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Reporting on Economy, Efficiency & Effectiveness in the use of Public Resources



AIN: 15953

**AUDIT REPORT
OF
“NORTHERN EAST-WEST HIGHWAY PROJECT”
IMPLEMENTED BY
REGIONAL OFFICE, LOBEYSA,
DEPARTMENT OF ROADS, MINISTRY OF WORKS AND HUMAN
SETTLEMENT**

MAY 2019

PERIOD: INCEPTION TO 30 JUNE 2017

‘Every individual must strive to be principled. And individuals in positions of responsibility must even strive harder’

- His Majesty the King Jigme Khesar Namgyel Wangchuck

P.O. Box: 191 | Kawangjangsa | Thimphu | Bhutan | Tel: +975-2-322111/328729/ Fax: +975-2-323491

Website: www.bhutanaudit.gov.bt | Email: info@bhutanaudit.gov.bt & tkezang@bhutanaudit.gov.bt



རྒྱལ་ཁཚམས་ལྷན་ཁུངས་འཛིན་པ།
ROYAL AUDIT AUTHORITY

Bhutan Integrity House

Reporting on Economy, Efficiency & Effectiveness in the use of Public Resources



RAA/AR/ DSA-SCID/RO-Lobeysa/2019/1384

Dated: 29th May 2019

The Hon'ble Minister,
Ministry of Works and Human Settlement
Thimphu.

Subject: Audit Report of GOI funded project "Northern East west Highway Project" (NEWH) implemented by the Regional Office, Lobeysa for the period from inception to 30.6.2017

Your Excellency,

Enclosed herewith please find the audit report on the operations, internal controls, and contract management in respect of Northern East West Highway Project implemented by the Regional Office, Lobeysa, covering periods from inception to 30.06.2017 The RAA has conducted audit as required under the Audit Act of Bhutan 2018.

Audit Findings and Recommendations

The auditor's review of the operations, accounting records, internal controls and contract managements of the East West Up-gradation Project revealed deficiencies and lapses of significant nature involving improper planning and preparation of estimates and BOQs, inappropriate tender evaluations, claims of inflated quantities through RA bills, acceptance of substandard and defective works, excess and inadmissible payments. The lapses also involved violations and non-enforcement of provisions of technical specifications and contract agreements, decisions of coordination meetings and government directives, provisions of PRR 2009 as well awards of substantial value of additional works despite slow progress of works that were detrimental to the economic, efficient and effective contract management and uses of public funds.

The audit findings along with recommendations is detailed in main report. Part A contains General observations with and without the accountability; Part B contains specific observations pertaining to contract packages with accountability and Part C with specific observations without accountability but requiring remedial actions to prevent occurrence of similar deficiencies and lapses for similar project in future. However, in the event the DOR and the Ministry do not take measures and actions on the recommendations within three months' time from the issue of the report, as agreed during the exit meeting, the RAA would fix the accountability for appropriate action.

The audit findings under **Part A** of the report contains those issues, which are recommendatory in nature and intended to bring improved compliances through appropriate interventions and as such no accountability has been fixed for the findings as decided in the Audit Exit Meeting.

Some of the findings of significant nature involving wasteful expenditures are briefly mentioned below for kind reference and appropriate action:

1. Adhoc Change of design/drawings and increase of 1m width carriageway after awards of contracts resulted in extra financial burden to the Government Exchequer with financial implication of Nu. 119.519 million. (Refer Para no.)
2. The enhancement of the rate for formation cutting works by 15% for requiring execution of works at night to accommodate traffic had tantamount to violation of provisions of

technical specification and double payment as well as resulted into wasteful payment Nu.11.666 million.

3. Award of three work packages in violation to the Nganglam Resolution of 23 December 2014 and subsequent Project Management Team decision taken on 12 January 2015 have resulted into abnormal delays and time overruns of the project.
4. Adoption of varying practices of rate analysis by contractors and wrong application of coefficient for 80mm, instead of 75mm design thickness of DBM and for 50mm thick Asphalt resulted wasteful payment of Nu. 36.985 million.
5. Flawed rate analysis through incorporation of transportation cost of bitumen as percentage to the overall derived cost of the item of work by the winning bidders and failure to take cognizance by the evaluation committee resulted into wasteful payment of Nu. 1.759 million.
6. Inconsistency in the fixation of construction durations for contract packages having same design and scope of construction works within the Regional Office indicated absence of standard procedures and processes for the fixation of contract durations resulted into abnormal time overruns.
7. Non-maintenance of 1.5m/1m width shoulder at Valley as per drawings and technical specifications and non-adjustment of cost to the extent of shoulder width not maintained resulted into payments for works not executed.
8. Flawed decision on the realization of differential amount between estimated and quoted value net of 20% resulted into non-realization of differential amounts of Nu. 94.17 million. Further, BG for differential amounts of Nu. 62.068 million were found not renewed on expiry of the validity periods benefiting the contractors and forgoing the financial safeguards of the project.
9. Flaws in the BOQ and technical Specification on the transportation of Spoil materials as the designated dumping yards were within the vicinity of 500m though the BOQs indicated that the quantified transportation of spoil materials were beyond 500m to 120m. Thus, it had resulted into payments for transportation of spoil materials within 500m lead.
10. Damages to Environment due to Dumping of muck in unidentified areas and push/freely rolling of mucks over the valley despite payment for transportation of spoil materials beyond 500m lead resulted into wasteful payments for spoil materials allowed to dump in unidentified areas and roll over of mucks over the valley.
11. Flaws in the allowable wastage of 5% on the bitumen consumption fixed for manual executions despite mechanized execution of works resulted financial loss to the Government exchequer of Nu. 9.178 million for five contract packages.
12. Non-insurance for cost of bitumen issued to contractors along with the contract amounts Nu. 977.037 million and non-recovery of cost of re-issued bitumen for redoing of damages pavement works due to execution of works not as per technical specifications Nu. 7,085,432.30.
13. Excessive engagement and payment of hired charges of machineries not complying with coefficient specified in LMC for departmentally executed formation cutting works Nu. 8.566 million resulted into wasteful payments.
14. Non-stacking/recording of excavated rock materials from rock cutting works and non-recovery of cost from the contractors with resultant financial loss Nu. 58.912 million.
15. Non-Installation of Asphalt Plant by the NEWH contractors despite cost being in-built in the related item of works for the installation of the plants resulted into payments for non-deployment of machineries and plants.
16. Inconsistencies in the incorporation of cost of Bitumen in the preparation of estimates indicated absence of standard procedures and processes as well as results in wasteful payments to the extent of excessive issue of bitumen to the contractors.
17. Inadmissible payment for redoing of damaged pavement works to M/s Chogyal Construction Pvt. Ltd Nu. 3,494,255.71
18. Non-deployment committed key Personnel and equipment at site as per the requirements and non-deduction of penalty
19. Non-installation of laboratory at site as per BOQ despite payments for installation of laboratory facilities resulted into payments for laboratory facilities not provided at site.
20. Acceptance of inflated rate analysis of DBM and Asphalt concrete through inclusion of cost of Bitumen resulted into ineligible payments as the bitumen was issued free of cost Nu. 4,998,201.79
21. Ineligible payments for slip clearance works in violation of the provisions of the technical specifications Nu. 2,718,476.24

22. Ineligible payment towards Monsoon Restoration Works in violation of the provisions of the technical specifications - Nu. 3,504,074.36
23. Inadmissible payment on the execution of GSB and WMM works beyond required width Nu. 8,763,229.14
24. Irregularities and unjustified direct award of contract package 15 on the ground of surrender of the contract works under RO Trongsa Nu. 39.40 Million despite claims and payments of Nu. 40.987 million against the contract amount Nu.39.40million for execution of just 955m works out of 2.5km road stretch. The direct award has also resulted into huge financial loss of Nu. 15,860,537.63 to the Government Exchequer as the firm quoted price for contract package 14 awarded through competitive bidding process was 40% below the departmental estimated cost.
25. Flaws in evaluation of bids and procurement of Gabion wires from non-responsive bidder with resultant extra payments Nu. 1,267,573.00
26. Application of exorbitant annual quotation rates of Sand, Aggregates and Boulders for analysis of built up rates for various road item of works with resultant preparation of inflated departmental estimates Nu. 272,797,750.38
27. Irregularities in payments for works executed through Labour Contracts by way of payments of overhead and water charges Nu. 9,530,232.56
28. Acceptance of defective and substandard works indicating poor supervisions and monitoring by the site engineers and RO.
29. Over/excess payments due to wrong measurements and improper verification of RA bills indicating absence of proper measurement system and certification of RA Bills prior to settlement of RA bills.

The RAA has reviewed the replies furnished by the RO, Lobeysa, DOR and the Ministry and incorporated in the report. Some of the audit findings were resolved in view of reply and related supporting documents and evidences furnished subsequently.

In view of significant of the audit findings, the Ministry and the DOR is requested to further review the whole process followed in the preparation of drawings, estimates, BOQS, tendering and evaluation processes, changes of drawings in deviations to standards and soon after awards of contracts, executions of substandard infrastructures works, awarding of foreseeable permanent works as additional works. The Ministry should also review the decisions on 15% extra payment on FC works for accommodating traffic, which was in violation to the provisions of the technical specification and double benefited the contractors as well as the non-enforcement of the decisions on the increase of defect liability period of 3 years.

The Ministry is requested to review the deficiencies and lapses pointed out and institute appropriate check and balance systems to curb such lapses in future. The Royal Audit Authority would appreciate receiving an Action Taken Report (ATR) **within three months** from the date of issuance of this report.

The Royal Audit Authority acknowledges the kind co-operation and assistance extended to the audit team by the officials of the RO, Lobeysa, DOR and the Ministry, which facilitated smooth completion of the audit.

Yours sincerely,



(Tshering Kezang)
Auditor General

Copy to:

1. The Secretary, Ministry of Works and Human Settlement, Thimphu for kind information and necessary action
2. The Director, Department of Roads, MoWHS, Thimphu for necessary action

3. The Director, Directorate of Finance Service, MoWHS, Thimphu for necessary action
4. The Chief Engineer, Regional office, Lobeysa
5. The AAG, PPAARD, Royal Audit Authority, Thimphu
6. The AAG, Follow-Up & Clearance Division, Royal Audit Authority, Thimphu

'Every individual must strive to be principled. And individuals in positions of responsibility must even strive harder.'

• - His Majesty The King Jigme Khesar Namgyel Wangchuck

• Post Box No. 191 Tel: +975 (02) 322111 (EPABX) Fax : +975 02323491

Website: www.butanaudit.gov.bt e-mail: info@bhutanaudit.gov.bt&tkezang@bhutanaudit.gov.bt

TITLE SHEET

1	Title	:	Audit Report of GOI funded project “Northern East West Highway Project, RO, Lobeysa
2	Head of the Agency	:	1. GM Rai, Ex Chief Engineer, EID: 8212026 Period From 1/7/2012 to 30/4/2018 2.Karma Tenzin, Chief Engineer, EID: 9009057 Period from 1/1/2018 till date
3	Drawing and Disbursing Officer	:	1. GM Rai, Ex Chief Engineer, EID:8212026 2.Karma Tenzin, Chief Engineer, EID:9009057 3. Tshering Dorji, Acctt Asstt III,EID: 9907033
4	Finance Personnel	:	1. Tshering Dorji, Acctt Asstt III,EID: 9907033 2. Lhab Tshering, Acctt. Asstt IV, EID:200907150
5	Period Audited	:	From Inception to 30 June 2017
6	Schedule of Audit	:	Planning : 01/08/2017 to 31/08/2017 Actual : 01/09/2017 to 31/12/2017
7	Composition of teams	:	Team Leader: Karma Wangchuk, Dy. Chief Auditor (EID No. 9209042) Team Member: 1.Tashi, Audit Officer (EID No. 20130101140) 2. Jamtsho, Audit Officer (EID No. 20170107993) 3. Wangchuk T, Senior Auditor (EID No.9610090) 4. Wangchuk C, Senior Auditor (EID No. 9509035) 5. Kinzang Chophel, Senior Auditor (EID No.9907042) 6. Pema Wangda, Senior Auditor (EID No. 9410041)
8.	Supervising Officer	:	Tempa Gyeltshen, Assistant Auditor General EID No.7701018
9.	Overall Supervising Officer	:	1. P. M. Pradhan, Joint Auditor General, DSA (EID No. 8304036) 2. B.B Chettri, Audit Specialist
10.	Engagement Letter No	:	RAA/DSA-SCID/MoWHS/int-01/17-18/2203 dated 08/08/2017
11	Focal Person	:	Karma Wangchuk
12	Date of Exit Conference	:	31.12.2018 & 01.01.2019



Disclaimer Note

The coverage of this report is based on the facts, figures and information made available and accessible to the audit team by the **RO, Lobeyza**. The opinion of the auditors shall confine to the period covered and information made available till the time of issue of this report.

This is also to certify that the auditors during the audit had neither yielded to pressure, nor dispensed any favour or resorted to any unethical means that would be considered as violation of the Royal Audit Authority's Oath of Good Conduct, Ethics and Secrecy of Auditors.

Glossary of Abbreviations & Acronyms

AAG	: Assistant Auditor General
AC	: Asphalt Concrete
AE	: Assistant Engineer
AFD	: Administration & Finance Division
AIN	: Audit Information Number
AR	: Audit Report
ARA	: Audit Recoveries Account
ATR	: Action Taken Report
BSB	: Bhutan Standard Bureau
BSR	: Bhutan Schedule of Rates
BOQ	: Bills of Quantity
CDB	: Construction Development Board
DBM	: Dense Bitumen Macadam
DLTC	: Department Level Tender Committee
DSA	: Department of Sectorial Audit
DOR	: Department of Roads
EID	: Employee Identification Number
FUCD	: Follow-up & Clearance Division
GCC	: General Condition of Contract
GSB	: Granular sub base
HR	: Human Resource
ITB	: Instruction to Bidder
JE	: Junior Engineer
LTD	: Limited
MoF	: Ministry of Finance
NLC	: National Land Commission
Pvt	: Private
PP&AARD	: Policy Planning & Annual Audit Report Division
PRR	: Procurement Rules and Regulations
RAA	: Royal Audit Authority
RO	: Regional Office
RRM	: Rubble Ransom Masonry
SBD	: Standard Bidding Document
SCID	: Social, Communication & Information Division
SCC	: Special Condition of Contract
TS	: Technical Specification
WMM	: Wet Mix Macadam

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AUDIT FINDINGS ON THE ACCOUNTS AND OPERATIONS OF THE REGIONAL OFFICE, LOBEYSA

PART A: GENERAL AUDIT FINDINGS

Report on the Audit of Up-gradation Project Northern East-West Highway implemented by the Ministry of Works & Human Settlement

1 Introduction

The Up-Gradation Project Northern East West Highway is the most important road construction activity undertaken during the 11th five year plan period both in terms of financial outlay and scope of works. Considering its significance and nature of risks involved in such a large project, the Royal Audit Authority conducted the Audit of the Up-Gradation Project - Northern East West Highway covering the period inception (end of 2014) to 30th June 2017.

- 1.1 The audit was primarily directed towards ascertaining whether the implementation of the project complied with Procurement Rules and Regulations, Financial Rules and Regulations and approved Design Standard envisaged in the Guidelines on Road Classification System and Delineation of Construction and Maintenance Responsibilities 2009.
- 1.2 The up-gradation project was proposed under the Project Tied Assistance (PTA) and tabled for discussion during the 3rd Plan Talk held with the Government of India in Thimphu on September 11, 2014.
- 1.3 The Government of India concurred to finance the up-gradation from Semtokha to Trashigang with the total budget of Nu 4,636.646 in the 11th Five Year Plan period although the total estimated cost is Nu. 7,284.211 million.
- 1.4 During the discussion it was agreed that Project DANTAK to carry out the up-gradation works of 52 km from Trashigang to Yadi. The survey and design for the up-gradation works to be provided by the Ministry of Works & Human Settlement.
- 1.5 The Department of Roads, Ministry of Works and Human Settlement is mandated to implement the project within 3 years of time period starting 1st January 2015.
- 1.6 The composition of the Project Management Team (PMT) were as follows:
 - Hon'ble Secretary, MoWHS (Chairman)
 - Director, DoR
 - Chief Engineer, Construction Division
 - Chief Engineer, Design Division
 - Project Coordinator, GoI Projects
- 1.7 The composition of the Technical Management Team (TMT) were as follows:
 - Kunzang Wangdi, Specialist, DoR
 - C.K. Pradhan, PE, Const. Division, DoR
 - Karma Tenzin, EE, Design Division
 - Tempa Thinley, Geotech Unit, Design Division, DoR
- 1.8 The composition of the Ministerial Level Tender Committee were as follows:
 - Phuntsho Wangdi, Secretary (Chairman)
 - Dhak Tshering, Director, Secretariat
 - Karma Galay, Director, DOR

Tenzin, Director, DES
 Karma Sonam, Director, DHS
 Karma Ugyen, Dy. Chief Accounts Officer
 Lungten Jamtsho, CE, Construction Division
 Ugyen Dorji, EE, Construction Division

1.9 The up-gradation of Northern East West Highway (NEWH) works started towards the end of 2014.

1.10 The rationale and benefit of the project are as follows:

- Shortening travel time between Thimphu and Trashigang
- Enhance the socio-economic wellbeing of the people of Bhutan
- Facilitates timely transportation of heavy electro-mechanical equipment for Hydro-Electric projects
- Serve smooth and convenient access for tourist, VVIPs and to the road users

1.11 The Projects were implemented by the Four Regional Offices of DOR and Project DANTAK as tabulated below:

Table 1.11: Project implementing Agency			
Regional Office	Scope of work distance in Km	Locations	Total Estimates in million
Thimphu and Lobeysa	65	Semtokha-Wangdue	764.217
Lobeysa	82	Wangdue-Chuserbu	1,156.061
Trongsa	100	Chuserbu-Trongsa-Nangar	2,454.575
Lingmethang	39	Yadi-Lingmithang	1,763.745
Project DANTAK	52	T/gang –Yadi	1,145.613
Total			7,284.211

1.12 As of 30 June 2017, GOI releases amounted to **Nu. 3,605.21 million** against committed fund of **Nu. 4,636.646 million** and expenditures amounted to **Nu. 4,293.12 million** exceeding the releases by **Nu.687.91 million**.

Table 1.12: GOI Releases and Expenditure				
Regional Office	Scope of work distance in Km	Locations	GOI release Nu. in million	Total Estimates in million
Thimphu and Lobeysa	65	Semtokha-Wangdue	1,197.50	1,166.31
Lobeysa	82	Wangdue-Chuserbu	693.64	1,031.74
Trongsa	100	Chuserbu-Trongsa-Nangar	643.64	882.31
Lingmethang	39	Yadi-Lingmithang	383.06	525.39
Project DANTAK	52	T/gang –Yadi	687.37	687.37
Total			<u>3,605.21</u>	<u>4,293.12</u>

1.13 The status of work progress as of 15th November 2018 were as highlighted below:

Table 1.13: Status of Work Progress

Regional Office	Scope of work distance in Km	Locations	Overall progress	
Thimphu & Lobeysa	65	Semtokha-Wangdue	-	All 7 Contract Packages Completed
Lobeysa	82	Wangdue-Chuserbu	2 Contract Packages On-going	12 Contract Packages completed
Trongsa	100	Chuserbu-Trongsa-Nangar	11 Contract Packages still On-going	Only 3 Contract Packages completed
Lingmethang	39	Yadi-Lingmithang	All 7 Contract Packages On-going	1 Packages yet to be retendered out
Total				

The status of work progress as of 20th April 2019 were as highlighted below:

Regional Office	Length Km	No. of Contract Packages	Locations	Overall progress	Status as of 20 th April 2019
Thimphu & Lobeysa	65	7	Semtokha-Wangdue	Nil	All 7 Contract Packages Completed
Lobeysa	82	14	Wangdue-Chuserbu	2 Contract Packages On-going	12 Contract Packages completed
Trongsa	100	14	Chuserbu-Trongsa-Nangar	4 Contract Packages still On-going including 1Contract Package terminated	Only 10 Contract Packages completed
Lingmethang	39	7	Yadi-Lingmithang	2 Contract Packages terminated and On-going 1Pacakge executed Departmentally	5 Packages completed

1.14 Time overruns as from the initial contract periods, revised completion time and time lapsed from the revised time periods for completed contract packages:

Name of Contractors	Time to complete the road						Remarks
	Packages	Planned months	Actual months	Time overruns in months	% Time overruns	No. of revisions	
RO, Thimphu							
M/s. Raven Builders & Company (P) LTD	Simtokha-Dochula Package 1	15	33	18	120	2	
M/s Yangkhil Construction Pvt Ltd	Simtokha-Dochula& Olakha Package 2	15	22	7	47	2	
RO, Lobeysa							

M/s Chogyal Construction Pvt. Ltd.	Dochula-Lampari Package 1	15	14.9	(0.1)	-	-	
M/s Chogyal Construction Pvt. Ltd.	Lampari-Menchuna Package 2	15	16.9	1.9	13	-	
M/s Chogyal Construction Pvt. Ltd.	Menchuna-Chasagang Package 3	15	16.8	1.8	12	-	
M/s Singye Construction Pvt. Ltd	Chasagang-Langkena Package 4	15	29.2	14.2	71	-	
M/s Etho Metho Construction Pvt. Ltd.	Langkena-Tekizam Package 5	20	34.5	14.5	72.5	2	
M/s Tshering Tobgyel Construction Pvt. Ltd. Wangdue	Tekizampa-Khelekha Package 6	25	32.5	17.5	70	2	
M/s Loden Construction Pvt. Ltd, Thimphu	Khelekha-Rachau Package 7	20	32.4	12.4	62	2	
M/s Welfare Construction, Pvt. Ltd, Thimphu	Bumilo-Rukubji Package 9	25	30.4	5.4	22	2	
M/s Rigsar Const. Pvt .Ltd	Rukubji-Chuserbu Package 10	24	39.7	15.7	65	2	
M/s Hi Tech Company Pvt. Ltd, Punakha	Pelela-Dungdungnyelsa Package 11	25	34.8	9.8	39	2	
M/s Tagsingchungd ruk Construction Pvt. Ltd, Thimphu	Wangdue-Langkena Package 12	11	14.9	3.9	36	1	
M/s Empire Construction Pvt. Ltd, Punakha	Nobding-Dungdungnyelsa	10	23.2	13.2	132	1	
M/s Empire Construction Pvt. Ltd, Punakha	Nobding-Dungdungnyelsa	12	19.4	7.4	62	1	
RO, Trongsa							
M/s Rigsar Const. Pvt .Ltd	Chuserbu-Nyelazam Package 1	30	37	7	23	2	

M/s Gaseb Const. Pvt .Ltd	Nyelazam-Sakachawa Package 2	30	35	5	17	2	
M/s Rinson Const. Pvt .Ltd	Sakachawa-Tsangkha Package 3	30	42	12	40	2	
M/s Druk Lamsel Const. Pvt. Ltd	Trongsa-Punzhi Package 7						
M/s Dungkar Const. Pvt .Ltd	Punzhi-Tashipokto Package 8	28	40	12	43	2	
M/s Welfare Const. Pvt .Ltd	Tashipokto–Dorji Gonpa Package 8	28	40	12	43	2	
M/s Dungkar Const. Pvt .Ltd	Bongzam-Gyatsazam package 12	28	40	12	43	1	
M/s Rinson Const. Pvt .Ltd	Gyatsazam-Nangar Package 13	28	40	12	43	1	
M/s Lamneka Const. Pvt. Ltd	Sonam Kuenphen-Hurjee bypass	15	17	2	13	1	Scope reduced
RO, Lingmithang							
M/s. Bhutan Zeocrete Pavement Technologies (JV)	Between Yadi & Ngatsang Package 1	18	28.5	10.5	58	3	
M/s. KD Builders Pvt. Ltd, Gelephu	Pangser & Kilikhar Package 3	24	37	13	54	2	
M/s. Gongphel Construction Pvt. Ltd, Samdrup Jongkhar	Kilikhar & Mongar Package 4	30	38	18	60	2	
M/S Norbu Construction Company Pvt Ltd, Gelephu	Mongar and Gangola Package 5	30				1	Contract terminated
M/s Rigsar Const. Pvt .Ltd	Gangola & Kurizam Package 6	28	30	2	7	2	
M/s. Tshering Construction Pvt Ltd, Bumthang	Kurizampa & Lingmethang Package 7	15	28	13	87	1	

Time overruns from the initial contract periods for completed contract packages as of **15th November 2018** are as highlighted below:

Table 1.10: Time overruns					
Name of Contractor	Time to complete the road Packages				
	Planned months	Actual months	Time overruns in months	Remarks	

RO, Thimphu	2 Contract packages	15	22 & 33	7 & 18	
RO, Lobeysa	5 Contract Packages	11 to 25	14.9 to 30.4	1.8 to 5.4	
	8 Contract Packages	10 to 25	19.4 to 39.7	7.4 to 17.5	
RO, Trongsa	1 Contract Package	15	17	2	
	8 Contract Packages	28 to 30	35 to 42	5 to 12	
RO, Lingmithang	1 Contract Package	30			Contract terminated
	4 Contract Packages	15 to 30	28 to 38	13 to 18	

All contract packages have exceeded the original set time and the extension is quite significant for most packages. This was also the case for those contract packages that were completed after a decision to reduce the scope of the works. All of contract periods were revised under the construction phase.

1.15 Northern East-West Highway GOI funded Project Financial statement/Requirements as of 15th November 2018, prepared by ROs, DOR, MoWHS:

Table 1.15: Financial Status							
Sl.No.	Stretches NEWH	FIC	Initial Committed Fund 6th PT	Total Revised Committed Amount (M)	Total Revised Contract Amount (M)	Expenditure as of 15/11/2018 (M)	Pre-Financing requests beyond committed fund to the extent of contract Amount (M)
1	Semtokha - Wangdue	3036	1,197.602	1,233.358	1,035.047	1,225.739	
2	Wangdue-Chuserbu	3037	1,293.291	1,510.567	1,844.012	1,519.115	
3	Chuserbu-Trongsa	3038	744.440	744.440	1,022.282	599.322	
4	Trongsa-Nangar	3039	835.668	835.668	1,277.348	763.921	
5	Lingmithang - Yadi	3040	1,018.600	1,018.600	1,351.663	751.221	
		Total	5,089.601	5,342.633	6,530.352	4,859.318	1, 187.72

1.16 Tendering processes and contract awards, change orders in terms of designs/drawings, acceptance of new technology, time extensions, and awards of additional works were carried out by the Ministerial Level Tender Committee (MLTC) under the Chairmanship of the Secretary, Ministry of Works & Human Settlement (MoWHS). However, the contract managements and overseeing of project works were carried out by the four Regional Offices of Thimphu, Lobeysa, Trongsa and Lingmethang.

1.17 It was apparent from letter No. MoWHS/Sec-29/2015-2016/524 dated 16th October 2015 that the Secretary, MoWHS had conveyed the decisions on the meeting held on **16th June 2015** with the contractors and directed the Regional Offices for issuance of amendments to the contract agreements on the decisions subsequently taken on the following areas:

✓ **15% extra on FC Works**

Since the contractors executing the widening works are required to work at night (7pm to 8AM) to allow undisturbed flow of traffic during the day, it has been decided to enhance the rate of FC work by 15%.

✓ **Increase in pavement width from 6.50mtr to 7.50mtr**

It has also been decided to increase the width of pavement by 1meter from 6.5 meters to 7.5 meters.

✓ **Enhancement of Defect Liability Period from 1year to 3 years**

During the meeting held between the Hon'ble Prime Minister & the contractors working on NEWH on 24th August 2015, the contractors have agreed to the proposal of increasing the defect liability period for the works from one to three years.

1.18 Ineligible advances of Nu.250.110 million were sanctioned to 13 contractors by the ROs on the strength of approval of the Ministry and the MLTC exclusive of all other normal entitled advances like Mobilization advance, Secured advance etc. as detailed in table 1.18 below:

Table 1.18: Payment of Ineligible Advances				
Sl.No.	Name of contractor	Contract Package	Date of Payment	Amount (Nu.)
RO, Trongsa				
1	M/s welfare Construction Pvt. Ltd.	Package IX	12.4.2017	20,000,000.00
2	M/s Dungkar Construction Pvt. Ltd.	Package VIII, XI & XII	9.12.2017	20,000,000.00
3	M/s Gyalcon Construction Pvt. Ltd.	Package IV	28.6.2017 & 26.10.2017	15,000,000.00
4	M/s Druk Lhayul Construction Pvt. Ltd.	Package V	19.5.2017 & 14.6.2017	20,000,000.00
5	M/s Rinson Construction Company Pvt. Ltd.	Package III,X & XII		30,000,000.00
6	M/s Raven Construction Company (P) Ltd.	Package VI		9,410,000.00
		Total		114,410,000.00
RO, Lobeysa				
7	M/s Chogyal Construction Pvt. Ltd	(Packages I, II and III)	2015/2016	46,000,000.00
8	M/s Singye Construction Pvt. Ltd (CDB No. 2148)	Package IV	12/2015	39,700,000.00
9	M/s welfare Construction Pvt. Ltd.	Package IX	12.11.2017	10,000,000.00
10	M/s Rigsar Construction Pvt. Ltd	Package X	6.6.2017 & 22.12.2017	4,500,000.00
11	M/s TT construction Pvt. Ltd	Package VI	7.2.2017 & 20.12.2017	19,000,000.00
		Total		119,200,000.00
RO, Lingmethang				
12	M/s Gongphel Construction Pvt. Ltd.	Package IV	9.4.2017 & 22.12.2017	10,000,000.00
13	M/s Rigsar Construction Pvt. Ltd	Package VI	8.2.2017 & 9.5.2017	6,500,000.00
		Total		16,500,000.00
RO, Thimphu				
14	M/s Raven Construction Company (P) Ltd.	Package I		4,000,000.00

		Total		4,000,000.00
		Grand Total		254,110,000.00

- 1.19 In terms of the Technical specifications under Clause 502 -“Dismantling Culverts, other Structures and Pavements” categorically stipulates as “All salvaged or un-salvaged materials shall be the property of the employer”. It also stipulates that prior to commencement of dismantling, the work of dismantling structures shall be measured in unit given under the clause of section (6). While all the contract packages included permanent works viz. culvert extensions, catchpits, gabion walls, RRM & CRM walls, etc. involving huge cost to the project, the ROs and the DOR had neither taken stock of all existing permanent structures nor accounted for all the salvaged materials. Thus, in the absence of stock accounts for the existing permanent structures, the RAA was not in a position to verify and ensure proper accountal and disposal thereon. Thus, non-accountal of salvaged materials from the existing permanent structures had resulted in substantial financial loss to the Government. The Ministry and the Government should look into the issue for appropriate decisions and actions.
- 1.20 In terms of the Technical specifications under Clause 107, “Survey and Setting Out” amongst others categorically stipulated as “ During the period of commencement of works the contractor shall resurvey the Base lines, Traverse Points, Bench Marks and confirm the co-ordinates and levels of the stations. All stations and reference points shall be clearly marked and protected to the satisfaction of the Engineer. Where survey station point is likely to be disturbed during construction operations, the contractor shall establish suitable reference stations at locations where they will not be disturbed during construction. The existing profile and cross-sections shall be taken jointly by the Engineer and the contractor. These shall form the basis for the measurements and payments”. However, the ROs have not conducted the final survey on completion of formation cutting as to ascertain actual quantum of earthwork excavations and the extent of formation cutting works carried out by the contractors.

The RAA in its attempt to carry out the final survey of the formation cutting works, engaged survey officials from the National Land Commission(NLC) for a month but failed to conduct the survey in the absence of the initial survey stations and reference points as the same were found disturbed and not protected during the construction operations. Thus, the extent of formation cutting and the actual quantum of earthwork excavations could not be verified and cross checked with the estimated quantum reflected in the estimates and BOQs.

- 1.21 The status of budgetary releases and expenditures incurred as of 30.06.2017 are a summarized in the table below:

Stretches NEWH	FIC	Initial Committed Fund 6th PT	Total Revised Committed Amount (M)	Total Revised Contract Amount (M)	Expenditu re as of 5/9/2018 (M)	Advance s O/S (M)	Exp + Adv	Name of Ros
Semtokha – Wangdue	3036	1,197.602	1,233.358	1,035.047	1,225.739	-	1,225.739	Thimphu & Lobeysa
Wangdue- Chuserbu	3037	1,293.291	1,510.567	1,844.012	1,514.813	2.112	1,516.925	Lobeysa
Chuserbu- Trongsa	3038	744.440	744.440	1,022.282	578.612	110.989	689.601	Trongsa

Trongsa-Nangar	3039	835.668	835.668	1,277.348	727.057	88.198	815.255	Trongsa
Lingmithang – Yadi	3040	1,018.600	1,018.600	1,351.663	736.337	327.843	1,064.180	Lingmethang
	Total	5,089.601	5,342.633	6,530.352	4,782.558	529.142	5,311.700	

2. DEFICIENCIES AND LAPSES

Review of the related records and documents including designs and drawings, estimates and BOQs, tendering processes, contract documents, supervision and monitoring controls, contract management, and physical visits and verification of works done at sites with reference to technical specifications indicated inadequacies, irregularities and deficiencies resulting from inadequacies in planning, weak supervisory and monitoring controls and lack of proper contract management system. Major issues observed in planning, tendering processes, implementation of contracts and taking over of works from contractors are as discussed below:

2.1 Increase of 1meter width carriageway due to change in design and drawing with resultant cost implication of Nu. 317.637 million

The initial approved design and drawing attached with the bidding documents were prepared as per the approved **Technical Standard and Road Classification and Standard 2009**.

The design provided standard carriageway width of 6.5m, 1m L-drain at hill and hard shoulder of 1.50 m between L-Drain and carriage way and 1.50m at valley side with granular sub soil drain to be provided in marshy areas.

The shoulders provided at both side of the carriage pavement width of 1.50m each was generally to provide for the Safety and efficient traffic operations, emergency storage of disabled vehicles, space for law enforcement activities, an area for drivers to maneuver to avoid crashes, space for maintenance activities and for bicycle accommodation.

The typical cross section of approved drawing which was instrumentally used in conceiving the estimates and BOQs to derive estimated cost of the project as well as obtaining competitive bids and awards of contracts is as depicted in the photograph below:

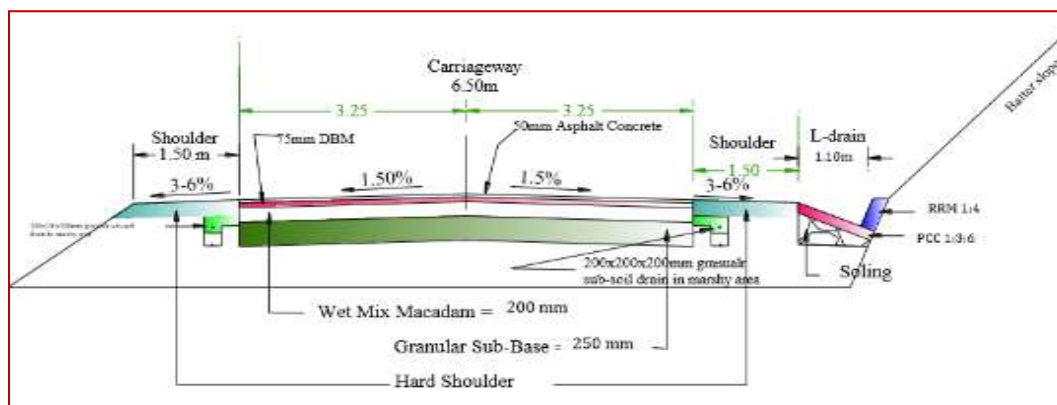


Fig: 2.1 –Initial approved design and drawings

However, vide letter No. MoWHS/Sec-29/2015-2016/524 dated 16th October 2015, the Secretary, MoWHS had conveyed the meeting held on **16th June 2015** with the contractors and directed the Regional Offices for issuance of amendment to the contract agreements based on the decisions subsequently taken to increase the carriageway width from 6.5m to 7.5 m. Reasons for increase of carriageway width was found not documented.

In addition, vide letter No. DoR/ROL/16/15-16/481 dated 21/10/15, all Regional Offices were informed to increase the pavement width from 6.5 meters to 7.5 meters. In line with change order,

the revised drawing developed and circulated by Design Division, DoR Thimphu was as depicted in the photograph below:

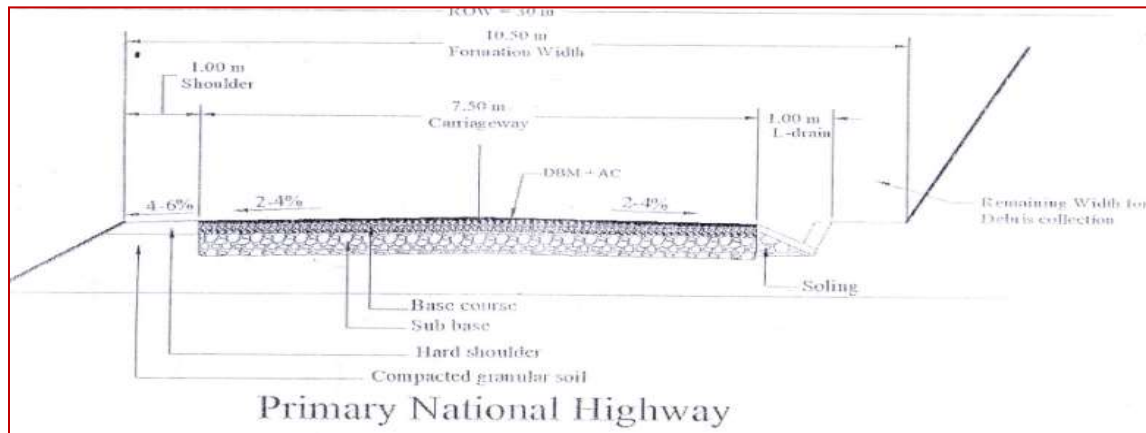


Fig: 2.1(1)-Revised design and drawing

Thus, the increase of pavement width of 1m from the initial carriageway width of 6.5m to 7.5m after a time lapse of almost eight months from the dates of awards of contract works was irrational and inappropriate as it had not only distorted the drawings, estimates, BOQs, Projected Cost and funding modality but also adversely impacted the overall project cost by **Nu. 317,636,875.54** as summarized in table 2.1 below:

Sl. No.	Regional Office	No. of Packages	Amount (Nu. in Million)	Remarks
1	RO, Lobeysa	15 contract packages	119,519,393.84	
2	RO, Thimphu	2 Packages	11,504,832.70	
3	RO Trongsa	13 Contract Packages	112,753,111.00	
4	RO Lingmethang	7 contract packages	50,638,059.00	
5	RO Lingmethang	1 package	23,221,479.00	ZeoCrete pavement works contract
	Total		317,636,875.54	

In addition, the change in design also impeded the following benefits to government and the commuters:

- The provision of 1m width between hillside and L-drain technically benefited the contractors as 1m width were not insisted upon to be maintained as the contractors were allowed to construct L-Drains attaching the hillside.
- Doing away of 1.5m shoulder width between L-Drain and carriageway and reduction of 1.50m to 1m at valley sides had resulted in compromising necessary safety measures and safety of commuters.
- The Physical verifications indicated that overall formation width were not achieved in certain stretches of roads and no cost adjustments were carried out for non-achievement of formation width and non-maintenance of 1m width at hillsides. As a result, contractors benefited financially since the payments were made on the basis of running meters and not based on the quantum of works executed.

The Regional Offices in consultation with the Ministry should comment on the changes of drawings and technical specifications after the awards of contract works that had resulted in additional avoidable financial implication to the extent of **Nu. 317,636,875.54**.

Auditee's Response:

Increasing of Pavement width from 6.5m to 7.5m came from the need to upgrade our very important Primary National Highway of the country spanning East to West by gradually improving its basic specifications to meet with the growing demands by ever increasing road users and to ensure traffic reliability, passenger comfort and their safety when the opportunity existed for such an intervention under GOI funding.

From over several decades of experiences in the construction and maintenance of roads in Bhutan and learning from experiences of many developed countries, it has been established that ingress of water is the top most factor for premature damages to road pavements (especially the flexible pavement system). Factors such as environmental conditions, traffic intensity and increased loadings, and the design inadequacies are some other contributing factor for premature pavement damages. Based on this premise, since pavement works were not commenced in all of the contracts awarded for all stretches from Simtokha to Korilla, the intervention was deemed timely. DoR also appraised this ministry that under GOI funding on NEWH project, it expected huge savings then.

Therefore, instead of providing 1.5m wide earthen shoulder on the hillside of the pavement the ministry proposed increasing the pavement width from 6.5m to 7.5m taking up 1.0m of the 1.5m shoulder and fixing the 1.0m wide L-shaped/U-shaped side drains next to the pavement structure only. This intervention brought following improvements and benefits to the overall flexible pavement system.

- 1. Earthen shoulders are a porous medium that will allow gradual seepage of surface run off water and the normal rainwater. The water percolates into underlying pavement payers of DBM, WMM and GSB that are fairly porous in nature. When ground temperatures reach 40 degrees centigrade, the bitumen strips off the aggregates causing segregation of bituminous concrete. During winter in high altitude areas, the water in the pavement layers undergo freezing / icing breaking open the bituminous concrete and when weather warms up in Spring and after, the thawing of frozen ice takes place melting it into water leaving cracks in the bituminous concrete. This phenomenon of icing and thawing leads to crushing of cracked road surfaces under wheels of trucks and vehicles, forming cracks of all kinds and potholes. Addition of this 1.0m extra blacktop instead of earthen shoulder definitely prevents this undesirable phenomenon - saving huge recurrent expenditures.*
- 2. The side drain running parallel to the centerline of the pavement next to the pavement structure not only ensures that road surface is impervious to ingress of water enhancing the life of the pavement, the aesthetics of the pavement alignment improves to a great extent.*
- 3. The 1.0m extra pavement width will allow much desired unrestricted speed of the traffic flow in both directions preventing the pulling force that will otherwise develop between vehicles crossing past in opposite directions close to each other. In fact, to enhance safety, if space permits there should be a solid divider between lanes in opposite directions to avoid pulling (vacuum) force and the glares from headlights.*
- 4. The extra wide road will compensate for the absence of super-elevation at curves as the introduction of which is not possible in our highways due to lack of space to lay the transition curves that precedes the Super-elevation. Super-elevation counter acts the centrifugal force of speeding vehicles.*

5. *This initiative allows leaving a 1.0m space between the hillside slope toe and the side's L-drain, which not only will hold back the first slides getting into the drain directly from slope erosion under rains, but also improves the sight distance for the drivers at the curves and sharp corners. It also ensured a relatively dust and mud free highway pavement as only valley side shoulder exists.*
6. *The introduction of 1.0m extra avoided payment for 1.5m wide shoulder, although an additional expenditure was required to be made for 1.0m wide DBM and AC layers. A certain percentage on the cost for BT would have been compensated.*

The 1.0m extra wide black top pavement did not affect any fundamental geometrics or integrity of the national highway. In fact it definitely has enhanced the longevity of the pavement life, improved the safety and riding comfort of road users, the long desired national highway specification upgraded with aesthetics significantly improved and all of these are vital for the growth and sustenance of our economy.

With these positive outcomes in the perspective, the proposal thus submitted was endorsed by the MLTC members and recommendations duly approved jointly by the Ministers for Finance and Works & Human Settlement ministries vide MoWHS/SEC/29/2015/476 dated 5/8/2015 (Copy enclosed).

The RAA is therefore requested to consider the submission favorably given the benefits and many positive outcomes from the initiative by not pursuing the matter further please.

RAA's Further Comments & Recommendations:

*The RAA had noted that the initial design and drawings incorporated in the tender and contract documents were as per the Road Designs outlined in the **Guidelines on Road Classification System and Delineation of Construction and Maintenance Responsibilities 2009 approved by the Cabinet.***

In addition, in line with the responses, it was evident that the Ministry despite having several decades of experiences in the construction and maintenance of roads in Bhutan and learning from experiences of many developed countries and having established that ingress of water is the top most factor for premature damages to road pavements (especially the flexible pavement system) had failed to consider such factors in the initial design and drawings. It also indicated that the Ministry had failed to exercise due diligence while preparing the project plans, designs, and specifications to ensure that all information are accurate and complete and prevent changes including time and cost overruns.

It is thus evident that the change of designs and drawing and technical specification on the increase of Impavement width after award of contracts and during execution phase of contracts was an adhoc decision and was also not aligned to the approved design and technical specification of the Guidelines. The change of designs by doing away the 1.5m shoulder width between L-Drain and carriageway and reduction of 1.50 m to 1m at valley sides had resulted in compromising necessary safety measures and safety of commuters.

*In addition, the extra financial burden to the government due to change is design and technical specification particularly due to increase of 1m carriage way alone after the contract awards amounted to Nu. 317.637 million (**Ministerial Level Committee were responsible for the changes**)*

The Ministry should not only strengthen the Design Divisions for accurate designing of road structures but also institute a technical team to review project plans, designs, and

specifications to ensure that the same are accurate and complete including verification of the accuracy of surveys for future projects as to prevent changes in designs as well as time and cost overruns.

The huge financial loss to the extent of Nu. 317.637 million to the government Exchequer is brought to the notice of the Government for appropriate decisions and actions.

2.2 Decisions in violation to the technical specification and huge cost implication due to enhancement of 15% over the quoted rate for FC work as well as ambiguity in the maintenance of records to support the claims of night working allowances of Nu. 44.275 million

The rate for FC works was enhanced by 15% on the grounds that the contractors executing the widening works are required to work at night (7pm to 8AM) to allow undisturbed flow of traffic during the day as conveyed by the Secretary, MoWHS under letter No. MoWHS/Sec-29/2015-2016/524 dated 16/10/15 on the basis of the decision taken during the meeting held on **16th June 2015** with the contractors.

Accordingly, project cost on account of 15% enhanced rate for contractors executing the widening works increased by **Nu. 44,274,922.00** as shown in table 2.2 below:

Sl. No.	Regional Office	No. of Packages	Amount (Nu. in Million)
1	RO, Lobeysa	6 contract packages	11,666,449.74
2	RO Trongsa	13 Contract Packages	24,061,503.00
3	RO Lingmethang	5 contract packages	8,546,469.45
	Total		44,274,922.00

However, the Technical Specifications categorically stipulated on Traffic Safety & Control under Section 100-General Requirement, Clause 105, Sub Clause (2) General Requirements that, *“The Contractor shall at all times carry out works on the road in a manner creating least interferences to the flow of traffic. For all works involving improvement of the existing road, the Contractor shall provide and maintain a passage for traffic either along a part of the existing carriageway under improvement, or along a temporary diversion constructed close to the road. The Contractor shall take prior approval of the Engineer regarding traffic arrangements during construction Traffic Safety & Control. The Contractor may be allowed to stop traffic temporarily. The period of such closure shall be as agreed by the engineer. For this the Contractor shall submit the time and period of the closure to the Engineer at least 14 days in advance, to enable the Engineer to issue the relevant notices”*

In addition, clause 105(5) Traffic Safety & Control, and under sub para on **Measurement and Payment**, stipulated as *“No separate measurement and payment shall be made for the works described in this clause. All the costs in connection with the work specified herein shall be considered included in the related item of work specified in the bill of quantities”*

Thus, in terms of the technical specifications, bidders were to in-built the cost on the “Traffic Safety & Control” as well as hindrances expected to hamper the execution of FC works in rates in the related item of work specified in the bill of quantities.

The enhancement of the rate for formation cutting works by 15% and payment of Nu. 44,274,922.00 as of date of audit for requiring works to be done at night tantamount to double

payments to the contractors as the quoted rates of the contractors were inclusive of cost for ensuring least interference to the flow of traffic during execution of works.

Further, the audit team noted that there were no properly defined working procedures for execution of works at night. In addition, maintenance of subsidiary records to substantiate the works done at night for eligibility of claiming of 15% night working allowances and any other related records if maintained were not available on records. In the absence of such records, the correctness of the claims were not susceptible for audit scrutiny.

Considering the huge magnitude and cost of formation cutting works, decision of paying extra 15% having enormous amount of additional financial implication certainly warranted a detailed analysis of incremental cost arising from night work. However, there were no evidence produced indicating analysis carried out to ascertain the cost elements and extent of additional cost entailed in executing the formation cutting works at night that necessitated the compensation payment beyond what was already covered as stipulated under the Technical Specifications.

The Regional Offices in consultation with Ministry should revisit the decisions in terms of the provisions of the contract documents and technical specifications and should recover the built up cost for “traffic safety and control cost” in the quoted rates of contractors. Besides, the Ministry should also direct the site engineer and the contractor to provide documentary evidences of work done at night.

Auditee’s Response:

The DoR Regional Offices would like to thank the RAA for carrying out the detailed auditing of all the NEWH project packages and for the observations.

With great concern to the public travelling on our NEWH projects having to wait at the time of FC work during daytime, the meeting of 16th June 2015 chaired by Hon’ble Secretary in presence of all contractors decided to carry out FC work during the night to avoid disturbances to the traffic flow. The contractors had submitted their incentive requirement to the Ministry and it was decided at 15% of FC cost vide order no. DoR/CD GoI PMU/NEWH 19/1522 dated 31st July 2015. The RO then issued the letter no. RO/DoR/Trongsa/E-01/2015-2016/85 dated 3rd Aug 2015 in line to the above order to contractors to carry out FC work during night time (i.e. 7 PM – 8 AM). However, RO accepts on the ground stated that there was no record keeping for FC done at night but we made sure that FC works were carried out during night ONLY mostly in presence of our site engineers without any incentives working both day and night after the order had been circulated.

The improvement works on the Northern East West highway beyond Wangdue was about to be started with 36 contract packages of which 21 have even the widening of existing road widths to 10.5m. Each of these contract packages spanning anywhere from 6 to 10 km in length were located immediately next to each other with men and machines. Crossing past one package and then through the rest was the biggest challenge DoR and the contractors together foresaw since commuters cannot be blocked at series of locations separated by a maximum of five to ten kilometers. We say five to ten kms because most widening operations took place mostly with two sets of machines in each contract package.

The objective of the 16th June 2015 meeting was therefore to bring about a slight change to the execution methodology of the Formation Cutting (FC) item and also to improve the pavement specification of the Primary National Highway. The very interactive discussion finally came to an agreement that contracts having FC works would thenceforth work at night from 7PM until 8AM next morning. To this change, contractors submitted a joint application demanding 20% raise in the FC work item for night works, overtime payment to cover risks, and to provide lighting systems.

After intense arguments that followed in pursuit for negotiations where the Ministry and DoR actually desired to pay for lights only, contractors finally stayed put with 15% only as against 20%. This 15% on FC item accounts for only 3.29% raise in the overall contractual allocation.

International experiences and researches indicate that, “the general opinion is that costs are significantly higher at night than daytime. Night shifts are theoretically more expensive due to overtime and night-premium pay, lighting expense, use of additional traffic control devices, and higher bids. Hinze and Carlisle (6) said that overall contracts costs increase by 10%. In 1990 they (Hinze and Carlisle) found that contract cost was 9% higher at night. Hacher and Taylor (2001) and Al-Kaisy and Nassar (2002) conclude that cooler temperature at night and longer undisturbed working hours can actually increase nighttime work quality.”

While the contract stipulates a requirement that contractor shall ensure traffic flow with least interferences requiring the contractor to allow unhindered flow of traffic, the contractor (if lone) as a single entity would easily fulfill this requirement with specific timings for blockings and openings. The next contractor/s at every 6 to 10km distance will have to set yet another timings and so forth by all the 21 widening contractors. It may be perhaps possible with just one direction traffic, but with both directions traffic and added by those with emergency commuters, the permutation and combination coordination set ups would have brought in much commotion and frustration to both contractors and the general road users and the most undesirable complaints and reports to the headquarters in Thimphu on a daily basis. Even with just the two blocks on over 40km stretch between Dochula and Wangdue had caused every road user to sacrifice one to two hours of his/her one-way travel time. The contractors would have also found valid reasons for delaying their work resulting in justifiable cost escalations and time extensions.

The night work therefore definitely resulted in many positive outcomes such as inculcating the culture of night work for the construction industry, eased travelers with uninterrupted flow of daytime safe travel, enabled continuation of the conduct of socio-economic activities by one and all, and allowed the administrative functions to continue by local governments served by East West highway corridor in particular without let or hindrances. This initiative also served the contractors with unrestricted amount of time and working spaces for the contractors themselves, which greatly enhanced their work progress. The many indirect benefits thus accrued by this initiative would have far outweighed the cost for 15% extra paid for night FC works.

The contract further stipulates, “For all works involving improvement of the existing road, the contractor shall provide and maintain a passage for traffic either along part of the existing carriageway under improvement, or along a temporary diversion constructed close to the road”. Provisionally, and in general the clause makes sense, but in the current situation, unlike for projects plain areas, the requirement cannot be met, as each widening contract location had neither the extra carriageway nor any convenient space for making a temporary diversion, because the widening works were contracted where none of these two conditions existed.

The stipulation continues, “the contractor shall take prior approval of engineer at least 14 days in advance, to enable engineer to issue the relevant notices”. Since the fixation of timings for blocks and openings for a series of block points spread over a long distance in a single stretch was not possible, which are perhaps possible for block points that are fairly isolated or lonely, for reasons stated in the foregoing paragraphs, taking engineer’s permission or issuing of relevant notices by engineer obviously did not arise. Supposedly, despite issuance of such notices as per contract requirement, should any of the contract package default in sticking to set timings, the occurrence of which are inevitable given the nature of works in a hostile terrain as ours and the unpredictability nature of equipment’s performance etc. – the whole chain of timings for both direction traffic would get completely distorted. In most times, due to varying speeds of vehicles, a car will cross one block only to meet with series of subsequent blocks in such a long stretch of multiple block points.

RAA would consider favorably based on the merits of the initiative and not pursue the matter further. This initiative was implemented only with the kind approval of the Honorable Ministers for Works & Human Settlement and the Ministry of Finance on the Note vide No. MoWHS/SEC/29/2015/476 dated 5.8.2015 (Copy enclosed for reference please). In view of above justifications, RAA is kindly requested to drop the memo.

RAA's Further Comments & Recommendations:

The RAA while noting the rationale of the compensation payments for executing formation works at night, reiterates that the technical specification categorically incorporated the Traffic Safety & Control under Section 100-General Requirement, Clause 105, Sub Clause (2) General Requirements and regulation of payments under Clause 105(5) Traffic Safety & Controls. It was very clear that the contractors were to in-built the cost on the "Traffic Safety & Control" as well as hindrances expected to hamper the execution of FC works in rates in the related item of work specified in the bill of quantities.

Further, decisions for the payment of 15% did not outline the procedures and modality of working at night and regulating payments. No documentary evidences were maintained either by the site engineers of ROs or by the contractors to support widening works executed at night. It is also reiterated that the Director, DOR vide letter No. DOR/CD/GOI-PMU/NEWH19/1522 dated 3.8.2015, had informed ROs that the widening works were being executed as usual with traffic disruption during the day and instructed to notify the contractors to abide by the decisions. Indicating that execution of FC was done during day time in some locations.

It is noted that the flat increase of 15% for FC works at night hours was not supported by detailed analysis of additional cost involved in working during night hours which were not specifically covered by the existing contract rates. Thus, the Ministry failed to pursue a prudent and sound financial management practice in utilizing the public resources. Further, Ministry should note that payment were made not in line with the signed contract agreement.

Considering the above fact and events, the Ministry should revisit the decisions in terms of the provisions of the contract documents and technical specifications and should recover the built up cost for "traffic safety and control cost" in the quoted rates of contractors. It is also to reiterate that payments amounting to Nu. 44,274,922.00 without regulating to technical terms would tantamount to double payments to the contractor and ineligible expenditures by the government.

The huge financial loss to the extent of Nu. 44.275 million to the government Exchequer is brought to the notice of the Government for appropriate decisions and actions.

2.3 Inadmissible Payments of 15% enhanced rate for completed FC works prior to approval of Nu. 5.329million – (5.1.19)

The rate for Formation Cutting (FC) works was enhanced by 15% as per the executive order vide letter No. MoWHS/Sec-29/2015-2016/524 dated 16/10/15. However, the letter did not specify the effective date of the order.

On verification of contractor's bills, MB recording, it was noted that enhanced rate of 15% was paid to those contractors, who had completed the FC works prior to the date of the Secretary's letter No. MoWHS/Sec-29/2015-2016/524 dated 16/10/15 conveying the approval for rate enhancement of 15%.

The payment of RA bill although was made on 14.11.2015, the actual works were carried out prior to the approval conveyed under letter dated 16th October 2015. Thus, the contractor was not eligible for enhanced rate of 15% for the completed works prior to the approval Order issued.

The enhanced rate for FC works paid to contractors who had completed the FC works prior to the approval of the enhanced rates resulted in ineligible payments and undue favour to the contractors to the extent of Nu. 5,328,975.00 as detailed in table 2.3 below:

Table 2.3: Ineligible payments				
Sl. No.	Regional Office	No. of Packages	Amount (Nu. in Million)	Remarks
1	RO, Lobeysa	(Package V) by M/s Etho Metho Construction Pvt. Ltd	191,070.00	As per work plan, FC of 1.061km should have been completed prior to issuance of the order
2	RO Trongsa	Package II M/s Gaseb construction Ltd	1,224,405.00	RA Bill Amount paid before 16/10/2015
3	RO Trongsa	M/s Rigsar Construction Pvt Ltd	1,190,250.00	RA Bill Amount paid before 16/10/2015
4	RO Lingmethang	M/s Tshering Construction Pvt Ltd	546,750.00	RA Bill Amount paid before 16/10/2015
5	RO Lingmethang	M/s Norbu Construction Pvt Ltd	1,462,500.00	RA Bill Amount paid before 16/10/2015
6	RO Lingmethang	M/s KD Builders Pvt Ltd	714,000.00	RA Bill Amount paid before 16/10/2015
Total			5,328,975.00	

The RO should comment on payment of 15% on FC works prior to issuance of Executive order besides recovering the inadmissible payment of Nu. 5,328,975.00 and the same deposited to Audit Recoveries Account.

Auditee's Response:

Though the execution of FC work has been started prior to approval of 15% incentive, the complete FC width was not achieved due to arrangement for traffic to ply without hindrance during daytime. The actual execution of FC works has been carried out after the announcement of night execution i.e. from 7PM to 8AM was broadcast on BBS TV & Radio for a week w.e.f. 23rd July 2015. The RO took the date of the above advertisement as eligible for 15% incentive for carrying out FC works at night.

The contractors were instructed to strictly follow the order to provide disturbance free movement of vehicles during daytime. The Order of Director, DoR vide letter no. DoR/CD GoI PMU/NEWH 19/1522 dated 31st July 2015 is attached for ready reference please.

"Construction Industry: Solutions through Innovation & improved technology"

DoR/CD/GoI PMU/NEWH 19/ 1522 31 July 2015

The Chief Engineer
DoR Regional office
Lobeyesa, Trongsa, Ligmethang & Trashigang

Upgradation / Double Laning of Northern East West highway (NEWH)

During the meeting held on 16th June 2015 with the contractors who have been awarded the contract for widening works on the Northern East West highway, it has been decided that the widening works should be carried out without disrupting the flow of traffic. It was agreed that the traffic would be completely closed from 7 p.m. till 8 a.m. The contractors have to devise ways and means to carry out the widening works without disrupting the flow of traffic including the purchase of lighting equipments.

Following the above, it was also announced through BBS TV & radio for a week to with effect from 23rd July 2015 to follow the above timing for widening works. However, during my recent journey to Bumthang & back, it was observed that widening works were being carried out as usual with traffic disruption during day time.

Therefore, you are hereby instructed to notify the contractors executing the widening works under your respective jurisdiction to henceforth to abide by the decision & carry out the works at night. The Local Government authorities may also be informed about the decision of the Ministry.


Karna Galay
Director

CE-01

Copy to:

- 1) Hon'ble Zhabtog Lyonpo, MoWHS, Thimphu for kind information please.
- 2) Hon'ble Secretary, MoWHS, Thimphu for kind information please.
- 3) The Chief Engineer, Project Dantak HQ, Semtokha for kind information and further necessary actions with regard to widening works on Trashigang - Yadi PNH.

In view of above justifications, RAA is kindly requested to drop the memo.

RAA's Further Comments & Recommendations:

The RAA while taking note of the response on the airing of decision on the payment of 15% enhance rate and requiring execution of formation works at night from 7PM to 8AM on BBS TV & Radio for a week w.e.f. 23rd July 2015, reiterates that the executive order for the enhancement of rate for FC works by 15% was notified and instructed the ROs to amendment the contract only in October 2015 in terms of the Secretary, MoWHS letter No. MoWHS/Sec-29/2015-2016/524 dated 16/10/15. In addition, the letter did not specify the effective date of the order and in terms of normal practice, in absence of specified effective date, the date of issuance of order should be considered as the effective date.

Further, the ROs had not amended the contract agreement in line with the executive order. Thus, payment of 15% enhance rate on the RA bills payments was not justifiable. It is also to reiterate that the Director vide letter No. DOR/CD/GOI-PMU/NEWH19/1522 dated 3.8.2015, had informed ROs that the widening works were being executed as usual with traffic disruption during the day and instructed to notify the contractors to abide by the decisions. The audit team during site visits had also noted execution of formation works during day time in some locations

Considering the above fact and events, the Ministry should revisit the payments made by ROs for those completed FC works prior to the executive order of the Secretary and without amendment of the contract agreements and recover payments of Nu. 5.329million.

Who is accountable?

<i>Direct Accountability</i>	<i>: Refer Accountability Statement attached</i>
<i>Supervisory Accountability</i>	<i>:Refer Accountability Statement attached</i>

2.4 Non amendment of contract document pertaining to enhancement of defective liability period - (4.4.69)

One of major component of works for double Lanning of Northern East West Highway Project was FC works by extension of existing pavement roads to facilitate smooth ride to commuters and particularly for the flow of traffic.

The Secretary, MoWHS vide letter No. MoWHS/Sec-29/2015-2016/524 dated 16th October 2015, had conveyed the decisions of the meeting held on **16th June 2015** with the contractors and directed the Regional Offices for issuance of amendment to the contract agreements on the decisions subsequently taken on the following areas:

- ✓ **Enhance rate of 15% on FC Works**
Since the contractors executing the widening works are required to work at night (7pm to 8AM) to allow undisturbed flow of traffic during the day, it has been decided to enhance the rate of FC work by 15%
- ✓ **Increase in pavement width from 6.50mtr to 7.50mtr**
It has also been decided to increase the width of pavement by 1meter from 6.5m- 7.5m.
- ✓ **Enhancement of Defect Liability Period from 1year to 3 years**
During the meeting held between the Hon'ble Prime Minister and the contractors working on NEWH on 24/8/15, the contractors have agreed to the proposal of increasing the defect liability period for the works from one to three years.

However, the audit team noted that while no amendments were made in the contract documents, the decisions on the payment of 15% extra on FC works, and execution of additional 1m Increase in pavement width from 6.50m to 7.50m were found implemented, the defect liability from 1 year to 3 years were found not implemented.

The Ministry besides commenting on the failure to amend the contract agreements should investigate the circumstances leading to non amendments of contract agreement as of date. In addition, the Ministry should take action to recover all the rectification and road maintenance cost incurred by the ROs through award of additional works to the contractors from the FC contractors as these were to be covered under 3 years defect liability periods.

Auditee's Response:

Based on the decision of MLTC which was held on 16th June 2015 with the eleven contractors of NEWH vide reference no. MoWHS/Sec/29/2.15-2016/ the RO has written a letter of amendment vide letter no. DoR/ROL/16/2015-2016/481 dt. 21/10/2015.

However, none of the contractors whose defect liability period of 1 year enshrined in the initial contract agreement agreed to amend the contract as per the instruction of Ministry. The contractors stated that they have not built probable defect's cost beyond one year, as the initial bidding document did not have the provision of three years DLP. Should they need to increase the

DLP to 3 years, they even hinted to compensate the risk factor. The issue of non-acceptance to amend the DLP was made known to the Department and Ministry.

It is to inform that three decisions taken during the meeting with the NEWH contractors and MoWHS, chaired by Hon'ble Lyonchoen, Prime Minister of Bhutan are to be understood differently. The 15% extra on FC works is for night allowance, odd hour working time, high risk involved at night working, additional lighting systems required etc. Whilst 1m increase in the pavement width is to prevent the seepage of water through the unpaved shoulder between the paved surface and the L-drain.

ROs concern of non- acceptance by the contractors to amend the DLP to 3years, the MLTC that held on 28th May 2018 (attached as supporting documents) holistically deliberated at length and in line with the signed contract agreement, which is the mother document for reference in case of litigation, decided to do away with the amendment of defect liability period. However, the DLP of 3 years already incorporated in the later contract agreement shall remain as it since the bidder might have incorporated the risk factor. Therefore, RO requests the RAA to kindly drop the memo & not to pursue further.

Response RO, Lingmethang

However, the RO has received a letter of acceptance from only one contractor out of six contractors working under RO (attached for reference). The rest of the firms did not submit their acceptance hence; defect liability period could not be amended. Moreover if the defect liability period has to be increased, contractor could have inbuilt the rates and accordingly the cost of construction would increase substantially. (Refer the letter from Ministry to do away with the 3 yrs defect liability period).

Therefore, RO request the RAA to kindly drop the memo & not to pursue further.

RAA's Further Comments & Recommendations:

While noting the response, the RAA would like to reiterate that "In terms of letter No. MoWHS/Sec-29/2015-2016/524 dated 16th October 2015, the Secretary, MoWHS, had explicitly conveyed the decisions of the meeting held on 16th June 2015 with the contractors and directed the Regional Offices for issuance of amendment to the contract agreements on the decisions subsequently taken on the 15% extra on FC Work, Increase in pavement width from 6.50mtr to 7.50mtr and Enhancement of Defect Liability Period from 1year to 3 years". Thus, the decisions were to be read in conjunction to each other and not in isolation.

Further, decision on the 15% extra on FC Work and Increase in pavement width from 6.50mtr to 7.50mtr were also not in line with the signed contract agreement and stands recoverable either from the contractors or executives responsible for the unilateral decisions. It is also construed that Enhancement of Defect Liability Period from 1 year to 3 years was to support the decision on the payment of 15% extra on FC Work and Increase in pavement width from 6.50mtr to 7.50mtr.

Further, the decision of the MLTC held on 28th May 2018 to do away with the amendment of defect liability period was not in the interest of the Government since huge government funds to the extent of Nu. 361.912 million were spent by way of refinancing process towards payments of 15% extra on FC works and execution of 1m increase pavement width.

The decisions for the payment of 15% extra on FC was in contrary to the technical specifications where the contractors were required to built-up their rates for Traffic Safety & Controls envisaged under Technical Specifications Section 100-General Requirement, Clause 105, Sub Clause (2) General Requirements. In addition, the increase of pavement width from 6.5m to 7.5m by doing

way the Hard Shoulder between the L-Drain and Carriageway was also in contravention to Road Design Standard outlined in the Guidelines on Road Classification System and Delineation of Construction and Maintenance Responsibilities 2009 approved by the Cabinet as well as had compromised the safety of the commuters.

In the light of the decision of the MLTC of doing away with the amendment of defect liability period from 1 year to 3 years which was dully approved by the Government in conjunction to payment of 15% extra on FC Work and 1m increase in carriage width as well as at the verge of the completion of contracts is bought to the notice of the Government for appropriate decisions and actions.

Who is accountable?

Direct Accountability	: Refer Accountability Statement attached
Supervisory Accountability	:Refer Accountability Statement attached

2.5 Inconsistency in the implementation of Double Lanning works

The Guidelines on Road Classification System and Delineation of Construction and Maintenance Responsibilities 2009 prepared by MoWHS in collaboration with relevant stakeholders (GNHC, MoHCA, MoAF, Dzongkhag Administrations and Department of Roads) was approved by Lhengye Zhungtshog on 24th February 2009.

The road classifications and its design standards and drawing approved are as shown below:

Road Design Standards																	
Road Classification		Primary National Highway				Secondary National Highway				Dzongkhag Road				Farm Road			
Terrain classification		L	R	M	S	L	R	M	S	L	R	M	S	L	R	M	S
Design speed (km/h)		60	50	40	30	50	40	30	20	40	30	20	15	30	25	15	10
Traffic volume (vpd)		>200				100-200				30-100				<30			
Width (m)	Right of way	30				30				30				30			
	Carriageway	6.5				3.5				3.5				3.5			
	Shoulder	1.5x2				1.5x2				0.5x2				0.5x2			
	Drain	1.0				1.0				0.6				0.6			
Min. radii of horizontal curve (m)		115	80	50	30	75	75	25	15	75	25	15	15	15 Exceptional =10			
Pavement slope (%)		2-5				2-5				4				4			
Shoulder slope (%)		3-6				4				5				5			
Type of pavement		Double bituminous treatment				Dense bituminous premix				Base Course				Single Layer Base Course			
Max. super-elevation (%)		10				10				10				10			
Max. vertical grade (%)		4	5	6	7	5-9				6-10				6-10			
Structure loading (minimum)		HS20-44				As per DoR standard				As per DoR standard				As per DoR standard			

Fig: 2.5- Approved Road Design Standards

NEWH is classified as the Primary National Highway, the Ministry had prepared the design/drawing and estimation for carriageway of 6.5 m with 1.5m hard shoulder each on both side of carriageway and 1m L drain at hillside as depicted below:

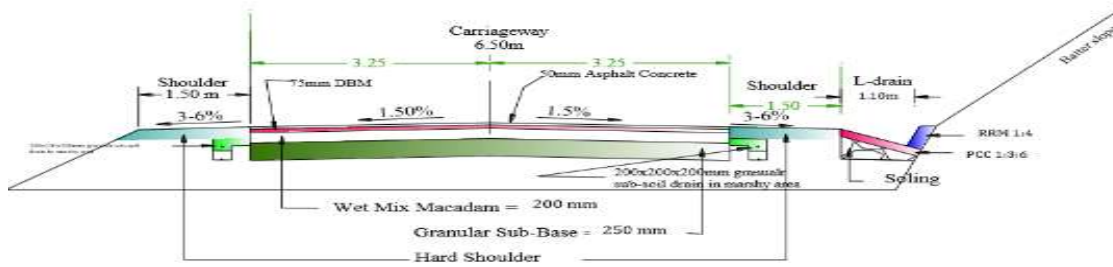


Fig 2.5(1)- Design and Drawing aligned to Road Design Standard

However, the Secretary, MoWHS vide letter No. MoWHS/Sec-29/2015-16/524 dated 16th October 2015 amongst others, directed all the Regional Offices on the decisions taken during the meeting held on February, 2016, after a time elapse of more than eight months from the commencement of the contract works, to increase pavement width from 6.5 m to 7.5 m and to issue amendment to the contract agreement signed with the contractors under respective jurisdictions.

In line with change order, the revised drawing was developed and circulated by Design Division, DoR Thimphu. However, during the course of the review of drawings implemented by the four Regional Offices, and site verifications, the audit team noted two (2) different drawings with difference technical specification for the same NEWH Up-gradation works.

It was noted that RO Thimphu and Trongsa were following one drawing and RO Lobeysa and Lingmethang were following a different as shown in Figure 1 & 2 below:

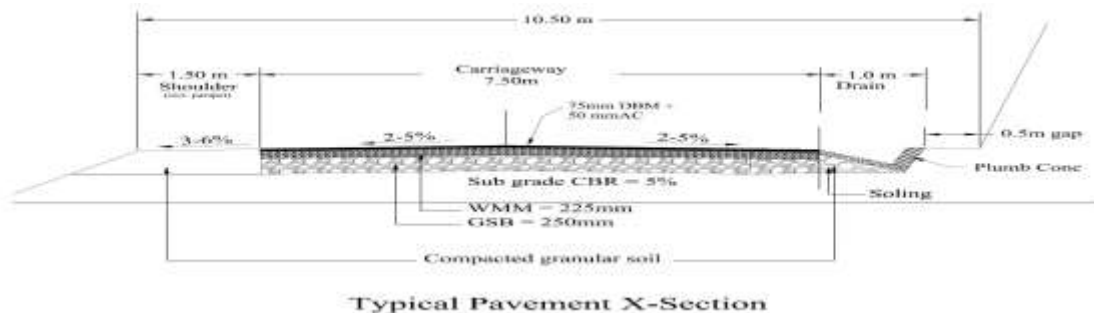


Figure 1.5(2): Revised drawing No. 1: Pavement drawing followed by RO Lobeysa and Lingmethang

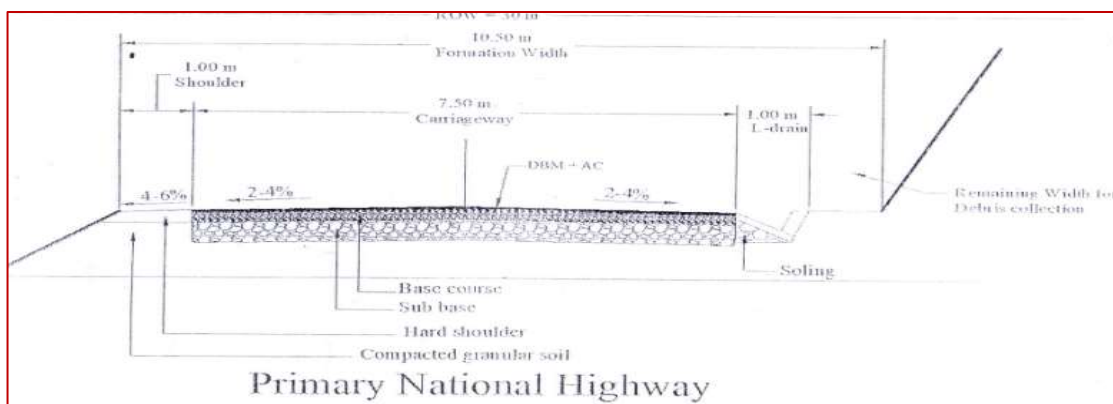


Figure 2.5(3): Revised drawing No. 2: Pavement drawing followed by RO Thimphu and Trongsa

Thus, for the Primary National Highway, two different types of pavement drawings and specification were applied resulting in inconsistency in the implementation of Double Lanning works as well as non-adherence to the Road Design Standards specified in the *Guidelines on Road Classification System and Delineation of Construction and Maintenance Responsibilities 2009*.

Adoption of two different drawings with varying pavement specifications and non-adherence to the approved Road Design Standard indicated improper planning and lack of due diligence in the preparation of drawings and specifications. Such mismatches in technical specification of road works would inevitably result in execution of two different type of pavement works for the same NEWHdouble lanning works.

The Ministry should review the adoption of two different types of drawings in the execution of road pavement works besides taking measures to ensure adoption of one type of drawings and technical specifications as outlined in the Road Design Standard to avoid inconsistencies and other impacts on the execution of road works.

Auditee's Response:

DoR ROs would like to acknowledge the observation of RAA and would like to submit the following justifications. The widening & up-gradation of the NEWH was approved in September 2014. A total of 385 kms of the road was to be widened & up-graded to PNH standard & completed within a period of three years by Dec 2017. By any standards, it is a huge task and time was of essence.

We partly agree to the observation of RAA regarding improper planning & lack of due diligence in the preparation of drawings & specifications. To be honest, there was not enough time to carry out proper survey, design and drawings. RAA has already noted the fact that the pavement width for PNH was originally 6.5 mtr as per the Guidelines on Road Classification System & Delineation of Construction & Maintenance Responsibilities, 2009. This was however revised later to have a pavement width of 7.5 mtr.

As recommended by RAA, the Guidelines on Road Classification System & Delineation of Construction & Maintenance Responsibilities, 2009 has been revised and the new Road Classification System, June 2017 has been circulated to all the Regional Offices of DoR. We hope that uniformity can be achieved in 12th FYP projects. In view of the above justifications, RAA is requested to drop the memo.

RAA's Further Comments & Recommendations:

While the initial design was prepared as per the Road Design Standard provided in the Guidelines on Road Classification System and Delineation of Construction and Maintenance Responsibilities 2009 and was adopted by all the ROs, the adhoc changes in design including technical specification was the main factor for executing NEWH project by the ROs applying two different sets of road designs. It also indicated absence of design review process within the Design Division of the Ministry to review that any changes made in design complies with good practices and relevant standards and guidelines.

The ministry should review the circumstances leading to the implementation of two different sets of designs by the ROs besides instituting design review process to ensure consistent and uniform implementation of designs and drawing for similar projects in future.

In addition, the Ministry should also revisit the revised designs circulated to ROs, as the requisite gap between hillside and drains was found not maintained in majority of the work due to site specific and alignment problem of the drain works. Further, the Ministry should also relook on

doing away of 1.5m Hard shoulders between the L-Drain and Carriageway in terms of risks towards safety of the commuters.

2.6 Ambiguities and flaws in the change of Road designs & Drawings with resultant deviations from the approved Design Standard envisaged in the Guidelines on Road Classification System and Delineation of Construction and Maintenance Responsibilities 2009 and almost doing away of 1m formation width vis-à-vis compromising necessary safety measures and safety of commuters

The *Guidelines on Road Classification System and Delineation of Construction and Maintenance Responsibilities 2009* for various categories of roads were as tabulated below:

Road Classification	Primary National Highway				Secondary National Highway				Dzongkhag Road				Farm Road			
	L	R	M	S	L	R	M	S	L	R	M	S	L	R	M	S
Terrain classification																
Design speed (km/h)	60	50	40	30	50	40	30	20	40	30	20	15	30	25	15	10
Traffic volume (vpd)	>200				100-200				50-100				<30			
Width (m)	Right of way				Right of way				Right of way				Right of way			
	30				30				30				30			
	Carriageway				Carriageway				Carriageway				Carriageway			
	6.5				6.5				6.5				6.5			
Shoulder	1.5x2				1.5x2				0.5x2				0.5x2			
	1.0				1.0				0.6				0.6			
Min. radii of horizontal curve (m)	115	80	30	30	75	75	25	15	75	25	15	15	15			
	Exceptional =10				Exceptional =10				Exceptional =10				Exceptional =10			
Pavement slope (%)	2-5				2-5				4				4			
Shoulder slope (%)	3-6				4				5				5			
Type of pavement	Double bituminous treatment				Dense bituminous premix				Base Course				Single Layer Base Course			
Max. super-elevation (%)	10				10				10				10			
Max. vertical grade (%)	4	5	6	7	3-9				6-10				6-10			
Structure loading (minimum)	H820.44				As per DoR standard				As per DoR standard				As per DoR standard			

Note:

1. Thromde Roads – Design standards to be prepared by DUDES in consultation with DoR.
 2. Access Road - Design standard to be set by DoR in consultation with the concerned agencies.
 3. The Design standards for AH are at par with the design standards for PNH.
 4. Design standard of Farm Roads are equivalent to the design standards of Dzongkhag Roads.
- vpd = vehicles per day
L = Level terrain (0 to 10 per cent)
R = Rolling terrain (10 to 25 per cent)
M = Mountainous terrain (25 to 60 per cent)
S = Steep terrain (More than 60 per cent)

Guidelines on Road Classification System and Delineation of Construction and Maintenance Responsibilities

Fig: 2.6- Road Design standard

The Guidelines also stipulates that “All AHs, PNHs and SNHs shall have necessary safety measures including road signs and guardrails as per the DoR standards”.

The initial approved drawings attached with the bidding documents were found designed by the Design Division, DOR in line with the approved technical standard and road classification and standard of 2009 as depicted in the photograph below:

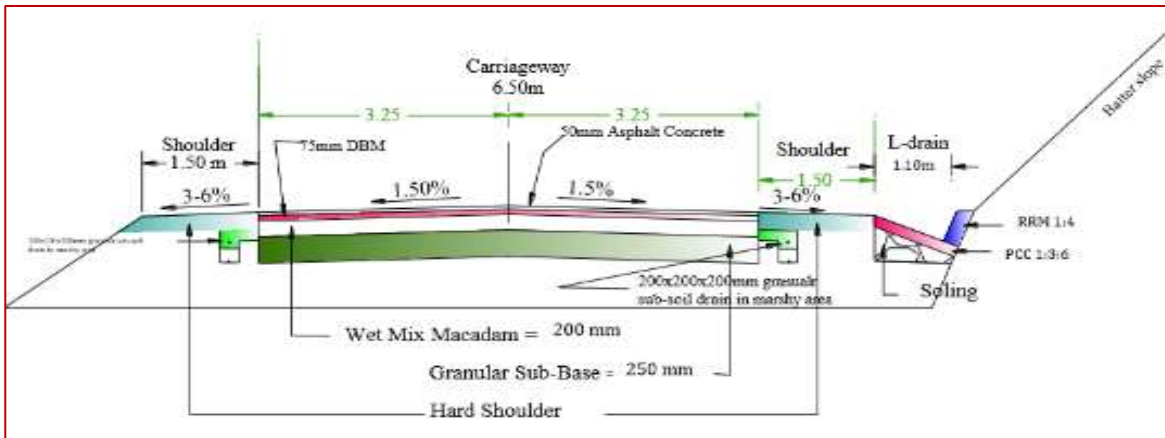


Fig:2.6(1)- Initial Approved drawing

The drawings outlined the following technical specifications and standards of the road:

- Overall Formation width 10.5m
- Carriage paved width 6.5m;
- Hard shoulder of 1.5m between 1m L-drain and carriage paved width and 1.5m hard shoulder at valley side; and
- Line Drain 1m width at hill side
- 200X200X200mm granular sub soil drain in marshy area:

In terms of the technical standards of Road Design, the Shoulders provide a number of important functions. Safety and efficient traffic operations can be adversely affected if any of the following functions are compromised:

- *Shoulders provide space for emergency storage of disabled vehicles. Particularly on high-speed, high-volume highways such as urban freeways, the ability to move a disabled vehicle off the travel lanes reduces the risk of rear-end crashes and can prevent a lane from being closed, which can cause severe congestion and safety problems on these facilities.*
- *Shoulders provide space for enforcement activities. This is particularly important for the outside (right) shoulder because law enforcement personnel prefer to conduct enforcement activities in this location. Shoulder widths of approximately 8 feet or greater are normally required for this function.*
- *Shoulders provide space for maintenance activities. If routine maintenance work can be conducted without closing a travel lane, both safety and operations will be improved. Shoulder widths of approximately 8 feet or greater are normally required for this function. In northern regions, shoulders also provide space for storing snow that has been cleared from the travel lanes.*
- *Shoulders provide an area for drivers to maneuver to avoid crashes. This is particularly important on high-speed, high-volume highways or at locations where there is limited stopping sight distance. Shoulder widths of approximately 8 feet or greater are normally required for this function.*
- *Shoulders improve bicycle accommodation. For most highways, cyclists are legally allowed to ride on the travel lanes. A paved or partially paved shoulder offers cyclists an*

alternative to ride with some separation from vehicular traffic. This type of shoulder can also reduce risky passing maneuvers by drivers.

- Shoulders increase safety by providing a stable, clear recovery area for drivers who have left the travel lane. If a driver inadvertently leaves the lane or is attempting to avoid a crash or an object in the lane ahead, a firm, stable shoulder greatly increases the chance of safe recovery. However, areas with pavement edge drop-offs can be a significant safety risk. Edge drop-offs occur where gravel or earth material is adjacent to the paved lane or shoulder. This material can settle or erode at the pavement edge, creating a drop-off that can make it difficult for a driver to safely recover after driving off the paved portion of the roadway. The drop-off can contribute to a loss of control as the driver tries to bring the vehicle back onto the roadway, especially if the driver does not reduce speed before attempting to recover.
- Shoulders improve stopping sight distance at horizontal curves by providing an offset to objects such as barrier and bridge piers.
- On highways with curb and enclosed drainage systems, shoulders store and carry water during storms, preventing water from spreading onto the travel lanes.
- On high-speed roadways, shoulders improve capacity by increasing driver comfort.

All the estimates and BOQ's were prepared based on the above drawings. Accordingly, the contract works for all packages were awarded based on the initial approved drawings and works commenced from July /August 2015.

However, it was apparent from the records that based on the decisions taken during the meeting held in **February, 2016, after a time elapse of more than eight month from the commencement of the contract works**, drawings were found revised for different category of Road in Bhutan as depicted in the photograph below:

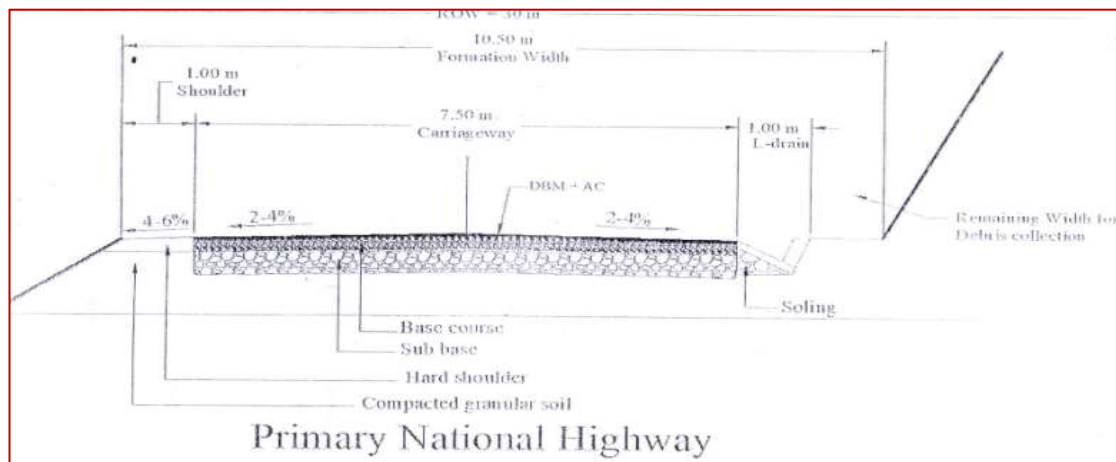


Fig: 2.6(2)- Revised design and drawing

As per the record of discussion dated 26/02/2016, the revised drawing and design were circulated to respective ROs vide letter No. MoWHS/Sec-29/2015-16/524 dated 16/10/2015 for adoption. The drawings outlined the following technical specifications and standards of the road:

- Overall Formation width of 10.5m;
- Carriage width 7.5m;

- iii. 1m width maintained for Debris collection on hillside;
- iv. Line drain of 1m between the paved carriage way and 1m width at hill side;

In line with the directive, the Regional Office, Lobeysa had conveyed to all Sub-Division to implement the work as per standard drawing vide letter No. DoR/ROL/2015-2016/Plg-05/1828 dated 11/5/2016.

While the subsequent design and drawing had maintained increased carriage pavement width of 7.5m, other structural drawings were also changed from the initial designs and drawings as evident from the above photograph.

The above changes in the design and drawing not only resulted in extra financial implication to the government exchequer for increase of 1m carriage width to the extent of approximately Nu.317.637 million but also impeded timely completion of work due to grant of time extension for the increased scope of work as well as compromised safety measures by doing away Hard shoulders of 1.5m width between the L-Drain and Paved carriageway width including reduction of 0.5m hard shoulder at valley side. Besides, due to design changes, overall formation width of 10.5m were found not achieved as 1m width supposedly maintained for Debris collections between hillside and L-Drain were found not maintained in entirety for all stretches of the roads as majority of the L-Drain was found constructed attached to the hillside. Further, 1m shoulder width on the valley sides were also found not maintained as in some stretches of roads the pavement road were found executed at the edge of the road width.

In this connection, the Ministry may also comment on the following aspects:

- The design deviation from the approved design stipulated in the Guidelines 2009 and approval of the Lhengye Zhungtshog, if any, obtained as “The *Guidelines on Road Classification System and Delineation of Construction and Maintenance Responsibilities 2009 prepared by the Ministry of Works and Human Settlement (MoWHS)* was dully approved in the 31st Session of Meeting of Lhengye Zhungtshog held on 24th February 2009;
- Doing away of 1.50 m Hard shoulder width between the L-Drain and Paved carriage way;
- Non-achievement and non-maintenance of 1m width for Debris collection at the hillside;
- Non/inconsistent maintenance of 1m width at valley sides; and
- Approval for deviation of design from approved designs and sources for additional funds to the extent of Nu. 317.637million.

Besides, the Ministry must hold the officials responsible for design changes after the award of the contract as well as deviations from the approved design for appropriate decisions and action.

Auditee’s Response:

Increasing of Pavement width from 6.5m to 7.5m came from the need to upgrade our very important Primary National Highway of the country spanning East to West by gradually improving its basic specifications to meet with the growing demands by ever increasing road users and to ensure traffic reliability, passenger comfort and their safety when the opportunity existed for such an intervention under GOI funding.

From over several decades of experiences in the construction and maintenance of roads in Bhutan and learning from experiences of many developed countries, it has been established that ingress of water is the top most factor for premature damages to road pavements (especially the flexible pavement system). Factors such as environmental conditions, traffic intensity and increased loadings, and the design inadequacies are some other contributing factor for premature pavement damages. Based on this premise, since pavement works were not commenced in all of the contracts

awarded for all stretches from Simtokha to Korilla, the intervention was deemed timely. DoR also appraised this ministry that under GOI funding on NEWH project, it expected huge savings then.

Therefore, instead of providing 1.5m wide earthen shoulder on the hillside of the pavement the ministry proposed increasing the pavement width from 6.5m to 7.5m taking up 1.0m of the 1.5m shoulder and fixing the 1.0m wide L-shaped/U-shaped side drains next to the pavement structure only. This intervention brought following improvements and benefits to the overall flexible pavement system.

- 1. Earthen shoulders are a porous medium that will allow gradual seepage of surface run off water and the normal rainwater. The water percolates into underlying pavement payers of DBM, WMM and GSB that are fairly porous in nature. When ground temperatures reach 40 degrees centigrade, the bitumen strips off the aggregates causing segregation of bituminous concrete. During winter in high altitude areas, the water in the pavement layers undergo freezing / icing breaking open the bituminous concrete and when weather warms up in Spring and after, the thawing of frozen ice takes place melting it into water leaving cracks in the bituminous concrete. This phenomenon of icing and thawing leads to crushing of cracked road surfaces under wheels of trucks and vehicles, forming cracks of all kinds and potholes. Addition of this 1.0m extra blacktop instead of earthen shoulder definitely prevents this undesirable phenomenon - saving huge recurrent expenditures.*
- 2. The side drain running parallel to the centerline of the pavement next to the pavement structure not only ensures that road surface is impervious to ingress of water enhancing the life of the pavement, the aesthetics of the pavement alignment improves to a great extent.*
- 3. The 1.0m extra pavement width will allow much desired unrestricted speed of the traffic flow in both directions preventing the pulling force that will otherwise develop between vehicles crossing past in opposite directions close to each other. In fact, to enhance safety, if space permits there should be a solid divider between lanes in opposite directions to avoid pulling (vacuum) force and the glares from headlights.*
- 4. The extra wide road will compensate for the absence of super-elevation at curves as the introduction of which is not possible in our highways due to lack of space to lay the transition curves that precedes the Super-elevation. Super-elevation counter acts the centrifugal force of speeding vehicles.*
- 5. This initiative allows leaving a 1.0m space between the hillside slope toe and the side's L-drain, which not only will hold back the first slides getting into the drain directly from slope erosion under rains, but also improves the sight distance for the drivers at the curves and sharp corners. It also ensured a relatively dust and mud free highway pavement as only valley side shoulder exists.*
- 6. The introduction of 1.0m extra avoided payment for 1.5m wide shoulder, although an additional expenditure was required to be made for 1.0m wide DBM and AC layers. A certain percentage on the cost for BT would have been compensated.*

The 1.0m extra wide black top pavement did not affect any fundamental geometrics or integrity of the national highway. In fact it definitely has enhanced the longevity of the pavement life, improved the safety and riding comfort of road users, the long desired national highway specification upgraded with aesthetics significantly improved and all of these are vital for the growth and sustenance of our economy.

With these positive outcomes in the perspective, the proposal thus submitted was endorsed by the MLTC members and recommendations duly approved jointly by the Ministers for Finance and Works & Human Settlement ministries vide MoWHS/SEC/29/2015/476 dated 5/8/2015 (Copy enclosed). The RAA is therefore requested to consider the submission favorably given the benefits and many positive outcomes from the initiative by not pursuing the matter further please.

The *Guidelines on Road Classification System and Delineation of Construction and Maintenance Responsibilities 2009* prepared by the Ministry of Works and Human Settlement (MoWHS) approved in the 31st Session of the Lhengye Zhungtshog Meeting held on 24th February 2009.

RAA’s Further Comments & Recommendation:

It is to reiterate that “The Guidelines on Road Classification System and Delineation of Construction and Maintenance Responsibilities 2009” prepared by the Ministry of Works and Human Settlement (MoWHS) was approved in the 31st Session of the Lhengye Zhungtshog Meeting held on 24th February 2009. As the Guidelines was approved by the Cabinet, the approval, if any, obtained on the changes in technical specification of road was not available on records.

It is also to reiterate that the changes in technical specification for providing 1m gap between the Drain works and hill side were found not achieved in all contract packages as the L-Drains were found executed attaching to hills as provided in the initial designs/drawings. Thus, given the present scenario, the RAA is of the opinion, that non-achieving of or maintaining the required gaps was a result of technical flaws.

As discussed in the exit meeting, the DOR in consultation with the Ministry should revisit the revised drawing for appropriate decisions and taking measures to address any technical flaws and ambiguities. Besides, the Ministry should also look in to the requirement of approval of Cabinet on the revised designs as it had deviated from “The Guidelines on Road Classification System and Delineation of Construction and Maintenance Responsibilities 2009”.

2.7 Inconsistency in the fixation of construction duration for the same design and scope of construction works within and among the Regional Offices

The Construction of East West double lanning works followed the same design and specifications. However, the quoted rates and project durations had huge variations as tabulated in table 2.7 below:

Table 2.7: Inconsistency in fixation of construction durations							
RO	Packages	Type of works	Scope of work in terms of Chainage coverage	Estimated Cost (in millions of Nu)	Quoted rates (in millions of Nu)	Project Duration (in months)	Duration in month per Km
Lobeysa	I, II, III	Pavement works	10 Km each	119,590,876.28	102,286,495.00	15	1.5
Lobeysa	IV	Pavement works	11 Km	127,642,926.26	107,120,422.00	15	1.364
Lobeysa	VI	Pavement works	12.14 km	131,989,514.38	112,652,539.00	25	2.06
Lobeysa	XII	Pavement works	7 km	100,267,497.37	66,128,323.00	11	1.571
Lobeysa	XIII	Pavement works	8 km	126,747,002.70	69,441,930.00	17	2.125
Lobeysa	XIV	Pavement works	3.25 km	46,552,814.61	27,808,65.00	10	3.077
Lobeysa	XV	Pavement works	2.75 km	39,390,946.46	39,390,946.46	12	4.364
Lobeysa	V	Widening & Pavement works	7 Km	92,439,003.48	72,680,325.00	20	2.857

Lobeysa	VII	Widening & Pavement works	6.86 km	90,091,287.54	71,417,679.10	20	2.915
Lobeysa	VIII	Widening & Pavement works	7 km	87,463,950.28	78,967,074.00	25	3.571
Lobeysa	IX	Widening & Pavement works	7 Km	92,798,931.12	93,263,506.00	25	3.571
Lobeysa	X	Widening & Pavement works	6 Km	84,881,450.38	56,974,612.41	24	4.00
Lobeysa	XI	Widening & Pavement works	10 km	153,688,193.47	107,568,025.00	25	2.5
Lingmethang	PKG - VII	Pavement works	4 Km	70,459,887.01	37,106,895.00	15	3.75
Lingmethang	I(a)	Pavement works with ZeoCrete Technology	10 Km	166,708,500.00	166,708,500.00	18	1.8 (Estimated cost higher only due to cost of ZeoCrete materials)
Lingmethang	II	Widening & Pavement works	5.70 Km	82,050,303.45	62,478,155.55	24	4.2
Lingmethang	III	Widening & Pavement works	6 Km	94,700,240.00	73,783,024.22	24	4
Lingmethang	IV	Widening & Pavement works	5 Km	77,382,142.43	59,469,881.70	30	6
Lingmethang	V	Widening & Pavement works	11.56 km	131,001,271.16	111,902,235.00	30	2.6
Lingmethang	VI	Widening & Pavement works	12 Km	140,282,847.00	125,555,774.00	28	2.33
Trongsa	TR-VII	Pavement works	6.4 Km	95,574,000.00	70,131,698.00	18	2.81
Trongsa	TR-XII	Pavement works	5 Km	100,267,497.37	78,928,350.00	20	4.00
Trongsa	TR-I	Widening & Pavement works	12 Km	191,662,477.46	147,882,777.62	30	2.5
Trongsa	TR-II	Widening & Pavement works	7.5 Km	171,993,910.77	111,563,269.46	30	4.0
Trongsa	TR-III	Widening & Pavement works	7.5 Km	151,041,704.92	97,306,916.89	30	4.0
Trongsa	TR-IV	Widening & Pavement works	5 Km	146,426,379.15	94,860,888.47	30	6.0
Trongsa	TR-V	Widening & Pavement works	5.7 Km	131,935,342.62	77,150,269.45	30	5.26
Trongsa	TR-VI	Widening & Pavement works	6.7 Km	138,898,344.12	79,151,909.00	30	4.48
Trongsa	TR-VIII	Widening & Pavement works	7.2 Km	105,297,611.69	73,239,890.20	28	3.89

Trongsa	TR-IX	Widening & Pavement works	7.98 Km	127,405,641.48	120,072,191.07	28	3.51
Trongsa	TR-X	Widening & Pavement works	6.02 Km	150,325,008.00	85,883,906.60	28	4.65
Trongsa	TR-XI	Widening & Pavement works	8 Km	117,475,584.76	89,839,558.00	28	3.5
Trongsa	TR-XIII	Widening & Pavement works	10.10 Km	129,964,945.98	124,174,327.15	28	2.77
Trongsa	TR-XIV	Widening & Pavement works	2.18 Km	55,771,219.28	45,714,110.00	15	6.88
Thimphu	TH-I	Pavement works	8.7 Km	115,642,860.00	81,088,430.15	15	1.72
Thimphu	TH-II	Pavement works	6.5 km +2 km	108,362,690.31	84,347,137.15	15	1.74

It would be apparent from the table above varying construction durations have been derived as the construction durations were neither based on Chainage coverage nor the estimated cost. The construction durations had been estimated differently within the ROs and amongst the ROs indicating absence of systems and procedures for estimation of contract durations.

The Ministry should comment on the adoption of varying practices for the fixation of construction durations and any systems or procedures put in place vis-à-vis Rules of thumb required to be used by engineers for estimating the construction durations on a more realistic, transparent and fair manner.

Auditee's Response:

Internationally there is hard formula stating definite contract duration. And no two projects are identical in nature, size and conditions. Therefore, the contract duration is either fixed based on the past experiences or considering many factors such as scope of work, unseen geological conditions, availability of resources (materials), process to obtain environmental clearances, settlement nearby the project, availability of suitable machinery etc. Sometimes, the contract duration is even governed by the urgency of the infrastructure needed, like construction of extended class room after the earthquake. In cases, the work can be accomplished by doubling the resources and usually comes at higher cost.

In the hill roads, unexpected geological conditions, apart from many factors is predominate factor that often delays the project completion and cost overrun. A good example is Punachangchu Hydro power project.

Therefore, please drop the memo.

RAA's Further Comments & Recommendations:

While acknowledging the responses on the fixation of contract duration based on experiences and work related factors, the analysis carried out by the RAA indicated flaws and ambiguities as differing durations were determined by ROs for various constructions packages. The contract durations per KM for Pavement Works ranged from as low as 1.4 months to as high as 4.4 months. Similarly, for Formations and Pavement work contracts, the contract duration per km ranged from as low as 2.5 months to as high as 6.8 months.

Thus, there is a need for determination of contract duration in an objective manner based on scheduling major quantum of works expected to be executed and assigning activity durations and the minimum resources expected to be committed during the execution including factors such as full work season of the year, weather limitations, concrete curing times, rainfalls, locally available materials and lead time involved in transportation materials from base towns.

One of the main reasons for time and cost overruns of most of the construction works is apparently due to fixing of unreasonable contract durations. Besides, there is also possible risk of compromising the quality of works in an effort to complete the contract work within unreasonable deadline.

The MoWHS should, therefore, formulate specific guidelines or a Rule of thumb to provide reasonable and consistent basis for determining the construction duration for all construction works undertaken by government agencies.

2.8 Inconsistencies in the incorporation of cost of Bitumen in the preparation of estimates

The Four Regional Offices had prepared two cost estimates for each contract packages of double Lanning works. One cost estimate prepared is inclusive of cost of bitumen and other one without including the cost of bitumen. The cost estimates without the cost of bitumen were considered for cost comparison with the quoted prices of the bidders as well as for the realization of the differential amount in cases of abnormally low quoted bids.

The RAA made an attempt to cross verify the consistencies in the incorporation of cost of bitumen in the estimates in terms of cost per kilometer since the technical specification including DBM and AC thickness were same for all the contract packages. On review of the cost estimates prepared by the Regional Offices for various contract packages, it was noted that bitumen cost per kilometer within and among the ROs were varying as shown in table 2.8 below:

RO Trongsa							
Packages	Estimate without bitumen	Estimate with bitumen	Cost of Bitumen	Chainage Awarded	Total Km awarded	Cost per KM	% Variations
1	191,662,477.46	279,895,177.46	88,232,700.00	0.00 to 12 = 12 Kms.	12	7,352,725.00	87.72
2	171,993,910.77	227,139,348.27	55,145,437.50	12 - 19.5 = 7.5 Kms.	7.5	7,352,725.00	87.72
3	151,041,704.92	206,187,000.00	55,145,295.08	19.5 - 27 = 7.5 Kms	7.5	7,352,706.01	87.72
4	146,426,379.15	187,701,324.56	41,274,945.41	27 - 32 = 5 Kms	5	8,254,989.08	110.75
5	131,935,342.62	171,648,867.12	39,713,524.50	32 - 37.7 = 5.7Kms	5.7	6,967,285.00	77.88
6	138,898,344.12	185,370,135.07	46,471,790.95	37.7 - 44.4 = 6.7 Kms	6.7	6,936,088.20	77.08
7	95,574,000.00	119,467,000.00	23,893,000.00	44.7 - 50.8 = 6.10Kms	6.1	3,916,885.25	0.00
8	105,297,611.69	155,462,063.69	50,164,452.00	50.8 - 58 = 7.2Kms	7.2	6,967,285.00	77.88
9	127,405,641.48	183,004,575.78	55,598,934.30	58 - 65.98 = 7.98 Kms	7.98	6,967,285.00	77.88
10	150,325,008.00	182,465,053.60	32,140,045.60	65.98 - 72 = 6.02Kms	6.02	5,338,878.01	36.30
11	117,475,584.76	174,263,864.76	56,788,280.00	72 - 80 = 8 Kms	8	7,098,535.00	81.23

12	98,619,592.00	130,933,412.42	32,313,820.42	80 - 85 = 5 Kms	5	6,462,764.08	65.00
13	129,964,945.98	201,016,750.70	71,051,804.72	85 - 97.3 = 10.10 Kms	10.10	7,034,832.15	79.60
14	55,771,219.28	65,277,109.28	9,505,890.00	87.62 - 89.8 = 2.18 Kms	2.18	4,360,500.00	11.33

Table 2.8.1: Inconsistencies in the incorporation of cost of bitumen in the estimates

RO, Lobeysa							
Packages	Estimate without bitumen	Estimate with bitumen	Cost of Bitumen	Chainage Awarded	Total Km awarded	Cost per KM	% Variations
1	114,155,909.36	197,346,703.07	83,190,793.71	477-467 (10 Kms)	10	8,319,079.37	44.92
2	118,573,848.79	201,764,642.50	83,190,793.71	467-457 (10 Kms)	10	8,319,079.37	44.92
3	119,590,876.28	202,781,669.99	83,190,793.71	457-447 (10 Kms)	10	8,319,079.37	44.92
4	127,642,926.26	201,169,182.50	73,526,256.24	447-436 (11 Kms)	11	6,684,205.11	16.44
5	92,439,003.48	150,265,331.42	57,826,327.94	429-422 (7 Kms)	7	8,260,903.99	43.90
6	131,989,272.17	231,546,557.29	99,557,285.12	422-409.86 (12.14)	12.14	8,200,764.84	42.86
7	90,091,287.54	146,348,534.32	56,257,246.78	409.86-403 (6.86 Kms)	6.86	8,200,764.84	42.86
8	87,463,950.28	144,869,304.13	57,405,353.85	379-372 (7 Kms)	7	8,200,764.84	42.86
9	92,978,931.12	150,384,284.98	57,405,353.86	379-389 (10 kms)	10	5,740,535.39	0.00
10	84,881,450.38	134,086,039.40	49,204,589.02	365-359 (6 Kms)	6	8,200,764.84	42.86
11	153,688,193.47	236,339,379.80	82,651,186.33	379-389 (10 kms)	10	8,265,118.63	43.98
12	100,267,497.37	158,692,087.37	58,424,590.00	436-429 (7 Kms)	7	8,346,370.00	45.39
13	126,747,002.70	193,517,962.70	66,770,960.00	403-395 (8 Kms)	8	8,346,370.00	45.39
14	46,552,814.61	73,678,517.11	27,125,702.50	392.25-389 (3.25 Kms)	3.25	8,346,370.00	45.39
15	39,390,946.46	62,343,463.96	22,952,517.50	395-392.25 (2.75 Kms)	2.75	8,346,370.00	45.39

Note: Under Lobeysa, DBM and AC thickness for contract packages 12, 13, 14, and 15 were reduced from 75mm to 60 and 50mm to 40mm respectively.

Table 2.8.2: Inconsistencies in the incorporation of cost of bitumen in the estimates							
RO, Lingmethang							
Packages	Estimate without bitumen	Estimate with bitumen	Cost of Bitumen	Chainage Awarded	Total Km awarded	Cost per KM	% Variations
1 (B)	88,210,000.00	144,900,000.00	56,690,000.00	51.00-61.50 = 10.50 km	10.50	5,399,047.62	0.00
2	82,050,303.45	127,410,000.00	45,359,696.55	73.19-78.89 = 5.79 km	5.79	7,834,144.48	45.10
3	94,700,240.00	142,445,000.00	47,744,760.00	78.89-84.89 = 6.00 km	6	7,957,460.00	47.39
4	77,382,142.43	117,169,000.00	39,786,857.57	84.89-89.89 = 5.00 km	5	7,957,371.51	47.38
5	131,001,271.16	222,969,000.00	91,967,728.84	90.89-102.45 = 11.56 km	11.56	7,955,685.89	47.35
6	140,282,847.00	235,773,000.00	95,490,153.00	102.45-114.45 = 12.00 Km	12	7,957,512.75	47.39

7	70,459,887.01	96,717,000.00	26,257,112.99	114.45-118.45 = 4 Km	4	6,564,278.25	21.58
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Note: Under Lingmethang, DBM and AC thickness for contract package 7 was reduced from 75mm to 60 and 50mm to 40mm respectively

Table 2.8.3: Inconsistencies in the incorporation of cost of bitumen in the estimates							
RO, Thimphu							
Packages	Estimate without bitumen	Estimate with bitumen	Cost of Bitumen	Chainage Awarded	Total Km awarded	Cost per KM	% Variations
1	115,642,860.00	169,193,479.02	53,550,619.02	527 to 527.7 & 530 to 538	8.7	6,155,243.57	0.00
2	108,362,690.31	163,597,831.25	55,235,140.94	538 to 544.5 & Simtokha Olakah 2Km	8.5	6,498,251.88	5.57

In consideration to the equal thickness of DBM and AC for all contract packages except 5 packages where DBM and AC thickness were reduced, the bitumen cost per kilometer should have been comparable. It is apparent from the tables above that cost of bitumen incorporated in the cost estimates varied from Nu. 3,916,885.25 per km to as high as Nu. 8,346,370.00 per km indicating flaws and ambiguity in the cost estimates for bitumen.

The Ministry should review the cost estimates and ascertain the circumstances leading to substantial bitumen cost differences in the estimates.

Auditee's Response:

In compliance to the existing policy, the bitumen required for road works is being procured centrally by the Directorate Services, MoWHS.

The cost of bitumen at source is not constant due to fluctuation of price of petroleum products in the international market. In addition, there is also the transportation cost for the bitumen from the source to the Central Stores in P'ling. Also, the cost of transportation of bitumen from Central Stores to the respective Regional offices varies based on the distance from P'ling.

As recommended by RAA, DoR RO Trongsa will request the Ministry to review the cost estimates to ascertain the facts leading to substantial difference in the cost of bitumen in the cost estimates.

RAA's Further Comments & Recommendation:

While taking note of the response on the fluctuation of price of petroleum products in the international market and the transportation cost for the bitumen from Central Stores to RO Regional Stores and project sites, the fact remains that the bitumen cost per kilometer varied from as low as Nu. 3,916,885.25 per km to as high as Nu. 8,346,370.00 per km representing more than 113% variations indicated flaws and ambiguity in the cost estimates for bitumen.

However, as discussed during the exit meeting, the DOR and Ministry should review all the estimates prepared by the ROs to validate the correctness of the estimates and ascertain existence of any systemic flaws and ambiguities in the preparation of estimates for initiating corrective measures for future project works. The Ministry should furnish the outcome of the review and

measures put in place to address flaws and ambiguities in the preparation of estimates for future projects.

2.9 Adoption of varying practices of rate analysis by contractors and wrong application of coefficient for 80mm, instead of 75mm design thickness of DBM and also for 50mm thick Asphalt and recoverable amount aggregating to Nu. 69.334 million

Special Conditions of Contract, Point No. 2, stipulates as “*The bidder must attach the detail rate analysis for DBM and AC along with the bidding document*”. It was made to understand that submission of rate analysis by contractor was to ensure that the cost of bitumen was not included and that rates incorporated for design thickness for DBM and Asphalt concrete did not exceed 75mm and 50mm thick respectively.

On review of contractor’s rate analysis attached with the tender documents, lapses and discrepancies were observed in the application of co-efficient for the item of work 75mm DBM & 50mm AC as the LMC provided were only for 70mm and 80mm, DBM work and 40mm AC work. Thus, the co-efficient used for 75mm DBM was considered for 80mm thick and co-efficient for 50mm thick AC works was randomly worked out by contractors. In addition clerical errors were also found on deriving the analyzed rates.

Thus, due to wrong application of Co-efficient and clerical errors, the rates accepted by the Evaluation Committee and reflected in the BOQs were found inflated. The overall financial implication due to wrong acceptance of rates for the two item of works amounted to Nu. 69,334,409.38 as shown in table 2.9 below:

Sl. No.	Regional Office	No. of Packages	Amount (Nu. in Million)	Remarks
1	RO, Lobeyasa	8 Contract packages	20,782,438.38	
2	RO Trongsa	7 Contract Packages	28,468,525.00	
3	RO Lingmethang	73 Contract packages	10,984,878.00	
4	RO, Lobeyasa	M/s Chogyal Construction Pvt. Ltd (Packages I, II and III)	7,104,603.83	Acceptance of inflated rate analysis due to inclusion of rate for Bitumen Spreader. The Bitumen Spreader was not specified in the LMC for DBM and Asphalt concrete works.
5	RO, Lobeyasa	M/s Welfare Construction Pvt. Ltd –	9,098,568.00	Inclusion of cost for Generator & Control Panel not Complying to LMC and 5% for mobilization and installation of Labour Camps, Machinery yard, tools and plants
6	RO Trongsa	M/s Druk Lamsel Construction Pvt. Ltd(Package 7A) (AM18.6)	1,488,000.00	Acceptance of inflated rate analysis due to inclusion of rate for Bitumen Spreader. The Bitumen Spreader was not specified in the LMC for DBM and Asphalt concrete works
Total			69,334,409.38	

The Ministry must thoroughly review the aforementioned discrepancies involving substantial amounts of financial implication to the Government and also ascertain the circumstances leading to failure on the part of the Evaluation Committee and MLTC despite obtaining the rate analysis from the prospective bidders. The Ministry should also fix the officials responsible for such unwarranted lapses for appropriate decisions and actions.

Besides, the Ministry must either recover the amount of **Nu.69,334,409.38** if already paid or correct the quoted rates to prevent ineligible payments in the upcoming RA Bills.

Auditee's Response:

The pavement thickness was derived from the pavement chart based on the average traffic in msa and CBR value. For NEWH Project, based on the traffic count and traffic forecast including future traffic, the DBM and AC were determined to be 80mm and 50mm thickness respectively. However, there is no coefficient in the BSR for above thickness. Therefore, the coefficients were interpolated and extrapolated in the departmental estimates.

The main objective of asking the rate analysis for DBM and AC with the bid is to ensure that the bidder has not included the cost of bitumen since the bitumen is to be provided by the client. The rate analysis and pricing of the contractor varies from one contractor to another. Also to inform RAA that the issuance of the bitumen is based on the Job Mix Formula and not as per the coefficient of the rate analysis.

As per the ABSD recommendation, bitumen has been listed as one of the central procurement materials to ensure quality and the study found that there is substantial saving if it is procured centrally. Initially, there was a practice in the Department to recover the cost of the bitumen issued based on the prevailing rates. However, many bidders did not appreciate the deduction being done from their running bill and also there was contention in using different bitumen rates in the recovery.

Therefore, in order to streamline the process and reduce contention in the interpretation, the Department through the approval of the Ministry has decided to issue the bitumen free of cost to the contractors executing the BT works.

Since the main objective of the rate analysis was to check the cost of the bitumen as "zero" in the quote, the evaluation team neither the award committee felt necessary to check the LMC of the DBM & AC. In the competitive tender, rate will definitely vary and internationally it is never practiced to increase the coefficient of those items that are less and similarly cutting down the coefficient of those items where the LMC is high. Contractor's rate vary from item to item.

Therefore, RAA is requested to kindly drop the memo based on the justifications provided above.

RAA's Further Comments & Recommendations:

While taking note of the response, it is clear that the Ministry has failed to incorporate appropriately in the tender documents and TOR of Evaluation Committee on the requirement of Rate analysis to be aligned with the Labour and Material Co-efficient (LMC) and BSR not just to check that the cost of bitumen is "Zero" in the rate analysis.

The wrong application of Co-efficient and clerical errors by the contractor in its rate analysis had inflated the quoted rates of the above item of works. The failure on the part of the Evaluation Committee to ensure application of correct labour and material co-efficient during rate analysis had resulted in overall financial implication to the Government Exchequer to the extent of Nu. 60,235,841.38.

In view of huge financial implication, the Ministry should consider forming a dedicated technical team to review all the rate analysis of the contractors and measures taken to correct the discrepancies to avoid similar lapses in future contract works.

The huge financial loss to the extent of Nu. 69.334 million to the government Exchequer is brought to the notice of the Government for appropriate decisions and actions.

2.10 Flawed rate analysis through incorporation of transportation cost of bitumen as percentage to the overall derived cost of the item of work with resultant avoidable cost to the project Nu. 12.323 million

Under SCC (Additional Clause) and Addendum issued vide letter DoR/ROL/Plg-15 (A)14-15/3439 dated 16/4/15, No. R0-T/DoR/2014-2015/W-9/1469 dated April 14, 2015, Clauses amongst others were amended as below:-

1. *The Department will procure Bitumen(VG-10) and supply to the contractors*
2. *The Bidder(s) shall apply “0” Zero for the cost of Bitumen (VG-10) in their rate analysis for Dense Bituminous Macadam (DBM) and Asphalt concrete(AC) as department is to supply bitumen (VG-10)*
3. *In order to authenticate the above point No ii, the Bidder (s) should compulsorily submit the details of rate analysis for DBM & AC along with the bids.*
4. *The contractor shall lift the required bitumen (VG-10) from Store, Regional Offices, DoR, and transport it to their respective sites(s) at his or her own cost.*

On review, the Rate analysis for the DBM and Asphalt works submitted with the tender documents revealed that eight (8) Contract packages had included transportation cost for lifting of Bitumen from Regional Store to work site either as cost component of the item work or as percentage to the overall analyzed cost of the item work.

Thus, the inclusion of transportation charges as a part of the component of cost in lieu of cost of bitumen in addition to loading, wastage and overhead charges applied for deriving the item rates for the item works was not in compliance to the aforementioned Addendum issued.

The cost implication based on estimated quantities of DBM & AC works for transportation of bitumen from the Regional store to site alone amounted to Nu. 12,322,823.58 as computed in table 2.10 below:

Sl.No.	Regional Office	No. of Packages	Amount (Nu. in Million)	Rate charged	Remarks
1	RO, Lobeysa	M/s Taksing Chungdruk Construction Pvt. Ltd. (Packages 12)	1,758,512.08.	DBM= Nu.19 per Sqm AC= Nu. 14 per Sqm	Added 10% as transportation charges for lifting of bitumen on over cost
2	RO Lingmethang	M/s K.D Builder Pvt Ltd. Bumthang (Packages 3)	803,300.00	DBM= Nu.11.31 per Sqm AC= Nu. 6.63 per Sqm	Acceptance of inflated rate analysis due to inclusion of rate for transportation cost of Bitumen in the rate analysis for the DBM and AC item of work
3		M/s Rigsar Construction Pvt. Ltd (Package 6)	2,156,400.00	DBM= Nu.13.31 per Sqm AC= Nu. 10.65per Sqm	Acceptance of inflated rate analysis due to inclusion of rate for transportation cost of Bitumen in the rate analysis for the DBM and AC item of work
4	RO Trongsa	M/s Rinson Construction Pvt. Ltd (Package 13) (AM25.9)	2,053,582.50	DBM= Nu.15.98 per Sqm AC= Nu. 11.13 per Sqm	Acceptance of inflated rate analysis due to inclusion of rate for transportation cost of Bitumen in the rate analysis under the DBM and AC item of work

5		M/s Rigsar Construction Pvt. Ltd (Package 1)	2,156,400.00	DBM= Nu.13.31 per Sqm AC= Nu. 10.65 per Sqm	Acceptance of inflated rate analysis due to inclusion of rate for transportation cost of Bitumen in the rate analysis under the DBM and AC item of work
6		M/s Rinson Construction Pvt. Ltd (Package 3)	2,032,875.00	DBM = Nu. 21.30 per Sqm AC= Nu. 14.84 per Sqm	Acceptance of inflated rate analysis due to inclusion of rate for transportation cost of Bitumen in the rate analysis under the DBM and AC item of work
7		M/s Welfare Construction Pvt. Ltd (Package 9)	239,400.00	DBM= Nu. 2.00 per Sqm AC= Nu. 2.00 per Sqm	Acceptance of inflated rate analysis due to inclusion of rate for transportation cost of Bitumen in the rate analysis under the DBM and AC item of work
8		M/s Rinson Construction Pvt. Ltd (Package 10)	1,122,354.00	DBM= Nu. 15.98 per Sqm AC= Nu. 11.13 per Sqm	Acceptance of inflated rate analysis due to inclusion of rate for transportation cost of Bitumen in the rate analysis under the DBM and AC item of work
	Total		12,322,823.58		

It is apparent that the Evaluation Committee and MLTC had failed to review the rate analysis submitted by the contractors in line with the addendum and for appropriateness and to take corrective measures prior to acceptance of the rates. The RO in consultation with the Ministry should revisit the analyzed rates. Cost implication due to inclusion of transportation cost as a component of cost of the item work in addition to the wastages and overhead charges applied on the overall item rates should be worked out and recovery effected deposited into ARA.

The Ministry besides commenting on the deficiencies and lapses on the part of the Evaluation Committee and MLTC members should hold the responsible officials accountable to make good the loss in the event contractor disagree to refund the cost implication.

Auditee's Response:

As per the section VI of the SCC: the additional clause reads:

i) Bitumen VG-10 shall be supplied by the client and no recovery shall be made. However, the contractor shall lift the bitumen from the Regional Offices, DoR, and transport it to respective work site at their own cost.

ii) The bidders are required to submit rate analysis for the following items:

- 1. Providing & Laying DBM*
- 2. Providing and laying AC.*

Note: *The rate of bitumen VG-10 must be "0" (Zero) in the above rate analysis: however, the transportation cost of bitumen from above store to the respective work site must be included in relevant items of the rate analysis.*

From the above clauses, it is understood that contractor has to submit the rate analysis for DBM and AC. The contract document also highlights that contractor can add transportation cost of bitumen from RO store to work site in relevant items of the rate analysis. In compliance to the tender document, the contractor has submitted the rate analysis and added the transportation cost in the relevant coefficient.

RAA's Further Comments & Recommendations:

Evaluation committee plays a crucial role in procurement as it is their due diligence and decision that determines the outcome of the tendering process. The members have to be competent and

charged with the responsibility to uphold the core principles of procurement to ensure procurements at most competitive manner.

It was the responsibility of the Evaluation Committee to present the facts correctly to the MLTC on the incorporation of transportation charges as component cost of the item of works against the cost of bitumen though was to be “Zero” in the rate analysis. The cost of transportation should have been covered under overheads and profit charges as incorporated by other contractors. The decisions on the evaluation committee to ignore such flaws in the rates analysis had resulted in overall financial implication to the Government Exchequer to the extent of Nu.12,322,823.58.

Failure of evaluation committee members seem to be a major cause for most procurement errors or non-compliances. The absence of consistent structures in place in different procuring agencies leave room for isolated approach and differing practices undermining the PRR’s objective of achieving uniformity and effectiveness of procurement procedures.

Considering huge financial implication, the Ministry should institute technical team to review all the rate analysis of contractors and formulate specific guidelines in carrying out rate analysis by the ROs and contractors detailing the processes for incorporating transportation and other related cost if construction materials are to be supplied to the contractors by the executing agencies to avoid flaws, ambiguities and complications in future project works.

The huge financial loss to the extent of Nu. 12.323 million to the government is brought to the notice of the Government for appropriate decisions and actions.

2.11 Award of three work packages in contravention to the Nganglam Resolution

The review of documents relating to the construction of the NEWH indicated following pre-construction decisions taken by the Ministry as discussed below:

☞ *Coordination Meeting held at Nganglam on 23rd December, 2014 deliberated series of issues on management of Double Lanning of NEWH, such as formation of Project Management Team(PMT), Division of contract packages, Monitoring and Supervision issue, Requirement of sign boards. Amongst other decisions, the procurement of contract was decided that only two work packages were to be awarded to each contractor.*

☞ *Subsequently, the Project Management Team met on 12th January 2015 at Thimphu with the objective to follow-up and take immediate action on the resolutions of Nganglam’s meeting held on 23rd December, 2014.*

During the Meet, besides formation of the Technical team and assigning the tasks to the GoI project coordinator on the maintenance of keep updated financial information, manpower & HR issues again reiterated on the award of two work packages each to the individual contractor by the Chief Engineer of Regional Office of Trongsa, Lobeyisa & Lingmithang.

☞ *75 mm thick Dense Bituminous Macadam and 50mm Asphalt concrete was designed by Design Division, Ministry of Works & Human Settlement, Thimphu to withstand the plying of heavy traffic.*

However, the approved design particularly was beyond the purview of Bhutan Schedule of Rates 2015, thus bidder was ask to submit separate rate analysis with bidding documents, further, it was stipulated in additional clause in the Special Condition of Contract to analyze the rate for the said item excluding the cost of bitumen.

However, it was noted that four contractors were awarded three contract packages each in contravention to the resolutions of the Nganglam Meet **23rd December 2014** and Project Management Team **12th January 2015** at Thimphu to award maximum of two packages to each contractor.

The three contract packages awarded with a total road stretch ranging from 13 km to 30 km along with contract amounts are as tabulated below:

Table 2.11: Award of three contract packages						
M/s Chogyal Construction Pvt. Limited, Thimphu holding trade license No.1032785, CDB No.7640						
Package (RO, Lobeyesa)	Estimated amount (Nu)	Contract Amount (Nu)	% of deviation (Estimate-Contract value)	Contract duration in month(s)	Work done value (Nu)	% of Deviation (Contract value – Work done value)
I-(Ch:477-467) (10km)	114,155,909.36	100,376,501.11	-12.07	15	116,399,663.99	15.97
II- Ch: 467-457)(10km)	118,573,848.79	102,070,100.40	-13.92	15	115,511,304.38	13.17
III-(Ch:457-447)(10km)	119,590,876.28	102,286,495.00	-14.48	15	115,504,285.38	12.93
Total stretch of 30Km		304,733,096.51				

Table 2.11.1: Award of three contract packages						Delays in months from the initial completion periods
M/s Chogyal Construction Pvt. Limited, Thimphu holding trade license No.1032785, CDB No.7640						
Package (RO, Trongsa)	Estimated amount (Nu)	Contract Amount (Nu)	% of deviation (Estimate-Contract value)	Contract duration in month(s)		
VIII Ch: 50.8-58 (7.2km)	150,298,000.00	73,239,890.20	-30.45%	28		12
XI Ch: 72-80 (8 km)	117,475,584.76	89,839,558.00	-23.52%	28		12(Ongoing)
XII Ch: 80-85 (5km)	106,509,159.36	78,928,350.00	-25.89%	20		12
Total road stretch of 20.2 Km		242,007,798.20				

Table 2.11.2: Award of three contract packages						Delays in months from the initial completion periods
M/s Rigzar Construction Pvt. Limited, Trashigang holding trade license 6004726, CDB No. 2435						
Package	Estimated amount (Nu)	Contract Amount (Nu)	% of deviation (Estimate-Contract value)	Contract duration in month(s)		
X- Ch 365-359 (6Km) (Lobeyesa)	78,073,915.54	56,974,612.41	-27.03%	24		15.7
I - Ch 0-12 (12 Km) (Trongsa)	191,662,477.46	147,882,777.62	-22.84%	30		7
VI- Ch:102.45-114.45 (12Km) (Lingmithang)	140,282,847.00	125,557,813.70	-10.49%	28		2
Total road stretch of 30 Km		330,415,203.73				

Table 2.11.3: Award of three contract packages						Delays in months from the initial completion periods
M/s Rinson Construction Pvt. Limited holding trade license No.1000488 and CDB No.1965						
Package (RO, Trongsa)	Estimated amount (Nu)	Contract Amount (Nu)	% of deviation (Estimate-Contract value)	Contract duration in month(s)		
III-(Ch: 19.5-27) (7.5km)	151,041,704.92	97,306,916.89	-35.58	30		12
X- Ch: 65.98 -72)(6.02km)	150,325,008.00	85,883,906.60	-42.87	28		13 (On-going)
XIII-(Ch:85-97.3)(12.3km)	139,964,945.98	124,174,327.15	-11.28	28		12
Total road stretch of 25.82 Km		307,365,150.60				

Table 2.11.4: Award of three contract packages					Delays in months from the initial completion periods
M/s Empire Construction Pvt. Ltd, Punakha					
Package (RO, Lobeysa)	Estimated amount (Nu)	Contract Amount (Nu)	% of deviation (Estimate-Contract value)	Contract duration in month(s)	
XIV-Ch-392.25-389 (3.25 Kms)	46,552,814.61	27,808,65.00	-40.26%	10	13.2
XV-Ch-395-392.25 (2.75 Kms)	39,390,946.46	39,390,946.46	Direct on estimated cost	12	7.4
VIII_Ch-379-372 (7 Kms)	87,463,950.28	78,967,074.00	-9.71%	25	17(Ongoing)
Total road stretch of 13 Km		118,358,020.46			

While the other contract works were in progress, the contract packages awarded to M/s Chogyal Construction Pvt. Limited, Thimphu were found completed prior to start of the audit. On review, the RAA noted that the contract works including additional works were found completed with delays by more than 3.8 months except one package as tabulated below:

Table 2.11.5: Award of three contract packages with resultant delay completion of contract						
M/s Chogyal Construction Pvt. Limited, Thimphu holding trade license No.1032785, CDB No.7640						
	Chainage	Contract Amount (Nu)	Work done value (Nu)	Due completion Date	Actual Completion Date	Delays in Months
Dochula-Lampari	477-467 (10 Kms)	100,376,501.11	116,399,663.99	28/9/2016	26/09/2016	-
Lamperi-Menchuna	467-457 (10 Kms)	102,070,100.40	115,511,304.38	28/9/2016	20/01/2017	3.8
Menchuna-Chasagang	457-447 (10 Kms)	102,286,495.00	115,504,285.38	9/11/2016	03/01/2017	3.8

The Regional Office in consultation with the MTLC should comment on the circumstances leading to award of three packages disregarding the critical resolution of the Nganglam Coordination Meet of Ministry, Departments and Regional Offices, besides, the Regional Offices should also comment on the decision taken to scope in pavement works with stretches in packages ranging from 5km to 12.3km deviating from the projected average allotment of 6.7 Kms per package.

Auditee's Response:

During the 1st Coordination meeting for NEWH held in Nganglam on 23rd Dec 2014, it was discussed & resolved to award only two packages to one bidder in order to ascertain timely completion of the works & to the desired quality. However, in subsequent discussions with CDB & PPPD, MoF it was pointed out by the two agencies that a contractor can have a minimum of five works in hand at any given time. Therefore, the decision to award only two works could not be adhered to.

Widening & improvement works on the NEWH was a major project of the DoR, MoWHS. The duration for completion of the project was 3 years only until Dec 2017. So, for the project time was of essence.

The e-tool system allows the contractors to bid for several packages using the same set of equipment & human resources; these resources do not get blocked until the contract is formally signed between the contractor & the procuring agency.

The decision to award the three packages to the same contractor (lowest evaluated) was taken by the MLTC in view of the financial advantages. Moreover, awarding the three packages to the same contractor made sense as the management of the works on the part of the contractor would be easier & more productive on the same stretch of road. Timely completion & quality deliverance of the work was anticipated. In view of the above justifications, the para may please be dropped.

Response of RO, Lobeyasa

The up-gradation of the 385 km Northern East West Highway (NEWH) from Semtokha to Trashigang was a priority project of the Government then and started from 1st January 2015 with three years' time period. The first coordination meeting between the Ministry and Department including Regional Offices was held in Nganglam, Pema Gatshel on 23rd December 2014 under the chairmanship of Zhabtog Lyonpo. Issues pertaining to project implementation such as contract packaging & size, tendering, uniform bidding document, quality control etc. were discussed in the coordination meeting. Following the first coordination meeting in Nganglam, the first Project Management Team Meeting was convened on 12th January 2015 at Thimphu and one of the issues discussed was to award only two contract packages of double lanning of east west highway per contractor. The meeting also decided that approval of Ministry of Finance would be sought for change in the procurement standard.

Based on the recommendation of the first Project Management Meeting, a separate consultative meeting was held on 14th January 2015 under the chairmanship of Hon'ble Zhabtog Lyonpo. Officials from ACC, CDB and MoF were present during the meeting (a copy of minutes attached for ready reference). The meeting discussed many issues including the proposal to award only two NEWH works to one contractor.

Although, it is not captured in the minutes of the meeting, the meeting indeed discussed and decided that the proposal of MoWHS to award only two works to one contractor is a violation of PRR 2009 and CDB e-tool work in hand information. Therefore, the MLTC had to follow the existing procurement rules and regulations i.e. maximum of five works in hand as per the e-tool report.

Based on above stated facts and justifications submitted, RAA is requested to kindly drop the memo.

RAA's Further Comments & Recommendations:

While the RAA takes note of the responses, the fact remains that the Ministry had failed to strictly adhere to its own decisions taken during the Coordination Meeting held at Nganglam on 23rd December, 2014 and affirmation of the decision taken during the Project Management Team met on 12th January, 2015 at Thimphu. It is to put on records that contractors who were awarded one or two contract packages had failed to complete projects in time let alone those contractors who were awarded three contract packages.

The maximum of five works in hand as allowed by CDB e-tool is for evaluation purpose. Decision as to how many packages should be awarded to each contractor must be based on the capacity of contractor to undertake and complete the work within the prescribed contract period. A maximum of five works in hand would not mean that the Contractors without any work in hand should be awarded five works as otherwise it would constitute violation of procurement norms as suggested in the response.

Thus, the decisions of MLTC to award of three contract packages to the five firms were not in the interest of project as the contractors failed to complete the packages on time with overall delays in completion of the Project.

In the light of the failure to implement its own decisions on the award only two contract packages due to overriding of decisions by the MLTC, it is imperative for the Government and the authority concern to review the existing policy and system of MLTC functions and responsibilities and take measures to prevent overriding of decisions for future similar project.

2.12 Flawed decision on the realization of differential amount between estimated and quoted value net of 20% with resultant non- realization of Nu. 446.142 million as well as short realization of Nu. 52.150 million due to application of approved percentage on the quoted contract price and subsequently non-renewal of BG for approved differential amount of Nu. 203.406 million

Clause 5.4 Evaluation of Bids sub clause 5.4.5 Abnormally Low Bid of Procurement Manual 2009, states as *“Where the prices in a particular bid appear abnormally low or the bid appears seriously unbalanced, the Procuring Agency may reject it only after seeking written explanations from the bidder submitting the low or seriously unbalanced bid. In the case of a bid which appears seriously unbalanced, the procuring agency shall request from the bidder an analysis of rates of the relevant items”.*

“If the Procuring Agency decides to accept the abnormally low bid or the bid with the seriously unbalanced rates after considering the above factors, the bidder shall be required to provide additional differential security equivalent to the difference between the estimated amount and the quoted price in addition to the performance security”.

In addition, ITB Clause 29.6 stipulates as *“If the Bid which results in the lowest evaluated Bid price is abnormally low, seriously unbalanced and/or front loaded in the opinion of the Employer, the Employer shall require the Bidder to produce written explanation of, justifications and detailed price analyses for any or all items of the Bill of Quantities, to demonstrate the internal consistency of those prices if the Procuring Agency decides to accept the abnormally low, seriously unbalanced and /or front loaded price, the bidder shall be required to provide additional differential security equivalent to the difference between the estimated amount and the quoted price in addition to the performance security”.*

On review of the documents and accounting records relating to realization of differential amounts, flaws and deficiencies were observed as discussed below:

2.12.1 Non-realization of differential amounts to the extent of Nu. 446.142 million

On review of the bidding processes and tender evaluation reports, the contract packages were found awarded to the lowest evaluated bidders. It was noted that on the basis of tender evaluation reports, the MLTC had passed decisions to award the contract to the lowest evaluated bidder on realization of differential amounts. However, the Awarding Committee had taken decisions to realize the differential amounts net of 20% variations.

In line with the decisions of the MLTC and Awarding Committee, the ROs had realized differential amounts net of 20% amounting to Nu. 203,406,293.05 as against the actual differential amounts of Nu. 649,557,598.08 as detailed below:

Table 2.12.1: Short realization of differential amounts						
Name of contractor	Estimated Amount (Nu.)	Quoted Amount (Nu.)	Differential Amount (Nu.)	% Differential Amount	% Differential Amount realized	Total Amount realized (Nu.)
RO, Trongsa						
(Package 1) M/s Rigсар Construction Pvt. Ltd.	191,662,477.46	147,882,777.62	43,779,699.84	22.84%	2.84%	4,199,870.88
(Package 2) M/s Gaseb Construction Pvt. Ltd	171,993,910.77	111,563,269.46	60,430,641.31	35.14%	15.14%	16,890,000.00
(Package 3) M/s Rinson Construction Pvt. Ltd	151,041,704.92	97,306,916.89	53,734,788.03	35.58%	15.58%	15,160,417.65
(Package 4) M/s Gyalcon Infrastructure Pvt. Ltd	146,426,379.15	94,860,888.47	51,565,490.68	35.22%	15.22%	14,437,827.23
(Package 5) M/s Druk Lhayul Construction Pvt. Ltd	131,935,342.62	77,150,269.45	54,785,073.17	41.52%	21.52%	16,602,737.99
(Package 6) M/s Raven Construction Pvt. Ltd	138,898,344.12	79,151,909.00	59,746,435.12	43.01%	23.01%	18,212,854.26
(Package 7A) M/s Druk Lamsel Construction Pvt. Ltd	95,574,000.00	70,131,689.00	25,442,311.00	26.62%	6.62%	6,326,100.00
(PKG-8) M/s. Dungkar Construction Pvt Ltd. Thimphu	105,297,611.69	73,239,890.20	32,057,721.49	30.44%	10.44%	10,993,070.66
(Package 10) M/s Rinson Construction Pvt. Ltd	150,325,008.00	85,883,906.60	64,441,101.40	42.87%	22.87%	34,379,329.33
(Package 11) M/s Dungkar Construction Pvt. Ltd	117,475,585.00	89,839,558.00	27,636,027.00	23.52%	3.52%	4,135,140.59
(Package 12) M/s. Dungkar Construction Pvt Ltd. Thimphu	98,620,000.00	78,930,000.00	19,690,000.00	19.97%		-
RO, Lobeysa						
(Package VII) M/s Loden Construction Pvt. Ltd	90,091,287.54	71,417,679.10	18,673,608.44	20.73%	0.73%	657 666.40
(Package XI) M/s Hi-Tech Company Pvt. Ltd	153,688,193.47	107,568,025.00	46,120,168.47	30.01%	10.01%	15,369,197.50
(Package XII) M/s Taksing Chungdruk Construction Pvt. Ltd	100,267,497.37	66,128,323.00	34,139,174.37	34.05%	14.05%	14,087,583.38
(Package XIII) M/s U.P Construction Pvt. Ltd	126,747,002.70	69,441,930.80	57,305,072.7	45.21%	25.21%	31,953,919.38
Total			649,547,312.22			203,405,715.25
	Short realization					446,141,596.97

Thus, differential amounts to the extent of Nu. 446.151 million were not realized thereby failing to safeguard the interest of the Government. In addition, the decisions of the Awarding Committee to realize net of 20% variations was in deviation to Clause 29.6 of ITB of Standard Bidding Document which clearly stipulated requirement to realize the differential amount between the estimated amount and the quoted price in addition to the performance security.

2.12.2 Short realization of differential amount to the extent of Nu. 52.150 million due to wrong application of differential percentages on contract prices

On cross check on the differential amounts realized in terms of the approved differential percentages with that of the estimated cost, it was noted that the differential percentages were found applied to the contract prices instead of estimated costs. Thus, wrong application of differential percentages had resulted in short realization of differential amounts to the extent of Nu. 52,150,092 which benefited six contractor to that extent.

The short realization of differential amounts is as tabulated below:

Name of contractor	Estimated Amount (Nu.)	Quoted Amount (Nu.)	% Differential percentage realized	Differential amount on estimated cost (Nu.)	Amount realized on contract price (Nu.)	Total Amount short realized (Nu.)
RO, Trongsa						
(Package 1) M/s Rigsar Construction Pvt. Ltd.	191,662,477.46	147,882,777.62	2.84%	5,443,214.36	4,199,870.88	1,243,343.48
(Package 2) M/s Gaseb Construction Pvt. Ltd	171,993,910.77	111,563,269.46	15.14%	26,039,878.09	16,890,000.00	9,149,199.09
(Package 3) M/s Rinson Construction Pvt. Ltd	151,041,704.92	97,306,916.89	15.58%	23,532,297.63	15,160,417.65	8,371,879.98
(Package 4) M/s Gyalcon Infrastructure Pvt. Ltd	146,426,379.15	94,860,888.47	15.22%	22,286,094.91	14,437,827.23	7,848,267.68
(Package 5) M/s Druk Lhayul Construction Pvt. Ltd	131,935,342.62	77,150,269.45	21.52%	28,392,485.73	16,602,737.99	11,789,747.75
(Package 6) M/s Raven Construction Pvt. Ltd	138,898,344.12	79,151,909.00	23.01%	31,960,508.98	18,212,854.26	13,747,654.72
Total				137,654,479.70	85,504,387.00	52,150,092.69

Wrong application of differential percentages indicated existence of either weak management system or possible unhealthy practices.

The Ministry should to recover short realization of differential amounts of Nu.52.150 million and deposited into Audit Recoveries Accounts, besides taking action against the responsible official for wrong computation of differential amount for six contract packages.

2.12.3 Non-renewal of Bank Guarantees/Cash warrants obtained against differential amounts on expiry of the initial validity periods

Provisions of PRR 2009 and SBD provides that, “*the bidder shall be required to provide additional differential security equivalent to the difference between the estimated amount and the quoted price in addition to the performance security*”.

In addition Clause 51, sub-clause 51.1 state that, “The Performance security shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in an amount specified in the SCC by a bank or surety acceptable to the Employer, and in denominated in the types and proportions of the currencies in which the Contract Price is payable. The Performance security shall be valid until a date 30 days from the date of issue of the Certificate of Completion”.

Thus, in terms of the above provisions, the security for the differential amounts was to be obtained with validity period aligned to the performance security validity periods.

On review of the Bank Guarantee and Cash Warrant related records, it was noted that while the contractors had renewed the Performance Guarantees, the ROs had failed to renew the Bank Guarantees for the differential amounts of **Nu. 203,406,293.05** initially obtained in the form of Bank Guarantee/Cash Warrant on expiry of the validity periods as detailed below:

Table 2.12.3: Non- renewal of Bank Guarantees/ Cash warrants						
Name of contractor	Contract Duration in month	Total Amount realized (Nu.)	Bank Guarantees/ Cash warrants validity period	Validity periods in months	Expiry date of the BG/ CW	Remarks
RO, Trongsa						
(Package 1) M/s Rigsar Construction Pvt. Ltd.	5 th December 2017	4,199,870.88	BG No. PG/TG/2015-10 of 2.6.2015 that too with validity till 31st May, 2016.	12 month	31st May, 2016.	Only Bank Guarantee for performance security renewed on 20 th June 2016
(Package 2) M/s Gaseb Construction Pvt. Ltd	30 months i.e., until 05.12.2017 with time extension granted up to 18 th March 2018	16,890,000.00	No. PG/PL2015-50 & 51 of 1.6.2015 with validity period of just 6 months up to 30 th November 2015	6 months	30 th November 2015	Only BG for performance security renewed on 1 st December 2015 with validity period of 12 months up to 29 th November 2016 as evident from BG No.. G/PL2015-50 E of 1.12.2015.
(Package 3) M/s Rinson Construction Pvt. Ltd	contract duration of up to 15.12.2017	15,160,417.65	Bank Guarantee that too with validity till 26th June, 2016	12 months	26th June, 2016	Only Performance Guarantee (PS) PG/HO/2016-447E amounting to Nu. 9,715,000.00(that too less by Nu.30,691.69) representing performance security of 9.98% only on 27/06/2017 which was valid till 31 st December 2017
(Package 4) M/s Gyalcon Infrastructure Pvt. Ltd	30 months up to 17 th December 2017	14,437,827.23	BG No. PREGRNTEE/2015/4300 dated 18/6/2015) that too valid till 15/6/2016	12 months	15/6/2016	Only Bank Guarantee PS was renewed on 8 th October 2016 up to 3 rd October 2017 for a period of another 12 months
(Package 5) M/s Druk Lhayul Construction Pvt. Ltd	30 months up to 12 th December 2017.	16,602,737.99	BG No. 00101150115 dated 11.6.15) that too valid till 15/6/2016	12 months	15/6/2016	Only Bank Guarantee (PRFGRNTEE/2017/6443 dt.20/4/2017) for performance security amounting to Nu 8,000,000.00 on 20 th April 2017 up to 31 st December 2017 that too after a time lapse of almost 10 months

(Package 6) M/s Raven Construction Pvt. Ltd	30 months up to 21.11.2017	18,212,854.26	Bank Guarantee obtained with validity period of just 12 months up to 9.6.2016	12 months	9.6.2016	only BG for PS renewed on 19.8.2016 with validity period up to 19.8.2017
(Package 7A) M/s Druk Lamsel Construction Pvt. Ltd	18 months up to 12.1.2018	6,326,100.00	Cash Warrant with validity period of just 6 months up to 10.1.2017	6 months	10.1.2017	only BG for PS renewed on 6.6.2017 as evident from BG/CORP/2017-326 OF 6.6.2017 with validity till 2.2.2018
(PKG-8) M/s. Dungkar Construction Pvt Ltd. Thimphu		10,993,070.66				Not realized
(Package 10) M/s Rinson Construction Pvt. Ltd	28 months up to 31.12.2017	34,379,329.33	Bank guarantee which was valid till 28th February 2016 under BG No. BH/HO/2015-892 of 29.8.2015	6 months	28th February 2016	PS expired on 28 th February 2016 and renewed only the PS on 28 th March 2017 with validity till 31 st December 2017 as evident form the BG No. PG/HO/2017-160 of 28.3.2017 after a delay of 13 months
(Package 11) M/s Dungkar Construction Pvt. Ltd	28 months up to 31.01.2018.	4,135,140.59	Bank guarantee which was valid till 30th September 2016 under BG No. 000101150223 of 16/9/2015 & 000101150224 of 16/9/2015	12 months	30th September 2016	Only PS was renewed on 18th April 2017 with validity of just 9 months till 31 st January 2018 as evident form the BG No. 00001170109 of 18.4.2017 that too after delays of 6 1/2 months
RO, Lobeysa						
(Package VII) M/s Loden Construction Pvt. Ltd	3 rd August 2015 to 24 th March 2017	657 666.40	Bank Guarantee vide BG No. 167801/PG/PL/2015/11(E) dated 18 th April 2017.			
(Package XI) M/s Hi-Tech Company Pvt. Ltd	26 th Nov 2015 to 14 th December 2017	15,369,197.50	Bank Guarantee vide BG No. 126603 dated 16 th November 2015.			
(Package XII) M/s Taksing Chungdruk Construction Pvt. Ltd	3 rd March, 2016 to 26 th January, 2017	14,087,583.38	Bank Guarantee vide BG No.			
(Package XIII) M/s U.P Construction Pvt. Ltd	22 nd February 2016 to 15 th July 2017	31,953,919.38	Guarantee vide BG No. PRFGRNTE1/ 2016/23 of 13.2.16.			
non-renewal of BG		203,406,293.05				

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The Ministry should investigate the circumstances leading to the failure to renew the Bank Guarantee for differential amounts after expiry of initial validity period along with the renewal of Performance Guarantee. Besides, the Ministry must recover the interest on the differential amounts for time periods not renewed including one month period for issuance of certification of completion.

In addition, the Ministry should take appropriate action against the ROs for laxity and extension of undue favour to the contractor. The inaction on the part of the ROs to recover the differential amounts indicated apathy towards enforcement of contract provisions and safeguards the government interest.

Auditee’s Response:

In the case of NEWH project, the MLTC in its wisdom had decided that the additional performance security would only be imposed for bids after allowing for deduction of 20% from their quoted amount.

Clause 5.4.5.3 under Abnormally Low Bid of PRR 2009 (revised July 2015) allows the Procuring Agency to accept abnormally low bid or bid with seriously unbalanced rates after considering factors specified under clause 5.4.5.2. The bidder shall be required to provide additional bid security equivalent to the difference between estimated amount & the quoted price in addition to the performance security.

In the Ministry, it is a generally accepted fact that bids within the range of +/- 20% of the departmental estimated cost is workable.

In view of the above, the decision of MLTC to ask the lowest evaluated bidders to submit the additional differential security beyond (-) 20% only may be considered by RAA.

Also, as RAA is aware of, Bhutanese contractors in their effort to win the bids quote low rates to the tune of (-) 40% also. However, if the full (-) 40% is to be deposited by the bidder as differential security, the bidder would be seriously constrained with working capital. Thus, the decision of MLTC to get the differential security beyond (-20)% only.

The Ministerial Tender Committee (MLTC) is the highest decision making body in the Ministry for procurement of goods, services & works. MLTC takes decisions based on consensus in the best interest of the works and the Government. Therefore, the decision of MLTC may kindly be reviewed holistically & honored. In view of the above justifications, the para may please be dropped.

RAA’s Further Comments & Recommendations:

While taking note of the response, it is reiterated that under Instructions to Bidder ITB under section “Evaluation and Comparison of Bids, the decisions and actions on the part of the MLTC and Awarding Committee to realize net of 20% variations were in violation to the provisions of the PRR and Standard Bidding Documents (SBD). There is no scope provided in the PRR to adjust +/- 20% for the purpose of depositing differential security.

The Ministry in consultation with the Ministry Finance should take immediate decisions and measures to either amend the provisions in the PRR and SBD for consistency and uniform adoptions by all government agencies or take actions against the MLTC and Awarding Committees for the violations which had resulted in non-realization of differential amounts to the extent of Nu.

446.151 million to ensure timely completion of contracts and safeguard the interest of the Government in the event of the failure to fulfil the contractual obligations by the contractors.

Regarding the wrong application of approved differential percentages with resultant short realization of differential amounts of Nu. 52.150 million, the Ministry should ascertain the circumstances leading to such lapses only for 6 contract packages besides taking actions against the officials responsible for the failure to appropriately apply the percentage to the estimated amounts.

Further, the Ministry should investigate the circumstances leading to the failure to renew the Bank Guarantee for differential amounts after expiry of initial validity period along with the renewal of Performance Guarantee. Besides, the Ministry must recover the interest on the differential amounts for time periods not renewed either from the contractors or officials responsible for the violation of the Procurement norms.

Furthermore, in the light of flaws and deficiencies in the applications and realization of security for differential amounts and performance security, the Ministry should institute a mechanism to create responsiveness on the procedures and process for the realization and disposal of bank Guarantees in the best interest of the Government.

2.13. Non-deployment/Mismatch of Personnel at site as per the requirements and non-deduction of penalty approximately - Nu. 40,579,000.00 (4.4.15)

As per the bidding data sheet, Section II, Employer's Requirements (ERQ) key personnel requirements on the widening and pavement construction works were found met by contractors in terms of the declared individual CV submitted along with the project profile.

During the site verification conducted by the joint team comprising of audit team and officials from RO, an attempt was made to cross check the personnel present at site with that of committed key personnel in the contract documents. It revealed that the personnel committed were not present but different set of key personnel were found deployed at site. The status of key personnel committed as per bidding document and actual employment at work sites as noted during the physical verification for all the contract packages were as tabulated and discussed below:

RO, Lobeyasa

2.13.1 Dochula to Chasagang (Packages I, II and III) executed by M/s Chogyal Construction Pvt. Ltd recoverable penalty Nu.7.144 million (RO, Lobeyasa)

The joint verification of site conducted on *29 September 2017 & 2 October 2017* revealed the following lapses:

- On reviewing associated HR and equipment aspects in new point based system of evaluation in e-tools through hard copy of e-tools report noted few HR and Equipment were used commonly to evaluate in system all the three packages I, II and III. However, the evaluation committee used same HR & Equipment for evaluation in e-tools system for contract packages II & III.
- This particular concern was presented to in MLTC meeting convened on 3rd June, 2015 wherein, MLTC unanimously decided that contractor should allocate separate HR & Equipment considering the work being separate package and also on contractor's commitment to provide separate HR & Equipment as per letter No. CCCPLT/T&Q-11/2015/11 dated June 19, 2015.

- Following the decisions of the MLTC convened on **3rd June, 2015**, the Regional Office vide letter No. DOR.ROL/Plg-15/2014-2015/3721 dated June 9, 2015 had directed the contractor to submit the letter of commitment for deployment of separate resources for the two packages.
- In response, the contractor had sought one-week time extension for submission of additional resources vide letter No. **CCCPLT/T&Q-11/2015/10 dated June 12, 2015** and had subsequently assure availability of adequate resources for the deployment of separate HR and equipment vide letter No. **CCCPLT/T&Q-11/2015/11 dated June 19, 2015**.
- The audit team could not verify the documentary evidences as Regional Office had failed to produce documents relating the deployment of separate HR and equipment in particular for package III despite repeated request.
- On probing further, the RO stated the contractor had used the same HR & Equipment for package II & III. This scenario proved that the contractor had failed to allocate separate HR & Equipment for package II & III, resulting in fundamental breach of contractual obligation.
- The Regional Office have neither invoked the termination clause nor enforced the penalty clause GCC 10.1

Particular of HR	Penalty amount /month (Nu)	penalty amount for the duration of the contract 18.8 months
Project Engineer	50,000.00	940,000.00
Materials Engineer	40,000.00	752,000.00
Project Manager	50,000.00	940,000.00
Junior Engineer	25,000.00	470,000.00
Laboratory Technician	15,000.00	282,000.00
Site Supervisor	15,000.00	282,000.00
Total:		3,666,000.00

Similarly, the contractor had failed to deploy separate HR and equipment against the same HR and equipment committed for the three packages. Thus, in line with the penalty provisions under Clauses GCC 10.1 and SCC and failure to terminate the contract, the Regional Office should recover the salaries of such personnel and hire charges of equipment at a rate stipulated in the Special Condition of Contract per month per personnel and equipment for the duration of the contract amounting to Nu. 3,478,000.00 as computed below:

Particular of HR	Name	Packages	Penalty amount /month (Nu) (II)	Penalty amount for the duration of the contract 18.8 months (Nu.)
Project Manager	Biren Thapa	Same for all packages (I,II, & III)	50,000.00	940,000.00
Project Engineer	Babu Madhavan Puthenpurayil	Same for all packages (I,II, & III)	50,000.00	940,000.00
Material Engineer	Sonam Tobgay Dorji	Same for all packages (I,II, & III)	40,000.00	752,000.00
Surveyor	Karchung	Same for all packages (I,II, & III)	15,000.00	282,000.00

Lab Technician	Megraj Gurung	Same for all packages (I,II, & III)	15,000.00	282,000.00
Site supervisor	Nidup Lhamo	Same for all packages (I,II, & III)	15,000.00	282,000.00
Site supervisor	Lhendup Tshering Lepcha	Same for all packages (I,II, & III)	15,000.00	282,000.00
Total:				3,478,000.00

- The following correspondences apparently indicated failure of the Pavement works for Packages II and III valuing Nu. 26.490 million and additional compensation payment of Nu. 3.593 million in addition to the insurance claim of Nu. 19.453 million.
 - DoR/CE(TMT)/2015-16/8 date 1st June 2016
 - CCCPL/ROL-(III)/Works-09/2016-2017/002 dated 7th January 2017
 - DoR/Lobeysa/construction Division(09)/2016-2017/037 dated 24th January 2017
 - CCCPL/ROL-(II)/Works-07/2016-2017/049 dated 13th April 2017
 - DoR/CE(CD)/2016-2017/W-7/3795 dated 17th April 2017
 - DoR/CD/7/2016-2017/4059 dated 26th June 2017
 - DoR/CD/28/2017-2018/4245 dated 8th August 2017

The failure of such magnitude of pavement works is a clear evidence of non-deployment of separate HR by the contractor as well as laxity on the part of the Regional Office and MLTC in allowing the contractor to execute three packages with the same HR for all the three works.

2.13.2 Langkena-Tekizampa (Package V) executed by M/s Etho Metho Construction Pvt. Ltd (RO, Lobeysa)

Table 2.13.2:HR requirement/employed as per bidding documents				HR as per physical verification at site			
Sl. No.	Key Personnel Required	Qualification Required	Nos.	Nos.	Key Personnel Stated in Proposal	Present at site Qualification & Experience	Remarks
1	Project Manager	Degree in any field or Diploma in Civil Engineering	1	1	J.D Karchung	Sonam Dorji, Degree in Tourism	
2	Project Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	1	Ashok Maheswari	Nil	Not present at site
3	Material Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	1	Phuntsho Wangdi Diploma in Civil Engg		Not present at site
4	Junior Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	1	Kinley Penjor	Bhawana, Degree in Civil Engg	
5	Surveyor	Diploma in Survey or trained surveyors	1	1	Mr. Gurung	Surya Bdr Chettri	
6	Lab Technician	Class X pass with experience	1	1	Kinley Chopel	Choki, Class X passed	
7	Site Supervisors	VTI Graduate or equivalent with more	1	1	Sangay Phuntsho	Lok Bdr	

		than 2 years' experience					
8	Site Supervisors	VTI Graduate or equivalent with more than 2 years' experience	1	1	Tshering Tobgay	Pema Wangchuk	

- The site engineer was also not aware of unauthorized replacements
- The Project Engineer and Material Engineer were not at site during physical verifications.

The Regional Office should work out the penalty amounts as per the above-referred clause for non-deployment of project engineer and other key personnel and accordingly deposit into Audit Recoveries Account.

2.13.3 Pelela to Bumilo (Package VIII) executed by M/s Empire Construction Pvt. Ltd, recoverable penalty Nu. 1,125,000.00 (RO, Lobeysa)

Designation	Name & CID at site	Qualification	Working Experience	Remarks
Project Manager	Ugyen Dorji, CID No. 11909000813			Documents produced for Dawa Tenzin, graduate of 2008, but person available at site is Ugyen Dorji
Project Engineer	Lobzang Chodup, CID No. 11007001278	Degree	May - 2014 - 2016 (2 yrs)	Not meeting the criteria
Material Engineer	Kinga, CID No. 10306001264	Diploma	9 years	
Junior Engineer	Yejay, CID No. 11506005017	Diploma	pass out in 29.6.15 from JNEP	Not meeting the criteria
Surveyor	Sonam Tshering, CID No. 11909000811	Certificate in survey		Not at site
Laboratory Tech.	Jigme Dawa, CID No. 11405001432	12 pass	5 years	Not at site
Work Supervisor	Jigme Wangdi, CID No. 11806001347			Documents not produced
Work Supervisor	1. Sonam Tshewang, CID No. 10904000060	VTI	3 years	Not at site

- Set of key personnel committed in the bid documents were replaced without meeting the criteria stated in the GCC and without appropriate approvals of the client.
- During physical verification conducted at site, Mr. Ugyen Dorji, bearing CID No. 11909000813 present at work site was stated as Project Manager. However, the available documents submitted by the company for verification showed Mr. Dawa Tenzin, bearing CID No. 11007001276 as Project Manager.
- The Project Engineer & Junior Engineer were replaced by personnel having less working experience. The Project Engineer has 1-year working experience (i.e. 2015 with M/s D Builders) and Mr. Yejay, JE had just passed out from JNP, Deothang.
- The contractor had failed to deploy the Surveyor, Laboratory Technicians and one work supervisor, as they were not available at site.

The Site Engineer had failed to enforce the contract Clause SCC 10.1 of the GCC on the deduction of amounts as specified in the SCC for absence of officials at site as computed below:

Particular of HR	Penalty amount /month (Nu)	Amount	Remarks
Surveyor	15,000.00	375,000.00	Deduction for 25 months
Laboratory Technician	15,000.00	375,000.00	Deduction for 25 months
Work Supervisor	15,000.00	375,000.00	Deduction for 25 month
Total:		1,125,000.00	

2.13.4 Pelela to Dungdungnesa (Package XI) executed by M/s Hi-Tech Company Pvt. Ltd and recoverable penalty Nu. 2,125,000.00 (RO, Lobeysa)

HR requirement/employed as per bidding documents				HR Committed	HR recruited at site	
Sl. No.	Key Personnel Required	Qualification Required	Nos.	Key Personnel Stated in Proposal	Present at site Qualification & Experience	Remarks
1	Project Manager	Degree in any field or Diploma in Civil Engineering	1	Kharka Prasad Upreti	Tshewang Norbu, Diploma in civil Eng.	Owner
2	Project Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	Tshewang Norbu, Diploma	Mon Bhadur Subba,	Not at site
3	Material Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	Karma Renzin	Not available	-
4	Junior Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	Pema Wangchey	Karchung, Diploma in civil	
5	Surveyor	Diploma in Survey or trained surveyors	1			
6	Lab Technician	Class X pass with experience	1			
7	Site Supervisors	VTI Graduate or equivalent with more than 2 years' experience	1	Mon Bdr. Mongar	Sherub, VTI	
8	Site Supervisors	VTI Graduate or equivalent with more than 2 years' experience	1	Not mentioned	Not available	

- Set of key personnel committed in the bid documents were changed without meeting the criteria stated in the GCC and made without approval of appropriate authority.
- During physical verification conducted at site, except the site supervisor, all the HR personnel were engaged on Gasa Secondary National Highway (SNH) work site.
- The contractor had failed to deploy separate personnel for two different contract works.
- All the committed key personnel were replaced with lesser qualification and working experiences.
- The contractor had not deployed the Material Engineer, Surveyor, Laboratory Technicians and one work supervisor

The Site Engineer had failed to enforce the contract Clause SCC 10.1 of the GCC on the deduction of amounts as specified in the SCC for absence of officials at site as computed below:

Table 2.13.4.1: Deductions		
Particular of HR	Penalty amount /month (Nu)	penalty amount for the duration of the contract 25 months
Materials Engineer	40,000.00	1,000,000.00
Laboratory Technician	15,000.00	375,000.00
Surveyor	15,000.00	375,000.00
Site Supervisor	15,000.00	375,000.00
Total:		2,125,000.00

2.13.5 Razhau to Nobding (Package XIII) executed by M/s U.P Construction Pvt. Ltd and recoverable penalty Nu. 1,190,000.00 (RO, Lobeyasa)

- The contractor had failed to recruit Material Engineer, Lab-Technician and Site supervisor as committed in the contract documents.
- The site engineer was not aware of absence of HR personnel at site.
- The Site Engineer had failed to enforce the contract Clause SCC 10.1 of the GCC on the deduction of amounts as specified in the SCC for absence of officials at site as computed below:

Table 2.13.5: Deductions		
Particular of HR	Penalty amount /month (Nu)	penalty amount for the duration of the contract 17 months
Materials Engineer	40,000.00	680,000.00
Laboratory Technician	15,000.00	255,000.00
Site Supervisor	15,000.00	255,000.00
Total:		1,190,000.00

RO, Trongsa

2.13.6 Chuserbu to Nyelazam (Package 1) executed by M/s Rigsar Construction Pvt. Ltd- recoverable penalty - Nu.195,000.00 (RO, Trongsa)

Table 2.13.6: HR requirement/employed as per bidding documents				HR recruited at site			
Sl. No.	Key Personnel Required	Qualification Required	Nos.	Nos.	Key Personnel Stated in Proposal	Present at site Qualification & Experience	Remarks
1	Project Manager	Degree in any field or Diploma in Civil Engineering	1	1	Pema Khenrub, B.Com 10yrs	Sonam Chogyel BA with 23 years' experience	Not at site
2	Project Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	1	Jampel, BE Civil, 7yrs	Nidup Chong, BE civil with 12 years' experience	Not at site, and also the project engineer was overseeing all the 3 packages

							awarded to the firm
3	Material Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	1	Sachitra Pokhrel, BE Civil	Phuntsho Wangdi, BE Civil 3years experience	
4	Junior Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	1	Ram Bhadur Rai, Diploma in civil	Namgay Tshering, Diploma in Civil with 3 years' experience	
5	Surveyor	Diploma in Survey or trained surveyors	1	1	Phuntsho, Diploma in Civil	Puran Ghalley Class XII with locally trained surveyor with 7 years' experience	
6	Lab Technician	Class X pass with experience	1	1	Tashi Dorji, Class X passed	Tashi Dorji, Class X	Not at site
7	Site Supervisors	VTI Graduate or equivalent with more than 2 years' experience	1	1	Dechen Yangden, VTI graduate	Sacha, Class 12 with 7 years' experience	
8	Site Supervisors	VTI Graduate or equivalent with more than 2 years' experience	1	1		Thinley Yoezer, X pass with 9 years' experience	

- All committed key personnel except Lab Technician, Tashi Dorji, were substituted with different sets of key personnel without approval.
- Project Manager, Project Engineer and Lab-Technician were not at work site during the physical verification of key personnel.
- The Site Engineer, RO was also not aware of unauthorized replacements and absence of the Project Engineer.
- Mr. Nidup Chong, the Project Engineer was handling all the three 3 packages awarded to the firm

The Site Engineer had failed to enforce the contract Clause SCC 10.1 of the GCC on the deduction of amounts as specified in the SCC for absence of officials at site as computed below:

Particular of HR	Penalty amount /month (Nu)	Amount	Remarks
Project Manager	50,000.00	150,000.00	Deduction for 3 months
Laboratory Technician	15,000.00	45,000.00	Deduction for 3 months
Project Engineer			Separately worked out under different audit memo
Total:		195,000.00	

2.13.7 Nyelazam to Sakachawa (Package 2) executed by M/s Gaseb Construction Pvt. Ltd (RO, Trongsa)

Table 2.13.7: HR committed as per Agreement			Present at Work site on		
Sl/No	Name of HR Personnel with Designation	Qualification &No. of years' experience	Name of HR Personnel with Designation	Qualification &No. of years' experience	Remarks
1	Kumar Poudyel, Project Manager	Degree in Civil engg. 25 years	Not present		Stated on leave
2	Sonam Kuenga Tshering, PE	Master in Geitech & Degree in CE, 24 years	Saji Thomas	Diploma in civil engg. 23 years	
3	Kinley Wangchuk, ME	Degree in Civil Engg	Indraman Limby	Diploma in Civil engg. 2.5 years	
4	Saji Thomas, JE	Diploma in civil engg. 23 years	Bhim Kumar Gurung, SE	Diploma in civil engg. No experience	
5	Doten, Surveyor	Degree in civil engg. Trained surveyor	No present		
6	Yam Kumar Pradhan, laboratory	Class 12 passed out	Not present		
7	Tandin Wangchuk	VTI Graduate	Bhim Mukha, VTI	6 years	
8	Tshering	VTI Graduate	Tshering	3 years	

- All committed key personnel except three personnel were substituted with different sets of key personnel without approval.
- Project Manager, Material Engineer, Surveyor and Lab-Technician were not present at work site during the physical verification of key personnel.
- The Site Engineer, RO was also not aware of unauthorized replacements and absence of the key personnel
- Mr. Saji Thomas, JE, Diploma in civil engineering with 23 years of experiences was designated as Project Engineer in place Mr. Sonam Kuenga Tshering, PE with Master in Geitech & Degree in CE, having 24 years experiences.

2.13.8 Sakachawa to Tsangkha (Package 3) executed by M/s Rinson Construction Pvt. Ltd –recoverable penalty Nu. 1,765,000.00 (RO, Trongsa)

Table 2.13.8: HR requirement/employed as per bidding documents				HR recruited at site			
Sl. No	Key Personnel Required	Qualification Required	Nos	Nos	Key Personnel Stated in Proposal	Present at site Qualification & Experience	Remarks
1	Project Manager	Degree in any field or Diploma in Civil Engineering	1	1	Tity Varu Ghese, Degree in civil, 29 yrs.	Rinzin Dorji Diploma in Electrical	Not qualified to become Project Manager
2	Project Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	1	Sonam Dorji, Dip. In civil, 19 yrs.	Sonam Dorji, Dip. In civil, 19 yrs.	
3	Material Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	1	Tara Rai, Dip. In civil, 14 yrs.	No.	-
4	Junior Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	1	Pema Dorji Wangdi, Diploma in civil	No	

5	Surveyor	Diploma in Survey or trained surveyors	1	1	Kumar Pradhan, Surveyor	Kumar Pradhan, Surveyor	
6	Lab Technician	Class X pass with experience	1	1	Lachimi Narayan	Thinley Tenzin...General Degree	
7	Site Supervisors	VTI Graduate or equivalent with more than 2 years' experience	1	1	Wangchuk, VIT, 8 yrs.	Wangdi. Class VIII passed	Inexperienced for site supervision
8	Site Supervisors	VTI Graduate or equivalent with more than 2 years' experience	1	1	Rinzin Dorji, VTI, 8 yrs.	Surjaman Rai, Class 12 passed	Inexperienced for site supervision

- Material Engineer and Junior Engineer not recruited.
- The Project Manager and Site Supervisors were substituted with lesser qualification and experiences.
- Except the Project Engineer and Surveyor, all other committed Key personnel were replaced without approval.

The Site engineer not aware of absence of HR personnel at site. The Site Engineer had failed to enforce the contract Clause SCC 10.1 of the GCC on the deduction of amounts as specified in the SCC for absence of officials at site as computed below:

Particular of HR	Penalty amount /month (Nu)	Amount	Remarks
Materials Engineer	40,000.00	240,000.00	Deduction for 6 months
Project Manager	50,000.00	1,500,000.00	Deduction for 30 months
Junior Engineer	25,000.00	25,000.00	Deduction for 1 month
Total:		1,765,000.00	

2.13.9 Tshangkha to View Point (Package 4) executed by M/s Gyalcon Infrastructure Pvt. Ltd-recoverable penalty Nu. 750,000.00 (RO, Trongsa)

Sl/ No	Name of HR Personnel with Designation	Qualification &No. of years' experience	Present at Work site on		
			Name of HR Personnel with Designation	Qualification &No. of years' experience	Remarks
Jun 1	Thinley Dem, Project Manager	Master in Environment Engg.	Ugyen Dorji	Diploma in Civil Engg	Replaced with low qualifications
2	Ugyen Dorji, PE	Diploma in Civil Engineering	Mewash Gurung	Degree in Civil Engg	only 1 and ½ years' experience
3	Passang Dorji, ME	Diploma in Civil Engineering	Tshering Dorji,	Diploma in Civil Engg. Years	Replaced with less work experience (Fresh graduate)
4	Kamal Chhetri, JE	Diploma in Civil Engineering			Not present
5	Kaamba Singh Singdhan, w/s	RBIT	GB Gurung	No qualification	Working experience 25 years
6	Rinzin Wangchuk, WS	VTI	Sonam Tobgay	12 passed	2 years

- Junior Engineer not recruited.
- The Project Manager and Site Supervisors were substituted with lesser qualification and experiences.
- All Committed Key Personnel were replaced without approval.
- The Site engineer not aware of absence of HR personnel at site.

The Site Engineer had failed to enforce the contract Clause SCC 10.1 of the GCC on the deduction of amounts as specified in the SCC for absence of officials at site as computed below:

Table 2.13.9.1: Penalty deductions			
Particular of HR	Penalty amount /month (Nu)	Amount	Remarks
Junior Engineer	25,000.00	750,000.00	Deduction for 30 months
Total:		750,,000.00	

2.13.10 View Point- BjeeZam (Package 5) executed by M/s Druk Lhayul Construction Pvt. Ltd-recoverable penalty Nu. 1,200,000.00 (RO, Trongsa)

Table 2.13.10: HR committed as per Agreement			Present at Work site on		
Sl/ No	Name of HR Personnel with Designation	Qualification &No. of years' experience	Name of HR Personnel with Designation	Qualification &No. of years' experience	Remarks
1	Karma Phuntsho, Project Manager	Degree in Civil Engineering, Experience around 15 years	Kuenzang Wangchuk, PM	BBA with 2.5 years	Replaced with no experience and required qualification
2	Choki Dorji, Material Engineer	Diploma in Civil Engineering, 15 years' Experience			Not deployed at site
3	Kinley Penjor, Junior Engineer	Diploma in Civil Engineering, 16 years' Experience	Sonam Dendup, JE	Diploma in Civil Engg. 3 years	Replaced with less work experience
4	Deo Prakash Rai, Project Engineer	Diploma in Civil Engineering, 16 years' Experience	Jigme Tashi, PE	B.Tech Civil, 1 year	Replaced with no experience and required qualification
5	Nil		Yeshe Wangmo, SS	Class X, 2 years	
6	Nil		Sunjok Subha, SS	Class X, 2 years	

- Material Engineer not recruited.
- The Project Manager, Project Engineer and Junior Engineer were substituted with lesser qualification and experiences.
- All Committed Key Personnel were replaced without approval.
- The Site engineer not aware of absence of HR personnel at site.

The Site Engineer had failed to enforce the contract Clause SCC 10.1 of the GCC on the deduction of amounts as specified in the SCC for absence of officials at site as computed below:

Table 2.13.10.1: Penalty deductions	
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Particular of HR	Penalty amount /month (Nu)	Amount	Remarks
Material Engineer	40,000.00	1,200,000.00	Deduction for 30 months
Total:		1,200,000.00	

2.13.11 Bjeezam- Trongsa (Package 6) executed by M/s Raven Builders & Company Pvt. Ltd recoverable penalty Nu. 3,210,000.00 (RO, Trongsa)

Table 2.13.11: HR requirement /employed as per bidding documents				HR recruited at site			
Sl. No	Key Personnel Required	Qualification Required	Nos	Nos	Key Personnel Stated in Proposal	Present at site Qualification & Experience	Remarks
1	Project Manager	Degree in any field or Diploma in Civil Engineering	1	1	Sangay Dorji, B.Com, 11years expel	Phub Tshering, Diploma in Civil	Fresh graduate
2	Project Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	1	Dorji Tshering, BE Civil, 35 yrs	-	Not present
3	Material Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	1	Tenzin Wangdi, BE Civil, 15 yrs	-	Not present since start of the project
4	Junior Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	1	Kinley, Diploma in Civil, 7yrs	Yogita, B.E Civil	
5	Surveyor	Diploma in Survey or trained surveyors	1	1	Sonam Phuntsho, Survey Engg	-	Not present
6	Lab Technician	Class X pass with experience	1	1	Cheku, Class 12 passed, 7yrs	-	Not present since start of the project
7	Site Supervisor	VTI Graduate or equivalent with more than 2 years' experience	1	1	Choten, VTI Civil, 4yrs	Karma Tshomo, VTI, 1year graduate	
8	Site Supervisor	VTI Graduate or equivalent with more than 2 years' experience	1	1	Neten Dorji, VTI Civil, 5yrs	-	Not present since September 2017

- The Project Manager was found substituted with fresh graduate.
- All Committed Key Personnel were replaced without approval.
- Except Project Manager, Junior Engineer and one site supervisor, all other key personnel were not present at work site during the physical verification of key personnel's
- The Site engineer not aware of absence of HR personnel at site.

The Site Engineer had failed to enforce the contract Clause SCC 10.1 of the GCC on the deduction of amounts as specified in the SCC for absence of officials at site as computed below:

Particular of HR	Penalty amount /month (Nu)	Amount	Remarks
Project Engineer	50,000.00	1,500,000.00	Deduction for 30 months
Materials Engineer	40,000.00	1,200,000.00	Deduction for 30 months
Project Manager	50,000.00	-	
Junior Engineer	25,000.00	-	
Laboratory Technician	15,000.00	450,000.00	Deduction for 30 months
Site Supervisor	15,000.00	60,000.00	Deduction for 4 months
Total:		3,210,000.00	

2.13.12 Pinzhi-Tashipokto (PKG-8) executed by M/s. Dungkar Construction Pvt Ltd. Thimphu -recoverable penalty Nu. 5,180,000.00 (RO, Trongsa)

Sl/ No	Name of HR Personnel with Designation	Qualification &No. of years' experience	Present at Work site on		
			Name of HR Personnel with Designation	Qualification &No. of years' experience	Remarks
1	Sherab Penjor, Project Manager	B.Com (computer Science)			Not present at site
2	Om Kumar Pradhan, project Engineer	Diploma in Civil Engineering			Not present at site
3	MD. Alludin Aanasari, Material Engineer	Degree in Civil Engineering			Not present at site
4	Yonten Dorji, Laboratory	Class 12 passed			Not present at site
5	Patitapaban Jagamohan, Junior Engineer	Diploma in Civil Engineering	Sanvir Singh, Junior Engineer	Diploma in Civil Engineering	
6	Karma Wangchuk, Work Supervisor	VTI Graduate			Not present at site
7	Pema Lethro, Work supervisor	VTI Graduate			Not present at site

- All Committed Key Personnel were either not recruited or deployed for the three packages
- Except Junior Engineer, all other key personnel were not present at work site during the physical verification of key personnel's
- The Site engineer not aware of absence of HR personnel at site.

The Site Engineer had failed to enforce the contract Clause SCC 10.1 of the GCC on the deduction of amounts as specified in the SCC for absence of officials at site as computed below:

Sl/No	Name of HR Personnel with Designation	Penalty deductible per month Nu.	No. of months	Amount Nu.
1	Sherab Penjor, Project Manager	50,000.00	28	1,400,000.00
2	Om Kumar Pradhan, project Engineer	50,000.00	28	1,400,000.00
3	MD. Alludin Aanasari, Material Engineer	40,000.00	28	1,120,000.00
4	Yonten Dorji, Laboratory	15,000.00	28	420,000.00
5	Karma Wangchuk, Work Supervisor	15,000.00	28	420,000.00
6	Pema Lethro, Work supervisor	15,000.00	28	420,000.00
Total				5,180,000.00

2.13.13 Tashipokto to Dorjigonpa (Package 9) executed by M/s Welfare Construction Pvt. Ltd-recoverable penalty Nu. 2,665,000.00 (RO, Trongsa)

Table 2.13.13: HR requirement/employed as per bidding documents				HR recruited at site			
Sl. No	Key Personnel Required	Qualification Required	Nos	Nos	Key Personnel Stated in Proposal	Present at site Qualification & Experience	Remarks
1	Project Manager	Degree in any field or Diploma in Civil Engineering	1	1	Tshelthrim Dukar, Degree in science, 10yrs	Dradul, Degree in geology	Not present since December 2017
2	Project Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	1	Sujith N.S, Diploma in C.Egg, 10yrs	Karma, B.E Civil, 18yrs	
3	Material Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	1	Chandra Kumar Giri, Diploma in C.Egg, 7yrs	Nil	Not present since start of project
4	Junior Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	1		Nil	Was at site only for 5 months
5	Surveyor	Diploma in Survey or trained surveyors	1	1	DD Gurung, Certificate in Surveying, 20yrs	Nil	Not present since start of project
6	Lab Technician	Class X pass with experience	1	1	Mon Maya Tamang, Class X, 10yrs	Nil	Not present since start of project
7	Site Supervisors	VTI Graduate or equivalent with more than 2 years' experience	1	1	Yeshey Kuenzang, VTI, 7yrs	Tshering Dorji,	Not at site since December 2017
8	Site Supervisors	VTI Graduate or equivalent with more than 2 years' experience	1	1	Pema Tshering, Class 12, 10yrs	Nil	Not present since start of project

- Committed Key Personnel viz. Material Engineer, Surveyor, Lab Technician and One Site Supervisor were not recruited since the start of the contract works
- Project Manager, Project Engineer and One Site Supervisor though deployed were substitute of committed key personnel and were replaced without approval and verification of qualifications and experiences
- Project Manager and One Site Supervisor was stated to have been deployed but were not present since December 2017.
- Junior Engineer stated to have been deployed for just 5 months
- The Site engineer not aware of absence of HR personnel from the site.

The Site Engineer had failed to enforce the contract Clause SCC 10.1 of the GCC on the deduction of amounts as specified in the SCC for absence of officials at site as computed below:

Table 2.13.13.1: Penalty deductions			
Particular of HR	Penalty amount /month (Nu)	Amount	Remarks
Project Manager	50,000.00	100,000.00	Deduction for 2 months
Material Engineer	40,000.00	1,120,000.00	Deduction for 28 months
Junior Engineer	25,000.00	575,000.00	Deduction for 23 months
Lab Technician	15,000.00	420,000.00	Deduction for 28 months
Site Supervisor I	15,000.00	30,000.00	Deduction for 2 months
Site Supervisor II	15,000.00	420,000.00	Deduction for 28 months
Total:		2,665,000.00	

2.13.14 Dorji Gonpa to Yotongla (Package 10) executed by M/s Rinson Construction Pvt. Ltd-recoverable penalty Nu. 2,670,000.00 (RO, Trongsa)

Table 2.13.14: HR requirement/employed as per bidding documents				HR recruited at site			
Sl. No	Key Personnel Required	Qualification Required	Nos	Nos	Key Personnel Stated in Proposal	Present at site Qualification & Experience	Remarks
1	Project Manager	Degree in any field or Diploma in Civil Engineering	1	1	Angela Alexander, B.Com, 8yrs	Tara Rai, Diploma in Civil	On leave
2	Project Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	1	Tity Varu Ghese, Degree in civil, 29 yrs.	Ugyen, B.E.Civil	On leave
3	Material Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	1	Tara Rai, Diploma in Civil, 14yrs	Jigme Wangchuk, Diploma in Civil, 2yrs	
4	Junior Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	1	Sonam Dorji, Diploma in Civil, 19yrs	Som Bdr Rai, Diploma in Civil, 1 yr	Transferred to Package 13
5	Surveyor	Diploma in Survey or trained surveyors	1	1	Pema Namgyel, Class 12	Nil	Not present since start of project
6	Lab Technician	Class X pass with experience	1	1	Bir Bdr Adikari, VTI	Nil	Not present since start of project
7	Site Supervisors	VTI Graduate or equivalent with more than 2 years' experience	1	1	Rinzin Dorji, RBIT pass, 8yrs	Wangdi, 10yrs	Only present for 4 months
8	Site Supervisors	VTI Graduate or equivalent with more than 2 years' experience	1	1	Wangchuk, VTI, 3 yrs	Nil	Not present since start of project

- Committed Key Personnel viz. Surveyor, Lab Technician and One Site Supervisor were not recruited since the start of the contract works

- All key personnel deployed at work site were substitutes of committed key personnel and replaced without approval and verification of qualifications and experiences
- Project Manager, Project Engineer and One Site Supervisor was stated to have been deployed but were either on leave and not present at work during the physical verifications of the key personnel
- One Site Supervisor was stated to have been deployed for just 4 months
- Junior Engineer was not present at work site during physical verification but stated to have been transferred to Package 13.
- The Site engineer not aware of absence of HR personnel from the site.

The Site Engineer had failed to enforce the contract Clause SCC 10.1 of the GCC on the deduction of amounts as specified in the SCC for absence of officials at site as computed below:

Particular of HR	Penalty amount /month (Nu)	Amount	Remarks
Junior Engineer	25,000.00	50,000.00	Deduction for 2 months
Lab Technician	15,000.00	435,000.00	Deduction for 29 months
Surveyor	15,000.00	375,000.00	Deduction for 29 months
Site Supervisor I	15,000.00	375,000.00	Deduction for 25 months
Site Supervisor II	15,000.00	435,000.00	Deduction for 29 months
Total:		2,670,000.00	

2.13.15 Yotongla to Bongzam (Package 11) executed by M/s Dungkar Construction Pvt. Ltd- recoverable penalty Nu. 6,440,000.00 (RO, Trongsa)

SL. No.	Position	Name of personnel	Qualification	No.	Status at site during physical verification
1	Project Manager	Ms. Pema Lhadon	Degree in any field OR Diploma in Civil Engineering	1	No separate HR deployed at site but HR same as HR deployed for Contract Package XII
2	Project Engineer	Mr. Prasant Kumar	Degree in civil Engineering OR Diploma in Civil Engineering	1	
3	Material Engineer	Mr. Namgay Dorji	Degree in Civil Engineering OR Diploma in Civil Engineering	1	
4	Engineer/Junior Engineer	Not provided	Degree in Civil Engineering OR Diploma in Civil Engineering	1	
5	Surveyor	Ms. Sonam Zam	Diploma in Survey Or trained surveyors	1	
6	Laboratory Technician	Mr. Sonam Tashi	Class X pass with experience	1	
7	Work/Site supervisor	Mr. Namdak Rinchen	VTI graduate	2	
	Work/Site supervisor	Not Provided	VTI graduate		

- No separate HR deployed at site but same HR deployed for Contract Package XII were used for the management of the contract works
- The Site engineer and RO had failed to ensure deployment of separate HR personnel for the contract package

The Site Engineer had failed to enforce the contract Clause SCC 10.1 of the GCC on the deduction of amounts as specified in the SCC for absence of officials at site as computed below:

Particular of HR	No.	Penalty amount /month (Nu)	Penalty amount for the duration of the contract 28 months (XI)	Remarks
Project Engineer	1	50,000.00	1,400,000.00	On Completion of works, the RO should work out and recover the deductions for the extended contract periods
Materials Engineer	1	40,000.00	1,120,000.00	
Project Manager	1	50,000.00	1,400,000.00	
Junior Engineer	1	25,000.00	700,000.00	
Surveyor	1	20,000.00	560,000.00	
Laboratory Technician	1	15,000.00	420,000.00	
Site Supervisor	2	15,000.00	840,000.00	
Total:			6,440,000.00	

2.13.16 Bongzam to Gyatsa Zam (Package 12) by M/s Dungkar Construction Pvt. Ltd- recoverable penalty Nu. 2,380,000.00 (RO, Trongsa)

Table 2.13.16: Human Resource required as per ITB 4.3 (e) of Section II, Bidding Data sheet						Status at site during physical verification
SL. No.	Position	Qualification	Name of personnel	Qualification	No.	No separate HR deployed at site but HR same as HR deployed for Contract Package XI
1	Project Manager	Qualification	Ms. Pema Lhadon	BA Eco	1	
2	Project Engineer	Degree in any field OR Diploma in Civil Engineering	Mr.Prasant Kumar	Degree in civil Engineering	1	
3	Material Engineer	Degree in civil Engineering OR Diploma in Civil Engineering	Mr. Namgay Dorji	Diploma in Civil Engineering	1	
4	Engineer/Junior Engineer	Degree in Civil Engineering OR Diploma in Civil Engineering	Not provided		1	
5	Surveyor	Degree in Civil Engineering OR Diploma in Civil Engineering	Ms. Sonam Zam	Bachelor in Architecture	1	
6	Laboratory Technician	Class X pass with experience	Mr. Sonam Tashi	Degree in Electrical Engineering	1	
7	Work/Site supervisor	VTI graduate	Mr. Namdak Rinchen	Class XII passed	2	
			Not Provided			

- No separate HR deployed at site but same HR deployed for Contract Package XII were used for the management of the contract works
- All key personnel deployed at work site were substitutes of committed key personnel and replaced without approval and verification of qualifications and experiences
- Material engineer, Laboratory Technician and two Work Site Supervisors, if deployed, were not present at work site during the physical verification of the key personnel conducted on 3rd January 2018.
- The Site engineer and RO had failed to ensure deployment of separate HR personnel for the contract package .

The Site Engineer had failed to enforce the contract Clause SCC 10.1 of the GCC on the deduction of amounts as specified in the SCC for absence of officials at site as computed below:

Table 2.13.16.1: Human Resource required as per ITB 4.3 (e) of Section II, Bidding Data sheet					HR personnel available at site		
Sl/ No	Position	Name of personnel	Qualification	No.	Name & Qualification	Penalty Amount (Nu.)	Remarks
1	Project Manager	Ms. Pema Lhadon	BA Eco	1	Tharpa Tashi, Ph.D Economics		Present
2	Project Engineer	Mr.Prasant Kumar	Degree in civil Engineering	1	Prabat Rai, Master in Engg.		Present
3	Material Engineer	Mr. Namgay Dorji	Diploma in Civil Engineering	1		Nu. 1,120,000.00 (i.e.,40,000.00 * 28)	Not present
4	Engineer/Junior Engineer	Not provided		1	Dipak Galey, Diploma in Civil Engg.		Present
5	Surveyor	Ms. Sonam Zam	Bachelor in Architecture	1	Ms. Sonam Zam		Present
6	Laboratory Technician	Mr. Sonam Tashi	Degree in Electrical Engineering	1		Nu. 420,000.00(i.e. , 15,000.00 *28)	Not present
7	Work/Site supervisor	Mr. Namdak Rinchen	Class XII passed	2		Nu.840,000.00 (i.e.,15,000.00 *28*2)	Not present
			Total			2,380,000.00	

2.13.17 Gyatsazam to Ngangar (Package 13) executed by M/s Rinson Construction Pvt. Ltd-recoverable penalty Nu. 2,240,000.00 (RO, Trongsa)

Table 2.13.17: HR requirement/employed as per bidding documents				HR recruited at site			
Sl. No.	Key Personnel Required	Qualification Required	Nos.	Nos.	Key Personnel Stated in Proposal	Present at site Qualification & Experience	
1	Project Manager	Degree in any field or Diploma in Civil Engineering	1	1	Angela Alexander, BCom., 8 years	Tashi Norbu, Diploma in civil, 8 years	

2	Project Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	1	Tity Varu Ghese, Degree in civil, 29 yrs.	Som Raj Rai, Diploma in civil, 1 yr.
3	Material Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	1	Tara Rai, Dip. In civil, 14 yrs.	No.
4	Junior Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	1	Sonam Dorji, Dip. In civil, 19 yrs.	No
5	Surveyor	Diploma in Survey or trained surveyors	1	1	Pema Namgyel, class XII with certificate	No
6	Lab Technician	Class X pass with experience	1	1	Bir Bdr. Adhikari, VTI, 15 yrs.	No
7	Site Supervisors	VTI Graduate or equivalent with more than 2 years' experience	1	1	Wangchuk, VIT, 8 yrs.	Wangchuk, VIT, 8 yrs.
8	Site Supervisors	VTI Graduate or equivalent with more than 2 years' experience	1	1	Rinzin Dorji, VTI, 8 yrs.	Sher Bdr. Tamang, work experience

- Committed Key Personnel viz. Material Engineer, Junior Engineer, Surveyor, Lab Technician were not recruited since the start of the contract works
- All key personnel except One Site Engineer deployed at work site were substitutes of committed key personnel and replaced without approval and verification of qualifications and experiences
- The Site engineer not aware of absence of HR personnel from the site.

The Site Engineer had failed to enforce the contract Clause SCC 10.1 of the GCC on the deduction of amounts as specified in the SCC for absence of officials at site as computed below:

Particular of HR	Penalty amount /month (Nu)	28 months (Nu.)
Materials Engineer	40,000.00	1,120,000.00
Laboratory Technician	15,000.00	420,000.00
Junior Engineer	25,000.00	700,000.00
Total:		2,240,000.00

2.13.18 Sonam Kuenphen to Hurjee (Package 14) executed by M/s Lamnekha Construction Pvt. Ltd-recoverable penalty Nu. 1,050,000.00 (RO, Trongsa)

HR requirement/employed as per bidding documents				HR recruited at site			
Sl. No	Key Personnel Required	Qualification Required	Nos.	Nos.	Key Personnel Stated in Proposal	Present at site Qualification & Experience	Remarks
1	Project Manager	Degree in any field or Diploma in Civil Engineering	1	1		Tshering Wangdi, Ex- policemen	No qualification
2	Project Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	1		Yonten Tobgay, Degree in civil	

3	Material Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	1		No	-
4	Junior Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	1		Karma Tsundru, Diploma in Civil	
5	Surveyor	Diploma in Survey or trained surveyors	1	1		No	
6	Lab Technician	Class X pass with experience	1	1		No	
7	Site Supervisors	VTI Graduate or equivalent with more than 2 years' experience	1	1		Tshering Dorji, VIT	

- The RO and the project manager had failed to produce the companies' profile. In the absence of which the committed key personnel in the proposal, tender as well as in put in e-tool could not be verified in audit.
- The Project Manager should have bachelor degree in any field with 7 years' experience or diploma in civil engineer with 10 years' work experience but had deployed ex-policeman and no profile of the official was made available on record.
- Key personnel viz. Material Engineer, Junior Engineer & Lab-Technician were not recruited since the start of the contract works.

The Site Engineer had failed to enforce the contract Clause SCC 10.1 of the GCC on the deduction of amounts as specified in the SCC for absence of officials at site as computed below:

Particular of HR	Penalty amount /month (Nu)	15 months (Nu.)
Materials Engineer	40,000.00	600,000.00
Surveyor	15,000.00	225,000.00
Laboratory Technician	15,000.00	225,000.00
Total:		1,050,000.00

RO, Lingmethang

2.13.19 Korila-Pangser (Package-2) executed by M/s. Tshering Construction Pvt Ltd. Bumthang (RO, Lingmethang)

The status of key personnel required and committed by the Contractor as per bidding document are as tabulated below:

S l. N o .	Key Personnel Required	Qualification Required	Number require	Name of committed personal	Qualification

1	Project Manager	Degree in any field with 1 to 7 years or more work experience or Diploma in Civil Engineering with 3 to 10 years or more work experience and Any other qualification	1	Sonam Jamtsho	Bachelors in Commerce
2	Project Engineer	Degree in Civil Engineering and and with 1 to 5 years or more work experience or Diploma in Civil Engineering and also with 3 to 10 years or more work experience in road/bridge works and Any other qualification	1	Karsang Norbu	Post graduate diploma in water supply and treatment engineering
3	Material Engineer	Degree in Civil Engineering with 3 to 5 years' experience or Diploma in Civil Engineering with 3 to 10 years' experience and Any other qualification	1	Binod Rana Mongar	Degree in Civil Engg
4	Junior Engineer	Degree in Civil Engineering or Diploma in Civil Engineering with experience 5 to 10 years or more other than road work	1	Vinod Kumar Lal	Diploma in Civil Engg
5	Surveyor	Diploma in Survey and also with 3 to 7 or more work experience or Certified/trained surveyor with 1 to 10 years or more work experience and Any other qualification	1	Dilli Ram Baraily	Diploma in Survey
6	Lab Technician	Class XII pas with 5 years experiences as lab technician or Class X pass with 3 to 5 years' experience as Lab Technician and Any other qualification	1	Nil	
7	Work/Site Supervisors	VTI Graduate or equivalent with 1 to 5 years or more work experience ans Any other level of qualification or experience	2	Tshitrim Dorji	Diploma in electrical
				Lham Chenzom	VTI

The status of key personnel committed as per bidding document and actual employment at work site as noted during the physical verification are as tabulated below:

Sl. No	Key Personnel Required	Name of the committed personal	Qualification	Personnel Engaged At Site as per record	Qualificatio n & Experience	Status during physical verification	Remarks
1	Project Manager	Sonam Jamtsho	Bachelors in Commerce	Sonam Jamtsho	Bachelors in Commerce	Present	
2	Project Engineer	Karsang Norbu	Post graduate diploma in water supply and treatment engineering	Jucdeep,	Degree in Civil	Not Present	Need to review the score assigned
3	Material Engineer	Binod Rana Mongar	Degree in Civil Engg	Phub Dorji,	Diploma in Civil, 1 year experience		Need to review the score assigned as replacement is by diploma holder as against Degree holder
4	Junior Engineer	Vinod Kumar Lal	Diploma in Civil Engg	Surja Ghalley,	Diploma in Civil, 2 years		Review experience of

							Vinod Kumar Lal and score assigned
5	Surveyor	Dilli Ram Baraily	Diploma in Survey	Nill		Not Available/engaged	
6	Lab Technician	Nill		Narayan,	Class 12 Passed		
7	Site Supervisors	Tshitrim Dorji	Diploma in electrical	Tashi Tshering,	VTI		Review the score assigned during evaluation
8	Site Supervisors	Lham Chenzom	VTI	Nill		Not available /engaged	

- Set of key personnel committed in the bid documents were replaced without meeting the criteria stated in the GCC and without appropriate approvals of the client.
- The contractor had failed to deploy the Surveyor, Laboratory Technicians and one work supervisor, as they were not available at site.

2.13.20 Pangser-Kilikhar (Package-3) executed by M/s. K. D Builder Pvt Ltd (RO, Lingmethang)

The status of key personnel required and committed by the Contractor as per bidding document are as shown in table 2.13.20 below:

Sl. No.	Key Personnel Required	Qualification Required	Number require	Name of committed personal	Qualification
1	Project Manager	Degree in any field with 1 to 7 years or more work experience or Diploma in Civil Engineering with 3 to 10 years or more work experience and Any other qualification	1	Dorji Wangda	B.Com, 8 years
2	Project Engineer	Degree in Civil Engineering and with 1 to 5 years or more work experience or Diploma in Civil Engineering and also with 3 to 10 years or more work experience in road/bridge works and Any other qualification	1	Chencho Tshering	Diploma in Civil Engg, 26yrs
3	Material Engineer	Degree in Civil Engineering with 3 to 5 years' experience or Diploma in Civil Engineering with 3 to 10 years' experience and Any other qualification	1	Prasenjit Mukhoadhyay	Diploma in Civil Engg, 23 yrs
4	Junior Engineer	Degree in Civil Engineering or Diploma in Civil Engineering with experience 5 to 10 years or more other than road work	1	Ranjan Kumar	Diploma in Civil Engg, 23 yrs
5	Surveyor	Diploma in Survey and also with 3 to 7 or more work experience or Certified/trained surveyor with 1 to 10 years or more work experience and Any other qualification	1	Nill	

6	Lab Technician	Class XII pas with 5 years experiences as lab technician or Class X pass with 3 to 5 years' experience as Lab Technician and Any other qualification	1	Kuenzang Wangmo	Class XII, 8 years
7	Work/Site Supervisors	VTI Graduate or equivalent with 1 to 5 years or more work experience ans Any other level of qualification or experience	2	Tshering	VTI, 8 years
				Sonam Choden	VTI, 7 years

The status of key personnel committed as per bidding document and actual employment at work site as noted during the physical verification is shown in table 2.13.20.1 below:

Sl. No.	Key Personnel Required	Name of committed personal	Qualification	Personnel Engaged At Site as per record	Qualification & Experience	Status during physical verification	Remarks
1	Project Manager	Dorji Wangda	B.Com, 8 years	Karma Dema	BBM	Present	Need to furnish documents to validate Experience met the requirement and score assigned during evaluation
2	Project Engineer	Chencho Tshering	Diploma in Civil Engg, 26yrs	Chencho Tshering	Diploma in Civil Engg	Present	
3	Material Engineer	Prasenjit Mukhoahyay	Diploma in Civil Engg, 23 yrs	Dorji Wangdi	Diploma in Civil Engg	Present	Need to furnish documents to validate Experience met the requirement and score assigned during evaluation
4	Junior Engineer	Ranjan Kumar	Diploma in Civil Engg, 23 yrs	Tenzin Norbu	BE Civil engg	Present	Need to furnished documents to validate Experience though replaced by a Degree holder.
5	Surveyor	Nil		Ram Chandra	Diploma in Survey	Present	Need to furnish documents to validate qualification and experience met the requirements
6	Lab Technician	Kuenzang Wangmo	Class XII, 8 years	Norbu	VTI	Present	Need to furnish documents to validate

							Experience met the requirement.
7	Work/Site Supervisors	Tshering	VTI, 8 years	Bikash Rai,	Class X passed	Present	Need to furnish documents to validate Experience met the requirement
		Sonam Choden	VTI, 7 years	Ganga Raj,	Class X passed	Present	Need to furnish documents to validate Experience met the requirement

Set of key personnel committed in the bid documents were replaced without meeting the criteria stated in the GCC and without appropriate approvals of the client.

2.13.21 Kilikhar to Mongar (Package 4) executed by M/s Gongphel Construction Pvt. Ltd

The status of key personnel required and committed by the Contractor as per bidding document are as tabulated in table 2.13.21 below:

Sl. No.	Key Personnel Required	Qualification Required	Number require	Name of committed personal	Qualification
1	Project Manager	Degree in any field with 1 to 7 years or more work experience or Diploma in Civil Engineering with 3 to 10 years or more work experience and Any other qualification	1	Dawa Rinchen	BA
2	Project Engineer	Degree in Civil Engineering and and with 1 to 5 years or more work experience or Diploma in Civil Engineering and also with 3 to 10 years or more work experience in road/bridge works and Any other qualification	1	Parimal Das Gupta	Diploma in Civil Engg
3	Material Engineer	Degree in Civil Engineering with 3 to 5 years' experience or Diploma in Civil Engineering with 3 to 10 years' experience and Any other qualification	1	Paltu Datta	Diploma in Civil Engg
4	Junior Engineer	Degree in Civil Engineering or Diploma in Civil Engineering with experience 5 to 10 years or more other than road work	1	Partha Partim Basu	Diploma in Civil Engg
5	Surveyor	Diploma in Survey and also with 3 to 7 or more work experience or Certified/trained surveyor with 1 to 10 years or more work experience and Any other qualification	1	A.K.Mohan an	Diploma in Civil Engg
6	Lab Technician	Class XII pas with 5 years experiences as lab technician or Class X pass with 3 to 5 years' experience as Lab Technician and Any other qualification	1	Pema Luwang	Class 12 passed
7	Work/Site Supervisors	VTI Graduate or equivalent with 1 to 5 years or more work experience ans Any other level of qualification or experience	2	Ugyen Tobgay	BBA
				Mon Bdr Rai	Class 6 pass

The status of key personnel committed as per bidding document and actual employment at work site as noted during the physical verification is shown in table 2.13.21.1 below:

Table 2.13.21.1: Key personnel at site							
Sl. No	Key Personnel Required	Number required	Name of committed personal	Qualification	Personnel Engaged At Site as per record/	Qualification & Experience	Remarks
1	Project Manager	1	Dawa Rinchen	BA	Dawa		
2	Project Engineer	1	Parimal Das Gupta	Diploma in Civil Engg	Sherab Phuntsho	Master in transportation engineering	Need to furnish documents to validate Experience met the requirement and score assigned during evaluation
3	Material Engineer	1	Paltu Datta	Diploma in Civil Engg	Jambay	BE Civil Engg	Need to furnish documents to validate Experience met the requirement and score assigned during evaluation
4	Junior Engineer	1	Partha Partim Basu	Diploma in Civil Engg	Parimal Das	Diploma in Civil Engg	Need to furnish documents to validate Experience met the requirement and score assigned during evaluation
5	Surveyor	1	A.K.Mohanan	Diploma in Civil Engg	AK Mohanan		Need to furnish documents to validate Experience met the requirement and score assigned during evaluation
6	Lab Technician	1	Pema Luwang	Class 12 passed	Divanath Sharma	Class X passed	Need to furnish documents to validate Experience met the requirement and score assigned during evaluation
7	Work/Site Supervisors	2	Ugyen Tobgay	BBA	Kinley Penjor,	Class X passed	Need to furnish documents to validate Experience met the requirement and score assigned during evaluation
			Mon Bdr Rai	Class 6 pass	Wangchuk	Certificate in Civil	Need to furnish documents to validate Experience met the requirement and score

							assigned evaluation	during
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- The cross check revealed that the personnel committed were not present but different set of key personnel were found deployed at site and without appropriate approvals of the client.
- The contractor had failed to deploy the Surveyor, as was not present at site.

2.13.22 Mongar-Gongola (Package-5) executed by M/s. Norbu Construction Company Pvt. Ltd, Gelephu (RO, Lingmethang)

The status of key personnel required and committed by the Contractor as per bidding document are as shown in table 1.13.22 below:

Table 2.13.22: Status of key personnel committed					
Sl. No.	Key Personnel Required	Qualification Required	Number require	Name of committed personal	Qualification
1	Project Manager	Degree in any field with 1 to 7 years or more work experience or Diploma in Civil Engineering with 3 to 10 years or more work experience and Any other qualification	1	Sangay Rinzin	Bachelor of Arts
2	Project Engineer	Degree in Civil Engineering and and with 1 to 5 years or more work experience or Diploma in Civil Engineering and also with 3 to 10 years or more work experience in road/bridge works and Any other qualification	1	Karthik Muthu	BE Civil Engineering
3	Material Engineer	Degree in Civil Engineering with 3 to 5 years' experience or Diploma in Civil Engineering with 3 to 10 years' experience and Any other qualification	1	Pankaj Baruwa	Diploma in Civil Engg
4	Junior Engineer	Degree in Civil Engineering or Diploma in Civil Engineering with experience 5 to 10 years or more other than road work	1	Abdur Rahman	Diploma in Civil Engineer
5	Surveyor	Diploma in Survey and also with 3 to 7 or more work experience or Certified/trained surveyor with 1 to 10 years or more work experience and Any other qualification	1	Suren Pradhan	Trained Surveyor
6	Lab Technician	Class XII pas with 5 years experiences as lab technician or Class X pass with 3 to 5 years' experience as Lab Technician and Any other qualification	1	Phuentsho Wangdi	VTI Graduate
7	Work/Site Supervisors	VTI Graduate or equivalent with 1 to 5 years or more work experience and Any other level of qualification or experience	2	Tsheten Dorji	VTI Graduate
				Yonton Jamtsho	VTI Graduate

The status of key personnel committed as per bidding document and actual employment at work site as noted during the physical verification is shown in table 2.13.22.1 below:

Table 2.13.22.1: key personnel at site							
Sl. No.	Key Personnel Required	Name of committed personal	Qualification	Personnel Engaged At Site as per record	Qualification & Experience	Status during physical verification	Remarks
1	Project Manager	Sangay Rinzin	Bachelor of Arts	Karma Dema	Sangay Rinzin	Present	
2	Project Engineer	Karthik Muthu	BE Civil Engineering	Karthik Muthu	BE Civil Engg	Present	
3	Material Engineer	Pankaj Barua	Diploma in Civil Engg	Dhendup Tshering	BE Civil Engg	Present	Need to review the score assigned as replacement is by a Degree holder (Experience need to be reviewed)
4	Junior Engineer	Abdur Rahman	Diploma in Civil Engineer	Nil		Not Engaged	Need to review the score assigned
5	Surveyor	Suren Pradhan	Trained Surveyor	Suren Pradhan		Present	Need to review the score assigned and Experience need to be reviewed.
6	Lab Technician	Phuentsho Wangdi	VTI Graduate	Pema Tshewang,	VTI	Stated on leave	Experience to be reviewed
7	Work/Site Supervisors	Tsheten Dorji	VTI Graduate	Pema Lhamo	VTI	Present	Score assigned and Experience to be reviewed
		Yonton Jamtsho	VTI Graduate	Nil		Not Engaged	Score assigned to be reviewed

- The cross check revealed that the personnel committed were not present but different set of key personnel were found deployed at site and without appropriate approvals of the client.
- The contractor had failed to deploy the Junior Engineer, one Work Site Supervisor.
- The Lab Technician was stated to be on leave as was not present at site.

2.13.23 Gangola-Kurizampa (Package 6) executed by M/s. Rigzar Construction Pvt Ltd. Trashigang (RO, Lingmethang)

The status of key personnel required and committed by the Contractor as per bidding document is as tabulated below:

Table 2.13.23: Status of key personnel committed					
Sl. No.	Key Personal Required	No. of Personnel Required	Present Personnel At Site,	Qualification & Experience	Remarks
1	Project Manager	Degree in any field or Diploma in Civil Engineering	1	Karma Wangchuk	Bachelor of Arts
2	Project Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	Nidup Chong	BE Civil Engineering

3	Material Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	Karma Tenzin	Diploma in Civil Engg
4	Junior Engineer	Degree in Civil Engineering or Diploma in Civil Engineering	1	Karma Dizang	Diploma in Civil Engineer
5	Surveyor	Diploma in Survey or trained surveyors	1	Pema Wangchuk	Trained Surveyor
6	Lab Technician	Class X pass with experience	1	Rinzin Pelden	VTI Graduate
7	Site Supervisors	VTI Graduate or equivalent with more than 2 years' experience	2	Yani Maya Newar	VTI Graduate
				Khandu Wangmo	VTI Graduate

The status of key personnel committed as per bidding document and actual employment at work site as noted during the physical verification is shown in table 2.13.23.1 below:

Table 2.13.23.1: Key personnel at site					
Sl. No.	Key Personal Required	No. of Personnel Required	Present Personnel At Site,	Qualification & Experience	Remarks
1	Project Manager	1	Karma Wangchuk,	General Degree	
2	Project Engineer	1	Nidup Chong,	Degree in Civil Engg	Not present at site
3	Material Engineer	1	Dorji Dhendup,	Diploma in Civil Engg	
4	Junior Engineer	1	Om Prakash Puri,	Diploma in Civil Engg	
5	Surveyor	1	Puran Ghalley,	Class XII Passed	
6	Lab Technician	1	Rinzin Pelden,	Class X passed	
7	Site Supervisor	1	Tashi Phuntsho		Not present at site
8	Site Supervisor	1	Karma Tshering,	Class XII passed	

- The cross check revealed that the personnel committed were not present but different set of key personnel were found deployed at site and without appropriate approvals of the client.
- The contractor had failed to deploy one Work Site Supervisor.
- The Project Engineer was not present at site during the physical verification.

As per General Conditions of Contract (GCC) clauses 10 – Personal, 10.1 “ *the Contractor shall employ the key personnel named in the Schedule of Key Personnel, as referred to in the SCC, to carry out the functions stated in the Schedule or other personnel approved by the Project Manager. The Project Manager shall approve any proposed replacement of key personnel only if their relevant qualifications and abilities are substantially equal to or better than those of the personnel listed in the schedules. If the contractor fails to deploy the personnel as committed in the Bid documents, the employer shall stop the work if the quality of work is going to suffer or otherwise deduct the salaries of such personnel at a rate stipulated in the SCC per month per personnel for every month of absence of such personnel from the site. Such deductions shall continue till such time that the contractor deploys the key personnel acceptable to the employer. If the contractor fails to deploy such key personnel within one to four months, the deduction shall be discontinued and the contractor’s failure to deploy such personnel shall be treated as a fundamental breach of contract*”.

As evident from above tables all the contractors had violated the aforementioned terms and condition of the contract. In this context, the audit had observed following lapses:

- Set of key personnel committed in the bid documents were changed without following due process as outlined in the GCC of the contract documents. The replacements and substitutions were also found made without the approval of appropriate authority.
- Committed key personnel were found replaced by those having less qualification and working experiences. The replacements were in contrary to the contractual provisions wherein it categorically stipulated that their relevant qualifications and abilities are substantially equal to or better than those of the personnel listed in the Schedules of key personnel.
- The contractors had failed to recruit and deploy key personnel since the start of the contract works.
- The personnel deployed were not available at site during the physical verifications of key personnel.
- The RO and the Site Engineer had allowed the contractors to deploy same key personnel for two or three contract packages instead of ensuring deployment of separate key personnel for each contract package.
- The RO and the Site Engineers had failed to either ensure deployment of committed key personnel by the contractors or take action as per the provisions of the contract agreements against the defaulting contractors.

Non-deployment of committed key personnel was in total violation of the contract with reference to clause GCC 10.1 GCC and keeping in view that the firms had qualified the technical category by obtaining scores based on the proposed deployment of key personnel. Further, it was the responsibility of site engineer to report the matter to Regional Office for appropriate decisions and actions. The inaction on the part of the site engineer indicated laxity and complacency as well as extension of undue favour to the contractor

The RO, should comment on the basis of accepting the key personnel other than those committed in the contract including acceptance of same Project Engineer for all 3 packages whose service is critical for providing technical support to construction staff under the supervision of the Project Manager, overseeing progress of work, scheduling and ensuring execution of works as per drawings and technical specifications.

Besides, the RO must also comment on course of action taken against the contractors in term of the contract Clause SCC 10.1 of the GCC for deployment of different set of key personnel in the event no approval were sanctioned for change of key personnel.

The Regional Office besides recovering the penalties computed by the RAA should also work out the exact penalty amounts deductible taking into consideration the revised and actual completion dates, and non deployment of committed key personnel and deposited in to Audit Recoveries Account.

Auditee's Response:

It is to inform RAA that M/s. Chogyal construction had deployed separate set of machineries and human resources for all three packages during the execution. RAA was provided with the set of resources deployed for two packages during the auditing time itself. However, RO could not able to produce documentation for one package due to its misplacement. We regret for not having produced the documents as required during the auditing. Finally, after hard work of searching every day, finally RO could able to find the documents for the third package. The copy of HR and equipment for package II & III attached for reference and record, please. Therefore, RAA is

requested to kindly drop the memo. Further RO also assures RAA that such important documents shall be kept under safe custody for future works.

The Project Engineer, Mr. Ashok Maheshwari was replaced by Mr. Ugyen Penden, Degree in Civil Engineering. However, during the site visit by RAA Mr. Ugyen Penden & Mr. Phuntsho Wangdi, Material Engineer may not have been present. The deduction of penalty for non-enrolment of key personnel is found not applicable. Therefore, please drop the memo. (His signatory attested for reference in the annexure)

During the initial stage of pavement strengthening works, the precise requirement of Key personnel was not felt necessary. However, during the actual execution the required key personnel are deployed and as per work requirement. Actually, Mr. Ugyen Dorji is Site Supervisor and Mr. Dawa Tenzin is Project Manager. However, during the visit of RAA team it was erroneously acknowledged Ugyen Dorji as Project Manager although both of them were present at site. During the field visit by RAA team, it was peak winter season (December) during which almost all the works were stopped due to adverse climatic conditions. The required HR personnel were engaged by the contractor for execution of work when the weather favored.

RAA's Further Comments & Recommendations:

While taking note of the response, the fact remains that timely deployment of committed key personnel is a critical factor for project success in terms of time, cost, and quality. The RO had failed to ensure not only deployment of requisite and committed personnel at work site but also replacement of personnel in line with the procedures and process outlined in the contract document. The change of entire or partial key personnel by the contractor without following due process and the failure on the part of the RO and the Site Engineer to ensure deployment of all committed personnel at work site and adoption of due processes for replacements as envisaged in the contract documents indicated laxity and complacency as well as existence of systemic flaws, deficiencies and poor contract management.

It is apparent that abnormal delays of the contract works beyond the original contract period and revised completion period were attributed by the absence of deployment of adequate and committed key personnel by the contractor for the works as well as replacement of personnel with lower qualification and experiences to save cost. The contract delays were also possible due to engagement of same key personnel for the both contract packages II and VII.

Non- enforcement of contract clauses strictly and non-levy of penalty as envisaged in the contract document tantamount to extension of undue favour as the contractors not only benefit financially from not having to entirely deploy personnel at site and incur associated cost but also annulling the payment of penalty for non- deployment of personnel at site. It is to reiterate that the quoted rates of contractor for the related items of works is built up cost inclusive of cost of committed key personnel and all risks factors.

However, as agreed during the exit meeting, DOR and RO should work out the amount to be deducted for non-deployment of key personnel and recover within three months from the date of issue of the report beyond which penalty @ 24% per annum shall be levied as per Chapter IV, Section 4.5.1.4 of the Finance and Accounting Manual 2016.

Further DoR and the Ministry should review and analyze the impact of poor human resource management particularly in relation to non-deployment of key committed personnel on delays in completion of work as well as quality of work executed. Besides, the DoR and the Ministry should also conduct appropriate studies in terms of skills and experiences required for key personnel and labourer including number requirements, as well as adequate human resources deployment plan

in relation to the quantum of works and cost of the project for effective human resource management by both the site engineer and the contractor.

The studies conducted and actions and measures initiated to improve the human resource management system to prevent such flaws and lapses intimated to RAA for records and follow-up in future audits.

Who is accountable?

<i>Direct Accountability</i>	<i>: Refer Accountability Statement attached</i>
<i>Supervisory accountability</i>	<i>:Refer Accountability Statement attached</i>

2.14 Non-deployment of equipment at site as per the requirements and non-deduction of penalty approximately - Nu.94,388,400.00 (4.4.15)

As per the bidding data sheet, Section II, “Employer’s Requirements (ERQ)”, Equipment requirements on the widening and pavement construction works were found met by contractors in terms of the declared individual CV submitted along with the project profile.

A joint team comprising of audit team and officials from RO visited the construction sites for carrying out measurements of completed structures. During the course of the site visits, an attempt was made to cross check the equipment deployed at site with that of committed equipment in the contract documents. The status of equipment committed as per bidding document and actual deployment at work sites as noted during the physical verification for all the contract packages were as tabulated and discussed below:

RO, Lobeysa

2.14.1 Dochula to Chasagang (Packages I, II and III) executed by M/s Chogyal Construction Pvt. Ltd recoverable penalty Nu. 57.302 million (RO, Lobeysa)

The joint verification of site conducted on **29 September 2017 & 2 October 2017** revealed the following lapses:

- On reviewing associated HR and equipment aspects in new point based system of evaluation in e-tools through hard copy of e-tools report noted few HR and Equipment were used commonly to evaluate in system all the three packages I, II and III. However, the evaluation committee used same HR & Equipment for evaluation in e-tools system for contract packages II & III.
- This particular concern was presented to in MLTC meeting convened on 3rd June, 2015 wherein, MLTC unanimously decided that contractor should allocate separate HR & Equipment considering the work being separate package and also on contractor’s commitment to provide separate HR & Equipment as per letter No. CCCPLT/T&Q-11/2015/11 dated June 19, 2015.
- Following the decisions of the MLTC convened on 3rd June, 2015, the Regional Office vide letter No. DOR.ROL/Plg-15/2014-2015/3721 dated June 9, 2015 had directed the contractor to submit the letter of commitment for deployment of separate resources for the two packages.
- In response, the contractor had sought one-week time extension for submission of additional resources vide letter No. CCCPLT/T&Q-11/2015/10 dated June 12, 2015 and had

subsequently assure availability of adequate resources for the deployment of separate HR and equipment vide letter No. CCCPLT/T&Q-11/2015/11 dated June 19, 2015.

- The audit team could not verify the documentary evidences as Regional Office had failed to produce documents relating to the deployment of separate HR and equipment in particular for package III despite repeated request.
- On probing further, the RO stated the contractor had used the same HR & Equipment for package II & III. This scenario proved that the contractor had failed to allocate separate HR & Equipment for package II & III, resulting in fundamental breach of contractual obligation.
- The Regional Office have neither invoked the termination clause nor enforced the penalty clause GCC 10.1

Particular of Equipment	Penalty/day of non-deployment	Total contract duration in Months	Total Contract duration in Days	Penalty calculated as per approved work schedule (Nu)
Asphalt plant	10,000.00	18.8	564	5,640,000.00
Excavator	10,000.00	18.8	564	5,640,000.00
Backhoe Loader	7,000.00	18.8	564	3,948,000.00
Motor Grader	10,000.00	18.8	564	5,640,000.00
Paver	8,000.00	18.8	564	4,512,000.00
Static Roller	4,000.00	18.8	564	2,256,000.00
Concrete Mixer	500	18.8	564	282,000.00
Water tanker	1,000.00	18.8	564	564,000.00
Four Tipper truck	1,500.00	18.8	564	3,384,000.00
Vibrator roller	5,000.00	18.8	564	2,820,000.00
Total station	500	18.8	564	282,000.00
Tandem Roller	6,000.00	18.8	564	3,384,000.00
Bitumen Sprayer	3,000.00	18.8	564	1,692,000.00
Plate compactor	300	18.8	564	169,200.00
Air compressor	5,000.00	18.8	564	2,820,000.00
Total:				43,033,200.00

Similarly, the contractor had failed to deploy separate HR and equipment against the same HR and equipment committed for the three packages. Thus, in line with the penalty provisions under Clauses GCC 10.1 and SCC and failure to terminate the contract, the Regional Office should recovered the salaries of such personnel and hire charges of equipment at a rate stipulated in the Special Condition of Contract per month per personnel and equipment for the duration of the contract amounting to Nu. 14,269,200.00 as computed below:

Particular of Equipment	Name	Packages	Penalty/day of non-deployment	Total Contract duration of 18.8 month in Days (II)	penalty amount for the duration of the contract 18.8 months
Backhoe Loader	BP-1-1124	Same for Packages I, II & III	7,000.00	564	3,948,000.00
Concrete Mixer	Inv. 365 of 22.12.05	Same for Packages I, II & III	500.00	564	282,000.00
Tipper truck	BP-2-A5481	Same for Packages I, II & III	1,500	564	846,000.00
Tipper truck	BP-1-A1910	Same for Packages I, II & III	1,500	564	846,000.00

Tipper truck	BP-2-A5479	Same for Packages I, II & III	1,500	564	846,000.00
Tipper truck	BP-2-A5480	Same for Packages I, II & III	1,500	564	846,000.00
Vibratory roller	BP-1-A1918	Same for Packages I, II & III	5,000	564	2,820,000.00
Total station		Same for Packages I, II & III	500	564	282,000.00
Tandem Roller	BP-2-A7572	Same for Packages I, II & III	6,000	564	3,384,000.00
Plate compactor	Inv. 165 of 1.2.12	Same for Packages I, II & III	300	564	169,200.00
Total:					14,269,200.00

- The following correspondences apparently indicated failure of the Pavement works for Packages II and III valuing Nu. 26.490 million and additional compensation payment of Nu. 3.593 million in addition to the insurance claim of Nu. 19.453 million.
- DoR/CE(TMT)/2015-16/8 date 1st June 2016
- CCCPL/ROL-(III)/Works-09/2016-2017/002 dated 7th January 2017
- DoR/Lobeysa/construction Division(09)/2016-2017/037 dated 24th January 2017
- CCCPL/ROL-(II)/Works-07/2016-2017/049 dated 13th April 2017
- DoR/CE(CD)/2016-2017/W-7/3795 dated 17th April 2017
- DoR/CD/7/2016-2017/4059 dated 26th June 2017
- DoR/CD/28/2017-2018/4245 dated 8th August 2017

The failure of such magnitude of pavement works is a clear evidence of non-deployment of separate equipment by the contractor as well as laxity on the part of the Regional Office and MLTC in allowing the contractor to execute three packages with the same equipment for all the three works.

2.14.2 Langkena-Tekizampa (Package V) executed by M/s Etho Metho Construction Pvt. Ltd (RO, Lobeysa)

Equipment	Numbers Required	Numbers Committed	Remarks
Excavator	5	5	Available
Total Station	1	0	Not committed
Asphalt Plant	1	1	Available
Paving Machine	1	1	Available
Vibrating Road Roller	1	1	Not Available
Tandem Roller	1	1	Available
Motor Grader	1	1	Available
Backhoe	1	1	Available
Static Road Roller	1	1	Available
Bitumen Sprayer	1	1	Not Available
Tripper Truck	6	6	Available
Concrete Mixer	1	1	Available
Water Tanker	1	1	Available
Plate Compactor	1	1	Not Available
Air Compressor	2	2	Only 1 Available

- The Contractor had failed to deploy some critical equipment/plants namely vibrating road roller, bitumen sprayer, plate compactor and one air compressor at work site at work site.
- One number Total Station was not committed as per the tender document. The contract did not deploy the equipment at site.

RO, Trongsa

2.14.3 Chuserbu to Nyelazam (Package 1) executed by M/s Rigsar Construction Pvt. Ltd (RO, Trongsa)

Table 2.14.3: Status of Equipment					
Equipment committed as per Agreement			Present at Work site on		
Sl/ No	Name of Equipment's	Qty (Nos.)	Name of Equipment's	Qty (Nos.)	Remarks
1	Excavator	4 Nos.	Excavator	4	
2	Excavator with rock breaker	2 Nos.	Excavator with bucket	2	
3	Trucks Tripper	6 Nos	Trucks Tripper	4	2 Nos. not available
4	Pay Loader	2 No.	Pay Loader	1	1 No. not available
5	Asphalt plant	1 No.	Asphalt plant	1	
6	Paver finisher	1 No.	Paver	1	
7	Static Roller	1 No.	Static Roller	1	
8	Air Compressor	2 No	Air Compressor	1	1 No. not available
9	Bitumen sprayer	1 No.	Bitumen sprayer	1	
10	Pneumatic Roller	1 No.	Pneumatic Roller	1	
11	Water Tanker	1 No.	Water Tanker	1	
12	Plate Compactor	2 No.	Plate Compactor	1	1 No. not available
13	Motor Grader	1 No.	Motor Grader	1	
14	Crusher plant	1 No	Crusher plant	1	
15	Vibratory road roller	1 No	Vibrator	1	
16	Total station	1 No	Total station	1	

- Two trippers and one each of Pay Loader, Air Compressor and Plate Compactor were not deployed at site.

2.14.4 Nyelazam to Sakachawa (Package 2) executed by M/s Gaseb Construction Pvt. Ltd (RO, Trongsa)

Table 2.14.4: Status of Equipment					
Equipment committed as per Agreement			Present at Work site on (7 th December 2017)		
Sl/ No	Name of Equipment's	Qty (Nos.)	Name of Equipment's	Qty (Nos.)	Remarks
1	Asphalt plant	1 No.	Asphalt plant	Not available	
2	Paver	1 No.	Paver	Not available	
3	Bitumen sprayer	1 No.	Bitumen sprayer	Not available	
4	Pneumatic Roller	1 No.	Pneumatic Roller	Not available	
5	Water Tanker	1 No.	Water Tanker	Not available	

The Contractor had failed to deploy some critical equipment/plants namely Asphalt Plant, Paver, Pneumatic Roller, Bitumen Sprayer, at work site.

2.14.5 Sakachawa to Tsangkha (Package 3) executed by M/s Rinson Construction Pvt. Ltd (RO, Trongsa)

Table 2.14.5: Status of Equipment					
Equipment committed as per Agreement			Present at Work site on 7.12.2017		
Sl/ No	Name of Equipment's	Qty (Nos.)	Name of Equipment's	Qty (Nos.)	Status/Remarks
1	Excavator	4 Nos.	Excavator	4	2 off road
2	Excavator with rock breaker	2 Nos.	Excavator with bucket	2	1 off road
3	Trucks Tripper	6 Nos	Trucks Tripper	4	3 off road
4	Pay Loader	2 No.	Pay Loader	1	Off road
5	Asphalt plant	1 No.	Asphalt plant	0	
6	Paver finisher	1 No.	Paver	0	
7	Static Road Roller	1 No.	Static Roller	1	Off road
8	Air Compressor	2 No	Air Compressor	3	2 off road
9	Bitumen sprayer	1 No.	Bitumen sprayer	0	
10	Pneumatic Roller	1 No.	Pneumatic Roller	0	
11	Water Tanker	1 No.	Water Tanker	0	
12	Plate Compactor	2 No.	Plate Compactor	0	
13	Motor Grader	1 No.	Motor Grader	0	
14	Crusher plant	1 No	Crusher plant	1	Manual crusher not as per the requirement
15	Vibratory road roller	1 No	Vibrator	1	Off road
16	Total station	1 No	Total station	0	

- Majority of machineries and equipment deployed were found off road during the physical verification.
- Machineries and equipment required for bituminous works were found not deployed
- Manual Crusher plant was installed instead of requisite Crusher plant
- Committed machineries were not deployed but deployed different machineries

2.14.6 Tshangkha to View Point (Package 4) executed by M/s Gyalcon Infrastructure Pvt. Ltd (RO, Trongsa)

Table 2.14.6: Status of Equipment					
Equipment committed as per Agreement			Present at Work site on 3/1/2018		
Sl/ No	Name of Equipment's	Qty (Nos.)	Name of Equipment's	Qty (Nos.)	Remarks
1	Asphalt plant	1 No.	Asphalt plant	0	
2	Paver Machines	1 No.	Paver	0	
3	Static Roller (8-10MT)	1 No.	Static Roller	1	Off road
4	Vibratory Road Roller	1 No	Vibratory Road Roller	1 No	
5	Pneumatic Roller	1 No.	Pneumatic Roller	0	
6	Water Tanker	1 No.	Water Tanker	1	Off road
7	Bitumen sprayer	1 No.	Bitumen sprayer	0	
8	Motor Grader	1 No.	Motor Grader	0	

- Machineries and equipment required for bituminous works were found not deployed
- Static Roller and Water Tanker deployed were found off road during the physical verification.

2.14.7 View Point- BjeeZam (Package 5) executed by M/s Druk Lhayul Construction Pvt. Ltd (RO, Trongsa)

Table 2.14.7: Status of Equipment			Present at Work site on 7 th December, 2017		
Equipment committed as per Agreement			Present at Work site on 7 th December, 2017		
Sl/ No	Name of Equipment's	Qty (Nos.)	Name of Equipment's	Qty (Nos.)	Remarks
1	Excavator	4 Nos.	Excavator	2	
2	Excavator with bucket	2 Nos.	Excavator with bucket	1	Off road
3	Trucks Tripper	6 Nos	Trucks Tripper	2 Nos.	Primer equivalent to 2 trippers
5	Asphalt plant	1 No.	Asphalt plant	0	
6	Paver	1 No.	Paver	0	
9	Bitumen sprayer	1 No.	Bitumen sprayer	0	
10	Pneumatic Roller	1 No.	Pneumatic Roller	0	
11	Water Tanker	1 No.	Water Tanker	0	
12	Plate Compactor	1 No.	Plate	0	

- Asphalt plant and paver machine and related equipment which are critically required at site for bituminous works were not deployed at work site.
- One out of two excavators deployed was found off road during the physical verification
- Two tripper trucks were deployed against Six committed as per contract agreement

2.14.8 Bjeezam- Trongsa (Package 6) executed by M/s Raven Builders & Company Pvt. Ltd (RO, Trongsa)

Table 2.14.8: Status of Equipment			Present at Work site on 14.12.2017		
Equipment committed as per Agreement			Present at Work site on 14.12.2017		
Sl/No	Name of Equipment's	Qty (Nos.)	Name of Equipment's	Qty (Nos.)	Remarks
1	Excavator	4 Nos.	Excavator	3	1 off road
2	Excavator with rock breaker	2 Nos.	Excavator with bucket	1	
3	Trucks Tripper	6 Nos	Trucks Tripper	3	
4	Pay Loader	2 No.	Pay Loader	1	
5	Asphalt plant	1 No.	Asphalt plant	0	
6	Paver finisher	1 No.	Paver	0	
7	Static Roller	1 No.	Static Roller	0	
8	Air Compressor	2 No	Air Compressor	1	
9	Bitumen sprayer	1 No.	Bitumen sprayer	0	
10	Pneumatic Roller	1 No.	Pneumatic Roller	1	
11	Water Tanker	1 No.	Water Tanker	1	
12	Plate Compactor	2 No.	Plate Compactor	0	
13	Motor Grader	1 No.	Motor Grader	0	
14	Crusher plant	1 No	Crusher plant	1	
15	Vibratory road roller	1 No	Vibrator	1	
16	Total station	1 No	Total station	0	

- Asphalt plant and paver machine and related equipment which are critically required for bituminous works were not deployed at work site.
- One out of three excavators deployed was found off road during the physical verification
- Three tripper trucks were deployed against Six committed as per contract agreement
- One Excavator with rock breaker was deployed against two required and committed
- One each of Pay Loader and Air Compressor were deployed against two required and committed.

2.14.9 Pinzhi-Tashipokto (PKG-8) executed by M/s. Dungkar Construction Pvt Ltd. Thimphu (RO, Trongsa)

Table 2.14.9: Status of Equipment					
Equipment committed as per Agreement			Present at Work site on 18th January, 2018		
SI/No	Name of Equipment's	Qty (Nos.)	Name of Equipment's	Qty (Nos.)	Remarks
1	Excavator	4 Nos.	Excavator	2	2 Nos not available at site
2	Excavator with rock breaker	2 Nos.	Excavator with rock breaker	1	1 Nos not available at site
3	Trucks Tripper	6 Nos	Trucks Tripper	1	5Nos not available at site
4	Water Tanker	1 No	Water Tanker	0	Not available at site
5	Asphalt plant	1 No.	Asphalt plant	0	Not available at site
6	Paving Machine (Paver)	1 No.	Paving Machine (Paver)	1	Not available at site
7	Vibratory roller (8-10mt)	1No	Vibratory roller (8-10mt)	0	Not available at site
8	Static Road Roller (8-10Mt)	1No	Static Road Roller (8-10Mt)	0	Not available at site
9	Bitumen sprayer	1 No.	Bitumen sprayer	0	Not available at site
10	Pneumatic Roller	1 No.	Pneumatic Roller	0	Not available at site
11	Water Tanker	1 No.	Water Tanker	0	Not available at site
12	Plate Compactor	1 No.	Plate Compactor	0	Not available at site
13	Crusher (min 30TPH)	1 No.	Crusher (min 30TPH)	0	Not available at site
14	Pay loader/back hoe	2 Nos.	Pay loader/back hoe	0	Not available at site

- Asphalt plant and paver machine and related equipment which are critically required for bituminous works were not deployed at work site.
- Majority of key machineries and equipment were found not deployed at work site during the physical verification.

2.14.10 Tashipokto to Dorjigonpa (Package 9) executed by M/s Welfare Construction Pvt. Ltd. (RO, Trongsa)

Table 2.14.10: Status of Equipment					
Equipment required as per Agreement			Present at Work site on		
SI/No	Name of Equipment's	Qty (Nos.)	Name of Equipment's	Qty (Nos.)	
1	Excavator	4 Nos.	Excavator	4	
2	Excavator with rock breaker	2 Nos.	Excavator with rock breaker	1	
3	Tripper Trucks	6 Nos	Tripper Trucks	2	

4	Pay Loader	2 No.	Pay Loader	0
5	Asphalt plant	1 No.	Asphalt plant	0
6	Paver finisher	1 No.	Paver	0
7	Static Road Roller	1 No.	Static Roller	0
8	Air Compressor	2 No	Air Compressor	2
9	Bitumen sprayer	1 No.	Bitumen sprayer	0
10	Pneumatic Roller	1 No.	Pneumatic Roller	0
11	Water Tanker	1 No.	Water Tanker	0
12	Plate Compactor	2 No.	Plate Compactor	0
13	Motor Grader	1 No.	Motor Grader	0
14	Concrete Mixer	1 No.	Concrete Mixer	1
15	Crusher plant	1 No	Crusher plant	1
16	Vibratory road roller	1 No	Vibratory road roller	0
17	Total station	1 No	Total station	1

- Asphalt plant and paver machine and related equipment which are critically required for bituminous works were not deployed at work site.
- Majority of key machineries and equipment were found not deployed at work site during the physical verification

2.14.11 Dorji Gonpa to Yotongla (Package 10) executed by M/s Rinson Construction Pvt. Ltd (RO, Trongsa)

Table 2.14.11: Status of Equipment					
Equipment committed as per Agreement			Present at Work site on 18.1.2018		
Sl/No	Name of Equipment's	Qty (Nos.)	Name of Equipment's	Qty (Nos.)	Remarks
1	Excavator	4 Nos.	Excavator	4	2 off road
2	Excavator with rock breaker	2 Nos.	Excavator with bucket	1	off road
3	Tripper Trucks	6 Nos	Tripper Trucks	6	5 off road
4	Pay Loader	2 No.	Pay Loader	1	
5	Asphalt plant	1 No.	Asphalt plant	0	
6	Paver finisher	1 No.	Paver	0	
7	Static Road Roller	1 No.	Static Roller	0	
8	Air Compressor	2 No	Air Compressor	2	
9	Bitumen sprayer	1 No.	Bitumen sprayer	0	
10	Pneumatic Roller	1 No.	Pneumatic Roller	0	
11	Water Tanker	1 No.	Water Tanker	1	Same for Package 13
12	Plate Compactor	2 No.	Plate Compactor	0	
13	Motor Grader	1 No.	Motor Grader	0	
14	Concrete Mixer	1 No.	Concrete Mixer	1	
15	Crusher plant	1 No	Crusher plant	1	
16	Vibratory road roller	1 No	Vibratory road roller	1	Same for Package 13
17	Total station	1 No	Total station	0	

- Same machineries and equipment committed for Package 10 and package 13.
- Majority of machineries and equipment deployed were found off road during the physical verification.
- Machineries and equipment required for bituminous works were found not deployed.

- One Water Tanker and one Vibratory Road Roller deployed was also used for package 13 instead of separate deployment
- One Excavator with rock breaker, One Pay Loader were deployed against requirements/commitment of two each.

2.14.12 Yotongla to Bongzam (Package 11) executed by M/s Dungkar Construction Pvt. Ltd. recoverable penalty Nu. 37,086,000.00 (RO, Trongsa)

Table 2.14.12: Status of Equipment						
Machinery/Equipment required as per ITB 4.3 (a) of Section – II, Bidding Data Sheet			Commitment as per tender document		Status at site during physical verification on 03/1/2018	
Sl/ No	Name of Equipment's	Qty. (Nos.)	Qty. (Nos.)	Qty (Nos.)	Remarks	
1	Excavator	4	2	Nil	No separate Machinery/equipment deployed at site but same as Machinery/equipment deployed for Contract Package XII	
2	Excavator with rock breaker	2		Nil		
3	Total Station set	1	1	Nil		
4	Asphalt Plant (Min 30TPH)	1		Nil		
5	Paving Machine (Paver)	1		Nil		
6	Vibratory Road Roller (8-10 ton Capacity)	1	1	Nil		
7	Pneumatic Tyred Roller	1		Nil		
8	Motor Grader	1	1	Nil		
9	Pay Loader/Backhoe	2	1	Nil		
10	Static Road Roller (8-10 ton capacity)	1		Nil		
11	Air Compressor	2		Nil		
12	Bitumen sprayer	1	1	Nil		
13	Tipper Trucks	6	3	Nil		
14	Concrete Mixer 7/5 cft. capacity or more	1	1	Nil		
15	Water Tanker	1		Nil		
16	Plate Compactor	2		Nil		
17	Crusher (Min 30 TPH)	1		Nil		

- On reviewing associated machineries and equipment aspects in new point based system of evaluation in e-tools through hard copy of e-tools report noted that for both the packages XI and XII, awarded to the firm, same HR and Equipment were used for evaluation in e-tools system.
- The contractor had failed to allocate separate HR & Equipment for package XI & XII, resulting in fundamental breach of contractual obligation.

The Site Engineer had failed to enforce the contract Clause SCC 10.1 of the GCC on the deduction of amounts as specified in the SCC for absence of officials at site as computed in table 2.14.12.1 below:

Table 2.14.12.1: Deductions for non-deployment of HR and equipment-Contract Packages					
Particular of Machinery/Equipment	No.	Penalty/day of non-deployment	Total contract duration in Months	Total Contract duration in Days (III)	Penalty calculated as per approved work schedule (Nu)
Asphalt plant	1	10,000.00	28	420	4,200,000.00
Excavator	4	10,000.00	28	420	4,200,000.00
Excavator with rock breaker	2	10,000.00	28	420	4,200,000.00
Backhoe Loader	2	7,000.00	28	420	2,940,000.00

Motor Grader	1	10,000.00	28	420	4,200,000.00
Paver	1	8,000.00	28	420	3,360,000.00
Static Roller	1	4,000.00	28	420	1,680,000.00
Concrete Mixer	1	500.00	28	420	210,000.00
Water tanker	1	1,000.00	28	840	840,000.00
Tipper truck	6	1,500.00	28	840	1,260,000.00
Vibrator roller	1	5,000.00	28	420	2,100,000.00
Total station	1	500.00	28	420	210,000.00
Pneumatic Tyred Roller	1	5,000.00	28	420	2,100,000.00
Bitumen Sprayer	1	3,000.00	28	420	1,260,000.00
Plate compactor	2	300.00	28	420	126,000.00
Air compressor	2	5,000.00	28	840	4,200,000.00
Crusher (Min 30 TPH)	1	5,000.00	28	840	4,200,000.00
Total:					37,086,000.00

2.14.13 Bongzam to Gyatsa Zam (Package 12) by M/s Dungkar Construction Pvt. Ltd (RO, Trongsa)

Table 2.14.13: Status of Equipment						
Equipment required as per ITB 4.3 (a) of Section – II, Bidding Data Sheet			Commitment as per tender document		Status at site during physical verification on 03/1/2018	
Sl/No	Qty. (Nos.)	Qty. (Nos.)	Qty. (Nos.)	Qty (Nos.)	Remarks	
1	Excavator	2	2	2		
2	Excavator with rock breaker					
3	Total Station set	1	1	1		
4	Asphalt Plant (Min 30TPH)	1	1	0	Not available	
5	Paving Machine (Paver)	1	1	0	Not available	
6	Vibratory Road Roller (8-10 ton Capacity)	1	1	1		
7	Pneumatic Tyred Roller					
8	Motor Grader	1	1	1		
9	Pay Loader/Backhoe	1	1	1		
10	Static Road Roller (8-10 ton capacity)					
11	Air Compressor					
12	Bitumen sprayer	1	1	0	Not available	
13	Tipper Trucks	3	3	3		
14	Concrete Mixer 7/5 cft. capacity or more	1	1	1		
15	Water Tanker	1	Nil	0	Not available	
16	Plate Compactor	1	Nil	0	Not available	
17	Crusher (Min 30 TPH)	1	Nil	1		

- On reviewing associated machineries and equipment aspects in new point based system of evaluation in e-tools through hard copy of e-tools report noted that for both the packages XI and XII, awarded to the firm, same HR and Equipment were used for evaluation in e-tools system
- Machineries and equipment which are critically required for bituminous works were not provided as on the date of physical verification.
- The contractor has been allowed to execute three contract packages with the same HR and equipment and that too without adequate deployment of HR and machinery/equipment for contract packages VIII and XI.

2.14.14 Gyatsazam to Ngangar (Package 13) executed by M/s Rinson Construction Pvt. Ltd (RO, Trongsa)

Table 2.14.14: Status of Equipment			Present at Work site on 18.1.2018		
Equipment committed as per Agreement			Present at Work site on 18.1.2018		
Sl/No	Name of Equipment's	Qty (Nos.)	Name of Equipment's	Qty (Nos.)	Remarks
1	Excavator	4 Nos.	Excavator	2	1 off road
2	Excavator with rock breaker	2 Nos.	Excavator with bucket	0	
3	Tripper Trucks	6 Nos	Tripper Trucks	3	
4	Pay Loader	2 No.	Pay Loader	1	
5	Asphalt plant	1 No.	Asphalt plant	0	
6	Paver finisher	1 No.	Paver	0	
7	Static Road Roller	1 No.	Static Roller	1	
8	Air Compressor	2 No	Air Compressor	2	
9	Bitumen sprayer	1 No.	Bitumen sprayer	0	
10	Pneumatic Roller	1 No.	Pneumatic Roller	0	
11	Water Tanker	1 No.	Water Tanker	1	Same for Package 10
12	Plate Compactor	2 No.	Plate Compactor	0	
13	Motor Grader	1 No.	Motor Grader	0	
14	Concrete Mixer	1 No.	Concrete Mixer	0	
15	Crusher plant	1 No	Crusher plant	0	
16	Vibratory road roller	1 No	Vibratory road roller	1	Same for Package 10
17	Total station	1 No	Total station	0	

- On reviewing associated machineries and equipment aspects in new point based system of evaluation in e-tools through hard copy of e-tools report noted that for both the packages X and XIII, awarded to the firm, same machineries and Equipment were used for evaluation in e-tools system
- Machineries and equipment which are critically required for bituminous works were not provided as on the date of physical verification.
- One Excavator deployed was found off road during the physical verification.
- One Water Tanker and one Vibratory Road Roller deployed was also used for package 10 instead of separate deployment
- Deployed: Two Excavators against 4 committed, three trippers against 6 committed and one Pay Loader against 2 committed.
- Different sets of machineries and equipment were found deployed at site as against committed as per contract documents.

RO, Lingmethang

2.14.15 Korila-Pangser (Package-2) executed by M/s. Tshering Construction Pvt Ltd. Bumthang (RO, Lingmethang)

Table 2.14.15: Status of Equipment			
Type of Equipment	Equipment Numbers Required/ and Committed	Status of availability of equipment during physical verification at site	
		Available at site	Not Available at site
Excavator	2	Available	
Excavator with rock breaker	2	Available	
Total Station	1	Available	

Asphalt Plant	1		Not Available
Paving Machine	1	Available	
Vibrating Road Roller	1	Available	
Pneumatic Tyred Roller	1		Not Available
Motor Grader	1	Available	
Backhoe	2	Available	
Static Road Roller	1		Not Available
Bitumen Sprayer	1		Not Available
Tripper Truck	6	Available	
Concrete Mixer	1		Not Available
Water Tanker	1	Available	
Crusher	1	Available	
Plate Compactor	1		Not Available
Air Compressor	2	1 Available	1 Not Available

The Contractor had failed to deploy some critical equipment/plants namely Asphalt plant, Pneumatic Tyred Roller, Static Road Roller, bitumen sprayer, Concrete Mixer, plate compactor and one air compressor at work site.

2.14.16 Pangser-Kilikhar (Package-3) executed by M/s. K. D Builder Pvt Ltd (RO, Lingmethang)

Table 2.14.16 : Status of Equipment			
Equipment	Numbers Required	Numbers Committed	Status of availability of equipment during physical verification at site
Excavator	2	2	Available
Excavator with rock breaker	2	-	Not Available
Total Station	1	1	Available
Asphalt Plant	1	1	Not Available
Paving Machine	1	1	Available
Vibrating Road Roller	1	1	Available
Pneumatic Tyred Roller	1	-	Not Available
Motor Grader	1	1	Not Available
Backhoe	1	1	Available
Static Road Roller	1	-	Not Available
Bitumen Sprayer	1	1	Not Available
Tripper Truck	6	6	Only 4 Available 2 No. Not Available
Concrete Mixer	1	1	Available
Water Tanker	1	1	Available
Crusher	1	1	Available
Plate Compactor	1	1	Not Available
Air Compressor	2	2	Only 1 Available 1 No. Not Available

- The contractor had failed to deploy some critical equipment/plants namely Excavator with rock breaker, Asphalt Plant, Pneumatic Tyred Roller, Motor Grader, Static Road Roller, Bitumen Sprayer, Plate compactor, two Tripper Trucks and one air compressor at work site.
- Two numbers Excavator with rock breaker, Pneumatic Tyred Roller and Static Road Roller were not committed as per the tender document. Accordingly, the contractor did not deploy the plant and equipment at site.

2.14.17 Kilikhar to Mongar (Package 4) executed by M/s Gongphel Construction Pvt. Ltd (RO, Lingmethang)

Table 2.14.17: Status of Equipment				
Equipment	Numbers Required	Equipment Committed	Status of availability of equipment during physical verification at site	
Excavator	4	4	4	Available
Excavator with rock breaker	2	2	2	Available
Total Station	1	1	1	Available
Asphalt Plant	1	1	-	Not Available
Paving Machine	1	1	-	Not Available
Vibrating Road Roller	1	1	1	Available
Pneumatic Tyred Roller	1	2	-	Not Available
Motor Grader	1	1	1	Available
Backhoe	1	1	1	Available
Static Road Roller	1	1	-	Not Available
Bitumen Sprayer	1	1	-	Not Available
Tripper Truck	6	6	5	One tripper truck not available
Concrete Mixer	1	1	1	Available
Water Tanker	1	1	1	Available
Crusher	1	1	1	Available
Plate Compactor	2	2	-	Not Available
Air Compressor	2	2	2	Available

- The contractor had failed to deploy some critical equipment/plants namely Asphalt Plant, Paving Machine, Pneumatic Tyred Roller, Static Road Roller, Bitumen Sprayer, Plate compactor and one number tripper truck at work site.

2.14.18 Gangola-Kurizampa (Package 6) executed by M/s. Rigsar Construction Pvt Ltd. Trashigang (RO, Lingmethang)

Table 2.14.18: Status of Equipment			
Equipment	Numbers Required	Numbers Committed	Remarks
Excavator	4	4	Available
Excavator with rock breaker	2	2	Available
Total Station	1	1	Available
Asphalt Plant	1	1	Available
Paving Machine	1	1	Available
Vibrating Road Roller	1	1	Available
Pneumatic Tyred Roller	1	1	Not Available
Motor Grader	1	1	Available
Exca drill	1	1	Available
Backhoe	2	2	Available
Steel Road Roller	1	1	Available
Bitumen Sprayer	1	1	Available but off road
Tripper Truck	6	7	Available
Concrete Mixer	1	1	Available
Water Tanker	1	1	Available
Crusher	1	1	Available
Plate Compactor	1	1	Available

- The contractor had failed to deploy some critical equipment/plants namely Pneumatic Tyred Roller and the Bitumen Sprayer though available at site was found off road.

2.14.19 Kurizampa-Lingmethang Highway (Package-7) executed by M/s Tshering Construction Pvt. Ltd, Bumthang (RO, Lingmethang)

Table 2.14.19: Status of Equipment			
Equipment	Numbers Required	Equipment Committed	Remarks
Excavator	2	2	Available
Total Station	1	1	Available
Rock Breaker	1	1	Available
Asphalt Plant	1	1	Available
Paving Machine	1	1	Not Available
Vibrating Road Roller	1	1	Available
Tandem Roller	1	1	Available
Motor Grader	1	1	Available
Backhoe	1	1	Available
Static Road Roller	1	1	Available
Bitumen Sprayer	1	1	Not Available
Tripper Truck	6	6	Available
Concrete Mixer	1	1	Available
Water Tanker	1	1	Available
Plate Compactor	1	1	Not Available
Air Compressor	2	2	Available

The contractor had failed to deploy some critical equipment/plants namely Paving Machine, Bitumen Sprayer and Plate compactor at work site.

As per General Conditions of Contract (GCC) clauses 10 – Personal, 10.1 “ *the Contractor shall employ the key personnel named in the Schedule of Key Personnel, as referred to in the SCC, to carry out the functions stated in the Schedule or other personnel approved by the Project Manager. The Project Manager shall approve any proposed replacement of key personnel only if their relevant qualifications and abilities are substantially equal to or better than those of the personnel listed in the schedule. If the contractor fails to deploy the personnel as committed in the Bid documents, the employer shall stop the work if the quality of work is going to suffer or otherwise deduct the salaries of such personnel at a rate stipulated in the SCC per month per personnel for every month of absence of such personnel from the site. Such deductions shall continue till such time that the contractor deploys the key personnel acceptable to the employer. If the contractor fails to deploy such key personnel within one to four months, the deduction shall be discontinued and the contractor’s failure to deploy such personnel shall be treated as a fundamental breach of contract*”.

“This shall also apply to the commitment of employment to Vocational Training Institute Graduates (VTI)/skilled local labourers and commitment to provide internship to VTI graduates. However, in this case, Contract may not be terminated but wage rates as mentioned in the SCC shall be deducted for the duration of the contract”.

“Similarly, if the committed equipment are not available at site, the hiring charges of such equipment shall be deducted at a rate stipulated in the SCC per month for every month of absence for a period of one to four months after which the deductions shall be discontinued and the contractor’s failure to produce such equipment at site shall be treated as a fundamental breach of contract”.

As evident from above tables all the contractors had violated the aforementioned terms and condition of the contract. In this context, the audit had observed following lapses:-

- Machineries and equipment were not deployed as committed in the bid documents and were replaced without the approval of appropriate authority.
- The contractors had failed to deploy Machineries and equipment since the start of the contract works.
- Few of Machineries and equipment deployed at work sites were found Off Road and no actions were taken to either repair or replace as on the date of audit.
- The RO and the Site Engineer had allowed the contractors to deploy same machineries and equipment for two or three contract packages instead of ensuring deployment of separate equipment for each contract package.
- Different sets of machineries and equipment were found deployed at site as against committed as per contract documents.
- Few Contractors had failed to commit the machineries and equipment viz. Water Tanker, Plate Compactor and Crusher Plant, which were critical equipment, required for the smooth execution of road works. The Evaluation Committee and MLTC/DLTC had not taken decisions to address the non-commitment of the equipment despite the work was awarded to the firm. During the physical verification of the machinery /equipment, revealed that contractors had not deployed such equipment and the RO had failed to take action on the issue.
- The RO and the Site Engineers had failed to either ensure deployment of committed machineries and equipment by the contractors or take action to deduct the hiring cost as per the provisions of the contract agreements against the defaulting contractors.

Non-deployment of committed machineries and equipment were in total violations with reference to Clause SCC 10.1 of the GCC of the contract agreements and keeping in view that the firms had qualified the technical category by obtaining scores based on the proposed deployment of key equipment and machineries. Further, it was the responsibility of site engineer to report the matter to Regional Office for appropriate decisions and actions. The inaction on the part of the site engineer indicated laxity and complacency as well as extension of undue favour to the contractors. The RO, should comment on the basis of accepting machineries and equipment other than those committed in the contracts including acceptance of same equipment for contractors executing two or three contract packages as different work plans and completion deadlines were set against each contract package. Besides, the RO must also comment on course of action taken against the contractors in term of the contract Clause SCC 10.1 of the GCC for deployment of different set of machineries and equipment in the event no approval were accorded for replacements.

The Regional Office besides recovering the penalties computed by the RAA should also work out the exact penalty amounts deductible taking into consideration the revised and actual completion dates, substitutions with lesser capacity of machineries and equipment and deposited in to Audit Recoveries Account.

The DOR and the Ministry should hold the RO and the Site Engineer accountable for the failure to ensure deployment of machineries and equipment as per bidding documents for appropriate decisions and action.

Auditee's Response:

It is to inform RAA that M/s. Chogyal construction had deployed separate set of machineries and human resources for all three packages during the execution. RAA was provided with the set of resources deployed for two packages during the auditing time itself. However, RO could not able to produce documentation for one package due to its misplacement. We regret for not having produced the documents as required during the auditing. Finally, after hard work of searching

every day, finally RO could able to find the documents for the third package. The copy of HR and equipment for package II & III attached for reference and record, please. Therefore, RAA is requested to kindly drop the memo. Further RO also assures RAA that such important documents shall be kept under safe custody for future works.

M/s Etho Metho Construction has deployed machineries as per the agreement. However, the Bitumen Sprayer was not brought to site yet the BT works was successfully executed by spraying the bitumen manually to the required specification. The RO thus accepted the work and penalty for not deploying the bitumen sprayer was not imposed. Therefore, RO requests RAA to consider and drop the memo, please.

RAA's Further Comments & Recommendations:

While taking note of the response, the fact remains that timely deployment of committed machinery and equipment is a critical factor for project success in terms of time, cost, and quality. The RO had failed to draw appropriate time schedule for the deployment of machinery and equipment in line with the work programs to enable the site engineer to monitor and direct the contractors for deployment of equipment as scheduled. It is apparent that abnormal delays of the contract works beyond the contract and revised completion periods were in the absence of predetermined schedules for deployment of equipment by the contractor for the works. The contract delays was also possible due for engagement of same equipment for the both contract packages II and VII.

Non-levy of penalty as envisaged in the contract document tantamount to extension of undue favour as the contractors not only benefit financially from not having to bring the equipment at site and incur associated cost but also on annulling the payment of penalty for non- deployment of equipment at site. It is to reiterate that the quoted rates of contractor for the related items of works is built up cost inclusive of cost of equipment and all risks factors.

The failure on the part of the RO and the Site Engineer to ensure deployment of all committed Plants and Equipment at work site indicated laxity and complacency as well as existence of systemic faults, deficiencies and poor contract management.

However, as asserted in the response on the deployment of all machinery and equipment at site on readying the bituminous works, the RO should submit the list equipment and machinery deployed along with documentary evidences for both the contract packages for records and verification in audit. In the event of failure to furnish the requisite records, the RO should recover the penalty as envisaged in the contract documents. In addition, it is to reiterate that non-deployment of one concrete mixture and one air compressor as noted during the physical verification were require throughout constructions not just for bituminous works.

However, as agreed during the exit meeting, DOR and RO, should work out the exact penalty amounts deductible for non-deployment of equipment as per contract document and amounts be recovered within three months from the date of issue of the report beyond which penalty @ 24% per annum shall be levied as per Chapter IV, Section 4.5.1.4 of the Finance and Accounting Manual 2016.

Further DoR and the Ministry should study on the impact of poor plant and equipment management existing within the present system and practices on the progress and quality of works. Besides, the DOR and the Ministry should also conduct appropriate studies in terms of types of plant and equipment and efficiency requirements, numbers of plant and equipment requirements, adequate machinery and equipment deployment plan in relation to the quantum of works and cost of the project for effective equipment management by both the site engineer and the contractor. In addition, the Ministry should also review on the non-commitment of critical and requisite machineries and equipment by the winning bidders and appropriate measures and system put in

place to address such flaws in the tender process as well as avoid complication in the contract management for similar project in future.

The studies conducted and actions and measures initiated to improve the equipment management system as well as to prevent such flaws and lapses intimated to RAA for records and follow-up in future audits.

Who is accountable?

Direct Accountability	: Refer Accountability Statement attached
Supervisory Accountability	:Refer Accountability Statement attached

2.15 Non-installation of laboratory at site as per BOQ (5.1.15)

The Regional Office, Trongsa and Lingmethang, despite clear instruction in the technical specification that no separate measurements and payment to be made on the provisions and maintenance of Camps, Offices, Stores, Equipment Yards and Workshops, had prepared detailed estimates for *Installation of Labour camps, contractors’ site office, accommodation with proper toilets and sanitation, stores signage, water supply, electricity, lab facilities including equipment etc.* and included as a separate “**item of work**” in the BOQ.

For this item of work, the contractors had quoted lump sum amounts and were paid for including establishment of laboratory at work sites as detailed below:

RO, Trongsa-Table 2.15: details of estimated cost, quoted price and payments thereon				
Packages	Name of Contractor	Departmental estimate (Nu.)	Quoted Amount (Nu.)	Amount paid (Nu.)
Package 1	M/s Rigsar Construction Pvt. Ltd	200,000.00	200,000.00	200,000.00
Package 2	M/s Gaseb Construction Pvt. Ltd	200,000.00	2,000,000.00	2,000,000.00
Package 3	M/s Rinson Construction Pvt. Ltd	200,000.00	1,000,000.00	1,000,000.00
Package 4	M/s Gyalcon Infrastructure Pvt. Ltd	200,000.00	1,200,000.00	1,200,000.00
Package 5	M/s Druk Lhayul Construction Pvt. Ltd	200,000.00	500,000.00	500,000.00
Package 6	M/s Raven Builders & Company Pvt. Ltd	200,000.00	400,000.00	400,000.00
Package 7	M/s Druk Lamsel Construction Pvt/ Ltd	300,000.00	600,000.00	600,000.00
Package 8	M/s. Dungkar Construction Pvt Ltd. Thimphu	200,000.00	150,000.00	150,000.00
Package 9	M/s Welfare Construction Pvt. Ltd	200,000.00	2,000,000.00	1,800,000.00
Package 10	M/s Rinson Construction Pvt/ Ltd	200,000.00	750,000.00	675,000.00
Package 11	M/s Dungkar Construction Pvt/ Ltd	200,000.00	150,000.00	150,000.00
Package 12	M/s Dungkar Construction Pvt Ltd	300,000.00	150,000.00	150,000.00
Package 13	M/s Rinson Construction Pvt/ Ltd	200,000.00	500,000.00	500,000.00
Package 14	M/s Lamnekha Construction Pvt Ltd	300,000.00	50,000.00	50,000.00
Total		3,100,000.00	9,650,000.00	9,325,000.00

RO, Lingmethang-Table 2.15(a): details of estimated cost, quoted price and payments thereon				
Packages	Name of Contractor	Departmental estimate (Nu.)	Quoted Amount (Nu.)	Amount paid (Nu.)
Package 2	M/s Tshering Construction Pvt. Ltd	1,744,875.00	2,500,000.00	2,500,000.00

Package 3	M/s KD Builders Pvt. Ltd.)	1,794,875.00	4,800,000.00	4,800,000.00
Package 4	M/s Gongphel Construction Pvt. Ltd.	2,194,875.00	1,000,000.00	1,000,000.00
Package 5	M/s Norbu Construction Pvt. Ltd)	2,294,875.00	700,000.00	700,000.00
Package 6	M/s Rigsar Construction Pvt. Ltd.	2,294,875.00	250,000.00	200,000.00
Package 7	M/s Tshering Construction Pvt. Ltd	1,225,175.00	2,500,000.00	2,000,000.00
	Total	11,549,550.00	11,750,000.00	11,200,000.00

During site visit, the audit team in the presence of the Officials from Regional Offices and contractors, physically verified the establishment of proper camps, toilets, water supply and equipment etc. as defined in the estimates and contract document. The team observed that while the payments were made, some contractors had not installed laboratory and some had failed to procure necessary equipment for the laboratory as discussed below:

RO, Trongsa

2.15.1 Nyelazam to Sakachawa (Package 2) executed by M/s Gaseb Construction Pvt. Ltd (RO, Trongsa)

M/s Gaseb Construction Pvt. Ltd had quoted Nu. 2,000,000.00 and was paid accordingly. However, during site verification by the audit team along with the site engineer and the contractor, observed that while most of the lab equipment were available, no separate laboratory facilities was found established. The following equipments were not made available for verification:

Procurement of lab equipment and other related items		No.	Remark
I	Bitumen thermometer – digital	1	No
II	CBR testing machine	1	No
III	Flakiness & elongation Index	1	No

2.15.2 Sakachawa to Tsangkha (Package 3) executed by M/s Rinson Construction Pvt. Ltd (RO, Trongsa)

M/s Rinson Construction Pvt. Ltd had quoted Nu. 1,000,000.00 and was paid accordingly. However, during the site visit made on 12.01.2017 by the audit team along with the site engineer and the contractor, observed that the laboratory was not installed at site as laboratory equipment as detailed in the table below were not available for verification:

Installation of labor camps, contractor's site office, accommodation with proper toilets and sanitation, stores, signage, water supply, electricity, lab facilities including equipment etc. as per Technical Specification.			
Procurement of lab equipment and other related items		No	Remarks
I	Sand Replacement Equipment	1	No
II	Sieve - all sizes	1	No
III	Flakiness & elongation Index	1	No
IV	Moisture content (speedometer)	1	No

V	Slump Cone	1	No
VI	Cube moulds	1	No
VII	Bitumen thermometer – digital	1	No
VII	Marshall equipment/apparatus	1	No
IX	Bituminous Oven	1	No
X	Water bath	1	No
XI	Centrifuge extractor	1	No
XII	Digital balance	1	No
XIII	Jaw crusher (small)	1	No
XIV	Triple Beam balance 1 set	1	No
XV	Density wire basket	1	No
XVI	CBR testing machine	1	No

On enquiry, the project engineer stated that only one laboratory was installed for package 3 (III) and for Package 10 (X) although installation of camp and laboratory for individual packages were paid separately.

2.15.3 Tshangkha to View Point (Package 4) executed by M/s Gyalcon Infrastructure Pvt. Ltd (RO, Trongsa)

M/s Gyalcon Infrastructure Pvt. Ltd. had quoted Nu. 1,200,000.00 and was paid accordingly. However, during site verification by the audit team along with the site engineer and the contractor, observed that the contractor had not established laboratory since the start of the project.

2.15.4 View Point- BjeeZam (Package 5) executed by M/s Druk Lhayul Construction Pvt. Ltd (RO, Trongsa)

M/s Druk Lhayul Construction Pvt. Ltd had quoted Nu. 1,000,000.00 and was paid accordingly. However, during the site visit by the audit team along with the site engineer and the contractor, observed that the laboratory was not installed at site as laboratory equipment as detailed in the table below were not available for verification:

Table 2.15.4: Lab Equipment not available at site			
Installation of labor camps, contractor’s site office, accommodation with proper toilets and sanitation, stores, signage, water supply, electricity, lab facilities including equipment etc. as per Technical Specification.			
Procurement of lab equipment and other related items		No.	Remark
I	Sand Replacement Equipment	1	No
II	Sieve - all sizes	1	Only fine aggregates equipment present
III	Flakiness & elongation Index	1	No
IV	Moisture content (speedometer)	1	No
V	Slump Cone	1	Yes
VI	Cube moulds	1	Yes

VII	Bitumen thermometer – digital	1	Yes
VII	Marshall equipment/apparatus	1	No
IX	Bituminous Oven	1	No
X	Water bath	1	No
XI	Centrifuge extractor	1	No
XII	Digital balance	1	No
XIII	Jaw crusher (small)	1	No
XIV	Triple Beam balance 1 set	1	No
XV	Density wire basket	1	No
XVI	CBR testing machine	1	No

Sieve of all sizes, Slump Cone and Bitumen thermometer – digital only were made available for verification

2.15.5 Bjeezam- Trongsa (Package 6) executed by M/s Raven Builders & Company Pvt. Ltd (RO, Trongsa)

M/s. Raven Builders & Company (P) LTD had quoted Nu. 400,000.00 and was paid accordingly. However, during the site verification by the audit team along with the site engineer and the contractor, observed that no laboratory facilities was found established.

2.15.6 Pinzhi-Tashipokto (PKG-8) executed by M/s. Dungkar Construction Pvt Ltd. Thimphu (RO, Trongsa)

M/s Dungkar Construction Pvt. Ltd quoted only Nu. 150,000.00 and was paid accordingly. However, during site verification by the audit team along with the site engineer and the contractor, observed while most of the lab equipment were available, no separate laboratory facilities was found established.

2.15.7 Tashipokto to Dorjigonpa (Package 9) executed by M/s Welfare Construction Pvt. Ltd (RO, Trongsa)

M/s Welfare Construction Pvt. Ltd had quoted Nu. 2,000,000.00 and was paid accordingly. However, during site verification on 19.01.2017 by the audit team along with the site engineer and the contractor, the team was informed that the contractor had not established laboratory since the start of the project.

On pointing out, the RO, stated that Nu. 200,000.00 representing 10% of the quoted amount for non-installation of laboratory was deducted.

2.15.8 Dorji Gonpa to Yotongla (Package 10) executed by M/s Rinson Construction Pvt. Ltd (RO, Trongsa)

M/s Rinson Construction Pvt. Ltd had quoted Nu. 750,000.00 and was paid Nu. 675,000.00. However, during the site visit on 18.01.2017 by the audit team along with the site engineer and the contractor, observed that the laboratory was not installed at site as laboratory equipment as detailed in the table below were not available for verification:

Table 2.15.8: Lab Equipment not available at site
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Installation of labor camps, contractor's site office, accommodation with proper toilets and sanitation, stores, signage, water supply, electricity, lab facilities including equipment etc. as per Technical Specification.			
Procurement of lab equipment and other related items		No.	Remarks
I	Sand Replacement Equipment	1	No
II	Sieve - all sizes	1	Yes
III	Flakiness & elongation Index	1	Yes
IV	Moisture content (speedometer)	1	No
V	Slump Cone	1	Yes
VI	Cube moulds	1	Yes
VII	Bitumen thermometer – digital	1	No
VII	Bitumen Penetration	1	No
IX	Marshall equipment/apparatus	1	No
X	Lab Oven	1	Yes
XI	Water bath	1	No
XII	Centrifuge extractor	1	No
XIII	Digital balance	1	Yes
XIV	Jaw crusher (small)	1	No
XV	Triple Beam balance 1 set	1	No
XVI	Density wire basket	1	Yes
XVII	CBR testing machine	1	Yes

On enquiry, the project engineer stated that only one laboratory was installed for package 3 (III) and for Package 10 (X) although installation of camp and laboratory for individual packages were paid separately.

On pointing out, the RO, stated that Nu. 75,000.00 representing 10% of the quoted amount was deducted for not fully establishing the laboratory.

2.15.9 Yotongla to Bongzam (Package 11) executed by M/s Dungkar Construction Pvt. Ltd (RO, Trongsa)

M/s Dungkar Construction Pvt. Ltd have quoted Nu. 150,000.00 and was paid accordingly. However, during the site verification by the audit team along with the site engineer and the contractor, observed that the no separate laboratory facilities was found established except for Package 8.

2.15.10 Bongzam to Gyatsa Zam (Package 12) by M/s Dungkar Construction Pvt. Ltd (RO, Trongsa)

M/s Dungkar Construction Pvt. Ltd have quoted Nu. 150,000.00 and was paid accordingly. However, during the site verification by the audit team along with the site engineer and the contractor, observed that the no separate laboratory facilities was found established except for Package 8.

2.15.11 Gyatsazam to Ngangar (Package 13) executed by M/s Rinson Construction Pvt. Ltd (RO, Trongsa)

M/s Rinson Construction Pvt. Ltd had quoted Nu. 500,000.00 and was paid accordingly.

However, during the site verification on 21.12.2017 by the audit team along with the site engineer and the contractor, observed that the no separate laboratory facilities was found established as laboratory equipment as detailed in the table below were not available for verification:

Table 2.15.11: Lab Equipment not available at site			
Installation of labor camps, contractor's site office, accommodation with proper toilets and sanitation, stores, signage, water supply, electricity, lab facilities including equipment etc. as per Technical Specification.			
Procurement of lab equipment and other related items		No.	Remarks
I	Sand Replacement Equipment	1	No
II	Sieve - all sizes	1	No
III	Flakiness & elongation Index	1	No
IV	Moisture content (speedometer)	1	No
V	Slump Cone	1	No
VI	Cube moulds	1	No
VII	Bitumen thermometer – digital	1	No
VIII	Marshall equipment/apparatus	1	No
IX	Bituminous Oven	1	No
X	Water bath	1	No
XI	Centrifuge extractor	1	No
XII	Digital balance	1	No
XIII	Jaw crusher (small)	1	No
XIV	Triple Beam balance 1 set	1	No
XV	Density wire basket	1	No
XVI	CBR testing machine	1	No

On enquiry, the project engineer stated that only one laboratory was installed for package 10 (X) and for Package 13 (XIII) although installation of camp and laboratory for individual packages were paid separately.

RO, Lingmethang

2.15.12 Korila-Pangser (Package-2) executed by M/s. Tshering Construction Pvt Ltd. Bumthang (RO, Lingmethang)

M/s. Tshering Construction Pvt Ltd. had quoted Nu. 2,500,000.00 and was paid accordingly. However, during site visit, the audit team in the presence of the Officials from Regional Office and contractor physically verified the establishment of proper camps, toilets, water supply etc. as defined in the estimates and contract document. The team noted that while the payments were made, some necessary equipment were found not procured by the contractor as detailed below:

Table 2.15.12: Lab Equipment not available at site			
Procurement of lab equipment and other related items		No.	Remark
I	Marshall equipment/apparatus	1	No
II	Bituminous Oven	1	No

III	Water bath	1	No
IV	Centrifuge extractor	1	No
V	Sand equivalent test apparatus	1	No
VI	Jaw crusher (small)	1	No
VII	Triple Beam balance 1 set	1	No
VIII	Density wire basket	1	No
IX	CRB testing machine	1	No

2.15.13 Pangser-Kilikhar (Package-3) executed by M/s. K. D Builder Pvt Ltd (RO, Lingmethang)

M/s. K. D Builder Pvt Ltd. had quoted Nu. 4,800,000.00 and was paid accordingly. However, during site visit, the audit team in the presence of the Officials from Regional Office and contractor physically verified the establishment of proper camps, toilets, water supply etc. as defined in the estimates and contract document. The team noted that while the payments were made, some necessary equipment were found not procured by the contractor as detailed below:

Table 2.15.13: Lab Equipment not available at site			
Installation of labor camps, contractor's site office, accommodation with proper toilets and sanitation, stores, signage, water supply, electricity, lab facilities including equipment etc. as per Technical Specification.			
Procurement of lab equipment and other related items		No.	Remark
I	Marshall equipment/apparatus	1	No
II	Bituminous Oven	1	No
III	Centrifuge extractor	1	No
IV	Jaw crusher (small)	1	No
V	Triple Beam balance 1 set	1	No
VI	Density wire basket	1	No
VII	CBR testing machine	1	No
VIII	Safety goggles	1	No

On enquiry, the project engineer stated that only one laboratory was installed for package 3 (III) and for Package 10 (X) although installation of camp and laboratory for individual packages were paid separately.

2.15.14 Kilikhar to Mongar (Package 4) executed by M/s Gongphel Construction Pvt. Ltd (RO, Lingmethang)

M/s Gongphel Construction Pvt. Ltd had quoted Nu. 1,000,000.00 and was paid accordingly. However, during site visit, the audit team in the presence of the Officials from Regional Office and contractor physically verified the establishment of proper camps, toilets, water supply etc. as defined in the estimates and contract document. The team noted that while the payments were made, some necessary equipment were found not procured by the contractor as detailed below:

Table 2.15.14: Lab Equipment not available at site			
Installation of labor camps, contractor's site office, accommodation with proper toilets and sanitation, stores, signage, water supply, electricity, lab facilities including equipment etc. as per Technical Specification.			
Procurement of lab equipment and other related items		No.	Remark
I	Bituminous Oven	1	No
II	Centrifuge extractor	1	No
III	Water bath	1	No
IV	Density wire basket	1	No
V	CBR testing machine	1	No
VI	Safety goggles	1	No
VII	Safety Belts	1	No

2.15.15 Mongar-Gongola (Package-5) executed by M/s. Norbu Construction Company Pvt. Ltd, Gelephu (RO, Lingmethang)

M/s. Norbu Construction Company Pvt. Ltd, Gelephu had quoted Nu. 700,000.00 and was paid accordingly. However, during site visit, the audit team in the presence of the Officials from Regional Office and contractor physically verified the establishment of proper camps, toilets, water supply etc. as defined in the estimates and contract document. The team noted that while the payments were made, no separate lab facilities was found established at site as laboratory equipment as detailed in the table below were not available for verification:

Table 2.15.15: Lab Equipment not available at site			
Installation of labor camps, contractor's site office, accommodation with proper toilets and sanitation, stores, signage, water supply, electricity, lab facilities including equipment etc. as per Technical Specification.			
Procurement of lab equipment and other related items		No.	Remark
I	Flakiness & elongation Index	1	No
II	Moisture content (speedometer)	1	No
III	Bitumen thermometer – digital	1	No
IV	Marshall equipment/apparatus	1	No
V	Bituminous Oven	1	No
VI	Water bath	1	No
VII	Centrifuge extractor	1	No
VIII	Jaw crusher (small)	1	No
IX	Triple Beam balance 1 set	1	No
X	Density wire basket	1	No
XI	CBR testing machine	1	No

2.15.16 Gangola-Kurizampa (Package 6) executed by M/s. Rigzar Construction Pvt Ltd. Trashigang (RO, Lingmethang)

M/s. Rigzar Construction Pvt Ltd had quoted Nu. 250,000.00 and was paid Nu. 200,000.00.

However, during the site verification by the audit team along with the site engineer and the contractor, observed that while most of the lab equipment were available, no separate lab facilities was found established at site as laboratory equipment as detailed in the table below were not available for verification:

Table 2.15.16: Lab Equipment not available at site			
Installation of labour camps, contractor's site office, accommodation with proper toilets and sanitation, stores, signage, water supply, electricity, lab facilities including equipment etc. as per Technical Specification.			
Procurement of lab equipment and other related items		Qty. in No.	Remarks
I	Marshall equipment/apparatus	1	No
II	Bitumen Oven	1	No
III	Water bath	1	No
IV	Centrifuge extractor	1	No
V	Jaw crusher (small)	1	No
VI	Triple Beam balance 1 set	1	No
VII	Density wire basket	1	No
VIII	CBR testing machine	1	No
IX	Insurance		documents not available

2.15.17 Kurizampa-Lingmethang Highway (Package-7) executed by M/s Tshering Construction Pvt. Ltd, Bumthang (RO, Lingmethang)

M/s Tshering Construction Pvt. Ltd, Bumthang had quoted Nu. 2,500,000.00 and was paid Nu.2,000,000.00. However, during the site verification by the audit team along with the site engineer and the contractor, observed that the no separate laboratory facilities was found established as laboratory equipment as detailed in the table below were not available for verification:

Table 2.15.17: Lab Equipment not available at site			
Installation of labor camps, contractor's site office, accommodation with proper toilets and sanitation, stores, signage, water supply, electricity, lab facilities including equipment etc. as per Technical Specification.			
Procurement of lab equipment and other related items		No.	Remarks
I	Sand Replacement Equipment	1	No
II	Flakiness & elongation Index	1	No
III	Moisture content (speedometer)	1	No
IV	Slump Cone	1	No
V	Bitumen thermometer – digital	1	No
VI	Marshall equipment/apparatus	1	No
VII	Bituminous Oven	1	No
VIII	Water bath	1	No
IX	Centrifuge extractor	1	No

X	Sand equivalent test apparatus	1	No
XI	Digital balance	1	No
XII	Jaw crusher (small)	1	No
XIII	Triple Beam balance 1 set	1	No
XIV	Density wire basket	1	No
XV	CBR testing machine	1	No

The Regional Office should comment on the non-establishment of lab facilities which is a critical component of contract obligations for ensuring execution of contract works with quality materials and testing of executed works to validate that works met the required technical standards and specifications.

The Regional Office should comment as to how such technical requirements on the execution of works were achieved without laboratory facilities. Besides, the RO should recover the proportionate amount from the contractor for not installing laboratory at site or installation of combined laboratory, if any, and the amount recovered deposited into Audit Recoveries Account. Further, the Regional Office should also comment on non availability of lab equipments at site.

Auditee's Response:

The Regional Office acknowledges the observations issued by Royal Audit Authority and we have great concerns and high regards for the observation made by Royal Audit Authority. We would like to furnish the following facts and evidences as comprehensive explanations for kind consideration by Royal Audit Authority.

From the list of equipment enclosed, RO acknowledges that though the firm has not brought all the requisite equipment at site, the minimal pre-requisite testing equipment are present at site. More over the firm carries out the required test at site as demanded by the nature of work from the neighboring contractor's laboratory.

For some equipment made not available at site during the course of testing, proportionate amount will be worked out and will be recovered and deposited to ARA We would like to request the Royal Audit Authority to kindly review above detailed explanations and consider dropping the above Para.

Other Responses:

As long as many contractors getting their materials tested from APECs and nearby contractor with their own expenses, RO could not do anything despite several instructions.

With every bill submission, contractors are instructed to attach test reports/results and each & every contractor is complying with this requirement

RAA's Further Comments & Recommendations:

The response of the RO that request test were conducted by the contractors from APECs and neighboring contractors' laboratories is not tenable as the incorporation of such extra item of works in the estimates and BOQs was made in violation of the provisions of the technical specifications and also such decisions should have been taken prior to incorporation of the lab requirements in the estimates/BOQs, tendering and awarding the contract works. The

incorporation of installation of laboratory facilities in the estimates/BOQs would have cost implications which bidders are expected to include in their rates.

It is apparent from the response that the RO had not adhered to the contract provisions by allowing the contractors to conduct the test in APECs and neighboring contractors' laboratories instead of directing the contractors to establish own laboratory as per the contract agreement. It also indicated laxity and complacency on the part of the RO to enforce the provisions of the contract agreement.

Non-enforcement of contract clauses strictly and non-levy of penalty tantamount to extension of undue favour as the contractors benefits financially on not having to procure and install the lab facilities and incur associated cost. It is to reiterate that the quoted rates of contractors for the related items of works is built up cost inclusive of cost of lab equipment and all risks factors.

However, as agreed during the exit meeting, DOR and RO should work out the exact penalty amounts deductible for non-establishment of laboratories and non-furnishing of full laboratory facilities in terms of the total payments made to Contractors as the deduction of just 10% made by the RO from few contractors were not justified. The deductible amounts should be recovered within three months from the date of issue of the report beyond which penalty @ 24% per annum shall be levied as per Chapter IV, Section 4.5.1.4 of the Finance and Accounting Manual 2016. Besides, the details of recoveries affected and accounted for in the books of accounts should be furnished to RAA for review and record.

Further, in the light of the failure not only to establish laboratory facilities by majority of the contractors but also on the part of the RO and Site Engineer to strictly enforced the provisions as per contract agreement, the DoR and the Ministry should revisit the estimates/BOQs and technical specifications for appropriate decisions and action on the requirement for inclusion of installation of separate laboratory facilities by contractors for similar future works.

The outcome of the decisions should be intimated to RAA for records and follow-up in future audits.

Who is accountable?

<i>Direct Accountability</i>	<i>: Refer Accountability Statement attached</i>
<i>Supervisory Accountability</i>	<i>: Refer Accountability Statement attached</i>

2.16 Flaws in the BOQ and technical Specification on the transportation of Spoil materials in designated dumping yards (4.4.69)

The Nomenclature provided in the BOQ for item work RW0024 for dumping of spoil materials were as under:

“Transportation of loose spoil materials in designated locations including loading/unloading, Dressing of dump sites and plantation of vegetation after completion of dumping beyond 500 up to 1210 m.”

While the bidder was required to bid in lump sum amount for FC works comprising item of works “RW0014 for exaction of all kinds of rocks”, RW0013 for “excavation of all kinds of soil” and RW0024 for “transportation of loose soil”, the nomenclature categorically provided under RW0024 transportation of loose spoil materials beyond 500m up to 1210m indicating that the designated dumping sites were beyond 500m distances.

Accordingly, the quotes though obtained as lump sum amount for formation works, had invariably built up rates for the transportation of loose soil beyond 500m up to 1210 m. It was apparent from the records and documents that the Regional Office had obtained NEC clearance for dumping yards for all contract packages prior to estimations and awards of contracts.

The designated dumping yards for the various contract packages were approved as detailed in table 2.16 below:

Table 2.16: Flaws in the BOQ and technical Specification			
Name of contractor	Contract Chainage	Designated Dump Yard Chainage	Remark
M/s Empire Construction (Package VIII) – Lobeysa	372km to 379km (7km) Pelela- Bumilo	379.10KM,378.70KM,377.90KM,377.80KM,376.5KM,375.50KM,374.50KM,374.3KM&372.6KM	Analysis based on the designated dumping yards indicated that from a less than a kilometer, transportation of loose materials were required beyond 500m. (M/s Empire Construction Pvt. Ltd. as evident from the NEC clearance letter No. NECS/ESD/DOR/3023/2014/1018 dated 18/12/2014).
M/s Gaseb Construction Pvt. Ltd - (Package 2) Trongsa	12.00km to 19.50km (7.5km) Nyelazam – Sakachawa	13960-14020, 14420-14490, 14700-14750, 15000-15040, 15520-15580, 15720-15790, 16220-16280	Analysis based on the designated dumping yards indicated that in between Chainage 12000 to 13460m and 16780 to 19500m , transportation of loose material beyond 500m were required only for about 1460m and 2720m respectively.
M/s Druk Gyalcon Construction Pvt. Ltd (Package 4) -Trongsa	27km to 32.00km (5km) Tsangkha to Trongsa View point	27274m, 27372m, 2772m, 28794m, 28956m, 29120m, 29256m, 29500m, 29709m, 31743m	Analysis based on the designated dumping yards indicated that transportation of loose materials beyond 500m were required only for 1313m
M/s Druk Lhayul Construction Pvt. Ltd (Package 5) Trongsa	32.00km to 37.70km (5.7km) View Point-Bjee Zam	32160-32240m, 32380-32440m, 33610-33640m	Analysis based on the designated dumping yards indicated that transportation of loose materials beyond 500m were required only for 3730m
M/s Raven Construction Pvt. Ltd (Package 6) Trongsa	37.7km-44.4km(6.7 km) Bjezam-Trongsa	37,960m-38,000m, 39,540m-39,620m, 41,520m-41,600m, 43,260m-43,300m	Analysis based on the designated dumping yards indicated that transportation of loose materials beyond 500m were required only for 2700m
M/s. Dungkar Construction Pvt Ltd. Thimphu (Package 8) Trongsa	50.80km to 58.00km (7.2km) to Pinzhi-Tashipokto	53310m, 56569m	Analysis based on the designated dumping yards indicated that transportation of loose materials beyond 500m were required only for 5200m
M/s Welfare Lamsel Construction Pvt. Ltd (Package 9) Trongsa	58km to 65.98km (7.98km) Dorjigonpa to Tashipokto	58.76 - 58.82km, 60.66 - 60.80km, 61.29 - 61.39km, 63.22 - 63.36km, 63.85 - 63.91km	Analysis based on the designated dumping yards indicated that transportation of loose materials beyond 500m were required only for 4.5km
M/s Rinson Construction Pvt. Ltd (Package 10) Trongsa	65.98km to 72km (6.02km) Dorjigonpa to Yotongla	71353-71763m, 70823-71001m, 68061-68106m	Analysis based on the designated dumping yards indicated that transportation of loose materials beyond 500m were required only for 3298m
M/s. Dungkar Construction Pvt Ltd.	72km to 80km (8km) Yotongla to Bongzam	81.2-81.26km, 81.78-81.84km, 84.76- 84.81	Analysis based on the designated dumping yards indicated that transportation of loose

Thimphu (Package 11) Trongsa			materials beyond 500m were required only for 2.61km

Further, it was evident from the documents that the NEC clearance for dumping yards in respect of contract package VIII (Lobeysa) awarded to M/s Empire Construction was obtained seven months ahead of the award of the contract on 23/07/2015.

The audit in an attempt to validate the requirement for the transportation of loose materials beyond 500 up to 1210 m carried out an analysis based on the approved designated dumping yards and observed that transportation of loose materials beyond 500m lead were not required in most of chainages as the dumping yards were well within 500m lead. The extent of transportation of loose materials required beyond 500m were as depicted in the table 2.16 above in respect of each packages.

The specification in the BOQ requiring transportation beyond 500m up to 1210m of excavated loose spoil materials indicated flawed BOQs specification. The Regional Offices should have taken into consideration the approved dump yards and to the extent of loose materials actually required to be transported beyond 500m lead quantified and incorporated in the departmental estimates and specified in the BOQ of the tender documents. Thus, inclusion of a standard nomenclature in the BOQ on the transportation of spoil materials indicated requirement of transportation of all excavated materials beyond lead of 500m which adversely impacted the departmental estimates as well as bid prices.

The Regional Offices and the DOR besides commenting on the lapses should also hold the concerned officials accountable for preparation of flawed estimates, BOQs and technical specification relating to the transportation of loose spoil materials despite knowing that designated dumping yards were approved by NEC for each contract packages.

The DoR and the Ministry should revisit the departmental estimates and ascertain the financial implications due to flawed estimation and nomenclature in the BOQs of the tender documents.

Auditee's Response:

The lead for transportation of spoils were anticipated within the lead of 500.00M-1,210.00M in the estimates. The NEC visited the sites and identified the dumping yards which fell distance lesser than the above lead which were assumed during the time of estimates. In reality, the actual lead for transportation is more than 500M. Therefore, please drop the memo.

RAA's Further Comments & Recommendations:

While taking note of the response, it is reiterated that the approvals for dumping yards were obtained prior to the awards of the contracts by ROs from respective authorities and known to the ROs. The analysis carried out in terms of approved dumping yards as detailed in the table of the report revealed that for 9 contract packages, the requirement of transportation of spoil materials beyond 500m lead ranged just from half a kilometer to 5.2 kms against allotted road stretches ranging from 5km to 8km. The transportation of spoil materials incorporated in the departmental estimated cost in respect of Lobeysa ranged from 40% to 65% in respect of contract packages and the departmentally executed formation cutting works showed as high as 98.74%.

Thus, in consideration to the above facts, there exist flaws in the departmental estimations and nomenclatures in the BOQs.

However, as discussed during the exit meeting, the DOR and Ministry should revisit all the departmental estimates prepared by the ROs and flaws and ambiguities, if any, remedial measures taken to prevent unrealistic preparation of estimates and inclusion of flawed nomenclatures in the BOQs for similar projects in future. The outcome of the review and remedial measures put in place intimated to RAA for records and follow-up in future audits.

2.17 Damages to Environment due to Dumping of muck in unidentified areas and push/freely rolling of mucks over the valley

The dump yards were found identified and dully approved by Dzongkhags NEC, and the National Environment Commission Secretariat for each contract packages. The NEC clearances clearly stipulated the following terms and conditions amongst many others:

1. The holders shall ensure that Environmentally Friendly Road Construction (EFRC) techniques are adopted for the widening of this road to minimize adverse environmental impacts;
2. The holder shall ensure that excavated materials are never pushed downhill and are loaded, Hauled and dumped at the pre-identified/approved spoil dumpsites to avoid downstream environmental damages; and
3. The holder shall ensure that dusts generated during widening of the road are adequately suppressed by spraying water.

However, during the joint physical verification of construction sites comprising officials from respective ROs, and audit team, spoil materials were found dumped at various locations by the contractors despite allocation of designated dumping yards within the contract Chainages. The excavated spoil materials found either dumped in places other than the designated dump sites or freely rolled/pushed over the hills causing downstream environmental damages in the chainages are as discussed below:

RO, Lobeysa

2.17.1 Pelela to Bumilo (Package VIII) executed by M/s Empire Construction Pvt. Ltd

During the joint site verification of the construction site, spoil materials were also found dumped at locations viz. chainages 378.94km, 378.52 and 377.69KM by the contractor despite allocation of nine designated dumping yards within the contract scope of works of seven Kilometers (*Refer audit memo 15.6*) as depicted in the Photograph below:



Fig: 2.17.1- Spoil materials rolled down the cliff in places other than *designated areas*

RO, Trongsa

2.17.2 Trongsa Nyelazam – Sakachawa executed by M/s Gaseb Construction Pvt. Ltd - (Package 2) Trongsa

The dump yard identified by RO, Trongsa for the excavated soil are in between Chainages 14450 to 17005 meters and 17973 to 24058 meters for 7.5km FC works. However, the audit team noted that excavated soil were not transported to dump yard but rolled/pushed over the hills in the following chainages:

Sl. No.	Identified dump yard (Chainage)	Chainages where muck are dumped/rolled over	Remarks	Chainages requiring transportation of spoil materials to dump yards
1	13960-14020			12000-13960
2	14420-14490			14020-14420
3	14700-14750	12123-12369	Rolled over	14490-14700
4	15000-15040	12595-13683	Rolled over	14750-15000
5	15520-15580	13727-15496	Rolled over	15040-15520
6	15720-15790	13956-16072	Rolled over	15580-15720
7	16220-16280			15790-16220
				16280-19500

As would be transpired from the table above that against the 7 identified dump yards, loose materials were found directly rolled over/ pushed down the hills from additional 4 places without the approval causing downstream environmental damages as depicted in the photographs below:



Fig: 2.17.2-Spoil materials dumped and freely rolled/pushed over the hill causing damaged to the environment

Thus, inclusion of a standard nomenclature in the BOQ on the transportation of spoil materials indicated requirement of transportation of all excavated materials beyond the lead of 500m which adversely impacted the bid price.

2.17.3 Tsangkha to View Point (Package 4) executed by M/s Druk Gyalcon Construction Pvt. Ltd (RO, Trongsa)

During the joint physical verification of site along with officials from RO, Trongsa and contractor’s staff, it was observed that the excessive earth excavated from the formation cutting were not transported to dump yard but rolled/pushed over the hills in the following chainages:

Table 2.17.3: Soil rolled/pushed over the hills and not dump in designated dumping yards			
SL. No	Identified dump yard (Chain age)	Chainages where muck are dumped	Remarks
1	27274	27372	Roll over
2	27372	27619	Roll over
3	27724	27737	Roll over
4	28794	28842	Dump yard
5	28956	29014	Dump yard
6	29120	29168	Roll over
7	29256	29486	Roll over
8	29500	29595	Dump yard
9	29709	29861	Dump yard
10	31743	31843	Roll over

It would be noted that against the 10 identified dump yards, additional 3 places were used as dump yards without the approval. The spoil materials directly rolled/push over the hills are as shown in the photographs below:



Fig: 2.17.3- Spoil materials dumped and freely rolled/pushed over the hill causing damaged to the environment

2.17.4 View Point- Bjee Zam (Package 5) executed by M/s Druk Lhayul Construction Pvt. Ltd (RO, Trongsa)

During the joint physical verification of site along with officials from RO, Trongsa it was observed that dumping of muck were done in haphazard manner or freely rolled/pushed over the hills in unidentified areas causing downstream environmental damages in the following chainages:

Table 2.17.4: Soil rolled/pushed over the hills and not dump in designated dumping yards			
SL. No	Identified dump yard (Chain age)	Chainages where muck are dumped	Remarks
1	32160-32240	32160-32247	Dump at identified place
2	32380-32440	32530-32685	Dump at identified place
3		32916-33068	Roll over
4		33080-33212	Dump yard though not identified
5		33220-33305	Roll over
6		33433-33448	Dump yard though not identified
7	33610-33640	33588-33702	Dump at identified place
8		34513-34600	Roll over
9		34677-34850	Dump yard though not identified
10		35097-35147	Dump yard though not identified
11		35297-35412	Dump yard though not identified
12		35503-35651	Roll over
13		35691-35916	Roll over
14		36117-36297	Roll over
15		36848-36927	Dump yard though not identified
16		36950-37110	Roll over

17		37138-37178	Roll over
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It was also noted that against the 3 identified dump yards, additional 6 places were used as dump yards without the approval. The spoil materials directly rolled/push over the hills are as shown in the photographs below:



Fig: 2.17.4- Spoil materials dumped and freely rolled/pushed over the hill causing damaged to the environment

2.17.5 Bjeezam-Trongsa (Package 6) executed by M/s Raven Construction Pvt. Ltd (Package 6) Trongsa

During the joint physical verification of sites comprising officials from RO, Trongsa and audit team on 14th December 2017, it was observed that despite assigning specific dump sites for stretch between Bjeezam -Trongsa, the excavated spoil materials were found either dumped in places other than the designated dump sites or freely rolled/pushed over the hills causing downstream environmental damages in the chainages detailed below:

SL. No	Ch. From (m)	Ch. To (m)	Length (m)	Remarks
1	40476	40535	59	Not identified as dumping areas by NEC
2	41318	41446	128	Not identified as dumping areas by NEC
3	41612	41665	53	Not identified as dumping areas by NEC
4	41864	41910	46	Not identified as dumping areas by NEC

5	42250	42275	25	Not identified as dumping areas by NEC
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In addition, photographic evidences of spoil materials dumped and freely rolled/pushed over the hills are as depicted below:



Fig: 2.17.5-Roll over of mucks over the valley

2.17.6 Pinzhi-Tashipokto (Package8) executed by M/s. Dungkar Construction Pvt Ltd. Thimphu (RO, Trongsa)

During the joint physical verification of site along with officials from RO, Trongsa and contractor's staff, it was observed that the dumping of excessive earth excavated from the formation cutting were either not done in the identified dumping yards/areas or freely rolled/pushed over the hills causing downstream environmental damages in following chainages:

Table 2.17.6: Soil rolled/pushed over the hills and not dump in designated dumping yards		
SL. No	Identified dump yard (Chain age)	Chainages where muck are dumped/rolled over
1	53310	57798-57876
2	56569	57603-57674
3		57474-57509
4		57372-57427
5		55818-55975
6		55754-55791
7		55576-55632
8		55417-55494
9		54475-54565

As against 2 identified dump yards, additional 9 places were used at dump yards/rolled over without the approval. The spoil materials directly rolled/push over the hill are as depicted in the photographs below:



**Fig: 2.17.6-Spoil materials dumped and freely rolled/pushed over the hill causing damaged to the environment
2.17.7 Dorjigonpa to Tashipokto (Package 8) executed by M/s Welfare Lamsel Construction Pvt. Ltd (RO, Trongsa)**

The dump yard identified by RO, Trongsa for the disposal of excavated soil are in between Chainages 58.76 km to 63.91km as indicated below:

Table 2.17.7: Identified dumping yards	
Identified dump yard (Chain age)	Chainages where muck are dumped/rolled over
58.76 - 58.82	- dumping yard
60.66 - 60.80	- dumping yard
61.29 - 61.39	- dumping yard
63.22 - 63.36	- dumping yard
63.85 - 63.91	- dumping yard

However, the audit team during site visit along with the officials of Regional Office, noted that all the excavated soil from chainages 65581 to 65096 were not transported to the designated dump yards instead rolled/pushed over the hills in the following chainages:

Table 2.17.7.1: Soil rolled/pushed over the hills and not dump in designated dumping yards				
Sl. No.	Chainage		Total length	Remarks
	From	To		
1	65980			
2	65581	65513	68	399-467 Rolling over
3	65270			
4	65167	65096	71	813 – 884 – Roll over

Further, out of five designated dumping yards, the contractor had dumped at various locations as shown below:

Table 2.17.7.2: Soil rolled/pushed over the hills and not dump in designated dumping yards		
Sl. No.	Chainage	Remarks

1	65980	
2	65581	399-467 Rolling over
3	65270	
4	65167	813 – 884 – Roll over
	63850 – 63910	Dumping yard designated
5	63631	Box cutting
6	63460	Camp
	63220 - 63360	Dumping yard designated
7	62840	
8	61498	
	61290 – 61390	Dumping yard designated
9	60961	Filling
10	60871	
11	60782	Dumping Yard
	60660 - 60800	Dumping yard designated
12	60128	
13	60000	
14	59167	
15	58908	
	58760 – 58820	Dumping yard designated
16	58661	
17	58055	

2.17.8 Dorjigonpa to Yotongla (Package 10) executed by M/s Rinson Construction Pvt. Ltd (RO, Trongsa)

The dump yards identified by RO, Trongsa for the disposal of excavated soil are in between Chainages 53310 meters and 56569 meters for 6.02km FC works. However, the audit team noted that all excavated soil are not transported to dump yards and instead rolled/pushed over the hills in the following chainages:

Table 2.17.8: Soil rolled/pushed over the hills and not dump in designated dumping yards			
SL. No	Identified dump yard (Chain age)	Chainages where muck are dumped/rolled over	Remarks
1		71726-7200	Roll over/muck dump
2	71353-71763	71353-71763	Identified dump yard
3	70823-71001	70823-71001	Identified dump yard
4		70506-70705	Roll over/muck dump
5		70272-70514	Roll over/muck dump
6		70062-70198	Roll over/muck dump
7		69877-69942	Roll over/muck dump
8		69739-69810	Roll over/muck dump
9		69503-69739	Roll over/muck dump
10		69291-69478	Roll over/muck dump
11		69111-69169	Roll over/muck dump
12		68149-68852	Roll over/muck dump
13	68061-68106	68061-68106	Identified dump yard

14		67554-67680	Roll over/muck dump
15		66925-67189	Roll over/muck dump
16		66668-66831	Roll over/muck dump
17		66494-66504	Roll over/muck dump

As against 3 identified dump yards, additional 14 places were used at dump yards/rolled over without the approval. The spoil materials are directly rolled over the hill as shown in the photographs depicted below:



Fig: 2.17.8- Spoil materials dumped and freely rolled/pushed over the hill causing damaged to the environment

2.17.9 Yotongla to Bongzam (Package 11) executed by M/s. Dungkar Construction Pvt Ltd. Thimphu (RO, Trongsa)

The joint physical verification of site along with officials from RO, Trongsa revealed that dumping of muck are either not done in identified areas or freely rolled/pushed over the hills causing downstream environment damages in the following chainages:

Table 2.17.9: Soil rolled/pushed over the hills and not dump in designated dumping yards		
SL. No	Approximate chainages (in meter)	Remarks
1	1110-1166	Rolled over
2	1303-1358	Muck dumped
3	1483-1551	Rolled over
4	6505-6611	Rolled over
5	7007-7249	Rolled over
6	7249-8000	Muck dumped

As against 6 identified dump yards, additional place was used as dump yard without the approval. The spoil materials are directly rolled over the hill as shown in the photographs below:

RO, Lingmethang



Fig: 2.17.9-Spoil materials dumped and freely rolled/pushed over the hill causing damaged to the environment

2.17.10 Korila-Pangser (Package-2) executed by M/s. Tshering Construction Pvt Ltd. Bumthang (RO, Lingmethang)

The dump yard identified by RO, Lingmethang for the disposal of excavated soil are in at Chainage 36.4km, 36.6km, and 36.9km.

During the joint physical verification of sites comprising of officials from RO, Lingmethang on 17th November 2017, it was observed that despite assigning specific dump sites for stretch between Korila to Pangsar, the excavated spoil materials were found either dumped other than the designated dump sites or freely rolled/pushed over the hills causing downstream environment damages as detailed below:-

Table 2.17.10: Soil rolled/pushed over the hills and not dump in designated dumping yards		
SL. No	Approximate chainages (in meter)	Remarks
1	37324	Rolled over
2	37372	Muck dumped
3	37647	Rolled over
4	37883	Rolled over
5	38090	Rolled over
6	39374	Muck dumped
7	40687	Muck dumped
8	41228	Rolled over
9	41295	Muck dumped
10	41518	Muck dumped

The spoil materials directly rolled/push over the hill are as depicted in the photographs below:



Fig: 2.17.10-Spoil materials dumped and freely rolled/pushed over the hill causing damaged to the environment

2.17.11 Pangser-Kilikhar (Package-3) executed by M/s. K. D Builder Pvt Ltd (RO, Lingmethang)

The dump yard identified by RO, Lingmethang for the disposal of excavated soil are in at Chainage Identification of dumpsite at Chainage 29.5 km, and 32.8km.

During the joint physical verification of sites comprising of officials from RO, Lingmethang on 13th November 2017, observed that despite assigning specific dump sites for stretch between Korila to Pangsar, the excavated spoil materials were found either dumped other than the designated dump sites or freely rolled/pushed over the hills causing downstream environment damages as detailed in the table below:

Table 2.17.11: Soil rolled/pushed over the hills and not dump in designated dumping yards			
SL. No.	Approx. chainages (in meter)		Approx. length (in meter)
	From	To	
1	29376	29595	219
2	29607	30035	428
3	30099	30200	101
4	30219	30359	140
5	31188	31213	25
6	31378	31401	23
7	32648	32707	59
8	33496	33814	318
9	34715	34797	82

Photograph evidences of spoil materials dumped and freely rolled/pushed over the hills are as depicted below:



Fig: 2.17.11- Spoils materials dumped and freely rolled/pushed over the hill

2.17.12 Kilikhar-Mongar (Package-4) executed by M/s. Gongphel Construction Pvt. Ltd. (RO, Lingmethang)

The dump yard identified by RO, Lingmethang for the disposal of excavated soil are in at Chainage 27.3 km, and 28km.

However, during the joint physical verification of site along with officials from DoR, Lingmethang on 8th November 2017, it was observed that between Chainages 25.735km to 25.818km, all the excavated spoil materials were freely rolled/pushed over the hills causing downstream environment damages. Photograph evidences of spoil materials dumped and freely rolled/pushed over the hills are as depicted below:



Fig: 2.17.12- Freely rolled/pushed down of excavated materials over the hill

2.17.13 Mongar-Gongola (Package-5) executed by M/s. Norbu Construction Company Pvt. Ltd, Gelephu (RO, Lingmethang)

The dump yard identified by RO, Lingmethang for the disposal of excavated soil are in at Chainage 13.7km, 21 km, and 22.6km.

During the joint physical verification of sites comprising of officials from RO, Lingmethang on 4th November 2017, observed that despite assigning specific dump sites for stretch between Korila to Pangsar, the excavated spoil materials were found either dumped other than the designated dump sites or freely rolled/pushed over the hills causing downstream environment damages pertaining to Chainages detailed in the table below:-

Table 2.17.13: Soil rolled/pushed over the hills and not dump in designated dumping yards	
SL. No.	Chainages (approximately in meter)
1	1185m
2	2605m
3	5100m
4	5130m

2.17.14 Kurizam to Gongola ((Package 6)) executed by M/s. Rigsar Construction Pvt Ltd. Trashigang (RO, Lingmethang)

The dump yard identified by RO, Lingmethang for the disposal of excavated soil are in at Chainages 2.3km, 3 km, 9.3km, 10.3km, and 12.3km.

However, during the joint physical verification of site along with officials from RO, Lingmethang on 30th October 2017, it was observed that excavated muck materials were found dumped in unidentified areas along the stretches/chainages as detailed below:

Table 2.17.14: Soil rolled/pushed over the hills and not dump in designated dumping yards	
SL. No.	Chainages (approximately in meter)
1	4480m
2	5000m
3	5100m
4	5130m
5	8880m
6	8960m
7	9780m
8	10440m
9	10640m
10	11900m

Similarly, in some chainages viz. 1,425m, 1,443m, 1,570m-1,705m and 10,000m (approx.) excavated materials were freely rolled/pushed over the hill causing downstream environment damages as shown in the photographs below:



Fig.: 2.17.14- Freely rolled/pushed down of excavated materials over the hill

2.17.15 Kurizampa-Lingmethang (Package-7) executed by M/s Tshering Construction Pvt. Ltd, Bumthang (RO, Lingmethang)

The dump yard identified by RO, Lingmethang for the disposal of excavated soil are in at Chainages 2.3km, 3 km, 9.3km, 10.3km, and 12.3km.

During the joint physical verification of sites comprising of officials from RO, Lingmethang on 25th October 2017 observed that despite assigning specific dump sites for stretch between Kurizampa-Lingmethang, the excavated spoil materials were found dumped other than the designated dump sites in Chainages detailed in the table below:-

Table 2.17.15: Soil not dump in designated dumping yards		
SL. No.	Chainage	Remarks
1	115.25 Km	Not identified as dumping area by NEC
2	115.90 Km	Not identified as dumping area by NEC
3	116.45 Km	Not identified as dumping area by NEC
4	116.95 Km	Not identified as dumping area by NEC

Similarly, in Chainages 114.95Km, 115.85Km, 116.4Km and 116.75Km, the excavated materials were freely rolled/push over the hill causing downstream environment damages as evident form the Photographs depicted below:



Fig: 2.17.15-Roll over of mucks over the valley

2.17.16 Kurizampa-Yadi executed departmentally (RO, Lingmethang)

The dump yard identified by RO, Lingmethang for the disposal of excavated soil are in Chainages 43.8km, 50km, 51.7km, 55.7km, 56.1km and 64km in between Yadi-Korila.

During the joint physical verification of sites comprising of officials from RO, Lingmethang on 18th November 2017, observed that despite assigning specific dump sites for stretch between Yadi-Korila, the excavated spoil materials were dumped in unidentified areas along the stretches/chainages as detailed below:

Table 2.17.16: Soil not dump in designated dumping yards		
SL. No.	Soil dump in various Chainages (approximately in Km)	Dump Yard Identified at Chainages as per Environment Management Plan
1	43.4km	43.8km
2	44.6km	
3	46.1km	
4	48.1km	
5	48.5km	
6	48.9km	
8	54.9km	50km, 51.7km, 55.7km
10	58.49km	56.1km
11	59.1km	
12	59.7km	
13	63.5km	64km

In addition, the excavated materials were freely rolled/push over the hill in chainages 47.4km, 47.5km, 51.1km, 55.2km, 55.5km, 57.5km, 59.1km, 59.8km, and 63.8km (approx.) causing downstream environment damages as depicted in the photographs below:



Fig: 2.17.16-Freely rolled/pushed down of excavated materials over the hill

The extent of volume of mucks dumped in unidentified areas and rolled over the hills could not be ascertained in audit. Further, during the site visit, it was also observed that dusts generated from the widening of the road were not adequately suppressed by spraying water. As such, all of the above have breached the terms and conditions laid down in the renewed Environmental Clearance issued by the Dzongkhag Environment Committee/NEC which needs to be justified. Therefore, the ROs, Lobeysa and Trongsa should justify for failing to comply with the provisions contained in the Environment Clearance.

It is to reiterate that since the lump sum contract included transportation of spoil materials at designated places, the disposal of spoil materials in places other than the designated places were not only in violation of the environment regulations but also benefited the contractors by way of not having to transport spoil materials to the dump yards. Further, designated dumping sites were also not found dressed and planted with vegetation as per the technical specification of the BOQs wherein it categorically stipulated as *“Dressing of dump sites and plantation of vegetation after completion of dumping”*.

The Regional Office should comment for non adherence to environmental regulations. Besides, the Regional Office should ascertain the volume of spoil materials dumped/roll down the cliff in the aforementioned chainages and cost recovered including the environment penalty liable as per environment norms and deposit into ARA.

In addition, the Regional Office, should fix the site engineers accountable for allowing the contractor to dump/roll over the cliff the spoil materials and dumping in unidentified places. In the event the site engineer had taken any measures/action against the contractor the same should be furnished to audit for verification and record.

Auditee's Response:

The Contractor as far as possible followed the directives of National Environment Commission and action taken in consultation with the NEC officials. But at times due to unavoidable circumstances especially working at night and continuous flow of rain water, some of the spillage over the valley side could not be controlled. In-fact, NEC has imposed fines and penalty to the contractors for failing to adhere to the rules and regulations of NEC. Therefore, please drop the memo.

RAA's Further Comments & Recommendations:

While taking note of the response, the fact remains that though the lump sum contract price for formation cutting included transportation of spoil materials at designated dump yards, the contractors were allowed to not only dump spoil materials indiscriminately in unidentified areas but also freely roll/push spoil materials down the hills causing damaged to the environment as evident from the Physical verification of sites. The disposal of spoil materials in areas other than the designated areas and rolling over the hills had benefited the contractors at the cost of the Government and damage to pristine environment.

Further, designated dumping sites were also not found dressed and planted with vegetation as per the technical specification of the BOQs wherein it categorically stipulated as **“Dressing of dump sites and plantation of vegetation after completion of dump”**.

However, as discussed during the exit meeting, the DOR and Ministry should depute a technical team or direct the ROs to quantify the extent of spoil materials dumped in areas other than the designated dump yards as well as rolled/pushed over hills in the aforementioned chainages and cost recovered and deposited into ARA. Besides, the Ministry in consultant with the NEC should thoroughly investigate all constructions sites to ascertain the extent of environmental damages by the contractors to timely address and measures put in place to avoid future complications. The outcome of the review and remedial measures put in place intimated to RAA for record and follow-up in future audits.

2.18 Flaws in the allowable wastage of 5% on the bitumen consumption with resultant financial loss to the Government exchequer of Nu. 13,956,639.07

On review of the documents and records relating to the **Theoretical consumption of bitumen worked out based on the Job Mix Formula and test results by the ROs**, it was noted that for comparison of the Theoretical consumption with that of actual consumption, the ROs have allowed bitumen wastages of 5% on the total theoretical consumptions. Cases where **Theoretical consumption of bitumen were worked out based on the Job Mix Formula and test results by allowing 5% bitumen wastages** by the ROs including huge financial loss to the Government Exchequer are detailed below:

Name of Contractor	Total issue as per register (MT)	Total No. of barrels	Theoretical consumption (MT)	5% Wastage on Theoretical consumption (MT)	Rate per MT	Amount (Nu.)	Remarks
M/s Chogyal Construction Pvt. Ltd (Packages)	3680.664	22866	3447.20	172.36	42,401.87	7,308,386.31	

I,II,III) (RO, Lobeyasa)							
M/s Raven Builder & Co. Pvt. Ltd, RO, Thimphu	1265.248		1,106.0393	55.3019	35,951.17	1,988,168.01	
M/s Yangkhil Construction Pvt. Ltd(Package 2)RO, Thimphu	1284.2066		1,199.4285	59.9714		2,156,041.99	
M/s SL Construction Pvt. Ltd (M/s Raven) RO, Thimphu	370.4617		352.996	17.6498	35,951.17	634,530.96	
Package X) by M/s Rigsar Construction Pvt. Ltd., RO, Lobeyasa	632.891			27.7206	35,951.17	996,558.93	Actual wastage 4.38%
M/s KD Builder Pvt. Ltd.	809.36			24.2808		872,923.17	Actual wastage 3%
						13,956,639.07	

It was reported that 5% bitumen wastages were allowed for the following contract packages. It would be apparent that in terms of bitumen issued to the contractors, the total wastages amounts to Nu. 13,956,639.07 for six contracts alone in consideration to the present mechanized method of execution of bitumen works.

The RAA in an attempt to confirm the admissibility of the 5% wastage for bitumen, had referred the Financial Manual 1988 where Allowance variations percentage were given on the following selected items as detailed below:

Sl.No	Item	Variation	Allowance variation
1	Cement	+/-	3%
2	Steel	+/-	10%
3	Bitumen	+/-	5%
4	M.S Sheet/G.I Pipe	+/-	10%

Thus, it was apparent that the RO had applied the same allowance variations percentage for bitumen stipulated in the 1988 Financial Manual.

The RAA is of the opinion that taking into cognizance the present scenario where execution of bituminous works are carried out through mechanized processes with the deployment of advance plants, machineries and equipment with minimum wastages as compared to the manual processes where wastages were high, the application of same wastage percentage on bituminous works was not rationale and justified.

It was evident from the analysis carried out by the RO, on the theoretical consumption and bitumen issued as per stock ledger in respect of the following contractors that the wastages of bitumen varied from minus 6.70% to just plus 0.962% except M/s Rigsar Construction Pvt. Ltd. with plus 4.38% and M/s Tshering construction Pvt. Ltd. with plus 3% as tabulated below.

Table 2.18.2 : Detailing Bitumen wastage percentages allowed for various contract packages						
Name of Contractors	Issue in barrel as per stock register/MT	Return in barrel	Total consumption in barrel/MT	Theoretical consumption computed based on JMF and quantity of works done(Barrel.MT)	Total variation in barrel /MT	% of wastage
RO, Lobeysa						
M/s Singye Construction Pvt. Ltd.	8224	223	8001	7924.31	76.69	0.962%
RO, Trongsa						
(Package V) by M/s TT Construction Pvt. Ltd.	777.702					-2.24%
(Package VI) by M/s Etho Metho Construction Pvt. Ltd.	1436.788					0.51%
(Package VII) by M/s Loden Construction Pvt. Ltd.	811.027					-1.78%
(Package IX) by M/s Welfare Construction Pvt. Ltd.	741.904					-6.70%
Package X) by M/s Rigsar Construction Pvt. Ltd.	632.891					4.38%
(Package XI) by M/s Hi-Tech Company Pvt. Ltd.	1201.409					0%
(Package XII) executed by M/s Taksing Chungdruk Construction Pvt. Ltd.	671.47					0.75%
(Package XIV & XV) executed by M/s Empire Construction Pvt. Ltd.	557.976					0%
RO, Lingmethang						
M/s KD Builder Pvt. Ltd.	809.36					3%
M/s Rigsar Construction Pvt. Ltd.	1446.18					0%
M/s Tshering Construction Pvt. Ltd.	377.17					0%

Thus, in the light of bitumen wastages of minus % to less than 1% as tabulated above, it is obvious that the application of 5% wastage based on old allowable percentage was not rationale and tantamount to extension of undue financial benefit of Nu. 13,956,639.07 to six contractors.

The RO should comment on the application of 5% wastages on the bituminous works as no proper analysis had been carried out by the RO prior to entertainment of such wastages. It is also reiterated

that consideration of 5% wastages despite having adopted mechanized methods, will have huge cost implication to the Project and Governments besides benefiting the contractors.

The RO in consultation with the Ministry should relook on the admissibility of the 5% wastages on the bituminous works in consideration to the vast difference in the execution of bituminous works through mechanized method as compared to the conventional methods.

Auditee's Response:

The RO, Lobeyasa agrees that mechanized bituminous works would lessen the wastages in comparison to manual way of bituminous works. However, the wastage of bitumen at site occurred due to the following reasons.

- *Transportation: The transportation of bitumen has to transit/load & unload multiple times from the factory till work site (example losses in the transportation of bitumen from Mumbai to Falakata, unloading and reloading at Falakata yard, unloading and loading at the central store, unloading and loading at the regional store).*
- *There are leakages in the stock yard despite efforts to safeguard the barrels.*
- *The extreme heat due to global warming have major impact on viscosity.*
- *The wastages after the mix rejected at site due to unforeseen machinery breakdown.*

Above all, the RO had sought the consensus of HQ and was accordingly approved by DCC vide letter No.DOR/CD/7/2016-2017/3909 dated 4th May 2017. RO Lobeyasa also would like to inform that, we have not sought approval for uniform application of plus 5% wastages. The wastages could be plus or minus 5% which is practically unavoidable during the execution of bituminous works at site and furthermore we have not issued excess bitumen more than actual requirement at site. The wastages reflected in the consumption statement is due to site conditions. Therefore, RAA is requested to kindly drop the said memo.

RAA's Further Comments & Recommendations:

Considering the fact that the allowable wastage of 5% were fixed for the execution of bituminous works manually, the application of same wastage percentage for mechanized bituminous works was not justified and decisions of the HQ and DCC has caused adverse financial implication to the Government Exchequer.

It is noted that the approval accorded for application of 5% wastage by the HQ & DCC was not supported by detailed analysis on the application of same wastage percentage for both manual and mechanized method. The variation percentage was also not specifically covered by the existing contract provisions. Thus, the Ministry did not pursue a prudent and sound financial management practice in allowing 5% wastage for the bitumen issued by the Government free of cost.

Considering the above fact and events, the Ministry should revisit its decision of allowing 5% bitumen wastage keeping in view the actual wastage of just 1% worked out in respect of M/s Singye Construction Pvt. Ltd. and determine the allowable wastage for the mechanized bituminous works.

It is also to reiterate that allowing 5% bitumen wastages without proper analysis just for six contract packages alone have adversely impacted Project funds to the extent of Nu. 13.957 million.

The huge financial loss to the extent of Nu. 13.957 million to the government Exchequer is brought to the notice of the Government for appropriate decisions and actions.

2.19 Excessive engagement and payment of hired charges of machineries not complying with coefficient specified in LMC for departmentally executed formation cutting works of Nu. 89.061million

The earthwork quantity for the formation cutting for the departmentally executed works was derived based on the survey report. The ROs had prepared estimates detailing excavation of all kind of soil and rocks including quantum of spoil materials to be dumped beyond 500m up to 1210m amounting to Nu. 131.352 million as submitted below:

Code	Particular of item	Estimated Qty (Cu.m)	Amount (Nu)
	RO, Lobeysa, (a total of 7Kms), RO, Trongsa (a total of 6.1Kms and 5km) RO, Thimphu (a total 19.5 km) and RO, Lingmethang (a total of 21.19 km)		
RW0014	Excavation of road formation cutting/trace/box cutting, with excavator including separate deposition of soil, rock and stone within 50m for reuse-all kind of rocks	321,632.89	69,074,709.70
RW0013	Excavation of road formation cutting/trace/box cutting, with excavator including separate deposition of soil, rock and stone within 50m for reuse-all kind of soil	446,549.57	21,389,857.93
EW0096	Banking with granular material for road, flood banks, guide banks, back filling for walls & depressions, in layers <200mm depth, including watering, rolling & dressing up within 50m lead & 1.5m lift - All kind of soil	37,235.69	3,076,629.26
	Sub total	825,418.15	93,541,196.89
RW0021	Transport of loose spoil materials in designated locations including loading, unloading. Dressing of dump sites and plantation of vegetation after completing of dumping-beyond 500 up to 1210m	443,036.80	37,811,295.33
	Total	1,268,454.95	131,352,492.22

The actual expenditure for formation cutting as compared to the estimated amount had substantially exceeded as detailed below:

Particular of item	Amount (Nu)	Amount (Nu)	Amount (Nu)	Amount (Nu)	Amount (Nu)
	RO, Lobeysa	RO, Trongsa	RO, Trongsa	RO Lingmethang	RO, Thimphu
Particular of item	Amount (Nu)	Amount (Nu)	Amount (Nu)	Amount (Nu)	Amount (Nu)
Estimated Amount	17,432,935.40	21,161,521.78	8,718,671.79	54,345,523.29	29,693,839.95
Total Expenditure	22,631,933.00	54,344,376.50	15,700,590.00	53,412,867.00	8,190,441.50*
Excess expenditure over the Estimated cost (Nu.)	5,198,997.60	33,182,854.72	6,981,918.21	(932,656.29)	
Increase in terms of %	29.82 %	156.81%	80%	(1.72%)	

*Note: Expenditure pertained to financial year 2016-2017 and not comparable

Based on the Labour and Material Co-efficient (LMC), the actual machinery hours required to be hired and deployed were worked out and cross checked with the total hours of equipment and machinery engaged in terms of hiring charges paid. The comparison indicated excessive engagement of machine hours amounting to Nu. 89,061,496.31 as detailed below:

Particulars	Amount (Nu.)	Excess expenditure in terms of LMC Amount (Nu.)
RO, Lobeysa, (Chainages 44.7km to 50.8km, a total of 6.1Kms)-Trongsa to Punzhi		
Actual expenditures incurred as per bills and MB	17,841,512.16	
Less: Expenditure to be incurred based on the LMC Co-efficient	<u>9,275,174.16</u>	8,566,338.00
RO, Trongsa, (Chainages 44.7km to 50.8km, a total of 6.1Kms)-Trongsa to Punzhi		
Actual expenditures incurred as per bills and MB	54,344,376.50	
Less: Expenditure to be incurred based on the LMC Co-efficient	<u>13,785,775.07</u>	40,558,601.43
RO, Trongsa (Chainages 80 to 85km, a total of 5km) Bongzam-Gaytszam		
Actual expenditures incurred as per bills and MB	15,700,590.00	
Less: Expenditure to be incurred based on the LMC Co-efficient	<u>4,624,568.04</u>	11,076,021.96
RO, Lingmethang, (Chainages 52km to 73.19km, a total of 21.19 km)- Yadi-Korila		
Actual expenditures incurred as per bills and MB	53,412,867.00	
Less: Expenditure to be incurred based on the LMC Co-efficient	<u>29,358,343.36</u>	24,054,523.64
RO, Thimphu: 19.5 km road from Simtokha-Dochula,		
Actual expenditures incurred as per bills and MB	8,190,441.50	
Less: Expenditure to be incurred based on the LMC Co-efficient	<u>3,384,430.17</u>	4,806,011.33
Total cost impact		89,061,496.31

The payments of hiring charges also included payments of Nu. 5,416,382.00 for machineries which were not defined in the LMC 2015 for the execution of formation works as presented below:

Types of machine engaged	Work done volume (m3)	Nos. of days	Nos. of hrs. engaged	Rate (Nu)	Amount (Nu)
RO, Lobeysa					
Backhoe loader	119,630.84	216	1,723.00	670.64*	1,152,822.00
Pay loader	119,630.84	210	1,674.00	2,000.00	3,348,000.00
Tailor	119,630.84	4	24.00	1,732.67*	40,840.00
				Total	4,541,662.00
RO, Thimphu					
Deployment of machineries and materials not in LMC with resultant inadmissible payment					874,720.00
Grand Total					5,416,382.00

Note: * Average rates of hiring charges

The deployment of machineries that were not in the LMC and huge difference between the required hours of deployment of machineries in terms of estimated volume of works and actual hours deployed and paid, indicated either flaws in deployment of machineries or inefficient deployment of machineries due to poor monitoring and supervision.

Auditee's Response:

Basically, the departmentally executed works are based on LMC. However, due to the following unavoidable circumstances, the actual expenditures have deviated as compared to the LMC.

1. *In our country we do not have diversion road where vehicle movement can be diverted in one direction and work site would be in free of vehicle movement disturbance. In such cases we are not able to achieve work done by machine as per LMC but machine will be in start while passing vehicles.*
2. *Due to difficult terrain of road cutting.*
3. *Movement of VVIP and AMBULANCES.*
4. *Working with difference types of Machineries of Horse power.*
5. *The backhoe and pay loader were engaged to push the dumped materials and clear the road during the emergency hours which is not captured in the initial estimates.*
6. *Trailer was engaged to transport the machineries from one location to another mainly to save time and allow smooth flow of traffic congestion which is not incorporated in the LMC.*
7. *FC works were executed during night hours to expedite the progress of the works whereby the efficiency of the work done is comparatively low due to risk involved and poor visibility at night.*
8. *The soil strata are unstable in nature and the slips were occurred at various locations at all times. These lead to marching of machineries for clearance which ultimately lead to loss of resources.*
9. *Frequent usage of machineries to clear the slips which was not envisaged during the initial estimation.*
10. *The usage of explosives was prohibited due to settlement below the road and earthen irrigation channel above whereby the more numbers of days for machinery had to be engaged. Therefore, please drop the memo.*

During the detailed survey detail geotechnical studies are not carried out and the identification of soil type cannot be studied accurately whereby It was based upon visual judgment of the surface. During execution of the FC work, more rock was discovered thereby increasing the quantity of rock cutting volume.

Moreover, in some stretches due to cutting height being too high the quantity of rock excavation was increased. It was also noticed that during the cutting from design fixed batter peg, the total width of 10.5m was not achieved so in order to achieve the width of the FC, the batter peg were moved 1-1.5m outward. Due to which the volume of cutting had been increased.

At times FC work being involved for two monsoon seasons and the cutting being fresh, several slide occurred which also increased the volume of excavation. Thus the difference in estimated quantity and executed quantity was noticed as per the site condition. In view of the above justifications, RAA is requested to drop the memo.

RAA's Further Comments & Recommendations:

The quantum of formation works exceeded allowable variations of +/- 20% from estimated quantities and excess payment of hiring charges to the extent of Nu. 89.061 million indicated either flaws in the deployment of machineries or inefficient deployment of machineries due to poor monitoring and supervision. The violations and deviations from the procurement norms, financial rules and regulations and BSR are due to absence of standard guidelines and procedures for departmentally executed works including monitoring controls over execution of works from appropriate authorities.

As discussed in the exit meeting, the DoR and the Ministry are advised to review and investigate excessive deployment of machineries and deployment of machineries not in LMC to the extent of Nu. 94.477 million (Nu.89.061+5.416) computed in audit and work out the quantum of works executed by the RO to regulate the expenditures accordingly.

The Ministry is also advised to review the present practices and procedures adopted by ROs in conducting survey, preparation of drawings, estimates, BOQs and executions including hiring and deployment of machineries and equipment and execution of permanent works and develop standard guidelines and procedures to prevent such irregularities and lapses in future.

2.20 Bitumen issued to contractors not covered by insurance - Nu. 2,237.655 million

The Contract Document stipulates following conditions to be complied by contractor and/or employer on insurance of contract works:

- Clause 14.1 under Section V: General Conditions of Contract stipulated that the Contractor shall provide, in the joint names of the Employer and Contractor, insurance cover from the Start Date to the end of the Defects Liability Period, in the amounts and deductibles stated in the SCC for the following events which are due to the Contractor’s risks:
 - (a) Loss of or damages to the Works, Plant, and Materials to be built into the works.
- As per Clause 14.2, Policies and certificates for insurance shall be delivered by the Contractor to the Project Manager for the Project Manager’s approval before the Start Date. All such insurance shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred.
- Clause 14.3 provides that if the Contractor does not provide any of the policies and certificates required, the Employer may affect the insurance which the Contractor should have provided and recover the premiums the Employer has paid from payments otherwise due to the Contractor or, if no payment is due, the payment of the premiums shall be a debt due from the Contractor to the Employer.
- Clause 14.4 stipulates that alterations to the terms of insurance shall not be made without the approval of the Project Manager.
- As per Clause 14.5, both the parties shall comply with any conditions of the insurance policies.
- Further, the requirement of insurance was reiterated under Section VI: Special Conditions of contract (Clause GCC 14.1).
- Section 103 of the Technical Specification, it also stipulates as under:
 - “The Contractor shall provide and maintain the insurance cover in accordance with Clause 14 of the General Conditions of Contract from an approved insurance company from the start date to the end of the Defects Liability Period.”
 - “No separate payment shall be made for insurance. All costs involved in connection with the work insurance herein shall be considered included with other related items of the work in the Bill of Quantities”.

Contrary to the above clauses in the contract document, both the contractor and the employer had failed to maintain insurance coverage for the bitumen issued to the various contractors. An abstract of bitumen issued to various contractors by ROs are tabulated below:

Regional Office:	Qty. of Bitumen Issued (in Metric tonne)	Estimated cost of bitumen (Nu.) in million
RO, Thimphu	2,549.75	108.237
Ro, Lobeyesa	10,714.70	977.037

RO, Trongsa	2,881.91	740.326
RO, Lingmethang	5199.08	412.055
Grand Total	16,146.36	2,237.655

Accordingly, it was noted that the contractor had insured Works, Plant and Material for the minimum contract amount only as evident from the insurance coverage of **M/s Chogyal Construction for Package I, II & III**). Thus, insurance did not cover the cost of bitumen that were issued by the Regional Office as the insurance claims and compensation payments received by the contractor were solely used by the contractor as the RO had not deducted the cost of bitumen although the claims and compensation pertained to bituminous works. Further, it was evident from the records that the RO had issued the bitumen for redoing the damaged works.

The RO should comment on the circumstances leading to non-insurance of the cost of bitumen by the contractor as bituminous works are executed by the contractor and damages and loss to works are contractor's risks. Besides, the RO should comment on the measures put in place to safeguard against such loss.

Auditee's Response:

The bitumen was procured departmentally and was issued to the contractor free of cost as per the Job Mix Formula/consumption thereon. However, insurance for bitumen was not covered since the contract amount in the BOQ is exclusive of bitumen. The insurance company while insuring the work takes into account the contract amount/work order amount only, which is determined from the signed contract agreement.

The bitumen is transported from the Regional Store and adjustment is made with the central store, Pl'ing. Till now there is no system of insuring the bitumen during the transportation.

The additional clause in the SCC also states that the cost of the bitumen should be 'zero', which means that the employer is asking the bidder to quote for the execution of work only excluding the cost of bitumen. Since the cost of bitumen is not included in the contract price, and the premium (determined from the contract amount) paid to the insurance company by the contractor, the RO did not find a base to recover the cost of bitumen for redoing the damaged work.

The issuance of bitumen free of cost has increased the workload of the site engineers and often the site engineers complain that they had to literally take care and monitor the bitumen issued to the contractor till the BT work is completed. In view of this, RO is proposing to discuss this issue with DoR HQ during the upcoming DoR Quarterly Meeting. Hence, RAA is requested to kindly drop the memo.

RAA's Further Comments & Recommendations:

It is apparent from the response that the ROs and DOR failed to enforce the provisions stipulated under SBD on the requirement of insurance coverage for loss of or damage to the Works, Plant and Materials to be built into the works from the Start Date to the end of the Defects Liability Period, in the amounts and deductibles stated in the SCC.

The non-insurance of cost of bitumen either by the Contractors or ROs also clearly indicated flaws in the tender documents and contract agreements. The failure to insure the bitumen cost with the cost of bituminous works had resulted in avoidable reissuance of bitumen valuing Nu. 7,085,432.30 for redoing the damaged bituminous works for two packages (I & II) executed by M/s Chogyel Construction Company Private Ltd. under RO, Lobeyasa.

The DOR and the Ministry should investigate the circumstances leading to failure of insuring cost of bitumen with the bituminous works by the contractors as well as non-incorporation of such requirements in the tender and contract documents which had cost the Government Nu. 7.085 million for reissuing the bitumen for redoing the damaged pavement works.

The DOR in consultation with the Ministry should immediately direct all the contractor to insure the cost of bitumen for all completed pavements works to safeguard the interest of the Government and avoid complications in future. Besides, the Ministry should come up with clear policy and procedures for insuring the cost of bitumen by the contractors even if the bitumen is issued free of cost by the Government as otherwise the Ministry should consider the desirability of allowing the contractors to include the cost of bitumen in the contract price but recovery is to be made at the prescribed departmental rates to enable the contractors insuring the cost of bituminous works with bitumen cost and avoid complications.

The decisions and measures taken on the issue should be furnished to RAA for record and follow-up in future audits. The non-insurance of substantial cost of bitumen by the contractors and ROs resulting in loss of Nu. 7.085 million to the Project for reissuance of Bitumen for redoing the damaged bituminous works for three packages is brought to the notice of the Government for appropriate decisions and actions.

2.21 Non-stacking/recording of excavated rock materials with resultant loss of Nu. 674,501,379.27

The works of Northern East-West Highway include Formation Cutting, Permanent works and Pavement works. One of the major works is the formation cutting work, for which the department had quantified the volume of earthwork excavations on the basis of survey reports.

In line with the survey report, the departmental estimates projected excavation of rock of 2,489,385.58 m³ involving Nu. 674,501,379.27 as detailed in table 2.21 below:

Name RO	No. of Contracts	Qty(m ³)	Amount (Nu.)	Remarks
Execution through Contracts				
Regional Office Lobeyasa	Six Contractors	256,342.71	46,659,927.29	No stock accountal were made on records
Regional Office Trongsa	Twelve Contractors	1,412,406.578	440,596,648.44	
Regional Office Lingmethang	Six Contractors	320,725.21	68,945,647.21	
Departmental Executions				
Regional Office Lobeyasa		68,360.48	12,252,248.83	
Regional Office Trongsa		184,655.44	57,662,354.25	
Regional Office Lingmethang		118,836.84	25,497,632.39	
Regional Office Thimphu		107,289.84	19,848,620.40	
	Total	2,489,385.58	674,501,379.27	

During the physical verification of the work sites, it was noted that the rocks excavated from the roadside excavation works were found used by the contractors responsible for formation cutting works for construction of permanent structures without accounting the excavated boulder and recovering the cost of used boulders. In addition, the excavated materials were found not properly stacked along the road causing inconvenience to the commuters.

As per the GCC A20.2 of the contract document “*All materials obtained during excavation from the site and that have not been accounted for in the bid shall be the property of the Employer and the contractor shall take care of useful materials obtained during the execution of the Works and stack at place designated by the Employer*”.

Further, the technical specifications Clause 605-Execution in Cutting states as ***“All suitable excavated materials shall be used in construction of the roadway to the extent as required”***.

Thus the use of usable excavated materials without accounting in the books of account and also without recovering the equivalent cost was in violation of the contract terms.

Further, in terms of the Specification for Building and Road Works, Clause 21.3.2 Excavations, ***“The contractor shall take all precautions necessary to preserve the materials or existing structures below and beyond any line of excavations in the soundest possible conditions”***. It also states as ***“the contractors controlled blasting and other operations in excavation shall be such that they will yield as much materials as possible suitable for use in the work”***.

Proper retrieval of stone boulder from the rock excavation would not only have saved the cost on the permanent structures but also benefited the RO through cost recovery of recovered boulders through disposals in the best interest of the Project.

The contractors are paid for excavation and transportation of spoil materials besides payments for execution of permanent structures. Thus, allowing the contractors to use the useful materials free of cost tantamount to extending double benefits to contractors.

The ROs and DOR should comment on the circumstances leading to non-accountal of excavated useful materials and investigate whereabouts of excavated materials and ascertain the extent of materials used by the contractors on permanent works. The DOR and ROs should recover the cost of the material to the extent of quantum of materials used by contractor for permanent works. Besides, the DOR should also investigate whereabouts of excavated materials for the departmentally executed formation works.

Auditee’s Response:

DoR, RO Trongsa would like to thank the RAA for the observation and would like to submit the following justifications. The total quantity of earthwork by the twelve contractors is 1,412,406.58 cum valued at Nu. 440,596,648.44 and for departmental works it was 186,655.44 cum valued at Nu. 57,662,354.25. In view of the above justifications, RAA is requested to drop the memo.

RAA’s Further Comments & Recommendations:

*The ROs and DOR have not appropriately provided the response on the observation. The RAA would invite reference to provisions of the General Conditions of Contract (GCC) under **“Discoveries Clause”** which categorically states as under:*

“Anything of historical or other interest or of significant value unexpectedly discovered on the Site shall be the property of the Employer. The Contractor shall notify the Project Manager of such discoveries and carry out the Employer’s instructions for dealing with them. All materials obtained during excavation from the site and that have not been accounted for in the bid shall be the property of the Employer and the contractor shall take care of useful materials obtained during the execution of the Works and stack at place designated by the Employer. An arrangement shall be made between the Contractors”.

*Thus, in view of the specific provisions under Technical specifications as well as GCC as highlighted above, non-accountal of materials(Boulder) obtained from the formation cutting works (**Projected rock excavation of proximately Nu.674.501million** executed either by contractors or departmentally, was in violation of the provisions of the contract. This has also deprived the Government of the benefit to the extent of boulders retrieved and used in the permanent and pavement works by the contractors and department.*

The DOR and the Ministry should investigate and ascertain the quantum of boulder retrieved and used by the contractors and ROs, and recover the cost as per the existing provisions of the technical specifications and SBD and the amount recovered deposited into ARA. Besides, the Ministry should also take appropriate action on the officials responsible for non-accountal of boulders despite huge amount of of Nu.674.501 million projected towards cost for excavation of rocks.

The Ministry should not only strengthen the Design Divisions for accurate designing of road structures but also institute a technical team to review project plans, designs, and specifications to ensure that the same are accurate and complete including verification of the accuracy of surveys for future projects to prevent changes in designs as well as time and cost overruns.

The huge financial loss to the extent of excavated boulders not accounted against the projected rock excavation of **Nu. 674.501 million** to the government Exchequer is brought to the notice of the Government for appropriate decisions and actions.

2.22 Irregular release of additional advances of Nu.254.110 million

Huge amounts of inadmissible additional advances were paid and payment for POL and release of retention money were made to contractors despite availing all financial benefits entitled as per the contractual agreement.

The ROs, DOR and the MLTC had failed to ensure utilization of available Credit line to the extent committed as per the bidding documents. Non-utilization of Credit line extended by the financial institutions by the contractors raises doubts on the genuineness and validity of Credit Lines. Besides, extension of such financial support to the extent of Nu. 254,110,000.00 were in violation to the provisions of the contract agreements and Financial Rules and Regulations.

Table 2.51: Detailing huge releases of irregular advances to the contractors				
Sl.No.	Name of contractor	Contract Package	Date of Payment	Amount (Nu.)
Thimphu & Trongsa				
1	M/s Raven Builder & Company (P) Ltd	Package 1	21.9.2016	4,000,000.00
2	M/s Raven Builder & Company (P) Ltd	Package VI	various dates during fiscal years 2016,2017 and 2018	9,410,000.00
Total				13,410,000.00
Trongsa				
1	M/s welfare Construction Pvt. Ltd.	Package IX	12.4.2017	20,000,000.00
2	M/s Dungkar Construction Pvt. Ltd.	Package VIII, XI & XII	9.12.2017	20,000,000.00
3	M/s Gyalcon Construction Pvt. Ltd.	Package IV	28.6.2017 & 26.10.2017	15,000,000.00
4	M/s Druk Lhayul Construction Pvt. Ltd.	Package V	19.5.2017 & 14.6.2017	20,000,000.00
5	M/s Rinson Construction Company Pvt. Ltd.	Package III,X & XII		30,000,000.00
Total				105,000,000.00
RO, Lobeysa				
1	M/s Chogyal Construction Pvt. Ltd	(Packages I, II and III)	2015/2016	46,000,000.00

2	M/s Singye Construction Pvt. Ltd (CDB No. 2148)	Package IV	12/2015	39,700,000.00
3	M/s welfare Construction Pvt. Ltd.	Package IX	12.11.2017	10,000,000.00
4	M/s Rigsar Construction Pvt. Ltd	Package X	6.6.2017 & 22.12.2017	4,500,000.00
5	M/s TT construction Pvt. Ltd	Package VI	7.2.2017 & 20.12.2017	19,000,000.00
Total				119,200,000.00
RO, Lingmethang				
1	M/s Gongphel Construction Pvt. Ltd.	Package IV	9.4.2017 & 22.12.2017	10,000,000.00
2	M/s Rigsar Construction Pvt. Ltd	Package VI	8.2.2017 & 9.5.2017	6,500,000.00
Total				16,500,000.00
Grand Total				254,110,000.00

Auditee's Response:

The ROs responded that advances not within the provisions of the contracts were released based on verbal instruction and approval accorded by Minister and Secretary, MoWHS to extend necessary support to the contractor in the interest of works. The RO also mentioned that the financial support rendered is purely to expedite the progress of works.

RAA's Further Comments & Recommendations:

The Granting of advances beyond the provisions of the contract is in violation of the contract agreements and Financial Rules and Regulations and clear indication of undue financial support extended to the contractors. The failure on the part of the ROs, DOR and Ministry to direct the contractors to avail the credit facilities indicated existence of poor contract management system. As discussed during the exit meeting, the DOR and the Ministry are advised to recover all the irregular and ineligible advances from the contractors with penal interest.

The Ministry besides directing officials in positions to strictly abide by the Financial Rules and Regulations and provisions of the contract documents is also advised to institute appropriate control mechanism over the sanctioning of construction advances to prevent payments of advances in violations of rules and contract agreements.

*The huge financial payments of **Nu. 254.110 million** from project funds in violation to the provisions of the contract documents and financial Rules and Regulations by the authority in position is brought to the notice of the Government for appropriate decisions and actions.*

2.23 Irregular Change of pavement thickness with resultant inconsistency in the execution of pavement works

Northern East-West Highway being the Primary National Highway, both the initial and revised drawings has specified a total pavement thickness of 600mm as shown in the diagram and in the table below:

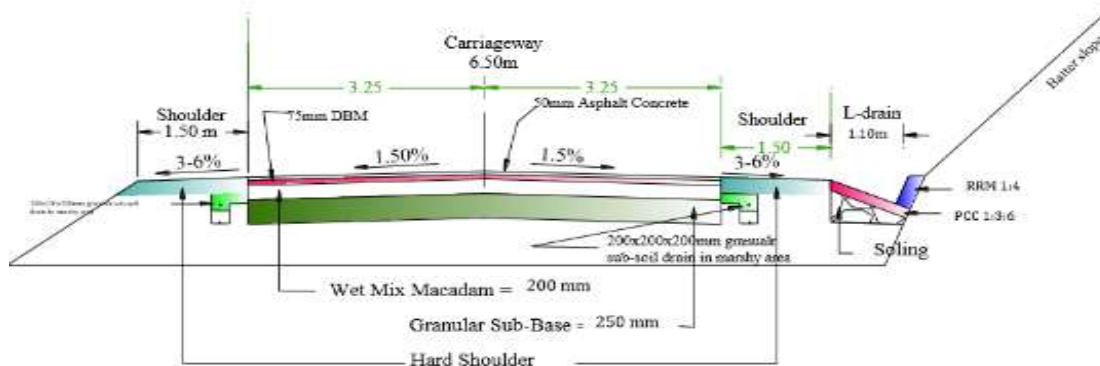


Fig: 2.22- Initial approved design and drawing

Table 2.22: Pavement thickness	
The pavement thickness of various layers is as follows:	
Item works	Thickness
GSB	250mm
WMM	225mm
DBM	75mm
AC	50mm
Total:	600mm

In all contract packages the above design parameters were required to be followed. However, on 7th DoR Quarterly Meeting held on 27-29 July, 2015, the meeting discussed and decided to reduce the thickness of DBM from 75mm to 60mm and AC from 50mm to 40mm thereby reducing the overall pavement thickness to 575mm against initial pavement thickness of 600mm for the NEWH work.

Accordingly, under RO Lobeysa, out of 15 contract packages, four (4) packages were awarded with the new pavement design thickness as detailed in table 2.22.1 below:

Table 2.22.1: Application of different Pavement thickness			
Package No	Location	Chainage	Contractor
12	Wangdue-Langkena	436-429 (7 Kms)	M/s Tagsing Chungdruk Construction Pvt. Ltd, Thimphu
13	Razhau-Nobding	403-395 (8 Kms)	M/s U.P Construction, Thimphu
14	Nobding-Dungdungnyelsa	392.25-389 (3.25 Kms)	M/s Empire Construction Pvt. Ltd, Punakha
15	Nobding-Dungdungnyelsa	395-392.25 (2.75 Kms)	M/s Empire Construction Pvt. Ltd, Punakha

Under RO, Lingmethang, out of 6 packages only one (1) was awarded with the new pavement design thickness as detailed below:

Table 2.22.2: Application of different Pavement thickness	

Package No	Location	Chainage	Contractor
7	Between Kurizampa & Lingmethang	114.45-118.45 = 4 Km	M/s. Tshering Construction Pvt Ltd, Bumthang

However, although the revised pavement design thickness was approved during the 7th DoR Quarterly Meeting held on 27-29 July, 2015, the RO Trongsa had failed to comply with the resolution as the work for up gradation of pavement of 2.18Km from Chainage 87.62-89.8 (Sonam Kuenphen to Hurjee (bypass)) was found awarded to M/s Lamnekha Construction Pvt. Ltd during April 2016 with the initial pavement design thickness of 600mm instead of revised thickness of 575mm.

The reason stated in changing of pavement thickness was low volume of traffic between Wangdue and Trashigang. Thus, the decision of DOR and the Ministry to change pavement design thickness to 575 mm just for five packages with Chainage coverage of just 25 km was found impetuous and in violation to the *Guidelines on Road Classification System and Delineation of Construction and Maintenance Responsibilities 2009 as the traffic volume of Primary National Highway is standardized as >200vpd (Vehicle per day).*

The Ministry should comment on the change of pavement design thickness just for Five (5) contract packages despite the fact that the decisions were taken in July 2015 just after the awards of contracts when all contractors were carrying out only the formation cutting and permanent works. The DOR and Ministry should have issued changed order on the pavement thickness of all contract packages if the changes were made on the basis of low volume of traffic between Wangdue and Trashigang. Besides, the Ministry should also comment on the fact that if the revised pavement thickness were to suffice the low volume traffic, why the decisions and approval for the initial thickness were taken which had substantially impacted the construction cost.

The Ministry should also comment on the failure of the RO, Trongsa to abide by the revised design thickness of pavement works awarded after the decision of the Meeting.

Auditee's Response:

Initially, the pavement width was to be 6.5 mtr wide with total 600 mm thickness of various layers. However, as per policy decision taken at a later stage, the pavement width was increased from the original 6.5 mtr to 7.5 mtr in the larger interest of the Government. Similarly, as discussed & decided during the 7th DoR Quarterly meeting held on 27-29th July 2015, the thickness of DBM & AC was reduced from the original 75 mm to 60 mm and for AC from 50 mm to 40 mm respectively.

The reason for reducing the pavement thickness from 600 mm to 575 mm was due to the consideration of lesser traffic volume plying from Wangdue Bridge towards Trongsa & further. In view of the above justifications, RAA is requested to drop the memo.

RAA's Further Comments & Recommendations:

While taking note of the response on the reduction of pavement thickness due to low traffic volume between Wangdue and Trashigang, the fact remains that the reduced pavement thickness from 600mm to 575mm (reduction of DBM thickness from 75mm to 60mm and AC thickness from 50mm to 40mm) was just for a stretch of 25km. For all remaining road stretches, the initial DBM thickness of 75mm and AC thickness of 50mm was maintained.

It is also to reiterate that the changes in DBM and AC thickness were approved during the meeting held on 27-29th July 2015 when formation cutting and permanent works were being carried out

and it would have been possible to issue change orders for the revised DBM and AC thickness. The changes of DBM and AC thickness on the ground of low volume of traffic within the same stretches of roads indicated flaws and deficiencies in the decisions as the decisions were not supported by adequate study carried out, if any, on the technical merit of such changes only in stretches covered in the five contract packages. Such decisions and actions indicated adhoc changes of designs, lacked coordination amongst ROs and DOR and monitoring controls by the DOR.

The varying pavement thickness approved by the DOR and Ministry within the same stretches of roads as well as deviations from the Guidelines on Road Classification System and Delineation of Construction and Maintenance Responsibilities 2009 is brought to the notice of the Government.

2.24 Non-deduction of cost for reduced 1.5 m Hard Shoulders between Paved carriageway and L-Drain and 0.50m at valley side

The initial and revised design/drawings for pavement works provided the following specifications:

Initial Drawing:

1. Formation cutting width 10.5m
2. Carriage width 6.5m
3. L-Drain hillside 1m
4. Shoulder between L-Drain and Carriage Way 1.5m
5. Shoulder at valley side 1.5m

The execution of required 1.50m Hard Shoulders between the L-Drain and Paved Carriageway and 0.5m at valley side was done away due to change in the design and drawing of the double lanning works.

However, in terms of the initial designs, the contractors were required to executive the Hard Shoulder. As no separate item of works were provided in the BOQs for Hard Shoulder, the cost was required to be built up in the item rates quoted for the execution of pavement items of works. Thus, doing away the execution of Hard Shoulders and paying for execution of increased carriage way of 1m width separately tantamount to payments made without execution at site.

The Ministry should comment on the circumstances leading to non-deduction/non-adjustment of cost for Hard Shoulders from payment for increased scope of 1m pavement works. Besides, the Ministry must thoroughly review the execution of hard shoulder at valley sides and cost to the extent of hard shoulders not maintained and executed at valley sides including cost of 1.5m hard shoulders not executed between L-Drain and Paved Carriageway should be worked out and deposited into ARA.

Auditee's Response:

The item for hard shoulder was not incorporated in the BOQ and the specification was not mentioned in the document. The contractors were paid as per the actual measurement for the rest of the items whereby the double payment by RO has not been made. Since the other items in the BOQ are in cubic meter, the payments were done for actual work done only. Hence deduction of cost for not constructing hard shoulder was not applicable. Hence the memo may be dropped.

RAA's Further Comments & Recommendations:

In view of the requirement to execute Hard Shoulders in terms of the initial drawings, even though the item was not incorporated in the BOQ, the contractors were required to either built up the

rates with the relevant item of works or the contingencies such as overhead cost was to cover up variety of possible risks or events that are not specifically identified or quantified in the BOQs. Thus, non-deduction or adjustment of cost for Hard shoulders from the payments on the increased pavement width of 1m tantamount to financial benefit to the contractors.

However, the Ministry should institute a technical team to review the cost implication in terms of the initial design/ drawings where the contractors were required to execute and maintain Hard Shoulders between the L-Drain and Carriageways and at valley site in terms of the contractual documents and appropriate decisions and action taken on the issue intimated to the RAA.

2.25 Non-maintenance of 1.5m/1m width shoulder at Valley side

The initial and revised design/drawings for pavement works provided the following specifications:

Initial Drawing

6. Formation cutting width 10.5m
7. Carriage width 6.5m
8. L-Drain hillside 1m
9. Shoulder between L-Drain and Carriage Way 1.5m
10. Shoulder at valley side 1.5m

Revised Drawing

11. Formation cutting width 10.5m
12. Carriage width 7.5m
13. Shoulder hillside 0.5m
14. L-Drain between shoulder hillside and Carriageway 1m
15. Shoulder at valley side 1.5m/1m

In terms of the technical specifications, the contractors responsible for Formation Works were required to achieve formation width of 10.5m and contractor for Pavement works were to execute and maintain Hard Shoulder at valley side of 1.5m/1m respectively as per the revised drawings. The quantum of work was required to be executed as per initial and revised drawings and cost thereof either built up with “Providing and Laying GSB” or other pavement related works.

During the physical verification of sites with the ROs site engineers and officials, the RAA observed that the Hard Shoulders of 1.5 m/1m width at valley side were found not maintained homogeneously throughout the stretches of the road. The RAA noted that DBM and AC works were found executed at the edge of the roads at the valley side to achieve the 7.5m carriageway.

Thus, the failure to maintain the hard should of 1.5m/1m at valley side by the contractors responsible for Pavement works indicated the failure on the part of the contractors and ROs to achieve the overall formation width of 10.5m.

In addition, non-provisioning of the 1.5m/1m width Hard Shoulder at the valley side again had financially benefited the contractor as no adjustment of the amount was found made for area where Hard shoulders width were not maintained.

The Ministry should comment on the revisions of the designs/drawings and non-adjustment of cost thereof for works not required to be executed and works not actually executed. Besides, the Ministry should institute a technical team to carry out measurements of the formation width and pavement works to regulate payments to the extent of actual works done as per designs/drawings and technical specification as well as adjust cost for the hard shoulders not executed at site.

Auditee's Response:

The shoulder width of 1.5 m has been maintained where ever possible. However, in some of the stretches where there was requirement of huge rock cutting and some stretches highly vulnerable to major slide have been left out to save future maintenance cost. Further RO was also instructed verbally by the then Hon'ble Lyonpo, MoWHS that formation width can be reduced in rocky stretches as long as required pavement width is achieved to speed up the completion of the project. Copy of the mail is attached below. Therefore, the memo may be kindly dropped.

2. Contract packaging of the east-west highway should be carefully prepared to engage all levels of contract categories including CDCL and Department works; and also to ensure efficiency with regard to sequencing and site management.

3. While the national highway standard specifications will be applied, site specific flexibility that will save us substantially in money and time should be permitted. (for example, no need to get the full specified formation width at rocky/cliff stretches; no blacktopping needed on the wet and unstable stretches; choices to adopt "V" or box drain as per the site condition - for wet stretches, box drain is said to be more effective; etc..)

4. To address problems with asphalt surfacing on wet and moist stretches, it may be worthwhile to experiment concrete pavement. DoR Director was instructed to look at this through a desk top research and prepare presentation to see the possibility of piloting few stretches on the lateral east west highway works.

RAA's Further Comments & Recommendations:

Notwithstanding the instructions issued through e-mail as well as verbal instruction of the then Hon'ble Lyonpo, MoWHS, it was the responsibility of the ROs and the Site Engineers to regulate and adjust the cost for the formation width not achieved since the quoted rates for formation works were running meters with overall formation width of 10.5m.

Thus, non-deduction or adjustment of cost to the extent of formation width not achieved from the payments tantamount to payments to the contractors for works not executed. In addition, the achievement of formation width had led to non- maintenance of Hard Shoulders at valley side by the Contractors responsible for Pavement works. This has also resulted in payments for Hard Shoulders not executed at site.

However, the Ministry as agreed during the exit meeting should institute a technical team to review the cost implication in terms of non-achievement of formation width and non- maintaining of Hard Shoulders at valley site in terms of the contractual documents and appropriate decisions and action taken on the issue intimated to the RAA.

2.26 Non-achievement of formation width 10.50 meters and non-execution of FC works

As per the approved revised drawing and design, the technical specifications required maximum Formation road width of 10.50 meter (m) comprising 1.5 m width shoulder on the valley side, 0.50 m width on hill side behind the L Drain for the purpose of debris collection, and 1m width L-drain and Carriageway width of 7.50 m.

In terms of the contract documents, the quoted rates in lump sum for formation cutting works was to achieve overall road width of 10.50 m for ensuring achievement of technical specifications defined for pavement works.

The joint physical verification of site revealed that in many stretches of roads, the formation width was not achieved as well as formation works were found not executed as detailed below:

RO, Lingmethang

2.26.1 Korila-Pangser (Package-2) executed by M/s. Tshering Construction Pvt Ltd. Bumthang

SL. No.	Approx. Chainage (in meter)	Approx. length (in meter)	Approx. width measured (in meter)	Width Deficit
1	36605-36641, 37244-37251	43	9	1.5
2	36753-36786, 37212-37217 37594-37598,39435-39445	52	10	0.5
3	37190-37194	4	9.5	1.0
Total		99		

2.26.2 Pangser-Kilikhar (Package-3) executed by M/s. K. D Builder Pvt Ltd.

Sl.No.	Approx. Chainage (in meter)	Approx. length (in meter)	Approx. widths measured (in meter)	Width Deficit (in Meter)
	From			
1	29284-29319, 29878-29889, 31659-31675, 31926-31956, 34108-34121, 34443-34466, 34912-34938,	154	10	0.5
2	29618-29649, 29679-29708	60	10.3	0.2
3	29752-29786, 29817-29828, 29965-30001	81	9.4	1.1
4	29845-29864, 32707-32720, 34965-34989, 35018-35033	71	9	1.5
5	32410-32427	17	9.7	0.8
6	33039-33051	12	9.9	0.6
Total		395		

2.26.3 Kilikhar to Mongar (Package 4) executed by M/s Gongphel Construction Pvt. Ltd

SL. No.	Chainage/ total length (in m)	Approx. length (in meter)	Physically measured width (approx. in meter)	Width Deficit
1	25377m-25320m and 26291m-26114m	234	9	1.5
2	26588m-26569m	19	10	0.5

3	27384m-27347m	37	9.7	0.8
4	29058m-29028m	30	9.5	1.0
Total		320		

2.26.4 Mongar-Gongola (Package-5) executed by M/s. Norbu Construction Company Pvt. Ltd , Gelephu

Table 2.26.4: Formation width not obtained along 11.56 km road (Physical verification conducted on 4 th November 2017)				
Sl.No	Chainage/ total length (in meter)	Approx. length (in meter)	Physically measured width (approx. in meter)	Width Deficit
1	15m-0m, 120m-103m, 899m-890m , and 1410m-1400m	51	9.5	1.0
2	3382m-3350m	32	10	0.5
3	5450m-5400m	50	9	1.5
Total		133		

2.26.5 Kurizampa-Lingmethang Highway (Package-7) executed by M/s Tshering Construction Pvt. Ltd, Bumthang

Table 2.26.5: Formation width not obtained along 4 km road (Physical verification conducted on 30 th October 2017)				
Sl. No	Chainages (in km)	Length in M	Physically measure width (approx. in m)	Width Deficit (in m)
1	114.526-114.562, 115.019--115.048, 115.07-115.089, 115.113-115.144, 116.372-116.401, 116.523,116.448-116.462, 116.523-116.543	178	10	0.5
2	114.735-114.816, 116.795-116.839	125	9	1.5
3	116.719-116.747	28	9.5	1.0
Total		331		

RO, Trongsa

2.26.6 Chuserbu to Nyelazam (Package 1) executed by M/s Rigsar Construction Pvt. Ltd

Table 2.26.6: Non-achievement of formation width as per revised width				
SL. No.	Chainage/ total length (in meter)	Length in (M)	Physically measured width (approx. in meter)	Width Deficit in (m)
1	125m-90m, 506m-440m, 1050m-1040m, 1985m-1978m, 3270m-3246m	142	10	0.5
2	1187m-1175m	12	9.7	0.8
3	2890m-2883m	7	9.5	1.0
Total		161		

Table 2.26.6.1: Non-achievement of carriage width 7.5 meters as per revised width					
SL. No.	Chainage	Meter	Length	Width Measured in (m)	Width deficit in (m)
1	2147	2147	10	7.4	0.01

2	2156	2156	9	7.2	0.30
3	5145	968	8	7.25	0.25
4	7629	3452	81	7.15	0.35
Total			108		

2.26.7 Nyelazam to Sakachawa (Package 2) executed by M/s Gaseb Construction Pvt. Ltd

Table 2.26.7: Non-achievement of formation width and FC not carried out					
SL. No.	Chainage	Approx. length (in meter)	Approx. width measured (in meter)	Width Deficit (in m)	FC not carried (in m)
1	12360-12324, 13596-13610, 13641-13650	79	10.0	0.5	
2	14666-14688	22	9.9	0.6	
3	12000-12059				50
4	16031-16068				37
Total		101			87

2.26.8 Sakachawa to Tsangkha (Package 3) executed by M/s Rinson Construction Pvt. Ltd

Table 2.26.8: Non-achievement of formation width and FC not carried out							
Sl. No.	Chainage	Meter	Length in (m)	Width	Width Deficit (in m)	Chainage in (m)	FC not carried in (m)
1	21271	1600	59	10.4	0.1	1047-1168	121
2	21586	1915	73	9.5	1.0	1886-1915	29
3	22145	2474	559	8.8	1.7	5259-5409	150
4	22638	2967	227	10.0	0.5	536-556	20
5	23158	3487	189	9.7	0.8	223-402	179
6	25206	5535	40	9.3	1.2		
Total			1147				459

2.26.9 Tshangkha to View Point (Package 4) executed by M/s Gyalcon Infrastructure Pvt. Ltd

Table 2.26.9: Non-achievement of formation width				
SL. No.	Approx. chain age (in meter)	Approx. length (in meter)	Approx. width measured (in meter)	Width Deficit (in m)
1	27435-27460	25	8.0	2.5
2	27724-27737	13	9.5	1.0
3	30039-33042, 30168-30238, 30667-30673	79	10.0	0.5
Total		117		

2.26.10 View Point- BjeeZam (Package 5) executed by M/s Druk Lhayul Construction Pvt. Ltd

Table 2.26.10: Non-achievement of formation width and FC not carried out				
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SL. No.	Approx. chain age (in meter)	Approx. length (in meter)	Approx. width measured (in meter)	Width Deficit (in m)	FC not carried in (m)
1	33276-33305	29	4.7	5.8	
2	33305-33352	47	7.3	3.2	
3	34164-34198, 35445-35487, 36648-36686	114	9.0	1.5	
4	34541-34594, 36786-36806	73	10.0	0.5	
5	35351-35387	36	7.0	3.5	
6	35564-35619, 35792-35916,	179	8.5	2.0	
7	36067-36099	32	8.7	1.8	
8	36273-36416	143	8.0	2.5	
8	3200-32053				53
9	34316-34361				45
10	37627-37710				83
Total		653			181

2.26.11 Bjezam- Trongsa (Package 6) executed by M/s. Raven Builders & Company (P) LTD

SL. No	Ch. From (in m)	Length (in m)	Physically measure width (approx. in m)	Width Deficit (in m)	FC not carried (in m)
1	37811-37930, 40172-40192, 39384-39410, 39317-39338	186	9.3	1.2	
2	38153-38231, 39233-39291	136	9.0	1.5	
3	38556-38646, 42821-42851	120	8.0	2.5	
4	40284-40324, 41637-41665, 41819-41837, 42073-42145, 43033-43087	212	10.0	0.5	
5	40728-40836, 41954-41983	137	7.0	3.5	
6	40856-40980, 42645-42702, 39849-39860	192	9.7	0.8	
7	42393-42441, 42730-42768, 41495-41513	104	7.5	3.0	
8	43441-43465, 43570-43638	92	8.5	2.0	
9	37700, 40324, 40531, 42536, 43548, 43785				992
Total		1179			992

2.26.12 Gyatsazam to Ngangar (Package 13) by M/s Rinson Construction Pvt. Ltd

Sl. No.	Chainage	Wheel Meter reading	Width measured	Width Deficit (in m)
1	85418,	438	10.3	0.2
2	85706, 99527,	3661	10.0	0.5
3	87118	2138	9.7	0.8
4	87288, 99244	4960	9.5	1.0
5	89881	81	7.7	2.8
6	90558, 96675,	841	9.0	1.5
7	96592	4060	8.0	2.5
8	97655, 98592, 99080	5551	10.2	0.3
Total		21,730		

2.26.13 Sonam Kuenphen to Hurjee (Package 14) executed by M/s Lamnekha Construction Pvt. Ltd

Table 2.26.13: Non-achievement of formation width and FC not carried out						
Sl. No.	Chainage	Wheel meter reading	Length (in m)	Width (in m)	Width deficit (in m)	FC not carried (in m)
1	87917	159-297				138
2	88220	549-600				51
3	88376	687-756				69
4	88622	889-1002				113
5	88695.9	1002-1075.9	73.9	10.2	0.3	
6	88803	1098.9-1183				84.1
7	88892	1183-1272	89	9.9	0.6	
8	89011.7	1272-1391.7	119.7	9.0	1.5	
9	89190.7	1391.7-1570.7	179	7.6	2.9	
10	89234.6	1570.7-1614.6	43.9	8.8	1.7	
11	89268.2	1614.6-1648.2				33.6
12	89606.6	1810.4-1986.6				176.2
13	89791.6	1986.6-2171.6	185	8.6	1.9	
Total			690.5			664.9

The non-achievement of formation width requirement of 10.50 m as per revised drawings and technical specifications as well as non-execution of formation works indicated execution of works in deviation to the technical design and specification and inadequate monitoring and supervision by the site engineers over the execution works.

Further, the non-achievement of the required widening width and non-execution of formation works entailed payments for unexecuted works as the quotes for FC works were on lump sum basis.

Auditee's Response:

The DOR and the Ministry responded that while almost all the stretches completed have width 10.5m, the road width were not achieved only in areas where there is local resident, private properties, water tanks, permanent structures, public utilities, Religious, cultural, Historic and ecologically important sites.

The ROs also responded that the Minister, during her visit to sites and during meetings instructed that there was no need to get full specified formation width at rocky and cliff stretches as well as black topping on the wet and unstable stretches to save substantially in money and time.

The ROs also responded that the FC width not achieved shall be deducted and payment will be made accordingly on pro rata-basis.

Response RO, Lobeyasa

The Regional Office duly acknowledges the observation made by RAA and has concerns for it. We would like to furnish the facts and evidences of following comprehensive explanations for kind consideration by Royal Audit Authority.

It is to apprise that the project officials involved in double lanning of NEWH has been constantly monitoring the entrusted works to execute the works as per the standard drawings and design. The formation cutting were carried out based on the survey line fixed by the Department.

Moreover, the FC works were ongoing during the RAA's site visit and most of the stretches were covered with landslides and found as width not achieved. Now the contractor has cleared the landslides from most of the stretches and trimming works being carried out and FC width are found fully achieved.

*Other reasons for non-achievement of formation width as per individual responses
The FC works is still ongoing and out of 0.992 Km, 48 m near the Bjezam will not be possible to cut due to presence of RCC Composite Bridge and RBP Infrastructures.*

Moreover, 492 m stretch at the end point near the Town area will also not be possible to cut due to presence of Human Settlement above the road and Sherubling bypass road and accordingly the bill will not be paid for the FC not carried out.

FC width were achieved except few exceptional stretches (rocky cliff and Town area) for which payment will be made accordingly on pro rata-basis.

FC width at very few location not achieved due to the human settlement, transmission line and restricted areas for cutting hill sides due to presence of private land above the road way, the road geometric has been re-designed.

In some of the stretches where slides are not prone and to improve the road geometric further FC width was restricted.

In few stretches due to unavoidable circumstances FC width had to be restricted or relaxed up to 9.5 mtr. For instance, at Nikachu Power house junction the FC work was not achieved due the presence of surge shaft above the road as well as project colony below the highway. This was done jointly at site with Nikachhu and RO. The FC width not achieved shall be deducted and payment will be made accordingly on pro rata-basis.

RAA's Further Comments and Recommendations

There were inadequacies in the site feasibility studies for formation cutting works as well as lack of proper planning as the ROs had failed to consider in the preparation of design, estimates and BOQs, the limitations for formation works expected in locations where there were local resident, private properties, permanent structures, public utilities, Religious, Historic and ecologically important sites as well as rocky and cliff areas. The non-execution of formation works, and non-achievement of formation width would defeat the very objective of up-gradation project of the NEWH.

The lump sum payments for formation cutting works in running meter without adjustment of the cost for road stretches where requisite formation width were not achieved and FC works not carried out tantamount to payments for unexecuted works.

As agreed during the Audit Exit meeting, the ROs and DOR are advised to regulate the payments for FC works on pro rata basis for road stretches where FC width were not achieved and FC not carried out and amounts recovered within three months from the date of issue of the report.

The Ministry is also advised to institute a technical team to conduct site verification on the non-achievement of formation width, the extent of FC works not carried out, non-maintenance of specified Hard Shoulder width at hillside and valley side under all contract packages, and ascertain the actual cost implication on the project and also to ascertain the remedial actions that may be required to improve the road conditions in such stretches.

2.27 Procurement and irregular issue of extension kits to the non-field officials - Nu. 311,900.00 (5.9.3)

An amount of Nu. 311,900.00 was paid to M/s Kinley & Sonam Manufacturing, Thimphu for the supply of extension kits to the Technical Monitoring Team. Since the NEWH activities are spread over 4 Regional Offices, expenditures are allocated amongst four ROs at equal amount of Nu. 77,975.00 each. Further review of the related documents revealed the following irregularities:

As per the approved note dated 02.02.2016, the following extension kits were approved for the procurement by the Secretary:

SI/No	Description	Qty
1	Sleeping bags	9 Nos
2	Expedition mats	9 Nos
3	Safety boots	9 Nos
4	Torch lights	4 Nos
5	Tent (A or E type)	3 Nos

The audit team noted another note sheet dated 2.2.2016 approving the procurement of following extension kits by the Secretary:

SI/No	Description	Qty
1	Sleeping bags	12 Nos
2	Expedition mats	12 Nos
3	Safety boots	12 Nos (not approved)
5	Tent (A or E type)	12 Nos

It is also noted that no dispatch numbers for both the Note sheets were available and the two note sheets were approved on the same day. Therefore, the audit team could not ascertain as to whether both the above two note sheets were approved for procurement.

Further, the procurement was made during the FY 2016-2017, though the procurement was approved for procurement during the FY 2015-2016 indicating flaws in the approval and procurements of extension kits. On review of the records made available, the RAA noted procurement of the following extension kits:

SI/No.	Items	Qty	Total Qty.	Rate (Nu.)	Amount (Nu.)
1	Sleeping bag A	2		10,990.00	21,980.00
2	Sleeping bag 2	8		9,990.00	79,920.00

3	Sleeping bag 3	<u>7</u>	17	5,990.00	41,930.00
4	Safety boots A	9		3,890.00	35,010.00
5	Safety boots B	<u>7</u>	16	1,990.00	13,930.00
6	Rain Gear A	8		3,690.00	29,520.00
7	Rain Rear B	<u>6</u>	14	1,450.00	8,700.00
8	Tent D/type	9	9	8,990.00	80,910.00
	Total				311,900.00

On further review on the issue of extension kits, it was noted that extension kits were also issued to officials other than the TMT Officials as shown below:

SI/No	Name	sleeping bag	Safety boot steel	Rain Gear	Tent D/type	Total cost Nu
1	Karma Ugyen, DCAO	1	1	1	1	26,560.00
2	Kinzang Norbu, Budget officer	1	1	1	1	26,560.00
3	Ugyen Thinley, AFD	1	1	1	1	26,560.00
4	Thinley Dorji, MTO	1	1	1	1	24,660.00
5	Sonam Dorji, Store	1	1	1	1	26,560.00
6	Pema Eden	1	1	1	0	17,570.00
7	TMT officials	11	10	8	4	163,430.00
						311,900.00

Further, following irregularities were also observed:

- The extensions kits were excessively procured as noted from the stock balances as on the date of audit.
- Procurement of 8 Nos Rain Gears valuing Nu. 38,220.00 were not in the list of extension kits listed in both the approved Note sheets.
- In terms of approved Note Sheets, Tent A or E type was to be procured but tent D types were found procured. Thus the procurement was in violation of the approved note sheets
- As per available records, the **Technical Monitoring Team (TMT)** comprise the following team members:
 - ✓ Tshering Wangdi A (TMT Leader)
 - ✓ C.K. Pradhan, PE, Const. Division, DoR
 - ✓ Karma Tenzin, EE, Design Division
 - ✓ Tempa Thinley, Geotech Unit, Design Division, DoR

Thus, the reasons for issuing extension kits to other than TMT officials was not understood in audit.

- The issue of tents to individual was not rational and correct as the tents could be used by other field officials as and when required.
- The charging of expenditure to the Project was not justified as such expenditure could have been booked under normal LC accounts.

- The necessity of the extension kits to the above officials including TMT officials are found not genuine since the TMT official visits are not regular. Further, all ROs have established transit camps well equipped with all necessary items.

Taking into the consideration of the above facts, the DOR and Ministry should recover the amount from the above officials besides the Ministry should also hold the approving authority accountable for approving such procurements from project funds.

Auditee’s Response:

We would like to furnish our reply as detailed below:

1. *In order to monitor the work progress and quality of the NEWH Project, a Technical Monitoring Team (TMT) comprising Chief Engineers, Principle Engineers and other senior engineers from HQ have been formed during the 8th DoR Quarterly Meeting held in 28th – 30th, 2015. A copy of minutes attached for reference. As per ToR, TMT is mandated to check the quality of work and carry out the field tests.*
2. *Although the core TMT members were from the Department, at times there was a requirement of finance and procurement officials to visit the project sites to evaluate the financial and procurement processes and constraints faced by the bidders. Since there was no separate fund for purchase of extension kits, the stuffs were procured and booked under the project head only.*
3. *An amount of Nu. 311,900.00 were paid to M/s Kinley and Sonam Manufacturing, Thimphu for the supply of extension kits to the Technical Monitoring Team.*
4. *Since the NEWH activities are spread over four Regional Offices, expenditures are divided among the ROs and each RO has incurred an amount of Nu. 77,975.00.*

The above amount of Nu. 77,975.00 was paid based on the directive of ministry and DOR, HQ vide note sheet approval no. DOR/TMT/2016-2017/3522 on February 2017.

We would like to submit the Royal Audit Authority to kindly review above details explanations and requested to consider the above Para.

RAA’s Further Comments & Recommendations:

The RAA has taken note of the response. It is to reiterate that in terms of budgetary norms, separate budget allocation are approved for procurement of extension kits for the field staff under the normal budgetary system (LC). The procurement of extension kits from the project fund in addition to budgetary fund is in violation of the budgetary norms. Besides, the issuance of extension kit to non-field staff is unjustified.

However, as discussed during the exit meeting, the ROs and DOR should get back the tents and account for in stock ledger and intimated to RAA for verifications and record. Besides, the Ministry should direct the DOR and ROs to refrain from such decisions and action in future.

Who is Accountable?

<i>Direct Accountability</i>	<i>: Refer Accountability Statement</i>
<i>Supervisory Accountability</i>	<i>: Refer Accountability Statement</i>

2.28 Non-aligning of pavement thickness with the item of works provided in the Bhutan Schedule of Rates (BSR) with resultant cost implication by way of applying built up rates through rate analysis

In terms of BSR, the item of work “*Providing and Laying Dense Bituminous Macadam (DBM) to required degree of compaction based on mixture design (Job mix formula) approved by the supervising engineer including preparation of surface with road broom, application of prime coat @0.75 kg/sq. m by mechanized method using asphalt plant, paver, steel roller, tyre roller etc. complete*”– outlines built-up rates for the execution of pavement works only for the varying thickness as shown below:

Item Code	DBM thickness
RW0132	50mm
RW0133	60mm
RW0134	70mm
RW0135	80mm

Similarly, for the item of works “*Providing and Laying Asphalt/Bituminous Concrete to required degree of compaction based on the job mixture design approved by the supervising engineer using asphalt plant, paver, steel roller, tyre roller etc. as per material gradation and aggregate quality specified*” also outlines built-up rates for the execution of pavement works only for the varying thickness as shown below:

Item Code	AC thickness
RW0136	25mm
RW0137	30mm
RW0138	35mm
RW0139	40mm

However, for the double lanning of Northern East-West National Highway, the Ministry has prepared the designs/drawings with a total pavement thickness of 600mm as shown below:

The pavement thickness of various layers is as follows:

GSB	=	250mm
WMM	=	225mm
DBM	=	75mm
AC	=	50mm
Total:		600mm

It was apparent that DBM and AC thickness were not aligned to the thickness provided in the BSR but maintained as design thickness for DBM as 75mm in-between the defined thickness of 70mm and 80mm and 50mm for AC against maximum thickness of 40mm provided in the BSR.

Thus, specifying different DBM and AC thickness had resulted in requirement of carrying out rate analysis both by the ROs in the preparation of estimates and contractors while submitting the rates for the two item works. On review of contractor’s rate analysis attached with the tender documents, lapses and discrepancies in the application of co-efficient for the item of work 75mm DBM & 50mm AC were noted as the LMC provided only for 70mm and 80mm DBM work and 40mm AC work. Thus, the co-efficient used for 75mm DBM was considered for 80mm thick and co-efficient for 50mm thick AC works was randomly worked out by contractors.

However, the varying rates used by the RO through rate analysis in the preparation of estimates including rates applied for departmentally executed works and BSR rates are detailed in table 2.26.2 below:

Packages	BSR Code reference	DMB rate without bitumen	AC rate without bitumen	Departmental		BSR Rates	
				DMB rate with bitumen for 75 mm	AC rate with Bitumen for 50mm	DBM with bitumen 80mm (BSR 2015-Thimphu Base)	AC with bitumen 40 mm (BSR 2015-Thimphu Base)
VI, VII, VIII, IX, X	AR	213.14	159.14	839.65	648.22	891.92	521.27
XI	AR	252.43	153.15				
I, II, III, IV, V	AR	205.85	140.87				
XII, XIII, XIV, XV	RW0133	247.47	148.2				

Further, it was noted from the Minutes of the 7th DoR Quarterly Meeting held on 27-29 July, 2015, the meeting discussed and decided to reduce the thickness of DBM from 75mm to 60mm and AC from 50mm to 40mm aligning to the thickness provided in the BSRs. However, the execution of pavement thickness was found maintained in line with the initial approved design thickness in majority of the contract packages.

The Ministry in particular the Design Division should comment on designing of bitumen thickness not provided in the BSR for the preparation of estimates and subsequently reducing the bitumen thickness in line with the thickness provided in the BSR.

Auditee’s Response:

The Regional Office acknowledges the observations issued by Royal Audit Authority. While BSR is prepared as a tool to assist in the estimation of project costs, it is to inform you that it does not cover every items in detail. For instance, laying of WMM is done with the use of motar grader while it is not reflected in the labour coefficient.

The required items are incorporated based on site specific as and when required and found necessary. Likewise, varying thickness for DBM & AC for NEWH is based on design traffic volume and site requirement. There is no added cost on the application of present DBM & AC thickness adopted for the above work.

In view of the above justification, RAA is kindly requested to drop the memo.

RAA’s Further Comments & Recommendations:

While taking note of the response that the pavement design thickness is guided by the traffic volume, the fact remains that the change in design thickness of DBM from 75mm to 60mm and AC from 50mm to 40mm were made only for 25km stretch of road between Wangdi and Trongsa and Yadi to Lingmethang despite having same traffic volume. Thus, adhoc change of design thickness

of DBM to 60mm and AC to 40mm on the basis of traffic volume, indicated that the Design Division, DOR could have designed the DBM and AC thickness within thickness provided in the BSR and LMC. The providing of design thickness of 75mm for DBM and 50mm for AC not provided in the BSR and LMC had resulted in application of varying rates by the ROs in the preparation of estimates and wrong application of material co-efficient in the analysis of rates for items of works by the contractors inflating the quoted rates with overall financial implication to the extent of Nu.60.236 million as reported under Para 2.4 of the report.

However, as discussed in the exit meeting the DOR in consultation with the Ministry should take measures to maintain the design thickness of DBM and AC and other item of works as per the thickness provided and available in the BSR and LMC or incorporate in the BSR and LMC varying design thickness requirements in terms of traffic volume and site specific conditions to minimize wrong application of labour and Material Co-efficient in carrying out rate analysis in future.

The decisions and measures taken by the Ministry to address the issue intimated to the RAA for record and follow-up in future audits.

2.29 Irregularities in supply of lab equipment for NEWH (5.6.8)

As noted from Kuensel issue of 7/10/15, the NIT for procurement of laboratory Testing Equipment for road works was found invited with completion period of supply of 3 months. Details of laboratory testing equipment required were as shown below:

i.	Proctor Compaction Test Apparatus	4 sets
ii.	California Bearing Ratio (CBR) Test Apparatus	4 sets
iii.	Field Density (Sand Cone Method) Test Apparatus	4 sets
iv.	Binder Determination(Centrifuge Extractor Method) Test apparatus	4 sets
v.	Compaction of Bituminous Marshall Test Apparatus	4 sets
vi.	Core Cutting Machine (Portable& diesel/petro engine operated)	4 sets

As per evaluation reports, M/s GS Traders were the lowest evaluated bidder with bid amount of Nu. 2,462,660.00. The contract agreement was found drawn accordingly between the Director, DoR and M/s GS Traders, Olakha, Thimphu.

During the review of the documents, the following lapses were observed:

2.29.1 Non-supply of testing equipment in full quantity

The supply order was issued vide order No. DoR/CE(CD)/2015-2016/W-47/1994datex 5/1/16 for supply and delivery of Lab Testing Equipment for Road Works valuing Nu.2,462,660.00. The supply order amongst others categorically stipulated that ***“inferior quality or re-conditioned product must be avoided. The joint inspection of supply delivery shall be carried by the procuring agency”***.

As per the Handing taking letter No. DoR/CE(CD)15-16/W-7/ dated 23/8/16, the demonstration of core cutting machine was conducted on 22/8/16 in the presence of the following officials:

- i. Tshering Wangdi A (TMT Leader)
- ii. Karma Wangdi, CE Construction Division
- iii. Sonam Jamtsho, Engineer, Construction Division
- iv. Pema Tshewang, Lab Tech, RO, Lingmithang
- v. Tshejamo, Lab Tech, RO, Trongsa
- vi. Gagan Lama, CEO, M/s GS Traders &
- vii. Binod Ghalley, Manager, M/s GS Traders 17629259

After demonstration, it was decided not to accept the core cutting machine since it was not as per specification. The supplier agreed to supply the whole set of core cutting machine within 1st week of September 2016. However, as of date of audit i.e.17/5/2018 even after a time lapse of almost two years the supplier had failed to replace core cutting machine. In addition, the DOR had also failed to take any action against the supplier. Further, some equipment items were also found not supplied by the supplier as shown in **Appendix “A”**.

2.29.2 Irregular payment of advance Nu. 560,000.00

Minutes of DLTC meeting held on 30/8/16 after deliberations had endorsed following decisions:

- The supplier is eligible for the payment only after supplying all the equipment as per the contract agreement. However, since his bills are pending the committee decided to make advance payment of Nu. 560,000.00.
- Payment of the quoted amount for 4 sets of core cutting machine and Nu. 246,266.00 being the 10% mobilization advance payment as per contract agreement on furnishing BG from the reputed bank. This is to facilitate the supplier to replace the core cutting machine at the earliest.
- The supplier shall supply the core cutting machine within 2 weeks after making the above payment by the department.

In accordance with the decisions of the DLTC, payment of Nu. 560,000.00 was found released to the supplier as advance payment since the bills are kept pending as the supply was not fully completed. The advance payments were made from four ROs as shown below:

SI/No	Name of ROs	Amount Nu.
1	RO, Thimphu	140,000.00
2	RO, Lobeyssa	140,000.00
3	RO, Trongsa	140,000.00
4	RO, Lingmithang	140,000.00
	Total	560,000.00

The decision of DLTC for payment of advance amounting to Nu. 560,000.00 was not justified as the supplier failed to supply the equipment even on the date of the audit.

2.29.3 Supply of testing equipment not as per specification and acceptance thereof - Nu. 1,902,660.00

M/s GS Traders, Thimphu had supplied lab testing equipment amounting to Nu. 1,902,660.00 except the Core Cutting Machines. Accordingly, RO, Thimphu had paid an amount of Nu. 475,665.00 vide dv No.6.134 dated 20/6/17 for cost of 5 Nos. (1 set testing equipment) as the balance amounts were to be met by ROs Lobeyssa, Trongsa and Lingmithang as detailed below:

SI/No	Name of ROs	Amount paid Nu.	Vr. No & date	Remarks
1	RO, Thimphu	475,665.00	6.134 of 20/6/17	After adjustment

RO, Thimphu informed that equipment received were tested as required and payment released based on the stock entry and verification of bills by head sub division. However, the audit team noted that balance amounts were found not released by the three ROs.

On enquiry with the Lab In-charge of RO, Lobeysa, Trongsa & Lingmithang, it was stated that though they have received the equipment, payments were not released as the equipment did not meet the specification requirements. This indicated that the payment by RO, Thimphu had been released without inspecting the equipment by the joint team.

It was also apparent that the ROs had not initiated actions either to return the equipment or to obtain replacement as on the date of audit. The Ministry should investigate the circumstances leading to acceptance of the equipment without prior inspection and certification of the same and retaining as of the date of audit. Such retention of equipment may complicate the issue further.

The Ministry should immediately direct the ROs to return the equipment and direct the supplier to replace the equipment along with the core testing machines. Further, any Bank Guarantee available should be renewed.

The inaction on the part of the Ministry and ROs also indicates procurement of testing equipment on the bases of to make use of funds and not based on actual requirements.

Auditee's Response:

M/s GS Traders, Thimphu has supplied lab testing equipment amounting to Nu. 1,902,660.00 except the Core Cutting Machines. According However, the audit team noted that balance amounts were found not released by the three RO offices equipment's are tastes as required and payment released based on the stock entry and verification of bills by head sub division.

- *M/S GS Traders, Thimphu supplier was placed with the supply order No. DOR/CE(CD)/2015-2016/W-47/1994 on Date 5/1/16 for supply and delivery of Lab Testing Equipment for Road Works*
- *M/S GS Traders, Thimphu has failed to supply the above lab testing equipment and Core Cutting Machines as per the specification as per terms and conditions of contract within the duration of three months date line issued by DOR, HQ, accordingly LD has been imposed based on terms and condition of contract agreement, imposed full amount LD 10% vide DV.06.134 on Dated 20/6/17 amounting to Nu. 47,567.00.*
- *We would like to put way forward to further substantiate that M/S GS Traders, Thimphu has supply the above lab testing equipment and Core Cutting Machines, while supplying to other ROS*
- *It is to submit here because of time lost while making twice procurement of lab testing equipment and Core Cutting Machines from third country by M/S GS Traders, Thimphu, the supplier could not supplied on time and therefore, the supplier was imposed penalty i.e., LD 10% of the contract value.*

Further, we would like to furnish our reply as detail below:

- i. It is to submit here all the tendering process has been undertaken at DOR, HQ, as per the directive of DOR, HQ, we have received the lab testing equipment 4nos and Core Cutting Machines 1 no was received from M/S GS Traders, Thimphu.*
- ii. It is to further substantiate the quality of lab testing equipment 4nos and Core Cutting Machines 1 no was found satisfactory while performing its output at our various field.*
- iii. The quality of lab testing equipment 4nos and Core Cutting Machines 1 no was verified accordingly to specification in contract document jointly by our Executive Engineer and Sub-Store In-charge based on the instruction of Chief Engineer Bridge Division DOR, HQ, instructed on the body of letter.*
- iv. The note sheet put up by Finance and Administration Division under RO-T, clear remarks has been noted payment of bill has been process after verification with other ROS, involved on NEWH.*

- v. Accordingly the payment had been released amounting to Nu. 475,665.00 vide DV.06.134 on Dated 20/6/17 for cost of lab testing equipment 4nos and Core Cutting Machines 1 no.
- vi. M/S GS Traders, Thimphu has failed to supply the above lab testing equipment and Core Cutting Machines as per the supply order date line issued by DOR, HQ, accordingly LD has been imposed based on terms and condition of contract agreement, imposed LD 10% vide DV.06.134 on Dated 20/6/17 amounting to Nu. 47,567.00.
- vii. It is to further substantiate that M/S GS Traders, Thimphu has supply the above lab testing equipment and Core Cutting Machines, while supplying to other ROs, however our Executive Engineer SD No. 1, and Sub-Store In charge has rejected and returned back the equipment to M/S GS Traders, Thimphu.
- viii. It is to submit here because of time lost while making twice procurement of lab testing equipment and Core Cutting Machines by M/S GS Traders, Thimphu, the supplier was imposed LD 10% vide DV.06.134 on Dated based on terms and condition of contract agreement.

We would like to submit the Royal Audit Authority to kindly review above details explanations and requested to reconsider dropping the above Para.

RAA’s Further Comments & Recommendations:

It is apparent that the ROs, and DOR had failed to take action against the supplier either to get all the equipment replaced as per technical specification or recover the payments including the Liquidated damages as per the terms and conditions of the supply contract even after a time lapse of almost two years as on the date of audit.

The DOR should immediately return the equipment retained by the ROs/DOR to the supplier and obtain replacement of the same. Besides, the DOR should also investigate the circumstances leading to non-return of the rejected equipment for almost two years and those responsible should be made accountable in event of any complications arising in future. The DOR must also test the equipment accepted by the RO, Thimphu by the joint inspection team.

The decisions and actions initiated by the DOR and the Ministry on the issues and outcome thereof intimated to RAA for records and follow-up in future audits.

Who is Accountable?

Direct Accountability	: Refer Accountability Statement
Supervisory Accountability	: Refer Accountability Statement

2.30 Unsafe Storage of explosives materials

In the light of the explosive materials being hazardous in nature and government controlled items, the audit team during site visits had also visited explosive storage facilities installed by the contractor at site offices. During the physical verification of site, the team noted that in most cases, explosive materials were found stored in open space, temporary sheds and in office instead of storing the materials in the designated explosive Magazines or designated stores constructed for the purposes. The status of explosives received, issued and balances of explosives in respect of RO, Lingmethang are shown in **Appendix “B”**.

The storing of explosive in open space and temporary shed compromises safety and security requirements as materials were exposed to possible risk to theft, pilferage and deterioration and health hazard to employees, labourers and general public and in particular commuters. While no major accidents related to explosives were reported as of date, considering the hazardous nature of explosive materials it is imperative for RO, Lingmethang to ensure proper storage arrangement and physical safe guards of materials.

Auditee's Response

RAAs observations on storage of explosives at various contractors of NEWH is well noted by the RO and the project officials. Despite several reminders through monthly coordination meetings and field visits has briefed about the risk of explosives and the rules and regulations and possible impacts for keeping in exposed condition and safety aspects. But many contractors in due process have improved a lot while still some fails to do so. In this regards, strict monitoring will be done by the RO and defaulters will be penalized accordingly in future. Therefore, the RAAs advice will be strictly noted for future guidance and strict implementation.

RAA's Further Comments & Recommendations:

While taking note of the response the fact remains that explosives are hazardous in nature and government controlled items, and exposed to possible risk to theft, pilferage and deterioration and health hazard to employees, labourers and general public and in particular commuters and were found not stored in designated explosive Magazines or designated stores constructed for the purposes.

However, as agreed during the Audit Exit Meeting, the DoR and the Ministry should immediately direct all the ROs and contractors for proper storage of the hazardous explosives. The DOR and Ministry should also direct the ROs to take stock of the explosives in terms of approval accorded by the Ministry, accountal of receipts, usages for the works and stock balances to prevent mishandling, misuses and ensure proper disposal of balance stocks. Besides, the DOR an the Ministry should institute proper procedures in the accountal, usages and disposal of unutilized explosives as well as monitoring mechanism to ensure enforcement of related explosives rules and regulations to prevent untoward complications in future.

PART B: PACKAGE SPECIFIC OBSERVATIONS WITH ACCOUNTABILITY

3. Award of three packages of work to M/s Chogyal Construction Pvt. Ltd (Packages I, II and III) from Dochula to Chasagang and lapses in deployment of Human Resources and equipment for each package and non-recovery of cost of bitumen and other overpayments - Nu. 75.486million

It was noted that the contractor was awarded three contract packages in violation to the resolutions of Nganglam Meet of *23rd December 2014* and Project Management Team of *12th January 2015* at Thimphu to award maximum of two packages to each contractor.

The three contract packages awarded with a total road stretch ranging from 30km along with contract amounts are shown in table 3 below:

Package (RO, Lobeyesa)	Estimated amount (Nu)	Contract Amount (Nu)	% of deviation (Estimate-Contract value)	Contract duration in month(s)	Work done value (Nu)	% of Deviation (Contract value – Work done value)
I-(Ch:477-467) (10km)	114,155,909.36	100,376,501.11	-12.07	15	116,399,663.99	15.97
II- Ch: 467-457)(10km)	118,573,848.79	102,070,100.40	-13.92	15	115,511,304.38	13.17
III-(Ch:457-447)(10km)	119,590,876.28	102,286,495.00	-14.48	15	115,504,285.38	12.93
Total stretch of 30Km		304,733,096.51				

On review of documents relating to the tenders, evaluations reports, awards of contracts estimates, Bills of Quantities (BOQs) and Running Bills including Pre-construction decisions, Minutes of Meetings, the RAA observed the following irregularities, lapses and deficiencies:

3.1 Excess issue of Bitumen and recoverable amount - Nu. 460,229.90 (5.1.20)

On assessing, the bitumen issued for all the three packages as per the stock records vis-à-vis theoretical consumption of bitumen calculated based on approved job mix formula the RAA noted excess issue of 430.456 barrels valuing to Nu. 608,212.42 as detailed in **table 3.1** below:

Total issue as per register (MT)	Total No. of barrels				Total	Diff. (MT)	Short recovery (MT)Nu.
		Pack I	Pack II	Pack III			
3680.664	22,866	1166.6	1131.3	1149.28	3447.2	233.464	
		Bitumen returned to RO, DOR				46.76	
		Diff. after deducting returned bitumen				186.704	
			Less 5% wastage			172.36	14.344
			Rate per MT				42,401.87
						Total value	608,212.42

While the Regional Office had issued the bitumen in line with the contract documents, it had failed to monitor and regulate actual consumptions through application of the approved job mix formula and recover any excess issues.

In the absence of such exercise by the Regional Office on the completion of contract works, it had failed to recover the excess issue of bitumen valuing Nu. 608,212.42 from the contractor.

The Regional Office, besides, commenting on the failure to compare the physical and theoretical consumption of bitumen for completed works should recover the cost of excess issue of bitumen valuing Nu. 608,212.42 from the contractor and deposit into Audit Recoveries Accounts (ARA).

Auditee's Response:

Since the Central Store was not in a position to supply the bitumen emulsion due to procurement issues though the sites were ready for BT works. Therefore, 16 (sixteen) barrels of VG-10 @ 161.80 kg per barrel (i.e. $16 \times 161.8 / 1000 = 2.588$ MT) was issued to the contractor in place of emulsion to be used as tack coat. The Detail of actual bitumen issued is shown below.

Total issue as per register (MT)	Total No. of barrels	Diff. (MT)	Theoretical consumption				Diff. (MT)	Remarks
			Pack I	Pack II	Pack III	Total		
3680.664	22866	0.646	1166.6	1131.3	1149.28	3447.2	233.454	
			Bitumen returned to RO, DOR				46.760	
			Diff. after deducting returned bitumen				186.694	
			Less 5% wastage				184.034	172.36
			Theoretical Consumption of emulsion				173.290	
			Actual Emulsion Issued				169.800	
			Difference				3.490	

SI No	Items	Qty (sqm)	Bitumen Emulsion		
			Prime/tack coat	Theoretical Consumption (kgs)	Barrels (Nos)
P-I	DBM	79,370.07	0.50	39,685.04	198.43
	AC	79,600.47	0.25	19,900.12	99.50
P-II	DBM	75,203.40	0.50	37,601.70	188.01
	AC	75,203.40	0.25	18,800.85	94.00
P-III	DBM	76,397.45	0.50	38,198.73	190.99
	AC	76,397.45	0.25	19,099.36	95.50
				173,285.80	866.43
			Theo. Compt.	173.29mt	
			Actual Issued	(169.80mt)	849 nos.

From the above table the emulsion quantity of 3.49mt have been replaced by VG-10. Therefore memo may kindly be dropped.

RAA's Further Comments & Recommendations:

The RAA has taken note of the issue of 3.49MT of VG 10 as emulsion. However, the MAS account supporting the issue of just 169.80MT of emulsion should be furnished for review in audit. In addition, as discussed in the exit meeting, the 5% wastages should be calculated on the theoretical consumption not on the total bitumen issued which works out to 172.36MT instead of 184.03 MT

computed by the RO. Thus, the net shortage of bitumen works out to 10.854MT (i.e.14.344-3.49) MT amounting to Nu. 460,229.90 (10.854MT * Nu. 42,401.87).

The RO, Lobeysa should recover the overpayment of Nu. 460,229.897 and deposit into Audit Recoveries Account within three months from the date of issue of the report beyond which penalty @ 24% per annum shall be levied as per Chapter IV, Section 4.5.1.4 of the Finance and Accounting Manual 2016.

The DOR and RO should come up with strict control mechanism over issues and use of bitumen by contractors to prevent bitumen remaining unaccounted for in future.

Who is Accountable?

Direct Accountability	: • Sonam Thinley, JE, EID No. 201101238 • Karchung, AE I, EID No. 9907116 • M/s Chogyal Construction Pvt. Ltd (CDB No. 7640)
Supervisory Accountability	: Garja Man Rai, Ex CE, (EID No . 8212026)

3.2 In admissible, non-recovery of cost of bitumen and other irregularities on the payment of damaged pavement works to M/s Chogyal Construction Pvt. Ltd.

3.2.1 Inadmissible payment for the damaged pavement (Package I, II & III) Nu. 3,494,255.71 (5.1.20)

The contractor had claimed and was paid Nu.3,494,255.71 for redoing damaged pavement works vide voucher No.DV10.24 dated 10/10/2017 as per approval as evident under Minutes No. DoR/CD/7/2016-2017/4098 dated 26/06/2017.

The review of tour report of Technical Monitoring Team (TMT), Minutes of meeting and other correspondences (*Refer to chronological order of activity enclosed as Exhibit "A"*) for the damaged pavement showed the following mismatch of information and decisions:

- The Technical Monitoring Team (TMT) clearly reported that the cause of base failure for contract package II as segregation of Wet Mix Macadam (WMM) materials during laying at almost all the location between 457.00 to 458.50KM. The base failure for about 300m length at the middle portion was due to high water table and seepage through GSB and DBM. The major cause of failure in contract package III is due to excessive ground water percolation and capillary action from the sub-grade. (*Refer to tour report of TMT*)
- The Project Engineer vide letter No.DOR/ROL/LSD-25/2015-2016/121 dated 20/05/2016 had also reported cause of pavement failure as excess fine materials especially clay soil in the WMM, which absorb more water during rainy season resulting in low carrying capacity during movement of vehicles.
- The minutes of meeting No.DOR/CE(TMT)/2015-2016/8 dated 01/06/2016 had also given cause of failure as segregation of GSB & WMM materials, Excessive quantity of fines /clayey soil in GSB & WMM & Stagnation of water in the pavement due to trenching effect.

In contrary to the above findings, the final minutes of meeting No. DoR/CD/7/2016-2017/4098 dated 26/06/2017 had stated the cause of pavement failure as follows:

- High ground table which was not captured during the design stage;
- Unexpected early monsoon (March & April 2016); and
- Design failure as the client failed to provide solutions to lower the ground water table & seepages from the hillside.

Based on the approval of above minutes, the contractor was paid Nu. 3,494,255.71 in addition to the insurance claim amount of Nu.19.453 million for redoing the pavement works as shown in **table 3.2.1** below:

Sl. No.	Chainage		Description of item	L	Qty(m3)	Area(m2)	Remarks
	From	To					
1	447	467	WMM	4144	6915.05	30,733.55	Package II
2	“	“	GSB	4200	4200	16,800.00	“
3			DBM	1692		12,351.06	“
4			Scarifying	1692		12,351.06	“
5	457	447	WMM	917	1629.97	7,244.00	Package III
6			GSB	400	400	1,600.00	“
7			DBM	917		7005.88	“
8			Scarifying	917		7005.88	“

From the above table, it transpires that the WMM works for package II & III were re-done for total length of 4144m & 917m respectively in contrary to 300m length in package II failed due to high water table and seepage through GSB and DBM as per the TMT report.

The Audit team further verified the additional works approved vide letter No.DOR/ROL/2015-16/Plg-05/1787 dated 03/05/2016 which showed French drain construction for about 919.20m as against the damaged road claimed for 5061m (**Package II 4144m+Package III 917m**).

Sl. No.	Contract Package No.	MB page No.	Description of item	Location	Total qty.	Rate	Amount (Nu.)
1	Package II	82/067	French Drain 600X1000 (without geotextile)	Mechuna resort	536.40	1281.70	687,503.88
2			French Drain 600X1000 with geotextile	Totokha	70.30	1622.95	114,093.39
3			French Drain 1000X1500 with geotextile	“	97.80	3302.94	323,027.53
Total					704.50		
4	Package III	54/193	French Drain 600X1000 with geotextile	BHU junction 25.7, Above Thinleygang town 95m+60 & Below Thinleygang Town 34m	214.7	1622.95	348,447.37
Total					214.70		

Hence, failure of the remaining length was mainly due to following reasons:

- Segregation of GSB & WMM materials;
- Excessive quantity of fines /clayey soil in GSB & WMM; and
- Stagnation of water in the pavement due to trenching effect.

As such, payment for the redoing of work due to reason cited in the minutes of meeting No.DOR/CD/7/2016-2017/4098 dated 26/06/2017 indicated extension of undue favour to the contractor as explained here under:

- The high ground water table affected only 704.50m in package II and 214.70m in package III against total length of pavement failure claimed for 4144m & 917m respectively. The need to lower the water table was addressed by French drain as per additional works approved vide letter No. DOR/ROL/2015-16/Plg-05/1787 dated 03/05/2016.
- The time allotted was anticipating the rainfall;
- The Project Engineer himself vide letter No.DoR/ROL/LSD-25/2015-2016/121 dated 20/05/2016 had also reported the cause of pavement failure as excess fine materials especially clay soil in the WMM, which absorb more water during rainy time resulting in low carrying capacity during movement of vehicles.
- The TMT clearly reported the cause of base failure for contract package II as segregation of Wet Mix Macadam (WMM) materials during laying at almost all the locations between 457.00km to 458.50km. The base failure for about 300m length at the middle portion due to high water table and seepage through GSB and DBM only shown in the report of the TMT.
- The DoR, Lobeysa vide letter No. DoR/Lobeysa/Construction Division (09)2016-2017/1037 dated 24/01/2017 had stated that the work is insured as per the GCC (14.1(a) and RO, Lobeysa and will not be in position to compensate the loss incurred by contractor. However, RO will fully assist the firm to get compensated for the losses incurred from the Insurance Company. Accordingly, the contractor had claimed and was compensated Nu.19,452,619.00 by Bhutan Insurance Limited (BIL) as per the contractor's letter No. CCCPL/ROL-(III)/Workd-02/2016-2017/049 dated 13/04/2017. (*Details of Insurance Claim not produced for audit verification*).
- The contractor had failed to engage and deploy key personnel and machineries separately despite commitment to deploy the same during the acceptance of the three contract awards. Same key personnel and machineries were deployed for all three contract packages. Thus, the failures were also attributable to non-deployment of separate key personnel and machineries.
- The package III was found not insured and the compensation did not include the same. The payment for the damages under Package III was not justified, as the contractor should have insured the packages as the built up rates included the cost of insurance.

Therefore, in the light of the aforementioned facts and events, the payment for damaged pavement works were not justified and stand recoverable. The RO, DoR Lobeysa and the MLTC should either recover the amount from the contractor or from the responsible officials approving the ineligible payments and failure to insure the contract package III as per the contractual agreements.

The amount recovered should be deposited into ARA. In addition, the details of insurance coverage along with premium paid vis-à-vis compensation payments by the Bhutan Insurance Limited (BIL) furnished for verification.

Auditee's Response:

It is to inform RAA that there was early deterioration of pavement work from Mechuna to Thinleygang area. Initially RO instructed the contractor to redo the failed portion of the pavement again. The contractor did repair the damaged portion at certain locations on the failed area. However, the failures were repetitive and the contractor had requested for team from the HQ to carry assessment of the surface/area.

Based on the request of the contractor and RO Lobeysa, a TMT team including the geotechnical engineer carry out detail study of the area. The team checked the quality of materials used, reviewed the tests done by the contractor etc. The team also carried out independent in-situ tests. After detail study of the site and tests thereon, the concluded as below:

- Due to lack of time, proper geotechnical study of the area was not done.
- The failure of the pavement is due to high ground water table.
- Failures were mostly concentrated at the marshy area and.
- Continuous seepage of water from the slope.

Based on the study done, the team recommended to provide subsurface drainage like 'french drain' at the location of the failure. The team presented its findings to the DCC and MLTC. A copy of the team's presentation to DCC and MLTC attached for ready reference.

The payment has been made for the redoing of failed pavement as per the decision of the MLTC minutes of the meeting letter No. DOR/CD/7/2016-2017/4098 dated 26/06/2017 held on 11th May 2017. In the minutes of the meeting, it was clearly stated that the failure is because of high ground water table, poor design as no geotechnical study was conducted prior to finalization of design drawings. The tests conducted by the contractor were fulfilling the test requirement as per the TS.

We have missed out to validate the insurance for P-III because we speculated that contractors had already insured. The speculation has built up on the day of Progress review meeting held at RO Lobeysa on 21/07/2016 when majority of contractor were affirmative on insurance mandate. Moreover, many had claimed to have insured. It would have been a wise step to validate their claim of having insured but RO had missed to do so because of the above reasons. However, contractor was asked to insure the work later since majority of works were ongoing. The contractor had accordingly insured including DLP. The copy of insurance policy and minutes of the above mentioned meeting is attached for your kind reference. Therefore, memo may be kindly dropped.

RAA's Further Comments & Recommendations:

The response on the rectifications of damaged pavement works in the initial stage by the contractor was not documented. In the event pavement works had failed and rectified, the RO and the TMT team should have carried out detail study of the area on the causes of the failure of the pavement works and remedial measures taken to prevent damages. However, the documents relating to rectified works and measures taken to address the failure of pavement works were not provided to RAA for review. Therefore, the RO, Lobeysa should submit documents to substantiate the rectification works carried out by the contractor and measures put in place to address the failure of pavement works.

However, as discussed during the exit meeting, the RAA taking in to cognizance of the various TMT reports on the failure of pavement works due to segregation of Wet Mix Macadam (WMM) materials during laying at almost all the location, excess fine materials especially clay soil in the WMM, requiring execution of French drain construction for about 919.20m, and non-insurance of the package III works by the contractor, the payment of Nu.3,494,255.71 was not justified and stands ineligible and recoverable. An amount should be recovered within three months from date of issue of this report, beyond which penalty @ 24% per annum shall be levied as per Chapter IV, Section 4.5.1.4 of the Finance and Accounting Manual 2016.

The DOR and RO, Lobeysa should recover the amounts and deposit into ARA. Besides, the DOR in consultation with Ministry should carry out detail geo-technical study particularly in such marshy areas and freezing zone to have appropriate structures and drawings and prevent wasteful expenditures and maintenance costs.

Who is Accountable?

Direct Accountability:	<p>1. Phuntsho Wangdi, Secretary, EID No.8403049</p> <p>2. Lungten Jamtsho, CE, EID No. 2101064</p> <p>3. Tashi Wangmo, Offtg. Director, DHS, EID No.2001076</p> <p>4. Mahesh Pradhan, Offtg. Director, DES, EID No.8901047</p> <p>5. Kinzang Norbu, Offtg. CAO, EID No.200701128</p> <p>6. M/S Chogyal Construction Pvt. Ltd (CDB No. 7640)</p>
Supervisory Accountability:	Phuntsho Wangdi, Ex Secretary, EID No.8403049

3.2.2 Non-recovery of bitumen cost from the damaged pavement works executed by M/s Chogyel Construction Company Private Ltd. - Nu. 7,085,432.30 (5.9.17)

The causes of failure of the pavement works executed by M/s Chogyel Construction Company Private Limited was construction defects due to various factors as outlined under Para 1.1.1 of the report. Major causes in terms of reports/minutes/correspondences are reiterated below:

- The Technical Monitoring Team (TMT) clearly reported the cause of base failure for contract package II as segregation of Wet Mix Macadam (WMM) materials during laying at almost all the location between 457.00 to 458.50KM. The base failure for about 300m length at the middle portion was due to high water table and seepage through GSB and DBM. The major cause of failure in contract package III is due to excessive ground water percolation and capillary action from the sub-grade. **(Refer to tour report of TMT)**
- The Project Engineer vide letter No.DOR/ROL/LSD-25/2015-2016/121 dated 20/05/2016 had also reported cause of pavement failure as excess fine materials especially clay soil in the WMM, which absorb more water during rainy season resulting in low carrying capacity during movement of vehicles.
- The minutes of meeting No.DOR/CE(TMT)/2015-2016/8 dated 01/06/2016 had also indicated cause of failure as segregation of GSB & WMM materials, excessive quantity of fines/clayey soil in GSB & WMM and stagnation of water in the pavement due to trenching effect.
- The DoR, Lobeysa vide letter No. DoR/Lobeysa/Construction Division(09)2016-2017/1037 dated 24/01/2017 had stated that the work is insured as per the GCC (14.1(a) and RO, Lobeysa will not be in position to compensate the loss incurred by contractor.
- The contractor had failed to engage and deploy key personnel and machineries separately despite commitment to deploy the same during the acceptance of the three contract awards. Same key personnel and machineries were deployed for all three contract packages. Thus, the failures were also attributable to non-deployment of separate key personnel and machineries.
- The package III was found not insured and the compensation for the same was not claimed by the contractor. The payment for the damages under Package III was not justified as the contractor should have insured the packages as the built up rates included the cost of insurance.

In the light of above facts as well as the contractor was exclusively responsible for the damaged pavement works due to poor workmanship, execution of substandard works due to non-

deployment of separate key personnel and machineries and failure to obtain insurance coverage for the works despite payments through item rates, the cost of bitumen for carrying out the damaged works was thus not admissible and recoverable.

The bitumen issued and consumed for the redoing of damaged pavement works amounted to Nu. 7,085,432.30 as computed in **table 3.2.2** below:

Table 3.2.2: Damaged Pavement								
Sl. No.	Package	Area (m ²)	Depth (m)	Bulk density of DBM (kg/m ³)	Bitumen content as per Job Mix Formula (%)	Qty of Bitumen in Kgs	Rate (Nu.)	Amount (Nu.)
1	Package II	12,351.60	0.075	2398	0.048	106,628.89	42.40	4,521,065.04
2	Package III	7005.88	0.075	2398	0.048	60,480.36	42.40	2,564,367.26
Total cost of bitumen for damaged pavement (Nu.)								7,085,432.30

The DOR and RO should take immediate steps to recover the cost of bitumen used for the rectification of damaged pavement works and deposited into ARA.

Auditee's Response:

As per the NEWH contract document, the bitumen shall be issued by the employer and the contractor should quote for doing the work only. The contract amount is exclusive of the cost of bitumen. The contractor had insured the work based on the contract amount which is excluding the cost of bitumen. Therefore, recovery of bitumen for redoing of pavement from contractor's insurance claim would not be correct.

As explained under memo no.10.10.1, the MLTC has decided to pay the contractor for redoing the work, the recovery of bitumen from the contractor does not arise. Also the contractor is paid at the rate quoted without the cost of bitumen.

It is also to inform RAA that issuance of bitumen free of cost has increased the work load of the field engineers. Therefore, the RO will submit our report to the department/ministry and suggest including the cost of bitumen in the rate analysis.

The contractors were compensated for pavement failure by the MLTC, thus recovery for bituminous works for redoing of pavement works was not sensible since the payment is made at the rate quoted by the bidder i.e., rate without the cost of bitumen. The overall bitumen consumption is well within the limit of $\pm 5\%$.

However, such type of lapses is noted seriously for future works and would like to thank RAA for making such observation. The RO in consultation with Department will explore the probabilities to recover the bitumen cost in future works. Hence memo may be kindly dropped.

RAA's Further Comments & Recommendations:

The response stating that the contractor had insured the work based on the contract amount that is exclusive of the cost of bitumen is noted. However, the fact remains that various TMT reports

on the failure of pavement works had categorically pointed out that the damages were due to segregation of Wet Mix Macadam (WMM) materials during laying at almost all the locations and excess fine materials especially clay soil in the WMM. The failure of the pavements on such grounds indicated execution of work not as per technical specifications and execution of substandard works due to poor workmanship. The RAA had also noted that the contractor had failed to deploy committed key personnel and machineries for each contract packages. Thus, bitumen issued amounting to Nu. 7,085,432.30 free of cost for redoing the damaged pavement works was not justified and stands inadmissible and recoverable. The amount should be recovered and deposited into ARA within three months from the date of issue of the report beyond which penalty @ 24% per annum shall be levied as per Chapter IV, Section 4.5.1.4 of the Finance and Accounting Manual 2016.

Besides, the DOR in consultation with Ministry should revisit the policy and decisions on the free issuance of bitumen for works executed through contracts and flaws on obtaining of insurance coverage by the contractors for contract works to safeguard the interest of the government against such losses. The decisions and measures taken to address such flaws by the DOR and Ministry intimated to RAA for record and follow-up in future audits.

Who is Accountable?

Direct Accountability:

1. Phuntsho Wangdi, Ex Secretary, EID No.8403049
2. Lungten Jamtsho, CE, EID No.2101064
3. Dhak Tshering, Director, EID No.8801090
4. Tashi Wangmo, Offtg. Director, DHS, EID No.2001076
5. Mahesh Pradhan, Offtg. Director, DES EID No.8901047
6. Kinzang Norbu, Offtg. CAO, EID No.200701128
7. M/S Chogyal Construction Pvt. Ltd (CDB No. 7640)

Supervisory Accountability: Phuntsho Wangdi, Ex Secretary, EID No.8403049

4 Irregularities noted in construction of Pavement works for Double Lanning of Northern East-West Highway from Chasagang to Wangdue (Package-IV) by M/s Singye Construction Pvt. Ltd.

The road pavement works from Chasagang-Wangdue (Ch: 447-436 Km) covering a distance of 11 Kilometers was awarded to M/s Singye Construction Pvt. Limited, Thimphu holding trade license No.1008251, CDB No.2148 being the lowest evaluated bidder vide work order No.DoR/ROL/Plg-15/2015-2016/121 dated 23rd July, 2015. Estimated and contract amount and other important milestones were as indicated below:

- | | |
|----------------------------------|-----------------------------------|
| i. Estimated Amount | : Nu.127,642,926.26 |
| ii. Contract Amount | : Nu.107,120,422.00 |
| iii. Contract Duration | : 15 months |
| iv. Start Date | : 4 th August, 2015 |
| v. End date | : 26 th October, 2016 |
| vi. Actual Completion date | : 27 th December, 2016 |
| vii. Actual cost of construction | : Nu.116,924,355.82 |

On scrutiny of tender documents, final bills disbursed under the voucher No. DV. 8.97 dated 31/8/2017 with reference to tender documents, MB and joint verification of site conducted on **29th September 2017 & 2nd October 2017** revealed following irregularities and lapses:

4.1 Acceptance of inflated rate analysis of DBM and Asphalt concrete through inclusion of cost of Bitumen - Nu. 4,998,201.79 (5.1.20)

On the issuance of bitumen, Additional Clause of the bidding documents under Special Conditions of Contract (SCC), categorically stipulated the following conditions:

- *The rates for Bitumen (VG-10) must be '0' (zero) during the analysis of rate for DBM & AC by the bidders i.e. the cost of bitumen shall not be included in analysis.*
- *The bidder must attach the detail rate analysis for DBM and AC along with the bidding document.*
- *The contractor shall lift the required bitumen (VG-10) from Store, Regional Office, DoR, Lobeyasa and transport it to their respective site(s) at his or her own cost.*
- *Necessary sign boards for contract details and cautionary shall be installed at the work sites.*

On review of rate analysis submitted by the contractor for DBM and Asphalt concrete works, it was noted that the rate analysis included cost of Bitumen contrary to the aforementioned additional provisions of the Special Condition of Contract (SCC).

Thus, the inclusion of cost for Bitumen in the rate analysis by the contractor had resulted in inflated rate analysis for the item of work DBM and AC as the Bitumen was supplied free of cost by the Regional Office from the Regional Store, Lobeyasa. It was also not understood as to how the Tender Committee and Evaluation Committee had ignored the ineligible incorporation of cost of Bitumen in the rate analysis as the very purpose of obtaining rate analysis for the two items of works was to ensure that the cost of bitumen was not included in the quoted rates.

The cost of Bitumen included as a part of rate analysis for DBM and Asphalt concrete works amounting to Nu. 4,998,201.79 stands ineligible and recoverable as computed in table 4.1 below:

BSR Code	Description of work	Actual quantity	Analyses rate	Actual analyses rate	Diff.	Amount Recoverable (Nu.)
AR004	DBM	85,662.33	320.00	275.17	44.83	3,840,242.25
AR005	AC	85,269.48	200.00	186.42	13.58	1,157,959.54
Total						4,998,201.79

The Regional Office besides commenting on the circumstances leading to acceptance of inflated rate analysis through incorporation of cost of Bitumen should hold the responsible officials/contractor accountable for appropriate decisions and actions.

The Regional Office should immediately recover the ineligible amount of Nu.4,998,201.79 and deposited into Audit Recoveries Account (ARA).

Auditee's Response:

The NEWH Project was conceptualized by the previous government towards the end of 2014 and directed MoWHS and DOR to start the work immediately. In a way, sufficient time for planning of the project of such magnitude was not provided. There was unlimited mounting pressure to initiate the work immediately. At times RO was seriously warned for the time taken to adhere with the basic requirements of PRR. Even the estimates have to be framed in hurry and scurry. Given to work under such peer pressure, the RO had to literally accelerate the tendering process and in the

process missed out several important aspects of the bidding process. For example, RO has overlooked to go into the details of the rate analysis of DBM & AC submitted with the bid.

Another misleading factor for not being serious in referring the detail of rate analysis by the evaluation team and awarding committee could be, both the committees might have focused on lowest cost only. Fulfilling the conditions set forth in the tender document, the work is awarded to the lowest evaluated bidder. In this case, the quote submitted by M/S Singye Construction was the lowest, and the evaluation team did not bother to go into the details of the rate analysis purely in the interest of time.

On the lighter note, if the evaluation team would have declared M/s Singye Construction as ‘non-responsive’ based on the tender clause - non-compliance to the requirements of bid document, the contract would have been won by second lowest quote i.e. M/s Kelwang Private Ltd. at (-) 9.91% below the employer estimate. There is significant difference in the quote between M/s Kelwang Construction and M/s Singye Construction (Nu.114,988,213.00 - 107,120,422.00 = Nu. 7,867,791.00). Thus, with due diligence the work was awarded to the 1st lowest M/s Singye Construction Private Limited. Also the contractor’s rates of DBM & AC do not vary by huge margin with the rates determined by the employer. By awarding the work to the lowest quote, there was a saving of Nu. (Difference between 7.86 – 4.86 = 3.00 million).

The observation made by RAA is well noted, in future RO will be extra cautious while handling with tender processes. We assured not to repeat similar mistakes in the future project. Thus please drop the memo.

RAA’s Further Comments & Recommendations:

While agreeing to the response on the award of contract at the lowest evaluated bid amount, the very objective of obtaining the rate analysis for the two items of works (DBM & AC) was to ensure that the contractors did not incorporate the cost of bitumen in the rate analysis as the bitumen was to be issued free of cost to the contractors. Thus, the waiving off the recovery of cost of bitumen on the grounds of lowest evaluated bid amount is not justified and stands recoverable. It was apparent failure on the part of the evaluation committee and awarding committee and indicated absence of due diligence as well as laxity in the evaluation of tenders as section VI of the SCC under **Note** categorically stipulated as:

“Note: The rate of bitumen VG-10 must be “0” (Zero) in the above rate analysis: however, the transportation cost of bitumen from above store to the respective work site must be included in relevant items of the rate analysis”.

Since the contractor has incorporated the cost of bitumen in the rate analysis the question of issuing bitumen free of cost does not arise. The Ministry should investigate the circumstance leading to acceptance of rates inclusive of cost of bitumen besides fixing accountability on the officials responsible for such unwarranted lapses involving ineligible payment of substantial amount of Nu. 4.998 million.

However, as agreed in the audit exit meeting, the DOR and RO should recover the amount of Nu. 4,998,201.79 and deposit it into Audit Recoveries Account within three months from the of issue of the report beyond which penalty @ 24% per annum shall be levied as per Chapter IV, Section 4.5.1.4 of the Finance and Accounting Manual 2016.

Further, the DOR in consultation with the Ministry should institute appropriate control mechanism to curb such lapses on the part of the Evaluation Committee and Awarding Committee in future.

Who is Accountable?

Direct Accountability:	1. Jigme Chodup, PE, EID No. 8707045 2. Sanjay Kumar Bomzan, JE, EID No. 20130101904 3. Ganga Maya Acharya, ADM, EID No. 9104055 4. Tika Maya Acharya, Road Inspector, EID No. 201006027 5. M/s Singye Construction Pvt. Ltd (CDB No. 2148)
Supervisory Accountability:	Garja Man Rai, Ex Chief Engineer, EID No. 8212026

4.2 Ineligible payments for slip clearance works including payments to other two contractors - Nu. 2,718,476.24 (5.1.1)

The Regional Office in line with the directive of the Secretary conveyed vide Note Sheet No. DoR/Lobeysa/Construction (10)/2016-2017/938 dated 15/6/2017 had verified and released Nu.665,424.50 to the Contractor on account of Slip clearance as shown in table 4.2 below:

Details	Qty.	Disposal lead	Rate (Nu)	Amount (Nu.)	Remarks
Slip clearance	5,717.69	Up to 50 meter	56.36	322,249.01	Analyzed rates
	5,717.69	Up to 1000 meter	60.02	343,175.76	
				665,424.77	

In this regard, the Technical Specification (TS 109) categorically stipulated as “*The routine maintenance of the road shall include besides other, trimming vegetation; cleaning all culverts, ditches, borrow pits, road side drainage, drainage channels and any other obstructions including clearance of debris/landslides of any volumes; etc...*”

Further, SCC (GCC 1.1 (ff)) also stipulated categorically as “*The Works consist of: Road widening work, construction of retaining wall, construction of lined drain, sub-grade preparation, laying of granular sub-base, wet mix macadam, dense bituminous macadam and asphalt concrete from Km 389.00-379.00. The contractor shall assume full responsibility for the removal of landslide/debris of any volume until the completion and handing over of the project to the Client*”.

On further review of the related construction records, it was noted that while the contract provision is very clear on the responsibility of the Contractor for the removal of landslides/debris of any volume until the completion and handing over of the project to the Client, the Contractor had submitted appeal vide letter No. Ref. SCP/Highway-Dor/2016/83 dated 26/12/2016 for payment for slip clearance works aggregating to Nu. 2,433,596.50.

In response, the Regional Office vide letter No. DoR/Lobeysa/Construction Division (20)/2016-2017/345 dated 6.4.2017 responded that claims could not be considered in line with the contractual provision under Technical specification (109) and SCC which did not favour such payment to the contractor. In addition, the letter also stressed that during the Meeting held on 14.11.2016 in Lobeysa with contractors in presence of the Secretary, Director and Key Technical Officials from HQ, the firm had not raised such issues wherein all other contractors had raised the issue of huge slip clearances.

Subsequently, the contractor further submitted the petition to Secretary vide letter No. SCPL/DoR/Chasagang-Wangdue/Lobeysa/17/3392 dated 11/4/17 seeking intervention on the said issue.

The Secretary vide Note Sheet No. DoR/Lobeysa/Construction (10)/2016-2017/938 dated 15/6/2017 informed the Regional Office that the issue was deliberated in the MLTC held on 11/5/2017 and instructed to carry site verification and verify the measurements and pay to the contractor for the slip clearance that were genuinely executed by the contractor particularly for those locations where the landslide occurred were of huge quantity and recurrent because the contractor was awarded only the pavement work.

Thus, the Regional Office based on the directive of the Secretary had verified and released Nu.665,424.50 to the contractor on account of Slip clearances.

It is reiterated that in keeping with the contractual provisions under TS 109 and SCC (GCC 1.1(ff), the payment for slip clearances was not admissible. Further, it was also evident on the verification of the RA Bill claims of the other executing contractors that no claims and payments were made for clearance of heavy landslides though the issue was raised during the meeting held on 14.11.2016 in Lobeysa. Thus, the decision of the MLTC and payment of Nu. 665,424.77 were made in contravention to the provisions of the contract documents and indicated extension of undue favour to the said contractor. The RO should recover the amount either from the contractor or MLTC and deposit into ARA. The Ministry should hold the MLTC accountable for ineligible payment and violation of the contractual provisions and technical specifications as well as for extending undue favour to the contractor.

Auditee's Response:

M/s Singye Construction had submitted for slip clearance for amounting to Nu.2,433,595.50 vide their letter no SCPL/Highway-DoR/2016/83 dated 26th Dec,2016. The claim was declined by RO based on the Technical Clause enshrined in the contract document. The contractor had further approached to Ministry in seek of intervention vide their letter no. SCPL/DoR(Chasigang-Wangduezam) Lobeysa/2017/3392 dated 11th April 2017. Therefore, it was deliberated in the MLTC meeting held on 11th May 2015 and RO was directed to carry out site verification and verify the measurements and pay to the contractor for the landslides that were genuinely cleared by the contractor. It was also instructed by the MLTC members that slip clearance to be accepted only for the locations where the quantity was huge and recurrent one as because the contract was awarded only the pavement works. In pursuant to the decision of the MLTC the RO verified the measurements and a bill of Nu.665,424.76 was finalized as payment to be made to the contractor. Further RO had also accorded approval for final payment from ministry vide note sheet no DoR/Lobeysa/Construction (10)/2016-2017/1938 dated 15th June 2017. Accordingly, as per the approval accorded the payment was released. Note Sheet Attached for kind reference. Therefore, the memo may kindly be dropped.

RAA's Further Comments & Recommendations:

While taking note of the response and approval accorded by the MLTC, the fact remains that the technical specifications which is the integral part of the contract documents categorically stipulated under TS 109 and SCC (GCC 1.1 (ff)), on the responsibilities of the contractors for "removal of landslide/debris of any volume until the completion and handing over of the project to the Client". It is to reiterate that the quoted rates of contractor for the related items of works is built up cost inclusive of cost of all risks factors involved in terms of requirements stipulated in the technical specifications and provisions in the contract document.

It was also apparent from the correspondence on the issues that the MLTC had not only overruled the decision and actions of the RO but also violated the provisions stipulated in the technical specification and contractual documents.

However, as discussed in the exit meeting the RO and DOR should recover the amount of Nu. 665,424.50 entertained for slip clearance and deposit into ARA within three months from the date of issue of the report beyond which penalty @ 24% per annum shall be levied as per Chapter IV, Section 4.5.1.4 of the Finance and Accounting Manual 2016.

Besides, the RO and DOR should also recover the payment to the following contractors on account of slip clearance:

<u>Sl.No.</u>	<u>Name of contractor</u>	<u>Contract Package</u>	<u>Date of Payment</u>	<u>Amount (Nu.)</u>
1	M/s TT Construction	Package VI	29.6.2018	443,532.55
2	M/sUP Construction	Package XIII	28.6.2018	1,609,518.92
			Total	2,053,051.47

The RO and the DOR should furnish documentary evidences of the recoveries and accountal in the books of accounts for review and records.

In addition, keeping in view the violation of provisions envisaged in technical specifications and contract document as well as overriding of decisions on RO by MLTC, the DOR in consultation with the Ministry should revisit and review the provisions to assess on the appropriateness and practicability of inclusion of such provisions in the technical specifications and contract documents to safeguard the interest of the government for similar future projects.

Who is Accountable?

Direct Accountability	<ul style="list-style-type: none"> • Phuntsho Wangdi, Secretary, EID No.8403049 • Lungten Jamtsho, CE, EID No. 2101064 • Dhak Tshering, Director, EID No.8801090 • Tashi Wangmo, Offtg. Director, DHS,EID No.2001076 • Mahesh Pradhan, Offtg. Director, DES,EID No.8901047 • Karma Ugyen, CAO, EID No.2101187 • M/s Singye Construction Company Private Limited (CDB No. 2148) • M/s TT Construction Pvt Ltd (CDB No. 3267) • M/s UP Construction Pvt Ltd, (CDB No. 3329)
Supervisory Accountability	Dorji Chhoden, Former Hon'ble Minister, MoWHS

5 Irregularities noted in construction of Paveyment works for Double Lanning of Northern East-West Highway from Pelela to Bumilo (Package VIII) by M/s Empire Construction Pvt. Ltd.

The contract for the Double Lanning works from Bumilo-Pelela covering Chainages from 379Km to 372Km a total of 7Km road works (contract package VIII) was awarded to M/s Empire Construction Pvt. Ltd vide work order No. DoR/ROL/Plg-15-2016/124 dated 23/07/2015 at contract price of Nu.78,967,074.00. The contract duration was 25 months starting from 4/08/2015 with completion deadline scheduled on 23/08/2017.

The verification of drawings, estimates, bill of quantities, contractor's bill and the actual construction at site revealed following irregularities and lapses:

5.1 Inadmissible payment for the Coursed Rubble Masonry works in RCC culvert abutments - Nu. 113,209.27 (5.1.20)

The culvert extension was approved vide variation order No. DoR/ROL/2015-2016/PLG-37/1903 dated 02/06/2016. The abutment walls for the RCC slab were to be constructed with Coursed Rubble Masonry with hard stone hammer dressed. However, on physical verification of the abutment walls constructed, Random Rubble Masonry were found instead of Coursed Rubble Masonry as explained here under and depicted in the photograph:

- Face stones are not found hammer dressed on all beds and joints so as to give it approximately rectangular block shape.
- The stones were not found squared on all joints and beds.
- The bed joints were not found dressed for at least 8 cm back from the face and side joints for at least 4 cm such that no portion of the dressed surface is more than 10 mm from a straight edge placed on it.
- The remaining portion of the stone were found projecting beyond the surface of bed and side joints.
- The courses were not found laid truly horizontal and vertical joints were not truly vertical.

Further, the abutment walls were found constructed without adhering to the drawings and specifications of constructions for abutment wall for the RCC slab as the works executed at site were neither CRM nor RRM item of work. The execution of abutment walls with huge boulders and weak cement mortar was not actually a load-bearing wall. The poor workmanship and use of inferior construction materials was evident from the photograph as depicted Fig. 5.1 below



Fig: 5.1: Defective construction of CRM wall

During the joint site verification, the Regional Office also accepted the construction of abutment wall not as per drawing and technical specification.

The CRM quantity paid in the third running bill was for 104.77 cubic meter involving Nu.113,209.27 as detailed in table 5.1 below:

Table 5.1: Details of payments for CRM works						
Code	Description	L	B	H	No	Quantity
SM0025	P/L coursed rubble masonry with hard stone hammer dressed in foundation in plinth in cement mortar 1:4					
1	Chainage 377					
	Panel 1 right	4.05	2.15	1.9	1	16.54
	Left	4.13	2.25	1.9	1	17.66
2	Chainage 377.8					
	Panel 4 left	4	1.49	1.8	1	10.73
	Right	3.95	1.48	1.82	1	10.64
3	Chainage 376.4					
	Panel 5 left	4.5	1.58	2	1	14.22
	Right	4.5	1.6	2	1	14.40
4	Chainage 376					
	Left	4.5	1.3	2	1	11.70
	Right	4.6	1.3	2	1	11.96
	Deductions					-3.08
	Total					104.77

Thus, RO, Lobeyssa should recover the difference in cost of CRM and RRM amounting to Nu.113,209.27 $\{(104.77) @ (CRM \text{ rate of Nu.}3380.86\text{-RRM rate of Nu.}2300)\}$.

The execution and payment for works not as per drawing and technical specification was a serious lapse on the part of the Regional Office in particular the Site engineer responsible for overseeing construction works.

The Regional Office should take immediate steps to either redo all walls as per the technical drawing and specification to achieve quality works and value for money or recover entire cost of Nu. Nu.113,209.27 $\{(104.77) @ (CRM \text{ rate of Nu.}3380.86\text{-RRM rate of Nu.}2300)\}$ and deposited into Audit Recoveries Account.

Auditee's Response:

The defects pointed out by the Audit team during field visit was dismantled and rectified immediately as per the required specification. The RCC culvert abutment with photographic evidence attached for reference and record. Therefore, please drop the memo.

RAA's Further Comments & Recommendations:

While taking note of the response, the principles of CRM masonry work was not yet achieved even after reconstructing the abutment. As such, the RO should work out the cost difference for construction of CRM and RRM and deduct from the subsequent RA bill and adjusted bill should be furnished to audit for verification and record within three months from the date of issue of the report beyond which penalty @ 24% per annum shall be levied as per Chapter IV, Section 4.5.1.4 of the Finance and Accounting Manual 2016.

As discussed in the exit meeting, the DOR in consultation with the Ministry besides instituting appropriate supervisions and monitoring controls over the execution of works should constitute a technical team for verification of all infrastructure works executed by the contractors to ensure execution of quality infrastructure works as per technical drawings and specification with proper workmanships and preventing acceptance of defective works.

Who is Accountable?

Direct Accountability	4. Nima Wangchuk, Junior Engineer, EID No. 20140704512 5. Balaram Acharya ,AE I, EID No. 8908099 6. M/s Empire Construction Pvt. Ltd (CDB No. 2206)
Supervisory Accountability	5. Karma Tenzin, CE, EID No. 9009057

5.2 Substantial delays in execution of work (4.4.69)

The review of physical work progress in terms of approved work plan for the contract package from Bumilo-Pelesa (Chainage 37Km to 372Km) as on September 2017 showed substantial delays as shown in table 5.2 below:

Table 5.2: Work status				
Sl. No.	Code	Items	Completion date of work	Status of work
1	RW0131	Providing and laying wet mix macadam graded aggregate base course to required degree of compaction with proper formation of cross fall by using well graded crushed aggregates premixed with OMC using suitable mixer, motor grader as per material gradation and aggregate quality specified	May-17	Not started
2	AR003	Providing and Laying Dense Bituminous Macadam (DBM) to required degree of compaction based on mixture design (job mix formula) approved by the supervising engineer including preparation of surface with road broom, application of prime coat @ 0.75 kg/sq.m by mechanized method using asphalt plant, paver, steel roller, tyre roller etc complete - 75mm	Jun-17	Not started
3	AR004	Providing and Laying Asphalt/Bituminous Concrete to required degree of compaction based on the job mixture design approved by the supervising engineer using asphalt plant, paver, steel roller, tyre roller etc. as per material gradation and aggregate quality specified : 50mm	Jun-17	Not started
4	RW0145	Scarifying metaled (water bound) road surface disposal of rubbish up to 50m and consolidation of the aggregate received from scarifying	Jun-17	Not started
5	AR005	Provide and lay hot applied thermoplastic compound 2.5 mm thick including reflectorizing glass beads @ 250 gms per sqm area. The thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC:35 .The finished surface to be level, uniform and free from streaks and holes all complete as per Technical specifications and as directed by the Engineer. Centerlines on sharp curves, Edges and other marking along strips	Jun-17	Not started

The critical situation is for the pavement construction works viz. WMM, DBM & AC which should have been completed by June 2017 were found not yet started as on September 2017 even after time lapse of 3 months from the contract completion deadline. The RAA could not understand the circumstances leading to such abnormal delays as neither documentary evidences were put on

record for delays nor course of action taken against the contractor to speed up the progress of work were on record for verification.

Such delays and failure to complete contract works within the initial contractual completion deadline and even with time lapse of 3 months beyond the deadline indicated existence of inadequate monitoring and supervision mechanism over the contract works and approved work program by the site supervisors and engineers. These are also indicative of poor contract management system instituted within the Regional Office.

The RO, should furnish justification for such delays along with measures initiated to speed up the work progress including time extension granted with details of hindrances supporting the time extensions. Besides, the RO, should impose applicable liquidated damages for delays as per section 49.1 GCC & SCC and furnish course of actions proposed to be taken against the contractor for subsequent delays.

Auditee's Response:

The initial completion date for this contract package was on 23/08/2017. However, during actual execution additional permanent works had to be constructed which were not envisaged during initial estimates. The variation orders for the additional works have been obtained from competent authority and time extension was accordingly accorded. The revised date of completion is 22/10/2018. The contractor has been constantly reminded to expedite the work otherwise LD shall be imposed as per the contract document. The RAA shall be intimated accordingly. Therefore, please drop the memo. (Series of notice issued to contractor to expedite the work progress is attached for your kind reference).

RAA's Further Comments & Recommendations:

While taking note of the response, the fact remains that the RO and MLTC had failed to take cognizance of the capacity of the contractor and work progress at the time of the award of additional works. It was apparent in terms of the progress of works, the contractor had failed to keep up the progress with the agreed work plans and awarding of additional works had further exacerbated the work progress. Besides, extension of time for additional works, both the MLTC and RO had failed to identify the additional resources required for additional works but the contractor was allowed to execute the work with same resources. In addition, non-deployment of key personnel and equipment at sites by contractors could have been one of the main reasons for delays in completion of works.

However, since the work is not yet completed even after lapse of 2 months from the revised completion deadline, the RO should impose liquidated damages to the contractor effective from 23 October 2018. The RO should furnish the details of time extension granted up to 23rd October for review and validation in audit.

In addition, the DoR in consultation with the Ministry should review the procedures and processes on the award of additional works with time extension to ascertain flaws and causes impeding the work progress with resultant abnormal delays and time overruns. Besides, the DoR and Ministry should also develop measures to remedy the flaws and causes as well as looking into the desirability of incorporating additional resources required for additional works.

Who is Accountable?

Direct Accountability	1. Nima Wangchuk, Junior Engineer, EID No. 20140704512 2. Balaram Acharya, AE I, EID No. 8908099 3. M/s Empire Construction Pvt. Ltd (CDB No. 2206)
Supervisory Accountability	: Karma Tenzin, CE, EID No. 9009057

6 Irregularities noted on Improvement works for Double Lanning of Northern East-West Highway from Wangduezam to Langkena (Package XII) executed by M/s Taksing Chungdruk Construction Pvt. Ltd.

The Contract of Pavement works for the Double Lanning of Northern East-West Highway from Wangduezam to Langkena with a total of 7Km in between Chainages 436 to 429 km was awarded to lowest evaluated bidder M/s Taksing Chung Druk Construction Pvt. Ltd holding trade license No.1000725, CDB. No.1748. The work order No. DoR/ROL/Plg-15/2015-2016/43 dated 25/02/2016 issued contained amongst others matters the following important contract details:

i. Estimated Amount	:	Nu.100,267,497.37
ii. Quoted amount	:	Nu.66,128,323.00
iii. Revised contract price (including additional works)	:	Nu.79,099,819.85
iv. Start date	:	3 rd March 2016
v. Due date of completion	:	26 th January 2017
vi. Contract duration	:	11 months
vii. Revised due date with award of additional works	:	31 st May 2017
viii. Revised Contract duration	:	15 months
ix. Actual completion date	:	26 th April 2017

- *The contractor's quoted amount of Nu.66,128,323.00 was 34.05% below the departmental estimated cost of Nu.100,267,497.37.*
- *The Regional Office accepted contractor's quoted amount recommending for the recovery of the differential amount between the estimated amount and quoted amount in addition to 10% performance security in acceptance letter.*
- *Additional works such as Gabion wall, RRM wall and culvert extension estimated based on BSR 2015 + 10.09% cost index with a total estimate of Nu.12,971,497.35 were found approved and awarded under the variation order DoR/ROL/2015-2016/Plg-37/12013 dated 31st July, 2017 increasing the scope of work and extension of the contract deadline till 31st May 2017.*
- *So far as appeared from the sub ledger, 2nd running account bill valuing Nu.32,375,628.56 was disbursed which accounted 48.96.% of the contract value. The contractor had submitted the work completion report on 26th April 2017. The final bill was yet to be settled, despite taking over of completed work by the Regional Office on 5th June 2017.*

Detailed verification of drawings, estimates, bill of quantities, contractor's bills, technical specification and physical verification of site revealed following irregularities and lapses:

6.1 Variations in work measurements with resultant overpayment to the contractor - Nu. 263,442.00 (5.1.14)

A cross check of the work done quantity shown in RO's joint measurements recorded in the MB with the measurements obtain during the joint physical verification conducted by audit team in presence of site engineer on 16th October 2017, revealed excessive measurement of quantities of DBM and Asphalt work as summarized in table 6.1 below and detailed in **Appendix "C"**.

Table 6.1: Excess payment for DBM and AC			
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Particular of item	Qty. as per RO, Joint measurement	Qty. as per audit joint measurement on 16/10/2017	Diff in Qty.	Rate (Nu)	Amount (Nu.)
DBM	54,362.32	53,288.24	1,074.08	240	257,799.10
Asphalt concrete	54,538.07	53,868.80	669.3	180	120,474.00
Total					378,273.10

Excess measurements had resulted in inflation of RA Bills by Nu. 378,273.10. The RO must immediately recover the amount and the same deposited into ARA. The RO must also comment on the circumstances leading to excess measurement of works.

Further, the RO should also comment on the abnormal delays in the settlement of bills as the works were taken over on 5th June 2017 besides furnishing the details of the settlement of RA Bill for review and record.

Auditee's Response:

During the joint measurement with RAA, the interval of length was taken as 20m whereas during the time of RO's joint measurement the interval of length was taken as per the road curvature to arrive at the precise quantity. Moreover, the road edges were covered with vegetation and siltation at the time of site verification by RAA team due to which full road pavement width could not be ascertained in some locations. The payment made is as per the actual work done as far as possible and is not excess payment. Hence, please drop the memo.

RAA's Further Comments & Recommendations:

The RAA taking note of the response, agreed in the exit meeting for carrying out re-measurements of quantities of DBM and Asphalt work with the officials from the RO and contractor.

As decided and agreed, joint re-measurement of the works were carried out on 14th November 2018. Even after the re-measurements, the audit team noted excessive measurements of work done with resultant overpayment of Nu. 263,442.00 as tabulated below:

Particular of item	Qty. as per RO, Joint measurement	Qty. as per audit joint measurement on 14/12/2018	Diff in qty.	Rate (Nu)	Amount (Nu)
DBM	54,362.32	53,536.28	826.04	240	198,249.60
Asphalt concrete	54,538.07	54,175.89	362.18	180	65,192.40
Total					263,442.00

It is evident thus that measurements of works were not taken diligently and correctly by the Site Engineer which resulted in excess measurements and overpayments. The DOR should investigate the circumstances leading to occurrence of such lapses.

The DOR and RO should immediately recover the excess payment of Nu. 263,442.00 and recovery affected along with documentary evidences produced to RAA for verification and record within three months from the date of issue of the report beyond which penalty @ 24% per annum shall be levied as per Chapter IV, Section 4.5.1.4 of the Finance and Accounting Manual 2016.

Further, The DoR and the Ministry should institute appropriate control mechanism over the measurements of work done at site including recording in MB and certification and settlement of RA Bills to prevent such lapses in future.

Who is Accountable?

Direct Accountability	: 1. Subash Rai, Junior Engineer, EID No.20130101905 2. Karchung, AE I, EID No. 9907116 3. M/s Tagseng Chung Druk Construction Private Limited (CDB No. 1748)
Supervisory Accountability	: Garja Man Rai, Ex Chief Engineer, EID No.8212026

7 Irregularities noted on Improvement works for Double Lanning of Northern East-West Highway from Razhau to Nobding (Package XIII) by M/s U.P Construction Pvt. Ltd

The pavement of road from Razhau to Nobding covering Chainage 403Km -395km with a total of 8Km (Package XIII) was awarded to successful bidder M/s UP Const. Pvt. Ltd holding trade license No.5005973, CDB. No.3329 vide work order No.DoR/ROL/Plg-15/2015-2016/1316 dated **19th February 2016** with the following important contract details:

- | | | | |
|-------|-------------------------|---|---|
| i. | Estimated Amount | : | Nu.126,747,002.70 |
| ii. | Quoted Amount | : | Nu.69,441,930.00 |
| iii. | Revised contract Amount | : | Nu.77,347,058.41 |
| iv. | Duration of work | : | 17 months (Including rainfall & snowfall) |
| v. | Date of start | : | 22 nd February 2016 |
| vi. | Date of completion | : | 15 th July 2017 |
| vii. | Revised due date | : | 30 th December 2017 |
| viii. | Actual completion date | : | On progress |
- *The contractor's quoted amount was -45.21% (Nu. 126,747,002.70 – Nu. 69,441,930.00) and the contractor was asked to deposit differential amount for -25.21% in acceptance letter vide letter No. DoR/ROL/Plg-15/2015-2016/1179 dated 1st February, 2016.*
 - *The variation orders for construction of L-Drain, Gabion wall, culvert extension and RRM wall was approved vide letter No.DoR/ROL/Const-24/2017-2018/963 dated 8th November 2017 at the estimated value of Nu.7,905,128.61 worked out based on the quoted amount.*
 - *So far as appeared from the sub ledger, 6th running account bill valuing Nu.50,704,972.95 was disbursed which accounted 73.02% of the contract value.*

From detailed verification of drawings, estimates, bill of quantities, contractor's bill, technical specification and physical verification of site on **6th December 2017**, following lapses were observed:

7.1 Ineligible payment on account of Monsoon Restoration Works - Nu. 3,504,074.36 (5.1.15)

The RAA observed that payments of **Nu. 3,504,074.36** were made to the contractor on account of Monsoon Restoration Works. The payments were ineligible and in violation to the following provisions of the contract agreement and technical specifications.

- The SCC (GCC 1.1 (ff)) categorically stipulated as “*The Works consist of: Road widening work, construction of retaining wall, construction of lined drain, sub-grade preparation, laying of granular sub-base, wet mix macadam, dense bituminous macadam and asphalt concrete. The contractor shall assume full responsibility for the removal of landslide/debris of any volume until the completion and handing over of the project to the Client*”.
- Clause GCC 1.1(ff) it stated that “*The contractor shall assume full responsibility to keep the road open at all times during non-working hours under any circumstances. The contractor is also responsible for removal of landslide/debris of any volume until the completion and handing over of the project to the Client*”.
- In addition, the Technical specifications for the Double Lanning of Northern East West Highway amongst other stipulate the following obligations of the Contractors:
Section 100 – General Requirements, Sub section 106 - Maintenance of Services of the Technical Specification amongst other specifies the followings condition and all costs in connection with the work specified to be considered included in the related items of the work specified in the Bill of Quantities.
- *if any government, publicly and privately owned service for drinking water, electricity, drainage, irrigation channel, sewers, telecommunication cables/line and other services and structures, passing through the site is affected by the works, the Contractor shall provide a satisfactory alternatives service in full working to the satisfaction of the owner of the services and of the Engineer before terminating the existing services.*
- *Drawings and scheduling the affected services like water pipes, sewer, cables, etc. owned by various authorities including government and public undertakings and local authorities shall be verified by the Contractor for the accuracy of the information prior to commencement of any work.*
- *The contractor must also allow for any effect of these service and alternations upon the works and for arranging regular meetings with the various bodies at the commencement of the contract and throughout the period of the works in order to maintain the required co-ordination.*
- *No clearance or alterations to the utility shall be carried out unless ordered by the Engineer.*
- *Any services affected by the works shall be restored immediately by the Contractor who must also take all measures reasonably required by the various bodies to protect their services and property during the progress of works.*
- *The contractor may be required to carry out the permanent removal or shifting or diversion of certain services/utilities o specific orders from the Engineer for which payments shall be made to him. Such works shall be taken up by the contractor only after obtaining clearance from the Engineer and ensuring adequate safety measures.*
- *No separate measurement & payment shall be made for the work of temporarily supporting; maintaining and protecting the government and privately owned services.*

In the light of the aforementioned provisions of the technical specification, no separate measurement and payments to be made for such works and to be considered included with other related items of the work in the Bill of Quantities.

Further, Section 100, **Sub-section 109 Maintenance of Road**, categorically stipulated as under:

Maintenance of Existing Road

“The Contractor shall be responsible for undertaking all routine maintenance of the existing road and all bridges on it under the contract from the day the road is officially handed-over to the Contractor until the issue of work completion certificate by the Engineer. The existing road and

bridges on the road shall be refer to the length of road and bridges within the contract package. The contractor shall also carry out the routine maintenance of all completed works from the time of their substantial completion until the work completion certificate is issued.

The contractor shall also maintain roads that the contractor uses for the constructions or access and the use of such roads shall be identified in advance to the Engineer for inspection prior to use. The routine maintenance of the road shall include besides other, trimming vegetation, cleaning all culverts, ditches, borrow pits, road side drainage, drainage channels and any other obstructions including clearance of debris/landsides of any volume, cleaning road signs and checking and undertaking repair of guardrails/crash barriers and other road safety structures; cleaning including removal of obstructions of bridge decks and bridge deck of drainage elements; cleaning and checking of expansion joints and bearings, cleaning bearing shelves and weep holes; removing accumulated debris and vegetation around and between piers and abutments, repairing parapets, clearance on the road to allow free flow of traffic and reinstatement of any damaged or deteriorated carriageway; and protection of adjoining works

The contractor shall perform the maintenance works as often as required to keep the carriageway, shoulders, and adjoining structures in proper working order to the satisfaction of the Engineer. The contractor shall carry out reinstatement of works(pavement, pavement surface, shoulder or any other works) washed out or damaged due to poor routine maintenance of drains, drainage channels, culverts, shoulders, lacking clearance of obstructions such as landslides. No separate measurements and payments shall be made for the works. All costs in connection with the work specified herein shall be considered included in the related items of works specified in the Bill of Quantities.

No extra payment shall be made to the contractor in case of reinstatement of works, washed out or damaged due to poor routine maintenance”.

Maintenance of New Road Section

The Contractor shall be responsible for undertaking all routine maintenance of the completed works of new road construction including bridges till completion and handing/taking over of the project.

The contractor shall also maintain roads that the contractor uses for the constructions or access and the use of such roads shall be identified in advance to the Engineer for inspection prior to use.

The routine maintenance of the road shall include besides other protection of plants and vegetation; cleaning of culverts, road side drainage(including reshaping/restoring in case of unlined drains) and drainage channels; and clearing any other obstructions including landslide and maintaining all completed road features to allow free flow of traffic. The material removed from the cleaning and clearing as above shall be disposed off at safe places as directed by the Engineer.

The contractor shall carry out reinstatement of works(pavement, pavement surface, shoulder or any other works) washed out or damaged due to poor routine maintenance of drains, drainage channels, culverts, shoulders, lacking clearance of obstructions such as landslides etc. other than those occurred due to earthquake.

The Contractor shall perform the maintenance works as often as required to keep the carriageway, pavement, shoulders and adjoining structures in proper working order to the satisfaction of the Engineer. The Contractor shall mobilize labour, equipment and materials to carry out the routine maintenance of the road.

No separate measurement and payment shall be made for the works described in this Clause. All costs in connection with the work specified herein shall be considered included in the related items of the work specified in the Bill of Quantities.

No extra payment shall be made to the contractor in case of reinstatement of works, washed out or damaged due to poor routine maintenance of drains, drainage channels, culverts, shoulders, lacking clearance of obstructions such as landslides etc.”

In the light of the aforementioned provisions of the technical specification, no separate measurement and payments to be made for such works and to be considered included with other related items of the work in the Bill of Quantities.

Section 100 – General Requirements **Sub section 111- Environment Protection Works** of the Technical Specification amongst other specifies the followings condition and all costs in connection with the work specified to be considered included in the related items of the work specified in the Bill of Quantities:

- *The contractor shall take all precautions for safeguarding the environment during the execution of the contract*
- *In particular, the contractor shall fully comply with Environment Codes of Practices for Highways and Roads*
- *The Contractor shall follow the requirements specified in the Environment Management Plan under the contract*
- *During clearing activities the contractor shall make efforts not to disturb or destroy the vegetation outside the construction corridor.*
- *All areas susceptible to erosion shall be protected as soon as possible either by temporary or permanent drainage works. All necessary measures shall be taken to prevent concentration of surface water and to avoid erosion and scouring of slopes and other areas.*
- *Materials in excess of the requirement for permanent works and unsuitable materials shall be disposed off in locations and in the manner as agreed with the engineer.*
- *The disposal sites shall be designated such as not to promote instability, destruction of properties and public service systems. Exposed areas of such disposal sites shall be suitably dressed and to be planted with suitable vegetation.*
- *The disposal of muck to designated dump yards is also included in Earthwork Excavation item, it is the duty of contractor to transport and properly dump the excavated spoil materials without rolling over. Thus, in line with the technical specification, any preventive measures initiated by the contractor to protect rolling over of spoil materials should be at the cost of the contractor.*

Further, Technical Specifications, **Section 500, sub-section 501** Clearing and Grubbing categorically stipulated as under:

“Clearing shall consist of the cutting, removing and disposal of all trees, bushes, shrubs, grass, weeds, other vegetation, anthills, rubbish, fences, top soil of thickness approximately 200 mm and all other objectionable material, resulting from the clearing and grubbing. It shall also include the removal and disposal of structures that obtrude, encroach upon or otherwise obstruct the work.

The moving of a certain amount of soil or gravel material may be inherent to or unavoidable during the process of clearing and no extra payment shall be made for this. Clearing shall include the removal of all rocks and boulders of up to 0.15 m³ in size exposed or lying on the surface.

No separate payment will be made for clearing, grubbing, and felling of tress. It shall be deemed to have included in the rates of the relevant items for complying with the requirements of this Section”.

Thus, in terms of the technical specifications and provisions of the Contract Documents, the cost on the clearing of rocks in Existing and Newly Constructed Roads were to be in-built in their quoted rates for the relevant item of work “*Excavation of road formation with excavator including disposal of muck to designated dump yards and clearing, grubbing and removal of bushes - all kinds of soil and rock. The item to be executed correct to specified batter slope, road width, gradient and to the Technical Specifications*”.

Further, Section 600 – Earthworks sub section 602 –Definitions and General Requirements outlines:

- *At all times the Contractor shall ensure that earthworks are not damaged by weather or traffic. In the event of such damage occurred, the Engineer may withdraw approval from the affected works until the Contractor has carried out repairs to restore the works to their original condition. The cost of all such repairs and any additional testing shall be borne by the Contractor without extra cost to the Employer (refer 602(9)).*

Sub section 605-Excavation in Cutting also outlines:

- *While executing excavations, the Contractor shall take adequate precautions against soil erosion and water pollution (refer sub point-3);*
- *The slopes of cutting shall be cleared of all rock fragments, which move when pricked by a crowbar, unless otherwise directed by the Engineer. Where the Engineer considers that the slope, immediately after dressing, shall not be permanently stable, he shall direct the Contractor as to the stabilization measures required. The Contractor shall carry out these measures soon after Engineer's instruction(refer sub point-7); and*
- *If slips, slides, over breaks or subsidence occur in cutting, they shall be removed. Adequate precautions shall be taken to ensure that during construction, the slopes are not rendered unstable or give rise to recurrent slides after construction (refer sub point-8).*

Thus, in terms of the technical specifications and provisions of the Contract Documents, the cost on the Maintenance of Existing and Newly Constructed Roads were to be in-built in their quoted rates, as the clause categorically stipulated that “***No separate measurement and payment shall be made for the works described in this Clause. All costs in connection with the work specified herein shall be considered included in the related items of the work specified in the Bill of Quantities***”

In the light of the above Clauses, payments of **Nu. 3,504,074.36** to the contractor on account of Monsoon Restoration Works was in total violation of provisions of the contract agreement and technical specifications.

The Ministry besides, thoroughly reviewing the payments made in violation of the technical specifications should recover the ineligible payments of **Nu. 3,504,074.36** and the amount deposited into ARA. In addition, the Ministry must also fix the Officials responsible for such ineligible payments for making the good of the amount in the event contractor fails to refund the amount.

Auditee's Response:

The additional structures had to be constructed due to monsoon damages. Since these additional structures were constructed which were out of scope of initial contract, the approval for variation have been accorded from the competent authority and paid to the contractor accordingly. Therefore, please drop the memo

RAA's Further Comments & Recommendations:

While taking note of the response on the construction of additional structures, it is to reiterate in terms of the technical specifications and provisions of the Contract Documents, the cost on the Maintenance of Existing and Newly Constructed Roads were to be in-built in their quoted rates, as the clause categorically stipulated as **“No separate measurement and payment shall be made for the works described in this Clause. All costs in connection with the work specified herein shall be considered included in the related items of the work specified in the Bill of Quantities”**.

It is also to state that any additional payments in deviation to and violation of technical provisions tantamount to extension of undue financial favour to contractor. However, as discussed in the exit meeting, the payments of **Nu. 3,504,074.36** to the contractor on account of Monsoon Restoration Works was in total violation of provisions of the contract agreement and technical specifications and stands recoverable.

The RO and DoR should recover the ineligible payment of **Nu. 3,504,074.36** and documents detailing recoveries or adjustments if made from RA bills should be produced to RAA for verification and record within three months from the date of issue of the report beyond which penalty @ 24% per annum shall be levied as per Chapter IV, Section 4.5.1.4 of the Finance and Accounting Manual 2016. In addition, the Ministry must also fix the Officials responsible for making good the amount in the event contractor fails to refund the amount.

The DOR and the Ministry should thoroughly review the technical specifications developed for the Northern East West Highway and come up with appropriate technical specifications particularly on the **Monsoon Restoration Works and types of structures eligible for payments** to prevent flaws and ambiguities in provisions and clauses as well as to avoid adverse financial cost to the government exchequer for similar projects in future.

Who is Accountable?

Direct Accountability	1. Karchung, JE, EID No. 201101239 2. Balaram Acharya, AE, EID No. 8908099 3. M/s U.P Construction Pvt. Ltd (CDB No. 3329)
Supervisory Accountability	: Karma Tenzin, Chief Engineer, EID No. 9009057

7.2 Overpayment due to non-achievement of DBM & AC thickness - Nu. 802,516.71 (5.1.18)

The claim for DBM & AC works for 2.04KM was made through 6th running bill and paid vide voucher No. DV.10.3 dated 10/10/2017 as detailed below:

Sl.No.	Particulars	Qty(m ²)	Rate (Nu.)	Amount (Nu.)
1	DBM	16230.90	174.97	2,839,920.57
2	AC	15,128.40	140.18	2,120,699.11
Total				4,960,619.68

During the physical verification of structures at site, five core samples were collected to ascertain that the laying of DBM and AC were carried out as per the requisite thickness outlined in the drawings and technical specifications.

On measurement of the thickness of five sample cores, the DBM and AC works measured an average thickness of 87mm $\{(80+60+100+95+100)/5\}$ as against the required thickness of 100mm (DBM 60mm+AC 40mm).

Thus, it was apparent from the physical measurements that the payments for the DBM and AC works had been made without site verification and ascertaining the achievement of the DBM and AC thickness as outlined in the technical specifications. It also indicated that the RO had failed to conduct core testing of the pavement works as stipulated under 1204(7) in the technical specifications.

Thus, non-achievement of DBM and AC thickness had resulted in payment of works not executed to the extent of Nu.645,043.71 as calculated in table 7.2.1 hereunder:

Table 7.2.1: payments for Non-achievement of DBM and AC thickness				
Sl.No	Particulars	Qty(m²)	Rate (Nu.)	Amount (Nu.)
Payment released as per specification				
1	DBM	16230.90	174.97	2,839,920.57
2	AC	15,128.40	140.18	2,120,699.11
	Total			4,960,619.68
Payment admissible as per actual execution of DBM & AC thickness				
1	DBM	16230.90	152.22	2,470,667.59
2	AC	15,128.40	121.95	1,844,908.38
	Total (Nu.)			4,315,575.97
Total Overpayment				645,043.71

Further, the core obtained from Chainage 397KM was getting segregated upon cutting indicating less bitumen content and improper compaction. The length of such execution measured 120 meters valuing Nu. 157,473.00 ([120X7.5 @ Nu. 174.97](#)).

The RO, Lobeysa should comment on the circumstances leading to non-conduct of core test to ascertain that there was no pavement deficiency in composition, compaction and thickness. The RO should either direct the contractor to redo the whole works as per the specification or recover the cost of Nu. 802,516.71 as computed by audit. However, in the event the RO opts for recovery, the pavement works should be technically investigated and certificate to the effect that there were no quality impact in the life span of structure due to non-achievement of the desired thickness to be obtained and furnished to audit.

Auditee's Response:

In some locations, it is obvious that contractor could not maintain thickness of both DBM and AC consistently throughout the stretches due to practical problems. Considering it as RA bill we quantify only the work done portion and core cutting test was not done at site for thickness check. Since the contract is ongoing, we assure contractor to redo the work with specification prior to release of final payment. Therefore, please drop the memo.

RAA's Further Comments & Recommendations:

The contractor's failure to maintain and achieve pavement thickness as per technical specification was an indication of poor supervision and monitoring over the execution of works by the site

engineer as well as non-conducting of core test on the completed pavement works by the RO as stipulated under 1204(7) in the technical specifications. It is apparent that the RO and site engineer had accepted the pavement works and payments entertained without ascertaining the achievement of the DBM and AC thickness as outlined in the technical specifications.

However, as discussed during the exit meeting, the DoR and the RO should review the possibility of re-doing the work as otherwise the cost to the extent of thickness not achieved as computed in audit amounting to Nu. 802,516.71 should be deducted from the subsequent RA bills. The outcome of review and actions initiated either to redo the works to achieve the required thickness or amounts adjusted from the RA bills should be produced to RAA for verification and record.

Further, the DOR and the Ministry should constitute a technical team for conducting the requisite core testing of all completed pavement works to ascertain the execution of pavement works as per technical specifications. The Ministry should take immediate measures in the event of existence of deficiencies in execution of works and non-achievement of design thickness to expedite corrective action within the defect liability periods.

Who is Accountable?

Direct Accountability	: 1. Karchung, JE, EID No. 201101239 6. Balaram Acharya, AE I, EID No. 8908099 7. M/s U.P Construction Pvt. Ltd (CDB No. 3329)
Supervisory Accountability	: Karma Tenzin, Chief Engineer, EID No. 9009057

8 Irregularities noted on Improvement works for Double Lanning of Northern East-West Highway from Nobding to Dungdungnesa (Package XIV) executed by M/s Empire Construction Pvt. Ltd

The contract for the Double Lanning works from Nobding to Dungdungnesa covering Chainages from 392.25Km to 389Km a total of 3.25 Km road works (contract package xiv) was awarded to M/s Empire Construction Pvt. Ltd vide work order No. DoR/ROL/Plg-15-2016/1695 dated 18/04/2016 at his quoted price of Nu. 27,808,665.00. The contract duration was ten months effective from 22/04/2016 with completion deadline scheduled on 15/02/2017.

The verification of drawings, estimates, bill of quantities, contractor's bill and the actual construction at site showed the following lapses:

8.1 Inadmissible payment in the execution of WMM width beyond 7.5m - Nu. 1,411,087.50 (5.1.20)

Initial drawing with the bidding documents has provisioned for Carriageway of 6.5 mtrs, 1mtr L-drain and hard shoulder of 1.5mtrs each on both side of road with granular sub soil drain to be provided in marshy areas. The typical cross section of approved drawing which was issued in

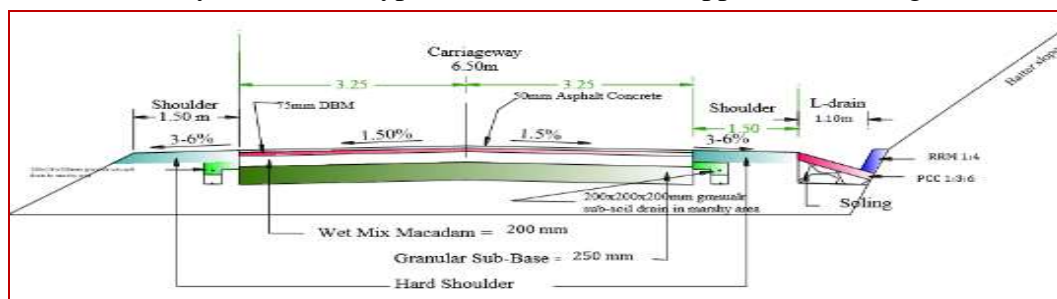


Fig: 2.1 –Initial approved design and drawings

conceiving the estimates, BOQs to derive probable cost of the project as well as obtaining competitive bids and awards of contracts is as depicted in the photograph below: However, vide order No. MoWHS/Sec-29/2015-2016/524 dated 16th October 2015, the Secretary, MoWHS had directed the Regional Offices for issuance of amendment to the contract agreements on the decisions subsequently taken on the increase of carriageway width from 6.5m to 7.5 m. Accordingly, vide letter No. DoR/ROL/16/15-16/481 dated 21/10/15, all Regional Offices were informed to increase the pavement width from 6.5 meters to 7.5 meters. In line with change in order, the revised drawing developed and circulated by Design Division, DOR Thimphu was as depicted in the photograph.

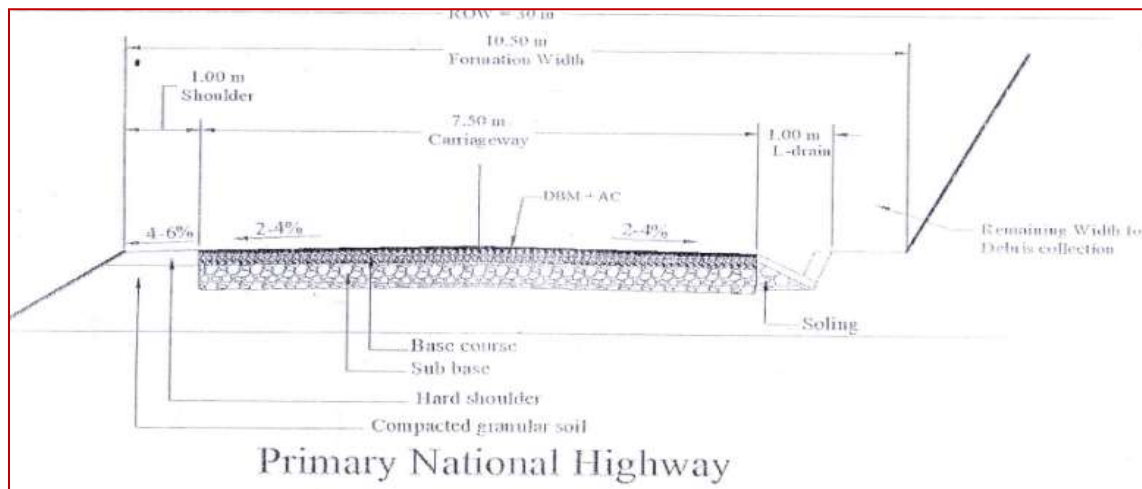


Fig: 2.1(1)-Revised design and drawing

Thus, in line with the revised drawing, the pavement works were to be carried out to increase the carriage way width to 7.50m from 6.5 meters.

On review of the RA bills of the contractor, measurements recorded in the MB and payments of RA bills, it was noted that payments for pavement works were found made beyond the carriageway width approved in the revised drawing. In the light of the payments beyond admissible carriageway width, a joint team comprising Project officials, contractor and audit team had conducted joint measurement of works done at site on 4.12.2017. Based on the joint measurements, it was noted that the average width of WMM works executed worked out to 8.39m as per the contractor's bill which exceeded 0.89m from the approved carriage width of 7.50m.

In addition, on review of the site order book, it was noted that the site and supervising engineer had recorded instruction not to execute beyond the approved pavement width. On pointing out, the site/supervising engineer stated that no approvals were given for execution of pavements works exceeding the carriageway width. As verified from pavements carried out by other contractors, it was noted that pavement works were found regulated strictly with the pavement width provided in the revised drawings and technical specification.

Thus, it was evident from the aforementioned facts and events that the execution beyond the approved width indicated unauthorized execution of works by the contractor. The payments for the average increase in width of 0.89m in WMM works alone had led to ineligible claims and payment of **Nu. 1,411,087.50** as detailed in **Appendix "D"**.

The RO, Lobeysa besides immediately recovering the ineligible payments of **Nu. 1,411,087.50** and depositing into ARA should furnish justification for not regulating the payments as per

drawing and technical specification which had resulted in undue benefit to the contractor and also hold the Site Engineer accountable for such lapses.

Auditee's Response:

Drawing issued by DoR, HQ to RO is a standard and typical drawing on the straight road at ideal condition showing only road camber geometry. However, most of our country roads are zigzagging through mountains and valleys, it is technically and practically not appropriate to keep uniform road width as we need to provide widening on the curves, whereby we need to create extra width on the bases of radius of curvature and speed of the vehicles.

Other important design parameters of hill road is maintaining sufficient sight distance in order to prevent accident due to obstacles. Therefore, extra few centimeter road width was increased on the curves based on the site condition. The highway now has wider carriage way width compared to the past and it has improved the riding quality; vehicle now can drive at higher speed, substantial saving in time and low recurrent maintenance cost from lesser wear and tear. We admit that increase of road width is purely due to provision of extra width on curves.

Since the road transport is one of the important means of transport in Bhutan in the past, now and in future, the department and the Regional Offices, being the technically competent agency had to make few site specific adjustments. Therefore, RAA is requested to kindly drop the memo.

RAA's Further Comments & Recommendations:

While taking note of the response, it is reiterated that designs, drawing and estimates including technical specifications are the basis of technical controls over the execution of project works to regulate the execution of works and prevent and minimize extravagant expenditures.

On review of other contract packages, it was also noted that the RO and site engineers had regulated the payments for pavement works as per the approved design carriage width. Thus, the failure on the part of the RO and site engineer in one singular package to regulate the payments within the approved carriageway width was indicative of extension of undue financial benefit to the contractor.

However, as discussed during the exit meeting, the DOR should recover the ineligible payment of Nu. 1,411,087.50 and documents detailing recoveries or adjustments if made from RA bills should be produced to RAA for verification and records within three months from the date of issue of the report beyond which penalty @ 24% per annum shall be levied as per Chapter IV, Section 4.5.1.4 of the Finance and Accounting Manual 2016. In addition, the Ministry must also fix the Officials responsible for such ineligible payments for making good the amount in the event contractor fails to refund the amount.

The DOR and the Ministry in the interest of the Government should thoroughly review the flaws and causes of the failure on the part of the ROs and site engineers to execute works and regulate payments as per the approved designs, drawing estimates and the technical specifications. Besides, the DOR and the Ministry should develop appropriate system to curb such deviations and violation of technical designs and estimates, BOQs in similar projects in future.

Who is Accountable?

Direct Accountability	<ol style="list-style-type: none">1. Karchung, JE ,EID No. 2011012392. Balaram Acharya, AE I, EID No. 89080993. M/s Empire Construction Pvt. Ltd (CDB No. 2206)
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Supervisory Accountability	: <i>Garja Man Rai, Ex, CE, EID No. 8212026</i>
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8.2 Inadmissible payment for execution of GSB beyond existing paved road width of 4.23m - Nu. 1,311,254.94 (5.1.20)

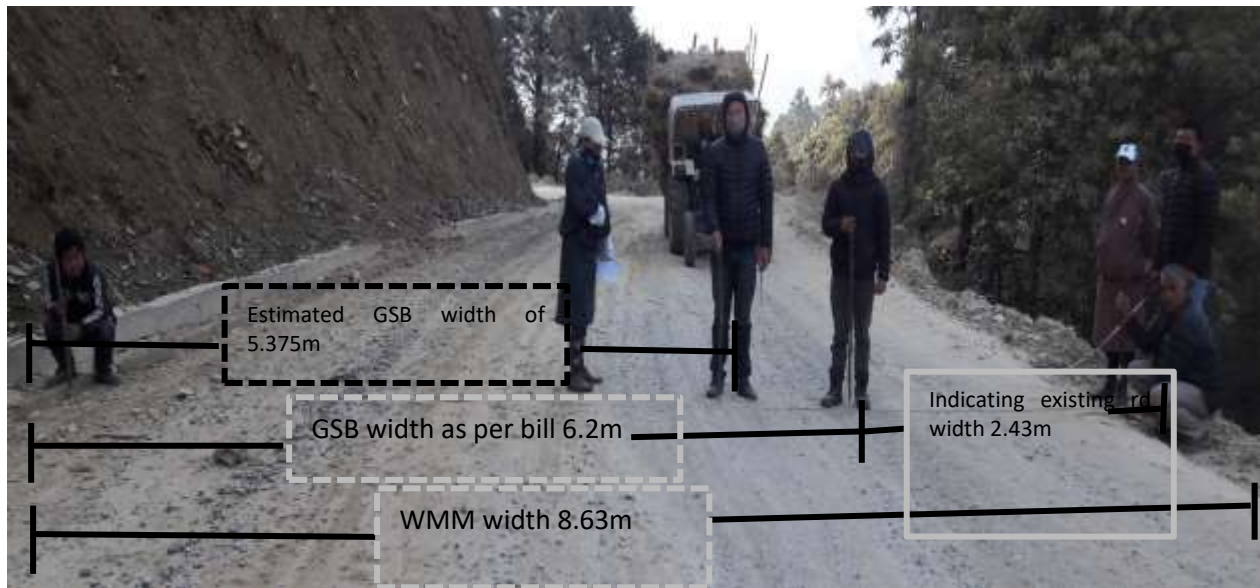
The Initial Project Document under Para 2.3.2 stipulated as “*As design thickness is 600mm, the existing pavement will have to be overlaid either by WMM + bituminous layer or by bituminous layer alone if found adequate*”. Thus in terms of the Initial Project Document, designs, drawings and estimates, Granular Sub-Base (GSB) was to be provided only on the widened pavement works.

On review of the detailed measurements cum abstract of cost and BOQs/estimates prepared for the package, it was noted that the RO, Lobeysa had not regulated the measurements of the works executed in terms of the drawing, technical specification and existing road width. The measurements recorded and paid for the width of some of the items of works are shown in table 8.2 below:

Sl. No.	Item Description	Existing carriage width	Carriageway width as per revised drawing	Width executed and paid for in meter	Indicating varying Existing carriage width /excess width executed	Remark
1	Sub grade preparation	4.23m	7.50m	4.3m	3.20m	Should have executed only 3.27m. Excess measurement and payment for 1.03m
2	Consolidation of subgrade with roller	4.23m	7.50m	5.0m	2.70m	Should have executed only 3.27m. Excess measurement and payment for 1.73m
2	Providing & Laying GSB	4.23m	7.50m	5.375m	2.125m	Should have executed only 3.27m. Excess measurement and payment for 2.105m.
3	Providing & Laying WMM	4.23m	7.50m	8.2m	0.70m	As per revised drawing WMM to be executed for just 7.50m. Excess executed by 0.70m
4	Providing & Laying DBM	4.23m	7.50m	8.2m	0.70m	As per revised drawing DBM to be executed for just 7.50m. Excess executed by 0.70m
5	Providing & Laying AC	4.23m	7.50m	8.2m	0.70m	As per revised drawing AC to be executed for just 7.50m. Excess executed by 0.70m

Further, in terms of the MB and RA bills, the average width of GSB provided on widened road were calculated to 6.31m and WMM paved road width of 8.39m thereby showing the existing road width as just 2.08m (8.39m minus 6.31m). In terms of the carriageway of 7.50m, the existing road width works out to just 1.19m (7.50m less 6.31m) indicating flaws in the measurement of executed works recorded in the MB and RA bills.

The detail analysis of road width is shown in the picture below:



Considering the flaws in the width of existing road, the audit team along with DoR officials physically measured the existing road width at Khelekha where widening work was not carried out. The physical verification/measurements of existing road indicated the average existing road width of 4.23m (***Refer to joint physical measurement sheet on existing road width***).

Therefore, the providing and laying of GSB on widened road is admissible to the extent of 3.27m (i.e. Carriageway of 7.50m less existing road width of 4.23m). The acceptance of width beyond 4.23m had resulted in inadmissible payment of Nu.1,311,254.94 as detailed in **Appendix “D1”**.

The RO, Lobeysa should immediately recover the inadmissible payment and deposit it to Audit Recoveries Account. Besides, the site/supervising engineer should be held accountable for not regulating the payments as per the drawing and technical specification which had resulted in such inadmissible payments.

Auditee’s Response:

In the process of execution of widening work, the existing pavement surface gets damaged by machineries and due to falling boulders during excavation of works. Further the existing base course was deteriorated due to heavy traffic movement for which massive rectification of base course work required at the time of actual execution of GSB work on the widen portion as well as 1.5m to 2m on the valley side on some stretches. Moreover, as the project is located at high altitude, the existing base course has been weakened due to snow clearance works by machineries every year. In some location due to improvement of road geometric the whole road width gets shifted which also attributes in increased of GSB quantity. Therefore the GSB quantity has become higher than what is anticipated. Therefore, please drop the memo.

RAA’s Further Comments & Recommendations:

The RAA has taken width of the existing paved road as 4.23m based on the joint physical measurements conducted by RAA team along with DoR officials at Khelekha where widening work was not carried out as on the date of the physical verification. The RO while preparing the

estimates had quantified the GSB works based on the requirement of GSB works for paved width of 5.375m indicating flaws in the estimation.

However, as agreed during the audit exit meeting, the DOR and RO keeping the required GSB width as 5.375m should work out the chainages where GSB was provided more than 5.375m and deduct the amount accordingly. The details of chainages where excessive measurements were given and excess payments made thereon along with recovery or adjustment from RA bills furnished to RAA for verification and record within three months from the date of issue of the report beyond which penalty @ 24% per annum shall be levied as per Chapter IV, Section 4.5.1.4 of the Finance and Accounting Manual 2016.

The DoR and Ministry should constitute a technical team to review estimates and BOQs prepared by the ROs for the pavement works to ascertain flaws, ambiguities and other related problems and come up with appropriate system and mechanism for consistency and reliable cost estimations as per site specific conditions for similar projects in future.

Who is Accountable?

Direct Accountability	16. Karchung, JE ,EID No. 201101239 17. Balaram Acharya, AE I, EID No. 8908099 18. M/s Empire Construction Pvt. Ltd (CDB No. 2206)
Supervisory Accountability	: Garja Man Rai, Ex, CE, EID No. 8212026

9 Irregularities noted on Improvement works for Double Lanning of Northern East-West Highway from Nobding to Dungdungnesa (Package XV) by M/s Empire Construction Pvt. Ltd.

The direct contract for the Double Lanning works from Nobding to Dungdungnesa covering a total of 2.75 Km from Chainages 392.25Km to 395Km (contract package xiv) was awarded to M/s Empire Construction Pvt. Ltd vide work order No. DoR/CE-(CD) 2016-17/2808dated 18/07/2016 at their quoted price of Nu.39,390,946.56. The contract duration was twelve months effective from 15/08/2016 with completion deadline scheduled on 15/08/2017.

The verification of drawings, estimates, bill of quantities, contractor's bill and the actual construction at site revealed following irregularities and lapses:

9.1 Irregularities and lapses in the Direct Award of Contract Package XV at exorbitantly high-analyzed rates involving huge financial implication to the Government Exchequer - Nu. 15,860,537.63 (4.4.69)

Notice Inviting Tender for the road stretch from Nobding-Dungdungnesa covering chainages from **395Km to 389Km with a total of 6Km road** estimated at Nu.136,021,712.41 was floated vide NIT No. DoR/ROL/Plg-15A/2015-16/527 dated 20/10/2015. Subsequently the tender was found cancelled vide letter No. DoR/ROL/Plg-15A/2015-16/615 dated 12/11/2015. The RAA observed following events leading to cancellation of the NIQ and direct award of work:

- RO, Lobeyasa received verbal order from HQ to reduce the scope of work from 6Km to 4Km in the tender document.
- Following the verbal instruction, the RO, Lobeyasa issued an addendum vide reference No. DoR/ROL/Plg-15A/2015-16/583 dated 02/11/2015 reducing scope of work to 4.0Km.
- The RO, Lobeyasa again received another verbal instruction from Ministry and DoR HQ to cancel the whole tender.

- The tender was cancelled vide letter No. DoR/ROL/Plg-15A/2015-16/615 dated 12/11/2015.
- Subsequent to the cancellation, the Director instructed RO, Lobeysa to tender out 3.25Km out of 6Km. The remaining 2.75Km was stated to be processed for approval by MOF for awarding to M/s Empire Construction Pvt. Ltd directly.
- Accordingly estimates amounting to Nu. 46,552,814.61 was found prepared for 3.25 km from Chainage 389km to 392.25km and work awarded to M/s Empire Construction Pvt. Ltd at his quoted amount of Nu. 27,808,665.00 being the lowest evaluated bid.
- The remaining 2.75 km from Chainage 392.25km to 395km was left out to be awarded directly to the same firm at the departmental estimated cost.
- The Departmental estimate amounting to Nu. 39,390,946.46 was prepared for the 2.75km through analysis of rates.
- Based on the proposal submitted by Hon'ble Zhabtog Lyonpo, Ministry of Finance had approved the direct award of 2.75KM to M/s Empire Construction in lieu of the work made to surrender under Regional Office, Trongsa as per Note sheet DoR/CD/GOI/PMU/19/2017-2017/2781 dated 06/07/2016.
- Following the approval, the work for the pavement construction from Nobding-Dungdungnyelsa covering Chainages 395Km to 392.25KM with a total of 2.75Km road was awarded to M/s Empire Construction Company Pvt. Ltd. directly vide letter of acceptance No. DoR/CE(CD)/2016-17/W-28/2808 dated 18/07/2016 at the departmental estimate of Nu.39,390,946.46 prepared by applying the analyzed rates.

The close study of the contract and related documents in particular surrendering of contract works under Regional Office, Trongsa which was the very ground of direct award as asserted by the Ministry exhibited unjustified direct award of work at exorbitantly high analyzed rates resulting in siphoning of huge government funds but also to an inefficient contractor as discussed here under:

9.1.1 Use of exorbitant rates of sand and aggregates for Rate Analysis with resultant inflated preparation of departmental estimates (4.4.65)

The rates for the main item of works viz. GSB, WMM, DBM & AC were analyzed using annual quotation rates of Nu. 2,097.38 for aggregates and Nu. 1,141.13 for sand obtained for the financial year 2015-16 which were exorbitantly higher as compared to 2015 BSR Thimphu Base rates of Nu. 542.00 & Nu. 610.42 per cubic meter respectively. The Material cost as well as the analyzed rates were much higher than the base rates and Built up rates of BSR 2017.

The comparison of the Base Rates and Built up Rates of BSR 2015 and 2017 with that of the Analyzed Rates for items of works are as shown in table 9.1.1 below:

Item works	Type of material	Basic rates for materials (BSR 2015) (Base Town-Thimphu)	Built-up Rates as per BSR 2015(Base Town-Thimphu)	Basic rates for materials (BSR 2017) (Base Town-Thimphu)	Built-up Rates as per BSR 2017(Base Town-Thimphu)	Rate of the material taken for rate analysis in 2016	Rate Analyzed by RO for item works for preparation of estimates in 2016
Granular Sub base (GSB)	Sand	610.42	1,445.07	733.03	1,479.88	1,141.13	3,027.27
Wet Mix Macadam (WMM)	Aggregates 20mm to 10mm	542.00	1840.74	552.84	1,830.19	2,097.38	3,000.00

The analyzed rates for GSB & WMM were also found exorbitantly higher as compared to the rates quoted by winning contractors of other packages for the same item of works which ranged from Nu.725 to Nu.1,680.00 for GSB and Nu.1,150.00 to Nu.2,000.00 for WMM respectively as shown below:

Table 9.1.1.1: Comparison of quoted and departmental rates								
Contract package No.	Name of the contractor	Rates quoted by contractor				Department Rates as per estimates		Date of issue of Acceptance letter
		GSB (Nu.)	WMM (Nu.)	DBM (Nu.)	AC (Nu.)	GSB (Nu.)	WMM (Nu.)	
1	M/s Chogyel Construction Pvt. Ltd	1053	1842	320	200	2115.65	2147.45	9.6.2015
2	M/s Chogyel Construction Pvt. Ltd	1053	1842	320	200	2115.65	2147.45	9.6.2015
3	M/s Chogyel Construction Pvt. Ltd	1053	1842	320	200	2115.65	2147.45	23.6.2015
4	M/s Singye Construction Pvt Ltd.	1100	1500	320	200	2115.65	2147.45	9.7.2015
5	M/s Etho Meto Construction Pvt Ltd.	1576.14	1884.50	221	144	2115.65	2147.45	9.7.2015
6	M/s TT construction Pvt Ltd.	1100	1700	355.57	232.55	2385.1	2336.53	9.7.2015
7	M/s Loden Construction Pvt Ltd.	1120	1300	360.96	238.38	2385.1	2336.53	9.7.2015
8	M/s Empire Construction Pvt. Ltd.	1500	2000	255	175	2385.1	2336.53	9.7.2015
9	M/s Taksing Chundu Construction Pvt Ltd.	1680	1800	240	180	2385.1	2336.53	3.8.2015
10	M/s Welfare Construction Pvt Ltd.	1300	1600	390	320	2385.1	2336.53	3.8.2015
11	M/s Rigsar Construction Pvt Ltd.	1170	1350	254.64	229.11	2385.1	2336.53	30.10.2015
12	M/s Hi Tech Construction Pvt Ltd.	750	1150	328.96	163.60	2991.38	2757.79	12.2.2016
13	M/s Up Construction Pvt Ltd.	1100	1400	174.97	140.18	3027.27	3000	1.2.2016

14	M/s Empire Construction Pvt. Ltd.	725	1850	260.00	160.00	3027.27	3000	4.4.2016(NIT 24.12.2015)
15	M/s Empire Construction Pvt. Ltd.	3027.27	3000	247.47	148.20	Rates analyzed by the RO		18.7.2016

It would be apparent from the table above that the M/s Empire Construction itself had quoted Nu.725.00 per cum for the GSB works and Nu.1,850.00 per cum for WMM works for contract package fourteen (XIV) while the department had analyzed Nu. 3,027.27 per cum for GSB and Nu.3,000.00 per cum for WMM works. Thus, the splitting of initial contract package covering 6km to two packages of 3.25km and 2.75km and awarding directly the 2.75km Chainage based on departmental estimates was unjustified and construed as extension of undue favour to the contractor.

Further, the RO, Lobeysa had failed to crosscheck the rates of construction materials and build up rates for items of works viz. GSB and WMM, not only with the BSR 2015 available at the time of preparation of the estimates but also the quoted rates of all other winning contractors and the quotes of the M/s Empire Construction for the package fourteen (XIV). Failure to exercise due diligence on the part of the RO had resulted in awarding of 2.75 km pavement work contract at a huge cost as compared to package 14 of 3.25KM awarded through competitive bidding process at Nu. 27,808,665.00 and that too in the same location.

The total financial loss to the Government and benefit to the contractor by way of direct awarding amounted to Nu.15,860,537.63 as detailed below:

Name of the contract package	Length of road	Contract Amount (Nu.)	Cost per KM	Additional cost on Package 15	Remarks
14	3.25KM	27,808,665.00	8,556,512.30		The cost includes Nu. 3,250,000.00 for L-Drain works
15	2.75KM	39,390,946.46	14,323,980.53		The cost does not include L-Drain works
			5,767,468.23	15,860,537.63	cost impact on Pavement constructions with same specification

The huge cost difference is attributed to main item of works like GSB & WMM which is paid at exorbitantly higher analyzed rates of Nu. 3,027.27 per cum and Nu.3,000.00 per cum respectively. The circumstances leading to preparation of estimates by analyzing rates despite existence of BSR 2015 was not on record. Besides, due diligence exercise was also not carried out by the RO and the engineer responsible for preparation of the estimates in the light of the quoted rates for similar item of work by all the winning contractors as well as the stipulation of provisions for the mandatory establishment of stone quarry under respective contract sites. The RO should furnish appropriate comments for the lapses. Besides, the Ministry should review the tendering process on the procurement of construction materials by the Regional Office, since the rates obtained and selected were exorbitantly higher than the prevailing market rates. In additional, the Ministry should also review the estimates for departmentally executed works, as there are indications of over estimations due to uncontrolled material cost built in the estimates.

Auditee's Response:

Initially, the ROs were adopting analysis rate for all construction works including the NEWH activities. The BSR rates were adopted after having received the instruction to implement BSR rates & cost index later for additional works. Therefore, please drop the memo.

RAA's Further Comments & Recommendations:

While taking note on the adoption of analysis rate for estimation of all construction works, it was the responsibility of the RO to appropriately analyze the rates of materials in keeping with contractual provisions on establishing own quarry at the construction site for production of construction materials and also related cost quoted by other contractors for such item of works.

The deliberate use of annual quotation rates for analysis of rates for the item of works and used for estimation for the contract package which was predetermined to be awarded to the said contractor was unethical and not in the interest of the Government as the direct award of contract at the departmental estimated cost had huge adverse financial implication of Nu.15.861million on the Government Exchequer.

However, as discussed during the exit meeting, the DOR in consultation with the Ministry should investigate the circumstances leading to use of annual quotation rates of construction materials despite clear stipulations that the materials were to be obtained from the stone quarry established within the construction site. The Ministry should also investigate the reliability of the annual quotation rates having regard to the prevailing market rates as well as the process and procedures adopted for analysis of the rates.

Besides, the DOR and Ministry should rework the applicable rates for the items of works based on the competitive rates quoted by all the contractors or BSR built up rates and recover the extra payment either from the contractor or responsible officials for inflated cost estimations. In addition, the Ministry should also investigate similar payments made for other activities/project due to inclusion of exorbitant materials rates in the rate analysis.

The huge financial loss to the extent of Nu. 15.861million to the government Exchequer as a result of unjustified direct award of contract is brought to the notice of the Government for appropriate decisions and actions.

Who is Accountable?

Direct Accountability	: 1. Phuntsho Wangdi, Former Secretary, EID No. 8403049 2. Dorji Choden, Former Zhabtog Lyonpo 3. Namgay Dorji, Former Finance Minister
Supervisory Accountability	: Dorji Choden, Former Zhabtog Lyonpo

9.1.2 Irregularities and unjustified direct award of package XV on the ground of surrendering the contract works under RO Trongsa – Nu. 39.40 Million (4.4.69)

As transpired from the Note sheet DoR/CD/GOI/PMU/19/2017-2017/2781 dated 06/07/2016, the Ministry of Finance had approved the direct award of work for the pavement construction from Nobding-Dungdungnyelsa covering Chainages from 395Km to 392.25KM with a total road stretch of 2.75Km to M/s Empire Construction based on the proposal submitted by Hon'ble Zhabtog

Lyonpo for the direct award of work in lieu of the work made to surrender under the Regional Office, Trongsa.

Following the approval, the work was awarded to M/s Empire Construction Company Pvt. Ltd. directly under letter of acceptance No. DoR/CE(CD)/2016-17/W-28/2808 dated 18/07/2016 at the departmental estimated cost of Nu.39,390,946.46.

The RAA made an attempt to ascertain the grounds under which the contractor was made to surrender the contract on widening works of approximately 2.5km of rocky stretch of Dzongkhalum awarded by RO, Trongsa. On review of related records and documents particularly the write up on the widening works from Trongsa to Yurmo by Empire Construction submitted to the Secretary by the Chief Engineer, RO, Trongsa duly signed by the Chief Engineer, Dy. EE, Sub Division and Site Engineer, following facts and events were observed:

- MHPA had requested DOR to carry out critical widening works as deposit works especially the cliff of Dzongkhalum.
- Accordingly MoU was signed by the Ministry with MHPA on 16th September 2014.
- The RO, Trongsa awarded the contract to M/s Empire Construction through open tender at a cost of Nu.39.40 million for widening of approximately 2.5km of rocky stretch and other related construction activities.
- The agreement was signed on 24th April 2015 with contract duration of 16 months ending by 16th July 2016.
- In terms of MoU, formation cutting was to be completed by end of December 2015 to enable MHPA to transport heavy Electro-mechanical equipment.
- Accordingly, the contractor was informed of the condition during the signing of the agreement and supplemented during the meeting with contractor at Dam Colony on 20th June 2015 where the contractor agreed and assured to complete the formation cutting works by end of December 2015 and rest of the works by 16th July 2016.
- On 9th September 2015, due to the progress being not satisfactory after time lapse of 5 months, meeting was conducted with the contractor and MHPA at DOR Head Quarter where the contractor still gave commitment to finish the work in time as required by MHPA and DoR.
- During the visit of Hon'ble Finance Minister on 28th September 2015, MHPA and JPCL reported along with other numerous complaints in the past that:
 - There is huge risk to the lives of people and commuter as result of unprofessional widening techniques adopted by the contractor which is proved by emitting flying boulders into the JP colony located about 300m away due to uncontrolled blasting by the contractor.
 - Due to indiscriminate pushing of muck to the valley side, the stream could change and effect the JP colony in times to come.
 - The contractor will no way complete the FC works in December due to "inexperience and poor technology adopted by the contractor".
- The Secretary was instructed both by Zhabtog Lyonpo and Ngyultse Lyonpo to explore the solution to the public safety and timely completion of critical road widening from Trongsa to Yurmo.
- Based on the directive of Ngyultse Lyonpo, Meeting with the secretary, MHPA and contractor was held on 3rd October 2015. During the Meeting, MHPA and JPCL expressed their doubt and informed the meeting that loosing time would ultimately lead to financial loss of Nu.22million per day. MHPA also inform the floor that loss will have to be borne by the defaulter (contractor) and expected to complicate DoR as whole.
- The write up mentioned that after extensive deliberation, it was decided that the works will be handed over back to MHPA on the following reasons:
 - After time lapse of 5 months, the progress is hardly 30% due to so many requirements imposed by MHPA and mostly due to difficult terrain and continuous rainfall.

- It was perceived that the contractor will not be able to meet December deadline with required level of safety aspects to commuters and contractor not getting enough time to do the works due to continuous project based requirement.
- The contractor is required to start the works simultaneously at many places with required safety level at par with international standards to enable to meet the deadline. It will be beyond our norms to penalize the contractor as put forward by MHPA.
- As a support by the Government, the Secretary informed the contractor that they will be given the equivalent value of work elsewhere due to the fact that they have not failed the contract but due to safety issues being not able to put in place at the level of international standards to which the contractor had agreed.
- The contractor will be paid for the work executed so far.

The Write up also highlighted on BOQ and work executed wherein the BOQ quantity of 103,387.50 cum was done by MHPA purely on the basis of assumption without any detail survey works and work is expected to execute by way of half tunneling method with average height of cut of hardly 10m. On RO's instruction, the contractor had tried to do a type of half tunneling excavation but they could not do it due to high risk and lack of requisite experience and resources. Due to above facts, the contractor had to resort to conventional cutting. It was also mentioned that as the Bhutanese contractors lack capability of doing half tunneling works, the contractor had adopted full cutting technique as high as 100m height of cut to get the required road width due to vertical to almost negative slope of existing terrain.

Considering the above facts and event, the Ministry's decision to compensate the contractor through direct award of other works was not justified on the following grounds:

- The contractor was made aware of the rocky terrain and execution by way of half tunneling method.
- The formation cutting was committed by the contractor to complete by end of December 2015 as agreed by the DOR in the MoU signed with by the MHPA.
- The contractor did not have experience to execute the works as per approved technical method of execution and resorted to conventional method.
- For any works, safety of the lives of people and commuter are required to be maintained at all cost and by any standards. Unprofessional widening techniques adopted by the contractor had led to high risk as conventional technique adopted had been emitting flying boulders into the JP colony located about 300m away due to uncontrolled blasting by the contractor.
- There was indiscriminate pushing of muck to the valley side not only affecting the flow of stream and risking the JP colony but also violating the environmental norms.
- Even after time lapse of 5 months the progress was hardly 30% and remaining 70% FC works was bound to remain uncompleted within 3months as the FC was to be completed by end of December 2015.
- It was noted that requirements imposed by MHPA were basically for the safety of the lives of people and commuter and to ensure completion of FC works within end of December 2015 as delays could cost the MHPA millions of Ngultrums per day. The ground of difficult terrain and continuous rainfall was not justified as such aspects are foreseen and known to the DOR and Contractor.
- It is evident that the Ministry had favoured the contractor by requiring them to surrender the works as they would have been liable for their failure to complete the FC works within December 2015, for compensation payment of Nu.22 million per day since MHPA had categorically informed that loss will have to be borne by the defaulter (contractor).
- Above all, the contractor was found compensated with a total payment of Nu. 40,987,391.00 for works executed against the contract cost of Nu. 39,400,443.00 (***Refer 3rd and final bill paid under DV6.90 dated 24.6.2016***) despite the failure to complete 70% of the works. Thus awarding of equivalent value of works of Nu.39.40 million directly from the Northern East West Highways Project without consideration to the amount claimed and paid indicated

flaws and extension of undue financial favour to the said contractor as the work was found awarded at the departmentally estimated cost which entailed extra financial cost to the Government to the extent of Nu. 15.861million as compared to their quoted price of contract package XIV awarded through competitive bidding process.

Thus, the decision and commitment of the Secretary in awarding work directly that to after adopting various processes to cancel the already invited NIQ for the Chainage and asserting reasons of making the contractor surrender the already delayed contract work under RO, Trongsa was not rational and in the best interest of the Government. In the light of aforementioned grounds which proved to show inefficiency and slow progress of work, poor workmanship, technical capacity issues as well as lack of due diligence and professionalism on the part of contractor posing threat to safety of structures and commuters, the direct award of Contract at inflated contract amount is indicative of extension of undue favour to the contractor. It is reiterated that all contract packages awarded through competitive bidding processes were very competitive and far below the estimated cost ranging from 12.07% to 45.21% below the estimated cost. Even the same firm's quoted price for the contract package XIV was 40.26% below the departmental estimated cost. The Ministry should comment on the direct award of equivalent value of the contract at the estimated cost prepared based on analyzed rates and not as per prevailing BSR including following aspects:

- The Contractor was already compensated with Nu.40.987 million against the contract amount of Nu.39.40 million despite completing just about 30% of the contract works that too was made to surrender as the contractor's failure to meet the required deadline of MHPA would lead to compensation payment of Nu. 22.00 million per day.
- MHPA and JPCL reported along with other numerous complaints in the past that:
- There is huge risk to the lives of people and commuter as result of unprofessional widening techniques adopted by the contractor which is proved by emitting flying boulders into the JP colony located about 300m away due to uncontrolled blasting by the contractor.
- Due to indiscriminate pushing of muck to the valley side, the stream could change and effect the JP colony in times to come
- The contractor will no way complete the FC works in December due to "inexperience and poor technology adopted by the contractor".
- The direct award of contract indicated possible existence conflict of interest as well as extension of undue favour, as the MLTC/RO had awarded the works despite the fact that the contractor's performance was poor and failed to progress the works as per committed work schedules.

The Ministry should investigate the direct award on the ground of compensation for surrendering the contract of different program as the contractor had already benefited substantial financial amounts despite completing roughly 30% of contract works.

Auditee's Response:

RO would like to sincerely applaud RAA for detail observations made on the direct award. It is evident from the subsequent observations that the direct award was as result of surrendering the contract package under MHPA to DoR, Trongsa in lieu of time clashes between the early completion of widening work and start of transportation of heavy electro-mechanical equipment. In the best interest of MHPA to prevent huge demurrage claim that needs to be paid to the transporter in case of road not getting ready on time, the contract awarded to M/s Empire Construction was asked to surrender to DoR Trongsa vide letter no. DoR/CD/GoI PMU/2015-2016/1785 dated 28th October 2015 signed by Hon'ble Zhabtog Lyonpo Dasho Dorji Choden. The same letter stated that the contractor shall be compensated through award of a work of similar value under Regional Office, Lobeysa. It was also proposed to process the award of pavement construction work for 2.75km (Ch. 391 – 388.25) of equivalent value of Nu. 39.390 Million.

Subsequently as notified in the letter no. mentioned above, the pavement construction work value of Nu. 39.390 Million was awarded to M/s Empire Construction through the note no. DoR/CD/GoI PMU/2015-2016/2781 dated 6th July 2016 from Hon'ble Zhabtog Lyonpo to Hon'ble Nyultse Lyonpo (Minister for Ministry of Finance).

Since the work was awarded after following due process of approval from the Minister, Ministry of Finance in the best interest of MHPA, RAA is requested to kindly into the justifications provided above and reconsidering in dropping the memo.

RAA's Further Comments & Recommendations:

While noting the response, it is to iterate that the direct award of contract was not justified under the following facts and events:

- *The contractor had failed to progress the widening work as scheduled for completion by end of December 2015 to enable MHPA to transport heavy Electro-mechanical equipment.*
- *The poor progress of works was also attributable due to unprofessional widening techniques, inexperience resources to execute the works as per approved technical method of execution resorting to conventional method.*
- *The surrender of the contract package became inevitable as the contractor was failing to complete the widening works within the deadline of December 2015, thereby attracting the payment of compensation of Nu.22 million per day to MHPA as latter had categorically informed the floor that loss will have to be borne by the defaulter (contractor) and expected to complicate DoR as whole.*
- *The decisions taken by the Secretary by making the contractor to surrender the contract work was purely to protect the contractor and not in the interest of the government.*
- *The contractor was found compensated with a total payment of Nu. 40,987,391.00 for works executed against the contract award cost of Nu. 39,400,443.00 (**Refer 3rd and final bill paid under DV6.90 dated 24.6.2016**) despite the failure to complete 70% of the works.*

Thus, awarding of equivalent value of works of Nu.39.40 million directly from the Northern East West Highways Project without consideration to the amount claimed and paid indicated flaws and extension of undue favour to the said contractor as the work was found awarded at the departmentally estimated cost which entailed extra financial cost to the Government to the extent of Nu. 15.861million as compared to his quoted prices of contract package XIV awarded through competitive bidding process.

The Ministry should thoroughly investigate the entire process adopted for direct award of the contract at the departmentally estimated cost including splitting of the contract package initially tendered out through cancellation of NIQ and preparation of estimates by applying exorbitantly high analyzed material cost to rule out the existence of possible conflict of interest and collusive practices and take appropriate action against the concerned officials as per the Law of the Land.

The unjustified direct award of the contract is also bought to the notice of the Government for appropriate decisions and actions.

Who is Accountable?

Direct Accountability	: 1. Phuntsho Wangdi, Ex. Secretary, EID No. 8403049 2. Dorji Choden, Former Zhabtog Lyonpo 3. Namgay Dorji, Ex. Finance Minister
Supervisory Accountability	: Dorji Choden Former. Zhabtog Lyonpo

9.2 Inadmissible payment for execution of WMM width beyond required carriageway of 7.5m - Nu. 2,126,925.00 (5.1.20)

The revised drawing provisioned 7.5m carriage width only. However, on review of the RA bills of the contractor, measurements in the MB and payments of RA bills indicated payments for pavement works beyond the carriageway width approved in the revised drawing and technical specifications. In the light of the payments made beyond admissible carriageway width, a joint team comprising Project officials, contractor and audit team had conducted joint measurement of work done at site on 4.12.2017.

During the joint measurements, it was noted that the average width of WMM works executed worked out to 8.63m indicating execution of works beyond approved carriage width by 1.13m. Subsequent review of the site order book also disclosed that the site and supervising engineer had recorded instruction not to execute beyond the approved pavement width. On pointing out, the concern site/supervising engineer also stated that no approvals were given for execution of pavements works exceeding the carriageway width. An attempt to validate the execution of pavement works width by other contractors executing same pavement works noted that pavement works were found regulated strictly with the approved carriageway width provided in the drawings and technical specification and payments made accordingly.

Thus, it was evident from the aforementioned facts and events that the execution beyond the approved width indicated unauthorized execution of works by the contractor. The payments for the average increase width of 1.13m in WMM works alone had led to illegal claims and payment of Nu.2,129,625.00 as detailed in **Appendix “D2”**.

It was also apparent from the review for rate analysis for the item of works carried out by the Project Engineer for the preparation of estimates for awarding directly to the firm, that the analyzed rate was computed at Nu.3,000 per cubic meter (**Contract package 15 is directly awarded to M/s Empire Construction at analyzed rates**) although the 2015 BSR rate was only Nu.1,840.74 per cubic meter for the item of work fixed for the Thimphu Base Town.

The RO, Lobeysa besides immediately recovering the illegal payments of Nu. 2,129,625.00 and depositing into ARA should also furnish justification for non-regulating the payments as per drawing and technical specification which had resulted in undue benefit to the contractor. The Site engineer should also be held accountable for such lapses, which had resulted in payment for works not executed.

Auditee’s Response:

Drawing issued by the Department of roads, HQ to the Regional Office is a standard and typical drawing on the straight road, ideal condition showing only road camber geometry. The road super-elevation, which is the critical and important part of the road geometry is not shown in the standard typical drawing. However, the super-elevation, wherever required are provided at the road curves. Most of our country roads fall under the hill road category and are zigzagging through the profile of mountains and valleys. Therefore technically it is absolutely not possible to keep uniform road width throughout the road length as the road traverses the mountains and

valleys. Also as per the road design, minimum radius needs to be provided on the curves on the bases of radius of curvature and speed of the vehicles.

We fully agree with RAA observation on increase of road width at certain locations; however, increase in road width is as per the provision of the road design on the road curves and sometimes dictated by the site conditions. The Road Survey and Design Manual 2005 published by Department of Roads is attached as shown below wherein the provision of radius on the curves according to speed of the vehicle

Road Survey & Design Manual 2005

5.6.1 Widening

BASIC FORMULA

$$W_a = R - (R^2 - B^2)^{1/2}$$

$$W_b = VR^{1/2}$$

$$W_d = (R^2 + b[2B + b])^{1/2} - R$$

$$W_c = 2W_a + W_d + W_b + 0.002z + 2a$$

$$= R - 2(R^2 - B^2)^{1/2} + (R^2 + b[2B + b])^{1/2} - VR^{1/2} + 0.002z + 2a - W_a$$

$$W = W_c - W_a$$

Where

- W = widening for two lane pavement on curve (m)
- W_a = distance rear wheels track inside from wheels on curve (m)
- W_b = extra width allowance for difficulty of driving on curves (m)
- W_c = width of two lane pavement on curve (m)
- W_d = additional width of front overhang of vehicle on curve (m)

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HORIZONTAL CURVE DESIGN DATA

Radius (m)	Speed (Kmph)	Super-elevation (%)	Sight Distance		Transition Super elevation (m)	Widening		SD offset	
			Stopping (m)	Over-taking (m)		Single lane (m)	Double lane (m)	Stopping (m)	Double stopping (m)
15	20	8	15	-	20	0.9	1.8	5	15
25	30	8	25	110	30	0.6	1.8	5	16
40								3	11
45	40	8	40	140	45	0.6	1.5	5	17
70								3	12
75	50	8	60	200	60	-	1.2	5	20
110									14
120	60	7	80	300	70	-	0.9	6	23
160								5	17
200								4	14
240								3	12
260	80	7	120	450	80	-	0.6	7	29
300								6	24
400								5	18
500								4	15

SD - Sight Distance

The total percentage deviation is only about 7.12% and they were necessitated by the site conditions and maintaining road radius following the natural mountain profile.

Therefore, based on the justifications provided above we would like to request RAA to kindly consider in dropping the memo.

RAA's Further Comments & Recommendations:

While taking note of the response, it is reiterated that one of the very drive for revision of the initially approved drawing involving huge cost implication to the Government after time lapse of almost eight month from the award of contracts was to maintain sufficient sight distance in order to prevent accident due to obstacles and zigzagging through mountains and valleys. Moreover, designs, drawing and estimates including technical specifications are the basis of technical controls to ensure execution of quality works and regulate expenditures.

On review of other contract packages, it was also noted that the RO and site engineers had regulated the payments for pavement works as per the approved design carriage width. Thus, the failure on the part of the RO and site engineer in one single package to regulate the payments within the approved carriageway width was indicative of an extension of undue financial benefit to the contractor.

However, as discussed during the exit meeting, the DOR should recover the ineligible payment of Nu. 2,126,925.00 and documents detailing recoveries or adjustments made from RA bills should be produced to RAA for verification and records within three months from the date of issue of the report beyond which penalty @ 24% per annum shall be levied as per Chapter IV, Section 4.5.1.4 of the Finance and Accounting Manual 2016. In addition, the Ministry must also fix the Officials responsible for such ineligible payments for making the good of the amount in the event contractor fails to refund the amounts.

The DOR and the Ministry in the interest of the Government should thoroughly review the flaws and causes of the failure on the part of the ROs and site engineers to execute works and regulate payments within approved designs, drawing estimates and the technical specifications. Besides, the DOR and the Ministry should develop appropriate system to curb such unwarranted deviations and violation of technical designs and estimates, BOQs in similar projects in future.

Who is Accountable?

Direct Accountability	: 1. Karchung, JE EID No. 201101239 2. Balaam Acharya, AE I, EID No. 8908099 3. M/s Empire Construction Pvt. Ltd (CDB No. 2206)
Supervisory Accountability	: Garja Man Rai, Ex, CE, EID No. 8212026

9.3 Inadmissible payment in the execution of GSB beyond existing paved road width of 4.23m - Nu. 3,913,692.50 (5.1.20)

The Initial Project Document under Para 2.3.2 stipulates "As design thickness is 600mm, the existing pavement will have to be overlaid either by WMM + bituminous layer or by bituminous layer alone if found adequate". It is apparent from the Initial Project Document that, GSB was to be provided only on the widened pavement works.

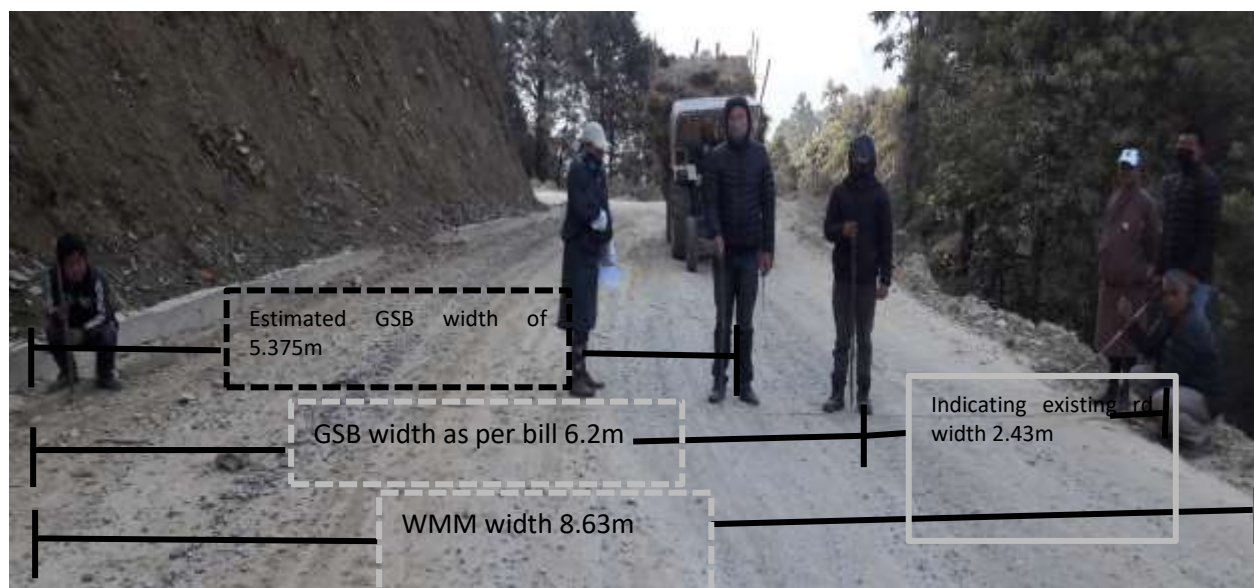
On review of the detailed measurements cum abstract of cost and BOQs/estimates prepared for the package, it was noted that the RO, Lobeysa had not regulated the measurements for the works executed in terms of the drawing, technical specification and existing road width. The measurements recorded and paid for the width of GSB works are shown in table 9.3 below:

Sl. No.	Item Description	Existing carriage width	Carriageway width as per revised drawing	Width executed and paid for in meter	Indicating varying Existing carriage width /excess width executed	Remark
1	Sub grade preparation	4.23m	7.50m	4.3m	3.20m	Should have executed only 3.27m. Excess measurement and payment for 1.03m
2	Consolidation of subgrade with roller	4.23m	7.50m	5.0m	2.70m	Should have executed only 3.27m. Excess measurement and payment for 1.73m
2	Providing & Laying GSB	4.23m	7.50m	5.375m	2.125m	Should have executed only 3.27m. Excess measurement and payment for 2.105m.

3	Providing & Laying WMM	4.23m	7.50m	8.2m	0.70m	As per revised drawing WMM to be executed for just 7.50m. Excess executed by 0.70m
4	Providing & Laying DBM	4.23m	7.50m	8.2m	0.70m	As per revised drawing DBM to be executed for just 7.50m. Excess executed by 0.70m
5	Providing & Laying AC	4.23m	7.50m	8.2m	0.70m	As per revised drawing AC to be executed for just 7.50m. Excess executed by 0.70m

Further, in terms of the MB and RA bills, the average width of GSB provided on widened road calculated to 6.2m and WMM paved road width of 8.63m thereby showing the existing road width as 2.43m (8.63m less 6.2m). In terms of the carriageway of 7.50m the existing road width works out to just 1.30m (7.50m less 6.2m) indicating flaws in the estimates and executed works recorded in the MB and RA bills.

The analysis of road width is as shown in the photograph below:



Considering the flaws in the width of existing road, the audit team along with DoR officials physically measured the existing road width at Khelekha where widening had not been carried out. The physical verification/measurements of existing road revealed average existing road width of 4.23m (**Refer to joint physical measurement sheet on existing road width**).

Therefore, providing and laying of GSB on widened road is admissible to the extent of 3.27m (*i.e. Carriageway of 7.50m less existing road width of 4.23m*). The acceptance of width beyond 4.23m had resulted in inadmissible payment of **Nu. 3,913,692.50** as detailed in **Appendix “D3”**.

The RO, Lobeyasa should immediately recover the inadmissible payment and deposit to Audit Recoveries Account. Besides, the site/supervising engineer should be held accountable for not

regulating the payments as per the drawing and technical specification which had resulted in such inadmissible payments.

Auditee's Response:

In the process of execution of widening work, the existing pavement surface gets damaged by machineries or due to falling boulders during excavation works. Further the existing base course was deteriorated due to heavy traffic movement for which massive rectification of base course work required at the time of actual execution of GSB work on the widened portion as well as 1.5m to 2m on the valley side on some stretches. Nevertheless as the project located on high altitude the existing base course has been weakened due to snow clearance works by machineries. In some locations due to improvement of road geometric the whole road width gets shifted which also attributes in increased of GSB quantity. Therefore the GSB quantity has become higher than what is anticipated. Therefore, please drop the memo.

RAA's Further Comments & Recommendations:

The RAA has taken the width of existing paved road as 4.23m based on the joint physical measurements conducted by RAA team along with DoR officials on the existing road width at Khelekha where widening had not been carried out as of the date of the physical verification. The RO while preparing the estimates had quantified the GSB works based on the requirement of GSB works for paved width of 5.375m indicating flaws in the estimation.

However, as agreed during the audit exit meeting, the DOR and RO keeping the required GSB width as 5.375m should work out the chainages where GSB was provided more than 5.375m and deduct the amount accordingly. The details of chainages where excessive measurements were taken and excess payments made along with recovery or adjustment from RA bills furnished to RAA for verification and record within three months from the date of issue of the report beyond which penalty @ 24% per annum shall be levied as per Chapter IV, Section 4.5.1.4 of the Finance and Accounting Manual 2016.

The DoR and Ministry should constitute a technical team to review estimates and BOQs prepared by the ROs for the pavement works to ascertain flaws, ambiguities and other related problems and come up with appropriate system and mechanism to ensure consistency and reliable cost estimations aligned to specific site conditions for similar projects in future.

The DoR and RO should institute supervision and monitoring controls to prevent unauthorized execution of works in future.

Who is Accountable?

Direct Accountability	: 1. Karchung, JE EID No. 201101239 2. Balaam Acharya, AE I, EID No. 8908099 3. M/s Empire Construction Pvt. Ltd (CDB No. 2206)
Supervisory Accountability	: Garja Man Rai, Ex, CE, EID No. 8212026

9.4 Direct award in violation to the Exclusion Criteria issued on 2nd July 2016 (4.5.21)

In terms of Public Announcement issued on 2nd July 2016, contractors were to be excluded from bidding process who have not fulfilled their contractual obligations with the Department in the past. The following were the exclusion Criteria:

Table 9.4: Exclusion Criteria		
Sl. No	Exclusion Criteria	No. of years of Exclusion
1	Contract terminated for fundamental breach of Contract and/or on completion of the stipulated Liquidated Damages (LD) period - if the works remains incomplete; or Minimum of three Works not completed within Liquidated Damages(LD) period	Three (3) years
2	Minimum of two Works not completed within Liquidated Damages(LD) period	Two (2) years
3	Minimum of one Work not completed within Liquidated Damages(LD) period	One (1) years

It was apparent from the related records that M/s Empire Construction was awarded contract for carrying out the critical widening works especially the 2.5 km cliff of Dzongkhalum by the RO Trongsa based on MoU signed by the Ministry with MHPA on 16th September 2014.

The agreement signed between the RO and the Contractor on 24th April 2015 indicated a contract duration of 16 months ending by 16th July 2016. Further, in terms of MoU, formation cutting was to be completed by end of December 2015 to enable MHPA to transport heavy Electro-mechanical equipment.

On 9th September 2015, due to the unsatisfactory progress at work site even after time lapse of 5 months, meeting was conducted with the contractor and MHPA at DOR Head Quarter where the contractor still gave commitment to finish the work in time as required by MHPA and DoR.

During the visit of Hon'ble Finance Minister on 28th September 2015, MHPA and JPCL reported along with other numerous complaints that unprofessional widening techniques was being adopted by the contractor which is proved by emitting flying boulders into the JP colony located about 300m away due to uncontrolled blasting by the contractor and indiscriminate pushing of muck to the valley side, and possibility of causing the stream to change course and effect the JP colony in times to come. The authority also reported that the contractor will no way complete the FC works in December due to "inexperience and poor technology adopted by the contractor".

It was also noted that even after time lapse of 5 months, the progress made at site was roughly 30% and remaining 70% FC works was bound to remain incomplete within remaining agreed time frame of 3 months for the FC works which was December 2015.

It was evident from the records that the Ministry had favoured the contractor by way of requiring the contractor to surrender the works as failure to complete the FC works within December 2015 was almost certain for which the contractor was liable for compensation payment of Nu.22 million per day as MHPA had categorically informed the floor that loss will have to be borne by the defaulter (contractor).

Considering the failure of the contractor to complete the scope of works within the agreed deadline, the direct award of the contract Package XV on the ground of surrendered contract works was in total violation of the approved Exclusion Criteria issued on 2nd July 2016.

The Ministry should investigate the direct award of work contrary to the approved Exclusion Criteria for appropriate decisions and actions.

Auditee's Response:

As explained above the contract was awarded to M/s Empire Construction in order to compensate the losses the firm has incurred by canceling the contract under MHPA. A copy of letter and note sheet attached for reference. As per the provisional exclusion clause intended to be used by DoR subjected to the approval of Ministry of Finance after one year from the date of collection of contract information, the particular contractor cannot be excluded from award off new contract

since the failure is not from the contractor side. During the tripartite meeting held in Thimphu on 9th Sept. 2015 between the officials of MHPA, DoR & Contractor, it was agreed the contractor will surrender the work to the RO, Trongsa as it is very unlikely that the work would be completed before the start of transportation of heavy electro-mechanical equipment to the project site.

The late completion of work would risk the MHPA project to pay huge demurrage to the transporter.

The direct award was then processed and awarded as per the approved note sheet. Therefore, RAA is requested to drop the memo.

RAA's Further Comments & Recommendations:

Taking note of the response, it is to reiterate that the contract work for Trongsa-Yurmo work was surrendered due to inability of the contractor to complete the work on time and execution of the road widening works with unprofessional techniques like uncontrolled blasting and indiscriminate pushing of muck to the valley side causing the blockage of stream.

Besides numerous complaints from MHPA and JPCL regarding poor workmanship of M/s Empire, the authority also reported that the contractor would no way complete the FC works in December due to "inexperience and poor technology adopted by the contractor".

Considering the failure of the contractor to complete the widening works within the agreed deadline of December 2015, the direct award of the contract Package XV on the ground of surrendered contract works was in total violation of the approved Exclusion Criteria issued on 2nd July 2016.

The Ministry should investigate the direct award of work which was contrary to the approved Exclusion Criteria for appropriate decisions and actions.

Who is Accountable?

Direct Accountability	: 1. Phuntsho Wangdi, Former Secretary, 8403049 2. Dasho Dorji Choden, Former. Zhabtog Lyonpo 3. Namgay Dorji, Former. Finance Minister
Supervisory Accountability	: Dasho Dorji Choden, Former Zhabtog Lyonpo

10 Flaws in evaluation of bids and procurement of Gabion wires from non-responsive bidder and competitive bidding process with resultant extra payments - Nu. 1,267,573.00 (3.1.3)

NIT vide Letter No.DoR/ROL/Plg-15 (A)/2014-2015/3595 dated 15/5/2015 was advertised in the MoWHS website for the supply of hardware items and construction materials for FY 2015-2016. In response to NIT, 10 bidders participated in the bidding process and submitted their offers.

On review of the tender documents, it was noted specifically for Gabion mesh, documents provided 4 different sizes of gabion mesh with same technical specification as shown in table 10.1 below:

Sl. No.	Items	Specification	Unit
247	Gabion Mesh 1.0mx1.0mx1.0m	Wire thickness-2.7/3.7mm, Salvage wire-3.4/4.4 mm lacing wire 2.2/3.2mm (machine made)	Nos.

248	Gabion mesh 1.50x1.0mx1.0m	Wire thickness-2.7/3.7mm, Salvage wire-3.4/4.4 mm lacing wire 2.2/3.2mm (machine made)	Nos.
249	Gabion mesh 2.0mx1.0mx1.0m	Wire thickness-2.7/3.7mm, Salvage /3.7mm, Salvage wire- 3.4/4.4 mm lacing wire 2.2/3.2mm wire 2.2/3.2mm (machine made)	Nos.
250	Gabion mesh 3.0mx1.0mx1.0m	Wire thickness-2.7/3.7mm, Salvage wire-3.4/4.4 mm lacing wire 2.2/3.2mm (machine made)	Nos.

The tender documents and the Evaluation Report indicated that except M/s Bhutan Hardware, Phuentsholing, who had quoted different rates for wire thickness of 2.7mm and wire thickness of 3.7mm, all other bidders had quoted one price each against 4 different sizes irrespective of different specification. It was also apparent from the NIT documents that only one rate was required to be quoted against each sizes of Gabion Mesh.

It was noted that despite existence of flaws in the quoted rates, M/s Bhutan Hardware Phuentsholing was declared and selected as lowest evaluated bidder as his quoted rates for Gabion wire of 2.7mm thickness was declared as the lowest as compared to the single quoted rates of other bidders.

From the records, it was noted that till end of December 2016 the supplier had supplied wire mesh of 2.7mm thickness at his quoted rates based on the supply orders placed by the RO for use in the departmentally executed Gabion works.

Subsequently, in December 2015, the RO had received order/directive through letter No. MoWHS/38/2015/552 dated 16/12/2015 issued by Phuntsho Wangdi, Ex Secretary, MoWHS, on the use of 8 to 10 SWG wire mesh on the basis of strength and durability point of view instead of 12 SWG wire mesh presently being used on all gabion works. The review noted that wire thickness of 2.7mm was equivalent to 12 SWG and wire thickness of 3.7mm was equivalent to 8 to 10 SWG wire mesh.

As the supplier M/s Bhutan Hardware, Phuentsholing had quoted different rates for the wire thickness of 3.7mm, the RO, Lobeysa based on the directive of the Ex-Secretary had notified the supplier for supply of wire mesh of 3.7mm thickness at his quoted rates ignoring the competitive rates of other bidders who had quoted one rate for wire thickness of 2.7mm/3.7mm of different sizes of gabion mesh on the basis of defined technical specification in the tender.

On comparison of the rate of 3.7mm thickness wire of M/s Bhutan Hardware with that of other bidders, it was noted that the rates quoted for gabion boxes were very high except for gabion box 3.0*1.0*1.0m.

The procurement of gabion wire mesh of specification 3.7mm thickness from M/s Bhutan Hardware after the instruction of the Secretary had resulted in extravagant and inadmissible payment of Nu. 1,267,573.00 as computed below:

SI/No	Size	Specification	Qty	Rate paid to M/s Bhutan Hardware	Rate of lowest evaluated bidder	Rate diff	Amount Recoverable	Name of Lowest Evaluated Bidder
1	Gabion Mesh 1.0mx1.0mx1.0m	Wire thickness- 3.7mm, Salvage wire-3.4 mm lacing wire	50	1,357.00	930.00	427.00	21,350.00	M/s Dradhen Ent.

		2.2mm (machine made)						
2	Gabion mesh 1.50x1.0mx1.0m	Wire thickness-3.7mm, Salvage wire-3.4 mm lacing wire 2.2mm (machine made)	955	1,797.00	1,280.00	517.00	493,735.00	M/s Tshering Trading
3	Gabion mesh 2.0mx1.0mx1.0m	Wire thickness-3.7mm, Salvage wire-3.4 mm lacing wire 2.2mm (machine made)	994	2,497.00	1,745.00	752.00	747,488.00	M/s Tshering Trading was lowest bidder
			1,999				1,262,573.00	

The audit is of the view that technical specification provided for the gabion mesh by RO, Lobeysa was technically correct as either of 2.7mm thickness wire or 3.7mm thickness can be used at site. Further, the RO, Lobeysa had used the wire 2.7mm thickness till December 2016 and no report regarding the poor strength, durability and performance were reported and available on records. On enquiry, it was informed by the RO that use of 2.7mm thickness of wire mesh suffice the requirement in terms of quality of gabion box. In addition, it was noted that all gabion works executed by the contractors of various contract packages were to use gabion wire mesh thickness of 2.7 mm irrespective of the height of gabion walls as per technical specification provided in the BOQ of the contract documents. This also indicated that the use of wire mesh thickness of 2.7mm for gabion works were satisfactory in terms of strength, durability and performance.

Thus, the sudden change effected by the Secretary by directing RO, Lobeysa to use 8 to 10SWG wire mesh for gabion works in place of existing 12 SWG wire mesh and procurements at rates higher than the lowest quoted rates indicated existence of possible corrupt practices.

The Ministry should investigate the circumstances leading to sudden change in the use of wire mesh thickness from 2.7mm to 3.7 thickness without the actual complaint for strength, durability and performance from ROs and procurement from M/s Bhutan Hardware, P'ling despite the quoted rates of other bidders being much lower than of the said firm as well as non-amendment of technical specification of gabion works executed by the contractors.

Besides, the Ministry should recover the cost difference of Nu.1,267,573.00 from either the officials responsible for procurement at higher rates or M/s Bhutan Hardware, P'ling and the amount recovered and deposited into ARA. In addition, the Ministry should fix the accountability on the officials for violations and lapses for appropriate actions.

Auditee's Response:

Basically, DOR used standard gabion mesh which was 2.70mm thickness and accordingly the rates quoted. The materials supplied and rate quoted were meant for 2.70mm thickness only. However, after the receipts of Hon'ble Secretary Note vide order No. MoWHS/38/2015/552 dated 16.12.2015, the gabion mesh with 3.70mm was made to be used compulsory for strength and durability. Herein, all the responsive suppliers were informed verbally for acceptance of their rates for supply of 3.70mm thickness wire mesh but all denied. The Bhutan Hardware Agency was also asked to supply 3.70mm thickness wire mesh though denied in the beginning but negotiated to supply with their already quoted rates. Considering the limited time and taking due diligence,

the supply of gabion mesh were decided to be awarded to Bhutan Hardware Agency. Therefore, the memo may kindly be dropped.

RAA's Further Comments & Recommendations:

While taking note of the response, the fact remains that there were flaws in evaluation and selection of lowest evaluated bids. It is to reiterate that M/s Bhutan Hardware had quoted two different rates as against single rates by other bidders on the basis of format attached with the tender documents. The selection and award of supply contract to a non-responsive bidder lacked transparency, fairness and competitive bidding process. In addition, the single rates quoted by other prospective bidders as per tender specifications of varying gabion wire sizes were much cheaper than the quoted rates of M/s Bhutan Hardware for gabion mesh of 3.70mm thickness which had resulted in extra payments to the extent of Nu.1,267,573.00.

The Ministry should investigate the evaluation process and rule out the existence of collusive practices as the Evaluation Committee had failed to declare M/s Bhutan Hardware as non-responsive bidder as the rates quoted were not in conformity with the specification given in the format attached with the tender documents. The rates of the firm for various sizes of gabion wire were not comparable with the single or average quoted rates for the two gabion wire thickness as required in format by other bidders. Besides, the Ministry should also investigate on the sudden change of specification from 2.70mm to 3.70 mm thickness without any complaints from ROs against strength, durability and performance and procurements from M/s Bhutan Hardware despite the fact that in terms of quotations obtained, single quoted rates of other bidders were much cheaper.

The Ministry besides recovering the extra payments and depositing into ARA should take appropriate actions on the officials responsible for such decisions and lapses. The Ministry should also institute appropriate control mechanism over the tendering, evaluations and procurements to curb such lapses in future.

Who is Accountable?

Direct Accountability	: 1. Jigme Chodup, PE, EID No. 8707045 2. Sanjay Kumar Bomzan, JE, EID No. 20130101904 3. Ganga Maya Acharya, ADM, EID No. 9104055 4. Tika Maya Acharya, Road Inspector, EID No. 201006027
Supervisory Accountability	: Garja Man Rai, Ex Chief Engineer, EID No. 8212026

11 Irregularities in the Procurement of Gabion box at the end of the FY with resultant adverse financial implications - Nu. 396,000.00 (3.1.3)

As evident from supply order No. DoR/ROL/2014-2015/Plg-08/3827 dated 30/6/2015, the RO had procured gabion box of different sizes valuing Nu. 8.876 million from M/s Bhutan Hardware Phuentsholing based on the existing rates at the fag end of the fiscal year 2014-2015 as detailed shown in table 11.1 below:-

Sl. No.	Particulars	Qty.	Rate (Nu.)	Amount (Nu.)
1	Gabion Mesh 1.0mx1.0mx1.0m . Wire thickness-2.7/3.7mm, Salvage wire-3.4/4.4 mm lacing wire 2.2/3.2mm (machine made)	1100	1,387	1,525,700.00

3	Gabion mesh 2.0mx1.0mx1.0m .Wire thickness-2.7/3.7mm, Salvage /3.7mm, Salvage wire-3.4/4.4 mm lacing wire 2.2/3.2mm wire 2.2/3.2mm (machine made)	850	1,747	1,484,950.00
4	Gabion mesh 3.0mx1.0mx1.0m .Wire thickness-2.7/3.7mm, Salvage wire-3.4/4.4 mm lacing wire 2.2/3.2mm (machine made)	750	2,487	1,865,250.00
Total				4,875,900 .00

It was noted that supply order for the said procurement was issued on the last date of the fiscal year 2014-2015 i.e. as on **30th June 2015** and the payments were found released during FY 2015-2016 vide DV. No. 8.111 of 26/8/15 and DV. No. 8.113 of 27/8/15.

On review of the tender related records, it was noted that just before placing of the supply order No. DoR/ROL/2014-2015/Plg-08/3827 dated 30/6/2015, the quotations on the supply of materials for FY 2015-2016 was found floated on 15th May 2015 and was suitably **opened on 15th June 2015**. Thus it was apparent that the RO was well aware of the rates of the prospective bidders for fiscal year 2015-2016 prior to issuance of the supply order dated 30th June 2015.

On comparison of the quoted rates for the gabion boxes for fiscal year 2014-2015 and 2015-2016, it was noted that the rates for fiscal year 2014-2015 was found much higher than the quoted rates of the fiscal year 2015-2016. Thus, the procurement of the gabion box at the quoted rates of the fiscal year 2014-2015 had resulted into excess payment of Nu.396,000.00 to the supplier as shown in table 11.2 below:

Sl no	Items	Qty (No)	Quoted rate 2014-2015		Quoted rate FY 2015-2016		Difference Nu.
			Rate Nu.	Amount Nu.	Rate Nu.	Amount Nu.	
1	Gabion box 1.5*1*1	1100	1,387.00	1,525,700.00	1,187.00	1,305,700.00	220,000.00
2	Gabion box 2*1*1	850	1,747.00	1,484,950.00	1,637.00	1,391,450.00	93,500.00
3	Gabion box 3*1*1	750	2,487.00	1,865,250.00	2,377.00	1,782,750.00	82,500.00
							396,000.00

The placing of supply order at the close of the fiscal year (30/6/2015) and that too at the higher rates despite knowing the quoted rates for the fiscal year 2015-2016 was lower than the earlier selected rates was a deliberate action to favor the supplier.

The RO, besides investigating the grounds of procurement at the last date of the fiscal year subsequent to opening and knowing the quoted rates of material for the fiscal year 2015-2016 was lower/cheaper should recover the extra payment of Nu. 396,000.00 either from supplier or officials responsible for such unwarranted action and deposited the same into ARA. The Ministry should also investigate and take appropriate action on the concerned officials for such lapses.

Auditee's Response:

Generally the availability of balance is best known towards the end of financial year, and returning back the sanctioned, sometime affects the performance of the regional office. Therefore, in order to utilize the balance fund, RO prioritizes the activities and the materials to be required are procured from the saving.

Since the materials (Gabion boxes) are procured through open tendering process in different Financial Years (2014-2015 & 2015-2016), it is obvious that there will be fluctuation in the rates due to the competition of the suppliers and market's volatility. RO do not have such intention to

provide undue advantage to one particular supplier/bidder, neither RO could predict the rate of the supplier in the market.

The materials were procured in different FYs based on its requirement at the work sites. RO will take note of RAA observation and pursue further with the Department of Directorate Service, DoR in the Ministry to streamline the procurement process. Therefore, based on above justifications, RAA is kindly requested to drop the memo.

RAA's Further Comments & Recommendations:

Taking note of the response, the fact remains that supply order was issued deliberately on 30/06/2015 after knowing the quoted rates of FY 2015-2016 which was lower than the rates of FY 2014-2015 which resulted in avoidable extra financial implication of Nu. 396,000.00 to the Government Exchequer.

The Ministry besides investigating the matter for possible collusive practices should recover the extra cost of Nu. 396,000.00 from accountable persons/supplier and the same deposited into ARA within three months from the date of issue of the report beyond which penalty @ 24% per annum shall be levied as per Chapter IV, Section 4.5.1.4 of the Finance and Accounting Manual 2016.

The Ministry should also institute appropriate control mechanism over the procurements of goods and services to curb such unethical practices and lapses in future.

Who is Accountable?

<i>Direct Accountability</i>	<i>: Garja Man Rai, Ex CE, EID No. 8212026</i>
<i>Supervisory Accountability</i>	<i>: Garja Man Rai, Ex CE, EID No. 8212026</i>

PART C: FINDINGS OF RECOMMENDARY NATURE WITHOUT ACCOUNTABILITY

The audit findings under this section of the report contains those issues, which are recommendatory in nature and intended to bring improved compliances through appropriate interventions and as such no accountability has been fixed for the findings. However, in the event the DOR and the Ministry do not take measures and actions on the recommendations within three months’ time from the issue of the report, as agreed during the exit meeting, the RAA would fix the accountability for appropriate action.

12 Award of three packages of work to M/s Chogyal Construction Pvt. Ltd (Package I, II and III) from Dochula to Chasagang and lapses in deployment of Human Resources and equipment for each package and liable penalty - Nu. 10,292,197.13

On review of documents relating to the tenders, evaluations reports, awards of contracts estimates, Bills of Quantities (BOQs) and Running Bills including Pre-construction decisions, Minutes of Meetings, the Royal Audit Authority observed the following irregularities, lapses and deficiencies:

12.1 Execution of works not as per approved specification with resultant inadmissible payment - Nu. 464,605.66

Standard drawing for the French drain showed 50-100mm stone fill instead of GSB as per detail cross section of the French drain as depicted in the drawing below:

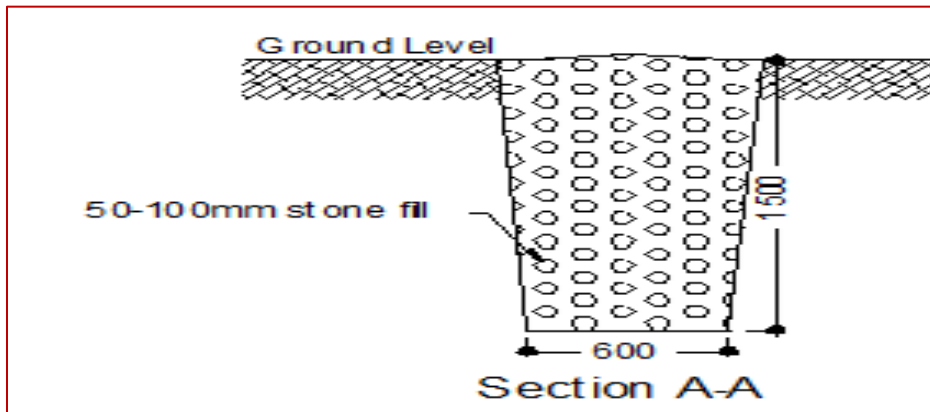


Fig:12: Approved drawing for French drain

In contrary to the drawing and the specification, the contractor was paid for execution of GSB and sub grade preparation valuing Nu.464,605.66 which was beyond the scope of work. The details of work done and payments made are shown in table 12.1 under:

Table 12.1: Payment made for French drain				
Sl. No.	Particulars	Total qty.	Rate (Nu.)	Amount (Nu.)
1	Sub-grade	421.22	50.00	21,061.00
2	GSB	421.22	1053.00	443,544.66
Total				464,605.66

Further, audit team could not understand the reasons why GSB was replaced instead of stone fill which acts as filter media. The material used in GSB are natural sand, moorum, gravel, crushed

stone or combination thereof depending upon the grading required and there will be no voids for ground water to flow freely. Thus, use of GSB in French drain to drain off the underground water was not correct.

The Regional Office, besides commenting on the execution of GSB and payment thereof in deviation to the approved drawings should recover the inadmissible payment of Nu.464,605.66 from either the contractor or officials responsible for the deviations and the amount deposited into Audit Recoveries Accounts (ARA).

Auditee's Response:

It was during trenching of Subgrade in Menchuna area about five to six location there were emergence of ground water in the trench. Soon after subgrade trenching the trench were filled by underground water. There was no possibility of trench getting dried due to presences of underground water. As an immediate solution we have instructed to provide French drain to lower ground water table to keep the subgrade dry and subsequently consolidation of subgrade. For construction of French drain was paid to contractor at the rate of GSB as GSB item.

As Audit has pointed out GSB materials and French drain materials are different in character and its function. However, we had constructed with French drain specification (coarse materials only). By doing and paying to contractor at GSB rate actually we had saved some amount if not we would land up paying contractor at higher rate, which worked out Nu. 2,395.90 per metre

(French drain size of 1.00mx1.50m) 2015 BSR i.e without cost index amounts to Nu. 10,57,121.27 and whereas GSB quoted rate was Nu.1053.00 cum amounts to nu.4,64,605.66 and there is net saving of Nu. 5,92,515.61.



Therefore, memo may be kindly dropped.

RAA's Further Comments & Recommendations:

The response and the justification provided in discussions during audit exit meeting on the actual use of coarse materials of 50-100mm stone fill during execution, however paid for GSB item since

the item was present in BOQ and cost saving thereon, have been noted. However, the fact remains that work done and item paid are of different works which it technically incorrect and to be noted in future.

However, as agreed in the exit meeting, DoR, Lobeyssa should furnish assurance letter certifying that the use of coarse materials were as per technical specifications and would not pose any damages to the road in future.

The Ministry and DOR should institute appropriate monitoring controls over the execution of works to ensure that execution and payments are regulated as per technical specification and hence avoided such lapse in the future construction works.

12.2 Execution of defective and substandard works on various stretches of road

During the site visit and verification of the executed works already taken over by the Regional Office, Lobeyssa, the RAA noted formation of alligator cracks and depression of edge of roads at several stretches of road due to laying of pavement on unstable filled-up areas. The existing condition of newly constructed roads as noted during physical verification are depicted in the photographs below:

Fig: 12.2-Inferior masonry works



Fig: 12.2.1-Execution of Defective and substandard pavement works



Considering the magnitude of damages occurred at site, the assessment was carried out based on physical length of damages and found that out of total scope of work, at least 538.99m, had been badly damaged within short span of time since its completion and taking over of work on **20th October 2016**.

The Ministry should depute appropriate technical team(s) to thoroughly conduct inspection of the road conditions for all the completed works to ascertain the extent of defective and substandard

works taken over by the Regional Office, Lobeyasa. In addition, such timely inspections of the road conditions would facilitate the Ministry to hold the contractors accountable and redo the works at the cost of the contractors. Besides, the Ministry should also hold the officials accountable for not only allowing execution of defective and substandard works but also taking over without proper inspections and verifications of road works which had led to deterioration of road conditions within a short span of time.

Auditee's Response:

Early occurrence of defects on the road pavement on various locations are because of following reasons:

- *Sinking of Road edge has taken place due to settlement in the stretches of unstable geological conditions.*

The road surface cracking is attributable to:

- *Constant moisture content in the base of pavement, which reduces bearing capacity of soil.*
- *Subjected to excessive axle load due to movement of heavy and super heavy vehicles.*
- *Transportation of heavy equipment as heavy as 130 tones transformer of PHPA-I, PHPA-II and MHPA, while on movement such vehicles create lots of vibration in the surrounding which let to rearrangement of subsoil eventually failure take place in monsoon time (photo attached above as an evidence).*

Road surface deteriorates due to freezing and thawing action in high altitude that leads to premature failure of pavement by developing alligator cracks. Please drop the memo.

RAA's Further Comments & Recommendations:

The defects on newly constructed road is a proof of poor quality of road works and workmanships that led to early development of crocodile cracks and depression and also indication of lack of adequate supervision and monitoring of works by the site engineers.

However, as agreed in the audit exit meeting, the DoR should direct the RO to rectify the defective works and correct the depression/undulation areas departmentally if defect liability period was over.

Further, DOR should come up with proper control mechanism to oversee that Site Engineers adequately monitor and supervise the works executed by the contractors to ensure quality of works and facilitate timely detection and rectification of defective and substandard works within the defect liability periods at the cost of the contractors. The control mechanism and measures put in place should be intimated to RAA for record and follow up in future.

12.3 Execution of defective works - Nu. 158,382.00

Lined drain under package I measuring 126m worth Nu.158,382.00 (*126m @ Nu. 1,257.00*) was found in dilapidated condition, worn-out of cement plaster on plum concrete and exposing aggregate on the PCC pad probable due to the following problems:

- Weak cement ratio
- Inadequate curing/Curing less than 28 days

- Not compacted thoroughly and completely worked in to the corners of formwork



Fig:12.2(2)-Drain in dilapidated condition- cement plaster on plum concrete worn-out and exposing aggregate on the PCC

The Regional Office besides furnishing appropriate justification for taking over of defective works depicted in the photographs must recover the related cost and initiate rectification of the damages promptly. Further, the Regional Office must hold the site engineer/responsible officials accountable for the failure to appropriately supervise and monitor the execution of works which had led to execution and taking over of defective works.

Auditee's Response:

Although works were executed as per technical specification and required quality, the defects has appeared due to freezing action since the location of the work site is at high altitude.



Para:12.3 -DRAIN CONSTRUCTION

The contractor had repaired the defects but it has again developed the same failure as the reason stated above. Therefore, memo may be kindly dropped.

RAA's Further Comments & Recommendations:

While taking note of the response that the defects have occurred due to freezing action, there is no documentary evidences on rectifications carried out by the contractor as well as study carried out validating that the defects were due to freezing action.

In addition, the drains have remained un-rectified defeating the very purpose of providing drains. As discussed during the exit meeting, the RO, Lobeysa in consultation with DoR should come up with effective means to construct drains in higher altitude areas to prevent damages due to freezing action and cost to the governments for continuous rectifications works within and after defect liability periods. The remedial measures put in place should be intimated to RAA for record and follow up in future.

12.4 In admissible and non-recovery for the cost of bitumen and other irregularities for payment of damaged pavement works

12.4.1 Non-inclusion of Insurance coverage for loss of or damaged of bituminous related works with resultant non-recovery for the cost of bitumen

In terms of Clause 14, the contractor was to provide in the joint names of the Employer and contractor, insurance cover from the Start Date to the end of the Defects Liability Period in the amounts and deductibles stated in the SCC for Loss of or damage to the works, plant and materials. The SCC (GCC14.1) also stipulated insurance coverage for Works, Plant and Materials as “minimum insurance amount-Contract Price”.

It was noted that the contractor had insured Works, Plant and Material for the minimum contract amount only. Thus, insurance cover did not cover the cost of bitumen that were issued by the Regional Office. However, the details of issuance coverage along with premium paid by the contractor for the three packages vis-à-vis compensation payments by the Bhutan Insurance Limited (BIL) were not furnished for verification.

It was apparent from the records that insurance claims and compensation payments received by the contractor were solely used by the contractor as the RO had not deducted the cost of bitumen although the claims and compensation pertained to bituminous works where the RO had issued free bitumen.

In the event cost of bitumen was insured, the RO should recover the cost of bitumen from the contractor as the compensation from the BIL were entirely taken by the contractor as well as those cost of bitumen reissued for redoing the rectification works.

If the cost of bitumen is not insured, the RO should comment on the circumstances leading to non-insurance of the cost of bitumen by the contractor as bituminous works are executed by the contractor and damages and loss to works are contractor risks. Besides, the RO in consultation with the Ministry should comment on the course of measures put in place to safeguard against such loss of the ongoing works.

In addition, the Ministry should look in to the desirability of stopping the issue of bitumen free of cost but issuance with realization of cost at frozen rates. Such change of methodology would not

only prevent misuse of bitumen by the contractors but also prevent incurring substantial losses to the government with the existing system for similar future projects.

Auditee's Response:

As per the NEWH contract document, the bitumen shall be issued by the employer and the contractor should quote for doing the work only. The contract amount is exclusive of the cost of bitumen. The contractor had insured the work based on the contract amount which is excluding the cost of bitumen. Therefore, recovery of bitumen for redoing of pavement from contractor's insurance claim would not be correct.

As explained under memo no.10.10.1, the MLTC has decided to pay the contractor for redoing the work, the recovery of bitumen from the contractor does not arise. Also the contractor is paid at the rate quoted without the cost of bitumen.

It is also to inform RAA that issuance of bitumen free of cost has increased the work load of the field engineers. Therefore, the RO will submit our report to the department/ministry and suggest including the cost of bitumen in the rate analysis. However, such type of lapses is noted seriously for future works and would like to thank RAA for making such observation. The RO in consultation with Department will explore the probabilities to recover the bitumen cost in future works. Hence memo may be kindly dropped.

RAA's Further Comments & Recommendations:

While taking note of the response, the fact remains that the compensation obtained by the contractor from Bhutan Insurance Ltd. (BIL) pertaining to bituminous works were solely used by the contractor as the RO had not deducted the cost of bitumen although RO had issued free bitumen.

However, as discussed during the exit meeting, the DOR and the RO in consultation with the Ministry should come up with concrete measures and procedures to address such flaws in the tender and contract documents which had led to non-insurance of bitumen by the contractor as the contract value insured did not include the cost of bitumen. Thus, the Government had sustained substantial financial loss to the extent of cost of bitumen not covered under insurance despite the fact that the damages of bituminous works were found due to poor workshop and non-execution of work as per technical specifications by the contractors.

The loss sustained by the Government on damaged bituminous work due to flaws in the tender and contract documents is brought to the notice of the Government.

13 Irregularities noted in the construction of Pavement works for Double Lanning of Northern East-West Highway from Chasagang to Wangdue (Package IV) by M/s Singye Construction Pvt. Ltd.

The road pavement works from Chasagang-Wangdue (Ch: 447-436 Km) covering a distance of 11 Kilometers was awarded to M/s Singye Construction Pvt. Limited, Thimphu holding trade license No.1008251, CDB No.2148 being the lowest evaluated bidder vide work order No. DoR/ROL/Plg-15/2015-2016/121 dated 23rd July, 2015. The contract amount, estimated cost and other important details of the contract were as indicated below:

i.	Estimated Amount	: Nu.127,642,926.26
ii.	Contract Amount	: Nu.107,120,422.00
iii.	Contract Duration	: 15 months
iv.	Start Date	: 4 th August, 2015

- v. End date : 26th October, 2016
- vi. Actual Completion date : 27th December, 2016
- vii. Actual cost of construction : Nu.116,924,355.82

Scrutiny of tender documents, final bills disbursed under voucher No.DV. 8.97 dated 31/8/2017 with reference to tender documents, MB and also joint verification of site conducted on **29th September 2017 & 2nd October 2017** revealed the following lapses:

13.1 Taking over of Defective works - Nu.1,682,352.94

The Contractor was paid Nu. 10,477,311.00 (8059*Nu.1,300) for the construction of L-shaped drain. The physical verification conducted on 5/10/17 revealed peeling off of cement works about 2 Kms due to the followings:

- Use of Weak cement ratio in contrary to specification
- Inadequate curing/curing less than 28 days
- Not compacted thoroughly and completely worked in to the corners of formwork

Photographic evidence of such defective work is depicted below:



Fig:13.1- Defective drain work

The total value for the defective L-drain works for 2 kms worked out to Nu. 1,682,352.94 as shown below:

Table 13.1: Amount of defective L-drain			
Description of item	Volume	Rate	For defective 2km
Plum concrete	0.09	1300	
PCC pad	0.165	1300	
Total volume	0.255		
Percentage Cost breakdown			
Plum concrete	35.29%	458.82	
PCC pad	64.71%	841.18	1,682,352.94

The Regional Office should comment on the taking over of defective works besides directing the contractor for immediate redoing of the defective works. The Regional Office should also hold the site engineer accountable for failure to adequately monitor and supervise the works as well as taking over of such defective works. In addition, the Regional Office may comment on the monitoring mechanism instituted to identify defects for the completed and taken over works to rectify the defective within the defect liability periods.

Auditee's Response:

We would like to express that the defective L-drain is not 2km as mentioned in the memo but has occurred only in few stretches. We would further like to appraise that it is not due to faulty construction but the drain surface was slightly pilled off due to splashing of rainwater at initial stage when PCC had not fully cured. Further, rough surface has appeared on the surface due to vehicle that has overrun on the PCC surface in the turning areas only. It is not because of water cement ratio deficiency as concrete base is still intact. However, the contractor has rectified the defects as shown in the photographs below.



REPAIR OF DEFECT L-DRAIN



Therefore, please drop the memo.

RAA's Further Comments & Recommendations:

The rectification of defective drain works is noted. However, it is to reiterate that rectification of defective and substandard works on the instant of audit verification of sites is an indication of laxity on the part of the RO and Site engineer toward works and procedures. It was apparent that the contractor would have been paid for defective and sub-standard works if not observed by RAA.

However, as agreed during the exit meeting, the DoR and RO should institute strict supervision and monitoring controls to prevent execution and acceptance of defective and sub-standard works in future. The control mechanism proposed to be put in place intimated to RAA for record and follow-up during future audits.

14 Deferral of contract beyond the contract deadline, excess payment and other lapses in widening and pavement work from Langkena-Tekizampa (Package V) by M/s Etho Metho Construction Pvt. Ltd and liable liquidated damages - Nu. 8,096,590.53

The widening and pavement work under Chainage 429km - 422km, Wangdue to Chuserbu (Package V) was awarded to M/s Etho Metho Construction Pvt. Ltd, Thimphu holding trade license No.1000518, CDB No.1784 at the lowest evaluated bid vide work order No. DoR/ROL/Plg-15/2015-2016/22 dated 23rd July 2015. The contract amount, estimated cost and other important details of the contract were as indicated below:

i.	Estimated Amount	:	Nu.74,111,156.94
ii.	Tendered Amount	:	Nu. 72,680,325.47
iii.	Additional work amount	:	Nu. 8,285,579.87

iv.	Revised contract Amount	:	Nu.80,965,905.34
v.	Start date	:	5 th August, 2015
vi.	Due date of completion	:	26 th March, 2017
vii.	Revised contract deadline	:	26 th May, 2017
viii.	Contract duration	:	20 Months
ix.	Work Status	:	On-going

- *Additional work such as Gabion wall, RRM wall and culvert extension were estimated based on BSR 2015 with addition of cost Index of **14.66%** arriving at total value of Nu.8,285,579.87. The work was approved under the variation order DoR/ROL/2015-2016/Plg-37/1900 dated 2/06/2016 increasing the scope of work and revised the contract deadline till **26th May 2017**;*
- *So far as appeared from the sub ledger, 7th running account bill valuing Nu.37,514,473.31 was disbursed which accounted **51.62%** of initial contract value, **46.34%** of revised contract value.*
- *The night working allowance i.e 15% approved under the order MoWHS/Sec-29/2015-16/524 dated 16th October 2015 for the formation cutting work aggregating to Nu.1,367,526.49 was paid till date, which accounted **1.88%** of initial contract value.*

Detailed verification of drawings, estimates, bill of quantities, contractor's bill, technical specifications and physical verification of site on **9th October 2017** revealed over payments and other irregularities as discussed under:

14.1 Non-execution of Gabion Wall as per drawing and technical specification

The specification for construction of gabion wall stipulated as under:

“Construction of Gabion Wall, height up to 2m with dry stone masonry (hammer dressed facing) including delivery of materials, weaving of gabion mesh with GI wire 2.7mm dia, fixing of selvedge, binding/lacing wire 2.4mm dia”.

All gabions shall be machine made. The wire shall be woven into hexagonal mesh with minimum of 3 twists. All edges of crates shall be finished with a selvedge wire at least 3 gauges heavier than mesh wire.

Diaphragms shall be manufactured of same materials as the parent gabion box and shall have selvedge wire through perimeter. The number and size of diaphragms to be provided with each crate shall be as in Table 15.1. All crates shall be supplied with binding and connecting wire of same gauges shown in Table 15.2 of sufficient quantity to bind all diaphragms and closing edges. The specified mesh opening was 114 X 128 and the specified mesh type was 100 X 120 as shown in the in the table below:

Mesh opening (mm)	Mesh Type	Thickness of mesh wire	Thickness of binding and connecting wire	Thickness of selvedge wire
(DXH)		SWG	SWG	SWG
83X114	80X100	9,10,11	11,12,13	6,7,8
114X128	100X120	10,9	12,11	7,6

The mesh opening shall be as instructed by the site engineer

SWG	6	7	8	9	10	11	12	13	14
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MM	4.88	4.77	4.06	3.66	3.25	2.95	2.64	2.34	2.03
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During the physical verification of executed works, it was noted that while the dimensions of mesh provided were found correct, the weaving of GI mesh, fixing of selvedge wire, binging/lacing were of poor quality and workmanship and did not comply with the technical specifications.

In addition, GI wire was found to be of inferior quality as the mesh was found rusted indicating that the materials were not galvanized resulting in lower durability. Un-galvanized wire is vulnerable to weather and rusting. Low quality wire mesh used and poor workmanship is as depicted in the photograph below:



Fig: 14.1: Rusted mesh wire

The above pictorial evidences indicated existence of inadequate supervision and monitoring controls over the execution of works by the Site Engineer and Regional Office. The acceptance and taking over of poor quality or substandard works despite investment of huge Government scarce resources indicated laxity on the part of the Regional Office to enforce execution of work as per technical specifications.

The Ministry should institute a dedicated technical committee to thoroughly inspect and certify all completed works including use of BSB certified gabion wire mesh as per technical specification to prevent taking over of poor quality and defective works from the contractor. Besides, the Ministry must fix the site engineer accountable for such unwarranted lapses and direct the contractor immediately to redo the defective and substandard works and rectification carried out intimated to RAA for review and records.

Auditee's Response:

The contractor was informed to rectify the gabion wall with specified gabions mesh. The contractor had successfully rectified the defective gabion wall. The concerned site engineer was warned to be cautious while handling such works in the future. The pictorial evidence of the rectified structure is attested below for reference, please. Therefore the memo be kindly dropped.

RAA's Further Comments & Recommendations:

While taking note of the response on the replacement of rusted wires with a new one, the RO should obtain copies of challans/company certificate on the procurement of wire mesh by the contractor to validate that the gabion wires were purchased from authorized dealer and the same produced to RAA for verification and records.

As agreed during the exit meeting, the DoR and RO should institute appropriate control mechanism including supervision and monitoring process to ensure that materials procured are as per specification and from BSB authorized dealer, quality of workmanship maintained and defective works are not accepted in future.

14.2 Non-execution of RRM walls as per drawing and technical specifications - Nu. 35,679.38

On physical verification of RRM walls at site, it was noted that specified 100 mm thickness of top PCC coping in mix ratio of 1:5:10 was not achieved as the physical measurement of work executed indicated thickness of only 50mm. Thus the works were not executed as per drawing and technical specification indicating that quality of work was compromised. As a result of which, the quantum of PCC work was inflated and paid for to the extent of thickness not achieved.

It was also indicative that the payments to the contractor were made without proper verification of admissibility of claims by site engineer. The extent of work not executed as per technical specification amounted to Nu.35,679.38 as computed in table 14.2 below:

Table 14.2: Overpayment for PCC coping															
Particular	As per contractor's bill					As per physical verification					Diff. in Qty. cu.m	Rate (Nu)	Amount (Nu)		
	No.	L	B	H	Qty. in cu.m	No.	L	B	H	Qty. in cu.m					
Top PCC coping	1	122.4	0.76	0.1	8.5424	1	122.4	0.76	0.05	4.65	3.89	3601.34	14,013.53		
Top PCC coping	1	38	0.7	0.1	2.66	1	38	0.7	0.05	1.33	1.33	3601.34	4,789.78		
Top PCC	1	126.7	0.74	0.1	9.37	1	126.7	0.74	0.05	4.69	4.69	3601.34	16,876.06		
Total Qty.					20.57						10.67				
Qty. variation in % (physical Qty/contractor claims*100)					51.85										
Total														35,679.38	

The Regional Office besides commenting on the non-execution of work as per drawing and technical specification should direct the contractor to redo the works. In the event the Regional Office take over the works as actually constructed at site without rectification, the Regional Office should comment on the designing of the initial drawing with technical specification for such item of works as it would construe design flaws as execution with 100mm thickness were not required at site. Besides, the Regional Office should also fix responsibility on the officials responsible for such lapses.

Auditee's Response:

The retaining wall PCC coping 100m thick was supposed to be constructed but only 50mm thick was constructed due to oversight. The official involved is warned for not adhering to the proper specification and drawings. However, Nu. 35,679.38 recovered and shall be intimated to RAA. Therefore, please drop the memo. Details of MB for recovery made is attested.

RAA's Further Comments & Recommendations:

The recovery of cost for work not executed as per technical specification is noted. However, it is to reiterate that the site engineer had failed to properly cross check the claims with that of actual work done at site. It also indicated entertainment of RA bills without actual verification of site and measurements as required under technical norms and financial rules and regulations (FRR). It

was apparent that the contractor would have been paid for defective and sub-standard works if not observed by RAA.

However, as agreed during the exit meeting The DoR and RO should institute strict supervision and monitoring controls to prevent execution and acceptance of defective and sub-standard works in future. The measures and procedures proposed to be put in place intimated to RAA for record and follow-up during future audits. Besides, the recoveries affected and accounted for in the books of accounts should be furnished for RAA's review and record.

14.3 Execution of substandard WMM works - Nu. 853,997.43

In terms of MB # 60, page No. 077 and 078, 453.15m³ of WMM materials valuing Nu.853,997.43 (453.15m³ @ Nu. 1,884.58 were reflected as laid quantity. However, the site visit and verification of the WMM works indicated execution of inferior/defective works through use of oversized WMM materials which were not as per the technical specification. The existing condition of newly executed WMM works roads as noted during physical verification is depicted in the photograph below:



Fig: 14.3: Defective WMM works

The details of valuation of defective work has been worked out in **Appendix “E”**.

The RO should comment on the execution of inferior/defective WMM works despite deployment of site engineer for overseeing the work. Besides, the RO must direct the contractor immediately to rectify the defective work prior to laying of DBM and AC. Besides, appropriate test should be carried out to see that the works executed conform to the technical specification and results intimated to RAA. The Contractor including the site supervisor should be held accountable for the failure to execute the work as per technical specification which would tantamount to time overrun to the extent of time taken to redo the works.

The Ministry in addition to the already instituted two member monitoring team should depute appropriate technical teams to thoroughly conduct inspection of the all ongoing road works and road conditions for all the completed works to ascertain the extent of defective and substandard works taken over by the Regional Office, Lobeysa. In addition, such timely inspections of the road conditions would facilitate the Ministry to hold the contractors accountable and redo the works at the cost of the contractors. Besides, the Ministry should also hold the officials accountable for not only allowing execution of defective and substandard works but also taking over without proper inspections and verifications of road works.

Auditee's Response:

The payment to the contractor for the substandard works was withheld till the contractor rectified the works with required WMM materials with proper specification. The copy of photographic evidence for rectified WMM works shown below for reference. Therefore, please drop the memo.

RAA's Further Comments & Recommendations:

The rectification of defective WMM works is noted. However, it is to reiterate that rectification of defective and substandard works at the instance of audit verification of sites is an indication of laxity on the part of the RO and Site engineer towards works and procedures. It was apparent that the contractor would have been paid for defective and sub-standard works if not observed by RAA.

The Ministry should institute appropriate technical teams to thoroughly conduct inspection of the all ongoing road works and road conditions for all the completed works to ascertain the extent of defective and substandard works taken over by the Regional Office, Lobeysa.

However, as agreed during the exit meeting, the DoR and RO should institute strict supervision and monitoring controls to prevent use of inferior quality materials in future. The control mechanism proposed to be put in place intimated to RAA for record and follow-up during future audits.

15 Irregularities noted in construction of Pavement works for Double Lanning of Northern East-West Highway from Tekizampa to Khelekha (Package VI) by M/s T.T Construction Pvt. Ltd

15.1 Execution of Substandard works and unrectified damages

A joint team comprising officials from Regional office, DoR, Lobeysa and the audit team had conducted the physical verification of sites on 11th October 2017. During the physical verification, the team noted execution of substandard works on the following items of works as well as damages by the monsoon slides along Tekizampa-Khelekha road:

Item Code	Descriptions of items	Qty.	Rate (Nu.)	Amount (Nu.)	Remarks
SM0007	Providing & Laying Random Rubble Masonry with hard stone in foundation & plinth in Cement Mortar 1:6 • [Culvert 12, Catch pit 4 Ch. 418 km, Catch pit 6 Ch.417 km, 2 nd Panel Ch.412.20km]	= (2.29 + 5.98+ 4.51+ 64.9) = 77.68m ³	2,000.00	155,369.00	
RC0013	Providing & Laying in position reinforced cement concrete 1:1:2 work in suspended floor, roofs, having slope upto 15 ^o , landings, balconies, shelves and chajas upto floor five level excluding the cost of centering & shuttering and reinforcement. - Slabs: 17 Culvert	2.22m ³	8,339.68	18,514.00	
Total				155,388.00	

The execution of substandard and damaged Random Rubble Masonry walls are apparent from the pictorial evidences as depicted under:



Fig: 15.1: Sub-standard RRM works

The execution of such works indicates poor workmanship and inadequate monitoring which needs to be rectified immediately before making the payments.

Auditee's Response:

The Retaining wall Constructed at Ch. 412.20km was damaged due to toe slip during monsoon season because of incessant rainfall. The contractor was asked to widen the stretch on their cost to achieve the required width. In addition, same damaged quantity has been recovered from breast wall payment at ch.421.50km as shown in below measurement book.

091 FAM.6.3

Particulars	Physical Measurements				Content of Area
	No	L	B	H	
2 nd pncel →	11	2	1.33	4	64.90 ✓
3 rd pncel →	10	2	1.33	4	54.26 ✓
parapet →	4	0.7	0.45	0.6	3.40 ✓
Total (E) =					122.56 ✓
ch. 411.60km (R/S)					
Top wall =	2	8	3	2	96 ✓
Wall without toe =	18	8	1.63	1.5	71.72
Toe wall above toe wall =	2	8	1.4	1.7	110.54 ✓
Parapet →	15	0.5	0.45	0.6	36.5 ✓
Total (F) =					261.91 ✓
Grand total = (A) + (B) + (C) + (D) + (E) + (F)					204.69 + 625.63 +

080 FAM.6.3

Particulars	Physical Measurements				Content of Area
	No	L	B	H	
Item - IX - Sample					
Providing & laying Random measuring with hard stone in cement mortar 1:2					
Pinnel 1 →	1	9.7	$(\frac{1.83}{2} + 0.2)$	3.8	42.55 m ²
Pinnel 2 →	1	10.6	$(\frac{1.83}{2} + 0.2)$	3.8	51.06 m ²
Total =					93.61 m ²
Deduction =					64.90 m ² - pinnel
Parapets =					0.50 m ²
Total =					67.21 m ²
Net quantity =					(93.61 - 65.94)
(10 - 200 - 0.20) =					33.71 m ² //

Rectified Parapets and Parapets base at Ch. 417 km Catch pit 6 & Repair of culvert which was damage during monsoon Culvert.12, Catch pit 4 Ch. 418 km as shown below:



Repaired Parapets and RCC slab damaged by flash flood during monsoon season Culvert 12, Catch pit 4 Ch. 418 km as shown below.



Based on the above justification, please drop the memo

RAA's Further Comments & Recommendations:

The response on the recovery of amount paid for damaged wall panel and rectification of damaged catch pits is noted. It was apparent that the contractor would have been paid for defective and sub-standard works if not observed by RAA.

However, as agreed during the exit meeting, the DoR and RO should institute strict supervision and monitoring controls to prevent execution and acceptance of defective and sub-standard works and regulate payment for works executed as per required standards in future.

The measures and procedures proposed to be put in place intimated to RAA for record and follow-up during future audits. Besides, the details of recoveries affected and accounted for in the books of accounts should be furnished for review and records.

15.2 Use of defective WMM materials with resultant execution of poor quality WMM works

The joint team also found defective WMM materials with more fines and oversized aggregates along the crushing site, which indicates acceptance of defective materials by the site-supervising engineer as shown below:



Fig 15.2: Defective WMM materials stacked at site

It was observed from the physical verification of sites that the above materials were directly laid at site.

The above pictorial evidences indicated existence of inadequate supervision and monitoring controls over the execution of works by the Site Engineer and Regional Official. The acceptance and taking over of poor quality or substandard works despite investment of huge Government scarce resources indicated laxity on the part of the Regional Office.

The Ministry should institute a dedicated technical committee to thoroughly inspect and certify all completed works including use of WMM materials as per technical specification to prevent taking

over of poor workmanship/quality works from the contractor. Besides, the Ministry must fix the site engineer accountable for such unwarranted lapses and direct the contractor to redo the defective and substandard works and rectification carried out intimated to RAA for review and records.

Auditee's Response:

The WMM material which was laid before monsoon season looked finer due to silts deposited during rain. In addition, for some stretches which might have destroyed due to flow of debris to road. However, during the time of black toping work, contractor rectified the defective surface by removing deposited silts by road broom and relaying of WMM materials wherever there was defective surface.

WMM materials produced during RAA team site visit was little bigger in size due to worn out crusher jaws and were crushing boulders only so that they could mix with fine materials later. But we had rejected the oversize materials and made them to re-crush after they replaced with new crusher jaws as team were aware of the changes. The pictures shown below for reference and record, please.



Based on the above justification, please drop the memo.

RAA's Further Comments & Recommendations:

The response with the pictorial evidences on the rejection of oversize materials and use of re-crush materials as per specification is noted. However, the fact remains that if not pointed out by RAA, contractor would have used the defective materials that would affect the quality of road works.

However, as agreed during the exit meeting, the DoR and RO should institute strict supervision and monitoring controls to prevent use of materials not as per technical specifications or inferior quality materials in future.

The measures and procedures proposed to be put in place intimated to RAA for record and follow-up during future audits.

16 Irregularities noted in construction of Pavement works for Double Lanning of Northern East-West Highway from Pelela to Bumilo (Package VIII) by M/s Empire Construction Pvt. Ltd

The contract for the Double Lanning works from Bumilo-Pelela covering Chainages from 379Km to 372Km (i.e. 7Km) road works (contract package VIII) was awarded to M/s Empire Construction Pvt. Ltd vide work order No. DoR/ROL/Plg-15-2016/124 dated 23/07/2015 at contract price of Nu.78,967,074.00. The contract duration was 25 months starting from 4/08/2015 with completion deadline scheduled on 23/08/2017.

From the verification of drawings, estimates, bill of quantities, contractor's bill and visit of the actual construction following lapses were observed:

16.1 Defective WMM materials stacked along the road site

During the joint visit of the contract work site from Bumilo-Pelela (379Km to 372Km =7Km) executed by M/s Empire Construction Pvt. Ltd, the Audit Team on visual examination observed inferior WMM materials stacked along the road site. Pictorial evidence on the stacking of inferior WMM materials are as shown below:



The RO should comment on the measures taken to address use of substandard materials by the contractor as well as allowing stacking of defective materials at sites. The RO should also furnish test reports for the test conduct.

The RO should comment on the measures taken to address use of substandard materials by the contractor as well as allowing stacking of defective materials at sites. The RO should also furnish test reports for the test conduct namely *Angeles abrasion value test, Aggregate impact value test, Combined flakiness and elongation indices (combined) and Gradation* prior to allowing the materials to be used and after laying of the materials to support use of materials as per technical specifications.

The Ministry should also institute a technical team to conduct physical verification and tests that WMM materials already laid are as per specifications prior to taking over of works from the contractor.

Fig: 16.1: Defective WMM materials

Auditee's Response:

During audit team visit they have stacked raw WMM material at open area in their stretch. WMM material that were stacked along road area were not directly laid. Prior to laying, we have let them crushed into proper gradation as per our specification. During laying, the contractor deployed labours to segregate over sized material and unwanted material. The relevant photographic evidences attached for kind reference and record.



Therefore, please drop the memo.

RAA's Further Comments & Recommendations:

The response with the pictorial evidences that all the defective oversized materials were crushed into proper gradation is noted. However, the fact remains that if not pointed out by RAA, contractor would have used the defective materials that would affect the quality of road works.

However, as agreed during the exit meeting, the DoR and RO should institute strict supervision and monitoring controls to prevent use of materials not as per technical specifications or inferior quality materials in future.

The measures and procedures proposed to be put in place intimated to RAA for record and follow-up during future audits.

16.2 Overpayment for gabion works due to inflated length of gabion wall - Nu.57.176.78

The length of Gabion wall up to 2m height at Chainage 375.47Km beside Yakla Hotel measured 33m on physical verification instead of 40.5m reflected in contractor's bill. The variation in the length of gabion wall had resulted in overpayment of Nu. 57,176.78 *{(40.5m-33m) @ Nu. 7623.57}*).

The Regional Office should comment on the circumstances leading to discrepancies in the measurement of actual work done and overpayments thereon. Besides, the Regional Office must recover the overpayment and deposit into Audit Recoveries Account and hold the site engineer and the contractor accountable for inflating the length of gabion wall in the MB and RA Bills for appropriate decisions and actions.

Auditee's Response:

We agree, due to oversight the excess payment was made while passing the RA bill. However, the excess payment was realized from the 6th RA bill as per Measurement Book No-76 Page-131 mentioned below.

Revenues	
21702	227,629.00
102 Reclamation work	3,582,449.00
1052 Rehabilitation Works	4,122,792.00
Total Revenues	8,032,870.00
Deduction on excess payment made on RA bill on 4 th RA bill	11,922.00
Net amount payable to the contractor (A)	8,020,948.00
33,381,937.78 (-)	25,362,362.99
	25,362,362.99

Therefore, kindly drop the memo please

RAA's Further Comments & Recommendations:

The recovery of all overpayments from the 6th RA Bill is noted. However, it is to reiterate that the site engineer had failed to properly cross check the claims with that of actual work done at site. It also indicated entertainment of RA bills without actual verification of site and measurements as

required under technical norms and financial rules and regulations. It was obvious that the contractor would have benefited the overpayments if not observed by RAA.

However, as agreed during the exit meeting, the DoR and RO should institute appropriate control mechanism over the measurement of works done at site and verification of RA bills prior to settlement of the claims to prevent overpayments in future. The measures and procedures proposed to be put in place intimated to RAA for record and follow-up during future audits. Besides, the details of recoveries affected and accounted for in the books of accounts should be furnished for review and records

16.3 Flawed preparation of BOQ for items of works seeking lump sum rate

The quantity of formation cutting works deduced from the survey and design and incorporated in the estimates are as shown in table 16.3.1 below:

Table 16.3.1: Estimation of formation cutting						
Code	Description of item	Unit	Qty	Rate (Nu.)	Amount(Nu.)	% in terms of total estimated excavation of earthwork and rocks Qty.
RW0014	Excavation of road formation/trace/box cutting, with excavator including separate deposition of soil, rocks and stones within 50m for reuse - all kinds of rocks	Cu.m	12,010.19	183.09	2,198,945.69	11.88
RW0013	Excavation of road formation/trace/box cutting, with excavator including separate deposition of soil, rocks and stones within 50m for reuse - all kinds of soil	Cu.m	89,096.78	38.64	3,442,699.58	88.12
RW0021	Transport of loose spoil materials in designated locations including loading/unloading. Dressing of dump sites and plantation of vegetation after completion of dumping - beyond 500 up to 1210 m	Cu.m	50,553.50	58.07	2,935,641.75	50
	Total				8,577,287.01	

The above three item of works while separately shown in the BOQ, the quantum of works to be executed was combined and shown in running meters in the BOQ attached with the tender documents and had sought lump sum rate for the said item of work. Accordingly, contractor had quoted Nu.12,600,000.00 for the formation cutting works which includes excavation in all kinds of soil, all kinds of rock and transportation of spoil materials as shown in table 16.3.2 below:

Table 16.3.2: FC work payment					
Item code	Description	Qty	Unit	Amount (Nu.)	% variation from cost estimates
RW0014	Excavation of road formation/trace/box cutting, with excavator including separate deposition of soil, rocks and stones within 50m for reuse - all kinds of rocks				

RW0013	Excavation of road formation/trace/box cutting, with excavator including separate deposition of soil, rocks and stones within 50m for reuse - all kinds of soil	7000mtrs	lump sum	12,600,000.00	46.90
RW0021	Transport of loose spoil materials in designated locations including loading/unloading. Dressing of dump sites and plantation of vegetation after completion of dumping - beyond 500 up to 1210 m				

Review of the BOQ attached with the Tender document indicated existence of following flaws in seeking lump sum quote for the combined item of works:

- i. The BOQ for formation cutting works did not clearly specify the exact percentage of soil and rock excavation required to be excavated since there was substantial variation in item rate for the two items of works.
- ii. The BOQ also did not reflect the percentage of loose spoil materials required to be transported beyond 500m up to 1210 m.
- iii. The estimate and BOQ as well as the tender document did not incorporate information on the approved designated dumping yards to enable the prospective bidder to assess the quantum of spoil materials required to be transported beyond 500m up to 121m.
- iv. On cross check of the rock excavations between estimated Quantity and actually executed quantity noted that actual rock cutting measured just 247meters out of the total 7000meters representing just 3.53% $(247/7000*100)$ against estimated quantity of 11.87% $(12010.19/101,106.97*100)$. Thus, the estimated quantities was inflated to the extent of 8.34%. This also indicated flaws in the survey and design report as the estimated quantities were based on the survey report.

In addition, it was noted from the quoted price for the formation cutting works that the lump quote of the contractor was higher by Nu. 4,022,712.00 representing 46.90% above the estimated cost. This indicated that substantial cost difference was due to flaws in the BOQ and absence of adequate disclosure of information on the extent of excavation required under individual item of work including designated dumping yards for formation cutting works.

The RO should comment on the preparation of estimates in terms of individual item of works along with percentage of excavation required for soil and rock including extent of transportation required but obtaining a lump sum rate in running meters without specifying the actual percentage of each item work to be executed. The RO should also comment on the non-disclosure of approved designated dumping yards in the tender to enable the prospective bidder to appropriately quote rates and ensure cost effective award of contract works.

The Ministry should also revisit all the departmentally estimated costs for all contract packages as well as seeking of lump sum rates without specifying the percentage of each item of work to ascertain the flaws and financial impact to the Government exchequer. The Ministry should also come up with appropriate processes to streamline the preparation of estimates, BOQs and extent of disclosure of information required to ensure fair and cost effective tendering procedures for similar future contract works.

Auditee's Response:

Generally, the earthwork quantity is determined from the design drawing after carry out detail survey. It is hard on the part of the designer to differentiate the types of soil (loose & ordinary) and rock (soft & hard) in the BoQ unless the designer himself/herself traverse the road alignment. Even if the designer has travelled along the road alignment, it is still difficult to obtain exact quantity of different types of soil and rock since the inner core of the earth cannot be seen from outside. The exact nature of soil and rock are known only when actual excavation progresses.

Therefore, in absence of designer site visit the classification of soil is done by the concerned site engineer (JE & EE) through visual judgment by making necessary traverse at site. Even it is difficult and challenging task as it is never possible to anticipate or envisage the correct quantity of different soil classification through visual judgment during initial stage. In some rock stretches, the surface would be covered with soil but in actual execution, rock is encountered and vice versa. Unless we carry out soil investigation tests like borehole, earth resistivity test like in the tunneling works it is very difficult to classify the soil by visual judgment. In addition, to conduct such test for road work will incur huge investment and time.

With regard to the NEWH Project, it was conceptualized by the previous government towards the end of 2014, and directed MoWHS & DoR to implement at the earliest to complete the up gradation works by end of 11th Plan. Further we would also like to appraise that computation of soil classification with respect to length only may not be fully correct as the volume will depend on the height and width to be excavated. We do accept the length as pointed out by RAA for rock stretch. During their site visit, the FC excavation was completed and the length measured is actual which may not have been possible if it was to be during initial stage because of the above-mentioned reasons. Shown below are the different rates quoted by different contractors for different packages for FC work.

Sl. No	Name	FC WORKS			
		Estimated	Quoted	Difference	Diff %
1	M/s Etho Metho Construction	18,327,846.54	8,400,000.00	- 9,927,846.54	-54%
2	M/s Loden Construction	13,980,324.51	12,349,800.00	- 1,630,524.51	-12%
3	M/s Hi-Tech Company	12,157,854.32	20,000,000.00	7,842,145.68	65%
4	M/s Empire Construction	8,577,287.01	12,600,000.00	4,022,712.99	47%
5	M/s Welfare Construction	17,172,592.45	18,000,000.00	827,407.55	5%
6	M/s Rigsar Construction	22,596,778.42	7,500,000.00	- 15,096,778.42	-67%

From the above table comparisons, it is quite evident that the rates differ from one contractor to another, and the difference is from as low as minus 67% to as high as 65%. As per the contract document, the bidders are strongly encouraged to visit the site, acquainted with the site and its condition before analysis the rate. We believe that the ultimate motto of the contractor differs from individual and there are various reasons for their pricings; some quote to make profit whilst some quote just to get the work to cover the running operation cost of the company. The contract is awarded to the lowest evaluated bidder, normally it is the low quote that wins the contract.

Nevertheless, we have noted the observation for future reference and will incorporate without fail. In the light of above facts and practical problems involved, the memo may kindly be dropped.

RAA's Further Comments & Recommendations:

While taking note of the response and analysis carried out on the quoted prices by various contractors on the formation works and keeping the condition on the requirement of the contractor to the visit of work sites prior to bidding, the RAA is of the opinion that the ROs had failed to carry out proper and detailed study on the site specific packages. Thus, the estimates prepared by the RO were at higher side leading to quoting of contract prices by contractors as low as 45.21% below the estimated cost.

However, as discussed in the exit meeting, DOR in consultant with the Ministry should revisit all the departmentally prepared estimated costs for all contract packages to ascertain flaws and causes of substantial variations between the estimated cost and quoted prices of the contractors.

Besides, the Ministry should also come up with appropriate processes to streamline the preparation of estimates, BOQs and extent of disclosure of information required to ensure fair and competitive tendering for similar future contract works. The decisions and measures instituted to remedy the existence of any flaws in the preparation of departmental estimates intimated to audit.

17 Irregularities noted on Improvement works for Double Lanning of Northern East-West Highway from Pelela to Dungdungnesa (Package XI) by M/s Hi-Tech Company Pvt. Ltd

The pavement of road from Pelela to Dungdungnesa covering chainages from 379Km to 389Km a total of 10Km (Package XI) was awarded to lowest evaluated bidder M/s Hi-Tech Company Pvt. Ltd. Punakha holding trade license No. 1025255, CDB. No.4840 vide work order No. DoR/ROL/Plg-15/2015-2016/688 of 16th November, 2015 with the following contract details:

i.	Estimated Amount	:	Nu.153,688,193.47
ii.	Quoted amount	:	Nu.107,568,025.00
iii.	Revised contract price	:	Nu.79,099,819.85
iv.	Start date	:	26 th Nov 2015
v.	Due date of completion	:	14 th December 2017
vi.	Contract duration	:	25 months

During the verification of tender and other relevant documents, the audit team noted following irregularities and lapses:

17.1 Excess quantification of L-Drain works with resultant excess payment to contractor Nu. 670,010.00

The audit team along with the site engineers and work supervisor of M/s Hi-Tech Construction Company visited the site on 13.12.2017 to carry out the physical verification of permanent works. During joint measurements of structures, the team noted discrepancies in L-Drain quantity with resultant excess payment of Nu.670,010.00 as computed in table 17.1 below:

Sl. No.	L Drain Qty. not done at site	Total Qty. paid	Length of L Drain at site (Drain not done + qty. paid)	Total road length	Diff.	Rate (Nu.)	Amount (Nu.)
1	1109.10	9,500	10,609.10	10,000.00	609.10	1,100.00	670,010.00

As per the RA bills settled as of the date of the audit, the contractor was already paid 9,500.00 meters for L-Drain works and as per physical verification, unexecuted works measured 1109.10 meters. Thus, considering the L-Drain lengths executed and paid and remaining unexecuted, total L-Drain length works out to 10,609.10 meters, as against actual contract road length of 10,000 meters indicating flaws and ambiguity in the measurements of 9,500 meters already paid to the contractor. Considering the unexecuted L-drain length of 1109.10 meters at site, the contractor had claimed excess drain length of 609.10 meters with resultant excess payment of Nu. 670,010.00 to the contractor for works not executed at site.

The RO, should comment on the extra measurements and resultant excess payments, recovered and deposited into ARA. The RO should also hold the site engineer accountable for appropriate action for such lapses.

Auditee's Response:

In fifth RA bill it is apparent that the quantity of L-Drain bill paid was for 9500m and during site inspection from RAA team, length of L- Drain was coming around 8890.90m whereby the excess payment for differential Quantity of 609.10m has been accepted and paid. Considering it as RA bill and further the similar work was ongoing at site we calculated L-drain length from kilometer chainage post and made payment to the contractor.

However, during final joint measurement of the L-Drain length of 9666.2m out of which 9500m has been paid during fifth RA bill. Therefore, the difference quantity of 166.2m was paid during eight RA bill through MB-No. 71/p-139 and there was no quantity excess payment made to the contractor. Therefore, please drop the memo.

RAA's Further Comments & Recommendations:

While taking note of the response, the fact remains that the contractor was overpaid in the RA bills to the extent of Nu. 670,010.00 for works not executed. The inflated measurements and payments indicated existence of weak internal controls over the measurements of work done and verification of RA bills and laxity on the part of the site engineer to cross verify claims with actual work done at site.

However, as agreed during the exit meeting, the DoR and RO should institute appropriate control mechanism over the measurement of works done at site and verification of RA bills prior to settlement of the claims so as to prevent such overpayments in future. The measures and procedures proposed to be put in place intimated to RAA for record and follow-up during future audits.

18 Irregularities noted on Improvement works for Double Lanning of Northern East-West Highway from Wangduezam to Langkena (Package XII) executed by M/s Taksing Chungdruk Construction Pvt. Ltd

The Contract of Pavement works for the Double Lanning of Northern East-West Highway from Wangduezam to Langkena with a total of 7Km in between Chainages 436 to 429 km was awarded to lowest evaluated bidder M/s Taksing Chung Druk Construction Pvt. Ltd holding trade license No.1000725, CDB. No.1748. The work order No. DoR/ROL/Plg-15/2015-2016/43 dated 25/02/2016 was found issued with the following contract details:

i.	Estimated Amount	:	Nu.100,267,497.37
ii.	Quoted amount	:	Nu.66,128,323.00
iii.	Revised contract price (including additional works)	:	Nu.79,099,819.85
iv.	Start date	:	3 rd March 2016
v.	Due date of completion	:	26 th January 2017
vi.	Contract duration	:	11 months
vii.	Revised due date with award of additional works	:	31 st May 2017
viii.	Revised Contract duration	:	15 months
ix.	Actual completion date	:	26 th April 2017

- *The contractor's quoted amount of Nu.66,128,323.00 was 34.05% below the departmental estimated cost of Nu.100,267,497.37.*

- The Regional Office accepted contractor's quoted amount recommending for the recovery of the differential amount between the estimated amount and quoted amount in addition to 10% performance security in acceptance letter.18
- Additional work such as Gabion wall, RRM wall and culvert extension estimated based on BSR 2015 + 10.09% cost index arriving at total value of Nu.12,971,497.35 were found approved and awarded under the variation order DoR/ROL/2015-2016/Plg-37/12013 dated 31st July, 2017 increasing the scope of work with revised contract deadline till 31st May 2017.
- So far as appeared from the sub ledger, 2nd running account bill valuing Nu.32,375,628.56 was disbursed which accounted 48.96.% of the contract value. The contractor had submitted the work completion report on 26th April, 2017. The final bill was yet to be settled, despite work being taken over by Regional Office on 5th June 2017.

Detailed verification of drawings, estimates, bill of quantities, contractor's bills, technical specification and physical verification of site revealed following irregularities and lapses:

18.1 Non-execution of Gabion Wall as per drawing and technical specification

The technical specification for construction of gabion wall outlines as under:

“Construction of Gabion Wall, height up to 2m with dry stone masonry (hammer dressed facing) including delivery of materials, weaving of gabion mesh with GI wire 2.7mm dia, fixing of selvedge wire 3.4mm dia, binding/lacing wire 2.4mm dia”.

During the physical verification of executed works, it was observed that the weaving of GI mesh, fixing of selvedge wire, binging/lacing and execution of gabion works were of poor quality and workmanship. The RAA noted development of huge voids, gabion crates and bulged out, binding wire rusted and stone used were of river boulders which did not comply with the technical specifications.

In addition, GI wires was found to be of inferior quality as the mesh were found rusted indicating that the material were not galvanized resulting in lower durability. Un-galvanized wire is vulnerable to weather and rusting. Photographs below depict use of low quality wire mesh and poor workmanship:

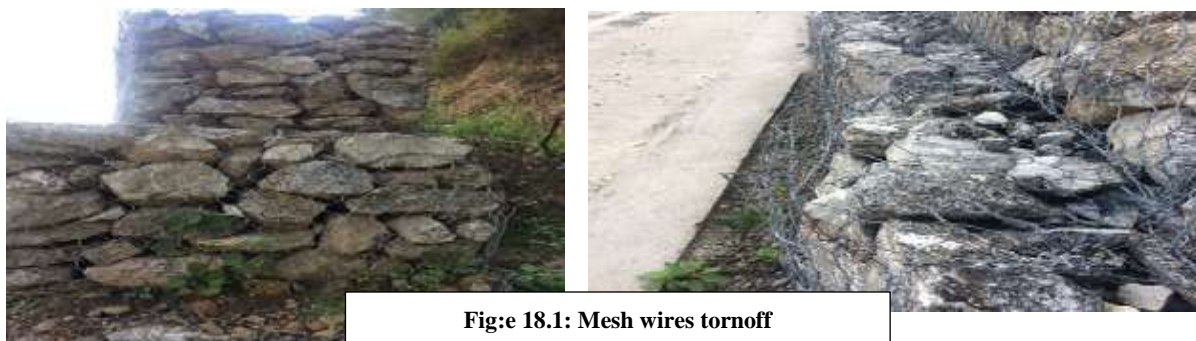


Fig:e 18.1: Mesh wires tornoff



The execution of poor works indicates lack of proper monitoring and taking over of defective works by the Taking over Committee. The RO, besides justifying the execution of poor quality works should make the contractor to re-do the defective works in line with approved technical drawings and workmanship. The rectification carried out should be furnished to RAA for verifications.

The Ministry in addition to the already instituted two member monitoring team should depute appropriate technical teams to thoroughly conduct inspection of the all ongoing road works and road conditions for all the completed works to ascertain the extent of defective and substandard works taken over by the Regional Office, Lobeysa. In addition, such timely inspections of the road conditions would facilitate the Ministry to hold the contractors accountable and redo the works at the cost of the contractors. Besides, the Ministry should also hold the officials accountable not only for allowing to execute defective and substandard works but for also taking over without proper inspections and verifications of road works.

Auditee's Response:

The gabion wall was constructed as per specification and drawings but sudden slides and heavy shooting boulders above have resulted the distortion of alignment of gabion wall and its workmanship. Some spots of gabion mesh have sustained rust due to abrasion by falling boulders. Although deformation had occurred due to the impact of landslides, but the wall is still intact and there is no further deformation observed. Therefore, please drop the memo. (Photographic evidence is attached)



RAA's Further Comments & Recommendations:

While taking note of the response, the RO, Lobeysa should carry out rectification of the rusted gabion wires and gabion boxes wherever required in order to prevent further collapse in future.

However, as agreed during the exit meeting, the DoR and RO should institute a technical team to further review the damages for technical soundness and carrying out remedial measures as deemed required as per technical review report. Besides, the DOR in consultation with the Ministry should institute technical monitoring team to oversee technical soundness of all constructed infrastructures to facilitate timely rectification of structures.

1 P&L DBM	Materials	Amount	Remarks	2 P&L AC	Materials	Amount	Remarks
1	Labour	15.36		1	Labour	3.243	
2	Road broom	0.35		2	Road broom	0.35	
3	Tractor with trailer, toyota	0.21		3	Tractor with trailer, toyota	0.21	
4	Asphalt /Bitumen heating kettle	3.1		4	Asphalt /Bitumen heating kettle	2	
5	Asphalt/Bitumen sprayer	2.25		5	Asphalt/Bitumen sprayer	2.25	
6	Spot mix plant	24.75		6	Spot mix plant	16.6	
7	Asphalt paver	2.1		7	Asphalt paver	3.5	
8	Road roller	2.25		8	Road roller	3.6	
9	Road roller (Pneumatic tyre)	2.25		9	Road roller (Pneumatic tyre)	3.6	
10	Payloader	4.55		10	Payloader	7.28	
11	Tata Tipper	9		11	Tata Tipper	9	
12	Compactor, plate type	4.95		12	Compactor, plate type	4.95	
13	Bitumen 80/100	0		13	Bitumen 80/100	0	
14	Crushed rock, 20mm	60		14	Crushed rock, 12.5mm to 6mm	40	
15	Crushed rock, 12.5mm to 6mm	57		15	Sand	43.2	
16	Sand	5.7					
		193.82				139.783	
	Add: 10% transportation charges for lifting Bitumen	19			Add: 10% transportation charges for lifting Bitumen	14	
	Add: 2% contractor tax	4			Add: 2% contractor tax	3	
	Add: 5% overhead charges	10			Add: 5% overhead charges	10	
	Add: 7% Contractor profit	14			Add: 7% Contractor profit	14	
		236				177	

18.2 Acceptance of inflated rate analysis of DBM and Asphalt concrete through inclusion of 2% contractor tax - Nu. 374,759.34

In terms of the bidding document under General Conditions of Contract (GCC), under clauses 45 - Tax, 45.1 “*The prices bid by the contractor shall include all duties, taxes and levies that may be levied in accordance with the laws and regulations in being as of the date 30 days prior to the closing date for submission of bids*”.

On review of contractor’s rate analysis submitted for DBM and Asphalt concrete (AC) revealed inclusion of 2% contractor tax in the rate analysis in contravention to the aforementioned provision of General Conditions of Contract as illustrated below:

The inclusion of 2% contractor tax in the rate analysis by the contractor had resulted in inflated rate analysis for the item of work “DBM and AC”. It was not understand as to how the tender Committee and Evaluation Committee had ignored incorporation of 2% contractor tax in the rate analysis in contravention to the existing contract norms. Thus, the rate claims for 2% contractor tax as a part of rate analysis for DBM and Asphalt concrete works amounting to Nu. 374,759.34 stand ineligible and recoverable as computed in the table 18.2 below:

BSR Code	Description of item	Actual quantity	Analysed rate	Correct analysed rate	Diff.	Amount Recoverable (Nu)
AR004	DBM	53,288.25	240.00	236.00	4.00	213,153.00
AR005	AC	53,868.78	180.00	177.00	3.00	161,606.34
Total						374,759.34

The Regional Office besides commenting on the circumstances leading to acceptance of inflated rate analysis through incorporation of 2% contractor tax should hold the responsible officials/contractor accountable for appropriate decisions and actions. In addition, the Regional Office should immediately recover the ineligible payment of Nu.374,759.34 and the amount deposited into Audit Recoveries Account (ARA).

Auditee's Response:

As per the GCC, the contractor shall include all taxes and duties levied in accordance with the laws and regulation. Thus, the contractors have incorporated the rate to build up the rate for their bid. The question of recovery above may not be possible. Therefore, please drop the memo.

RAA's Further Comments & Recommendations:

Evaluation committee plays a crucial role in procurement as it is their due diligence and decision that determines the outcome of the tendering process. The members have to be competent and charged with the responsibility to uphold the core principles of procurement to ensure procurements at most competitive and economic manner.

It was the responsibility of the Evaluation Committee to present the facts correctly to the MLTC on the incorporation of 2% tax. The 2% tax should have been covered under overheads and profit charges as incorporated by other contractors. The decisions on the evaluation committee to ignore such flaws in the rates analysis had resulted in overall financial implication to the Government Exchequer to the extent of Nu.374,759.34. It should also be noted that the 2% Tax is not an extra tax on contractor and the same is subject to deduction from contractor's final tax liability. Thus unlike other taxes and duties paid on import of materials, the contractors should not include this in their rate analysis.

Failure on the part of evaluation committee members seem to be a major cause for most procurement errors or non-compliances. The absence of consistent structures in place in different procuring agencies leave room for isolated approach and differing practices undermining the PRR's objective of achieving uniformity and efficiency of procurement procedures.

As agreed in the exit meeting, the DOR in consultation with the Ministry should institute technical team to review all the rate analysis of contractors and formulate specific guidelines in carrying out rate analysis by the ROs and contractors detailing the processes for incorporating transportation and other related cost if construction materials are to be supplied to the contractors by the executing agencies to avoid flaws, ambiguities and complications in future project works.

18.3 Execution of works in deviation to drawings including execution of substandard works

During the physical verification of works, it was noted that the entire length of L-drain was found executed with drain width of 600mm instead of 800mm in deviation to the approved drawing. In addition, the PCC works on the drain were also found worn out indicating use of weak cement ratio as shown in the photographs below:



Figure 21.3: L-shaped drain PCC worn out



Fig:18.3: L-shaped drain measuring only 600mm width

The execution of such work indicates poor workmanship and lack of proper monitoring besides taking over of defective works by the taking over Committee. The RO, besides justifying the taking over of defective works should make the contractor re-do the defective works in line with approved technical drawings and workmanship. The details of rectification carried out should be furnished to RAA for verifications.

The Ministry in addition to the already instituted two member monitoring team should depute appropriate technical teams to thoroughly conduct inspection of the all ongoing road works and road conditions for all the completed works to ascertain the extent of defective and substandard works taken over by the Regional Office, Lobeysa.

In addition, such timely inspections of the road conditions would facilitate the Ministry to hold the contractors accountable and redo the works at the cost of the contractors. Besides, the Ministry should also hold the officials accountable not only for allowing the execution of defective and substandard works but also taking over without proper inspections and verifications of road works.

Auditee's Response:

The widening of stretch from 436.00 – 435.50KM was not possible due to risk associated with settlement above including Wangdue Dzong. Therefore, the width of the L-drain along these stretch have to be reduced to 0.90M instead of 1.10M to achieve maximum carriage width. Moreover, the payment for L-drain was made on pro-ra-ta basis and not on linear measurement. The copy of measurement attested below for reference.

The worn out of PCC had taken place due to continuous discharge of wastewater from the settlement above. The contractor was asked to correct the defective works and has successfully rectified (Photographic attached).



Therefore, please drop the memo.

RAA's Further Comments & Recommendations:

The RAA has taken note of the response on the payment for L-drain on pro-rata basis and rectification carried out for defective works. However, the decisions taken and change order in scope of works on L-drain specification due to non-widening of stretch from 436.00 – 435.50KM was not documented on record.

In addition, execution of defective work indicates poor workmanship and lack of proper monitoring besides taking over of defective works by the taking over Committee. The RO, besides justifying the taking over of defective works should make the contractor re-do the defective works in line with approved technical drawings and workmanship. The rectification carried out should be furnished to RAA for verifications.

As agreed during the exit meeting, DOR in consultation with the Ministry should device measures to document decisions to validate the changes on the scope of work, technical specifications and designs as well as other changes during construction.

19 Irregularities noted on Improvement works for Double Lanning of Northern East-West Highway from Razhau to Nobding (Package XIII) by M/s U.P Construction Pvt. Ltd.

The pavement of road from Razhau to Nobding covering Chainage 403Km -395km with a total of 8Km (Package XIII) was awarded to successful bidder M/s UP Const. Pvt. Ltd holding trade license No.5005973, CDB. No.3329 vide work order No.DoR/ROL/Plg-15/2015-2016/1316 dated **19thFebruary 2016** with the following contract details:

- | | | | |
|-------|-------------------------|---|---|
| i. | Estimated Amount | : | Nu.126,747,002.70 |
| ii. | Quoted Amount | : | Nu.69,441,930.00 |
| iii. | Revised contract Amount | : | Nu.77,347,058.41 |
| iv. | Duration of work | : | 17 months (Including rainfall & snowfall) |
| v. | Date of start | : | 22 nd February 2016 |
| vi. | Date of completion | : | 15 th July 2017 |
| vii. | Revised due date | : | 30 th December, 2017 |
| viii. | Actual completion date | : | On progress |

- *The contractor's quoted amount was -45.21% (Nu. 126,747,002.70 minus Nu. 69,441,930.00) and the contractor was asked to deposit differential amount for -25.21% in acceptance letter vide letter No. DoR/ROL/Plg-15/2015-2016/1179 dated 1st February 2016.*
- *The variation orders for construction of L-Drain, Gabion wall, culvert extension and RRM wall was approved vide letter No. DoR/ROL/Const-24/2017-2018/963 dated 8th November 2017 at the estimated value of Nu.7,905,128.61 worked out based on the quoted amount.*
- *So far as appeared from the sub ledger, 6th Running Account Bill valuing Nu.50,704,972.95 was disbursed which accounted 73.02% of the contract value.*

Detailed verification of drawings, estimates, bill of quantities, contractor's bill, technical specification and physical verification at site on **6th December 2017** revealed the following lapses:

19.1 Flaws in the inclusion of cost index in the analysis of rates for additional item of works resulting in excess payment to the contractor - Nu. 1,094,580.56

The 3rd Running bill amounting to Nu. 7,198,468.06 was paid to M/s UP Construction Company for executing permanent works along Razhau-Nobding stretch as noted from DV. No. 4.84 of 20th April 2017. The payments also included expenditures of Nu. 3,504,074.36 incurred for the monsoon restoration works.

On cross checking the analyzed rates paid for the additional works with that of the quoted rates for the items of works in the BOQ, the audit noted that the rate paid were totally different from the existing BOQ rates of the contractor. On enquiry, the audit team was informed that since the monsoon restoration works was beyond the scope of pavement works, the rate was paid at analyzed rates. The payments for the item of works which were available in the Bills of Quantities (BOQ) at analyzed rates are illogical and inappropriate in terms of item Clause 6.3.6.3 on Pricing of the Variations wherein it stipulates that as

“All variations, except for those listed under item 6.3.6.1(a), shall be valued at the contract rates and prices as mentioned in the priced Bill of Quantities. If the contract does not contain any rate(s) applicable to the variation, suitable rates or prices shall be agreed upon between the Procuring Agency and the Contractor. In the event of disagreement between the parties, the procuring Agency shall fix the rates as may be considered fair and appropriate and those shall be notified to the contractor”.

*In addition, **under Note:** it is categorically stipulated as “ Generally, the average percentage above or below the applicable BSR quoted by the contractor shall be taken into consideration for fixing prices of the varied items not existing in the contract (Bill of Quantities)”.*

Further, Sub-clause 40.2 of Clause 40-payment for variations under GCC also stipulated that *“If the work in Variation correspond in the Bill of Quantities and if in the opinion of the Project Manager, the quantity of work above the limit stated in GCC Sub-clause 38.1 or the timing of its execution do not cause the cost per unit of quantity to change, the rate in the Bill of Quantities shall be used to calculate the value of the Variation. If the cost per unit of quantity changes, or if the nature or timing of the work in the Bill of Quantities, the quotation by the Contractor shall be in the form of new rates for the relevant items of work”.*

In line with the aforementioned clauses, the payment at higher rates for item of works corresponding in the Bills of Quantities was in total violation of the contractual provisions and had resulted to ineligible payments to the contractor. The details of ineligible payments are as summarized in table 19.1 below and detailed in **Appendix “F”**.

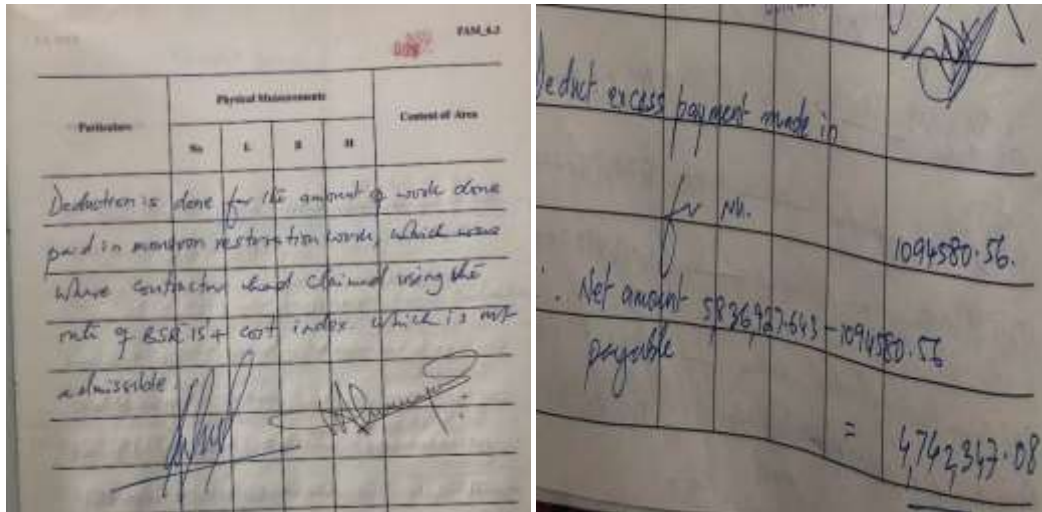
Table 19.1: Payment made at higher rates							
Code	Particular of Items	Unit	BOQ Rate	Cost index rate paid	Diff.	Qty. Paid	Amount (Nu.)
EW0105	Excavation in foundation trenches or drains not exceeding 1.5m in width or area 10 sq.m on plan, - Ordinary soil	M ³	90.00	119.38	29.38	643.13	18,895.16
EW0107	Excavation in foundation trenches or drains not exceeding 1.5m in width or area 10 sq.m on plan, - Ordinary rock with or without blasting	M ³	420.00	498.22	78.22	275.63	21,559.78
SM0072	P&L Hand packed stone filling or soling with stones	M ³	360.00	1101.47	741.47	26.69	19,789.83
CW0011	P&L in PCC concrete - All work upto plinth level. 1:5:10	M ³	2600.0	3768.39	1,168.39	26.69	31,184.33
CW0005	P&L in PCC concrete - All work upto plinth level. 1:3:6	M ³	3000.0	4811.11	1,811.11	1.2	2,173.33
RC0090	P&F centering and shuttering (formwork),	M ²	350.00	322.36	(27.64)	17.01	(470.16)
SM0007	P&LRRM with hard stone in foundation & plinth - In cement mortar 1:6	M ³	2000.0	2987.46	987.46	959.1	947,072.89
PO0036	P&L H.D.P.E Pipes - 110mm	M	450.00	742.65	292.65	294	86,039.10
RW0035	Filling of trenches,	M ²	120.00	76.89	(43.11)	785	(33,841.35)
PL0021	Providing & laying 12mm cement plaster C.M 1:4	M ²	110.00	202.43	92.43	23.56	2,177.65
Total							1,094,580.56

It is not understood as to how the payment was made at analyzed rate for the monsoon restoration works by the RO office when the sites were already in the custody of the contractor and rates already existed in the BOQ.

The RO should comment on the payment of rates inclusive of cost index for items of works already available in the BOQs. The RO should recover the ineligible payment of Nu.1,094,580.56 as the payment should have been regulated at the quoted rates of the contractor and the amount deposited into ARA. The Ministry should fix the responsibility on the RO for such ineligible payments.

Auditee's Response:

In this case apart from contractual work there was no budget to carry out critical monsoon damaged work and instructed contractor to carry out construction of RRM retaining wall at Ch: 395.8km and Gabion wall at Ch: 397.2km and paid item rates inclusive of 24.78% upon BSR rate 2015 as an additional work. Since the monsoon damaged portion falls under their project location, department decided them to execute the works which is urgently required at site. The differential excess payment amounting to Nu. 1,094,580.56 has been recovered from their seventh RA bill through MB-71/p-085.



RAA’s Further Comments & Recommendations:

The RAA has taken note of the response on the recovery of excess payment of Nu. 1,094,580.56. However, it is reiterated that any payments beyond the contractual provisions tantamount to extension of undue financial benefits to the contractor.

In addition, it is also noted that the failure on the part of the RO to regulate payments in terms of contractual provisions is an indication of existence of either weak internal controls over the enforcement of contract clauses or absence of standard procedures for preparation of the cost estimates for additional works.

However, as agreed during the exit meeting, the DoR and RO should institute appropriate control mechanism over the preparation of cost estimates for additional work aligning with the contractual provisions for consistency and uniformity as well as to avoid unwarranted extension of financial benefits through excess or inadmissible payments to the contractors in future.

The measures and procedures proposed to be put in place intimated to RAA for record and follow-up during future audits.

19.2 Non-achievement of workmanship for construction of CRM abutment for RCC culvert and recoverable amount - Nu.116,435.00

During the physical verification of the permanent structures, the team observed that the CRM abutment works was poorly executed as the finishing for culvert extension was not even up to the standard of RRM works. It was also observed that though the CRM wall was a load bearing structure, the same was constructed with huge boulders as depicted in photographs below:



Picture 19.2: Sub-standard construction of CRM

The construction of Coursed Rubble Masonry wall requires certain skills and workmanship, while the executed abutment had not achieved the following workmanship as required for the CRM works:

- *Face of stone should have been dressed properly with hammer to give good outlook and all beds and joints so as to give them approximately rectangular block shape,*
- *The stones were not found squared on all joints and beds,*
- *The bed joints were not found dressed for at least 8 cm back from the face and side joints for at least 4 cm such that no portion of the dressed surface is more than 10 mm from a straight edge placed on it,*
- *The remaining portion of the stone were found projecting beyond the surface of bed and side joints, and*
- *The courses were not found laid truly horizontal and vertical joints were not truly vertical.*

Despite not achieving the required workmanship, the contractor was paid CRM quantity, instead of RRM resulting in excess payment of Nu.116,435.00.

The Regional Office besides furnishing appropriate justification for the acceptance of substandard and poor workmanship structures should direct the contractor to redo the CRM walls as per the requisite technical specification. In the event the RO accepts the structures, besides recovering the cost as computed in audit should also certify that the existing structures suffice the intended purpose of the designed CRM walls.

The Ministry in addition to the already instituted two member monitoring team should depute appropriate technical teams to thoroughly conduct inspection of the all ongoing road works and road conditions for all the completed works to ascertain the extent of defective and substandard works taken over by the Regional Office, Lobeyasa. In addition, such timely inspections of the road conditions would facilitate the Ministry to hold the contractors accountable and redo the works at the cost of the contractors. Besides, the Ministry may also hold the officials accountable not only for allowing execution of defective and substandard works but also taking over without proper inspections and verifications of road works.

Auditee's Response:

In the process of construction of CRM abutment wall for culvert extension works, the construction principles is not much different with that of RRM wall only difference is in CRM the stone should

be neatly dressed and cement mortar is rich. As per the contractual norms we had tried and executed the work much judiciously with specification but unfortunately in the picture, we could see cement mortar seems little uneven which we had already informed the contractor to rectify immediately. However while visiting and inspecting the site RAA team observed that CRM wall was of poor workmanship and not as per technical specification. Subsequently as per RAA's observation, we had recovered the differential rates of CRM and RRM quantity amounting to Nu. 145,425.00 through MB-71/p-083 in the seventh RA bill. The copy of MB attached (below).

Particulars	Physical Measurements				Content of Area
	No	L	B	H	
Full under CRM quantity (MB-71)					Rate = 145,425.00
Rate					145,425.00
Net amount payable					145,425.00
<i>(Signature)</i>					
<i>(Signature)</i>					
Total work done in this bill					145,425.00
(Recovered)					145,425.00
24.705					145,425.00
10% Retention money					14,542.50
12.5% Retention advance					18,178.125
30% Security deposit advance					43,704.375
Balance due to contractor					69,000.00

RAA's Further Comments & Recommendations:

The RAA has taken note of the response on the recovery of excess payment of Nu. 145,425.00. However, it is also reiterated that the failure on the part of the RO to regulate payments in terms of actual work done at site is an indication of existence of either weak contract management controls over the enforcement of technical specifications and drawings or absence of proper monitoring and supervisions by the site engineer during the execution of works.

As agreed during the exit meeting, the DoR and RO should institute appropriate control mechanism to oversee that the execution of works are as per drawings and technical specifications as well as ensure adequate monitoring and supervisions controls to prevent execution of substandard works and extension of financial benefits through inadmissible payments to the contractors in future. The control measures and procedures proposed to be put in place intimated to RAA for record and follow-up during future audits. Besides, the details of recoveries affected and accounted for in the books of accounts should be furnished for review and records

20 Irregularities noted on Improvement works for Double Lanning of Northern East-West Highway from Nobding to Dungdungnesa (Package XV) by M/s Empire Construction Pvt. Ltd.

The direct contract for the Double Lanning works from Nobding to Dungdungnesa covering Chainages from 392.25Km to 395Km a total of 2.75 Km road works (contract package xiv) was awarded to M/s Empire Construction Pvt. Ltd vide work order No. DoR/CE-(CD)2016-17/2808 dated 18/07/2016 at their quoted price of Nu. 39,390,946.56. The contract duration was twelve months effective from 15/08/2016 with completion deadline scheduled on 15/08/2017.

The verification of drawings, estimates, bill of quantities, contractor's bill and the actual construction at site showed the following lapses:

20.1 Payment for unexecuted works - Nu.3,340,485.19

20.1.1 Payment for L-Drain works not executed - Nu. 632,385.19

The contractor had claimed and was paid Nu.632,385.19 for providing 364.67 cubic meter of stone soling works under the L-drain vide voucher No.DV11.46 dated 17/11/2017. The audit team during the physical verification of the construction sites on 23/11/2017 had noted construction of L-drain without placing stone soling as sub-base although payments were found made on the review of the RA bills.

On pointing out, the contractor claimed to have executed the stone soling works. However, to ascertain the actual execution of the said item of work, a joint team comprising project officials and audit team in the presence of the contractor conducted physical verification of work by excavation of the structure on 04/12/2017. The joint team noted that the L-drain construction was carried out without stone soling as sub-base. The pictorial evidences are as depicted in the photographs given below:



L-drain during construction without sub-base: stone soling as noted on 23.11.2017



Section of L-drain without sub-base: Stone soling after the completion of Construction –noted during joint verification on 4.12.2017

20.2 Payments for WMM Works not executed - Nu. 2,708,100.00

Similarly, the WMM works were not found executed for a road length of 460meters near the contractor's campsite. However, payment for WMM works was found released for the entire stretch of 2780m under contract package 15. This had also resulted in payment for unexecuted works valuing to **Nu.2,708,100.00** as detailed in **Appendix "G"**. The payment for unexecuted WMM works is evident from picture which showed existence of oversized materials and also accepted by the Project officials and contractor during the physical verification conducted at site on 4.1.22107.

Payment for unexecuted works indicates settlement of claims without proper verification of work done at site and exercising due diligence on the part of supervising engineer.

The RO, Lobeyssa besides recovering the payment for the unexecuted works should also furnish justification for making such illegitimate payments. The site engineer should be held accountable for certifying the payment for works not executed.

Auditee's Response:

The ineligible for soling under the L-drain of contract package 15 had been deducted in the 2nd RA bill which was paid in the 1st RA bill due to oversight. However, the site engineer is warned to refrain from such lapses in future. Details of deduction with MB reference are attached. Therefore, the memo may please be dropped.

Particulars	Physical Measurements				Content of Area
	No	I	II	III	
Concrete for drainage					
Laying of BT works					
Total amount					
Total amount in RA bill					
Deduction for unexecuted work					
Net amount payable					

The WMM work was completed for the whole stretches but rectification works were remaining in some of the stretches. The RAA team during site verification had made an observation nearby contractor's camp area which is about 460 meters. The same stretch was rectified before laying BT works. Hence the memo may be kindly dropped.

RAA's Further Comments & Recommendations:

The recovery of cost for work not executed is noted. However, it is to reiterate that the site engineer had failed to properly cross check the claims with that of actual work done at site. It also indicated entertainment of RA bills without actual verification of site and measurements as required under technical norms and financial rules and regulations. It was apparent that the contractor would have been paid for works not executed at site if not observed by the RAA.

Regarding the rectification of defective WMM works for 460m stretch road is noted. However, it is to reiterate that payments were made for work not executed at site. The rectification of defective and substandard works on the instant of audit verification of sites is an indication of laxity on the part of the RO and Site engineer toward works and procedures. It was apparent that the contractor would have been paid for defective and works not executed if not observed by RAA.

The Ministry should institute appropriate technical teams to thoroughly conduct inspection of the all ongoing road works and road conditions for all the completed works to ascertain the extent of defective and substandard works taken over by the Regional Office, Lobeyssa.

However, as agreed during the exit meeting, the DoR and RO should institute strict supervision and monitoring controls to prevent use of inferior quality materials and payments for unexecuted

works in future. The control mechanism proposed to be put in place intimated to RAA for record and follow-up during future audits. Besides, the recoveries affected and accounted for in the books of accounts should be furnished for review and records

20.3 Overpayment for L-drain works - Nu. 251,012.69

The joint physical verification of the L-drain works was conducted on 4.12.2017. During the physical measurements of the structures, the actual length of L-drain measured 2030m only against 2210.1m measured and recorded in the MB and contractor's bill. Thus, the excess measurements of 180.1 m had resulted in overpayment of Nu.251,012.69 as computed in the table 20.3 below:

Sl. No.	Description of item	Nos	L	B	H	Qty	Rate (Nu.)	Amount (Nu.)
1	Providing & fixing centering and shuttering (form work), including strutting, propping etc. and removal of formwork - Foundation & plinth etc.	2	180.1		0.15	54.03	252.61	13,648.51
2	P/L in position plain cement concrete excluding the cost of centering & shuttering. All works upto plinth level. 1:3:6 (1cement:3sand:6graded crushed stone 20mm nominal size)	1	180.1	1.1	0.15	29.72	5494.62	163,280.88
3	Providing & Laying 300mmx300mm thick plum concrete (60% PCC 1:3:6 and 40% 75mm down boulder) hill side wall, including excavation, leveling , backfilling, including necessary form works and disposal of surplus earth within 50m lead complete as per drawing.	1	180.1	0.30	0.34	18.37	3990.43	73,264.90
4	Filling of trenches, sides of foundations etc. in layers <200mm using selected excavated earth, ramming etc. within lead 50 m & lift 1.5m	0.50	180.1	0.30	0.53	14.4	56.88	819.01
	Total							251,012.69

Overpayment in construction in terms of measurements indicates either laxity on the part of the site engineer or absence of joint measurements of works done by the contractor and site engineer.

The RO, Lobeyssa besides recovering the overpayment should furnish justification for making such overpayments. The Site engineer should also be held accountable for such lapses which had resulted in payments for works not executed.

Auditee's Response:

In first RA bill it is apparent that the quantity of L-Drain bill paid was for 2210.1m and during site inspection from RAA team, length of L- Drain was coming around 2030m whereby the excess payment for differential Quantity of 180.1m has been accepted and paid. Considering it as RA bill and further the similar work was ongoing at site we calculated L-drain length from kilometer chainage post and made payment to the contractor.

However during final joint measurement of the L-Drain length of 2691.9 m out of which 2210.1 m has been paid during 1st RA bill. Therefore, the net quantity of 481.8 m was paid during 3rd and final bill through MB-No. 74/p-169 and there was no quantity excess payment made to the contractor. Hence, please drop the memo.

RAA's Further Comments & Recommendations:

While taking note of the response on the adjustment of excess payment from the 3rd and final RA Bill, the fact remains that the excess payment were made in the 1st RA Bills and any payments not regulated as per actual work done at site tantamount to extension of undue financial benefits to the contractor.

However, it is to reiterate that the site engineer had failed to properly cross check the claims with that of actual work done at site. It also indicated entertainment of RA bills without actual verification of site and measurements as required under technical norms and financial rules and regulations (FRR). It was obvious that that the contractor would have benefited from the overpayments if not observed by RAA.

However, as agreed during the exit meeting, the DoR and RO should institute appropriate control mechanism over the measurement of works done at site and verification of RA bills prior to settlement of the claims to prevent overpayments in future. The measures and procedures proposed to be put in place should be intimated to RAA for record and follow-up during future audits. Besides, the details of recoveries affected and accounted for in the books of accounts should be furnished for review and records.

21 Application of exorbitant annual quotation rates of Sand, Aggregates and Boulders for analysis of built up rates for various road item of works with resultant preparation of inflated Departmental Estimates - Nu. 272,797,750.38

The Departmental Estimates provided under various Notice Inviting Tender (NIT) works packages were found prepared by applying the analyzed rates on the estimated quantum of works derived from the drawings and the technical specifications.

On review of the Departmental estimates, it was noted that the Regional office had used annual quotation rates of sand, aggregates and boulders to analyze the built up item rates for the item of works of GSB, WMM, CRM, RRM & Stone soling. However, in keeping with the technical specification of the contract documents, the application of annual quotation rates of sand, aggregates and boulders was found not rational and correct for the preparation of estimates of pavement construction works as explained here under:

- The contracts for stone boulders, aggregates and sand supply works for 2015-2016 were awarded to M/s Druk Kuenphen Supplier, Lobeyasa and M/s Brive Wave Supplier, Punakha vide agreement No. DoR/ROL/Plg-08/2015-2016/07 & No. DoR/ROL/Plg-08/2015-2016/07 respectively. The materials were supplied from their quarry based in Baygogang (Near Khotokha) and Khelekha Stone Quarry to various Sub-Divisions like Lobeyasa, Pinsa, Damji & Nobding.
- Materials for the GSB, WMM, RRM, CRM and Stone soling works were to be extracted from respective construction sites or approved quarry as defined in the technical specification.
- Accordingly, actual extraction of materials were found done at sites as shown in the photograph and table below:



Picture showing crushing machine producing WMM material at site.

Table 21: Specification for pavement works			
TS Clause No.	Name of the item	Source of Materials as per Technical Specification	Actual Execution
902	GSB	Approved roadside excavation in borrow or cut from other sources.	Surface collection were used as GSB
1003.3	WMM	Crushing plant	Approved quarry
1302	RRM/CRM	Collection from the site	Found produced by rock breakers at site.

- As such, it was incorrect to use the rates from annual quotations for analyzing the rates of items of works of GSB, WMM, CRM, RRM and Stone Soling which involves long distance transportation of materials whereas contractors were to use the materials extracted from the construction sites and approved stone quarries located nearby. **If transportation factor affects the cost, it would be within the radius of distance in contract packages.**
- The significant differences were seen in rates of GSB & WMM as the analyzed rates was as high as Nu.3,027.27 and Nu.3,000 per cubic meter as against the built up BSR 2015 of Nu.1,445.07 and Nu.1,840.74 respectively and BSR 2017 rates of Nu.1,479.88 and Nu.1,830.74 respectively (**Refer to GSB & WMM rates of contract package 12,13,14 & 15**).
- In addition, it was also noted that the annual quotation rate of crushed sand itself was found as high as Nu.1,141.13 per cubic meter compared to river sand supplied by NRDCL @ Nu.867.53 per cubic meter at Nobding.
- The wrong application of exorbitant annual quotation rates for analysis of built up item rates and preparation of departmental estimates had resulted in inflation/increase in the estimates for item of works of GSB, WMM, CRM, RRM and Stone Soling for all 15 contract packages by Nu.272,797,750.38 as detailed in **Appendix “H1”**. The inflated estimates had direct impact on the contract price as departmental estimates were being made available to the prospective bidders through the NIQ.
- The review also showed that whilst the original departmental estimates were found prepared by applying the analyzed rates, the RO had used BSR plus cost index in line with the

approved Note sheet No. DOR/ROL/2015-2016/Plg-05/1787 dated 03/05/2016 for the preparation of estimates for the additional works in all the contract packages.

- It was not understood in audit as to why original estimates were not prepared by adopting the applicable BSR plus cost index as carried out for preparation of estimates for additional works.
- In an attempt to ascertain the financial implication on the preparation of original estimates for the items of works GSB, WMM, CRM, RRM and Stone soling by applying the BSR plus cost index, the RO would have curtailed overall estimated cost of all contract packages by Nu.150,661,257.78 as computed in **Appendix “H2”**.

Considering the above flaws in application of annual quotation rates for analyzing the built up item rates despite categorical stipulation on the extraction and use of construction materials from the construction sites, the Departmental Estimated cost had an adverse financial implication of **Nu. 272,797,750.38** to the Project. The RO with proper planning and preparation of cost estimates with due diligence could have not only curtailed the estimated cost but also obtained competitive and better contract prices to the extent of inflated cost of Nu. 272.798 million.

The RO, Lobeysa should furnish justification for inflating the departmental estimates by applying the analyzed rates which were arrived at by application of exorbitant annual quotation rates of the suppliers for construction materials.

The Ministry should institute a technical team to review all the estimated cost prepared for all packages including additional works by the ROs to ascertain the correctness and applicability of the estimated cost and exact financial impact to the Project and the Government Exchequer. Besides, the Ministry should also come up with appropriate guidelines and processes for the preparation of estimated cost for similar future project to address flaws and ambiguities as well as to prevent similar adverse financial impacts.

Auditee’s Response:

Initially, the ROs were adopting analysis rate for all construction works including the NEWH activities. However, the BSR rates were adopted after having received the instruction to implement BSR rates & cost index for all additional works. Thus, all the additional works awarded thereafter has used the BSR & cost index.

RAA’s Further Comments & Recommendations:

While taking note of the response on adoption of rate analysis, the fact remains that the RO had analyzed the rates for GSB, WMM, RRM, CRM & Stone soling works using annual quotation rates of boulder, aggregates and sand despite the materials were required to be obtained from the specific construction sites or stone quarry approved by the RO in terms of the Technical specification.

*It is also to reiterate that there were significant differences in rates of GSB & WMM. The analyzed rates were as high as Nu.3,027.27 & Nu.3,000 per cubic meter as against the built up rates of BSR 2015 of Nu.1,445.07 & Nu.1,840.74 and BSR 2017 of Nu. 1,479.88 and Nu.1,830.19 respectively. Thus, application of annual quotation rates for analyzing the built up item rates despite categorical stipulation on the extraction and use of construction materials from the construction sites, the Departmental Estimated cost had an adverse financial implication of **Nu. 272,797,750.38** to the Project. The RO with proper planning and preparation of cost estimates with due diligence could have not only curtail the estimated cost but also obtained competitive and better contract prices*

to the extent of inflated cost of Nu. 272.798 million since the departmental estimates were being made available to the prospective bidders through the NIQ.

However, as agreed in the audit exit meeting, the DoR in consultant with the Ministry should review the procedures and practices adopted by the ROs in the preparation of departmental estimates as to ascertain flaws and problems, Besides, the Ministry should come up with appropriate guidelines and processes to ensure that project cost estimates are prepared properly and appropriately in a consistent and uniform manner across all ROs and executing agencies for rendering the cost estimates more reliable and realistic and avoiding inflation of cost estimates. It may also be ensured that project cost estimates beyond certain specified threshold should be subject to independent technical and financial scrutiny and approval process.

The adverse financial implication of Nu. 272.798 on the project due to incorporation exorbitant material cost in the rate analysis used for the preparation of departmental is brought to the notice of the Government for appropriate decisions and actions.

22 Deficient planning, estimations and BOQ preparations with resultant award of additional works valuing Nu.62.613 million and avoidable payments of cost index - Nu. 8,976,955.7 and other flaws thereon

22.1 Deficient planning, estimations and BOQ preparations with resultant award of additional works valuing Nu.62.613 million and avoidable payments of cost index - Nu. 8,976,955.7

It is imperative that construction works of such magnitude and scale entail proper planning and feasibility studies prior to scoping of works and preparation of estimated cost. It was, however, observed that the estimates and BOQs was prepared without proper survey and adequate planning with consequential adverse impact on the cost and time due to awarding of foreseeable works as additional works as discussed below:

In the absence of appropriate study and planning prior to preparation of estimates and BOQs, Culvert Extension works, Gabion walls, Box drains and RCC Hume Pipe works required to be executed along the existing stretched of road were not identified and incorporated in the original estimates and BOQs. As such, all the foreseeable permanent structures involving Nu. 62,612,818.77 including cost index payment of Nu. 8,976,955.7 were awarded as additional works immediately after the issue of the work orders for all contract packages as detailed in table 22.1 below:

Package No.	Name of contractor	Initial contract cost (Nu.)	Total additional Amount (Nu.)	Cost Index amount included (Nu.)	% of award amount to contract cost
Package XI	M/s Hi Tech Company Pvt. Ltd, Punakha	107,568,025.00	2,870,125.52	303,284.43	2.67
Package VIII	M/s Empire Construction Pvt. Ltd, Punakha	78,967,074.00	13,285,832.74	1,654,394.01	16.82
Package V	M/s Etho Metho Construction, Pvt. Ltd	72,680,325.00	2,994,332.66	940,505.78	4.12

Package VI	M/s Tshering Tobgyel Construction Pvt. Ltd. Wangdue	112,652,539.00	11,661,249.55	1,807,149.88	10.35
Package X	M/s Rigsar Construction Pvt. Ltd. Thimphu	56,974,612.41	10,836,839.31	1,135,137.4	19.02
Package IX	M/s Welfare Construction, Pvt. Ltd, Thimphu	93,263,506.00	5,652,246.24	818,495.98	6.06
Package –VII	M/s Loden Construction Pvt. Ltd, Thimphu	71,417,679.10	15,312,192.76	2,317,988.22	21.44
	Total		62,612,818.77	8,976,955.7	

- a. The deficient planning had necessitated awarding of additional works entailing payment at analyzed rates through payment of cost index over the BSR 2015. Thus, proper planning and inclusion of all activities in the initial estimates and BOQs would have avoided payment of cost index to the extent of Nu. 8.977 million as tabulated above.
- b. Further, the Procurement Rules and Regulations while allowing direct award of Additional Works specify as under:

“In case of additional works provided that the value of the additional works shall not exceed twenty percent (20%) of the original contract amount or the maximum threshold value for the use of Limited Tender (above Nu. 200,000 and up to Nu.1,000,000) whichever is lower. Additional works exceeding twenty percent (20%) of the original contract price and subject to availability of budget within the same program, special approval must be sought from the competent authority”.

While the value of additional works of six packages ranged from 2.67 % to 19.02 % of the original contract amount and were within the permissible ceiling of 20%, the additional work value had exceeded the limited tender threshold of Nu. 1,000,000.00. Thus, the award of all additional works directly to the respective Contractors were in violation of procurement norms. The permanent works could have been awarded based on competitive bidding processing as the work can be easily carried out by a different contractor. The RO should comment on the violation of the procurement norms including failure to incorporate in the initial estimates and BOQs particularly the extension works of existing culverts, Gabion walls, Box drains and RCC Hume Pipe works as the requirement were easily identifiable as per the existing road locations and terrains.

The Ministry should investigate the circumstances leading to failure to incorporate foreseeable activities by the RO which had led to awarding foreseeable works as additional works involving extra financial burden to the government Exchequer.

Auditee’s Response:

It was not possible to foresee the extent of lengths and heights of the wall to be constructed prior to widening of the highway however, after the completion of the widening works the needs for additional walls & culvert extension etc. were found necessary. Realizing the facts that additional works were urgently required to achieve standard road design, the RO sought approval from HQ vide note sheet No. DOR/ROL/2015-2016/PLG-15 dated 25th March 2016 and accordingly MLTC was convened on 12th April 2016. The MLTC members deliberated on the issue and decided that RO should use the quoted rates of the respective contractors for similar item of works & calculate the cost for the additional items. In cases where similar items were not available in the BOQ, rest should be worked out using the BSR & than negotiate with the contractor. In the light of the above facts, the memo may be kindly dropped.

RAA's Further Comments & Recommendations:

The assertion of the RO that the extent of length and heights of the walls were not foreseeable was not correct in the light of the facts that widening works were an extension of the existing roads and any existing permanent structures within the widening works were required to be constructed on completion of widening works. The failure to incorporate all the foreseeable permanent structures in particular extension of existing culverts in the initial contract estimates indicated poor planning and lack of due diligence in the preparation of estimates and BOQs.

However, as discussed in the exit meeting, the DoR in consultant with the Ministry besides, reviewing the circumstances leading to failure to incorporate permanent structures aligning to the existing structures, should issue proper guidelines and standards as well as institute effective mechanism to ensure conduct of detailed survey and adequate planning process prior to preparation of detailed estimates and BOQs and prevent unwarranted awards of substantial additional works in future projects.

The outcome of the review and guidelines and standard proposed to be put in place intimated to RAA for records and follow-up in future audits.

22.2 Flaws and inconsistency in the fixation of and application of Cost Index for the cost estimation of Additional works directly awarded to the Contractors

On review of the estimates prepared by the RO, it was noted that varying cost index as well as varying rates were found analyzed and applied on the item of works indicating existence of inconsistencies in the computation of cost index and analysis of rates.

The application of varying cost index on items of works under different contract packages are as tabulated below:

Package No.	Name of contractor	Chainages	% of Cost Index applied on BSR 2015	Date of Award	Value of Additional Work	Distance in Km	Accumulated Distance in Km
Package X	M/s Rigsar Construction Pvt. Ltd. Thimphu	Rukubji-Chuserbu (359-365Km)-	24.78	9 th June 2016	10,836,839.31	6	54.0
Package IX	M/s Welfare Construction, Pvt. Ltd, Thimphu	Bumilo- Rukubji (365-372Km)	24.78	9 th June 2016	5,652,246.24	7	49.0
Package VIII	M/s Empire Construction Pvt. Ltd, Punakha	Pelela- Bumilo (372-379 Km)	24.78	9 th June 2016	13,285,832.74	7	42.0
Package XI	M/s Hi Tech Company Pvt. Ltd, Punakha	Pelela- Dungdungnyelsa (379-389 KM)	24.78	9 th June 2016	2,870,125.52	10	36.0
Package – VII	M/s Loden Construction Pvt. Ltd, Thimphu	Khelekha- Rachau (403-409.86Km)	24.78	9 th June 2016	15,312,164.21	6.86	26.0

Package VI	M/s Tshering Tobgyel Construction Pvt. Ltd. Wangdue	Tekizampa-Khelekha (409.86-422KM)	24.78	9 th June 2016	11,661,249.55	12.14	19.14
Package V	M/s Etho Metho Construction, Pvt. Ltd	Langkena-Tekizampa (422-429Km)	14.66	9 th June 2016	8,285,579.87	7	0

It would be noted from the table above that while cost index of just 14.66% was applied for contract package V, cost index of 24.78 % was uniformly applied to all other contract packages irrespective of existence of distances ranging from as far as 54km as to just 19.14km from the location of Package V. Adoption of two sets of cost index indicated flaws and inconsistencies in the application cost index for preparation of cost estimates for additional works. This also indicates absence of standard practices and processes in the preparation of cost estimates of project works.

Auditee's Response:

Ideally, the cost of the project needs to be estimated through detail rate analysis based on the site conditions. However, due to time constraint, BSR, which is a guide for cost estimation is usually referred for computing project cost/item rate. To obtain item rate of the project, the base town rate is multiplied by the cost index.

The computation of cost index depends upon the lead distance from the nearest source; therefore there will be different cost index for different project locations. The first DoR Quarterly Meeting has resolved to adopt site specific rate analysis for project cost estimation and do away with the system of using cost index as it is cumbersome and there is no clear guidance on its computation.

RAA's Further Comments & Recommendations:

While taking note of the response on the decisions of the first DoR Quarterly Meeting to adopt site specific rate analysis for project cost, the fact remains that the RO had used cost index of 24.78% for the preparation of cost estimates of additional works for Six (6) contract packages which were not site specific except one package with cost index of 14.66%. Thus, adoption of just two cost indices indicated either existence of flaws and inconsistencies in the calculation of cost indices applied for cost estimations or absence of standard guidelines and procedures on the calculation of the cost indices.

As agreed in the exit meeting, the DOR in consultation with the Ministry should develop proper guidelines and procedures for the calculation of cost indices as per the location of projects to ensure consistency and fair application of cost indices in the preparation of cost estimates by ROs and government executing agencies in future.

The guidelines and procedures developed and implemented should be intimated to the RAA for records and follow-up in future audits.

22.3 Exorbitant application of 24.78% cost index over and above the BSR 2015 rates as compared to BSR 2017 Built-up rates

For the award of additional works, the estimates and BOQs, for Culvert Extension works, Gabion walls, Box drains and RCC Hume Pipe works were found prepared by applying 24.78 % cost index over and above the BSR 2015(updated edition issued on 6th May 2015).

With a view to ascertain the correctness of the application of substantial percentage of cost index over the 2015 within a period of one year (awarded on 2nd June 2016), a comparison was made between the BSR 2015 and BSR 2017 built-up rates of the item of works awarded as additional works. The details of comparisons and status of increase of built up rates from BSR 2015 to BSR 2017 for Base Town Thimphu are as tabulated below:

Table 22.3: Increase of built up rates					
Item of works	Particular	Rate as per BSR 2015 (6/5/215)	Rate as per BSR 2017 (8/5/2017)	Amount increase in 2 years (Nu.)	% Increase
Gabion Walls	RW0066 Height up to 2.0m	6,109.61	8,280.90	2,171.29	35.54
	RW0067 Height up to 3.0m	10,852.75	14,672.63	3,819.88	35.20
	RW0068 Height up to 4.0m	16,883.27	22,860.10	5,976.83	35.40
	RW0069 Height up to 5.0m	26,507.09	36,346.20	9,839.11	37.12
	RW0070 Height up to 6.0m	36,333.23	45,699.13	9,365.9	25.78
	RW0071 Height up to 7.0m	44,516.48	60,263.88	15,747.4	35.37
	RW0072 Height up to 8.0m	56,274.43	76,291.72	20,017.29	35.57
	RW0073 Height up to 9.0m	70,136.34	95,045.47	24,909.13	35.52
RCC Culvert Extension	SM0025 In cement mortar 1:3	3203.54	4,523.42	1319.88	41.20
	RC0013 1:1:2 (1 cement : 1 sand : 2 graded crushed rock 20 mm nominal size)	6,683.51	7,996.26	1312.75	19.64
	RC0083 Providing & fixing Thermo-Mechanically Treated reinforcement bar	78.32	69.96	-8.36	-10.67
	RC0095 Suspended floor, roof, landing, shelves and their supports, balconies, chajjas, etc	599.26	637.25	37.99	6.34
	PO0036 110mm	595.17	584.71	-10.46	-1.76
	CW0011 1:5:10 (1 cement : 5 sand : 10 graded crushed stone 40 mm nominal size)	3,020.03	3,373.81	353.78	11.71
	CW0022 1:2:4 (1 cement : 2 sand : 4 graded crushed rock 20 mm nominal size)	4753.59	5,566.93	813.34	17.11
	PL0021 C.M 1:4	111.06	141.54	30.48	27.44

It would be noted from the table above that the average increase in base rates in BSR 2017 for Gabion walls was just 34.44% and RCC Culvert works 13.88% over the BSR 2015 base rates within a period of two (2) years.

Thus, the application of 24.78% and 14.66% cost index over BSR 2015 Thimphu Base Rates for the estimation of additional works awarded within a time gap of 1 year was not rational and indicated flaws in the cost estimation of additional works.

The Ministry should review the calculation and application of cost index and excess payments thereon recovered and deposited into ARA.

Auditee's Response:

Initially, the ROs were adopting analysis rate for all construction works including the NEWH activities. However, the BSR rates were adopted after having received the instruction to implement

BSR rates & cost index for all additional works. Thus, all the additional works awarded thereafter has used the BSR & cost index. Therefore, please drop the memo.

RAA's Further Comments & Recommendations:

The RO had failed to provide appropriate response on the application of higher cost index as compared to average increase built-up rates of BSR 2017 over BSR 2015. However, as discussed during the exit meeting, the DOR in consultation with the Ministry should review the existing procedures for calculation of cost index outlined in the BSR to address any flaws, ambiguity and drawbacks to prevent unjustified calculation and application of cost index for future project works. The measures taken to address such flaws in the calculation and application of cost indices should be intimated to RAA for records and follow-up in future audits.

22.4. Non-inclusion of item of works in the tender BOQs initially incorporated in departmental estimate and later awarding as additional works with inflated quantities with resultant extra financial burden to the project - Nu. 960,580.90

An attempt was made to ascertain the circumstances leading to scope out of RCC culvert extension works relating to the existing RCC culvert structure of the road and awarding as additional works at higher estimated cost.

On review of the initial estimate and BOQs prepared for contract package VII, it was noted that under Permanent Works, 2 Nos. RCC Culvert Extensions Works valuing to **Nu. 5,281,884.11** (each RCC culvert works was estimated at **Nu. 2,640,942.06** each) were found incorporated. However, the BOQ provided in the tender document had reflected quantities of just one RCC culvert extension works and accordingly found quoted by the winning firm M/s Loden Construction Pvt. Ltd. In line with the quoted prices, execution of one (1) number RCC Culvert Extensions Works was carried out at their quoted price.

The remaining one (1) number RCC Culvert Extensions Works was found awarded as additional works estimated at the quoted price of contractor. However, the quantities of items of works were found inflated from the initially estimated quantities incorporated in the departmentally estimated BOQ as detailed below:

Table 22.4: Details of excluded culvert items in BoQ						
Culvert Extension	Unit.	Initial estimated Qty.	Qty as per Additional work order	Extra Qty	Quoted Rate	Extra financial implication (Nu.)
EW0105	Cum	348.21	638.50	290.20	70.00	20,320.30
EW0107	Cum	348.21	127.70	(220.51)	200.00	(44,102.00)
SM0072	Cum	12.59	110.90	98.90	600.00	59,340.00
CW0011	Cum	17.47	45.90	28.43	3,000.00	85,290.00
CW0005	Cum	28.80	77.40	48.60	3,800.00	184,680.00
RC0090	Sqm	28.58	137.40	108.82	400.00	43,528.00
SM0025	Cum	197.79	441.00	243.21	2,100.00	510,741.00
CW003						
SM0005						
SM0007	Cum	497.95	88.10	(409.85)	2,000.00	(819,700.00)
CW0022	Cum	1.52	9.00	7.48	5,500.00	41,140.00
RC0013	Cum	9.00	72.00	63.00	8,000.00	504,000.00
RC0083	Kgs	1443.48	5,248.90	3,805.42	80.00	304,433.60
RC0095	Sqm	28.65	94.10	65.45	400.00	26,180.00

RW0035	Cum	963.20	437.50	(525.70)	50.00	(26,285.00)
P00036	M	329.40	396.00	66.60	650.00	43,290.00
PL0021	Sqm	0	110.90	110.90	250.00	27,725.00
Extra financial impact						960,580.90

The Ministry should thoroughly review the circumstances leading to failure to incorporate the scope of One RCC culvert extension works in the tender BOQ despite inclusion in the departmental estimated scope of works and cost. Besides, the Ministry should also review the circumstances leading to inclusion of quantities of which were different from the initially assessed quantities.

Auditee’s Response:

Due to sheer pressure within short period of notice to complete the project within three years and not having enough time to plan, the RO could not estimate the required numbers of culvert extensions. However, during construction phase it was realized that additional numbers of culvert extension were required. To this, the RO had acquired variations approval from competent authority prior to actual executions. The rates for the additional quantity were paid as per the initial contract rates which are cheaper as compared to BSR 2015 plus cost index. Therefore, please drop the memo.

RAA’s Further Comments & Recommendations:

It is reiterated that two RCC culverts were included in the estimates and BOQ where as one of culverts omitted in tender BOQ was later awarded as additional work with inflated quantities of various items of works which had resulted into extra financial implication to the extent of inflated quantities.

However, as discussed in the exit meeting, the DOR should review the circumstances leading to variations in the quantities of item of works from the initially estimated quantities besides instituting proper mechanism to curb such lapses in future.

22.5 Failure of Zinc Coating as per Test Results of Gabion Mesh Wire conducted for NEWH

As per the Specifications for Buildings and Road Works 2015, Gabions shall consist of steel wire mesh crates. The steel wire shall be mild steel wire complying with IS 280-197. All wires used in the manufacturing of crates and diaphragms, binding and connecting lids and boxes shall be galvanized with a heavy coating of zinc by an electrolytic or hot dip galvanizing process. The weight of deposition of zinc shall be in accordance with IS 4826-1979. Zinc coating shall be uniform and be able to withstand minimum number of dips and adhesion test specified in IS 4826-1979. Tolerance on diameter of wire shall be + 2.5 percent. The tensile strength of gabion wire shall be between 300 and 550 N/mm².

All gabions shall be machine made. The wire shall be woven into a hexagonal mesh with a minimum of 3 twists. All edges of the crates shall be finished with a selvedge wire at least 3 gauges heavier than the mesh wire.

Diameter	Tensile strength	Elongation	Zinc Coating as per IS 16014
2.7	300-550 N/mm ²	More than 10%	260 g/m ²
3.4			270 g/m ²
2.4			260 g/m ²

Further, in terms of the technical specifications for double lanning of Northern East West Highway, the specification for construction of gabion wall stipulates, as under:
 “Construction of Gabion Wall, height up to 2m with dry stone masonry (hammer dressed facing) including delivery of materials, weaving of gabion mesh with GI wire 2.7mm dia, fixing of selvedged, binding/lacing wire 2.4mm dia”.

All gabions shall be machine made. The wire shall be woven into hexagonal mesh with minimum of 3 twists. All edges of crates shall be finished with a selvedge wire at least 3 gauges heavier than mesh wire.

Diaphragms shall be manufactured of same materials as the parent gabion box and shall have selvedge wire through perimeter. The number and size of diaphragms to be provided with each crate shall be as in Table 15.1. All crates shall be supplied with binding and connecting wire of same gauges shown in Table 15.2 of sufficient quantity to bind all diaphragms and closing edges. The specified mesh opening was 114 X 128 and the specified mesh type was 100 X 120 as shown in the in table below:

Mesh opening (mm)	Mesh Type	Thickness of mesh wire	Thickness of binding and connecting wire	Thickness of selvedge wire
(DXH)		SWG	SWG	SWG
83X114	80X100	9,10,11	11,12,13	6,7,8
114X128	100X120	10,9	12,11	7,6

The mesh opening shall be as instructed by the site engineer

SWG	6	7	8	9	10	11	12	13	14
MM	4.88	4.77	4.06	3.66	3.25	2.95	2.64	2.34	2.03

The test result of Gabion mesh produced to RAA by BSB vide letter no BSB/MLSD/PTL/2017-2018/1084 dated 11/04/2018 are detailed in **Appendix “I”**.

As apparent from the test results, the zinc coating for samples collected from M/s Empire Construction Pvt Ltd (Package 8, 14 and 15) and M/s Loden Construction Pvt Ltd (Package 7) have failed to achieve the required specification for zinc coating which indicated poor galvanization of wires. Galvanization is done mainly to prevent rusting of steel underneath. The zinc coating was found ranging from as low as 1.31 g/m² to 59.63 g/m². Poor galvanization of the mesh wires indicates the wires are more susceptible to environmental factors which could lead to rusting of wires and ultimately get damaged.

Looking at the test results, it was indicative that the materials were not purchased from the BSB approved manufacturers that are as tabulated below:

Sl.No	Product Category	Product Brand	Manufacturer	Factory Location	Certificate Validity	Dealership Details
62	Gabion Mesh	1.TERRAMESH 2. GREEN TERRAMESH 3. GABION & GABION MATTERESS (Both Zn coated and Zn+PVC coated)	Maccaleri Environmental Solutions Private Limited	Pune	2019-01-24	Rabsel Enerprise, Toorsa, Phuntsholing, Chukha
63	Gabion Mesh	GTI (Both Zn coated and Zn+PVC coated)	Gabion Technologies India Private Limited	New Delhi	2018-11-22	NA
64	Gabion Mesh	Adjust Wire (Both Zn coated and Zn+PVC coated)	Adjust Wire Products	Gujarat	2018-08-30	Sparkle Traders, Phuntsholing
65	Gabion Mesh	Thangtong (only Zn coated) M.S wire brand-Nirmal	Thangtong Iron and Steel Products	Phuntsholing	2018-11-22	NA
66	Gabion Mesh	Gurukrupa	Gurukrupa Wire Netting Industries	Gujarat	2018-08-30	Sparkle Traders, Phuntsholing

The acceptance of the Gabion materials, which did not meet the required galvanization specified in the technical specification, was apparently due to weak supervision and laxity while inspecting and authorizing to use the materials for the work by the contractors.

The Regional Office should verify the wire mesh brand and justify the acceptance of gabion materials not meeting the specification. Besides, the RO must direct the contractors to re-construct the gabion walls using correct specification. The action initiated on the matter should be intimated to RAA. Further the RO should conduct tests of gabion wire of all the contract packages to verify whether the gabion materials are provided as specified in the technical specification.

Auditee's Response:

We have checked the GI wire 2.7mm dia, selvedge, binding/lacing wire 2.4mm dia, All gabions are machine made. The wire shall be woven into hexagonal mesh with minimum of 3 twists. All edges of crates shall be finished with a selvedge wire at least 3 gauges heavier than mesh wire. The hexagonal openings for the mesh supplied at site were checked and found correct as per specification. However, we could not check the zinc coating test because of non-availability of facility at the site. Since all the physical requirements were fulfilled the structures were accepted. Therefore, the memo be kindly dropped.

RAA's Further Comments & Recommendations:

The RAA has taken note of the response on the inspection and checks carried out on physical requirements of gabion wire and found correct as per the technical specifications.

However, as accepted on the non-conduct of test for zinc coating, the RO should immediately carry out test for zinc coating, diameter and elongation tests as required and necessary to validate the quality of the wire. It is to reiterate that as evident from test report, M/s Empire and M/s Loden Construction gabion wires have failed zinc coating tests.

As agreed, the DOR should direct the RO to conduct necessary tests of gabion wire for all other contract packages and test results of Gabion mesh produced to RAA for review and records. Besides, the DOR and RO should take actions against the above two contractors for the failure to achieve the required zinc coating which indicated poor galvanization of wires.

Further as agreed, the RO should also confirm the procurement of gabion wire mesh from authorized dealer approved by the BSB and outcome intimated to RAA. In additional, the DOR in consultation with the Ministry should develop a system to validate the procurement of gabion wires by the contractors from authorized dealers dully approved by BSB for future project works.

23 Procurement of Gabion wire mesh from firm other than the authorized dealer of BSB approved manufacturer M/s. Maccaferri Environmental Solutions Private Limited, Pune, Maharashtra

The BSB approved manufacturer of Gabion wire mesh was M/s. Maccaferri Environmental Solutions Private Limited, Pune, Maharashtra. The product brands were Terramesh, Green Terramesh and Gabion & Gabion Mattress (both GI & PVC coated) and certificate validity was till 12/11/2016.

Further, it was noted that M/s. Rabsel Enterprise, located at Toorsa, Phuentsholing, Chhukha Dzongkhag having the whole sale trade license No.2002828 was the authorized dealer of the

Maccaferri Environmental Solutions Private Limited. India in Bhutan. (Brands included WT (*Gabion & Gabion Mattress, Terramesh, Green Terramesh, Paraweb, Paralink and Geotestiles*).

It was evident from the tender and procurement of gabion wire mesh, that the MLTC and ROs had been procuring gabion wire mesh from M/s Bhutan Hardware, Phuentsholing although M/s. Rabsel Enterprise, located at Toorsa, Phuentsholing, Chhukha Dzongkhag was the authorized dealer of BSB approved manufacturer M/s. Maccaferri Environmental Solutions Private Limited, Pune, Maharashtra.

The MLTC and ROs should comment on as to whether M/s Bhutan Hardware, Phuentsholing is also the authorized dealer of BSB approved manufactures of gabion wire mesh. In addition, the MLTC and ROs should also validate all the procurements of gabion wire mesh so far made with the test reports and documentary evidences supporting that manufacturing firms are BSB approved manufacturers.

In the event procurements are made from other suppliers, the RO should review to ascertain that the steel wire crates comply with IS 280-197 and the weight of deposition of zinc is in accordance with IS 4826-1979, tolerance on diameter of wire +2.5 percent, tensile strength of gabion wire between 300 and 550M/mm² and all gabions are machine woven with a minimum of 3 twists as defined under section 1500 of the Technical Specification.

Auditee's Response:

The Open Tender was invited for supply of gabion mesh vide NIT No. DoR/ROL/Plg-15(A)/2014-2015/3595 dated 15/5/2015 in the MoWHS website.

In response to NIT, 10 prospective suppliers participated and submitted their rate for the supply of gabion mesh and M/s. Rabsel Enterprise, Phuentsholing have neither quoted their rate nor made any inquires about their dealership. Unintentionally and with due diligence the lowest rate quoted have been accepted and award letter issued. The materials supplied have been thoroughly checked to ascertain the quality of the mesh supplied. Therefore, please drop the memo.

RAA's Further Comments & Recommendations:

While taking note of the response, the DOR and ROs should confirm as to whether M/s Bhutan Hardware is the authorized dealer of BSB authorized manufacturer whereby the quality of materials are not certified.

The RO in consultation with DoR should consult with BSB to certify and gabion wires supplied by M/s Bhutan Hardware.

Further as agreed, the RO should also confirm the procurement of gabion wire mesh by the contractors from authorized dealer approved by the BSB and outcome intimated to RAA. In addition, the DOR in consultation with the Ministry should develop a system to obtain information on the procurement of gabion wires by the contractors for use in government projects to validate procurements from authorized dealers duly approved by BSB for future project works.

The system developed to ensure procurements by contractors from authorized dealers of BSB approved manufacturers should be intimated to RAA for records and follow-up in future audits.

24 Wrong appliance of cost index in the Gabion wall resulting into excess payment to the contractors - Nu. 199,911.04

On scrutiny of the detailed estimates prepared for the NEWH works it was noted that construction of **Gabion walls** were not included in the initially prepared estimates and the Bill of Quantities

(BOQ). The RO, had instructed the contractors to execute the gabion works wherever necessary in all the packages and paid at the rates derived by analyzing the rates adding cost index.

On review of the analyzed rates for gabion works, it was noted that rates were derived and paid for gabion works by adding 24.78% cost index which was calculated for Retaining walls based on BSR 2015. As the nature of works are different from Retaining Walls, the RO should have calculated the cost index for Gabion wall separately. Thus wrong application of cost index had resulted in excess payment to the contractors on gabion works. The contractor-wise excess payments are summarized below and detailed in **Appendix “J”**.

Sl. No.	Contractor	Qty. of gabion wall	Amount excess paid	Remarks
1	M/s Loden Construction (Pack-VII)	168.50 m	39,514.62	Sub-Division Nobding
2	M/s Etho Metho Construction (Pack - V)	140.50 m		Sub-Division Lobeysa
3	M/s UP Const. (Pack-XIII)	18.50 m	5,240.06	Sub-Division Nobding
4	M/s Empire Construction (Pack-VIII)	151.62 m	34,973.48	Sub-Division Nobding
5	M/s Rigsar Construction (Pack. X)	560.90 m	60,359.69	Sub-Division Nobding
6	M/s Hi-Tech Construction (Pack-XI)	43.50 m	19,416.41	Sub-Division Nobding
7	M/s Welfare Construction Company (Pack. IX)	389 m	40,406.79	Sub-Division Nobding
8	M/s Chogyel Construction Company (Pack. II)	68 m		Sub-Division Lobeysa
	Total		199,911.04	

The Regional Office, should justify for not calculating the cost index separately for Gabion Walls besides recovering the excess payment of Nu. 199,911.04 from the contractors and deposit the amount to Audit Recoveries Account. The RO should also hold the officials responsible for the lapses.

The Ministry should also institute an appropriate technical team to thoroughly review all the cost indices calculated and applied for estimation purpose and additional works by the RO, Lobeysa to prevent application of same cost indices for different nature of works as well as to recover all resultant excess payments.

Auditee’s Response:

It is to inform that the road works is predominately classified into three broad category such as (i) formation work, (ii) pavement work & (iii) permanent work. All works like retaining/breast, gabion wall, drain etc. falls under the category of permanent work. Therefore, the cost index is also deduced for three broad category. For example BSR 2017, page 121 shows sample calculation of cost index for road permanent works: retaining walls, culvert and other similar works (copy enclosed for reference).

In line with the BSR sample calculation the Department had been adopting single cost index for permanent works since the purpose of work is similar irrespective of different permanent works.

To be more precise and accurate cost estimate, we would suggest going for project/site specific rate analysis in future projects. The 1st DoR Quarterly Meeting of the 12th FYP has pass a resolution to carry out project specific rate analysis and do away with the cost index system since determination of cost index is tedious and does not represent true cost of the site.

Therefore, RAA is requested to kindly drop the memo based on the justification provided above.

RAA's Further Comments & Recommendations:

It may be noted that nature of permanent works differs in terms of requirement of component of items (material/equipment) as tabulated below:

As Per LMC component of item required for Gabion works		As Per LMC component of item required for RRM & CRM works	
SM0051	Dry hand packed rubble masonry hammer dressed (facing), with stone boulder > 0.04 cu.m	LB0051	Mason Gd.2
LB0077	Labour	LB0077	Labour
LB0051	Mason Gd. II	MT0043	Sand
LB0039	Supervisor	MT0060	Boulder
MT0256	G.I wire (assorted diameters)	MT0145	Cement (OPC / PSC

It would be apparent from above table that GI wire is not required for RRM works viz-a-viz cement for gabion works. Thus application of same cost index was not correct and justified.

However, as agreed during audit exit meeting, the DOR in consultation with the Ministry should thoroughly review the sample cost indices provided in the BSRs and ascertain the correctness of the applicability of same cost index for different nature of works viz. retaining/breast, gabion wall, drain etc. though all categorized under permanent road works. The outcome of the review and decisions and measures taken to address such flaws intimated to RAA for record and follow-up in future audits.

Further, the DOR and Ministry should revisit the decisions taken during the 1st DoR Quarterly Meeting of the 12th FYP to carry out project specific rate analysis and do away with the cost index system as the RAA is of the opinion that adequate studies is required to be carried out to assess pros and cons of both the system prior to taking decisions to opt for project specific rate analysis.

25 Irregularities in payments for works executed through Labour Contracts - Nu. 9,530,232.56

The RO, Lobeyasa had executed RRM walls, breast walls, Gabion walls, extension of culvert and cross drains departmentally through engagement of labour contractors in line with the current practices adopted across the country by Regional Offices for execution of departmental works. It was noted that no tendering process were adopted to avail competitive rates but works were directly awarded to individual person based on the past work relationship and work experiences assessed by the RO, Lobeyasa.

The accounting and construction related records indicated payments of Nu. 9,530,232.56 in the fiscal years 2014-2015, 2015-2016 and 2016-2017 to various labour contractors for executing the permanent structures.

On verification of the contract documents and modality of rates agreed and paid, it was observed that payments were made based on analysis of rates for item of works including 1% water charges and 10% Overhead Charges.

The RAA is of the opinion that since all materials and tools and plants and other related cost are borne by the Department and works were awarded without undergoing competitive processes, the payment towards such accounts were not justified and admissible.

Thus, considering the above facts, the inadmissible payments to the extent of Nu. 9,530,232.56 were made to the various labour contractors as summarized below and detailed in **Appendix “K”**.

Table 25 : Inadmissible payment for LC work					
Name of work	Total contract (Nu.)	Labour Amount	Overhead charges paid 10%(Nu.)	1% water charges (Nu.)	Total Inadmissible Payments (Nu.)
Permanent Works	86,6384,77.86		8,663,847.79	8,66,384.78	9,530,232.56

Therefore, RO, Lobeyssa besides commenting on the above lapses should recover the inadmissible payments amounting to Nu. 9,530,232.56 from the concerned labour contractors and deposit into ARA.

Auditee’s Response:

The rationale behind the introduction of labour contract is to help our own national workers who have been with the Department of Roads for so long. The labour contract system was introduced in order to retain the existing workers in the field of road maintenance despite having low daily wage compared to the market rates. There is a labour contract guideline distributed by the HQ and RO, as of now have following the guideline.

Although the materials, tools and plants are issued by the department, the imperceptible overhead cost like shifting of materials from the site store to the work site, and transportation of materials from the road point to the construction site are always there. In certain cases, the shifting of materials is a continuous process, to and fro to the work sites.

1% water charge is internationally accepted in the rate analysis for drinking, curing, washing hands before eating, and preparation of cement mortar, concrete etc.

RO would like to submit that the 10% overhead and 1% water charge are part and parcel of the rate analysis and cannot be separated, and therefore RAA is requested to kindly drop the memo.

RAA’s Further Comments & Recommendations:

It is to reiterate that the labour contracts are awarded without having to have a trade license, undergoing competitive bids and without establishment of firm/office. Besides, in terms of the guideline of the labour contract Clause 9(h)-Payment, the payment is purely labour payment similar to daily wage paid to labours and does not include payment for 1% water charges and 10% overhead charges. Thus, the payment of water charges and overhead charges was not justified and stands recoverable.

The DoR should recover Nu. 9,530,232.56 from the labour contractors besides issuing instructions to all ROs to stop such payments in respect of works executed through labour contracts in future.

As discussed in the exit meeting, the DOR in consultation with the Ministry should review the process and methodology adopted by the Regional Offices in the execution of departmental works besides instituting appropriate system for the execution of departmental works and engagement of labour contractors to prevent extravagant estimations and expenditures. The appropriate system developed and implemented on the engagement of labour contracts including payments of water charges and overhead cost should be intimated to RAA for record and follow-up in future audits.

