



ACN 009 253 187

**AUSTRALIAN SECURITIES EXCHANGE ANNOUNCEMENT**

**27 MAY 2022**

**COLORADO DEPARTMENT OF TRANSPORTATION  
INTERSTATE 70 VAIL PASS PAVING TRIAL UPDATE**

Please see attached an ASX Announcement by Eden Innovations Ltd (ASX: EDE) for further details.

**Background**

Tasman through its wholly owned subsidiary, Noble Energy Pty Ltd, holds 684,534,029 fully paid shares in Eden representing 29.56% of the total issued capital of Eden Innovations Ltd.

A handwritten signature in black ink, appearing to read "A. Gates", with a long horizontal line extending to the right.

Aaron Gates  
Company Secretary



Innovations that work.™

ACN 109 200 900

## AUSTRALIAN SECURITIES EXCHANGE ANNOUNCEMENT

27 May 2022

### Colorado Department of Transportation Interstate 70 Vail Pass Paving Trial Update

#### The Trial

As previously announced on 15 June 2021 by Eden Innovations Ltd (“Eden”)( ASX: EDE), in early May 2021, the culmination of several long years of planning, design, and preparation came to fruition when the Colorado Department of Transportation (CDOT) completed the Portland cement concrete paving trial in Summit County. CDOT collaborated with Peak Materials, the American Concrete Pavement Association (ACPA), Eden Innovations, and IHC Scott to plan and execute the trial to evaluate three concrete mix designs at ~10,000 feet (~3050 meters) elevation, with the reference being placed first, followed by the EdenCrete® enriched section and then by the silica fume enriched section.

Historically, CDOT’s high-altitude designs required asphalt pavement due to its flexibility, ease of placement and repair, and cost. Their arguments against concrete pavement are increased cost, long construction cycles, and extended lane closures creating unsafe traffic conditions. The soil in the mountains is notorious for movement under load, and a more flexible material such as asphalt pavement has always been assumed to perform better regarding crack resistance than concrete .

Typically, high mountain passes like Vail Pass expose pavements to severe winter weather and freeze-thaw cycles that require the application of harsh de-icer chemicals. Coupled with this, semi-truck chains and passenger vehicles with studded snow tyres for driving safely in icy conditions create pavement rutting, a dangerous safety hazard for the motoring public.

The argument presented to support this trial is that CDOT should use concrete pavement instead of asphalt, as the time until repair or replacement is required will be greatly extended. The longer lifespan will offset the increased upfront cost of concrete construction, allowing it to become competitively priced with asphalt. CDOT is evaluating EdenCrete® as the tool to accomplish this. This is the first time CDOT has placed concrete on Interstate 70 (I-70) near Vail (CDOT Region 3).

CDOT decided to evaluate three mixes: a control mix, a silica fume mix, and a mix dosed with EdenCrete®. They specified a 4500 psi (31 MPa) exterior paving mix as the base design for the control. Their second mix used the same control mix but replaced 7% of the cement with silica fume. The third mix included EdenCrete® at 2 gal/yd<sup>3</sup> (9.9 l/m<sup>3</sup>) without silica fume. The three concrete trial sections of the pavement

#### Evaluation Criteria

The concrete pavement sections will be evaluated over time for surface wear, cracking, scaling, and rutting.

#### Placement Details

The general contractor, IHC Scott (Merger between Interstate Highway Construction and Scott Contracting), provided the milling and paving.

Peak Materials was the concrete supplier which also undertook the preliminary testing of the three concrete mixes to ensure they all met the 12-hour early strength requirement of 3000 psi.

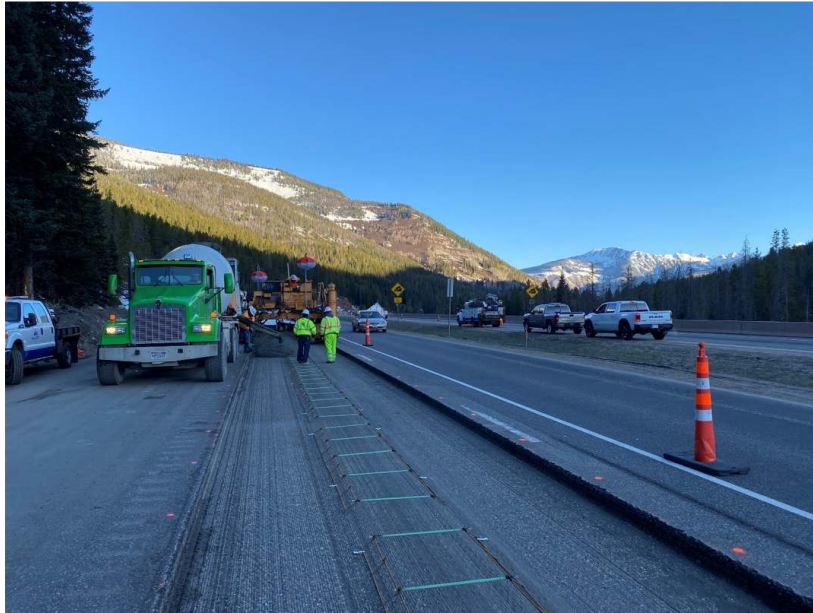
IHC Scott placed approximately 600 yd<sup>3</sup> (460 m<sup>3</sup>) of concrete at a thickness of 6 inches (15 cm) in the drive lane at Mile Marker 184 on eastbound I-70. Each of the three mixes were placed in approximately 200 yd<sup>3</sup> (153 m<sup>3</sup>) increments that were laid over ~1000 linear feet (305 meters) (see Figures 1-3 below).



**Figure 1 – Vail Pass Summit on I-70**



**Figure 2- Placing portion of the concrete pavement at night**



**Figure 3- Placing portion of the concrete pavement during the day**

### **Future Objectives**

High-altitude highway pavement has always been challenged by the environment. With the first concrete placement now completed on Vail Pass, successful performance by the EdenCrete® pavement will support the possible future use of concrete pavement in these extreme conditions, not only for Colorado, but also for other mountainous states.

Using concrete in place of asphalt will help to minimize rutting and provide ancillary benefits to public safety. The extended service life of concrete (vs. asphalt) pavement could potentially save millions of dollars for DOTs in mountainous regions of the USA.

### **Trial Evaluation**

The trial evaluation is scheduled to take place over three years.

In Augusta, Georgia, between August 2015 and the end of 2016, an EdenCrete®-enhanced concrete mix was first trialled against the standard concrete mix in concrete highway pavement repairs on the Interstate Highway I-20, and photographs of the respective trial sections taken at periodic intervals provided very clear evidence of the comparative performance benefit delivered by the EdenCrete®.

Based upon this experience, Eden decided to undertake its own assessments on an annual basis and to visually record the progressive deterioration of the three sections of pavement after it has been in service for 1, 2, and 3 years and to incorporate the periodic data in a report that will be shared with all relevant parties, including CDOT as well as any other Departments of Transportation in other US states.

The first of these annual assessments was recently completed and the details of the assessment together with the photographic record are set out below. Similar follow-up assessments by Eden will occur in both May in 2023 and May 2024.

### **Eden's 1-Year In-Service Evaluation**

After 1 year of use, which included an entire winter, the three pavement sections are already reflecting the impacts of both nature and the heavy traffic use on a major Interstate Highway. Eden recently conducted a visual evaluation to assess the pavement performance across five modes of deterioration, and plans to repeat this in May 2023 and again in May 2024:

- Scaling and surface ablation due to abrasion

- Aggregate pop outs and pitting
- Cracking
- Joint rot
- Rutting

Table 1 below summarizes the performance metrics over the first year for all three pavement sections, which are shown in Figures .

Pavement	Scaling/Abrasion	Pop Outs/Pitting	Cracking	Joint Rot	Rutting
Reference	Yes	Yes	Yes	Yes	Yes
EdenCrete®	Yes	No	No	No	No
Silica Fume	Yes	Yes	Yes	Yes	No

**Table 1**

Photographs (see Figures 4-20) were all taken by Eden on 10 May 2022, approximately 1 year from the placement date on 5 May 2021. These photos have been labelled and categorized into:

- Section 1-Reference mix pavement (Figures 4-10),
- Section 2-EdenCrete mix pavement (Figures 11-15), and
- Section 3- Silica Fume mix pavement (Figures 16-20).

All three concrete sections were photographed in the same areas: the beginning, middle, and end of each section. As shown in the table above, all three sections of concrete were evaluated for surface abrasion due to ablation, scaling, aggregate pop outs, joint rot and rutting, with the relative performance of the three trial sections being clearly evident from these photographs.

#### **Reference Pavement Assessment**

The Reference pavement has clearly deteriorated the most, as is reflected in the summary table with a ‘yes’ for all modes of deterioration and also in Figures 4-10.

Considering the pitting, small potholes, and shallow rutting already occurring, this section of pavement could require repair as it continues to deteriorate to a level which is unsafe for public and commercial vehicle traffic. The top surface of the pavement has abraded below the surface of the coarse aggregate from edge to edge and along the entire length of the reference section. There is a large crack across one section of the reference pavement and there is damage from snow chains across the entire surface.

#### **EdenCrete® Pavement Assessment**

The EdenCrete® pavement is performing well and demonstrating superior durability over the reference and the silica fume sections. This is reflected also in the summary table, and figures 11-15, with only one ‘yes’ out of 5 modes of deterioration. The EdenCrete® pavement has not cracked and is showing no signs of scaling or joint rot, however, the surface has been abraded down into the coarse aggregate. Although abrasion has begun to occur, the pavement is still in good condition and is expected to continue to perform well in service.

#### **Silica Fume Pavement Assessment**

The silica fume pavement has also deteriorated significantly, as is also reflected in the summary table with a ‘yes’ for 4 of 5 modes of deterioration, and also in Figures 16-20. Similar to the reference, the top surface of the pavement has scaled to the point of delamination and the surface has abraded below the surface of the coarse aggregate across the entire surface. There is also a large crack across one section of the silica fume pavement. Snow chains are also damaging the surface to the point of rutting.



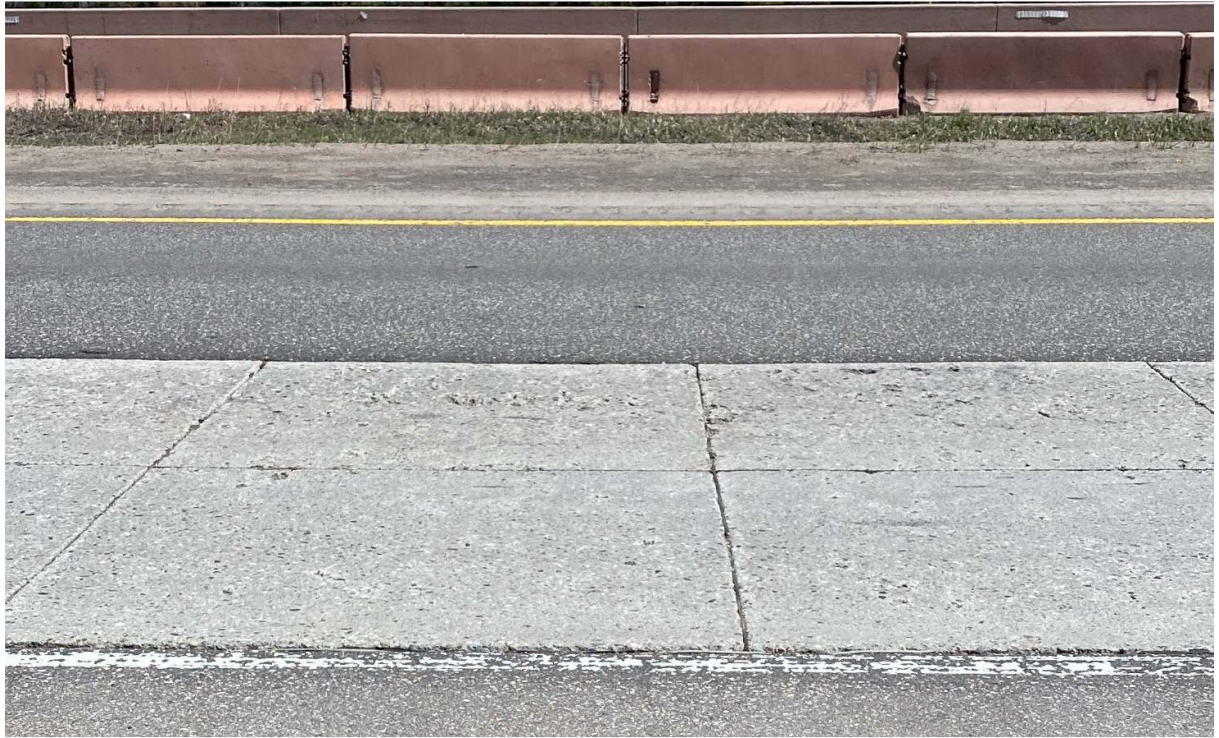
**Figure 4**

Beginning-Section Reference Slab -12 months

Top concrete surface worn off, Cracking, Scaling, Surface Aggregate Pop Outs, Rutting, Joint Rot



**Figure 5**  
Beginning-Section Reference Slab -12 months  
Top concrete surface worn off, Cracking, Scaling, Surface Aggregate Pop Outs, Rutting, Joint Rot



**Figure 6**  
Mid -Section Reference Slab -12 months  
Scaling, Surface Damage, Pitting and Aggregate Pop Outs, Rutting, Joint Rot





**Figure 7**  
Mid-Section Reference Slab -12 months  
Close up Figure 3 Scaling, Surface Damage, Pitting and Aggregate Pop Outs



**Figure 8**  
Mid-Section Reference Slab -12 months  
Close up Figure 3 Severe Surface Damage, and Joint Rot



**Figure 9**  
Mid-Section Reference Slab -12 months  
Scaling, Surface Damage, and Joint Rot



**Figure 10**  
End-Section Reference Slab - 12 months  
Scaling, Surface Damage Aggregate Pop Outs



**Figure 11**

Beginning-Section EdenCrete® Slab - 12 months

Top concrete surface partially worn off, No Scaling, No Surface Damage, No Pitting and Aggregate Pop Outs, No Rutting, No Joint Rot



**Figure 12**

Mid-Section EdenCrete® Slab – 12 months

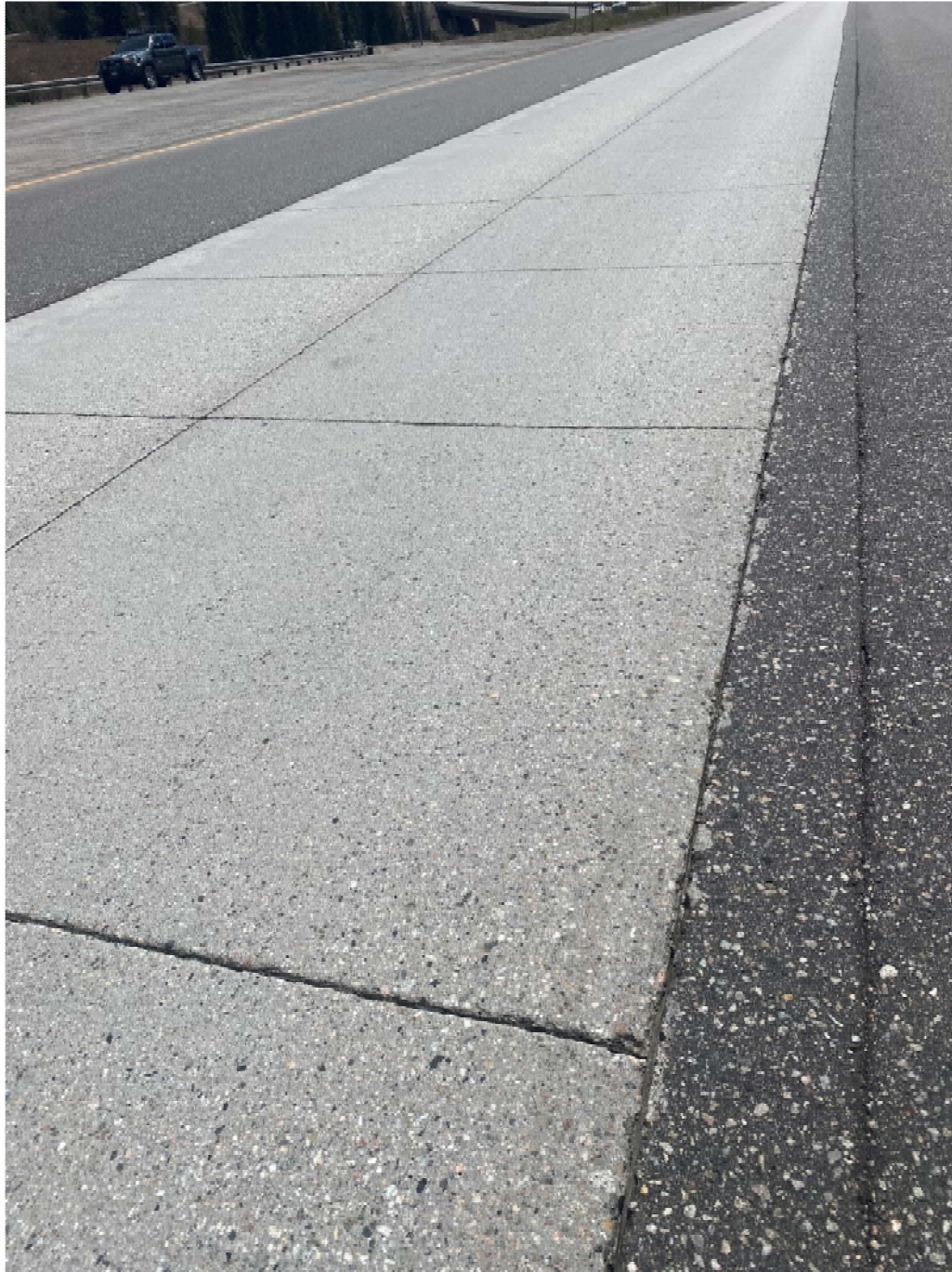
Top concrete surface partially worn off, No Scaling, No Surface Damage, No Pitting and Aggregate Pop Outs, No Rutting, No Joint Rot



**Figure 13**

Mid-Section EdenCrete® Slab - 12 months

Top concrete surface partially worn off, No Scaling, No Surface Damage, No Pitting and Aggregate Pop Outs, No Rutting, No Joint Rot



**Figure 14**

End-Section EdenCrete® Slab -12 months

Top concrete surface partially worn off, No Scaling, No Surface Damage, No Pitting and Aggregate Pop Outs, No Rutting, No Joint Rot





**Figure 15**

End-Section EdenCrete® Slab – 12 months

Top concrete surface partially worn off, No Scaling, No Surface Damage, No Pitting and Aggregate Pop Outs, No Rutting, No Joint Rot



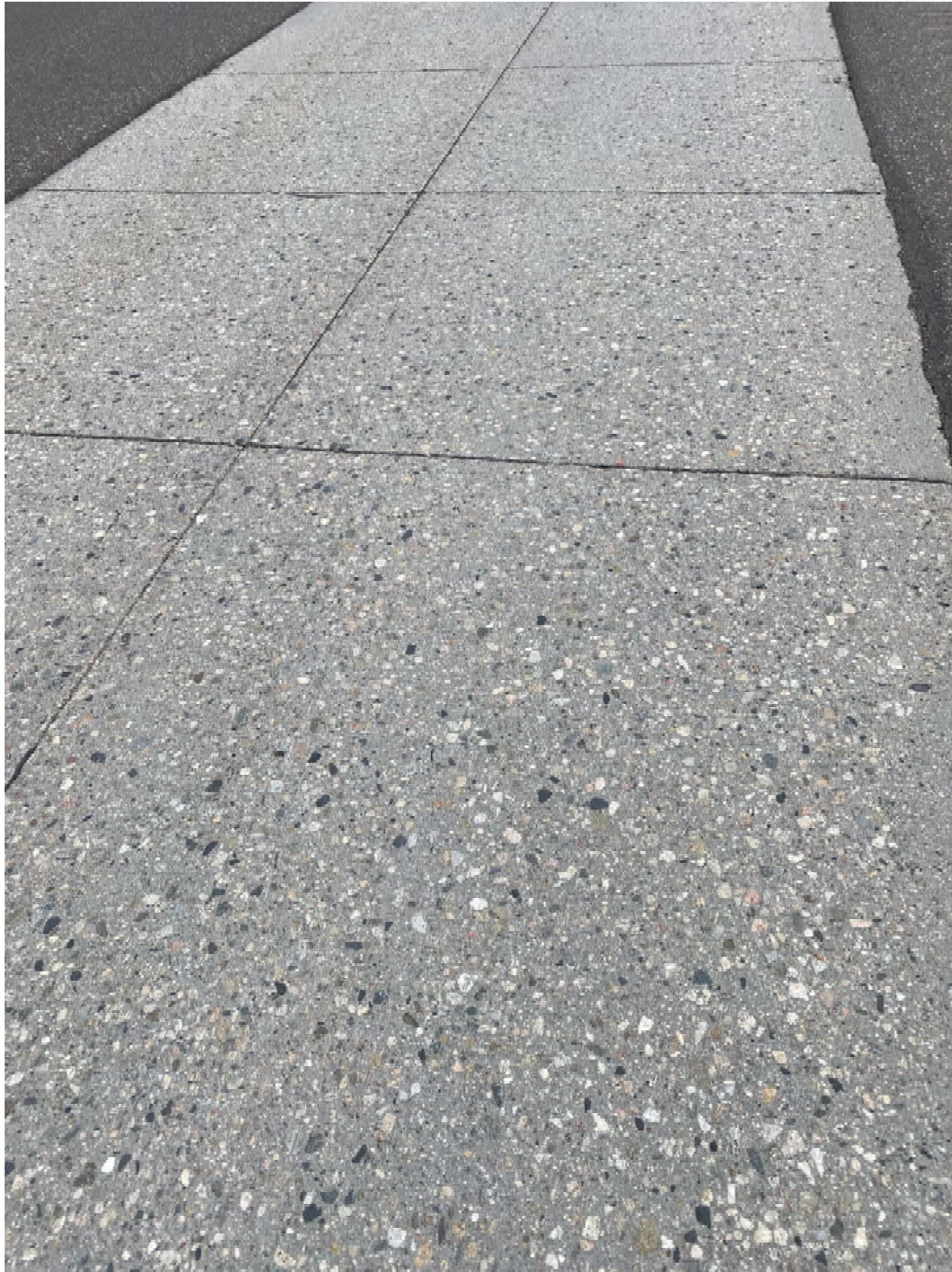
**Figure 16**  
Beginning-Section Silica Fume Slab – 12 months  
Top concrete surface worn off, Scaling, Cracking, Pitting and Aggregate Pop Outs, Joint Rot



**Figure 17**

Beginning-Section Silica Fume Slab - 12 months

Top concrete surface partially worn off, Scaling, Cracking, Pitting and Aggregate Pop Outs, Joint Rot



**Figure 18**  
Mid-Section Silica Fume Slab - 12 months  
Top concrete surface worn off, Scaling, Pitting and Aggregate Pop Outs



**Figure 19**  
End-Section Silica Fume Slab - 12 months  
Top concrete surface partially worn off, Scaling, Pitting and Aggregate Pop Outs, Joint Rot



**Figure 20**

End-Section Silica Fume Slab - 12 months

Top concrete surface partially worn off, Scaling, Pitting and Aggregate Pop Outs, Joint Rot

## **CONCLUSION**

The clearly demonstrated, superior performance that delivered by the EdenCrete®-enhanced concrete in the first 12 months of a 3-year trial in such harsh service conditions, is highly encouraging. Based upon its longer-term performance in other projects, the EdenCrete® concrete is likely to continue to outperform the other slabs over the 3 years.

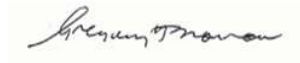
Such an achievement is likely to be great assistance to Eden in its efforts to extend the existing EdenCrete® market footprint further into the highways and bridges through state and federal Departments of Transportation, and into the broader US infrastructure market.

## **EdenCrete® - BACKGROUND**

*EdenCrete® and EdenCrete®Pz are Eden's 100% owned, proprietary carbon-strengthened concrete additives that enhances a wide range of performance characteristics of the concrete including compressive strength, flexural strength, tensile strength, abrasion resistance, reduced permeability, increased modulus of elasticity, and reduced shrinkage, delivering stronger, tougher, more durable and longer lasting concrete.*

*One of the primary target markets for EdenCrete® is improving the performance of concrete used in the construction and maintenance of buildings, concrete roads, bridges and other infrastructure, particularly*

*where it is subject to heavy wear, freeze/thaw weather conditions and/or high levels of added salt. Additionally, it is already in use in the USA in many other concrete applications including high-rise building construction, marine and coastal applications, water storage and pipelines, hardstand areas, warehouses, shotcrete applications and pre-stressed and pre-cast concrete structures and products.*

A handwritten signature in black ink, appearing to read "Gregory H. Solomon", is centered on a light yellow rectangular background.

**Gregory H. Solomon**  
Executive Chairman

This announcement was authorised by the above signatory.  
For further information please contact Aaron Gates on +61 8 9282 5889.