
USACE / NAVFAC / AFCEC

UFGS-10 14 53 (February 2015)

Change 1 - 05/17

Preparing Activity: USACE

New

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated April 2025

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SECTION 10 14 53

TRAFFIC SIGNAGE
02/15, CHG 1: 05/17

NOTE: This guide specification covers the
requirements for traffic signs and sign posts.

The use of state DOT specifications and standard
detail drawings is encouraged.

Adhere to [UFC 1-300-02](#) Unified Facilities Guide
Specifications (UFGS) Format Standard when editing
this guide specification or preparing new project
specification sections. Edit this guide
specification for project specific requirements by
adding, deleting, or revising text. For bracketed
items, choose applicable item(s) or insert
appropriate information.

Remove information and requirements not required in
respective project, whether or not brackets are
present.

Comments, suggestions and recommended changes for
this guide specification are welcome and should be
submitted as a [Criteria Change Request \(CCR\)](#).

PART 1 GENERAL

1.1 REFERENCES

NOTE: This paragraph is used to list the
publications cited in the text of the guide
specification. The publications are referred to in
the text by basic designation only and listed in
this paragraph by organization, designation, date,
and title.

Use the Reference Wizard's Check Reference feature
when you add a Reference Identifier (RID) outside of
the Section's Reference Article to automatically

**place the reference in the Reference Article. Also
use the Reference Wizard's Check Reference feature
to update the issue dates.**

**References not used in the text will automatically
be deleted from this section of the project
specification when you choose to reconcile
references in the publish print process.**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM A36/A36M	(2019) Standard Specification for Carbon Structural Steel
ASTM A123/A123M	(2024) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A499	(2015, R 2020) Standard Specification for Steel Bars and Shapes, Carbon Rolled from "T" Rails
ASTM A500/A500M	(2023) Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
ASTM A563M	(2007; R 2013) Standard Specification for Carbon and Alloy Steel Nuts (Metric)
ASTM A653/A653M	(2023) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A709/A709M	(2024) Standard Specification for Structural Steel for Bridges
ASTM A1011/A1011M	(2023) Standard Specification for Steel Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength
ASTM B209M	(2014) Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric)
ASTM B221M	(2021) Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric)
ASTM C94/C94M	(2025) Standard Specification for Ready-Mixed Concrete

ASTM D4956	(2013) Standard Specification for Retroreflective Sheeting for Traffic Control
ASTM F436/F436M	(2024) Standard Specification for Hardened Steel Washers Inch and Metric Dimensions
ASTM F3125/F3125M	(2019) Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength

REPUBLIC OF KOREA (ROK) LAW

KNSTS	(2024) Korean National Standards for Traffic Safety Signs
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KOREAN INDUSTRIAL STANDARDS (KS)

KS B 1010	(2022) Set of High Strength Hexagon Bolt, Hexagon Nut and Plain Washers for Friction Grip Joints
KS D 3506	(2024) Hot-Dip Zinc-Coated Steel Sheets and Coils
KS D 3515	(2018; R 2023) Rolled Steels for Welded Structures
KS D 3568	(2024) Carbon Steel Square Pipes for General Structural Purposes
KS D 6701	(2018; R 2023) Aluminium and Aluminium Alloy Sheets and Plates, Strips and Coiled Sheets
KS D 6759	(2022) Aluminum and Aluminum Alloy Extruded Shapes
KS D 8308	(2016; R 2021) Zinc Hot Dip Galvanizings
KS F 4009	(2024) Ready-Mixed Concrete
KS T 3507	(2019; R 2024) Standard Specification for Retroreflective Sheeting for Traffic Control & Industrial Safety

1.2 GENERAL

NOTE: If the project is located in a state that has their own MUTCD, signage must conform to the state DOT MUTCD. State DOT MUTCD's should be in substantial conformance with the national MUTCD. Where local standards are more stringent than the MUTCD, the local standards should be followed.

All signs must be in accordance with the Korean National Standards for Traffic Safety Signs (**KNSTS**) in accordance with the Korean Road Traffic Act.

1.3 SUBMITTALS

NOTE: Review submittal description (SD) definitions in Section **01 33 00 SUBMITTAL PROCEDURES** and edit the following list, and corresponding submittal items in the text, to reflect only the submittals required for the project. The Guide Specification technical editors have classified those items that require Government approval, due to their complexity or criticality, with a "G." Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a "G" to an item, if the submittal is sufficiently important or complex in context of the project.

For Army projects, fill in the empty brackets following the "G" classification, with a code of up to three characters to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy and Air Force projects.

The "S" classification indicates submittals required as proof of compliance for sustainability Guiding Principles Validation or Third Party Certification and as described in Section **01 33 00 SUBMITTAL PROCEDURES**.

Choose the first bracketed item for Navy and Air Force projects, or choose the second bracketed item for Army projects.

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section **01 33 00 SUBMITTAL PROCEDURES**:

SD-03 Product Data

Traffic Sign Posts

Traffic Sign Retroreflective Sheeting

SD-04 Samples

Flexible Posts

PART 2 PRODUCTS

2.1 TRAFFIC SIGN POSTS

NOTE: Sign posts located within the clear zone of roads and streets must be a breakaway or yielding design meeting the crashworthiness criteria of NCHRP 350 or the Manual for Assessing Safety of Hardware (MASH) or must be shielded by guardrail, barrier, or an energy absorbing system meeting the requirements of NRCRP 350 or AASHTO MASH. FHWA acceptance letters for various breakaway supports for signs are available on the FHWA Safety Program webpage.

Ensure details of sign posts are included in the drawings. Breakaway support anchor posts may extend no more than 100 mm above grade to lessen the probability of snagging the undercarriage of a vehicle after a support has broken away from its base. Extend anchor posts at least 450 mm below grade.

2.1.1 Steel Flanged Channel Section (U-Shape)

Fabricate steel posts from steel conforming to ASTM A36/A36M, ASTM A499, or KS D 3515 and with a minimum yield strength of 207 MPa and a minimum tensile strength of 345 MPa. Punch or drill 7.9 to 9.5 mm diameter holes spaced at 25.4 or 50.8 mm centers along the centerline of the web prior to galvanizing for the entire length of the post. Galvanize posts after punching in accordance with ASTM A123/A123M or KS D 8308.

2.1.2 Perforated Steel Tube

Fabricate steel posts from steel conforming to either ASTM A653/A653M or KS D 3506, structural steel, Grade 340, Class 1, coating designation G90 or ASTM A1011/A1011M, structural steel, Grade 340, hot-dip galvanized after punching in accordance with ASTM A123/A123M or KS D 8308. Prepunch holes approximately 11.1 mm in diameter spaced at approximately 25.4 mm centers along each side of the tube for the entire length of the post.

2.1.3 Steel Tube

NOTE: Fill in the required Test Level (TL) if triangular slip bases are used.

NOTE: Sign supports are tested at two levels under NCHRP 350. TL-2 includes four tests conducted at speeds of 35 and 70 km/hr. TL-3 includes four tests conducted at speeds of 35 and 100 km/hr.

Sign supports are tested at three levels under MASH. TL-1 includes three tests conducted at speeds of 30 and 50 km/hr. TL-2 includes three tests

conducted at speeds of 30 and 70 km/hr. TL-3
includes three tests conducted at speeds of 30 and
100 km/hr.

Conform to [ASTM A500/A500M](#) or [KS D 3568](#), Grade B or C, and hot-dip
galvanized in accordance with [ASTM A123/A123M](#) or [KS D 8308](#).

2.1.4 Structural Steel H Section

Conform to [ASTM A709/A709M](#), Grade 345 or 345W. Galvanize posts, fuse
plate and splice plate after fabrication in accordance with [ASTM A123/A123M](#)
or [KS D 8308](#).

2.1.4.1 Slip Base, Fuse Plate and Splice Plate

Conform to [ASTM A36/A36M](#) or [KS D 3515](#), minimum yield strength 345 MPa.

2.1.4.2 High-Strength Bolts, Nuts and Washers

High strength bolts must conform to [ASTM F3125/F3125M](#). Nuts must conform to
[ASTM A563M](#). Washers must conform to [ASTM F436/F436M](#). Local high
strength bolts, nuts, and washers conforming to [KS B 1010](#) are also
acceptable. High strength bolts, nuts and washers must be zinc coated.

2.2 FLAT ALUMINUM SIGN PANELS

Aluminum sign panels must conform to [ASTM B209M](#) or [KS D 6701](#), alloy-temper
6061-T6 or 5052-H38. The blanks must be free from laminations, blisters,
open seams, pits, holes, other defects that may affect their appearance or
use. The thickness must be uniform and the blank commercially flat.

2.3 EXTRUDED ALUMINUM SIGN PANELS

**NOTE: Extruded aluminum sign panels are used for
large signs.**

Delete aluminum edge molding if not used.

Conform to [ASTM B221M](#) or [KS D 6759](#), alloy 6063-T6. The maximum allowable
deviation from flat on the face is 4.2 mm per meter.

2.4 TRAFFIC SIGN RETROREFLECTIVE SHEETING

All background sheeting applied to flat sheet and extruded panel signs
must be in accordance with [ASTM D4956](#) or [KS T 3507](#), Type III, IV, VII,
VIII, IX or XI retroreflective sheeting and must have Class 1, 3, or 4
adhesive backing. Retroreflective sheeting must be high intensity that is
an unmetallized micro prismatic reflective material.

Retroreflective sheeting must have sufficient adhesion, strength and
flexibility such that the sheeting can be handled, processed and applied
according to the manufacturer's recommendations without appreciable
stretching, tearing, cracking or other damage.

2.4.1 Legend and Border

Apply retroreflective sheeting as legend and border in accordance with [ASTM D4956](#) or [KS T 3507](#), Type IX, XI. Retroreflective sheeting must be an unmetallized cube corner microprismatic reflective material.

2.4.2 Screen Printed Transparent Colored Areas

For screen printed transparent colored areas or transparent colored overlay films on white sheeting, the coefficient of retroreflection (RA) must be no less than 70 percent of the original values for the corresponding color.

2.4.3 Adhesive Performance

Adhesive performance for retroreflective sheeting must be in accordance with [ASTM D4956](#) or [KS T 3507](#). The sheeting surface must be in condition to be readily screen processed and compatible with transparent overlay films, plus recommended transparent and opaque screen process colors. Furnish manufacturer's information as to the type of solvent or solvents that may be used to clean the surface of the sheeting without detrimental loss of performance and durability.

2.5 LETTERS, NUMERALS, ARROWS, SYMBOLS, AND BORDERS

Apply letters, numerals, arrows, symbols, and borders on the retroreflective sheeting or opaque background of the sign using the direct or reverse screen process. Apply messages and borders of a color darker than the background to the paint or the retroreflective sheeting using the direct process. Messages and borders must be of a color lighter than the sign background and applied using the reverse screen process. Use opaque or transparent colors, inks, and paints of the type and quality recommended by the retroreflective sheeting manufacturer in the screen process. Perform the screening in a manner that results in a uniform color and tone, with sharply defined edges of legends and borders and without blemishes on the sign background that will affect intended use. Air dry or bake the signs after screening according to the manufacturer's recommendations to provide a smooth hard finish. Reject any signs with blister's or other blemishes.

2.6 DELINEATOR POSTS

2.6.1 Steel Posts

Fabricate posts from steel conforming to [ASTM A36/A36M](#), [ASTM A499](#), or [KS D 3515](#) and having a minimum yield strength of 207 MPa and a minimum tensile strength of 345 MPa. Galvanize posts after punching in accordance with [ASTM A123/A123M](#) or [KS D 8308](#).

2.6.2 Flexible Posts

NOTE: Indicate the color of post on the drawings.

Provide one-piece driveable or two-piece with driveable steel anchor flexible posts. Posts must be impact-resistant, integrally colored UV stabilized polymer or polycarbonate extrusion or fiberglass reinforced composite material. Other materials are subject to approval by the

Contracting Officer's Representative. Include a retroreflective sheeting plate with each post as indicated.

2.7 DELINEATOR RETROREFLECTORS

2.7.1 Circular Prismatic Reflectors

Retroreflectors attached to steel posts must be a 75 mm minimum diameter acrylic plastic lens with prismatic optical elements and a smooth, clear, transparent face. Fabricate the back from similar material and fuse to the lens around the entire perimeter to form a homogeneous unit. Permanently seal the units against the intrusion of dust, water, or air. Mount the retroreflector unit in a housing fabricated from 1.6 mm aluminum alloy or similar, or from cold-rolled, hot dip, galvanized steel, having a thickness of 1.6 mm. Provide the indicated color.

2.7.2 Retroreflective Sheeting

A retroreflective sheeting plate must be applied to each flexible post by the post manufacturer and must be in accordance with ASTM D4956 or KS T 3507, Type III, IV, V, VII, VIII, IX or XI retroreflective sheeting. Retroreflective sheeting must be high intensity that is an unmetallized cube corner micro prismatic reflective material. Provide the size and color of the retroreflective sheeting plate as indicated.

2.8 HARDWARE

Bolts, nuts, post clips, lock and flat washers must be either aluminum alloy or commercial quality stainless steel, hot-dip galvanized or cadmium plated after fabrication. Bolts/nuts must be an approved tamper resistant design. Provide fiber washers of commercial quality.

2.9 CONCRETE

ASTM C94/C94M or KS F 4009, using 19 mm maximum aggregate, and having minimum compressive strength of 21 MPa at 28 days.

PART 3 EXECUTION

3.1 SIGN POSTS

NOTE: Sign supports located within the roadway clear zone must be designed to yield, fracture, or separate when impacted by a vehicle. Although the clear roadside concept is still the goal of the designer, compromises are often required in urban or restricted environment areas. Chapter 10 of the AASHTO Roadside Design Guide provides guidance for roadside safety in urban or restricted area. In these areas, sign supports located within the enhanced lateral offset should be designed to yield, fracture, or separate when impacted by a vehicle.

3.1.1 Steel Flanged Channel Section Perforated Square Steel Tube Round Steel Tube

Sign posts consist of a base post and sign post. Drive steel sign base

posts with a suitable driving head. Attach sign posts to base posts. Replace any base posts damaged during driving or otherwise at no additional cost to the Government. Or, embed steel sign base posts in concrete as indicated. Install manufactured triangular slip bases in accordance with the manufacturer's instructions.

3.1.2 Structural Steel H Section Posts

**NOTE: Ensure the drawings indicate the procedure
for tightening bolts and the required torque.**

Tighten all breakaway assembly bolts in a systematic manner to the prescribed torque indicated. Loosen each breakaway assembly bolt and re-tighten to the required torque in the same order as the initial tightening. Burr the threads at the nut using a center punch to prevent the nut from loosening. Tighten nuts on hinge plate bolts to the required minimum bolt tension values indicated.

3.2 SIGN PANELS

Clean, degrease and etch the face of metal panels using methods recommended by the retroreflective sheeting manufacturer. After cleaning and degreasing, apply retroreflective sheeting material to the sign panels as recommended by the manufacturer. Perform shearing, cutting and punching prior to preparing the blanks for application of reflective material. Do not field drill holes in any part of the panel. Use nylon washers recommended by the sign sheeting manufacturer between the bolt heads and sign faces on flat sheet aluminum signs. Replace any damaged sign panels at no additional cost to the Government.

3.3 DELINEATORS

**NOTE: Flexible delineators driven into the soil
require a manufacturer's installation tool to
install.**

Drive steel delineator posts into the ground in a manner that will not damage the post. Attach flexible delineator posts to steel anchors [or drive into the soil in accordance with the manufacturer's instructions]. Demonstrate the method of installation for the Contracting Officer's Representative to verify that posts will be installed without being damaged.

3.4 LOCATION AND POSITION OF SIGNS

**NOTE: Some State DOT single post sign mounting
details bend the sign panel. If this type of
mounting detail is used, delete the requirement for
flat sign face surface.**

Locate and erect all signs in accordance with the drawings. Vertically mount signs at right angles to the direction of, and facing, the traffic that they are intended to serve. Where mirror reflection from the sign

face is encountered to such a degree as to reduce legibility, turn the sign slightly away from the road. Turn signs that are placed 9 m or more from the pavement edge toward the road. On curved alignments, determine the angle of placement by the direction of approaching traffic rather than by the roadway edge at the point where the sign is located. Mounted signs must present a smooth flat surface varying no more than 10 mm from a 1.2 m straightedge placed in any position on the face of the sign after erection. Mount signs on traffic signal posts with strap or clamp type sign supports. Each installed sign will be inspected by the Contracting Officer's representative prior to acceptance by the Government.

-- End of Section --