

MONITORING GUIDE FOR ROADS

Classification of Road

- 1. National Road** - This road connects one province to another province. Its minimum thickness is 0.23 meter (9 inches) and a width of 6.10 meters for a two way traffic.
- 2. Provincial Road** connects the municipalities within the province. The minimum thickness is 8 inches but sometimes they adopted a 9 inches and a width of 6.10 meters for a two way traffic.
- 3. Municipal Road** - refers to the road network within a town. Its thickness is 0.2 meter (8 inches) with a width of 6.10 meters for a two way traffic.
- 4. Barangay Road** - refers to the road that connects the barangays from the town. The minimum thickness is 0.15 meter (6 inches) with an ideal width of 4.50 meters.
- 5. Farm-to-Market Road** - this refers to the access to transport of products to the market outlet. The minimum thickness is 0.15 meter with an ideal width of 4.50 meters.

General Work items involved in road construction /rehabilitation

I. EARTHWORK

A. *Item 100 - Clearing and Grubbing*

This refers to the clearing of all vegetations and debris within the road project and it should be confined within the work limit designated in the contract.

▮ **How to Assess Clearing & Grubbing (Item 100)**

1. All surface objects, like trees, stumps, roots and other protruding obstructions shall be removed.
2. The monitor should verify the existence of vegetations to be cleared prior to the execution of work
3. For environmental concerns, the contractor should only confine their operations within the work limit specified specially when the project is new road opening
4. Look for the change of method
The area being cleared and grubbed will be the basis of payment.

B. *Item 101 - Removal of Structures*

This refers to the removal and satisfactory disposal of obstructions (Existing Structures) like buildings, fences, old pavements, abandoned pipelines, etc. which are not permitted to remain.

□ **How to assess Item 101**

Prior to placing of new work, all existing structures or obstruction indicated not to remain in the plan be removed.

C. *Item 102 -Roadway Excavation*

It is the excavation and grading for roadways. Slope rounding including the removal of unsuitable materials from the roadbed.

There are two classification of excavation

- a. Common Earth Excavation
- b. Solid Rock Excavation

□ **How to Assess Excavation (Item 102: Widening or Opening)**

- 1. Compare existing field profile/condition with that of the plan.**
- 2. Verify the class of soil that is being excavate and compare it with the class of soil loaded into the cost breakdown.**
- 3. Verify the actual quantity of work to be done vis-à-vis the programmed**
- 4. The planned width of the road is met.**
- 5. The roadbed is set with respect to the planned grades and slopes**
- 6. The newly constructed roadway is free from landslides.**
- 7. The quantity of rock and common earth excavation is calculated separately as basis of payment.**
- 8. The road shall be provided with earth canal or side ditches to avoid scouring at the roadway due to water run-off.**
- 9. Verify the actual quantity of work to be done vis-à-vis the programmed**

D. *Item 103 - Structure Excavation*

This refers to the excavation for foundation of structures like riprap, trenches for drainage, ditches, etc.

E. *Item 104: Embankment*

Embankment is the placing and compacting of approved materials within the roadway where unsuitable materials has been removed, and the placing and compacting of material in holes, pits and other depressions within the roadway area.

▯ How to Assess Embankment (Item 104)

- 1. Look for the established vertical control point. This will be used for the computation of the actual volume of embankment.**
- 2. Verify the actual source of embankment materials and compare it with the approved quarry site.**
- 3. Any approved change in the quarry site/borrow pit location should bear a corresponding adjustment on the computation of cost.**
- 4. Make sure that the materials used is granular such as sand and gravel or selected borrow.**
- 5. The embankment should be compacted.**
- 6. The embankment should be completed as planned and programmed.**

F. *Item 105 – Subgrade Preparation Description*

Subgrade Preparation is the removal of unsuitable and detrimental organic materials such as grass roots and sewage which can not be properly compacted which may eventually cause the surface to sink or make the surface uneven.

▯ How to Assess Subgrade Preparation (Item 105)

- a) Prior to commencing subgrade preparation, all culverts, cross drains (including their fully compacted backfill), ditches, drains and drainage outlets must be done first.
- b) The subgrade are prepared to the full width of the roadway.
- c) This should be properly graded, compacted and stabilized.
- d) In a cut section, the subgrade is the original soil lying below the subbase and base materials.

- e) The subgrade consist of the materials taken from nearby roadway cuts or from borrow pit.
- f) Determine the area of work to be done and compare it with the program.

II. SUB-BASE AND BASE COURSE

Item 200 - Aggregate Sub-base Course

Item 201 - Aggregate Base Course

Item 200 & Item 201 : Aggregate Sub-base Course and Aggregate Base Course

These items are the furnishing, placing and compacting an aggregate or sand and gravel

sub-base or base course over a prepared road subgrade.

▮ How to assess these items? (Items 200 & 201)

1. Verify the actual area and thickness of the compacted road base vis-à-vis the plan.
2. For the materials, the coarse aggregates should be provided with right amount of binding materials and should be mixed uniformly.
3. The sub-base and base materials should be compacted in accordance with the specifications.
4. Verify the source of materials

Characteristics of the Sub-base / Base Courses:

- a) Should be free of large rocks/stones,
- b) The full width of the roadway should be properly prepared/compacted.
- c) The maximum compacted thickness is 150mm for each layer. If the required thickness is greater than 150mm, the materials should be spread and compacted in two or more layers of approximately equal thickness.
- d) The road surface should be properly shaped to prevent water accumulation within the roadway.
- e) The sub-base and base should be properly prepared and compacted prior to placing of forms.

- f) Verify the actual area and thickness of the compacted road base vis-a-vis the plan.
- g) For the materials, the coarse aggregate should be provided with right amount of binding materials and should be mixed uniformly.
- h) Verify the actual source of materials and compare it with the approved quarry site.

III. SURFACE COURSES

Item 311 – Portland Cement Concrete Pavement (PCCP)

A pavement of Portland cement concrete with or without reinforcement constructed over a prepared road base.

▯ **How to assess Portland Cement Concrete Pavement (Item 311)?**

• A. Pre-Construction

- a. Prior to pouring of concrete, the road base should be well-prepared.
- b. Ensure that there is no excessive crowning on the base cross-sectional profile. This will create a substandard pavement in terms of thickness of the mid section.
- c. No boulders are laid over the prepared road base that will lessen the required thickness of the pavement.
- d. The forms should be rested over the prepared base and not embedded in the ground.
- e. Dowel and tie bars are present with their specified size and spacing.
- f) River mix gravel or unscreened aggregates should not be used without the approval of the engineer.
- g. The aggregates are screened. The maximum size of coarse aggregate (gravel) is 2 1/2 inches.
- h) Dirty aggregates should not be used.
- i) Verify for the provision of the specified slope/crown of the pavement surface.
- j) Provision of specified tie bars

B. During Construction

- a. The concrete mixture should be “Class A”. A bag of cement is mixed with 2 boxes of fine aggregates (sand) and 4 boxes of coarse aggregates (gravel).

- b. Concrete vibrator or concrete screeder with vibrator should be used during a spreading of concrete to prevent honeycombs
- c. For every 4.50m length of the pavement, a contraction joint or weakened plane joint should be provided.
- d. For every pouring of concrete, the end of the pavement should be provided with dowel bars spaced at 0.30m O.C.
- e. Too much water or too wet concrete mixture will weaken the structure.
- f. Construction joint should be located at 1/3 or 2/3 away from the weakened plane joint
- g. Shear key or groove is provided at the center line (pavement side) for better connection to the other lane.
- h. Brooming on the pavement surface should be uniform in depth and direction.

IV. DRAINAGE AND SLOPE PROTECTION

Item 500 : Reinforced Concrete Pipe Culvert

This item consists of the construction or reconstruction of pipe culverts and storm drains, oftentimes referred to as “conduits”.

Culverts are reinforced concrete drainage having dimensions of 0.30m to 2.0m diameter and a standard length of 1.0. They are usually installed along the original stream bed. The laying of the conduit/culvert must begin at the downstream end of the conduit line.

□ How to Assess Pipe Culvert & Storm Drains (Item 500)?

1. The size of the reinforced concrete pipe culvert should accommodate the volume of water run-off in the area.
2. The culvert should be installed with minimum covering of 300mm or deeper.
3. All joints should be applied with mortar
4. **Headwall, catch basin and concrete apron should be constructed at the culvert inlet and outlet respectively.**
5. **The culvert must be installed with 10% slope descending from inlet to outlet for smooth flowing of water.**
6. **The culvert should extend to the full width of the roadway.**
7. **Verify the actual quantity as basis of payment.**

Item 504 : Grouted Riprap

A riprap is commonly used to protect the sloping ground from sliding or scouring. This item is composed of boulders laid at the designed width and height of the structure. Mortar is poured between the boulders in order to bind them.

Item 505 : Stone Masonry

Stone Masonry is always used in minor structures like headwall for culverts and retaining walls.

Material Requirements

- **Stones** which are clean, hard, durable and of good shape.
- **Mortar** of a stone masonry is made of one part Portland cement and two parts of fine aggregates and sufficient water to make it easy to spread. Mortar that is not used within 90 minutes after mixing is discarded

▮ How to assess Grouted Riprap (Item 504) and Stone Masonry (Item 505)?

- 1. The foundation should reach the hard strata of the soil.**
- 2. The stones/boulders being used should be clean, hard and durable.**
- 3. Every layer of stones/boulders should be applied with mortar**
- 4. All voids of boulders should be poured with mortar**
- 5. The structure should be provided with PVC weep holes spaced not more than 2.0 meters on center.**
6. Check the volumetric quantity of the structure as basis for payment.
7. Verify depth of foundation which will be deep enough to reach stable formation.
8. Verify backfill materials if it is conforming to specification which is a granular soil.
9. As to the method of construction, grouting should be per layer basis or “patong-buhos” not “patong, patong, buhos.
10. Verify the kind of boulders/stone used vis-à-vis the programmed.

Item 509 : Gabion

Gabions are wire mesh baskets which are filled with durable rocks and used as protection walls and flood control systems and installed at designated locations.

Material Requirements

- A.** The length of gabions come in various lengths: in multiples of 2, 3 or 4 times its width. The horizontal width of the gabion shall not be less than one (1) meter

B. Rock Fill

Rocks used in the gabions shall consist of hard, durable rock pieces that will not deteriorate nor break when submerged in water or when exposed to severe weather conditions.

The sizes of rocks/stones range from 100mm to 200mm.

▯ **How to assess Gabions?**

1. The foundation should reach the hard strata of the soil or river bed.
2. The gabion is assembled with wire ties at all vertical edges on approximately 6 inches spacing or by wire stitching around the vertical edges.
3. The stones/boulders filled in the gabion should be bigger than the wire mesh or screen opening and it should be hard and durable.

MONITORING PROCESSES

I. PRE-MONITORING ACTIVITIES

1. Data gathering and review of project documents such as plans and specifications of the project, program of work, construction schedule, memorandum of agreement, project status or accomplishment reports and other pertinent documents.
2. Information and coordination with the implementing agency/office, the Water District or Barangay Waterworks and Sanitation Association (BAWASA) and the concerned LGU who has jurisdiction over the project site/location.
3. Preparation of monitoring tool kit and equipment like camera, measuring tape, record book, etc.

II. ACTUAL MONITORING

1. Courtesy Call to LGU, Implementing Agency, contractor
2. Conduct of Project visits or Ocular Project Inspection
Ocular inspection is done by going through the different scopes and items of work.
Checking what happened on the project related activities through the following strategies:
 - Conduct of interviews to project beneficiaries/workers, contractor and field personnel of the implementing agency

- Checking the actual work accomplishments and compare it to the work programmed and also to validate reported accomplishments
 - Verifying the actual work if it is in accordance with the project plans and specifications. If there are discrepancies, note them as monitoring findings/observations. Articulate on possible recommendations for concerned agency considerations
3. Conduct of exit conference to project beneficiaries, contractor and implementing agency
- Presentation of initial findings in the project especially if there are problems that need immediate actions
 - Recommendation and suggestion of solutions to resolve problems, if there are.

The table below will be used as a tool to monitor the development of a domestic water supply project. The items and questions are to be answered with yes or no with follow-up questions. Plans and specifications, programs of work, pictures, minutes of meetings and other documents are means of verifying the answers to the questions.

ITEMS AND QUESTIONS	YES	NO	REMARKS OR RECOMMENDATIONS	MEANS OF VERIFICATION
Pre-Implementation Phase				
a. Is the project based on the felt needs of the community?			<ul style="list-style-type: none"> • If yes, are there minutes/ resolution on the General Assembly consultation with the community? • 	<ul style="list-style-type: none"> • Minutes of General Assembly
b. Is there a resolution passed by the LGU or Community?			<ul style="list-style-type: none"> • If yes, who made it? 	<ul style="list-style-type: none"> • Copy of the resolution
c. Is the project acceptable to the majority of the people?			<ul style="list-style-type: none"> • If no, explain why? 	
d. Is the project fund a grant or a loan?			<ul style="list-style-type: none"> • If grant, indicate fund source • If loan, what is the mode of payment 	<ul style="list-style-type: none"> • Memorandum of Agreement (MOA)
e. Is there a counterpart shouldered by the community beneficiaries?			<ul style="list-style-type: none"> • If yes, how many percent of the total project cost? 	<ul style="list-style-type: none"> • Project proposal
f. Are there Rights-of-Way issues?			<ul style="list-style-type: none"> • If none, explain why? • If yes, how many land-owners are affected? • Are there out-of-town landowners? How many? 	
g. Are all Rights-of-Way issues resolved/ negotiated?			<ul style="list-style-type: none"> • If no, give details. 	<ul style="list-style-type: none"> • Right-of-Way waiver, deed of donation
Procurement Stage of the Project				
a. Is the project procured through the Government Procurement Processes (GPR 9184)			<ul style="list-style-type: none"> • If yes, secure procurement documents. 	<ul style="list-style-type: none"> • Copy of the documentation in the procurement proceedings
b. Is there a Pre-Procurement Conference conducted?				<ul style="list-style-type: none"> • Minutes of the conference

c. Is the project posted in the PHIL-GEPS, agency website, newspaper with nationwide circulation and in conspicuous place at the agency premises.				<ul style="list-style-type: none"> • Copy of the invitation to bid posted/ advertised
d. Is there a Pre-Bid Conference conducted?				<ul style="list-style-type: none"> • Minutes of the conference • Photo documentation
e. Is there any supplemental bid bulletin posted after the pre-bid conference?				<ul style="list-style-type: none"> • Copy of the supplemental bid bulletin posted
f. In the submission and receipt of bids, are there bidder(s) who submit bids?			<ul style="list-style-type: none"> • How many prospective bidder(s) who submitted bid. 	<ul style="list-style-type: none"> • Bids received
g. Are all bidder(s) qualified?			<ul style="list-style-type: none"> • How many bidder(s) are eligible • If there are ineligible bidder(s), what are the grounds/reasons for their disqualification? 	<ul style="list-style-type: none"> • Abstract of Bids
h. In the post qualification, are there bidder(s) rated as responsive?			<ul style="list-style-type: none"> • Who are the bidder(s) qualified during the post qualification stage? 	<ul style="list-style-type: none"> • Copy of the BAC recommendation to award the contract to the bidder with Lowest Calculated and Responsive Bid (LCRB)
i. Is the project awarded to the bidder with Lowest Calculated and Responsive Bid (LCRB)?			<ul style="list-style-type: none"> • Who is the winning bidder? 	<ul style="list-style-type: none"> • Copy of the Notice of Award issued by the procuring entity. • Copy of the signed contract
Implementation Phase				
a. Did the Procurement			<ul style="list-style-type: none"> • If yes, what is the date? It 	<ul style="list-style-type: none"> • Copy of the

Entity issue Notice to Proceed (NTP) to the contractor?			is also the reckoning date of project duration.	NTP
b. Was there a Pre-construction conference conducted?				<ul style="list-style-type: none"> • Minutes of the Conference.
c. Did the contractor(s) hire laborers from the community?			<ul style="list-style-type: none"> • How many are hired? • What is the mode of payment? • Is it on a daily basis? • How much is the minimum wage for unskilled workers? 	<ul style="list-style-type: none"> • List of manpower
d. In case of a Force account work or by administration; are there pakyaw groups formed?			<ul style="list-style-type: none"> • The basis of payment for this kind of work arrangement is the volume of work accomplished by each working group using the unit cost of the item of work done. 	
e. Are all project structures constructed in accordance with the plans and specifications?			<ul style="list-style-type: none"> • If no, why? Request the variation order document or revised plan to the implementing agency. 	Revised plan
f. Is there a Project-in-charge who supervised the construction works?			<ul style="list-style-type: none"> • If yes, how frequent is his presence in the area? 	
g. Is the quantity of materials delivered on site the same as indicated in the bill of materials?			<ul style="list-style-type: none"> • If no, why? Quantify the lacking materials and to verify with the contractor if there is a revision of work. 	<ul style="list-style-type: none"> • Revised POW
h. Does the quality of materials delivered on site correspond to the technical specifications as stipulated in the POW?			<ul style="list-style-type: none"> • If no, quantify the materials that do not conform to the technical specifications for verification with the contractor during coordination meeting. 	<ul style="list-style-type: none"> • Revised POW • Technical Specifications

III. **POST MONITORING ACTIVITIES**

- A. Prepare and submit monitoring report to implementing agency, a copy of which to be furnished to the contractor.

Monitoring Report Format

Project Title:

Location :

Appropriation/Project Cost:

Source of Fund:

Implementing Agency:

Contractor:

Date of Inspection:

Team Composition:

Findings/Observations:

- a. Brief description//background of the project
- b. Status of the project

Scope of Work	Programmed Quantity as per POW	Findings/Observations	Recommendations
The scope of works are the items of work to be done in the project as enumerated in the programs of work	Every item of work, a corresponding quantity is indicated in the POW. This will be the basis of project actual accomplishments.	During monitoring work, what is the actual accomplishment or status of the project in terms of quantity and quality? Is the programmed quantity already done? Are the plan and specifications of the project followed? What are your observations?	Based on your findings and observations, what do you recommend in order to address or resolve deviations, problems or issues in the project, if there are?

Prepared by: These are the names of people involved duly signed by those who monitored and prepared the report.

Tips on Writing a Good Monitoring Report

Objectives of Monitoring

- **To ascertain the existence of the project.**
- **To validate/ confirm compliance of project plans and specifications.**
- **To validate financial expenditures against actual work.**

- Check on physical accomplishment (Quantity and Quality)
 1. There should be no figures in the report if there is no actual measurement conducted.
 2. Indicator of failures or defects noticed/observed in the project should be specified.
 3. Make the report specific.
- Describe in detail the extent of defects such as major, minor, severe, etc. These should be supported with pictures and other means of documentation.
- Give enough details necessary for decision making. Report with too many unnecessary details are usually not read. Most often, they are placed in the trashcan or put in the library archives.

B. Conduct Problem Solving Session with all stakeholders if there are major problems in the Project.

- Dialogue among project stakeholders like the implementing agency, contractor, beneficiaries, LGUs, CSOs, etc to discuss issues and concerns regarding the project in order to resolve issues and find possible solution to the problems.

C. Follow-up agreements made during Problem Solving Session

- Get updates from implementing agency
- Ocular inspection of the project site

SAMPLES OF MONITORING REPORT

MONITORING REPORT

PROJECT INFORMATION:

NAME OF PROJECT:
LOCATION/LIMITS:
APPROPRIATION:

ROAD UPGRADING OF ABRA-KALINGA ROAD
BAAY-LICUAN, ABRA (Bituen section)
P143,669,000.00

LENGTH:
 CLASSIFICATION: NATIONAL ROAD
 STARTING DATE:
 IMPLEMENTING AGENCY: DPWH-CAR REGIONAL OFFICE
 PROJECT BRIEF OF DESCRIPTION:
 DATE OF VISIT: SEPTEMBER 09,2011

TEAM COMPOSITION : CCAGG MONITORING TEAM

Engr. Don B. Smith
 Elaine Mercado
 Princess Vanessa Alcantara
 Jessalyn Agudal
 Maverick Dannang

Engr. Renato P. Brasuela
 Michaella Isabelle Bagioan
 Tonet Pearl Bayle
 Sharon Disagan

FINDING/OBSERVATIONS AND RECOMMENDATIONS;

SCOPE OF WORKS	FINDINGS AND OBSERVATIONS	RECOMMENDATIONS
ITEM 105 (SUB-GRADE PREPARATION)	<ul style="list-style-type: none"> ☐ The subgrade was prepared by the use of a loader instead of a road grader. ☐ It was observed that no compaction was done after scraping the road subgrade. 	<ul style="list-style-type: none"> ☐ The implementing agency should require the contractor to follow the standard preparations of the subgrade to ensure a better quality of the project. ☐ The subgrade preparation should be done through the use of road grader.
ITEM 201 (AGGREGATE BASE COURSE)	<ul style="list-style-type: none"> ☐ It was observed that base course was spread at some portions only. Most part of the road, the existing road gravel is served as the road base course. Forms for the pavement was placed right after scraping the existing road. ☐ After placing the lumber forms, levelling course is filled up at portions where the elevation of roadbed is not on grade. The filled materials are no longer compacted. ☐ No compaction on the road base was done as no compaction equipment was present in the project site. ☐ According to the foreman, he already requested a road roller to their boss but no action yet. 	<ul style="list-style-type: none"> ☐ The standard specifications for road base preparation should be followed. Placing of base course should be done especially if this is included in the POW. The base should be compacted prior to concreting works. ☐ The levelling coarse should be compacted through the use of road roller. ☐ Field density test shall be done and make

		<p>sure that the density requirement will be attained prior to pouring of concrete.</p>
<p>ITEM 311 (PORTLAND CEMENT CONCRETE PAVEMENT)</p>	<ul style="list-style-type: none"> ☐ During concrete pouring, no concrete vibrator was used to consolidate the concrete. The concrete vibrator was stocked in the bunk house. A concrete screeder was being used. However, its vibrating machine was out of order. ☐ Honeycombs were found during the inspection. ☐ Dowel and tie bars were visible at the finished concrete pavement. ☐ The width of the half-lane that was previously accomplished is 3.05 m. but the newly poured lane during the project visit is 3.35 m. According to the foreman, a field personnel from DPWH-CAR instructed them to make the width of the pavement a total of 6.70 m. for the 2 lanes. ☐ Bamboo was used for the provision of shear key which resulted to an irregular form or shape of the groove. 	<ul style="list-style-type: none"> ☐ Concrete vibrator should be used for concrete consolidation to avoid honeycombs. ☐ Lumber should be used for the provision of shear key.
<p>Construction Supervision</p>	<ul style="list-style-type: none"> ☐ The CCAGG monitoring team witnessed that both the implementing agency and contractor have no technical people deployed in the project site to supervise the day-to-day activities. The quality of the project might be affected due to the absence of technical people. 	<ul style="list-style-type: none"> ☐ The contractor must deploy a technical person in the project site to manage and supervise the project implementation. ☐ The implementing agency should detail an engineer to closely supervise the work of the contractor.





Prepared by: The CCAGG Monitoring Team

DON B. SMITH
RENATO P. BRASUELA
ELAINE MERCADO

Noted by:

PURA C. SUMANGIL
CCAGG Chairperson

MONITORING REPORT

PROJECT INFORMATION:

NAME OF PROJECT: Rehab./Reconstruction/ Upgrading of Damage Paved National Road LOCATION/LIMITS: Abra - Ilocos Sur (Pidigan and Bangued Section)

APPROPRIATION: P23,830,000.00

SOURCE OF FUND:

CLASSIFICATION: National Road

STATION LIMITS: Km 398+ 000 - Km 405 + 000

NET LENGTH :

IMPLEMENTING AGENCY: DPWH-Abra Engineering District

DATE OF VISIT: October 17, 2011

TEAM COMPOSITION : CCAGG Monitoring Team

Don B. Smith
Renato P. Brasuela

FINDING/OBSERVATIONS:

The CCAGG monitoring team visited the on-going project along Abra - Ilocos Sur Road particularly at Pidigan and Bangued section. During the project visit, the following are the findings:

1. The reblocking at both approaches of Alinaya Bridge was already completed. The existing pavement with major cracks has been removed and replaced with new concrete pavement. However, the half-lane that was already opened to traffic has major defects. Major scaling of the pavement surface were found at some sections.
2. Pouring of concrete at the widening block and construction of curb and gutter are the on-going activities during the visit. It was

observed that the base for the widening block was not properly prepared. The base course was not compacted through the use of road roller. There was no concrete vibrator used during the concrete pouring to consolidate the concrete.

Recommendations:

1. To ensure a better road quality, a closer supervision from the implementing agency is much needed.
2. The implementing agency should require the contractor to remove and replace the pavement with major defects.
3. The contractor should prepare the road bed based on the specifications prior to the pouring of concrete.



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