

# STATE OF COLORADO

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Dedicated to protecting and improving the health and environment of the people of Colorado

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Colorado Department  
of Public Health  
and Environment

## SOLID WASTE GUIDANCE DOCUMENT

**Title:** Concerning Solid Waste Site and Facility Engineering Design/As-built Documents

**Date:** April 16, 2008

**Purpose:** To improve the efficiency of the regulatory review process by clarifying the desired content of solid waste site and facility engineering design/as-built documents that are required to be submitted to the Colorado Department of Public Health and Environment (Department) Hazardous Materials and Waste Management Division (Division) for review and approval.

**Proposed Distribution:** Any interested party, by request, and to the Division Homepage.

**Statement of Guidance:** The Division's Solid Waste and Material Management Unit has recognized a need to establish an improved level of consistency in the area of document review, specifically the review of facility engineering design submittals and as-built construction certification reports. This guidance document is an effort to promote consistency regarding the desired content of such documents and the Division's review and approval process. The Division encourages communication between all relevant parties during the review process.

**Background and Discussion:** The Solid Wastes Disposal Sites and Facilities Act (Title 30, Article 20, Part 1) requires that an application for a Certificate of Designation be accompanied by "...engineering, geological, hydrological, and operational data...for review and for recommendation as to approval or disapproval..." by the Department (C.R.S. 30-20-103(1)). The Regulations (6 CCR 1007-2) definition of an

"Application for a Certificate of Designation" means all documents, data and drawings which are submitted, for review, by an applicant to a governing body having jurisdiction. The application shall contain the site location, the type of facility, the engineering design and operations report which includes, but is not limited to, geological, hydrological, engineering and operational data for the design, operation, closure and post-closure of the facility. This information shall be prepared in accordance with these regulations and all local requirements.

In addition, the Regulations state:

**"Engineering design"** means the analysis and design work prepared for construction, operation and closure of a solid waste disposal site or facility which may contain a preliminary report of design specifications, maps and plans drawn to a convenient and common scale, provides site or facility operation plans and site or facility closure plans, and contains all information and data otherwise specified by these regulations.

A Certificate of Designation application requires an engineering design, which includes the design work prepared for construction, operation and closure of a solid waste disposal site and facility. Good engineering practice necessitates plans, specifications, criteria, drawings, calculations and other supporting information prior to construction of the solid waste disposal site and facility. Therefore in accordance with the regulations and good engineering practice, a Quality Assurance and Quality Control Plan must be submitted as part of the application.

Various portions of the Regulations Pertaining to Solid Waste Sites and Facilities (6 CCR 1007-2) refer to facility design standards as appropriate to a specific type of solid waste disposal facility. All solid waste disposal sites and facilities are to have an engineering design plan, operations plan, or engineering design and operations plan (these terms are often used interchangeably). The term engineering design and operations plan (EDOP) will be used throughout the rest of this document. Again, a written Quality Assurance/Quality Control (QA/QC) Plan must be submitted as part of the EDOP, or as a stand-alone document, subject to Division review and approval prior to construction.

In past instances, many facility EDOP's lacked sufficient engineering design information and detail (i.e., in accordance with standard engineering practice) necessary to adequately construct required facility structures. Consequently, additional engineering design QA/QC plans, drawings and specifications were developed to focus on particular EDOP construction elements and to support the technical review by staff for a particular project. For instance, engineering design documents for construction were issued to describe in sufficient detail the specific parts, phases, modules, cells, etc. being built for a distinct construction project (e.g., design drawings issued at a scale to facilitate ease of review). Over time some confusion has evolved regarding requirements for EDOP engineering design addendums and corresponding construction certification reports that require review and approval by the Division.

Guidance: The Division requires sufficient engineering design and technical detail to enable the staff reviewer and the public to readily ascertain how a facility will be constructed and be maintained. While the details will vary depending upon the type of facility and site-specific conditions, the following will be considered minimal to support a review.

If compatible with local governing body requirements, all facility engineering design documents that are consistent with the approved EDOP and approved QA/QC Plan (e.g., within design constraints and tolerances), which are prepared to aid the construction effort, may be submitted to the Department and the local governing body for informational purposes. A cover letter and certified engineering report that supports that this is the case should accompany such design submittal(s) and state that the design

submittal(s) is consistent with the EDOP. If the Department is requested to make a determination as to whether or not the design submittal(s) is consistent with the approved EDOP, the Department will use its best efforts to make such a determination within thirty (30) calendar days of receipt. The Department will consider this request a technical review. A determination may not be forthcoming in the absence of a request. Provided such design submittals are consistent with the approved EDOP and approved QA/QC Plan, they will serve as the approved design documents for comparison with the as-built certification report, pending any additional design documentation required by the certifying engineer. Such additional design documentation should be concurrently shared with the Department and the local governing body.

All facility engineering design documents required by the local governing body must also be submitted to the Division with exception of ancillary components (e.g., entrance roads, gate houses, maintenance buildings, etc.). All facility engineering design documents that are developed as supplemental EDOP engineering design revisions must be submitted to the Division and the local governing body (i.e., alternatively, the local governing body must be notified of such revisions per Section 2.4 of the Regulations, as appropriate). The Division has approval authority in consultation with the local governing body (although in some cases, approval may be required by the local governing body as well). A cover letter that describes the construction project and clearly denotes the specific design modification(s) should accompany each engineering design submittal. Engineering design documents prepared for bid purposes typically contain a sufficient level of detail. However, facility engineering design submittals should include drawings, specifications and a separate “stand alone” QA/QC plan, as applicable. Based on the complexity of the design modification(s), the engineering design package (or notification of revisions to the local governing body, as appropriate) should be submitted to allow the Division at least thirty (30) calendar days to respond. Significant issues identified during this review may require additional time to reach resolution.

The format of engineering design drawings should incorporate (as applicable), but not be limited to, a north arrow, legend, survey grid system referenced to the site benchmark, common engineering scale, plan view(s) showing existing and proposed contours and appropriate cross sections and detail views. Engineering design specifications should include a table of contents and employ a format similar to that used by the Construction Specification Institute. A QA/QC plan should include, but not be limited to, the methods and frequency of manufacturing/construction materials testing. All engineering design documents are to be properly sealed by a Colorado registered professional engineer. Additional documentation may be required to provide clarification to the satisfaction of the Department. In an effort to promote consistency in the design and construction of facility components, the Division’s geotechnical guidance document should be used when it becomes available.

The Department will issue a written decision concerning engineering design submittals required by the local governing body or that are developed as supplemental EDOP engineering design revisions. After the Department (in consultation with the local governing body) approves the specific engineering design submittal, the facility may implement construction activities. Representatives of the Department and the local governing body may visit the site to observe any construction activities.

The Department does not require and will not review, unless otherwise requested in writing and deemed acceptable by the Department, non-essential documents (e.g., contractual agreements that address payment terms between an owner/operator and a construction contractor) that may accompany engineering design submittals. If these documents are submitted to the Department/local governing body, they are considered public records and will be treated as such.

Following construction of solid waste site and facility structures, the Department (in consultation with the local governing body) will review the as-built construction certification report for approval/disapproval. This report should be consistent with the approved engineering design documents (e.g., drawings of record at the same common engineering scale as the design drawings for construction) and should contain all appropriate observations and as-built documentation, including, but not limited to, the following:

- Text in an organized report format with a table of contents. The report will clearly identify the facility and specific project (i.e., designated cell, phase, module, etc.), describe the work completed, reference appropriate supporting information (as listed below), and describe any field modifications and design deviations from the approved design documents,
- Land survey data and drawings (e.g., contour maps that illustrate the surface elevations and grades of applicable liners, final covers and surface water control features),
- Manufacturing material test frequencies and results (as appropriate),
- Construction material test frequencies, test locations, and test results,
- Pertinent thickness surveys/measurements.

The as-built construction certification report should contain a statement by the certifying engineer that the designed construction has been completed in accordance with the approved engineering design plans, drawings, and specifications (as appropriately modified, if applicable). A Colorado registered professional engineer should properly certify the as-built construction certification report.

The as-built certification report will be reviewed by the Department and compared with the approved engineering design plans, drawings and specifications. The Department will issue a written decision concerning the as-built certification report. Typically, the Department will issue written approval/disapproval within thirty (30) calendar days after receipt of a landfill cell liner/leachate collection system as-built certification report.

Construction documentation should also include reports or logs describing day-to-day field observations during construction and captioned photographs of construction progress and major components of construction. The reports and photographs should be retained by the facility or project QA/QC consultant and made available for review by the Department or local governing body at their request.

All documents that are reviewed are subject to the Department's per hour review fee as established in regulation and authorized by statute.