

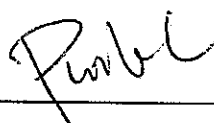
Quality Enhancement Grant Scheme

Progress Report

Project No.: 06/QEGS/A-08-09

Reporting Period: From July 2011 to December 2011

Signature: _____



Organization Chop: _____



Name of Authorized Person: Dr. PUN Kwok Leung

Name of Grantee: Chu Hai College of Higher Education

Organisation: Chu Hai College of Higher Education

Project Manager /
Position of Authorized Head, Department of
Person: Civil Engineering

Date: 15 January 2012

Part A

Project Title: Enhancement of Teaching and Learning on
Environmental Sustainability

Name of Grantee: Chu Hai College of Higher Education

Project Period: From July 2009 to June 2012

Part B

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1 THE PROJECT

1.1 Introduction

This document reports the progress of the project (Project Title: Enhancement of Teaching and Learning on Environmental Sustainability; Project No.: 06/QEGS/A-08-09) for the period from July 2011 to December 2011.

2 PROGRESS ON TASKS

2.1 Project Activities

This section reports the project activities held/completed during the reporting period from July 2011 to December 2011. A summary of the project activities held/completed is presented in Table 2.1.

Table 2.1 Summary of the Project Activities Held/Completed between July 2011 and December 2011

	Type of Activity	Date, Time, Venue and No. of Participants	Resources Used	Description
1	Project Team Meeting No. 10	<u>Date/Time:</u> 12 Oct 2011, 10:00 a.m. <u>Venue:</u> President Office, Chu Hai College of Higher Education <u>No. of Participants:</u> 9	-	Regular meeting to update and review progress.
2	Traffic Noise Study	<u>Date/Time:</u> July to Dec 2011 <u>Venue:</u> Tsuen Wan District, Tung Chung, Sham Tseng <u>No. of Participants:</u> 2	B&K 4231 Sound Level Calibrator; B&K 2238 Sound Level Meter; RION NL-22 Sound Level Meter	Field measurement for final year dissertation study.
3	Traffic Noise Study	<u>Date/Time:</u> 22 November 2011 <u>Venue:</u> Acoustics and Air Testing Laboratory	B&K 4231 Sound Level Calibrator; B&K 2238 Sound Level Meter; Equipment and Facilities provided	Supporting the Environmental Engineering Laboratory.

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	Type of Activity	Date, Time, Venue and No. of Participants	Resources Used	Description
		Company Limited <u>No. of Participants: 12</u>	by Acoustics and Air Testing Laboratory Company Limited	
4	Traffic Noise Study	<u>Date/Time:</u> 22 November 2011 <u>Venue:</u> Acoustics and Air Testing Laboratory Company Limited <u>No. of Participants: 18</u>	-	Providing a technical visit to years 1 to 3 students.
5	Indoor Air Quality Study	<u>Date/Time:</u> July to Dec 2011 <u>Venue:</u> Shopping Malls in Tsuen Wan District <u>No. of Participants: 1</u>	Indoor Air Quality Meter, Aerosol Monitor; TVOC meter, Formaldemeter	Field measurement for the final year dissertation study.
6	Indoor Air Quality Study	<u>Date/Time:</u> 22 November 2011 <u>Venue:</u> Acoustics and Air Testing Laboratory Company Limited <u>No. of Participants: 12</u>	Indoor Air Quality Meter; Equipment and Facilities provided by Acoustics and Air Testing Laboratory Company Limited	Supporting the Environmental Engineering Laboratory
7	Indoor Air Quality Study	<u>Date/Time:</u> 22 November 2011 <u>Venue:</u> Acoustics and Air Testing Laboratory Company Limited <u>No. of Participants: 18</u>	-	Providing a technical visit to years 1 to 3 students.
8	Air Ventilation Study (Civil) (3 rd Public Talk)	<u>Date/Time:</u> 15 Jul 2011, 5:00pm <u>Venue:</u> Lecture Theatre K, HKUST <u>No. of Participants: 60</u>	Phoenics, Computers	Introduction of air ventilation assessment to secondary school students.
9	Air Ventilation	<u>Date/Time:</u>	Phoenics,	Workshop on Computer

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	Type of Activity	Date, Time, Venue and No. of Participants	Resources Used	Description
	Study (Civil)	14 Oct 2011, 2:00 pm <u>Venue:</u> Room 208, Chu Hai College of Higher Education main campus <u>No. of Participants:</u> 20	Computers	Simulation for Air Ventilation.
10	Air Ventilation Study (Architectural Design)	<u>Date/Time:</u> 4 Oct 2011, 5:30pm <u>Venue:</u> Computer Centre, Chu Hai College of Higher Education <u>No. of Participants:</u> 5	Phoenics, computers	Discussion of application of Phoenics for Design Assignment .
11	Air Ventilation Study (Architectural Design)	<u>Date/Time:</u> 14 Oct 2011, 2:45pm <u>Venue:</u> Room 105, Chu Hai College of Higher Education <u>No. of Participants:</u> 28	Phoenics, computers	Demonstration of Phoenics for Design Assignment 'Market Bridge Network of Wind'.
12	Air Ventilation Study (Architectural Design)	<u>Date/Time:</u> 18 Oct 2011, 2:00pm <u>Venue:</u> Waterside Studio, Chu Hai College of Higher Education <u>No. of Participants:</u> 28	Phoenics, computers	Presentation of Phoenics application as a research tool for site modelling and Air Ventilation Assessment.
13	Air Ventilation Study (Architectural Design)	<u>Date/Time:</u> 20 Dec 2011, 2:00pm <u>Venue:</u> Waterside Studio, Chu Hai College of Higher Education <u>No. of Participants:</u> 28	Phoenics, computers	Presentation of Phoenics application as a design tool for market design.
14	Water Quality Study	<u>Date/Time:</u> 16 Dec 2011, 11:15am <u>Venue:</u>	Delft3D suite of models, computer	Presentation of a paper supported by the project at the 6 th International

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	Type of Activity	Date, Time, Venue and No. of Participants	Resources Used	Description
		Ballroom B, Sheraton Hong Kong Hotel & Tower, 20 Nathan Road, Kowloon Hotel, TST <u>No. of Participants:</u> ~ 60 in Ballroom B		Conference on Asian and Pacific Coasts (APAC 2011).
15	Water Quality Study	<u>Date/Time:</u> Jul to Dec 2011 (weekly) <u>Venue:</u> Classrooms, Chu Hai College of Higher Education <u>No. of Participants:</u> 2	Delft3D suite of models, computers	Reviewing the modelling work and progress of the final year dissertation.
16	Lighting Design	<u>Date/Time</u> 17 Sept 2011, 9.45am <u>Venue:</u> Room 201, Chu Hai College of Higher Education <u>No. of Participants:</u> 19	—	Briefing of the project and the coming tasks
17	Lighting Design	<u>Date/Time</u> Sept - Dec 2011 (bi-weekly) <u>Venue:</u> Different assigned sites in Hong Kong <u>No. of Participants:</u> 19	Lux meter	Field work, Lux meter records.
18	Lighting Design	<u>Date/Time</u> 5 Nov 2011, 9.45am <u>Venue:</u> Room 201, Chu Hai College of Higher Education <u>No. of Participants:</u> 19	Computers	Interim presentation of field-work records.
19	Lighting Design	<u>Date/Time</u> 10 Dec 2011, 9.45am <u>Venue:</u>	Computers	Final presentation of field-work records.

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	Type of Activity	Date, Time, Venue and No. of Participants	Resources Used	Description
		Room 201, Chu Hai College of Higher Education <u>No. of Participants:</u> 19		
20	Project Website Design	<u>Date/Time</u> Jul – Dec 2011 (bi-weekly) <u>Venue:</u> Computer Laboratory on 2/F <u>No. of Participants:</u> 4 per each meeting	Computers	Students analyzed the existing project, studied the problems embedded, and designed the prototype of the new project website.
21	Extension of the Mid-project Exhibition	<u>Date/Time:</u> 21 and 24 Nov 2011 <u>Venue:</u> Hall, Chu Hai College of Higher Education <u>No. of Participants:</u> ~ 50	B&K 4231 Sound Level Calibrator; B&K 2238 Sound Level Meter; Indoor Air Quality Meter, Computers,	Promoting the project “Enhancement of Teaching and Learning on Environmental Sustainability” to the College’s students.

2.2 The Five Major Studies

Traffic Noise Study

Two students are studying the aircraft noise impact in Hong Kong and the vehicular noise characteristics respectively. A sound level meter purchased under this funded project was used for noise measurements. Literature reviews were completed and the noise measurements were conducted to confirm the measurement set up of the final year dissertation studies. Noise measurements in terms of sound pressure level and 1/3 octave band spectrum were also measured to study the aircraft noise impact and vehicular noise characteristics.

Apart from the final year dissertation, sound level meters were used to support the teaching in the course “Environmental Engineering”. Students conducted the noise measurements in a HOKLAS Laboratory – “Acoustics and Air Testing Laboratory

Company Limited". A doubled-glazed glass panel were tested according to the ISO 140-5.

A technical visit to the HOKLAS Laboratory – Acoustics and Air Testing Laboratory Company Limited, were arranged on 22 Nov 2011. Some years 1 to 3 students joined the technical visit. A normal practice of the HOKLAS Laboratory for testing construction materials according to the ISO and ASTM standards were introduced and demonstrated to the students. It was a valuable chance for students to understand more about the laboratory measurement of construction materials in Hong Kong. Only a few HOKLAS companies in Hong Kong can provide the laboratory measurement about the noise characteristics of construction materials. **Appendix A** shows the photos of the visit to "Acoustics and Air Testing Laboratory Company Limited".

Relevant information about the traffic noise study is regularly uploaded to the project website.

Indoor Air Quality Study

Indoor air quality equipment was used to support a final year dissertation. A student is studying the indoor air quality between the new-style and old-style shopping malls in Tsuen Wan District. The ventilation systems and the arrangements of the shop characters are different between two styles of shopping malls. A literature review, site survey and measurement set up were completed in his study. Measurement of indoor air quality will be carried in both styles of shopping malls in the next stage of the dissertation study.

Indoor air quality equipment was also used to support the course "Environmental Engineering". A technical visit to the HOKLAS Laboratory – Acoustics and Air Testing Laboratory Company Limited, was conducted on 22 Nov 2011. A demonstration of indoor air quality for 12 parameters was performed to show to the students the measurement procedures and set up for obtaining an Indoor Air Quality Certification. **Appendix B** shows the photos of introduction and demonstration of measurement procedures of indoor air quality parameters.

Relevant information about the indoor air quality study is regularly uploaded to the project website.

Water Quality Study

The study outcomes of final year dissertation studies from three students involved in the water quality study of this project commencing from 2009, contributed to the publication of a conference paper entitled “Modelling Dispersion Characteristics in Rambler Channel” at the 6th International Conference on Asian and Pacific Coasts (APAC 2011), which was hosted by The University of Hong Kong during 14-16 December, 2011. The international conference provided a platform for the engineers and researchers to keep abreast of the latest scientific and technological developments in coastal and port-related research and practice. The paper presented a hydrodynamic model with two grid domains, and drogue tracking and tracer simulation techniques to investigate the tidal and dispersion characteristics in Rambler Channel. **Appendix C** provides relevant information of the conference including a programme for oral presentations showing the presentation schedule of the paper, and some pages of the paper showing the abstract of the paper and acknowledgement to the funding provided by the Quality Enhancement Grant Scheme, Education Bureau of the Government of HKSAR.

A final year dissertation study on near-field modelling of stormwater discharges at Tsuen Wan Waterfront is ongoing. Based on the far-field hydrodynamic model outputs obtained from the previous final year dissertation studies, a near-field model “CORMIX3” was applied to study the surface plume behaviour of stormwater discharges.

The Delft3D software was also used to support two ongoing final year dissertation studies with one on the investigation of wind effects on water circulation in a reservoir and the other one on the simulation of flow field and particle settling in a sedimentation basin.

Air Ventilation Assessment

(i) Civil Engineering Design

A public talk was offered on 15 Jul 2011 at 5:00pm at HKUST for about 60 secondary school students. The topic was "Introduction to Air Ventilation from the Perspectives of Civil Engineers and Architects". The talk was about an hour. The students showed great interest in the question and answer session after the end of the presentation. **Appendix D** shows the photos about the 3rd public talk at HKUST.

There was a workshop about the computer simulation for air ventilation assessment for the students of the Department of Architecture. The workshop was about 2.5 hours and there were about 20 students in the workshop.

(ii) Architectural Design

In this semester, concepts of Air Ventilation Assessment were introduced and application of Phoenics was inserted in the course 'Architectural Design and Theory 3'. A workshop demonstrating the use of Phoenics for studying wind effect on urban fabrics was conducted in mid of Oct 2011 (pictures 1 & 2 in **Appendix E**). From then till early December 2011, the concepts of air ventilation and the fluent dynamics modelling was further expanded and became a research tool for background analysis of a city. In December, the application and technique further extended and became a design tool for designing a piece of architecture 'Market Bridge Network of Wind' and 'market design' under the design parameters set up earlier (pictures 3 & 4 in **Appendix E**). Students also make use of 'Phoenics' modelling to present and explain the concepts of their design projects (pictures 5 & 6 in **Appendix E**).

Lighting Design

In this semester, investigation of lighting design was expanded to locations outside Chu Hai campus. Students taking the course 'Building Technology and Sustainability II' were asked to investigate, explore and evaluate lighting provision and usage in different sites in Hong Kong.

The three different assigned sites were: firstly, commercial lighting advertisement boards (pictures 7 & 8 in **Appendix F**); secondly, highly-illuminating façade of a luxurious residential building (pictures 9 & 10 in **Appendix F**), and lastly, public parks, footbridges and subway (pictures 11 & 12 in **Appendix F**). After taking on-site records of pedestrian flow, people's usage, lighting fittings' Lux levels in different periods of

time and in different days, students then used the data to evaluate the lighting provisions in relation to the actual usage by the end-users. Students were also requested to criticize the current lighting provision in the different sites and to suggest possible measures to minimize the energy consumption or reduce the wastage.

2.3 Project Website

A new team of three students in their final year study joined this project as they participated in the course 'BIS390A/B Final Year Project' with the supervision of the course supervisor. The objectives of the students include the reengineering of the existing Web system, the redesigning of the user interface, and the improvement of the Web site for future development. Several activities have been completed and are shown as follows:

- Project contents provided by the Area Leaders were updated
- Problems of the existing Web site were identified and analyzed
- New interface for the home page of the Web site was designed and implemented
- Prototype of the front-end Web site interface was designed
- Interface of the back-end Web site was analyzed
- Database of the Web system was studied and analyzed

In the coming six months, a new interface of the front-end and back-end Web site will be designed, searching function will be improved, the photo gallery function will be implemented, and the reengineering of the whole Web system will be completed.

3 MID-PROJECT EXHIBITION

To extend the mid-project exhibition, which was held in April 2011 outside Chu Hai campus, an exhibition was conducted on 21 and 24 November 2011 at the Hall, Chu Hai College of Higher Education. Students of the College visited the exhibition booth to understand more about the project of "Enhancement of Teaching and Learning on Environmental Sustainability". Posters of the project, measurement equipment (B&K

4231 Sound Level Calibrator; B&K 2238 Sound Level Meter; Indoor Air Quality Meter) and computer simulations (Delft3D software and Phoenics) were displayed. Students of the Department of Civil Engineering helped organise and execute the exhibition. **Appendix G** shows the poster of the exhibition booth. Some photos taken during the exhibition are enclosed in **Appendix H**.

4 FINANCIAL CONDITION

Appendix I gives a summary of the financial condition of the Project.

5 PROJECT MILESTONES AND DELIVERABLES

The project milestones and deliverables attained in the reporting period from July 2011 to December 2011 are shown in **Table 5.1**.

Table 5.1 Project Milestones and Deliverables Attained

Milestone Completed – Stage 3 Part I	
Reporting and Dissemination of Study Outputs (Period: Jul 2011 – Dec 2011)	
Milestone and Deliverable	% Completed
➤ Final stage of traffic noise study	100%
➤ Final stage of indoor air quality study	100%
➤ Final stage of water quality study	100%
➤ Final stage of air ventilation study	100%
➤ Final stage of lighting design study	100%

The above-listed key tasks that have been completed contribute to approximately 18% of the overall Project (100%). Together with the key tasks completed from the first to the fourth reporting periods (Jul 2009 – Jun 2011), about 80% of the overall Project has been completed.