size 2 sign, and 2.75 inches (70 mm) for a Size 1 sign. When a dash or dot, or any arrow that is not vertical is used with an "A", "W" "V" or "Y", the dash, dot or arrow may be spaced from the character's outer edge at its vertical center.

Note 4: For an arrow, the border of the sign must be per the requirements in Table A-9 (minimum horizontal spacing between the legend and border or inner edge of the sign, if no border). See Figure H-1 for edge locations. See paragraph 1.2.6, subparagraph 3d, for additional information about sign edges.

Note 5: The following is applicable only to an arrow: For the purposes of retrofit panels only, the minimum spacing goal for an arrow should be 4 inches. If an existing sign frame cannot accommodate this dimension, the arrow may be spaced closer to the character to which the arrow refers to allow fitting a new panel into the frame. However, the retrofitted panel must not adversely affect the overall proportionality or readability of the sign. In addition, the border of the sign must remain per requirements in Table A-9 (minimum horizontal spacing between legend and border or sign edge, if no border). Use Table A-1, Table A-2, Table A-3, Table A-4, and Table A-5 to determine letter to letter, numeral to numeral, and numeral to letter spacing. Each table applies only to the sign size in the table title. A tolerance of ± 1/4-in. (6.4 mm) is allowed.

1117 **Table A-1. Character-to-Character Spacing for Size 1 Sign – 12-inch (305 mm)**
1118 **Legend**

	Following Character		
Preceding Character	**B D E F H I K L M N P R U 1 5**	**C G O Q S X Z 2 3 6 8 9 0**	**A J T V W Y 4 7**
A	2-1/4 (57)	2-1/4 (57)	3/4 (19)
B	2-13/16 (71)	2-1/4 (57)	2-1/4 (57)
C	2-1/4 (57)	2-1/4 (57)	1-1/2 (38)
D	2-13/16 (71)	2-1/4 (57)	2-1/4 (57)
E	2-1/4 (57)	2-1/4 (57)	1-1/2 (38)
F	2-1/4 (57)	2-1/4 (57)	1-1/2 (38)
G	2-13/16 (71)	2-1/4 (57)	2-1/4 (57)
H	2-13/16 (71)	2-13/16 (71)	2-1/4 (57)
I	2-13/16 (71)	2-13/16 (71)	2-1/4 (57)
J	2-13/16 (71)	2-13/16 (71)	2-1/4 (57)
K	2-1/4 (57)	2-1/4 (57)	1-1/2 (38)
L	2-1/4 (57)	2-1/4 (57)	3/4 (19)
M	2-13/16 (71)	2-13/16 (71)	2-1/4 (57)
N	2-13/16 (71)	2-13/16 (71)	2-1/4 (57)
O	2-13/16 (71)	2-13/16 (71)	2-1/4 (57)
P	2-13/16 (71)	2-1/4 (57)	2-1/4 (57)
Q	2-13/16 (71)	2-13/16 (71)	2-1/4 (57)
R	2-13/16 (71)	2-1/4 (57)	2-1/4 (57)
S	2-13/16 (71)	2-1/4 (57)	2-1/4 (57)
T	2-1/4 (57)	2-1/4 (57)	3/4 (19)
U	2-13/16 (71)	2-13/16 (71)	2-1/4 (57)
V	2-1/4 (57)	2-1/4 (57)	3/4 (19)
W	2-1/4 (57)	2-1/4 (57)	3/4 (19)
X	2-1/4 (57)	2-1/4 (57)	1-1/2 (38)
Y	2-1/4 (57)	2-1/4 (57)	3/4 (19)

	Following Character		
Preceding Character	**B D E F H I K L M N P R U 1 5**	**C G O Q S X Z 2 3 6 8 9 0**	**A J T V W Y 4 7**
Z	2-1/4 (57)	2-1/4 (57)	1-1/2 (38)
1	2-13/16 (71)	2-13/16 (71)	2-1/4 (57)
2	2-13/16 (71)	2-1/4 (57)	2-1/4 (57)
3	2-13/16 (71)	2-1/4 (57)	2-1/4 (57)
4	2-1/4 (57)	2-1/4 (57)	3/4 (19)
5	2-13/16 (71)	2-1/4 (57)	2-1/4 (57)
6	2-13/16 (71)	2-1/4 (57)	2-1/4 (57)
7	2-1/4 (57)	2-1/4 (57)	3/4 (19)
8	2-13/16 (71)	2-1/4 (57)	2-1/4 (57)
9	2-13/16 (71)	2-1/4 (57)	2-1/4 (57)
0	2-13/16 (71)	2-1/4 (57)	2-1/4 (57)

Note: Dimensions are in inches - dimensions in ( ) are in millimeters

Table A-2. Character to Character Spacing for Size 2 Sign - 15-inch (381 mm) Legend

	Following Character		
Preceding Character	**B D E F H I K L M N P R U 1 5**	**C G O Q S X Z 2 3 6 8 9 0**	**A J T V W Y 4 7**
A	2-7/8 (73)	2-7/8 (73)	15/16 (24)
B	3-1/2 (89)	2-7/8 (73)	2-7/8 (73)
C	2-7/8 (73)	2-7/8 (73)	1-7/8 (48)
D	3-1/2 (89)	2-7/8 (73)	2-7/8 (73)
E	2-7/8 (73)	2-7/8 (73)	1-7/8 (48)
F	2-7/8 (73)	2-7/8 (73)	1-7/8 (48)
G	3-1/2 (89)	2-7/8 (73)	2-7/8 (73)
H	3-1/2 (89)	3-1/2 (89)	2-7/8 (73)
I	3-1/2 (89)	3-1/2 (89)	2-7/8 (73)

	Following Character		
Preceding Character	**B D E F H I K L M N P R U 1 5**	**C G O Q S X Z 2 3 6 8 9 0**	**A J T V W Y 4 7**
J	3-1/2 (89)	3-1/2 (89)	2-7/8 (73)
K	2-7/8 (73)	2-7/8 (73)	1-7/8 (48)
L	2-7/8 (73)	2-7/8 (73)	15/16 (24)
M	3-1/2 (89)	3-1/2 (89)	2-7/8 (73)
N	3-1/2 (89)	3-1/2 (89)	2-7/8 (73)
O	3-1/2 (89)	3-1/2 (89)	2-7/8 (73)
P	3-1/2 (89)	2-7/8 (73)	2-7/8 (73)
Q	3-1/2 (89)	3-1/2 (89)	2-7/8 (73)
R	3-1/2 (89)	2-7/8 (73)	2-7/8 (73)
S	3-1/2 (89)	2-7/8 (73)	2-7/8 (73)
T	2-7/8 (73)	2-7/8 (73)	15/16 (24)
U	3-1/2 (89)	3-1/2 (89)	2-7/8 (73)
V	2-7/8 (73)	2-7/8 (73)	15/16 (24)
W	2-7/8 (73)	2-7/8 (73)	15/16 (24)
X	2-7/8 (73)	2-7/8 (73)	1-7/8 (48)
Y	2-7/8 (73)	2-7/8 (73)	15/16 (24)
Z	2-7/8 (73)	2-7/8 (73)	1-7/8 (48)
1	3-1/2 (89)	3-1/2 (89)	2-7/8 (73)
2	3-1/2 (89)	2-7/8 (73)	2-7/8 (73)
3	3-1/2 (89)	2-7/8 (73)	2-7/8 (73)
4	2-7/8 (73)	2-7/8 (73)	15/16 (24)
5	3-1/2 (89)	2-7/8 (73)	2-7/8 (73)
6	3-1/2 (89)	2-7/8 (73)	2-7/8 (73)
7	2-7/8 (73)	2-7/8 (73)	15/16 (24)
8	3-1/2 (89)	2-7/8 (73)	2-7/8 (73)
9	3-1/2 (89)	2-7/8 (73)	2-7/8 (73)
0	3-1/2 (89)	2-7/8 (73)	2-7/8 (73)

1122 **Note:** Dimensions are in inches - dimensions in ( ) are in millimeters

1123 **Table A-3. Character-to-Character Spacing for Size 3 Sign- 18-inch (457 mm)**
1124 **Legend**

	Following Character		
Preceding Character	**B D E F H I K L M N P R U 1 5**	**C G O Q S X Z 2 3 6 8 9 0**	**A J T V W Y 4 7**
A	3-3/8 (86)	3-3/8 (86)	1-1/8 (29)
B	4-1/4 (108)	3-3/8 (86)	3-3/8 (86)
C	3-3/8 (86)	3-3/8 (86)	2-1/4 (57)
D	4-1/4 (108)	3-3/8 (86)	3-3/8 (86)
E	3-3/8 (86)	3-3/8 (86)	2-1/4 (57)
F	3-3/8 (86)	3-3/8 (86)	2-1/4 (57)
G	4-1/4 (108)	3-3/8 (86)	3-3/8 (86)
H	4-1/4 (108)	4-1/4 (108)	3-3/8 (86)
I	4-1/4 (108)	4-1/4 (108)	3-3/8 (86)
J	4-1/4 (108)	4-1/4 (108)	3-3/8 (86)
K	3-3/8 (86)	3-3/8 (86)	2-1/4 (57)
L	3-3/8 (86)	3-3/8 (86)	1-1/8 (29)
M	4-1/4 (108)	4-1/4 (108)	3-3/8 (86)
N	4-1/4 (108)	4-1/4 (108)	3-3/8 (86)
O	4-1/4 (108)	4-1/4 (108)	3-3/8 (86)
P	4-1/4 (108)	3-3/8 (86)	3-3/8 (86)
Q	4-1/4 (108)	4-1/4 (108)	3-3/8 (86)
R	4-1/4 (108)	3-3/8 (86)	3-3/8 (86)
S	4-1/4 (108)	3-3/8 (86)	3-3/8 (86)
T	3-3/8 (86)	3-3/8 (86)	1-1/8 (29)
U	4-1/4 (108)	4-1/4 (108)	3-3/8 (86)
V	3-3/8 (86)	3-3/8 (86)	1-1/8 (29)
W	3-3/8 (86)	3-3/8 (86)	1-1/8 (29)
X	3-3/8 (86)	3-3/8 (86)	2-1/4 (57)
Y	3-3/8 (86)	3-3/8 (86)	1-1/8 (29)

	Following Character		
Preceding Character	**B D E F H I K L M N P R U 1 5**	**C G O Q S X Z 2 3 6 8 9 0**	**A J T V W Y 4 7**
Z	3-3/8 (86)	3-3/8 (86)	2-1/4 (57)
1	4-1/4 (108)	4-1/4 (108)	3-3/8 (86)
2	4-1/4 (108)	3-3/8 (86)	3-3/8 (86)
3	4-1/4 (108)	3-3/8 (86)	3-3/8 (86)
4	3-3/8 (86)	3-3/8 (86)	1-1/8 (29)
5	4-1/4 (108)	3-3/8 (86)	3-3/8 (86)
6	4-1/4 (108)	3-3/8 (86)	3-3/8 (86)
7	3-3/8 (86)	3-3/8 (86)	1-1/8 (29)
8	4-1/4 (108)	3-3/8 (86)	3-3/8 (86)
9	4-1/4 (108)	3-3/8 (86)	3-3/8 (86)
0	4-1/4 (108)	3-3/8 (86)	3-3/8 (86)

Note: Dimensions are in inches - dimensions in ( ) are in millimeters.

Table A-4. Character-to-Character Spacing for Size 4 Sign – 40-inch (1016 mm) Legend

	Following Character		
Preceding Character	**B D E F H I K L M N P R U 1 5**	**C G O Q S X Z 2 3 6 8 9 0**	**A J T V W Y 4 7**
1	8-1/4 (210)	8-1/4 (210)	6-3/4 (172)
2	8-1/4 (210)	6-3/4 (172)	6-3/4 (172)
3	8-1/4 (210)	6-3/4 (172)	6-3/4 (172)
4	6-3/4 (172)	6-3/4 (172)	2-1/4 (57)
5	8-1/4 (210)	6-3/4 (172)	6-3/4 (172)
6	8-1/4 (210)	6-3/4 (172)	6-3/4 (172)
7	6-3/4 (172)	6-3/4 (172)	2-1/4 (57)
8	8-1/4 (210)	6-3/4 (172)	6-3/4 (172)
9	8-1/4 (210)	6-3/4 (172)	6-3/4 (172)

	Following Character		
Preceding Character	**B D E F H I K L M N P R U 1 5**	**C G O Q S X Z 2 3 6 8 9 0**	**A J T V W Y 4 7**
0	8-1/4 (210)	6-3/4 (172)	6-3/4 (172)

Note: Dimensions are in inches - dimensions in () are in millimeters.

Table A-5. Character-to-Character Spacing for Size 5 Sign – 25-inch (635 mm) Legend

	Following Character		
Preceding Character	**B D E F H I K L M N P R U 1 5**	**C G O Q S X Z 2 3 6 8 9 0**	**A J T V W Y 4 7**
1	5-1/8 (130)	5-1/8 (130)	4-1/4 (108)
2	5-1/8 (130)	4-1/4 (108)	4-1/4 (108)
3	5-1/8 (130)	4-1/4 (108)	4-1/4 (108)
4	4-1/4 (108)	4-1/4 (108)	1-3/8 (108)
5	5-1/8 (130)	4-1/4 (108)	4-1/4 (108)
6	5-1/8 (130)	4-1/4 (108)	4-1/4 (108)
7	4-1/4 (108)	4-1/4 (108)	1-3/8 (35)
8	5-1/8 (130)	4-1/4 (108)	4-1/4 (108)
9	5-1/8 (130)	4-1/4 (108)	4-1/4 (108)
0	5-1/8 (130)	4-1/4 (108)	4-1/4 (108)

Note: Dimensions are in inches - dimensions in ( ) are in millimeters

Table A-6. Width of Strokes

Letter Height		Stroke Width	
(inch)	**(mm)**	**(inch)**	**(mm)**
12	304.8	1.88	47.6
15	381.0	2.35	59.7
18	457.2	2.81	71.4

Letter Height		Stroke Width	
25	635.0	3.53	89.7
40	1016.0	5.64	143.3
Manufacturing Tolerance: ± 1/16-inch (1.6 mm).			

1133 **Table A-7. Width of Letters**

	Letter Height					
Letter	**12-inch (305 mm)**		**15-inch (381 mm)**		**18-inch (457 mm)**	
	(inch)	**(mm)**	**(inch)**	**(mm)**	**(inch)**	**(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

Letter	Letter Height					
	12-inch (305 mm)		15-inch (381 mm)		18-inch (457 mm)	
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
Manufacturing Tolerance: ± 1/16-inch (1.6 mm).						

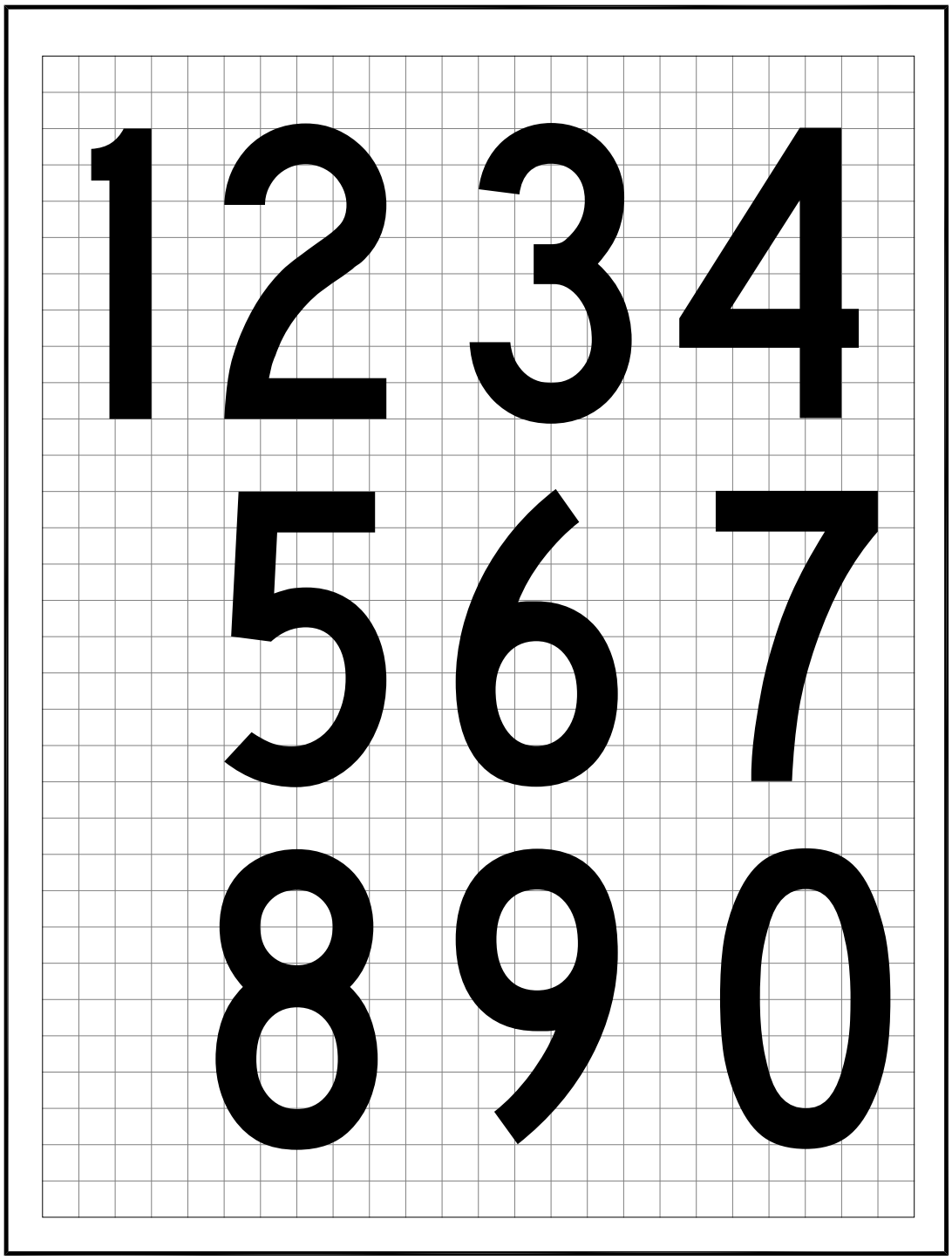
1134 **Table A-8. Width of Numerals**

Numeral	Numeral Height									
	12-inch (305mm)		15-inch (381 mm)		18-inch (457 mm)		25-inch (635 mm)		40-inch (1016 mm)	
	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)
1	2.91	73.9	3.65	92.7	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	13.7	348.0	21.88	555.8
3	8.06	204.7	10.08	256.0	12.09	307.1	13.7	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	13.7	348.0	21.88	555.8
6	8.06	204.7	10.08	256.0	12.09	307.1	13.7	348.0	21.88	555.8
7	8.06	204.7	10.08	256.0	12.09	307.1	13.7	348.0	21.88	555.8
8	8.06	204.7	10.08	256.0	12.09	307.1	13.7	348.0	21.88	555.8
9	8.06	204.7	10.08	256.0	12.09	307.1	13.7	348.0	21.88	555.8
0	8.44	214.4	10.55	268.0	12.66	321.6	14.4	365.8	23.12	587.2
Manufacturing Tolerance: ± 1/16-inch (1.6 mm).										

Table A-9. Lighted and Unlighted Sign Spacing Between Legend and Borders/Message Dividers

Letter or Numeral Height									
12 inches (305 mm) Size 1		**15 inches (381 mm) Size 2**		**18 inches (457 mm) Size 3**		**25 inches (635 mm) Size 5**		**40 inches (1016 mm) Size 4**	
Minimum horizontal spacing between legend and yellow border for Type L-858L signs with more than one character. See paragraph 3.2.5.4.1 for Type L-858L black margin width. Also applicable to signs with no border. For signs with no border, the distance is measured from the outermost edge of the character to the sign frame inner edge (viewable sign face area.) This measurement does not include the portion of the sign panel that is obscured by the sign frame. See Figure H-1 and paragraph 1.2.6, Definitions.									
inches	**mm**	**inches**	**mm**	**inches**	**mm**	**inches**	**mm**	**inches**	**mm**
1.50	38.1	2.00	50.8	2.50	63.5	3.00	76.2	4.00	101.6
Minimum Horizontal spacing between legend and yellow border for Type L-858L (taxiway location) signs that contain a single letter. *Not applicable for 25-inch or 40-inch letters.*									
inches	**mm**	**inches**	**mm**	**inches**	**mm**	**inches**	**mm**	**inches**	**mm**
3.00	76.2	3.50	88.9	4.00	101.6	N/A	N/A	N/A	N/A
Minimum horizontal spacing between legend and border (or the inner edge of the sign if there is no border - see Figure H-1) for type L-858R or L-858L signs that contain a single numeral. *Not applicable for 25-inch or 40-inch letters.*									
inches	**mm**	**inches**	**mm**	**inches**	**mm**	**inches**	**mm**	**inches**	**mm**
6.00	152.4	6.50	165.1	7.00	177.8	N/A	N/A	N/A	N/A
Minimum horizontal spacing between legend and message divider. *Not applicable for 25-inch or 40-inch letters.*									
inches	**mm**	**inches**	**mm**	**inches**	**mm**	**inches**	**mm**	**inches**	**mm**
3.00	76.2	3.50	88.9	4.00	101.6	N/A	N/A	N/A	N/A
A manufacturing tolerance of ± 1/16-inch (1.6 mm) applies to all dimensions.									

Figure A-6. Numerals for Size 4 and 5 Signs (Types L-858B and L-858Ba)



Note: Do not use numbers by themselves or the letters “I” and “O” because they could be mistaken for a runway number.

APPENDIX B. SIGN LEGENDS

This Appendix shows the dimensions for runway safety area/OFZ, runway approach boundary, ILS critical area, and no entry symbols.

Figure B-1. Runway Safety Area/OFZ and Runway Approach Boundary Symbol

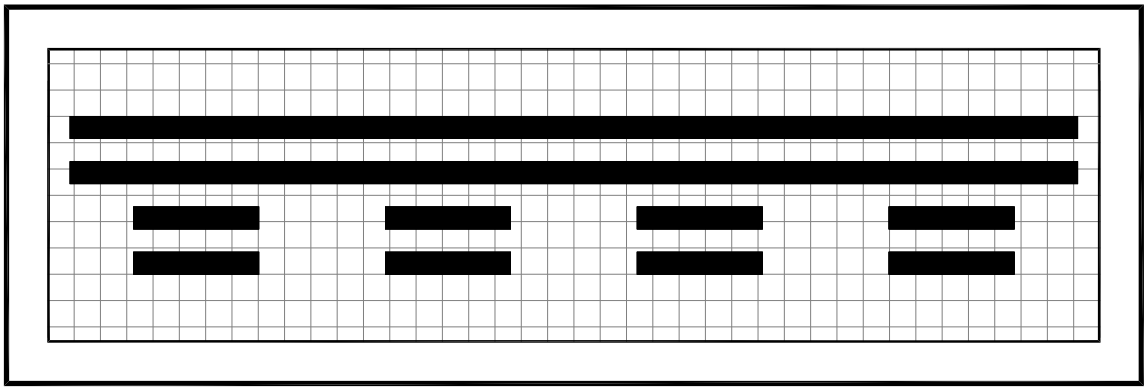


Table B-1. Dimensions for Runway Safety Area/OFZ and Runway Approach Boundary Signs

Sign Elements	Size 1		Size 2		Size 3	
	(inches)	(mm)	(inches)	(mm)	(inches)	(mm)
Legend Height	9.0	228.6	12.0	304.8	15.0	381.0
Legend Length	57.5	1460.5	73.0	1854.2	84.0	2133.6
Stroke Width	1.29	32.8	1.72	43.7	2.14	54.4
Dash Length	7.18	182.4	9.12	231.6	10.5	266.7
A manufacturing tolerance of ±1/16-inch (1.6 mm) applies to all dimensions.						

Note 1: Legend length may vary ± 2 in. (50.8 mm) as measured from the inside edge or the outside edge of the sign if there is no retaining lip (see Figure H-1 for inside and outside edge location).
Note 2: Vertical spacing between bars must be equal to the stroke width.
Note 3: Horizontal spacing between dashes must be equal to the dash length.
Note 4: Dash length and horizontal spacing must vary proportionally to legend length.
Note 5: The yellow background of the L-858Y Boundary sign (Information sign) should not extend beyond the ends of the solid horizontal bars.
Note 6: The symbol must be centered within the vertical viewable panel area.

Figure B-2. ILS Critical Area Boundary Symbol

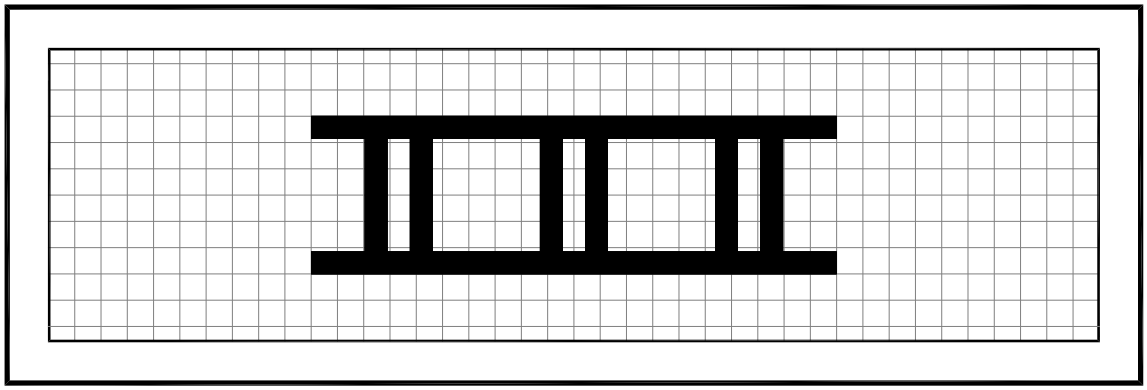


Table B-2. Dimensions for ILS Critical Area Boundary Signs

Sign Elements	Size 1		Size 2		Size 3	
	(inches)	(mm)	(inches)	(mm)	(inches)	(mm)
Legend Height	9.0	228.8	12.0	304.8	15.0	381.0
Legend Length	30.0	762.0	36.0	914.4	42.0	1066.8
Stroke Width	1.29	32.8	1.72	43.7	2.14	54.4
A manufacturing tolerance of ±1/16 inch (1.6 mm) applies to all dimensions.						

Note 1: The legend length may vary ± 2 inches (50.8 mm) as measured from the inside edge or the outside edge of the sign if there is no retaining lip (see Figure H-1 for inside and outside edge location).

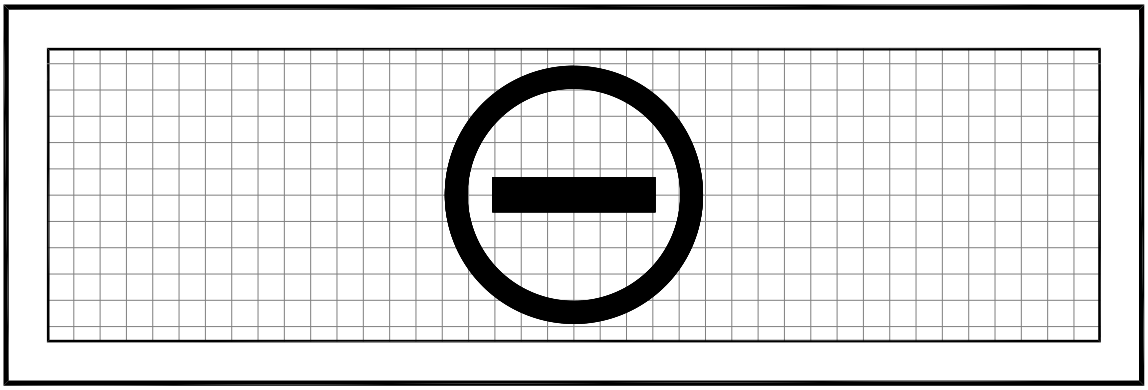
Note 2: The space within a pair of vertical bars must be equal to the stroke width.

Note 3: The space between each pair of vertical bars must vary proportionally to legend length.

Note 4: The yellow background of the L-858 Y Boundary signs should not extend beyond the ends of the horizontal bars.

Note 5: The legend must be centered within the vertical viewable panel area.

Figure B-3. No Entry Symbol



Note 1: The symbol must be centered within the vertical viewable panel area.
Note 2: This symbol is for Type L-858R legends only. Add black outline per paragraph 1.2.1, subparagraph 2.

Table B-3. Dimensions for No Entry Signs

Sign Elements	Size 1		Size 2		Size 3	
	(inches)	(mm)	(inches)	(mm)	(inches)	(mm)
Minimum Legend Panel Length	24.0	609.6	32.0	812.8	40.0	1016.0
Outer Radius	14.7	373.4	19.5	495.4	24.4	619.8
Inner Radius	12.1	307.4	15.9	403.8	20.0	508.0
Dash Length	8.0	203.2	11.5	292.1	15.5	393.7
Dash Width	2.0	50.8	2.7	68.6	3.3	83.8
A manufacturing tolerance of ± 1/16 inch (1.6 mm) applies to all dimensions.						

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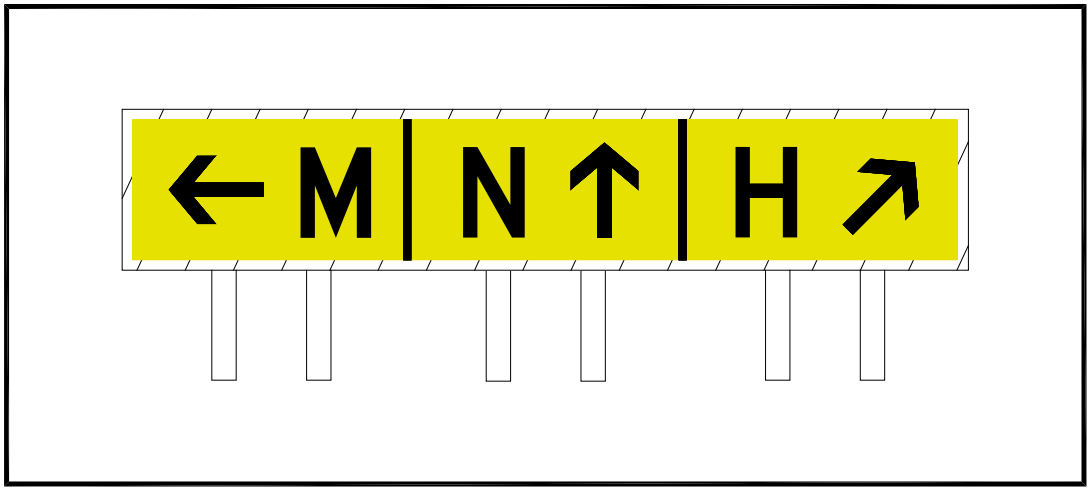
APPENDIX C. SIGN AND MESSAGE ARRAYS (LIGHTED SIGNS)

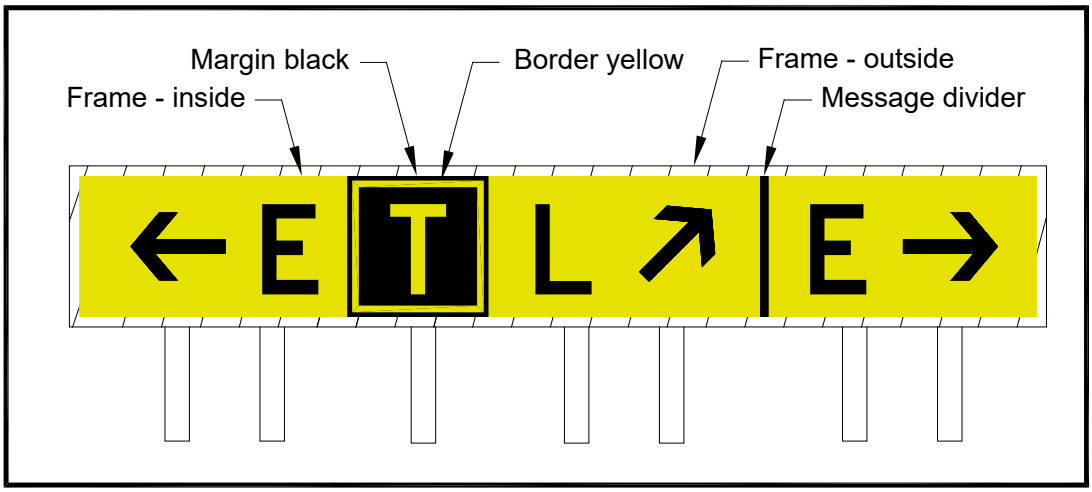
This Appendix represents typical installations of signs containing multiple message elements and sign types.

Figure C-1. Lighted Taxiway Sign Array Example A



Type L-858Y direction sign array composed of three message elements separated by message dividers. On modular signs, the message dividers may be coincident with panel joints. See paragraph 3.2.5.2, subparagraph 2, for guidance about the separation distance between message elements. See paragraph 3.2.5.4.2, subparagraph 3, for lighted message divider widths.

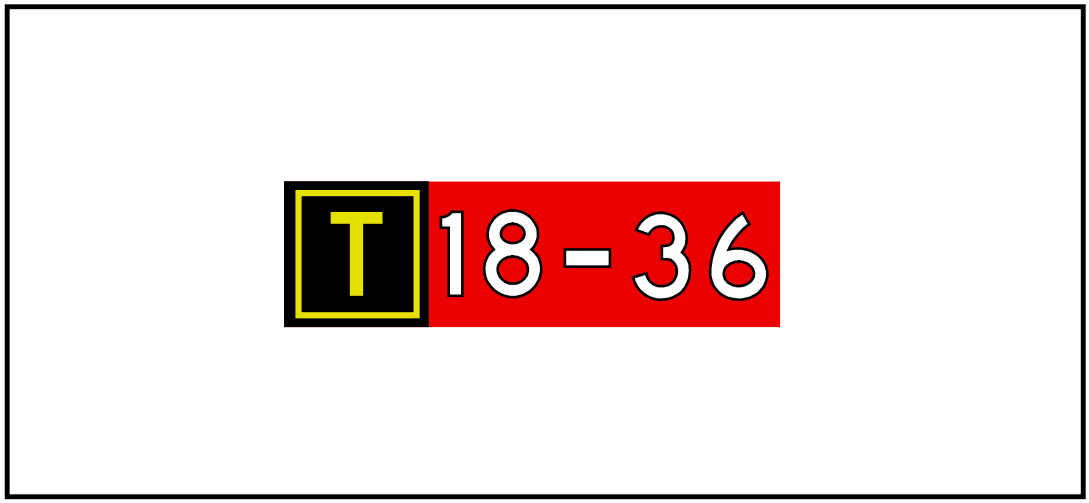
Figure C-2. Lighted Taxiway Sign Array Example B



Sign array that has three L-858Y (Taxiway Direction) signs separated by an L-858L (Taxiway Location) sign. Note that on the right-hand side of the sign array that the two

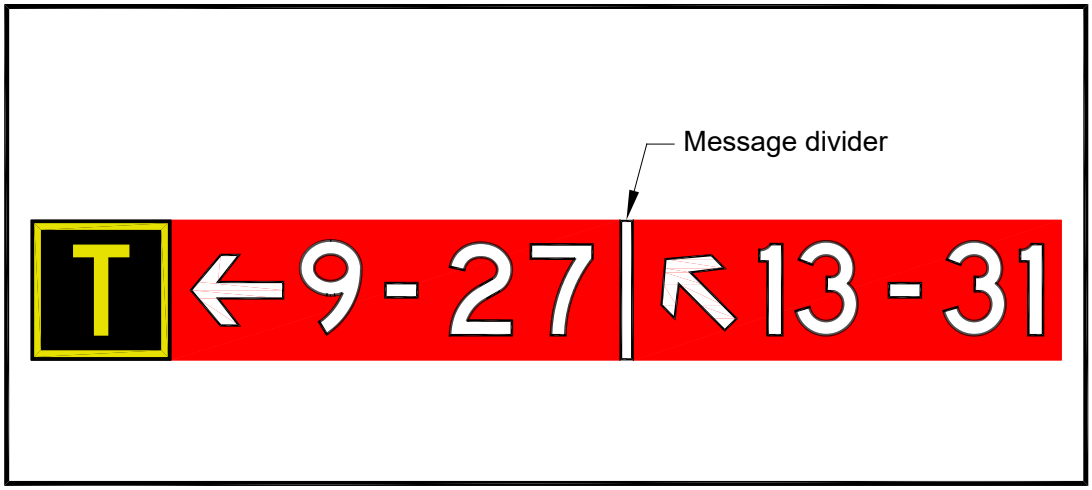
message elements are separated by a black message divider. See paragraph 3.2.5.4.1 for Lighted Type L-858L Borders and Margins.

Figure C-3. Lighted Sign Array Example A



An example of a sign that contains two message elements. Note black outline on L-858R white legend.

Figure C-4. Lighted Sign Array Example B

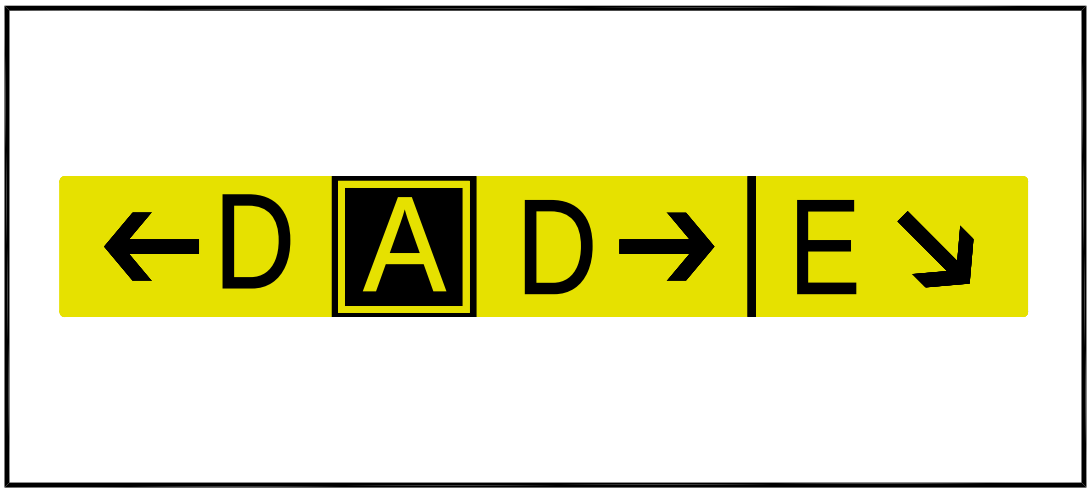


Example of a sign array that contains three message elements: a Type L-858L taxiway location sign and two L-858R mandatory instruction signs. Note the black outline on the white message divider. See paragraph 3.2.5.4.2 for additional information about message dividers.

APPENDIX D. SIGN AND MESSAGE ARRAYS (UNLIGHTED SIGNS)

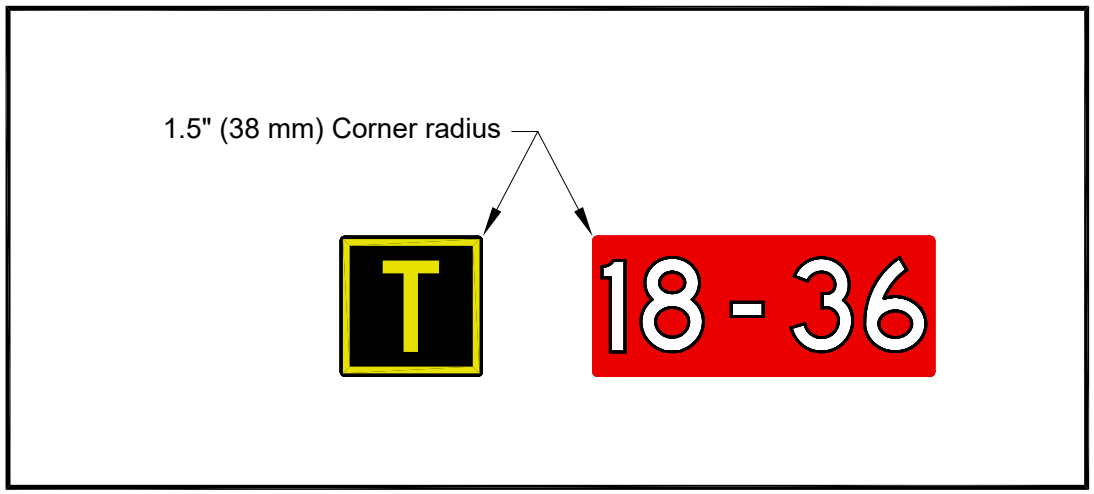
This Appendix represents typical installations of signs containing multiple message elements and sign types.

Figure D-1. Unlighted Sign Array Example A



A sign array that contains two Type L-858Y direction signs separated by a Type L-858L taxiway location sign. The Type L-858Y signs on the right contain two message elements separated by a message divider. See paragraph 3.2.5.2, subparagraph 2, for guidance about the separation distance between message elements. Reference paragraph 3.2.6.7 (or paragraph 3.2.5.4.2) for unlighted sign message dividers.

Figure D-2. Unlighted Sign Array Example B



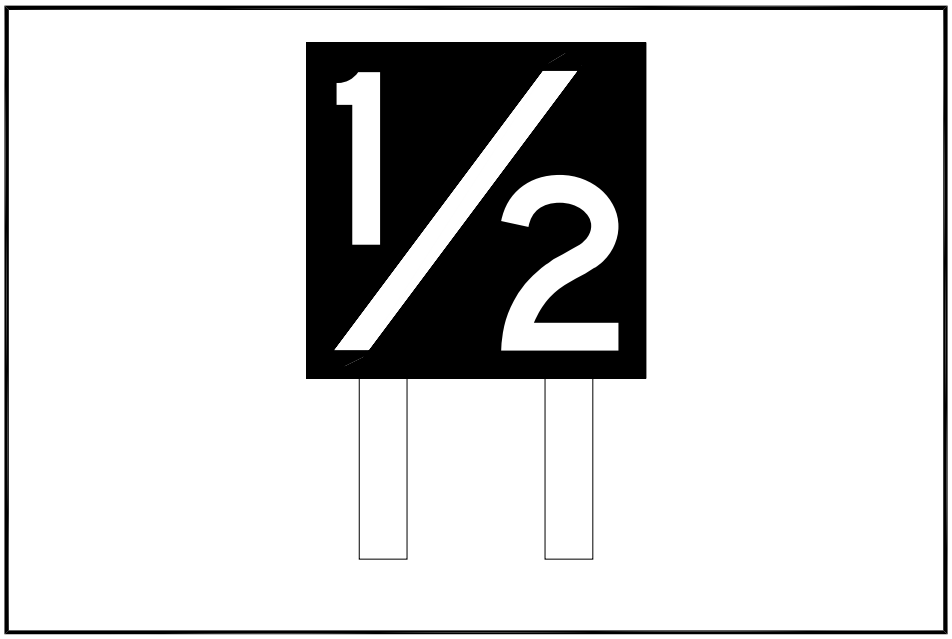
Sign array composed of multiple signs: a Type L-858L taxiway location sign and an L858R mandatory instruction sign. When multiple unlighted signs are used, see

paragraph 3.2.6.3, subparagraph 4, for the separation distance between legend panels. See paragraph 3.2.6.6 for Unlighted Type L-858L Borders and Margins.

APPENDIX E. ONE-HALF RUNWAY DISTANCE REMAINING SIGN

Overall sign dimensions are in paragraph 1.2.2 and Table 3-1.

Figure E-1. One-Half Distance Remaining Sign, Type L-858H



Note 1: Type L858H signs must not be used in combination with L-858B, Runway Distance Remaining signs.

Note 2: Sign must be Size 5 only.

Dimensions:

Numeral height:	15 inches (381 mm).
Numeral stroke width:	per Table A-6.
Angle of slash:	20 degrees.
Slash stroke width:	same as stroke width for numerals.
Horizontal spacing between slash and upper numeral:	
	4 inches (102 mm) at closest point.
Horizontal spacing between slash and lower numeral:	
	4 inches (102 mm) at closest point.
Total legend height:	25 inches (635 mm), 2.5 inches (63.5 mm) from panel top and bottom.

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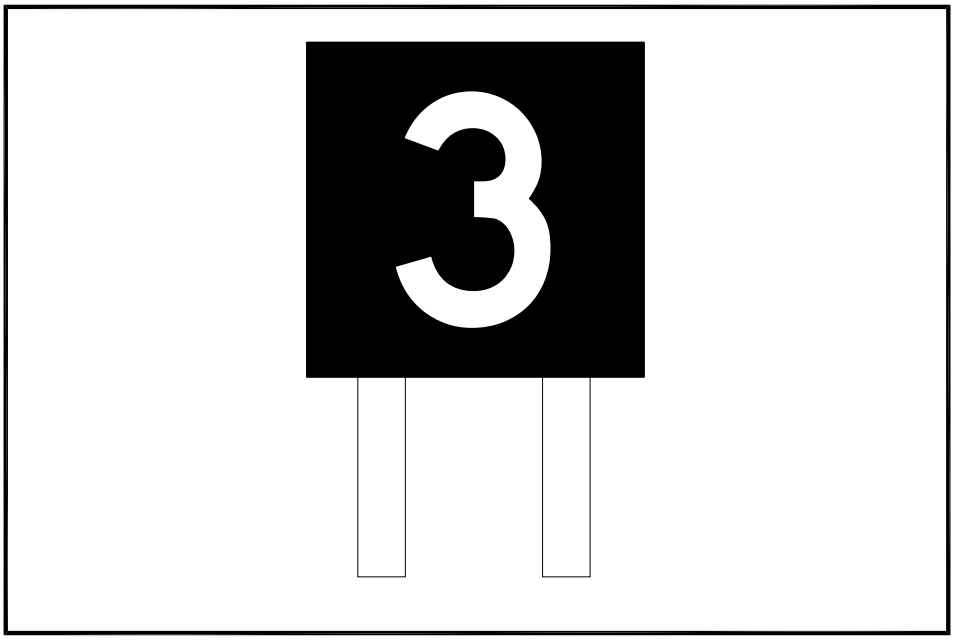
APPENDIX F. RUNWAY DISTANCE REMAINING SIGN

Overall sign dimensions are in paragraph 1.2.2 and Table 3-1.

Figure F-1. Runway Distance Remaining Sign, Type L-858B



Note: Sign must be Size 4 or 5.

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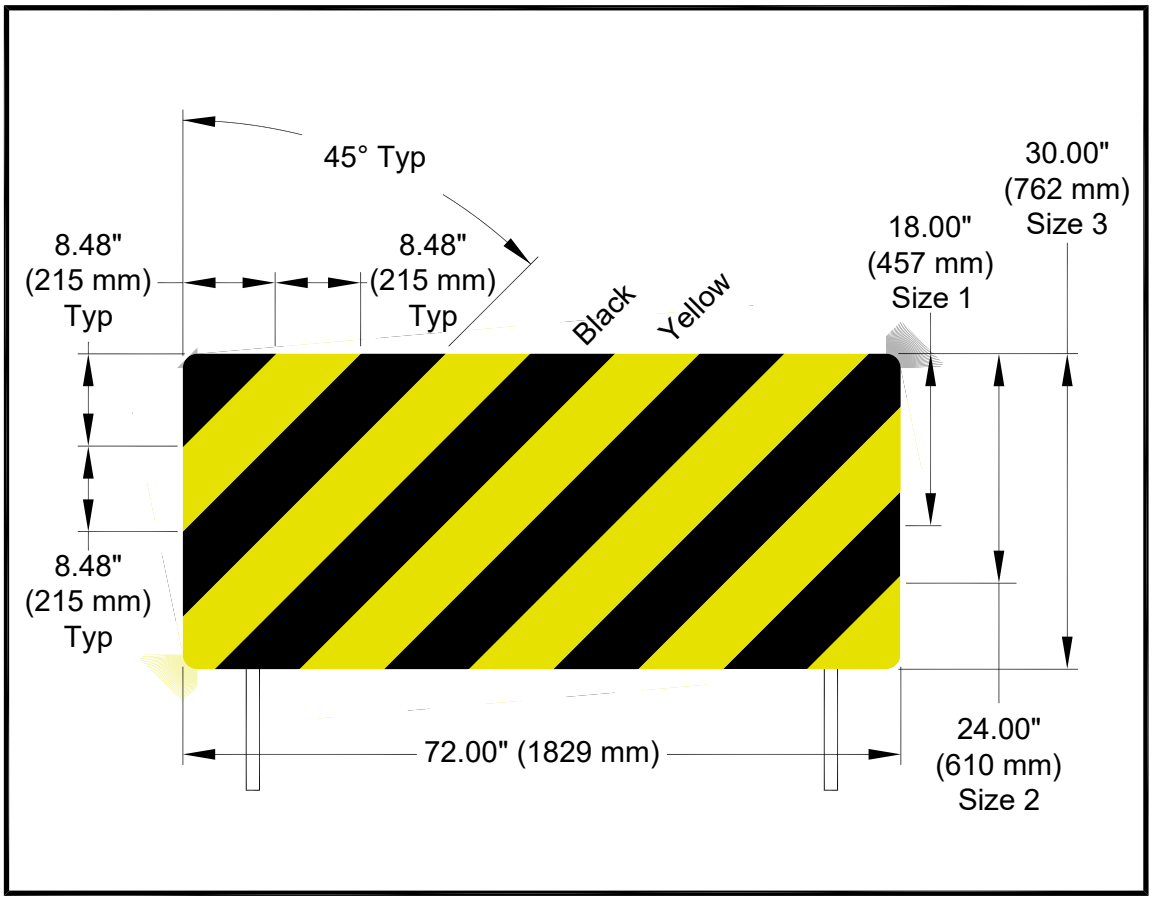
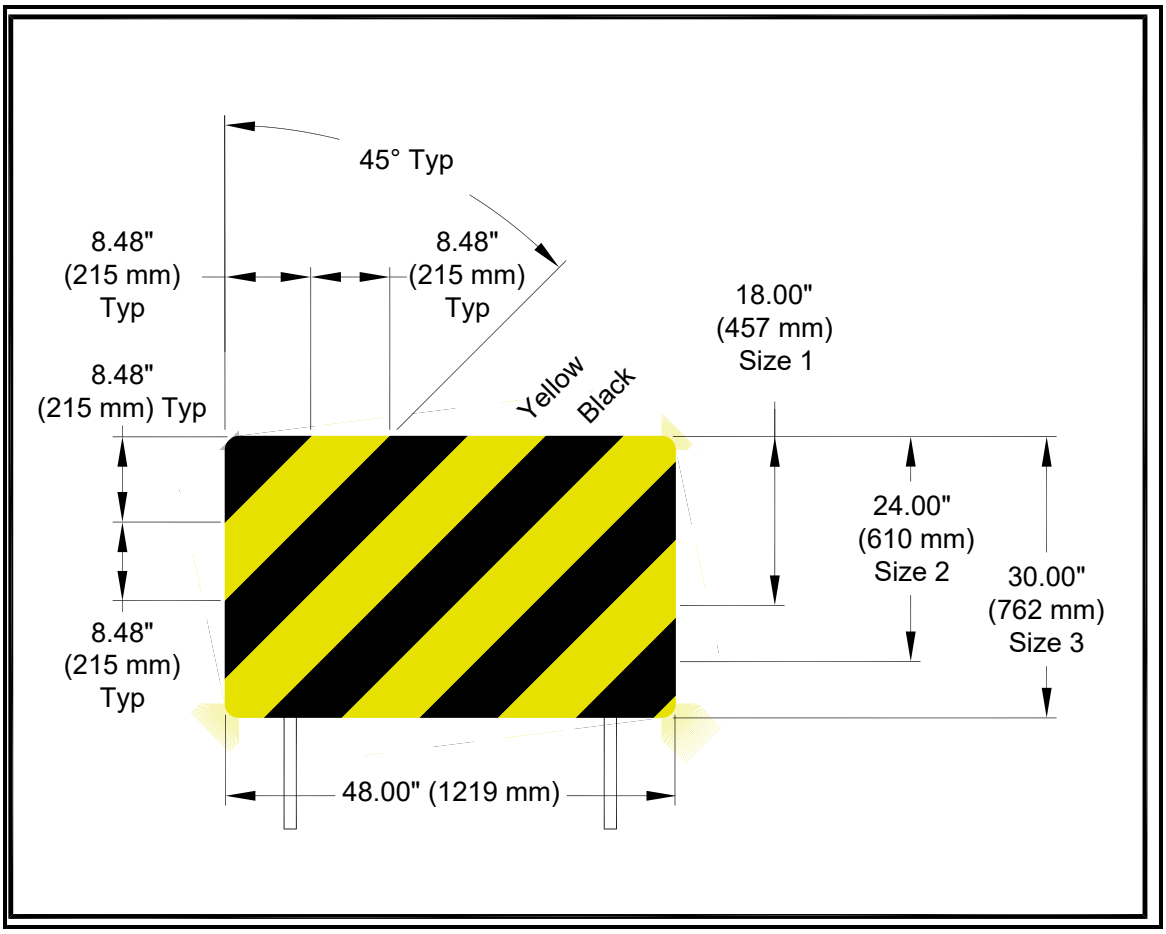
APPENDIX G. TAXIWAY ENDING MARKERS (UNLIGHTED SIGNS)

Figure G-1. Type L-858C, 72 Inch (1829 mm) Taxiway Ending Marker Signs



Note: This sign may be furnished as a lighted sign without the radius corners.

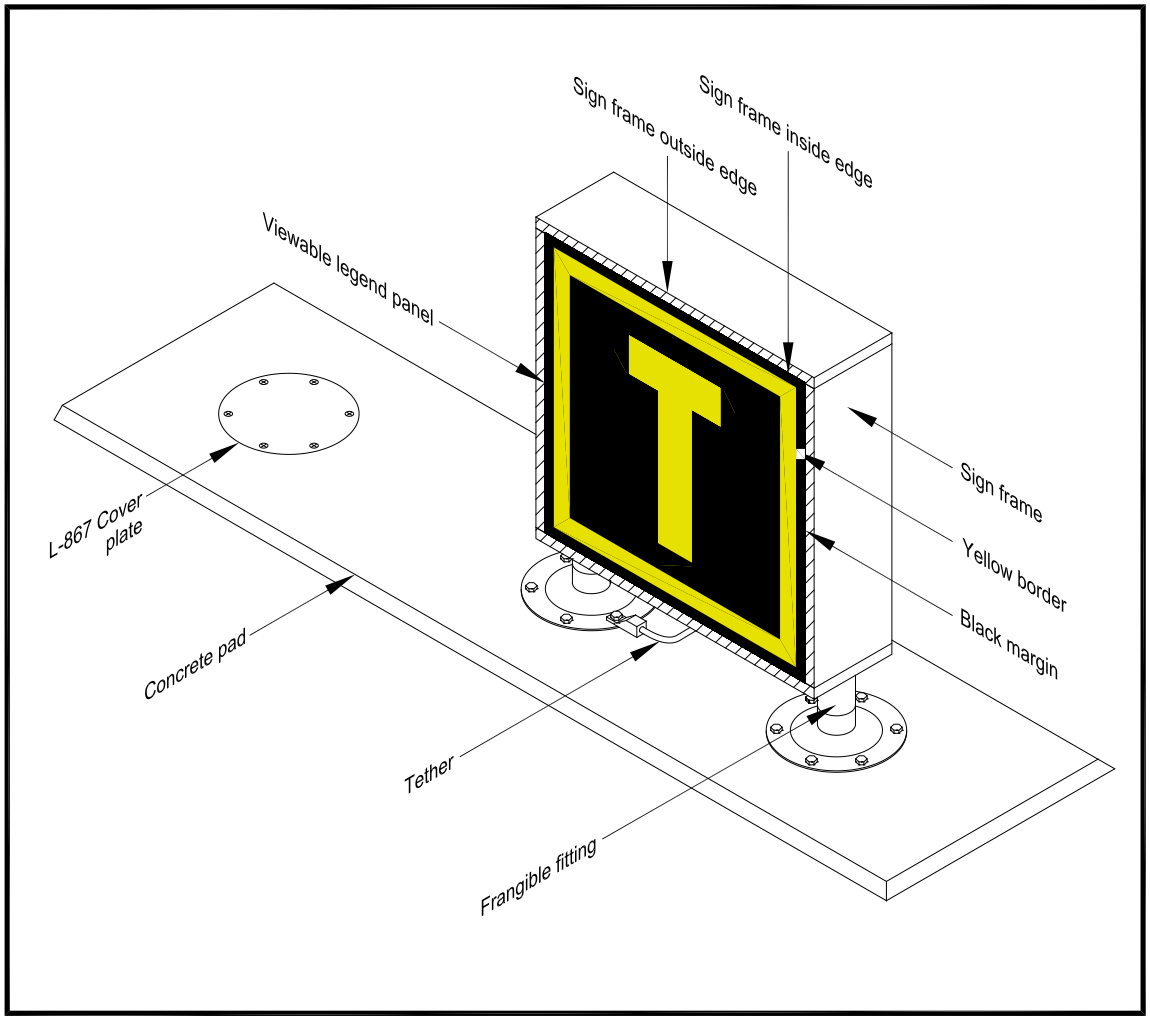
Figure G-2. Type L-858C, 48 Inch (1219 mm) Taxiway Ending Marker



This sign may be furnished as a lighted sign without the radius corner.

APPENDIX H. TYPICAL SIGN AND COMPONENT PARTS

Figure H-1. Typical Sign and Component Parts



Note 1: The sign frame outside and inside edge facing the viewer is considered to be part of the sign face (see paragraph 1.2.6 for definitions of the sign parts.

Note 2: Use the ZOOM function with PDF or MS Word to see drawing details.

Note 3: See paragraph 1.2.6 for sign face definition.

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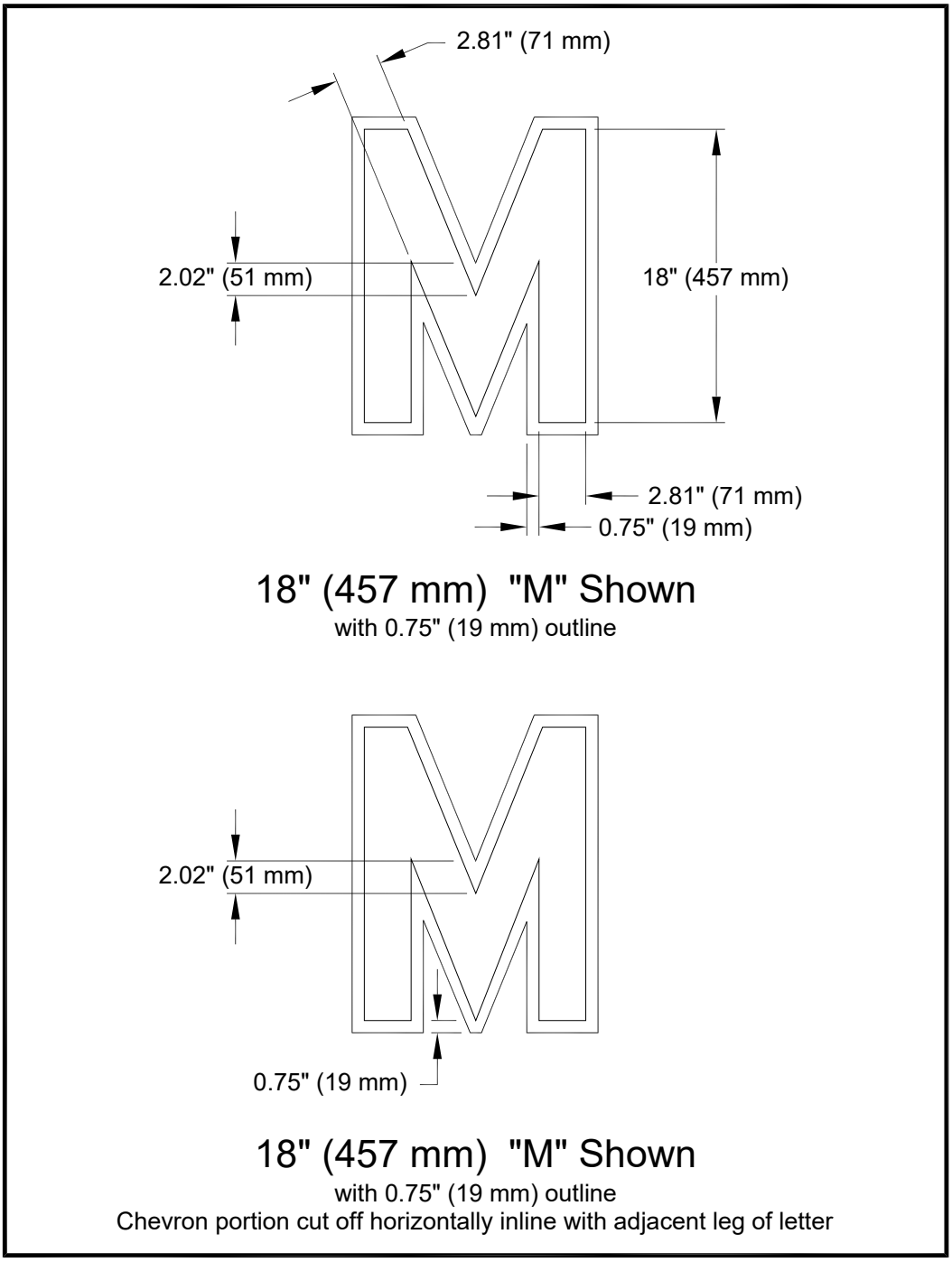
APPENDIX I. EXAMPLE OF LETTER “M” BLACK OUTLINE

Figure I-1. Letter M Black Outline



The black outline on the chevron portion of the “M” must be cut off horizontally in line with the adjacent leg of the letter.

Advisory Circular Feedback

If you find an error in this AC, have recommendations for improving it, or have suggestions for new items/subjects to be added, you may let us know by (1) mailing this form to Manager, Airport Engineering Division, Federal Aviation Administration ATTN: AAS-100, 800 Independence Avenue SW, Washington DC 20591 or (2) faxing it to the attention of the Office of Airport Safety and Standards at (202) 267-5383.

Subject: AC 150/5345-44L Date: _____

Please check all appropriate line items:

☐ An error (procedural or typographical) has been noted in paragraph _____ on page _____.

☐ Recommend paragraph _____ on page _____ be changed as follows:

_____
_____
_____

☐ In a future change to this AC, please cover the following subject:
(Briefly describe what you want added.)

_____
_____
_____

☐ Other comments:

_____
_____
_____

☐ I would like to discuss the above. Please contact me at (phone number, email address).

_____
_____
_____

Submitted by: _____ Date: _____