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Hawaii Ocean Plaza
1362 Kapiolani Boulevard
Honolulu, Hawaii

Proposal

Wind Engineering Services
RWDI #1700697
October 14, 2016

SUBMITTED TO

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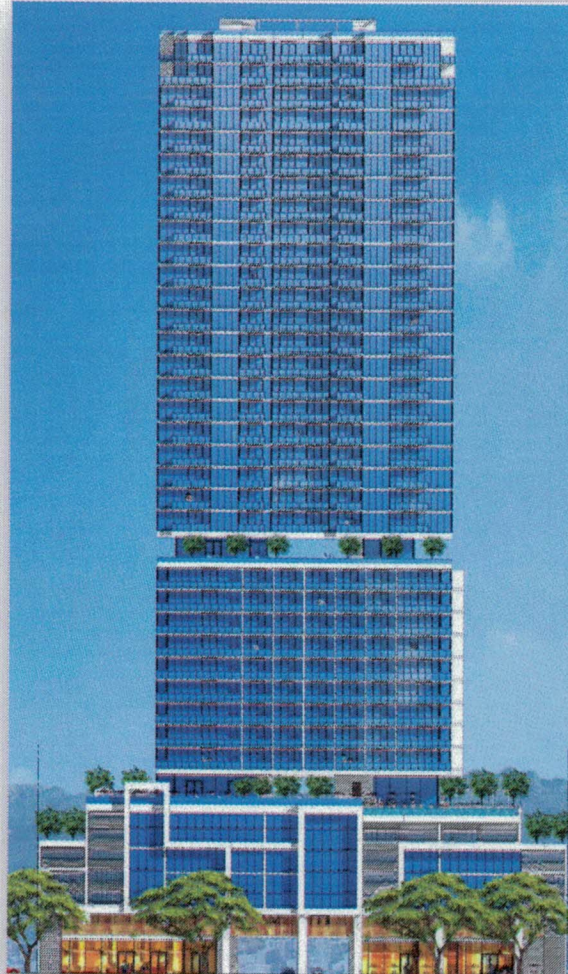
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PROJECT DESCRIPTION

RWDI is pleased to present you with our proposal to provide Pedestrian Wind Consultancy Services for the Hawaii Ocean Plaza project, located at 1362 Kapiolani Boulevard in Honolulu, Hawaii. The project is to be a combined hotel and residential development, 40 storeys in height.

Winds will tend to approach the site from the dominant northeasterly directions, and so we will be mindful of the potential for winds to impact key pedestrian areas, such as the outdoor dining on Level 1, the Level 8 amenity deck, and landscaped roof areas on Level 18.

We have currently proposed a 2-stage process, whereby we will complete a qualitative Pedestrian Wind Desktop Assessment to support the project team during the early design stages. A Pedestrian Wind Tunnel Study can also be carried out as the design progresses to quantify wind speeds, and to develop wind control strategies.



Rendering of Hawaii Ocean Plaza

PROPOSED SCOPE OF WORK

Phase 1: Pedestrian Wind Comfort - Desktop Assessment

Purpose: The objective of the proposed pedestrian wind desktop assessment is to provide the design team with an early qualitative assessment of the predicted wind conditions in and around the project site so that if adverse conditions are identified, there is time to develop and incorporate mitigation concepts into the design that may be required in order to improve pedestrian wind conditions. This also reduces the likelihood of detecting more serious pedestrian wind problems later in the design process, when they are more expensive to mitigate.

Analysis: Long-term meteorological data for Honolulu will be used to conduct the assessment. This information, along with information on the topography surrounding the wind instrument, will be used to establish wind speeds for the area and to develop a mathematical model of the joint probability of wind speed and direction.

We will conduct our qualitative design review of the project based on the following:

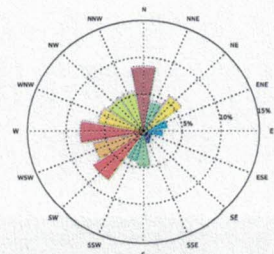
- The current design drawings
- Information regarding the existing building and surroundings
- Meteorological data for the Honolulu area
- Previous wind tunnel studies conducted in the area
- Use proprietary in-house software developed by RWDI (Windestimator) to assess development against the RWDI criteria for pedestrian comfort
- Our experience with similar microclimate studies
- Our engineering judgment

Report: Upon completion of our review, RWDI will prepare a letter report that will document our findings and recommendations.

Phase 2: Pedestrian Wind Comfort - Wind Tunnel Study

Objective: The overall goal of our work will be to gain an understanding of the wind patterns at the project site in order to provide a comprehensive study of wind and other meteorological effects and provide effective design guidance with regards to pedestrian comfort. We will simulate and assess the comfort level of the wind environment at the pedestrian pathways at ground level, various building entrances and outdoor public areas. The mitigating measures that may be derived from this study are geared toward providing a safe and positive wind environment to the users of the development.

Statistical Wind Climate Model: RWDI has already carried out a meteorological assessment where we gathered long-term meteorological data for the area. This was based on wind data collected at Honolulu International Airport and state-of-the-art typhoon simulations to account for the long term probability of extreme weather events. This information, along with information on the topography surrounding the wind instrument has been used to establish wind speeds for the area and to develop a statistical model of the joint



probability of wind speed and direction. This mathematical model of the Honolulu wind climate will be used to analyze the wind tunnel test data.

Wind Tunnel Proximity Modeling: A scale model of the site would be constructed. Surroundings beyond the study building would be constructed on an 8 ft. diameter disk, and would include all buildings and geographical features deemed by RWDI to be important for local air flows. Examples of scale models (with study and surrounding buildings) in our boundary-layer wind tunnels are shown here.

Study Model Construction: Wind speed sensors, which are used to measure the mean and gust wind velocities at a full-scale height of 5 feet above ground, will be installed on the model taking into consideration outdoor pedestrian-use areas around the proposed development. A sensor plan showing the locations of the wind speed measurements will be submitted for approval prior to conducting the tests. Landscaping will not be included during the base tests.

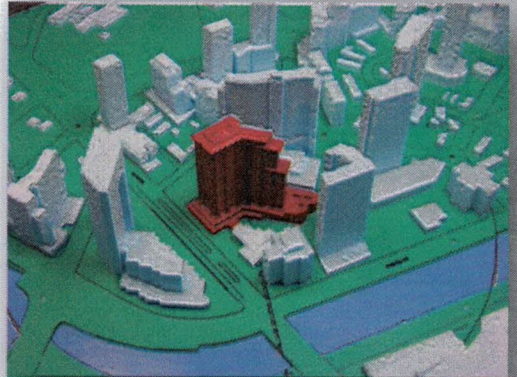
Wind Tunnel Testing: The test model together with the surrounding model will be tested in our boundary layer wind tunnel where the natural wind speed and turbulence levels will be simulated. During the tests, wind speed data will be collected for 36 equally spaced wind directions.

Test Configurations: Two (2) configurations of the study site and surroundings will be tested for our base studies:

- **Existing:** The existing surroundings, with any buildings currently on site, without the proposed Hawaii Ocean Plaza development.
- **Proposed:** The proposed Hawaii Ocean Plaza development, along with existing surrounding structures.

It is preferable to test both the existing and proposed configurations. This way, if any unacceptable wind conditions are identified, it is easier to determine if they are as a result of the new development, or if they were pre-existing.

If the project team is aware of any future buildings that are located in close proximity to the development which could impact wind flows, a second test configuration (Future) may be warranted. This has been reflected as an optional service.



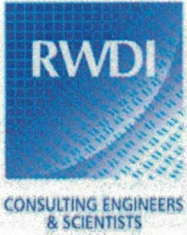
Data Analysis: The wind tunnel data will be analyzed together with the long-term meteorological statistics to predict the wind speeds that will occur for selected frequencies at each location. This analysis will be compared with comfort criteria to determine both safety and comfort, on a seasonal basis. For example, the results will indicate where conditions will be suitable for activities such as walking, standing or sitting and whether pedestrian safety is an issue. In the event that undesirable wind conditions are found, we will provide suggestions for how to improve the wind environment ranging from architectural features to planned pedestrian usage to landscape design concepts. If conditions are particularly severe in critical areas, we may recommend additional testing to develop specific solutions. However, additional testing in connection with detailed solution development has not been included within the scope of this proposal.



Report: A final report will be submitted at the conclusion of the project. This report will contain a discussion of the wind activity around the proposed development in terms of pedestrian comfort and safety. The report will also include model photos, a description of the test procedure and suggested solution concepts, if required.

Meetings

Representatives from RWDI will be able to attend meetings held in Honolulu, Hawaii as required. The associated fee per trip has been noted as a separate line item. At any time during the duration of the project, the design team is welcome to visit RWDI's facilities to witness testing and/or review study results at no charge. Please provide 7 business days' notice prior to meetings.



BUDGET AND SCHEDULE

Our fees (which include all professional fees and office expenses) and timelines are shown in the table below. We are prepared to commence work within about one week of receiving all required information and your signed authorization to proceed. Our schedule will be discussed with you upon approval as it may have changed from the time our proposal was issued.

Tasks	Fixed Fee (USD)	Schedule
Base Studies		
Phase 1 – Pedestrian Wind Comfort – Desktop Assessment	\$7,000	2 – 3 weeks
Phase 2 – Pedestrian Wind Comfort – Wind Tunnel Study	\$17,500	5 – 7 weeks
Optional Studies		
Future Build Test Configuration for Pedestrian Wind Study	\$2,500	
Meetings / Workshops in Honolulu, Hawaii	\$2,500 per person per meeting plus	

Notes:

1. Additional testing in connection with detailed solution development is not included within the scope of this proposal.
2. The cost for the additional test configurations assumes they occur during the same set of tests for the Base Studies.

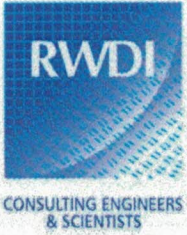
CLOSING

Thank you for your interest in working with RWDI Consulting Engineers on this project. We appreciate the opportunity to provide you with this proposal.

Respectfully submitted by:

ROWAN WILLIAMS DAVIES & IRWIN Inc.

Analene Belanger, P.Eng., PMP
Associate / Senior Project Manager



APPENDIX A: TERMS OF ENGAGEMENT

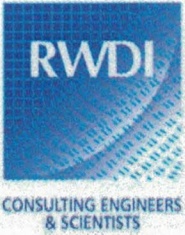
Please note that all pricing is in U.S. dollars and includes professional fees and anticipated office/lab expenses (photocopying, modeling materials, telephone calls, courier). Travel expenses (if required) and any applicable taxes are extra.

Due to the length of time that will normally occur from the start of our work and when we will begin to receive payment, **we will invoice for 30% of the contract amount when we receive authorization** to proceed. This will provide us with a cash flow that will be concurrent with the work performed. Thereafter, invoices will be submitted monthly according to work complete. Payment is due within 30 days of receipt of invoice.

Should the project be delayed or cancelled for reasons beyond the control of RWDI, an invoice proportional to the amount of work completed up to the time of the project delay or cancellation would be submitted including any significant demobilization costs. If the project is resumed after being suspended for more than three months, RWDI's compensation shall be equitably adjusted.

The fee quoted in this proposal will be considered valid for a period of 30 days, after which, we reserve the right to revise the quotation, if appropriate.

Work will be conducted according to RWDI's standard terms and conditions, and review of contractual documents will not be required.



APPENDIX B: LETTER OF AGREEMENT

We hereby authorize Rowan Williams Davies & Irwin Inc. (RWDI) to provide the services outlined in this proposal, reference #1700697 dated October 14, 2016 for the Hawaii Ocean Plaza – 1362 Kapiolani Boulevard project in Honolulu, Hawaii. This letter of agreement together with the proposal constitutes the entire agreement. No other agreement shall take precedence unless agreed to by both parties in writing.

RWDI is authorized to proceed with the services identified with a check mark :

Tasks	Fixed Fee (USD)	Approved (Please Check)
Base Studies		
Phase 1 – Pedestrian Wind Comfort – Desktop Assessment	\$7,000	[<input checked="" type="checkbox"/>]
Phase 2 – Pedestrian Wind Comfort – Wind Tunnel Study	\$17,500	[<input type="checkbox"/>]
Optional Studies		
Future Build Test Configuration for Pedestrian Wind Study	\$2,500	[<input type="checkbox"/>]
Meetings / Workshops in Honolulu, Hawaii	\$2,500 per person per meeting plus	[<input type="checkbox"/>]

This quotation covers all professional fees and office expenses (as per the scope of work defined in the proposal) but excludes any other tax that might be applicable. Progress invoices will be submitted as follows: 30% upon authorization; thereafter, monthly according to work complete. Invoices will be sent by email and mail. Payment is due within 30 days of receipt of invoice.

Client

Zhe Fang
 Name (Please print)

Hawaii Ocean Plaza
 Company

Munger
 Title

10/30/2016
 Date

[Signature]
 Signature (I am authorized to bind this corporation)