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WIND ENGINEERING AND AIR QUALITY CONSULTANTS

Final Report

Wind Tunnel Tests for

THE FOUNTAINS

Cabarete, Dominican Republic

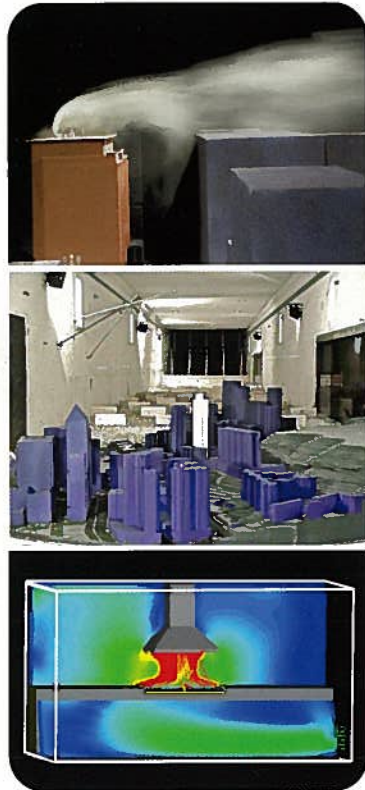
Prepared for:

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CPP Project 4354



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FINAL REPORT

WIND-TUNNEL TESTS—THE FOUNTAINS
Cabarete, Dominican Republic

CPP Project 4354

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EXECUTIVE SUMMARY

A wind-tunnel study of The Fountains, to be located in Cabarete, Dominican Republic, was conducted to assess pedestrian wind comfort and how the development may impact the sailing conditions off-shore. A model of the new building under design was fabricated at 1:300 scale and placed on a turntable in the wind tunnel. Replicas of surrounding buildings within a 430-m radius were constructed and placed on the turntable.

The wind-tunnel testing was performed in the natural boundary-layer wind tunnel of CPP, Inc., Fort Collins, Colorado. Approach boundary layers representative of a built-up environment and an open-country environment were established in the test section of the wind tunnel. The boundary-layer mean wind speed profiles had power-law exponents of 0.23 for land approaches and 0.10 for water approaches. The wind flow had appropriate turbulence characteristics.

Measurements of winds likely to be experienced by pedestrians were made with a hot-film anemometer at 42 locations for 16 wind directions each. These measurements were combined with wind statistics to produce graphs of wind speed versus the percentage time that wind speed is exceeded for each location. Comparison of wind speeds to published Lawson criteria are shown in Figure 8 and Table 5. The wind environment at ground level in the courtyards seems fine. Some corner balconies are windy and owners will be selective about the use of this external space. The rest of the terraces and surrounding areas should be pleasant.

An extensive study of the offshore windsurfing conditions with and without The Fountains in place was performed to explore the influence of the new development on how the wind conditions impact recreational sailing. The dominant winds come from the eastern sector and The Fountains do not influence those ambient flows along the beach. The rare southerly winds that pass over The Fountains site prior to arriving at the shore indicate no change in character due to the development. The sailing conditions are actually influenced by the beachside structures and not The Fountains on the south side of the road. It is likely that the stepped and staggered massing of the design also assists in the lack of impact on sailing conditions. Thus, the impact of The Fountains is negligible to the offshore conditions.