



# INDIANA DEPARTMENT OF TRANSPORTATION

## *Driving Indiana's Economic Growth*

### Design Memorandum No. 17-09 Technical Advisory

May 1, 2017

Revised May 11, 2017

**TO:** All Design, Operations, and District Personnel, and Consultants

**FROM:** /s/ David Boruff  
David Boruff  
Manager, Office of Traffic Administration  
Traffic Engineering Division

**SUBJECT:** Panel Sign Wide Flange Post Selection and Plan Detailing

**REVISES:** *Indiana Design Manual* Section 502-1.01(05)

**SUPERSEDES:** Design Memo 15-03

**EFFECTIVE:** Contracts let on or after September 1, 2017

This memo has been revised to identify the type designation for each Wide-Flange Sign Support Foundation and its associated pay item. Foundation types are now shown on 802-SNGP-16. New pay items are as shown below. Posts will continue to be paid for by the pound as Structural Steel, Breakaway.

Description	Pay Item Number	Unit
Wide Flange Sign Post Support Foundation, Type A	802-12222	Each
Wide Flange Sign Post Support Foundation, Type B	802-12223	Each
Wide Flange Sign Post Support Foundation, Type C	802-12224	Each

The Standards Committee has adopted revisions that incorporate the interim drawing details and the content of Design Memo 15-03 into the *Standard Drawings* series E 802-SNGP, *Standard Specifications* sections 802 and 910 and the referenced section of the *Indiana Design Manual* (IDM).

The five-post assemblies included in the interim details were not incorporated into the revised 802-SNGP series. The standard foundation details vary from the interim details and are no longer based on soil condition. The 2017 *Standard Drawings* series 802-SNGP are an attachment to this memo.

Revisions the referenced section of the IDM are below and will be incorporated into the IDM on-line. Please also note that where panel sign placed on fill slopes are offset less than 30 ft from the edge of the travel lane, approval from the Traffic Division Office of Traffic Design is now required.

#### **502-1.01(05) Ground-Mounted Sign Supports [Rev. May 2017]**

The following provides guidelines regarding placement of a ground-mounted sign and post selection for a ground-mounted panel sign.

Chapters 49 and 55 describe the Department's criteria for clear zone, roadside barriers, impact attenuators, and other roadside safety issues. These are also applicable to roadside signs. The following should also be considered.

1. Ground-Mounted Sheet-Sign Support. The support for each ground-mounted sign should be made breakaway or yielding within the clear zone. Posts should be of the square cross section type shown on the INDOT *Standard Drawings* series 802-SNGS for sheet signs. Support types I and II should be in accordance with district traffic office preference, with unreinforced or reinforced anchor base. Support type III shall be an unreinforced anchor base only. Criteria for use of support type I, II, or III are based on sign dimensions and are provided on the INDOT *Standard Drawings*.

For a local agency project, channel posts may be used if desired by the local agency. A new sign support behind guardrail should have adequate clearance to the back of the guardrail post to provide for the guardrail's dynamic deflection (see Chapter 49).

2. Ground-Mounted Panel-Sign Support.

- a. Placement/Offset. A sign with an area of over 50 ft<sup>2</sup> on slipbase breakaway supports should not be placed where the opportunity exists for it to be struck at a point that is more than 9 in. above the normal point of vehicular bumper impact. Normal bumper height may be assumed as 1'-8". To avoid being struck at an improper height, a sign should be placed in accordance with the INDOT *Standard Drawings* series 802-SNGP and as follows.
  - 1) Fill Slope. A sign should be located at a desirable offset of 30 ft from the edge of the travel lane to the nearest edge of the sign. **If a 30-ft offset is not**

available, the sign can be located closer to the travel lane with approval from the Traffic Division, Office of Traffic Design.

- 2) Cut Slope 3:1 or Steeper. Vertical clearance between the ground and the bottom of the sign shall be a minimum of 5 ft for the width of the sign. The 30-ft horizontal offset shall be adjusted as needed to allow for appropriate post lengths.
- 3) Roadside Appurtenance. A large breakaway sign support should not be located in or near the flow line of a ditch. If such a support is placed on a backslope, it should be offset at least 3 ft from the toe of the backslope of the ditch. If possible, signs should be placed such that posts are not located on both sides of the ditch.
- 4) Exit Gore Sign. An exit gore sign must be placed in each gore area of a freeway in accordance with *IMUTCD* requirements and as shown on Figure [502-1B](#).
- 5) Foundation Placement on Steep Slopes. Foundations on slopes 2:1 or steeper should be located at least 2.5 ft. from edge of ditch.
- 6) Bi-directional Upper Joint. For median or non-divided highways installation of bi-directional upper joint should be noted on the plans. The bi-directional upper joint consists of a perforated fuse plate on both the sides of structure and is detailed in the standard drawings.

b. Post Sizing and Plan Detailing for Panel Signs. The following guidance should be applied when determining the appropriate W-beam post sizes and for providing proper plan detailing for ground-mounted panel signs:

- 1) Determining sign area. The entire area of the sign, including any exit number panels, should be considered when selecting the w-beam post size. Exit number panel sizes may be converted into an equivalent area. Equivalent area may be determined by either partial height over the entire width of the sign or more conservatively by considering that the panel width matches the width of the main part of the sign.
- 2) Post length for signs with exit number panel. Where a sign includes an exit number panel, at least one of the w-beam posts should extend to the top of the exit number panel.
- 3) Supplemental signs. Supplemental signs should not be mounted below the fuse plate/hinge plate connection.
- 4) Other attachments. The equivalent surface area of any flashing beacons or other attachments should be added to the height and or width.

c. Post Selection Tables for Panel Signs. INDOT *Standard Drawings* series 802-SNGP contains the required W-beam post size, number of posts, and post spacing to be used with a ground-mounted panel sign. The following procedure should be utilized to select the appropriate post size.

- 1) Determine the height and width of the sign and the clear height. The clear height is the elevation difference between the top of the foundation and bottom of the sign.
- 2) Select the table based on the clear height. The clear height used should be that for the post with the lowest elevation, i.e. the largest value. Clear heights range from 8 ft to 22 ft, in 2-ft increments.

For instances where a post size is not indicated for a particular combination of sign height-sign width-clear height then the designer may contact the Traffic Design Office for recommendations on how to proceed.

d. Ground Elevation. The elevation of the ground in the area of the sign should be no more than 33 ft above the adjacent property/land particularly if there is no barrier (e.g. woods, buildings) to impede winds. Elevation differences greater than 33 ft need a special analysis to determine the wind loading which may necessitate larger posts- see ASCE/SEI 7-10, *Minimum Design Loads for Buildings and Other Structures*, for additional guidance.

e. Standard Foundation Dimensions and Details. Foundations as detailed in the standard drawings have been developed for all soil conditions except where peat, marl, or other very soft soils are present or if the foundation is to be placed in embankments comprised of sand or b borrow. An alternative foundation design may be needed where these soils are known to exist or are discovered.

Where the foundation is located on a slope steeper than 3:1, the depth of the foundation should be increased by a dimension equal to the foundation diameter.