



### OCEAN SWELLS

- WINDS FROM 20-120 DEG OCCUR 90 DAYS/YEAR
- SWELL TYPICALLY 6-8s EXCEPT SEVERE STORMS
- AVERAGE SWELL 0.5m PLUS WIND WAVES WHICH LEADS TO SUPERIMPOSED WAVES, A 3 DIMENSIONAL WAVE PATTERN, EVERY 7th WAVE IS A HIGH ONE
- L&T PREDICT Hs = 3.3m

### NORTHEASTERLY WIND WAVES

- GENERALLY < 15 KNOTS
- MOST SIGNIFICANT ONSHORE WIND DIRECTION
- OCCUR 6 % KERIKERI, 3 % MARSDEN PT, 0.8 % OPUA
- 15 KM FETCH (CAPE WIWIKI)
- 15 KNOT Hs = 0.55m T = 3.2s
- 26 KNOT Hs = 1.08m T = 4.0s

MOTUMAIRE ISLAND

TAYLOR ISLAND

NORTHERN BREAKWATER

EXISTING NAVIGATION CHANNEL

RE-ROUTED NAVIGATION CHANNEL

### NORTHERLY WIND WAVES

- GENERALLY < 20 KNOTS
- OCCUR 5 % OF THE TIME
- 15 KNOT Hs = 0.36m T = 2.4s
- 26 KNOT Hs = 0.7m T = 3.0s
- Hmax = 1.0m

OUTER WEST BREAKWATER

### SUMMARY OF WAVE CLIMATE

### EASTERLY WIND WAVES

- LOWEST FREQUENCY OF ALL DIRECTIONS
- OCCUR 2 % OF THE TIME
- 15 KNOT Hs = 0.27m T = 2.0s
- 20 KNOT Hs = 0.28m T = 2.2s
- 26 KNOT Hs = 0.5m T = 2.3s

### WITHOUT THE NORTHERN BREAKWATER

- Hs = 1.65m RAUDKIVI)
- CRESTS ARE 1.08m ABOVE WL = LEVEL OF ROADWAY.
- 1m HIGH BANK WILL DEFLECT WAVES (V=7m/s =25km/h) INTO THE AIR AND LAND ON THE ROAD

### CLOSED NORTHERN BREAKWATER

- Hs = 0.6-0.7m

INNER WEST BREAKWATER AND BEACH ABUTMENT

NIHINUI POINT

BOARDWALK ESPLANADE

RENOVATED BEACH

EASTERN BREAKWATER AND BEACH ABUTMENT

MARSDEN ROAD

