Kapiti Coast District Council

Interim Report on Beach Renourishment Trial at Marine Parade, Paraparaumu

The sand renourishment trial, over a 200 metre length of beach at the southern end of Marine Parade, Paraparaumu, commenced on Monday 7 November 1994. It was unfortunate that this work coincided with a series of severe north and northwest storms. The accompanying strong winds and low pressures resulted in high seas and elevated water levels, providing less than ideal conditions for work of this nature.

The sand used for replenishing the beach was obtained from the accreted beach along Manly Street to the north of the Paraparaumu headland. It was excavated by a method known as beach scraping from an area in the intertidal zone lying between 69 Manly Street and 135 Manly Street. The sand was transported along the beach and placed against the face of the remnant dune system and on the upper part of the beach along Marine Parade between Wharemauku Road and Tahi Street.

To a casual observer, the storm conditions appeared to remove much of the deposited sand in a very short space of time and it is, perhaps, not surprising that there were those who thought that the exercise had been a waste of time and money. The media were not slow to pick this up and reports along similar lines appeared both in the national press and on national radio.

It must be remembered here that the work that has been done to-date is purely for trial purposes and the amount of sand placed is far less than would be required to properly renourish the beach and provide an adequate buffer against erosion. In this sense, the storm conditions that prevailed during and after the trial has enabled an early assessment to be made of the effectiveness of beach renourishment as a coastal protection method along this section of coast.

To enable the trial to be monitored and assessments of its effectiveness to be made, several beach profiles (cross-sections) have been taken at the renourishment site and also at the source area along Manly Street.

The amount of sand deposited along the 200 metre long trial site at Marine Parade was 6000 cubic metres. This equates to 30 cubic metres for each metre of beach. Profiles were surveyed immediately before the trial began and again just after the work had been completed. Three profiles at intervals across the deposit zone showed build-ups of sand of 26, 28 and 31 cubic metres respectively, indicating losses during the trial of only around 6% which is quite acceptable. Two further profiles, immediately to the north and to the south of the trial site, also showed a build-up of sand during the same period of 15 and 18 cubic metres respectively, indicating some minor lateral spreading of the replenishment sand, which is to be expected.

To understand what has happened it is important realise that the beach does not end at the water's edge. The beach system, in fact, extends off-shore to a point where the sea bed is no

longer subject to modification by wave action. For the most part this means the off-shore limit of the breaker zone.

Following any period of relatively calm weather a storm will impose a new set of conditions on the coastline. The beach responds by endeavouring to establish a new equilibrium profile. In doing so, sand is moved off-shore to form one or more sand bars, which in time serve to limit the energy of waves reaching the shore and thus also limit the amount of erosion that takes place. Nature typically relies on a dune system, acting as a storehouse, to provide sand for this purpose. If no sand dune is present, sand will be removed from the beach and, perhaps, adjacent sources if such are available.

During periods of calm weather, and particularly over summer months, it can be expected that sand moved off-shore during storms will tend to return to the beach and allow dunes to reform. If the beach has a net deficit in its sediment budget and is thus suffering from long-term erosion, as has been the case along Marine Parade for the past decade, the rebuilding will be incomplete. Sand renourishment, in this case, may be used in a sacrificial sense just to effectively maintain the existing beach without any long-term building.

Placing sand on a beach also alters the equilibrium profile and it can be expected that such sand will be redistributed by wave action. In this case it has been found that, despite exposure to a series of storms, virtually none of the replenishment sand was "lost". A proportion of the sand was moved off-shore and profiling will continue over the next few months to determine how much of it returns to the upper part of the beach and the dunes. A planting and fencing programme is underway to assist in trapping wind-blown sand and limiting public access while vegetation becomes re-established.

Had the sand not been placed at the trial site, erosion of the existing dunes would certainly have occurred during the storms, further increasing the risk to the roadway.

The profiles surveyed at the source area along Manly Street require further analysis. It is however difficult to see any adverse impacts arising from the sand extraction. At the southern end of the source zone, the beach has actually accreted (grown in volume) whereas towards the northern end an increasing erosion trend is apparent. This trend continues to increase to the north well beyond the limits of the source area and there is no evidence to indicate that this erosion is related to the sand extraction. Again, these profiles will be monitored over the next few months.

J L Lumsden
Coastal Engineering Consultant
P O Box 8515
Christchurch

20 December 1994

KAPITI COAST DISTRICT COUNC

NEWS RELEASE

11.4.0

Copy

16.3.95

Beach Trial going to plan

A report by the Kapiti Coast District Council's Coastal Engineering consultant shows that the beach renourishment trial at Paraparaumu is going to plan

Dr John Lumsden says that when sand is moved from one part of the beach to another there is a natural process of readjustment. But he says that there has been less movement of the sand than might have been expected, given the storms in November and December.

It's estimated that about 20% of the sand placed on the beach at Marine Parade has moved, but not much of this has been "lost" and is still having an impact on the trial area.

Dr Lumsden says it is still too early to state whether the trial has been a success or failure, but at this stage he is very happy with what has occurred to date. He says further monitoring will be carried out later this month and this will give a better indication of just what is happening to the sand.

Dr Lumsden says there has been a lowering of an area of beach to the north of Manly Street, but he believes that this has nothing to do with the trial and this area will be closely monitored.

PLEASE NOTE.....A COPY OF DR LUSMDENS REPORT IS AVAILABLE ON REQUEST...CHEERS Peter Burke

Ngarara Building, Rim
Private Bag 601,
Paraparaumu.
Telephone (04) 298-51
Fax (04) 297-2563

IF ANY PAGES RECEIVED ILLEGIBLE PLEASE ADVISE

J L Lumsden
Coastal Engineering Consultant

FACSIMILE

21 December 1994

To: Blair Murray
Kapiti Coast District Council

Fax: (04) 297-2563

From: John Lumsden

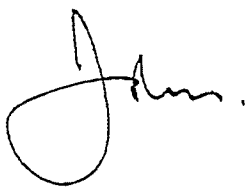
Subject: **Beach Renourishment Trial ~ Paraparaumu**

No of Pages: 3

Blair

Attached are the promised notes regarding the renourishment trial. I trust this is what you required but I will be happy to clarify any points if necessary. I hope you have a Merry Xmas and an enjoyable holiday. Please also pass on my good wishes to Ian Basire.

Regards



P O Box 8515 Christchurch Ph (03) 364 2210 Fax (03) 364 2069