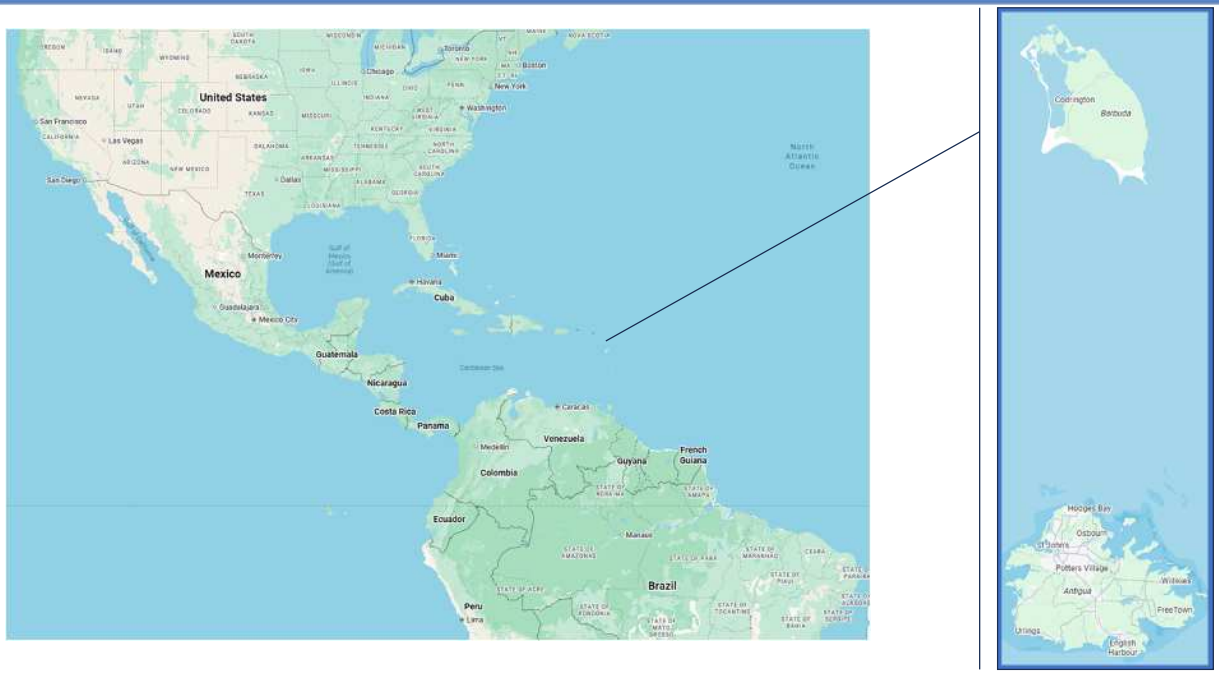
Good day. My name is Phikwe from Antigua & Barbuda

as you know



As you know, Antigua & Barbuda is a twin island state in the Caribbean, a tropical region that experiences similar climate, airborne salt levels and very strong cyclones (hurricanes) to Japan. In addition we experience significant corrosion issues from the effects of Sargassum Sea Weed blooms in the summer. It causes the release of hydrogen sulfide gas that accelerates the corrosion of structural reinforcing steel bars in concrete.

I Status & Issues of Road Maintenance In Antigua & Barbuda

Many of our Road & Bridge issues are of both administrative and technical in nature and include:

- Small budget and wasteful practices.
- Poor drainage planning – flooding, water damage to roads surface and road base.
- Technical gaps in erosion control, oxidation prevention, lifecycle maintenance.
- Reactive approach: maintenance only after failures.
- Political shifting of focus; poor continuity in project realization
- Salt & sulfide accelerated corrosion of rebars in bridge and culverts
- Poor enforcement in material quality assurance

CASE EXAMPLE: BENDALS BRIDGE

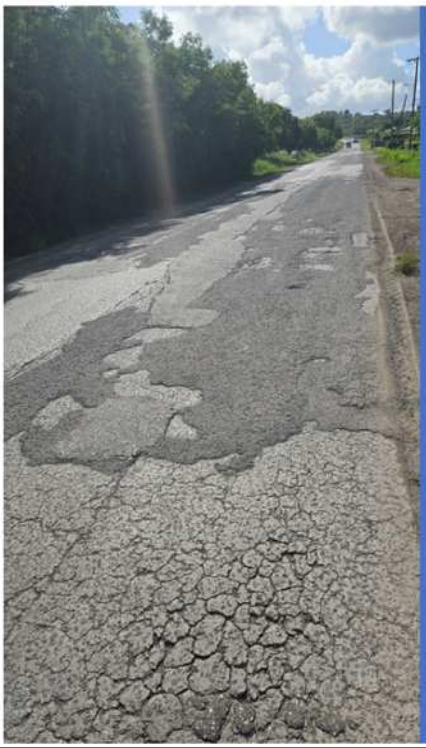
- Severe undermining due to inadequate maintenance.
- Demonstrates risks to public safety and costly emergency repairs.

II Status & Issues of Road Maintenance In Antigua & Barbuda

- Poor Drainage infrastructure & infrastructure planning on major Road Arteries

- Pot holes from surface water run-off in carriage way causing asphalt surface damage

II Status & Issues of Road Maintenance In Antigua & Barbuda

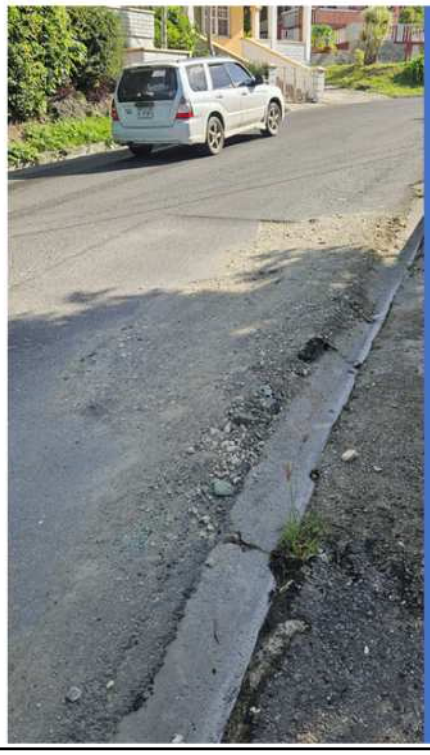


Treatment of base failures with surface dressing only on already failing surface and base.
This normally happens in an attempt to cause as little and short of traffic disruption as possible

Filling pot holes with asphalt from surface water run off with without addressing drainage issue and without cutting and removing failing surfacing.
Again normally caused by attempts to not disrupt traffic for long period of time

Treatment of base failures with surface dressing only on already failing surface and base.

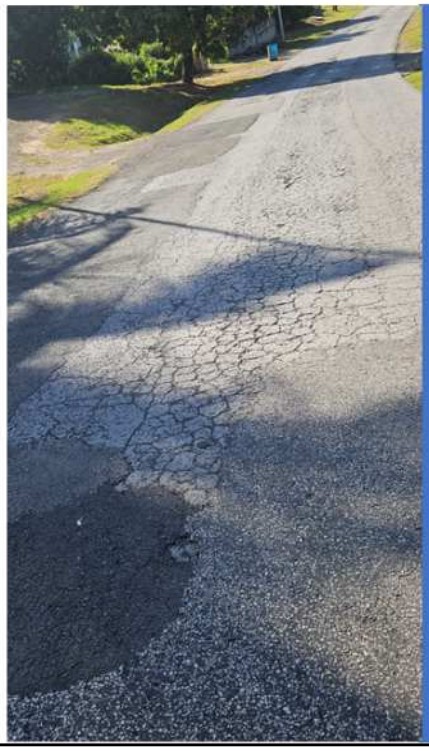
II Status & Issues of Road Maintenance In Antigua & Barbuda



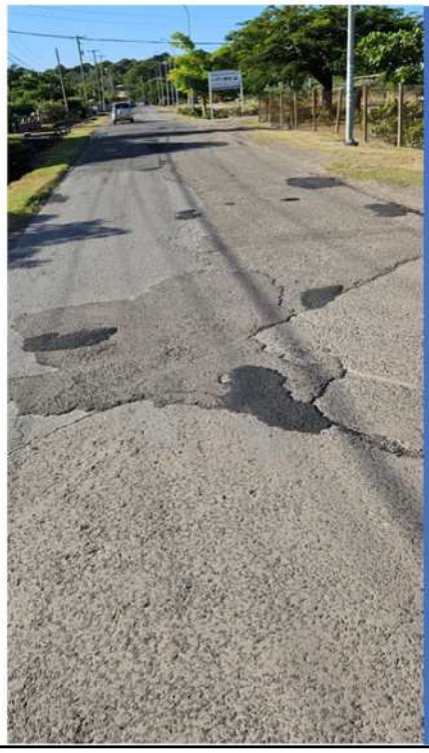
Constant rupture of aging water utility line located under carriage-way. Many of the water utility lines are aging and often not buried to adequate and required depth

Poor drainage cleaning schedules allowing runoff in drain to run on carriage way and causes damage to asphalt surface

II Status & Issues of Road Maintenance In Antigua & Barbuda



Failing and aging road base and subbase.
This could be from poor design, construction or quality control



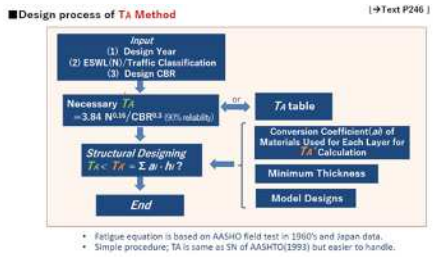
Multiple layering of asphalt at repair technique without first the removal of the deteriorated asphalt.
Again normally caused by attempts to not disrupt traffic for long period of time.

III Useful Knowledge & know-hows learnt in this training

Base stabilization for low traffic roads, many slope stabilization techniques, easy base design calculation techniques

Corrosion from salt mitigation techniques

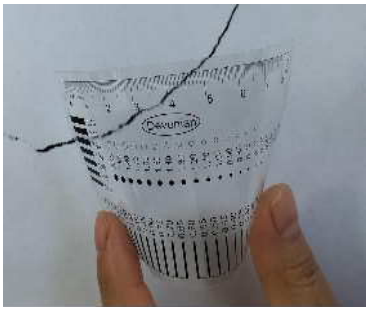
Concrete Maintenance techniques like the Sto dry concrete spraying method, crack monitoring and data collection



Vast amounts of well needed pavement design informatio n

excerpt from: Pavement Design and Damages in JICA Projects - "2025.11.05 pavement design and damages in JICA project_revised.pdf" by Furuki Moriyasu

Emergency asphalt quick repair products



Bridge Inspection data collection (crack monitoring)

This is badly needed in Antigua for our concrete culvert assets

Asphalt design and types

IV Additional technology and others that I am interested in learning more

- Foundation Pile Construction.
- Details on bridge inspection data recording
- Cold mix asphalt products and similar for emergency and rapid small repairs.
- More about application of anti erosion epoxy on rebars, its costs and drawbacks
- Hand help 3D modeling scanner

Foundation Pile Construction.

I am interested in learning about the various piling techniques as we plan to move from concrete culverts to open span bridges. We have very little experience in pile construction in the Ministry

Details on bridge inspection data recording

We need to start cataloging our bridge and culvert assets for efficient maintenance and targeting of resources spending.

Cold mix asphalt products and similar for emergency and rapid small repairs.

More about application of anti erosion epoxy on rebars, its costs and drawbacks

Hand help 3D modeling scanner

Because many of our bridges are not high in elevation we can use hand held scanners instead of drones for inspection and crack data reporting and processing. This will also be of grate use to create as built structural drawings of bridge and road assets

V Project and others that I wish to apply in my Antigua & Barbuda

1. Debrief my ministry and finalize decision on which technology and method to implement in Antigua
2. Immediately implement methods that we can immediately implement
3. Conduct feasibility study and research for technologies that we cannot immediately implement
4. Implement technologies that pass our feasibility and research study. These technologies and methods will be modified to the Antiguan context

I intend to complete 3 tastes when I get back to Antigua.

1) Meet with colleges and ministers of my ministry to debrief them. Then with them finalize decision on which technology and method to implement in Antigua
2) Immediately implement methods that we can immediately implement. I will detail those on the following slide
3) Conduct feasibility study and research for technologies that we cannot immediately implement. This will involve a heavy amount of liaising with consultants and engineers here in Japan to obtain costs, details, technical information of technology and methods
4) Implement these technologies with modifications to the Antiguan context

V Project and others that I wish to apply in my Antigua & Barbuda

Technologies and methods to immediately implement

- Salt testing of sand & aggregates used in concrete
- Bridge inspection data collection and data management

Technologies & methods about which to conduct feasibility study & research before implementation

- Semi-rigid Asphalt cement milk on roads prone to rutting
- 3D geocell for farm roads and low volume unpaved rural roads
- Obtain share strength of soils testing kit and knowhow
- Experiment with various slope stabilization techniques learned in Japan
- Fly ash additives to concrete as salt corrosion prevention and experiments to see if this additive also prevents hydrogen sulfide corrosion of rebars

Salt testing of sand & aggregates used in concrete

We don't test our sand at all in Antigua. We do have rules on washing the sand and aggregates used in concrete but there is no verification and I believe a significant amount of the rebar corrosion we have is due to salty sand and not airborne salt.

Bridge inspection data collection and data management

This is something Antigua needs to immediately implement as we do not have a proper data base on our bridges and inspection results. Crack tracking and corrosion needs of bridges and culverts needs to be properly logged and recorded.

VI Conclusion

There were many technologies, techniques, methods, and products introduced throughout this program, and as one engineer with a very finite amount of experience my ideas may be good ideas but not the best ideas. I have always believed that engineers achieve the best results when we work together and make decisions as a team.

For this reason, I believe that after I propose the technologies and methods that I think are suitable for Antigua and Barbuda, it is also important to review all the lessons from this course together with my team. Through open discussion, we can decide collectively which technologies are the most practical and beneficial to implement in our country.

I believe this collaborative approach will give us the greatest chance of success in improving Antigua and Barbuda's overall infrastructure, and in turn, contribute to a better quality of life for all citizens.

THANKS

Any questions?

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https://ab.gov.ag/detail_page.php?page=22