DIAGNOSTIC REPORT

COMPARATIVE ANALYSIS OF CO_2 IMPACT FOR 4001-5000 PSI CONCRETE (27.6-34.5 MPA)
EXAMPLE PROJECT

RECIPIENT **Customer ABC**
customerabc@email.com

ADDRESS Customer ABC
3958 Ruger Drive Royse City
75189

DATE 16/05/2024
AUTHOR Chryso
EMAIL info@chrysoinc.com

OVERALL RESULTS PER M³ OF CONCRETE

REFERENCE MIX DESIGN

CO_2 Impact
254
($kgCO_2eq/m^3$)

LOW CARBON MIX DESIGN

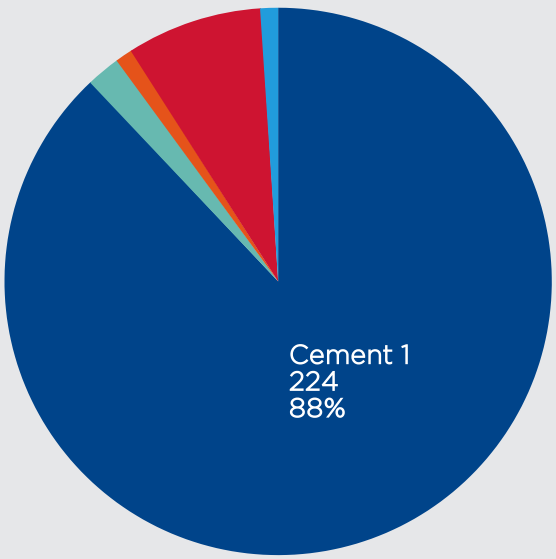
CO_2 Impact
152
($kgCO_2eq/m^3$)

-102
($kgCO_2eq/m^3$)
-40%

COMPARISON OF THE 2 MIX DESIGNS BREAKDOWN

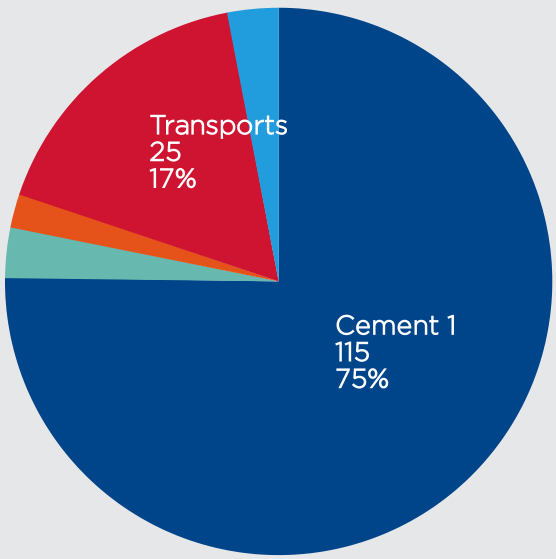
Breakdown of environmental impact comparison results by material.
All values are expressed in $kgCO_2eq/m^3$ and in percentage.

REFERENCE MIX DESIGN - 254 $KGCO_2EQ/M^3$



- Cement 1 : 88% - 224 $kgCO_2eq/m^3$
- Aggregates : 2% - 5 $kgCO_2eq/m^3$
- Admixtures : 1% - 3 $kgCO_2eq/m^3$
- Transports : 8% - 21 $kgCO_2eq/m^3$
- Other cementitious materials : 1% - 2 $kgCO_2eq/m^3$

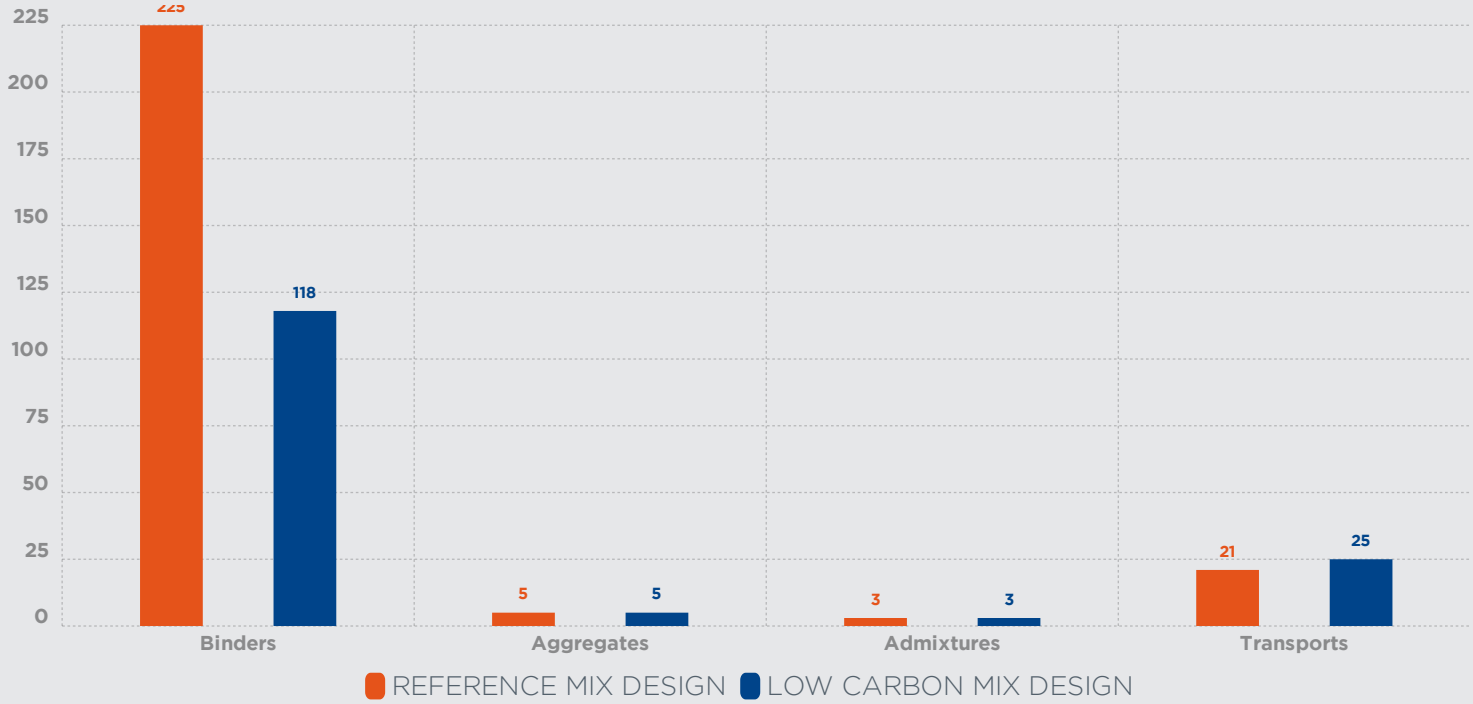
LOW CARBON MIX DESIGN - 152 $KGCO_2EQ/M^3$



- Cement 1 : 76% - 115 $kgCO_2eq/m^3$
- Aggregates : 3% - 5 $kgCO_2eq/m^3$
- Admixtures : 2% - 3 $kgCO_2eq/m^3$
- Transports : 17% - 25 $kgCO_2eq/m^3$
- Other cementitious materials : 3% - 4 $kgCO_2eq/m^3$

ENVIRONMENTAL IMPACT COMPARISON OF THE MATERIALS OF THE 2 MIX DESIGNS

Histogram showing the detail of the environmental impact of the two mix designs by material.
All values are expressed in kgCO₂eq/m³.



WATER CONSUMPTION

Water consumption comparison.
W/C is the ratio between water consumption and cements quantity.

REFERENCE MIX DESIGN

240 LB
W/C = 0.36

LOW CARBON MIX DESIGN

255 LB
W/C = 0.48

MIX DESIGNS EVALUATED COSTS COMPARISON

(In $ per M³ of concrete)

REFERENCE MIX DESIGN

0 $

LOW CARBON MIX DESIGN

0 $
0 $ (NaN%)

**no data entered for example*

TRANSPORTATION ENVIRONMENTAL IMPACT

Breakdown of the transportation environmental impact by transport type and by material.
Values are expressed in miles and kgCO₂eq/m³

REFERENCE MIX DESIGN

Trucking	685 miles 21 kgCO₂eq/m³	
Cement 1	0 miles 0 kgCO₂eq/m³	
Aggregates	88 miles 19 kgCO₂eq/m³	
Admixtures	447 miles 0.04 kgCO₂eq/m³	
Other cementitious materials	150 miles 2.28 kgCO₂eq/m³	

LOW CARBON MIX DESIGN

Trucking	685 miles 25 kgCO₂eq/m³	
Cement 1	0 miles 0 kgCO₂eq/m³	
Aggregates	88 miles 20 kgCO₂eq/m³	
Admixtures	447 miles 0.04 kgCO₂eq/m³	
Other cementitious materials	150 miles 5.21 kgCO₂eq/m³	

REFERENCE MIX DESIGN

Total
21
(kgCO₂eq/m³)
685 miles

LOW CARBON MIX DESIGN

Total
25
(kgCO₂eq/m³)
685 miles

CO₂ Impact
+4
(kgCO₂eq/m³)

DETAILED COMPOSITION OF THE MIX DESIGNS AND THEIR ENVIRONMENTAL IMPACT

	REFERENCE MIX DESIGN		LOW CARBON MIX DESIGN	
	Quantity (lb/yd³)	*CO_2 Impact* ($kgCO_2eq/m^3$)	*Quantity* (lb/yd³)	*CO_2 Impact* ($kgCO_2eq/m^3$)
Cement 1	Type 1L Cement 550	223.5	Type 1L Cement 282	114.6
Mineral additions 1	GGBS 110	1.7	GGBS 252	3.9
Aggregate 1	AASHTO #8 (3/8) Crushed aggregates coarse & fine (ASTM C33) 1807	2.7	AASHTO #8 (3/8) Crushed aggregates coarse & fine (ASTM C33) 1787	2.7
Aggregate 2	Concrete sand Crushed aggregates coarse & fine (ASTM C33) 1292	1.9	Concrete sand Crushed aggregates coarse & fine (ASTM C33) 1500	2.2
Water	240	0	255	0
Admixture 1	Adva 1	1.6	Adva 0.7	1.1
Admixture 2	Air entrainers 0.1	0	Concera 8080 0.7	1
Admixture 3	Water reducers 1	1.1	Water reducers 0.8	0.9
Transport		21.1		25.2
Total	4001.1	253.6	4078.2	151.6

REFERENCES

The table below displays the details of the values used to calculate the environmental impact comparison of the two mix designs, as well as their costs.

Material	*Source*	*CO_2 Impact* $kgCO_2eq$ / mt *or $kgCO_2eq$ per mt/mi for transports*	*Cost* $/lb
Type 1L Cement	https://pcr-epd.s3.us-east-2.amazonaws.com/571.EPD_FOR_AshGrove_EPD-Type_IL_Seattle_Athena.pdf	685	0
GGBS		26	0
Adva	Internal EPD - EPD verification pending	2710	0
Air entrainers		527	0
Water reducers		1880	0
Crushed aggregates coarse & fine (ASTM C33)		2.51	0
Trucking		465	0
Concera 8080	Internal LCA - EPD being verified	2590	0