

Appendix O – Environmental Product Declaration Protocol - 24

OVERVIEW - This protocol document contains the information that Contractors and CDOT Project Staff shall use to determine when and how Environmental Product Declarations are required to be submitted for eligible materials based on project size and material quantities. The requirements contained herein are intended to satisfy the requirements of Colorado House Bill 21-1303, specifically those relevant to the Department (Colorado Department of Transportation - CDOT) and as listed under Section 24-92-118 of the Colorado Revised Statutes.

DEFINITIONS:

Asphalt Mixture - A composite material consisting of aggregates, asphalt binder, filler or additives if required and approved, and reclaimed material if permitted and used. For the purpose of this document, this shall include all Hot Mix Asphalt, Stone Matrix Asphalt, and Warm Mix Asphalt.

Concrete Mixture - A composite material consisting of cement and supplementary cementitious materials, aggregates, admixtures, water, fibers, pigments, and curing materials if required and approved.

Eligible Materials - Definition HB 1303 under the CDOT section lists this as “Materials used in the construction of a public project, including, but not limited to: Asphalt and Asphalt Mixtures, Cement and Concrete Mixtures, and Steel.”

Eligible Projects - Projects determined by the Department requiring EPD submittals based on specific criteria as outlined in the “Eligible Projects” section of this document.

Environmental Product Declaration (EPD) - For this document, an EPD shall consist of a Type III Environmental Product Declaration, which is an environmental declaration providing 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 stage. The life cycle stages are divided into modules. An EPD may cover different combinations of modules, i.e., cover different life cycle stages or parts thereof. EPDs covering modules (A1-A3) are referred to as cradle-to-gate. Cradle-to-gate EPDs cover the mandatory production stage that includes the following information modules; extraction and upstream production (raw material supply), transport to factory and manufacturing (ISO, 2017). This protocol refers to cradle-to-gate EPDs when EPDs are mentioned.

Global Warming Potential (GWP) - Global warming potential is the heat absorbed by any greenhouse gas in the atmosphere, as a multiple of the heat that would be absorbed by the same mass of carbon dioxide (CO₂). Global Warming Potential is expressed in kilograms (kg) of carbon dioxide equivalents, CO₂-eq, over a 100-year time horizon as defined in the latest version of the Tool for Reduction and Assessment of Chemicals and Other Environmental Impacts (TRACI) impact assessment methodology developed by the Environmental Protection Agency (EPA) [Bare, 2012].

Greenhouse Gas (GHG) - A greenhouse gas is a gas that absorbs and emits radiant energy within the thermal infrared range, causing the greenhouse effect.

Precast and Prestressed Element - A construction product produced by casting concrete in a mold or “form” which is then cured in a controlled environment, transported to the construction site and maneuvered into place; examples include precast girders, panels, guardrail, pipes, inlets, or other underground drainage elements, etc. These products typically will incorporate reinforcement elements, which may include reinforcing steel, strand, wire mesh, etc., and they may be pre-stressed at the casting location.

Product Category Rule - A set of specific rules, requirements and guidelines for developing Type III environmental declarations for one or more product categories (ISO, 2010).

Product Category - A group of products that can fulfill equivalent functions (ISO, 2010).

Steel

Reinforcing Steel - A metal construction material that is used in concrete to provide additional tension and compression strength. Reinforcing steel includes rebar, epoxy-coated rebar, stainless-steel, etc.

Structural Steel - Consists of the elements of the structural frame that are shown and sized in the structural design documents and are essential to support the design loads. (ANSI/AISC 303-22).

Other Steel - other steel, iron, or metal items that are not generally described as Structural Steel per ANSI/AISC 303-22, including steel used as piling or piling accessories that are formed into typical structural steel shapes such as H-piles, or pipe piles.

OVERVIEW OF HB 21-1303

House Bill 1303 is a bill that was signed into Colorado Law in July of 2021. The bill as written requires both the Office of State Architect and the Colorado Department of Transportation to establish maximum Global Warming Potential (GWP) for materials used in eligible projects. Requirements of the bill specific to the Colorado Department of Transportation (CDOT) have been added to the Colorado Revised Statutes, Section 24-92-118. The overview contained below is specific to CDOT’s portion of the bill only.

By January 1, 2025, CDOT shall establish a policy to determine and record greenhouse gas emissions from eligible materials used in a public project with the goal of reducing Greenhouse Gas (GHG) emissions. CDOT shall do so through the use of a nationally or internationally recognized database of EPDs and through development of a tracking/reporting process consistent with the criteria in an EPD. CDOT may establish additional subcategories with distinct GWP limits within each eligible material category listed in the bill.

To establish GWP limits for eligible materials items, CDOT shall require the Contractor who is awarded a contract to submit a current Environmental Product Declaration for each of the eligible materials identified below by CDOT Bid Item number or inclusive material.

EPD data collected between July 1, 2022, through December 31, 2024, will be used to establish GWP limits for eligible materials items via CDOT policy.

ELIGIBLE PROJECTS

EPD submittal requirements shall be adhered to for projects that include the Standard Special Provision – Revision of Sections 101 and 106 – Environmental Product Declarations. A project cost threshold of \$3 Million has been established based on the Engineer's Estimate of bid items/quantities for which the Contractor submits a bid. The \$3 Million project cost threshold is not to include Construction Engineering (CE) and Indirect Costs, nor is it to include Force Account (FA) items.

ELIGIBLE MATERIALS

Eligible materials that the awarded Contractor shall submit EPDs for when required shall include the following items meeting or exceeding the bid item quantity limits established in Table 2. Bid Item Quantity Limits. CDOT requests facility-specific data be used in the development of EPDs, including material resources from module A1 used to manufacture the eligible materials in module A3 (for example but not limited to asphalt binder, cement, and mill steel). EPDs shall be in accordance with the relevant PCR as listed on our CDOT EPD website. If the same eligible materials are being produced/supplied from multiple plant sites, separate facility specific EPDs are required from each plant.

CDOT BID ITEMS REQUIRING EPD SUBMITTAL

EPD submittal(s) shall be required for the items listed in Table 1. Bid Items Requiring EPD Submittal on eligible projects.

Table 1. Bid Items Requiring EPD Submittal

Item Number Category	Item Description	Included Item Number / Range	Interpretation
206	Structure Backfill (Flow-Fill)	206-00065	EPD submittal required for the flow-fill (concrete) design.
310	Hydraulic Cement	310-00900	EPD submittal required for the cement.
403 ¹	Asphalt Mixtures (HMA/SMA/WMA)	403-09210 through 403-37971	EPD submittal for each asphalt mixture design and plant location required. If 411 - Asphalt Cement is paid separately, it shall be included in the 403 EPD submittal item. For portable Plant EPD Guidance, see footnote.
412 ¹	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. Separate EPD submittals are required for each mix design for each supplier. For portable Plant EPD Guidance, see footnote.

502	Piling	502-03500 through 502-11253; 502-11263 through 502-11274; 502-11284 through 502-11489; 502-14102 through 502-18135	EPD submittal required for steel piles.
503	Drilled Shafts	503-00012 through 503-00102	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 507-00100; 507-00105	Separate EPD submittals for concrete and reinforcing steel items are required.
509	Structural Steel	509-00000 through 509-00001	EPD submittals required for structural carbon steel, high-strength low-alloy structural steel, self-weathering tubing, and structural tubing.
601	Concrete (All Classes)	601-01000 through 601-05900	Separate EPD submittals are required for each class of concrete and mix design for each supplier. If prepackaged product is utilized for Class DR (Item 601-03057), then an EPD is not required.
602	Reinforcing Steel	602-00000 through 602-00025	Separate EPD submittals are required for each mill supplying steel.
603	Reinforced Concrete Pipe/End Sections/Culverts	603-01120 through 603-01185; 603-01210 through 603-01245; 603-01270 through 603-01780; 603-01785 through 603-01980; 603-02155 through 603-03360; 603-03420 through 603-03540; 603-03660; 603-03720; 603-03780 through 603-05054; 603-05060 through 603-05066; 603-05072; 603-05078 through 603-05172; 603-07150 through 603-71208; 603-71210 through 603-71812; 603-72008 through 603-77224; 603-80790 through 603-80820	EPD submittal required for Precast Elements (both dry and wet-cast products).

604	Inlets/Drainage Structures	604-00305 through 604-19515; 604-20000 through 604-39050; 604-50700 through 604-51024; 604-56000	Separate EPD submittals for concrete and reinforcing steel items are required for cast-in-place elements. EPD submittals for precast elements (finished products) are required.
606	Guardrail & Bridge Rail	606-00910 through 606-00944 (for Guardrail Type 9) and 606-10900 through 606-10905 (for Bridge Rail Type 9 and Type 9 (Special))	Separate EPD submittals for concrete and reinforcing steel items are required for cast-in-place elements. EPD submittals 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	EPD submittal required for concrete or asphalt mixtures.
608	Bituminous Sidewalk & Bikeway	608-01000 through 608-01500	EPD submittal required for concrete, or asphalt mixtures.
609	Curb & Gutter	609-20000 through 609-71000	EPD submittal required for concrete.
610	Median Cover Material	610-00010 through 610-00040	EPD submittal required for concrete or asphalt mixtures.
618	Prestressed Concrete Structures	618-00142 through 618-06038; 618-10000 through 618-11000	EPD required for finished products.
624	Drainage Pipe	624-20006 through 624-70120	EPD submittal required for Precast Elements (both dry and wet-cast products)

¹ Portable asphalt plants and concrete batch plants shall be modeled using the rules and requirements from the applicable PCRs. To clarify the interpretation of the rules and requirements, the following starting points for data collection and plant model should be included:

- The transportation distance and mode for raw materials for the declared mix.
- Regionalized data for energy and raw materials for the location indicated in the EPD.
- Mobilization of the plant to the location indicated in the EPD reported under module [A3]. This can be left out if the volume of transportation is less than 1% of the total transportation that includes the plant and the mix design raw materials for the intended project.
- Average operations based on an inventory of energy, consumables, emissions and waste and the produced volume, for a 12-month period not older than 2 years prior to issuing the EPD.

EPDs for portable asphalt plants and concrete batch plants are only considered valid for the location and the period that the mix is produced at the location indicated in the EPD.

As the industry readiness related to the development of EPDs matures, additional CDOT bid items that will require EPD submittals will be added to this eligible materials list. See section "Future Requirements" of this document for more information.

BID ITEM QUANTITY LIMITS

EPD Submittals are required for bid items meeting or exceeding the limits established in Table 2. For items not listed in Table 2, the quantity limits of the material(s) used to construct the element are to be utilized. Bid item quantities shall be aggregated by Item Number Category per project when evaluating quantity limit requirements.

Table 2. Bid Item Quantity Limits

Item Number Category	Item Description	Quantity Limits	Unit
206	Structure Backfill (Flow-fill)	50	CY
310	Hydraulic Cement	150	Ton
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

EPD SUBMITTAL TIMING

The awarded Contractor of an eligible project shall provide the required EPDs for those eligible materials identified per the following timelines:

- **Cement and Concrete Mixtures, Asphalt and Asphalt Mixtures**
 - Minimum of two weeks prior to materials placement
- **Reinforcing Steel and Structural Steel**
 - Before they are permanently incorporated into the work.
- **Precast & Prestressed Elements**
 - At the time of delivery to the project (e.g., with the Certificate of Compliance (COC)).

EPD SUBMITTAL PROCESS

Each EPD shall be submitted at the following address: [EPD Submittal](#)

Each EPD submittal will require information such as:

- Project information
- Material supplier information
- Material unit and conversion information
- EPD and PCR information
- GWP for modules A1-A3
- PDF copy of the EPD

FUTURE REQUIREMENTS

It is expected that more bid items will be added to **Table 1**. Bid Items Requiring EPD Submittal. It is expected that requirements for product-specific, facility-specific, supply-chain specific, and regional-specific data will become more strict. Uncertainty factors may be applied to GWP values shown in EPDs to account for non-facility specific data used when developing them. Ongoing outreach with industries producing and placing eligible materials will continue. It is expected that more materials will require EPD submittals, such as cold-rolled steel elements (e.g., guardrail and corrugated metal pipe) and material resources that are constituents of mix designs that are relevant for the GWP of the product supplied to CDOT (e.g. asphalt binder, emulsions, additives, cement, and admixtures). Improvements to existing EPDs and PCRs for other industries will also be expected. It is expected that EPD requirements will expand to projects other than CDOT Engineering projects such as Local Agency projects. The \$3 Million project threshold will be used for the initial EPD collection effort and may be revised in the future to include projects with a smaller engineer estimate bid item total.

REFERENCES

Bare, J. 2012. Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI). TRACI Version 2.1 User's Guide. EPA/600/R-12/554 2012. Environmental Protection Agency, Cincinnati, OH.

ISO, 2010. Environmental management – Type III environmental declarations – Principles and procedure. ISO14025: 2010

ISO, 2017. Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and services. ISO21930: 2017

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