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16 March 2017

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Guidance for Sustainable Supply Chain Practices and Environmental Product Declarations

We are pleased to present the following guidance aimed at fostering a more sustainable supply chain and incentivizing collaboration with Melbourne Water on sustainable initiatives, particularly those contributing to a circular economy.

As significant purchasers of construction materials and consequently contributors to Scope 3 carbon emissions, Melbourne Water Corporation (MWC) endeavors to promote responsible sourcing practices and enhance carbon data transparency within the Australian context. Recognizing the challenges associated with determining local Emission Factors (EFs) for major construction materials, MWC emphasizes the importance of Environmental Product Declarations (EPDs) to ascertain the carbon footprint of products and other pertinent environmental information.

The purpose of this addendum is to provide comprehensive guidance on EPD development, as well as to delineate packaging standards and protocols.

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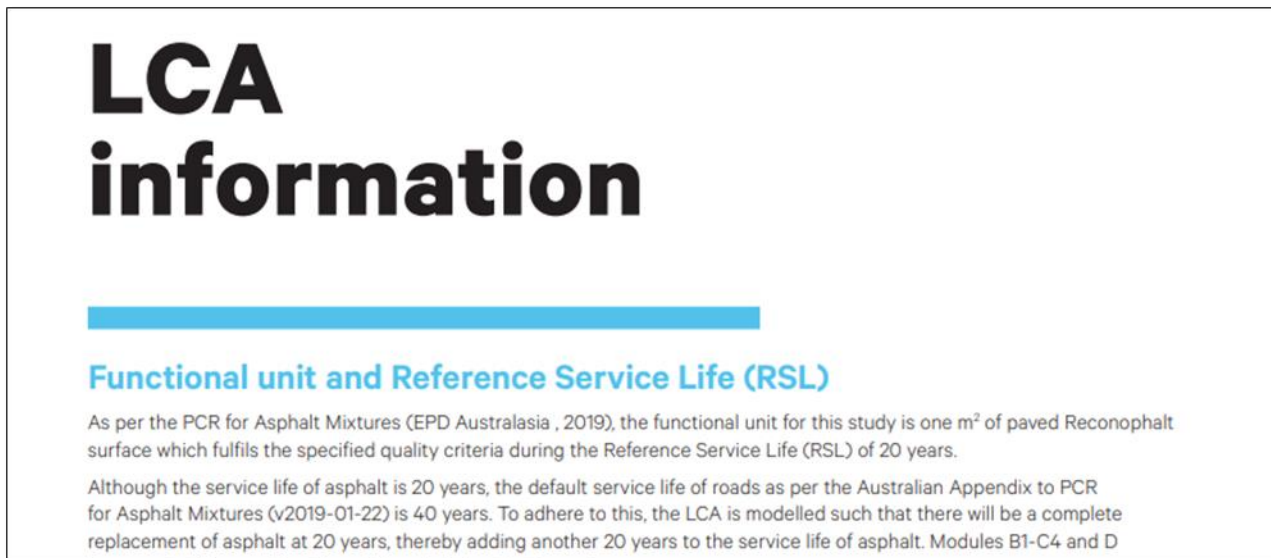
EPD Development Guidelines:

The following EPD guidance has been formulated to ensure that EPDs produced adhere to consistent high standards, are easily accessible, fit-for-purpose, and are compatible with various certification schemes such as ISC and Greenstar. While Melbourne Water does not directly align with these schemes, it is imperative to note that other infrastructure providers and tender processes may necessitate such certifications. Therefore, EPDs should be designed to maximize marketability across multiple sectors.

Requirements for EPDs:

EPDs submitted by suppliers for Melbourne Water projects must include the following information:

1. An easily readable summary table: EPDs should feature a concise summary table to facilitate comprehension. For example, the Downer Reconophalt SA EPD specifies its functional unit as per square meter (m²), however, it lacks a conversion factor from m² to weight. This omission poses challenges when comparing products or calculating emission factors related to transportation, which are contingent upon the weight being transported.



[Figure 1: : Excerpt from Downer Reconophalt SA EPD p4]

2. Provision of multiple yardsticks to ensure that various users of the EPD are provided with the required accurate, product specific information such as [PaveX EPD](#) (excerpt from p 7)

Product Weights					
Product Line	Product/Part Code	Description	Length (mm)	Weight each (kg)	Weight per m (kg)
PaveX™ Crack-A-Joint™	PXCAJ25B	PaveX™ Crack-A-Joint™ 25mm x 3000mm, Black	3000	0.511	0.170
PaveX™ Crack-A-Joint™	PXCAJ25G	PaveX™ Crack-A-Joint™ 25mm x 3000mm, Grey	3000	0.511	0.170
PaveX™ Crack-A-Joint™	PXCAJ38B	PaveX™ Crack-A-Joint™ 38mm x 3000mm, Black	3000	0.731	0.244
PaveX™ Crack-A-Joint™	PXCAJ38G	PaveX™ Crack-A-Joint™ 38mm x 3000mm, Grey	3000	0.731	0.244
PaveX™ Crack-A-Joint™	PXCAJ CJ	PaveX™ Crack-A-Joint™ Joiner, 200mm	200	0.02	0.100
PaveX™ Expanda™	PX100KIT	PaveX™ Expanda™ 100mm x 3000mm Assembly	3000	11.76	3.920
PaveX™ Expanda™	PX125KIT	PaveX™ Expanda™ 125mm x 3000mm Assembly	3000	11.955	3.985
PaveX™ Expanda™	3PX100	PaveX™ Expanda™ Panel, 100mm x 3000mm	3000	1.04	0.347
PaveX™ Expanda™	3PX125	PaveX™ Expanda™ Panel, 125mm x 3000mm	3000	1.235	0.412
PaveX™ Expanda™	3PXCAP	PaveX™ Expanda™ Capping	3000	0.79	0.263
PaveX™ Expanda™	3PXD14	PaveX™ Expanda™ 14mm x 240mm GFRP Round Dowel	240	0.5	0.167
PaveX™ Expanda™	CKP0001	PaveX™ Expanda™ Dowel Sleeve	N/A	0.14	N/A
PaveX™ Expanda™	PX100C	PaveX Expanda™ End Cap, 100mm	100	0.009	0.090
PaveX™ Expanda™	PX125C	PaveX Expanda™ End Cap, 125mm	125	0.011	0.088
PaveX™ Expanda™	3PXSTB	PaveX™ Expanda™ Stake Bracket	N/A	0.16	N/A
PaveX™ Expanda™	3PXJPT	PaveX™ Expanda™ Joiner Plate	N/A	0.12	N/A
PaveX™ Expanda™	3PXFTB	PaveX™ Expanda™ Foot	N/A	0.29	N/A
PaveX™ Expanda™	3PXSTK	PaveX™ Stake, 350mm, Galv	350	0.215	0.072

Figure 2: Excerpt from [PaveX EPD](#)

- EPD must be developed with utilisable yardsticks that are appropriate for use in carbon modelling and which designers and contractors are able to utilise for optioneering between similar products. Some examples provided below, but it is not an exhaustive list.

Table 1: Yardstick requirements for EPDs

Asset	Mandatory yardstick	Additional yardstick
Pipes & Cables	Defined diameter, per m length	Per kg
Pumps (and most mechanical and electrical equipment)	kW rating	
Blowers	kW rating and m3/h	Per kg
Concrete	Per Tonne, per m3	
Cables	Defined diameter, per m length	Per kg
Floor tiles	m2	Per kg
Tanks (circular)	Diameter, m3	Height

- EPDs must align with the current [General Programme Instructions](#), [PCR 2019:14 Construction products](#) and ISO 14040, ISO 14044 and ISO 14025. These standards

are reviewed periodically, therefore ensure that the EPD produced abide by the most recent relevant standards, and a summary is provided in Table 2.

5. The EPD must include the following information to ensure that data can be used to build other relevant models, and further costs are not incurred as a result of requesting further information from the EPD providers.
 - Density of the product
 - Reference service life
6. The EPD to include the relevant life cycle and environmental impacts as required by EN 15804 + A2:2019 and EN 15804 + A1 standards, as described in T 3, T4 and T5 respectively.

Table 2: Summary of standards

Parameter	EN 15804 + A2	EN 15804 + A1
Environmental Impact	Potential environmental impact – mandatory indicators	Additional mandatory impact indicators
Resource	Resource use indicator	
Waste	Waste indicators	
Output flow	Output flow indicators	
Other Environmental Assessment Schemes		<p>This enables EPD readers, ISC and Green Star ratings modellers, to utilise impact indicators aligned with the EN15804+A1 standard, which is still employed by ISC and Green Star rating systems in Australia.</p> <p>This standard provides environmental impact outcomes that align with Infrastructure Sustainability Council (ISC) and Green Star rating schemes. Whilst MWC does not partake in either of these schemes, the manufacturer/supplier of the product may desire to include these to further their cause.</p> <p>Additional voluntary impact indicators according to EN 15804+A1: 2013, for ISC and Green Star ratings (Table 5)</p> <p>Additional voluntary impact indicators in accordance with Green Star v1.3 (EN 15804+A1: 2013) (optional for Green Star ratings)</p>

Table 3: Life Cycle Impact, Resource and Waste Assessment Categories, Measurements and Methods accordance with EN15804+A2: 2019 standard

Impact Category	Abbreviation	Measurement Unit
Potential environmental impact		
Global warming potential (fossil)	GWP - Fossil	kg CO ₂ equivalents (GWP100)
Global warming potential (biogenic)	GWP - Biogenic	kg CO ₂ equivalents (GWP100)
Land use/ land transformation	GWP - Luluc	kg CO ₂ equivalents (GWP100)
Total global warming potential	GWP - Total	kg CO ₂ equivalents (GWP100)
Acidification potential	AP	mol H ⁺ eq.
Eutrophication – aquatic freshwater	EP - freshwater	kg P equivalent
Eutrophication – aquatic marine	EP - marine	kg N equivalent
Eutrophication – terrestrial	EP – terrestrial	mol N equivalent
Photochemical ozone creation potential	POCP	kg NMVOC equivalents
Abiotic depletion potential (elements)*	ADPE	kg Sb equivalents
Abiotic depletion potential (fossil fuels)*	ADPF	MJ net calorific value
Ozone depletion potential	ODP	kg CFC 11 equivalents
Water Depletion Potential*	WDP	m ³ equivalent deprived
Global warming potential, excluding biogenic uptake, emissions and storage**	GWP-GHG	kg CO ₂ equivalents (GWP100)
Resource use		
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ, net calorific value
Use of renewable primary energy resources used as raw materials	PERM	MJ, net calorific value
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	PERT	MJ, net calorific value
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ, net calorific value
Use of non- renewable primary energy resources used as raw materials	PENRM	MJ, net calorific value
Total use of non- renewable primary energy resources (primary energy and primary energy resources used as raw materials)	PENRT	MJ, net calorific value
Use of secondary material	SM	kg
Use of renewable secondary fuels	RSF	MJ, net calorific value
Use of non-renewable secondary fuels	NRSF	MJ, net calorific value
Use of net fresh water	FW	m ³
Waste categories		
Hazardous waste disposed	HWD	kg
Non-hazardous waste disposed	NHWD	kg

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Impact Category	Abbreviation	Measurement Unit
Radioactive waste disposed/stored	RWD	kg
Additional environmental impact indicators		
Particulate matter	Potential incidence of disease due to PM emissions (PM)	Disease incidence
Ionising radiation - human health	Potential Human exposure efficiency relative to U235 (IRP)	kBq U-235 eq
Eco-toxicity (freshwater)*	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	CTUe
Human toxicity potential - cancer effects*	Potential Comparative Toxic Unit for humans (HTP-c)	CTUh
Human toxicity potential - non cancer effects*	Potential Comparative Toxic Unit for humans (HTP-nc)	CTUh
Soil quality*	Potential soil quality index (SQP)	dimensionless

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

*** This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.*

¹ Method to calculate Cumulative Energy Demand (CED), based on the method published by Ecoinvent version 2.0 and expanded by PRé Consultants for raw materials available in the SimaPro database.

² Calculated based on the lower hearing value of renewable raw materials.

³ Calculated based on the lower hearing value of non-renewables raw materials.

⁴ Calculated as sum of Non-renewables, fossil, Non-renewable, nuclear and Non-renewable, biomass.

⁵ Calculated as sum of Bulk waste and Slags/ash

Table 4: Environmental impact indicators in accordance with EN15804+A1:2013 standard (for ISC and Green Star ratings)

Impact Category	Abbreviation	Measurement Unit (eq. = equivalence)
Global warming potential (GWP100)	GWP	kg CO ₂ eq.
Ozone depletion potential	ODP	kg CFC 11 eq.
Acidification potential	AP	kg SO ₂ e eq.
Eutrophication potential	EP	kg PO ₄ ³⁻ eq.
Photochemical ozone creation potential	POCP	kg C ₂ H ₄ eq.
Abiotic depletion potential for non-fossil resources	ADPE	kg Sb eq.
Abiotic depletion potential for fossil resources	ADPF	MJ net calorific value

Table 5: Environmental impact indicators in accordance with EN15804+A1:2013 standard (optional for Green Star ratings)

Impact Category	Abbreviation	Measurement Unit (eq. = equivalence)
Human toxicity cancer	HTPc	CTUh
Human toxicity noncancer	HTPnc	CTUh
Land use	LU	kg C deficit-eq.
Resource depletion - water	RDW	m ³
Ionising radiation	IR	kBq U-235-eq.
Particulate matter	PM	kg PM _{2.5} -eq.

We trust that these guidelines will serve as a valuable resource for our esteemed suppliers as we collectively strive towards fostering sustainability and environmental stewardship within the supply chain.

Should you have any queries or require further clarification on any aspect of this guidance, please do not hesitate to contact [Name, Title, Contact Information].

Thank you for your continued partnership and commitment to sustainability.

Yours sincerely

Name

Position