




Performance Audit - Managing Procurement Road Construction and Restoration Contracts



A Report by the Auditor General



The background of the page is a faded, light blue image of a large, classical-style building with a flag flying on a tall pole in front of it. The building has several arched windows and a central entrance. The flag is the national flag of Malta.

This report has been prepared under sub-paragraph 8(a)(ii) of the First Schedule of the Auditor General and National Audit Office Act, 1997 for presentation to the House of Representatives in accordance with sub-paragraph 8(b) of the said Act..

J. G. Galea
Auditor General

National Audit Office
January 2004

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Performance Audit

Managing Procurement

Road Construction and Restoration Contracts



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Abbreviations used within the report

ADT	Awtorita' dwar it-Trasport (Malta Transport Authority)
ASTM	American Society for Testing and Materials
BOQ	Bill(s) of Quantities
CBA	Cost Benefit Analysis
CET	Customs and Excise Tax
DoC	Department of Contracts
EIA	Environment Impact Assessment
EN	European Standards
ETC	Employment and Training Corporation
EU	European Union
FBOQ	Final Bill(s) of Quantities
GCC	General Contracts Committee
HOS	Home Ownership Scheme
ISO	International Organisation for Standardisation
LA	Letter of Acceptance
MEPA	Malta Environment and Planning Authority
NAO	National Audit Office
QAM	Quality Assurance Manager
RD	Roads Directorate
TINA	Transport Infrastructure Needs Assessment
VAT	Value Added Tax



Executive Summary

Executive Summary

Introduction

1. The Value for Money Section of the National Audit Office carried out a performance audit to assess the robustness of the public procurement system for substantial contracts, taking the Roads Directorate (RD) as a case study.

2. The decision to conduct the audit was instigated by the increasing emphasis by the European Court of Auditors on the performance of the public procurement systems in acceding countries. Expenditure on road construction and restoration projects was chosen to assess the procurement system due to the materiality of expenditure and the direct impact on the taxpayer, the community and business.

3. This report aims to establish whether effective and efficient procurement systems enabled the Department of Contracts (DoC) and the Roads Directorate to obtain the required services at the right price, at the right time, and of the right quality.

4. The RD, within the Malta Transport Authority (ADT), is the government entity responsible for an ongoing national programme for the construction, restoration and maintenance of the Maltese road network. The RD invested Lm19 million as capital expenditure on road infrastructure between 2000 and 2002. (*Appendix D*)

5. The DoC within the Ministry of Finance, is responsible for ensuring that the Public Service (Procurement) Regulations are being adhered to by public entities and is assisted in the execution of its duties by the General Contracts Committee (GCC). The Public Contracts Appeals Board, a fully independent body, considers objections by aggrieved bidders. (*Appendix C*)

6. Eleven tenders issued by the DoC covering nine road projects over a five-year period - between 1998 and 2002 - were selected as case studies (*Table A.1*). These cases were studied with the aim of providing an in-depth understanding of the systems and practices used by the DoC

and the RD during the management of procurement from planning to final delivery.

7. The main issues analysed are: (*Appendix A*)

- whether effective and timely planning processes were in place;
- whether tendering and adjudication processes for the appointment of contractors were based on value for money principles; and
- whether contracts were managed with due regard to effectiveness and efficiency.

8. The analyses of these issues are discussed in the main chapters. Selected findings of the studied cases are presented in detail in appendices attached to this report.

Main findings

(a) Incomplete approach to planning and design by the RD

9. The audit concluded that, in general, the RD failed to undertake the required planning and design for the procured requirements in the most effective and timely manner and many important decisions were postponed till after the award of tenders or during works. In some of the studied cases the RD opted to leave out complete parts of the project planning process, some of which were critical for effective contract management and control. There were also cases of site investigations and preparatory work being left out in order to accelerate the publication of the call for tenders. (*Para 2.9, 2.10, 2.12, 2.22, 2.26, 2.30, 2.33, 2.35*)

(b) Inaccurate estimates by the RD

10. Initial proposals and estimates presented by the RD for authorization were inaccurate. In many cases departmental estimates were revised during the adjudication process and work-in-progress to incorporate changes in designs and construction methodologies. (Para 2.28, 2.36, Table 3 and Table 4, Part 2)

(c) Shortcomings in contract details effecting adjudication by the RD and the GCC

11. The principal means of achieving value from the adjudication process is through comprehensive contract documentation, clear specifications, effective competitive bidding and the selection of the most suitable contractor offering the best price and with the required resources and capabilities to meet the agreed contract conditions and specifications.

12. The RD, the DoC and the GCC had systems and procedures in place to prepare the necessary tender documents, to publish calls for tenders, to attract bidders, to adjudicate and to award contracts. However, there were shortcomings in the manner these systems were operated that ultimately reduced the effectiveness of the whole tendering process. (Para 3.7, 3.23, 3.25, Table F.1 and Figure F.1)

13. Major issues identified from the case studies included:

- a) The requisites included by the RD in the bidding contract to prospective bidders and to the DoC were in most cases incomplete or inaccurate, mainly because of inadequate planning. (Para 3.10, 3.11, 3.12, 3.14, 3.16)
- b) The analyses undertaken by the Adjudication Board of the RD in its recommendations to the GCC was in most cases insufficient and in other cases non-existent. (Para 3.30, 3.33)
- c) The GCC had limited expertise at its disposal to gain a full understanding of the prevailing

market forces and to be able to establish the reliability of the short-listed bidders. (Para 3.30, 3.33, 3.35)

- d) The GCC gave the highest importance to the lowest bid price in nearly all the cases studied and other non-financial considerations such as past performance, capabilities, financial position and other commitments had minimal impact on the final decision. (Para 3.32)
- e) In many cases the bidders failed to submit all the information requested in the bidding documents. (Para 3.40)
- f) For most of the period reviewed, a dominant supplier amongst road contractors limited the options available for adjudication. On the initiative of the RD, the Commission of Fair Trading declared this supplier to be in breach of Article 5 of Act XXI of 1994, regarding inhibition of competition. As a result, the supplier had to be eventually dissolved. (Para 3.44, 3.45, 3.46).

(d) Weaknesses in contract management by the RD and the DoC

14. In implementing a procurement strategy for road construction and restoration, the RD, DoC and the GCC retain total responsibility, on behalf of the Government, for the quality and overall performance throughout the lifetime of the contracted works.

15. Although comprehensive technical standards and conditions were included in the awarded contracts, the RD and the DoC weakened their position by not taking action to enforce contract clauses or by waiving prescribed sanctions against defaulting contractors. This was a major shortcoming, which rendered ineffective the various legal safeguards incorporated in the studied contracts. (Para 3.20, 3.21)

16. Findings from the studied cases demonstrated that the RD did not have an effective project management approach based on sound quality assurance and internal control

practices, as well as the resources to monitor and enforce the contract conditions during and after the delivery of works. (Para 3.20, 3.21)

17. Although the RD set up a Road Testing Laboratory in 2001, this is currently unmanned due to an alleged shortage of suitably qualified personnel. (Para 2.44)

(e) Considerably high time and cost variations, not necessarily justifiable

18. It is highly understandable that given the scale, complexity and the unpredictable nature of road construction, during the course of works, it is necessary for the RD to modify or expand planned works to cater for unforeseen eventualities. (Para 4.31)

19. However, the audit also identified time, cost and quantity variances that were not necessarily caused by unexpected conditions but rather by the RD's inability to successfully minimise or prevent the risks of contract variations.¹ (Para 4.13, 4.32, Table G.1)

20. The main causes of these variations were inadequate planning, design changes, late instructions and weak project management. The most significant effects were delays in the commissioning of the projects, higher costs, community dissatisfaction with protracted traffic delays and litigation. (Para 4.32)

21. End-users also indicated that the overall projects' effectiveness was still being undermined by reported inconveniences, such as incomplete embellishment works, road surface imperfections, foul smells from ineffective drains and flooding after heavy rainfall, as well as persistent problems pertaining to street levels, road safety and traffic accidents. (Para 4.18)

22. Moreover, the RD, on several occasions, did not abide with the procedures on requests for variations established by the Fourth Schedule of the Public Service (Procurement) Regulations and presented final bills of variations to the DoC as a *fait accompli*. (Para 4.13k, 4.36)

f) Insufficient coordination with utilities and key stakeholders

23. Critical and timely discussions with utilities and stakeholders (including Local

Councils, residents and businesses) on project proposals and key requirements as well as effective coordination during project planning, were in many cases not adequately organised or implemented by the RD. However, the utilities were often unable to submit to the RD critical information of their infrastructure. These weaknesses, evident in the eleven reviewed contracts led to frequent changes during works and significant cost and time variations. (Para 4.13g, 4.13h, 4.18)

24. These shortcomings had a greater impact on projects where the utilities had significant involvement in the works being undertaken. Weak coordination during the planning, design and delivery stages of the contracts led to prolonged delays, disputes and significant cost variations.

g) Shortcomings in the financial control system at the RD

25. A detailed analysis on the internal controls at the RD regarding the approval of invoices and payments, in the case of the eleven reviewed contracts, revealed significant weaknesses. Main findings included: (Para 4.22, 4.23, 4.24)

- a) Invoices amounting to over Lm700,000 were not found. Out of 120 payment vouchers, no invoices were found in respect of 23 payment vouchers. Of the invoices that were found, covering the remaining 97 payment vouchers, there was no evidence in 14 cases that the invoices were checked by the quantity surveyor, project manager and chief engineer;
- b) 65 interim certificates, out of a total of 120, were not found.
- c) Retention money not withheld (an aggregate of about Lm45,000 from eight of the eleven reviewed contracts);
- d) Requests for variations were submitted after completion of works (a total of more than Lm800,000 from nine of the eleven reviewed contracts) or not submitted at all (Lm63,000 in the case of two contracts);

¹ Quality variances were not considered as they were outside the scope of this audit

- e) The RD failed to request the mandatory fiscal receipt once payments had been effected.

future management of the procurement process in the roads sector. These developments are adequately explained in pages 25 to 27 and 39 to 40 of the report.

h) Recent developments and conclusion

26. Furthermore, this report briefly outlines at the end of each chapter recent changes, such as new structures, policies, methodologies and procedures, adopted by the RD through the ADT and the DoC, and which, if implemented and enforced, could have a positive impact on the

27. The above-listed findings indicate that value-for-money could not be achieved, in the case of the eleven reviewed contracts, as various shortcomings during planning, design, adjudication and delivery impinged on the overall economy, efficiency and effectiveness and distorted the final outcomes of the projects.





Part 1 - Introduction

Part 1 - Introduction

Decision to undertake performance audit

1.1 An important principle of public procurement is that Government entities should have an overall strategy that permits the achievement of value for money through the application of the most advantageous procurement systems and best practices.

1.2 Given the magnitude and importance of the public procurement system, and the fact that the Department of Contracts (DoC) in the Ministry of Finance and the Roads Directorate (RD) within the Malta Transport Authority have not been subject to performance audit examination, a performance audit on the management of one sector of public spending - the contracting for road construction and restoration works - was selected for this study.

1.3 Expenditure on these type of contracts has increased significantly over the years and the performance of the RD, the General Contracts Committee (GCC) and the DoC in the management of the procurement process has a direct impact on public funds, the community and business.

1.4 A further factor in the decision to conduct an audit was the frequent reference in the House of Representatives and the increasing emphasis by The European Court of Auditors on the performance of the public procurement systems in the ten acceding countries.

1.5 Performance audits are performed in accordance with the First Schedule of the Auditor General and National Audit Office Act, 1997.

Audit Objective

1.6 The objective of this audit was to assess the robustness of the public procurement system

for substantial contracts, taking the Roads Directorate (RD) as a case study.

1.7 The audit aimed to establish whether effective and efficient procurement systems were enabling the DoC, the RD and the GCC to obtain the required resources and services at the right price, at the right time, and of the right quality.

1.8 In pursuit of this overall objective, importance was given towards determining whether:

- (a) effective planning processes were in place for the identification and prioritisation of requirements of major road restoration and formation projects;
- (b) the tendering and adjudication process for the appointment of contractors was based on value for money principles; and
- (c) the contracts of major road projects had been managed by the RD with due regard to effectiveness and efficiency.

1.9 Details on the study scope and methodology are given in Appendix A.

The strategic importance of procurement

1.10 For government entities, failure to procure effectively can put the achievement of their key objectives at risk. This is because procurement is central to the management of all organisations as it covers a cross-section of different operations and functions. The dynamics of procurement is highlighted in Figure 1 opposite.

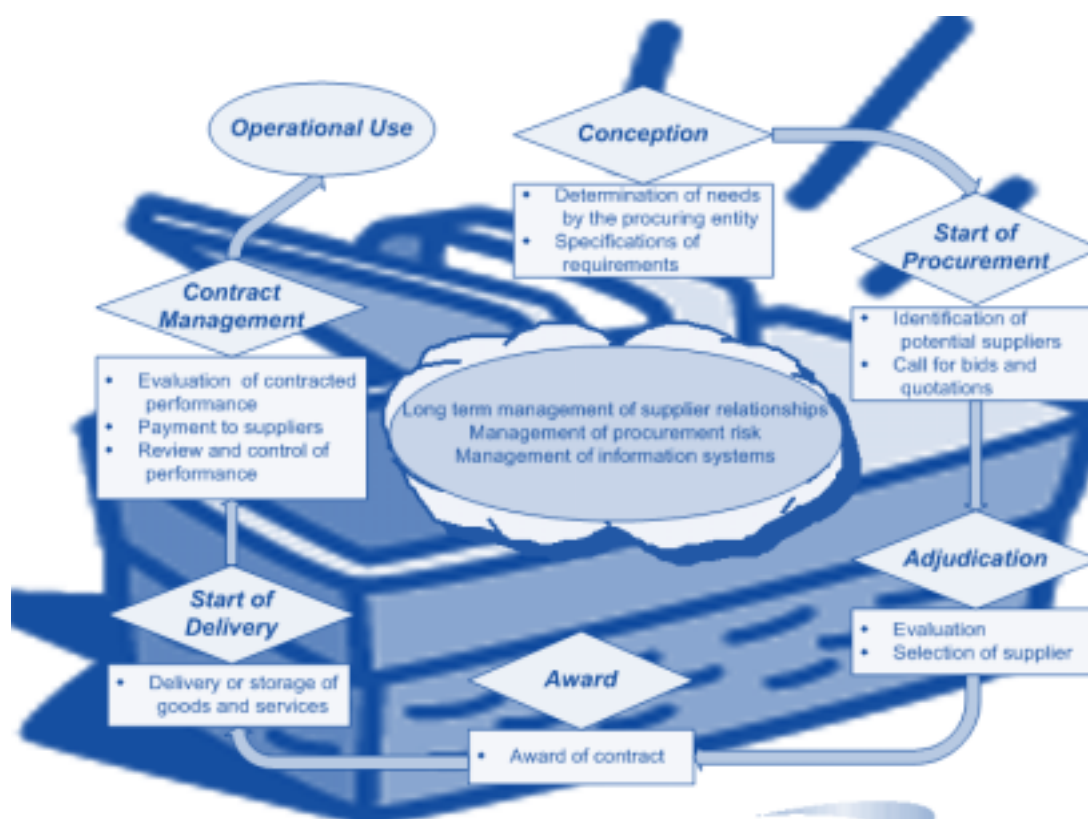


Figure 1: A General Overview of the Procurement System

Source: NAO working papers

The impact of public procurement on the Maltese economy

1.11 The public sector is undoubtedly one of the largest buyers in Malta and therefore a principal generator of business activity for many of the local commercial sectors. Every year, over one hundred departments, local authorities and government-owned bodies cumulatively spend tens of millions of *liri* on the procurement of a very broad range of goods and services in order to be able to deliver their respective core services. Major changes or developments in their general buying behaviour can have a direct impact on Malta's economy or specific business sectors.

The regulation of public procurement

1.12 Government procurement is regulated by the current Public Service (Procurement) Regulations, published by legal notice 70 of 1996, and amended by legal notices 139 of 1996, 140 of 1996, and 98 of 2002. The Regulations, which are in exercise of the powers conferred

on the Minister of Finance by section 4 of the Financial Administration and Audit Act (Chapter 174 of the Laws of Malta), together with Ministry of Finance circulars, provide a comprehensive framework for the limits and procedures to be followed for purchases from the open market, for departmental tenders and for tenders issued through the DoC.¹

1.13 The Government has extended the scope of Public Service (Procurement) Regulations in order to be in line with the European Union's *acquis communautaire*. The new regulations will cover all the new obligations provided for in Directives 92/50/EEC (public services contracts), 93/36/EEC (public supply contracts), 93/37/EEC (public works contracts) and 89/665/EEC (application of review procedures to the award of public supply and public works contracts).

¹ Areas in the legislation of particular importance to this performance audit are listed in Appendix B.

Table 1 – Breakdown of overall capital expenditure on road infrastructure

Entity	2000 (LM)	2001 (LM)	2002 (LM)	Total 2000 – 2002 (LM)	Entity's Percentage of Total 2000–2002 (LM)
Roads Directorate	6,519,670	4,973,991	7,353,266	18,846,927	78.7%
Local Councils*	1,315,563	683,992	683,992	2,683,547	11.2%
Ministry for Gozo**	704,056	529,967	496,306	1,730,329	7.2%
Min. for Social Policy***	299,000	399,999	-	698,999	2.9%
Total	8,838,289	6,587,949	8,533,564	23,959,802	

Source: National Statistics Office, Transport: Road Infrastructure Expenditure 2000-2002;
The Treasury Financial Reports (2000 – 2002)

Notes:

* Local Councils' data for 2001 is an estimate and for 2002 is provisional.

** Construction / widening / upgrading of roads and hot asphalt programme.

*** Works include road formation, extension of water and sewer mains in Home Ownership Scheme Areas and the development of public gardens in Housing Estates.

The role of the Department of Contracts in public procurement

1.14 The DoC within the Ministry of Finance is responsible for ensuring that the Public Service (Procurement) Regulations are being adhered to by public entities and is assisted in the execution of its duties by the GCC. The Public Contracts Appeals Board, a fully independent body, considers objections by aggrieved bidders.

1.15 Appendix C provides a general overview of the DoC's operations.

Public Procurement by the Roads Directorate in the Malta Transport Authority

1.16 The RD, formerly a department, is one of the directorates within the Malta Transport Authority (ADT). ADT, through its various directorates, is the national agency responsible for setting the standards for the construction, maintenance and the usage of the road network. The RD is responsible for the construction of new roads, the restoration of roads and for the maintenance of arterial and distributor roads.

1.17 The Government invested Lm24 million, as capital expenditure on road infrastructure between 2000 and 2002, according to data of the National Statistics Office and The Treasury. Lm19 million of these (79 percent) were spent by the Roads Directorate.

1.18 Table 1 above gives a breakdown of the overall capital expenditure on the road infrastructure and the share of the RD during the period under review

1.19 Also statistics obtained from the DoC show that between 1999-2002, Lm12.3 million worth of tenders were published by the DoC on behalf of the RD for road development purposes, the prime focus of this audit.

1.20 These projects were funded from the annual budgetary allocations to the Roads Directorate (mainly from allocations to sundry road improvements, as well as allocations for the levelling and asphaltting of private streets) and from special funds for specific road projects.

1.21 Between 2004 and 2006, expenditure on road construction and restoration is planned to increase significantly with an additional investment of Lm24 million from EU structural and cohesion

funds and from funds allocated for road projects in the Fifth Italo Maltese Financial Protocol.

1.22 Further information about the role and functions of the RD is given in Appendix D.

1.23 Figure 2 opposite summarises, to the extent practicable, the key stages of the management process employed by RD and the DoC for the contracting of road projects. The information to build this flow chart was gathered from interviews with key officials from both organisations.

Case Study Analysis

1.24 The National Audit Office undertook a case study analysis to obtain evidence for this report. Eleven tenders that covered nine road restoration / formation projects awarded and completed over a five-year period - between 1998 and 2002 - were selected as case studies to provide an in-depth understanding of the successful application and constraints of the systems and practices used by the DoC and the RD during the management of procurement from planning to final delivery.

1.25 The total payments to participating contractors for these nine road projects had amounted to approximately Lm3.7 million by June 2003.²

1.26 More details on the methodology are provided in Appendix A.

Report Structure

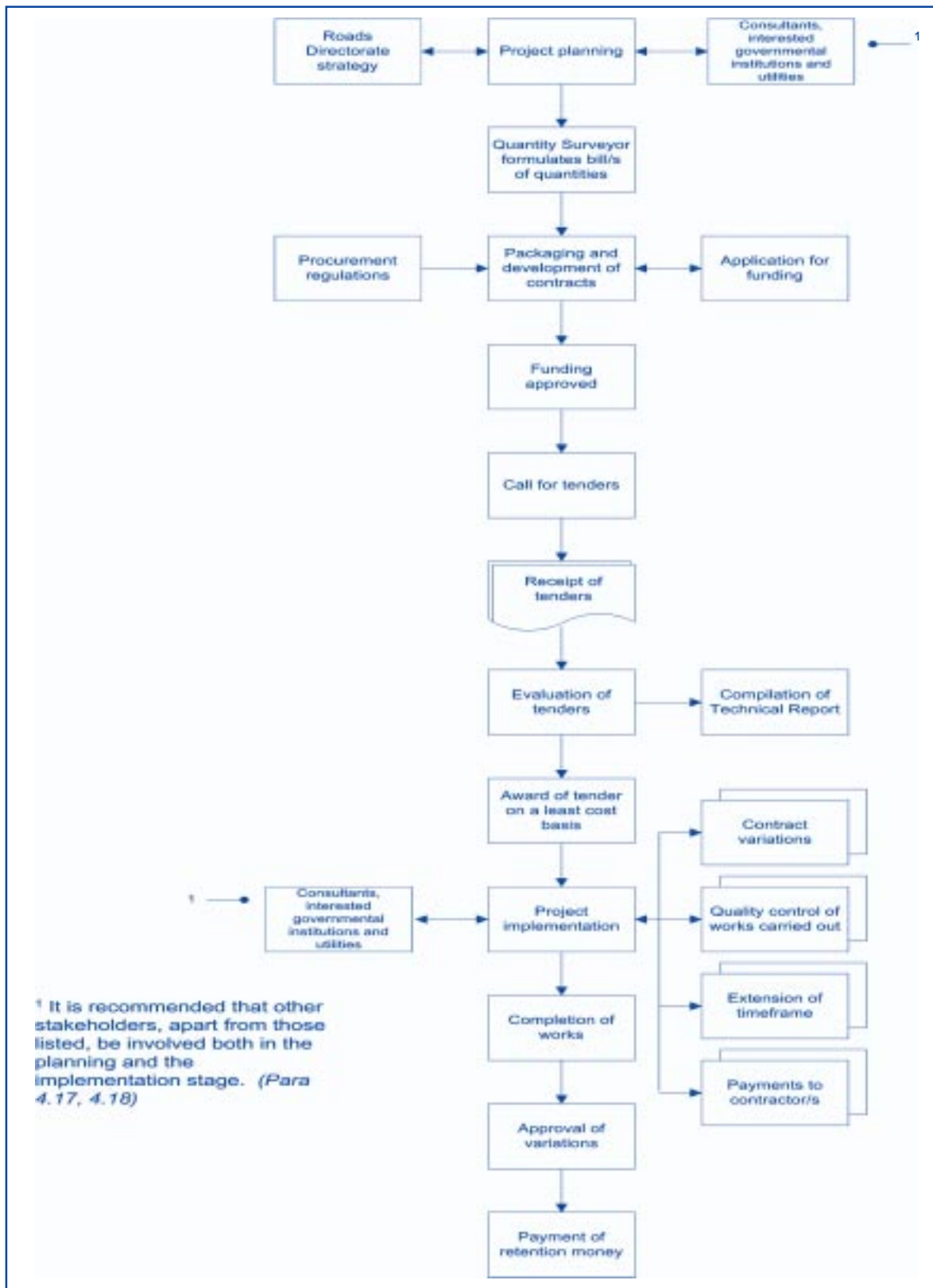
1.27 The structure for the report is as follows:

- a) **Part 2** studies the prevalence of planning practices in the RD during the eleven reviewed contracts.
- b) **Part 3** focuses on the contracting arrangements for such projects, including the factors that influenced the contract preparation, bidding and adjudication stages at the RD and the DoC.
- c) **Part 4** analyses contract management at the RD and studies whether the delivery of awarded contracts was undertaken in the most efficient, economic and effective manner. This part also presents a detailed assessment of contract variations identified in the studied cases and assesses how time and cost variations were managed by the RD and the DoC.
- d) **Part 5** presents the NAO's main conclusions and recommendations.

1.28 Furthermore, the audit briefly analysed recent changes, such as policies, methodologies and procedures adopted by the RD and the DoC and which could have an impact on the future management of their procurement processes.

² This amount could increase marginally to incorporate pending claims by the road contractors for works carried out.

Figure 2: Key Stages in the Management of the eleven reviewed Contracts



Part 2 - Planning

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AND
DISABLED
BADGE
HOLDERS
ONLY

ADTU
Public Transport Agency

Part 2 - Planning

Introduction

2.1 The procurement of major road projects can occur over a relatively long period of time with certain individual contracts taking several years from the initial development of a project concept, through planning, to the call for tenders, to the appointment of contractors and to the ultimate completion of construction works.

2.2 This part examines the prevalence of planning practices in the RD prior to the preparation of estimates and the call for tenders. Information and data was collected using eleven case studies of road construction and restoration contracts started and completed between 1998 and 2002.

2.3 A brief description of recent changes affecting planning at the RD is also included in this section.

Elements of planning

2.4 Effective planning for such high value and complex projects requires complete and thorough preparatory work before tenders are published and contractors are selected, in order to avoid unnecessary economic, social, financial, safety and environmental risks.¹

2.5 Key elements of an effective planning process include:

- a) An assessment of the prioritization determining the need for construction or restoration (definition of objectives, clear justification and prioritization of projects, feasibility studies);
- b) The testing of project concepts (through assessments, technical studies and consultations with stakeholders); and

- c) Comprehensive planning (harmonization of plans, assessment of key contractors, detailed designs, specification of time, quality, cost and performance parameters, allocation of resources, use of planning tools, compilation of a final planning document)

Measurement of performance during the planning process

2.6 The audit focused on the performance of the RD during the planning process of the eleven studied contracts, in order to assess whether decision-making, prior to call for tenders, was based on adequate information and effective methodology.

2.7 The study considered:

- a) the degree of efficiency and economy factors during the initiation and integration of the various planning activities; and
- b) the level of effective preparation undertaken by the RD prior to call for tenders.

Incoherent planning by the RD was evident in the eleven contracts under review

2.8 An examination of the projects' records and discussions with relevant personnel from the RD and representatives of stakeholders concluded that the planning of most of the eleven studied contracts, prior to the call for tenders, was managed by the RD in an incoherent and unstructured manner.

2.9 Evidence from records and interviews with staff at the RD indicated that the Department's management had not allocated adequate time and

¹ The extent of such planning depends on the nature and size of the proposed road project.

resources (prior to issue of tenders) for effective investigations and planning to be undertaken in the case of the eleven studied contracts.

2.10 This evident gap in the RD's planning process indicated that decisions (for example on construction methodology, time and cost estimates) were based, partially or fully, on "intuition" and incomplete information.

Main Findings

2.11 The main issues arising from shortcomings identified in the planning cycle of the RD are listed below.

a) No clearplanning guidelines and procedures were found

2.12 Interviews with personnel from the RD confirmed that during the period under review the Directorate did not have clearly documented guidelines, policies or procedures on how to carry out planning and design prior to publication of call for tenders.

2.13 Such procedures would have facilitated a coordinated and consistent approach to planning for each individual project and ensured that all critical components of planning were economically and efficiently integrated by the staff at the RD.

b) Projects were not clearly defined and prioritised

2.14 The RD's files of the eleven studied contracts did not contain any evidence of reports that proposed or justified the initiation of works and outlined the main considerations affecting each project.

2.15 Seven of the eleven reviewed contracts, however, were listed in Volume IV of *The Road Network Master Plan* initiated by external consultants for the RD in 1998. The objective of the Master Plan is to ensure short, medium and long term planning, budgeting and economizing for the whole transport mechanism and road safety. Furthermore, investigations were carried out to identify the reasons for road deterioration and to assess appropriate remedial treatment towards the establishment of a prioritization plan.

2.16 Four of the seven listed contracts were published in the Government Gazette during the

week period July 21 1998 and July 27 1998, while the Master Plan rollout occurred in 2000. However, before this date initial feedback from the technical investigations characterizing the formulation of the Master plan was disseminated internally through informal exchanges.

2.17 A further examination of the business plans of the RD for the periods under review (1998 – 2002) did not reveal any information on the objectives and the priorities of project under review as the projects were financed from sundry, as against project-specific, allocations of funds.

2.18 Table 2 below shows that the programmes that funded these projects reviewed were mainly the Road Restoration Programme, the Hot and Cold Asphalt Programme, the Sundry Road Improvement Programme and the Levelling and Asphaltting of Private Streets Programme.

2.19 Furthermore, records forwarded by the RD were found to contain scarce information of activities (e.g. feasibility analysis) that could have been undertaken by the RD prior to the call for tenders to define objectives, to identify benefits and to justify the capital outlay of each individual project. Typical findings / justifications mainly include vague references extracted from various documents, such as correspondence and minutes. This strengthens the perception that, in general, the proper motivation for the undertaking of the reviewed projects was wanting.

2.20 The overall audit conclusion is that the absence of records and evidence in the RD files raises concerns on how the reviewed projects were actually prioritised and initiated by the RD.

c) Minimal evidence that effective site investigations and assessments were undertaken prior to finalisation of plans

2.21 Another concern common in all eleven studied contracts was that the RD did not undertake adequate investigations and assessments during the preparation of cost and time estimations, required by the DoC, prior to the call for the tenders.

2.22 The absence of sound site, soil or survey investigations and professional technical assessments, such as traffic counts, and the apparent reliance by the RD on inaccurate and incomplete information consequently ultimately

Table 2: Source of funding of the eleven reviewed projects

Contract	Funding
<i>Road Construction Works, Including any Servicing Works at Vote New Access Road at Pembroke</i>	40IX – Roads Item 23 <i>Sundry Road Improvement Programme</i>
<i>Road Construction Works, Including Servicing Works at Dingli HOS and Dun K. Frendo</i>	Vote 3910 – Roads Item 25
<i>Road Construction Works, Including any Servicing Works at Mdina Road Zebbug / Qormi</i>	Vote 40IX – Roads Item 27 Road Restoration Project Vote 4009 – Item 02 Drainage Works
<i>Upgrading of Arterial Road at Hal Far</i>	Vote 40IX – Roads Item 27 Road Restoration Projects
<i>Asphalting Works at Mount Carmel Hospital Area Attard (Up to Blacktop)</i>	Vote 3910 – Roads Item 24 <i>Hot and Cold Asphalt Programme</i>
<i>Asphalting Works at Mount Carmel Hospital Area Attard (Blacktop Only)</i>	Vote 3910 – Roads Item 24 <i>Hot and Cold Asphalt Programme</i>
<i>Resurfacing Works at Mdina Road Qormi</i>	Vote 40IX – Roads Item 27 <i>Road Restoration Project</i> Vote 4009 – Item 02 <i>Drainage Works</i>
<i>Scarifying, Recompaction Base and Wearing Course at Rabat (South Bound Route Only)</i>	Vote 38VII – Item 13 <i>Road Restoration Projects</i>
<i>Resurfacing Works at Clarence Street, Pietà</i>	Cap VII – Capital Vote 35 – Roads Item 10 <i>Levelling and Asphalting of Private Streets programme</i>
<i>Construction of Various Roads and Resurfacing of Car Park Near Church of Santa Lucia</i>	Cap VIII – Capital Vote 35 – Road Item 10 <i>Levelling and Asphalting of Private Streets programme</i>
<i>Road Works at Hompesch Road / Marsascale Junction Zabbar</i>	Cap 35 Vote – Roads Item 7080 Road Restoration programme

Source: NAO working papers

compromised the quality and the reliability of the compiled estimates of the eleven studied contracts.

2.23 These shortcomings in the planning process also led to significant contract variations at the end of the projects (Part 4 studies contract variations in detail).

2.24 Table E.1 in Appendix E of this report shows a summary of an analysis carried out by

the NAO on the standard of technical assessments undertaken by the RD, during the planning process, prior to call for tenders, but after the decision had been taken to go ahead with the project.

2.25 The analysis in Table E.1 also:

- a) gives an indication of the evidence found in the departmental files that showed problems and issues that

arose because of lack of planning; and

- b) compares the level of preparation undertaken by the RD with the initial estimated value of the contracted works to give an indication of the overall relevance.

2.26 It is important to note that evidence found in the files clearly shows that the planning for the high value and complex projects studied in this performance audit lacked detail and completeness.

2.27 Another important observation is that the RD's external consultants on road design and quality were not included in the pre-tender stages of these projects. In a number of the studied cases, cumulatively accounting for 70% of the total estimated value of works, the key participation of the external consultants came during and/or after the award of contracts. This practice led to significant cost and time variations due to major changes being made to designs, construction methodologies and specifications, after the contracts had been awarded. (The causes of these variations are explained and discussed in Part 4 of this report).

2.28 The reviewed files also provided evidence that critical discussions with stakeholders (especially local government and utilities) on project proposals and on the coordination of requirements were not organised by the RD prior to the call for tenders. This again led to significant changes in designs and construction methodologies during works, as well as the sustaining of significant cost and time variations.

2.29 While all parties may face additional time pressures with more effective and timely coordination in the planning stages, addressing stakeholders' issues could lead to the achievement of significant financial benefits.

2.30 Other findings from the audit were:

- a) The RD did not compile project milestone documents and charts for any of the eleven studied contracts. This led to doubts as to how time estimates were calculated, and activities were scheduled for contractors to implement and project managers to enforce.

- b) The RD's resource planning was basically non-existent and projects were initiated without any evidence of internal assessments on capabilities and constraints. In most of the projects the RD consequently had problems to secure the necessary funds (due to over-commitments) to deliver the projects and to have enough competent staff to manage effectively the various awarded contracts, especially when work-in-progress was delayed and overlapped.

- c) No documented assessments were found in the RD individual project files that studied the availability of contractors and their supply chains to finish the projects within the specified timeframes, prior to the call for tenders. This assessment is important, as the road construction industry in Malta is a small business sector with very limited skilled personnel and machinery.

2.31 The overall absence of documents that would confirm that the RD undertook sufficient investigations, discussions and assessments before tenders were published and contractors were chosen, raises serious concerns on the level of planning undertaken by the RD before millions of Malta Liri were committed to the reviewed works.

d) Absence of adequate designs

2.32 The standard of design for road construction and restoration projects is considered, within the industry, to be as important in determining the ultimate quality of works as the standard of actual construction. Given this significance, an examination was undertaken to assess the quality of the design documentation for the eleven reviewed contracts.

2.33 In all the studied cases, it was concluded that the design documentation found was scarce, limited and not prepared on the basis of structured and reliable standards and procedures.

2.34 It was also clear from the documentation examined that most of the design work was done at a late stage, several weeks or

months, after the publication of the call for tender or after contractors had been selected.

2.35 Overall, the design documentation for eleven studied road construction and restoration projects was weak with respect to quality and detail. A summary of these findings is presented in Table E.2 in Appendix E of this report.

Consequences of identified shortcomings

2.36 This lack of coherence and completeness in the preparation and planning stages had several consequences:

- a) Proposals and estimates presented by the RD for authorisation were in general inaccurate. Table 3 below illustrates the notable difference in value between the funds initially authorised and the final cost of the completed contracts.²
- b) The departmental estimates had to be revised during the adjudication process, that is after bids had been submitted, to incorporate modifications. Table 4 opposite gives a list of these modifications.
- c) The goals set by the RD were inherently risky and not realistic, leading to higher risks of project delays, increased costs and disputes involving contractors, utilities, residents, businesses and other stakeholders.
- d) The resulting poor planning led to slow progress of works, disagreements with the DoC on the requested contract variations and regular stoppages due to unclear or late site instructions to contractors from the RD.³
- e) There were difficulties for the RD's management to determine the value

they were getting from their proposed expenditure and there were fewer possibilities to identify cost-saving opportunities as effective planning and scheduling prior to implementation was insufficient.

- f) There were frequent ad hoc cost and time variations and changes in specifications during the management of the contracts in order to compensate for several shortcomings or omissions in the drawings, bills of quantities and plans. (Details on contract variations are discussed in Part 4 of this report).

Conclusion

2.37 This part clearly shows that the RD did not undertake the required planning in the most effective and timely manner.

2.38 The RD left out complete parts of the project planning process, some of which were critical for effective management and control. Also many important decisions were postponed till after the award of tenders, and in several cases during works. In some of the studied cases investigations and preparatory work were not carried out in order to accelerate the publication of the call for tenders.

2.39 These practices had major negative consequences on the outcome of all cases studied. Findings showed that the absence of proper planning during the initial stages led to weak execution during tender adjudication (studied in Part 3) and project implementation (discussed in Part 4).

2.40 The shortcomings in the planning processes also led to poor performance in terms of additional costs, major delays, problems of quality and unwarranted inconveniences to stakeholders and end-users (analysed in Part 4).

2.41 The poor management of the planning process is considered by the NAO as one of the

² The procedure adopted by the RD is to forward to the Ministry details of the works to be carried out, time and cost required and the architect in charge of the plan.

³ Evidence showed that during the management of the reviewed projects, it became more difficult for the RD to control

the performance of contractors as specifications and targets were constantly being changed. Also, the resultant flaws in the original plans and designs could have encouraged contractors to bid seemingly low prices.

Table 3: Differences between the original estimated costs as presented for Ministerial approval and final costs of projects

Contract Name	Original value of ministerial authorisation (LM)	Final cost of project (LM)*	Percentage Difference
<i>Road Construction Works, Including any Servicing Works at New Access Road at Pembroke</i>	219,561.25 CET	266,688.42 CET	+ 21.46%
<i>Road Construction Works, Including Servicing Works at Dingli HOS and Dun K. Frendo</i>	347,567.37 CET	447,444.48 CET	+ 28.74%
<i>Road Construction Works, Including any Servicing Works at Mdina Road Zebbug / Qormi</i>	884,354.00 CET	623,986.78 VAT	- 34.35 %**
<i>Upgrading of Arterial Road at Hal Far</i>	734,789.51 CET	1,287,561.65 VAT	+ 63.04%**
<i>Asphalting Works at Mount Carmel Hospital Area Attard (up to blacktop) and Asphalting Works at Mount Carmel Hospital Area Attard (blacktop only)</i>	246,975.00 CET	444,407.13 VAT	+ 67.42%**
<i>Resurfacing Works at Mdina Road Qormi</i>	603,049.00 VAT	345,972.98 VAT	- 42.63%
<i>Scarifying, Recompaction Base and Wearing Course at Rabat (South Bound Route Only)</i>	81,985.00 VAT	102,492.52 VAT	+ 25.01%
<i>Resurfacing Works at Clarence Street, Pietà</i>	39,234.50 VAT	27,149.57 VAT	- 30.80%
<i>Construction of Various Roads and Resurfacing of Car Park Near Church of Santa Lucia</i>	98,830.50 VAT	148,424.10 VAT	+ 25.05%
<i>Road Works at Hompesch Road / Marsascale Junction Zabbar</i>	132,563.00 VAT	210,614.31 VAT	+ 58.88%

Source: NAO working papers

* These figures include road works and ancillary works.

** Values in CET were converted to VAT using the following equation: Divide the CET figure by 1.07 and multiply the result by 1.15.

Table 4: The adjudication process: Comparison between project estimates and value of works as per letter of acceptance

Contract Name	RD Estimate prior to issue of tender (BOQ) (CET/VAT)	RD Estimate at adjudication stage	Value of works as per Letter of Acceptance	Percentage Difference
<i>Road Construction Works, Including any Servicing Works at New Access Road at Pembroke</i>	219,561.25 (CET) 235,977.04 (VAT) adj	291,477.00 (CET) 313,269.67 (VAT) adj	222,003.00 (VAT) adj	- 5.92%
<i>Road Construction Works, Including Servicing Works at Dingli HOS and Dun K. Frendo</i>	347,567.37 (CET) 373,553.72 (VAT) adj	328,045.00 (CET) 352,571.73 (VAT) adj	364,377.00 (VAT) adj	- 2.46%
<i>Road Construction Works, Including any Servicing Works at Mdina Road Zebbug / Qormi</i>	1,425,727.00 (CET)	766,105.00 (CET) 823,383.88 (VAT) adj	631,171.00 (VAT) adj	- 37.73%
<i>Resurfacing Works at Mdina Road Qormi</i>	1,532,323.41 (VAT) adj	427,652.00 (VAT)	323,056.00 (VAT)	
<i>Upgrading of Arterial Road at Hal Far</i>	734,789.51 (CET) 789,727.04 (VAT) adj	685,220.01 (CET) 736,451.41 (VAT) adj	1,126,450.00 (VAT)	+ 42.64%
<i>Re-construction works at Mount Carmel Hospital Area Attard (Up to Blacktop)</i>	301,266.19 (CET)	147,544.24 (CET) 158,575.59 (VAT) adj	160,248.06 (VAT) adj	+ 1.05%
<i>Asphalting Works at Mount Carmel Hospital Area Attard (Blacktop Only)</i>	323,790.76 (VAT) adj	153,721.95 (CET) 165,215.18 (VAT) adj	158,472.74 (VAT) adj	- 4.08%
<i>Scarifying, Recompaction Base and Wearing Course at Rabat (South Bound Route Only)</i>	81,985.00 (VAT)	81,985.00 (VAT)	65,000.00 (VAT)	- 20.72%
<i>Resurfacing Works at Clarence Street, Pietà</i>	39,234.50 (VAT)	39,234.00 (VAT)	39,234.00 (VAT)	Nil
<i>Construction of Various Roads and Resurfacing of Car Park Near Church of Santa Lucia</i>	98,830.50 (VAT)	102,876.00 (VAT)	102,808.00 (VAT)	+ 4.02%
<i>Road Works at Hompesch Road / Marsascale Junction Zabbar</i>	132,563.00 (VAT)	132,536.00 (VAT)	132,112.58 (VAT)	- 0.34%

*Since transactions were held both under CET and VAT tax periods figures were adjusted accordingly using the following conversion method: divide by 1.07 and multiply the result by 1.15

key factors, which ultimately led to the unsatisfactory performance by the RD in the implementation of the studied contracts. Steps are to be taken by the newly established ADT (now responsible for the RD) to enhance accountability and performance in this area of management.

New trends and changes in road project planning

2.42 The objective of this section is to give a brief overview of recent changes and initiatives affecting the RD. However, the issue of whether such events or situations offered clear potential for value-for-money and better quality outcomes is not being assessed as such analysis is not part of the scope of this performance audit.

(a) The RD relies on land-surveying services of the Works Division

2.43 The RD does not have the full resources and competences to carry out land-surveying without external support. Currently, the RD has an informal arrangement with the Building and Engineering Department in the Works Division to provide land-surveying services such as site levels, topography, formation levels and door sills. These services are provided free-of-charge by the Works Divisions but requests for these services may be delayed or refused if priority is given to assignments of the Works Division.⁴

(b) Staff movement at the RD

2.44 Due to staff movements, since January 2003, the RD has been without a quantity surveyor. In addition, the Road Testing Laboratory, set up in 2001, is currently unmanned said to be due to a shortage of qualified personnel. The RD has recently recruited graduate road engineers and is in the process of recruiting a technician to manage the laboratory.

(c) Weak channels of communication between the RD and the MEPA

2.45 MEPA indicated that the links between the RD and MEPA with regard to planning of road projects in Malta existed but could be significantly improved. Towards this end, consultations

⁴ The Land Surveying Unit at the MEPA occasionally also provides site-levelling services to the RD.

between MEPA and ADT, especially concerning traffic planning, are currently in hand.

2.46 The main concerns were that:

- a) The Authority is not being involved during the initial concept stages in the planning of major roads where it can give its best contributions on the proposed projects, such as information on traffic flows and planned development in the targeted area.
- b) There were cases where road levels of existing roads were not confirmed with the MEPA and setting-out exercises were undertaken with the incorrect levels.

(d) Revised Rates

2.47 Following discussions with the Federation of Road Building Contractors, the RD had agreed in 2001 to commission an independent study to cost the rates used in the estimation and commissioning of works. An international consultancy firm was engaged to provide the RD with a report and recommendations. This exercise has been completed and the resulting report has been forwarded to the DoC and to road construction contractors.

(e) The RD has various software packages for design purposes

2.48 The principal software packages used for design purposes by the RD are:

- a) ACAD 2000 and Pro VI
- b) PICADY, ARCADY and OSCADY for junction modeling
- c) TRIPS for traffic modeling

(f) New procedures and specifications

2.49 The external consultants of the RD have presented to the Directorate's management proposals for new procedures and technical specifications that can be adopted during the planning, design and quality control stages. Legal Notice 364 of 2003 calls for observance of these procedures in the planning, design and building of road construction and maintenance works.

(g) Strengthening of controls related to financial issues

2.50 The Ministry of Finance has indicated that an enhanced system of management reporting from the RD has facilitated the approval of funding for any planned projects. These monthly "Returns" include data on financial expenditure and commitments by the RD.

2.51 Further strengthening of controls related to financial issues will occur through the envisaged recruitment of an Internal Auditor. Similarly, the formation of a Capital Expenditure committee, proposed by ADT management, should ensure a holistic prioritization of project proposals.

(h) Stocktaking of urban streets

2.52 In 1999, the RD started compiling information for a database that covers streets in Malta and Gozo that fall under the responsibility of the RD. However, due to the reported shortage of competent human resources within the RD, the progress on completion of this database has been considerably slow and most of the work has still to be undertaken.

(i) The inclusion of underground service culverts in road designs

2.53 Over the past years, underground service culverts have been included in designs in order to minimise the need for utilities to dig the completed roads after completion of road construction or restoration works.

(j) Increased cooperation between the RD and the main utilities

2.54 Representatives of the utilities working directly with the RD have commented positively on the increased cooperation between the RD and the utilities with respect to the planning of works, prior to order to start works. However, it was also indicated by the same utilities that there is scope for more improvement and increased coordination.

2.55 On the other hand, the RD has expressed its concerns on the short-term approach adopted by the same utilities when the RD requests for their plans and requirements for targeted development. The RD has problems integrating the short-term plans of the utilities with

the long-term investment of the RD, whose works have an intended lifespan of between fifteen to twenty years.

(k) Prioritisation of major road projects

2.56 A recent change at the RD was the completion of a comprehensive exercise that prioritised all the works required on arterial and distributor roads in Malta and Gozo.

2.57 The identified works were also allocated to specific sources of funding in order to ensure that no funds are lost due to overlapping.

2.58 The identified main sources of funds are:

- a) The National Budget,
- b) The Fifth Italo Maltese Financial Protocol, and
- c) The European Commission under schemes such as the Trans European Network, the TINA network and regional funds for Gozo.

(l) The Planning and Design Section

2.59 The Planning and Design Section in the RD has been restructured by additional technical staff in order to undertake the required planning and design for the procured requirements in a more effective and timely manner.

(m) Design and Build Contracts

2.60 Since the early 1990s, the RD has allocated an increasing range of functions to its road construction contractors. The transition from construct-only contracts to contracts encompassing both design and construct tasks have been a recent feature of this direction.

(n) Environment Impact Assessments (EIAs) and Cost-Benefit Analysis (CBAs)

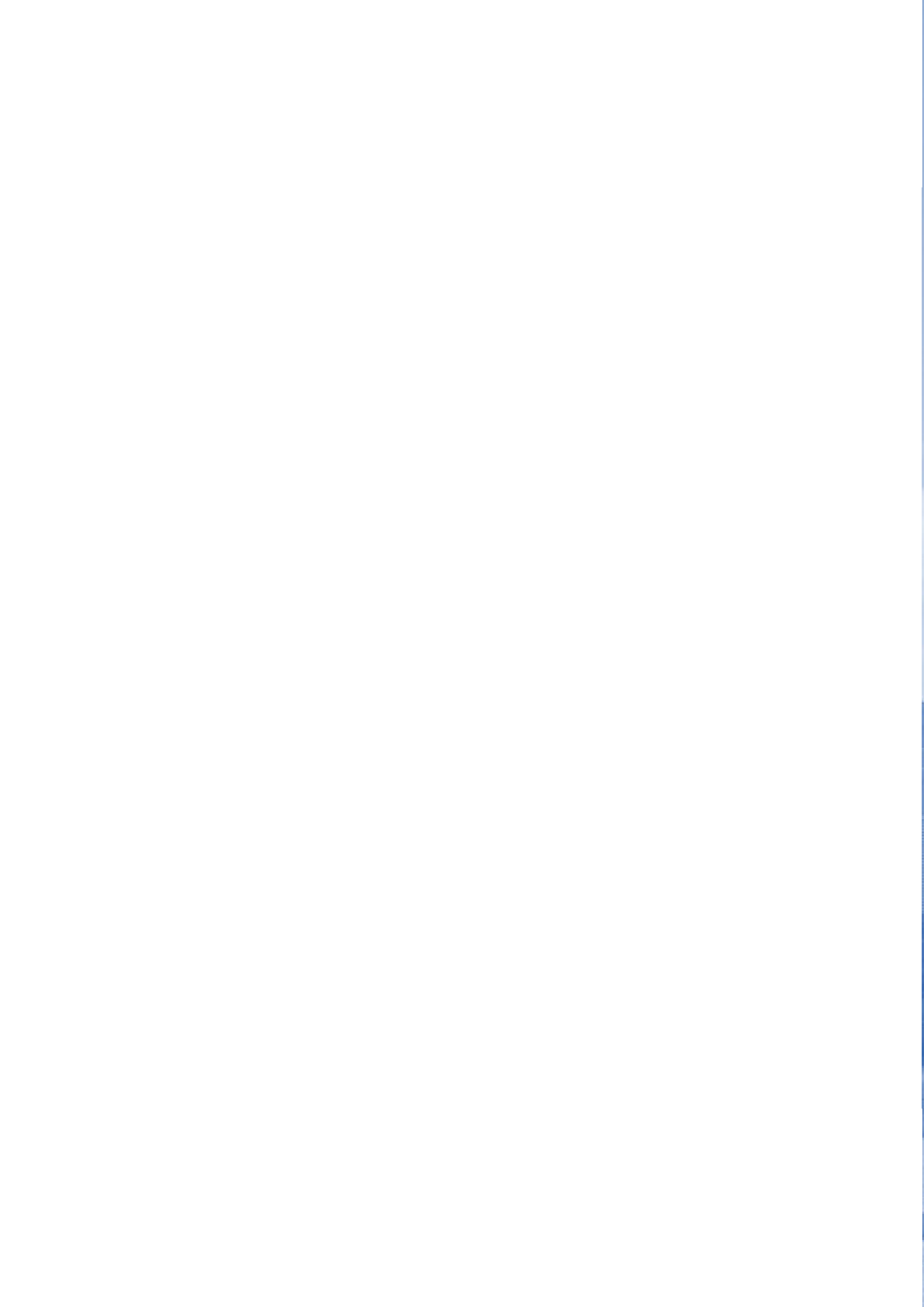
2.61 A recent novelty in the RD, identified during the study, was the commissioning of EIAs and CBAs during the planning of road projects to be funded by the Fifth Italo Maltese Financial Protocol and the European Commission. Officials in the RD also indicated that after accession in the EU, all major projects regardless of funding, would require EIAs and CBAs.

2.62 EIAs undertaken by the RD are regulated by LN 204 of 2001.

(o) Road Network Master Plan

2.63 Aware of the lack of local road planning and construction expertise, Government resorted to contracting German experts in the field to contribute to the formulation of a plan addressing the situation. One of the products of this initiative

was the multi-volume Road Network Master Plan, the first volume of which was completed in 2000. The RD intends to regularly revise the document to include new considerations. The volumes making up this plan documented the needs and priorities for improving the Maltese road network and have strongly influenced the development of road design and construction methodology in recent years.





Part 3 - Contract Documentation and Tender Adjudication

Part 3 - Contract Documentation and Tender Adjudication

Introduction

3.1 Contracts for major road projects are usually high value, high profile and involve significant procurement risks as they are typically delivered under conditions that may be considered intricate and uncertain. Therefore, the preparation of clear and complete contract documentation and the selection of suitable contractors are key factors to overall success or failure.

3.2 This part studies the contracting arrangements for such projects, the role of the RD, the GCC and the DoC in the tendering and adjudication process, and the factors that influence the final selection of contractors. Information and data was collected from the eleven case studies of road construction and restoration contracts started and completed between 1998 and 2002.

3.3 A brief description of recent changes which can have an impact on the tendering

and adjudication process is also included in this part.

Overview of the responsibilities of the RD and the DoC during the contract documentation and tender adjudication processes

3.4 It is the policy of the DoC that the process of selecting a contractor through competitive bidding should not take longer than three months after the closing date of the call for tenders for road contracts. The successful completion of the tender adjudication stage within this timeframe depends on the efficient and effective functioning of the systems adopted at the RD and the DoC.

3.5 Table 5 and Table 6 below outline the responsibilities assigned to each entity during the contract preparation, bidding and tender adjudication processes.

Table 5: The responsibilities of the RD during the contract preparation, bidding and tender adjudication processes.

The RD is initially responsible for:

- planning the project – discussed in detail in Part 2 of this report;
- acquiring a ministerial authorisation for the issue of a call for tenders and a statement from the Ministry of Finance confirming that funds are available for the implementation of the proposed contract;
- drafting contract conditions and clauses for approval by the DoC; and
- preparing accurate and detailed schedule of quantities, a tender originators form and a site plan highlighting the proposed development.

At a later stage, once the bidding process has been completed, staff at the RD is once again directly involved in the adjudication process by:

- compiling a comparative schedule of all the valid tenders;
- setting up an Adjudication Board; and
- preparing a technical report. This report should present appropriate conclusions and recommendations and should be submitted to the General Contracts Committee (GCC), which is the body entrusted with the final decision (refer to Appendix C for more information). The senior management of the RD also endorses the report prior to submission.

Prior to the issue of a letter of acceptance, officials of the RD may also be summoned by the GCC to provide further information on the project, supplier market and other technical issues.

Source: NAO Working Papers

Table 6: The responsibilities of the DoC and the GCC during the tender preparation, bidding and tender adjudication processes.

As described in Part 1 of this report, road contracts estimated to cost Lm20,000 and over are, in most cases, under contract to the DoC. For these type of contracts related to road projects, the DoC is directly responsible for ensuring that all submitted tender documentation of the RD is within the parameters set by the law and does not include conflicting clauses. The DoC also has a policy of ensuring that funding is approved by the Ministry of Finance prior to the release of tender.

The DoC is also accountable for the administrative procedures related to the release of tender, including the publication of a tender advertisement in the Government Gazette, as well as:

- the procedures governing the public opening of the tender box;
- the recording of the submitted bids (scheduling);
- the forwarding of the bidding documents to the RD;

Once the Adjudication Board of the RD forwards its recommendations through a Technical Report to the DoC, the responsibility for the adjudication process is shifted to the GCC. Procedures followed by the GCC include:

- the assessment of feedback received from the Adjudication Board and the senior management of the RD;
- further evaluative work (including consultation with external experts, interviews with officials from the RD and representatives of bidding parties); and
- the final decision for the award of the contract.

Once a decision has been taken by the GCC, the staff at the DoC is expected, within twenty-four hours, to announce the award through a facsimile communication to all competing bidders. In the absence of objections from any of the parties involved, the successful bidder is sent a letter of confirmation, followed by a formal letter of acceptance and an announcement on the entity's noticeboard.

More detailed information on the regulations and procedures that govern the tendering and adjudication process is given in Appendix B and Appendix C of this report.

Source: NAO Working Papers

Contract documentation

3.6 Road projects in Malta are constructed mainly by private sector companies. Given this reliance on private contractors, the soundness of the contract documentation is of critical importance to the RD and the DoC in their endeavours to achieve high quality roads, at the lowest possible cost and within reasonable timeframes.

3.7 In the case of the eleven reviewed contracts, the documentation found in the respective bids included a range of documents which, when considered together, defined the rights and obligations of the parties involved in connection with the scope of works to be undertaken. The main findings of the review of the tender documentation of the reviewed road projects confirmed that the contracts:

- a) Were detailed and comprehensive, although specific concerns such as: the acceptance and valuation of variations; delays and the extension of timeframes; and the resolution of disputes were considered to have fallen short of addressing the full implications.
- b) Accounted for diverse issues and concerns that could arise out of road construction and restoration projects.
- c) Contained clear clauses that regulated a wide range of circumstances including the duration of the contract, quality assurance,

the applicability of penalties and the mode of payments.

- d) Incorporated consistent terminology throughout the documents.
- e) Protected the DoC and the RD from several negative elements that could impinge on the progress and the completion of works.

3.8 Table F.1 as well as Figure F.1 (Appendix F) outline the main clauses incorporated in the eleven reviewed bidding documents.

3.9 It is important to point out that all the terms and conditions stated in the submitted bidding documentation become part of a formal instrument of agreement, once a letter of acceptance signed by the Director of Contracts and referring to the published specifications and conditions in the bidding document, is sent to the appointed contractor after the adjudication process has been completed. A copy of the letter of acceptance is also sent to the RD and a copy is kept at the DoC.

Issues related to Contract Documentation

(a) The inadequacies of the planning process at the RD affected the accuracy of the cost and time requisites of the contracts

3.10 In Part 2 it was concluded that, in the reviewed cases, the RD did not have sound procedures in place for appropriately estimating costs and timeframes at the project planning stage. In most cases the estimates were preliminary and provisional in nature and, in fact, changed significantly during subsequent design and development after the award of tender or during works.

3.11 The audit also confirmed, through the examination of documents presented by the Directorate, that the inadequacies of the planning process at the RD in the pre-tendering stages of the reviewed cases also led to serious shortcomings in the final contract documents, as the information presented in the bidding document by the RD was, in most cases, not collected using sound and reliable methodologies.

3.12 Furthermore, except for the inclusion of site plans to indicate the proposed area for development, the final designs of the reviewed

works were not available during the bidding process to help guide the contractors in their proposals.

3.13 In the absence of designs, the lists of required works incorporated in the bills of quantities became even more critical as they gave an indication to prospective bidders on the nature of the proposed works and the method of delivery.

3.14 However, evidence in the files of the contracts under review showed that the information on quantities requested from the bidders, through the bills of quantity in the bidding document, and the timeframe set by the RD for the completion of works were, in many cases, inaccurate or incomplete.

3.15 The outcome of these serious shortcomings, experienced in most of the reviewed contracts, eventually led to contract variations due to frequent changes in the designs, construction methodologies and timetables. These results are discussed in detail in Part 4 of this report.

(b) Scarce information was included in the contract documentation on the works for utilities

3.16 Further complications were also identified when details of additional works associated with the construction works such as the installation and relocation of water supply, sewerage, storm water drains, power, telecommunication and cable television services were not always clearly specified in the contract documentation. In most cases these omissions were resolved during works leading to costly variations and time delays. As the works on the services of utilities were very necessary, these omissions were ultimately resolved through the approval of variations by the DoC and, in several cases, through extra payments being made by the RD.

(c) Reference to detailed specifications of works in the contracts

3.17 In all the reviewed contracts, the RD, through the DoC, requested that all works were performed in accordance with its specifications document (*Specifications for Road and Street Works, Version 3-94*) and the American ASTM specifications that applied in default of the former. These specifications included clearly defined standards and performance criteria for materials, road composition and testing procedures.

Table 7: RD specifications as per ‘Specifications for Road and Street Works, Version 3-94’ prepared by the RD in 1994

Principal Specifications	Description
Site Clearance	Tackles matters pertinent to the preparation of the site ahead of the commencement of the works proper, which includes the removal and demolishing of structures obstructing the works and the preservation of existing trees if so reckoned.
Excavations, Backfilling and Surface Reinstatement	Explains in detail the methodologies and considerations that are to apply in the execution of works related to excavation, backfilling, compaction, remedial action and trenching.
Services	Provides instructions that are to apply in the fitting of services related installations, with particular emphasis on the materials to be used and the integration of new installations with existing ones.
Road Resurfacing	Lists important elements related to the execution of resurfacing works, including cleaning, surface preparation, compaction, testing and ideal asphalt temperatures for day-to-day use.
Road Pavements	Deals with elements such as alignments and construction factors with respect to the sub-bases, macadam, bitumen and wearing course. The tests that are to verify the attainment of predefined levels of quality are also listed.
Road Markings	Specifies the characteristics of road markings and reflecting road studs by way of colour, materials and thickness.
Street Furniture	Tackles the temporary or permanent installation of all non-technical elements that are to feature in the course of or after the completion of the works, such as safety measures, traffic signs and road lighting.

Source: NAO working papers

3.18 Table 7 above gives an overview of the contents of the RD specification document (*Specifications for Road and Street Works, Version 3-94*) that was prepared by the RD in 1994 and was in force during the reviewed works.

3.19 The audit, therefore, concluded that barring specific concerns discussed above (para 3.7a), contract documentation was adequately detailed. Effective enforcement by the RD of the contract conditions together with the tackling of the concerns expressed above could lead to a better control of cost and quality issues.

(d) Audit conclusions indicate a notable absence of enforcement of contract conditions and specifications

3.20 Contract clauses were ineffective on several instances, during the reviewed works, as the RD and the DoC weakened their position as

buyers by not taking action to enforce contract conditions and by waiving prescribed sanctions when payments were made for delivered works.

3.21 Despite the comprehensive technical standards and conditions contained in the documents of the eleven studied contracts, evidence collected from the audit study showed that, in practice, the RD and the DoC failed on several occasions, for a variety of reasons, to enforce the contract conditions and impose the prescribed sanctions and penalties against the contractors breaching the conditions of the contracts. This was a major shortcoming, which turned ineffective the various legal safeguards incorporated in the studied contracts against the contractors' infringement of clauses.

3.22 Further details on contract variations and their effects on project management and final outcomes (cost, time and quality) are reported in Part 4 of this report.

Issues related to the bidding period

3.23 The bidding system at the DoC is regulated by procedures listed in the Public Service (Procurement) Regulations and by decisions taken by the DoC and the GCC. The rationale behind these procedures is that the whole process should be equitable and transparent to allow fair competitive bidding.

3.24 In the case of the eleven reviewed contracts, it was confirmed through the examination of the documents in the departmental files and through interviews with officials from the DoC that the bidding processes were in conformance with the procedures set out in the Public Service (Procurement) Regulations.

3.25 The key findings were:

- a) The administrative procedures related to the issue of tenders, including the publication of a tender advertisement in the Government Gazette were undertaken in a correct manner. However, it was not possible to confirm in this audit whether the three-week timeframe permitted by the DoC for the submission of tenders after the publication of advertisement, was adequate for the bidders to make good quality bids.
- b) The DoC and the GCC applied adequate controls over the receipt, opening and recording of bids.
- c) Bidding documents were forwarded immediately to the RD for the preparation of the technical report.

Issues related to the adjudication system

3.26 The selection of road contractors represents a crucial phase of the overall procurement framework and the submitted bids need to be appropriately scrutinised by the GCC with the close cooperation of the RD.

3.27 This audit indicated that several factors, identified from the documented proceedings, events or decisions of the eleven case studies, could have conditioned the efficiency and effectiveness of the adjudication system and

possibly influenced negatively the outcome of the adjudication process.

3.28 The following is a list of these factors:

(a) **Unreliable or incomplete estimates were prepared by the RD for comparisons with submitted tenders**

3.29 One major concern identified was that the estimates prepared by the RD were, in general, inaccurate or incomplete. This shortcoming could have limited the effectiveness of the tender evaluation process as the comparative analysis might not have been meaningful when compared with inaccurate estimates.

(b) **In three cases the adjudication by the GCC was based mainly on the recommendations of the Director of Roads**

3.30 In the case of three out of the eleven reviewed contracts, the documentation in the forwarded files seems to indicate that the GCC took its decision without a report from the RD Adjudication Board. Instead it based its decision on a recommendation by the Director of Roads.

(c) **Irreconcilable differences between the GCC and the RD on the issue of tender award**

3.31 An important influence on the adjudication process was the divergence of views between the RD and the GCC identified in the eleven reviewed cases. In one particular case, the GCC wrote to the RD informing the latter that the figures presented were "misleading". This apparent absence of effective communication between the two entities may have weakened the adjudication process.

(d) **Decisions of the GCC were nearly always based on the lowest bid price and few investigative interviews were held with potential bidders**

3.32 In the eleven reviewed contracts, the documentation found in the files indicated the decision of the GCC was mainly driven by minimal cost, rather than other non-financial considerations.

3.33 Conclusions from these findings include:

- a) The technical reports of the RD did not delve deeply into the strengths and weakness of each bid and did not present effective assessments on the submitted bids. These reports, submitted to the GCC for consideration during the adjudication process, did not include any detailed assessments of the past performance and capabilities of the bidders. Instead the reports reported on the total value of each submitted bid and provided an indication of the workload of the most preferred bidder with the RD. As a result, very little technical information was forthcoming from the Adjudication Board of the RD to assist the GCC in the selection of the most suitable contractors.
- b) Moreover, the RD, through its Adjudication Board, failed to direct sufficient attention to the individual cost elements of the submitted tenders when reporting assessments of tenders and putting forward recommendations. This comparison of different cost elements in the bidding documents could have assisted the GCC in the analysis of low price bids and in the investigation of any significant variances between bids and tender estimates.
- c) Few investigative interviews were held by the GCC with potential bidders to ensure that the selected contractors had the resources to undertake the required works. The GCC held interviews with short-listed contractors in only four cases out of the eleven reviewed contracts.
- d) In the financially volatile construction industry, financial assessments are an important consideration in order to avoid awarding contracts to bidders who could in fact be suffering financial difficulties. It was noted that in the adjudication process this factor was not taken fully into consideration. In the eleven reviewed contracts, the

contractors were not made subject to an in-depth financial appraisal by the GCC, although, as a procedure, performance bonds were requested by the GCC as a form of guarantee should the awarded contractor default in the delivery or go in liquidation. These appraisals could include:

- i. An assessment of previous requests by bidding contractors for premature or more frequent payments.
 - ii. Requests to bidders for the deposit of financial statements for the previous two years and an analysis thereof.
- e) The documentation in the reviewed files indicated that the adjudication process did not stop contractors from being awarded too many contracts and the GCC did not impose a limit upon the value of contracts that a contractor could have at one time.

3.34 The above-listed issues raise concern on the quality of analysis carried out by the GCC and the RD (through its Adjudication Board) in the case of the eleven contracts studied in this audit. Further assessments might have prevented the shortcomings that selected contractors eventually demonstrated during the delivery of works.

(e) Limited expertise was available to the GCC, apart from the scarce feedback received from the RD

3.35 The assessments of the GCC were limited by the restricted expertise it had at its disposal in the field of road engineering. Apart from the limited technical experience within the GCC, the services of an experienced architect (not specialised in road construction) were used on an *ad hoc* basis when an issue arose which required a more detailed technical assessment.

3.36 Furthermore, it was also confirmed that the option of appointing a Special Contracts Committee with the "special expertise, skills or other input", as provided for in Article 7 (1) of the Public Service (Procurement) Regulations, was not made use of. This option could have made

more effective the process of selecting the right contractor capable of completing works within the right timeframe and specifications.

(f) The Director of Contracts did not use the option of classifying contractors

3.37 Despite the legal authority option given to the Director of Contracts, through the Second Schedule of the Public Service (Procurement) Regulations, to classify, upgrade or downgrade contractors, this procedure was not used by the Director to monitor the market and sanction contractors with a history of poor performance. The classification of contractors could have assisted the GCC in the selection of reliable contractors with a satisfactory track record of good performance.

(g) The GCC did not ensure that the short-listed contractors were aware of the requirements of the project, prior to selection

3.38 The audit also concluded that, in several cases, the GCC did not ensure, before awarding the contract, that the short-listed contractor was fully aware of the requirements of the proposed contracts, such as:

- a) The objectives of the project, special stakeholder needs, timetables, drawings and bills of quantity.
- b) The management structure of the project and the expected working relationship with the RD.
- c) How additional works or variances would be authorised.
- d) The specifications and procedures to be followed, such as:
 - i. The required quality standards.
 - ii. The expected timescales and project milestones.
 - iii. The contractors' available workforce including their experience and skills, and full details about any sub-contractors.
- iv. The contractors' equipment mix on hand.

v. The industry's supply chain including the contractors' access to raw materials, manufacturing processes and links with key suppliers.

vi. The type and terms of insurance coverage, including the maximum value of compensation for works, materials, plant and equipment and public liability.

In part, such assurance could have come through addressing concerns listed in 3.7 (a) above.

3.39 Although it is the responsibility of the bidders to be aware of all the conditions they are bidding themselves with, the GCC could prevent future problems by being more pro-active in the process of ensuring that the short-listed contractors have the resources and competences to meet the set objectives.

(h) There were regular instances of incomplete documentation being submitted with the tenders on the part of the bidders

3.40 The review of the eleven studied contracts clearly indicated that contractors bidding for the reviewed contracts limited the effectiveness of the adjudication process as, in many cases, they failed to submit the complete documentation requested in the bidding document. As this was a widespread situation, the right to remove incomplete bids was usually waived by the GCC and the missing information was requested during the adjudication stage.

(i) The adjudication process was hindered by lack of information on the road construction industry

3.41 The adjudication reports and decisions of the RD and the GCC indicated that both entities were slow to address the barriers, which existed in the road construction industry. Perhaps more attention could have been given at the adjudication stage to the economic drivers of the industry; the limited expertise of the bidding entities in certain fields such as road engineering, road construction and project management; the limited supply of skilled workers; and the absence of regulation in this business sector.

3.42 Furthermore, in the case of the eleven studied contracts, the RD and the GCC did not have up-to-date information on market prices to benchmark with quoted rates, as the rates used by the RD were considered to be outdated by the same entity. Without this essential information, disagreements arose between the RD and the GCC, and between the Government and private contractors, and the matter had to be resolved through meetings with business representatives at a Ministerial level.

3.43 These situations jeopardised the adjudication stage and in some of the reviewed cases led to uncertainty as the prices to be charged for the contracts could not be definitely determined until an independent study was carried out. The final outcome for these cases, after several years of delays, was that the study on rates was never completed by the RD and the contractors were paid by the GCC the higher rates the bidders had initially offered, in the absence of the necessary recommendations.

(j) The market was limited due to the existence of a dominant supplier

3.44 Another important factor identified during the audit was that the GCC and the RD were constrained by the prevailing market situation.

3.45 During the reviewed period, a dominant supplier operated within the road construction industry and limited the competitive rivalry amongst contractors for the tenders examined in this audit. Evidence from the proceedings of the case, against the supplier in question, presented to the Commission of Fair Trading by the RD, showed that during this period the market was dominated by one company, which grouped the interests of the majority of suppliers and road-building contractors. The collusion amongst potential bidders could have hindered new or independent contractors from competing successfully and limited the possible opportunities for the RD and the DoC to ensure the best rates for the quality of contracted work required.

3.46 The audit remarks in Table F.2 (Appendix F) give an indication of the level of competition between contractors for the reviewed bids by showing a comparison of the bids received for the eleven reviewed contracts.

(k) Split tendering was introduced with limited success

3.47 In five of the eleven contracts assessed in this audit, split tendering was introduced in order to:

- a) resolve a legal problem involving previous claims to the same tender by different contractors, or
- b) to exploit the different capabilities of different contractors by allocating road building and asphaltting to different contractors.

3.48 Evidence from the files examined indicated that this practice had limited success as, in practice, this system created problems of coordinating the work of different contractors, who were rivals in the same industry, and were working on the same construction site.

(l) There were lengthy delays in the delivery of the adjudication process in five of the eleven audited contracts

3.49 Table 8 overleaf shows that in five out of the eleven reviewed cases the adjudication process took significantly much longer to complete than the time normally given by the DoC (three months). The main reasons for these delays included legal disputes, internal delays on the part of the RD or disputes on rates between the GCC and road building contractors.

Conclusion

3.50 The principal means of achieving value for money from the adjudication process is through effective competitive bidding and the selection of the most suitable contractor offering the lowest price and with the required resources and capabilities to meet the agreed contract conditions and specifications.

3.51 The findings in this part have shown that the RD, the DoC and the GCC had systems in place to prepare the necessary tender documents, publish calls for tenders, attract bidders, adjudicate and award contracts. However, key shortcomings in the manner with which these systems were operated ultimately reduced the effectiveness of the whole tendering process.

3.52 Major concerns identified from the reviewed contracts, included:

Table 8: Time-related performance indicators showing the overall performance of the RD and the GCC during the adjudication process

Contract	Time taken by the Adjudication Board or the Director of Roads to present recommendations	Time taken by the GCC to award tender	Time taken by the DoC to issue Letter of Acceptance	Total time taken from the opening of bids till the issue of a Letter of Acceptance
<i>Road Construction Works, Including any Servicing Works at New Access Road at Pembroke</i>	14 days	2 days	13 days	29 days
<i>Road Construction Works, Including Servicing Works at Dingli HOS and Dun K. Frendo</i>	9 days	40 days	1 day	50 days
<i>Road Construction Works, Including any Servicing Works at Mdina Road Zebbug / Qormi *</i>	118 days	9 days	19 days	146 days
<i>Upgrading of Arterial Road at Hal Far **</i>	328 days	3 days	14 days	345 days
<i>Re-construction works at Mount Carmel Hospital Area Attard (Up to Blacktop and Blacktop Only) ***</i>	161 days	36 days	57 days	254 days
<i>Scarifying, Recompaction Base and Wearing Course at Rabat (South Bound Route Only)</i>	12 days	7 days	16 days	35 days
<i>Resurfacing Works at Mdina Road Qormi</i>	12 days	7 days	16 days	35 days
<i>Resurfacing Works at Clarence Street, Pietà</i>	27 days	21 days	31 days	79 days
<i>Construction of Various Roads and Resurfacing of Car Park Near Church of Santa Lucia ****</i>	21 days	26 days	141 days	188 days
<i>Road Works at Hompesch Road / Marsascale Junction Zabbar</i>	18 days	3 days	35 days	56 days

Source: NAO working papers

- * The RD was unable to forward recommendations to the DoC in a timely manner in view of a backlog in the production of designs for the project.
- ** There was a legal threat by contractors who were awarded the contract for the job two years before. It took nearly a year before a compromise was found between the involved parties.
- *** Two distinct contracts.
- **** There were delays in the adjudication of this tender as the rates to be charged by road contractors were discussed at a ministerial level.

- a) The information provided by the RD to prospective bidders and to the DoC was in most cases incomplete or inaccurate. This confirms the conclusion, made in Part 2 of this report, that the planning by the RD was inadequately carried out.
- b) The analyses undertaken by the Adjudication Board of the RD in its recommendations to the GCC was in most cases insufficient and in other cases non-existent.
- c) The GCC had limited expertise at its disposal to gain a full understanding of the prevailing market forces and to be able to establish the reliability of the short-listed bidders.
- d) The GCC gave the highest importance to the lowest bid price in nearly all the cases studied and other non-financial considerations such as past performance, capabilities, financial position and other commitments had minimal impact on the final decision.
- e) In many cases the bidders failed to submit all the information requested in the bidding documents.
- f) For most of the period reviewed in this audit, a dominant supplier amongst road contractors limited the options available for adjudication. This supplier had to be ultimately dissolved following initiative on the part of the RD.

New trends and changes in contract documentation and adjudication

(a) Regular meetings with representatives of the Road Building Industry were discontinued

3.53 For several years, prior to the absorption of the RD into the Malta Transport Authority, meetings were held by the Ministry for Transport and Communication with the participation of the RD and the Federation of Road Building Contractors to discuss overall matters related to the conditions of contract in road building. These

meetings, called the Roads Improvement Committee meetings, were chaired by the Permanent Secretary of the Ministry and various issues were raised and discussed, such as:

- a) pre-tendering permits before award of contract to expedite works;
- b) the classification of contractors by the Federation based on efficiency, experience, machinery and manpower; and
- c) delays in the approval of variations.

3.54 No further records were found in this audit on whether these meetings were continued by the RD over the past two years and whether the proposed changes were implemented or postponed.

(b) The official specification document of the RD is being updated

3.55 The RD has prepared an updated version of its specifications document. This document replaces the previous issue 'Specifications for Road and Street Works, Version 3-94'.

(c) The rates used by the RD for estimation and adjudication purposes are being updated.

3.56 International consultants were commissioned to prepare for the RD recommendations for the revision of rates used by the entity to value estimates and adjudicate submitted bids. This exercise, initiated in 2000, has now been concluded.

(d) The adjudication process will be governed by EU institutions rules.

3.57 With Malta's accession to the European Union, the adjudication process (especially in the case of projects proposed by the RD which will be substantially funded from the EU funds) will be governed by the rules of the related EU Directives.

3.58 These new changes imply that the RD, the GCC and the DoC would have to increase their efforts to ensure that the whole contract documentation and adjudication process is more effective and complete in order to ensure that all parties feel that they have been fairly informed

of the proposed works, equally assessed and adjudicated.

(e) The introduction of an on-line service for the application of permits

3.59 One of the standard clauses of the contract documentation adopted by the RD states that the contractor must ensure that all the necessary permits have been requested and granted by the RD prior to execution of works. In the absence of the relative permits, the contractor risks the suspension of such works and the imposition of penalties as prescribed. The issue of permits, whilst being more a question of procedure rather than performance, is important since, in default of compliance, a road project could become laden with variations.

3.60 A new system enabling the online application of permits for the conduct of trenching work through electronic means has recently been introduced by the RD. It is envisaged, by the authorities, that the process of obtaining permits will become more efficient and easier to control and record.

(f) Recent changes in the evaluation of tenders

3.61 It was noted from the examination of a recent high-value design and build contract proposed by the RD, that certain improvements have been undertaken by the RD for the adjudication of large contracts. The main observations, identified from the study of this contract, are condensed hereunder:

- a) The evaluative criteria adopted during adjudication were outlined in detail in the tender document.
- b) The Adjudication Board set up by the RD gave more attention to the evaluation of bids and introduced new variables in the evaluative process such as previous performance, operational improvements, availability of resources (directly owned or sub-contracted) and viability of commitment (or present workload).
- c) The expectations of the RD during the execution of works were clearly defined in a correspondence sent by the Director of the RD to all potential contractors with the tender documents.
- d) Reference was made to the handbook "*Safety at Street Works and Road Works*", which outlined good practices to be adopted by the contractors during road works.
- e) Two technical reports were produced by the RD Adjudication Board:
 - i. an initial document targeted the technical merits of the offers, and
 - ii. a second document assessed the pricing and quotations of bidders.
- f) The technical characteristics were given increased weighting.

A man wearing a white hard hat and a dark suit with a white shirt and a patterned tie is holding a tablet computer. He is standing on a construction site, with a blurred background of buildings and a railing in the foreground. The entire image has a blue color overlay.

Part 4 - Contract Management and Variations

Part 4 - Contract Management and Variations

Introduction

4.1 In implementing a procurement strategy for road construction and restoration, the RD, DoC and the GCC retain total responsibility, on behalf of the Government, for the quality and overall performance of road projects.

4.2 This part studies whether these entities managed in the most efficient, economic and effective manner the delivery of awarded contracts for road projects. Information and data were collected using a sample of eleven contracts started and completed between 1998 and 2002.

4.3 Furthermore, as it is rare for the RD to be able to complete the projected works without some variation to the scope of the works, (normally involving additional costs or time delays), detailed analysis was also carried out in this audit to determine:

- a) Whether the RD applied effective management and technical techniques to minimise or prevent the risk of contract variations.
- b) Whether the systems adopted by RD and the DoC to approve contract variations were based on the principles of value for money and good practices.
- c) Whether contract variations after tender award were fully justifiable.

4.4 The principal contract variations considered in this study were the time and cost factors and any disregard of contract conditions. Issues related to the quality factor of the contract requirements were outside the scope of this audit.

Issues related to the management of the reviewed contracts

4.5 Contract management is the process of monitoring and ensuring that the contractors' performance is in conformance with the agreed contract conditions and specifications.

4.6 The eleven cases of contracts of road construction and restoration projects studied in this audit demonstrated that these types of contracts were managed by the RD over a relatively lengthy period of time, with works ranging from an estimated 100 days for the shortest reviewed project to 835 days for the longest project. Contracts studied in this audit also entailed a guarantee period of two years after completion of works, during which contractors were responsible for any repairs and maintenance required because of failures in their performance.

4.7 The key objective behind contract management, as part of the overall procurement process, is that contractual requirements stipulated by the RD and the DoC to protect the interests of taxpayers, stakeholders and the public using the roads are at all times observed and enforced throughout the lifetime of the contracts.

4.8 To achieve this objective, two conditions must be met:

- a) Plans, designs, consultative meetings and timetables should be concluded before works are initiated, as stated in Part 2 of this report.
- b) Furthermore, senior management at the RD must ensure that effective management, resources and systems are in place and accessible before, during and after the delivery of works in order to be able to monitor and enforce the entire contract conditions explained in Part 3 of this report.

4.9 The sample of eleven contracts managed by the RD, however, revealed that these two essential conditions were, in many cases, not adequately satisfied and Table G.1 in Appendix G of this report provides an overview of the main issues identified from the forwarded documentation.

Part 4 - Contract Management and Variations

4.10 The study also identified a number of factors, which had an impact on the overall managerial effectiveness of the reviewed contracts. The main factors are listed below:

(a) Procedures of how to manage the contracts not established

4.11 The forwarded documentation on the management of the reviewed contracts demonstrated that the RD did not have clear and established procedures, guidelines, policies, methods and overall direction on how to plan, initiate, manage and control the activities of these relatively high-value contracts and of any variations or additional works emanating from the projects.¹

4.12 The analysis of the reviewed contracts, as presented in Table G.1 (Appendix G), indicated that the RD managed each project in an unstructured and informal manner and failed to apply a standard project management approach.

4.13 This apparent lack of consistency in methodology was reflected in the following recurring problems experienced in the reviewed contracts:

- a) The orders to start works were issued to the contractors without the required designs, detailed drawings and instructions, leading to delays and formal complaints from the contractors on the absence of information on how the required works were to be carried out. (More information on the inadequate pre-contract planning detected during the review of the eleven studied cases is presented in Part 2 of this report).
- b) Further delays in the forwarding of instructions by the RD to the contractors, throughout the lifetime of the projects, continued to weigh down the progress of most of the reviewed works.
- c) The project files lacked timetables (prepared by the RD or submitted by the contractors) and project planning documents such as GANTT charts to indicate that progress was being monitored against set targets.
- d) The project files of the RD did not contain regular progress photographs from the contractors as requested in the contract conditions.
- e) Progress reports by officials in the RD were scarce and intermittent and did not outline clearly developments against project milestones.
- f) Permits from the planning authorities for the construction of walls adjoining the roads were in two cases prepared and requested during works, leading to additional delays of several months that could have been avoided.
- g) Initial planning activities and coordination with utilities on the underground services were, in many cases handled during works, leading to critical delays due to the absence of forward planning, disputes on materials and construction methodologies and indecision on key requirements. On their part, the utilities were in various cases unable to provide the RD with critical information regarding the location of underground services in place.
- h) During the projects, site meetings with contractors and representatives of utilities and other stakeholders were, in many cases, *ad hoc* and not within structured schedules.
- i) Frequent and improper handovers from one project manager to another (that is, between architects and foremen employed by the RD, as well as with external architects engaged by the RD to manage the works) led to a high level of incidence of uncoordinated or discontinued efforts in the management of the contracts.
- j) Significant project management decisions, such as issues related to project delivery or quality shortcomings, were incoherently recorded in the project files and in most cases there was no evidence that follow-ups and conclusive

¹ RD indicated that guidelines regarding measurements of works and related payments are being formally developed.

actions were taken to remedy these serious shortcomings.

- k) Considerable contract variations of quantities and additional works were requested or implemented without written prior instructions or correspondence approving and justifying the additional outlay.
- l) The departmental files included scarce evidence of regular surveillance of contractors by officials of the RD. There were several incidents in which serious concerns on hazards, damage to third-party property, street levels, piling of construction debris and other problems that were repeatedly raised by residents, the Local Councils, the media and end-users, in the absence of supervision by the RD.
- m) The project files examined also did not contain all the required records of inspections and tests that were expected from the contractors .
- n) The RD had problems in ensuring that the contractors performed the different stages of material compaction in accordance with the specifications of the RD.
- o) As-built designs drawings were found in only one of the departmental files and there was no clear evidence of completion dates of projects or of a system of post-contract analysis.

(b) The project management of RD was constrained by problems of ongoing staff movements to other government departments and staff resignations

4.14 It was noted through the files submitted and from interviews held with officials of the RD that during the reviewed period the RD lacked suitably qualified people with the necessary hands-on roads construction experience to carry out effective project management and introduce quality assurance responsibilities. The RD attempted to modify this situation by training in the medium-term its architects in road engineering practices, by using its external advisors on road

design and quality as project managers (apart from consultants), by allocating more projects and a higher workload to a limited number of qualified employees, and by outsourcing the project management of certain contracts to self-employed architects. The main problem with this system was that as the workload of new projects increased, the RD was forced to apply crises-management techniques, which in turn backfired and produced weak results. Table G.1 in Appendix G of this report gives an overview of some of these failings.

(c) Difficulty experienced by Project Managers in exercising control

4.15 Interviewed architects who were involved with the project management of the reviewed contracts, as well as evidence collected from the documents found in the examined project files, indicated that the project managers were not always capable of controlling the performance of contractors.

(d) The road construction industry in Malta lacked professionalism in its own delivery of the reviewed contracts

4.16 Evidence from the departmental files indicated that, apart from the weaknesses identified in the RD's project implementation practices, the contractors working on the field were very constrained by inadequate human, financial and material resources and were notably not up to professional standards in their approach towards project management and quality assurance. Major constraints identified in the audit as originating from the weaknesses of the contractors included: insufficient skilled labour, a shortage of supervisory staff, inadequate equipment, shortage of supplies, cash flow problems, a poor knowledge of the required construction methodology, widespread non-observance of contract conditions and specifications, over-commitments in several projects and little control on sub-contractors.

(e) The impact of the works on key stakeholders

4.17 A further investigative study was undertaken during this audit to assess the views of the key stakeholders (Local Councils, utilities and businesses) on the manner in which the reviewed road projects, and other projects in general, were managed by the RD.

4.18 The main conclusions from this symptomatic study are produced hereunder:

Local Councils

- a) Out of the five Local Councils contacted, three reported that they were never formally informed by the RD of the reviewed works being carried out in their locality and they were not given the opportunity to influence the design and planning of the works. On the other hand, the other two Local Councils contacted in the study reported that they were informed of the works and also had the opportunity to influence planning and design.
- b) Furthermore, all the contacted Local Councils reported active *ad hoc* consultations with the RD during the work-in-progress, mainly because of residents' and businesses' complaints.
- c) Overall, the interviews with the Local Councils underlined the important role of these bodies in championing the needs of the local community during major road works and the problems that they encountered when dealing with the RD.

Utilities

- d) The contacted engineering functions within the five major utilities confirmed that they were, in general, satisfied with the communication between their entities and the RD during project management. They all reported that initially they were informed by a facsimile communication from the RD that works were envisaged and then informed during site meetings of the developments to be carried out.
- e) Their concerns were more related to the problems arising from:
 - i. the difficulty to identify unrecorded underground services during works;
 - ii. their inability to provide long-term plans to the RD;

- iii. the financing of the additional costs required for the re-location of services caused by works initiated by the RD;
- iv. delays in the issue of permits to contractors; and
- v. onsite problems with specific contractors used by the RD – issues were normally related to cases of substandard and incomplete work or non-compliance with agreed terms and conditions.

Businesses

- f) A small number of businesses located next to the sites of the reviewed works were contacted during this study. Their feedback was used to gain an overall view of their key concerns during the implementation of a road project managed by the RD.
- g) The businesses were mainly concerned with the:
 - i. loss of business caused by the prolonged delays of works;
 - ii. absence of effective supervision during works;
 - iii. isolation of their business properties, especially from major thoroughfares;
 - iv. inconveniences caused to their clients and customers; and
 - v. unfavourable conditions created by construction sites such as rubbish, dust, idle equipment blocking properties and dumped construction waste.
- h) The targeted businesses were also concerned with unfinished works, despite the finalisation of projects, such as the embellishment of developed areas, surface problems, cracking due to improper installation of manholes, blocked catchments and lack of maintenance once major works were completed.

Issues related to financial management

4.19 A detailed analysis on the internal controls applied at the RD regarding the approval of invoices and payments in the case of the eleven reviewed contracts was also carried out.

4.20 The NAO consulted and reviewed the files of the sampled contracts and accordingly derived its conclusions from the perusal of the financial documentation contained therein.

4.21 The objectives of this exercise were to obtain an indication of the internal control systems at the RD, namely whether:

- a) an invoice for works carried out was being raised by the contractor for works carried out;
- b) the invoice for works carried out was being checked by the quantity surveyor, project manager and chief engineer;
- c) interim certificates of works carried out were formulated by the RD and approved by the quantity surveyor and the project manager;
- d) retention money was being deducted from payments made;
- e) variations were being approved by the DoC prior to the execution of

such variation works; and whether

- f) a final reconciliation was made between total payment vouchers, FBOQ and cumulative total of the contractor's invoices.

4.22 The study concluded that there was weak internal control in the payment process. The main shortcomings in the financial control system were:

- a) There was no standard format in the way invoices were issued by contractors. In the eleven (11) reviewed contracts, covering a total of fifteen (15) contractors, eight (8) contractors issued invoices with cumulative amounts of work carried out and six (6) contractors issued invoices for work carried out since last invoice date. No invoices were found with respect to one (1) contractor. In exceptional cases, invoices were issued for an aggregate amount without an itemised breakdown.
- b) Invoices amounting to over Lm700,000 were not found. Out of 120 payment vouchers covering the 11 contracts reviewed, no invoices were found in respect of 23 payment vouchers. Table 9 below gives a breakdown of the amount in question:

Table 9: Amounts not covered by Invoices.

Details	Amount paid but not covered by Invoices Lm
<i>Road Construction Works, Including any Servicing Works at New Access Road at Pembroke</i>	271,702
<i>Road Construction Works, Including Servicing Works at Dingli HOS and Dun K. Frendo</i>	175,359
<i>Resurfacing Works at Mdina Road Qormi</i>	92,854
<i>Upgrading of Arterial Road at Hal Far</i>	73,668 15,118 5,638
<i>Road Works at Hompesch Road / Marsascula Junction Zabbar</i>	27,849
<i>Construction of Mdina Road</i>	10,350
<i>Asphalting of road opposite Mt Carmel Hospital, Attard</i>	40,453
<i>Total</i>	712,991

- c) Of the invoices that were found, covering the remaining 97 payment vouchers, there was no evidence in 14 cases that the invoices were verified by the Quantity Surveyor, Project Manager and Chief Engineer.
- d) 65 interim certificates of works, out of a total of 120, were not found.
- e) Out of the 55 interim certificates issued, there was no evidence of review by the Project Manager and the Chief Engineer in 13 cases.
- f) Only in 1 out of the 11 contracts were internal controls governing the release of payment vouchers against the receipt of invoices satisfactorily followed.
- g) The RD failed to observe tax legislation in that it did not ensure that suppliers duly forwarded a fiscal receipt following payment. By the end of the audit, fiscal receipts amounting to Lm 2,636,991 out of a total of Lm 3,797,874 were missing. Following comments in this regard by the NAO, the RD managed to obtain the missing fiscal receipts.

4.23 In the case of eight contracts cumulative retention money amounting to Lm 29,899 was not deducted. In addition, in one payment voucher the retention money amounting to Lm 14,968 was stated but not deducted from the amount paid to the contractor.

4.24 No evidence was found that penalties were being levied for late delivery of works covered by the 11 reviewed contracts.

4.25 The audit also revealed that the files did not contain any procedural evidence of post-contract inspections during the two-year guarantee periods prior to release of final payments to contractors.

4.26 The conclusion of this study was that the RD should strengthen the control mechanism through better segregation of duties to allocate clear and specific responsibilities, effective authorisation and approval of payments and the arithmetical and accounting checks including reconciliation exercises.

Issues related to contract variations

(a) The time variation

4.27 Time delays in the completion of works are also presented in Table 10, opposite. This table shows that all reviewed contracts experienced significant delays in the completion periods with time variations ranging from + 53 per cent to + 3,236 percent more than the original projected timeframe.

4.28 Evidence and interviews with stakeholders and end-users demonstrated that these significant time variations had a negative impact and were more of a concern than the cost variations discussed in Para 4.29 below.

(b) The cost/quality variations

4.29 The overall values of the recorded cost variations for each of the eleven studied contracts are presented in Table 11 below. Briefly, cost variations ranged from an underspend of -30 percent than estimated when the contract was finalised to an overspend of + 59 percent more than the original contract value. A significant three out of the eleven contracts had cost variances close to 60 percent.

(c) The identified causes of variations

4.30 It is highly understandable that given the scale, complexity and the unpredictable nature of road construction works, during the course of works it was necessary for the RD to modify or expand the planned works to cater for unforeseen eventualities, changes in requirements or shortcomings in its processes.

Table 10: An Analysis of time variations of the eleven studied contracts

Contract Name	Estimated time at LA	Estimated Actual Time	Estimated % Time Variance over and above the original estimated time
<i>Road Construction Works, Including any Servicing Works at New Access Road at Pembroke</i>	12 weeks or 84 days	579 days	+589.29 %
<i>Road Construction Works, Including Servicing Works at Dingli HOS and Dun K. Frendo</i>	13 weeks or 91 days	608 days	+568.13 %
<i>Road Construction Works, Including any Servicing Works at Mdina Road Zebbug / Qormi</i>	15 weeks or 105 days	756 days	+620.00 %
<i>Resurfacing Works at Mdina Road Qormi</i>	8 weeks or 56 days	670 days	+1,096.42 %
<i>Upgrading of Arterial Road at Hal Far</i>	30 weeks or 210 days	883 days	+320.48 %
<i>Re-construction works at Mount Carmel Hospital Area Attard (Up to Blacktop) And Asphaltting Works at Mount Carmel Hospital Area Attard (Blacktop Only)</i>	4 weeks or 28 days	934 days	+3,235.71 %
<i>Scarifying, Recomposition Base and Wearing Course at Rabat (South Bound Route Only)</i>	6 weeks or 42 days	456 days	+985.71 %
<i>Resurfacing Works at Clarence Street, Pietà</i>	7 weeks or 49 days	100 days	+104.08 %
<i>Construction of Various Roads and Resurfacing of Car Park Near Church of Santa Lucia</i>	16 weeks or 112 days	364 days	+225.00 %
<i>Road Works at Hompesch Road / Marsascale Junction Zabbar</i>	20 weeks or 140 days	214 days	+52.86 %

Source: NAO working papers

Part 4 - Contract Management and Variations

Table 11: An Analysis of Cost Variation of the eleven studied contracts
(Values in CET were adjusted to VAT using the following conversion method: $\div 1.07 \times 1.15$)

Contract Name	Value of LA ² (LM)	Values presented in Final Bills of Quantities (including reported additional works) to DoC	Percentage Variance
Road Construction Works, Including any Servicing Works at New Access Road at Pembroke	222,003.00 (VAT) adj.	286,627.74 (VAT) adj.	29.11 %
Road Construction Works, Including Servicing Works at Dingli HOS and Dun K. Frendo	364,377.00 (VAT) adj.	462,397.55 (VAT) adj.	26.90%
Road Construction Works, Including any Servicing Works at Mdina Road Zebbug / Qormi	634,113.17 (VAT) adj.	623,986.78 (VAT)	(1.60%)
Resurfacing Works at Mdina Road Qormi	323,056.00 (VAT)	345,972.98 (VAT)	7.09%
Upgrading of Arterial Road at Hal Far	1,126,449.95 (VAT)	1,287,561.65 (VAT)	14.30%
Re-construction works at Mount Carmel Hospital Area Attard (Up to Blacktop)	160,248.06 (VAT) adj.	191,862.73 (VAT)	19.73%
Asphalting Works at Mount Carmel Hospital Area Attard (Blacktop Only)	158,472.74 (VAT) adj.	252,544.40 (VAT)	59.36%
Scarifying, Recompaction Base and Wearing Course at Rabat (South Bound Route Only)	65,000.00 (VAT)	102,492.52 (VAT)	57.68%
Resurfacing Works at Clarence Street, Pietà	39,234.00 (VAT)	27,149.57 (VAT)	(30.80%)
Construction of Various Roads and Resurfacing of Car Park Near Church of Santa Lucia	102,808.00 (VAT)	123,590.63 (VAT)	20.21%
Road Works at Hompesch Road / Marsascale Junction Zabbar	132,112.58 (VAT)	210,614.31 (VAT)	59.42%

Source: NAO working papers

² Letter of Acceptance

4.31 Key unforeseen variations identified from the findings of the audit, included:

- a) Unexpected ground conditions;
- b) Public interference requiring changes to works;
- c) Contractor problems;
- d) Weather conditions;
- e) Shortage of skilled labour and materials supply;
- f) Equipment failure;
- g) Construction errors;
- h) Contractual disputes;
- i) Delays by utilities to finish works;
- j) Supply difficulties.

4.32 However, evidence collected during the audit also clearly indicated that reviewed projects were also beset by shortcomings on the part of the RD, such as:

- a) Inadequate planning and inconclusive definition of requirements (discussed in Part 2 of this report);
- b) Ineffective analysis during adjudication (Part 3);
- c) Design changes, late instructions and weak project management (discussed in the previous section above);
- d) The prescribed procedure for the request for cost variations was not always adhered to by the RD

4.33 According to the Fourth Schedule of the Public Service (Procurement) Regulations on variation orders, before a commitment is made by the RD with a contractor for a cost variation leading to an overspend of over five percent of

the total final bill, a documented request must be presented for approval to the DoC specifying the background to the cause and any effect on the expenditure.

4.34 The Fourth Schedule also states that the DoC has the right to specify views:

- a) for granting or refusing the variation requested by the RD;
- b) on whether such a variation could have been avoided;
- c) on the procedure to be followed in the future to avoid a recurrence.

4.35 Furthermore, a DoC circular (CT 2472/2000) released in 2000 clearly reminded all Heads of Government entities that requests for variations of over 5 percent should be timely, accurate and according to the Fourth Schedule, as otherwise the officials of the procuring entities would be personally responsible for the commitments made without the endorsement of the DoC.

4.36 This procedure was not always followed by the RD. In nine out of the eleven reviewed contracts, request for variations was made after works were carried out. Documentation found in the departmental files of the eleven reviewed contracts indicated that in most cases the RD sent urgent requests to the DoC asking for approval of significant variations in the contract conditions when projects would have been at an advanced stage and it was impossible to reverse or delay matters without creating unacceptable discontent among stakeholders and the public. Table 12 opposite details these variations.

4.37 Furthermore, the study detected a number of incidences when cost variations were committed by the RD without the prior consent of the DoC as required by the procurement regulations.

4.38 Out of the eleven reviewed contracts there was no approval from the DoC for a total variation works value of Lm 63,270. Table 13 numerically illustrates the issue.

Table 12: Request for variations by the RD to the DoC of the eleven reviewed contracts.

File Number	Details	Start date	End date	Date when request was made	Requested amount
					Lm
RD311/99	Mdina Road	Feb 2001	Mar 2001	Mar 2001	63,709
WD 691/97	Dingli HOS	Aug1998	Mar 2000	Mar 1999 Mar 2000	64,000 81,642
RD131/94/1	Attard	Jul 1999	Mar 2001	Jan 2000 Dec 2001	4,840 26,404
RD84/2000	Attard	Not known	Feb 2002	Feb 2001 Oct 2001 Nov 2001	10,976 76,826 13,588
WD1064/97	Pembroke	Jun 1998	Jan 2000	Mar 1999 Mar 2000	69,000 62,129
RD141/99	Rabat	Sep 1999	Nov 2000	Oct 1999 Mar 2000	32,516 7,854
RD960/97/Vol 3	Hal Far Road	Aug 1999	Dec 2001	May 2000 Nov 2001	75,691 58,675
RD 360/2001	M'Scala	Feb 2002	Sep 2002	Apr 2002 Oct 2002 Nov 2002	33,297 49,016 74,212
RD 467/2000	Santa Lucija	July 2001	April 2002	Jun 2003	14,358
Total					818,733

Table 13: Payments for variation works not covered by a relative approval by the DoC

File Number	Details	Variations
		Lm
WD 691/97	Dingli	12,475
RD 222/99/1	Hal Far Road	50,795
Total		63,270

(e) A high occurrence of quantity variations was identified in a sample of five contracts

4.39 A detailed analysis of five of the eleven contracts studied in this audit was commissioned by the NAO to an external consultant. The study specifically analysed issues surrounding the variation of quantities in the final Bills of Quantities (BOQ) and additional items of work that had not been included in the initial contract documents.

4.40 The analysis relied largely on the BOQs contained in the relevant project files and the documents consulted were mainly the estimated quantities and respective costs prior to issue of tenders, the record of offers tendered by contractors following issue of invitation to tender, the final BOQs and, where drawn up, the bills of additional works.

4.41 The main issues raised in this study were:

- a) There was a notable absence of well-documented project files including a lack of information concerning pre-contract planning, design and on-site project management. The study

concluded that if this information had indeed been compiled it should have been filed in the relevant project file.

- b) The files contained very little by way of detailed drawings upon which quantities contained in the estimates and tender BOQs were supposedly based, and no as-built drawings were found in the files to reconcile with the final BOQs.
- c) Most of the calculations and working papers of measurements were not found in the respective files and therefore no reconciliation could be undertaken.
- d) There were significant variations to the quantities indicated as being required in the original BOQs of the five studied contracts. Table 14 below shows the percentage increase or decrease in value caused by measured quantities over or under the originally estimated quantities indicated.

Table 14: The percentage increase or decrease in value caused by measured quantities over or under the originally estimated quantities indicated.

Contract Name	Over-spend from original contract price due to measured quantities over the estimated quantities caused by changes in quantities or methods (value excludes additional works)	Under-spend from original contract price due to measured quantities under the estimated quantities caused by changes in quantities or methods
<i>Road Construction Works, Including Servicing Works at Dingli HOS and Dun K. Frendo</i>	32 %	39 %
<i>Scarifying, Recomposition Base and Wearing Course at Rabat (South Bound Route Only)</i>	53 %	15 %
<i>Road Construction Works, Including any Servicing Works at New Access Road at Pembroke</i>	70 %	31 %
<i>Construction of Various Roads and Resurfacing of Car Park Near Church of Santa Lucia</i>	10 %	27 %
<i>Resurfacing Works at Clarence Street, Pietà</i>	32 %	37 %

Source: Commissioned Report on Analysis of Miscellaneous Road Contracts (NAO) - June 2003

- e) The study confirmed an overall positive variation (overspend) on all but one of the five cases studied. This positive variation was made up of changes in quantities and activities required and the inclusion of new additional works in the bills.
 - f) The items that caused the main occurrences of substantial overspend and considerable underspend, within one or more of the five analysed contracts, are listed in Table 15 overleaf.
 - g) The files did not contain any reliable project management data that recorded consistently progress of the works and any difficulties that arose. This lack of documentation did not permit a comprehensive appreciation of the escalation of costs during the course of the contracts.
 - h) The analysis carried out raised a number of questions on the pricing of items which were not included in the original contracts. (The confirmation, prior to execution, of the pricing of such additional works was not found in the examined files. However, these works were presented as completed in the bill of additional works).
 - i) The study also examined a number of strategic items that could have had an impact on the overall contract performance. These are presented in Table 16 opposite.
- b) Inadequate pre-construction tasks, especially surveys regarding topography and subsurface conditions.
 - c) Miscalculation at the outset of quantity and type of excavation or construction requirements.
 - d) Modification of road designs during the course of the works and / or the inclusion of additional works to the original contracts.
 - e) Changes in the methods and related prices of excavation or road construction works.
 - f) Unforeseeable works during execution.

4.42 The study concluded that these recurrent incidences of substantial measured quantities over and under the estimated quantities reflected:

- a) A lack of pre-planning by the RD.

Conclusion

4.43 The findings of the audit showed that the RD failed to apply a standard project management approach in the case of the eleven reviewed contracts. In most cases there was also a clear absence of established procedures, guidelines and methods to be adopted during projects. This had an impact on the final delivery of the projects, on the internal financial control systems and on the recording and estimation of variances.

4.44 Furthermore, the existence of a broad range of variations, in cost, time and quantity required, in the eleven reviewed contracts, as outlined above, is a very serious concern. These findings indicate that more preparatory work and effective management should have been undertaken by the RD to minimise the incidences of contract variations and avoid risks which included delays in the commissioning of the projects, inefficiencies, community dissatisfaction with protracted traffic delays, litigation, and higher costs for the RD including project management and administrative costs.

Table 15: Items leading to substantial over-spend and under-spend in the reviewed works.

§	<p>Substantial overspend and new additional items</p> <ul style="list-style-type: none"> - Excavation, over haulage and taking up of concrete paving and kerbs - Sub-base materials - Base and bitumen wearing courses - Cold milling - Rainwater drainage related works - The supply and deposit of soil - The construction of a boundary or retaining walls - The construction of footpaths and kerbs
§	<p>Substantial under-spend</p> <ul style="list-style-type: none"> - Oversight excavation in rock - Taking up existing road surface - Sub-base works - Wet mix macadam - Bitumen wearing courses - Footways <p>(In most cases of under-spend it could be remarked that unspent monies were used to cover any overspend on other items).</p>

Source: *Commissioned Report on Analysis of Miscellaneous Road Contracts (NAO) - June 2003*

Table 16: Strategic items which could have had an impact on the overall contract performance of five studied cases

<p>Excavation</p> <p>Complete miscalculation of required works, changes of work method and price variances were the three main causes of significant variations (over-measurements and under-measurements) of the studied contracts.</p> <p>Sub base material</p> <p>Changes in the construction methodology and miscalculation were the main causes of variations on this item.</p> <p>Bitumen base / wearing course</p> <p>Changes in construction methodology or additional works led to substantial increases or decreases in quantities required in two of the studied contracts. This item of works is central to road construction and should not be susceptible to the uncertainties such as those related to excavation.</p> <p>Adjoining structures</p> <p>There were significant variations in adjoining structures adjacent to the roads indicating a lack of forward planning and changes in designs during works. These normally included changes to footpaths and kerbs and the additional construction of retaining or boundary walls.</p> <p>Cold milling</p> <p>In one of the studied contracts, the value of cold milling was increased by 800 percent due to lack of forward planning by the RD.</p>

Source: *Commissioned Report on Analysis of Miscellaneous Road Contracts (NAO) - June 2003*

Part 5 - Conclusions and Recommendations



Part 5 – Conclusions and Recommendations

Conclusions

5.1 Shortcomings in planning for procurement, project management and control were conducive, in the case of the Roads Department (RD), to substantial variations in costs and delivery time. The latter might prove to be more costly in terms of disturbance to the public and businesses than the former. These shortcomings emerged due to inadequate management structures and lack of human resources, both in quality and in number of the organizations involved in public procurement. Additionally, the suppliers' side or the market situation might itself be a source of concern in the public procurement systems. If winning bidders (suppliers) are short of resources - funds, personnel and equipment - to deliver, procurement is bound to suffer. As these shortcomings in the procurement system may also be present in the public procurement of other goods and services, the recommendations below can be addressed to all public entities involved in procurement.

5.2 Detailed conclusions are provided at the end of each part, namely:

Para 2.37 – 2.41;

Para 3.50 – 3.52; and

Para 4.22, 4.43 and 4.44.

5.3 These conclusions are being reported upon, in a more concise form, below:

Planning

5.4 The RD lacked a coherent project planning approach and full planning philosophy.

5.5 This deficiency led to weak execution during tender adjudication and to poor project management performance and inconveniences to end-users.

Contract Documentation and Tender Adjudication

5.6 In many of the cases reviewed, the General Contracts Committee (GCC) received

inadequate information from the RD and from bidders.

5.7 The GCC was unable to gain a full understanding of the prevailing market forces and to gauge the reliability of short-listed bidders.

5.8 The GCC nearly always based its decisions on pricing, with non-financial considerations such as supplier performance and capability having a minimal impact on the final decisions.

Contract Management and Variations

5.9 Established procedures, guidelines and methods to be adopted during projects by the RD were not in place.

5.10 The RD lacked adequate internal control systems both as regards financial as well as technical matters.

5.11 The existence of a broad range of cost, time and quantity variations, indicated the need for more preparatory work and effective management on the part of the RD.

Recommendations

5.13 The procuring entity should:

- a) Lay the foundations for a thorough and complete planning and design system that assesses and plans requirements in a technical and systematic manner.
- b) Discuss and coordinate with critical third parties all key requisites of the procured product or service prior to the call for tenders.
- c) Have all plans, timetables and designs for the procured product or service completed prior to the call for bids.
- d) Increase its awareness of stakeholder requirements and

- concerns, and take them into appropriate consideration, in the early stages of its planning processes.
- e) Ensure that it has reliable information on the supply market, including prices, rates and market developments.
 - f) Develop the competences of its adjudication boards by encouraging enhanced ways of assessing bids and improving the quality of the technical reports presented to the GCC.
 - g) Explore where practicable, with representatives of the relevant industry, the supply side weaknesses and limitations and propose change programmes and continuous improvement initiatives.
 - h) Introduce an open and active quality assurance mechanism (similar to ISO 9000:2000) that addresses the identified lack of procedures and documentation relating to pre-contract planning, design, measurement, internal control and project management decisions.
 - i) Establish a comprehensive system that tracks and formalises, during the lifetime of a project, feedback on changes and variations as they occur.
 - j) Enforce the quality and performance specifications, through more effective inspections and strict enforcement of contract conditions.
 - k) Identify and manage the risks associated with the authorisation of payments.
 - l) Take more into account end-user requirements and concerns when managing contracts and monitoring contractors.
 - m) Introduce post-contract evaluations as a tool for learning and improvement.
 - n) Investigate the reasons for delays and cost variations, as well as introduce performance measures and benchmark its processes against the industry's best practices.
- 5.14 In the specific case of the RD, it is envisaged that developments reported upon in Part 2, Points 2.50 to 2.63, will have a positive effect on issues addressed above.
- 5.15 The Department of Contracts (DoC) should:
- o) Minimise the risks of contract variations by demanding more technical evidence of planning and design from the purchasing unit, prior to issue of tenders. This in order to ensure that all requirements are clearly investigated and quantified, thereby minimizing risks of misinterpretation by potential bidders.
 - p) Develop and maintain a momentum of improvement at the purchasing unit and in the relevant industry by applying, without reservations, all the prescribed sanctions against defaulting parties.
- 5.16 The GCC should:
- q) Discourage poor performance by the purchasing unit by returning for further evaluation incomplete assessments of bids and technical reports.
 - r) Reasonably ascertain, in greater detail, claims made by short-listed contractors and not base its decisions mostly on lowest costs.
 - s) Ensure that the successful bidder is aware of information, raised in Part 3, Para 3.38, regarding requirements of the contract.
- 5.17 All three bodies should investigate ways of how to develop staff and increase the level of competency and expertise at their disposal.

Appendices



Appendix A - Audit Scope and Methodology

Study Scope

A.1 The National Audit Office embarked as of July 2002 on a thorough appreciation and evaluation of the procedures and approaches prevalent within the local public procurement sphere and whether these were likely to deliver value for money. The study proposed to focus its thrust on the procurement for road construction and restoration, which entailed a study of the workings of three Governmental bodies: the Department of Contracts (DoC) and the General Contracts Committee (GCC), Ministry of Finance; the Roads Directorate (RD), part of the Malta Transport Authority (ADT) as of January 2003.

A.2 To achieve its objectives, the scope of the audit was limited to an examination of activities associated with the contracting of road construction and restoration projects. These activities encompassed the tackling of issues pertinent to:

- a) the planning practices in the RD prior to the preparation of estimates and the call for tenders;
- b) the contracting arrangements for such projects, the role of the RD, the GCC and the DoC in the tendering and adjudication process, and the factors that influence the final selection of contractors; and
- c) the delivery of awarded contracts for road projects.

A.3 The scope of the audit did not extend to incorporate the construction and rehabilitation of roads falling under the direct jurisdiction of the Local Councils.

A.4 In undertaking this study the NAO sought to identify the performance as regards the delivery of the contract to time and budget, to analyse the reasons for variations and review the planning and the management of road projects.

Study Methodology

A.5 The NAO undertook a detailed preliminary study, an issue analysis and a case-study approach.

A.6 The preliminary study was undertaken by the Office prior to the conduct of the audit to enable the NAO to better comprehend the working environment of the auditees, to scope the issues examined in this report and to suggest a feasible set of issues.

A.7 The issue analysis was employed to design the nature of the evidence required. The following issues were considered to assess the performance of the procurement process:

- a) whether the RD adopted effective systems in the planning for its road construction and restoration projects;
- b) whether contract documentation and the adjudication process enabled the RD, the DoC and the GCC to identify the best deal available;
- c) whether the RD's management had been adequate; and
- d) whether the DoC and the RD managed effectively contract variations.

A.8 A stratified selection of eleven contracts awarded by the GCC and representing nine road projects planned and managed by the RD was used in the study. The contracts were selected on the basis of a number of criteria, including:

- a) Type of road (arterial, distributor and urban)
- b) Type of treatment (re-/construction and/or re-/surfacing)
- c) Year of Letter of Acceptance (LA) (1998 to 2001)

- d) Value of LA (under Lm 100,000, between Lm 100,000 and under Lm 500,000, between Lm 500,000 and under Lm 1 million and over Lm 1 million)
- e) Awardee (broad range of contractors deliberately selected despite presence of a dominant supplier)
- f) Duration specified in LA (up to six weeks, over six weeks and up to thirteen weeks and over thirteen weeks and up to thirty-two weeks)
- g) Area (northern harbour district, southern harbour district, south-eastern district and western district)

A.9 A summary of the respective characteristics of the contracts is provided at the end of this Appendix.

A.10 Given the relatively small number of reviewed contracts, the Office undertook an in-depth but tightly focused methodology. Evidence was collected through file examination, interviews with relevant staff, a review of published literature, site visits and meetings with the key stakeholders.

A.11 The case study analysis was also conducted to provide practical illustrations of several of the issues highlighted in the study.

A.12 The NAO held several meetings with the main utilities to identify the general issues arising from road projects. Participants included

the technical staff of Enemalta, Maltacom, Water Services Coporation, the Drainage Department and Melita Cable plc.

A.13 The Office also had discussions with identified stakeholders pertinent to the reviewed contracts. The aim of the discussions was to gauge stakeholder satisfaction and classify primary concerns. This was achieved through the application of structured interviews offering a mix of graded and open-ended questioning to allow quick and easy tabulation, analysis and comparison. Stakeholders interviewed included representatives of local councils, hoteliers, hospital administrators, SME owners and community members.

A.14 Furthermore, the NAO interviewed officials from institutions bearing a direct or indirect role in the context of the local road construction industry, such as the Ministry of Finance, the Ministry of Transport and Communications, the Works Division, the Malta Environment and Planning Authority and the Office of Fair Trading.

A.15 Internal expertise was engaged to analyse auditee financial data and review internal controls and procedures.

A.16 The Office also sought the services of an external expert to supplement the research efforts by way of technical parity with the auditees. The terms of reference were intended to furnish further insights into the compilation of the bills of quantities and the applicability of related drawings.

Table A.1 – Case Details

Case study 1: Contract for Road Construction Works, Including any Servicing Works at New Access Road at Pembroke

Area	: Northern Harbour Region
Type of road	: Distributor
Type of treatment	: Construction and surfacing
Estimate submitted for ministerial authorisation	: 219,561.25 CET
Selected tenderer bid	: 206,560.00 CET
Contract start date	: June 1998
Planned completion date	: September 1998
Actual completion date	: January 2000

Case study 2: Contract for Road Construction Works, Including Servicing Works at Dingli HOS and Dun K. Frendo

Area	: Western District
Type of road/s	: Urban
Type of treatment	: Construction and surfacing
Estimate submitted for ministerial authorisation	: 347,567.37 CET
Selected tenderer bid	: 339,029.00 CET
Contract start date	: August 1998
Planned completion date	: December 1998
Actual completion date	: March 2000

Case study 3: Contract for Road Construction Works, Including any Servicing Works at Mdina Road Zebbug / Qormi

Area	: Northern Harbour District
Type of road/s	: Arterial
Type of treatment	: Reconstruction
Estimate submitted for ministerial authorisation	: 884,354.00 CET (including resurfacing works, see case study 4, below)
Selected tenderer bid	: 590,000.95 CET (reconstruction works <i>only</i>)
Contract start date	: February 1999
Planned completion date	: July 1999
Actual completion date	: March 2001

Case study 4: Contract for Resurfacing Works at Mdina Road Qormi

Area	: Northern Harbour District
Type of road/s	: Arterial
Type of treatment	: Resurfacing
Estimate submitted for ministerial authorisation	: 603,049.00 VAT (including reconstruction works, see case study 3, above)
Selected tenderer bid	: 323,056.00 VAT (resurfacing works <i>only</i>)
Contract start date	: March 2000
Planned completion date	: May 2000
Actual completion date	: December 2001

Appendices

Case study 5: Contract for Upgrading of Arterial Road at Hal Far

Area: South-eastern District

Type of road/s: Arterial

Type of treatment: Reconstruction and resurfacing

Estimate submitted for ministerial authorisation: 734,789.51 CET

Selected tenderer bid: 1,126,450.00 VAT

Contract start date: August 1999

Planned completion date: April 2000

Actual completion date: December 2001

Case study 6: Contract for Re-construction works at Mount Carmel Hospital Area Attard (Up to Blacktop)

Area: Western District

Type of road/s: Arterial and urban

Type of treatment: Reconstruction

Estimate submitted for ministerial authorisation: 301,266.19 CET (including resurfacing works, see case study 7)

Selected tenderer bid: 149,100.36 CET (reconstruction works *only*)

Contract start date: July 1999

Planned completion date: August 1999

Actual completion date: March 2001

Case study 7: Contract for Asphaltting Works at Mount Carmel Hospital Area Attard (Blacktop Only)

Area	: Western District
Type of road/s	: Arterial and urban
Type of treatment	: Resurfacing
Estimate submitted for ministerial authorisation	: 301,266.19 CET (including reconstruction works, see case study 6)
Selected tenderer bid	: 147,448.55 CET (resurfacing works <i>only</i>)
Contract start date	: July 1999
Planned completion date	: August 1999
Actual completion date	: February 2002

Case study 8: Contract for Scarifying, Recompaction Base and Wearing Course at Rabat
(South Bound Route Only)

Area	: Western District
Type of road/s	: Distributor
Type of treatment	: Surfacing
Estimate submitted for ministerial authorisation	: 81,985.00 VAT
Selected tenderer bid	: 65,000.00 VAT
Contract start date	: September 1999
Planned completion date	: November 1999
Actual completion date	: November 2000

Case study 9: Contract for Resurfacing Works at Clarence Street, Pietà

Area	: Northern Harbour District
Type of road/s	: Urban
Type of treatment	: Resurfacing
Estimate submitted for ministerial authorisation	: 39,234.50 VAT
Selected tenderer bid	: 46,728.00 VAT
Contract start date	: August 2001
Planned completion date	: September 2001
Actual completion date	: November 2001

Case study 10: Contract for Construction of Various Roads and Resurfacing of Car Park
Near Church of Santa Lucia

Area	: Southern Harbour District
Type of road/s	: Urban
Type of treatment	: Reconstruction and resurfacing
Estimate submitted for ministerial authorisation	: 98,830.50 VAT
Selected tenderer bid	: 134,065.75 VAT
Contract start date	: July 2001
Planned completion date	: September 2001
Actual completion date	: April 2002

Case study 11: Contract for Road Works at Hompesch Road / Marsascale Junction Zabbar

Area	: South-eastern District
Type of road/s	: Distributor
Type of treatment	: Reconstruction and resurfacing
Estimate submitted for ministerial authorisation	: 132,563.00 VAT
Selected tenderer bid	: 132,112.58 VAT
Contract start date	: February 2002
Planned completion date	: July 2002
Actual completion date	: September 2002

Appendix B - Provisions in the current Public Service (Procurement) Regulations related to the Director of Contracts

Table B.1 – Provisions in the current Public Service (Procurement) Regulations related to the Director of Contracts

Key provisions related to the Director of Contracts included:

- a) Purchases estimated to cost Lm20,000 or more have to be procured through a public call for tenders issued by the Director of Contracts, unless another procedure is authorised by the Minister responsible for finance.
- b) Three-package tendering procedure for calls is to be applied for tenders estimated to cost Lm250,000 and over.
- c) There are predetermined procedures to be followed for the award of contracts.
- d) The General Contracts Committee has specific functions to follow.
- e) The Director of Contracts is delegated powers over decisions taken by the Contracts Committees.
- f) The method of approval of variations to be followed on contracts awarded by the Director of Contracts and which exceed the contract value by more than five percent.
- g) The rights of the Director of Contracts to impose terms and conditions of payments and safeguards with regard to the awarding of public tenders.
- h) The authority of the Public Contracts Appeals Board.
- i) The responsibility of the Director for the infliction or remission of penalties becoming due in respect of contracts awarded by the Director.

Source: NAO Working Papers

Appendix C - Overview of the DoC Operations

C.1 The basic function of the Department of Contracts is that of ensuring adherence to the Public Service procurement regulations, and prescribed procedures, by all Government departments, public entities and corporations. The Department of Contracts is made up of a Pre-contract section, a Post-contract section and the General Contracts Committee (GCC).

C.2 The staple regulations governing the operations of the Department of Contracts are derived from the Public Service (Procurement) Regulations as determined in LN 70/96 in August 1996 and consolidated through various directives issued over the years. The procurement regulations previously in force have been harmonised with the *acquis* and relevant E.U. directives concerning public procurement.

C.3 A Contracts Committee – originally established in 1966 – examines and makes final recommendations on all proposed awards of contracts and assists the Director of Contracts in the execution of the applicable duties.

C.4 In April 2002 the Public Service (Procurement) Regulations were updated in order to enable the setting-up of the Public Contracts Appeals Board. This autonomous board is responsible for determining all appeals lodged in respect of tenders awarded and valued at Lm20,000 or over.

C.5 The GCC is supported by the Pre-contract Section that examines, scrutinises and processes public procurement proposals exceeding the Lm 20,000 threshold in estimated cost. Principally, the Pre-contract Section sees to the compilation of detailed tender documents

that address the intended purchase. Before proceeding to publish a tender, it ensures that all contractual obligations are adhered to and that the tender to be published guarantees full transparency and an even playing field amongst the prospective bidders. The Pre-contract Section furthermore oversees the receipt and subsequent opening of tenders and the cataloguing of the proposals therein. Following the GCC decision, the Pre-contract Section issues a binding Letter of Acceptance to the successful bidder/s and, accordingly, informs the unsuccessful bidder/s.

C.6 All procedures concerning bank guarantees, contract extensions, penalties and legal proceedings fall under the responsibility of the Post-contract Section. In this context, the main objective of this section is to ensure that the contractor fulfils its legal obligations governed by the applicable tender specifications. The Post-contract Section is also entrusted with handling of variations and extra works *vis-à-vis* the projected demands and the subsequent recommendations to the DoC with respect to rates for new items.

C.7 An E.U. Unit (within the DoC) has been set up for the purpose of vetting, issuing and monitoring of all tenders and contracts fully or partly financed under the Pre-Accessions Funds framework.

C.8 The ensuing series of charts pictorially demonstrate the principal operations undertaken by the DoC, namely the processing of tender documents ahead of adjudication, the processing of a request for an extension for the completion of works and the processing of a request for variations works.

Figure C.1: Flowchart of activities for Pre-contract section at the DoC – processing of a tender document



Figure C.2: Flowchart of procedure for the extension of project timeframe on the part of the Post-contract Section at the DoC

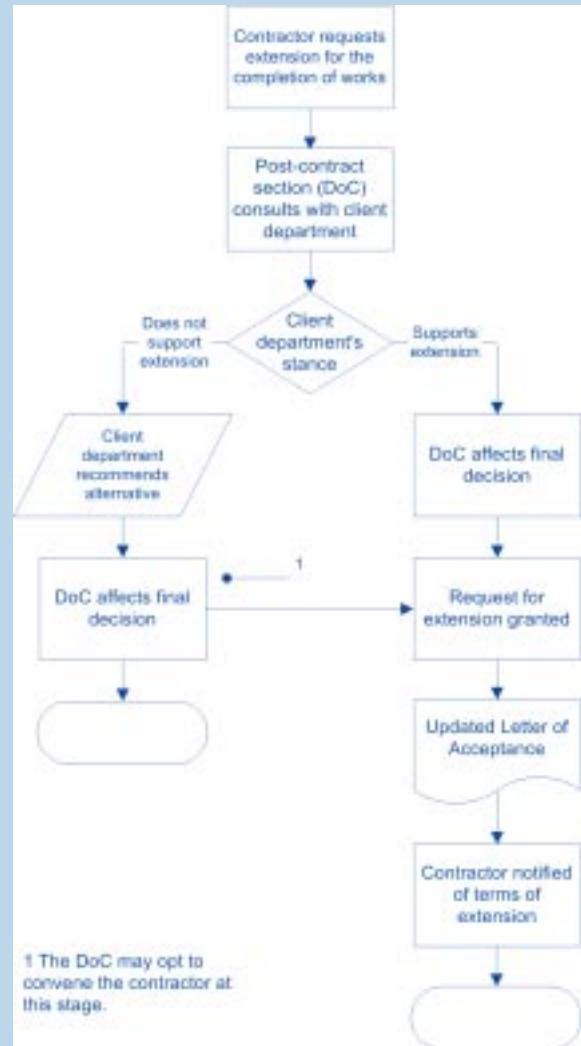
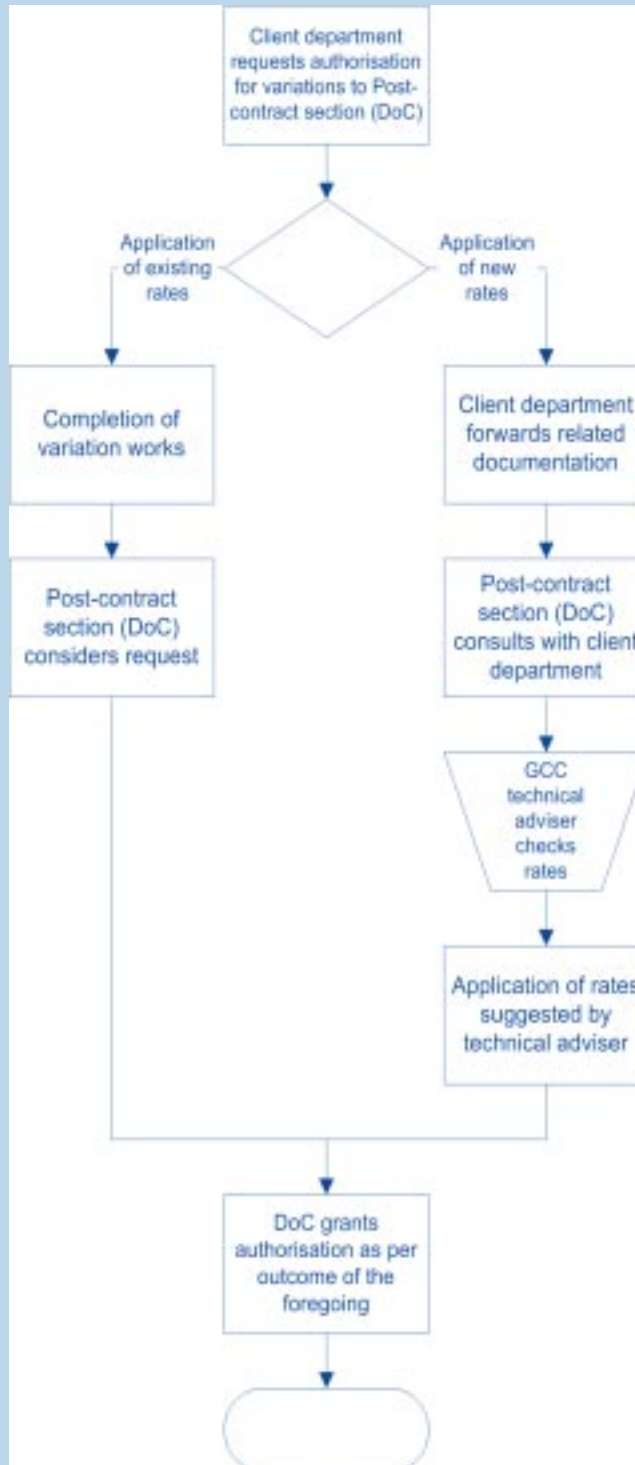


Figure C.3: Flowchart of procedure for the authorisation of project variations on the part of the Post-contract Section at the DoC



Appendix D - Overview of the role and functions of the Roads Directorate

D.1 The Roads Directorate (RD) is the entity responsible for the construction and maintenance of roads. It is also responsible for establishing standards and specifications for all works related to roads.

D.2 The road network in Malta comprises approximately of 1,600 kilometres of primary and secondary roads. The road network is a significant factor contributing to the social and economic development of the islands.

D.3 In 2001, the RD became one of the five directorates functioning under the Malta Transport Authority (ADT). The other four directorates within the ADT are: Licensing and Testing, Traffic Management, Public Transport and Corporate Services, the latter responsible for administrative functions of the four operational directorates. The ADT was set up through Parliamentary amendments of the Public Transport Act (Chapter 332) in July 2000, beginning formal, effective operations the following year. The Authority has a regulatory role in the road design and construction field.

D.4 The ADT is in the process of addressing the lack of core competence in the RD through recruitment. Currently, twelve civil engineers and a trainee are engaged within the RD and occupy key positions such as that of Roads Directorate Head, Chief Engineer, Maintenance Manager and Construction Manager. Furthermore, the

recruitment of a Design and Planning Manager, a Major Projects Manager and an Engineering Manager is in process.

D.5 The RD – originally a government department – was set up in 1992 when the Works Department, within the Ministry for Public Works and Construction, was re-engineered into the Works Division and transferred to the Ministry for the Environment. In March 1994, the RD became part of the Ministry for Transport, and Communications and Technology. In this capacity the RD assumed the function of regulating body for all issues related to the country’s road network while concurrently addressing the immediate and long-term planning and construction requirements of the road network.

D.6 In addition to the above, two German road-engineering experts were deployed – in February 1998 – for the purpose of providing consultancy services with respect to road design and construction. Since then, these consultants have provided services to the ADT, the Roads Directorate and to contractors rendering road services to the ADT. Through initiatives led by the experts, various road works related standards have been drawn up during 2003.

D.7 The chronology and background to the setting up of the Roads Directorate and the ADT is illustrated in Table D.1 below:

Table D.1 - Chronology and background to the setting up of the Roads Directorate and the ADT

i.	Roads Department established in temporary premises at Santa Venera	1995
ii.	Roads Department assimilated into Works Division and transferred to Floriana	1996
iii.	GTZ consultants appointed to the Roads Department	1998
iv.	Roads Department re-established at Floriana	1998
v.	ADT established and first Board appointed	2001
vi.	Second ADT Board appointed	Mar. 2002
vii.	Roads Directorate incorporated in ADT	Jan. 2003

D.8 The principal sections of the RD are the Planning and Design Section, the Estimating and Quantity Surveying Section and the Road Testing Laboratory.

D.9 The Planning and Design section engages on two functions: (i) the formulation of designs and construction plans to mirror the classification of targeted roads and (ii) the handling of expropriation procedures. The Planning and Design section liaises closely with the Directorate's consultants by way of test results and technical recommendations. Furthermore, the workings of the section involve close collaboration with third party agencies from time to time, namely the MEPA, the Works Division and the utilities in what concerns statistical traffic data, surveying works and location of underground services respectively.

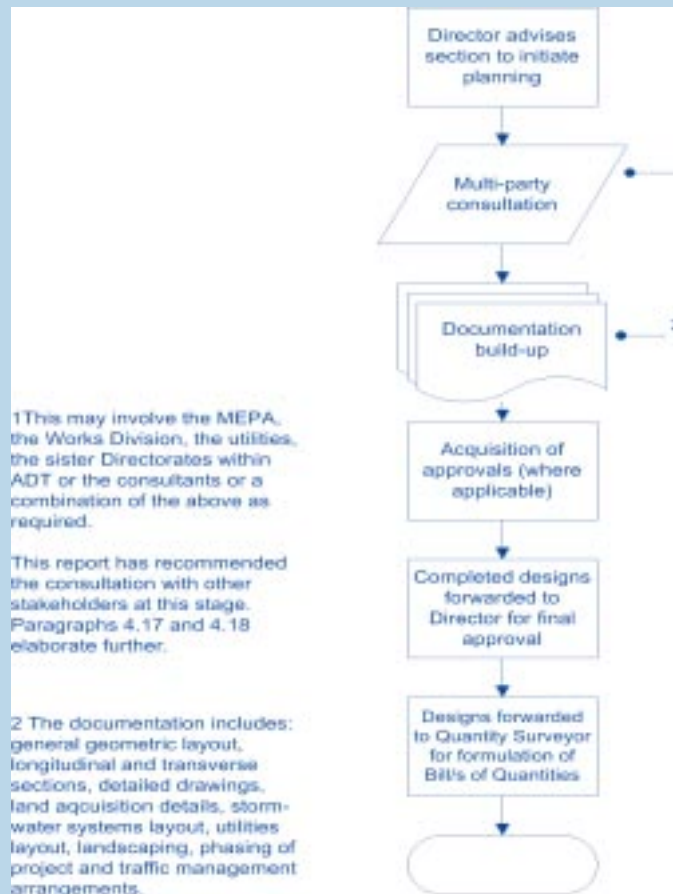
D.10 The compilation of a bill of quantities – which eventually determines the projected requirements – involves on site surveying, which is carried out by the Estimating and Quantity Surveying section. In instances of design and

build contractual arrangements the responsibility of surveying rests on the contractor entrusted with the works. The Estimating and Quantity surveying section is also involved in the compilation of the Technical Report during adjudication and in the measurement of the works – both projected and variation – carried out in the course of the implementation of the project.

D.11 The Road Testing Laboratory was set up in 2001 for the purpose of ensuring the compliance of executed works and proposed materials with the RD's specifications. Although the laboratory is currently unmanned due to a claimed shortage of suitably qualified personnel, the recruitment process of a technician to manage the laboratory is under way.

D.12 The ensuing flowcharts portray the relative work practices as expected by management to be exercised within the RD. Additional information reflecting both recommendations forwarded in this report and any regulatory requirements not implemented is included accordingly as appropriate.

Figure D.1: Procedure for the planning and design of road projects



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Figure D.2: Stages in the formulation of the Bill/s of Quantities

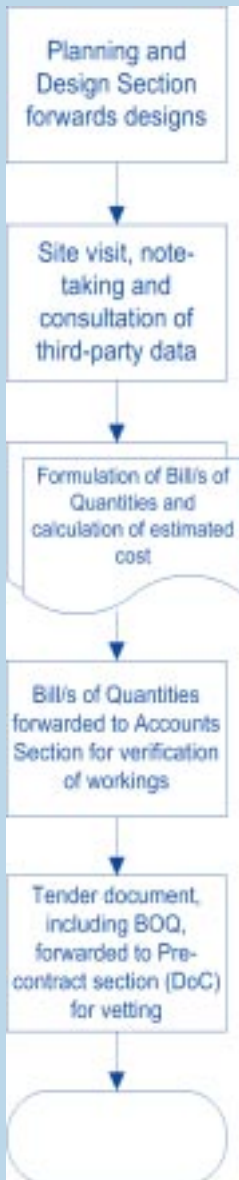


Figure D.3: Stages in the formulation of the Technical Report at the



Figure D.4: Measurement of and payment for works carried out in the course of the project



¹ As documented in Para. 4.22 (g) of this report, this stage was neglected by the RD. This flowchart, therefore, depicts the system that *should* have applied in the light of the departmental procedures therein and regulatory documentation required.

Appendix E - Case Study Analysis of the Planning Process

Table E.1: Summary of an analysis carried out by the NAO on the standard of technical assessments undertaken by the RD, during the planning process, prior to call for tenders.

Contract: *Road Construction Works, Including any Servicing Works at New Access Road at Pembroke*

Estimated cost of project: *Lm 219,561.25 (CET)*

Analysis:

The planning initiatives for this project were characterised by a strong presence of the Planning Authority (today MEPA), unavoidable in view of the nature of the project aiming to construct a previously inexistent stretch of road. The regulatory requirements in such circumstances enabled planning initiatives that were relatively more pronounced, such as the formulation of designs and the taking of photographs as per regulations. However, the forwarded files yielded documented evidence that demonstrated that the RD had not conducted adequate investigations and assessments prior to the commencement of works. Such evidence included:

- Internal reporting by the project manager on the lack of project-specific details, absence of necessary plans, amendments applied after the award of the tender and a flawed compilation of the bill of quantities. Consequently, Technical assessments were conducted in the course of the works.
- The contractor formally complained of insufficient data during construction to determine the projected load endurance of the pavement section, and that instructions were forwarded little by little and modified at will by the RD.
- The RD reported that the project went 35 percent over budget halfway through the project.
- NAO analysis revealed a substantial measured quantities over the estimated quantities ratio during the compilation of the bill of quantities of specific items (over site excavation, sub base material and stone walls), a substantial measured quantities under the estimated quantities ratio of other items (bitumen base course and over site excavation in rock) and additional items (removal of kerb and removal of concrete paving).
- A post-completion review exercise conducted by the RD concluded that for approximately half the time required to complete the works the contractor was awaiting for instructions and/or drawings from the Roads Department. The report also stated that the estimated duration of the works was not realistic.

Contract: *Road Construction Works, Including Servicing Works at Dingli HOS and Dun K. Frendo*

Estimated cost of project: *Lm 347.567.37(CET)*

Analysis:

Despite the high value of the works, with the exception of a bill of quantities, a site plan and financial estimates, the documentation in the project file yielded no evidence with respect to the conduct of investigations and assessments undertaken. The consequences were that:

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- Only two utilities out of five submitted bills of quantities.
- Details of works required by utilities were decided after the release of the tender leading to significant contract variations and long-drawn conflicts on the alignments of underground services.
- Documented protests from the appointed contractor that delays were being caused by conflicting or late instructions from the RD.
- Local Council requests were not considered before release of tender and this inattention may have led to additional works and contract variations.
- NAO analysis revealed significant contract variations were caused by a substantial measured quantities over the estimated quantities ratio during the compilation of the bill of quantities of specific items (cold milling, concrete in footpaths, excavation, backfilling, overhaulage and base / wearing course bitumen), a substantial measured quantities under the estimated quantities ratio of other items (sub base works, wet mix macadam and paving blocks) and additional items (excavation in rock, overhaulage and cold milling).

Contract: *Road Construction Works, Including any Servicing Works at Mdina Road Zebbug / Qormi and Resurfacing Works at Mdina Road Qormi*

Estimated cost of project: *Lm 1,425,727.00 (CET)*

Analysis:

The actual planning documentation present in the project file was scarce and no evidence of studies and investigations was detected, apart from the bill of quantities and rainfall statistics. Nevertheless, the following observations are warranted:

- The RD, aware of the engineering and technical challenges of the project, convened a series of meetings, during the tender adjudication stages bringing together the principal utilities for co-ordination purposes and to ensure the proper amalgamation of the respective requirements.
- The RD admitted to incomplete designs when the project tender came up for publication, to the extent that it was not possible (for the RD) to forward recommendations to the DoC during adjudication.
- The contractor complained on the absence of drawings after being given instructions to start works. Initial drawings concerning underground installations were eventually forwarded five months after the award of the tender.
- Documents indicated prevailing uncertainty in the location of underground installations of services leading to delays.
- Records show that the RD applied for a (planning authority) permit to cover development works in an untimely manner.
- The DoC contended that the project delays, in excess of two years over the optimistic and inaccurate 40-week estimate, resided outside of the control of the contractor.

Contract: *Upgrading of Arterial Road at Hal Far*

Estimated cost of project: *Lm 734,789.51(CET)*

Analysis:

The forwarded files yielded evidence to the effect that technical assessments were carried out prior to the formulation of the bill of quantities, some outsourced by the RD to third parties. Such assessments concerned the establishment of the construction work methods and the verification of site-specific elements. Nonetheless, correspondence suggested that despite the award of the tender and subsequent order to start works, the designs were revised and the contractors were not provided with the necessary documents in time. As a result:

- Crucial working documents to indicate the depth of road excavation, type of road structure and location of underground services were still being prepared by the RD despite the order for the commencement of works. The contractors were unable to comply with the order to start works until the said documents were presented.
- The contractors contended that amended drawings with correct alignments and levels were forwarded three months after the order to start works.
- A chronology of events and related correspondence compiled by the Quality Assurance Managers of the contractors suggested that actual planning documentation was being forwarded to the contractors little by little in tandem with the completion of works.
- The actual duration of the project was approximately 130 weeks, against the original RD estimate of 30 weeks.

Contract: *Re-construction works at Mount Carmel Hospital Area Attard (Up to Blacktop)*
and
Asphalting Works at Mount Carmel Hospital Area Attard (Blacktop Only)

Estimated cost of project: *Lm 246,974.48 (CET)*

Analysis:

Despite the high volume of the works, the documentation in the project file yielded no evidence of investigative initiatives and strategic assessments beyond those concerning the proper extent of necessary land expropriation. The consequences were:

- Correspondence suggested that the Local Council's concerns were not accounted for during the compilation of the bill of quantities.
 - RD records showed that plans concerning the installation of street furniture were relayed across the interested departments after the planning stage and during the adjudication of the tender.
 - The contractor requested surveying data (levels and street alignments) after the award of the tender. The RD had not previously presented this data.
 - The emergence of utilities-related issues in the course of the works, ranging from erroneous instructions, to downright lack of layout plans for services, to improper harmonisation of plans, some of these necessitating that works had to be halted.
 - The contractor highlighted, and was proven right by events, that potential damage to underground services would result if excavation instructions forwarded by the RD were to be followed.
 - RD records confirmed that a mandatory development permit was sought after the commencement of works, which works were halted in the intervening time.
-

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Contract: *Scarifying, Recompaction Base and Wearing Course at Rabat (South Bound Route Only)*

Estimated cost of project: *Lm 81, 985.00 (VAT)*

Analysis:

No planning documentation, save a bill of quantities formulated in-house, was found in the RD file for this project. Records showed that the RD resorted to delegating the whole conduct of the planning exercise – i.e. surveying work and road profile – to the selected contractor. This clearly shows that the investigations and assessments undertaken by the RD for this project prior to the call for tenders were incomplete and the BOQ unsubstantiated. The outcome was a separate bill of quantities, which eventually necessitated a revised Letter of Acceptance. Such an approach led to a three-month delay in the commencement of the works and the incurrence of variations from the outset. Other noteworthy observations included:

- The contractor remarked that the RD did not provide any information or drawings with respect to the works to be carried out.
- Documentation showed a lack of foresight in preventing avoidable disruptions and lack of planning in the execution of subsequent remedial action.
- Records included modifications of plans, themselves formulated after the award of the tender, in the course of the works. No original planning documentation was available to the DoC to substantiate and motivate the changes.
- Evidence of limited and delayed consultation with utilities that resulted in the forwarding of related instructions late into the second (i.e. last) phase of the works.
- NAO analysis revealed significant contract variations caused by a substantial measured quantities over the estimated quantities ratio during the compilation of the original bill of quantities of specific items (cold milling, concrete in footpaths and laying of kerbs), a substantial measured quantities under the estimated quantities ratio of other items (bitumen wearing courses) and additional items (removal of kerbs and concrete paving, granular sub base and supply and deposit of soil).
- The RD admitted in the course of the works that the integration of the North Bound Route with the South Bound Route would have led to potential gains from greater efficiency and economies of scale.

Contract: *Resurfacing Works at Clarence Street, Pietà*

Estimated cost of project: *Lm 39,234.50(VAT)*

Analysis:

Very little documentation was found in the project's file, except for the tender document, related bill of quantities and measurements of site-specific elements, prior to the call for tenders. Evidence showed that early contact with the Local Council was made. Other observations were the following:

- RD records indicated that the utilities were duly contacted albeit after the formulation of the tender document and related bill of quantities.
- Evidence of the co-ordination with third parties showed that this was, nevertheless, inadequate and untimely, with crucial planning-related exercises relegated to after the award of the tender, as was the forwarding of definite commitments and plans on the part of the utilities. The latter

circumstance, in particular, resulted in the incurrence of delays, misunderstandings and slight modifications in instructions forwarded to the contractor.

NAO analysis revealed a substantial measured quantities over the estimated quantities ratio of specific items (concrete in footways) and a substantial measured quantities under the estimated quantities ratio of other items (repair of footways, take up existing road surface and sub base material) in the compilation of the bill of quantities.

Contract: *Construction of Various Roads and Resurfacing of Car Park Near Church of Santa Lucia*

Estimated cost of project: *Lm 98,830.50 (VAT)*

Analysis:

Regardless of the number of roads targeted by the project, documented investigative initiatives found in the forwarded files amounted to a correspondence, with one accompanying location plan, sent to the principal utilities informing of the intended intervention. A bill of quantities was produced at this stage but proper surveying exercises were outsourced weeks after the award of the tender, resulting in a modified bill of quantities. Other observations are as follows:

- Evidence of a meeting held to gauge third-party requirements, including the Local Council and utilities, after the finalisation of estimates and the award of the tender.
- Records indicate that surveying work had not been done before award for tenders. Documentation shows that site inspections were carried out weeks after the award of the tender and surveying work had not been completed by the third month after the award of the tender.
- NAO analysis revealed a substantial measured quantities over the estimated quantities ratio during the compilation of the bill of quantities of specific items (taking up of kerbs), a substantial measured quantities under the estimated quantities ratio of other items (sub base material) and additional items (excavation of oversite and rainwater drainage related works).

Contract: *Road Works at Hompesch Road / Marsascala Junction Zabbar*

Estimated cost of project: *Lm 132,563.00 (VAT)*

Analysis:

Despite the estimated cost for this tender and according to RD records found in the project file, no investigations and planning initiatives were carried out ahead of the Ministerial monetary commitment. The RD delegated the conduct of surveying works to the contractor eventually selected, which selection was carried out on the basis of a provisional estimate backed by an apparently unsubstantiated bill of quantities.

- Records demonstrate that whilst momentum was maintained insofar as the co-ordination with utilities was concerned, such initiatives occurred after the award of the tender and the subsequent conduct of surveying works.
- Documentation indicates that the traffic management scheme that was to characterise the completed stretch of road was made available to the contractor one month into the progress of works.

Source: NAO working papers

Table E.2: Summary of an analysis on the standard of drawings found in the reviewed project files

Contract Name: *Road Construction Works, Including any Servicing Works at New Access Road at Pembroke*

Analysis:

- Design drawings, alignment and surface profile drawings were available due to planning consent being sought before project realisation.
- No evidence of pre-design and/or pre-contract survey were found in file to establish ground conditions and utilities services pipes and ducts.
- Survey works were carried out after contract was let. Tests pits were dug after issuing of LA. Drawings indicated that slops of site were not correct.
- Drawings were prepared and sketched in ball point pen by the contractor, after contract was let. Lack of geological and soil surveys were raised after issuing of contract.
- RD depended on contractor for designs on road construction. The involvement of a foreign consultant appears to have focused attention on this regard.
- Design changes were evident before issuing contract and on the insistence of the planning authorities.

Contract Name: *Road Construction Works, Including Servicing Works at Dingli HOS and Dun K. Frendo*

Analysis:

- Relevant file contained no road design drawings, no geometry designs and no surface profile designs.
 - Road construction designs were left at the discretion of contractor, with the RD providing limited approval.
 - No evidence of pre-design and/or pre-contract survey works was found to establish ground conditions and utilities service pipes and ducts.
 - Information provided was limited to 1:2500 scale which did not provide information on accurate location of pipes and ducts.
 - Lack of detailed design drawings and adequate planning at design stage, led to storm water and sewage flooding, retaining walls problems and inaccessibility to residential homes.
 - Asphalt mix could have imposed a potential serious consequence on road construction.
-

Contract Name: *Road Construction Works, Including any Servicing Works at Mdina Road Zebbug / Qormi/ Resurfacing Works at Mdina Road*

Analysis:

- Designs were altered after issuing of contract to extend service life from 2-4 years to 15-20 years. Drawings were with no scale or author identification. Freehand sketches were in pencil and ink. There were no geometry and surface profile design drawings. It appears that there was a change in design during the course of the contract.
- No evidence of pre-design and/or pre-contract survey works to establish ground conditions and establish utilities service pipes and ducts.
- Problems could be traced with regards to alignment of sewers and storm water.
- Mix design prepared by contractor during course of contract.
- RD depended on contractor for hot asphalt mix design.

Contract Name: *Upgrading of Arterial Road at Hal Far*

Analysis:

- Only drawings observed were a 1:2500 scale point location plan.
- No evidence of pre-design and/or pre-contract survey were found in file to establish ground conditions and utilities services pipes and ducts.
- Design information after the contract was awarded was contained in a variety of drawings. Some of the drawings contain little details of author. Some subsequent drawings referred to changes in design (alignment), however, there was evidence to suggest that such design issues could have been considered at the outset of the project.
- Surface profile drawings and construction drawings were evident after awarding of contract.
- Due to lack of attention to pre-design survey works at the design stage, several problems arose during the construction phase.

Contract Name: *Re-construction works at Mount Carmel Hospital Area Attard*

Analysis:

- The only drawing observed was a 1:2500 scale site location plan.
 - No evidence of pre-design and/or pre-contract survey works were found in file to establish ground conditions and utilities services pipes and ducts.
 - Problems during the construction phase concerning drainage mains and road alignments could not be traced due to a lack of detailed design drawings at the design stage of the project.
 - Due to sewage problems permit was included in file 7 months after order to start works.
-

Contract Name: *Scarifying, Recompaction Base and Wearing Course at Rabat (South Bound Route Only)*

Analysis:

- No drawings were found.
- No evidence of pre-design and/or pre-contract survey was found in file to establish ground conditions and utilities services pipes and ducts.
- No survey data on ground conditions were found in file.
- Survey/design drawings found in file were modified in pencil. There was no indication who carried out modifications and reasons behind such changes could not be traced in file. A freehand sketch relating to retaining wall was found on one fading fax.
- Contractor submitted alignment and surface profile designs after contract was let.

Contract Name: *Resurfacing Works at Clarence Street, Pietà*

Analysis:

- Only drawings observed were a 1:2500 scale point location plan.
- No evidence of pre-design and/or pre-contract surveys were found in file to establish ground conditions.
- Ground conditions problems could be traced, due to lack of survey and design drawings at the design stage of the project.

Contract Name: *Construction of Various Roads and Resurfacing of Car Park Near Church of Santa Lucia*

Analysis:

- No drawings were found.
 - No evidence of pre-design and/or pre-contract survey works to establish ground conditions and establish utilities service pipes and ducts.
 - Problems could be traced with regards to alignment of sewers due to a lack of detailed design drawings at the design stage of the project.
 - Site surveys raised three months after issuing of contract.
 - Drawings were with no scale or author identification. Freehand sketches were in pencil and ink.
 - Requests for survey were found in file dated three months after letter of intent to contractor.
-

Contract Name: *Road Works at Hompesch Road / Marsascala Junction Zabbar*

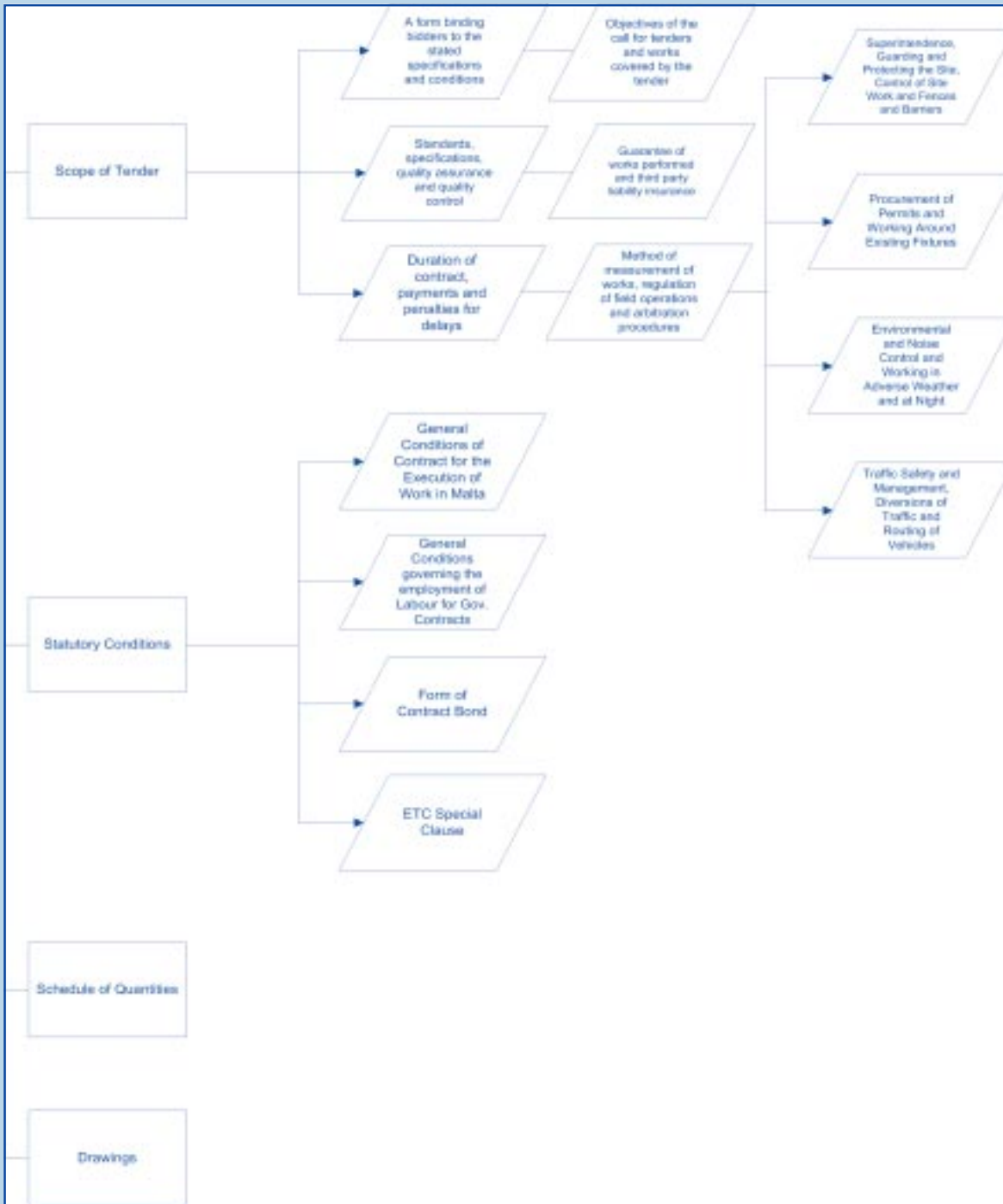
Analysis:

- Prior to issue of invitation to tender there was reference to planning permit drawings, but these were not evident in the file.
- The only drawing observed was a 1:2500 scale site location plan.
- No evidence of pre-design and/or pre-contract survey were found in file to establish ground conditions and utilities services pipes and ducts. A 1:2500 scale location site plan was evident in the file but it did not allow accurate location of the pipes and services, nor the levels they run
- Problems in reconstruction of traffic islands and storm water culverts.
- The decision taken by the Local Council to extend the project could have been considered in the initial project scope.
- Geometry, Surface profile drawings found in file. Possibility of alteration during course of the project.
- Variation in contract sum is due to weakness of sub grade material and lack of survey work.
- Identification of drawings warranted greater attention due to several different drawings with identical drawing numbers.

Source: NAO working papers

Appendix F - Case Study Analysis of Contract Documentation and Tender Adjudication Processes

Figure F.1: The main elements of the contract documentation of the eleven reviewed contracts



Source: NAO Working Papers

Table F.1: A description of the main elements of the contract documentation of the eleven reviewed contracts

<p>Scope of tender</p> <ul style="list-style-type: none"> • A form binding bidders to the implementation of the tender in conformity with specifications and conditions. • Objectives of the call for tenders. <i>This clause specifies the area and type of intervention.</i> • Works covered by the tender. <i>This clause provides details with respect to the nature of the works covered by the tender.</i> • Standards and specifications. <i>This clause makes reference to the RD specifications document (version 3-94) and the ASTM specifications that are to apply in default of the former.</i> • Quality assurance and quality control. <i>This clause stipulates testing procedures.</i> • Measurement of work. <i>This clause specifies the criteria and parameters for the measurement of works carried out related to all aspects of road re-/construction and asphaltting.</i> • Duration of contract. <i>This clause stipulates the maximum duration for the completion of the envisaged works.</i> • Penalties for delays. <i>This clause stipulates the fines for the failure to complete the envisaged works on time.</i> • Payments. <i>This clause describes the procedures for the request and issue of payments.</i> • Guarantee of works performed. • Third party liability insurance. <i>This clause requests contractors to enrol in an insurance policy aimed to safeguard the RD and its management against legal liabilities in the form of death or injury and damage to or loss of material property in the execution of the contract.</i> • Conduct of works on site. <i>This clause outlines field operations, which include superintendence of the site, procurement of permits, environmental control, installation of fences and barriers and traffic safety and management.</i> • Arbitration procedures. <i>This clause refers the resolution of disputes related to the works to the Malta Arbitration Centre and over-rules any other references to the subject of arbitration not involving the Centre.</i> • Fees for tender documents and drawings. <p>Statutory conditions</p> <ul style="list-style-type: none"> • General conditions of contract for the execution of work in Malta. • General conditions governing the employment of labour in connection with Government contracts. • Form of contract bond. • Employment and Training Corporation special clause. <i>This clause requires the tenderer to submit details and number of employees duly registered as per an ETC form.</i> <p>Schedule of Quantities.</p> <ul style="list-style-type: none"> • <i>Contains the bill of quantities tabulating the works for the implementation of the project for the bidder to manually compile the proposed rates.</i> <p>Drawings</p> <ul style="list-style-type: none"> • <i>Contains a site plan indicating the proposed area for development.</i>

Source: NAO working papers

Appendices

Table F.2: Evidence of competitive bidding or otherwise in the eleven reviewed bidding processes

Contract Name	Number of Bids	Bids Received Highest Value (LM)	Bids Received Lowest value (LM)	Audit Remarks
<i>Road Construction Works, Including any Servicing Works at New Access Road at Pembroke</i>	5	285,510.49 (CET)	206,559.53 (CET)	<ul style="list-style-type: none"> - Evidence of close, competitive bidding - All bids were below departmental estimate, one of them considerably so.
<i>Road Construction Works, Including Servicing Works at Dingli HOS and Dun K. Frendo</i>	2	339,029.34 (CET)	302,401.20 (CET)	<ul style="list-style-type: none"> - Presence of a dominant supplier - Dominant supplier's bid was above departmental estimate - The other bidder submitted a part tender - Tender awarded to the dominant supplier
<i>Road Construction Works, Including any Servicing Works at Mdina Road Zebbug / Qormi</i>	5	1,004,413.00 (CET)	590,000.00 (CET)	<ul style="list-style-type: none"> - Evidence of competitive bidding - Presence of a dominant supplier - Adjudication was on a split tendering basis - Three out of four bids for "blacktop only" works were cheaper than departmental estimate - Two out of five bids for "up to blacktop" works were cheaper than departmental estimate
<i>Resurfacing Works at Mdina Road Qormi</i>	2	360,128.00 (VAT)	323,056.00 (VAT)	<ul style="list-style-type: none"> - Presence of a dominant supplier - All bids were cheaper than departmental estimate - Bid by tenderer competing with the dominant supplier was cheapest overall
<i>Upgrading of Arterial Road at Hal Far</i>	3	707,000.00 (CET)	684,703.00 (CET)	<ul style="list-style-type: none"> - Interested bidders proceeded to uphold a previously awarded contract. - Contract was shared equally amongst contractors submitting lowest values.
<i>Re-construction works at Mount Carmel Hospital Area Attard (Up to Blacktop)</i>	4	171,315.40 (CET)	149,100.37 (CET)	<ul style="list-style-type: none"> - Evidence of close bidding. - Presence of a dominant supplier - One bidder submitted a part tender - Adjudication was on a split tendering basis
<i>Asphalting Works at Mount Carmel Hospital Area Attard (Blacktop Only)</i>		169,094.70 (CET)	147,448.55 (CET)	<ul style="list-style-type: none"> - All bids for "up to blacktop" works were above departmental estimate

Contract Name	Number of Bids	Bids Received Highest Value (LM)	Bids Received Lowest value (LM)	Audit Remarks
<i>Scarifying, Recompaction Base and Wearing Course at Rabat (South Bound Route Only)</i>	3	88,194.00 (VAT)	65,000.00 (VAT)	<ul style="list-style-type: none"> - Presence of a dominant supplier - Dominant supplier's bid was lower than departmental estimate
<i>Resurfacing Works at Clarence Street, Pieta</i>	1	46,728.00 (VAT)	46,728.00 (VAT)	<ul style="list-style-type: none"> - Only one bid was submitted - The bidder was the dominant supplier - Bid was above the departmental estimate
<i>Construction of Various Roads and Resurfacing of Car Park Near Church of Santa Lucia</i>	1	102,808.00 (VAT)	102,808.00 (VAT)	<ul style="list-style-type: none"> - Only one bid was submitted - The bidder was the dominant supplier - Bid was above the departmental estimate
<i>Road Works at Hompesch Road / Marsascala Junction Zabbar</i>	4	132,349.06 (VAT)	128,864.25 (VAT)	<ul style="list-style-type: none"> - Evidence of close bidding - Bids were marginally cheaper than the departmental estimate

Source: NAO working papers

Note: It is important to point out that the share of the contracts awarded to a dominant supplier who limited the options available for adjudication during the reviewed period was relatively low in our sample and not reflective of its actual market share. The audit used a sample, which encompassed as many different contractors as possible in order to be able to gain a clearer picture of the performance of different contractors.

Appendix G - Case Study Analysis of Contract Management and Contract Variations

Table G.1: Summary of analysis of contract management of the eleven reviewed contracts

Contract: *Road Construction Works, Including any Servicing Works at New Access Road at Pembroke*

Analysis:

Poor project management hampered the execution of works. The project was characterized by delays, scarcity of instructions relayed to the contractor and weak collaborative efforts:

- After the issue of the order for the commencement of works, the engineer in charge highlighted that the material making up the stretch of road to undergo treatment had not been identified correctly. Despite the order (for the commencement of works) actual works on site remained limited.
- The contractor complained on a number of occasions that requests for information were not being heeded by the RD.
- Weak collaborative efforts between the RD and the contractor incurred a number of misinterpretations. One such circumstance concerned the payment for utility works carried out and necessitated intervention by the DoC.
- Traffic management was inadequately handled, with the closure of an alternative route during the execution of the works, thus creating inconveniences.
- The RD completed a post-mortem exercise that attributed the extensive duration for the completion of the works to idle time during which the contractor had been awaiting for instructions. The contractor could only be made liable for six weeks by way of time variations despite the fact that in real terms the project duration was extended by roughly 400% over the original estimate.

The project was characterized by significant concerns expressed by third-party stakeholders in view of the delays in the execution of the works.

Contract: *Road Construction Works, Including Servicing Works at Dingli HOS and Dun K. Frendo*

Analysis:

Project management failed to resolve persistent residents' complaints in connection with inconveniences and damages to property:

- The works inconvenienced a number of residents in daily activities such as the garaging of vehicles and irrigation of crops, and also as a result of heavy downpours flooding dwellings.
- There was little collaboration among the utilities involved, the contractor and the project manager in the course of the works.

Contract: *Road Construction Works, Including any Servicing Works at Mdina Road Zebbug / Qormi and Resurfacing Works at Mdina Road Qormi*

Analysis:

Both these projects, the execution of which was handled concurrently from a given point onwards, denoted severe instances of mismanagement on a number of fronts, especially – though not exclusively – with respect to inconveniences, quality of works carried out, traffic accidents, contractor performance and construction methodologies:

- The contractor disobeyed clear instructions from the RD and DoC that works were not to be carried out in a given area, owing to commercial activities. The RD was unable to forcefully reverse the contractor's course of action and attempted to make the most, instead, of the resulting situation.
- The pre-defined levels of quality were not achieved for the asphalt base course laid on the first section of Mdina Road. The contractor was requested to replace the defaulting asphalt accordingly. Nine months of haggling and delays resulted in the RD instituting an arbitration case on the circumstance.
- The work-in-progress resulted in traffic accidents, damages and inconveniences to residents, several instances of which were picked up by the media.
- Contract clauses were enforced, although not in their totality, and only after exhaustive attempts at compromise.
- A poor level of collaboration between the project manager and the contractor in what concerns technical matters was apparent, as suggested by continuous correspondence addressed to the same circumstances. The project manager expressed the impression that the contractor was ignoring all correspondence.
- The GCC attributed the slow progress of works to situations that were beyond the control of the contractor, namely that certain construction methods were modified by the RD in the course of the works.
- The project manager was changed in the course of the works.

Contract: *Upgrading of Arterial Road at Hal Far*

Analysis:

A number of issues related to safety considerations, technical problems, lack of coordination, quality of work and traffic management were identified:

- The hiring of three contractors to work simultaneously relayed synchronization difficulties.
- Quality Assurance Managers (QAMs) were appointed by the contractors but reported to the RD. Their brief was to regularly monitor works and coordinate among the different contractors. These managers proved to be pivotal during the works by way of supervision and made attempts to introduce controls and procedures.
- The QAMs were at varying points in time unable to confirm the quantities of material being used and the levels to which this was laid. Deliveries of material were carried out unannounced and before the sub-grade testing was executed.

Appendices

- One of the contractors executed works without the prior consent and authorisation of the RD. In addition to this, such works did not fully comply with the standards expected. On one such occasion, the contractor referred the question to the FRBC, which in turn negotiated a memorandum of understanding with the RD on a wider scale. The specifics were eventually referred for arbitration, five months after the issue first surfaced.
- Traffic management in the course of the works was mediocre, at times downright hazardous, with vehicles cruising in opposite directions within the confines of a single, unidirectional lane of traffic. The issue of the setting up of an adequate traffic management framework was ultimately submitted for review to the Attorney's General office.

Contract: *Re-construction works at Mount Carmel Hospital Area Attard (Up to Blacktop)*
and
Asphalting Works at Mount Carmel Hospital Area Attard (Blacktop Only)

Analysis:

During the projects in caption, tackled simultaneously, the project management responded in a reactive fashion. The projects were characterized by weak collaborative efforts, inconveniences and delays and necessitated changes in the project management structure and the setting up of a departmental board to oversee quality of execution:

- Idle time was incurred on the implementation of the works until third parties involved in the works resolved pecuniary issues.
- The MEPA successfully insisted that a recently erected boundary wall be dismantled in view of non-compliance with environmental regulations. The contractor was unable to proceed in the meantime.
- Considerable delays – seven months into the execution of the envisaged works – induced the RD to adopt a new project management approach comprising consistent monitoring of works through weekly meetings and progress reports and the appointment of a supporting project manager.
- The project management function failed to appropriately address the widespread dissatisfaction on the part of the residents in view of the slow progress of works, constrictions of access to property and hazards compounded by inadequate safety measures. Such elements were reported extensively in the media.
- The possession of the site on the part of the contractor engaged to tackle the “blacktop” works proved troublesome, largely due to the non-removal of trees, incomplete works from the “up-to-blacktop” schedule, modified kerb alignments and changes in materials used.

Contract: *Scarifying, Recompaction Base and Wearing Course at Rabat (South Bound Route Only)*

Analysis:

An analysis of the execution of the works for this project highlighted elements that were not conducive to proper project implementation. These ranged from lack of co-ordination amongst the governmental departments directly and indirectly involved in the course of the works, the non-acquisition of permits and the occurrence of defects after completion of works:

- The RD received complaints from the Department of Agriculture to the effect that embellishment works previously carried out were dismantled in the course of the works.
- The RD failed to request authorisation in a timely manner to the DoC for the construction of a retaining wall, which in turn did not process the request promptly. The DoC's reply was forwarded 9 ½ months after the construction of the retaining wall.
- The construction of the retaining wall was carried out in disregard to incumbent MEPA regulations on environmental conservation and without a permit. The MEPA demanded alterations to the completed retaining wall, which were only partly adhered to by the RD.
- The RD discerned the formation of cracks in the asphalt in various areas that underwent road works. It withheld retention payments until the matter was resolved.

It is also pertinent to point out that the project suffered from delays and cost variations attributable to incidences of bad weather.

Contract: *Resurfacing Works at Clarence Street, Pietà*

Analysis:

Owing to the relative low value of the envisaged works and the limited scale of intervention, no significant project management considerations were discerned, save the following:

- The project manager reprimanded the contractor that the cement stabilization layer was not being treated as per requirements.
- The contractor liaised poorly with the RD in what concerns the execution of tests.
- The project manager prepared brief progress reports throughout the execution of works, principally covering the activity undertaken during the period of treated.

Contract: *Construction of Various Roads and Resurfacing of Car Park Near Church of Santa Lucia*

Analysis:

Although project management denoted instances of good practice, execution of works was hampered by delays. The project also failed to meet one of its original aims:

- On start of works, lack of coordination between the RD and the utilities related to the forwarding of plans disabled the smooth execution of such works.
- The Local Council informed the RD that the completed roads did not counter a heavy downpour and retained excessive levels of rainwater. The better channeling of rainwater constituted one of the stated objectives of the project.
- The individual fulfilling the role of project manager was retained throughout the implementation of the project.
- The project manager maintained a steady flow of correspondence with the entities, utilities and institutions concerned, which enabled prompt action when required. By way of illustration, the project manager promptly notified the contractor of all hazards arising out of the state of the works and instructed that the situation be rectified.

Separate projects concerning the same site were satisfactorily coordinated despite no previous planning to this effect.

Contract: *Road Works at Hompesch Road / Marsascale Junction Zabbar*

Analysis:

While no significant deficiencies in project management were evident, it was still possible to identify the following problems:

- Some initial coordination initiatives and consultative meetings with the utilities were carried out after the award of the tender, leading to delays pending the ironing out of outstanding issues.
- The construction method was modified soon after the commencement of the works
- The Local Council lobbied for the inclusion of additional works during implementation.

The project manager was not replaced at any time during the execution of works. Irrespective of the foregoing, the project manager managed to sustain a consistent approach with respect to tackling of and control over developments, largely through timely correspondence and reminders.

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