

Low-Carbon Concrete

Project Update

Oregon Sustainability Board

Jordan Palmeri

Oregon Department of Environmental Quality

6/12/20



State of Oregon
**Department of
Environmental
Quality**

Hi. My name is Jordan Palmeri



State of Oregon
**Department of
Environmental
Quality**



Materials Management Program

Focus = building material impact reduction

2014 Environmental Footprinting project w/ OSB

Environmental Solutions Division

Evaluation of actions to support product environmental footprinting in the Pacific Northwest:
Findings and recommendations from research, surveys and interviews of business leaders

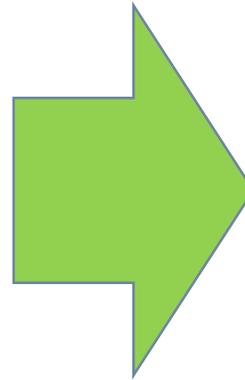


Environmental Solutions Division
Materials Management Program
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Portland, OR 97204
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(800) 452-4011
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Contact: David Allaway
www.oregon.gov/DEQ

DEQ is a leader in restoring, maintaining and enhancing the quality of Oregon's air, land and water.



Last Updated: 12/12/14
By: David Allaway



1. Business Case Studies
2. Food Footprinting profiles
3. Concrete

Environmental Product Declarations (EPDs)

RiverBend Materials

Environmental Product Declaration

Mix 313061 • Corvallis Plant



RiverBend
MATERIALS
A CRH COMPANY

This Environmental Product Declaration (EPD) reports the impacts for 1 m³ of ready mixed concrete mix, meeting the following specifications:

- ASTM C94: Ready-Mixed Concrete
- UNSPSC Code 30111505: Ready Mix Concrete
- CSA A23.1/A23.2: Concrete Materials and Methods of Concrete Construction
- CSI Division 03-30-00: Cast-in-Place Concrete

COMPANY

RiverBend Materials

3723 Fairview Industrial Dr SE, Suite 160
Salem, OR 97302

PLANT

Corvallis Plant

28054 Payne Road
Corvallis, OR 97333

EPD PROGRAM OPERATOR

National Ready Mixed Concrete Association

900 Spring St
Silver Spring, MD 20910



ENVIRONMENTAL IMPACTS

Declared Product:

Mix 313061 • Corvallis Plant
3000 PSI 3/4" INTERIOR WRA
Compressive strength: 3000 psi at 28 days

Declared Unit: 1 m³ of concrete

Global Warming Potential (kg CO ₂ -eq)	240
Ozone Depletion Potential (kg CFC-11-eq)	3.0E-6
Acidification Potential (kg SO ₂ -eq)	1.18
Eutrophication Potential (kg N-eq)	0.13
Photochemical Ozone Creation Potential (kg O ₃ -eq)	24.3
Abiotic Depletion, non-fossil (kg Sb-eq)	2.3E-6
Abiotic Depletion, fossil (MJ)	404
Total Waste Disposed (kg)	0.43
Consumption of Freshwater (m ³)	3.48

Product Components: natural aggregate (ASTM C33), type 1L cement (ASTM C595), fly ash (ASTM C618), batch water (ASTM C1602), admixture (ASTM C494)

Additional detail and impacts are reported on page three of this EPD

Oregon Concrete EPD Program

ENVIRONMENTAL PRODUCT DECLARATION CALPORTLAND

CalPortland Company
Front Avenue, Hillsboro and West Vancouver Plants
Ready Mixed Concrete

NRMCA CERTIFIED EPD

CalPortland

KNIFE RIVER
AN MOU RESOURCES COMPANY

ENVIRONMENTAL PRODUCT DECLARATION

Coffee Lake, Hillsboro, Linnton and Sundial Plants

NRMCA CERTIFIED EPD

Knife River

RiverBend Materials
Environmental Product Declaration
Mix 313061 - Corvallis Plant

ENVIRONMENTAL IMPACTS

Declared Product:
Mix 313061 - Corvallis Plant
3000 PSI 3/4" INTERIOR W/RA
Compressive strength: 3000 psi at 28 days

Declared Unit: 1 m³ of concrete

Global Warming Potential (kg CO ₂ e)	290
Ozone Depletion Potential (kg CFC-11e)	3.0E-04
Acidification Potential (kg SO ₂ e)	1.18
Eutrophication Potential (kg N)	0.13
Incineration/Open-Order Potential (kg CO ₂ e)	28.3
Abiotic Depletion, non-fossil (kg Sb-e)	2.2E-04
Abiotic Depletion, fossil (kg Sb-e)	406
Total Waste Disposal (kg)	0.10
Consumption of Freshwater (m ³)	3.46

ENVIRONMENTAL IMPACTS

Declared Product:
Mix 313061 - Corvallis Plant
3000 PSI 3/4" INTERIOR W/RA
Compressive strength: 3000 psi at 28 days

Declared Unit: 1 m³ of concrete

Global Warming Potential (kg CO ₂ e)	290
Ozone Depletion Potential (kg CFC-11e)	3.0E-04
Acidification Potential (kg SO ₂ e)	1.18
Eutrophication Potential (kg N)	0.13
Incineration/Open-Order Potential (kg CO ₂ e)	28.3
Abiotic Depletion, non-fossil (kg Sb-e)	2.2E-04
Abiotic Depletion, fossil (kg Sb-e)	406
Total Waste Disposal (kg)	0.10
Consumption of Freshwater (m ³)	3.46

Product Components: natural aggregate (ASTM C33), type 1, cement (ASTM C150), fly ash (ASTM C955), batch water (ASTM C150), admixture (ASTM C494)

Additional data and impacts are reported on page three of this EPD

COMPANY
RiverBend Materials
3723 Fairview Industrial Dr SE, Suite 100
Salem, OR 97302

PLANT
Corvallis Plant
2854 Payne Road
Corvallis, OR 97333

EPD PROGRAM OPERATOR
National Ready Mixed Concrete
Association
900 Spring St
Silver Spring, MD 20910
NRMAEPD-20208

DATE OF ISSUE
09/03/2019 (valid for 5 years until 09/03/2024)

ISO 21930:2017 Sustainability in Building Construction— Environmental Declaration of Building Products: serves as the core PCR for Concrete, NSF International, February 2019, serves as the sub-category PCR

Sub-category PCR review was conducted by Thomas P. Gloria - Industrial Ecology Consultants

Independent verification of the declaration, according to ISO 14025:2008: Internal external

Third party verifier: Cora Vought (vought@sustainablebusinesscorporation.com) - Sustainable Solutions Corporation

For additional explanatory material:
Manufacture Representative: Bill Trevis (billtrevis@riverbend.com)
Software Tool: CarbonCLARITY Suite, EPD Generator - Verification

RiverBend Materials
3723 Fairview Industrial Dr SE, Suite 100
Salem, OR 97302
503-976-2008

Corvallis
2854 Payne Road
Corvallis, OR 97333
503-654-1192

RiverBend

ENVIRONMENTAL PRODUCT DECLARATION (EPD) reports the impacts for 1 m³ of ready mixed concrete mix, meeting the following specifications:

- ASTM C34, Ready-Mixed Concrete
- UNSPSC Code 30111905, Ready Mix Concrete
- CSI A23.1.02/2.0 Concrete Materials and Methods of Concrete Construction
- CSI Division 03-30-00, Cast-in-Place Concrete

Declared Product:
Mix 3055420A - Bend Plant
Residential Light Commercial
Compressive strength: 3000 psi at 28 days

Declared Unit: 1 m³ of concrete

Global Warming Potential (kg CO ₂ e)	391
Ozone Depletion Potential (kg CFC-11e)	1.2E-04
Acidification Potential (kg SO ₂ e)	1.02
Eutrophication Potential (kg N)	0.39
Incineration/ Open-Order Potential (kg CO ₂ e)	65.8
Total Primary Energy Consumption (kg)	2,027
Nonrenewable (kg)	2,597
Renewable (kg)	60.3
Total Concrete Water Consumption (m ³)	3.98
Batching Water (m ³)	0.17
Washing Water (m ³)	0.13
Nonrenewable Material Resource Consumption (kg)	1,238
Renewable Material Resource Consumption (kg)	1.05
Nonrenewable Waste Production (kg)	0.01
Nonrenewable Waste Production (kg)	0.01

Product Components: natural aggregate (ASTM C33), cement (ASTM C150), batch water (ASTM C150), admixture (ASTM C494), admixture (ASTM C494)

COMPANY
Hooker Creek Companies, LLC
95 SW Scale House Loop Ste100
Bend, OR 97702

PLANT
Bend Plant
95 SW Scale House Loop Ste100
Bend, OR 97702

EPD PROGRAM OPERATOR
ASTM International
100 Bar Harbor Drive
West Conshohocken, PA 19388

DATE OF ISSUE
01/16/2019 (valid for 5 years until 01/16/2024)

The Carbon Leadership Forum PCR Product Category Rules (PCR) for ISO 14025 Type 3 Environmental Product Declarations (EPDs) for Concrete, Version 1.1 dated 12/4/2013, serves as the PCR for this EPD. (<http://www.carbonleadershipforum.org>)

PCR review was conducted by Nicholas Sarmiento - Shinkop (formerly PE International)

Independent verification of the declaration, according to ISO 14025:2008: Internal external

Third party verifier: Thomas P. Gloria (tgloia@industrial-ecology.com) - Industrial Ecology Consultants

LCA and EPD developer: Laurel McEwen (laurel.mcewen@climateearth.com) - Climate Earth

HOOKER CREEK COMPANIES, LLC
95 SW Scale House Loop Ste100
Bend, OR 97702
541-462-1442

95 SW Scale House Loop Ste100
Bend, OR 97702
541-462-1442

Hooker Creek



Reimbursements:

- \$2,500 / plant

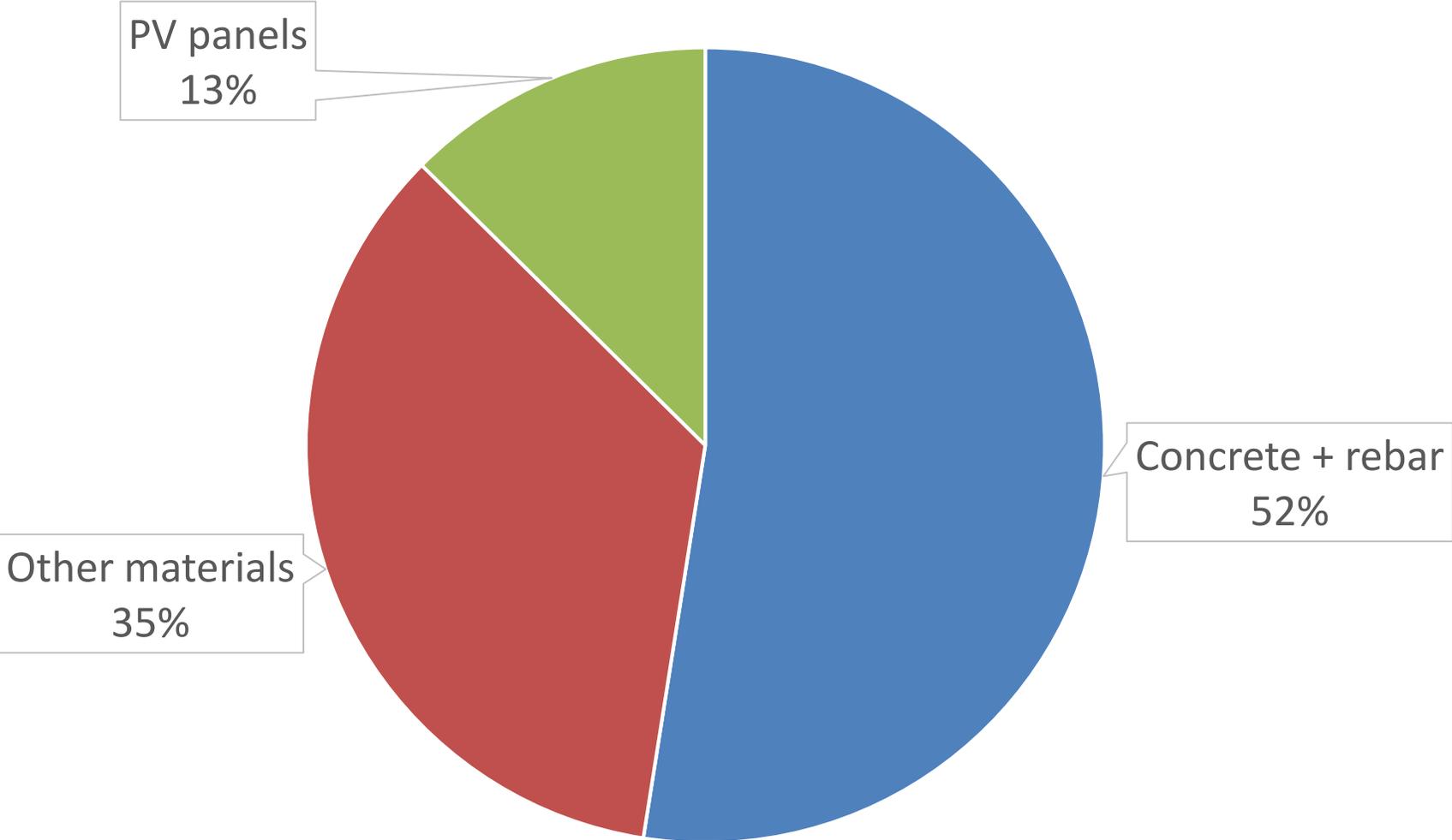
How are EPDs being used?

Oregon Department of Treasury – new construction



Lifecycle embodied carbon of select materials – Treasury Building (DRAFT)

(foundation/structure/enclosure)



Low carbon concrete-related policies

City of Portland - Concrete Procurement Policy



- Jan 1, 2020 - Require concrete EPDs on all City projects
- April 1, 2021 – City publishes global warming potential threshold
- Jan 1, 2022 – All EPDs must be below threshold

Policy: <https://www.portlandoregon.gov/bfrs/article/731696>

Response to Comments: <https://www.portlandoregon.gov/bfrs/article/731698>

EPDs for public purchasing

BUY 
CLEAN



EPDs required for:

- Structural steel
- Re-bar steel
- Mineral wool insulation
- Flat glass

Other State Efforts:

- Oregon
- Washington
- Minnesota
- New York

Federal Efforts:

- Buy clean Procurement Requirements

Thanks Oregon Sustainability Board!

OSB played a crucial role in:

- Convening
- Endorsing research
- Connecting partners



materials management

conserving resources · protecting the environment · living well

Jordan Palmeri | jordan.palmeri@state.or.us

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