



COLORADO

Department of Transportation

CDOT EPD Implementation for Precast Elements

Precast Industry Workshop
October 27, 2022



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- Training/Support





Key Team Members

- CDOT Members
 - Keith Stefanik
 - Andy Karsian
 - Craig Wieden
 - Hailey Goodale
- Consultant/SME
 - Bill Schiebel - Rocksol
 - Joep Meijer - The Right Environment Ltd.
- FHWA
 - Brian Dabling
- Academia/Research
 - Christopher Senseney/Michael Seamon - CU Boulder





HB 21-1303: Summary

- HB 21-1303 was passed in July 2021 and incorporated into CRS Statutes 24-91-117/118. <https://leg.colorado.gov/bills/hb21-1303>
- Section 118 requires CDOT to begin collecting Environmental Product Declarations (EPDs) on eligible materials including:
 - Asphalt and Asphalt Mixtures; Cement and Concrete Mixtures; Steel
- EPD Data collection began for eligible materials on eligible projects advertised after July 1, 2022.
 - Projects requiring EPD collection will contain the Standard Special Provision - Revision of Sections 101 and 106 - Environmental Product Declarations.
- CDOT will use these EPDs to develop a policy by January 1, 2025, that will establish a maximum Global Warming Potential (GWP) for each eligible material, with an overall intent of reducing GWP in the future.

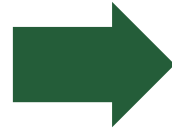


HB 21-1303: Key Terms

The Guidelines

Product Category Rule (PCR)

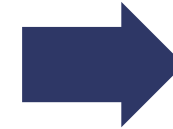
“Set of specific rules, requirements, and guidelines for developing Type III environmental product declarations for one or more categories”
(ISO 14025)



The Analysis

Life Cycle Assessment (LCA)

“A compilation and evaluation of the inputs, outputs, and potential environmental impacts of a product system throughout its life cycle.”
(ISO 14040)



The Communication

Environmental Product Declaration (EPD)

“Providing quantified environmental data using predetermined parameters and, where relevant, additional environmental information”
(ISO 14025)



HB 21-1303: Key Dates

July 2022

EPD Collection

Winning bidder to submit EPDs for eligible materials on public projects

July 2025

EPD Requirements

Winning bidder to submit EPDs for eligible materials as established by policy

January 2027

Review & Adjust Policy

CDOT to review and adjust policy every 4 years **

Policy Creation

CDOT is to establish policy setting maximum allowable Global Warming Potential

January 2025

Reporting

CDOT to begin reporting GHG reduction progress to legislature

2026

**** Once established, the Policy cannot be adjusted to be less stringent for any material.**



HB 21-1303: Key Dates - Precast EPDs

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EPD Collection on Precast Elements

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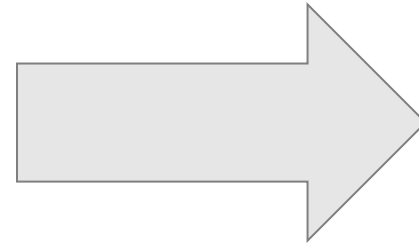
2026

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Analyses Process Overview/Results

- Eligible CDOT Bid Items
- 95th Percentile Item Expenditure Analysis
- Project Level Expenditure Analysis
- Five Major Items Analysis
- Focus EPD Bid Item Collection Items



13 Focus Bid Items



Process Overview: 13 Focus Bid Items

- **13 Focus Bid Items were:**

- Item 206 - Structure Backfill
- Item 403 - Hot Mix / Stone Matrix Asphalt
- Item 411 - Asphalt Binder (included in 403 item)
- Item 412 - Portland Cement Concrete Pavement
- Item 503 - Drilled Shafts
- Item 504 - Retaining Walls
- Item 601 - Structural Concrete
- Item 602 - Reinforcing Steel
- **Item 603 * - Culverts / Pipes / Box Culverts (precast)**
- **Item 604 - Inlets / Manholes**
- Item 606 - Guardrail
- Item 609 - Curb & Gutter
- **Item 618 * - Precast / Prestressed Structure Elements**

* Will be added to Protocol document for precast elements.

Other Added Items include:

- Item 310 - Hydraulic Cement
- Item 608 - Sidewalk and Bikeway
- Item 610 - Median Cover Material



Process Overview: Industry Readiness

- Most North American EPD efforts to date have centered around Buildings/LEED
- Current Industry PCR/EPD Readiness - 2022
 - Focus initial collection on those ready to go now
 - Hot Mix Asphalt Producers/Suppliers
 - Concrete - Ready Mix Suppliers and Concrete Paving Companies
 - Steel - Reinforcing Steel
- Planned Iterative Growth - Year 2 and Year 3 EPDs
 - Outreach and Education to Industry Stakeholders (precast, guardrail, corrugated metal culverts, etc.) Items 603 and 618 from original 13 bid items
 - Local and National Level



Process Overview: Project Limit Analysis

- Performed analysis of Projects (2017 through 2021) with bids over \$1M and over \$3M - Using 13 Focus Bid Items
 - With \$1M Total project cost threshold - 98.9% of total expenditures of 13 focus bid items would be included
 - With \$3M total project cost threshold - 92.3% of total expenditures of 13 focus bid items would be included
- Team proposed and moved forward with a \$3M total project cost threshold for initial EPD implementation - can be reduced in the future with industry growth
- Intent:
 - Looking for success with initial deployment



Process Overview: Item Quantity & Cost Limits

- Determine if small quantity exemption can be implemented with intent to limit undue burden on small suppliers & contractors
- Field Materials Manual (FMM) Small Quantity Test Exemption allowance
 - Items 206, 403, 411, 412, 601, and 609
 - Used these quantities to set quantity/cost threshold limits for individual items
- FMM small quantity limits appear reasonable, with typical associated costs estimate at between \$25K and \$50K for the items and quantities estimated
- Quantity/cost limits determined for items with no current exemption limits established - will be developed for precast elements and included in Protocol document in FMM to be published 7/1/23.



Status of Initial EPD Collection: Summary

- The initial EPD Specification and Protocol document were published/available on July 1st, 2022.
- 18 projects have been advertised to date that contain the EPD Specification and are eligible for EPD collection.
- CDOT has not received any EPDs on those projects yet, but we anticipate that we will soon.





Status of Initial EPD Collection: Industry Outreach

- Hosted multiple workshops and feedback meetings with each of the industries we are collecting EPDs on in Year 1 of our implementation. Have also given presentations at industry conferences to inform members of EPD requirements.
- Ongoing outreach with industries we plan to collect EPDs from starting July 1st, 2023:
 - Precast elements (Started in August)
 - Prestressed elements (Planned for November)
 - Structural steel (Planned for November)
 - Cold-rolled steel (Planned for November)



Next Steps: Precast Cost Analysis

Category	Unit	Estimated Total		% Cost
		Qty	\$	
RCP	LF	228,943	\$38,586,721	35.23%
Prestressed	LF	65,019	\$22,454,833	20.50%
Inlet	Each	1,841	\$12,750,597	11.64%
Prestressed	SF	170,166	\$12,546,338	11.45%
Culvert	LF	5,681	\$10,941,106	9.99%
Manhole	Each	791	\$7,190,576	6.56%
RCES	Each	1,021	\$1,989,951	1.82%
Culvert	Each	182	\$1,187,907	1.08%
Prestressed	Each	14,728	\$751,423	0.69%
Deck	SY	3,638	\$529,332	0.48%
Headwall	SF	6,946	\$407,508	0.37%
Inlet	LF	535	\$135,504	0.12%
Wall	CY	20	\$35,500	0.03%
Wall	SF	550	\$30,800	0.03%

Total non-prestressed / wall / deck item cost accounts for **66.82%** of total cost



- CDOT is providing support to contractors and project staff by attending mandatory pre-bid, pre-construction, and pre-pave conferences for eligible projects to offer EPD guidance
- Training and resources:
 - Resources and support email address posted to [CDOT EPD webpage](#)
 - Video tutorials demonstrating example EPD submissions for each material
 - Annotated EPDs showing the location of required information for each material
 - A spreadsheet tool to assist project staff and contractors in determining when and how many EPDs are required per project based on bid items and quantities
 - Publication of white paper on EPD implementation process
 - Recordings and PDFs of workshops we've conducted to date
- It's our expectation that manufacturers work with ACPA/NPCA to develop EPDs for facilities.



Questions?



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