INFRASTRUCTURE MANAGEMENT (VERTICAL CONSTRUCTION) OF STATE COLLEGES AND UNIVERSITIES IN SAMAR ISLAND: AN ASSESSMENT

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Master of Arts in Public Management

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APPROVAL SHEET

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This thesis is dedicated to my parents, friends, professors, my beloved wife and children who contributed a lot for the successful completion of this study.

My expectation to apply the experiences for the improvement of instruction as well as production processes is greatly enhanced with positive results of this research.

FRANCISCO M. GILBER, JR.

ABSTRACT

This study is concerned with the management of infrastructure projects of the state colleges and universities in Samar with the aim of providing these same colleges the information that would lead them to have more judicious handling of resources both human and material in undertaking vertical constructional projects and assessing the status of the project. The "planning and design" stage of the construction process was considered by the administrators and construction workers as "moderately implemented" with weighted means of 2.56 and 3.35, respectively. Meanwhile, the contractors' group considered this stage as "highly implemented" with a weighted mean of 3.70. under "prequalification, " the following were the weighted means obtained: administrators- 2.90 or "moderately implemented, " contractors- 4.05 or "highly implemented, " and construction workers- 3.38 or "moderately implemented." The contractors and construction workers showed less resistance among themselves. This could be attributed to the fact that they work closely with one another. Also, construction workers were hired by the contractors, hence, the former are expected to follow orders from the latter. The PBAC member should assign a member who will conduct background investigation regarding contractors' capabilities more so on financial, equipment and technical personnel.

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Chapter 1

THE PROBLEM AND ITS BACKGROUND

Introduction

Environment and organization influence each other. The organization is influenced by its environment in the same manner that the environment is being influenced by the organization. As such, an organization cannot be managed apart from its environment. It is a means of providing organization favorable conditions for development. Jose P. Leveriza (1986:207-209) has this incisive comments: "No organization exists in isolation. It continuously interacts with its environment. Such interaction operates within the organized environmental patterns which stimulates development in the organization."

In this context school buildings and other infrastructure projects have to be built to promote efficient instruction and to meet the requirements of safety and space in order to provide conducive environment for growth of the whole organization personnel and students alike. Unless the school building is properly planned and constructed, and the site is intelligently located there is bound to be waste. It is a difficult job to do a good job of teaching in a poor building. If the classrooms are not well lighted, if the building is not well ventilated, if

there is little space for storage of supplies - these factors will operate against good teaching and learning. A school building has no merit when built without due regards to its educational objectives.

In the last analysis, the only reasonable way of viewing the school plant and its premises is in terms of their function to facilitate instruction. As an important agency for instructional process the school plant must represent the ultimate consideration of cost. Initially, cheap and poorly designed buildings are more expensive than an initially superior and immediately more costly construction.

The practice in this country has been to make the school plant the best possible in point of aesthetic beauty and service; however, the school housing problem is still acute in the Philippines. Hundreds of school buildings are not healthful nor comfortable nor adapted to modern educational programs (Gregorio, 1975:629-330). Moreover, the problem has its roots in the meager resources of our government. Funds for school buildings are limited, that school administrators like the administrators of state colleges and universities have to do with whatever amount the Department of Budget and Management (DBM) has allocated for capital outlay. The tendency is to construct school buildings by phases according to the release of funds by

the DBM and because of this, adjustments have to be made especially when construction is done based on the materials delivered by suppliers.

Thus, the researcher was motivated to conduct a study on the infrastructure management of the different state colleges and universities in Samar. The aim is to provide these state colleges and universities insights in achieving optimum benefit out of the meager financial resources that they receive from the national government. With improved infrastructure management the general welfare of the students and personnel under each state college and university will be enhanced and for the teaching-learning process will be enhanced by the provision of a well planned school building with adequate building facilities.

Statement of the Problem

This study is concerned with the management of infrastructure projects of the state colleges and universities in Samar with the aim of providing these same colleges the information that would lead them to have more judicious handling of resources both human and material in undertaking vertical constructional projects and assessing the status of the project.

Specifically, the study sought answers to the following question.

1. What is the profile of the three groups of

respondents according to:

1.1 age,

1.2 educational attainment,

1.3 designation,

1.4 experience.

2. As perceived by the three groups of respondents what is the extent do state colleges and universities administrators, contractors and construction workers implement the following construction processes:

2.1 Planning and designing;

2.2 Prequalification;

2.3 Bidding - Actual bidding;

2.4 Construction;

2.5 Post construction.

3. Are there significant difference on the perception among the three groups of respondents as to the extent of implementation on the following construction processes:

3.1 Planning and designing;

3.2 Prequalification;

3.3 Bidding - Actual bidding;

3.4 Construction stage;

3.5 Post construction stage.

4. As perceived by the three groups of respondents, how adequate are the following standard provisions for

vertical infrastructure projects in the different state colleges and universities in Samar implemented:

4.1 architectural specification?

4.2 safety provisions?

4.3 lighting?

4.4 ventilation?

4.5 area?

5. Are there significant differences among the perceptions of the three groups of respondents as the implementation of the following standard provisions for vertical infrastructure projects in the different state colleges and universities in Samar:

5.1 architectural specification?

5.2 safety provisions?

5.3 lighting?

5.4 ventilation?

5.5 area?

6. What are the different problems encountered by state colleges and universities in managing vertical infrastructure projects as identified by administrators, contractors and construction workers?

7. What are the recommended solutions?

8. What implications relative to infrastructure management of SUCs can be derived from the results of the study?

Null Hypothesis

In trying to seek answer to the problem posed in this study the following hypotheses were pursued.

1. There are no significant differences among the perceptions of the administrators, contractors and construction workers concerning the extent of implementation of the following construction processes:

   1.1 Planning and designing

   1.2 Prequalification

   1.3 Bidding - Actual bidding

   1.4 Construction stage

   1.5 Post construction stage.

2. There are no significant differences among the perceptions of the three groups of respondents as to the extent of the adequacy of implementation of the following provisions in vertical construction:

   2.1 architectural specifications

   2.2 safety provisions

   2.3 lightings

   2.4 ventilation

   2.5 area

Theoretical Framework

Infrastructure projects which belong to the physical environment are contributory to the development of

organizations like the Samar State Polytechnic College. Their impact to the students, personnel and faculty members is best seen in the quality of the academe that SSPC maintains. Thus there is a need to assess their management in the light of exacting the optimum benefit that each member of the academe can get from these projects. This is one function of the management which is called controlling. Controlling is the aspect of verifying or tracking down projects.

The theory espoused by Dalton E. Mcfarland (1970:259-260) explains:

"Like all management action, the importance of control lies in the necessity for maximizing the use of scarce resources and in the need for order and system in the purposeful behavior of men."

Cleland and King (1975:324-325) supports the idea that in managing a project the cost scheduling and technical performance must be controlled within the established constraints. Control of the project requires that adequate plans be formed, suitable standards developed, and information system be set up, which all will enable the project to be "tracked" during its life cycle in terms of expected with actual performance.

Better planning and better management will evolve in the administration of state colleges and universities in

Samar to ensure maximum usefulness of the various infrastructure projects within the context of limited resources.

Conceptual Framework

The schema in Figure 1 explains the conceptual framework of this study. This study has, for its ultimate end the existence of quality and functional building/vertical infrastructure projects in learning institutions. In an effort to build better physical facilities, an evaluation is in order to determine whether their management is functional, efficient and effective. At the bottom of the schema are the different SUC's in Samar: University of Eastern Philippines, Samar State Polytechnic College, Tiburcio Tancinco Memorial Institute of Science and Technology and Eastern Samar State College. They were the research environment. The criterion variables were the perceptions of the three groups of respondents coming from the SUC's. They gave their perceptions regarding the extent of implementation of the construction processes, in vertical construction namely: 1.) planning and designing, 2.) pre-qualification, 3.) bidding, 4.) project implementation or construction stage, 5.) post construction stage. They also assessed the adequacy of implementation of the standard provisions in vertical construction such as: 1.) architectural specifica-

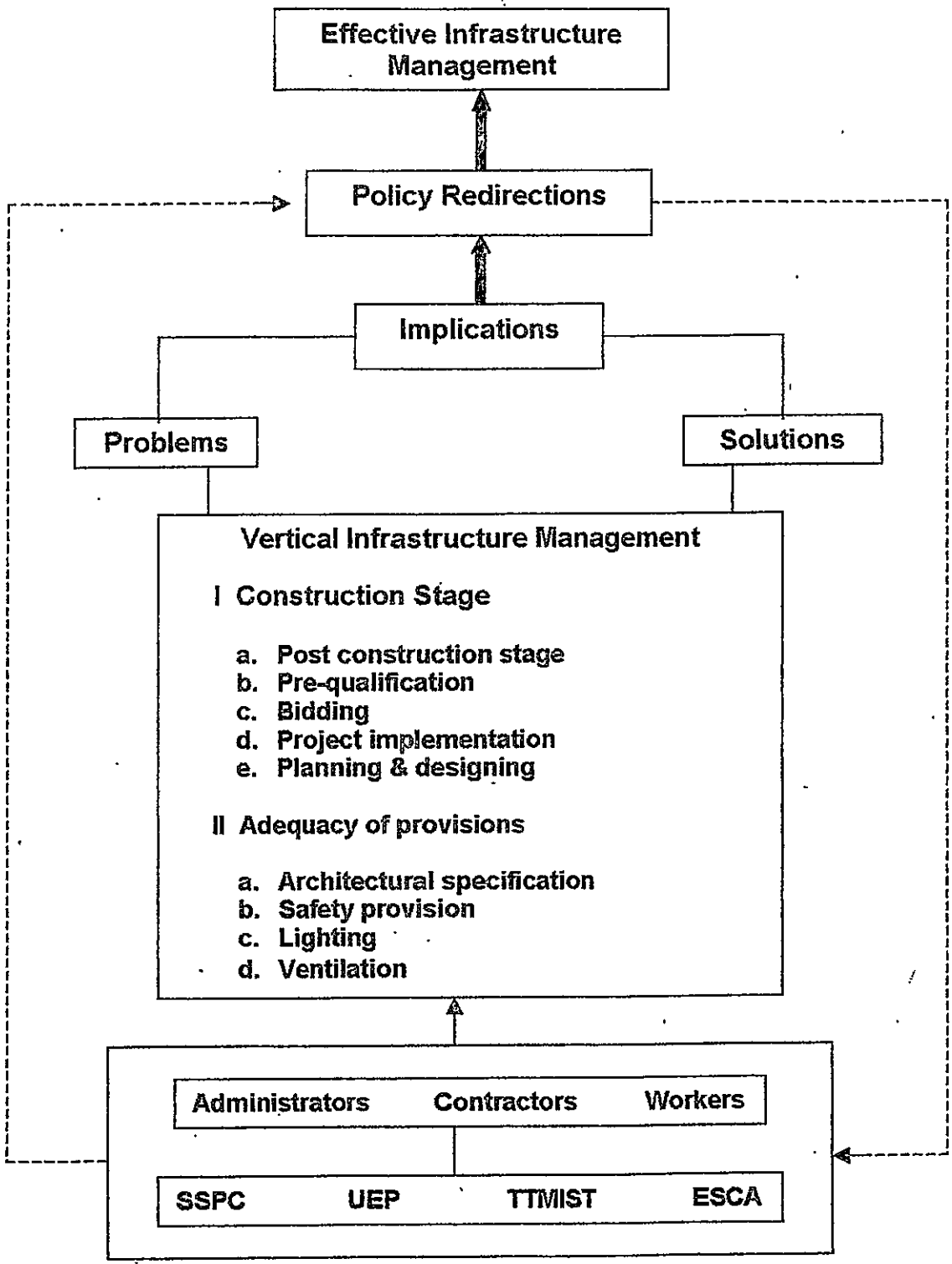

Figure 1. Schematic diagram of the conceptual framework Showing the research environment, the variables, and the objective of the study.

tions, 2.) safety, 3.) lighting, 4.) ventilation, 5.) area. These factors are important in construction management.

This study includes the respondents perceived problems in their infrastructure projects, with their suggestions and recommendations to their solution. The differences/similarities/problems/solutions/recommendations regarding the different aspects in infrastructure management shall serve others as inputs to policy redirections. In this study results of their perceptions were the researcher's basis for drawing out implications and suggested policy redirections.

The ultimate end of the study is effective infrastructure management based on the implications derived from the responses of the respondents.

Significance of the Study

This research will especially be beneficial to the following groups:

To the SUC Administrators. The results of the study will give the administrators insights into the improvement of management style and ability in relation to management of infrastructure projects. They will be able to identify where they are weak or strong in the mentioned aspect of infrastructure management.

To the national government. The result of the study will give information whether or not monetary resources are

maximized for optimum benefits.

To the engineering students. The findings of the study will give them greater knowledge and comprehension in infrastructure management as part of their training.

To the students and personnel of SUC's. Whatever improvement will be made by the institution as a result of this study, will greatly benefit them as they are the direct beneficiaries of better management of school buildings.

To the future researchers. The study will serve as a source of information regarding the different management practices on infrastructure projects.

Scope and Delimitation

This research deals with vertical construction management only. Aspects included in the evaluation are on planning and designing, prequalification, bidding, project implementation and post construction stage. Other infrastructure projects such as involving heavy construction are not included in the study.

All administrators and all contractors in the four SUC's were taken as respondents. A number of construction workers were also considered as respondents. The different state colleges and universities involved in this study were University of Eastern Philippines, Samar State Polytechnic

College, Tiburcio Tancinco Memorial Institute of Science and Technology and Eastern Samar State College.

The study covered the period 1996-1997.

Definition of Terms

For the frame of reference the following terms are defined as used in this study.

Architectural Specification. In this study this refers to the aesthetic value of the construction, which include the harmonious relationship of the building to its surrounding.

Bidding. This refers to standard practice for government and public agencies to provide for the public bidding of contracts for public infrastructure projects. Sealed bids are invited by advertising in newspapers and engineering publications within the legal required periods.

Bid Tender. This term refers to a delivery of proposal. Bid-tender or proposal must be signed and signatures legally acknowledged before being placed in an envelop furnished for the purpose and then sealed.

Contractors. This term refers to the person who contract to furnish supplies, services or perform work with a certain price or rate.

Equipment capability. This refers to the availability and completeness of the materials and equipment needed in the construction of building.

ESSC. This is an acronym for Eastern Samar State College.

Final billing. This refers to the last payment made by the agency to the contractor after doing the final touch of the project.

Infrastructure. This refers to horizontal and vertical constructions. Horizontal construction refers to canal, highways, airport, dams. Vertical construction refers to buildings.

Management. In this study it refers to the technique used in planning and controlling in which subordinates determine their objectives jointly with superiors and evaluation follows periodic monitoring and performance reviews.

ITB. This is an acronym for invitation to bid.

Prequalification. For a bid to be acceptable, there must have been prequalification check with the contracting agency for capability and financial standing, by submission of documents, furnishing required information, or otherwise qualified along the same lines furnishing evidence thereof with the bid.

Planning and Designing Aspect. This refers to a means of providing for the many necessities of life this can be achieved, and arrive at better results by allowing the combined needs of society to be meet by chance.

Planning includes economy as an inherent ingredient.

Quality control. This refers to the technical process of inspecting, monitoring, checking, and testing products, materials and services to ensure performance that conforms with standards.

SSPC. This is an acronym for Samar State Polytechnic College.

SUC's. This is an acronym for state colleges and universities.

Scheduling. In this study it refers to the operational activity usually associated with weekly or monthly achievement period. It considers at least four things, inventory, purchasing, human resources and cash flow.

TTMIST. This is an acronym for Tiburcio Tancinco Memorial Institute of Science and Technology.

UEP. Acronym for University of Eastern Philippines.

Vertical infrastructure. This refers to the infrastructure on buildings such as the school building.

Chapter 2

REVIEW OF RELATED LITERATURE AND STUDIES

This chapter gives the different readings the researcher used that influenced him in the conduct of the study. Various magazines, books, journals and unpublished works were consulted in order to come up with a viable study. The reading helped in the shaping of concepts otherwise not very clear to the researcher.

Related Literature

This study is focused in evaluation of the vertical construction in SUC's in Samar. According to Tenbrink (1974:10-12) evaluation is the process of obtaining information and using it to form judgments which in turn are to be used in decision making. It has three stages namely: 1. getting set to evaluate; 2. data collection and evaluation.

Making decisions is the ultimate end of evaluation. a decision is a choice among alternatives courses of action. A system of decision making should help to highlight similarities and difference among the various alternatives so that a choice might be more easily made.

On the other hand, information provides the data base for making judgments. It is the essential ingredient in evaluation. Without some kind of information, valid

judgments and decisions are virtually impossible to make.

S.W. Nunnally (1991:7-9) explains that construction management is a constractual arrangement under which a firm supplies construction management services to the owner. In general, it refers to the control of the four basic services of labor, material, machinery and money in executing a construction project. The principal objective of any construction manager should be to complete each construction project on time and within the budget while maintaining an acceptable level of quality.

The author also divided construction into two, namely heavy construction or horizontal construction and building construction or vertical construction. Horizontal construction includes highways, airplane, railroads, bridges, canal, harbor dams, utility lines and similar works. Building construction as the name implies involves the construction of buildings.

Donald Hepter and Paul Wallach (1982:14-20) expounds that functionalism, freedom and relationships are fundamentals of designing and planning buildings. Functionalism is the quality of being useful, of serving other than adding beauty or aesthetic value. "Form follows function" is a dictum that should be observed in constructing buildings. The authors further stated that functionalism in architecture has led to extreme

applications of simplicity in design. Simplicity and functionalism complement each other.

Freedom of expression, freedom in the use of space and structural freedom in design characterize modern architecture. Buildings should not challenge nature with our architecture but rather work with nature.

Lastly, relating the areas of the structure to each other and to its environment has become a well-established principle of modern architecture.

One of the important aspects in vertical construction is cost analyses. Budgets are the necessary framework within which architects must design most buildings ranging from the smallest residence to the longest office building. The designer must strive to create a design that will provide optimum facilities and keep within the budget.

According to Hepter and Wallach (1982:558-561) approximately 40 percent of the cost of the average home is for materials. Labor costs account for another 40 percent. The remaining 20 percent is taken up by the price of the lot. Factors affecting the total cost of a house are: 1. the location of the site, 2. labor costs, 3. cost of materials.

Major construction projects are usually subject to a bidding system. Architects and contractors estimate how much they would charge to design or erect a building. That

estimate must be based upon estimate of their costs in designing or constructing the building.

Two quicker rule of thumb methods for estimating the cost of a house are the square-foot method and the cubic-foot method. These methods are not as accurate as itemizing the cost of all materials, labor and other items. Other methods are metric measurements such as cubic-meter measurements and building materials method.

Callender (1982:4-3,4-5) pointed out that in designing a building, the designer should take into consideration the following environmental control: acoustics, ventilation and air conditioning, plumbing, drainage systems, fixtures, waste disposal, sewage disposal, lighting, electrical system, fire alarm systems, sound systems, elevators as well as escalators. All of these controls are treated exhaustively in the author's discussion.

Koonts and O'Donnell (1986:20-25) in their book on Management made a thorough discussion on the functions of management which are planning, organizing, staffing, directing, and controlling. They pointed out the importance of these functions in an organization.

Kerzner (1987:101-102) in his book on Project Management placed emphasis on project planning and controlling. His approach to these management functions

made use of the operations research tool - PERT/CPM.

Sison (1992:105-110) in his book on Personnel and Human Resource Management, elaborated the need for an effective management of human resources involving procurement of employees, placement and utilization, training and development, motivating employees and compensating.

John Betty (1988:3-10) points out that the prime function of project management is to monitor and control time and money. Tasks involved in a functional project management system include:

1. Monitoring the programme
2. Controlling the expenditure
3. Expediting and coordinating
4. Supervision and quality control
5. Reporting on progress and expenditure.

John Reyfuss (1989:61-70) has described the contracting out process. The first step is an internal feasibility study to identify contractable services and establish performance measure. The next step is to solicit and review bids. The manager must then decide whether to base the award on formal invitation to bid (ITB's) which involve sealed bids and public opening. The ITB process is normally used when the contract can be clearly defined. The other way of arriving at contract is through Requests

for Proposal (RFP's). They usually use for personal services, sale-source supplies, or emergency procedure. They involve negotiations among the parties prior to signing a contract.

The ITB process contains only a few basic steps. The first step is to prepare the invitation to bid. This is a job for attorneys, although managers should be generally aware of the elements of an ITB. The legal notice should include such things as where the bids should be delivered, when and where the bids will be opened, specifications for the proposal service, location where the formal bid proposal with all bidding details can be obtained, the name of the unit, and the statement that all bids maybe rejected.

The bid proposal form that bidders will find out should include such things as bidder instructions, terms and provisions, service specification place for the official bid and price information about bond deposits that maybe required, statement about bidder qualifications, provisions for disqualification and reporting and payment provisions.

After the bid proposal is completed, it is advisable to hold a prebid conference for potential contractors. All bidders who obtained bid proposals are invited to attend this meeting, the purpose of which is to clarify

instructions, answer questions, interpret the bid specifications and anticipate potential problems.

P.D. No. 1594 has listed down the necessary activities to be done when undertaking infrastructure projects:

1. No bidding and/or award of contract for a construction project shall be made unless the detailed engineering investigations, surveys and designs for the project have been sufficiently carried out in accordance with the standards and specifications prescribed by the head of office/agency/corporation concerned or his duly authorized representative.

2. Detailed engineering shall proceed only on the basis of the feasibility or preliminary engineering study made, which establishes the technical viability of the project and conformance to land use and zoning guidelines prescribed by existing laws.

Gregorio (1976:330-333) enumerated several factors to be considered in the construction of school buildings. Some of the important ones are:

1. Location. The school building should be located and constructed in the quietest section of the town. However, a school building should not be located far out of the way. It should be possible, a little elevated and easily accessible.

2. Health. Health of the children should be an important consideration in the construction of the school building. Ventilation, toilet and playground facilities, drinking fountains, and lighting should be attended to properly. It is also important that the school should be far from the street or road free from dust.

3. Safety. In like manner, the safety of the school children is of great importance in the construction of the school building.

4. Lighting. Proper lighting in the classroom is fundamental in the operation of the school.

The Committee of Schoolhouse Planning and Construction of the National Educational Association suggests that a school building should have the following qualities:

1. Adaptation to educational needs. The plan should conform to the schedule of the rooms already adapted.

2. Safety. The corridors and stairways should permit the building to be vacated in three minutes even if one stairway is made useless by smoke.

3. Healthfulness. Every room should have abundant natural light. The toilets should be distributed on each floor and schools should have windows opening directly to the open air.

4. Convenience. The location of the rooms with

reference to one another should be carefully studied.

5. Aesthetic fitness. The building must be made a pleasant and an attractive place where young people can engage happily in worthwhile enterprises. The exterior should reflect the major function of the school itself that is to attract the public. The interior should likewise produce attractive and pleasing effects.

6. Economy. Economy in the plan is secured through accurate determination of the size needed for each room, duplicate use of rooms, and elimination of waste areas.

Related Studies

Only few related studies were gathered by the researcher inasmuch as there were only few who attempted to study infrastructure management and its different facets and aspect. However, with meager materials the researcher was able to conceptualize the study on hand.

Dasig (1993) in his study "Samar Resettlement Program: an Assessment" was an attempt to come up with first hand information on the overall status of the program. He made an enumeration of different components of the Agrarian Reform Program of the government in its resettlement of Sta. Rita, Samar. The main problem was to find out the extent of implementation of the program in terms of the following components: a) land tenure

improvement; b) physical facilities and infrastructure; c) agricultural development; d) community organizing and institution building; e) credit and marketing services; and f) forest and environmental protection.

The following are the salient conclusions made: 1) The implementation of the Land Tenure Improvement component of the resettlement program is very slow due to non-incorporation of a provision that upon proclaiming the area for this purpose all lands under the resettlement program are automatically considered alienable and disposable. This hampered the distribution of Land Ownership Award to the farmer beneficiaries; 2) There are some infrastructure projects i.e. roads, water system, school buildings, etc. which were constructed not in accordance with accepted standard plans and specifications; 3) Agricultural practices in the area are still dominated by traditional methods thus, production of agricultural products is very low; 4) There is an extensive ecological and environmental destruction problem being felt in the area caused by massive illegal loggings and other destructive activities. Some of the recommendations were: 1) Conduct an inventory and investigation on all infrastructure projects that have been constructed; 2) Massive and appropriate agricultural technology transfer trainings and seminars should be conducted to transform the traditional agricultural

practices of the farmers in the area into a modernized one; 3) Extensive value formation/reorientation trainings of the farmer beneficiaries should be conducted by both government and non-government organizations.

Tabu's (1995) study entitled "Community-Based Skills Training Program: An Assessment" attempted to assess the impact of the skills training programs on the trainee-graduates and the communities as a whole. It aimed to gauge the over-all effectiveness of the training programs of National Manpower Youth Council in the Province of Samar.

The salient findings of the study were: 1) Adequacy of training inputs: The following items in the skills training programs were assessed by the trainee-graduates and stakeholders as existing but inadequate namely: tools and equipment, supplies and materials, trainors, commitment fee of P20.00, financial assistance from LGU's and other agencies and donations from NGO's and other civic groups; 2) Skills training in accordance to community needs. The following trainings were found to be relevant: barangay electricity, cosmetology, food processing and bag/basket making while dressmaking, root crops processing, marine processing, and resources processing were found to be moderately relevant. Only bamboo furniture making was found to be relevant; 3) Extent of contribution NMYC

Training Programs. The training program contributed a little in terms of the following: increased income after training, employment generation, establishment of production groups, poverty alleviation, sustained economic activity, and proper application of the acquired skills.

Tabu concluded that: 1) in general, both the trainee-graduates and the stakeholders considered the training inputs of the NMYC conducted trainings as "Existing but inadequate"; 2) The skills training conducted by the NMYC were deemed "Very relevant" by both the trainees and stakeholders; 3) The trainee-graduates and stakeholders perceived the objectives, policies and standards as "Quite achieved" by the NMYC conducted trainings.

The following were the recommendations of the writer: 1) Qualified and competent trainors should be employed/ hired to conduct trainings at the provincial and municipal level; 2) NMYC training programs should have a well-developed training design that will focus on the use of available indigenous materials in the community; 3) There should be a training coordinator based in the community to organize/activate and plan for a skills training program; and 4) Sustainability of programs should be included in the training design.

Marco's study (1993) attempted to assess the different projects undertaken towards bay-resource

regeneration, land based development, rural roads and enterprise development, and integrated health, nutrition and family planning along with the project concept and design and its organization and management as carried out in the Maqueda Bay Area. Conceptualized under a broader term, these development activities in the area are lumped as Maqueda Bay Area Development Program.

The major findings were: 1) The extent of the implementation of the Program components as perceived by the five groups of respondents revealed that the program was least implemented particularly along Concept and Design, Organization and Management, Land-Based Development and Bay Resource Regeneration. However, the program implementation was perceived as averagely implemented along the program component of Health, Nutrition and Family Planning. In addition to the components least implemented were Rural Roads and Enterprise Development and Finance; 2) The effects/influence of the program as perceived by the five groups of respondents show that the Maqueda Bay Area Development Project has "least impact" on Productivity Improvement, Enterprise Development, Diversified Production and Job Generation; 3) The seriousness of problems encountered in the implementation of the program components revealed that it was only in Concept and Design component and in Organization and Management that the problems were

considered serious.

The conclusions drawn from the study were: 1) As to the extent of implementation of the Maqueda Bay Area Development Program, it is perceived to be "Least Implemented"; 2) As to the impact of the implementation of the program, it has "Less Impact." The following measures were recommended: 1) Immediate legislative enactment from Congress be made for the creation of the development authority that shall be vested with the power to integrate government and non-government efforts and resources for a planned development and a balanced growth of Maqueda Bay area, to undertake massive regeneration activities on land-base, as well as, marine resources, to reclaim swamps and wastelands and make productive idle lands, to develop a food-catch within the Maqueda Bay Area by increasing agricultural and marine productivity and to adopt a model for development tapping the potentials that may be provided by the regenerated Maqueda Bay; 2) Get or undertake an inventory of the projects and activities had in the areas as reported in the Aquino Administration; 3) Undertake a massive, but appropriate, technology transfer trainings to improve the resource-mobilization competencies of the people in the area.

The three cited studies dealt on evaluation. This study was also on evaluation, hence, the similarity of the

process. However, they differed on the field to be evaluated. Dasig focused on the resettlement program in Sta. Rita, Tabu on the training skills program while Marco concentrated on the Maqueda Bay Area Development Program. The study on hand was about infrastructure management, hence, the nature of the evaluation largely differed from the aforementioned unpublished researches.

Amboayan (1984), in his study on the building construction industry in Iligan City, cited among others the problems of building construction industry on the faraway city of Iligan. He wrote that the industry has many problems that tend to obstruct the flow of work.

Some factors responsible for creating the weak areas of the organization setup are control, which is the most serious in management, others were staffing and planning, direction, organization, late payments of the owner and unstable construction materials in that order.

On personal recruitment, the lack of qualified workers and low compensation were the leading problems. These were followed by training of personnel and recruitment procedures.

In other management areas, achievement of work objectives was the common problem, followed by too much competition. These results indicated control, to be the most significant problem in the industry. Recruiting of

competent workers was also seen as a problem. However, it was revealed in his work that the span of control and lack of communication were not a hindrance in the study.

The problem related to the management of workers showed that the primary problem of the workers was their tenure of employment. Low wage rate was also felt, which do not even meet the minimum as stipulated in the wage law. The findings showed that the tenure of employment in the industry was the most controversial problem.

The above study has a direct relation to the present study in the sense that it dealt with the management of building construction and that the problems identified in Iligan City are not much different with the problems encountered in Samar. However, the two studies differed in their final implication, Amboayan's work focused primarily on the relevance of the curriculum of MSUIIT to the outside world of construction, whereas the present study is ultimately streamlined on the operating management procedures as being carried out by administrators of SUCs in Samar.

In Cebu, Engr. Shoallah Khalili Arabi, (1981) made a study on the management practices of selected construction firms on the same area. He pointed out that the management today including the construction industry has changed in outlook and has encompassed greater task. Its various area

covered the totality of planning, organizing and coordinating the multifarious problems affecting the firm.

For a construction firm, he thought, to succeed in their operations, the officers are expected to follow basic management practices in order to attain their goals, maintain and sustain them on an even keel, steer them to unchartered problems and prepare them adequately for the varied challenges in society.

He found out that not all the companies have problems on personnel. Eighty-five percent of the respondents however admitted that they do have. Those who signified having problems specified that tardiness of laborers was the number one problem, followed remotely by absenteeism and closely on the rank were demands for higher wages, petty quarrels among workers, petty thieveries and strained relationship between the management and labor.

Arabi's work was relevant to the present study in that both encompassed the field of construction. His work looked into the problems of the management particularly the personnel department that hindered the attainment of the goals of the construction firms. He noted that early recognition of the problem would allow the administrators to resolve them promptly and eventually would avoid more serious complications. Likewise the present study delved into the identification of the problems, so that

constructors will set up innovations and anticipations, hence problems will not affect severely the attainment of their goals. They differed however in that Arabi concentrated on the management practices of the construction firms and that problems met in this department came as side lights. The present study in the other hand dealt exclusively on the assessment of management aspect of implementations of vertical construction and level of adequacy in the implementation of standard provisions on infrastructure projects, as well as identification of management and laborer's problems in the project on the existing vertical construction of SUC's.

In his work on the status and middle level manpower requirements of the construction industry of La Union, Castro (1983) found the following realism: 1) That there was seemingly a projected need for skilled workers in the next five years, especially masons, plumbers, carpenters and electrician; 2) That the construction firms generally were not worried about turnover; 3) That the firms identified the following reasons for the movement of workers: transfer to other construction firms, employment overseas and establishment of their own small construction enterprises; and 4) That majority of firms approved apprenticeship but are not willing to accept them; 5) That construction firms felt there is a need of retraining

workers to update their competencies and skills.

Two problems were observed, to be not a bother to management: the labor turnover and the scarcity of qualified masons, tile setters, carpenters, heavy equipment operators, finishers and mechanics.

Castro in his findings concluded that: 1) Individual proprietorship is favored over partnership in construction industries in La Union; 2) The construction firms are engaged in a variety of construction jobs. The bulk of constructed works were school and government buildings; 3) There is a limited capital for infrastructure projects in most of the firms because of its nature of ownership; 4) Based on study, there is an expressed plan of the firms to double their capital in the next five years; and 5) A greater need for foreman, and leadman who are knowledgeable in welding, plumbing, painting, finishing, electricity and masonry is projected.

At this point, Castro found out that construction firms in La Union were of the same status with that of in Tarlac since majority of the construction firms here were of category D, having only P100,000.00 as minimum equity with a greater number having class E less than P100,000.00 equity. Majority of their constructed work were also revealed to be in line with school buildings and other government vertical structures.

Castro's work is related to the present study in the sense that they both deal on construction. Castro's work was more on the status and projection of manpower. The present study however, glimpses only on manpower as one of the aspects of vertical construction that needs monitoring.

At the national capital region, Malagapo (1982) conducted a study on construction projects cost control system adaptable to small contractors of Metro Manila. In his findings, he derived the following relevant conclusions to the present study: 1) Small contractors do not employ computers, but instead they resort to manual system, code of accounts, scheduling control, using milestone report, monitoring engineering status, employment of procurement method, inventory, control, summary of cost and progress report, cost control work of the budget projects. They appropriate money for the project which include cost control expenses, hiring experienced people for the project cost control work; 2) The board of directors passed resolutions on project cost control system objectives and procedures. They have a formal project and cost control program and maintain full time cost control head office which employs 0-5 size groups. They have 0-5 number of projects.

One of the truisms on vertical construction is that a lot of activities are done at the same time, while other

work are suspended, being dependent on the completion of the preceding activities before they could be started. Proper sequencing and scheduling of the performance of these activities are therefore imperative. Any deviation from the order means a delay in that work and the good name of the contracting firm is in danger. Cost control system with its instrument, the PERT CPM and PERT COST is an answer to the consequences and problems that arise on this basic fact of building construction. Both studies consider this aspect of the industry. But Malagapo's work substantially centers on cost control as one of the arms towards the facility of attaining construction goals. The present study takes into account that all construction procedures are to be monitored.

The financial capability of a construction firm is an important factor which may cause compounding problems if not properly controlled. Materials can not be delivered in time, equipment can not be properly selected, to name few basic problems of construction.

Domingo (1970) in his case study concerning the five-year financial goal and projection of a construction company attempted to traverse the ins and outs of a construction company.

He found out that the company was confronted with problems on properly drawing up its financial standards and

projections. This arose out of the inadequacy of clear cut and established procedures by which certain operational goals are defined in the company. The problems therefore were along the area of replanning and subsequently, control.

Although encountered in virtually all facets of company operations, acute difficulties prevail in establishing financial goals and projections which in effect, translate production and sale targets into more tangible terms. As such, the main aspect of consideration is financial management and score specifically on budgets, which represent more concrete mirror of a firm's total aspirations. Problems of firms are the key to consider to appraise the soundness of a construction firm's corporate objectives.

The problem lie in the search for appropriate standards in a company desirous of achieving optimum levels of performance and profitability. Financial goals as target indicated the direction in which future operations are going on and the basis of all activities of the company. Miscalculated standards and goals result in operational losses, if it sets and operates at relatively lower levels than what should be undertaken; or wastage if it aims and carries operations towards unattainable goals. This emanates from misdirected acquisition and utilization

of funds.

Thus, he concluded that standards must be set-up along with proper pacing of operations which is consistent with the overall company objectives and proper appraisal of operation efficiency of various units in the organization as guide to the future innovations and improvements.

Domingo's work elaborated the setting of standards as the basis and yardstick towards the prevention of compounding problems in construction industry, specifically the acquisition and utilization of funds. Mismanagement of funds will certainly lead to severe problems since materials which comprise seventy percent of the building structures cannot be procured on time. Along this line, the present study has similarity to the study of Domingo. Domingo's study was concerned problems in construction industry. On the other hand the present study takes into consideration problems that are relative to vertical construction.

Chapter 3

METHODOLOGY

This chapter presents a detailed discussion of the method and procedure with particular focus in research design, validation of the research instrument, sampling procedure, data gathering and statistical tools used in the treatment of the data.

Research Design

This study used the normative-descriptive research method with the questionnaire-checklist as the chief instrument used in data gathering. This method was supplemented by interviews and observation to verify or crosscheck some initial doubtful information and responses in the checklist.

Initially the researcher drafted the questionnaire and underwent expert validation. It was fielded later to four SUC's in Samar. After the retrieval of the questionnaire data were sorted, analyzed and interpreted.

Instrumentation

The researcher made use of questionnaire, personal observation and interviews as instruments in data gathering. However, among the three instruments, the questionnaire was considered as the primary instrument in

in the conduct of study.

Questionnaire-checklist. This instrument consisted of three main parts, namely: Part I - necessary Personal Information on the respondents, and Part II - the questionnaire proper, broken down into five sub-parts as follows: a.) On Planning and Designing, b.) On Prequalification, c.) Bidding, d.) On Project implementation, e.) On Post construction stage, f.) On Provision of adequacy. Part III contained the problems relative to the infrastructure management and the solution to the problems. The questionnaire was provided with a cover letter addressed to the respondents.

Part I of the questionnaire helped the researcher in grouping the respondents into three categories for the purpose of comparing their perceptions on the level of implementation by management, contractors and construction workers of the different phases of construction and adequacy of provision for architectural specification, lighting and ventilation, area and safety.

Part II was the questionnaire proper. Item A was a five point assessment scale which asked the extent to which the respondents agree on the extent of implementation of the different construction processes. Item B was about the extent of adequacy in the implementation of the provision for architectural specification, lighting, etc.

Interviews. Personal interview was conducted to verify and crosscheck informations in the questionnaire which were not very clear to the researcher.

Observation. The researcher also resorted to actual on going observation to supplement the present knowledge of the respondents on the different respondents in the infrastructure projects that were going on and included in the study.

Validation of the Instruments

After the questionnaire was drafted the researcher submitted the same to the adviser for comment and suggestions. The second questionnaire incorporated the suggestions given by the adviser. Copies of the drafted second questionnaire were given to some civil engineers for validation. Their comments and suggestions were included in the framing of the third questionnaire. The third draft had a dry run at the Leytè Institute of Technology, Tacloban City. The final questionnaires were distributed to the respondents.

Sampling Procedure

The take-all technique of sampling took place with the presidents of SUC's and the contractors. The lottery technique was employed in getting sample from the

construction workers: pieces of paper were rolled and given to the respondents. Those with marked x were taken as respondents. The size of the samples was determined by using the Sloven's formula.

The formula is:

$$n = \frac{N}{1 + Ne^2}$$

Wherein:

n ---> sample respondents

N ---> total population

1 ---> constant number

e ---> level of significance which is 0.05.

Data Gathering Procedure

The researcher sought permission from presidents of SUC's to distribute the questionnaire to the respondents. The researcher personally collected the questionnaire in order to ensure higher percentage of retrieval. As a supplementary technique, the researcher interviewed the respondents personally to ascertain their ideas on how building construction is managed, as well as their problems relative hereto. In doing so, he observed the current management procedures involved in the infrastructure projects.

Treatment of Data

The data from the gathered questionnaire were tallied in a master sheet properly tabulated, analyzed and interpreted qualitatively and quantitatively using the appropriate statistical tools.

For table which involved a five-point scale assessment the mean and frequency count were used. The following descriptive and numerical scales were arbitrarily developed to suit the purpose of this study. They were used in determining the extent of implementation of construction process. They were as follows:

Strongly Implemented	(SI)	5.00 - 4.51
Implemented	(I)	4.50 - 3.51
Undecided	(UD)	3.50 - 2.51
Weakly Implemented	(WI)	2.50 - 1.51
Unimplemented	(UI)	1.51 - 1.00

As to the extent the respondents' perception on the adequacy of implementation of the standard provision on safety, lighting, ventilations, area and architectural specification, the following descriptive and numerical methods were used:

Very Adequate	(VA)	5.00 - 4.51
Adequate	(A)	4.50 - 3.51
Undecided	(UD)	3.50 - 2.51
Inadequate	(I)	2.50 - 1.51

Very Inadequate (VI) 1.51 - 1.00

To compute the perception of the three groups of respondents as to the extent of adequacy of implementing standard prescribed provisions, the One-way Analysis of Variance (ANOVA) was used. The formula is:

1. $SSt = \Sigma X^2 \frac{(\Sigma X)^2}{N}$

2. $SSb = \frac{(\Sigma X_1)^2}{n} + \frac{(\Sigma X_2)^2}{n} + \frac{(\Sigma X_3)^2}{n}$

3. $SSw = SSt - SSb$

4. $Ms = \frac{SS}{df}$ $MSb = \frac{SSb}{df}$

5. $MSw = \frac{SSw}{df}$

6. $F = \frac{MSb}{MSw}$

Wherein :

SSt ---> the total Sum of Square

SSb ---> the Sum of Between Square

SSw ---> the Sum of Square

Ms ---> the Mean of Square

Chapter 4

PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

This chapter contains a detailed presentation, analysis and interpretation of data in accordance with the specific questions posed in this study. The data are presented starting with the profile of the three categories of respondents; the perceptions of respondents according to the implementation by management of the construction processes; problems met in infrastructure projects, as well as the respondents perceived solutions and recommendations relative to construction management.

Profile of Respondents

This section presents the profile of the respondents as to age and sex.

Sex. The sex distribution of the respondents can be gleaned from Table 1. As shown in this table, there were 101 respondents involved in the study broken down as follows: 14 administrators, 12 contractors and 75 construction workers. Among the 14 administrators, majority were males with 11 or 78.57 percent and there were only three females which comprised 21.43 percent. Moreover, for the contractors' group, 10 out of 12 or 83.33 percent were males and there were two or 16.67 percent

Table 1

Sex Distribution of the Respondents

Sex	Respondents' Category						Total	Percent
	Administrators		Contractors		Construction Workers			
	n	Percent	n	Percent	n	Percent		
Male	11	78.57%	10	83.33%	60	80.00%	81	80.20%
Female	3	21.43%	2	16.67%	15	20.00%	20	19.80%
Total	14	100%	12	100%	75	100%	101	100%
Percent	13.86%	-	11.88%	-	74.26%	-	100%	-

females. Meanwhile, the same trend was observed on the part of the construction workers as evidenced by the fact that there were 60 males or 80.00 percent and 15 females which comprised 20.00 percent.

On the whole, male dominance for the three groups of respondents was observed. This could be attributed to the fact that the activities undertaken in construction processes and generally masculine in nature.

Age. Data shown in Table 2 refers to the age distribution of the respondents. As revealed by the table, six administrators or 42.86 percent belonged to the age bracket of 55-59 years old, followed by those who were 50-54 years old, 60-64 years old and 45-49 years old with

Table 2

Age Distribution of the Respondents

Age (in years)	Respondents' Category						Total	Percent
	Administrators		Contractors		Construction Workers			
	n	Percent	n	Percent	n	Percent		
60 - 64	-	-	3	21.43	5	6.67	8	7.92
55 - 59	1	8.33	6	42.86	2	2.67	9	8.91
50 - 54	2	16.67	4	28.57	11	14.67	17	16.83
45 - 49	5	41.67	1	7.14	10	13.33	16	15.84
40 - 44	2	16.67	-	-	15	20.00	17	16.83
35 - 39	2	16.67	-	-	11	14.67	13	12.87
30 - 34	-	-	-	-	5	6.67	5	4.95
25 - 39	-	-	-	-	8	10.67	8	7.92
20 - 24	-	-	-	-	8	10.67	8	7.92
Total	12	100%	14	100%	75	100%	101	100%
Mean	46.17 years	-	55.93 years	-	40.73 years	-		-
S.D.	5.97 years	-	4.46 years	-	11.30 years	-		-

with four administrators or 28.57 percent, three administrators or 21.43 percent and one administrator or 7.14 percent, respectively. As a whole, the administrator-respondents pegged an average age of 55.93 years old with a standard deviation of 4.46 years, indicating that they are in their mid-50's.

Meanwhile, for the contractors' group, five of them or 41.67 percent were between 45 to 49 years of age, while two contractors comprising 16.67 percent were 50-54 years old, 40-44 years old and 35-39 years old. On the whole,

the ages of the contractors clustered around the mean age of 46.17 years and a standard deviation = 5.97 years. This implies that the contractors involved in the study were generally in their mid-40's.

Finally, for the construction workers involved in the study, their age distribution was sporadically between 20 years old to 64 years old, where the highest number, that is, 15 construction workers or 20.00 percent were between 40-44 years of age and the least number - two construction workers or 2.67 percent were 55-59 years of age. Thus, the average age of this group was posted at 40.73 years with a standard deviation of 11.30 years. This is indicative of the fact that the construction workers involved in the study were generally in their middle age. Thus, they are deemed physically capable of undertaking construction activities and undertakings.

Extent of Implementation of Construction Processes as Perceived by the Respondents

This part of the manuscript discusses the assessments given by the administrators, contractors as well as construction workers relative to the implementation of construction processes in five major areas, viz: 1) Planning and Designing, 2) Prequalification, 3) Bidding, 4) Construction Stage, and 5) Post Construction. The

responses given by the three groups of respondents were limited to the 5-point scale, thus: 5 for fully implemented, 4 for highly implemented, 3 for moderately implemented, 2 for slightly implemented and 1 for not implemented.

Planning and Designing. Contained in Table 3 are the responses given by the administrators pertaining to the extent of implementation of construction processes among the respondent-SUCs along Planning and Designing. As revealed by the table, all indicators falling under aesthetics were deemed "moderately implemented" by the administrator-respondents with weighted means of 3.28, 3.14 and 3.14 which referred to "The building design blends with the existing structure and surroundings," "The building design conforms with the trends of building design," and "The design is accepted by the general public," respectively. For economy of the plan and design, one indicator obtained a weighted mean of 3.21 or "moderately implemented," namely: "Maximized use of space," while the other remaining indicator posted a weighted mean of 2.43 or "slightly implemented." Moreover, the indicator which stated that "The structural design of building can withstand natural calamities" obtained a weighted mean of 3.00 or "moderately implemented." In general, the administrators' group deemed the implementation of the

Table 3

Extent of Implementation of Construction Processes Along Planning and Designing as Perceived by the Administrators

Indicators	Responses 5 (FI)	4 (HI)	3 (MI)	2 (SI)	1 (NI)	Weighted Mean/Interpretation
A. Aesthetics						
1. The building design conforms with the trends of building design.	0 (0)	5 (20)	6 (18)	3 (6)	0 (0)	3.14 MI
2. The design is accepted by the general public.	0 (0)	4 (16)	8 (24)	2 (4)	0 (0)	3.14 MI
3. The building design blends with the existing structures and surroundings.	0 (0)	6 (24)	6 (18)	2 (4)	0 (0)	3.28 MI
B. Economy						
1. Maximized use of space.	0 (0)	5 (20)	7 (21)	2 (4)	0 (0)	3.21 MI
2. Materials conform with Electrical Code and the Philippine Plumbing and Mechanical Code.	0 (0)	1 (4)	6 (18)	5 (10)	2 (2)	2.43 SI
3. Use of minimum size of structural member capable of holding the structure.	0 (0)	0 (0)	10 (30)	4 (8)	0 (0)	2.71 MI

Table 3 (cont'd.)

Indicators	Responses 5 (FI)	4 (HI)	3 (MI)	2 (SI)	1 (NI)	Weighted Mean/Interpretation	
C. Durability							
1. The structural design of building can withstand natural calamities.	0 (0)	4 (16)	6 (18)	4 (8)	0 (0)	3.00	MI
Grand Total	-	-	-	-	-	17.91	-
Grand Mean	-	-	-	-	-	2.56	MI

Legend:
4.51 - 5.00 Fully Implemented (FI)
3.51 - 4.50 Highly Implemented (HI)
2.51 - 3.50 Moderately Implemented (MI)
1.51 - 2.50 Slightly Implemented (SI)
1.00 - 1.50 Not Implemented (NI)

construction processes under Planning and Designing as "moderately implemented" as evidenced by the grand mean which resulted to 2.56.

On the part of the contractors, it can be noted from Table 4 that for aesthetics, the highest weighted mean of 4.08 or "highly implemented" corresponded to "The building design conforms with the trends of building design," while the lowest weighted mean of 3.33 or "moderately implemented" referred to "The design is accepted by the general public." Meanwhile, economy of planning and designing with three indicators pegged weighted means which belonged to "highly implemented." On the other hand for

Table 4

Extent of Implementation of Construction Processes Along Planning and Designing as Perceived by the Contractors

Indicators	Responses 5 (FI)	4 (HI)	3 (MI)	2 (SI)	1 (NI)	Weighted Mean	Interpretation
A. Aesthetics							
1. The building design conforms with the trends of building design.	5 (25)	3 (12)	4 (12)	0 (0)	0 (0)	4.08	HI
2. The design is accepted by the general public.	2 (10)	2 (8)	7 (21)	0 (0)	1 (1)	3.33	MI
3. The building design blends with the existing structures and surroundings.	2 (10)	3 (12)	6 (18)	1 (2)	0 (0)	3.50	MI
B. Economy							
1. Maximized use of space.	3 (15)	6 (18)	3 (12)	0 (0)	0 (0)	3.75	HI
2. Materials conform with Electrical Code and the Philippine Plumbing and Mechanical Code.	2 (10)	8 (32)	2 (8)	0 (0)	0 (0)	4.17	HI
3. Use of minimum size of structural member capable of holding the structure.	2 (10)	5 (20)	4 (12)	0 (0)	1 (1)	3.58	HI

Table 4 (cont'd.)

Indicators	Responses 5 (FI)	4 (HI)	3 (MI)	2 (SI)	1 (NI)	Weighted Mean/Interpretation	
C. Durability							
1. The structural design of building can withstand natural calamities such as typhoons, earthquakes, fires, etc.	3 (15)	8 (24)	1 (3)	0 (0)	0 (0)	3.50	MI
Grand Total	-	-	-	-	-	25.91	-
Grand Mean	-	-	-	-	-	3.70	HI

Legend:
4.51 - 5.00 Fully Implemented (FI)
3.51 - 4.50 Highly Implemented (HI)
2.51 - 3.50 Moderately Implemented (MI)
1.51 - 2.50 Slightly Implemented (SI)
1.00 - 1.50 Not Implemented (NI)

the durability aspect, that is, "The structural design of building can withstand natural calamities" was considered by the contractors as "moderately implemented." Thus, the grand mean of the responses of the contractors was posted at a value of 3.70, indicating that they assessed the planning and designing construction processes as "highly implemented."

As regards to the perceptions of the construction workers, it was revealed by Table 5 that all the indicators for aesthetic and economy posted weighted means which belonged to "moderately implemented" range. Only under the

Table 5

Extent of Implementation of Construction Processes Along Planning and Designing as Perceived by Construction Workers

Indicators	Responses 5 (FI)	4 (HI)	3 (MI)	2 (SI)	1 (NI)	Weighted Mean	Interpretation
A. Aesthetics							
1. The building design conforms with the trends of building design.	11 (55)	21 (84)	24 (18)	15 (72)	4 (30)	3.27	MI
2. The design is accepted by the general public.	6 (30)	26 (104)	26 (78)	14 (28)	3 (3)	3.24	MI
3. The building design blends with the existing structures and surroundings.	11 (55)	21 (84)	23 (69)	16 (32)	4 (4)	3.25	MI
B. Economy							
1. Maximized use of space.	17 (85)	21 (84)	20 (60)	12 (24)	5 (5)	3.44	MI
2. Materials conform with Electrical Code and the Philippine Plumbing and Mechanical Code.	13 (65)	22 (88)	26 (78)	11 (22)	3 (5)	3.41	MI
3. Use of minimum size of structural member capable of holding the structure.	9 (45)	28 (112)	22 (66)	11 (22)	5 (5)	3.33	MI

Table 5 (cont'd.)

Indicators	Responses 5 (FI)	4 (HI)	3 (MI)	2 (SI)	1 (NI)	Weighted Mean/Interpretation	
C. Durability							
1. The structural design of building can withstand natural calamities such as typhoons, earthquakes, fires, etc.	15 (75)	22 (88)	27 (81)	8 (16)	3 (3)	3.51	HI
Grand Total	-	-	-	-	-	23.45	-
Grand Mean	-	-	-	-	-	3.35	MI

Legend:
4.51 - 5.00 Fully Implemented (FI)
3.51 - 4.50 Highly Implemented (HI)
2.51 - 3.50 Moderately Implemented (MI)
1.51 - 2.50 Slightly Implemented (SI)
1.00 - 1.50 Not Implemented (NI)

durability aspect where the construction workers deemed the implementation to be "high" where the weighted mean resulted to 3.51. In general, the construction workers assessed the implementation of Planning and Designing Processes as "moderately implemented" inasmuch as the grand mean was pegged at 3.35.

Prequalification. In Table 6, data on the assessments by the administrators on the extent of implementation of construction processes specifically with respect to prequalification are presented. It can be

Table 6

Extent of Implementation of Construction Processes Along Prequalification as Perceived by the Administrators

Indicators	Responses 5 (FI)	4 (HI)	3 (MI)	2 (SI)	1 (NI)	Weighted Mean/Interpretation	
1. The contractor has the technical men capable of handling the project.	0 (0)	2 (8)	10 (30)	2 (4)	0 (0)	3.00	MI
2. The contractor has the financial capability.	0 (0)	1 (4)	12 (36)	1 (2)	0 (0)	3.00	MI
3. The contractor has adequate equipment and resources.	0 (0)	0 (0)	10 (30)	4 (8)	0 (0)	2.71	MI
Grand Total	-	-	-	-	-	8.71	-
Grand Mean	-	-	-	-	-	2.90	MI

Legend:
4.51 - 5.00 Fully Implemented (FI)
3.51 - 4.50 Highly Implemented (HI)
2.51 - 3.50 Moderately Implemented (MI)
1.51 - 2.50 Slightly Implemented (SI)
1.00 - 1.50 Not Implemented (NI)

observed from this table that the indicators which stated "The contractor has the technical men capable of handling the project" and "The contractor has the financial capability" posted the highest mean of 3.00 or "moderately implemented" while the indicator that "The contractor has adequate equipment and resources" obtained a weighted mean

of 2.71. Consequently, the grand mean of the administrators' responses resulted to 2.90 or "moderately implemented."

For the contractors, Table 7 reveals that they considered two indicators to be "highly implemented" with the same weighted mean of 4.33. This value corresponded to "The contractor has the technical men capable of handling the project" and "The contractor has the financial capability." Furthermore, the indicator that "The contractor has adequate equipment and resources" posted a weighted mean of 3.50 or "moderately implemented." Hence, the contractors' group assessed the implementation of Prequalification to be "high" since the grand mean was pegged at 4.05.

In Table 8, it can be seen that the construction workers considered all the three indicators of prequalification to be "moderately implemented." Among these, the highest weighted mean of 3.49 referred to "The contractor has the technical men capable of handling the project," while the lowest weighted mean of 3.19 was for "The contractor has adequate equipment and resources." Along this line, the general observation of the construction workers in the implementation of prequalification was "moderately implemented" as evidenced by the grand mean which was posted at 3.38.

Table 7

Extent of Implementation of Construction Processes Along Prequalification as Perceived by the Contractors

Indicators	Responses 5 (FI)	4 (HI)	3 (MI)	2 (SI)	1 (NI)	Weighted Mean/Interpretation	
1. The contractor has the technical men capable of handling the project.	4 (20)	6 (24)	2 (8)	0 (0)	0 (0)	4.33	HI
2. The contractor has the financial capability.	4 (20)	6 (24)	2 (8)	0 (0)	0 (0)	4.33	HI
3. The contractor has adequate equipment and resources.	2 (10)	8 (24)	2 (8)	0 (0)	0 (0)	3.50	MI
Grand Total	-	-	-	-	-	12.16	-
Grand Mean	-	-	-	-	-	4.05	HI

Legend:
4.51 - 5.00 Fully Implemented (FI)
3.51 - 4.50 Highly Implemented (HI)
2.51 - 3.50 Moderately Implemented (MI)
1.51 - 2.50 Slightly Implemented (SI)
1.00 - 1.50 Not Implemented (NI)

Table 8

Extent of Implementation of Construction Processes Along Prequalification as Perceived by the Construction Workers

Indicators	Responses 5 (FI)	4 (HI)	3 (MI)	2 (SI)	1 (NI)	Weighted Mean/Interpretation	
1. The contractor has the technical men capable of handling the project.	15 (75)	27 (108)	19 (57)	8 (16)	6 (6)	3.49	MI
2. The contractor has the financial capability.	13 (65)	24 (96)	24 (72)	12 (24)	0 (2)	3.45	MI
3. The contractor has adequate equipment and resources.	13 (65)	22 (88)	27 (81)	9 (18)	4 (4)	3.19	MI
Grand Total	-	-	-	-	-	10.13	-
Grand Mean	-	-	-	-	-	3.38	MI

Legend:
4.51 - 5.00 Fully Implemented (FI)
3.51 - 4.50 Highly Implemented (HI)
2.51 - 3.50 Moderately Implemented (MI)
1.51 - 2.50 Slightly Implemented (SI)
1.00 - 1.50 Not Implemented (NI)

Bidding. Shown in Table 9 are the perceptions of the three groups of respondents with regards to the implementation of bidding in the construction processes of the respondent-SUCs. As reflected, the administrators assessed this aspect of the construction process as "moderately implemented" with a grand mean of 3.00. More-

Table 9

Extent of Implementation of Construction Processes Along Bidding as Perceived by the Respondents

Indicators	Responses 5 (FI)	4 (HI)	3 (MI)	2 (SI)	1 (NI)	Weighted Mean/Interpretation	
A. Administrators' Responses							
1. The administration follows the policies set forth in P.D. 1594.	0 (0)	2 (8)	8 (24)	4 (8)	0 (0)	2.86	MI
2. The administration has adequate experience in bidding procedure.	0 (0)	5 (20)	6 (18)	3 (6)	0 (0)	3.14	MI
Total	-	-	-	-	-	6.00	-
Mean	-	-	-	-	-	3.00	MI
B. Contractors' Responses							
1. The administration follows the policies set forth in P.D. 1594.	2 (10)	4 (24)	6 (12)	0 (0)	0 (0)	3.38	MI
2. The administration has adequate experience in bidding procedure.	2 (10)	4 (16)	5 (15)	1 (2)	0 (0)	3.58	HI
Total	-	-	-	-	-	6.96	-
Mean	-	-	-	-	-	3.48	MI

Table 9 (cont'd.)

Indicators	Responses 5 (FI)	4 (HI)	3 (MI)	2 (SI)	1 (NI)	Weighted Mean/Interpretation	
C. Construction Workers' Responses							
1. The administration follows the policies set forth in P.D. 1594.	17 (85)	24 (96)	15 (45)	12 (24)	7 (7)	3.43	MI
2. The administration has adequate experience in bidding procedure.	16 (80)	19 (76)	24 (72)	11 (22)	4 (4)	3.39	MI
Total	-	-	-	-	-	6.82	-
Mean	-	-	-	-	-	3.41	MI

Legend:
4.51 - 5.00 Fully Implemented (FI)
3.51 - 4.50 Highly Implemented (HI)
2.51 - 3.50 Moderately Implemented (MI)
1.51 - 2.50 Slightly Implemented (SI)
1.00 - 1.50 Not Implemented (NI)

over, the same assessment was given by the contractors as well as that of the construction workers with grand means of 3.48 and 3.41, respectively. This implies that all the three categories of respondents considered the bidding process of the respondent-SUC's as "moderately implemented."

Construction Stage. Table 10 reflects the perceptions of the administrators in terms of the implementation of the construction processes in the respon-

Table 10

Extent of Implementation of Construction Processes Along Construction Stage as Perceived by the Administrators

Indicators	Responses 5 (FI)	4 (HI)	3 (MI)	2 (SI)	1 (NI)	Weighted Mean/Interpretation	
A. Quality Control							
1. The contractor follows the technical specification of the said building.	0 (0)	2 (8)	7 (30)	5 (4)	0 (0)	3.00	MI
2. The administration checks the materials used.	0 (0)	2 (8)	7 (21)	3 (8)	2 (1)	2.17	SI
3. The contractor follows the proper construction methodology.	0 (0)	2 (8)	7 (21)	4 (8)	1 (1)	2.71	MI
4. The administration assesses the implementation of the projects.	0 (0)	5 (20)	4 (12)	5 (10)	0 (0)	3.00	MI
B. Schedule							
1. The contractor follows schedule stipulated in the contract.	0 (0)	1 (4)	6 (18)	4 (8)	3 (3)	2.36	SI
2. The administration monitors the accomplishment of the contractor according to the schedule.	0 (0)	2 (4)	7 (21)	4 (8)	1 (1)	2.71	MI
Grand Total	-	-	-	-	-	15.95	-
Grand Mean	-	-	-	-	-	2.66	MI

Legend:

4.51 - 5.00	Fully Implemented (FI)
3.51 - 4.50	Highly Implemented (HI)
2.51 - 3.50	Moderately Implemented (MI)
1.51 - 2.50	Slightly Implemented (SI)
1.00 - 1.50	Not Implemented (NI)

dent-SUC's along construction stage. Specifically along quality control, three indicators were assessed by this group of respondents as "moderately implemented" while one indicator was considered by them as "slightly implemented." The highest weighted mean of 3.00 or "moderately implemented" corresponded to two statements, viz: 1) "The contractor follows the technical specification of the said building," and 2) "The administration assesses the implementation of the projects." Meanwhile, the lowest weighted mean was posted at 2.17 or "slightly implemented" which was referred to "The administration checks the materials used."

Relative to the schedule of the construction, the administrator-respondents deemed the indicator that "The administration monitors the accomplishment of the contractor according to the schedule" as moderately implemented." The indicator that "The contractor follows schedule stipulated in the contract" was assessed as "slightly implemented" since the weighted mean was 2.36.

In general, the administrators' group considered the implementation of construction processes along the construction stage as "moderate" as evidenced by the obtained grand mean of 2.66.

As regards the perceptions of the contractors, Table 11 shows that all the indicators listed under quality

Table 11

Extent of Implementation of Construction Processes Along Construction Stage as Perceived by the Contractors

Indicators	Responses 5 (FI)	4 (HI)	3 (MI)	2 (SI)	1 (NI)	Weighted Mean/Interpretation	
A. Quality Control							
1. The contractor follows the technical specification of the said building.	4 (20)	3 (12)	5 (15)	0 (0)	0 (0)	3.92	HI
2. The administration checks the materials used.	4 (20)	1 (4)	5 (15)	2 (4)	0 (0)	3.58	HI
3. The contractor follows the proper construction methodology.	3 (15)	4 (16)	5 (15)	0 (0)	0 (0)	3.83	HI
4. The administration assesses the implementation of the projects.	4 (20)	2 (8)	5 (15)	1 (2)	0 (0)	3.75	HI
B. Schedule							
1. The contractor follows schedule stipulated in the contract.	3 (15)	4 (16)	5 (15)	0 (0)	0 (0)	3.83	HI
2. The administration monitors the accomplishment of the contractor according to the schedule.	4 (20)	3 (12)	4 (12)	1 (2)	0 (0)	3.83	HI
Grand Total	-	-	-	-	-	22.74	-
Grand Mean	-	-	-	-	-	3.79	HI

Legend:

4.51 - 5.00	Fully Implemented (FI)
3.51 - 4.50	Highly Implemented (HI)
2.51 - 3.50	Moderately Implemented (MI)
1.51 - 2.50	Slightly Implemented (SI)
1.00 - 1.50	Not Implemented (NI)

control were deemed by this group as "highly implemented," where the highest weighted mean was 3.92 and the lowest weighted mean was 3.58. These values referred to: "The contractor follows the technical specification of the said building," and "The administration checks the materials used," respectively.

For the schedule, the two indicators were likewise assessed by the contractors as "highly implemented," as follows: "The contractor follows schedule stipulated in the contract" - 3.83 and "The administration monitors the accomplishment of the contractor according to the schedule" - 3.83.

As a whole, the construction processes in the respondent-SUCs along construction stage were assessed by the contractors as "highly implemented" as evidenced by the grand mean of 3.79.

In relation to the construction workers' assessment, it can be gleaned from Table 12 that all the indicators under quality control and schedule pegged weighted means which belonged to "moderately implemented" range. Among these, the highest weighted mean was 3.45 for "The administration assesses the implementation of the projects" and the lowest weighted mean was 3.15 for "The contractor follows the technical specification of the said building."

In general, the grand mean of the responses of the

Table 12

Extent of Implementation of Construction Processes Along Construction Stage as Perceived by Construction Workers

Indicators	Responses 5 (FI)	4 (HI)	3 (MI)	2 (SI)	1 (NI)	Weighted Mean/Interpretation	
A. Quality Control							
1. The contractor follows the technical specification of the said building.	7 (35)	24 (96)	23 (69)	15 (30)	6 (6)	3.15	MI
2. The administration checks the materials used.	13 (65)	22 (88)	19 (57)	16 (32)	5 (5)	3.29	MI
3. The contractor follows the proper construction methodology.	10 (50)	22 (88)	27 (81)	11 (22)	5 (5)	3.28	MI
4. The administration assesses the implementation of the projects.	13 (65)	25 (100)	22 (66)	13 (26)	2 (2)	3.45	MI
B. Schedule							
1. The contractor follows schedule stipulated in the contract.	12 (60)	23 (92)	21 (63)	12 (24)	7 (7)	3.28	MI
2. The administration monitors the accomplishment of the contractor according to the schedule.	14 (70)	20 (80)	26 (78)	8 (16)	7 (7)	3.28	MI
Grand Total	-	-	-	-	-	19.73	-
Grand Mean	-	-	-	-	-	3.29	MI

Legend:
4.51 - 5.00 Fully Implemented (FI)
3.51 - 4.50 Highly Implemented (HI)
2.51 - 3.50 Moderately Implemented (MI)
1.51 - 2.50 Slightly Implemented (SI)
1.00 - 1.50 Not Implemented (NI)

construction workers clustered around the grand mean of 3.29, indicating that this group considered the implementation of the respondent-SUC's construction processes along construction stage as "moderate."

Post Construction. Data found in Table 13 pertain to the perceptions of the three groups of respondents on the extent of implementation of post construction stage. As depicted by this table, the administrators assessed post-construction stage to be "moderately implemented" with grand mean of 2.82. Meanwhile, the contractors involved in the study considered construction stage as "highly implemented" where the grand mean was pegged at 4.00. Finally, the construction workers assessed construction stage to be "highly implemented" with a grand mean of 3.60.

Basing from the data just presented, only the administrators differed in their assessment. To them, post construction processes were "moderately implemented" while the contractors and construction workers' assessment was "highly implemented."

Comparison of the Perceptions of the Three Groups of Respondents on the Extent of Implementation of Construction Processes

This section of the manuscript summarizes the responses of the three groups of respondents relative to the implementation of construction processes in the respon-

Table 13

Extent of Implementation of Construction Processes Along Post Construction Stage as Perceived by the Respondents

Indicators	Responses 5 (FI)	4 (HI)	3 (MI)	2 (SI)	1 (NI)	Weighted Mean/Interpretation	
A. Administrators' Responses							
1. The administration evaluates properly the projects.	0 (0)	1 (4)	8 (24)	5 (10)	0 (0)	2.71	MI
2. The administration checks the final billing submitted by the contractor after the turnover.	0 (0)	1 (4)	11 (33)	2 (4)	0 (0)	2.93	MI
Total	-	-	-	-	-	5.64	-
Mean	-	-	-	-	-	2.82	MI
B. Contractors' Responses							
1. The administration evaluates properly the projects.	5 (25)	2 (8)	2 (15)	0 (0)	0 (0)	4.00	HI
2. The administration checks the final billing submitted by the contractor after the turnover.	4 (20)	4 (16)	4 (12)	0 (0)	0 (0)	4.00	HI
Total	-	-	-	-	-	8.00	-
Mean	-	-	-	-	-	4.00	HI

Table 13 (cont'd.)

Indicators	Responses 5 (FI)	4 (HI)	3 (MI)	2 (SI)	1 (NI)	Weighted Mean/Interpretation	
C. Construction Workers' Responses							
1. The administration evaluates properly the projects.	14 (70)	19 (76)	26 (78)	10 (20)	6 (6)	3.33	MI
2. The administration checks the final billing submitted by the contractor after the turnover.	16 (80)	21 (84)	22 (66)	8 (16)	8 (8)	3.87	HI
Total	-	-	-	-	-	7.2	-
Mean	-	-	-	-	-	3.60	HI

Legend:
4.51 - 5.00	Fully Implemented (FI)
3.51 - 4.50	Highly Implemented (HI)
2.51 - 3.50	Moderately Implemented (MI)
1.51 - 2.50	Slightly Implemented (SI)
1.00 - 1.50	Not Implemented (NI)

dent-SUCs. Afterwhich, a comparison of their responses using analysis of variance was undertaken.

Table 14 reveals that as summarized, the administrators' group deemed all the construction stages in their respective SUC's as "moderately implemented," where "Bidding" obtained the highest mean of 3.00 while "Planning and Designing" posted the lowest mean of 2.56. Hence, the overall mean of the administrators' responses was 2.79, indicating that they assessed the different stages of construction processes as "moderately implemented."

Table 14

Summary of the Responses of the Three Groups of Respondents on the Implementation of Construction Processes

Indicators/Stages	Respondents' Category					
	Administrators		Contractors		Construction Workers	
	Mean	Interpre-tation	Mean	Interpre-tation	Mean	Interpre-tation
1. Planning and Designing	2.56	MI	3.70	HI	3.35	MI
2. Prequalification	2.90	MI	4.05	HI	3.38	MI
3. Bidding	3.00	MI	3.48	MI	3.41	MI
4. Construction Stage	2.66	MI	3.79	HI	3.29	MI
5. Post Construction Stage	2.82	MI	4.00	HI	3.60	HI
Total	13.94	-	19.02	-	17.03	-
Overall Mean	2.79	MI	3.80	HI	3.41	MI

Legend:
4.51 - 5.00 Fully Implemented (FI)
3.51 - 4.50 Highly Implemented (HI)
2.51 - 3.50 Moderately Implemented (MI)
1.51 - 2.50 Slightly Implemented (SI)
1.00 - 1.50 Not Implemented (NI)

On the part of the contractors, four stages were deemed by them to be "highly implemented," as follows: 1) Post-construction - 4.00, 2) Construction stage - 3.79, 3) Planning and designing - 3.70, 4) Prequalification - 4.05. Only "Bidding" was assessed by this group as "moderately implemented" with a grand mean of 3.48. Thus, the grand mean of the responses of this group was posted at 3.80 or

"highly implemented."

Relative to the construction workers' perceptions, one indicator/stage was assessed by them as "highly implemented," Post construction with a weighted mean of 3.60. The four remaining stages were assessed as "moderately implemented" where the highest was 3.41 for "bidding" and the lowest was 3.29 for "construction stage." Consequently, the over-all mean of the construction workers' responses was posted at 3.41 or "moderately implemented."

It can be observed from the data just presented that the contractors' group posted the highest weighted mean of 3.80 or "highly implemented" followed by the construction workers and administrators as follows: 3.41 or "moderately implemented," and 2.79 or "moderately implemented," respectively.

To ascertain whether there are significant differences among the perceptions of the respondents, one-way Analysis of Variance was applied. The results are shown in Table 15. The responses were found to have greater variation among groupings compared to within groupings. This is supported by the fact that the mean squares between groups was 3.01 while for within groups, it was 0.38. Consequently, the computed F-value was pegged at 7.87 which turned out to be greater than the tabular

Table 15

ANOVA Table for Comparing the Perceptions of the Three Groups of Respondents on the Implementation of Construction Processes

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Sqaures	Computed F-value	Tabular F-value
Between Groups	6.02973	2	3.01	7.87	3.28
Within Groups	12.63294	33	0.38		
Total	18.66267	35			

Decision: Reject Ho

F-value of 3.28 at α = .05 and df = 2 and 33. Therefore, the hypothesis that "There are no significant differences among the perceptions of the three groups of respondents in relation to the extent of implementation of the construction processes along: Planning and Designing, Prequalification, Bidding, Construction Stage and Post Construction Stage" was rejected. This implies that the administrators, contractors as well as construction workers had different opinions relative to the aforestated aspects.

Scheffe's test in Table 16 revealed further that the contractors and administrators varied in their opinion, as well as the administrators and construction workers. Only the contractors and construction workers turned out to be in agreement in their perceptions.

Table 16

Scheffe's Test to Ascertain Where the Significant Difference Lies

Groups Compared	Difference in Means	Scheffe's F-value	Critical F-value	Evaluation
Administrators and Contractors	0.814	12.76	6.50	Significant
Administrators and Construction Workers	0.878	13.77	6.50	Significant
Contractors and Construction Workers	0.401	3.29	6.50	Not Significant

Problems Encountered by the Respondents Relative to Construction Management

In Table 17 the problems encountered by contractors are presented. The problem on whether the building blends with its surrounding is slightly felt with a weighted mean of 2.50. Landscaping and road networking is moderately felt problem with a weighted mean of 3.42. Shifting of materials from wood to concrete is a slightly felt problem. However, lack of testing materials facility is a highly felt problem.

In the prequalification, the problem on whether the contractor has financial capability or not was a slightly felt problem with a rating of 2.42.

Table 17

Problems Encountered by Contractors Relative to Construction Management

Problems	Extent of Impact (FI) 5	(HI) 4	(MI) 3	(SI) 2	(NI) 1	Weighted Mean/Interpretation	
I. Planning							
1. The recent design of the building does not blend with all structures or surrounding.	0 (0)	4 (16)	3 (9)	0 (0)	5 (5)	2.50	SF
2. Landscaping and road networking is difficult due to existing old buildings.	2 (10)	5 (20)	3 (9)	0 (0)	2 (2)	3.42	MF
3. Shifting of material from wood to concrete steel and fiber glass.	0 (0)	3 (12)	6 (18)	2 (4)	1 (1)	2.92	MF
4. Lack of testing materials facility.	3 (15)	5 (20)	2 (6)	2 (4)	0 (0)	3.75	HF
II. Prequalification							
1. Contractors are not rigidly checked as to financial and equipment capability, and technical, personal capability.	0 (0)	2 (8)	3 (9)	5 (10)	2 (2)	2.42	SF
III. Bidding Phase							
1. Submission of bid tender is not strictly followed as set forth in P.D. 1594.	0 (0)	1 (4)	3 (9)	2 (4)	6 (6)	1.96	SF
2. Professionalism in the conduct of bidding.	3 (15)	2 (8)	3 (9)	3 (6)	1 (1)	3.25	MF

Table 17 (cont'd.)

Problems	Extent of Impact (FI) 5	(HI) 4	(MI) 3	(SI) 2	(NI) 1	Weighted Mean/Interpretation	
IV. Construction Stage							
1. No submission and proper checking of materials used in the construction.	0 (0)	1 (4)	3 (9)	6 (12)	2 (2)	2.25	SF
2. Lack of routine monitoring on the construction process.	0 (0)	2 (8)	2 (6)	3 (6)	5 (5)	2.08	SF
3. No monitoring as to accomplishment.	0 (0)	1 (4)	4 (12)	1 (2)	6 (6)	2.00	SF
V. Post Construction							
1. Poor inspection procedure of finished building.	0 (0)	1 (4)	2 (6)	4 (8)	5 (5)	1.92	SF
2. Improper practice of final bidding procedure.	1 (5)	2 (8)	2 (6)	1 (2)	6 (6)	2.25	SF
VI. Vertical Construction							
1. Disregard of specification set forth by the building code on safety, lighting and ventilation.	1 (5)	1 (4)	2 (6)	3 (6)	5 (5)	2.17	SF

Legend:

5.00 - 4.51	Extremely Felt (EF)
4.50 - 3.51	Highly Felt (HF)
3.50 - 2.51	Moderately Felt (MF)
2.50 - 1.51	Slightly Felt (SF)
1.50 - 1.00	Not Felt (NF)

In the bidding phase whether the bid tender strictly follows the permissions set forth in P.D. 1594 or not this was considered slightly felt with a rating of 1,96.

Professionalism in the conduct of bidding was a moderately felt problem with a weighted mean of 3.25.

Under construction stage, problems on monitoring of construction process as well as accomplishment of work was thought to be slightly felt problems. Submission and proper checking of materials used in the construction was also a slightly felt problem. The ratings ranged from 2.50 to 1.51.

Under post construction, poor inspection procedure was a slightly felt problem and improper practice of final billing procedure were also slightly felt problems. The ratings were 1.92 and 2.25, respectively.

Under the bidding phase, submission of bid tender as set forth in P.D. 1594 and professionalism in the conduct of bidding were rated as moderately felt problems.

Table 18 provides data on the problems regarding construction management as perceived by the administrators. Problems in planning were considered to be generally "Moderately Felt." The problem on "the recent design of the building does not blend with all structure of surrounding" had a rating of 2.43 or "Slightly Felt" and item 2 on "the difficulty of landscaping and road networking due to the existing old buildings" and Item 3 on "the shifting of materials from wood to concrete, steel and fiber glass" were "Moderately Felt" by the administrators

Table 18

Problems Encountered by SUC's Administrators Relative to Construction Management

Problems	Extent of Impact (FI) 5	(HI) 4	(MI) 3	(SI) 2	(NI) 1	Weighted Mean/Interpretation	
I. Planning							
1. The recent design of the building does not blend with all structures or surrounding.	0 (0)	0 (0)	7 (21)	6 (12)	1 (1)	2.43	SF
2. Landscaping and road networking is difficult due to existing old buildings.	0 (0)	4 (16)	7 (21)	2 (4)	1 (1)	3.00	MF
3. Shifting of material from wood to concrete steel and fiber glass.	4 (0)	5 (20)	6 (18)	1 (2)	2 (2)	3.00	MF
4. Lack of testing materials facility.	0 (0)	0 (0)	10 (30)	3 (6)	1 (1)	2.64	MF
II. Prequalification							
1. Contractors are not rigidly checked as to financial and equipment capability, and technical, personal capability.	0 (0)	5 (20)	5 (15)	3 (6)	1 (1)	3.00	MF
III. Bidding Phase							
1. Submission of bid tender is not strictly followed as set forth in P.D. 1594.	0 (0)	1 (4)	6 (18)	5 (10)	2 (2)	2.43	SF
2. Professionalism in the conduct of bidding.	0 (0)	4 (16)	5 (15)	3 (6)	2 (2)	2.78	MF

Table 18 (cont'd.)

Problems	Extent of Impact (FI) 5	(HI) 4	(MI) 3	(SI) 2	(NI) 1	Weighted Mean	Interpretation
IV. Construction Stage							
1. No submission and proper checking of materials used in the construction.	1 (5)	1 (4)	8 (24)	4 (8)	1 (1)	3.00	MF
2. Lack of routine monitoring on the construction process.	0 (0)	3 (12)	7 (21)	4 (8)	0 (0)	2.93	U
3. No monitoring as to accomplishment.	0 (0)	1 (4)	6 (18)	7 (14)	0 (0)	2.57	U
V. Post Construction							
1. Poor inspection procedure of finished building.	1 (5)	3 (12)	4 (12)	6 (12)	1 (1)	3.00	MF
2. Improper practice of final bidding procedure.	0 (0)	2 (8)	6 (18)	5 (10)	1 (1)	2.64	MF
VI. Vertical Construction							
1. Disregard of specification set forth by the building code on safety, lighting and ventilation.	1 (5)	3 (12)	4 (15)	6 (10)	1 (1)	3.07	MF

Legend:

5.00 - 4.51	Extremely Felt (EF)
4.50 - 3.51	Highly Felt (HF)
3.50 - 2.51	Moderately Felt (MF)
2.50 - 1.51	Slightly Felt (SF)
1.50 - 1.00	Not Felt (NF)

with a mean of 3.00

Under prequalification the problem whether the contractor is checked or not on his financial capabilities

was considered as a "Moderately Felt" problem.

In the bidding phase, the problems attendant to it were "Slightly Felt," such as the submission of bid that conform with P.D. 1594 and professionalism in the conduct of bidding. The ratings were 2.43 and 2.78, respectively.

The result of the weighted mean under construction are as follows: 1. submission of and proper checking of materials was a problem "Slightly Felt"; 2. lack of monitoring on the construction process was rated as "Slightly Felt"; and 3. no monitoring as to accomplihsment was a "Slightly Felt" problem. The ratings were 3.00, 2.93 and 2.57 in succession.

The contractors considered poor inspection procedure and improper practice of final billing as problems not felt in post consutrction. The weighted means were 3.00 and 2.64, respectively.

The last item, on vertical construction was considered not felt. This is about following specification set forth in the building code.

Table 19 reflects the problem encountered by the laborer relative to construction management. As shown in the table all items on the construction management were "Moderately Felt" by the laborers. This suggests that the laborers are merely working in the construction and they are not affected by the different problems confronting

Table 19

Problems Encountered by Laborers Relative to Construction Management

Problems	Extent of Impact (FI) 5	(HI) 4	(MI) 3	(SI) 2	(NI) 1	Weighted Mean/Interpretation	
I. Planning							
1. The recent design of the building does not blend with all structures or surrounding.	6 (30)	29 (116)	31 (93)	5 (10)	4 (4)	3.37	MF
2. Landscaping and road networking is difficult due to existing old buildings.	14 (70)	27 (108)	24 (72)	7 (14)	3 (3)	3.56	HF
3. Shifting of material from wood to concrete steel and fiber glass.	6 (30)	29 (116)	26 (38)	8 (16)	6 (6)	3.28	MF
4. Lack of testing materials facility.	4 (20)	17 (68)	29 (87)	19 (38)	6 (6)	2.92	MF
II. Prequalification							
1. Contractors are not rigidly checked as to financial and equipment capability, and technical, personal capability.	4 (20)	18 (72)	30 (90)	14 (28)	9 (9)	2.92	MF
III. Bidding Phase							
1. Submission of bid tender is not strictly followed as set forth in P.D. 1594.	4 (20)	24 (96)	27 (81)	13 (26)	7 (7)	3.07	MF
2. Professionalism in the conduct of bidding.	4 (20)	19 (76)	29 (87)	14 (28)	9 (9)	2.93	MF

Table 19 (cont'd.)

Problems	Extent of Impact (FI) 5	(HI) 4	(MI) 3	(SI) 2	(NI) 1	Weighted Mean/Interpretation	
IV. Construction Stage							
1. No submission and proper checking of materials used in the construction.	7 (35)	26 (104)	24 (72)	8 (16)	10 (10)	3.16	MF
2. Lack of routine monitoring on the construction process.	4 (20)	10 (40)	27 (81)	25 (50)	9 (9)	2.67	MF
3. No monitoring as to accomplishment.	5 (25)	18 (72)	35 (105)	8 (16)	9 (9)	2.83	MF
V. Post Construction							
1. Poor inspection procedure of finished building.	4 (20)	19 (76)	30 (90)	13 (26)	4 (4)	2.88	MF
2. Improper practice of final bidding procedure.	4 (20)	15 (60)	28 (84)	22 (44)	6 (6)	2.85	MF
VI. Vertical Construction							
1. Disregard of specification set forth by the building code on safety, lighting and ventilation.	4 (20)	15 (60)	32 (96)	15 (30)	9 (9)	2.87	MF

Legend:

5.00 - 4.51	Extremely Felt (EF)
4.50 - 3.51	Highly Felt (HF)
3.50 - 2.51	Moderately Felt (MF)
2.50 - 1.51	Slightly Felt (SF)
1.50 - 1.00	Not Felt (NF)

construction management.

Suggested Solutions to the Problems in Construction Management as Perceived by the Contractors, Administrators and Laborers

Table 20 shows the extent to which the respondents "Agree" with the suggested solutions. The contractors "Agreed" with the solutions suggested regarding planning. They are: 1.) modifying and renovating buildings with the use of latest construction materials; 2.) demolishing some portions of existing buildings and or increasing their number of stories; 3.) using reinforced concrete and lightweight materials; 4.) asking certification from manufacturers. The items were rated 3.92, 3.75, 4.33 and 4.42, respectively, which when interpreted means "Agree."

The contractors strongly agree with the suggested solutions given under Prequalification. They "Strongly Agree" that the PBAC should be familiar with P.D. 1594 guidelines. They also "Strongly Agree" that PBAC member should be experienced and should have the highest moral integrity. The ratings were ratings 4.67, 4.83 and 4.67, respectively.

Under the bidding phase they also "Strongly Agree" to follow strictly P.D. 1594 and to invite more contractors to bid through radio and newspaper. The weighted means was 4.58 and 4.75, respectively.

All items falling under construction stage were rated

Table 20

Suggested Solutions of the Contractors Relating to Construction Management

Solutions	Assessment (EF) 5	(HF) 4	(MF) 3	(SF) 2	(NF) 1	Weighted Mean/Interpretation	
I. Planning							
1. The existing building should be modified and renovated using the latest construction materials.	5 (25)	3 (12)	2 (6)	2 (4)	0 (0)	3.92	A
2. Demolish some portion of existing building and maximize areas by increasing the number of storeys.	5 (25)	1 (4)	4 (12)	2 (4)	0 (0)	3.75	A
3. Use reinforced concrete and light weight materials in building construction also use steel pipes as scaffolding in the construction.	5 (25)	6 (24)	1 (3)	0 (0)	0 (0)	4.33	A
4. Ask certification from the manufacturer through the supplier of materials in case lack of testing facilities.	6 (30)	5 (20)	1 (3)	0 (0)	0 (0)	4.42	A
II. Prequalification							
1. The Prequalification Bids and Awards Committee (PBAC) members should be familiar with P.D. 1594 guidelines on pre-qualifying bidders.	9 (45)	2 (8)	1 (3)	0 (0)	0 (0)	4.67	SA
2. PBAC members should be experienced.	10 (50)	2 (8)	0 (0)	0 (0)	0 (0)	4.83	SA

Table 20 (cont'd.)

Solutions	Assessment (EF) 5	(HF) 4	(MF) 3	(SF) 2	(NF) 1	Weighted Mean/Interpretation	
3. PBAC members should have the highest moral integrity.	9 (45)	2 (8)	1 (3)	0 (0)	0 (0)	4.67	SA
III. Bidding Phase							
1. Strict compliance of P.D. 1594 should be observed.	8 (40)	3 (12)	1 (3)	0 (0)	0 (0)	4.58	SA
2. Invite more contractors to bid through radio & newspapers nationally circulated.	9 (45)	2 (8)	0 (0)	0 (0)	0 (0)	4.75	SA
IV. Construction Stage							
1. The resident engineer assigned by the management should be on full time basis.	9 (45)	3 (12)	0 (0)	0 (0)	0 (0)	4.75	SA
2. The resident engineer should always check the progress report submitted by the contractor.	8 (40)	3 (12)	1 (3)	0 (0)	0 (0)	4.58	SA
3. The resident engineer should require the contractor to serve a notice prior to the pouring of concrete and placing other materials.	9 (45)	3 (12)	0 (0)	0 (0)	0 (0)	4.75	SA
4. The resident engineer should require the contractor to submit materials samples.	9 (45)	2 (8)	1 (3)	0 (0)	0 (0)	4.67	SA

Table 20 (cont'd.)

Solutions	Assessment (EF) 5	(HF) 4	(MF) 3	(SF) 2	(NF) 1	Weighted Mean	Interpretation
V. Post Construction							
1. Requires progress report every billing period.	7 (35)	4 (16)	1 (3)	0 (0)	0 (0)	4.50	SA
2. Inform the contractor if they are on the positive or negative slippage.	7 (35)	5 (20)	1 (3)	0 (0)	0 (0)	4.83	SA
3. If the work has a negative slippage issue warning and require the contractor to submit a new schedule of work.	5 (25)	7 (28)	0 (0)	0 (0)	0 (0)	4.42	A
4. If the contractor cannot repair the damage as scheduled issue a make or break order.	4 (20)	5 (20)	3 (9)	0 (0)	0 (0)	4.03	A
5. Terminate the contract and take over the remaining works left by the contractor.	4 (20)	4 (16)	4 (12)	0 (0)	0 (0)	4.00	A
VI. Vertical Construction							
1. Verify the specification if they are in conformity with the building and electrical code of the Philippines.	7 (35)	4 (16)	1 (3)	0 (0)	0 (0)	4.50	SA
2. Check the materials if they are in accordance with the duly approved specifications.	7 (35)	3 (12)	2 (6)	0 (0)	0 (0)	4.42	SA

Legend:

5.00 - 4.51	Strongly Agree (SA)
4.50 - 3.51	Agree (A)
3.50 - 2.51	Undecided (U)
2.50 - 1.51	Disagree (D)
1.50 - 1.00	Strongly Disagree (SD)

as "Strongly Agree" by the respondents. They "Strongly Agree" that the resident engineer should be on full time basis; that the resident engineer should check the progress report submitted by the contractor; that the resident engineer should require contractor to give notice prior to the pouring of concrete materials and that the resident engineer should require the contractor to submit material samples. The responses ranged from the highest value of 4.75 to the lowest value of 4.58.

Two items under post construction were rated by the contractors as "Strongly Agree." They are: 1.) requiring progress report every billing period and informing the contractor whether they are positive or negative slippage. They also "Agree" to issue warning of new schedule if the slippage is negative. Furthermore, they "Agree" that the contractor should repair the damage or issue or make or break order. The last solution which the respondents "Agree" was to terminate the contract and take over the remaining work. In descending order are the following rating responses: 4.83, 4.50, 4.42, 4.03 and 4.00, respectively.

Table 21 shows the solutions proposed by the workers/ laborers in vertical construction such as: 1.) verifying the specification in reference to Electrical and Building Code of the Philippines, and 2.) checking materials accor-

Table 21

Suggested Solutions by Workers Relative to Construction Management

Solutions	Assessment (EF) 5	(HF) 4	(MF) 3	(SF) 2	(NF) 1	Weighted Mean	Interpretation
I. Planning							
1. The existing building should be modified and renovated using the latest construction materials.	14 (70)	21 (84)	28 (84)	10 (20)	2 (0)	3.47	U
2. Demolish some portion of existing building and maximize areas by increasing the number of storeys.	9 (45)	24 (96)	30 (90)	10 (20)	2 (2)	3.37	U
3. Use reinforced concrete and light weight materials in building construction also use steel pipes as scaffolding in the construction.	13 (65)	23 (92)	25 (75)	13 (26)	1 (1)	3.45	U
4. Ask certification from the manufacturer through the supplier of materials in case lack of testing facilities.	13 (65)	24 (96)	28 (84)	8 (16)	2 (2)	3.51	A
II. Prequalification							
1. The Prequalification Bids and Awards Committee (PBAC) members should be familiar with P.D. 1594 guidelines on pre-qualifying bidders.	20 (100)	20 (80)	22 (66)	11 (22)	2 (2)	3.60	A
2. PBAC members should be experienced.	22 (110)	18 (72)	25 (75)	7 (14)	3 (3)	3.65	A

Table 21 (cont'd.)

Solutions	Assessment (EF) 5	(HF) 4	(MF) 3	(SF) 2	(NF) 1	Weighted Mean/Interpretation	
3. PBAC members should have the highest moral integrity.	26 (130)	16 (64)	23 (69)	9 (18)	1 (1)	3.76	A
III. Bidding Phase							
1. Strict compliance of P.D. 1594 should be observed.	25 (125)	19 (76)	24 (72)	5 (10)	2 (1)	3.80	A
2. Invite more contractors to bid through radio & newspapers nationally circulated.	26 (130)	17 (68)	21 (63)	10 (20)	1 (1)	3.76	A
IV. Construction Stage							
1. The resident engineer assigned by the management should be on full time basis.	18 (90)	22 (88)	25 (75)	6 (12)	4 (4)	3.59	A
2. The resident engineer should always check the progress report submitted by the contractor	25 (125)	19 (76)	17 (51)	12 (24)	2 (2)	3.71	A
3. The resident engineer should require the contractor to serve a notice prior to the pouring of concrete and placing other materials.	28 (140)	14 (56)	23 (69)	8 (16)	2 (2)	3.77	A
4. The resident engineer should require the contractor to submit materials samples.	25 (125)	17 (68)	21 (63)	10 (20)	2 (2)	3.71	A

Table 21 (cont'd.)

Solutions	Assessment (EF) 5	(HF) 4	(MF) 3	(SF) 2	(NF) 1	Weighted Mean	Interpretation
V. Post Construction							
1. Requires progress report every billing period.	27 (135)	15 (60)	25 (75)	8 (16)	1 (1)	3.83	A
2. Inform the contractor if they are on the positive or negative slippage.	22 (110)	18 (72)	24 (72)	10 (20)	1 (1)	3.67	A
3. If the work has a negative slippage issue warning and require the contractor to submit a new schedule of work.	25 (125)	19 (76)	22 (66)	8 (16)	1 (1)	3.79	A
4. If the contractor cannot repair the damage as scheduled issue a make or break order.	19 (95)	23 (92)	22 (66)	8 (16)	3 (3)	3.63	A
5. Terminate the contract and take over the remaining works left by the contractor.	12 (60)	16 (64)	36 (108)	8 (16)	3 (3)	3.35	U
VI. Vertical Construction							
1. Verify the specification if they are in conformity with the building and electrical code of the Philippines.	24 (120)	18 (72)	21 (63)	9 (18)	3 (3)	3.68	A
2. Check the materials if they are in accordance with the duly approved specifications.	25 (125)	18 (72)	24 (72)	7 (14)	7 (1)	3.79	SA

Legend:
5.00 - 4.51 Strongly Agree (SA)
4.50 - 3.51 Agree (A)
3.50 - 2.51 Undecided (U)
2.50 - 1.51 Disagree (D)
1.50 - 1.00 Strongly Disagree (SD)

ding to approved specification were rated Strongly Agree with a weighted mean of 4.50 and Strongly Agree with a mean of 4.42, respectively.

The construction workers were "Undecided" with the first proposed solutions on planning: modification, renovation of existing buildings to conform with latest construction materials; demolition of some portions of existing building and maximize the use of the area by increasing the number of floors of the remaining buildings; the use of reinforcement to concrete and light weight materials for building construction and further use of steel pipes as scaffolding. They were all given a weighted mean of 3.47, 3.37, respectively. They readily "Agree" however, with a weighted mean of 3.51, on the suggestions of getting a certification from the manufacturers as to quality of materials through the suppliers, in case of lack of testing facilities.

All workers "Agree" on the solutions proposed under prequalification phase, bidding phase, construction phase and post construction phase, construction phase and vertical construction, except with one item under post construction phase, stating "terminate the contract and take over the remaining works left by the contractors" where they rated it 3.35, meaning "Undecided."

This is normal, since the workers would feel

insecured with their job, because they are usually hired by the contractors.

The administrators on the other hand unanimously "Agree" on the proposed solutions for planning and design, but also they all "Slightly Agree" with all the proposed solution for the qualification phase, bidding phase, construction phase as shown in Table 22. In the post construction phase, however, they also "Slightly Agree" with these two suggested solutions: Require progress report every billing period and inform the contractor if they are on the positive or negative slippage. With the rest of the proposed solution, they all "Agree." For the suggested solution to problems under vertical construction, they "Slightly Agree" with the suggestion, to verify the specification if they are in conformity with the bidding, electrical code of the Philippines, but they "Agree" to check the materials if they are in accordance with the duly approved specifications.

Table 22

Suggested Solutions of the Administrators Relative to Construction Management

Solutions	Assessment (EF) 5	(HF) 4	(MF) 3	(SF) 2	(NF) 1	Weighted Mean	Interpretation
I. Planning							
1. The existing building should be modified and renovated using the latest construction materials.	5 (25)	3 (12)	2 (6)	2 (4)	0 (0)	3.92	A
2. Demolish some portion of existing building and maximize areas by increasing the number of storeys.	5 (25)	1 (4)	4 (12)	2 (4)	0 (0)	3.75	A
3. Use reinforced concrete and light weight materials in building construction also use steel pipes as scaffolding in the construction.	5 (25)	6 (24)	1 (3)	0 (0)	0 (0)	4.33	A
4. Ask certification from the manufacturer through the supplier of materials in case lack of testing facilities.	6 (30)	5 (20)	1 (3)	0 (0)	0 (0)	4.42	A
II. Prequalification							
1. The Prequalification Bids and Awards Committee (PBAC) members should be familiar with P.D. 1594 guidelines on pre-qualifying bidders.	9 (45)	2 (8)	1 (3)	0 (0)	0 (0)	4.67	SA
2. PBAC members should be experienced.	10 (50)	2 (8)	0 (0)	0 (0)	0 (0)	4.83	SA

Table 22 (cont'd.)

Solutions	Assessment (EF) 5	(HF) 4	(MF) 3	(SF) 2	(NF) 1	Weighted Mean/Interpretation	
3. PBAC members should have the highest moral integrity.	9 (45)	2 (8)	1 (3)	0 (0)	0 (0)	4.67	SA
III. Bidding Phase							
1. Strict compliance of P.D. 1594 should be observed.	8 (40)	3 (12)	1 (3)	0 (0)	0 (0)	4.58	SA
2. Invite more contractors to bid through radio & newspapers nationally circulated.	9 (45)	3 (12)	0 (0)	0 (0)	0 (0)	4.75	SA
IV. Construction Stage							
1. The resident engineer assigned by the management should be on full time basis.	9 (45)	3 (12)	0 (0)	0 (0)	0 (0)	4.75	SA
2. The resident engineer should always check the progress report submitted by the contractor	8 (40)	3 (12)	1 (3)	0 (0)	0 (0)	4.58	SA
3. The resident engineer should require the contractor to serve a notice prior to the pouring of concrete and placing other materials.	9 (45)	3 (12)	0 (0)	0 (0)	0 (0)	4.75	SA
4. The resident engineer should require the contractor to submit materials samples.	9 (45)	2 (8)	1 (3)	0 (0)	0 (0)	4.67	SA

Table 22 (cont'd.)

Solutions	Assessment (EF) 5	(HF) 4	(MF) 3	(SF) 2	(NF) 1	Weighted Mean/Interpretation	
V. Post Construction							
1. Requires progress report every billing period.	7 (35)	4 (16)	1 (3)	0 (0)	0 (0)	4.50	SA
2. Inform the contractor if they are on the positive or negative slippage.	7 (35)	5 (20)	1 (3)	0 (0)	0 (0)	4.83	SA
3. If the work has a negative slippage issue warning and require the contractor to submit a new schedule of work.	5 (25)	7 (28)	0 (0)	0 (0)	0 (0)	4.42	A
4. If the contractor cannot repair the damage as scheduled issue a make or break order.	4 (20)	5 (20)	3 (9)	0 (0)	0 (0)	4.03	A
5. Terminate the contract and take over the remaining works left by the contractor.	4 (20)	4 (16)	4 (12)	0 (0)	0 (0)	4.00	A
VI. Vertical Construction							
1. Verify the specification if they are in conformity with the building and electrical code of the Philippines.	7 (35)	4 (16)	1 (3)	0 (0)	0 (0)	4.50	SA
2. Check the materials if they are in accordance with the duly approved specifications.	7 (35)	3 (12)	2 (6)	0 (0)	0 (0)	4.42	A

Legend:

5.00 - 4.51	Strongly Agree (SA)
4.50 - 3.51	Agree (A)
3.50 - 2.51	Undecided (U)
2.50 - 1.51	Disagree (D)
1.50 - 1.00	Strongly Disagree (SD)

Chapter 5

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

This chapter discusses the summary of findings, the subsequent conclusions drawn as well as the recommendations that were formulated.

Summary of Findings

Based on the data gathered, the following results were obtained:

1. Majority of the administrator-respondents were males with 11 out of 14 or 78.57 percent and there were only three females which comprised 21.43 percent. Meanwhile, for the contractors' group, 10 out of 12 or 83.33 percent were males and there were two or 16.67 percent females. The same trend was observed on the part of the construction workers as evidenced by the fact that there were 60 males or 80.00 percent and 15 females or 20.00 percent.

2. The administrator-respondents pegged an average age of 55.93 years old with a standard deviation of 4.46 years. On the other hand, the age distribution of the contractors involved in the study clustered around the mean age of 46.17 years and a standard deviation of 5.97 years. For the construction workers, their mean age was posted at 40.73 years with a standard deviation of 11.30 years.

3. The "planning and design" stage of the construction process was considered by the administrators and construction workers as "moderately implemented" with weighted means of 2.56 and 3.35, respectively. Meanwhile, the contractors' group considered this stage as "highly implemented" with a weighted mean of 3.70.

4. Under "prequalification," the following were the weighted means obtained: administrators - 2.90 or "moderately implemented," contractors - 4.05 or "highly implemented," and construction workers - 3.38 or "moderately implemented."

5. For "bidding," the assessments of the three groups were the same, that is "moderately implemented" as evidenced by the following weighted means: 3.00, 3.48 and 3.41 which were rated by the administrators, contractors and construction workers, respectively.

6. In the "construction stage," the implementation was assessed by the contractors' group as "high" with a weighted mean of 3.79, while the administrators and construction workers rated the implementation as "moderate" with weighted means of 2.66 and 3.29, respectively.

7. Under "post-construction stage" both the contractors and construction workers considered the implementation as "high" with weighted means of 4.00 and 3.60, respectively. Meanwhile, the administrators

considered the implementation as "moderate" with a weighted mean of 2.82.

8. On the whole, the contractors' group considered the implementation of construction processes in the respondent-SUCs to be high with an overall mean of 3.80 while the construction workers and administrators deemed the implementation to be "moderate" with overall means of 3.41 and 2.79, respectively.

9. The computed F-value for comparing the perceptions of the three groups of respondents turned out to be 7.87 which was found to be greater than the tabular F-value of 3.28 at α = .05 and df = 2 and 33. This led to the rejection of the hypothesis that "There are no significant differences among the perceptions of the administrators, contractors and construction workers in relation to the extent of implementation of the construction processes along: planning and designing, prequalification, bidding, construction and post construction stage."

10. The difference between the over-all means of the administrators and contractors was 0.814 with a corresponding Scheffe's F-value = 12.76 which was greater than the tabular Scheffe's F-value = 6.50. Thus the perceptions of the administrators and contractors were found to be significantly different.

11. For the administrators and construction workers,

the numerical difference between their overall means was posted at 0.878 with Scheffe's F-value = 13.77. This was greater than the critical Scheffe's F-value = 6.50. Hence, the observed difference was significant.

12. For the contractors' group and construction workers, the numerical difference in their overall means which was 0.401 was found to be not significant, as evidenced by the computed Scheffe's F-value of 6.29 which was lesser than the tabular Scheffe's F-value of 6.50.

13. Problems on "Lack of testing materials facility" and "Difficulty of landscaping and road networking due to existing buildings" were highly felt by the respondents.

14. The solution most popular among the contractors was "Inform the contractor if they are on the positive or negative slippage;" among the construction workers - "Check the materials if they are in accordance with the duly approved specifications;" and among the administrators - "PBAC members should be experienced."

Conclusions

Based on the aforestated findings, the following conclusions were drawn:

1. Implementation of the different construction processes in the respondent-SUCs in wanting improvement specifically along the following areas: 1) Planning and Designing, 2) Bidding and 3) Construction Stage.

2. Administrators of SUCs manifested concern relative to the construction processes undertaken in their respective SUCs.

3. Data showed that disagreements among the three groups of respondents - the administrators, contractors and construction workers occur. This is supported by the rejection of the hypothesis of the study. Moreover, the contractors and construction workers showed less resistance among themselves. This could be attributed to the fact that they work closely with one another. Also, construction workers were hired by the contractors, hence, the former are expected to follow order from the latter.

Recommendations

Based on the finding and conclusion of the study the following recommendation are hereby given.

1. There should be a resident engineer in every SUC to oversee the different infrastructure projects.

2. Persons designated as Prequalifications, Bids and Awards Committee (PBAC) members must be selected on the basis of their experience and unquestionable integrity.

3. The PBAC members should assign a member who will conduct background investigation regarding contractors' capabilities more so on financial, equipment and technical personnel.

4. The SUCs president should attend to the recommendations and suggestions by his appointed resident engineer.

5. The resident engineer should see to it that the contractor should provide adequate equipment and personnel to carry out its tasks.

6. The resident engineer should see to it that the materials delivered by the contractors are in accordance with the specification.

7. The resident engineer should inform the contractor about his accomplishment. The contractor should be notified whether or not he is in a negative or positive slippage.

8. The SUCs president should see to it that before a certain infrastructure project is in the bidding process, there should be an adequate funding to meet all the necessary expenses.

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BIBLIOGRAPHY

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C. PAMPHLET

Presidential Decree No. 1594.

APPENDICES

Appendix A

Request for Approval of Thesis Title

Republic of the Philippines
Samar State Polytechnic College
Catbalogan, Samar

June 15, 1996

The Dean of Graduate Studies
Samar State Polytechnic College
Catbalogan, Samar

M a d a m :

In my desire to start writing my research problem, I have the honor to submit for approval one of the following research problems, preferably item 1:

1. INFRASTRUCTURE MANAGEMENT IN STATE COLLEGES AND UNIVERSITIES OF SAMAR ISLAND: AN ASSESSMENT

2. INFRASTRUCTURE MANAGEMENT IN THE MUNICIPALITY OF GUIUAN: A MODEL

3. INFRASTRUCTURE MANAGEMENT IN LOCAL GOVERNMENT: AN ASSESSMENT

Hoping for your favorable action on this matter.

Very truly yours,

(SGD) **FRANCISCO M. GILBER, JR.**
Researcher

Approved:

(SGD) **RIZALINA M. URBIZTONDO, Ed.D.**
Dean, Graduate Studies

Appendix B

Republic of the Philippines
Samar State Polytechnic College
Catbalogan, Samar

SCHOOL OF GRADUATE STUDIES

APPLICATION FOR ASSIGNMENT OF ADVISER

NAME : FRANCISCO M. GILBER, JR.
CANDIDATE FOR DEGREE : MASTER OF ARTS
AREA OF SPECIALIZATION : PUBLIC MANAGEMENT

TITLE OF PROPOSED THESIS/DISSERTATION: **INFRASTRUCTURE MANAGEMENT IN STATE COLLEGES AND UNIVERSITIES OF SAMAR ISLAND: AN ASSESSMENT**

(SGD) **FRANCISCO M. GILBER, JR.**
Applicant

NORMA A. RICAFORT
Name of Designated Adviser

APPROVED:

(SGD) **RIZALINA M. URBIZTONDO, Ed.D.**
Dean, Graduate Studies

CONFORME:

(SGD) **NORMA A. RICAFORT**
Adviser

Appendix C

June 3, 1998

_____
_____
_____
_____

Sir/Madam:

The undersigned is a masteral student of Samar State Polytechnic College and is currently undertaking his study entitled "Infrastructure Management (Vertical Construction) in State Colleges and Universities in Samar Island: An Assessment," this study is a requirement in finishing the degree of Master of Arts in Public Management. In this connection, I would like to seek approval from your good office to field the questionnaire to the laborers and contractor involved in infrastructure projects in your college. Furthermore, I would like to ask your help by answering the questionnaire for administrators.

Thank you and more power.

Very respectfully yours,

(SGD) **FRANCISCO M. GILBER, JR.**
Researcher

Appendix D

SAMAR STATE POLYTECHNIC COLLEGE
Catbalogan, Samar

Dear Respondents,

This questionnaire is designed to elicit information in connection with the study entitled INFRASTRUCTURE MANAGEMENT (Vertical Construction) OF STATE COLLEGES AND UNIVERSITIES OF SAMAR. Please feel free to respond to the questions under its components or supply the needed information as called for. Rest assured that your response will be kept highly confidential.

I would be forever grateful for your cooperation in making my study a success.

Thank you very much.

Very truly yours,

FRANCISCO M. GILBER JR.
Researcher

****

PART I. Personal Information

Name:_____ Year & Sec: _____

Age:_____ Sex:_____

No. of yrs. involved in Construction Project:_____

Name of Contractors:_____

Type of Construction:_____

PART II. Questionnaire Proper

A. To what extent are you aware with the Construction Management in your area. Please encircle the number under the column which most appropriately corresponds to your response, such as:

5	Fully Aware	2	Slightly Aware
4	Highly Aware	1	Not Aware
3	Moderately Aware		

	Extent of Awareness				
	FA	HA	MA	SA	NA
I Planning Designing					
a. Aesthetic					
1. The building design conform with the trends of building design.	5	4	3	2	1
2. The design accepted in, by the general public.	5	4	3	2	1
3. The building design blends with the existing structures and surroundings.	5	4	3	2	1
4. Others (Please specify):_____					
b. Economy					
1. Maximized use of space.	5	4	3	2	1
2. Materials are conformity with Electrical Code set by the building and electrical Code of the Philippines plumbing and mechanical Code.	5	4	3	2	1
3. Use of minimum size structural member capable of holding the structure.	5	4	3	2	1
4. Others (Please specify):_____					
c. Durability					
1. The structural design of the building can withstand natural calamities such as typhoons, earthquakes, fire etc.	5	4	3	2	1
2. Others (Please specify):_____					

	Extent of Awareness				
	FA	HA	MA	SA	NA
II Prequalification					
1. The contractor has the technical men capable of handling the project.	5	4	3	2	1
2. The contractor has the financial capability.	5	4	3	2	1
3. The contractor has adequate equipment & resources to undertake the project.	5	4	3	2	1
4. Others (Please specify):_____					
III Bidding					
1. The administration follows policies set forth in P.D. 1594.	5	4	3	2	1
2. The administration has adequate experience in bidding procedure.	5	4	3	2	1
3. Others (Please specify):_____					
IV Construction Stage					
A. Quality Control					
1. The contractor follows the technical specification of the said building.	5	4	3	2	1
2. The administration checks the materials used.	5	4	3	2	1
3. The contractor follows the proper construction methodology.	5	4	3	2	1
4. The administration assesses the implementation of the projects.	5	4	3	2	1
5. Others (Please specify):_____					

	Extent of Awareness				
	FA	HA	MA	SA	NA
B. Schedule					
1. The contractor follows the schedule set by the administration in the contract.	5	4	3	2	1
2. The administration monitors the accomplishment of the contractor according to schedule.	5	4	3	2	1
3. Others (Please specify):_____					
V Post Construction					
1. The administration evaluates properly the project.	5	4	3	2	1
2. The administration checks the final billing submitted by the contractor after the turnover.	5	4	3	2	1
3. Others (Please specify):_____					

Part III

A. To what extent are you aware with the adequacy of provision on safety lighting, ventilation, area and architectural specification. Please encircle the number under the column which most appropriately corresponds to your response, such as:

5	Very Adequate (VA)	2	Inadequate (I)
4	Adequate (A)	1	Very Inadequate (VI)
3	Undecided (U)		

	Extent of Adequacy				
	VA	A	U	I	VI
Vertical Construction					
a. Architectural specification					
1. The existing building follows the standard specification set by the DECS.	5	4	3	2	1
2. The existing building contributes to the teaching-learning process.	5	4	3	2	1
3. Others (Please specify):_____					
b. Safety Provision					
1. The existing building provides adequate accessibility to the fire exit.	5	4	3	2	1
2. The existing building provides w/ fire warnings devices.	5	4	3	2	1
3. The existing building provides adequate lobbies and stairs.	5	4	3	2	1
4. Others (Please specify):_____					
c. Lighting and Ventilation					
1. The existing building conforms w/ the latest trend of electrical system.	5	4	3	2	1
2. The rooms are spacious enough for adequate ventilation.	5	4	3	2	1
3. Others (Please specify):_____					
d. Area					
1. The existing building has adequate area for the purpose.	5	4	3	2	1
2. The existing building provides smooth flow of traffic.	5	4	3	2	1
3. Others (Please specify):_____					

Part IV Problems

To what extent do you feel the problems relative to the construction management. Encircle the number under the appropriate column corresponding to the problem at the left column as:

5	Extremely Felt	2	Slightly Felt
4	Highly Felt	1	Not Felt
3	Moderately Felt		

	Extent of Adequacy				
	EF	HF	MF	SF	NF
I. Planning					
1. The recent design of the building does not blend with all structure/surrounding.	5	4	3	2	1
2. Landscaping and road networking is difficult due to existing old buildings.	5	4	3	2	1
3. Shifting of material from wood to concrete, steel and fiber glass.	5	4	3	2	1
4. Lack of testing material facility	5	4	3	2	1
5. Others (Please specify):_____					
II. Prequalification					
1. Contractors are not rigidly checked as to his financial & equipment capability, and technical personnel capability.	5	4	3	2	1
2. Others (Please specify):_____					
III. Bidding Phase					
1. Submission of bid tender is not strictly followed as set forth in P.D. 1594.	5	4	3	2	1
2. Professionalism in the conduct of bidding	5	4	3	2	1
3. Others (Please specify):_____					

	Extent of Adequacy				
	EF	HF	MF	SF	NF
IV. Construction Stage					
1. No submission and proper checking of materials used in the construction.	5	4	3	2	1
2. Lack of routine monitoring on the construction process.	5	4	3	2	1
3. No monitoring as to accomplishment	5	4	3	2	1
4. Others (Please specify):_____					
V. Post Construction					
1. Poor inspection procedure of finished building.	5	4	3	2	1
2. Improper practice of final billing procedure.	5	4	3	2	1
VI. Vertical Construction					
1. Disregard of specification set forth by the Building Code on safety, lighting, & ventilation.	5	4	3	2	1
2. Others (Please specify):_____					

Part V Suggestion

To what extent do you agree with the following suggested solution to the problems of construction management. Encircle the number under the appropriate column corresponding to the suggested solutions such as:

5	Strongly Agree	2	Disagree
4	Agree	1	Strongly Disagree
3	Undecided		

Suggestions	Extent of Adequacy SA	A	U	D	SD
I. Planning					
1. The existing building should be modified & renovated using the latest construction materials.	5	4	3	2	1
2. Demolish some portion of existing building & maximize areas by increasing the number of stories.	5	4	3	2	1
3. Use reinforced concrete and light weight materials in building construction. Also use steel pipes as scaffolding in the construction.	5	4	3	2	1
4. Ask certification from the manufacturer through the supplier of materials in case lack testing facilities.	5	4	3	2	1
II. Prequalification					
1. The Pre-qualification, Bid & Awards Committee (PBAC) members should be familiar with P.D. 1594 guidelines on pre-qualifying bidders.	5	4	3	2	1
2. PBAC member should be experienced	5	4	3	2	1
3. PBAC member should have the highest moral integrity.	5	4	3	2	1
III. Bidding Phase					
1. Strict compliance of P.D. should observed	5	4	3	2	1
2. Invite more contractors to bid through radio & newspapers nationally circulated.	5	4	3	2	1
IV. Construction Stage					
1. The resident engineer assigned by the management should be on full time basis.	5	4	3	2	1

Suggestions	Extent of Adequacy SA	A	U	D	SD
2. The resident engineer should always check the progress report.	5	4	3	2	1
3. The resident engineer should require the contractor to serve a notice prior to the pouring of concrete and placing of other construction materials require.	5	4	3	2	1
4. The resident engineer should require the contractor to submit materials samples.	5	4	3	2	1
V. Post Construction					
1. Requires a progress report from the contractor every billing period.	5	4	3	2	1
2. Inform contractors if they are on the positive or negative slippage.	5	4	3	2	1
3. If the work has negative slippage issue a warning and require contractor to a new schedule of work.	5	4	3	2	1
4. If the contractors cannot repair the damage as scheduled issue a make or break order.	5	4	3	2	1
5. Terminate the contractor and do the job by administration.	5	4	3	2	1
VI. Vertical Construction					
1. Verify the specification if they are in conformity with the building & electrical code of the Philippines.	5	4	3	2	1
2. Check if the materials used are in accordance with the daily approved specifications.	5	4	3	2	1

Thank you very much!

Appendix E

Computation of the Extent of Awareness as the Adequacy of Provision on Safety, Lighting, Ventilation, Area and Architectural Specification of the Administrator, Contractor & Laborer

	Administrator		Contractors		Laborers	
	3.14	9.86	4.0	16.00	3.37	11.36
	3.50	12.25	4.0	16.00	3.56	12.67
	2.93	8.58	3.83	14.67	3.29	10.82
	2.14	4.58	3.17	10.05	2.92	8.53
	3.00	9.00	3.33	11.09	3.59	12.89
	3.36	11.29	3.72	13.84	3.19	10.18
	3.14	9.86	3.67	13.47	3.43	11.76
	3.36	13.18	4.0	16.00	3.59	12.89
	3.50	12.25	4.0	16.00	3.64	13.25
ΣX	28.07	88.96	33.72	127.11	30.58	104.35
X	3.12		3.75		3.39	

$$\Sigma X = 3.12 + 3.75 + 3.39 = 10.25$$

$$\Sigma X^2 = 28.07 + 33.72 + 30.58 = 92.37$$

$$\Sigma X_T^2 = 88.96 + 127.11 + 104.35 = 320.42$$

$$C = \frac{(\Sigma X)^2}{N_T} = \frac{(92.37)^2}{27} = 316.008$$

$$\text{Total Sum of Square} = \Sigma_T^2 - C$$

$$= 320.42 - 316.008 = 4.41196$$

$$\text{Sum Between Mean (Group)} = \frac{\Sigma X^2}{n_j} - C$$

$$= \frac{(28.07)^2}{7} + \frac{(33.72)^2}{7} + \frac{(30.58)^2}{7} - 316.008$$

$$= 87.5472 + 126.3376 + 103.904 - 316.008$$

$$= 1.8056$$

Sum of Squares Within Groups = TSS - SSB

= 4.41196 - 1.8056

= 2.60636

Source of Variation	Degree of Freedom	Sum of Square	Mean of Square	Computed F-Value	Critical Value	Interpre-tation
Between Groups	2	6.02973	3.01	7.87	3.28	Rejected
Within Groups	33	12.63294	0.38			
Total	35	18.66267				

Appendix F

Computation of ANOVA for Comparing the Extent of Awareness of the Administrator, Contractor and Laborers of Construction Management in Samar

	CONTRACTOR		ADMINISTRATOR		LABORER	
	X_1	X_1^2	X_2	X_2^2	X_3	X_3^2
	3.64	13.2496	3.19	10.1761	3.25	10.5625
	3.83	14.6689	2.78	7.7284	3.39	11.4921
	3.50	12.2500	3.00	9.0000	3.35	11.2250
	4.05	16.4025	2.90	8.4100	3.38	11.4244
	3.70	13.6900	3.00	9.0000	3.41	11.6281
	3.77	14.2129	2.78	7.7284	3.29	10.8241
	3.83	14.6689	2.54	6.4516	3.32	11.0224
	4.00	16.0000	2.82	7.9524	3.60	12.9600
	4.00	16.0000	3.32	11.0224	3.47	12.0409
	3.44	11.8336	2.69	7.2361	3.27	10.6929
	3.71	13.7641	3.25	10.5625	3.31	10.9561
	4.00	16.0000	3.43	11.7649	3.62	13.1044
Total(Σx)	45.470	185.9900	35.70	107.0328	40.66	137.9329
Mean	3.789		2.975		3.388	

$\Sigma x = 45.47 + 35.70 + 40.66 = 121.83$

$\Sigma x_T^2 = 185.990 + 107.3028 + 137.9329 = 430.9557$

$\Sigma x_1 = 45.47$ $\quad \Sigma x_1^2 = 185.990$

$\Sigma x_2 = 35.70$ $\quad \Sigma x_2^2 = 107.0328$

$\Sigma x_3 = 40.66$ $\quad \Sigma x_3^2 = 137.9329$

$$C = \frac{(\Sigma x)^2}{N} = \frac{(121.83)^2}{36} = \frac{14842.549}{36} = 412.29303$$

$$\text{Total SS (TSS)} = \Sigma x_T^2 - C = 430.9557 - 412.29303$$

$$= 18.66267$$

$$\text{SS Between (SSB)} = \frac{\Sigma x_j^2}{n_j} - C$$

$$= \frac{(45.47)^2}{12} + \frac{(35.7)^2}{12} + \frac{(40.66)^2}{12} - 412.29303$$

$$= 174.34563 + 106.2075 + 137.76963 - 412.29303$$

$$= 418.32276 - 412.29303$$

$$= 6.02973$$

SS within = TSB − SSB

= 18.66267 − 6.02973 = 12.63294

Computation of degree of freedom:

Total df (dft) = N−1 = 36−1 = 35

Between df (dfb) = K−1 = 3−1 = 2

Within df (dfw) = $df_t - df_b$ = 35−2 = 33

Source of Variation	Degree of Freedom	Sum of Square	Mean of Square	Computed F-Value	Critical @ a=0.05	Interpretation
Between Group	2	6.02973	3.01365	7.8723	3.28	Rejected
Within Group	33	12.63294	0.38282			
Total	35	18.66267				

Appendix G

Computation of the Scheffe's F-value for Comparison of Mean

$$F_1 = \frac{\bar{X}_1 - \bar{X}_2}{MSW\left[\frac{N_1 + N_2}{N_1 N_2}\right]} = \frac{3.789 - 2.975}{0.3828\left[\frac{12 + 12}{12(12)}\right]}$$

$$= \frac{0.814}{0.3828163(0.166666)} = \frac{0.814}{0.0638026} = 12.758$$

$$F_2 = \frac{\bar{X}_1 - \bar{X}_3}{MSW\left[\frac{N_1 + N_2}{N_1 N_3}\right]} = \frac{3.789 - 3.388}{0.3828163(0.166666)}$$

$$= \frac{0.401}{0.0638026} = 6.2850$$

$$F_3 = \frac{\bar{X}_2 - \bar{X}_3}{MSW\left[\frac{N_1 + N_3}{N_1 N_3}\right]} = \frac{2.975 - 3.388}{0.0638026} = \frac{-0.8780991}{0.0638026} = 13.76$$

CURRICULUM VITAE

CURRICULUM VITAE

Name	:	FRANCISCO M. GILBER, JR.
Date of Birth	:	November 15, 1963
Place of Birth	:	Guiuan, Eastern Samar
Civil Status	:	Married
Name of Spouse	:	Josephine P. Gilber

EDUCATIONAL BACKGROUND:

ELEMENTARY	:	Guiuan East Central School Guiuan, Eastern Samar, 1970-1975 Grade I-V Elementary Grades
		Surok Bo. Community Elem. School Surok, Guiuan, Eastern Samar 1975-1976, Elementary Graduate
SECONDARY	:	Southern Samar School of Arts and Trades Guiuan, Eastern Samar, 1976-1980 High School Graduate
COLLEGE	:	Divine Word University Tacloban City, 1980-1985 Bachelor of Science in Civil Engineering
	:	Samar State Polytechnic College Catbalogan, Samar, 1992-1996 Master of Arts in Public Management (Complete Academic Requirements)

CIVIL SERVICE ELİGIBILITY:

Civil Engineering Licensure Examination

TRAININGS/SEMINARS:

Architectural Engineering, June 8, 1992 - March 18, 1993, Institute of Vocational Training, Sagamihara City, Japan

Computer Aided Design, February 2-14, 1993, Shibuya, Tokyo

Value Engineering in Construction, March 10-12, 1993, University of the Philippines, Quezon City

Seminar-Workshop on Construction Estimates and Analysis, October 20-23, 1993, University of the Philippines, Quezon City

Radar Remote Sensing, January 20-21, 1992, TCAGP University of the Philippines, Quezon City

Field Techniques, December 2-13, 1991, TCAGP University of the Philippines, Quezon City

Simulation & Computer Modeling Control, March 11-12, 1991, Central Philippines University, Jaro, Iloilo City

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