

SEASHELL POROUS ASPHALT – SUSTAINABLE ROAD CONSTRUCTION

INVENTOR : NICOLE LIEW SIAW ING
FACULTY : DEPARTMENT OF CIVIL ENGINEERING
UNIVERSITY : UNIVERSITI MALAYSIA PAHANG
EMAIL : nicole95liew@gmail.com
CO-INVENTORS : ASSOC. PROF. DR. RAMADHANSYAH PUTRA JAYA; DR. KHAIRIL AZMAN MASRI; DR. NORAM IRWAN RAMLI; DR. MOHAMAD IDRIS ALI



Product Background

- High consumption of aggregate will cause an environmental problem due to the decreasing of natural earth resources.
- In Malaysia, cockle shell aquaculture areas extend about 10,383.09 ha which has contribute to a production of 78,024.70 tons.

Objective

- To investigate the performance of seashell in porous asphalt.
- To study the image processing of porous asphalt containing seashell.

Benefits/Usefulness/Applicability

- Mostly used for parking lots to improve drainage system.
- Can perform well as compared to the normal porous asphalt.
- Reduction of spray to drivers and pedestrians.

Marketability & Commercialisation

- The growth of population and city development, required infrastructure development.
- Innovative infrastructure development.
- Improve drainage system.

Novelty/ Originality/ Inventiveness

- Reduce seashell waste.
- Save cost compared to the conventional pavement.
- Reduce traffic noise.
- Reduce the slipperiness.

Environmental Impact

There are both environmental and safety benefits of porous asphalt pavements including: improved storm-water management, improved skid resistance, reduction of spray to drivers and pedestrians, as well as a potential for noise reduction.

Collaboration with

RLanD TECHNIC RESOURCES, (SA0170332-M)
 No 32-G-B, Jalan 7A/2, Bandar Tasik Puteri Business Centre,
 Bandar Tasik Puteri,
 48020 Rawang, Selangor Darul Ehsan.
 Tel: +6 03 - 60342031 / Fax: +6 03 - 60342031
 E-mail : rlandtechnic@gmail.com

Letter of Intent to Collaborate

Between

UNIVERSITI MALAYSIA PAHANG (UMP)
 And
RLAND TECHNIC RESOURCES
 COMPANY NO: SA0170332-M

Universiti Malaysia Pahang (UMP) and RLAND TECHNIC RESOURCES having discussed collaborative efforts between Parties hereby record their intent towards the collaboration under following conditions on:

(a) Collaboration on the 1st Creation, Innovation, Technology & Research Exposition (CITREx 2021) project entitled: SEASHELL POROUS ASPHALT – SUSTAINABLE ROAD CONSTRUCTION

(b) Jointly publications

(c) Any co-operation between the Parties pursuant to this Letter of Intent that requires financial commitment will be formalised and secured by a written agreement detailing the Parties' rights and responsibilities, including any financial commitments on each of the project participated by the Parties.

(d) This Letter of Intent does not constitute or create, and shall not be deemed to constitute or create any legally binding or enforceable obligations on the part of either party to the Letter of Intent except by the execution of a Memorandum of Agreement between UMP, and RLAND TECHNIC RESOURCES containing such terms and conditions of the proposed collaboration.

Dated: February 26, 2021

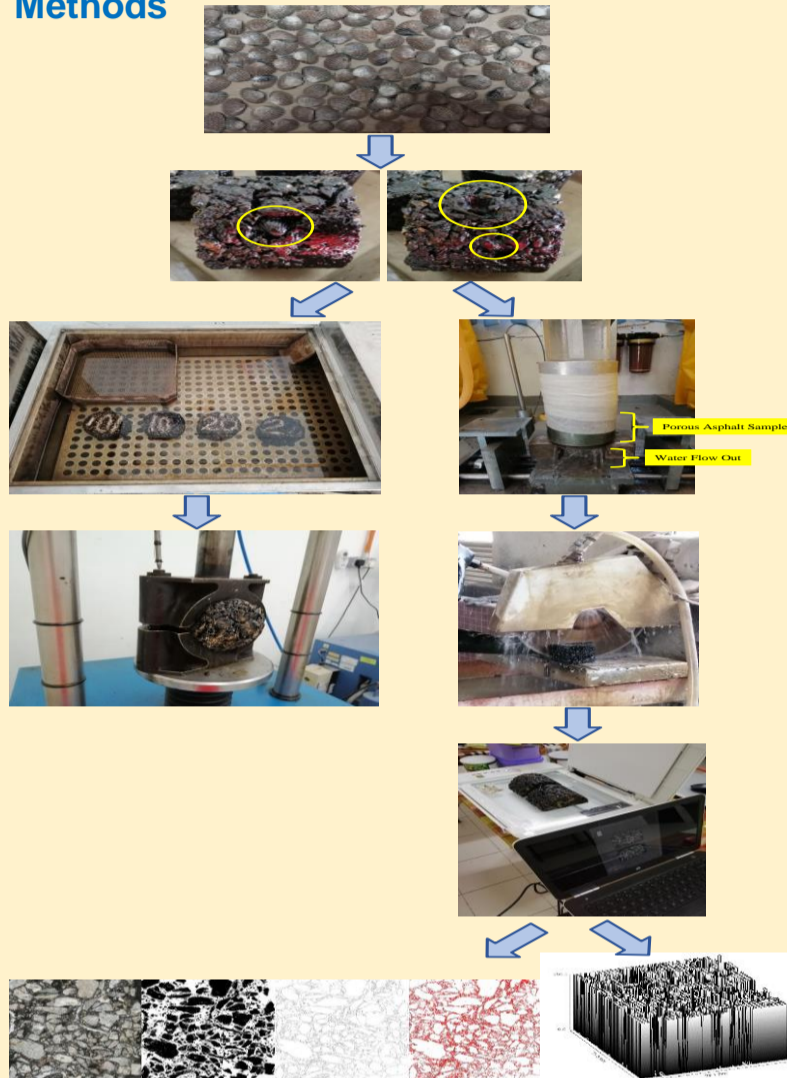
Assoc. Prof. Dr. Ramadhansyah Putra Jaya
 Associate Professor
 College of Engineering
 Universiti Malaysia Pahang

Roslina Bin Subri
 Director
 Rland Technic Resources.

Conclusion

- Can perform well as compared to the conventional porous asphalt.
- Can be proved that the porous asphalt that containing seashell as aggregate replacement shows a different result.
- The surface of seashell able to bond with bitumen.

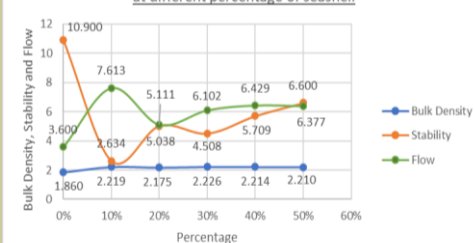
Methods



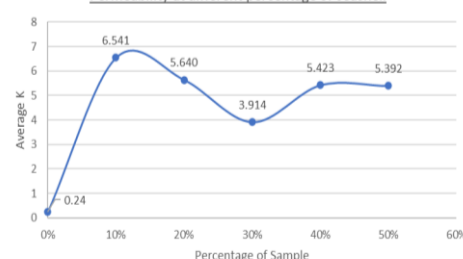
Product Image and Product Characteristics/Results



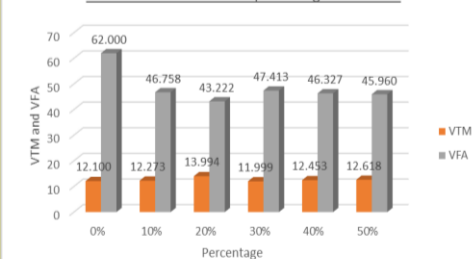
Relationship between Bulk Density, Stability and Flow at different percentage of seashell



Permeability at different percentage of seashell



VTM and VFA at different percentage of seashell



Cost Analysis

Processing cost of seashell size 14mm	RM1.00/kg
The optimum percentage of seashell size 14mm used	50%
Consider 1km length road of width 3.75m (Require 14mm limestone approximate 1600kg)	New Work
Cost of 14mm limestone	RM0.045/kg
14mm limestone required for work (Approximate)	1600kg/km
Cost of 14mm limestone in new work	RM72/km
Cost of 14mm limestone saved (50% seashell used)	RM36/km