

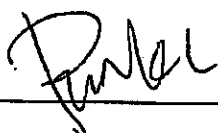
Quality Enhancement Grant Scheme

Progress Report

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

Reporting Period: From July 2009 to December 2009

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 Jan 2010

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

The Faculty of Science and Engineering of the Chu Hai College of Higher Education has been endeavouring to nurture the students with professional knowledge in resolving practical environmental problems and developing sustainable built environment specific to the Hong Kong environment. A series of environmental engineering and sustainable design courses have been introduced in the programmes of BEng (Hons) in Civil Engineering and BArch (Hons) Architecture. To further enhance students' learning experience in environmental sustainability meeting the needs from the civil engineering and building industries, it is our aim to introduce the most up-to-date technologies and engineering practices to students through day-to-day learning. This Project helps accelerate the achievement of this goal through the enhancement of teaching and learning on environmental sustainability.

The principal areas of focus in this Project include: 1) traffic noise; 2) indoor air quality; 3) water quality; and 4) sustainable building design including air ventilation assessment and lighting design. All years of students participate in different stages of the Project coordinated by the Faculty of Science and Engineering. The geographical study area of the Project focuses primarily on the Tsuen Wan District.

A project website is being established to provide learning materials on environmental sustainability and findings from the studies that can be accessible to the students and the public. Exhibitions and public talks will be organized to promote the awareness of environmental sustainability.

An Environment and Sustainable Development Centre will be established to provide support on the continuous development of teaching and learning on environmental sustainability.

1.2 Project Outcomes

The major outcomes of the Project are:

- 1) enhancement of teaching efficacy with the support of the advanced measurement equipment, data acquisition system and state-of-the-art computational modelling tools;

- 2) practical experience and skills gained by the students from conducting studies on real-life environmental problems and sustainability issues;
- 3) enhancement of student employability through the learning process;
- 4) support to the Final Year Project/Dissertation to investigate the most popular topics in environmental sustainability;
- 5) strengthening of the programmes on environmental sustainability education; and
- 6) improvement of awareness to the students of the College and the community on environmental sustainability.

1.3 Implementation Details

Stage 1 - Planning and Project Design (July 2009 – June 2010)

The first stage is planned for project preparation and staffing arrangement during the summer term break before the commencement of the academic year in September. The project team will hold meetings to define project scope and responsibilities of the team members, formulate the study methodology and schedule a study programme. Purchase of measurement equipment and modelling software started in September 2009 in order to ensure the timely commencement of the field measurement activities. The design work of the project website and all the studies will also be initiated at this stage.

Stage 2 – Project Implementation and Execution of Studies (July 2010 – June 2011)

Five major studies covering the traffic noise, indoor air quality, water quality, air ventilation and lighting design are conducted by students and supervised by Area Leaders with the support from teaching staff.

A series of public talks on environmental sustainability will be given to the students of the College and the public. Initial findings from the studies will be shared to the students and the public. Invitations will be sent to the secondary schools for their participation. A mid-project exhibition will be conducted in February 2011 to display the background of the Project and the preliminary study results so as to promote environmental sustainability to the community.

Project monitoring and self-evaluation will be conducted at all stages of the Project to ensure that the quality of the studies conducted by the students is up to professional standard and the milestones of the identified deliverables can be completed in a timely manner.

An Environment and Sustainable Development Centre is planned to establish in October 2010. The experience gained from the Project would definitely contribute to the establishment and future development of the Centre. During the study period of the Project, the project team members will be the key staff of the Centre. The College will provide additional resources to the Centre for the effective management and operation. The Centre will provide continuous support to the project and will also support the teaching and learning on environmental sustainability to the College after completion of the project.

Stage 3 – Project Finalization and Dissemination of Study Outputs (July 2011 – June 2012)

This final stage of the Project will focus on the report writing for each of the studies with the presence of all the field measurement data, computational and assessment results, and findings. There will be five Final Study Reports to cover the areas on traffic noise, indoor air quality, water quality, air ventilation and lighting design. Important findings and recommendations will be uploaded to the project website. A Project Report will also be prepared to record all the stages of the project works, achievement and recommendations on further study and research. A post-project public exhibition will be organized in Jun 2012 to display the study results and recommendations on improvement of environmental sustainability to the community. Monitoring and self-evaluation of the overall effectiveness of the Project will be conducted and reported to the College at the end of the Project.

1.4 Project Team

Project Manager

Dr. KL Pun, Head, Department of Civil Engineering

Deputy Project Manager

Dr. Edith Ngai, Assistant Professor, Department of Civil Engineering

Team Members

Mr. Paul Chu, Head, Department of Architecture

Mr. FM Li, Lecturer, Department of Architecture

Dr. Keith Cheung, Associate Professor, Department of Computer Science

Dr. KT Wan, Assistant Professor, Department of Civil Engineering

Dr. HH Tsang, Assistant Professor, Department of Civil Engineering

Mr. Thomas Tong, Lecturer, Department of Civil Engineering

Mr. Kennedy S. Wong, Head, Department of Business Information Systems

Ms. Karen Leong, Senior Lecturer, Department of Business Information Systems

The Vice President of the College, Prof. Y. P. Kong and the Dean of the Faculty of Science and Engineering, Prof. Y. T. Siu are the representatives from the College's Quality Assurance Committee to monitor the overall quality of the Project. **Appendix A** presents the organization chart of the project team.

1.5 Monitoring and Self-Evaluation Mechanism

A Project Quality Assurance (QA) Team is formed at the beginning of the Project. The members of the Project QA team are the Project Manager, the Deputy Project Manager and the Area Leaders. The chairman of the Project QA team is the Project Manager. Evaluation

forms will be designed to distribute to the Area Leaders, supporting teaching staff and students to collect their views and comments on the effectiveness and outcomes of the Project on an annual basis.

The Project QA team will submit the evaluation results and a summary report to the Dean of Faculty of Science and Engineering. The Dean will prepare and submit an Annual Quality Assurance Monitoring Report to the College's Quality Assurance Committee for review and endorsement. Any comments and suggestions from the College's Quality Assurance Committee will be given to the Dean and then the Project QA Team for improvement of the project quality.

Three Annual Quality Assurance Monitoring reports will be submitted to the College's Quality Assurance Committee. A Final Quality Assurance Monitoring Report will also be submitted from the Dean to the College's Quality Assurance Committee at the end of the Project to summarize all the evaluation results, improvement and achievement.

2 PROGRESS ON TASKS

2.1 Project Activities

This section reports the project activities held/completed during the reporting period between July 2009 and December 2009. 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 2009 and December 2009

	Type of Activity	Date, Time, Venue and No. of Participants	Resources Used	Description
1	Project Team Meeting No. 1	<u>Date/Time:</u> 8 Jul 2009, 5:00pm <u>Venue:</u> President Office, Chu Hai College of Higher Education <u>No. of Participants:</u> 10	-	A kick-off meeting for project preparation, staffing arrangement, defining project scope and responsibilities of the project team members, and formulation of study methodology and design of study programme.
2	Project Team Meeting No. 2	<u>Date/Time:</u> 2 Oct 2009, 7:00p.m. <u>Venue:</u> President Office, Chu Hai College of Higher Education <u>No. of Participants:</u> 8	-	Bi-monthly meeting to update and review progress.
3	Project Team Meeting No. 3	<u>Date/Time:</u> 16 Dec 2009, 2:00p.m. <u>Venue:</u> President Office, Chu Hai College of Higher Education <u>No. of Participants:</u> 9	-	Bi-monthly meeting to update and review progress.
4	Traffic Noise Study	<u>Date/Time:</u> Oct 2009 <u>Venue:</u> ➤ Campus of the College ➤ Roads in Tsuen Wan District including: 1. Tai Ching Road	B&K 4231 Sound Level Calibrator; B&K 2238 Sound Level Meter; RION NL-22 Sound Level Meter	Supporting the final year dissertation.

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Type of Activity	Date, Time, Venue, and No. of Participants	Resources Used	Description
	<p>2. Castle Peak Road and 3. Yeung Uk Road</p> <p><u>No. of Participants:</u> 1</p>		
5 Traffic Noise Study	<p><u>Date/Time:</u> Oct to Nov 2009</p> <p><u>Venue:</u> Rm304, Chu Hai College of Higher Education</p> <p><u>No. of Participants:</u> 16</p>	B&K 4231 Sound Level Calibrator; B&K 2238 Sound Level Meter; RION NL-22 Sound Level Meter	Demonstration of the equipment for noise measurement and practice by students.
6 Traffic Noise Study	<p><u>Date/Time:</u> Oct 2009-Jan 2010 (bi-weekly)</p> <p><u>Venue:</u> Rm304, Chu Hai College of Higher Education</p> <p><u>No. of Participants:</u> 2</p>	Wired data acquisition system	Supporting the final year dissertation.
7 Indoor Air Quality Study	<p><u>Date/Time:</u> Oct to Nov 2009</p> <p><u>Venue:</u> Rm304, Chu Hai College of Higher Education</p> <p><u>No. of Participants:</u> 3</p>	Indoor Air Quality Meter- Aerosol Monitor; Formaldehyde Meter; Gas Monitor; Volatile Organic Compound Monitor	Supporting the final year dissertation.
8 Indoor Air Quality Study	<p><u>Date/Time:</u> Oct to Nov 2009</p> <p><u>Venue:</u> Campus of CHC</p> <p><u>No. of Participants:</u> 16</p>	Indoor Air Quality Meter- Aerosol Monitor; Formaldehyde Meter; Gas Monitor; Volatile Organic Compound Monitor	Demonstration of the indoor air quality monitoring equipment and practice by students.
9 Indoor Air Quality Study	<p><u>Date/Time:</u> Oct 2009-Jan 2010 (bi-weekly)</p> <p><u>Venue:</u> Rm304, Chu Hai College of Higher Education</p> <p><u>No. of Participants:</u> 2</p>	Phoenics, computers	Supporting the final year dissertation.
10 Water Quality Study	<p><u>Date/Time:</u> Jul – Dec 2009 (bi-weekly)</p> <p><u>Venue:</u></p>	Delft3D suite of models; computer	Students learned the computer software for hydrodynamic and water quality modelling, and

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Type of Activity	Date, Time, Venue and No. of Participants	Resources Used	Description
	Meeting room of the Faculty of Science and Engineering <u>No. of Participants:</u> 3 per each meeting		worked on their dissertation studies using the Delft3D suite of models.
11 Water Quality Study	<u>Date/Time</u> 2 Dec 2009, 6:05p.m. <u>Venue</u> Rm206, Chu Hai College of Higher Education <u>No. of Participants:</u> 19	Delft3D suite of models; computer	A general introduction to the students on the Delft3D FLOW module and generation of tidal flow data for students to carry out design project on sewage discharge through a submerged outfall.
12 Air Ventilation Study	<u>Date/Time:</u> Oct – Dec 2009 (bi-weekly) <u>Venue:</u> Rm304, Chu Hai College of Higher Education <u>No. of Participants:</u> 2	Phoenics, computers	Supporting the final year dissertation.
13 Lighting Design	<u>Date/Time</u> Oct – Dec 2009 (bi-weekly) <u>Venue:</u> Meeting Room at Faculty of Science and Engineering <u>No. of Participants:</u> 3		Supporting the architectural design project.
14 Project website design	<u>Date/Time</u> Aug – Dec 2009 (bi-weekly) <u>Venue</u> Meeting room of the Faculty of Science and Engineering <u>No. of Participants</u> 4 per each meeting	Computers	Students learned and participated in the design work of the project website.

2.2 The Five Major Studies

Traffic Noise Study

Traffic noise equipment has been purchased and set up for data acquisition. There are two Final Year Dissertations (FYD) relating to traffic noise study, which started in September 2009. The FYD topics are:

- Study on the Characteristics of Road Traffic Noise in Tsuen Wan District – Study TN1
- Development of a Data Acquisition System for Traffic Noise Measurement – Study TN2

For Study TN1, the student has completed the background study and the literature review. Meanwhile, the approach of work has been confirmed and the first trial of measurement has been conducted. The student is able to use the sound level meters to acquire the noise parameters of L_{10} , L_{90} , L_{eq} , L_{max} and noise spectrum in 1/1 octave band. A field survey, trial measurement and measuring plan have been done for his study. Noise measurement at the designated locations in Tsuen Wan District will be carried out. After the data collection, student will analyse the data in accordance to the noise criteria for road traffic noise specified by Environmental Protection Department.

For Study TN2, the student is developing a wire data acquisition system for measuring the road traffic noise using an economical solution. A data collection box has been connected for collecting signal from the sound level meter to a computer program for data analysis. Student is currently setting up a computer program to handle the incoming signals and present the data in terms of L_{eq} , L_{10} , L_{90} , L_{max} and L_{min} .

A wire and wireless data acquisition system is being set up for data logging, transmission and storage. A Sonicwall TZ 210 wireless-N gateway and a Sonicwall's SonicPoint-N Dual-band access point have been purchased to support traffic noise data acquisition. The target is to provide wireless network access covering most of the classrooms on the third floor of the College. The controller will be set up and tested. A notebook computer supporting WPA will be configured to get wireless network access via the wireless gateway within the wireless coverage. The access point, as an additional antenna, will be used to increase the wireless network coverage. On-site testing has been planned to determine the suitable installation location of the gateway and the access point in order to get the best wireless coverage.

Apart from the FYD, the sound level meters were used to support the two laboratory classes in the course of “Environmental Engineering” for the road traffic noise measurement and noise measurement in different weightings. Students learnt the handling skills of sound level meters and the measuring procedure/setup. They applied the theoretical knowledge of acoustics for data analysis and comparison of the standards or limits in HKSAR. They gained practical and field measurement experience, which is useful for them at the workplace in future.

The framework of website for the traffic noise information has been designed. The relevant information including abbreviation, dissertation study’s details and data will be updated in the coming milestones.

Indoor Air Quality Study

The equipment for indoor air quality study has been purchased and applied in three FYD studies, which commenced in September 2009. Students used the equipment to measure the concentrations of indoor air pollutants by following the measuring procedure recommended by “A Guide on Indoor Air Quality Certification Scheme for Offices and Public Places”. The FYD topics are:

- Correlation between Indoor Air Quality and Air-conditioner's Operation – Study IAQ1
- Indoor Air Quality Impacts on Student in Classroom – Study IAQ2
- Numerical Analysis of Indoor Air Quality of Enclosed Classroom – Study IAQ3

For Study IAQ1, the student is investigating the concentration variations of indoor air quality due to the operation of air-conditioner. Background study and literature review have been completed. The student is currently doing the trial measurements to ascertain the measurement setup and strategy. The measurement is conducted to note changes in the air quality prior to, during and after the operation of air-conditioner. The measuring parameters include PM10, nitrogen dioxide, carbon monoxide, carbon dioxide, TVOCs, formaldehyde, humidity and temperature in the trial measurements.

For Study IAQ2, the health condition of students due to the indoor air quality during lesson is being studied. A questionnaire has been designed to collect the subjective feeling of students together with the measurement of temperature, humidity and carbon dioxide (CO₂). These

parameters are good indicators to reflect immediate health condition and comfort of students. Background, literature review, preliminary questionnaire and measurement planning have already been done in this dissertation study.

For Study IAQ3, the student is setting up a computer model using a commercial software named “PHOENICS” to model the dispersion pattern of air pollutants inside the configuration of the ventilation system in the classroom. A student is learning the basic operation of Phoenics for simulating dispersion pattern. The configuration of the designated location has been prepared for his study. The student is expected to provide feasible solutions to improve the indoor air quality by modifying the air ventilation system with supports of computer simulations.

The equipment for Indoor Air Quality was also used to support the indoor air quality measurement in the course of “Environmental Engineering”. Students gained the measurement and practical skills through field data collection. They were able to handle the collected data and compare the results with the IAQ standard in HKSAR.

The framework of website for the indoor air quality has been designed. The relevant information including abbreviation, details of FYD and measurement data will be updated in the coming milestones.

Water Quality Study

The following equipment, software and data have been purchased or obtained to support the water quality study:

- Delft3D suite of models for hydrodynamic and water quality modelling
- Dell Vostro Computer for model simulation
- Tide data from the Hong Kong Observatory and the Hydrographic Office of the Marine Department
- Topographic maps

The water quality study supports two final year dissertation studies in academic year 2009-10. Students commenced their studies in September 2009 and will complete their dissertation reports in June 2009. The model setup, collected data and findings from their studies will be used by another group of Year 4 students, who will start their dissertation in 2010-11 to

continue carrying out a more in-depth study in hydrodynamic and water quality modelling. The water quality study not only focuses on the tidal flushing capacity and seasonal water quality conditions in Rambler Channel but also covers the investigation on water circulation in a reservoir. The topics of the two dissertation studies are as follows:

- Numerical modelling of tidal flows in Rambler Channel
- Investigation of Wind Effects on Water Circulation in Shek Pik Reservoir

These two studies are primarily to reproduce the hydrodynamic regime and circulation pattern in the study areas. The simulation of water quality in Rambler Channel and Shek Pik Reservoir is expected to commence in September 2010 after the successful generation of the hydrodynamic conditions.

The students were involved in collection, review and analysis of data, and learning of the modelling techniques and the Delft3D software.

The FLOW module of the Delft3D suite of models was used in the course “Water and Wastewater Engineering” to demonstrate the hydrodynamic modelling to the year 4 students and to generate tidal flow data for students to carry out design project on sewage discharge through a submerged outfall in different locations of the Hong Kong waters.

Air Ventilation Assessment

(i) Civil Engineering Design

A student is working on a FYD about the Air Ventilation Assessment of Vision City in Tsuen Wan. The student has already finished the problem identification and literature review and is now establishing a computer model in “PHOENICS” according to the recommendations in the “Technical Guide for Air Ventilation Assessment for Developments in Hong Kong”. Wind data are being purchased from the Hong Kong Observatory to provide input to the computer model for simulation. The wind velocity ratio will be calculated from the simulated results. The impact of the development of Vision City will be assessed. Also, if the impact is significant, the student will formulate mitigation measures and provide recommendations to the future developments.

(ii) Architectural Design

A series of meetings have been held amongst the teaching staff involved to refine the study objectives and details. Students are being trained to involve in the air data collection, model simulation, audit and evaluation of the results via physical model design and testification. All the measurement data, initial modelling results and findings will be uploaded progressively to the project website on a regular basis. Relevant learning materials relating to the study will also be designed and made accessible to the students and the general public on the website.

Key tasks have been set as follows:

- Task 1 – Research and Literature Review
- Task 2 – Experiment & Testification
- Task 3 – Design Suggestion

The CFD software “PHOENICS” has been captured and is now under testification for the 2nd stage usage by students. Small thermometers have also been sourced and would be available for student’s uses in the coming stage.

Lighting Design

A series of meetings have been held amongst the teaching staff involved to refine the study objectives and details. In Hong Kong, the current lighting design standard is based on CIBSE or IES, which may not be updated along with the changes of life-style. Students are being trained to involve in the lighting data collection, model simulation, audit and evaluation of the results against these standards. It is anticipated that Year 1 and Year 2 students will complete their project reports with in-depth investigation of the principal areas assigned by the teaching staff. All the field measurement data, initial modelling results and findings will be uploaded progressively to the project website on a regular basis. Relevant learning materials relating to the study will also be designed and made accessible to the students and the general public on the website.

Key tasks have been set as follows:

- Task 1 – Research and Literature Review
- Task 2 – Experiment & Field Work
- Task 3 – Post Occupancy Evaluation

The Lighting Design Study applies the “Radiance” design software to simulate illumination, visual quality and evaluate different lighting conditions and light levels in selected offices to improve the lighting quality of a design. The software “Radiance” has been captured and is now under testification for the 2nd stage usage by students. Lighting Lux level measurement devices have been sourced and would be available for student’s uses in the coming stage.

2.3 Project Web Site

The design of the project website is aimed to provide learning materials on environmental sustainability and present findings from the five major studies (traffic noise, indoor air quality, water quality, air ventilation, and lighting) that can be accessible to the students and the public. It serves as a communication bridge linking between the project team, the students, and the public. To provide an opportunity for Year 4 students to participate, the course BIS390A/B Final Year Project is linked to this Project. This involves three students as a team in developing the web system by adopting the rapid application development (RAD) strategy together with supervision from the faculty staff.

The first version of the prototype and the following tasks have been completed:

- Website architectural design
- Web server setup
- Database design
- Front-end prototype design
- Back-end prototype design
- Menu maintenance subsystem building

For the first prototype of the web system, two kinds of users are allowed to access. The guest users can browse the web pages for the general project information and the information of the five major studies. The administrative user, with login ID and password, can access the administration page to maintain the menu and the information content of the five major studies.

The second version of the prototype will be built in the next stage of study and the planned tasks are as follows:

- Front-end and back-end user interface enhancement
- Topics maintenance subsystem building
- Contents maintenance subsystem building
- Upcoming news subsystem building
- Simple search function

To complete the above tasks, more information will be collected from the team members of the corresponding major studies. Further analysis and design will be held, and then the second version of the prototype could be built. Meanwhile, verification and validation of the prototype take place iteratively to achieve the project expectations.

2.4 Equipments

Table 2.2 gives a list of the purchased equipments and softwares for supporting the five major studies. Invoices/receipts are included in Appendix B. Appendix C shows the photos of the major equipments and softwares.

Table 2.2 Purchased Equipments and Softwares

Study Area	Equipment
Traffic Noise	<u>Wire and Wireless Systems</u>
	➤ WSN-IMote2 Wireless Data Acquisition System
	➤ Cable 5-Way #019841
	➤ UA301 A/D Data Acquisition System
	➤ Sonic Wall TZ210 Wireless Total Secure System W/TZ210 Security Appliance
	➤ Sonic Wall Soincpoint-N-Dual Band Access Point 3 Detachable External Antennas 802.11 A/B/G/N 802.3 AF/035 Poe Power Only. 8" VAP.MIMO.SSL VPN Enforcement Wireless IDS Bundle W/POE Injection (P/N) 01-SSC-8567)
	➤ RION C/N NL-32 Precision Integrating Sound Level Meter with CF Card Reader S/N 01182892
	➤ Sound Level Meter Cable
	➤ RION C/N NX-22RT 1/1, 1/3 Octave RTA Card
	➤ DELL Inspiron 15 Intel (R) Celeron Dual Core T3000 and DELL Inspiron Mini 10
Indoor Air Quality	➤ Aeroqual P/N 500No2 500 Series, 0 to 0.2 PPM Nitrogen

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	Dioxide (NO ₂) Gas Monitor S/N S5000061008-579 Sensor S/N NO2-1812081-033 ➤ PPM P/N 556161 Formaldemeter HTV Kit S/N F6236 ➤ RAE Systems P/N 05-C110-100 PPBRAE 3000 Model PGM-7340 S/N 594-001525 ➤ Dell Vostro Computer
Water Quality	➤ Delft3D Suite Software - University license ➤ Dell Vostro Computer and Hard Disc
Air Ventilation	➤ PHOENICS CFD software - SI 3501 and Intel Fortran Compiler ➤ Dell Vostro Computer and Hard Disc ➤ Matlab Software

2.5 Financial Condition

Table 2.3 shows the expenditure in Year 1 Term 1 (Stage 1 Part I of the Project). The approved expenditure in Year 1 Term 1 is HK\$578,150. The total expenditure that has been made is HK\$508,193. The remaining expenditure of HK\$69,957 will carry forward to Year 1 Term 2.

Table 2.3 Expenditure – Year 1 Term 1 (Stage 1 Part I of the Project)

Projected Expenditure	Approved Project Budget (HK\$)	Used Amount (HK\$)	Remaining (HK\$)
a. Manpower	216,000	216,000	0
b. Equipment/ Facilities	316,780	291,560	25,220
c. Services	35,370	633	34,737
d. General Expenses	10,000	-	10,000
e. Others (e.g. auditor's fee)	N/A	-	-
Total Expenditure	578,150	508,193 ^{Note A}	69,957 ^{Note B}

Notes:

A: The total expenditure on all the purchased items with invoices that have been issued by suppliers/service providers.

B: The remaining expenditure on the items that are currently waiting for confirmation of the final prices or issuing of invoices from the suppliers/service providers.

3 PROJECT MILESTONES AND DELIVERABLES

A programme showing the project milestones and deliverables is included in **Appendix D**. The project milestones and deliverables attained at the end of the first reporting period (Jul 2009 – Dec 2009) include:

Stage 1 Part 1

Planning and Project Design Stage

- project preparation and staffing arrangement
- defining project scope and responsibilities of the project team members
- formulation of study methodology and design of study programme
- acquisition of measurement equipment and computer software
- design work of the project website
- preparation work for traffic noise study, indoor air quality study, water quality study, air ventilation assessment and lighting design study
- submission of the 1st progress report covering the first six months (July 2009 to December 2009)

The above-listed key tasks that have been completed contribute to approximately **16%** of the overall Project (100%). There is no project variation during this reporting period.