COMPLETE REVISION
January 2012

Process Industry Practices
Civil

PIP CVE02350
Roadway Design Guide
(U.S. Customary)

PURPOSE AND USE OF PROCESS INDUSTRY PRACTICES

In an effort to minimize the cost of process industry facilities, this Practice has been prepared from the technical requirements in the existing standards of major industrial users, contractors, or standards organizations. By harmonizing these technical requirements into a single set of Practices, administrative, application, and engineering costs to both the purchaser and the manufacturer should be reduced. While this Practice is expected to incorporate the majority of requirements of most users, individual applications may involve requirements that will be appended to and take precedence over this Practice. Determinations concerning fitness for purpose and particular matters or application of the Practice to particular project or engineering situations should not be made solely on information contained in these materials. The use of trade names from time to time should not be viewed as an expression of preference but rather recognized as normal usage in the trade. Other brands having the same specifications are equally correct and may be substituted for those named. All Practices or guidelines are intended to be consistent with applicable laws and regulations including OSHA requirements. To the extent these Practices or guidelines should conflict with OSHA or other applicable laws or regulations, such laws or regulations must be followed. Consult an appropriate professional before applying or acting on any material contained in or suggested by the Practice.

This Practice is subject to revision at any time.

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1. Introduction

1.1 Purpose

This Practice provides guidance and recommended procedures for the layout and design of roadways inside plant boundaries and for access to a plant facility.

1.2 Scope

This Practice describes roadway classifications and provides guidance for design of right-of-ways, access to public roadways, use of local materials, climate effects, traffic loading, layout and traffic control, design of paving and roadways, providing drainage, and providing railroad and pipeline crossings for roadways within plant boundaries and for access to a plant facility. This Practice uses United States standards for roadway design. The user should research regional standards for variations from this design guide.

2. References

Applicable requirements of the following Practices, and industry codes and standards, and references should be considered an integral part of this Practice. The edition in effect on the date of contract award should be used, except as otherwise noted. Short titles are used herein where appropriate.

2.1 Process Industry Practices (PIP)

- PIP CVS02350 – *Roadway and Area Paving Construction Specification*
- PIP CVS02700 – *Underground Gravity Sewers Specification*
- PIP PNE00003 – *Process Unit and Offsites Layout Guide*
- PIP CVI02350 – *Roadway and Area Paving General Notes and Typical Details*

2.2 Industry Guides and Standards

- American Association of State Highway and Transportation Officials (AASHTO)
  - *Guide for Design of Pavement Structures (GDPS)*
  - *A Policy on Geometric Design of Highways and Streets (GDHS)*
  - *Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT ≤ 400) (VLVLR)*
- American Concrete Institute (ACI)
  - ACI 325.12R – *Guide for Design of Jointed Concrete Pavements for Streets and Local Roads*
  - ACI 350-06 – *Code Requirements for Environmental Engineering Concrete Structures and Commentary*
  - ACI 504R – *Guide to Sealing Joints in Concrete Structures*
- American Concrete Pipe Association (ACPA)
  - Concrete Pipe Design Manual
  - Design Data 1 (DD 1) – *Highway Live Loads on Concrete Pipe*

- ASTM International (ASTM)
  - ASTM C14 – *Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe*
  - ASTM C76 – *Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe*
  - ASTM D1195/D1195M – *Standard Test Method for Repetitive Static Plate Load Tests of Soils and Flexible Pavement Components, for Use in Evaluation and Design of Airport and Highway Pavements*
  - ASTM D1196 – *Standard Test Method for Nonrepetitive Static Plate Load Tests of Soils and Flexible Pavement Components, for Use in Evaluation and Design of Airport and Highway Pavements*
  - ASTM D1883 – *Standard Test Method for CBR (California Bearing Ratio) of Laboratory-Compacted Soils*
  - ASTM D2844 – *Standard Test Method for Resistance R-Value and Expansion Pressure of Compacted Soils*
  - ASTM D6373 – *Standard Specification for Performance Graded Asphalt Binder*
- Institute of Electrical and Electronic Engineers Inc. (IEEE)

  IEEE NESC – *National Electrical Safety Code*
- National Fire Protection Association (NFPA)

  NFPA 70 – *National Electrical Code (NEC)*
- U.S. Department of Transportation - Federal Highway Administration (FHWA)
  - *Manual on Uniform Traffic Control Devices (MUTCD)*
  - *Protocol P46 Long-Term Pavement Performance (LTPP)*

3. Definitions

base course: A layer of well-graded granular material that supports the paving and distributes wheel loads over a greater area of the subgrade

full contraction joint: A full contraction joint has no reinforcement crossing the joint (except for load transfer devices)

geogrid: High tensile strength polymer material designed with transverse and longitudinal grids. Laid directly on the subgrade, the grid geometry provides a mechanism for interlocking aggregate base or subbase material placed on the geogrid. The interlocking prevents lateral movement of the aggregate and improves load distribution to the subgrade.

geotextile: Polyester fabric material laid over subgrade materials directly below an aggregate subbase. It maintains separation of subbase from subgrade. Geotextile is permeable, allowing pore water to pass vertically through the fabric.

owner: The party who owns the facility wherein the roadway will be constructed

partial contraction joint: A partial contraction joint has 50% or less reinforcement crossing the joint