**Notice**

This Standard Special Provision (SSP) revises or modifies CDOT’s *Standard Specifications for Road and Bridge Construction*. These are the official instructions for its use on CDOT construction projects and have been reviewed, approved, and issued by the Construction Engineering Services Branch. Use as written without change. Do not use modified versions of this SSP on CDOT construction projects. Do not use this Standard Special Provision (SSP) on CDOT projects in a manner other than specified in the instructions without approval by CDOT’s Standards and Specifications Unit. The instructions for use appear below.

Other agencies using the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision appropriately and at their own risk.

**Instructions for use on CDOT construction projects:**

Use this Standard Special Provision on all CDOT Engineering projects with an Engineer's Estimate of $3 million or greater, not including Construction Engineering (CE), Indirect, and Force Account (F/A) item costs. This specification is not intended for use on Local Agency Construction projects or on Emergency projects as defined by §24-33.5-704, C.R.S. and Colorado Fiscal Rule 3-1 § 2.9.

**Section 106 of the Standard Specifications shall include the following:**

**106.14 Environmental Product Declarations (EPDs).** The Buy Clean Colorado (BCCO) Act (C.R.S. 24-92-118) requires the Colorado Department of Transportation (CDOT) to establish the maximum acceptable Global Warming Potential (GWP) limit for each category of eligible materials that are used in the project. The Contractor shall comply with the following requirements and shall meet the established GWP limits.

1. *Definitions.*
2. Environmental Product Declaration (EPD**).** A third-party verified document that summarizes the life cycle assessment (LCA) of a single material and publicly discloses its environmental impacts. EPDs enable comparisons between materials serving the same function but should not be used to compare dissimilar materials (for example, concrete and asphalt). An EPD shall consist of quantified environmental data using predetermined parameters and, where relevant, additional environmental information as defined by the International Organization for Standardization (ISO) (ISO, 2010). The environmental information of an EPD is subdivided into four life cycle stages being the production, construction, use and end-of-life stages. The life cycle stages are divided into modules. An EPD may cover different combinations of modules, in other words, cover different life cycle stages or parts thereof. EPDs covering modules (A1-A3) are referred to as cradle-to-gate EPDs and the associated emissions are often referred to as embodied carbon. Cradle-to-gate EPDs cover the mandatory production stage that includes the following information modules: extraction and upstream production (raw material supply) [A1], transport to factory [A2], and manufacturing [A3] (ISO, 2017). This specification refers to cradle-to-gate EPDs when EPDs are mentioned.

Types of EPDs (Carbon Leadership Forum, 2021)

* 1. Facility-specific. An EPD in which the environmental impacts can be attributed to a single manufacturer and manufacturing facility.
  2. Product-specific. An EPD that represents the impacts for a specific product and manufacturer, potentially across multiple facilities.
  3. Supply-chain-specific. An EPD that is product-specific and that uses supply chain–specific data in the LCA to model the impacts of key processes upstream in a product’s supply chain. For example, cement in concrete or mill-specific production data for steel.

1. Global Warming Potential (GWP**).** A measure of how much energy the emission of 1 ton of a gas will absorb over a given period of time, relative to the emission of 1 ton of carbon dioxide (CO₂) (EPA).
2. Greenhouse Gas (GHG). Includes carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆), and nitrogen trifluoride (NF₃) (C.R.S. 25-7-140).
3. International Organization for Standardization (ISO). An independent, non-governmental, international standard development organization composed of representatives from the national standards organizations of member countries (ISO Membership Manual).
4. Product Category Rule (PCR). A set of specific rules, requirements and guidelines for developing Type III environmental declarations for one or more product categories (ISO 14025).
5. Product Category. A group of products that can fulfill equivalent functions (ISO 14025).
6. Program Operator (PO). A body or bodies that conduct an EPD program. A program operator can be a company or a group of companies, an industrial sector or trade association, public authorities or agencies, or an independent scientific body or other organization (ISO 14025).

*(b) Eligible Material Categories.*Individual bid items requiring EPDs are detailed in Table 106-4.Eligible material categories include the following:

1. Asphalt and Asphalt Mixtures;
2. Cement and Concrete Mixtures;
3. Steel; and
4. Precast Concrete.

**(***c) EPD Development Requirements.* The Contractor shall provide Environmental Product Declarations (EPDs) for eligible materials per Table 106-4 to be utilized on the project. EPDs shall meet the requirements listed below and as defined by the relevant ISO standards and material-specific Product Category Rules (PCRs) published by the Program Operators (POs) linked below.

1. Asphalt Mixtures:
   1. National Asphalt Pavement Association (NAPA) - PO & PCR Owner [www.asphaltpavement.org/programs/napa-programs/emerald-eco-label](https://www.asphaltpavement.org/programs/napa-programs/emerald-eco-label)

Additional CDOT-specific requirements for developing an asphalt mixture EPD:

* 1. For the “Mix Name” field, use the same “Supplier Mix ID” that corresponds to the submittal of the mix design for CDOT approval.
  2. For the “Specification Entity” field, enter “CDOT”.
  3. For the “Specification” field, enter mix grading/and or type of asphalt mixture (for example, S, SX, ST, SMA, WMA), followed by the number of gyrations (for example, 75, 100), followed by the binder type of the asphalt mixture (for example, 58-28, 64-22, 76-28). The field should include the following, as an example: SX(100) PG 64-22.
  4. If known, for the “Customer Number [project/contract]” field, enter the project’s contract ID.
  5. Indicate if the plant is stationary or portable.
  6. Asphalt EPDs shall be product- and facility-specific.

1. Cement:
   1. NSF - PO & PCR Owner

<https://www.nsf.org/nsf-standards/product-category-rules>

Additional CDOT-specific requirements for developing a cement EPD:

* 1. Cement EPDs shall be product- and facility-specific.

1. Concrete Mixtures:
   1. National Ready Mixed Concrete Association (NRMCA) - PO

<https://www.nrmca.org/association-resources/sustainability/environmental-product-declarations/>

* 1. NSF International - PCR Owner

<https://www.nsf.org/nsf-standards/product-category-rules>.

Additional CDOT-specific Requirements for developing a concrete mixture EPD:

* 1. EPDs shall explicitly list disaggregated results for the A1, A2, and A3 modules.
  2. For the "Product" field, use the same "Supplier Mix ID" that corresponds to the submittal of the mix design for CDOT approval.
  3. For the "Description" field, enter "CDOT" followed by the concrete class (for example, Class P, B, D, BZ, etc.). Any additional product details, such as compressive strength (PSI), air entrainment (A/E), or the inclusion of fly ash, etc., can be included if applicable. If applicable to the mix design, include “high early” or “optimized” in the description.
  4. Include the address of the plant if not listed elsewhere in the EPD.
  5. Indicate if the plant is stationary or portable.
  6. Supply-chain specific EPDs including cement manufacturer-specific data shall be utilized in the concrete mixture EPD.
  7. Concrete EPDs shall be product- and facility-specific.

Additional CDOT-specific requirements for concrete mixture EPD submission to CDOT for Approved Products List (APL) mix design approval:

* 1. Provide the specific plant name and location for the concrete supplier. If this information is not available at the time of submission, report the plant that is most likely to be used.
  2. Indicate the type of plant (stationary or portable) that will be used to manufacture the submitted mix design.

1. Steel:
   1. UL Resources - PO & PCR Owner <https://www.ul.com/resources/product-category-rules-pcrs>
   2. Steel EPDs shall be product- and facility-specific.
2. Precast Concrete:
   1. NSF / ASTM - PO and PCR Owner

[www.nsf.org/nsf-standards/product-category-rules](https://www.nsf.org/nsf-standards/product-category-rules)

<https://www.astm.org/standards-and-solutions/certification/environmental-product-declarations/epd-pcr>

* 1. Precast EPDs shall be facility-specific.

*(d) EPD Submittal Requirements.*The Contractor is responsible for verifying that all required EPDs for eligible materials used on the project have been submitted in accordance with this subsection and 106.14(f) of this specification.

All EPDs submitted shall be published and unredacted. EPD submittal requirements are outlined for each of the eligible material categories below.

1. Asphalt Mixtures:
   1. EPDs shall be submitted via the EPD Submission Form at least 14 calendar days weeks prior to material placement.
2. Cement:
   1. EPDs shall be submitted via the EPD Submission Form at least 14 calendar days prior to material placement.
3. Concrete Mixtures:
   1. For project mix design submission, EPDs shall be submitted via the EPD Submission Form at least 14 calendar days prior to material placement.
   2. For pre-approval, mix design submission shall be accompanied by an EPD per CP 62 of the Field Materials Manual (FMM).
4. Steel:
   1. EPDs shall be submitted via the EPD Submission Form at least 14 calendar days prior to material placement.
5. Precast Concrete**:**
   1. EPDs shall be submitted via the EPD Submission Form at least 14 calendar days prior to material placement.
6. The EPD Submission Form is located at the following links or on the CDOT EPD webpage at [www.codot.gov/business/designsupport/materials-and-geotechnical/epd](https://www.codot.gov/business/designsupport/materials-and-geotechnical/epd)
   1. Jotform EPD Submission Form: <https://form.jotform.com/251424918039055>

**Table 106-4. Eligible Materials / Bid Items Requiring EPD Submittal**

|  |  |  |  |
| --- | --- | --- | --- |
| **Item Number Category** | **Item Description** | **Included Item Number/Range #** | **Interpretation** |
| 206 | Structure Backfill (Flow-Fill) | 206-00065 | EPDs for the flow-fill (concrete) design are required. |
| 310 | Hydraulic Cement | 310-00900 | EPDs for cement are required. |
| 403**\*** | Asphalt Mixtures (HMA/SMA/WMA) | 403-09210 through 403-37751 | If 411 - Asphalt Cement is paid separately, it shall be included in the 403 EPD submittal item. |
| 412**\*** | Portland Cement Concrete Pavement  (PCCP) | 412-00200 through 412-01500; 412-06060 | Separate EPD submittals for concrete, dowel bar, and reinforcing steel items are required.  If a prepackaged product is utilized an EPD is not required. |
| 502 | Piling | 502-08250 through 502-14117 | EPDs for steel piles are required. |

**Table 106-4 (Continued). Eligible Materials / Bid Items Requiring EPD Submittal**

| **Item Number Category** | **Item Description** | **Included Item Number/Range #** | **Interpretation** |
| --- | --- | --- | --- |
| 503 | Drilled Shafts | 503-00012 through 503-00200 | Separate EPD submittals for concrete and reinforcing steel items are required. |
| 504 | Walls | 504-04420 through 504-04430 | Separate EPD submittals for concrete and reinforcing steel items are required. |
| 507 | Slope & Ditch Paving | 507-00000 through 507-00105 | Separate EPD submittals for concrete and reinforcing steel items are required. |
| 509 | Structural Steel | 509-00000 through 509-00010 | EPDs for structural carbon steel, high-strength low-alloy structural steel, self-weathering tubing, and structural tubing are required. |
| 601**\*** | Concrete  (All Classes) | 601-01000 through 601-05900 | If a prepackaged product is utilized an EPD is not required. |
| 602 | Reinforcing Steel | 602-00000 through 602-00025 | Separate EPD submittals for each mill supplying steel are required. |
| 603 | Reinforced Concrete Pipe/End Sections/Culverts | 603-01120 through 603-01980; 603-02155 through 603-05172;  603-07150 through 603-07980;  603-70303 through 603-80800 | EPDs for Precast Elements (both dry and wet-cast products) are required. |

**Table 106-4 (Continued). Eligible Materials / Bid Items Requiring EPD Submittal**

| **Item Number Category** | **Item Description** | **Included Item Number/Range #** | **Interpretation** |
| --- | --- | --- | --- |
| 604 | Inlets/Drainage Structures | 604-00305 through 604-19515;  604-20000 through 604-39050;  604-50700 through 604-56000 | Separate EPD submittals for concrete and reinforcing steel items for cast-in-place elements are required.  EPDs for precast elements (finished products) are required. |
| 606 | Guardrail & Bridge Rail | 606-00910 through 606-00944;  606-10900 through 606-10905 | Separate EPD submittals for concrete and reinforcing steel items for cast-in-place elements are required.  EPDs for precast elements (finished products) are required. |
| 608 | Concrete Sidewalk & Bikeway | 608-00000 through 608-00012; 608-00020 through 608-00040; 608-00350 through 608-00500 | EPDs for concrete mixtures are required. |
| 608 | Bituminous Sidewalk & Bikeway | 608-01000 through 608-01500 | EPDs for asphalt mixtures are required. |
| 609 | Curb & Gutter | 609-20000 through 609-71000 | EPDs for concrete mixtures are required. |
| 610 | Median Cover Material | 610-00010 through 610-00040 | EPDs for concrete or asphalt mixtures are required. |

|  |  |  |  |
| --- | --- | --- | --- |
| 618 | Prestressed Concrete Structures | 618-00142 through 618-06036; 618-10000 through 618-11000 | EPDs for finished products are required. |
| 624 | Drainage Pipe | 624-20006 through 624-62042 | EPDs for Precast Elements (both dry and wet-cast) are required. |

**#** Install-only items within the listed bid item ranges do not require EPDs.

**\*** Separate EPD required for each mix design, supplier, and plant location.

The EPD Lookup Tool is available on the CDOT EPD webpage should the Contractor elect to use it. This tool may be used to determine the bid items requiring EPDs. The results of this tool do not nullify, void, or alter the EPD requirements per this specification.

*(e) Bid Item Minimum Quantity Limits.*EPD Submittals are required for bid items meeting or exceeding the limits established in Table 106-5. Quantities shall only be those listed in the bid tabs at the time of project award. A white paper detailing the analyses used to develop these limits is published on the CDOT EPD webpage.

The Project Engineer or their designee should calculate the estimated quantity of eligible material in each bid item to determine if minimum quantity limits are exceeded.

For bid items not listed in Table 106-5, but that encompass eligible materials in their construction, the quantity of eligible materials (in other words concrete, steel, HMA, etc.) is to be used when determining if an EPD is required. For example, when constructing a drilled caisson, the quantity of structural concrete and reinforcing steel used in the caisson will need to be determined to see if the 601 (structural concrete) or 602 (reinforcing steel) quantity limits are exceeded. If the total eligible material quantity exceeds the quantity shown below, EPDs are required for each material. Bid item quantities shall be aggregated by Item Number Category per project when evaluating quantity limit requirements.

**Table 106-5.** **Bid Item Minimum Quantity Limits**

|  |  |  |  |
| --- | --- | --- | --- |
| **Item Number Category** | **Item Description** | **Minimum**  **Quantity** | **Unit** |
| 206 | Structure Backfill (Flow-fill) | 50 | CY |
| 403 | Asphalt Mixtures (HMA/SMA/WMA) | 500 | Ton |
| 412 | Portland Cement Concrete Pavement (PCCP) | 1,000 | SY |
| 601 | Structural Concrete (Each Class) | 50 | CY |
| 602 | Reinforcing Steel | 15,000 | LB |
| 608 | Concrete Sidewalk & Bikeway | 250 | SY |
| 608 | Bituminous Sidewalk & Bikeway | 500 | Ton |
| 609 | Curb & Gutter | 1,000 | LF |
| 610 | Median Cover Material | 4,000 | SF |

*(f) Global Warming Potential (GWP) Limits.*CDOT’s benchmarking analysis utilized the current available EPD information to determine its GWP limits as listed in Table 106-6 GWP Limit Values. While the BCCO Act requires that CDOT shall not adjust policy for any eligible material to be less stringent, CDOT may establish subcategories with distinct GWP limits as warranted by technological advancements or changes to background data that leads to statistically significant differences.

If a GWP limit has not been established for a specific eligible material (class, gradation, etc.) used on the project, EPDs are still required to be submitted for all eligible materials as outlined in Table 106-4 Eligible Materials / Bid Items Requiring EPD Submittal. GWP limits for additional classes and materials will be determined as more data is available.

**Table 106-6. GWP Limit Values**

|  |  |  |
| --- | --- | --- |
| **Material** | **Category** | **GWP Limit** |
| Concrete Mixtures (kg CO₂-eq/m³)**$, %** | Class P | 346.2 |
| Concrete Mixtures (kg CO₂-eq/m³)**$, %** | Class D | 365.1 |
| Concrete Mixtures (kg CO₂-eq/m³)**$, %** | Class B | 360 |
| Asphalt Mixtures (kg CO₂-eq/metric ton) **$,****+** | S (neat binder) | 77 |
| Asphalt Mixtures (kg CO₂-eq/metric ton) **$,****+** | SX (neat binder) | 83.4 |
| Asphalt Mixtures (kg CO₂-eq/metric ton) **$,****+** | SX (modified binder) | 89 |
| Asphalt Mixtures (kg CO₂-eq/metric ton) **$,****+** | ST (neat binder) | 90.4 |
| Steel (kg CO₂-eq/metric ton) **^** | Reinforcing steel or rebar | 915.9 |

**$** Portable plants are currently exempt from GWP requirements until more data and data consistency is obtained. EPDs are still required as applicable per the project specifications.

**%** Limits shall apply to all listed concrete classes incorporated into the bid items in Table 106-4.

**+** Neat binder includes the following PG grades: PG 58-28 and PG 64-22. Modified binder includes the following PG grades: PG 58-34, PG 64-28, PG 70-28, and PG 76-28.

**^**Limits shall apply to all reinforcing steel or rebar incorporated into the bid items in Table 106-4. This is inclusive of coated and non-coated bar.

*(g) Exceptions***.**

If the Contractor cannot provide an eligible material with an EPD meeting the requirements of this specification, an alternate material meeting the requirements shall be proposed. If an alternate material meeting the requirements of this specification is not available, the Contractor shall notify the Project Engineer and provide a written explanation for the project files prior to material placement. The Contractor shall also send this explanation to [CDOT\_EPD@state.co.us](mailto:CDOT_EPD@state.co.us).

This explanation shall include material suppliers and associated plant locations contacted for an alternate material, the material category/categories and associated bid item(s), and the response(s) from the materials supplier(s) contacted describing why an EPD is not available for an eligible material, or why an alternate material meeting the GWP limits on the EPD is not available on a reasonable basis or for a reasonable cost.

*(h) Project Schedule***.**

The EPD activities below shall be included in the submitted project schedule and in the weekly meeting updates in accordance with CDOT Specification 108.03. At a minimum, the project schedule shall specifically detail the following activities:

* 1. Developing EPDs, as applicable;
  2. Obtaining EPDs, as applicable; and
  3. Submitting EPDs prior to material placement.

*(i) Cost.* All costs associated with the development of and submittal of an EPD and any other work associated will not be paid for separately but shall be included in the work.