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QUALITY CONTROL MANAGEMENT OF ROAD INFRASTRUCTURE PROJECTS OF THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS – LEYTE SECOND DISTRICT ENGINEERING OFFICE

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ABSTRACT

Quality control in construction is a vital element that should be given importance and in-depth assessment. This study looked into the quality control management of the road infrastructure projects of the Department of Public Works and Highways (DPWH) – Leyte Second District Engineering (2nd LED) Office for Calendar Years 2011-2015. Utilizing qualitative-descriptive research design, the study involved 30 Implementers, 30 Contractors, and 50 Beneficiaries of the road projects. Results of the study show that all road infrastructure projects were properly implemented, the quality control management were effective, material requirements were well complied, testing requirements were impressively complied, and the construction requirements had been strictly followed and remarkably complied. On project management, the primary problems or issues met by Project Implementers were on the need of the Resident Engineer to be present "at all times", Contractors being required to hire Materials Engineers "on site", and the Contractors being responsible for the quality control of all materials.Proper supervision, standard materials, experienced workmen, and proper coordination between technical men, among others, were the primary problems during project implementation.The primary problem on project evaluation fell on strictly administering quality management, keeping materials quality control documents, and work progress/accomplishments.Project Implementers must successfully manage and control the work to the highest level by identifying, tracking, managing, and resolving project issues; and they need to adhere to an open communication policy. Stakeholders need to be involved in the identification, implementation and evaluation of projects.DPWH-2nd LED Office needs to require technical and non-technical personnel to adopt “quality circles” where they will meet regularly to make suggestions for continuous quality control improvement; and hire additional technical personnel, rotate project assignments of the technical personnel, and minimize or remove sub-contractors with minor contracts who cannot come up with quality infrastructure road projects.

KEYWORDS: road infrastructure projects, Department of Public Works and Highways, DPWH Specifications, quality control management, quality assurance tools.

1. INTRODUCTION

Quality control is a process by which entities review the quality of all factors involved in production. ISO 9000 defines quality control as "A part of quality management focused on fulfilling quality requirements". [1] Quality control in construction is a vital element that should be given importance and thorough valuation. It means insuring compliance with requirements and specifications of material and workmanship in order to ensure the performance of the facility according to the design. These minimum standards are contained and discussed in the Department of Public Works and Highways Standard Specifications for Highways, Bridges and Airports. [2]

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Quality control management relies on the people who take charge of the activities in setting the strategy of an organization to ensure that the minimum standards are met in order to give the efficient service and maximum benefits to the Filipino people. [3]

According to the2012 Global Competitiveness Report of the World Economic Forum, [4], the Philippines is still lagging behind its neighbors in the Association of Southeast Asian Nations in terms of quality infrastructure and in particular, the quality of roads. In fact, on a scale of 1 to 7 — with 1 being extremely underdeveloped and 7 extensive and efficient by global standards — roads in the Philippines scored a low 3.4.

The state-owned think tank Philippine Institute for Development Studies (PIDS) said that underinvestment in quality roads is making it more costly to do business in the Philippines. Poor roads not only hold back local development but also make transporting goods more costly and time consuming. [5]

Likewise, World Bank said that poor road quality in the Philippines results in intercity freight rates that are 50 percent higher than Thailand or Vietnam which results from the low proportion of paved roads and how the roads function as a network. Both national government and LGUs cannot ignore this fact of underinvestment in maintenance and construction of good quality local roads. [5]

In Leyte, particularly the municipalities within the coverage area of the 2nd LED Office, three groups of stakeholders, namely: the implementers, the builders and the project beneficiaries took respective interests in road projects.

This depressing realization has led to the researchers' decision of coming up with a closer look at the quality control management in the DPWH– 2nd LED Office for Calendar Years 2011-2015.

1.1Objectives of the Study

This study generally aimed to look into the quality control management of the road infrastructure projects of the DPWH– 2nd LED Office for Calendar Years 2011-2015. Specifically, the study sought to determine the status of the road infrastructure projects; determine the level of compliance to DPWH Specification Standards for road infrastructure projects in terms of material requirements, testing requirements and construction requirements; and to identify the problems and issues encountered during the implementation of road infrastructure projects in terms of project management, project implementation and project evaluation.

2. MATERIALS AND METHODS

This study utilized the qualitative-descriptive research design which is an intensive and in-depth description of a particular situation. Three groups of respondents were the subjects of the study, namely: thirty 30 implementers, 30 contractors, and 50 beneficiaries. The main instrument used in the study was a semi-structured questionnaire following the items specified at the DPWH Standard Specifications for Highways, Bridges and Airports. [2].

To validate the gathered data regarding problems and issues encountered during the implementation of road infrastructure projects and other necessary information needed for the study, a structured interview was used for the focus group participants.

3. RESULTS AND DISCUSSION

3.1 Status of the Road Infrastructure Projects Completed from 2011-2015

Table 1 presents the five-year inventory of the road infrastructure projects completed from 2011 to 2015 in the DPWH– 2nd LED Office.

Result shows that all national and local projects at various municipalities within the DPWH– 2nd LED Office were properly implemented. It therefore suggests that the quality control management of DPWH for the road infrastructure projects had been effective.

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Table 1. Status of the Road Infrastructure Projects Completed in the DPWH–2nd LED Office from 2011 to 2015

Year of Implementation	Road Infrastructure Project Category							
	Local				**National**			
	No. of Projects	Location	Status of Implementation		No. of Projects	Location	Status of Implementation	
			Properly Implemented	Not Properly Implemented			Properly Implemented	Not Properly Implemented
2011	-	-	-	-	5	varied	5	-
2012	28	varied	28	-	6	varied	6	-
2013	7	varied	7	-	12	varied	12	-
2014	2	varied	2	-	10	varied	10	-
2015	28	varied	28	-	2	varied	2	-
Total			**65**	-	**Total**		**35**	-

3.2Level of Compliance to DPWH Specification Standards for the Road Infrastructure Projects
The level of compliance to DPWH specification standards for road infrastructure projects are presented on the following Tables 2, 3, 4 and 5.

Table 2shows the level of compliance to specification standards for the road infrastructure projects on material requirements. The Table shows that seven (7) out of nine (9) indicators under material requirements were having weighted means (WM) from 3.77 to 4.18, all interpreted as "well-complied". The lowest WM is 3.39, interpreted as "complied", and it was on cement being properly stored in weatherproof building that protected them from dampness.

On the other hand, the highest WM of 4.39, interpreted as "very well complied", was on using only clean or potable water being allowed to be incorporated in the mixing of concrete during construction.
The material requirements got an average weighted mean (AWM) of 3.93, interpreted as "well-complied". This indicates that the material requirements had been well-conformed under the quality control management of the road infrastructure projects in the DPWH – 2nd LED Office.

Table 2. Level of Compliance to Specification Standards for the Road Infrastructure Projects on Material Requirements

A. Material Requirements		
Indicators	**WM**	**Interpretation**
1. Only Type I Portland Cement was used unless otherwise provided for in the Special Provisions.	3.79	well-complied
2. Fine Aggregates used consist of natural sand, stone screenings or other inert materials with similar characteristics or combinations thereof, having hard, strong and durable particles.	3.77	well-complied
3. Coarse Aggregates used consist of crushed stone, gravel, blast furnace slag, or other approved inert materials of similar characteristics, or combinations thereof, having hard, strong, durable pieces and free from any adherent coatings.	3.80	well-complied
4. Water used in mixing, curing or other designated application was reasonably clean and free from oil, salt, acid, alkali, grass or other substances injurious to the finished product.	4.18	well-complied
5. Only clean or potable water was allowed to be incorporated in the mixing of concrete during construction.	4.39	very well complied

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A. Material Requirements		
6. Reinforcing steel consists of furnishing, bending, fabricating and placing of steel reinforcement of the type, size, shape and grade required in accordance with the Specification and in conformity with the requirements shown on the Plans or as directed by the Engineer.	4.16	well-complied
7. Reinforcing steel used was free from dirt, oil, paint, grease, mill scale and loose or thick rust which could impair bond of the steel with the concrete.	3.97	well-complied
8. The cement was properly stored in weatherproof building which protected the cement from dampness.	3.39	complied
9. A design mix was submitted to the Materials Engineer for approval and accompanied with certified test data from an approved laboratory demonstrating the adequacy of the design mix.	3.94	well-complied
AWM	**3.93**	**well-complied**

Table 3 presents the level of compliance to specification standards in terms of testing requirements.12 out of the 14 indicators under testing requirements were having WM from 3.49 – 4.25, all interpreted as "well-complied". They were on CBR, Organic Impurities, Grading, LL, PL, Compaction, Reinforced Steel Bar, Fine Aggregate, Coarse Aggregate, Curing Compound, Asphalt Sealant, and CBST. The other two (2) indicators on FDT and cement test had WM of 4.39 and 4.52, respectively; and both were interpreted as "very-well complied". The testing requirements got an AWM of 4.09, interpreted as "well-complied".

The findings imply that the testing requirements had notably been well-complied under the quality control management of the road infrastructure projects in the DPWH – 2nd LED Office.

Table 3. Level of Compliance to Specification Standards for the Road Infrastructure Projects on Testing Requirements

B. Testing Requirements		
Indicators B.1 On-going Construction Tests	**WM**	**Interpretation**
1.a Quality Tests of Soils		
California Bearing Ratio (CBR)	3.61	well-complied
Organic Impurities	3.49	well-complied
Grading	4.03	well-complied
Liquid Limit (LL)	4.04	well-complied
Plastic Limit (PL)	4.14	well-complied
Compaction	4.25	well-complied
Field Density Test (FDT)	4.39	very well complied
1.b Quality Tests of Materials for Portland Cement Concrete Pavement (PCCP)	**WM**	**Interpretation**
Cement	4.52	very well complied
Reinforced Steel Bar	4.21	well-complied
Fine Aggregate	4.12	well-complied
Coarse Aggregate	4.15	well-complied
Curing Compound	3.72	well-complied
Asphalt Sealant	3.72	well-complied
Concrete Beam Strength Test (CBST)	4.20	well-complied
AWM	**4.09**	**well-complied**

Table 4 shows the level of compliance to specification standards for the road infrastructure projects on construction requirements. Findings of the study show that eight (8) out of nine (9) indicators got WM from 3.46 to 4.19, interpreted as "well-complied". The indicator about re-tempering of concrete or mortar which had partially hardened were strictly not permitted got the lowest WM of 3.44, interpreted as "complied".
Overall, construction requirements got an AWM of 3.92, interpreted as "well - complied". This implies that the construction requirements were strictly followed and remarkably complied under the quality control management of the road infrastructure projects.

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Table 4. Level of Compliance to Specification Standards for the Road Infrastructure Projects on Construction Requirements

C. Construction Requirements		
Indicators	**WM**	**Interpretation**
1. Equipment and tools necessary for handling materials and performing all parts of the work are approved by the Project Implementer/Engineer as to design, capacity and mechanical condition.	3.75	well-complied
2. The aggregate sub-base material is placed at a uniform mixture on a prepared subgrade in a quantity which provides the required compacted thickness.	4.19	well-complied
3. When more than one (1) layer is required, each layer is shaped to the required thickness and properly compacted before the succeeding layer is placed.	3.82	well-complied
4. Mixing of concrete is done in an approved mixer capable of combining the aggregates, cement and water into a thoroughly mixed and uniform mass within the specified mixing period and discharging and distributing the mixture without segregation on the prepared grade.	3.86	well-complied
5. As the work progresses, at least one (1) set consisting of three (3) concrete beam test specimens are taken from each 330 sq. m. of pavement, 230 mm depth or fraction thereof placed each day subject for the Concrete Beam Strength Test (CBST).	3.85	well-complied
6. The concrete is placed with an approved paver designed to spread, consolidate, screed and float finish the freshly placed concrete in one complete pass of the machine in such a manner that a minimum of hand finishing will be necessary to provide a dense and homogeneous pavement in conformance with the Plans and Specifications.	3.86	well-complied
7. Sawing of the joint commenced as soon as the concrete has hardened sufficiently to permit sawing without excessive ravelling, usually 4 to 24 hours.	3.46	well-complied
8. Concrete not in place within ninety (90) minutes from the time the ingredients is placed into the mixing drum or that has developed initial set are discarded.	3.46	well-complied
9. Re-tempering of concrete or mortar which has partially hardened, that is remixing with or without additional cement, aggregate, or water, are strictly not permitted.	3.44	complied
AWM	**3.74**	**well-complied**

Table 5is the summary Table for the level of compliance to specification standards for road infrastructure project.

Results show that the level of compliance to all specification standards were “well-complied”. This implies that DPWH’s standard specifications were followed accordingly during the implementation stage of the road infrastructure projects in the 2nd LED Office.

Table 5. Level of Compliance to DPWH Specification Standards for the Road Infrastructure Project

Specification Standards Indicators	**AWM**	**Description**
Material Requirements	3.93	well-complied
Testing Requirements	4.09	well-complied
Construction Requirements	3.74	well-complied
OWM	**3.92**	**well-complied**

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3.3Problems and Issues Encountered during the Implementation of Road Infrastructure Projects

Tables 6, 7, and 8 presents the problems and issues encountered by the Project Implementers/Engineers during the implementation of road infrastructure projects in terms of project management, project implementation, and project evaluation.

The result from Table 6shows that the number one (1) problem or issue met by the Project Implementers during the execution of the projects was on the need of the Resident Engineer to be present "at all times" during the construction phase, followed by the Contractor being required to hire a Materials Engineer "on site", then for the Contractor being responsible for the quality control of all materials during handling, blending and mixing, and placement operations. The least felt problem was on the Project Engineer/Implementer being the overall responsible in the outcome of the project, maintaining project schedule by monitoring project progress, coordinating activities, and resolving problems.

This finding implies that with the presence of the implementers during the whole duration of the projects could greatly ensure quality project management. This is in consonance with the finding of DFID, [6], who stipulated that the quality of work and safety will be jeopardized if quality project management is insufficient because low quality materials maybe used, among other reasons.

Table 6. Problems and Issues Encountered During the Implementation of Road Infrastructure Projects on Project Management

Indicators	Rank
The Resident Engineer being present “at all times” during the construction phase of the project.	1
The Contractor being required to hire a Materials Engineer "on site" to ensure all the construction materials passed the minimum testing requirements in each project.	2
The Contractor being responsible for the quality control of all materials during the handling, blending and mixing, and placement operations.	3
The Government Materials Engineer and the Contractor's Materials Engineer need to have well-coordination in every scope of work and all the time that may deem necessary.	4
The Contractor needs to have the proper sampling, testing and inspection necessary to assure quality control of the component materials and the concrete.	5
The General Contractor allowed to hire subcontractors to perform all or portions of the construction work.	6
Workmen being qualified and experienced in performing batching or mixing operation for the concrete mix.	7
The Materials Engineer needs to ensure that all construction materials passed the minimum testing requirements before it is incorporated into the work.	8
The Project Engineer being the overall responsible in the outcome of the project, maintaining project schedule by monitoring project progress, coordinating activities, and resolving problems.	9

Table 7depicts the problems and issues during the implementation of road infrastructure projects in terms of project implementation.

The result from the Table shows that the number one (1) problem or issue during the implementation of road infrastructure projects in terms of project implementation was on the “proper supervision by the technical people during the implementation of the project”. This was followed by “ensuring standard materials for construction use”, then on “selecting experienced workmen to ensure proper workmanship of the road construction”, and on “proper coordination between the technical personnel”. The top four (4) least problems or issues were on “inaccessible construction site”, “Road-Right-of-Way problems”, “rainy weather condition affecting the duration of the projects”, and on “strictly following work schedules to prevent delayed accomplishments”.

The findings could imply that proper supervision, standard materials, experienced workmen, and proper coordination between technical personnel were the primary problems or issues during the implementation of the

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project since they really need to be taken care of and be fully compliant to standards to be able to produce quality roads. Insuring safe and quality construction, according to Fox and Cornell, [7], is a concern of the project manager for the overall responsibility of the project in addition to the concerns of personnel, cost, time and other management issues.

Table 7. Problems and Issues Encountered During the Implementation of Road Infrastructure Projects on Project Implementation

Indicators	Rank
1. Proper supervision by the technical people during the implementation of the project.	1
2.Ensuring standard materials for construction use.	2
3.Selecting experienced workmen to ensure proper workmanship of the road construction.	3
4.Proper coordination between the technical personnel.	4
5.Political pressures in the implementation of projects.	5
6.Construction sites which were not accessible.	6
7.Road-Right-of-Way (RROW) problems.	7
8.Rainy weather condition affecting the duration of the project.	8
9.Strictly following work schedules to prevent delayed accomplishments.	9

Table 8 presents the level of compliance of quality control issues during the implementation of road infrastructure projects on project evaluation. The result reveals that the primary problem on project evaluation fell on “strictly administering quality management”, followed by “keeping materials quality control documents for ready reference”, and then on “work progress/accomplishments as basis of billing”.

The bottom three (3) indicators of problems or issues on project evaluation were on “alignment/dimensions being in accordance with the approved plans”, “strength requirement needing to be attained”, and on “joint final inspection being conducted prior to final billing”.

The findings imply that administering quality management on project evaluation strictly, among others, isvery necessary for an efficient and effective quality control management for road infrastructure projects.This is supported by the result of the study by Ledbetter, [8], who found thatquality performance on successful projectis found to promote awareness and improve the understanding of the quality process, facilitate communication, focus management on where quality improvements could be made, and reduce the overall cost of quality.

Table 8. Problems and Issues Encountered During the Implementation of Road Infrastructure Projects on Project Evaluation

Indicators	Rank
1. Strictly administering quality management.	1
2. Keeping materials quality control documents for ready reference.	2
3. Work progress/accomplishments being the basis of billing.	3
4. Maintaining adequate records of all inspections and tests.	4
5. All materials to pass the laboratory and field tests.	5
6. Partial inspection in evaluating contractor's claim as pre-requisite to partial billing.	6
7. Joint final inspection being conducted prior to final billing.	7
8. Strength requirement needing to be attained.	8
9. Alignment/Dimensions being in accordance with the approved plans.	9

3.4 Focus Group Discussion with the Project Implementers

Table 9 presents the common responses of project implementers on the common issues and concerns or project engineers of road projects regarding the status of the road infrastructure projects completed from 2011-2015.

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Data from the Table shows that the issues and concerns of project implementers on road projects regarding "responsibilities in the construction of project" and "material testing requirements" got the highest rank of 1.5. All of the respondents (8 out of 8) said that they all complied the said requirements. All of them said they had strictly required the contractors to follow proper construction methods; completed road projects really followed the general terms in the standard plan with the correct dimensions, passed laboratory test results, and had good workmanship; and that all material testing requirements had been incorporated into the work.

For the "assessment of a completed project", "assurance that all construction materials passed the minimum testing requirements before incorporated into the work", and "assurance that the aggregate base and sub-base are properly poured" ranked 4. Six (6) out of eight (8) of them unanimously said they complied the said issues and concerns. They said that assessment of completed project through site/project inspection had been a standard operating procedure prior to billings because they were signatories of the billing documents, and such responsibility could be of great risk to their profession and career. They further said that it had been a requirement to pass the materials' test results prior to the execution of work in every item and contractors had never been allowed to proceed without the laboratory test results. Field Density Test of the road bed had been a requirement before concrete pouring.

Five (5) out of eight (8) of them, which all ranked 7, had given feedbacks on the issues and concerns on "sub-contractors' involvement in the construction of some projects", "number of projects usually supervised at the same time", and "number of people usually supervised at the same time" had been poorly met by the contractors. They said that the subcontractors sometimes had poor workmanship compared to the main contractors; that they had been given assignments by area and they were usually overloaded with 10 to 20 supervised projects at the same time; and they usually supervised about 30 people in every project.

The findings may imply that the main issues and concerns among the project implementers were on project assignment overload and the considerable number of supervised men at the same time. These issues could jeopardize the quality of road infrastructure projects.

Table 9. Focus Group Discussion with Project Implementers

Issues and Concerns	Common Responses	Rank
Responsibilities in the construction of project.	Out of eight (8) respondents, all of them said, "We strictly required proper construction methods to be done appropriately by the contractors. The completed road project really followed the general terms in the standard plan with correct dimensions, passed laboratory test results, and to have good workmanship".	1.5
Material testing require-ments.	Out of eight (8) respondents, all of them said, "There were several material testing requirements for every material before they were incorporated into the work. For soil, we had quality tests for California Bearing Ratio (CBR), organic impurities, grading, liquid limit, plastic limit, compaction, and field density test. We also required quality tests of materials for Portland Cement Concrete Pavement (PCCP) like cement, reinforced steel bar, fine aggregates, coarse aggregates, concrete beam strength test, asphalt sealant, and curing compounds when necessary".	1.5
Assessment of a completed project.	Out of eight (8) respondents, six (6) of them stated, "It was a standard procedure to make site/project inspection prior to every billing because we were signatories at the billing documents; and it was a great risk to our profession and career if we did not undertake site/project inspection".	4

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Assurance that all construction materials passed the minimum testing requirements before incorporated into the work.	Out of eight (8) respondents, six (6) of them stated, "It had been a requirement to pass the test results of the materials prior to the execution of work in every item. They were not allowed to proceed without the laboratory test results".	4
Assurance that the aggregate base and sub-base are properly compacted before concrete is poured.	Out of eight (8) respondents, six (6) said, "A Field Density Test (FDT) had been done prior to concrete pouring. The right density and moisture content of the soil must be strictly attained to have a good compacted base or foundation in the road infrastructure project".	4
Sub-contractors' involvement in the construction of some projects.	Out of eight (8) respondents, five (5) stated, "Subcontractors sometimes had poor workmanship compared to the main contractors".	7
Number of projects usually supervised at the same time.	Out of eight (8) respondents, five (5) said, "We had area assignments. We usually handled an average of 10 to 20 projects at the same time which is somewhat an overload to our job".	7
Number of people usually supervised at the same time.	Out of eight (8) respondents, five (5) said, "We usually supervised about 30 people in every project. It depends on the amount and duration of the project".	7

3.5 Focus Group Discussion with the Project Contractors

Table 10 presents the focus group discussion responses from the project builders or contractors of road infrastructure projects which were completed from 2011-2015.

As shown on the Table, rank one (1) on the issues and concerns was on the implementation of quality assurance system. All of the project builders, (10 out of 10), said that they had been complying all of the requirements before they were able to renew their licenses. This implies that they were all qualified to handle their respective projects.

The second in rank issues and concerns was on the responsibilities of being contractors. Majority of them, nine (9) out of 10, said that they had been compliant to the standard contractor's responsibilities, such as on their role to construct a road, oversee the construction and ensure that all necessary measures, and others. Their role was to provide all the materials, labor, equipment (such as engineering vehicles and tools) and services necessary for the construction of the project.

Next in rank, rank 3.5, was on issues and concerns regarding quality control of two or more projects simultaneously done at different locations, and on assurance that all the material requirements had been met in each project. Seven (7) out of 10 of the contractors said that they ensured that critical works, like pouring of concrete in road construction, had only been done with the presence of the technical people. Likewise, the same number of contractors said that they made sure that the material requirements had been met because all materials were needed to be tested by the DPWH or other Laboratory testing accredited by the DPWH prior to be incorporated into the work.

The last rank, rank 5, was about the "subcontractor to work on the whole scope of work". The Project Contractors were equally divided as to allowing or not allowing subcontractors to work on their projects. Half of them said, "they allowed subcontractors to work a specific scope of work or even the whole project as long as they made agreements covering all the needed terms and conditions". The remaining half of them said they did not let subcontractors to work any scope of work because they did not have any trust to the quality of sub-contractors' work performance. Besides, their names or licenses would be at stake in case of construction failures.

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The results could imply that in terms of road infrastructure project, project contractors had been responsible and accomplishing their respective tasks appropriately. This could also be the reason why they answered that all projects for the past five (5) years (2011-2015) were "well implemented" and that the level of compliance to DPWH specification standards for the road infrastructure projects in all components were "well-complied".
The project contractors should have agreed to Barrera, [9], who said, "Never stop studying or analyzing everything you see in a project. Never take anything for granted. The construction management profession demands complete attention, great commitment and excellent learning and analytics skills. Live the project in its day to day and never forget to prepare for the unexpected."

Table 10. Focus Group Discussion with Project Contractors

Issues and Concerns	**Common Responses**	**Rank**
Implementation of Quality Assurance System	Out of ten (10) respondents, all of them said that they had been complying all of the requirements before they were able to renew their licenses.	1
Responsibilities of being contractors of road infrastructure projects	Out of ten (10) respondents, nine (9) of them said that that their role was to construct a road, oversee the construction and ensure that all necessary measures had been taken care of in order to finish the project. Some of other responsibilities were to provide all the materials, labor, equipment (such as engineering vehicles and tools) and services necessary for the construction of the project.	2
Quality control of two or more projects simultaneously done in different locations.	Out of ten (10) respondents, seven (7) said that they ensured that critical works, like pouring of concrete in road construction, had only been done with the presence of the technical people like the Materials Engineer and the Project Engineer.	3.5
Assurance that all the material requirements are met in each project	Out of ten (10) respondents, seven (7) stated that they made sure that the material requirements were met because all materials needed to be tested by the DPWH or other Laboratory testing accredited by the DPWH prior to be incorporated into the work.	3.5
Subcontractor to work on the whole scope of work	Out of ten (10) respondents, five (5) said that they allowed subcontractors to work a specific scope of work or even the whole project as long as they made agreements covering all the needed terms and conditions. Others said that they did not let a subcontractor to work any scope of work because they did not have any trust to the quality of their work performance. Besides, their names or licenses would be at stake in case of construction failures.	5

3.6 Focus Group Discussion with the Project Beneficiaries

Table 11 presents the common responses of the project beneficiaries on issues and concerns related to road infrastructure projects.

The data shows that two (2) out of the four (4) issues and concerns which were on "information about the projects in the area" and "impact of the projects to the community" were both ranked 1.5. All of the project beneficiaries (20 out of 20) admitted that "only the Barangay Officials had been well informed prior to the implementation of the road infrastructure project, especially with regards to the location of the project". This implies that DPWH technical personnel and the contractors failed to inform the beneficiaries about the project before the actual implementation.

With regards to the impact of the projects to the community, all of the project beneficiaries (20 out of 20) felt the advantages of constructing the roads, such as making the transportation of their goods and commodities from the

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farm to the market easier, making the economy grew, and making their lives easier than before. These positive responses suggest that the beneficiaries had likewise been expecting that the quality control management of the road infrastructure projects were at high levels.

"Satisfaction with the quality of construction in road infrastructure projects" ranked number 3. One half of the project beneficiaries (10 out of 20) had not known how to assess the construction technically, but they had been somewhat satisfied with the quality of the construction". Finally, "safety standards in construction" ranked number 4. Almost one half of them (8 out of 20) had not known about safety standards, but had observed that there had been warning signs within the premises of the construction site.

From among the responses of the project beneficiaries, what emerged as their prevailing problem was on the information about the projects in their respective areas. According to Olander and Landin, negative attitude to a construction project by stakeholders can severely obstruct its implementation that causes cost overruns and negative slippage due to clashes and controversies concerning project design and implementation. [10]Likewise, Philip et al. , [11], found that communication scheme can be used to raise awareness of the positive benefits for the community which will help to further strengthen local ownership of the plan and encourage public *participation* in the implementation of projects. Further, Dykstras, [12], said that construction is all about teamwork and good communication is essential for every project manager or implementers. They have to communicate with their team, subcontractors, suppliers, client, designers, local authorities and sometimes neighbors and members of the public."

Table 11. Focus Group Discussion with the Project Beneficiaries

Issues and Concerns	Common Responses	Rank
Information about the projects in the area.	Out of 20 respondents, all of them stated that only the Barangay officials had been well informed prior to the implementation of the road infrastructure project, especially with regards to the location of the proposed project.	1.5
Impact of the projects to the community.	Out of 20 respondents, all of them said that the road infrastructure projects made the transportation of our goods and commodities from the farm to the market easier. It also made the economy grew which made their lives easier than before.	1.5
Satisfaction with the quality of construction in road infrastructure projects.	Out of 20 respondents, 10 of them stated they had not known as to how to assess the construction technically, but they had been somewhat satisfied with the quality of the construction".	3
Safety standards in construction.	Out of 20, 8 of them stated that they had not known about safety standards, but they observed that there had been warning signs within the premises of the construction site.	4

4. CONCLUSION

Based on the findings of the study, the following conclusions were drawn:

The quality control management of DPWH-2nd LED Office for the road infrastructure projects had been effective. The project implementers and contractors had been responsible and accomplishing their respective roles appropriately. The presence of the implementers during the whole duration of the implementation of the projects could greatly ensure quality project management. Proper supervision, standard materials, experienced workmen, and proper coordination between technical personnel were needed to be fully compliant to standards to construct or produce quality roads.

Administering quality management on project evaluation strictly, among others, is very necessary for an efficient and effective quality control management for road infrastructure projects; and project assignment overload and considerable number of supervised men of project implementers could jeopardize the quality of road infrastructure projects.

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