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The accumulated problem of C&D waste in Malta and how to deal with it!

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MY presentation shall be dealing with the problem of our Construction & Demolishing Waste (C&D Waste) and some proposals of how to deal with it. This is based on over 30 years of practical experience as one of the leading local building contractors, as well as from my various positions on numerous boards, councils, committees, etc.

My expertise is Infrastructure, and I sincerely hope some form of action is taken immediately to tackle this major issue. I personally have been writing and commenting for several times, but it seems that long term plans were never on any political agenda, and therefore a short term solution always prevailed.

The present massive landfill which was nicknamed "Mount Maghtab" was further aggravated as a result of a wrong decision taken around 20 years ago. During one of my presentations as Chairperson of an Environment Steering Committee within the Chamber of Commerce, on the 4th February 1993 to the Parliamentary Secretary responsible for the Environment, I had suggested very clearly that clean inert construction waste should be disposed of in used quarries, and not in the landfill. This was objected to, and I warned them of the aftermath. The result now is we have created a massive black spot on our island, known as "Mount Maghtab". Only four years ago, my proposal was adopted, but the waste has increased from around 500,000 tons per year to over 2,000,000 tons!

I would start by asking a simple question which every Government should be addressing continuously on various aspects of its decisions. "Are we planning for the long term, say 25 / 50 / 100 years?" In terms of the C&D Waste, I am afraid to say NO. We may only be planning for the next five years.

Unfortunately statistics were never accurate, since certain volumes of waste used to be dumped in private quarries without being accounted for.

The volume of C&D Waste has been increasing substantially over the past years. Today it accounts to around 2,000,000 tons and is bound to increase. As the land costs increase, the demand for further excavation increases and therefore the total volume of C&D Waste will continue to rise.

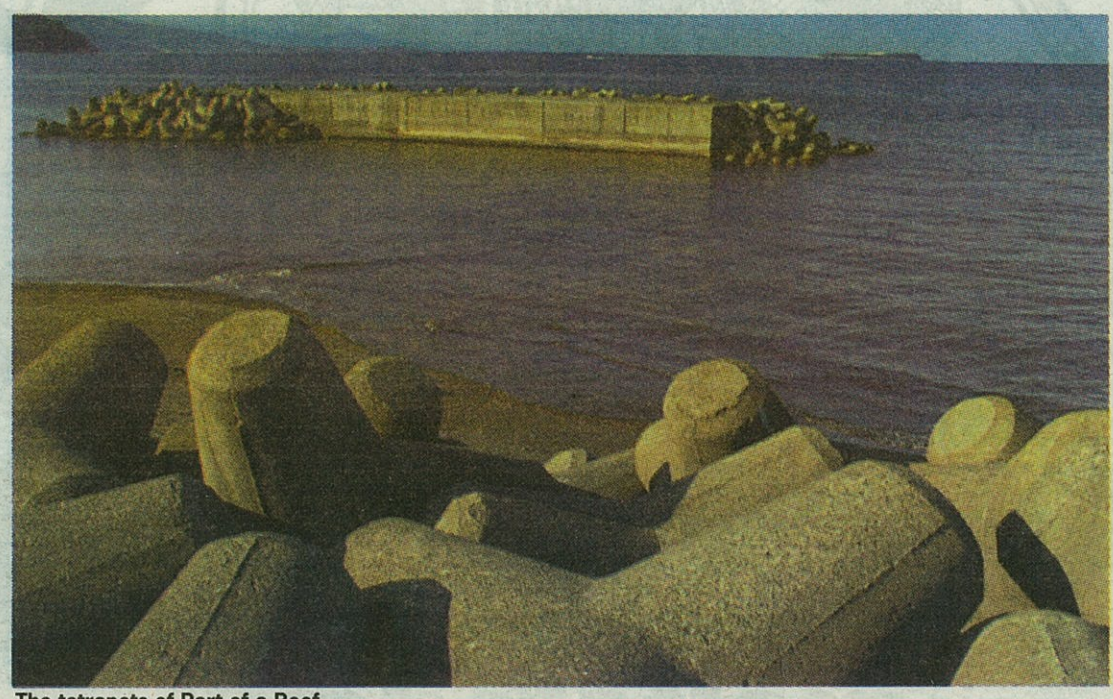
Let us make a distinction between construction waste "C" and demolishing waste "D". I calculate 70% of all C&D Waste is composed of excavated construction which is clean, inert material, while 30% is demolishing waste which may be contaminated with lime, paint, wood, steel etc. The latter is more of a problem.

Let us take a 25 year plan, NOT 50 or 100 years!! Do we have enough old quarries to fill up during these next 25 years? The answer is definitely not. We may manage to stretch it for the coming 10 years. Then what are we planning for this generation and future generations? To create another man made mountain? I hope not. The outcome from these questions clearly indicates this is a major problem which needs to be addressed NOW.

It is imperative to maximise the re-use and recycle principle. The construction inert waste could be used for many purposes with immediate effect, and not dumped into used quarries, while the demolishing waste can be sorted to some extent for re-use as building material of used stone features and rubble walls, and the excess could for the time being continue being dumped in used quarries.

Excavated rock which we refer to as "construction waste" could be used for mass concrete, although it does not have the crushing characteristics as that of hard stone gravel. With larger masses, this same objective as that of using hardstone can be achieved.

I have prepared a few samples of concrete testing cubes to demonstrate the difference between concrete using globigerina limestone (soft stone gravel) construction waste and lower coralline limestone (hard stone gravel). In both mixes I used the same quantity of cement and the same type of sand. The result is the soft stone achieved the compressive strength of 14.2N/mm² after 9 days while the other with hard stone gravel achieved 21.8N/mm². The results achieved after 14 days were 16.5N/mm² for the soft stone and 25.5 N/mm² for the hard stone. This means on average, the soft stone mix achieves two thirds of the strength achieved by hard stone, which in my opinion is quite remarkable. The density and mass are almost identical. The weight is



The tetrapots of Part of a Reef

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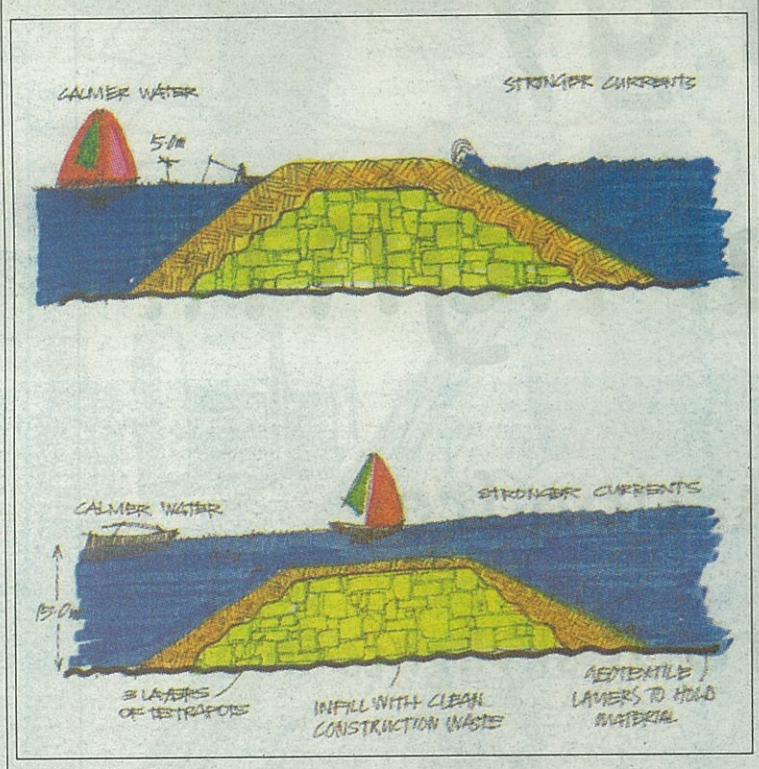
almost the same, but may not be of so much importance because the soft stone absorbs more water and may give distorted figures. With such relatively good results, we can make use of this by-product for the following uses.

Tetrapots for the use of breakwaters, more uses in road construction and creation of artificial islands



Artificial Reefs

Tetrapots or quatropots

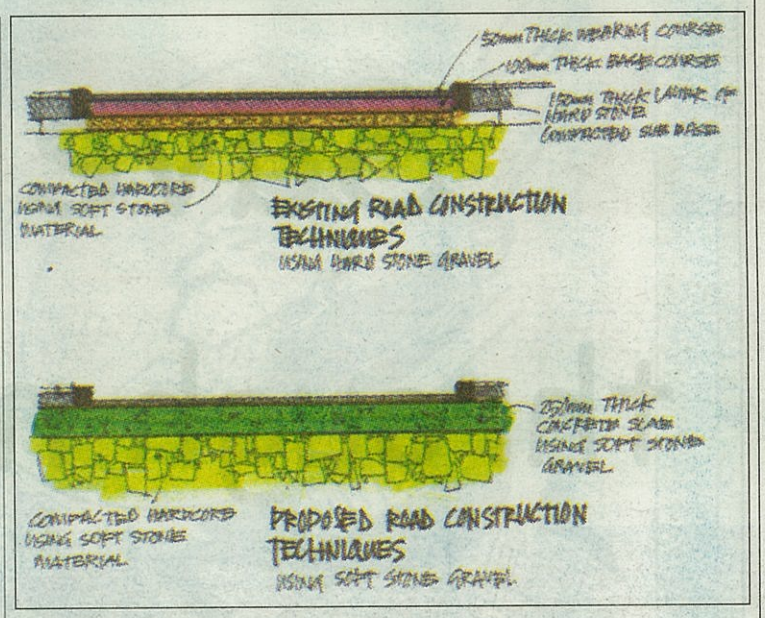
Normally these are composed of hard stone gravel mix and weigh around 20 tons each. This weight is normally required so that these are not washed away by the strong waves. However, if these units are casted with soft stone, but with larger volumes, say 30 tons each, these could achieve the same performance.

These pre-cast units could be utilised to create local wave breakers or artificial reefs in the mouth of a number of coves or bays which surround our Islands. These could be up to 4m below sea level, acting as a shelter for yachting and swimming. Where appropriate, these reefs could extend to say 4m above sea level to create an ever better shelter to the bays and boats. With the ever increasing number of yachts, within a few years time, we may end up with no place where to anchor the yachts during a weekend in summer time, with a wind force 4, which is quite common in our waters.

Furthermore, yachting is a lucrative tourism segment and should be encouraged. Therefore the positive impacts with these artificial reefs are numerous. Such reefs will protect the existing sandy beaches from being washed away, and will help to increase the sandy areas. One has to keep in mind such artificial reefs attract more marine habitats and indirectly could revive this dying sector. Furthermore, by leaving channels on both sides of the bay, the natural water flushing of the sea water will not be disturbed.

As an example, these artificial reefs could be located at the mouth of:

A. Marsascala Bay
B. St George's Bay
C. Qalet Marku (Bahar Ic-Caghaq)
D. Salina Bay
E. St. Paul's Bay
F. San Niklaw and Santa Maria, Comino
G. Marsalforn, Gozo



Use of more Construction Waste in Roads

More uses in Road Construction

Although during recent years the use of soft stone gravel as sub-bases for road construction was accepted, in my opinion we can make more use of this material.

If one goes deeper into the reason why our roads always end up with a smooth and slippery surface, this also refers to roads constructed only five years ago, one realises due to the low grade of hard stone for this purpose, the top wearing course becomes smooth and slippery. It shall be inevitable better quality gravel for the top 50mm tarmac wearing course would have to be imported from another country. I suggest instead of the usual tarmac base course, we can use a thicker concrete base bed using soft stone as its gravel which at ▶

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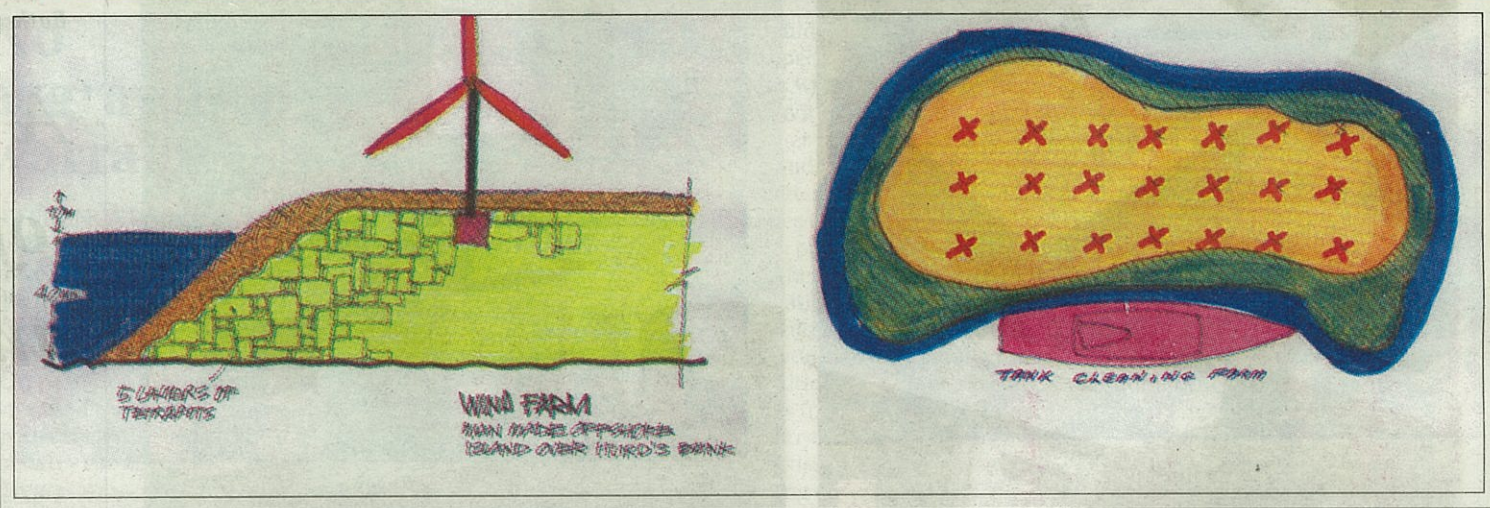
present is a waste.

One has also to keep in mind hard stone quarries are more damaging to the environment since this type of rock is normally found in ridges or valleys. Therefore any reduction in this use should alleviate this problem. Furthermore, the large blocks of concrete which presently are being used as retaining walls, MUST stop using good quality hardstone gravel but should use soft stone gravel which presently is being wasted. Their performance is to create weight and nothing else! It is crazy to think of this waste!



Creation of artificial island on hurd bank

It is a known fact clean inert excavated rock does not cause any harm to the marine life. In fact, over the past millions of years, the globigerina limestone was made up of layers of seashells and sand.

We are also aware the majority of our immediate surrounding sea is very deep to the tune of over one hundred metres. The fact that clean excavated rock from large projects like Excelsior, MIDI project and others are being dumped into deep sea of over 150m does not make sense. We should at least dump this material in an area where on a long term we can make use of an artificial island. "Hurd Bank" which is only 12km away and is around 30 to 40m deep. One can adopt the same principle of tetrapots casted with soft stone gravel on the periphery of this island and loose material on the internal part.

This artificial island could be used for uses like a large scale wind farm which indirectly helps reduce the air pollution by producing a clean renewable energy. It can also be used as a tank cleaning farm which presently is a threat to the vicinity of Ricasoli in the Grand Harbour. Furthermore this island can also act as a sheltered area for ships in waiting to be called into the harbour.

Conclusion

Long term planning for the C&D Waste is crucial and must be taken seriously, away from any political agenda. By long term planning I mean 25/ 50 / 100 years, but I am afraid to say our planning in this respect is only for 5 years! I am not saying my proposals are complete, since I have not tackled the demolishing waste in detail. The proposed "Smart City" will be generating a huge quantity of inert construction waste. I hope we shall make better use of such material. The C&D Waste is one of Malta's main environmental issues and now with the help of E.U. funds, our government should partly finance the necessary costs to implement these ideas into reality.

I hope my contribution on this subject based on my 30 years of practical experience shall be taken on board by the appropriate authorities. Many reports have been written and discussed. It is about time to change words into action. I am a firm believer action moves faster than words. I hope immediate action will prevail.