

THE INSTITUTE OF QUARRYING NZ BRANCH

and

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**HISTORICAL OVERVIEW — SAND AND  
ALLUVIAL QUARRYING  
Otago/Canterbury**

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# **HISTORICAL OVERVIEW SAND AND ALLUVIAL QUARRYING OTAGO/CANTERBURY**

## **1. GEOLOGY - OTAGO AND CANTERBURY QUITE DIFFERENT**

*(SLIDE - S I GEOLOGY)*

### **a) OTAGO**

OUT WASH FROM GREYWACKE/SAND STONES/QUANTITY OF SCHIST  
GENERALLY BROKEN DOWN IN MAJOR RIVERS.

### **b) CANTERBURY**

*(SLIDE OF CANTERBURY  
PLAINS)*

GREYWACKE GENERALLY OUT WASH FROM SOUTHERN ALPS  
MAJOR RIVERS WAITAKI/RANGITATA/RAKAIA/WAIMAKARIRI/WAIAU  
MINOR RIVERS OPIHI/ASHBURTON/SELWYN/ASHLEY/WAIPARA

### **c) TARATU FORMATION**

*(SLIDE OF WALTON PARK)*

CONTAINS QUARTZ SAND - OUT WASH FROM TO PENEPLAIN  
KAITANGATA - MT SOMERS (EXCELLENT FOR CONCRETE  
PLASTERING AND FILTER SAND

IN GENERAL, THE MAJOR RIVERS CONTINUE TO BUILD UP OR AGRADE  
LIMITED ONLY BY DAM CONSTRUCTION.

THE MINOR RIVERS ARE DEGRADING AND EXCAVATION FROM RIVER  
CHANNELS HAS ALL BUT STOPPED.

2. **HISTORY**

IN THE PAST SCREENING PLANTS WERE SET UP ON RIVER BANKS OPPOSITE SHINGLE BEACHES, A DRAG LINE INSTALLED ACROSS THE RIVER, THE BEACH EXCAVATED AND THEN EITHER THE DRAG LINE OR PLANT SHIFTED UNTIL THE DREDGE HOLE WAS REPLENISHED BY FLOODS. BY AND LARGE THE CATCHMENT BOARDS OF THE PAST DID A GOOD JOB POLICING THE RIVER BEDS AND WHILE THERE WERE SOME MISDEMEANOURS BY FLY-BY-NIGHT OPERATORS, MOST RIVERS WERE WELL CONTROLLED AND MOSTLY KEPT IN THEIR CHANNELS.

AN IMPORTANT PART OF GRAVEL EXTRACTION WAS, AND STILL IS, TO STOP THE BUILD UP OF THE RIVER BED, WHICH IN TURN COULD EASILY HAVE MEANT INUNDATION OF FARMS AND TOWNS IN TIMES OF FLOODING. *(SLIDE OF GORE GRAVEL)*

THE ADVENT OF HYDRAULIC EXCAVATORS, COUPLED WITH DECREES OF NO EXCAVATION BELOW WATER LEVEL IN RUNNING WATER WHICH MAY DISCOLOUR THE WATER, HAS FORCED A SIGNIFICANT CHANGE IN THE OPERATION OF ALLUVIAL DEPOSITS. *(SLIDE EXCAVATOR WORKING TO WATER LEVEL)*

PROBABLY HALF THE WORKINGS OF ALLUVIAL DEPOSITS IN OTAGO AND CANTERBURY HAVE OPERATED OUT OF PITS AWAY FROM RIVERS. THE REASONS FOR THIS ARE MAINLY -

- A) AWAY FROM THE DANGER OF FLOODING
- B) MATERIAL HAS CONTAINED MORE FINES AND THEREFORE PRODUCED A BETTER GRADED MATERIAL FOR ROAD CONSTRUCTION - RIVER GRAVEL BEING VERY CLEAN
- C) WASTE WATER COULD BE CONTAINED AND RETURNED TO THE PITS

UNFORTUNATELY MANY PITS WERE EXCAVATED, THE OPERATION MOVED ON, LEAVING EYE SORES ABOUT THE COUNTRYSIDE WHICH HAS NOT HELPED THE INDUSTRY'S IMAGE, BUT THERE HAVE BEEN EXCEPTIONS, THE MOST NOTEWORTHY BEING ISAAC'S OPERATION AT CHRISTCHURCH WHERE THE PONDS CREATED BY EXCAVATION HAVE NOW BECOME WORLD KNOWN AS A WILDLIFE RESERVE AND SALMON FARM.

*(SLIDE - ISAACS)*

NOWADAYS, WITH CONSIDERABLE PRESSURE FROM THE REGIONAL AUTHORITIES, MANAGEMENT PLANS MUST INCLUDE REHABILITATION ALLOWANCES AND THIS IS FORCING THE INDUSTRY TO PULL UP IT'S SOCKS.

SURPLUSES OF PRODUCT ARE THE BANE OF ALL AGGREGATE PRODUCERS AND IN GENERAL MOST ALLUVIAL DEPOSITS HAVE DEVELOPED TO A POINT WHERE -

1. THE RAW FEED IS SCREENED AND THE OVERSIZE CRUSHED AND RECOMBINED TO FORM AN ACCEPTABLE ROAD METAL OR
2. THE RAW FEED IS SCREENED TO SUPPLY CONCRETE AGGREGATE AND SAND AND THE OVERSIZE CRUSHED TO MAKE SEALING CHIP, ASPHALT AGGREGATE AND RAILWAY BALLAST.

ALTHOUGH THERE WILL ALWAYS BE ONE OR TWO SURPLUS SIZES, THE MAJORITY OF THE PRODUCT COULD BE SOLD.

NOWADAYS, WITH TIGHTER SPECIFICATIONS, THIS SYSTEM IS BECOMING MORE DIFFICULT AND MANY PLANTS HAVE TO ALLOW IN THEIR PRICING FOR CONTINUAL BUILD UP OF ONE OR MORE SURPLUS SIZES. THIS IS OFTEN A PROBLEM IN SMALLER TOWNS WHERE THE DEMAND FOR DRAINAGE TYPE MATERIAL IS LIMITED.

NATURAL CONCRETE SANDS WHICH WERE ONCE PLENTIFUL, HAVE SLOWLY BECOME SCARCER AND THE ADVENT OF MODERN CRUSHERS HAS MEANT THAT MORE AND MORE SANDS ARE BECOMING A COMBINATION OF CRUSHED AND NATURAL MATERIAL. THIS TENDENCY WILL INCREASE, WITH MORE ADDITIVES BEING USED IN CONCRETE TO MAKE UP FOR THE LOSS OF WORKABILITY OF NATURAL SAND VERSUS CRUSHED MATERIAL.

*STRIPPING 1:5*

*(SLIDE OF WALTON PARK FACE)*

OVERSEAS IT APPEARS THAT AS THE ALLUVIAL DEPOSITS ARE USED UP THE SWING IS TOWARDS MORE QUARRIED PRODUCTS. THIS WILL BE A SLOW PROCESS IN OTAGO AND CANTERBURY, AS PROBABLY OVER HALF OUR AGGREGATE REQUIREMENTS WILL CONTINUE TO BE SUPPLIED FROM RIVERS IN ORDER TO KEEP THEIR BEDS IN EQUILIBRIUM AND THE MANAGEMENT OF PITS IS IMPROVING TO INCORPORATE CONTROLLED LAND FILLS, AQUATIC AND WILD LIFE RESERVES.

IF NOTHING ELSE, THE RESOURCE MANAGEMENT ACT HAS FORCED US TO ADOPT LONG TERM PLANNING AND CONTROL AS PART OF OUR AGGREGATE OPERATIONS.

*(VIDEO - PLANT OPERATIONS 1930'S)*

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