



# INDIANA DEPARTMENT OF TRANSPORTATION

*Driving Indiana's Economic Growth*

## Design Memorandum No. 15-04 Technical Advisory

March 23, 2015

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

**FROM:** /s/ Elizabeth W. Phillips  
Elizabeth W. Phillips  
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Bridges Division

**SUBJECT:** Structure Backfill and Flowable Backfill

**REVISES:** *Indiana Design Manual* Section 17-2.08

**SUPERSEDES:** Design Memo 07-13

**EFFECTIVE:** Stage 3 on or after April 1, 2015

The No. 4 and No. 30 sand material acceptable as Structure Backfill Type 1 are subject to moisture infiltration from subgrade soils and difficult to compact adequately in small widths. These compaction issues occur more often in urban areas where curb and gutter sections are used. In these locations, coarser structure backfill material, Structure Backfill Type 2 is preferred.

The guidelines for specifying Structure Backfill Type 1 and Type 2 have been updated and the *Design Manual* revised accordingly. The use of Structure Backfill Types 3, 4, and 5 and Flowable Backfill are unchanged, but are included for completeness.

### I. Structure Backfill

Structure Backfill is included in section 211 of the INDOT *Standard Specifications*. The pay item for structure backfill must always include the type, i.e. 1, 2, etc. The pay unit is cubic yard. The backfill type must also be included in the Structure Data Table on the plans.

A. Structure Backfill Type 1. This type should be specified for a location as follows:

- 1) longitudinal or transverse structure placed under, or within 5 ft of, the back of paved shoulder or back of sidewalk of a new rural or urban facility, or
- 2) such a structure for an existing rural facility where all existing pavement is to be replaced.

B. Structure Backfill Type 2. This type should be specified for a location as follows:

- 1) longitudinal or transverse structure placed under, or within 5 ft of, the back of paved shoulder or back of sidewalk for an existing urban facility where all existing pavement is to be replaced;
- 2) longitudinal or transverse structure placed under, or within 5 ft of, the back of paved shoulder or back of sidewalk for a rural or urban facility where undisturbed existing pavement is to remain, or
- 3) precast-concrete three-sided or four-sided structure with height of cover of 2 ft or greater.

C. Structure Backfill Type 3. This type should be specified for use behind a mechanically stabilized earth (MSE) retaining wall.

D. Structure Backfill Type 4. This type should be specified for a location as follows:

- 1) trench where a utility line is present; or
- 2) behind a reinforced-concrete slab-bridge end bent.

E. Structure Backfill Type 5. This type should be specified for a location as follows:

- 1) precast-concrete three-sided or four-sided structure with height of cover of less than 2 ft;
- 2) filling voids in an underground facility;
- 3) filling in an abandoned pipe or structure; or
- 4) other application that does not require excavation.

## **II. Flowable Backfill**

Flowable Backfill is included in section 213 of the INDOT *Standard Specifications*. Flowable backfill not used as structure backfill must always include the type, i.e. non-removable or removable. The pay unit is cubic yard. The backfill type must also be included in the Structure Data Table on the plans, N for non-removable and R for removable.

## **III. Information to be Shown on Plans**

The specific type of Structure Backfill or Flowable Backfill should be included on the Structure Data table. For flowable backfill, “R” should be entered in the column if the material is removable and “N” should be entered in the column if the material is non-removable.

## **IV. Specifications and Pay Items**

Structure Backfill and Flowable Backfill material requirements and pay items are in sections 211 and 213 of the INDOT *Standard Specifications*, respectively.

## **17-2.08 Structure Backfill**

### **17-2.08(01) Structure-Backfill Types**

Structure backfill has been subdivided into types. Each type should be specified as described below.

1. Type 1. This type should be specified for a location as follows:
  - a. longitudinal or transverse structure placed under, or within 5 ft of, the back of paved shoulder or back of sidewalk of a new rural or urban facility, or
  - b. such a structure for an existing rural facility where all existing pavement is to be replaced.
2. Type 2. This type should be specified for a location as follows:
  - a. longitudinal or transverse structure placed under, or within 5 ft of, the back of paved shoulder or back of sidewalk for an existing urban facility where all existing pavement is to be replaced;
  - b. longitudinal or transverse structure placed under, or within 5 ft of, the back of paved shoulder or back of sidewalk for a rural or urban facility where undisturbed existing pavement is to remain; or
  - c. precast-concrete three-sided or four-sided structure with height of cover of 2 ft or greater.
3. Type 3. This type should be specified for use behind a mechanically-stabilized-earth retaining wall.
4. Type 4. This type should be specified for a location as follows:
  - a. trench where a utility line is present; or
  - b. behind a reinforced-concrete slab-bridge end bent.
5. Type 5. This type should be specified for a location as follows:

- a. precast-concrete three-sided or four-sided structure with height of cover of less than 2 ft;
- b. filling voids in an underground facility;
- c. filling in an abandoned pipe or structure; or
- d. other application that does not require excavation.

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