



INDIANA DEPARTMENT OF TRANSPORTATION

Driving Indiana's Economic Growth

Design Memorandum No. 10-06 Technical Advisory

January 14, 2010

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

FROM: /s/ Michelle Allen
Michelle Allen
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Production Management Division

SUBJECT: Joint Transportation Research Project (JTRP) SPR-2853

REVISES: The *Indiana Design Manual* as described below

EFFECTIVE: Start of Plan Development On or After April 1, 2010

JTRP SPR-2853 regarding IDEM Rule 5 permitting, water quality, Notice of Intent, and Notice of Termination has been completed. It has affects on the *Design Manual* which are described below. The actual *Manual* Sections are identified, with actual *Manual* wordage shown as overstruck if deleted, or italic if added. The online *Manual* has not yet been revised to show these changes. Such overstruck copy and italics in new copy will not be shown in the revised online *Manual*.

3-1.01(01) Office of Environmental Services

Item revised as follows:

9. Stormwater Pollution Prevention Plan. The designer has the primary responsibility to develop the plan for Best Management Practices (BMPs) for temporary erosion and settlement control. The designer has the primary responsibility for specifying design elements of post-construction BMPs for stormwater-pollution prevention. The designer has the primary responsibility for preparing ~~;~~ and submitting, ~~and obtaining~~ the Stormwater ~~quality technical review~~ *Pollution Prevention Plan to the Office of*

Environmental Services as soon as applicable, using the elements of the construction and post-construction stormwater-quality BMPs. Once approval is attained, INDOT will be responsible for submitting NOI and NOT.

3-1.01(03) Office of Structural Services

1. Hydraulics Team.

Item is revised as follows:

- e. ~~Temporary Erosion Control During Construction~~ *Permanent BMPs*. The designer has the primary responsibility to develop the ~~plan for temporary erosion control during construction~~ *permanent BMPs*. Where necessary, the designer may seek technical guidance from the Hydraulics Team.

Figure 14-1A; Sheet-Preparation Responsibilities for Road, Bridge, or Traffic Project; has been revised. It is attached herewith.

14-2.01(11) Final Field Check Meeting

2. Plans Sheets.

Item revised as follows:

- d. Details Sheets. Ensure that all details are completed and included. This includes details for traffic maintenance and traffic-design elements (e.g., intersections, signals, signing, and lighting). *This also includes details and notes for temporary erosion and sediment control.* The plans must be developed to satisfy the PDP Manual's Project Constructability Review 3.

New item added as follows:

3. Computations. *Include computations for erosion- and sediment-control features design.*

14-2.04(09) Stage 3 Review Submission

4. Computations and Quantities. Include the computations and quantities with this submission as follows:

New item added as follows:

- s. *erosion- and sediment-control features design.*

14-2.05(03) Preliminary Plans Submission

4. General Plan. This sheet should include the following:

Item revised as follows:

- f. general rehabilitation recommendations (e.g., legend, material notes, *required stormwater-pollution-prevention retrofits*).

29-4.0 CONCEPT DEFINITIONS

New items added as follows:

20. Volumetric Runoff Coefficient, R_v . This is used in water-quality calculations. It represents the portion of rainfall that becomes runoff and is dependent on percentage of impervious cover.
21. Water-Quality Volume. This is the treatment volume or accumulated direct runoff depth that should be treated to remove a significant percentage of the stormwater pollution load, or approximately 80% of the average annual post-development total suspended solids loading. Water-quality volume is identified as WQ_v for units of acre-feet (hectare-meters), or Q_{wv} for units of inches (millimeters). Water-quality volume is used to design a detention-based water-quality-treatment system such as a stormwater wetland, wet detention pond, or water-quality swale.
22. Water-Quality-Treatment Rate, Q_{wa} . This is the design flow rate for flow through a water-quality system. A properly designed flow-through system, such as an infiltration trench or hydrodynamic separator, should be able to satisfy pollutant-removal requirements at the design-flow rate, and should be able to bypass inflows greater than the design treatment rate.

30-1.02 Significance

Channel analysis is necessary for the design of a transportation drainage system to assess the following:

New item added as follows:

7. *potential impacts to water quality*.

30-2.03 INDOT Policy

The following INDOT policies apply.

Item revised as follows:

5. The environmental impacts of channel modification, including disturbance of fish habitat, wetlands, *water quality*, or channel stability, should be assessed.

33-1.02(07) Protection of Water Quality

Paragraph added as follows:

The number of drains that discharge directly into a waterway should be reduced. Where possible and practicable, stormwater treatment measures should be included to treat the stormwater runoff prior to entering the waterway. Additional treatment or additional measures may be required as a result of a commitment during early coordination or as a regulatory-agency-permit condition.

33-2.0 SYSTEM COMPONENTS

Paragraph revised as follows:

A bridge-deck drainage system includes the bridge deck itself, bridge gutters, inlets, pipes, ~~and~~ downspouts, *and stormwater-pollution-prevention controls*. The system is designed by the bridge designer and coordinated with the Hydraulics Team. Coordination of efforts is essential in designing the components of the system to satisfy the objectives described in Section 33-1.0.

Section added as follows:

33-2.01(06) Stormwater-Pollution-Prevention Controls

Stormwater-pollution-prevention controls (SWPPP) should be designed to provide an average annual post-development TSS removal rate of 80%. All stormwater controls should satisfy the other design criteria described herein. Controls should not increase the spread of water into traffic lanes, should function properly with minimum maintenance, and should not interfere with the structural integrity of the bridge. Downspouts should not be allowed to discharge untreated flow, unless such discharge is collected and treated on the receiving body beneath the bridge. Direct discharge of untreated stormwater runoff is not allowed. Flow consolidation should be considered to reduce the number of multiple BMP installations and maintenance requirements.

35-2.01 Introduction

The use of a storage facility for stormwater management has increased in recent years. Controlling the quantity of stormwater using a storage facility can provide the potential benefits as follows:

Item added as follows:

5. *improvement of downstream water quality through stormwater-pollution-prevention BMP design features.*

35-4.01 General Criteria

.... The design criteria for a storage facility should include the following:

Item added as follows:

6. *water-quality design requirements.*

35-12.0 LANDLOCKED RETENTION

Paragraph and items added as follows:

Directing a significant amount of treated or untreated stormwater toward a karst feature is an allowable practice if the following can be satisfied.

1. *The project karst evaluator has previously indicated to the project engineer that no adverse reactions are expected.*
2. *The practice is consistent with the karst MOU of 1993.*

36-2.01 Introduction

Paragraph revised as follows:

A highway storm-drainage facility collects stormwater runoff and conveys it through the roadway right of way to adequately drain the roadway and minimize the potential for flooding and erosion to properties adjacent to the right of way. A storm-drainage facility consist of curbs, gutters, storm drains, side ditches or open channels (as appropriate), or culverts. The placement and hydraulic capacity of a storm-drainage facility should be designed to consider damage to adjacent property and to secure as low a degree of risk of traffic interruption due to flooding as is consistent with the importance of the road, the design traffic service requirements, and available funds. *Stormwater-pollution-prevention requirements should be considered and addressed in the design process of each storm-drainage system.*

36-5.03 Required Data

Paragraph revised as follows:

The designer should be familiar with land-use patterns, the nature of the physical development of the area to be served by the storm-drainage system, the stormwater management plans for the area, and the ultimate pattern of drainage (both overland and by storm drains) to an existing outfall location. There should be an understanding of the nature of the outfall because it has a significant influence on the storm-drainage system. ~~In an environmentally sensitive area, there may be water quality requirements to consider.~~ *Water-quality requirements should always be considered, particularly in an environmentally-sensitive area.*

37-1.0 GENERAL INFORMATION

Paragraphs revised as follows:

An erosion- and sediment-control plan is required to be submitted *to IDEM for an INDOT project, or the applicable local Soil and Water Conservation District (SWCD) for an LPA project*, to comply with 327 IAC 15-5 (Rule 5) as required by Section 9-2.05(06). INDOT Standard Specifications and Standard Drawings have been developed for erosion and sediment control to formalize and expand on existing measures available to the designer. These guidelines will aid the designer in choosing the appropriate measures and frequency of their use. Although Rule 5 requires erosion- and sediment-control measures for a specified minimum disturbed area, these measures should be applied to each project if land is disturbed. Formal submittal to comply with Rule 5 is not required where less than the minimum specified area is disturbed. However, where soil is disturbed, an erosion- and sediment-control plan must be developed. This applies particularly where sediment can enter a waterway.

~~The goal of the erosion and sediment control plan is to minimize the amount of sediment generated by construction operations leaving the construction site.~~ *The goals of erosion control and sediment control are different. The purpose of erosion-control measures is to prevent sediment from being mobilized on the project site. The purpose of sediment-control measures is to recapture soil that has been mobilized and to prevent it from leaving the construction site.* Water flowing through a construction-disturbed area is to be filtered of sediment before it mixes with water which is not affected by construction operations. These guidelines concentrate on temporary erosion and sediment control measures. It is the designer's responsibility to include permanent measures where warranted. Temporary erosion-control measures should be in compliance with the construction-zone clear-zone criteria shown in Chapter Eighty-two. The erosion- and sediment-control plan should address erosion and sediment control during the entire construction process. This may mean that different measures will be used during different phases of construction. Allowance should be made for changes in the field to fit existing

conditions or the use of different measures where they are more appropriate. The erosion- and sediment-control measures have been listed in groups according to their use. Some of the measures may be used in multiple applications.

A copy of Rule 5 is available via the Indiana Department of Environmental Management (IDEM) website, at <http://www.in.gov/idem/4221.htm>. It lists items that should be submitted with the erosion- and sediment-control plan to the applicable SWCD. ~~A checklist of The designer is responsible for all items that should be considered in complying with Rule 5 is shown~~ listed in Figure 37-1A, *Erosion Control Sediment Plan Technical Review Checklist*. An *editable version of this form is available on the Department's website, at <http://www.in.gov/dot/div/contracts/design/dmforms/index.html>*. The erosion- and sediment-control plan should be prepared and submitted to the appropriate SWCD. The Notice of Intent letter should be filed with IDEM. The submittals are as follows.

Guidance on plans development in accordance with 327 IAC 15-5 (Rule 5) Plan Elements appears on IDEM's website, at <http://www.in.gov/idem/5419.htm>. Once on this page, click on the Guidance for Construction Plan/Storm Water Pollution Plan Development hyperlink, which appears under Step 1, fourth paragraph.

37-2.0 SITE ANALYSIS

Paragraph revised as follows:

In preparing the erosion- and sediment-control plan, the designer should start by looking at local drainage patterns, *soil types*, and topography. ~~The volume of water entering and leaving the construction site watershed area of each concentrated water flow entering the project site at various locations should be taken into consideration~~ *determined and shown on the erosion- and sediment-control plans plan at each point of entry*. Where reasonable, off-site waters should be isolated and allowed to pass through the project site. Sediments from on-site sources should be captured prior to leaving the site. The method of treatment depends upon the drainage area *and soil types*.

The following principles of erosion and sediment control should be utilized.

New item added after item 2 as follows:

3. *Where reasonable, perimeter dikes or waterways should be used to divert or intercept off-site runoff. In evaluating the decision as to whether diversion or interception of off-site runoff is reasonable, the increased sizing of a proposed BMP structure should be considered to treat off-site runoff if such diversion is not performed.*

Items originally numbered as 3 through 6 are now renumbered as 4 through 7. New items added as follows:

8. *The amount of disturbed area on the construction site should be minimized.*
9. *Construction phasing and incremental final stabilization of areas should be considered where such measures can adequately satisfy the intended use requirements of such areas.*
10. *The impervious surface should be kept at the minimum required to satisfy public safety needs. The use of porous material should be encouraged outside the mainline pavement area.*

Paragraphs revised and added as follows:

Temporary entrance points will likely be required for the contractor's use from off-road locations on to public roads. The INDOT Standard Specifications require the contractor to install stable construction entrances at these points in order to control movement of sediment off the project site by construction traffic. If the designer determines that such entrances are required, an undistributed quantity of 100 tons of No. 2 stone should be included in the preliminary estimate of quantities and cost estimate. This minimum quantity should be sufficient to provide two stable construction entrances. If the designer anticipates that additional entrances will be required, the quantity should be adjusted accordingly. ~~The locations of such entrances should not be shown on the plans.~~

Within the construction clear zone, straw bales, fiber wattle rolls, or other approved means should be considered instead of riprap.

37-3.01(03) Sediment Trap

Paragraph revised as follows:

If used independent of other sediment-control measures, the sediment trap should be designed for up to a maximum drainage area of 5.1 ac (≈ 0.4 ha). Where right of way is limited, the sediment trap should be designed considering the space rather than the drainage area. In this situation, other sediment-control measures should be specified in conjunction with the sediment trap. Ideally, the trap should be designed to store sediment for a minimum disturbed volume of 65 yd³/ac (125 m³/ha). In order to determine the volume of the trap; the watershed that is tributary to the sediment trap should be calculated.

37-3.01(04) Sediment Basin

Paragraph revised as follows:

A sediment basin is the last control measure encountered by runoff before it leaves the construction site. It is about twice as long as it is wide, but it must be shaped to fit the area it

will be used in. It should therefore be designed and detailed for each specific site, as no standard details have been developed. However, a schematic detail is shown in Figure 37-3H. If used independent of other sediment-control measures, the basin should be designed for a drainage range of 5 to 30 ac (2.04 to 12 ha). The basin should be designed to store a minimum water volume of 65 yd³/ac (125 m³/ha) for the watershed. If the watershed area is greater than 30 ac (12 ha), additional consideration should be given.

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