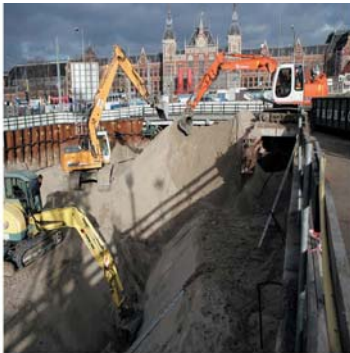


**GEMEENTERAAD
AMSTERDAM**



ONDERZOEK NOORD/ZUIDLIJN

DEFINITIEF RAPPORT

DEEL 2 - BIJLAGEN

OPGESTELD DOOR

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1 JUNI 2005

GEMEENTERAAD AMSTERDAM

ONDERZOEK NOORD/ZUIDLIJN

DEFINITIEF RAPPORT

DEEL 2 - BIJLAGEN

INHOUDSOPGAVE

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BIJLAGE A
LIJST VAN BIJEENKOMSTEN

Ref.	Datum	Onderwerp	Vertegenwoordigers van het Noord/Zuidlijn project	Vertegenwoordigers van Faithful & Gould
	11 januari 2005	Project Assimilatie Vergadering	Laurens Haanen (Municipality of Amsterdam) Henk van Veldhuizen (Project Bureau Director) Johan Bosch (Project Bureau) Arie Klinkert (Project Bureau) Herman Groot (Project Bureau) Stephan Beffers (Project Bureau) Pau Lian Staal-Ong (Project Bureau)	Nick Gray Gordon Reid Mike Mackenzie Jim Pearston Ian Isitt Pierre Ten Holter Erik Wind Marijke Pe (Raadsgriffie) Jacques van Berkel (Municipal Council representative)
	12 januari 2005	Eerste Vergadering met het Projectbureau	Henk van Veldhuizen (Project Bureau Director) Johan Bosch (Project Bureau) Stephan Beffers (Project Bureau) Pau Lian Staal-Ong (Project Bureau)	Gordon Reid Jacques van Berkel (Municipal Council representative)
1	18 januari 2005	Risico Management	Johan Bosch (Project Bureau) Stephan Beffers (Project Bureau) Pau Lian Staal-Ong (Project Bureau)	Gordon Reid Mike Brown Mike Mackenzie Lee Goult Jacques van Berkel (Municipal Council representative)
2	19 januari 2005	Aanbestedingen en Contracten	Johan Bosch (Project Bureau) Pau Lian Staal-Ong (Project Bureau)	Gordon Reid Mike Brown Mike Mackenzie Lee Goult Erik Wind Jacques van Berkel (Municipal Council representative)

Ref.	Datum	Onderwerp	Vertegenwoordigers van het Noord/Zuidlijn project	Vertegenwoordigers van Faithful & Gould
3	15 februari 2005	Contractoverzicht	Richard Bormans (Project Bureau Bouwmanager) Pau Lian Staal-Ong (Project Bureau)	Mike Brown Jonathan Wilson Anna van der Leeuw
4	15 februari 2005	Algemene Vragen betreffende Risicobeheersing	Aryan Snel (Advisory Bureau) Pau Lian Staal-Ong (Project Bureau)	Lee Goult Anna van der Leeuw
5	16 februari 2005	Projectbureau Organisatie en Rapportage Systemen	Henk van Veldhuizen (Project Bureau Director) Johan Bosch (Project Bureau)	Gordon Reid Anna van der Leeuw
6	18 februari 2005	Adviesbureau Structuur en Organisatie	Henk Vlijm (Advisory Bureau Director) Pau Lian Staal-Ong (Project Bureau)	Gordon Reid Anna van der Leeuw
7	22 februari 2005	Algemene Vragen over Contract Procedures	Maarten Kraneveld (Bouwmanager Project Bureau) Pau Lian Staal-Ong (Project Bureau)	Mike Brown Jonathan Wilson Anna van der Leeuw
8	22 februari 2005	Algemene Vragen over Contract Procedures	Richard Bormans (Bouwmanager Project Bureau) Frank Kaalberg (Contractmanager Advisory Bureau) Pau Lian Staal-Ong (Project Bureau)	Mike Brown Jonathan Wilson Anna van der Leeuw
9	22 februari 2005	Algemene Vragen over Contract Procedures	Richard Bormans (Bouwmanager Project Bureau) Theo Salet (Contractmanager Advisory Bureau) Pau Lian Staal-Ong (Project Bureau)	Mike Brown Jonathan Wilson Anna van der Leeuw

Ref.	Datum	Onderwerp	Vertegenwoordigers van het Noord/Zuidlijn project	Vertegenwoordigers van Faithful & Gould
10	22 februari 2005	Concept voor Verzekering van Noord/Zuidlijn	Stephan Beffers (Project Bureau) Frank van Kooten (Advisory Bureau) Pau Lian Staal-Ong (Project Bureau)	Gordon Reid Lee Goult
11	23 februari 2005	Presentatie van Prognose (Budget en Kostenberekening)	Stephan Beffers (Project Bureau) Dick de Zwart (Project Bureau)	Gordon Reid Mike Mackenzie Lee Goult
12	23 februari 2005	Algemene Vragen over Risico Management – Bouwmanager	Richard Bormans (Bouwmanager Project Bureau) Theo Salet (Contractmanager Advisory Bureau) Pau Lian Staal-Ong (Project Bureau)	Lee Goult Anna van der Leeuw
13	23 februari 2005	Algemene Vragen over Risico Management – Bouwmanager	Richard Bormans (Bouwmanager Project Bureau) Frank Kaalberg (Contractmanager Advisory Bureau) Pau Lian Staal-Ong (Project Bureau)	Lee Goult Anna van der Leeuw
14	28 februari 2005	Projectbureau Vergunningen	Marina van der Velde (Project Bureau) Marijke Manuel (Advisory Bureau) Maarten Kraneveld (Bouwmanager Project Bureau) Paul Lian Staal-Ong (Project Bureau)	Pierre Ten Holter Erik Wind
15	1 maart 2005	Bespreking van de huidige financiële prognose voor contracten die nog gesloten dienen te worden (Contracten 11.1, 11.2 & 12)	Hans Joachin Gorski (Contractmanager Advisory Bureau)	Gordon Reid Lee Goult

Ref.	Datum	Onderwerp	Vertegenwoordigers van het Noord/Zuidlijn project	Vertegenwoordigers van Faithful & Gould
16	1 maart 2005	Bespreking van de huidige financiële prognose voor contracten die nog gesloten dienen te worden (Contracten 1.1, 1.2, 1.3, 1.4 & 1.5)	John Groot (Advisory Bureau)	Gordon Reid Lee Goult
17	2 maart 2005	Adviesbureau Structuur en Organisatie – Tweede Vergadering	Henk Vlijm (Advisory Bureau Director) Paul Lian Staal-Ong (Project Bureau)	Gordon Reid Anna van der Leeuw
18	7 maart 2005	Juridische Vergadering inzake fase na Contractafsluiting	Frank van Kooten (Advisory Bureau) Paul Lian Staal-Ong (Project Bureau)	Mike Brown Jon Wilson Anna van der Leeuw
19	8 maart 2005	Bespreking met Projectbureau over Adviesbureau	Henk van Veldhuizen (Project Bureau Director) Johan Bosch (Project Bureau) Marina van der Velde (Project Bureau) Pau Lian Staal-Ong (Project Bureau)	Gordon Reid Anna van der Leeuw
20	9 maart 2005	Algemeen Overzicht van Verantwoordelijkheden van Arie Klinkert en Herman Groot	Arie Klinkert (Project Bureau) Herman Groot (Project Bureau) Pau Lian Staal-Ong (Project Bureau)	Gordon Reid Anna van der Leeuw
21	9 maart 2005	Projectbureau Programma Controle	Stephan Beffers (Project Bureau) Rick Lüschen (Advisory Bureau) Carla Zegers (Advisory Bureau) Frank Kaalberg (Advisory Bureau) Pau Lian Staal-Ong (Project Bureau)	Gordon Reid Phil Tansley

Ref.	Datum	Onderwerp	Vertegenwoordigers van het Noord/Zuidlijn project	Vertegenwoordigers van Faithful & Gould
	9 maart 2005	Overzicht Financiële Informatie	Dick de Zwart (Project Bureau) Hans Verstraelen (Advisory Bureau)	Mike Mackenzie
	9 maart 2005	Gedetailleerd overzicht van Budgetvoorbereiding voor Contract Cluster 1	John Groot (Advisory Bureau)	Mike Mackenzie Lee Goult
22	10 maart 2005	Juridische Vergadering inzake Bouwcontracten	Lieuwe de Boer (attorney NautaDutilh) Pau Lian Staal-Ong (Project Bureau)	Gordon Reid Anna van der Leeuw
23	14 maart 2005	Lessen die geleerd zijn voor de Gunning van Toekomstige Contracten	Henk van Veldhuizen (Project Bureau Director) Johan Bosch (Project Bureau) Bart Dahmen (Project Bureau Bouwmanager) Daan Sol (Project Bureau Bouwmanager) Pau Lian Staal-Ong (Project Bureau)	Gordon Reid Anna van der Leeuw
24a	15 maart 2005	Presentatie van Huidige Financiële Prognose voor Contract 4.2 (Tunnelboren)	Richard Bormans (Bouwmanager Project Bureau) Frank Kaalberg (Contractmanager Advisory Bureau) Paul Lian Staal-Ong (Project Bureau)	Lee Goult Mike Mackenzie
24b	15 maart 2005	Presentatie van Prognose - Contracten 5.2, 6.2 & 7.2 (Diep Stations)	Richard Bormans (Bouwmanager Project Bureau) Theo Salet (Contractmanager Advisory Bureau) Paul Lian Staal-Ong (Project Bureau)	Lee Goult Mike Mackenzie

Ref.	Datum	Onderwerp	Vertegenwoordigers van het Noord/Zuidlijn project	Vertegenwoordigers van Faithful & Gould
25	15 maart 2005	Overzicht inzake €55M Risicofonds	Stephan Beffers (Project Bureau) Norbert Mulder (Advisory Bureau) Theo Salet (Contractmanager Advisory Bureau) Paul Lian Staal-Ong (Project Bureau)	Lee Goult Mike Mackenzie
26	16 maart 2005	Overzicht Financiële Prognose	Stephan Beffers (Project Bureau) Dick de Zwart (Project Bureau) Norbert Mulder (Advisory Bureau) Paul Lian Staal-Ong (Project Bureau)	Gordon Reid Mike Mackenzie
27	16 maart 2005	Contractuele Afspraken van Adviesbureau	Henk Vlijm (Advisory Bureau Director) Rick van de Weerd (Witteveen + Bos legal advisor)	Mike Brown Jon Wilson Anna van der Leeuw
28	16 maart 2005	Juridische Vergadering over Aanbestedingsstrategie voor Contractafsluiting	Johan Bosch (Project Bureau) Marina van der Velde (Project Bureau) Frank Kaalberg (Advisory Bureau Contractmanager)	Mike Brown Jon Wilson Anna van der Leeuw
	17 maart 2005	Bezoek aan Hoofdkantoor van het Adviesbureau en Bouwplaatskantoor van Ceintuurbaan Station	Henk Vlijm (Advisory Bureau Director) Theo Salet (Advisory Bureau Contractmanager) Pau Lian Staal-Ong (Project Bureau)	Gordon Reid Mike Brown Jonathan Wilson Ian Isitt Anna van der Leeuw Erik Wind
29		Vergadering afgezet		

Ref.	Datum	Onderwerp	Vertegenwoordigers van het Noord/Zuidlijn project	Vertegenwoordigers van Faithful & Gould
30	7 april 2005	NZL Prognose Procedures – Algemene Vragen	Stephan Beffers (Project Bureau) Dick de Zwart (Project Bureau) Hans Verstraelen (Advisory Bureau)	Mike Mackenzie

BIJLAGE B
LIJST VAN AFKORTINGEN

Omschrijving/Term	Afkorting/Abbreviation
Accessibility, Liveability and Safety (Bereikbaarheid-Leefbaarheid en Veiligheidsplannen)	BLV
Agreement for the release of information between the Municipal Council's Preparatory Committee and the Alderman for Traffic and Transport	Information Protocol
Association of Project Manager's Project Risk Assessment Methodology	PRAM
Bentham Crouwel	BC
Central Government subsidy	Rijk Subsidy
College of Mayor and Aldermen (College van Burgemeester en Wethouders)	College van B & W, the
Construction All Risks Insurance	CAR
Damage Bureau Noord/Zuidlijn	Damage Bureau, the
De Weger Architecten- en Ingenieurs Bureau B.V.	De Weger
Department of Infrastructure, Traffic and Transport	dIVV
Design, supervision and engineering costs	VAT
Deutsche Eisenbahn Consulting GmbH	DEC
dienst Milieu en Bouwtoezicht, the Municipality of Amsterdam's permitting department	DMB
Districts within the City of Amsterdam (Stadsdelen)	Boroughs, the
Faithful & Gould	F&G
Greater City Project (Grootstedelijk Project)	GSP, the
High Speed Train Link	HSL
Independent Expert Committee (Commissie van Onafhankelijke Deskundigen); Commissie Sorgdrager	ICE
Ingenieursbureau Amsterdam	IBA
International Organization for Standardization	ISO
Inventarisatie, Beheersmaatregelen en Back-up	IBB
Investigation by Faithful & Gould into the Noord/Zuidlijn Project	Investigation, the
Joint term for consultants employed by the Municipality of Amsterdam on the Noord/Zuidlijn Project	Advisory Organisation, the
Key Performance Indicator	KPI
Meer en minderwerk	MMW
Municipality Insurances Organisation (Verzekeringen voor de Gemeente Amsterdam)	VGA
Municipality transport company	GVB
NautaDutilh	ND
Noord/Zuidlijn Design Team contract administrator	Contractmanager, the
Noord/Zuidlijn Design Team; Adviesbureau Noord/Zuidlijn v.o.f	Advisory Bureau, the
Noord/Zuidlijn Organisation	Project Organisation, the

Omschrijving/Term	Afkorting/Abbreviation
Noord/Zuidlijn Project	Project, the
Noord/Zuidlijn Project Office	Project Bureau, the
Noord/Zuidlijn Project Office Permits Management System	VBS
Noord/Zuidlijn Project Office Project Manager	Bouwmanager, the
Onderzoeksdienst voor Milieu en Grondmechanica Amsterdam	OMEGAM
Quantitative Risk Analysis	QRA
Quantitative Schedule Risk Analysis	QSRA
Risk Assessment Allocation Catalogue	RAAC
Royal Haskoning/Haskoning Nederland B.V.	RH
Standaard Rationalisatie en Automatisering in de Grond-, Water- en Wegenbouw Bepalingen	RAW
The Municipal Council of Amsterdam	MCA
The Municipality of Amsterdam	MA
Tunnel Boring Machine	TBM
Value Added Tax	BTW
VOF Stationseiland ; Holland Railconsult and Arcadis	VOFS
Witteveen + Bos Raadgevende Ingenieurs B.V.	W+B

BIJLAGE C
ORIGINEEL RAPPORT IN HET ENGELS

1 INTRODUCTION

1.1 Introduction

1.1.1 This report has been prepared under instruction from The Municipal Council of Amsterdam ("MCA"). This report is to be relied upon exclusively by MCA. No part of the report shall be reproduced and no reliance placed upon its content, recommendations or conclusions by any other party without the express permission of Faithful & Gould Limited ("F&G").

1.1.2 MCA acknowledges that this report has been prepared by a British consultancy. Consequently, if some of the points made in this report are lost in interpretation from the original English version (as we were contracted to do) to the Dutch version, then the English version incorporated in Appendix C will take precedence. The current Dutch version of the report has been requested by the Alderman for Traffic, Transport and Infrastructure to make it more accessible for Dutch users. We are only responsible for the English version.

1.2 Terms of Reference

1.2.1 We have been commissioned to instigate an investigation ("the Investigation") into the Noord/Zuidlijn Project ("the Project"). Our terms of reference were provided in MCA's enquiry letter dated 1 November 2004 as set out in Appendix D, and as further expanded in our Proposal for carrying out the Investigation dated 11 November 2004, as set out in Appendix E.

1.2.2 MCA also appointed a temporary Independent Expert Committee ("the ICE") to investigate aspects of the Project. The role of the ICE is:

- to investigate the executive role of the Municipality of Amsterdam ("MA") in the Project,
- to investigate other aspects of the Project as they consider appropriate within their own remit, and
- to regularly review with F&G progress and areas of mutual interest on the Investigation.

1.2.3 To assist in the efficient transfer of information between the Investigation team and the Noord/Zuidlijn Project Organisation ("the Project Organisation"), an agreement was signed between the Chairman of MCA's Preparatory Committee Noord/Zuidlijn and MA's Alderman for Traffic, Transport and Infrastructure on 31 August 2004. All parties involved in the Investigation adopted this "Information Protocol" during the Investigation.

1.3 Scope of the Investigation

1.3.1 In summary, we were requested to instigate a commercial and managerial review of the Project. In particular we were requested to investigate the following:

- Review and comment on the management structure of the Noord/Zuidlijn Project Office ("the Project Bureau"),
- Review and comment on the Project Bureau's contractual relationships with MA, the Noord/Zuidlijn Design Team ("the Advisory Organisation") and the contractors,
- Review and comment on the risk management methodology utilised on the Project,
- Review and comment on the construction and related cost management methodology on the Project,
- Review and comment on the Permit process methodology on the Project, and
- Review and comment on the insurance strategy utilised on the Project.

1.4 Report Format

- 1.4.1 The report is laid out in a manner that addresses each of the foregoing points.
- 1.4.2 MCA, in their enquiry letter of 1 November 2004, has raised a series of specific questions on the Project. Due to the complexity of the Project and the inter relationship of the questions raised by MCA, the answers to these questions is contained in the body of the report.

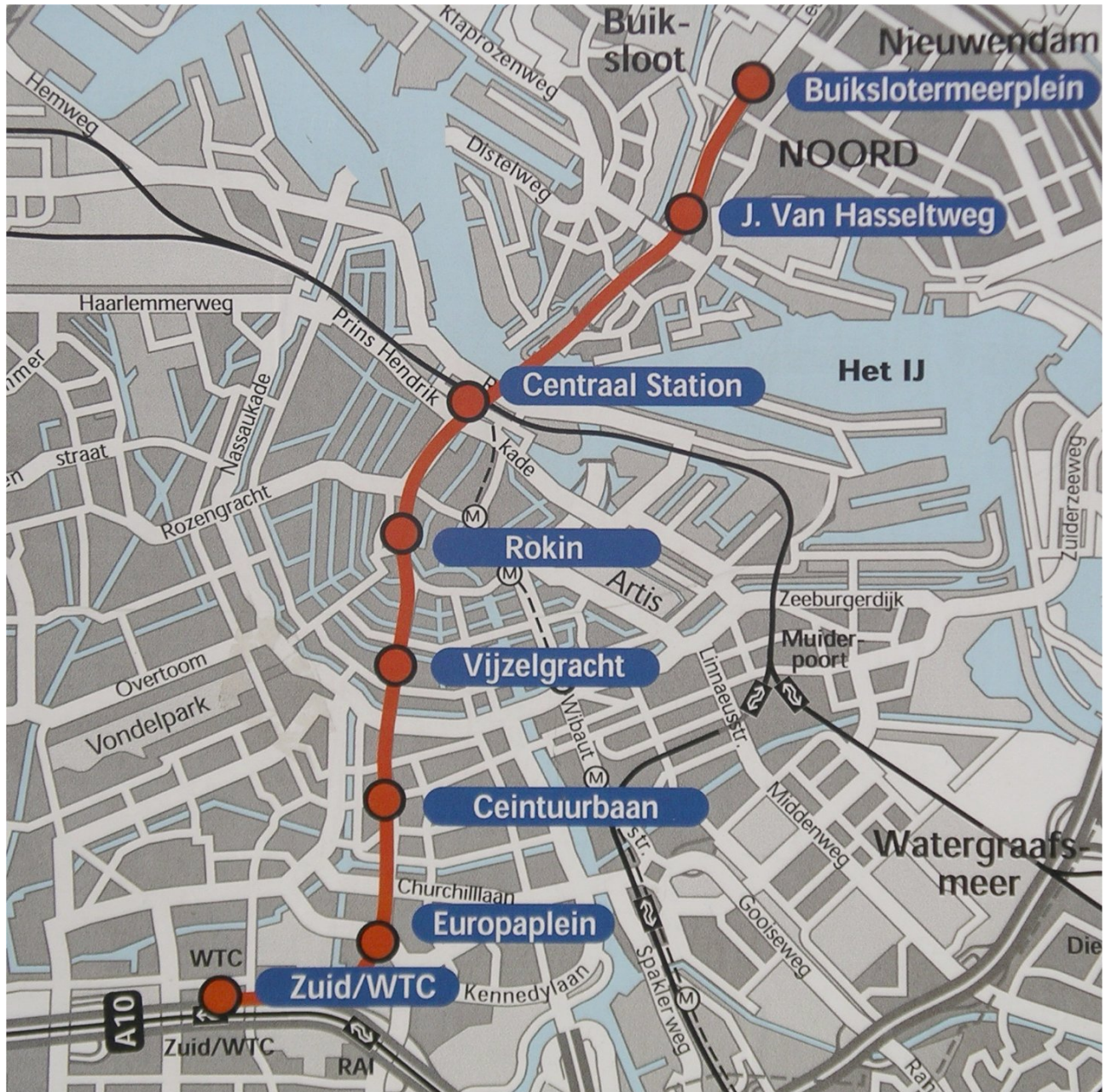
1.5 Parties Involved in the Investigation

- 1.5.1 MCA commissioned the Investigation through a Preparatory Committee under the chairmanship of Councilman drs. A. Bijlsma.
- 1.5.2 The following elements of the Project Organisation assisted in the Investigation:
- The Project Bureau management team,
 - The Project Bureau project managers (“the Bouwmanagers”),
 - The Damage Bureau Noord/Zuidlijn (“the Damage Bureau”),
 - One of MA’s retained legal advisors, NautaDutilh (“ND”),
 - MA’s principal design consultant, Witteveen + Bos Raadgevende Ingenieurs B.V. (W+B),
 - The Advisory Bureau management team, and
 - The Advisory Bureau contract administrators (“the Contractmanagers”).

1.6 Project Overview

- 1.6.1 The Project comprises:
- 9km of new metro infrastructure,
 - 6km of this is sub surface,
 - Seven new stations,
 - One existing station requiring significant modification,
 - Of the seven new stations, four of these are “deep” stations in excess of 15m deep (Centraal Station, Rokin, Vijzelgracht and Ceintuurbaan),
 - 3.2km of the 6km sub surface infrastructure is two parallel tunnels, comprising 7m diameter, single track tunnels below the Inner City of Amsterdam,
 - In addition, there is a combination of work at grade, work within caissons and traditional cut and cover and immersed tunnelling techniques,
 - The Project is due for completion in 2011/2012, and
 - Investment is in excess of €1.6bn, excluding rolling stock.

1.6.2 The following image depicts the route of the Project



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2 EXECUTIVE SUMMARY

2.1 Project Summary

Generally

- 2.1.1 The Noord/Zuidlijn Project is a very complex scheme which presents considerable technical challenges in the context of its design, procurement and construction. The long gestation period throughout which the Project has evolved compounds its inherent complexity which has had a significant influence upon the strategy under which the Project is currently being managed by the principle parties: the Project Bureau and the Advisory Organisation.
- 2.1.2 During the Investigation, the Project Bureau and the Advisory Organisation have impressed us with both their commitment and expertise which has been directed towards the successful management of the technical aspects of the Project. We consider that at both an individual and organisational level, the Project Bureau and the Advisory Organisation are complemented by appropriately qualified, experienced staff that are both motivated and well managed.
- 2.1.3 Whilst we consider that the technical aspects of the Project appear to be well managed, we have identified several areas where, in our opinion, the financial management of the Project is not sufficiently robust. In summary, these are set out below.

Risk Management

- 2.1.4 We have observed that the Advisory Bureau have put into place a risk database to serve as a tool to manage risk. We consider such a tool to be essential on a project of this nature with complex interface issues between both contracts and sections of the Project. Proprietary software can provide additional functionality which could enhance the Risk Management process. Despite the presence of this tool there appears to be confusion within the Advisory Bureau regarding the function of its Project Direction and Risk Management Department, and the duties with respect to Risk Management of the Contractmanagers. This compromises effective Risk Management. We consider the risk identification process to be limited and there appears to be little correlation between the risk identification outputs and the cost estimate for the Project. The lack of a sophisticated cost model does not allow the full spectrum of risks to be sufficiently reflected in the final outturn cost estimate for the Project. This could have a material and adverse impact on the reliability of the final outturn cost estimate for the Project.
- 2.1.5 We recommend that the Advisory Bureau's Project Direction and Risk Management Department is reviewed to ensure that an individual is identified to fulfil the discreet role and duties of Risk Manager. A clear job description and direct accountability to the Advisory Bureau's Project Director from this individual should also be established. Further, and to ensure that the current risk database is fully updated, risk identification workshops for each contract and the Project as a whole, with all stakeholders, including contractors should be held at the earliest opportunity

Financial Management

- 2.1.6 Whilst the Project Bureau delegates financial control of the Project to a dedicated Project Accountant, we note that the scope of this role is not sufficiently wide to include constructively challenging the basis of cost reports provided from the Advisory Bureau. Such a role would require a technical understanding of the composition of the underlying construction cost estimates. Similarly, there is both an apparent lack of ownership/responsibility for, and a broad strategic overview within the Project Bureau of the individual cost reports provided by the Advisory Bureau's Contractmanagers. This represents, in our opinion, a fundamental weakness in the financial management function within the Project's organisational structure.

-
- 2.1.7 We recommend that the Project Bureau identifies a technically qualified individual to support the Manager of the Finance and Planning Department in managing the cost of the overall design within the overall Project budget. This individual should possess substantial experience in the cost and commercial management of large infrastructure projects.

Cost Reports

- 2.1.8 Partly due to the two issues identified above, and given the optimism built in to the financial forecasts and by not addressing the uncertainties within the estimates, we remain concerned about the reliability and robustness of the current projected final outturn cost estimate for the Project. Whilst the current forecast would appear to be broadly comparable with costs for similar projects in other countries, we have observed a number of items within the final outturn cost estimate which we consider to be unrealistically optimistic at this stage of the Project.
- 2.1.9 We further recommend that to obtain a measure of confidence in the final outturn cost estimate, a full review of the cost model incorporating the recommendations contained in the Risk Management and the Review of Financial Model Sections of this report is carried out.
- 2.1.10 Confusion exists in the relationship between the Project Bureau and the Advisory Organisation. There is a formal contractual link between the Municipality of Amsterdam in the form of the Project Bureau and Witteveen + Bos. There is a formal contractual link between Witteveen + Bos and the Advisory Bureau. However, there is no formal relationship between the Project Bureau and the Advisory Bureau. Instead, there is a working arrangement between these two parties. The confusion surrounding these formalities is prevalent throughout the Project Organisation. Whilst the Project Bureau states it is reliant upon the correctness, completeness and soundness of the information provided to it by the Advisory Bureau in its decision making and reporting processes, it has no contractual remedy should this information be incorrect for whatever reason.
- 2.1.11 We recommend that steps are instigated to ensure that all information submitted to the Project Bureau by the Advisory Bureau follows the correct contractual procedure of being confirmed by Witteveen + Bos at the earliest opportunity thereafter. This will safeguard the Municipality of Amsterdam's contractual position in the event that the Project Bureau reacts to incorrect information.
- 2.1.12 We conclude that certain improvements in the overall financial management of the Project are necessary. We consider that such improvements can be achieved by both redefining roles/responsibilities of key staff and supplementing the existing organisations with the relevant skills. This will materially contribute to achieving a commercially, as well as technically, successful project.

3 BACKGROUND TO THE HISTORY OF THE PROJECT NOORD/ZUIDLIJN

3.1 General Information

- 3.1.1 The Project is meant to provide Amsterdam with a new, 9 kilometre-long metro line, which will connect the important centres of the city. When the Project opens in 2011/12 more than 200,000 passengers a day will make use of it. This will make it the busiest public transport line in the Netherlands.
- 3.1.2 Approximately 6 kilometres of the metro line will be tunnelled. Of this, 3.2km is within the centre of Amsterdam and utilises tunnel boring technology. The route of the line within the centre of Amsterdam was chosen so that the tunnel-boring machines could follow the existing street pattern, thus ensuring that almost no buildings need demolishing.
- 3.1.3 In the next paragraphs a brief historic overview of the Project until the 'Start-decision' will be presented as a historic framework for this report.

3.2 Early History of the Project

- 3.2.1 In 1964 the Bureau Stadsspoorwegen (Urban Railways) suggested the construction of a metro network to improve public transport in Amsterdam, complementary to the tight bus and tram network. In 1971 the construction of the East Line started. In 1975 withdrawal of the Metro plan took place following large-scale public opposition during construction of the East Line (due to the demolition of buildings). In 1978 Amsterdam decided not to extend its metro network.
- 3.2.2 However in 1988 the possibility of tunnelling below Amsterdam was raised by the local Chamber of Commerce and in 1989 a first North/South Line study was commissioned.
- 3.2.3 On **21 August 1991** a MCA recommendation was issued, which formulated the starting points and premises of the Project: "realize the metro North/South Line through the city, partly under the existing buildings, within time and within budget, without excessive hindrance, in order that the city remains functioning".
- 3.2.4 In 1994 planning preparation began and a Schedule of Requirements was prepared by the design bureau under the supervision of W+B.

3.3 Greater City Project

- 3.3.1 By the decision of MCA of **18 May 1995**, the proposed route of the Project had been designated as a Greater City Project (Grootstedelijk Project) ("the GSP"). This means that a number of well-defined administrative competences – e.g. the issuing of building and environmental permits – within a defined area had been transferred from the relevant Boroughs to MA. The boundaries of the GSP had been defined in such a way, that these nearly coincide with the boundaries of the City Planning NZL (Bestemmingsplan NZL).
- 3.3.2 Through the MCA decision of 14 May 1997, the boundaries of the GSP had been revised in order to harmonise this with several changes in the planned route.

3.4 Council Decision to Build the Project, Grant Application and Start Decision

- 3.4.1 By the decision of **27 November 1996**, MCA decided to approve the building of the Project and instructed the College of Mayor and Aldermen (College van Burgemeester & Wethouders) ("the College van B&W") to obtain certainty from the Dutch Ministry of Public Transport (Ministerie van Verkeer en Waterstaat) about the financing and exploitation of the Project, in order to be able to realise this decision.

-
- 3.4.2 After intensive negotiations with the Dutch State, on **29 June 1998** the Subsidy Application was submitted to the Dutch Government, including a risk analysis and explanation of risk management.
- 3.4.3 On **5 October 1999** the Grant was approved by the Tweede Kamer (Second Chamber). Subsequently on **23 December 1999** the Minister of Public Transport issued an Administrative Decision (Beschikking) of maximum NLG 2,454M (€1,114M) (lump sum) for the realisation of three directly related projects: the Project (NLG 1,868M, €847M), a traffic passage underneath Centraal Station (IJ-side) and a Bus Station at the IJ-side of Centraal Station (together NLG 70M, €32m). To the amount of the Subsidy was added a fixed amount for compensation of risks (NLG 187M, €85m) and Value Added Tax ("BTW") (NLG 329M, €149M).
- 3.4.4 By the decision of 21 **June 2000** MCA accepted the Subsidy for the three related projects.
- 3.4.5 On **9 October 2002** the definite decision of MCA to proceed with the Project (Startbesluit) was made. The budget for the Project at the time of the Starting Decision of 9 October 2002 was €1,461M (excluding risk fund of €50M). Pre construction activities commenced in December 2002, with the official construction of the Project commencing on 22 April 2003.
- 3.5 Public Poll (Referendum)**
- 3.5.1 During a public poll about the Project on 25 June 1997, 123,198 people cast their vote: 79,861 people voted against the Project, whereas a minority of 42,961 voted in favour of the Project. There were 376 void votes. However, for a successful poll the number of voters against required to be more than half the number of voters with the latest city council elections, plus one. This meant that at least 154,935 voters should have voted against the Project, to block the building of the new metro line.

3.6 Chronological Overview of the Project

Date	Key Milestone
21 August 1991	Decision of MCA with regard to the formulation of the starting points and premises of the Project.
18 May 1995	Decision of MCA to designate the Noord/Zuidlijn proposed route as Greater City Project (Grootstedelijk project).
27 November 1996	Decision of MCA to approve the building of the Project (Aanlegbesluit).
25 June 1997	Public poll (referendum) about the Project.
29 June 1998	Submission of Subsidy Application to the Dutch Government
5 October 1999	Approval of Subsidy by the Tweede Kamer (Second Chamber).
23 December 1999	Issue by the Minister of Public Transport of the Administrative Decision (Beschikking) of maximum NLG 2,454M (€1,114M) (lump sum) for the realisation of three directly related projects: the Project, a traffic passage underneath Centraal Station (IJ-side) and a Bus Station at the IJ-side of Centraal Station.
21 June 2000	Decision of MCA to accept the Subsidy for the three related projects.
12 December 2000	Receipt of the applications from the first tendering round.
25 October 2001	Receipt of the applications from the second tendering round.
May 2002	Receipt of the applications from the third tendering round.
9 October 2002	Definite decision of MCA to go ahead with the Project (Startbesluit).
1 December 2002	Preparatory works commenced
22 April 2003	Official commencement of construction of the Project.

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4 INVESTIGATION METHODOLOGY

4.1 Introduction

4.1.1 The Investigation methodology comprised five key components:

- Review of historical information on the Project,
- Gathering of documents specific to the Project,
- Meetings with representatives of the Project Organisation (see Appendix A),
- Agreement of the notes of the foregoing meetings with the Project Organisation, and
- Gathering of further substantiating documentary evidence during the foregoing meetings.

4.2 Review of Historical Information on the Project

4.2.1 MA provided various MCA committee papers and other documentation for our review. These papers are listed in Appendix F. This information provided us with:

- A background to the history of the Project,
- A timeline to the Project,
- Reference points on how the scope and budget developed through time,
- Some specific information on aspects of the various contracts comprising the Project, including:
 - Tendering processes, and
 - Risk management,
- Second opinions on aspects of the Project, including:
 - Insurances, and
 - Safety issues,
- The evolution of the Project Bureau, and
- Findings from earlier reports on large projects in the Netherlands, including Stopera, HSL and Betuweroute.

4.3 Gathering of Documents Specific to the Project

4.3.1 After reviewing the historical documentation, we requested the Project Bureau to provide us with documentation that was specific to our Terms of Reference. This request was issued before our series of meetings with the Project Organisation and was therefore generic in its nature. The requested documents were based upon our experience and expectations of the type of documents that should be available for a project of this nature and complexity.

4.3.2 The Project Bureau provided us with a series of documents in response to our request. These are listed in Appendix G. This information was stored in a Data Room located in a secure office within the Project Bureau offices at Centraal Station. We had unrestricted access to the Data Room. Generally, the information provided matched our generic requests.

4.3.3 Copies of relevant documents or abstracts of relevant documents were also retained by us at our office in the Stadhuis.

4.3.4 Confidentiality agreements were signed by all members of the Investigation Team.

4.4 Meetings with Representatives of the Project Organisation

- 4.4.1 Due to the restricted timescale of the Investigation, we considered the most appropriate approach to obtaining the required detailed understanding of the Project for the Investigation was by holding a series of meetings with the Project Organisation. The dates of these meetings, the attendees and subject matter are listed in Appendix A.
- 4.4.2 The purpose of the meetings was to discuss in detail aspects of the Project Organisation's approach to the matters being investigated.
- 4.4.3 The meetings together with the documents described in Sections 4.3 and 4.5 provide the basis for the formulation of this report, together with its conclusions and recommendations.
- 4.4.4 The meetings proved to be very informative. The Project Organisation was very accommodating and supportive of the Investigation despite the imposition of a significant number of meetings on them on what is already a demanding project. The Project Organisation provided clear answers to all our questions. A professional relationship was established between the Investigation team and the individuals from the Project Organisation.

4.5 Gathering of Further Documentary Evidence During the Foregoing Meetings

- 4.5.1 To substantiate statements made by the Project Organisation during the various meetings, we requested documentary evidence.
- 4.5.2 This evidence was generally supplied within a matter of days of the meeting and provided us with further support to the matters being reviewed.
- 4.5.3 The information requested forms part of Appendix G as noted in Section 4.3.2.

4.6 Time Period of the Investigation

- 4.6.1 The Investigation commenced on 14 December 2004 with an initial meeting between the Griffier, MA's NZL Liaison Officer and members of our Investigation team.
- 4.6.2 Also, during the latter part of December 2004 we carried out our historic research on the Project as indicated in Section 3.
- 4.6.3 Our meetings with the Project Organisation commenced on 11 January 2005 and were substantially complete by 17 March 2005. Also during this period, we carried out various exercises to substantiate the information being obtained from the Project Organisation by way of research of the information listed in Appendix G.
- 4.6.4 The "research" phase of the Investigation concluded on 7 April 2005. A draft of the report, excluding our Executive Summary, conclusions and recommendations was issued to the Alderman for Traffic, Transport and Infrastructure in accordance with the Information Protocol (refer to Section 1.2.3) on 3 May 2005 for comment on fact. These comments were received on 10 May 2005.
- 4.6.5 The final report is due for issue on 1 June 2005.

5 REVIEW OF PROJECT BUREAU NZL

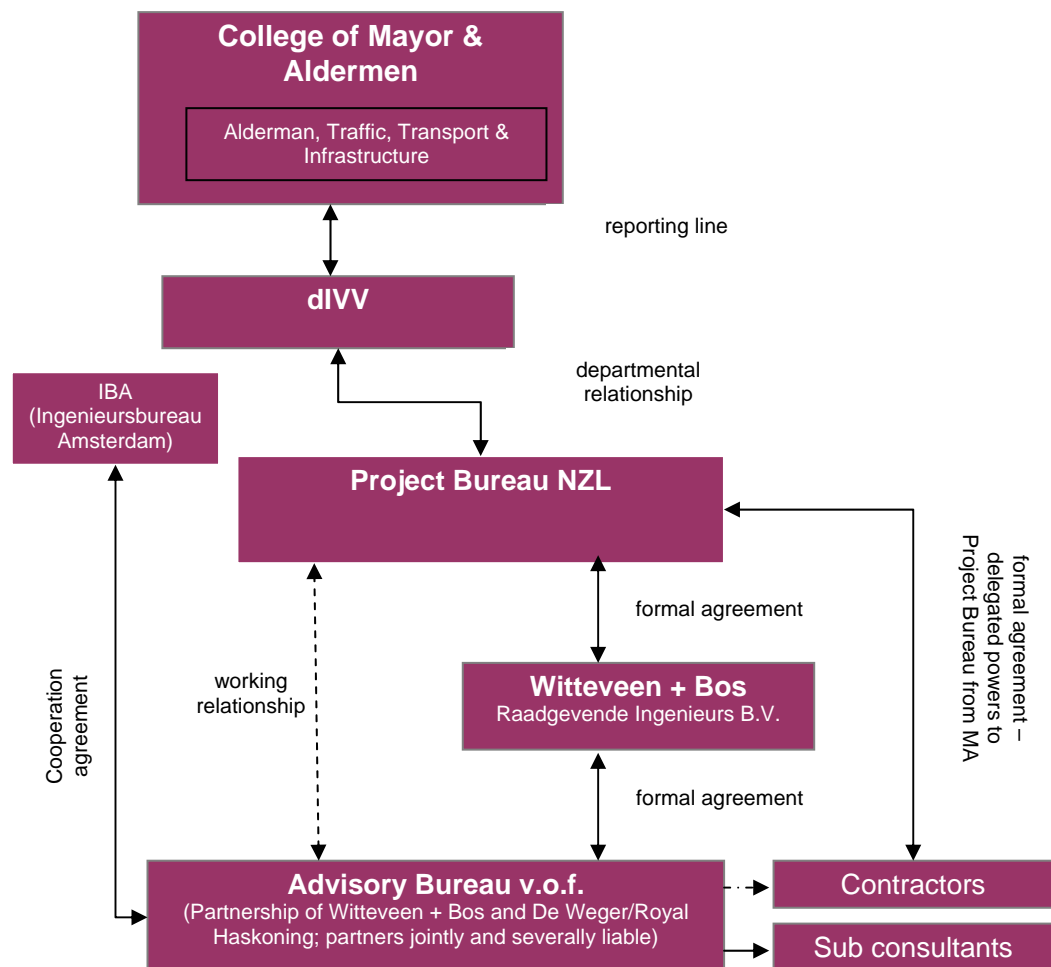
5.1 Introduction

5.1.1 This section of the report examines the management of the Project by the Project Bureau. It reviews:

- The history of the evolution of the Project Bureau,
- The terms of reference for the Project Bureau,
- The management structure of the Project Bureau,
- The Project Bureau's management of the Project,
- The Project Bureau's relationship with MCA and MA,
- The Project Bureau's reporting strategy, and
- The Project Bureau's relationship with the Advisory Bureau.

5.2 The Project Organisation

5.2.1 The following chart indicates the various relationships between the parties to the Project:



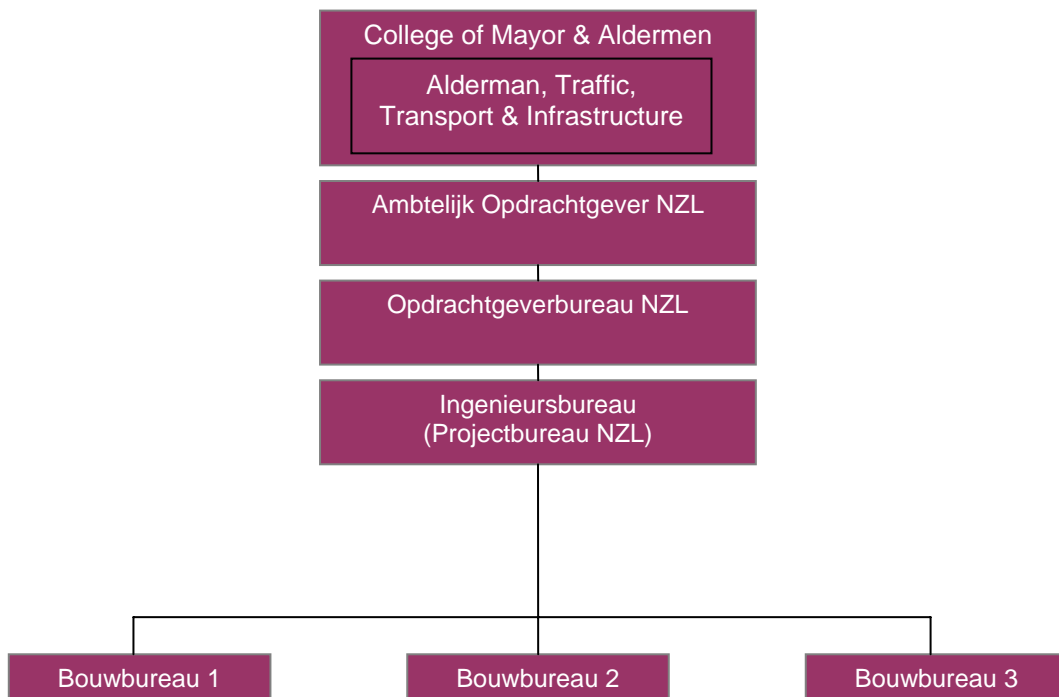
The Project Organisation

5.3 A Brief History of the Evolution of the Project Bureau

5.3.1 In 1993 the Project Organisation structure commenced.

5.3.2 A fuller description of its current form is provided in Section 5.5.

5.3.3 In 1994, the North/South Line organisation, the Opdrachtgeverbureau NZL was established. A cooperation of three external engineering organisations, the Ingenieursbureau was employed by MA and was responsible for design, finances (budget), planning and project management. The Ingenieursbureau was located at the offices of MA's transport company (Gemeentevervoeb) ("GVB"). The Ingenieursbureau reported directly to the Opdrachtgeverbureau, which employed eight people. The Opdrachtgeverbureau in turn reported to the Ambtelijk Opdrachtgever Noord/Zuidlijn. He in turn reported to the College van B&W.

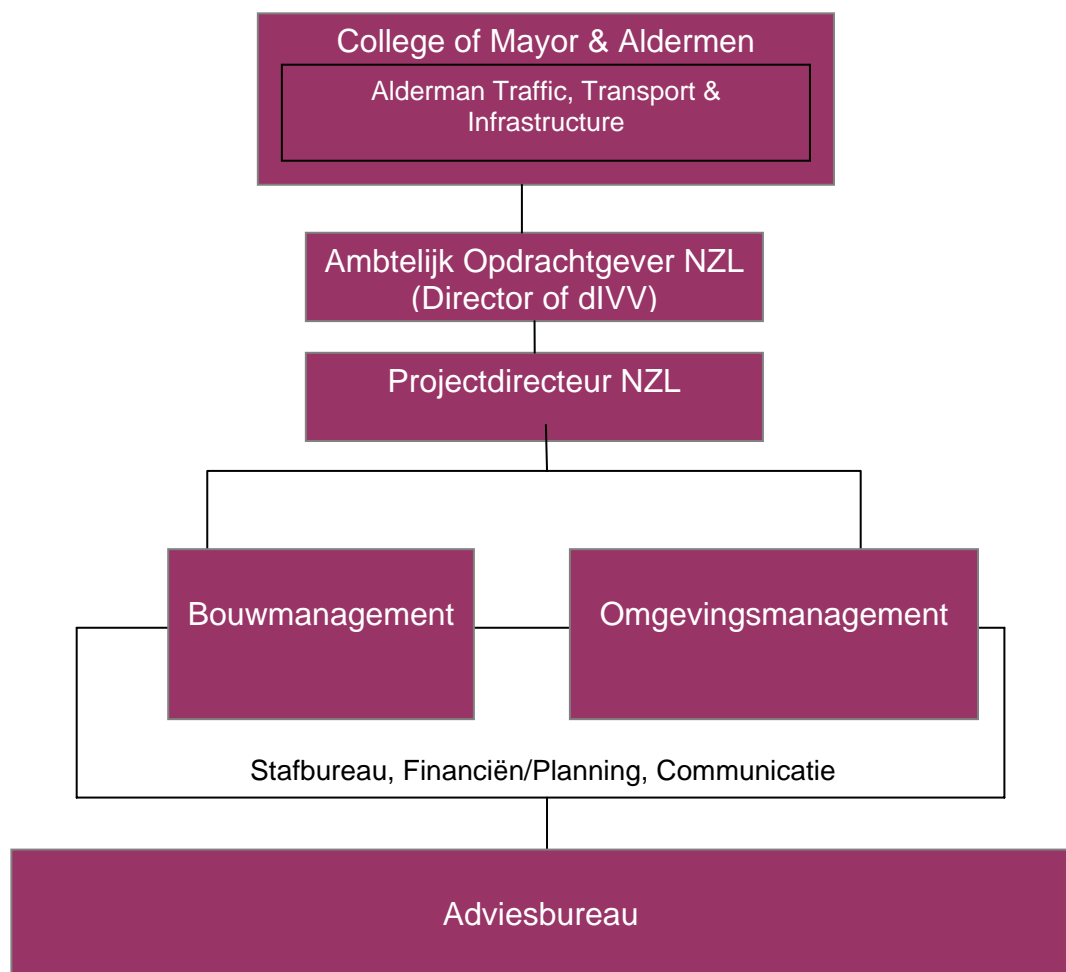


Project Bureau Model, 1994 - 1998

5.3.4 In 1998, the organisation was revised. This change coincided with a major milestone on the Project, namely the subsidy application to Central Government. As a result of this organisational change, the engineering cooperation, Ingenieursbureau, was renamed Advisory Bureau NZL. The Opdrachtgeverbureau was renamed Project Bureau NZL. Within the Project Bureau NZL, there were two departments, namely:

- Bouwmanagement who were responsible for technical operations, and
- Omgevingsmanagement who were responsible for the surroundings.

These departments were also collectively responsible for finance, legal and communications. They reported separately to the Projectdirecteur Noord/Zuidlijn, who in turn was responsible to the Ambtelijk Opdrachtgever Noord/Zuidlijn. The Ambtelijk Opdrachtgever Noord/Zuidlijn reported to the College van B&W.

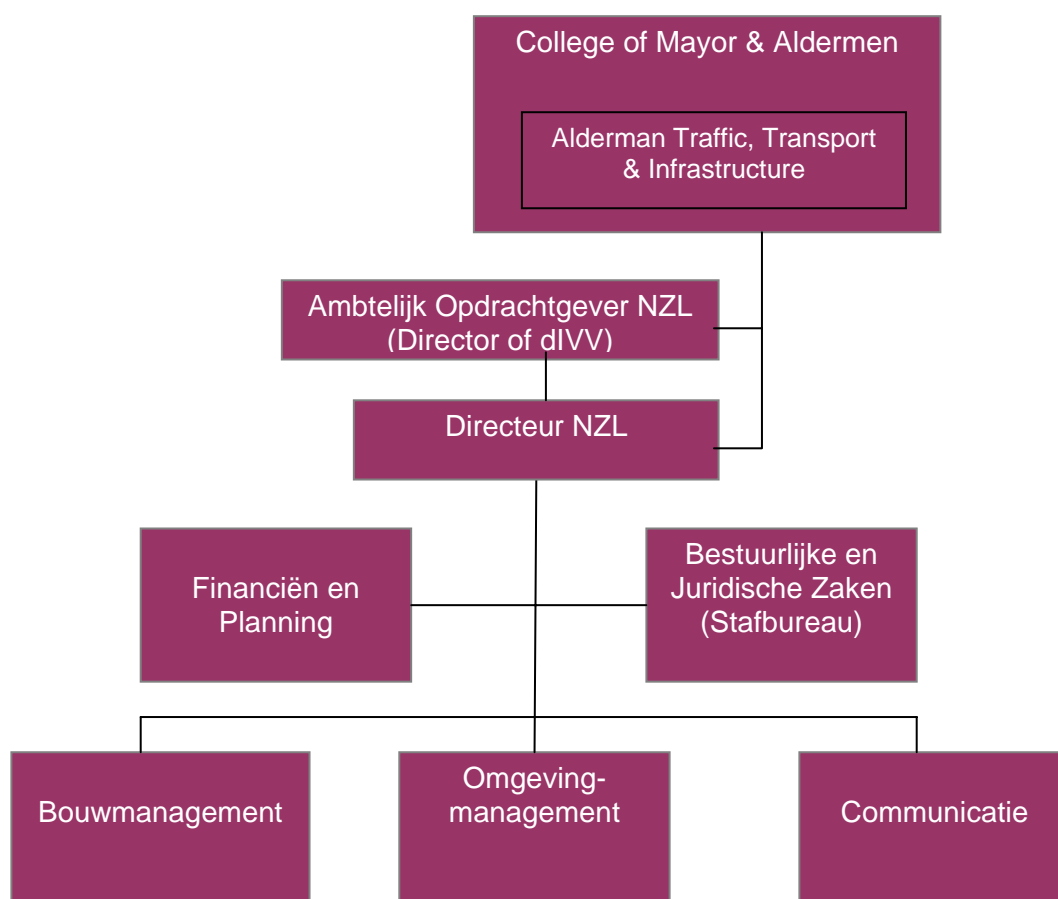


Project Bureau Model, 1998 - 2002

5.3.5 The organisation was further revised in 2002. This reorganisation coincided with MCA's decision to progress with the start of the construction of the Project at this stage. The organisation of the Project Bureau began to take on the form that it adopts today. The Advisory Bureau does not form part of the Project Bureau. Instead, the Project Bureau comprised five departments that reported to the Directeur Noord/Zuidlijn. These five departments are:

- Technical (Bouwmanagement),
- Environment (Omgevingsmanagement),
- Communications and Project Monitoring (Communicatie en Projectbegeleiding)
- Finance and Planning (Financiën en Planning), and
- Government and Legal Affairs (Bestuurlijke en Juridische zaken).

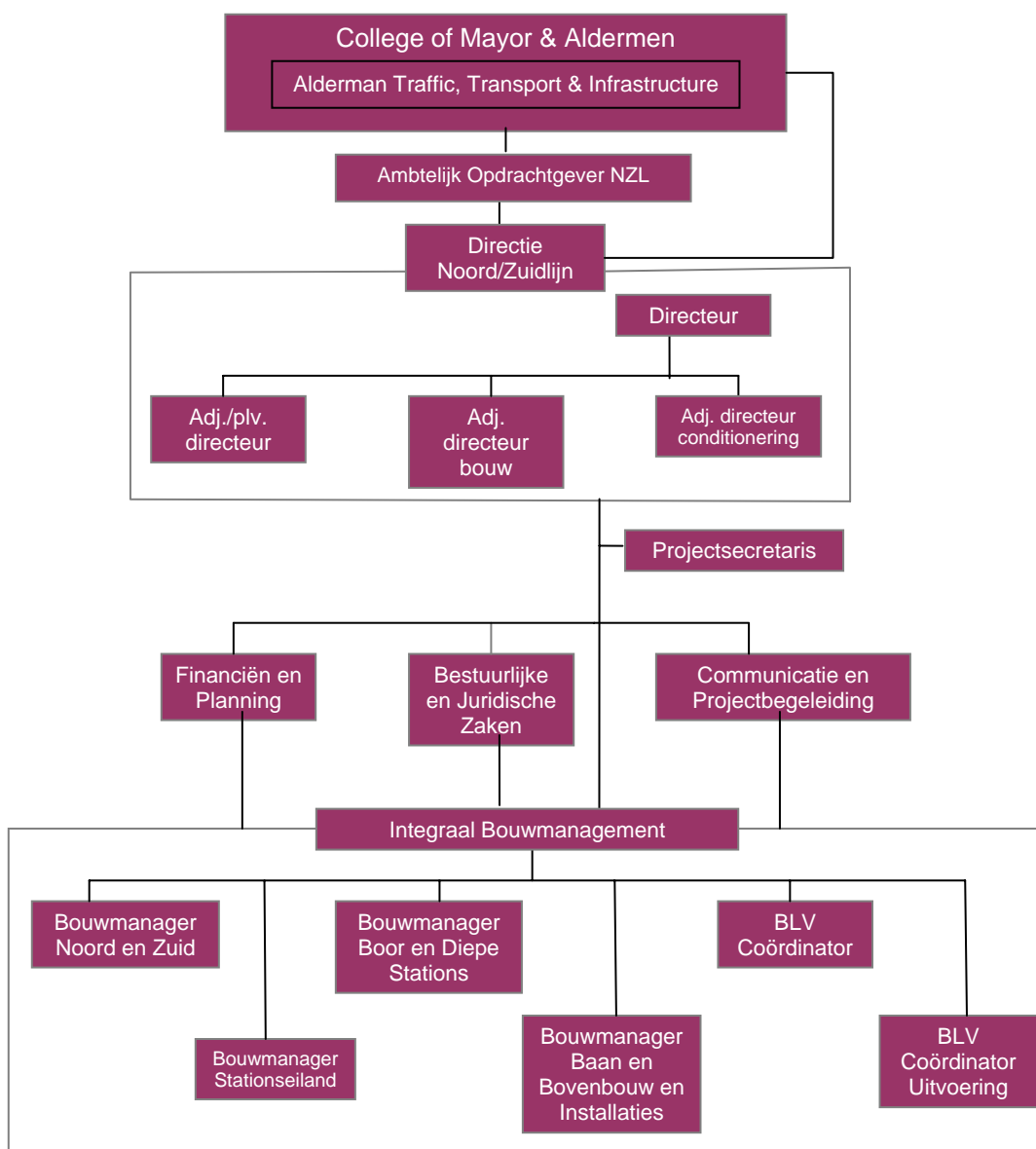
The Directeur Noord/Zuidlijn reported to both the Ambtelijk Opdrachtgever Noord/Zuidlijn and the College van B&W. The Ambtelijk Opdrachtgever Noord/Zuidlijn also reported to the College van B&W.



Project Bureau Model 2002 - 2004

5.3.6 The organisation described in Section 5.3.5 proved unmanageable as it was unclear who was making decisions and taking responsibility for the Project. Due to these concerns, and the issue of two reports¹² prepared on behalf of dIVV, the Project Bureau's current evolution occurred in 2004. This time, the five departments were reduced to four, namely:

- Technical (Integraal Bouwmanagement),
- Communications and Project Coordination (Communicatie en projectbegeleiding),
- Finance and Planning (Financiën en Planning), and
- Governmental and Legal Affairs (Bestuurlijke en Juridische zaken).



Project Bureau Model – 2004 till present

¹Omgevingsmanagement Noord/Zuidlijn, prepared by Mazars Management Consultants B.V., dated July 2003

²Verbeterpunten voor de Bestuurlijke informatievoorziening en voor de Financiële Beheersing van het Project Noord/Zuidlijn, prepared by Twynstra Gudde, dated 6 August 2003

It was also decided in 2004 to allocate one person per building contract to be responsible for all aspects of that contract (construction, finance, planning, communication, etc.), the Bouwmanager.

The four departments report to a Management Board comprising a Director and three Assistant Directors. The Management Board reports to the Ambtelijk Opdrachtgever Noord/Zuidlijn who in turn reports to the College van B&W.

5.4 The Terms of Reference for the Project Bureau

5.4.1 In the Investigation and meetings with the Project Bureau, we understand that there are no documents stating the formal terms of reference for the role of the Project Bureau. There does, however, exist a protocol, signed off by College van B&W dated 24 April 2004 which sets out the relationship between the MA's Department of Infrastructure, Traffic and Transport ("dIVV") and the Project Bureau on this project.

5.4.2 We were supplied with a draft document³ by the Project Bureau which outlines the roles of the various departments in the Project Bureau and their managers, including the Management Board. It does not state levels of financial responsibility. We understand that this draft document has still to be formalised. We have used this document as a basis for identifying each individual's responsibilities in Section 5.6.

5.4.3 It is also of note that the Project Bureau and all personnel in the Project Bureau are either employees of dIVV or secondees from elsewhere within MA. Consequently they require to comply with dIVV's procedures.

5.5 The Management Structure of the Project Bureau

5.5.1 As noted in Section 5.3.6, the Project Bureau is organised into a Management Board and four departments.

5.5.2 We have both held discussions with and reviewed the curriculum vitae of the Director and the three Assistant Directors who form the Management Board and conclude that they are all suitably qualified for the roles that they fulfil in the Project.

5.5.3 We have reviewed the curriculum vitae of the manager of the Finance and Planning Department. As noted in Section 6.6.19, technical financial management is the responsibility of W+B. Consequently, the role of the Finance and Planning Manager in the Project Bureau is more of an accountant's role, dealing with items such as administration, consolidation and reporting to the College van B&W and MA, for which the manager is suitably qualified. Given this expertise, we believe that his role, and also the Departments role in the Project could be enhanced with the assistance of an experienced construction cost manager. This would allow the Finance and Planning Manager to objectively and effectively challenge the basis of financial reports or information provided to him by W+B.

5.5.4 The Bouwmanagers are responsible for reporting to the Management Board on all aspects of the various construction contracts forming the Project. Together with a series of meetings, we have examined a selection of their curriculum vitae and found the Bouwmanagers to be suitably qualified for the tasks envisaged. In addition, through the various meetings we held at which the Bouwmanagers were present, their knowledge of the technical aspects of the Project and their ability to manage their counterparts in the Advisory Bureau, the Contractmanagers, was apparent. Consequently, we have no concerns on the ability and appropriateness of the Bouwmanagers in the overall structure of the Project Bureau.

³ Organisatie van het projectbureau Noord/Zuidlijn dated November 2004

5.6 The Management of the Project

The Management Board

- 5.6.1 The Management Board is responsible for every aspect of the Project and has collective responsibility for its successful delivery.
- 5.6.2 The Management Board comprises four individuals. Their job titles, names and responsibilities are:

Job Description	Name	Responsibility
Director	ir. HME van Veldhuizen	Overall responsibility for the direction of, and reporting to MA on the Project. Also jointly responsible for matters pertaining to governmental affairs, and the Communications and Project Coordination and the Finance and Planning Departments.
Assistant Director	prof. ir. JW Bosch	Jointly responsible for the Integral Bouwmanagement Department
Assistant/Depute Director	ing. A Klinkert	Jointly responsible for the Communications and Project Coordination Department. He is also involved in a separate but complimentary project dealing with the future exploitation of the completed Project, i.e. provision of rolling stock etc.
Assistant Director	ing. H Groot	Jointly responsible for the Surroundings and Environment matters.

- 5.6.3 The Management Board meets formally once a week to review the Project.
- 5.6.4 The members of the Management Board meet informally with their Departments on a weekly basis. These informal meetings provide the basis for the weekly Management Board meetings referred to in Section 5.6.3.

Integral Bouwmanagement Department

- 5.6.5 This Department currently comprises four Bouwmanagers and two coordinators with responsibility for the general public's well being in the vicinity of the Project sites.

5.6.6 Each Bouwmanager has responsibility for a group of contracts or clustered contracts. This split is:

- North and South (contract clusters 1 (North), 8 (Europaplein Station), 9 (A10 Ring Road) and 10 (World Trade Centre Station))
- Stationisland (contract clusters 2 (Immersed Tunnel below the River IJ), 3 (Centraal Station passage and entrances and caissons at Damrak))
- Tunnels and deep stations (contract clusters 4 (tunnelling), 5 (Rokin Station), 6 (Vijzelgracht Station) and 7 (Ceintuurbaan Station))
- Track and services installations (contract clusters 11 (track and electrification), 12 (signalling and telecommunications) and 13 (station services and finishes installations))

5.6.7 The Bouwmanager has total responsibility for each of his contracts. These responsibilities include:

- Coordination of technical and legal preparation of the works,
- Monitoring the budget and the planning of the works, and
- Providing clear communication on accessibility, liveability and safety to the surrounding.

5.6.8 Based on reports and information provided by the relevant Contractmanager from the Advisory Bureau, he is required to make commercial and technical decisions to ensure the smooth progress of the works and/or design. Advice from the Management Board is available if required.

5.6.9 In practice, this would appear not to be happening. There appears to be a division of responsibility between the Bouwmanagers and the Contractmanagers. In administering the various contracts, the Contractmanagers take responsibility for routine matters. However, on more contentious and complex issues, the Bouwmanagers appear to work closely with the Contractmanagers in resolving issues. In other words, the Bouwmanagers appear to be getting drawn into the administration and decision making process of contracts, rather than fulfilling the role described in Section 5.6.7.

The legal advice provided to the Project Bureau upon appointing the Advisory Bureau as referred to in Section 7.9, was that one company, W+B should be totally responsible for design and supervision. With the Bouwmanagers now being involved at contract level as noted above, this is not now the case.

5.6.10 The role of the Bouwmanager and his interface at contract level is explored further in Section 7.9.

Finance and Planning Department

5.6.11 This department is responsible for recording the overall budget and programme and for preparing financial reports for the Project. In addition, they have a responsibility for ensuring payment and management of invoices to contractors, consultants and other relevant parties.

5.6.12 The Advisory Bureau submits to this department financial information on the construction forecasted final cost as described in Section 5.8.10. This information is monitored by the Bouwmanagers, but not by the Finance and Planning Department. The Project Bureau is therefore reliant upon the correctness, completeness and soundness of information provided by an organisation with which they have no contractual relationship.

- 5.6.13 A detailed spreadsheet is used to monitor the Project's finances as further described in Section 1. Section 9.5.11 indicates that some of the input data is unnecessarily complicated. This concerns us as it could impact upon the reliability of the model's output data. The purpose of this spreadsheet is to provide a reporting function, as cost management is carried out using separate systems.
- 5.6.14 The monitoring, gathering, controlling and if needed, correcting of the financial information concerning the construction costs and the cost forecast by the Bouwmanagers referred to in Section 5.6.12 is carried out per contract or per cluster of contracts basis and not for the entire Project. It is therefore unclear who is responsible for challenging and maintaining the overall forecast of final costs within the overall Project budget.
- 5.6.15 Planning and programming information is again submitted by the Advisory Bureau to this department. This information is contained in the Quarterly reports submitted by the Advisory Bureau to the Project Bureau. Again it is worth noting that The Project Bureau is therefore reliant upon the correctness, completeness and soundness of information provided by an organisation with which they have no contractual relationship.

Governmental and Legal Affairs

- 5.6.16 This department is responsible for legal procedures such as dealing with local and central government issues, contractual issues and for obtaining statutory approvals such as permits.
- 5.6.17 The Permit management process is dealt with in more detail in Section 10.

Communications and Project Coordination

- 5.6.18 This department deals with:
- Communication of environmental information to the local inhabitants, commercial and retail concerns and other relevant third parties,
 - Strategic communication of the Project to the Boroughs, general public and other stakeholders,
 - Public relations with the Boroughs and general public,
 - Marketing material for the Project,
 - Managing the Project Information Office at Centraal Station.
- 5.6.19 The scope of the Investigation does not extend to this department. Consequently, we have not reviewed its function in any detail.

5.7 Relationship with the Municipal Council of Amsterdam and Municipality of Amsterdam

- 5.7.1 A formal reporting structure is in place between the Project Bureau and MCA. The way in which these reports are presented to MCA depends upon the content of the report. The following sections provide an overview on the content and process of issue for the Annual Financial Reports, Quarterly Reports and proposed Annual Trend Reports.

Annual Financial Reports

5.7.2 Annual financial reports are prepared by the Project Bureau. These reports identify the likely outturn cost for the Project and are reported at current prices. In other words, they do not reflect inflationary pressures on the Project budget to the completion of the Project.

In addition, this report provides

- Progress on the project,
- Budget information,
- A reconciliation and explanation on any movement in costs,
- Detailed individual contract cost information,
- Detailed cost information on W+B's, the Advisory Bureau's and other external consultant's fees,
- Detailed cost information on internal costs, i.e. the cost of the Project Bureau, the Damage Bureau etc.,
- Likely rentals from complimentary projects such as the car park at Rokin, and
- Any other current relevant matters.

5.7.3 Aspects of the foregoing report are treated as confidential. This is to protect the Project Bureau's commercial position in their dealings with the contractors and prospective tenderers.

5.7.4 The decision to ignore inflation is customary practice within MA on projects with a long life time. This methodology was discussed, but not formalised between MA's Finance Department (Gemeentelijke Accountantsdienst) ("ACAM") and the Project Bureau.

5.7.5 After the draft annual financial report is prepared by the Project Bureau, a meeting (Staffmeeting or "Wethoudersstaff") of the Alderman for Traffic, Transport and Infrastructure, the Director of dIVV and the Director of the Project Bureau reviews and discusses the content of the draft report.

The report is thereafter reviewed by the Financial Advisory Group NZL. This group comprises the Financial Controller of dIVV and the liaison advisors of Finance, Traffic, and Construction Supervision.

The annual financial report is then issued to the College van B&W, who then issue the report to the Infrastructure, Traffic and Transport Committee. If the need arises, the report can be discussed at Council.

Quarterly Reports

5.7.6 The Project Bureau prepares non-confidential Quarterly Reports that are issued to MCA. These are based upon information supplied by the Advisory Bureau on the progress of the Project. This report provides details on:

- Quality,
- Programme,
- Consolidated budget information,
- Public relations information, and
- Any other current relevant matters.

Annual Trend Reports

- 5.7.7 The Project Bureau intends to commence issuing annual trend reports. Whereas the annual financial report is issued during the First Quarter of each year, it is the Project Bureau's intention to issue the trend reports during the Third Quarter of each year. It is intended that this report will contain qualitative and financial information. It is their intention to commence this process in 2005.
- 5.7.8 The issue of this report will follow the same procedure as identified in Section 5.7.5 for the issue of the annual financial report. Aspects of this report will also be treated as confidential to safeguard the Project Bureau's commercial position in their dealings with the contractors and prospective tenderers.

5.8 Relationship with the Advisory Bureau

- 5.8.1 There is no direct contractual relationship between the Project Bureau in the form of MA and the Advisory Bureau. MA does have contractual links with specialist design consultants such as W+B and the architect. MA also has a direct contractual relationship with ND, Stibbe and GeoDelft. W+B's obligation is to manage the technical aspects of the Project. They in turn employ the Advisory Bureau to provide the engineering design, contract administration and site supervision of the Project. More detailed information on this matter and the contractual relationship of W+B and the Advisory Bureau is contained in Section 6.6.1.

However, in numerous instances, there is a degree of misunderstanding and a blurring around the edges of this relationship by all involved in the Project. The relationship between W+B and the Advisory Bureau at times is difficult to differentiate. It is also difficult at times to differentiate between W+B and the Advisory Bureau in their relationship with the Project Bureau and other sub consultants. This is highlighted in this Section of the report, as well as in Sections 1 and 7.

It is worth noting that this blurring around the edges is predominantly due to the practical relationships, as opposed to the contractual relationships between the Project Bureau, W+B and the Advisory Bureau. This relationship is explored further in Section 7.

- 5.8.2 There are no collateral agreements between the Project Bureau and any of W+B's sub consultants or sub sub consultants.
- 5.8.3 The Project Bureau has stated that they are reliant upon the correctness, completeness and soundness of the information provided to them by the Advisory Bureau.
- 5.8.4 There are two main interfaces between the Project Bureau and W+B/Advisory Bureau, namely:
- Technical, and
 - Financial.

Technical Interface

5.8.5 The Project Bureau Bouwmanagers formally meet on a fortnightly basis with their counterparts in the Advisory Bureau, the Contractmanagers. These meetings review progress and any pertinent issues on the relevant contracts. The meetings also assist the Bouwmanagers in their reporting to the Assistant Director Bouw so that he is fully briefed for the Project Bureau Management Board meetings as described in Section 5.6.4.

In addition, the Bouwmanagers and the Contractmanagers meet in an informal manner as regularly as is required to manage the contracts.

5.8.6 On a four-weekly basis, the Contractmanagers submit a progress report to the Bouwmanagers.

5.8.7 It should be noted, that whilst the relationship indicated in Sections 5.8.5 and 5.8.6 is directly between representatives of the Project Bureau and Advisory Bureau, W+B is copied in on the issued documentation.

5.8.8 On a Quarterly basis, the Advisory Bureau issues to the Project Bureau a technical report that summarises the four-weekly progress reports. In addition, this report contains financial and programme information. This report forms the basis of the Project Bureau's Quarterly report to MCA as described in Section 5.7.6.

Financial Interface

5.8.9 In a similar manner as the Contractmanagers report technical matters to the Bouwmanagers, so they also report financial information as part of the four-weekly progress reports.

5.8.10 In addition, the Advisory Bureau also reports costs on a four-weekly basis directly to the Project Bureau's Project Controller. The Project Controller is part of the Finance and Planning Department within the Project Bureau.

5.9 Quality Assurance

5.9.1 The Project Bureau is not accredited to, and has few formal procedures in place that are compatible with ISO 9000:2000 – Quality Management Systems. Whilst being accredited to ISO 9000:2000 does not automatically guarantee quality, it does set in place a regime that ensures that tasks are carried out in a standard and systematic manner. According to the International Organization for Standardization ("ISO")⁴ the primary concerns of ISO 9000:2000 is to ensure that an organisation fulfils:

- The customer's quality requirements, and
- Applicable regulatory requirements,
- While aiming to
 - Enhance customer satisfaction, and
 - Achieve continual improvement of its performance in pursuit of these objectives.

The last point about continual improvement is of particular importance and is reflected elsewhere in this report, particularly in Section 10.

5.9.2 We found very little evidence during the Investigation of any written procedures adopted by the Project Bureau. Reliance is placed on the short lines of communication within the Project Bureau and the length of service of each employee of the Project Bureau.

⁴ ISO Web site – ISO 9000 in brief

5.10 Conclusions and Recommendations

Conclusions

- 5.10.1 It is essential that MCA maintains a controlling role on the Project. They need to be aware of contentious matters, finances, scope changes and programme implications. To this end, we consider that the Project Bureau is fulfilling this requirement.
- 5.10.2 However, it would appear that the Project Bureau is doing this as a homogeneous part of the Advisory Bureau. From a programming, technical and financial aspect, the Project Bureau is wholly reliant upon the Advisory Bureau, but has full responsibility for any actions taken on the basis of that information. The Advisory Bureau has no contractual relationship with the Project Bureau. The Advisory Bureau is in an advisory role and takes no responsibility for decisions made by the Project Bureau on the basis of this information.
- 5.10.3 We believe the relationship between the Project Bureau and the Advisory Bureau has evolved through time and is possibly not what was originally intended. The involvement of the Bouwmanagers in the day to day running of the various contracts as described in Sections 5.6.9 and 7.7.14 particularly emphasises this point.

Through bypassing the contractual link between the Project Bureau and W+B, MA could be exposed should the Project Bureau instruct matters that contractually are the responsibility of the Advisory Bureau.

As noted in Section 5.6.9, the original intention of the Project Bureau, based on legal advice, was to appoint one company with total responsibility for the design and supervision of the contracts. The Bouwmanagers' involvement in assisting the Contractmanagers with their decision making process and issues resolution at contract level significantly diminishes this key responsibility of W+B and exposes MA to risk that was not intended.

- 5.10.4 The Finance and Planning Department has no construction experience. The key individuals are all accountants. Whilst this is ideal for the monitoring and apportionment of costs to various headings, it can lead to a failure to fully understand and critically challenge the reliability of the underlying costs which the Advisory Bureau is reporting. In addition they have no planning or programming expertise and rely upon the Advisory Bureau for this information.
- 5.10.5 It appears that there is no single point of responsibility for maintaining the Project forecast within the Project budget. It has been described at meetings as a shared responsibility between the Project Bureau and the Advisory Bureau. Although ultimately, responsibility must lie with the Project Bureau, no one individual within the Project Bureau appears to have ownership of this responsibility.
- 5.10.6 As noted in Section 5.7.2, annual reports are prepared by the Project Bureau for issue to MCA. These reports are based at current prices and ignore inflation projections to the end of the Project. MCA should be aware that potentially this could lead to the budget being increased on an annual basis to reflect actual inflation between the current year's and the previous year's forecast of final cost.
- 5.10.7 The Project Bureau would appear to have no terms of reference. This creates the potential for uncertainty and ambiguity in respect of key responsibilities, including accountability and liability.
- 5.10.8 There are no formal quality assurance procedures in the Project Bureau. This could lead to inefficient work, lack of understanding of processes if an employee of the Project Bureau is replaced and an inability to plan for improvement in the delivery of the service of the Project Bureau.

- 5.10.9 Having said that, there is evidence that the procedures in the Project Bureau are reviewed. The Project Bureau's intention to issue annual trend reports is a welcome example of this. This will significantly improve the information submitted to both MA and MCA and assist in any decision making which they are required to make.

Recommendations

- 5.10.10 We believe that the concept of the Project Bureau organisation fulfilling the role described in Section 5.10.1 is the correct way for MA to manage this project.
- 5.10.11 We believe that MA should formalise the Terms of Reference for the Project Bureau to assist all parties in understanding the Project Bureau's role and responsibilities.
- 5.10.12 The confusion that exists in the Project Organisation about the relationship of the Advisory Bureau and the Project Bureau and the reliance placed by the Project Bureau on the accuracy of the information supplied by the Advisory Bureau should be addressed. Whilst the practicalities of the working relationship between the Project Bureau and the Advisory Bureau are understandable, contractually, the Project Bureau is putting MA at risk should information supplied by the Advisory Bureau and acted upon by the Project Bureau prove to be incorrect. W+B require to formally confirm all advice provided by the Advisory Bureau to ensure the contractual chain remains intact.
- 5.10.13 MA should give consideration to amending the Project Bureau's technical management structure as follows:
- In contracts still to be placed, the Bouwmanagers should not become involved in assisting the Contractmanagers with the daily management of contracts, and
 - Whilst the reporting and working arrangement between these individuals are not contractually correct, it is certainly assisting with the management of the contracts currently on site. In the contracts currently being constructed, the Bouwmanagers should endeavour to extract themselves gradually from assisting the Contractmanagers with the daily management of the contracts, thus clearly devolving responsibility to W+B.

Both these steps will assist the Bouwmanagers to create time to spend in the strategic management of their respective contracts.

- 5.10.14 MA should give consideration to amending the Project Bureau's financial management as follows:
- Involve the Bouwmanagers, who have a technical knowledge of each of the contracts, in managing the contract finances, and
 - The Bouwmanagers should manage the overall construction budget to ensure that total construction costs and forecasts are maintained within the overall construction budget.

This will ensure that the largest and most volatile part of the Project budget is being managed by technically qualified managers, who can critically challenge the underlying costs being reported to them.

- 5.10.15 To strengthen the Finance and Planning Department, we recommend that MA give consideration to appointing a technically qualified individual to support the Manager of the Finance and Planning Department in managing the cost of the overall design within the overall Project budget. This individual should possess substantial experience in the cost and commercial management of large infrastructure projects. Whilst the Project Bureau delegates financial control of the Project to a dedicated Project Accountant, we note that the scope of this role is not sufficiently wide to include constructively challenging the basis of cost reports provided from the Advisory Bureau. Such a role would require a technical understanding of the composition of the underlying construction cost estimates.

5.10.16 We believe the Project Bureau should invest in formulating formal procedures for the processes that they undertake as an organisation. This does not mean they require to apply for third party accreditation to ISO 9000:2000, although this would be the ideal. It would be sufficient to have a process which complies with the requirements of the Standard.

5.11 Best Practice

5.11.1 We believe the following recommendations contained in the Herweijer Committee report into the Stopera project⁵ have been implemented on this Project, namely:

- Recommendation 10.2 – Discretionary Powers for the Project Manager – albeit, we believe that further definition of these powers is required,
- Recommendation 10.3 – Delegation of Powers by the College van B&W,
- Recommendation 10.7 – Appropriately experienced project directorate – albeit we believe the Finance and Planning Department requires augmenting with technical knowledge, and
- Recommendation 10.8 – MA Finance – partially instigated. The requirement for a functional relationship between the Project Bureau and the Finance Department of MA has not been instigated, however, the requirement for the Finance Department of MA to check that the Project budget has been properly accounted for has been instigated.

5.11.2 ISO 10006⁶ sets out guidelines for quality management of projects. It deals with:

- Management responsibility,
- Resource Management,
- Product realisation, and
- Measurement, analysis and improvement.

There is no evidence to suggest that this internationally recognised standard for the implementation of project management has been considered by the Project Bureau.

⁵ Rapport Van De Commissie Stadhuis/Muziektheater – 18 May 1988

⁶ ISO 10006:2003 – Quality Management Systems – Guidelines for Quality Management in Projects

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6 REVIEW OF THE ADVISORY ORGANISATION⁷

6.1 Introduction

6.1.1 This section of the report examines the role of the Advisory Organisation in the Project. It reviews:

- The history of the Advisory Organisation,
- Contractual relationship of the Advisory Organisation,
- Other consultant relationships,
- Witteveen + Bos and the Advisory Bureau terms of reference,
- The management structure of the Advisory Bureau,
- Relationship with the contractors,
- Remuneration of Witteveen + Bos,
- Project planning and programming,
- Document management,
- Technical documentation,
- Conclusions and recommendations, and
- Best practice.

6.2 The History of the Advisory Organisation

6.2.1 The relationship between MA and the advisory organisation Noord/Zuidlijn has evolved into its current form since the Project was established in 1994.

6.2.2 In 1993, Toornend & Partners B.V. were instructed by MA to advise on an organisation for project management and formulate criteria for consultant selection. From this advice, MA approached a number of engineering consultants to enquire if they were interested in bidding for the Project. Four engineering consultancy companies were selected for interview and requested to provide a fee proposal. Only Dutch companies were considered due to the complexity and innovativeness of the Project, language, cultural and economic reasons. The criteria for the selection of the appropriate consultant were their understanding of the Project, capacity to fulfil the assignment and competitiveness of their fees.

6.2.3 W+B were identified as being a suitable candidate due to the project management and design skills demonstrated at major construction works, in particular the Noordtunnel, the Wijkertunnel, the Coentunnel, and three tunnelling projects at Schiphol Airport. De Weger Architecten- en Ingenieurs Bureau B.V.⁸ ("De Weger") were also of interest to the Project Bureau due to their tunnelling and deep excavation experience.

6.2.4 MA's in-house legal department advised that a single consultancy should be appointed to deliver the engineering design services on the Project. This provides single point responsibility for the services being supplied as further described in Section 6.5.

Acting on this advice, MA decided to enter into an agreement with W+B. However, W+B were mandated to cooperate with De Weger.

⁷In parts of this Section of the report, we refer to the Advisory Organisation. This is a reference to W+B, the Advisory Bureau and other the consultants employed on the Project directly by MA, jointly.

⁸In September 2001 De Weger merged with Haskoning under the name Royal Haskoning/ Haskoning Nederland B.V. ("RH").

- 6.2.5 The original agreement between MA and W+B was signed on 30 June 1994 and was based on RVOI-1987 (revised 1993)⁹. The same day, a joint venture Adviesbureau Noord/Zuidlijn v.o.f. (“the Advisory Bureau”) was formed by W+B and De Weger. Both joint venture partners were mandated by MA to utilise the expertise and local knowledge of Ingenieursbureau Amsterdam (“IBA”), an engineering division of MA. A cooperation agreement between the Advisory Bureau and IBA was signed on 30 June 1994. In addition, MA stipulated that the Onderzoeksdienst voor Milieu and Grondmechanica Amsterdam (“OMEGAM”) be used for supplying local geotechnical expertise as a sub consultant of the Advisory Bureau.
- 6.2.6 The 1994 agreement between MA and W+B provided for a 9-month employment of W+B and was aimed at formulating the project definition, which resulted in adoption of the Programme of Requirements. Thereafter, due to the political uncertainty behind the project, W+B’s appointment was extended seven times on a half yearly basis. In 1998 a fuller brief for delivering the project was prepared by MA. W+B prepared a proposal to this brief setting out their approach to the Project. The new arrangement was agreed on 16 December 1998 in the first modification of the original agreement of 30 June 1994 between the parties (First Addendum) which stipulated the employment of W+B for the duration of the Project. W+B’s final appointment was agreed on 31 August 2000 by way of a Second Addendum to the earlier appointments provided by MA.

6.3 Contractual Relationship of the Advisory Organisation

- 6.3.1 MA directly contracts with W+B. This is depicted in Section 5.2.1.
- 6.3.2 W+B subcontracts all activities on the Project to the Advisory Bureau. The Advisory Bureau is a joint venture between W+B and De Weger. (De Weger merged with RH in September 2001.) W+B has the largest involvement in the joint venture by way of workload, share of costs and in relation to decision making powers. The Advisory Bureau is a legally recognised and registered company with the Chamber of Commerce of Amsterdam. Both partners are jointly and severally liable for the execution of the joint venture agreement. The current joint venture agreement to form the Advisory Bureau was signed on 14 August 2001 and replaced the previous agreements between the parties.
- 6.3.3 The Advisory Bureau has a framework agreement with IBA dated 15 August 2001 which replaced the earlier 1994 cooperation agreement. To all intents and purposes, IBA is treated as a joint venture partner of W+B and RH.
- 6.3.4 The direct contractual relationship on tactical advice, operational project management, design, contract administration and supervision lies between MA and W+B. In practice, the Advisory Bureau joint venture of W+B, RH and *de facto* partner IBA, performs these consultancy activities under the name of the Advisory Bureau.
- 6.3.5 When required, specialist sub consultants are employed by the Advisory Bureau.

6.4 Other Consultant Relationships

- 6.4.1 The Advisory Bureau employs a number of sub consultants. One of these is a German specialist railway engineering design consultancy Deutsche Eisenbahn Consulting GmbH (“DEC”) to whom Advisory Bureau has sub-contracted rail and related design.
- 6.4.2 If there is a need to supplement the Advisory Bureau with additional specialist sub consultants, W+B prepare a recommendation to the Project Bureau for authorisation. Sub-consultancy contracts are signed between the Advisory Bureau and the sub consultant.

⁹ Regeling van de Verhouding tussen Opdrachtgever en adviserend Ingenieursbureau.

-
- 6.4.3 The Advisory Bureau also has a duty to manage and coordinate other advisors employed on the Project directly by MA. These include the architect, Benthem Crouwel (“BC”), MA’s legal advisors ND and Stibbe, and the Dutch national rail designers Holland Railconsult and Arcadis.
- 6.4.4 Holland Railconsult and Arcadis act under the name of VOF Stationseiland (“VOFS”). VOFS is responsible for the design and site supervision of the Centraal Station Contract 3.2. However, the Advisory Bureau acts as Contractmanager for this contract. The Advisory Bureau also provides second opinions and checks on budgets prepared by VOFS. The Advisory Bureau has no involvement in the remuneration of VOFS, nor has Advisory Bureau a right of sanction against them.
- 6.4.5 Noted in Section 7.7.12 is a list of contractual concerns regarding Contract 3.2. It is also worth noting that the Advisory Bureau in their role as Project design coordinators and managers has no direct control over the output from VOFS.

6.5 The W+B/Advisory Bureau Terms of Reference

- 6.5.1 The Terms of Reference for advisory services were prepared by Toornend & Partners B.V. on behalf of MA in 1994. These Terms of Reference, revised as required by the evolution of W+B’s appointment form part of the agreement between MA and W+B.
- 6.5.2 The advisory works required of W+B is divided into tactical advice, operational project management, design, contract administration and supervision.
- 6.5.3 W+B has a robust procedure that they have agreed with the Project Bureau for dealing with changes in relation to their scope of service.

6.6 The Management Structure of the Advisory Bureau

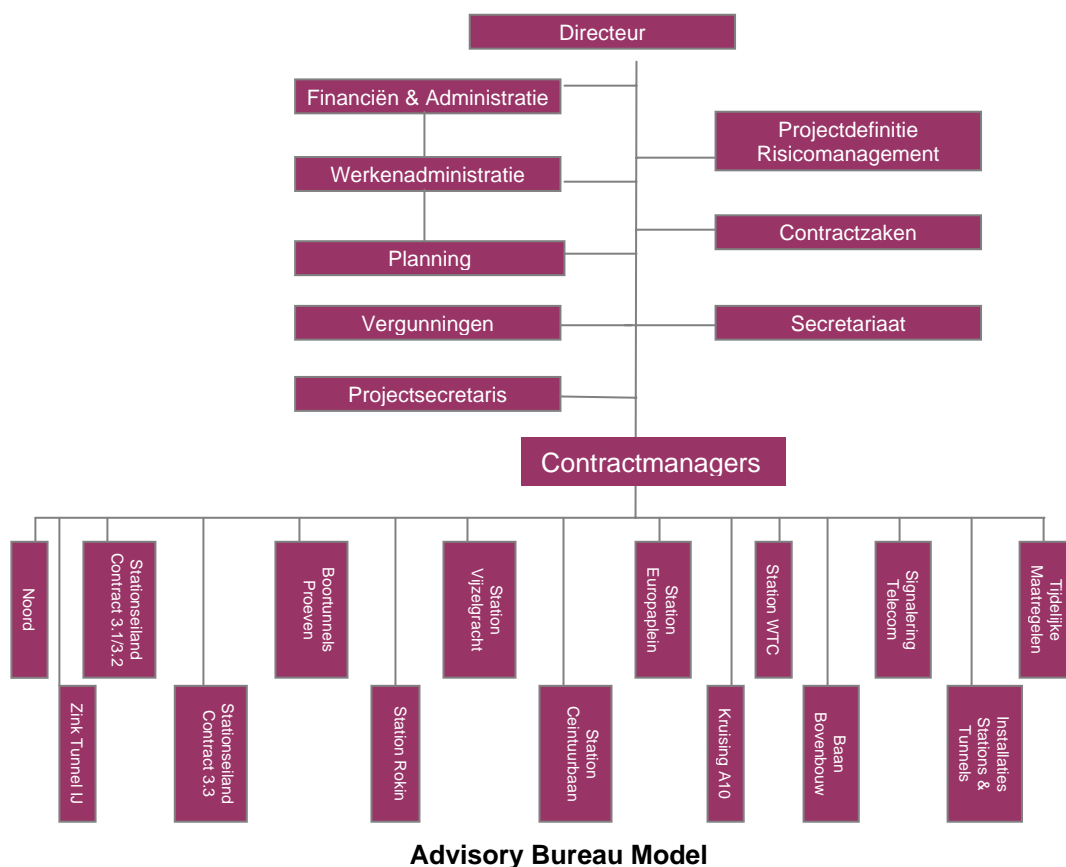
- 6.6.1 The working and contractual relationship between W+B and the Advisory Bureau at times is difficult to differentiate. It is also difficult, at times, to differentiate between W+B and the Advisory Bureau in their relationship with the Project Bureau and other sub consultants. This confusion is also referred to in Sections 5.6.9 and 7.7.14.
- 6.6.2 The Project has acquired a “special project” status within W+B. The Director of the Advisory Bureau is a W+B employee and has the status of project director for the Project within W+B. He is also authorised to make financial and managerial decisions within W+B regarding the Project. A considerable number of employees of W+B have been outsourced to work within the Advisory Bureau on the Project. W+B’s specialist services, i.e. legal department, are available for consultation by the Advisory Bureau.
- 6.6.3 The Advisory Bureau distinguishes three so-called “mother companies”: W+B, RH and IBA.

6.6.4 The key positions within the Advisory Bureau are currently occupied by:

Job Description	Name	Responsibility
Director	Ing. H.M. Vlijm	Overall responsibility for the direction the Project. Also W+B Project Director
Controller Finances and Administration	H. van der Scheer	Financial administration of the Advisory Bureau, advisory costs administration.
Controller Works Administration	Ing. H.J.M.M. Verstraelen	Budget and contracts administration
Controller Planning	Drs. C. Zegers	Coordination of planning on project and contract level
Coordinator Permits	Mw.ir.M.C.Manuel	Coordination of obtaining and monitoring of various permits for the Project
Projectsecretaris	ir. J.T.Lobeek, ing. N.H.F.Mulder MSc, ir. M.Kemner	Project secretariat
Manager of Project Definition and Risk Management	ir.A.J.M.Snel	Development of the general safety concept, and implementation of safety measures in the project, risk management for the entire Project
Contracts Controller	ir.F.van Kooten	Elaboration of general contract conditions, control over contract variations and claims, monitoring implementation of the changes
Contractmanagers ¹⁰	dr.ir.T.A.M.Salet ing.J.P.Groot ir. R. de Boer ir.J.C.G.Hesen ing.C. Poldervaart ir.F.J.Kaalberg ir. G.J.A. de Klerk Dipl.-ing.H.J.Gorski	Contracts 5, 6, 7, project coordinator and deputy director Contracts 1 Contracts 2 Contracts 3.1-3.2 Contracts 3.3 and 8 Contracts 4 Contracts 9,10 and 14 Contracts 11, 12 and 13

¹⁰ A more comprehensive list of Contracts and Contract Clusters is contained in Appendix I.

6.6.5 This can be summarised as follows:



- 6.6.6 We have both held discussions with and reviewed the curriculum vitae of the Director of the Advisory Bureau and conclude he is suitably qualified for the role that he fulfils in the Project.
- 6.6.7 Curriculum vitae for each of the Contractmanagers were also reviewed. Through the various meetings we held at which the Contractmanagers were present, their knowledge of the technical aspects of the Project and their ability to manage the contractors, site supervisors, surroundings and liaise with the Project Bureau was apparent. Consequently, we conclude that they are suitably qualified for the role they fulfil in the Project.
- 6.6.8 In addition, we held several meetings with a number of the other employees of the Advisory Bureau, listed in Section 6.6.4. We have no doubt in the ability and appropriateness of those individuals in the overall structure of the Advisory Bureau.
- 6.6.9 The Advisory Bureau's staffing levels have ranged from 100 to 120 engineers in the past, currently being at about 70. During the creative stage of the project (the first 6 years), the Advisory Bureau was based in one office. Subsequently, it has reverted to its constituent offices (several locations in Amsterdam, Rotterdam, Deventer and Frankfurt) for the production phase. The Director and the Contractmanagers are based at the Advisory Bureau's main office in Amsterdam, and visit the sites on a frequent basis. The Site Supervisors for the contracts are site based.

The Management Board (Bestuur)

- 6.6.10 The Management Board of the Advisory Bureau is formed by the directors of W+B (chair) and RH. The Management Board oversees the performance of the Director of the Advisory Bureau in the carrying out of his tasks. The Director of IBA actively participates in all these meetings.

Director

- 6.6.11 General management of the Advisory Bureau rests with its Director. The Director is entirely responsible for all contracts and reports to the Management Board of the Advisory Bureau.

Contractmanagers

- 6.6.12 The Contractmanagers are responsible for one or more contracts. These responsibilities include:

- Interfaces with third parties,
- Design of the contracts,
- Cost estimating,
- Management and contract administration of the contracts,
- Supervision of the contracts, and
- Monitoring the time, costs, organisation, information and obstructions in execution of the contract.

Each Contractmanager has a design team and a supervision team and draws upon the other resources and departments within the Advisory Bureau, for example the Finance and Administration Department. For execution of the contract the Contractmanager adopts a Plan of Action (Plan van Aanpak). Each Contractmanager is responsible for managing the interfaces of his contract with the adjacent construction contracts. The Contractmanager also usually fulfils the role of the contract administrator of the construction contracts.

- 6.6.13 The Contractmanager acts as a link between the Project Bureau, and the design and supervision teams.
- 6.6.14 The Contractmanagers are also responsible for the preparation and execution planning for their contracts, supported by the Planning team, refer to Section 6.6.22.
- 6.6.15 Every four weeks the Contractmanager prepares a progress report on the contracts under his supervision for issue by the Advisory Bureau to the Project Bureau's Bouwmanagers. (See Section 5.8.6).

Cluster coordinator

- 6.6.16 The Cluster Coordinator (Clustercoördinator) is responsible for the coordination of a group of contracts within a Cluster, as described in Appendix H. Coordination relates to the design, management and supervision, and monitoring the time, costs, organisation, information and obstructions in execution of the contracts cluster and management of the aspects exceeding the scope of one contract.

Projectsecretaris

- 6.6.17 The Projectsecretaris team is responsible for providing general reports on the Project, and ensures the flow of management information throughout the Advisory Bureau.

Finances and Administration Department (Sectie Financiën en Administratie)

- 6.6.18 This Department oversees the advisory costs budget and provides relevant financial information to the Director and the Advisory Bureau employees as appropriate. The department is managed by the Controller Finances and Administration.

Work Administration Department (Werken Administratie Groep)

- 6.6.19 This Department is directed by the Controller on Works and Administration (Controller Werken Administratie) and provides advice on the execution and management of:

- Budget administration,
- Contract administration,
- Preparation of the Project construction budget on the basis of the contract estimates, and
- Administration of statements of work by contractors.

Project Definition and Risk Management Department (Projectdefinitie en Risicomanagement team)

- 6.6.20 The Project Definition and Risk Management team deals with:

- Realising the implementation of the definitive Programme of Requirements for the Project,
- Formulation of the operational safety rules for the Project,
- Advising Contractmanagers on operational safety matters,
- Risk management and risk monitoring, and
- Contribute to the Risk Control Plus team. Refer to Section 8.6.4 for more detailed information on Risk Control Plus.

Contracts Department (Contractzaken)

- 6.6.21 The Contracts department under the leadership of the Contract Controller is responsible for the following:

- Preparation of the general contract conditions, both at time of tender and awarding a contract,
- Verification that changes and modifications of the construction contracts during the execution of the works conform to the provisions of the contract, and to provision of advice thereon to the Contractmanager,
- Ensuring consistency in the evaluation of the contract variations and claims by the Contractmanagers, and
- Monitoring the implementation of the changes in the contract lists which are then periodically reviewed with the Director and Contractmanagers.

The Contracts Department is supported by the in-house legal councils of W+B and, if necessary, by MA's external legal advisor ND.

Planning

- 6.6.22 The Controller Planning monitors total project planning. The Contractmanagers are responsible for preparing and monitoring programmes for each of their individual contracts. These are passed to the Controller Planning for input to the Project master programme. The function of the Controller Planning is currently fully outsourced to external consultants. For further details, see Section 6.10.

Permits coordinator

6.6.23 The Permits Coordinator is responsible for applying for permits relating to spatial planning, environment, water regulations and infrastructure. Refer also to Section 10.2.

6.7 Quality Assurance

6.7.1 W+B, RH and IBA are accredited to ISO 9000:2000. While not being itself accredited to these standards, the Advisory Bureau has adopted W+B's Quality Assurance procedures.

6.8 Relationship with the Contractors

6.8.1 The Parties to the construction contracts are MA (the Employer) and the Contractor (for more details on construction contracts, see Section 7 **Fout! Verwijzingsbron niet gevonden.**). On behalf of MA, W+B is responsible for the design and administration of the contracts. This responsibility has been sub contracted to the Advisory Bureau by W+B.

6.8.2 The Advisory Bureau has prepared a Handbook on Management and Supervision (Handboek Directievoering en Toezicht) describing the role of the Advisory Bureau in general, and the Contractmanagers and the Site Supervisors in particular, in administering the various contracts. This Handbook was incorporated into the tender documents and forms a part of all construction contracts.

6.9 Remuneration of Witteveen + Bos

6.9.1 W+B's remuneration is based on the Second Addendum to their appointment with MA dated 31 August 2000. The pricing information contained in this, i.e. hourly rates and lump sum fees (as described below) are adjusted annually for inflation using the agreed index stated in the appointment.

6.9.2 W+B is remunerated as follows:

- Time occupied, which is paid at the agreed hourly rates within their appointment
 - The work of management, supervision and strategic advice is remunerated on an annually reviewed, capped, time occupied basis. The annual review is carried out between the Project Bureau and W+B,
 - Preliminary design and design production are also paid on a capped anticipated time occupied basis. Each task is identified and has its own estimate,
 - Tender documentation preparation and construction drawing production for Contract 4.2 (TBM) due to its complexity,
 - Tender documentation and construction drawing production for Contract 14 (Temporary Measures) as these are very much ad-hoc contracts, and
 - Tender negotiations
- Lump sum
 - Specification and Detailed Design works for all contract clusters with the exception of Contract 4.2 (TBM) and Contract 14 (Temporary Measures).

6.9.3 The man hour estimates used in the foregoing time occupied calculations can be reviewed during the year if a special need arises.

6.9.4 W+B is obliged to use reasonable endeavours to work in an efficient manner.

6.9.5 The foregoing remuneration is backed down into the Advisory Bureau's contract with W+B.

6.9.6 All payments due to W+B, the Advisory Bureau and its sub consultants from MA are sanctioned by the Project Bureau and paid by the Project Bureau to W+B. W+B then pay the Advisory Bureau, who in turn pay their sub consultants.

6.9.7 W+B do not apply profit or handling charges to sub consultant costs. Administration costs in managing invoices and payments by W+B form part of the Advisory Bureau's management fee.

6.10 Project Planning and Programming

6.10.1 We consider the Advisory Bureau staff with responsibility for planning and programming to be experienced and competent in this field.

6.10.2 It is our view that the planning software used by the Advisory Bureau, Primavera, is fit for purpose and therefore a suitable tool for a project of this type, complexity and size.

6.10.3 Approximately at the end of 2004, the various programmes adopted by the Contractmanagers were standardised and integrated into a master project programme, using Primavera 3.1 software. The new programme (January 2005) is currently under review by the Advisory Bureau. The programme currently has some 5,500 activities identified; it is reported to be fully logic linked with key milestones identified. The programme and its sub programmes are base-lined and targets set accordingly.

6.10.4 Whilst the formulation of this consolidated master project programme is a significant advance over the previous planning management, the software itself is not being fully utilised to assist the Project Bureau and Advisory Bureau manage the overall Project. For instance:

- The programme coding structure is not linked to the Project budget, and
- Resource information is not input to the software.

These are both facilities within the software that can bring added value to the Project and its management.

6.10.5 With the programme coding structure not being linked to budget cost codes and resources estimated man-hours and associated costs not being assigned to the project programme, no financial information is derived from the programme on this Project. We consider this to be unusual. The software is designed to identify both schedule and cost issues. This provides the project managers with an early warning opportunity and consequently more time to evaluate and implement mitigating action. As project programmes are not currently resourced, it is impossible to identify resource deficiencies from the programme.

6.10.6 The various contractors use a variety of different planning software packages to update the Advisory Bureau of planned work and progress achieved. After inputting the contractors' data into the master project programme, conflicts are identified and the Contractmanager attempts to resolve them with the contractor. When this is not possible the Advisory Bureau's programme is adjusted to accommodate the conflict.

6.10.7 A Quantitative Schedule Risk Analysis ("QSRA")¹¹ has not been carried out on the Project. Primavera is a suitable tool to assist with this exercise.

¹¹ Refer to Section 8.2.4 for a definition of QSRA

6.11 Document management

- 6.11.1 Document management of the Advisory Bureau is performed in accordance with the Advisory Bureau's Project Plan which, as noted in Section 6.7 is in accordance with W+B's Quality Assurance procedures. All crucial documents issued by the Advisory Bureau, such as contract documents, offers, orders are approved and/or signed by the Director.
- 6.11.2 The Advisory Bureau employs a modern sophisticated electronic Document Management System (ZyLab) that we consider to be fit for purpose. There also exists a register for the construction drawings of the Advisory Bureau and the contractors per contract. In addition, there is a document management register where the status of the construction drawings and working plans is maintained.

6.12 Technical documentation

- 6.12.1 The scope of the Investigation did not include a technical appraisal of the Project. However, we did carry out a cursory review of a selection of sample drawings, specifications and other documents supplied by the Project Bureau. This information was contained on nineteen CDs and is listed in Appendix I.
- 6.12.2 The majority of the English technical documents on the disks were dated 2000 / 2001, and as such pre-dated the re-tendering of the deep station contracts. The information contained on the CDs was issued to the market place ahead of that time to provide a flavour of the work involved on the Project. Consequently, many of the documents were incomplete in themselves (values not entered in tables, etc), or referred to appendices that were either incomplete or missing. In our review, several of the documents were disregarded as a result of having no significant content. There was some duplication, and also inclusion of updated versions that added little of further consequence.
- 6.12.3 Despite these imperfections, the documents examined clearly displayed an acceptable course of design and contract procurement had been followed. Design documents included historical research, geotechnical foundation studies, risk catalogues, and health and safety plans. Issues of contamination, the handling of soils and other materials, and water discharge were covered by their own specific plans. Specifications relating to structures and workmanship were issued as Standaard Rationalisatie en Automatisering in de Grond-, Water- en Wegenbouw Bepalingen ("RAW") standard listings, supplemented with special clauses where appropriate. Detailed mechanical and electrical specifications were provided for the floodgate defences, and for the accommodation works around Centraal Station.
- 6.12.4 Two of the disks contained drawings, these relating to Vijzelgracht and Ceintuurbaan Stations respectively. These are the only drawings that have been inspected. The drawings viewed were considered to be of an acceptable standard, both in preparation and in content in relation to the works. A representative sample was plotted using AutoCAD 2004 for more detailed inspection.
- 6.12.5 The enormous technical complexity of the Project becomes clear as the documents are examined. The further documents provided, also noted in Appendix I, make clear the extensive thought and effort that has been put into the development of the tunnel boring process, including the contributions of external advisors. The modelling of ground conditions, the full size testing, and the monitoring of other projects that are still going on, give comfort that the final design will be correct. The development of the "short" tunnel boring machine ("TBM") with innovative shield and tail arrangements makes best use of the knowledge gained of the founding strata beneath Amsterdam. The sharing of this information with TBM suppliers Herrenknecht AG, and Contract 4.2 consortium Saturn, must also be to the advantage of successful implementation.

6.12.6 The advance establishment of the monitoring regime, and the planning of possible mitigating measures, will help to ensure that the rigorous conditions relating to ground water pressure and settlement will be met. The fact that the Project Bureau and the Advisory Bureau are to take an active part in the monitoring process provides additional comfort.

6.13 Conclusions and Recommendations

Conclusions

6.13.1 The Advisory Organisation is well organised. There is strong, clear leadership in the form of W+B, justifying MA's initial choice of them.

6.13.2 We consider that the Advisory Bureau is resourced with suitably qualified staff.

6.13.3 MA has a management and supervision contract with a limited liability company W+B. They subcontract all their duties and responsibilities to a joint venture, the Advisory Bureau, who in turn, subcontract some of their duties and responsibilities to other sub consultants. W+B has the largest involvement in the Advisory Bureau. This relationship has both benefits and shortcomings.

On the benefit side, such an arrangement shields MA from any problems arising with or amongst sub consultants, as the responsibility to manage the execution of the Project rests solely with W+B.

On the shortcoming side, the only sub consultant effectively employed by W+B is the Advisory Bureau itself. W+B holds the majority shareholding in the Advisory Bureau, who then subcontracts advisory works to all the other specialist companies (DEC, OMEGAM etc.) as required. Should a problem arise between MA and W+B, then:

- There are no collateral warranties or third party agreements between MA and either the Advisory Bureau or its sub consultants to enable MA to retain the services of the Advisory Bureau or the sub consultants directly, and
- This could question the status of the Advisory Bureau given that W+B is the majority shareholder in the Advisory Bureau.

It should also be noted that IBA are part of MA and consequently should continue to work on the Project.

6.13.4 The use by the Advisory Bureau of a master project programme utilising market leading software such as Primavera for a complicated linear project is essential to the successful management of this Project. We are surprised that the planning software is not being fully utilised, however, this could be because of its recent appearance as a management tool within the Advisory Bureau.

6.13.5 We are concerned that after the master project programme has settled in and once any conflict between the sub-programmes is resolved that it could produce a result that nobody in the Project Bureau or the Advisory Bureau was expecting. This could have a significant impact on the overall sequencing of the works.

6.13.6 We are surprised that a Project of this size has not instigated a QSRA. This maybe because the tools have not been available to the Project Organisation, or may indicate, as noted in Section 8.8.9, a lack of understanding of the principles of Risk Management by the Project Organisation.

Recommendations

- 6.13.7 We recommend that consideration be given to providing safe guards for MA in the event of an issue arising that leads to the termination of W+B's appointment. These could include:
- Collateral agreements from W+B's sub and sub sub consultants,
 - Parent Company and/or Ultimate Parent Company guarantees from a holding company, or
 - Bank guarantees.
- 6.13.8 We recommend that in conjunction with the recommendations contained in Section 8.8 that a QSRA is instigated, and reviewed on a regular basis.
- 6.13.9 We recommend that the consolidated master project programme is fully audited by an external consultant at an early stage to ensure there is no logic or other errors in it and before too much reliance is placed on it by the Project Bureau.

6.14 Best Practice

- 6.14.1 The Project does reflect best practice in planning, programming and scheduling through the use of market leading software in Primavera. In addition, this software is being managed by experts in their field.

The software is not being fully utilised, however, this is likely a result of circumstance, as the initiative to consolidate the individual programmes has only recently occurred and the back up information is not readily available.

- 6.14.2 The Major Projects Association¹² in their seminar on the Jubilee Line Extension project in London state the incremental delivery of transport projects is now recognised as industry best practice. In other words, the historical delivery of this type of project as a "big bang" usually only leads to disappointment when the Opening Date is missed with the associated cost of additional contractor claims, loss of income, and loss of political credibility. The principle of incremental delivery would appear not to have been adopted on this Project. However, given the nature of the contractual issues currently being encountered, consideration should perhaps now be given to this principle.
- 6.14.3 The adoption by designers of ISO 14000 Environmental Management Systems¹³ and ISO 18000 Occupational Health and Safety Management¹⁴ is becoming more prevalent in the United Kingdom and is now recognised as Best Practice. In addition, environmentally conscious clients are also demanding that their advisors are suitably accredited. This adoption is occurring in Europe and internationally. It is also happening, to a degree, in parts of the European construction industry. We understand that this is not the case in the Netherlands, especially for infrastructure projects. Consequently W+B is not accredited to these standards. However, W+B and their sub consultants do comply with the environmental legislation and legislation in the areas of construction safety and health. We believe W+B should give consideration to becoming accredited to these standards, thereby improving the sustainability and environmental status of both their own business and the Project.

¹² The Jubilee Line Extension – 17 November 2000

¹³ The Impact of ISO 14000 – ISO Management Systems, December 2001

¹⁴ Reasons for Implementing OH&S Management Systems – ISAS, 2004

7 CONSTRUCTION CONTRACTS REVIEW

7.1 Introduction

Scope of the contracts review

- 7.1.1 The contracts review has been undertaken using the information identified in Appendix F and Appendix G and from the series of meetings listed in Appendix A.
- 7.1.2 The contracts review considers the key developments in the contracting process from the development of a procurement strategy, through to the practical operation of the contracts placed to date.
- 7.1.3 Ultimately, with the benefit of the experience gained to date, the review looks at the proposals made by the Project Bureau for the updating and improvement of the procurement and contracting process.
- 7.1.4 The contracts review includes analysis and discussion of the following:
- Procurement strategy,
 - Responses received from contractors to the tender enquiries,
 - Modifications made to the procurement strategy following a review of the contractors' tender responses,
 - Responses received from contractors to the revised tender enquiries,
 - Formalised contracts currently in place,
 - Practical operation of the placed contracts,
 - Contracting attitude including claims and resolution of claims,
 - Project Bureau's proposals for improvement of the procurement and contracting process, and
 - Conclusions and recommendations.

Early Tendering Timetable

7.1.5 As will be described later in this Section, the first seven contracts were let over a seventeen month period. This can be summarised as follows:

Contract No	Contract	First Tendering Round 12 December 2000	Second Tendering Round 25 October 2001	Third Tendering Round May 2002
2.2	Immersed Tunnel		O	
3.1/3.2	Centraal Station Entrances, and Passage below Centraal Station		X	
3.3	Damrak Caissons		X	
4.2	Tunnel Boring and Tunnel Boring Machine	O		
5.2	Station Rokin	X	O	
6.2	Station Vijzelgracht	X	X	O
7.2	Station Ceintuurbaan	X	X	O

Where "X" represents the unsuccessful placing of a contract, and

Where "O" represents a successful placing of a contract.

Development of Procurement Strategy

7.1.6 In developing the procurement strategy for the Project, the Project Bureau consulted with third party expert advisors as noted below. This strategy and its evolution, is explored in more detail later in this Section.

Period	Subject	External Advisor
1995 - 1999	Determine procurement strategy	Audit Commission.
1999 – 2000	Procurement of three deep stations and tunnel boring contracts. First review of procurement strategy.	Procurement Advisory Board.
2000	Evaluate first tendering round.	Lloyds & Horvat, NautaDutilh and Procurement Advisory Board.
2001	Evaluate second tendering round.	NautaDutilh and Procurement Advisory Board.
2002	Adjust procurement strategy for Contracts 3.1/3.2 and 5.2 – 7.2.	NautaDutilh and Procurement Advisory Board.

7.1.7 The procurement strategy for the first seven contracts, and the changes brought about by the reviews noted in Section 7.1.6 can be summarised as follows:

7.1.7.1 Initial Procurement Strategy

- Tender Project in parts, and not as a whole,
- Cluster the works on the basis of their geographic position and type,
- Separate contracts for enabling works such as rerouting of roads, services diversions etc.,
- Combine tunnel boring and mitigation works into one contract,
- Utilisation of an Engineering and Construct contract with a Risk Assessment Allocation Catalogue, and
- Provide the opportunity for the contractors to price the three deep stations and the tunnel boring contract either as a whole, or in some combination, thereby allowing the market to define the “best buy” and possible design optimisation.

7.1.7.2 First Revision to Procurement Strategy

- Tender all complex works,
- RAW contract to be adopted,
- Deep stations to be let as separate contracts,
- Tender deep stations as shell only; fit out to be the subject of a later tendering round,
- Limit the number of contractors who can form a tendering joint venture, and
- Provide tendering documentation in English.

7.1.7.3 Second Revision to Procurement Strategy

- Introduction of “shared domain” for Contract 3.1/3.2 where some of the works exceeded a reasonably experienced contractor’s knowledge of specialist works such as jet grouting, vertical micro tunnelling and for sub contractor purchase for specialist works such as diaphragm walling, boring piles etc. and
- Introduction of provisional sums for Contracts 5.2 – 7.2 for tendering diaphragm walls, grouting and groundworks.

7.2 Procurement strategy

Investigation observations

7.2.1 A procurement strategy was developed by the Project Bureau for use in the placement of the contracts for the following.

- Immersed Tunnel IJ (Contract 2.2)
- Passage below Centraal Station, including entrances (Contracts 3.1/3.2).
- Caissons at Damrak (Contract 3.3)
- Tunnel Boring, including tunnel boring machine and mitigating measures (Contracts 4.2 and 4.3)
- Rokin (Contract 5.2), Vijzelgracht (Contract 6.2) and Ceintuurbaan (Contract 7.2) stations.

7.2.2 The main principles underpinning the procurement strategy were the need to achieve a fair distribution of risk between the contracting parties, and the requirement to maintain the opportunity to realise benefits through design optimisation. The procurement principles were observed as being applicable equally to the contracts noted above.

7.2.3 These principles were derived from previous experience of similar projects, most notably the High Speed Train Link (“HSL”). The tender responses received in connection with the HSL identified that imposing high levels of risk upon contractors resulted in correspondingly high tender prices. For this reason, the procurement strategy sought to achieve an allocation of risk which placed Project risks with the party best placed to manage the particular risk.

7.2.4 The procurement strategy included an option for contractor design in an attempt to maintain a competitive element in the design of the Project. It was envisaged that the international contracting market offered a potential pool of experience which could be drawn upon to generate alternative designs which would offer benefits over the design prepared by the Advisory Bureau. The optimum tender offer would be one which optimised the design, fitted within the Project budget, and did not increase MA's risk profile.

7.2.5 At the request of the Project Bureau, an independent panel, consisting of experts in various disciplines relevant to the Project, was convened, with the task of critically reviewing the procurement strategy. Following the review, minor amendments to the procurement strategy were made, but the key principles of fair risk allocation, and design optimisation, were retained.

7.2.6 Having established the principles of the procurement strategy, the Project Bureau took legal advice from ND as to how to ‘capture’ their requirements and transmit this requirement to the contracting market. The Project Bureau was advised to tender the contracts on an engineer and construct basis.

7.2.7 Tender documents were issued to the contracting market which included the opportunity for the contractors to offer alternative designs to those provided by the Advisory Bureau.

Investigation Comments

- 7.2.8 In the context of the Project, procurement is an important strategic activity. The implementation of an appropriate procurement strategy is necessary to support the ultimate objectives of the Project.
- 7.2.9 With regard to the approach to procurement strategy adopted by the Project Bureau, there is evidence that the importance of the procurement strategy has been, and continues to be, appreciated. Clear, strategic decisions were made. The adequacy of these decisions will become clear in due course.
- 7.2.10 The decisions were, in the first instance, made by suitably qualified individuals, and in the second, these decisions were independently tested. Further, the Project was actively promoted by the Project Bureau both before and during the tendering process in an attempt to generate interest from the contracting market. These principles are similar to those expressed in Procurement Excellence¹⁵.
- 7.2.11 The use of an independent committee to review the procurement strategy is a positive action. The Project Bureau included some of the recommendations, including limiting the number of contracts to reduce interface risk, and contractor selection by best value, in the procurement strategy.

7.3 Response to tender enquiriesInvestigation Observations

- 7.3.1 The tender offers received were considerably in excess of the available budgets.
- 7.3.2 In response to the unexpectedly high tender prices, the Project Bureau instigated a review of the budget. The review was undertaken by Lloyds and Horvat. The review concluded that the actual market conditions in which the contracts were tendered were significantly 'harder' than anticipated with the effect of increasing the tender figures by up to 30%.
- 7.3.3 The returned tenders did not reflect the anticipated risk allocation. Section 8.4 provides further information in respect of the contractors' attitude to risk allocation.

Investigation Comments

- 7.3.4 The accuracy of the tender documents in terms of 'capturing' the designed procurement strategy in paper form is not in doubt. The requirements of the Project were transmitted to the contracting market as intended.
- 7.3.5 The budget review carried out following the receipt of tenders considerably in excess of the budget was a positive action. The conclusions reached by the report carried out by Lloyds and Horvat are significant. As a matter of principle, a budget should reflect the market conditions in which a project is to be tendered.
- 7.3.6 The conclusion reached by the Lloyds and Horvat report has merit. However, during the course of the Investigation a further influence has been identified which potentially caused or contributed to, the high tender pricing, see Section 7.4.3. Lloyds and Horvat correctly observed the potential for two other major infrastructure projects, the HSL, and Betuweroute, to have an effect, through market saturation, on the tender prices submitted in connection with this Project.

¹⁵ 'Procurement Excellence' A Guide To Using The EFQM Excellence Model In Procurement 1999, as published by the European Foundation for Quality Management

- 7.3.7 Due to the specialist nature of the Project, and its similarities to aspects of the HSL and Betuweroute projects, it is not unusual that there are contractors who are common, even if the connection only amounts to the submission of a tender, to two, or possibly all three, of these projects.
- 7.3.8 The quantity of work available to the specialist contracting market targeted by the Project potentially dampened the contractors' appetite for competitive tendering. Further, the experience gained by the contractors involved in the HSL and Betuweroute projects should not be overlooked. Whilst the Investigation has not involved consultation with any of the contractors included in the tender process, and consequently it is not possible to present tangible evidence, it is suggested, that through the experience gained on the HSL and Betuweroute projects, the contracting market has developed an unwillingness to accept high levels of risk without attaching high levels of contingency as a safeguard, hence the high tender prices submitted for the Project.
- 7.3.9 Due to the complexity of the Project, a considerable amount of information was shared with the contracting market over a period of several months. Whilst this action was necessary to enable the tendering contractors to obtain an appreciation of the Project, it potentially had the effect of reducing the element of competition as contractors were able to 'pick and choose' which aspects of the works and which risks they were inclined to accommodate. Little incentive existed for contractors to assume significant risks without a sizeable contingency provision.
- 7.3.10 We observed that, following the evaluation of the tenders submitted in connection with Contract 4.2 (TBM), all tenders, with the exception of that submitted by Saturn, the eventual successful contractor, were rejected as unsuitable on the grounds of price. The decision was taken by the Project Bureau to negotiate Contract 4.2 with Saturn. This action was successful to the extent that it resulted in the placement of the tunnel boring contract.

The elimination of all tenderers except Saturn signalled a move away from competitive tendering. In the absence of any incentive, the element of competition was lost from the tender negotiation process, and any commercial incentive for the preferred contractor to reduce the tender offer, bear additional risk, or to introduce further value to the Project was removed. It is evident that over the course of the negotiations, which lasted two years, very little advantage was acquired by the Project in terms of reducing the tender price, reducing MA's risk profile or adding value in other areas.

With the Project Organisation having made a significant commitment to negotiation in terms of time and cost, a factor which the contractor would be aware of, it ultimately became prohibitive for the Project Organisation to withdraw from the negotiations.

- 7.3.11 During the course of negotiating the tunnel boring contract, a proportion of the risk which was intended to be placed with the contractor, was transferred back to MA.
- 7.3.12 Whilst several alternative designs were suggested by contractors, these were not considered appropriate for development and inclusion in the Project. During the Investigation it was suggested that the option for contractor design was not realistic. Having taken approximately six years to prepare the original design it was considered, in retrospect, to have been unrealistic to expect the contractors to develop suitable, robust, alternative designs within a six month tender period.

7.4 Modification of procurement strategy

Investigation Observations

- 7.4.1 With the exception of the tunnel boring contract the decision was taken to re-tender the contracts.

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- 7.4.2 Consultations were held with the tendering contractors in an attempt to identify the underlying reasons for the high tender prices.
- 7.4.3 The exercise revealed that one of the key contributors to the high tender prices was the risk perceived to be associated with the remoteness in time of certain work elements. The contractors identified that elements of the work, including mechanical and electrical services and station fit out, were so remote from the date of tender that they considered there to be a very significant risk inherent in the pricing of these items of work. Consequently, the scope of the tenders offered was reduced reflecting the removal of these work packages. These packages will be tendered separately at a future date.
- 7.4.4 The option for contractors to suggest design alternatives was removed from the tender requirements and the RAW form of construction contract was included in the procurement strategy.

Investigation Comment

- 7.4.5 The decision to review the procurement criteria in the light of the tender responses received was a positive one. The Project Bureau retained confidence that the budget available was robust, and consequently needed to identify the reason for the high tender prices.
- 7.4.6 The identification of remoteness, and in particular the contractors' attitude to exposure to price increases, of certain work elements as a contributor to the high tender prices is significant. The risk associated with these elements, including the procurement of contracts within the available budget, remains with MA. The robustness of the available budget to support the procurement of these elements of the work is considered further in Sections 0 and 1.
- 7.4.7 The effect of market conditions, as observed by the Lloyds and Horvat report, does not appear to have driven any change in the procurement strategy.

We have observed, as noted in Section 7.3.2, that market conditions contributed to the high tender return prices. It is not evident what measures are incorporated within the procurement strategy adopted in respect of the remaining contracts to ensure that tenders are presented to the contracting market at the optimum time.

7.5 Response to revised tender

Investigation Observations

- 7.5.1 Contracts 2.2, 3.3 and 5.2 were placed within budget.
- 7.5.2 The tenders submitted for the remaining contracts, 3.1, 3.2, 6.2 and 7.2, were approximately 20% over budget.
- 7.5.3 Contract 3.1 / 3.2 was offered to the market for a third time, with design alternatives requested. Through a combination of design optimisation and provisional sums the contract was procured within the budget available.
- 7.5.4 Contracts 6.2 and 7.2 were offered to the market for a third time. Through the introduction of provisional sums the contracts were procured within the available budget.

Investigation Comments

- 7.5.5 The use of provisional sums to facilitate the procurement of contracts within available budgets creates a potential problem. There is evidence, for example the diaphragm walls and jet grouting in contracts 3.1 / 3.2, 5.2, 6.2 and 7.2, that the risk presented by some elements of the works have been 'bought back', in the form of a provisional sum, by MA. It is possible that the true value of these risks is in excess of the provisional allowances available. Consequently, the conclusion that these contracts were procured within budget may ultimately prove not to be the case.
- 7.5.6 The Investigation has identified that, in practice, the management and construction of the items covered by the provisional sums has proved to be difficult. A significant number of variations, many of which carry implications in terms of additional time and cost, have been claimed by the contractors for contracts 3.1 / 3.2, 5.2, 6.2 and 7.2. There exists a material risk that the provisional sums available will be exceeded. Project Bureau acknowledges this situation and has therefore provided a higher level of management for these contracts.

7.6 Contracts placedInvestigation Observations

- 7.6.1 Contracts 2.2, 3.1 / 3.2, 3.3, 5.2, 6.2 and 7.2 have been placed on the basis of the RAW form of contract. The RAW form of contract was not the form on which the original procurement strategy was based. The change to RAW reflects the general trend of contractors' adversity to risk and the inability to offer design alternatives on a scale offering any significant advantage to the Project.
- 7.6.2 Contract 4.2, tunnel boring, has been placed on the basis of a bespoke, engineer and construct contract. The engineer and construct form of contract was not the form on which the original procurement strategy was based. The change to engineer and construct reflects the lack of opportunity for contractors to provide a 'design' for the tunnel boring.
- 7.6.3 During the tender process, including those contracts which were ultimately agreed through discussion between the parties to resolve outstanding issues, the terms and conditions of contract were agreed pragmatically with reference to the principle that the party most able to manage a risk should bear the risk.
- 7.6.4 The original procurement strategy envisaged that the contractors would assume the majority of the risks with only the extremes being the responsibility of MA. It is acknowledged (Refer to Section 8.4.5), that MA bears more risk than originally intended. Measures were taken during the tender and negotiation period, to track and identify the allocation of the risk prior to agreement of contracts.

Investigation Comment

- 7.6.5 In principle, the RAW form of contract is an appropriate form for use on the Project. The RAW form is a commonly used form of contract in the Netherlands offering a high degree of certainty in its practical application.
- 7.6.6 In practical terms, the implication of using the RAW form of contract, as opposed to a contractor design form, is that responsibility for the management and design of the works lies with MA rather than the contractor. Where resource, including both available budget, and personnel, are available, then the RAW form of contract may be employed for the successful delivery of the Project.

- 7.6.7 The Investigation has identified a fundamental shift, from the original principles of a procurement and contracting strategy based on contractor design and management, to an actual contracting structure based on employer design and management. The roles and responsibilities of the respective contracting parties have changed, such that MA's scope of responsibility is now wider than anticipated, with a consequently greater risk profile, and conversely, the role and risk of the contractors, has narrowed and reduced. There exists a material risk that where construction budgets are not revised to reflect the actual nature of the contracting structure, any comparison between the cost to procure a particular contract and the budget available may not be valid. Whilst the cost to procure a contract may remain as budgeted, the value procured for that cost may be reduced. Similarly, the budget available for the design and management of the project may remain the same, yet be required to deliver an increased scope of work for the designers which will result in higher VAT costs.
- 7.6.8 Notwithstanding the foregoing, by the use of the RAW contract, the Project Bureau has endeavoured to better manage the risks transferred to MA associated with the contracts by fully designing those items of work not covered by provisional sums.
- 7.6.9 The engineer and construct form of contract used for the tunnel boring contract, is an appropriate form given the bespoke nature of the tunnel boring contract. Whilst this form of contract is appropriate, it is important to recognise that neither the contracting parties nor the judicial system have the practical benefit of previous experience where a bespoke form of contract is used. Establishing the operation and precedence of contracts develops, through use over time, with the effect that standard forms of contract can be operated in practice with a high degree of certainty. Bespoke contracts lack the element of certainty and frequently prove to be fertile grounds for dispute.

7.7 Practical operation of the placed contracts

Investigation Observations

- 7.7.1 A formal approach to the practical application of the contracts has been adopted by the Project Bureau and the Advisory Bureau. The contracts are strictly interpreted and applied.
- 7.7.2 The contracts currently in place offer a practical mechanism for contract administration.
- 7.7.3 The contractors have claimed a large number of variations to date.
- 7.7.4 The contracts contain a variation procedure. Evidence demonstrating compliance with this procedure has been provided during the Investigation. A large number of the variations relate to changing environmental or surrounding factors, including the conditions relating to permits, which influence the mode of carrying out the construction work. Refer also to Section 10.
- 7.7.5 A significant number of claimed variations, with time and cost implications, remain un-agreed at present. There do not appear to be adequate procedures in place to facilitate resolution of claimed variations which are disputed.
- 7.7.6 The seat of authority under the contract is not clear. The project organisation structure suggests that the Contractmanagers are the contract administrators, whereas in practice this role is exercised in part by the Bouwmanagers. This shared responsibility is also dealt with in more detail in Section 5.
- 7.7.7 Contract 3.1 / 3.2, Passage Below Centraal Station, including Entrances, is experiencing difficulties as a result of the interface with ProRail.
- 7.7.8 The contractors' attitude to claims for additional time and payment are generally assertive.

Investigation Comments

- 7.7.9 Whilst a contract is placed to record the agreement reached between the contracting parties, and it may be argued that the contract should be rigidly applied, the practical operation of a contract may benefit from some carefully applied discretion. For example, the Investigation has identified a tendency to treat every claim to a variation on its individual merits. When administering a contract, particularly where a large number of variations are involved, this approach can become stifled in the small detail, making the variation process arduous, expensive, and ultimately confrontational. Assessment of entitlements under a contract is rarely a clear cut matter and usually requires some degree of interpretation. Some claims are 'strong' and some are not so 'strong'. For this reason, it is important to retain a degree of objectivity and attempt to resolve as many of the matters arising under the contract as work progresses. To achieve this, it is often useful to take a higher level view, and, particularly where there are a number of inter-related matters, administer these as a whole rather than on an individual basis. Negotiation can deliver real benefits in terms of reduced cost, time and maintenance of good working relationships.
- 7.7.10 In practical terms, it is desirable that a contract provides a mechanism for the administration of all matters arising under that contract. Where a contract is unable to deal clearly and directly with an issue arising, the potential for disagreement, and ultimately dispute, is increased. We have reviewed, with the Bouwmanagers, Contractmanagers and the Contracts Controller¹⁶, matters arising under the contracts to date. It is a positive observation that, to date, the contracts placed have proved an adequate tool for administration of matters arising.
- 7.7.11 With respect to the large number of variations claimed to date by the contractors, it is evident that there are several common factors which contribute to the high incidence of variation claims. At a simple level, the change from a contractor design form of contract to the RAW form cannot be ignored. As a general rule, the contractors bear less risk than was envisaged by the original procurement and contracting strategy. Consequently, it is a simple matter of probability that some risk items, whether foreseen or unforeseen, are encountered in practice, and where this is the case, the matter generates variations, many of which fall for payment by MA.

¹⁶ Refer to Section 6.6.21 for further information on the role of the Contract Controller

7.7.12 At a more detailed level, we have reviewed evidence that identifies the following as major contributors to the high incidence of variation claims.

- The 'surrounding' or 'environmental' conditions which affect the mode of carrying out the work are described in the RAW contracts. In practice, and the effects of the permitting process should be recognised here, these conditions have been different from those described in the contracts. The change in conditions has frequently been to the detriment of the contractors, affecting the mode of working and restricting the contractor's execution of the works. In addition, the contractors' requirement for working extended hours has also had an effect on this matter.
- The conditions attached to permits, particularly those issued by the local Boroughs, have also contributed to the high incidence of variations. More details of the permitting process, and the matters which have contributed to the claims for variations by the contractors, are provided in Section 10.6.3.
- At an individual contract level, we have observed an actual problem in respect of contract 3.1 / 3.2, Passageway below Centraal Station, including Entrances. The interface between the Project Organisation and ProRail has been described during the Investigation as difficult. The obligations placed upon MA in respect of this contract have affected the scope of the contractors' works and the mode of execution. Consequently, a large number of variations have resulted. There exists a material risk that, if left unchecked, this observed difficulty will continue to give rise to significant numbers of variations with cost and time implications. Further details of this interface are also provided in Section 6.4.4.

7.7.13 A significant number of the claims to variations raised to date are not agreed. The settlement of these matters may have a significant impact on the time and cost to complete the Project. We have reviewed the procedure for the management and ultimate agreement of variations. The contracts placed contain a detailed procedure for processing claims to a variation. Evidence has been provided during the course of the Investigation which identifies that this procedure is followed in practice. We have observed that, whilst a detailed system of discussion and negotiation takes place, the contracts do not provide for any interim form of dispute resolution. Consequently, there are a number of claimed variations which have escalated through the various levels of discussion and negotiation, starting at Contractmanager level and ending up at Project Bureau Director level, yet remain unresolved. There is a material risk that in the absence of an interim forum for resolution of these matters, a significant number of variations will accumulate pending final resolution through arbitration. The eventual resolution, through arbitration, of these disputed variations may have a significant effect on the cost of the Project.

7.7.14 The practical exercise of the authority available under the contract is not clear. From the organisational structure of the Project it appears that the Contractmanagers employed by the Advisory Bureau would exercise this responsibility. In practice, the actual exercise of the authority appears to be split, with Contractmanagers acting in respect of routine matters, and Bouwmanagers in respect of more complex or disputed matters. Further details of this relationship are provided in Section 5.6.9.

7.8 Proposals for improvement of the procurement and contracting procedures for use with future contracts

Investigation Observations

7.8.1 The following are the principles on which the Project Bureau intend to develop their procurement and contracting strategy:

- Continued use of the RAW form of contract when appropriate,
- Procurement to be based on competitive tendering rather than negotiation,
- Disputes referred to Court rather than arbitration,
- Issue smaller contract packages,
- Restrict the number of companies that can form joint ventures in submitting a tender offer,
- Keep procurement and contracting processes as simple as possible, and
- Seek tender offers from contractors experienced in working with the Dutch permitting system.

Investigation Comments

7.8.2 Our comments in respect of future proposals will be discussed in the form of recommendations.

7.9 Conclusions and Recommendations

Procurement Strategy Conclusions

7.9.1 A procurement strategy was developed for the Project. This initiative was lead by the Project Bureau and contained clear strategic direction for the procurement operation designed to facilitate the achievement of the objectives of the Project.

7.9.2 The procurement strategy was independently reviewed by a panel of experts, who, through the range of disciplines, held an understanding of the Project and the procurement objectives.

7.9.3 The procurement strategy was communicated within the Project and resources were made available to manage the procurement process.

7.9.4 The procurement requirements of the Project were transmitted accurately to the contracting market.

7.9.5 The tender offers received were considerably in excess of the available budget.

7.9.6 The presence of other major infrastructure projects available to the target contracting market appears to have been a major factor causing the tender offers to exceed the budget. The specialist contracting market targeted by the Project Bureau was potentially saturated with work at the time of tender. This factor, combined with contractors' increasing experience gained through similar work, had the effect of decreasing contractors' appetite for the competitive pricing of high risk work. Consequently, the work was priced at a higher level than anticipated, a feature which was compounded by the high level of contingency attached to the elements of the work perceived as high risk by the contractors.

- 7.9.7 The tender strategy was reviewed and amended in an attempt to remove or mitigate those factors which contributed to the high tender prices. Consequently, the change in the procurement strategy lead MA to assume risks which were previously intended to be placed with the contractors, thus increasing MA's overall risk profile.
- 7.9.8 For the placed contracts, the form of contract upon which the procurement process was ultimately concluded is fundamentally different from that envisaged by the original strategy. The high tender pricing levels were, to a large extent, a key driver of this change. The change in form of contract is reflected by a directly corresponding increase in the management responsibility and risk borne by MA.

Procurement Recommendations

- 7.9.9 Future procurement would benefit from continuation of the established practice of developing, testing, and communicating, clear, strategic, procurement requirements. Similarly, the practice of carrying out key stage reviews should be continued.
- 7.9.10 Market conditions must be reflected in budgets and forecasts.
- 7.9.11 The principle of achieving reductions in tender prices through the introduction of provisional sums and contingencies, represents in practice, risk transfer from contractor, back to MA. Whilst this course of action may appear to offer a commercial advantage at the point of placing a contract, difficulties associated with the management of provisional sums have already been observed in practice. It is possible that the time and cost associated with the provisional work, may ultimately exceed the level at which the contractors were prepared to accept this risk. Consequently, this procedure should be treated with extreme caution.
- 7.9.12 The RAW form of contract is more resource intensive to administer than a contractor design form of contract. It should be ensured that the available budget will support a procurement and contracting strategy based on administering (professional fees) the works under RAW.
- 7.9.13 The inability to describe accurately, under the RAW form of contract, the surrounding environmental conditions which will affect the mode of execution of the work adopted by the contractor, should be addressed. It is vital that the contract documents contain an accurate description of these conditions. Whilst the Project is large and complex, the opportunity exists to review individual contracts, and attempt to define the surrounding environmental conditions in detail. Whilst we recognise that this task is not simple, there is a material risk that significant numbers of variations, carrying implications of additional time and cost, will continue to arise.

Contract Strategy Conclusions

- 7.9.14 The contract strategy has undergone a fundamental shift, from the use of a contractor design and construct form of contract, to an employer design and manage form.
- 7.9.15 The contract procedures are followed very closely by the Project Bureau and the Advisory Bureau.

- 7.9.16 In the view of the Bouwmanagers and the Contractmanagers the contractors' attitude towards claims for additional time and payment is very assertive.

Where a claim of entitlement to a variation is made by a contractor, the Advisory Bureau prepares a "position statement" confirming whether, under the contract, the claim represents a valid variation. We have observed that, where a claim to a variation is not agreed, the contractor is advised of the refusal and the grounds on which it is refused. Following the presentation of the "position statement" by the Advisory Bureau to the contractor, the contractor is requested to formally agree that the claim is not a variation. In the majority of cases, even where the grounds for refusal are strong, the contractors do not agree to the rejection of a claim.

- 7.9.17 The combination of the employer's contractual responsibilities, the difficulties experienced in respect of defining the surrounding conditions affecting the mode of execution of the works, and the changes in permit conditions, together with the assertive approach adopted by the contractors, has led to a high incidence of claims for additional time and payment.

- 7.9.18 On an individual contract basis, Contracts 3.1 / 3.2, Passageway below Centraal Station, including Entrances, has to date experienced serious difficulties due to the interface with ProRail and VOFS. Further detail is provided at Section 7.7.12.

- 7.9.19 The procedure for resolving disputes arising under the contracts is not robust. Where negotiation has failed to achieve settlement of a disputed matter, the next step is to refer the issue to arbitration. A decision in arbitration may be some years remote from the date on which a dispute comes into existence. Consequently, there arises, during the interim period, an obligation to maintain relevant records and information, and where possible the key staff members necessary to support the resolution of the dispute. Maintenance of these factors may prove to be an onerous burden. Further, whilst a dispute remains current, an element of uncertainty exists. As the Project is complex and, constructed over several years, it is natural that disputes will arise. If the disputes prove to be numerous, the potential for the project carrying a correspondingly sizeable uncertainty factor for several years exists. Ultimately, resolution of disputes in arbitration may have a significant effect on the actual cost of the Project.

Contract Recommendations

- 7.9.20 The proposal to continue to use the RAW form of contract in connection with the contracts to be let in the future is appropriate in principle. To support this principle in practice it is recommended that the comments in Section 7.9.17 are addressed.
- 7.9.21 It should be recognised that the RAW form of contract is different, and potentially more intensive, from the perspective of the Project Bureau and the Advisory Bureau, to administer. The available resources, including the available budget, should be reviewed and revised where necessary, in the context of this fundamental change in contracting strategy. This observation is potentially compounded by the assertive stance displayed to date by the contractors. For this reason it is recommended that the comments in Section 7.9.17 are addressed in order to limit MA's exposure to claims for additional time and payment.
- 7.9.22 The detailed and thorough compliance with the variation process, which has been observed to date, should be continued.
- 7.9.23 When reviewing claims of entitlement to variations submitted by the contractors, the possibility, where this is commercially attractive, of concluding a number of related claims should be considered.

- 7.9.24 The exercise of authority under the contract would benefit from confirmation or clarification. If the exercise of authority is to be split between Bouwmanager and Contractmanager, a clear procedure may prove beneficial.
- 7.9.25 The position, and operation of contract 3.1 / 3.2, Passageway below Centraal Station, including Entrances would benefit from a separate review. The objectives of the review would include, but not necessarily be limited to, resolution of current disputes, clarification of the various roles and responsibilities, a review of the management procedures in place and a commitment to co-operation between all parties and stakeholders.
- 7.9.26 The introduction into the contracts of a dispute resolution mechanism may offer real benefits. The current dispute resolution procedure facilitates uncertainty. Certainty of time and cost offers advantages to both MA and the contractors, and should be viewed as a positive objective. Whilst it is recommended that negotiation of settlements remains the primary method of dispute resolution, other alternatives include:
- Mediation,
 - Conciliation,
 - Expert determination by an independent expert,
 - Neutral evaluation, and
 - Adjudication.

7.10 Best Practice

- 7.10.1 Our comments on contract best practice should be considered next to the corresponding sections under the headings of cost and risk.
- 7.10.2 The procurement strategy will continue to benefit from:
- Clearly recognised and defined objectives,
 - Communication of these objectives to relevant team members,
 - Communication of these objectives to the contracting market,
 - A critical review of contractors' tenders with the procurement objectives, and
 - Revision / improvement of the procurement strategy to reflect opportunities identified during the procurement process.
- 7.10.3 We recognise the proposal made by Project Bureau to treat the procurement of the remaining contracts on an individual needs basis. Project Bureau has formulated a high level strategy which recognises the requirement to select a form of contract which best matches the procurement objectives. The policy identifies a need to identify a form of contract best suited to the requirements of individual contracts. The strategy identifies that contracts comprising, civil engineering works, mechanical and electrical services, architectural fit out and track electrification works, require individual assessment of the most appropriate contract form. In this respect the strategy formed by Project Bureau reflects good practice. The strategy requires the support of appropriate resource and should be reviewed at key points, including tender analysis, to ensure that the procurement progress is on target to achieve the objectives.

7.10.4 The procurement and contracting strategy may benefit from:

- Information gained from experience of the procurement of previous contracts, including but not limited to, the effect of the failure to define the general conditions which affect the mode of work execution by the contractors, should be used to improve procurement, and
- Prompt resolution of disputed claims, would be assisted by the inclusion in the contracts of an interim, possibly binding, form of dispute resolution, typical forms of which include:
 - Mediation,
 - Conciliation,
 - Expert determination by an independent expert,
 - Neutral evaluation, and
 - Adjudication.

8 RISK MANAGEMENT

8.1 Introduction

8.1.1 Our risk management review considers the Risk Management processes in place on the Project and considers them in relation to practices we have observed on other projects which we consider comparable.

8.1.2 Our review has been undertaken through a number of meetings with the Project Bureau's Finance and Planning Manager and Bouwmanagers, and the Advisory Bureau's Project Definition Risk Management Manager and Contractmanagers and by reviewing appropriate documentation as listed in Appendix G.

8.1.3 We have considered the key developments in the application of risk management on the project from approximately 1994 through to the present day.

8.2 Risk Management Overview

8.2.1 We have set out below the general features which a comprehensive Risk Management strategy should encompass in order to establish a common understanding of the matters which will be addressed in this section of the report.

8.2.2 A Risk Management Process Model should contain the following basic elements;

- **Identification** - interviews, workshops, prompt lists, historical data,
- **Assessment** - classification, consequences, risk register, qualitative assessment, rank and
- **Management**
 - Action - identify owner, mitigation plans (or treatment plans), action lists,
 - Review - update actions and progress, identify change in circumstances, identify new risks, update model(s), and
 - Close out - absorbed into other risks, event passed, permanently transferred, 100% insured against.

8.2.3 It is important to recognise that Risk Management is the whole process described above and that a weakness in any of the elements will reduce the effectiveness of the whole.

8.2.4 Definition of terms used in Risk Management and in Risk Analysis:

- Risk Register - A register of information listing all the risks identified for the project, explaining the nature of each risk and recording information relevant to its assessment and management. The register may be a simple list, a spreadsheet or a relational database.
- Mitigation or Treatment Plan - The current proposals for reducing the likelihood of a risk occurring or reducing the impact of a risk should it occur, its management, specific actions required, and by whom, and identification of the best party to manage the risk.
- Fall Back or Contingency Plan - A plan for an alternative course of action to minimise the impact and consequences of the risk should it occur. This includes an evaluation of any tasks necessary to render the plan practical - including their costs.
- Residual Risk - The amount of risk that is left after the mitigation action. The mitigation plan may reduce, or eliminate the risk in its entirety. The effectiveness and value of a particular mitigation plan can be determined by the amount of Residual Risk.
- Qualitative Risk Assessment - A method of measuring risks against a number of criteria in order to efficiently assess the likelihood that the risk will impact on the objectives of the project, combined with an estimation of the actual impact should the risk occur. Assessment criteria may include, amongst others, the effect of the risk of exceeding Time (Programme), exceeding Cost (Budget), negatively affecting Quality, negative effect on Reputation and increased Health and Safety exposure.
- Quantitative Schedule Risk Analysis - An analytical simulation technique used to determine the combined outcome of risk and uncertainty on programme objectives.
- Quantitative Risk Analysis or Cost Quantitative Risk Analysis - An analytical simulation technique used to determine the combined outcome of risk and uncertainty on a Cost Plan. It is sometimes referred to as Cost QRA.
- Risk Analysis. - This term includes:
 - Quantitative Schedule Risk Analysis, or
 - Cost Quantitative Risk Analysis, or
 - Both Quantitative Schedule Risk Analysis and Cost Quantitative Risk Analysis.
- Risk Profile - This term includes:
 - The risk characteristics of a project which can be interpreted from the shape (or profile) of the graphical output(s) of a Quantitative Risk Analysis, or
 - The risk characteristics of a project which can be determined using a Qualitative Assessment of the risks.

The Practical Application of Risk Management

- 8.2.5 Preliminary assessment of risk should be used for the purpose of confirming the viability of a project. The process is used to highlight projects with an unacceptable level of risk and may therefore be considered nonviable.
- 8.2.6 Risk identification and assessment is used for the purpose of establishing the Risk Profile of the project so that the quantity and impact of risk can be understood by the stakeholders prior to committing to the project.
- 8.2.7 Analysis of risks is used to determine whether mitigation and / or transfer of risk is cost effective. This may include investment to better quantify risk by the means of feasibility studies or site tests.
- 8.2.8 Risk information can be used to help determine a procurement strategy which allows appropriate allocation (through transfer) of risk. Reappraisal of the Risk Profile of the project would need to be undertaken if the optimum allocation of risk is compromised.

- 8.2.9 Ongoing risk identification processes, assessment and management will facilitate the early identification of risk to enhance opportunities for mitigation.
- 8.2.10 Risk Analysis' results are used to determine a robust Risk Management Plan.
- 8.2.11 Ongoing Qualitative Assessment of risks to show movement in the criteria identified as being critical to the success of the project and thus focus resources to mitigate and plan to improve likelihood of success. The results of Qualitative Assessments are used to compile the Risk Register. 'Heat maps' are often used to present the Risk Profile of the project at any one point in time. The maintenance of the Risk Register(s) is key to the successful management of risk as it clearly defines the risk, and sets out the actions which have been identified, who is responsible for those actions, and the timescales for completion. The Risk Register is a dynamic tool and therefore needs appropriate processes to maintain its integrity.

8.3 History of Risk Management on the Project

- 8.3.1 We understand that in 1994, it was widely believed that it was very difficult to undertake tunnel boring within Amsterdam. Studies supported this belief. International experts from Germany, England and the Netherlands were consulted to establish if tunnel boring could be undertaken in Amsterdam using Tunnel Boring Machines. A Design Report¹⁷, was produced which stated that a Tunnel Boring Machine could indeed be used within Amsterdam to create the tunnels for the Project. It was apparent, even at this early stage, that Risk Management would be a key discipline in the delivery of this Project.
- 8.3.2 Because Central Government and MA were to fund the project, they wished to gain confidence in the design method. Because neither Central Government nor MA had the expertise to judge the design, an independent review¹⁸ of the project was undertaken.
- 8.3.3 During Autumn 1996 a risk exercise was undertaken to consider the risks which were faced by the Project at this point in time, together with a look ahead at the risks which would potentially impact during the execution phase of the Project.
- 8.3.4 The risks were identified using interview techniques and the following parties were consulted in the process:
- A Consultant, Twijnstra Gudde, advised on (management) processes,
 - Central Technical Office of Department for Waterways (Bouwdienst Rijkswaterstaat),
 - The Advisory Bureau in the role as design party, and
 - The Project Bureau.
- 8.3.5 A qualitative assessment of the risks was undertaken using the following criteria:
- Time,
 - Cost, and
 - Quality.
- 8.3.6 We were informed that Quantitative Schedule Risk Analysis was undertaken on the high level programme at this stage.
- 8.3.7 In 1995, funds were made available for risk analysis and site tests as part of the studies undertaken for the report entitled "Request for a Subsidy for Main Route North / South Metroline" ("Aanvraag rijksbijdrage kerntracé Noord / Zuidlijn") submitted on 29 June 1998 to Central Government.

¹⁷ Schetsmatig voorontwerp

¹⁸ Government Design Bureau – "Bouwdienst Rijkswaterstaat"

- 8.3.8 The study built on the findings of the previous studies with much emphasis being placed on the technical problems facing the Project. This emphasis was intended to help the decision of who should bear the risks, Central Government or MA.
- 8.3.9 The report referred to in Section 8.3.7 makes reference to a contingency of NLG330M (€150M). This figure was 25% above the standard amount applied in these circumstances. This was the Government contingency which was added to the base estimate. The contingency amount was determined using Quantitative Risk Analysis. Large value losses were not included in the analysis due to their low probability. It is normal practice to omit very low probability, catastrophic risks from Quantitative Risk Analysis due to the fact that they will generally only impact on the extreme results of the analysis which are usually disregarded in any case. Notwithstanding this, these risks must be clearly identified and communicated to project stakeholders to allow them to make informed decisions regarding the viability of a project. Once the project is sanctioned these risks require close monitoring and reviews due to their catastrophic nature.

8.4 Risk Management in the Context of the Project Procurement Strategy

- 8.4.1 The Project Bureau recognised that fundamental to their procurement strategy was the need to place risk with the party best placed to manage the particular risk.
- 8.4.2 We understand that it was the general philosophy of the Project Bureau to transfer a reasonable amount of risk to the contractor with MA retaining only the extremes.
- 8.4.3 In order to set out the division of risk in a formal manner within each of the contracts, previous risk reports and expert input, as noted in Section 8.3, were used to produce Risk Assessment Allocation Catalogues ("RAAC"). These were in essence lists of specific technical considerations for the contractors.
- 8.4.4 During negotiations with the contractors it became apparent that they were not willing to accept risk without being paid what the Project Bureau considered to be disproportionate remuneration.
- 8.4.5 The tender clarification phase resulted in a greater retention of risk by MA than had been previously envisaged. The MA risk profile exceeded that which had been represented in the Cost Estimate produced to justify the request for subsidy, as noted in Section 8.3.7.
- 8.4.6 For the deep station contracts the contractor priced the main cost items but qualified the tender in order to avoid the transfer of risk from MA. Again this presented the Project Bureau with a high price for a reduced scope.
- 8.4.7 The RAACs were withdrawn from the Invitation to Tender documentation for all the contracts other than the Tunnel Boring Contract.
- 8.4.8 In order to agree apportionment of risk, workshops were held with contractors during the tendering process. This was in lieu of the intention of RAACs.

8.5 Risk Management by the Project Organisation

- 8.5.1 We have reviewed the methods used by the Project Bureau to implement Risk Management.
- 8.5.2 We understand from the Project Bureau that Risk Management is intended to be part of the "ethos" and culture of the Project Organisation.

- 8.5.3 We further understand that Risk Management is an integral part of the responsibility of the Advisory Bureau's Contractmanagers. However, the Contractmanager for Contract 4.2 stated that the manager of the Advisory Bureau's Project Definition and Risk Management Department is coordinating all the risks for Contract 4.2.

There is a degree of confusion around the role of the Project Direction and Risk Management Department in the Project Organisation, as the description of this Department's responsibilities, as noted in Section 6.6.19, is at odds with the responsibilities noted above.

- 8.5.4 In May 2003, following a decision to self insure, a special team was formed by the Advisory Bureau called the "Risk Monitoring Team" under the leadership of The Manager of the Advisory Bureau's Project Direction and Risk Management Department. The Advisory Bureau is of the opinion that this team performs the function of Risk Management and that a risk database was created to support this function.

- 8.5.5 We have reviewed the example risk database (hard copy output) provided by the Project Bureau. The example database is dated 17 September 2004.

We would make the following observations on this document:

- It contains the components of a risk register
- The Contractmanagers are stated as the "Risk Owners",
- The "Urgency" field within the database contains only "urgent" or "attention",
- It is not apparent if the "Urgency" field refers to the imminent nature of the risk, the urgency of the identified mitigations or a reference to the relative severity of the risk,
- The mitigations do not appear to have specific action dates and as such progress cannot be readily monitored,
- The mitigations often make reference to "monitor" and it is our experience that mitigation plans should relate to specific actions and completion dates, and
- There is no apparent detailed Qualitative Risk Assessment included and as such it is not clear if the "Urgency" field is consistent with the relative severity of the risk. A Qualitative Risk Assessment would allow a ranking of the risks and therefore assist with prioritisation.

- 8.5.6 We are advised that lessons were learnt from the HSL and the Betuweroute projects through a paper which was issued by the Minister for Traffic and Waterways to the Second Chamber of Parliament. This paper was forwarded to the Project Bureau. These lessons were as follows:

- Quantify risks before making decisions,
- Estimate a range of uncertainty, and
- Transparency in scope changes.

- 8.5.7 The Project Bureau explained that they categorise risks as follows:

- Legal risks (including permits),
- Organisation – management,
- Technical Risk – technology in carrying out the project,
- Physical Risks – e.g. below ground obstructions,
- Financial – inflation and uncertainty of Third Party Income, and
- Environment – regulating authorities, business interruption and the citizens of Amsterdam.

8.6 Project Bureau Risk Management in practice

8.6.1 There is evidence which demonstrates that strategic risk management is being implemented in order to manage high level Project risks to reduce the Risk Profile of the Project. Some examples of these are set out below.

8.6.2 IBB Methodology in design. (The Advisory Bureau utilise their own risk management practice, Inventarisatie, Beheersmaatregelen en Back-up (“IBB”). This is listing the risks, defining and implementing control measures, and identifying back up measures):

- Risk assessment techniques were used to develop the design and avoid “Dead End Engineering”. In practice this is the formulation of successive back up measures to give security in project progress,
- The methodology is more technically judged than financially,
- The IBB methodology does support Risk Management to the extent that it mitigates risk in design, and
- The cost plan reflects the mitigation and fall back costs identified during design in accordance with the IBB methodology.

8.6.3 Contract 4.3 (Monitoring Contract).

- The risks associated with damage to property during the construction of the Project were considered to be significant, and a Monitoring Contract (Contract 4.3) was placed specifically as a mitigation measure. This contract allows real time monitoring of ground movement during construction thus allowing progress to be halted and changes in construction method instructed to mitigate any damage to property. This represents a significant mitigation investment for the Project.

8.6.4 ‘Risk Control Plus’ concept.

- This management function ensures that the risk profile of the project does not alter for the purpose of Construction All Risks insurance (CAR). Risk Control Plus monitors the execution of the construction works to ensure that construction methods are not altered without due regard to the Risk Profile of the works.

8.6.5 Permit System.

- Considerable investment has been made in terms of resources and procedures to mitigate the risk of failure to obtain permits for the Project. These are described in more detail in Section 10.2. This is an example of the best placed party managing a risk.

8.6.6 Large Scale Site Tests.

- Large scale site tests were undertaken to prove certain construction methods and also test known methods in the actual environment where the works would take place. Trials of deep diaphragm walls were undertaken to a depth of 33 metres. Pile tests, grout tests and tail split injection tests were also undertaken. The large scale site tests provided a test of buildability (“maakbaarheid”) and therefore provided some certainty in the method of construction. The tests also assisted in the understanding of the residual risks associated with the adopted method.

8.6.7 Disaster Plans.

- Disaster plans (Calamiteitplannen) have been prepared by the Advisory Bureau together with the Project Bureau. They have been developed in consultation with MA and are fully integrated with MA’s disaster plans.

8.7 Front Line Risk Management

- 8.7.1 We have set out some of the more strategic applications of Risk Management on the Project in Section 8.6. Set out below are our findings with respect to low level implementation of Risk Management.
- 8.7.2 When the RAACs were withdrawn from the schedule of enquiry documents, this was done to enable the Project Organisation to compare the tenderers' lists of risks with those that the Advisory Bureau had prepared.
- 8.7.3 There is a plan within each of the contracts called Accessibility, Liveability and Safety (Bereikbaarheid - Leefbaarheid en Veiligheidsplannen) ("BLV"). We were informed that these plans detail all the risks which were on the withdrawn RAACs.
- 8.7.4 Method statements are produced by each contractor two months ahead of the relevant work and these include some risk assessment.
- 8.7.5 Fall back plans are recorded in the contractors' "Draaiboeken". We were informed by a Contractmanager that the contractors are not working proactively on the "Draaiboeken".
- 8.7.6 The dienst Milieu en Bouwtoezicht ("DMB") and Boroughs dictate the conditions of the permits to work and therefore this agency is responsible for checking the working plans, action plans and monitors performance of the plans.
- 8.7.7 Supervisors' Checklists (toetsingmetinglist) details the risks identified, the method statements, and the environmental risks.
- 8.7.8 During the Investigation a Contractmanager expressed the opinion that it is not necessary to define the risks for the contractor as it is better to make it absolutely clear that the design is handed over to the contractor and review the risks he identifies by cross checking against the RAACs.
- 8.7.9 We understand that there is a contractual obligation on the contractors to provide risk inventories and detailed method statements which contain preventive and proactive risk mitigation measures.
- 8.7.10 The Advisory Bureau's Project Direction and Risk Management Department and the Damage Bureau with its Risk Control Plus team supervise the contractors' activities as noted in Section 8.7.9.
- 8.7.11 The Project Bureau suggested that they have confidence in the contractors' procedures for risk management because the contractors are ISO 9001 certified and the Project Bureau audit their procedures. We did not establish whether the scope of certification extended to Risk Management.

8.8 Conclusions and Recommendations

Conclusions

- 8.8.1 Prior to construction commencing, there appears to have been a broad understanding of some of the concepts of Risk Management. There was wide consultation to identify the risks and this was done by interview which we consider to be an appropriate method considering the status of the Project at that time. A Qualitative Risk Assessment was undertaken using Time, Cost and Quality criteria. The studies which took place between 1994 and 1996 were carried out in the manner we would expect in order to confirm the viability of the Project.

- 8.8.2 We observed that Quantitative Risk Analysis (Cost QRA) was undertaken on the project in support of the "Request for a Subsidy for Main Route North / South Metroline" ("Aanvraag rijksbijdrage kerntracé Noord / Zuidlijn") submitted on 29 June 1998.
- 8.8.3 It is important that any Risk Management strategy addresses all the risks to the overall objectives of the project, and as such Reputation might have been added to the Qualitative Risk Assessment criteria.
- 8.8.4 We have observed that the Project Organisation recognise "Risks" as technical, physical or technological challenges to a greater extent than in any other context. This is borne out by the Project Bureau's risk categorisation table described in Section 8.5.7 which does not appear to include, for example, risks of a commercial nature or associated with the Contractor's procurement of critical resources and materials.
- 8.8.5 We have not found any evidence that further Qualitative Risk Assessment was undertaken to take into account the fact that the contract negotiation phase had resulted in unexpected retention of risk by MA. It might be considered that the overall risk position would not be affected by this shift but we consider that such a view is flawed for the following reasons:
- A contractor's commercial assessment of particular risks may be offset by commercial astuteness elsewhere in a bid,
 - The retention of a risk which had previously been identified to be transferred will generally need to be re-evaluated to recognise that the risk is no longer to be managed by the party previously identified as the best placed party to manage the risk, and
 - The risk is to be managed by the client and therefore significant investment may be needed to provide a management structure to deal with the risk and additionally for any fall back plans which may be appropriate. In simple terms, the client may need to replicate certain parts of a normal contracting organisation in order to manage a risk as an expert would.
- 8.8.6 Since construction has commenced, detailed Qualitative Risk Assessment does not appear to have been undertaken taking into account both probability and actual impact against specific criteria. The results of Qualitative Risk Assessment are the first step in analysis for decision support and to ensure that resources both in terms of time and effort are focussed on the significant risks. Consequently, the major risks facing the Project at any one point in time are not accurately identifiable.
- 8.8.7 Although we discovered evidence that some efforts had been made to ensure that risks identified on the Project at an early stage continue to be managed, an audit trail leading from identification to Risk Registers could not be produced.
- 8.8.8 A Risk Register for Project wide risks does not appear to have been produced. This may be a result of the Project being considered as a number of contracts and consequently there is not an obvious place to capture and report Project wide risks.
- 8.8.9 We have repeatedly observed that Risk Management terminology is often misused by both the Project Bureau and the Advisory Bureau. This confusion is evidenced by the free interchange of Risk Management definitions such as "Risk Analysis", "Risk Identification" and "Risk Management". Consequently, we conclude that the understanding of the application of a formal Risk Management process may not be as widespread as the Project Bureau believes. It is imperative that the principles of Risk Management and the responsibilities for its implementation are clearly understood by all involved.

- 8.8.10 There appears to be some confusion regarding the duties of the Manager of the Advisory Bureau's Project Direction and Risk Management Department. Contractmanagers believe that this department is controlling risks. The example risk data base make specific references to Contractmanager risk ownership and corresponding mitigation actions as we would expect, but we were not convinced that the Contractmanager was aware of the actions he was to undertake. Further we are unclear whether the Contractmanager is aware that Risk Management is an integral part of his responsibilities.
- 8.8.11 Contractmanagers have relatively small lists of risks which they report for the purpose of contingency calculation. These lists of risks appear to have been generated independently from any other risk identification process and appear to deal with uncertainty in scope in most cases. More information on this matter is included in Section 9.5.7.
- 8.8.12 A risk theme, or categorisation methodology, is in place. This should assist a Risk Manager to monitor risk trends against the themes identified.
- 8.8.13 As previously noted, we have observed that a high level understanding of Risk Management appears to have been implemented during the justification stage of the Project. There are good examples of fundamental risk identification and strategic mitigation listed in Section 8.6, namely:
- IBB Methodology in design,
 - Monitoring Contract 4.3,
 - 'Risk Control Plus' concept,
 - Permit System,
 - Large Scale Site Tests, and
 - Disaster Plans
- We would stress that these are examples of good practice. However, they do not represent a comprehensive Risk Management Plan for the overall Project.
- 8.8.14 Whilst acknowledging that there was a high level understanding and a corresponding high level implementation of Risk Management principles prior to construction commencing, we have not found adequate evidence of "Front Line" Risk Management where the risks associated with the intimate activities associated with the construction of the Project are being proactively identified and managed by the Contractmanagers or the contractors. Additionally, the Project Bureau does not appear to place sufficient importance in the risks which are considered "contractor's risks". We consider that it is important that risks are assessed regardless of liability in order that they can be monitored. For example, if a particular contractor's risk has the tendency for increased impact, it is in MA's interests to ensure adequate management is being applied, and to be mindful that when a contractor suffers delay and/or financial loss he is likely to try and recover such losses either through the event itself or by some other opportunity.
- 8.8.15 There is a heavy reliance on the BLV plan, the method statements and the contractor's "Draaiboeken", with respect to management of risks. We have not identified any evidence that these documents and processes satisfy the disciplines required to effectively manage risks across the full spectrum of the Project.
- 8.8.16 By way of an example, in respect of which a risk has been identified but for which no mitigation has been developed, the Advisory Bureau has considered the risk that steel prices may rise extraordinarily thereby increasing MA's exposure to additional costs. In our opinion, potential mitigation could include a review of designs to substitute steel with other materials, co-operative buying of steel, advance ordering and the like.

- 8.8.17 The relentless avoidance of risk in the design by avoiding “Dead End Engineering” and the pursuit of a “bullet proof” design may mean that opportunities are missed. The overriding principle of avoiding “Dead End Engineering”, and the associated removal of all risk from the design process, has the potential to stifle innovation, result in conservative proposals, and limit the opportunities for “best value” to be achieved. It is essential that a corresponding ethos of Value Engineering and optioneering is supported.
- 8.8.18 The emphasis on technical issues may have affected the balance of cost of mitigation versus the corresponding reduction in risk.

Recommendations

- 8.8.19 We recommend that a Risk Identification workshop is held for each of the contracts and for the Project as a whole. The workshops should be facilitated by an experienced professional in Risk Management. These workshops should be attended by representatives from each of the stakeholders. Risks should be identified for the purpose of management regardless of which party bears the contractual liability. The risk workshop should be used as an open forum with the intent of promoting trust and a team spirit which recognises that the success of the Project is in the interests of all parties. The purpose of the workshops is to ensure thorough identification of the full spectrum of risks currently facing the Project and to refresh the Advisory Bureau’s existing risk database. The workshops would also serve as a timely opportunity to clarify individuals’ responsibilities with respect to Risk Management and the processes in support of these. The latest risk information should then form the basis of the risk analysis described in Section 9.6.7.
- 8.8.20 Formal Risk Reviews should be held Quarterly to tie in with the Advisory Bureau’s Quarterly reports to the Project Bureau as described in Section 5.7.6. These should be undertaken under the direction of a professional facilitator.
- 8.8.21 We recommend that the Advisory Bureau’s Project Direction and Risk Management Department is reviewed to ensure that an individual is identified to fulfil the discreet role and duties of a Risk Manager. The following responsibilities should be incorporated within that scope of service and that this role should be clearly understood by the Project Organisation:
- Direction and co-ordination of risk management activities across the Project,
 - Control, maintenance and regularly updating of the Risk Register(s) (database),
 - Ensuring that risk mitigation plans are actioned,
 - Organising regular risk review meetings,
 - Monitoring and reporting as required on risk and risk trends, and
 - Ensuring that Risk Management is cost effective.

Further, we recommend that these duties are supported by including:

- Provision of information to and employment of a Risk Analyst to enable the analysis described in Sections 8.2.7 and 8.2.10, and
- Provision of information to and employment of a Risk Analyst for Risk Analysis as described in Section 9.6.7.

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- 8.8.22 We recommend that the risk database is enhanced to include the following features
- A method of monitoring the progress of action owners. i.e. percentage complete
 - A method of capturing detailed qualitative information. All identified risks should be qualitatively assessed and compiled into Risk Registers.
- 8.8.23 Risk Registers should be reported through the stakeholder chain of command to ensure strategic decisions can be made in time to influence mitigation or treatment plans. Senior managers need to be informed of the critical areas. For example:
- Financial loss or gain,
 - Delay or schedule improvement,
 - Reduced or improved quality, and
 - Potential for prosecution.
- This information can be summarised as appropriate. Heat Maps can be an appropriate method.
- 8.8.24 Risk owners should be aware of their obligations and the timescales for completion. The example risk database appears to include the capability to summarise this information but does not monitor progress against specific mitigation actions.
- 8.8.25 Risk reporting should be kept as simple as is reasonably practicable.
- 8.8.26 We recommend that the Risk Register(s) feed directly into the cost plan to ensure that the cost plan captures the complete risk exposure of the Project. Risks should be carried over individually and the rolling up of risks should be avoided during modelling. For example, in the case of Contract 4.2, some 384 risks have been presented on one line of the risk list to determine contingency. Referencing of the risks should be kept consistent for the purpose of auditability. As a matter of clarification, we do not recommend that all risks are quantifiably modelled.
- 8.8.27 We recommend that Cost Quantitative Risk Analysis is undertaken by a suitably qualified person in support of the cost estimate.
- 8.8.28 We recommend that Quantitative Schedule Risk Analysis is undertaken by a suitably qualified person and that the output is used in the Cost QRA.
- 8.9 Best Practice**
- 8.9.1 Risk Management guidelines are many and varied. However, for larger construction projects of the type being undertaken here, the United Kingdom's Association of Project Managers' Project Risk Assessment Methodology ("PRAM"), offers a good example of what can be considered Best Practice.
- 8.9.2 The main basis of PRAM is that good practice in construction project Risk Management involves three main stages and these are consistent with the Project Bureau's high level understanding of Risk Management. Refer to Appendix J.
- 8.9.3 We have included at Appendix J some further guidance on the content of a comprehensive Risk Management process with examples of the output which would be consistent with PRAM.

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9 REVIEW OF FINANCIAL MODEL

9.1 Introduction

- 9.1.1 The purpose of this section is to report on the procedures being used in the preparation of the Project's financial forecasts, both historically and currently and identify any areas where we believe the forecasting of costs could be improved.
- 9.1.2 In carrying out the Investigation for this section, we spent time reviewing project forecasts (particularly from 2003) and appropriate supporting information as noted in Appendices G and H. We also undertook a number of meetings with the Project Bureau and the Advisory Bureau personnel involved in the forecasting process at both contract and Project level. The meetings were carried out to explain how figures in the project forecast were arrived at and the consultees were asked to demonstrate at various levels, how estimates, contract costs, variations and risks were developed and input to the overall forecast.
- 9.1.3 In reviewing the current forecast for this project, research was carried out into similar infrastructure projects elsewhere in the world to provide some cost comparison with this Project. While recognizing that such high level metrics do not compare with the detailed forecasting processes undertaken by the Project Organisation, they indicate that the current forecast is neither improbably low nor particularly high in comparison to other schemes. Comparisons are shown in the table below:

Scheme	Description	Number of Stations	Approximate Cost per kilometre (Million Euros)
London (Jubilee)	16km	11	450 ¹⁹
Athens	18km	21	190 ²⁰
Oedo Line - Tokyo	40.8km	38	175 ²¹
NZL	9.5km	8	169
Singapore	20km	16	108 ²²

9.2 Cost Reporting

Reporting Format

- 9.2.1 The financial model illustrates financial information at a number of different levels. At the highest level, construction costs are reported by section of line (where attributable to a specific section) while non construction costs (design, supervision and engineering costs ("VAT") and the Damage Bureau costs, etc.) are reported separately. Subsidies are deducted from the forecasted total, the remainder being MA's contribution to the Project. At the next level, costs are broken down by contract. Construction forecast information included in this model is provided by the Advisory Bureau and consolidated by the Project Bureau while other forecast information is prepared by the Project Bureau.
- 9.2.2 We consider the report format to be fit for the purpose of the project, showing, at a high level, information necessary to obtain a general overview of the financial state of the project. This includes current budget, current and previous forecast (including Mutations), information on committed and expended costs and variations from the budget.

¹⁹ Colin Buchanan & Partners: Reappraisal of the Jubilee Line Extension

²⁰ J M Anderson: Reducing risks and achieving success - focussing on the one issue that really matters

²¹ Masayuki Fuchigami: A Comparison of Tokyo's Oedo Line & London's Jubilee Line Extension

²² Singapore Government: Land Transport Authority Website

9.2.3 Two items of the report that are of some concern is the risks to the total forecast related to BTW and indexing of the Central Government subsidy ("Rijk Subsidy"). These can be described briefly as follows:

- With regards to BTW, the issue is the refusal by the Ministry of Finance to refund BTW incurred by the Project prior to 2003. MA's exposure to this matter is approximately €15M. MA is challenging this decision by the Ministry of Finance in the Courts. Whilst MA was successful with the first legal decision, the Ministry of Finance has taken the matter to appeal. Should MA lose the appeal, this decision will have a significant impact on the total forecast, as to date, no provision has been made in the Project budget for this matter. The issue of repayment of BTW after 2003 is irrelevant as the Compensation Fund ensures BTW is refunded to all municipalities.
- The Rijk Subsidy is indexed at a level below that of actual inflation. The effect of this on future years is not reflected in the current forecast, but the risk lies with MA. This decision by Central Government is currently the subject of a legal challenge by MA.

We have been advised by the Project Bureau that MA is aware of these risks and that MA is in agreement with the way costs are being reported in the current forecast.

Reporting Procedures

9.2.4 The process for reporting forecasts to MCA is fully described in Section 5.7.2.

In summary annual financial prognosis are prepared and issued to MCA.

9.3 Original Project Forecast at Subsidy Request

9.3.1 It is not the scope of this Investigation to review the forecast during the early phases of the Project as history now shows there was a significant underestimation of the outturn costs. However, we would comment on the reliance of this figure as the basis for the subsidy request to Central Government.

- 9.3.2 Flyvbjerg²³ undertook a review of major infrastructure projects similar to this Project and concluded that underestimating outturn costs was a worldwide phenomenon. In the UK this is termed 'Optimism Bias'. The UK Treasury has prepared guidance for project assessors²⁴, a section of which covers procedures to be implemented with suggested uplifts to project estimates to balance the effects of Optimism Bias. It would appear that such data was not utilised by the assessors when preparing forecasts at the stage of subsidy request for the Project. In the absence of this a fairly crude methodology was used to arrive at a risk fund of NLG 250M (€113M) in addition to the overall Project estimate.

Had data from similar projects been used as a comparison, it may have been apparent that a risk fund of NLG 250M (€113M) (11.5%) was fairly modest, given the technical complexities involved in the project. For comparison, the UK Treasury guidelines suggest uplifts of 57% be added to projects similar to this Project at Outline Business Case to balance the effects of Optimism Bias (although this can be adjusted to take account of project specific circumstances). Flyvbjerg²⁵ also presents some interesting statistics based on several major infrastructure projects which also indicate that this figure of 11.5% was extremely optimistic:

Type of Infrastructure Project	Average Cost Overrun as a Percentage
Rail	44.7
Bridges and tunnels	33.8
Road	20.4

- 9.3.3 It is recognized that most infrastructure projects in Amsterdam do not result in cost overruns, for instance Piet Heintunnel and Ring Road. However, the technical complexities of this Project (and similarly complex projects) are such that a significant increase to the base estimate could have been expected and should have been included at this stage.

9.4 Cost Forecast – Historical

- 9.4.1 The Project had a forecast final cost of €1,469M at 3rd quarter 2002. This was increased, to account for inflation, to €1,516M in 2003. The Project was then reforecasted at €1,608M an increase of €92M.
- 9.4.2 At the time of the 2002 forecast, the contingency for unforeseen costs in the construction budget was €46.9M plus €33.1M risk fund. In percentage terms this amounts to just 4.1% of remaining expenditure in unforeseen or 6.9% of remaining expenditure including risk funds. In either case, this is an extremely low figure considering the level of risk involved in the Project. This was recognized by the Project Organisation and the 2003 forecast was increased to reflect a higher percentage provision for unforeseen costs. This was the main contributory factor to the increase of €43.8M in the construction forecast.
- 9.4.3 In percentage terms, there was a much larger increase in the 2003 forecast for VAT costs (€43.6M) and provisions to improve conditions for public (€4M). The main contributors to this increase were W+B and the Advisory Bureau (€34.1M) and the Project Bureau (€7M). This was largely a result of an extension to the programme to 2012 but also included increasing resources to match the contractors' teams.

²³ Flyvbjerg, Underestimating Costs in Public Works Projects – Error or Lie, APA Journal (2002)

²⁴ HM Treasury: the 'Green Book, Appraisal and Evaluation in Central Government'

²⁵ Presentation to The Hague – 3 May 2004

9.5 Cost Forecast – Current

Contracts not yet awarded

9.5.1 In undertaking the Investigation, we reviewed the following contracts which are not yet awarded:

- Contract Cluster 1 (Overview),
- Contract 1.1 Buikslotermeerplein Station (Detailed Review), and
- Contract Cluster 11 – Rail Infrastructure.

9.5.2 In general we found the procedures used to be fit for purpose with an audit trail from costs included in forecast, back to detailed estimate build-up. The Contractmanager for Contract 1.1 (Buikslotermeerplein Station) demonstrated the estimating system used which included a checking procedure. Costs were based on historical data and confidence was enhanced by market testing.

9.5.3 While we have found the estimating procedures generally to be satisfactory, we would identify the following items as areas for concern:

- Optimism adjustment: Despite preparing a comprehensive and high quality estimate, contracts due to be tendered this year (notably Contract Cluster 1 (Noord) and Contract 8.2 (Stations and Tunnels Europaplein/RAI) have significant optimism anticipated for favourable market conditions deducted from the base estimate. This decision has been taken as a result of market research carried out by W+B and supported by dIVV statistics. However, based on other comments from the Project Bureau, indicating that contractors were not pricing this Project's tenders competitively, the fact that the base estimate was market tested and given the large fluctuations in price currently being experienced in the tender market, we believe the introduction of such significant optimism is an optimistic decision.
- Estimate uncertainty: There is no sensitivity adjustments included in the risk allowance for estimate uncertainty. While we accept that such inaccuracies are theoretically provided for in the unforeseen allowance, it would be good practice to include, as part of the risk analysis process, risks for uncertainties in both quantity and pricing. This is discussed in more detail in the Construction Contingencies Section below.

9.5.4 We found no evidence of a structured approach to Value Engineering. While the Project Organisation members indicated that opportunities for making savings were constantly being sought, the omission of any structured review means that additional potential opportunities may be missed.

Awarded Scope

9.5.5 Costs relating to awarded scope are included in the forecast at the award value. Provisions for adjustment to the award value are captured in the contingency (C, D and E amounts) as described below. Therefore this element of the report is purely a reporting function and as such requires no further comment, other than to state that the reporting would appear to be accurately recorded.

Mutations to Scope

9.5.6 Mutations to scope are recorded in a spreadsheet referred to as the meer en minderwerk list ("MMW"). The mutations are split into two categories as follows:

- A amounts – agreed Mutations. These items have been accepted by the Project Bureau as changes to the contract scope, and
- B amounts – Contractor identified variations. These items have been proposed by the contractor as changes to the contract but have not yet been accepted by the Project Bureau.

Costs within these categories have varying degrees of accuracy depending on whether they are agreed or not and also if they are contractor proposals or the Advisory Bureau estimates. The methodology used in recording these costs makes no provision for the potential estimate inaccuracies where a figure is not agreed. This risk could be modelled as part of the risk analysis process described in the Construction Contingencies Section below.

Construction Contingencies

9.5.7 The financial model makes provision for risks and unforeseen costs under the heading of C, D and E amounts, described below:

- C amounts – risks identified by the Contractmanager and the Bouwmanager. These are generally risks controllable at Contract level and are relatively sure, as opposed to E amounts (see below) which are considered by the Project Organisation to be more managerial and less certain.
- D amounts – this is an allowance for unforeseen costs and is calculated as a percentage of the unexpended contract value. Prior to mutation and risk identification this figure is generally 8% of the contract value. As the contract progresses this figure can be reduced as low as 1% before the overall forecast for the particular contract is increased or thoroughly reviewed. The standard percentage applied to contracts was increased for the 2003 forecast and was the main contributor to the increase of €43.8M in Construction costs referred to in Section 9.4.2.
- E amounts – calculated in the same manner as C. Amounts are allocated to E where the risk is more managerial but less certain and considered to be out with the control of the Contractmanager.

Whilst we have grouped all the above items under the heading of contingency it is apparent that many of the costs under both C and E are over 90% certain and in some cases considered to be 100% certain. In such instances we would not consider these sums as risks (other than the price and quantity uncertainty) but known additional costs (or in the case of optimisms, reductions in cost).

- 9.5.8 We have reviewed a number of C and E lists and analysis carried out on the Project and discussed these at our meetings with the Project Organisation members. Observations from our review are as follows:
- There is a lack of consistency in the format used in arriving at C and E amounts. For example, contract 5.2, 6.2 and 7.2 (Deep Stations) uses a different risk analysis format than other contracts.
 - There is a lack of consistency in the methodology used for arriving at final risk total for C and E amounts. For example all risks identified on the risk register reviewed for contract 3.1 and 3.2 (Centraal Station) have a 100% probability and as a result are realities rather than risks. The only risk element is in the cost uncertainty and this is not reflected using the methodology which simply takes a mid point between a high and a low estimate. (Note: The Project Bureau advised that a statistical analysis is carried out prior to this stage which justifies the use of such a format. We did not see, nor were we presented with any evidence to substantiate this statement. However, the statement regarding lack of consistency in format is still valid).
 - Contract 5.2, 6.2 and 7.2 (Deep Stations) allocate costs from the MMW against the items in the risk register. This is inconsistent with other formats viewed and serves little purpose as future risks are not connected to costs already committed. It also has the effect of making some risks negative (where committed costs have exceeded risk amounts) which does not make sense.
 - The format of the list of risks includes references to probability and impact as we would expect. However it is not our experience that the probability of a risk occurring be expressed as a range but rather a single likelihood percentage. Furthermore, the impacts have been recorded on a minimum and maximum basis. More appropriate methods exist which will provide a better risk analysis, reflecting the distribution of the values.
 - We note that the risks included in the risk list are generated and assessed by a small cross section of the Project Organisation and as such may be subject to optimism bias to a greater extent than when risks are identified and qualitatively assessed in an environment where people with diverse motives and experiences contribute.
 - Whilst data has been captured to enable a QRA using statistical simulation, such an analysis has not been undertaken. The raw data is used in a very crude manner to determine C and E amounts, the result being a single sum, as opposed to a distribution output if a full risk analysis was being undertaken.
 - Risks that are dependant are not modelled as such. This is best demonstrated in the way the opportunities for favourable market conditions have been modelled in Contract 1.1. In the calculation of C and E amounts, the output reported is an opportunity of a 15% reduction. The 5% allocated to the E category cannot exist unless the first 10% - allocated to the C category - is fully realised. This is an example of the effect of not modelling the risks and uncertainties using logical statistical processes and an experienced risk modeller.
- 9.5.9 The use of a percentage allowance for unforeseen amounts (D amounts) removes many of the benefits of a full QRA. Specifically a single contingency amount is more difficult to actively manage than a series of risks and the ability to stay within the total budget is much more a matter of chance than if it can be managed by use of Risk Management tools.
- 9.5.10 Once a full QRA has been carried out, a cumulative frequency plot can be generated that shows a risk profile demonstrating likely outturn costs against corresponding confidence levels.

Design, Supervision and Engineering (“VAT”)

- 9.5.11 Whilst it was relatively clear for the Investigation Team to understand and follow the build-up to the construction elements of the forecast, the same could not be said for the build up to the VAT forecast. While the Project Bureau is involved in the preparation of construction forecasts, it is ultimately the Advisory Bureau who is responsible for developing the forecasts for these elements of the work. The Advisory Bureau provides approximately 90% of the input in the preparation of the VAT forecast.
- 9.5.12 From available information and interviews held with the Project Organisation we have ascertained the following information regarding the 2003 forecast for VAT:
- The forecast included an allowance for a 12 month extension in resources involved in the VAT functions. This has reduced to 10 months in the latest forecast,
 - The forecast includes an allowance of €4.2M to cover unforeseen costs for the Advisory Bureau. This amounts to 4.2% of the forecast or 6.5% of unexpended costs in forecast for the Advisory Bureau,
 - There is a further allowance of €3.2M (2.5% of remaining expenditure) included in the overall VAT forecast for unforeseen costs, and
 - In addition to the contingencies identified above there is an unallocated element of the risk fund of €21M.
- 9.5.13 Despite the statements above, we have been unable to fully ascertain the build-up to the Advisory Bureau forecast, and as a consequence, the VAT forecast. The forecast appears to be unnecessarily complex in its operation. As a consequence we do not feel able to comment on the adequacy of the VAT forecast. However, we believe that the contingencies for VAT, excluding the risk fund, held within the forecast is extremely modest given the level of risk.

Other Costs

- 9.5.14 The main other cost in the 2003 forecast is for the Damage Bureau. The adequacy or otherwise of the forecast for this element of the work is considered in Section 11.3.6.

9.6 Conclusions and Recommendations

Conclusions

- 9.6.1 We believe that the “favourable” optimism built into some of the contracts due to be tendered in the future as described in Section 9.5.3 is a high risk strategy being adopted by the Project Organisation. Whilst we have seen no specific evidence to corroborate this possibility, it is conceivable that the Project Organisation is aware of the likely budget pressures but still seek to report the final cost as within the current budget. Similar observations have been made by both Flyvbjerg²⁶ and De Tijdelijke Commissie Infrastructuurprojecten²⁷ in recent studies they have carried out on major infrastructure projects in both the Netherlands and internationally.
- 9.6.2 Due to the confused manner in which contingencies are both arrived at and reported, as described in Section 9.5.7 and 9.5.8, it is unclear to us from the reported figures what the true level of Project contingency currently held is.
- 9.6.3 As described in Section 9.5.8 we have reviewed a number of C and E lists and analyses carried out on this Project. It is our opinion that there are some fundamental flaws in the way the contingency sums have been calculated.

²⁶ Megaprojects and Risk - 2003

²⁷ Onderzoek naar infrastructuurprojecten presented to the Tweede Kamer der Staten-Generaal on 15 December 2004.

9.6.4 Due to the reasons listed in the previous two Sections, and based on our understanding of the calculation of what the overall Project contingency is for the Project as described in Section 9.5.7, we lack confidence in the sufficiency of the contingent amount.

9.6.5 In summarising our findings on the forecast, we would make the following comments:

- A satisfactory procedure is in place for estimating packages of work still to be awarded and reporting costs of awarded packages, including costs of identified Mutations. However, it does not reflect potential inaccuracies in estimated information which should be considered as part of the overall Risk Management process.
- The Project forecast is reported on a single point basis. That is to say that the financial model is deterministic using a single estimate for each variable. The main drawbacks of the single point method are:
 - It does not explicitly recognise the individual significance of uncertainty and the combined impact, and
 - The absence of cost QRA means that there is no real measure of confidence in the result.
- We believe the procedure for calculating project contingencies could be significantly improved to provide a higher level of confidence in the final forecast.
- We are unable to establish the adequacy of the forecast for VAT costs but believe the same comments as stated above for construction costs are valid.

Recommendations – the Project

9.6.6 Carry out a full review of contingencies held on the contract by means of a statistical simulation method, facilitated by a professional experienced in the use of risk analysis tools. This will mean creating a model that produces a large number of scenarios from which the software will monitor the results. In practical terms the Risk Analysis will:

- Model the uncertainty that exists in the base estimate for quantity and for price (amongst other factors),
- Model the impact of discrete risks (Risks that have a chance of occurring less than 100%),
- Address dependencies, and
- Address correlation

9.6.7 Risks should be analysed based on a suitable range of impacts. This is usually on an Optimistic, Most Likely and Pessimistic (3 Point) basis, but it may be appropriate to use another method. An experienced risk analyst can provide advice on particular risks in this regard.

9.6.8 Certain events (assessed as having a 100% probability of happening) should be included as part of the base cost estimate although pricing and quantity uncertainty should be included in the risk analysis as described in Section 9.6.6.

9.6.9 Recommendations regarding the identification, assessment and management of the discrete risks are described in the Section 8.8

9.6.10 The financial model, or risk model, would create an ascending cumulative frequency plot of the results. The cumulative frequency plot is very useful for reading off quantitative information about the uncertainty of the variable. In the context of the financial model this will be the total Project cost forecast. Using the cumulative frequency plot one could read off the probability of exceeding the latest prognosis. This will then provide a measure of confidence in the forecast.

- 9.6.11 On projects where a full risk model is implemented, the cumulative frequency plot is usually used to set the project budgets. The budget is often set at the expected (median) value of the variable determined from the analysis output which effectively includes a risk contingency to be managed by the project manager. This is usually considered a reasonable target for the project to aim for and therefore appropriate for project management purposes. However, it must be understood that there is still a 50% chance that this amount may be exceeded. A 50/50 chance of completing a project for a particular sum is not a very practical confidence level with respect to the provision of overall project funding. Clients may therefore decide to use a Percentile between the 80th and 95th for project funding purposes. This represents a higher confidence that the available funds will not be exceeded.
- 9.6.12 After the two legal reviews on BTW and Central Government subsidy indexation are complete, we would recommend that there is a complete re-appraisal of the Project budget. If these two decisions contradict the assumptions of the current forecast, they would have a significant effect on the Project's budget.
- 9.6.13 Simplify forecast for VAT so that a clear build-up can be demonstrated. Risks should be analysed using the same methodology as described above and form part of the overall statistical analysis used in developing the Project forecast as described above.

Recommendations – Future Projects

- 9.6.14 Further research should be undertaken into outturn costs of infrastructure projects so that for future schemes, a realistic assessment of the effects of underestimation or Optimism Bias can be added when assessing a project's viability.

9.7 Best Practice

- 9.7.1 According to Flyvbjerg²⁸ 9 out of 10 infrastructure projects overspend. Consequently, best practice in preparing estimated costs is to ensure the following:
- Anticipated costs are benchmarked, on a like for like basis with other similar, preferably complete projects,
 - Historical cost data should be analysed and adjusted to reflect time, quality and location for the project being examined. These adjustments should be based on facts and not be subjective, and
 - Risks should be properly and statistically analysed and correct ownership identified.
- 9.7.2 There is evidence to suggest that the Project Bureau and Advisory Bureau has reflected some of this best practice in the preparation of the Project budget. However, the procedures utilised in calculating the Project contingency require significant improvement.

²⁸ Megaprojects and Risk - 2003

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10 REVIEW OF PERMITTING PROCESS

10.1 Introduction

10.1.1 The timely preparation, issue and control of all required permits is crucial in order to complete the Project within planning and budget constraints. Approximately 550 permits have to be obtained by the Project Bureau / the Advisory Bureau from 15 different authorities.

10.2 Permitting Process

10.2.1 The Project Bureau in combination with the Advisory Bureau have implemented a specific process for the whole permitting process and compliance management in relation to the monitoring of adherence to the permit requirements by the contractors. The execution of this process of course is strongly related to the relevant legal times and terms. The process consists of the following steps:

- Initial inventory of necessary permits: ± 550 permits from 15 different authorities,
- Preparation of application for each individual permit,
- Execution of application process,
- Monitor progress of application, and
- Securing compliance with permit requirements.

10.2.2 In general it is the target of the Project Bureau and the Advisory Bureau to have the required permits available in final approved version before issue of the construction contracts.

10.2.3 No evidence or indication has been found to expect one or more critical permits (permits on the critical path of the Project) not to be available in time.

10.2.4 The Bouwmanagers are integrally responsible for the timely availability of the required permits and associated costs in relation to the contracts that they are responsible for.

10.2.5 However, the Bouwmanagers are supported by the Project Bureau and the Advisory Bureau. The Advisory Bureau has a mandate to execute the permit obtaining process, whereas the Project Bureau is responsible for the more strategic and political decisions, for instance, negotiating with relevant authorities.

10.2.6 Received permits are registered in the Permits Management System ("the VBS") in order to ensure that all stakeholders have the required information.

10.2.7 The status of all identified permits is available in a large spreadsheet and is regularly updated. Within the spreadsheet, compliance with the construction planning targets can be checked.

10.2.8 The permitting process as performed by the Project Bureau and the Advisory Bureau is characterised by:

- A strong proactive control of permit statuses,
- A proactive follow-up of all new and problematic applications,
- The status of all identified permits being available and maintained in the VBS, and also in relation to construction planning targets,
- Formal meetings with DMB approximately every 6 weeks to discuss progress, and possible obstacles.

10.3 Quality Management and Cost Control

- 10.3.1 The Advisory Bureau has adopted W+B's documented Quality Management System as noted at Section 6.7.1. Internal audits on the processes of the Advisory Bureau, including the actual permitting process, however do not take place.
- 10.3.2 The man hour budgets required for the permitting process have been reviewed and updated by the Advisory Bureau in December 2004 and were reviewed and approved by the respective Bouwmanagers.
- 10.3.3 There is suitable control on the budget for VAT costs for permitting. This was last updated in December 2004. No significant deviations in permitting process costs have arisen.
- 10.3.4 Compliance management costs (personnel costs) however are higher (see also compliance management) and rather unpredictable (dependant on the efforts of the contractors).

10.4 Communication and Reporting

- 10.4.1 There are several internal and external communication meetings on the subject of permitting, and there is a bi-weekly report with details of the status of each permit. Communication lines are clear and reporting is adequate.
- 10.4.2 The communication and reporting structure is as follows:

Meeting:	Frequency:
Advisory Bureau/Permits - Advisory Bureau/Contractmanager	Once every 4 weeks (dependent on project phase)
Project Bureau/Permits - Project Bureau/Bouwmanager	Weekly (dependent on project phase)
Project Bureau/Permits - Advisory Bureau/Permits	Once every 4 weeks
Project Bureau/Permits & Advisory Bureau/Permits - DMB	Once every 6 weeks
Project Bureau/Permits & Advisory Bureau/Permits - relevant authorities (in case of new applications, legal objections or appeal against permits)	When necessary

10.5 Greater City Project (Grootstedelijk project)

- 10.5.1 As indicated in Section 3.3, the Project is designated GSP. The DMB is competent and responsible for the issuing of all building and environmental permits, and the Boroughs can comment on this process. The Boroughs, however, stay entitled to issue all permits that concern the execution of building activities. These permits require to be applied for by the contractors. Also, in some places, the boundaries of the GSP-area are too narrow and lead to debate on competence issues between DMB and the relevant Borough.
- 10.5.2 Consequences of the present GSP-boundaries of the Project are:
- Influence of Boroughs in GSP-area by means of permit enforcement,
 - Differences in view on competence issues between DMB and the Boroughs, and
 - Influence of Boroughs in GSP-area by means of issuing execution permits that are applied for by the contractors, but issued to the client.

10.6 Permits to be Obtained by Contractors

- 10.6.1 In addition to the permits which have to be supplied by the Project Bureau and Advisory Bureau, all permits in relation to the execution of the *work itself* have to be applied for by the individual contractors. Obtaining all execution permits is the sole responsibility of the relevant contractors. This obligation is incorporated into each of the contractors' construction contracts.
- 10.6.2 A comprehensive, but not limited list of permits which have to be applied for by the contractors is part of the contract documents.
- 10.6.3 When the Boroughs are issuing permits for the actual work to the contractors, the permits often contain more stringent requirements than anticipated in the overall permits and existing contract requirements. Among other things, this has to do with the fact that work is being carried out by the contractors during evening hours. Also additional requirements are added during permit enforcement activities by the Boroughs. As these extra requirements were not known and could not be foreseen by the contractors before start of the work, the costs for these additional requirements are charged to the Project. Examples for the Centraal Station contracts are:
- Extra stairs and gangways,
 - Extra noise measurements,
 - Extra fencing,
 - Extra traffic controllers,
 - Change of workplans, and
 - Temporary stop of activities until all requirements are settled.
- 10.6.4 The financial implications of these additional requirements at Centraal Station, together with the requirements of other relevant parties, can be summarised as follows:

Contract Number:	Extra work to date:	Extra work (expected):
3.1 / 3.2	€ 540,000	€ 460,000
3.3	€ 200,000	€ 300,000
TOTAL	€ 740,000	€ 760,000

- 10.6.5 This practice is commonplace on all the contracts let to date. For instance at Contract 2.2 – Immersed Tunnel an additional €350,000 has been spent to date, with provision for a further €160,000. Similarly, at Contract 7.2 - Ceintuurbaan Station, an additional €1,000,000 has been spent to date. All these sums are as a result of additional permit requirements from the Boroughs and third party compensation.

10.7 Compliance Management

- 10.7.1 The permits received by the contractors are communicated to the Project Bureau, which details them per section in order to manage compliance in view of the execution of the work by the contractors.
- 10.7.2 Each detail of the permit is checked by the Project Bureau during construction in order to ensure that the contractor has taken the required actions (examples: water sampling, safety measures, noise measurement, soil sampling etc.).

10.7.3 The strategy on compliance for the Project is to minimize effort on compliance management by the Project Bureau as the qualified contractors will have their own internal Quality Assurance systems for control of compliance. In practice, however, the contractors do not have 100% functional systems in place, which results in additional cost for compliance management by the Project Bureau and the Advisory Bureau supervising personnel.

10.7.4 It was therefore noted by the Advisory Bureau that the contract text of future contracts has to be modified on the subject of compliance management. The contractors should be obliged to provide the Project Bureau with details of the requirements of their own applied permits. The Project Bureau requires this information to initiate strict compliance management activities.

10.8 Cables and pipelines in the Project Routing

10.8.1 All issues concerning cables and pipelines in the routing are handled by IBA. Within the Advisory Bureau this responsibility has been delegated to IBA. The Project Bureau/permits and Advisory Bureau/permits have no activities in relation to this aspect.

10.9 Right of Way

10.9.1 The whole trajectory of the Project is almost 100% on land owned by MA. Right of way is organised in the Overall Permit (Bestemmingsplan). With one minor exception there has been no 'buy-out' of property or premises which do not belong to MA.

10.10 Archaeological Investigation

10.10.1 For all contracts time and cost provisions have been allocated for archaeological investigations. MA's Archaeological Department is regularly consulted. Planning matters are dealt with by the respective Bouwmanagers.

10.10.2 No evidence has been found that archaeological investigations are obstructing planned progress of the Project's construction activities.

10.11 Conclusions and Recommendations

Conclusions

10.11.1 The permitting process is competently managed by the Project Bureau and the Advisory Bureau. This process is characterised by:

- A strong proactive control of permit statuses,
- Proactive follow-up of all new and problematic applications,
- Availability and maintenance of status of all identified permits in the VBS, also in relation to construction planning targets, and
- Formal meetings with DMB (every 6 weeks) to discuss progress and possible obstacles.

10.11.2 However, the Project Bureau and the Advisory Bureau focus mainly on the execution of the permitting process and less on continuous improvement of this process by:

- Auditing the fulfilment of this process, and
- Reviewing the adequacy of this process itself by measuring and evaluation of process performance.

Regular performance of internal audits and structural review of process adequacy could raise the management of the permitting process to a 'best practice' level.

-
- 10.11.3 No evidence or indications have been found to expect one or more critical permits (permits on the critical path of the Project) not to be available on time. Based on the actual status reports of the Advisory Bureau, we anticipate that approximately 90% of all required permits will be available and complete on time (that is before issue of contract). The remaining 10% will expectedly be complete before the start of construction work.
- 10.11.4 Contractor permits are correctly identified and included in Contract documents. Obtaining the actual permits however requires additional and unforeseen assistance from the Advisory Bureau. Additional costs are caused by including additional requirements in permits by the Boroughs and during compliance inspections.
- 10.11.5 Details of permit requirements are available and updated in a compliance database. Compliance management activities are not performed by contractors as planned and agreed and therefore cause additional costs for the Project Bureau, mainly as a result of extra manpower for compliance activities of the Head of Daily Supervision.
- 10.11.6 Actual costs related to the man hours for the permitting process itself are within budget. Additional costs for the Project are the result of more stringent permit requirements during the execution of the work, cost for additional compliance management activities by the Project Bureau and the Advisory Bureau and support of contractors for obtaining the required permits. These costs have not been foreseen by the Project Bureau and Advisory Bureau.

Recommendations

- 10.11.7 We recommend a formal meeting is convened between the relevant officers of MA and the Boroughs with the intention of bring a degree of reasonableness to the requirements of the Boroughs in the permitting process.
- 10.11.8 Although the Advisory Bureau has a documented Quality Management System the actual permitting process has never been audited. We recommend internal audits of the permit process be carried out on a regular basis.
- 10.11.9 Although the targets for the permitting process are clear, there is no formal reporting of the level of achievement, which provides important information about the quality of the permitting process. It is recommended that compliance / achievement of the process is documented by means of Key Performance Indicators ("KPI's").
- Note: It is envisaged by the Advisory Bureau to start this monitoring by means of KPI's.
- 10.11.10 The actual project is designated as a GSP-project which is the legal qualification for the execution of the project and provides the Project with the required mandate for execution of the Project. For future projects it is suggested to negotiate at the start of the project a larger mandate in relation to the other parts of the city (the regional city parts) as this will speed up the whole permitting process.

10.12 Best Practice

- 10.12.1 As noted in previous Sections of this report, the implementation of a formal quality assurance procedure covering the key elements of the permitting process will deliver "best practice".

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11 REVIEW OF INSURANCES

11.1 Introduction

11.1.1 This section of the report examines how the Project is insured. It provides:

- An outline of how the current philosophy of self insurance arose,
- How the current philosophy operates,
- What is and is not insured under this philosophy,
- The risks to the successful implementation of this philosophy,
- How these risks are being mitigated, and
- Future actions proposed by the Project Bureau.

11.2 Current Philosophy of Self Insurance

11.2.1 According to one of the world's leading risk management and insurance intermediaries, Willis²⁹, nearly all major projects worldwide are now insured by a project specific insurance programme operated by the Employer. They bring significant benefits to a project through providing:

- A means to fully assess project specific risks,
- A single focus for the purchase and management of project insurances,
- The most cost effective method of procuring cover by making use of "bulk-buying" in the insurance market,
- An insurance programme that responds to the risks and exposures of all the project participants regardless of risk apportionment under the contract,
- A coordinated claims reporting and handling facility which will assist in the prompt settlement of claims,
- Premium savings by consolidation of insurance covers,
- Non cancellable cover,
- Coverage of interfaces between the various parties and stakeholders to a project, and
- Ease of administration.

Another of the world's leading risk specialists, Marsh³⁰, concurs with these opinions on project specific insurance programmes.

11.2.2 The Project Bureau investigated the availability of such insurances with the insurance industry. During the course of this investigation, it became apparent that the industry's view on the anticipated risk profile of the Project was having an adverse effect on the premiums and coverage being quoted. Initially, premiums were higher than anticipated by the Project Bureau. As the investigations continued, the anticipated premiums increased further, with a rapid reduction in coverage.

²⁹ Insurance Programme Considerations – May 2002

³⁰ Case Study – Power & Utilities - 2004

11.2.3 These findings at this time were not unusual in the insurance market. Willis³¹ comment that the insurance market post September 11 2001 was “hardening”, due not only to the disaster at the World Trade Centre in New York, but due also to, amongst other things:

- The reduction in capacity in the insurance market through acquisition, mergers and insolvencies,
- Sustained poor underwriting results,
- Poor investment income results, and
- Prohibitive reinsurance treaty costs.

11.2.4 The Project Bureau considered they were not achieving value for money from the insurance industry and commissioned two studies.

The first study by Aon Risk Consultants B.V.³² provided information to the Project Bureau on the likely associated costs if an insurable event occurred. This information was provided to E Horvat Consultants B.V.³³ for a second report that statistically examined the likelihood of occurrence of the insurable risks and costs. E Horvat Consultants B.V. then compared these results with the premiums being requested by the insurance industry.

11.2.5 The Project Bureau also consulted with the Minister for Traffic and Waterways on other major infrastructure project being constructed at that time in The Netherlands. These included:

- HSL
- The Betuweroute
- The Hague Tunnel

The results of these discussions indicated that whilst insurable events occurred, there was no track record of significant or catastrophic events occurring on the majority of the projects reviewed.

11.2.6 The subsequent result of these exercises was a decision taken by MCA on 7 May 2003 to self insure the project based upon a paper submitted by the Project Bureau³⁴ at the MCA meeting of 7 May 2003.

11.3 How the Current Self Insure Philosophy Operates

11.3.1 After MCA’s decision to self insure the Project was taken, the Alderman with responsibility for MA’s insurances created a new office, the Damage Bureau with specific responsibility for the Project.

11.3.2 The Damage Bureau prepared a “virtual” insurance policy for the Project. This was based on industry benchmarks and personal experience of the Damage Bureau manager. It is contained in a document entitled Handbook Construction Damages Noord/Zuidlijn. The handbook sets out:

- The cover that is provided,
- The deductibles (excesses), and
- Guidance on the operation of the “virtual’ policy

11.3.3 The handbook is incorporated into all the existing construction contracts.

³¹ Market Conditions – May 2002

³² North/South Line Amsterdam Subway System Probable Maximum Loss Risk Information Research – 27 January 2003

³³ Final Second Opinion on Loss Scenario Regarding Council Decision on Insurances for the Noord/Zuidlijn Project – 21 May 2003

³⁴ Recommendation to Council on Insurances for the Noord/Zuidlijn Project – 7 May 2003

11.3.4 An operational budget of €15m has been allocated for the funding of the management of the Damage Bureau and the payment of any settled claims. This fund has arisen from a transfer of anticipated insurance premiums and an allocation of risk monies from the Project Bureau's budget. The budget is supplemented by a further €20M from MA's insurance contingency fund. Consequently, for the purposes of self insuring the Project, a total amount of €35M is reserved.

It should be noted that whilst some of the Damage Bureau funding is supplied from the Project Bureau's budget, the Damage Bureau is totally independent from the Project Bureau, with completely separate lines of reporting to MCA.

It should be further noted that a specific application to the Alderman VGA has to be made to access the €20m element of the budget.

11.3.5 The principle behind the establishment of this budget was the statistical analysis carried out by E Horvart Consultants B.V. as described in Section 11.2.4.

11.3.6 We have not appraised or checked E Horvart Consultants B.V.'s calculation used to arrive at a budget for the Damage Bureau to confirm its adequacy or not. However, we can confirm that it was modelled in a sensible and acceptable manner. MCA should be aware, that whilst the costs of a catastrophic event with an extremely low probability of occurrence are naturally excluded from the model, this does not diminish MA's exposure to such cost if such an event occurred.

11.3.7 Consequently, the Damage Bureau operates in the role of a "virtual" insurance company. Claims are submitted to them and they are responsible for evaluating the appropriateness of the claim and for its evaluation and eventual settlement. Independent Loss Adjusters assist the Damage Bureau in the evaluation of the claim. The Project Bureau can only contest questions of fact with the Damage Bureau. If the Project Bureau challenges the evaluation of the claim, the Alderman with responsibility for insurance is the final adjudicator.

11.3.8 The Damage Bureau prepares a Quarterly Report for the Project Bureau. This report has been compared favourably by ABN AMRO³⁵ with similar reports provided by other insurance brokers. The report identifies:

- Number of claims received,
- Value of claims received, and
- Remaining reservations available for future claims.

The reserve budget is reviewed annually to ensure there are sufficient funds available for claims management and processing.

11.4 What is Insured under this Philosophy

11.4.1 The following matters are covered by the self insure philosophy:

- Construction All Risks ("CAR") insurance for the value of the works
- Third Party Liability to a value of €11,344,500 for each and every claim and €40m in the aggregate.

³⁵ Letter dated 30 October 2003

11.4.2 The following matters are not covered by the self insure philosophy:

- Employees of the Project Bureau are covered by MA's Employer's Liability and Public Liability insurances,
- Employees of W+B are covered by W+B's Professional Indemnity, Employer's Liability and Public Liability insurances,
- Employees of the Advisory Bureau are covered by their respective companies' Professional Indemnity, Employer's Liability and Public Liability insurances,
- Employees of the Contractors are covered by their respective companies' Employer's Liability and Public Liability insurances,
- Contractors' Professional Indemnity insurance in so far as it relates to those areas where the contractor is responsible for design,
- Contractors' temporary buildings,
- Contractors' plant and equipment,
- Environmental Pollution, and
- Terrorism cover.

Various levels of deductible are also provided. These vary depending on the insurable event.

11.4.3 The Project Bureau was conscious of the possibility that claims in excess of €40m could arise on the Project. Consequently, prior to the time of the decision to self insure, they explored the possibility of an insurance policy that would provide cover in excess of the €40m limitation, i.e. a policy with a deductible of €40m. At the time, the insurance industry was unable to provide this type of policy as there was insufficient capacity in the market. This was due to a certain degree to the matters referred to in Section 11.2.3.

11.5 Risks to the Successful Implementation of this Philosophy

11.5.1 There are several significant risks to the successful implementation of this philosophy.

11.5.2 The contractors are legally required to indemnify the Employer (MA) against third party claims, which means that if the individual or aggregate limits are exceeded, the contractors are liable for the balance. The contractors do not accept that the "virtual" policy will only underwrite these claims to the limits indicated in Section 11.4.1.

11.5.3 As this is a "virtual" policy, terrorism cover is totally at the risk of MA. In a "traditional" insurance policy, the insurance industry can access a "Central Terrorism Fund" to pay for any claims arising through terrorism.

11.5.4 Whilst the "virtual" policy is currently operating, there has as yet been no offsetting of claims paid against deductibles in the "virtual" policy against contractors. This is perceived by the Damage Bureau as a possible "problem" when this is implemented.

11.6 How These Risks are being Mitigated

11.6.1 The works have now been underway for over two years. The monitoring and other mitigation measures implemented at the start of the Project by the Project Bureau are demonstrating a proactive approach to third party claims by them. The third party claims history of the Project in that period would appear to be better than originally anticipated by the insurance industry. Consequently, the Project Bureau is actively pursuing the purchasing of a third party insurance policy for the Project based on the Project's track record to date.

11.7 Future Actions by the Project Bureau

11.7.1 The Project Bureau believes that the construction tender market is more favourable to Employers at this point in time, than it is to contractors, as was the case in some of the earlier tender rounds. This belief by the Project Bureau is evidenced throughout this report.

In addition, the contracts that are still to be tendered are all significantly less technically challenging and consequently have less risk attached.

Therefore, in the current tendering round, the Project Bureau intends to stipulate in the enquiry documentation the need for the contractors to provide CAR and Third Party Insurances.

11.7.2 Obviously, this is a departure from their original aspirations of these insurances being subject of a project specific insurance policy.

11.8 Conclusions and Recommendations

Conclusions

11.8.1 The Damage Bureau operates in a professional manner.

11.8.2 The insurance and contracting industries have dictated insurance terms to the Project Bureau. Consequently, whilst a “virtual” insurance provision is in place, it is far from ideal. MA are at risk from:

- Claims in excess of the limitations on liability on the CAR and Third Party insurances,
- Disputed insurance contract terms with contractors, and
- Terrorism and pollution.

11.8.3 The “virtual” insurance policy is operating well, albeit, the contractors do not accept its terms.

11.8.4 We believe, given the circumstances surrounding the insurance provisions on the Project that the self insure philosophy currently demonstrates value for money and is operating effectively. However, as stated in Section 11.8.1, MA is exposed to significant risk if a major insurable event occurs.

Recommendations

11.8.5 The Project Bureau should continue to explore the insurance market for an underwriter to provide insurance for Third Party Liability.

11.8.6 Financial provision and dispute resolution procedures should be negotiated between the Project Bureau and contractors to resolve the current disagreement on the “virtual” insurance policy.

11.8.7 The Project Bureau should continue to explore the insurance industry to instigate a project specific insurance policy for the remaining contracts.

11.9 Best Practice

11.9.1 On projects of this nature, it is common to have project specific insurance. This is demonstrated in Section 11.2.1. However, in this instance, the insurance industry precluded this best practice being operated by demanding premiums that provided poor value for money with excessive restrictions on the available coverage.

BIJLAGE D
ONDERZOEKSOPDRACHT

Definitieve Offerteaanvraag Onderzoek en Advies inzake het Project Noord-Zuidlijn

Definitieve Offerteaanvraag voor het verrichten van onderzoek en het uitbrengen van advies inzake het project Noord-Zuidlijn

1 november 2004

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1 Inleiding

Voor u ligt de offerteaanvraag voor het verrichten van onderzoek en het uitbrengen van advies inzake het project Noord-Zuidlijn. De grondslag voor deze werkzaamheden, is een besluit genomen door de Gemeenteraad op 16 juni 2004. Dit besluit werd genomen naar aanleiding van een motie door raadslid Bijlsma c.s. inzake de financiële prognoses tot 2012 van het project Noord-Zuidlijn.

Opdrachtgever is de Gemeenteraad die vanuit zijn controlerende functie behoefte heeft aan een advies of, en zo ja in hoeverre en op welke wijze, bijsturing van dit investeringsproject wenselijk is.

Omdat de Noord-Zuidlijn een ingewikkeld investeringsproject is, acht de Gemeenteraad het wenselijk de doorlichting (naast de concreet geformuleerde onderzoeksvragen) mede te beoordelen in het licht van een bestaande *best practice*, voor het inrichten van grote infrastructurele projecten.

2 Leeswijzer

Onderdeel 3 beschrijft het selectieproces van deze opdracht. In onderdeel 4 staan de vragen die gedurende het onderzoek in ieder geval beantwoording behoeven. Aansluitend behandelt onderdeel 5 de eisen die wij aan uw organisatie en offerte stellen. Onderdeel 6 beschrijft de gunningcriteria die wij hanteren bij het beoordelen van uw aanbieding.

3 Selectieproces onderzoek Noord-Zuidlijn

Hieronder staan de belangrijkste data en beslismomenten samengevat.

Eind week 43: Verzenden Concept Offerteaanvraag aan de uit te nodigen onderzoeksbureaus. Dit onderdeel is reeds afgerond.

Begin week 44: Kennismakingsbijeenkomst met de voorbereidingscommissie. Doel van debijeenkomst is tweeledig. Wij verwachten dat u: a) de kennis en ervaring van uw organisatie demonstreert en b) uw mening geeft over de aan u verzonden Concept Offerteaanvraag.

Op basis van uw visie en commentaar op de Concept Offerteaanvraag past de voorbereidingscommissie waar wenselijk de Definitieve Offerteaanvraag aan. Dit onderdeel is reeds afgerond.

Eind week 44: Verzenden Definitieve Offerteaanvraag. U krijgt 2 weken om uw offerte in te dienen (eind week 46).

Week 48:

Toelichting op uw offerte (indien u hiervoor geselecteerd wordt) aan de voorbereidingscommissie. Met name ten aanzien van de gekozen onderzoekssystematiek alsmede de in te zetten projectleider en adviseurs.

Week 49: Gunning van het contract en start van de activiteiten. Deonderzoekswerkzaamheden moeten zijn afgerond eind maart 2005.

4 Onderzoeksvragen

Grondslag voor het onderzoek is voornoemde motie van de heer Bijlsma c.s. Hierin staat:

Aan de Gmdaeenteraad

Ondergetekenden hebben de eer voor te stellen:

De Raad,

Gehoord de discussie over de voordracht van het College van Burgemeester en Wethouders van 10 mei 2004 inzake de financiële prognoses tot 2012 van het project Noord-Zuidlijn (Gemeentebld afd. 1, nr. 282);

Gezien de voormelde voordracht, waarin opgenomen:

- een verwachte verlenging van een halfjaar van de projectduur;
- een geprognosticeerde kostenverhoging tot het einde van het project van 92 miljoen euro;
- een inventarisatie van risico's van in totaal 55 miljoen euro, zijnde het gemiddelde van de geschatte bandbreedte;
- een inventarisatie van risico's van in totaal 64 miljoen euro, zijnde het gemiddelde van de geschatte bandbreedte en waarvoor nog geen dekkingvoorstel is aangegeven (p.m.-risico's);

Overwegende, dat het van groot belang is om de nu bekende kostenverhoging en risico's te beheersen en, waar mogelijk, te verminderen.

Ten slotte overwegende, dat de controlefunctie van de Gemeenteraad bij grote projecten, zoals de Noord-Zuidlijn, dient te worden versterkt;

Spreekt uit, dat de door het College verstrekte antwoorden de ongerustheid ten aanzien van de beheersing van uitgaven en risico's bij de Noord-Zuidlijn op dit moment onvoldoende hebben weggenomen,

Besluit:

- I. een tijdelijke commissie van onafhankelijke deskundigen in te stellen en deze te vragen om:
 - de projectleiding en het management van de Noord-Zuidlijn door te lichten;
 - te onderzoeken, of de financiële beheersing van het project Noord-Zuidlijn adequaat is en, zo niet,
 - een advies uit te brengen op welke wijze deze kan worden verbeterd;
 - daarnaast een advies uit te brengen, hoe de controlefunctie van de Gemeenteraad bij grote projecten kan worden versterkt;
- II. dit advies in de Gemeenteraad te bespreken vóór de finale besluitvorming over de begroting voor 2005.

De leden van de Gemeenteraad, A. Bijlsma (PvDA), H.H.M.M. Marres (PvDA), R.E. Flos (VVD), L.M. Spee-Roupe van der Voort (CDA), A. van Pinxteren (GroenLinks), J.C. Kalt (Amsterdam Anders/De Groenen).

Nadat dit besluit in de Gemeenteraad werd genomen, is een voorbereidingscommissie onder leiding van de heer Bijlsma gestart met de volgende activiteiten:

- 1) het samenstellen van een onderzoekscommissie van onafhankelijke deskundigen. Deze onderzoekscommissie wordt het aanspreekpunt voor het adviesbureau waaraan deze opdracht wordt gegund;
- 2) het nader uitwerken van de onderzoeksvragen zoals beschreven in bovenstaand Raadsbesluit.

Beide werkzaamheden worden hieronder toegelicht.

Ad 1 De onderzoekscommissie

Het onderzoek wordt begeleid door een onderzoekscommissie van onafhankelijke deskundigen. De samenstelling van de onderzoekscommissie voor het onderzoek naar het project Noord-Zuidlijn is op dit moment nog vertrouwelijk.

De onderzoekscommissie is lijdelijk van aard; d.w.z. zij fungeert als klankbordgroep voor het onderzoeksbureau dat de beschreven onderzoeksvragen uitvoert. Naar verwachting komt de onderzoekscommissie maximaal 6 keer bijeen gedurende de onderzoeksperiode.

Indien er zich problemen voordoen tussen de onderzoekscommissie en het onderzoeksbureau dient de voorzitter van de voorbereidingscommissie te worden ingeschakeld.

Ad 2 De onderzoeksvragen

De voorbereidingscommissie onder leiding van de heer Bijlsma, heeft de onderzoeksvragen meer gedetailleerd uitgewerkt in de volgende 4 deelvragen.

Deelvraag 1: de projectleiding en het management

De vraag om de projectleiding en het management door te lichten. Hierbij waren onder meer aandacht te besteden aan de volgende deelontwerpen en vragen:

- a) de vraag of de opzet met (1e) een adviesbureau voor het eigenlijke advieswerk, (2e) een projectbureau voor de invulling van de opdrachtgeverrol en (3e) een bestuurlijk team om het geheel vanuit de politieke verantwoordelijkheid te managen, voldoet uit oogpunt van:
 - a. onderlinge onafhankelijkheid en scheiding van verantwoordelijkheden;
 - b. effectiviteit, beheersing van de processen;
 - c. beschikbaarheid en inzet van voldoende deskundigheid op de juiste plaatsen;
- b) de vraag of de bedoelde taken en opdrachten van het projectbureau en het bestuurlijk team voldoende helder en adequaat zijn geformuleerd en vastgelegd;
- c) de vraag of de opdrachtschrijvingen aan het adviesbureau voldoen aan de eisen zoals die in het normale maatschappelijke verkeer worden gesteld, o.a. voor wat betreft de honorering, de ondernemersrisico's van de adviseurs, de verantwoordelijkheid bij eventueel gemaakte fouten, de regeling van vervolgoopdrachten en de verzekering en of de gangbare regelingen voor de verhouding tussen opdrachtgever en adviseur zijn toegepast.

Deelvraag 2: de financiële systematiek

De vraag te onderzoeken of de financiële beheersing/systematiek van het project Noord-Zuidlijn adequaat is. Hierbij onder meer aandacht te besteden aan de volgende deelontwerpen:

- a) het niveau qua ervaring en deskundigheid van betrokken ambtenaren en adviseurs, met name de vraag of zij opgewassen zijn tegen hun tegenspelers aan aannemerszijde;
- b) de vraag of het project adequaat is georganiseerd voor wat betreft het opknippen van het werk in bestekken, de onderlinge aansluitingen, het tijdschema en de risico's. De gang van zaken bij de diverse aanbestedingsronden en de wijze waarop in elke situatie op de aanbestedingsresultaten is gereageerd en de conclusies die hieruit zijn getrokken voor de aanbesteding die nog moeten plaatsvinden;
- c) de vraag of het in 2002 gehanteerde financiële model up-to-date was en de vraag of het huidige aangepaste model up-to-date is en de mate van betrouwbaarheid van gegevens die deze hebben gegenereerd;

- d) de realiteitswaarde van de financiële gegevens betreffende de kostenposten, zoals genoemd in de voordrachten sinds 2002 en de aangenomen raadsmoties (met o.a. VAT-kosten, onvoorzien, rentekosten, vergoeding indexeringskosten, BTW enz. enz.) en de toekomstverwachtingen dienaangaande. Met andere woorden: het toetsen van de materiele betrouwbaarheid van het initiële voorstel uit 2002 (speciale aandachtspunten VAT-kosten, stelposten, inschatting mogelijke risico's);
- e) de vraag in hoeverre reeds geconstateerde of verwachte overschrijdingen gemeten moeten worden aan inadequate ramingen, onvoorziene marktomstandigheden of het buiten beeld houden (op enig niveau) van eerder verwachte of gevreesde overschrijvingen;
- f) de vraag of tijdig en adequaat is, respectievelijk, wordt gerapporteerd over de technische en financiële gang van zaken en de (dreiging van) toekomstig meerwerk door het adviesbureau aan het projectbureau, door het projectbureau aan het bestuurlijk team, door het bestuurlijk team aan B&W en door B&W aan de Gemeenteraad.
- g) de wijze waarop met scopewijzigingen wordt omgegaan;
- h) de anticipatie op toekomstig meerwerk en andere risico's, inclusief de vraag naar de mogelijke effecten van de recente verhoging van het onvoorziene;
- i) de beheersing van de vergunningen;
- j) interfaceproblemen;
- k) **de beheersing van eventuele bouwfraude aspecten; deze vraag komt te vervallen;**
- l) de technisch-financiële opzet van de bestekken en de daarin opgenomen onderdelen als stelposten en gemeenschappelijke risicodomeinen, waarbij speciale aandacht wordt gevraagd voor de vraag of het risico voor de opdrachtgever in het geval van calamiteiten of technische problemen van geringe omvang, voldoende c.q. op de meeste haalbare wijze is afgedekt. Met andere woorden: het toetsen van de betrouwbaarheid van de geprognosticeerde 92 miljoen en de toekomstige risico's;
- m) de opzet en uitvoering van de verzekeringen die door de gemeente zelf ter hand zijn genomen en de vraag of de risico's die voor de aannemer resteren voldoende zijn gedefinieerd en afgedekt;
- n) de vraag of een aanvullende verzekering tegen extreme calamiteiten gewenst is;
- o) de vraag of opzet en uitvoering voldoen aan de algemene eisen die destijds zijn geformuleerd in het rapport Herweijer n.a.v. de overschrijdingen van het budget voor de Stopera;
- p) de vraag of door B&W, het projectbureau en het adviesbureau is gehandeld in overeenstemming met de besluiten van de Gemeenteraad.

Deelvraag 3: advies inzake financiële beheersing

De vraag om een advies uit te brengen op welke wijze de financiële beheersing van de Noord-Zuidlijn kan worden verbeterd, mocht deze inadequaat zijn. Deze vraag heeft geen nadere omschrijving, aangezien het antwoord zal moeten volgen uit de bevindingen van de commissie. Opgemerkt wordt dat deze vraag uitsluitend betrekking heeft op de Noord-Zuidlijn. Met name de vraag of de 92 miljoen Euro onontkoombaar is en de vraag of binnen of het project of daarmee samenhangende projecten compenserende maatregelen te treffen zijn.

Deelvraag 4: advies inzake controlefunctie Gemeenteraad

De vraag om een advies uit te brengen, hoe de controlefunctie van de Gemeenteraad bij grote projecten kan worden versterkt. Deze vraag geldt uiteraard voor 'grote projecten' in het algemeen. De vraag spruit voort uit onvrede over de situatie dat de Gemeenteraad regelmatig achteraf met grote overschrijvingen van grote projecten wordt gecontroleerd, zij het dat er ook veel voorbeelden van grote Amsterdamse projecten zijn die binnen de ramingen blijven.

De Gemeenteraad is zich ervan bewust dat de situatie waarbij ambtenaren en/of adviseurs tijdens de voorbereidingsfase te hoog gaan ramen om kritiek achteraf te voorkomen, te allen tijde vermeden moet worden en verzoekt de commissie daarmee rekening te houden. In hoeverre kan de Gemeenteraad hierbij gebruik maken van de lessen die uit de lopende parlementaire enquête over de HSL en Betuwelijn komen? Professor Flyberg wijst op de noodzaak van het ontwikkelen van incentives om te komen tot een goede informatie over en adequate beheersing van de kosten van grote projecten. Kan de commissie deze aanbevelingen concretiseren voor de Gemeenteraad?

5 Eisen aan de leveranciers

De eisen die wij stellen aan de opdrachtnemer vallen uiteen in kwalitatieve en financiële eisen. Wij verwachten in uw aanbieding dat u een antwoord geeft in de mate waarin u aan deze eisen voldoet. Tevens stellen wij een aantal vormeisen aan uw offerte om het onderling vergelijken van de aanbiedingen te vergemakkelijken.

5.1 De kwalitatieve eisen

De volgende kwalitatieve eisen worden gesteld aan uw organisatie:

- 1) Ervaring met het opzetten en/of doorlichten van dit type grote infrastructurele werken. Wij verzoeken u ten minste 2 referentieprojecten aan te geven inclusief referentiepersonen (namen en telefoonnummers).
- 2) Kennis van de Nederlandse situatie in de bouw. Het betreft hier zowel de aanbodzijde van de bouw (aannemers, ingenieurs enz.) als de vraagzijde (de wijze waarop de overheid als opdrachtgever acteert).
- 3) Continuïteit en kwaliteit. De adviseurs en projectleider die u aanbiedt in uw offerte zijn ook de adviseurs en projectleider die de uiteindelijke werkzaamheden uit gaan voeren (geen substitutie tenzij daadwerkelijke overmacht). Tevens zien wij graag onderbouwd hoe uw organisatie de kwaliteit van haar dienstverlening borgt.
- 4) Overige kwalitatieve eisen. U dient aan te geven dat géén van de onderstaande situaties op uw organisatie van toepassing is:
 - a. uw organisatie in staat van faillissement, vereffening, surséance van betaling of akkoord verkeert, dan wel haar werkzaamheden heeft gestaakt of in een andere soortgelijke toestand verkeert, ingevolge een gelijkwaardige procedure van de nationale wettelijke regeling;
 - b. voor uw organisatie faillissement is aangevraagd of tegen wie een procedure van vereffening of surséance van betaling of akkoord dan wel een andere soortgelijke procedure, die in de nationale wettelijke regeling is voorzien, aanhangig is gemaakt;
 - c. uw organisatie bij een rechterlijke beslissing die kracht van gewijsde heeft, veroordeeld is geweest voor een delict dat de beroepsmoraliteit van de dienstverlener in het gedrang brengt;
 - d. uw organisatie in de uitoefening van zijn beroep een ernstige fout heeft begaan, vastgesteld op elke grond die de aanbestedende diensten aannemelijk kunnen maken;
 - e. uw organisatie niet aan haar verplichtingen heeft voldaan ten aanzien van de betaling van de sociale verzekeringsbijdragen overeenkomstig de wettelijke bepalingen van het land waar zij gevestigd is of van het land van de aanbestedende dienst;
 - f. uw organisatie niet aan zijn verplichtingen heeft voldaan ten aanzien van de betaling van haar belastingen overeenkomstig de wettelijke bepalingen van het land van de aanbestedende dienst.

5.2 De financiële eisen

U dient uw financiële en economische draagkracht aan te tonen door het aanleveren van een verklaring, dat uw omzet op de gevraagde diensten zoals hierboven omschreven, over de laatste drie boekjaren tenminste 1.000.000 Euro per jaar bedroeg.

5.3 Overige eisen aan uw aanbieding

Om tot een objectieve beoordeling van offerten te kunnen komen stellen wij enkele eisen aan de vorm van uw offerte. Uw offerte bestaat uit de volgende drie onderdelen:

A) Een inhoudelijk voorstel

In dit deel staat beschreven op welke manier (methode, planning, enz.) u denkt uw onderzoek in te richten en welke adviseurs en/of projectleider(s) ingezet gaan worden inclusief de c.v's met relevante werkervaring. Uw offerte dient in het Nederlands te zijn opgesteld.

B) Een financieel voorstel

Wij zien graag een financieel voorstel voor een vaste prijs. Gezien het feit dat:

- 1) de Gemeenteraad zich strikt houdt aan de Europese en nationale regelgeving;
- 2) de Europese Commissie van mening is dat de uitzonderingsbepaling in artikel 11, lid 3, sub d van Richtlijn 92/50/EEG niet van toepassing is;

hopen wij dat de waarde van uw offerte beneden de voor de gemeente Amsterdam geldende drempelwaarde voor Europese Aanbestedingen ligt. Mocht dit niet het geval zijn, dan zullen wij alsnog een Europese Aanbesteding moeten uitschrijven, respectievelijk ontheffing via de rechter moeten aanvragen.

c) Een contractueel voorstel

De Gemeenteraad is verplicht de Algemene Inkoopvoorwaarden van de gemeente Amsterdam te hanteren (separaat reeds aan u verzonden). Graag zien wij in uw contractueel voorstel of u wel of niet kunt instemmen met de bepalingen in die inkoopvoorwaarden. Op dit onderzoek is tevens een zogenaamd informatieprotocol van toepassing waar u zich aan moet conformeren (tevens separaat reeds aan u verzonden).

6 Gunningcriteria

Bij het beoordelen van uw offerte hanteren wij het criterium economisch meest voordelige aanbieding. De wegingsfactoren die wij hanteren zijn:

Kwaliteit inhoudelijk voorstel en aangeboden adviseurs:	70%
Prijs:	20%
Conformiteit met de Algemene Inkoopvoorwaarden:	10%

U dient uw offerte, in tweevoud en in een gesloten envelop, in te dienen bij de Raadsgriffie op uiterlijk 12 november 2004 om 12:00 uur. Op de envelop dienen de volgende gegevens te staan:

Gemeente Amsterdam
T.a.v. Mw. Marijke Pe, Raadsgriffier
Postbus 202
1000 AE Amsterdam

Met grote letters moet u vermelden **NIET OPENEN VOOR 12 NOVEMBER 12:00 UUR**. Per fax of e-mail ingediende aanbiedingen worden niet geaccepteerd.

Tot uiterlijk 5 november 2004 kunt u per e-mail of post vragen stellen over de Definitieve Offerteaanvraag. Alle vragen worden geanonimiseerd, gebundeld en van antwoord voorzien per e-mail toegezonden aan alle partijen die zijn uitgenodigd een aanbidding uit te brengen. Het antwoord wordt op uiterlijk 8 november 2004 toegezonden.

BIJLAGE E
OFFERTE FAITHFUL & GOULD

FAITHFUL & GOULD

**Amsterdam
Noord-Zuidlijn
Project**

**Proposal to
Undertake an
Investigation and
Project Review**

for the

Municipal Council of Amsterdam

11 November 2004

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- 2.0 Project Appreciation
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1.0 INTRODUCTION

1.1 Invitation to Submit Proposals

- 1.1.1 Faithful & Gould Limited has been invited by the Municipal Council of Amsterdam ('the Council') to conduct an investigation of the Noord-Zuidlijn project ('the Project') in accordance with a decision taken by the Council on 16th June 2004. The purpose of this investigation ('the Investigation') will be to address the concerns of the Council regarding the financial prognoses for the Project up to the Year 2012 in the light of existing best practice for setting up large infrastructure projects.
- 1.1.2 The Council's invitation to submit a Definitive quotation is contained within a document dated 1st November 2004 which has been issued to us following our preliminary presentation to the Council on Monday 25th October 2004.

1.2 Faithful & Gould

- 1.2.1 Faithful & Gould is one of the world's leading project and cost management consultants, operating at the forefront of the transport, property and industry sectors. From an international network of offices and over 2,000 staff, Faithful & Gould works with clients throughout every stage of a project, from initial concepts, through design and construction to maintenance and property management.
- 1.2.2 A flexible and multi-disciplinary approach enables Faithful & Gould to provide an independent service in three key areas: consultancy, project management and commercial services. A multi-skilled workforce provides the experience and expertise to minimise costs and enhance development across every business sector, ensuring that clients' individual needs are met at every stage of the project process.
- 1.2.3 Faithful & Gould concentrates on specific markets across the transport, property and industry sectors.
- 1.2.4 In Transportation, a broad range of consultancy services and integrated solutions are offered in the rail, roads, ports and maritime, aviation and logistics sectors.
- 1.2.5 Faithful & Gould Consult delivers solutions to the investment decisions faced by corporate and public sector bodies, and gives robust and focused business advice to those considering major capital investment and operational expenditure. Contractual advice and services are provided across all business sectors. Services encompass private finance initiative; due diligence; contracts consultancy, dispute management; development consultancy; risk and value management; capital tax allowances and strategic asset management. In response to client demand, Faithful & Gould Consult has expanded its services to encompass comprehensive training programmes on every aspect of contractual and commercial administration, in addition to a wide range of topics from adjudication and partnering to health and safety. Effective leadership and teamwork, together with a proactive and non-confrontational approach to solving problems, enables Faithful & Gould to achieve clients' expectations and guarantee delivery.
- 1.2.6 In 1996, after 50 years as a successful partnership, Faithful & Gould became a member of the WS Atkins group. In recent years Atkins plc has expanded from its historical base in traditional engineering, management consultancy and property services into related technological consultancy and the management of outsourced facilities.
- 1.2.7 Atkins provides services for a wide range of governments, local and regional authorities, funding agencies and commercial enterprises. In addition, operating out of 175 offices worldwide, the Atkins group undertakes projects in some 86 countries and has over 15,000 staff. Faithful & Gould benefits from the broader experience and resources of the Atkins group.

1.2.8 Faithful & Gould is recognised as a major player in the global market for project and cost management services, continually striving for excellence in every service offered. This combined strength; global vision and integrated solutions approach continue to set Faithful & Gould apart.

1.3 Experience

1.3.1 In undertaking this appointment, Faithful & Gould would work closely with the specialist Rail engineering division within our parent company, Atkins. Both individually and collectively, Faithful & Gould and Atkins Rail have an unrivalled capability and expertise in the management and delivery of major rail projects. This strength and breadth of both technical and commercial/project management capability equips us, we believe, to provide a unique service to the Council in connection with the Investigation of the Project.

1.3.2 We have set out in Appendix A our vast track record in the design, management and procurement of rail projects ranging from relatively small assignments to our role in the design and delivery of two of the largest Underground rail projects (Metronet SSL and BCV Projects) ever undertaken in the UK (valued in excess of €40bn). Both of these projects were procured under a complex and innovative Public-Private Partnership ('PPP') structure.

1.3.3 In addition to our expertise in the rail sector, we have extensive experience of advising investors in the procurement of major projects through the conduct of major technical due diligence reviews the scope of which compare closely with the content of our Investigation of the Noord-Zuidlijn Project. We have again included a summary of such experience under Appendix B.

1.3.4 We have included at Appendix C letters of commendation from some of our international financial clients and indicate below two referees who can also be contacted :

Dominic Baldwin
Network Rail North West
111 Piccadilly
Ducie Street
Manchester
UK
Tel. 00 44 (0) 161 228 8500

Steve Smith
Network Rail
100 Wharfside Road
Birmingham Mailbox
Birmingham
B1 1RT
Tel. 00 44 (0) 121 345 3000

Glenn Fox
FGIC UK Limited
11 Old Jewry
London.
EC2R 8DU.

2.0 PROJECT APPRECIATION

2.1 Background

- 2.1.1 The Project is a large and complex engineering scheme comprising the construction of an underground rail line beneath Amsterdam using bored tunnelling techniques and incorporating eight passenger stations. The Project, which is expected to reach completion in 2012, is currently estimated to be six months in delay with anticipated cost increases of 92 million Euro's. In addition, risk inventories in the ranges of 55 million Euro's and 64 million Euro's respectively have also been identified.
- 2.1.2 Against this background, the Council has decided to appoint a temporary commission of independent experts to investigate the leadership and management of the Project; to determine whether the financial controls over the Project are adequate; to advise how such controls can be improved and to advise on how the Council's supervisory function in the case of other, large infrastructure projects can be strengthened.
- 2.1.3 If we are appointed to undertake the Investigation, Faithful & Gould will be responsible directly to the Council but will liaise closely with an investigation commission ('the Investigation Commission') consisting of independent experts. The Investigation Commission will work as part of the Council and we will expect to meet periodically with it to discuss and present our findings and to use it as a sounding-board on behalf of the Council.

2.2 Purpose of the Investigation

- 2.2.1 We understand and appreciate that the Project is currently suffering delay and substantial cost overruns above the value of the initial cost estimates. It is therefore the intention of the Council to understand and manage the risks of further time slippage and cost increases in the period leading up to completion of the Project. It is also the intention of the Council to identify and apply 'lessons learned' and best practice in relation to the Noord-Zuidlijn Project to other large, infrastructure projects with which the Council is engaged.
- 2.2.2 Accordingly, it is our intention to conduct the Investigation with the objective of identifying specific recommendations and proposals in respect of the completion of Noord-Zuidlijn and to distil from this, more general advice and recommendations in relation to Council's procurement of other infrastructure projects.

2.3 Key Issues

- 2.3.1 We have identified below, in summary form, some of the Key Issues which we believe will form the basis of our Investigation and review. We have identified in Section 3.0 below how these matters will be investigated by our team in detail.
- Project Structure
 - understanding of key participants (client, contractors, consultants) and contractual relationships;
 - definition of key participant's roles and responsibilities;
 - which are the critical sub-contractor interfaces and how are they being managed?
 - what is the experience/capability of the various consultants and contractors?

- Project Controls
 - how are key risks allocated between the various contracting parties?
 - how is the planning/programming function being lead and co-ordinated?
 - how are Project costs being reported and managed? What tools/processes are in place?
 - what risk management processes are in place?
- Contractual Arrangements
 - how are Variations and Scope changes being managed?
 - which risks remain with the Council?
 - are the Works adequately scoped and defined? Is this fully stepped-down into sub-contract work packages?
 - are completion and commissioning activities adequately defined?
 - what contractual status does the programme (and any partial/sectional completions) have?
- Completion of Remaining Works
 - quantification/analysis of time and cost risks in respect of the balance of the project which remains to be completed?
 - what sub-contract work packages (design and construction) remain to be tendered and what processes are in place to manage the tendering/selection process?
 - what technical risks to current budgets and programme exist? Who is responsible for these risks and how are they being managed?
 - are the proposed resources in relation to the completion of the remaining works consistent with planned activity durations?
 - how robust is the supply chain and are interfaces between works package contractors adequately managed/controlled?
 - what function/role will the Project Office and Administrative team (of the Council) play?
 - to what extent are insurance requirements sufficient to meet the risks of the Project?
 - what (if any) major scope changes are envisaged?
 - how robust are the current cost estimates to complete and what assumptions are they based upon.?
 - do the current Project control processes comply with the requirements of the Herweijer report?
 - have the key stakeholders in the Project (Mayor, Aldermen, Project Office and Consultants) complied with the decisions and directives of the Council?
 - can lessons learned from the HSL and Betuwelijn projects be applied to this Project?
 - what alternative financing and risk allocation structures could be implemented to transfer risk (and cost certainty) to the private sector?

3.0 DELIVERY OF OUR SERVICES

3.1 Project Execution Plan

3.1.1 We have outlined in section 4.0 below the structure of our team which will incorporate a range of specialist, complimentary skills for the successful completion of the Project. To explain how we will conduct the review, we have set out below the key stages/processes in our work programme (see also appendix F). These will form the basis of a specific project execution plan once we have conducted an initial review of the Project to determine the key risks and matters for detailed consideration.

3.2 Stage 1 – Preliminary Review and Project Familiarisation

3.2.1 This stage of the Investigation will comprise initial familiarisation with the Project and the various stakeholders/participants. A register of all key Project documents will be compiled and a “data room” set up to facilitate access. A programme of translation of key documents into English – prioritising those most critical – will also be established. We would seek to utilise our bespoke document management system, iProNet to assist in the secure transmission and accessibility of documents to those within the Project team who may not otherwise need to be permanently resident in Amsterdam.

3.2.2 Once the basic document management systems have been established we will identify the key design and construction work packages and establish a structure within which the Investigation can take place. We anticipate that this will include identification of at least the following key work packages:

- Geotechnical - Tunnelling, Excavation, Water extraction, spoil management
- Track - (Permanent Way)
- Control & Communication systems
- Electrification
- Passenger Facilities - Stations, Building Services
- Operations and Maintenance - Management Systems

3.2.3 In order to identify a comprehensive register of all identifiable Project risks, we would then anticipate conducting an extensive quantitative risk management workshop. This would involve inviting all key Project participants to attend the workshop which would be facilitated by an experienced risk manager. The outcome of the workshop (which will be repeated periodically throughout the course of the Investigation) will be to identify all potential risks to the completion of the Project within the current financial and programme/schedule forecasts. The risks identified from the workshop will be distilled and analysed to produce a comprehensive risk register from which the time and budgetary implications of each risk will be modelled. This process utilises quantitative statistical modelling techniques based on proprietary software packages. When complete, the risk model will provide a robust forecast of the statistical probability of attaining completion of the Project within defined time and cost parameters.

3.2.4 An essential part of this stage will also be forming a relationship with the individuals who will be required to contribute to the Investigation process including the Project Office; Administrative team; contractors and consultants. Initial interviews will be held with selected personnel to contribute to our building a broader understanding of the way in which the Project has been developed and managed to date.

- 3.2.5 In parallel with the analysis of risks in this way, we will also commence a review of the key sub contract agreements to identify where Project risks have been allocated and how work packages have been tendered. This will identify the key interfaces between the various sub contracts which may create potential difficulties in the ongoing management of the Project. We would for example, expect to focus on the following key interfaces:
- tunnelling with street interface management
 - tunnelling with ProRail for Amsterdam Central tunnel under
 - tunnelling through the IJ River with start of track construction
 - electrification with Electro-mechanical Compatibility (EMC) environment (external to metro)
 - electrification with Control & Communications systems
 - civils construction with environmental management (and specifically waste management)
 - Legal and Consent issues
- 3.2.6 We would expect this stage of the review to be complete within 3 weeks of commencement (ie. Christmas 2004).

3.3 Stage 2 – Project Review

- 3.3.1 Following completion of stage 1, we would then anticipate developing the Investigation based on the key risks and issues to completion in addition to undertaking a more detailed review of the processes by which the Project is currently being managed.
- 3.3.2 This stage of the Investigation will explore in more detail the matters raised in questions 1 to 4 of the Council's "Definitive Quotation Request". We will expect to undertake analysis of the Project Controls and management systems being utilised in the management of the Project and to compare these with our experience of managing large infrastructure projects and current best practice. The design and construction work packages identified in Stage 1 will be used to provide a structure to our ongoing review. We will have as our objective two principal aims:
- To review; analyse and advise upon the systems; processes and controls currently in place to manage the Project and what improvements/changes we consider to be necessary to improve certainty and control of the procurement of the remainder of the Project; and To assess the risks remaining to the Project in terms of securing its completion within the current forecast time and budgetary constraints.
- 3.3.3 The Investigation will therefore focus both on how the Project has been and should continue to be managed and what risks will influence its successful outcome. The Quantitative risk workshops and risk models undertaken during stage 1 will be further refined and developed to provide statistical confidence intervals in the forecast outturn programme and costs to accompany and support the review and assessment of the Project management controls and processes necessary to complete the Project.
- 3.3.4 This stage of the Investigation will be driven by the need to establish how the Project is being managed rather than a detailed audit of the technical adequacy of the design and construction solution. Accordingly, whilst we will seek to understand and advise upon the technical capability; resourcing and general capability to deliver of the various parties, we will not be conducting a review of the general adequacy of the design or construction as built on site. Our review at this stage will encompass whether the technical specifications have been appropriately structured/drafted and in particular, whether and to what extent they are consistent with the provisional budgets and tender prices which have been based upon them.

-
- 3.3.5 We anticipate that this stage of the review will be complete by end January/early February and will result in the presentation of our conclusions and recommendations in the form of an outline report based on the two broad objectives set out in paragraph 3.3.2 above.

3.4 Stage 3 – Finalisation of the Investigation

The final stage of the investigation will comprise the detailed development of the conclusions and recommendations from stage 2. It is inevitable that the content and scope of this stage of the Investigation will be subject to further definition as the outcome of the stage 2 Investigation becomes clearer. For this reason we anticipate that our initial workscope may change as we develop the stage 2 investigation further. It is likely that certain matters will require more extensive investigation than may be currently anticipated whilst others may require less.

We anticipate that the outcome of work in Stage 3 will be a detailed report setting out our final opinions on the likely outturn cost and programme in respect of the Project, together with a clear set of recommendations as to what further controls and processes should be implemented in order to provide Project Management which is in accordance with Best Practice. This report will be available for presentation to the Council at the end of March 2005.

3.5 Generally

- 3.5.1 We anticipate attending periodic meetings with the Council and its independent advisory team when appointed to discuss our findings and to take further instructions/clarification as to the scope of our Investigation.

4.0 TEAM STRUCTURE

4.1 Proposed Team

- 4.1.1 We have given careful thought to selecting a Project team which will maximise the benefits and unite the range of Commercial, Management and Technical skills from within Faithful & Gould and across the Atkins group.
- 4.1.2 Our team will comprise a Project Director, Nick Gray, who is a Director of Faithful & Gould Limited and has extensive experience in leading technical reviews for investors in large, infrastructure projects. Nick Gray will have overall responsibility for the delivery of the assignment. Day-to-day management of the Project will be undertaken by Gordon Reid, a Regional Director of Faithful & Gould, who has significant experience of undertaking the Commercial and Project Management of large, infrastructure projects including liaison with public authorities and politicians. Gordon Reid will be based in Amsterdam for the duration of the Project and will be supported by a team of various commercial and technical specialists who will be resident in Amsterdam at appropriate intervals during the course of the Investigation.
- 4.1.3 We have included at Appendix D an organogram setting out the structure of our team, together with CV's for the key members of staff.
- 4.1.4 We would draw to the Council's attention our intention to utilise a Dutch national, Pierre Ten Holter within our team. Pierre Ten Holter will play a key role in supporting the review process providing both detailed knowledge and experience of the Dutch construction industry but also acting as an important interface with the various parties to whom we will need to interact and communicate during the course of the review.

4.2 Quality of Service

- 4.2.1 In common with most parts of the Atkins group, Faithful & Gould has attained Quality accreditation to European standard ISO 9002. Our certificate of registration is enclosed at appendix *.

5.0 FINANCIAL PROPOSAL

5.1 Introduction

5.1.1 We are aware of the Council's desire to obtain a fixed fee proposal and we note in particular, the Council's desire to ensure that the fee submission does not exceed the threshold value for services of this description within the European Commission directives. Accordingly, we have sought to narrow our scope of work as far as possible. This will enable us to offer a competitive, fixed fee proposal. Where additional work is then required which is beyond the scope of this fee proposal, we will endeavour to offer the Council further fixed fees or an alternative charging mechanism.

5.2 Fee Proposal

5.2.1 It is inevitable that an Investigation of the size and complexity of this Project will identify matters which require further investigation, once they have been initially established. Accordingly, our proposed fee is based on the narrowly defined scope set out below.

5.2.2 For ease of reference, we have used the same Question numbers as those used by the Council in the 'Definitive Quotation Request'.

Question 1

Our proposed fee for this scope of the Works is €**** and is based on the following:

- determine which of the 3 options identified under Question 1(a) is most appropriate;
- determine whether the tasks and duties of the Project Office and team have been sufficiently clearly set out (Question 1(b));
- review the terms and conditions of the appointment of the individual Project Consultants (we assume that no more than ten appointments will require to be reviewed).

This fee excludes the consideration of any options other than the three identified under Question 1(a) and also excludes any recommendations as to changes in the content of the appointment of the individual Project Office under Question 1(b).

Question 2

Our proposed fee for this scope of the works is €***** and is based on the following (we have again used the lettering sequence from Question 2):

- (a) We assume a maximum of ten consultancy firms will require to be reviewed and have allowed one day to review each of them.
- (b) We will conduct a high level review of the work programme/breakdown; identify key interfaces and conduct a quantitative risk analysis by means of a two-day workshop to identify the Key Project Risks; we will also review the tendering procedures and select the five most significant contracts/tenders upon which we will comment.
- (c) We will review the 2002 financial model to identify the key data and assess whether it reflects the latest reported cost estimates (cost reports). NB This does not include an overall review of the likely cost to complete the Project which is addressed under paragraph (d) below.

- (d) We will analyse the contracts and current cost estimates from the 2002 financial statements and will identify which of them are reliable and which may be subject to future risk of increase. We have not allowed for estimating how big such future cost increases will be as we do not yet understand the basis of the current estimates.
- (f) We will review the procedure for reporting and frequency of reports to the Council; we will review the framework for the contents of reports and we will review a sample of key reports during the last six months of the Project. We have not included within our fee for a detailed review of all reports issued within the Project.
- (g) We will assess the likelihood of future variations and the way in which these are to be dealt with under the various contracts.
- (j) We have allowed for identification of key interfaces under paragraph (b) above. Our fee proposal cannot, at this stage, include for advising on how interfaces should be managed by the Council. This will be possible once the extent of interfaces has been identified and we will then provide an appropriate fee quotation.
- (k) We note that this is now excluded.
- (l) We will identify the major workscopes (we have assumed 8 number) of the Project to determine the degree of definition within the specifications and the extent of certainty within the budgets. We will then summarise these key risks and their impact on the current estimate of 92 million Euro's. We have not included for addressing any as yet unidentified risks or their potential impact on the overall budget.
- (m) We will identify which insurances have been arranged directly by the Council and will review the high level risks which have been insured. We have not included within our proposal to undertake a detailed review of the terms, conditions and excess applicable to the various insurance policies.
- (n) We will identify what we consider to be any uninsured risks but our proposal does not include advising on the extent of such cover.

Question 3

Our fee in respect of this scope of the Works will be €****.

We will identify and summarise the key issues arising from the matters set out in Question 2 above and present this as part of our final report.

Question 4

Our fee in respect of this scope of the Works will be €*****.

We will outline the principal issues identified from our conduct of the Investigation generally and present these in our final report to the Council. We have not included in our proposal for the preparation of detailed processes and procedures which the Council may require to implement to give effect to our recommendations.

- 5.2.3 The fixed fee proposals set out above are calculated and will be payable in £ Sterling. We will submit invoices monthly and these will be payable within 28 days of the invoice date.

5.2.4 The fixed fee proposals set out above are exclusive of the following matters which will be reimbursable at nett cost (or as indicated otherwise below) :

- all local taxes and levies at the applicable rate;
- all incidental expenses including travelling to/from the UK and accommodation for staff based in Amsterdam;
- costs of translation of all Project documents from Dutch to English and our reports from English to Dutch.

Where additional work is necessary beyond that included in the fee proposal set out above, this will be recovered at the following hourly rates:

Project Director:	€***
Project Manager:	€***
Senior Technical Manager:	€***
Technical Manager:	€***
Technical Support Manager:	€***
Administrative support:	€***

We will not undertake any additional work without the prior written agreement/authorisation of the Council.

5.3 Financial Standing

We confirm that Faithful & Gould is not insolvent and that it is not subject to any of the circumstances set-out in paragraph 4(a) to (f) of the Council's "Definitive Request for Quotation".

We confirm, further to paragraph 5.2 of the Council's "Definitive Request for Quotation", that our turnover in respect of the services comprising this assignment are in excess of 1 million Euro's per annum over the last three financial years.

5.4 Terms of Appointment

5.4.1 We have reviewed the General Purchasing Conditions of the Municipality of Amsterdam and confirm that we will require to discuss with the Council certain of the Conditions as part of any negotiation of our appointment.

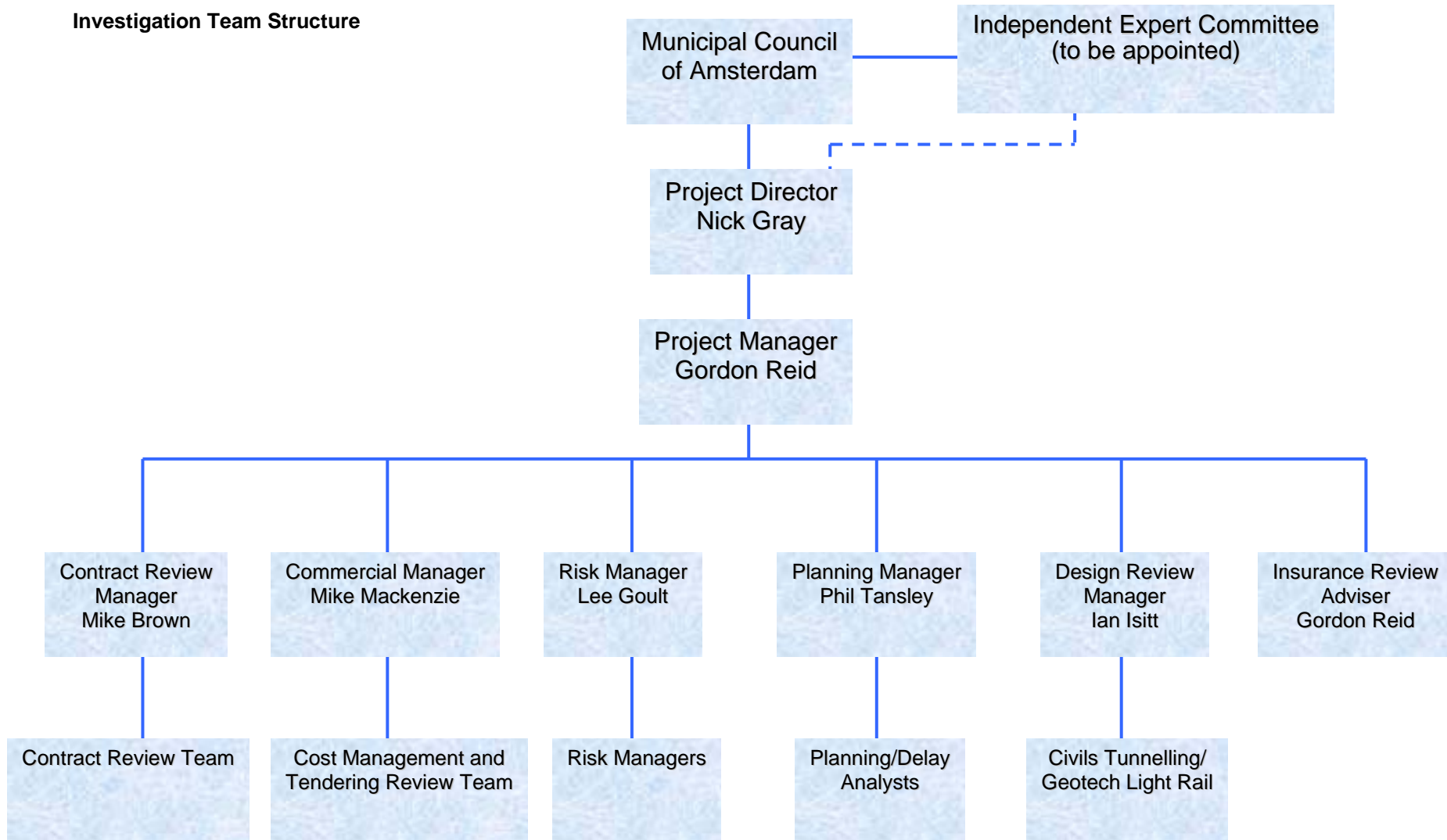
6.0 SUMMARY

Why Faithful & Gould?

- 6.1.1 We consider that Faithful & Gould, together with the specialist Rail engineering skills and experience within the Atkins group provides us with a unique skillset to undertake the Investigation. We have an extensive track record in the conduct of commercial- technical reviews of large, complex infrastructure projects across a wide variety of procurement methods including traditionally financed and PFI/PPP. This track record incorporates the conduct of reviews for International funding institutions and investors; Government bodies and major contractors. Supplementing this capability in the conduct of independent project reviews is the vast knowledge and expertise of Atkins Rail in some of the largest and most innovative rail engineering projects in the UK.
- 6.1.2 Our team will be lead by an experienced and senior Chartered Surveyor with significant civil engineering experience who will be based in Amsterdam and will be supported by a dedicated Project team possessing the optimum combination of Project Management; commercial and technical skills to undertake a rigourous and comprehensive review of the Project.
- 6.1.3 Our objective will be to identify a clear and defined set of recommendations from which a practical plan and process to manage the rest of the Project can be established. This will encompass not only advice on the procurement of the remaining packages of work which have not yet been tendered but also whether a more innovative approach to the allocation of risk can be established which will provide the optimum value for money for the Council.
- 6.1.4 We have endeavoured as far as it is appropriate to do so at this stage to develop a lump sum fee in respect of our involvement in the Project. We have structured this to deliver good value for money to the Council but recognise that the scope can only be fully and definitively developed once the outcome of the initial stages of the Investigation is known.
- 6.1.5 We are delighted to have the opportunity to submit our proposal to the Council and would welcome any further questions/clarifications which the Council may require.

APPENDICES

Investigation Team Structure



BIJLAGE F

**LIJST VAN DOOR RAADSGRIFFIE VOOR AANVANG ONDERZOEK VERSTREKTE
DOCUMENTEN**

Lijst van documenten die door de Raadsgriffie zijn verstrekt voor aanvang van het Onderzoek

NR	DATUM	TITEL	STATUS
A: Subsidiebeschikking en vervolg eerste aanbesteding binnenstad			
1.	23-12-1999 4-10-2000	Subsidiebeschikking en aanvaarding ervan door de gemeenteraad	Openbaar
2.	12-1-2001	Resultaat eerste aanbesteding contracten binnenstad (Bestuurlijk Team)	Vertrouwelijk
3.	22-2-2001	Eerste aanbesteding contracten binnenstad; voorstellen voor vervolg (Bestuurlijk Team)	Vertrouwelijk
4.	13-3-2001	Stand van zaken en vervolgtraject na eerste aanbesteding contracten binnenstad (Bestuurlijk Team)	Vertrouwelijk
B: Periode januari tot september 2002 (aanloop tot en met het startbesluit)			
1.	24-1-2002	Raadsvoordracht Uitkomst aanbestedingen en vervolgbesluiten	Openbaar
2.	24-6-2002	Raadsvoordracht Start aanleg NZL	Openbaar
3.	23-8-2002	Brief projectdirecteur Geluk aan wethouder Dales	Vertrouwelijk
4.	27-8-2002	Actualiteit over afkalkvend draagvlak	Vertrouwelijk
5.	12-9-2002	Beantwoording ca 150 vragen Raadscommissie 5-9- 2002	Vertrouwelijk/ Openbaar
6.	17-9-2002	Brief aan minister V&W	Openbaar
7.	25-9-2002	Brief van de minister V&W aan College	Openbaar
8.	24-9-2002	Raadsvoordracht 5e uitvoeringskrediet NZL	Openbaar
9.	27-9-2002	Brief weth. NZL over motie Giskes aan cie. VVI	Openbaar
10	19 en 27-9- 2002	Adviezen Nauta Dutilh over wijziging subsidie	Vertrouwelijk
11	1-10-2002	Beantwoording ca 25 vragen Raadscommissie 24-9- 2002	Openbaar/ Vertrouwelijk
12	8/9-10-2002	Behandeling in de gemeenteraad, vier moties	Openbaar
C: Openbare Kwartaalverslagen 1^e kwartaal 2002 t/m 1^e kwartaal 2004 (9 stuks)			
D: Rapportages periode 4^e kwartaal 2002 t/m 3^e kwartaal 2003			
1.	23-4-2003	Gebundelde rapportage 4 ^e kwartaal 2002 t/m 1 ^e kwartaal 2003	Vertrouwelijk
2.	12-5-2003	Brief afdoening motie Bijlsma	Openbaar
3.	13-6-2003	Aanvulling op afdoening motie Bijlsma	Openbaar
4.	22-5-2003	Brief wethouder aan Raadscommissie met aangepaste rapportage 4 ^e kwartaal 2002 t/m 1 ^e kwartaal 2003	Openbaar
5.	28-8-2003	B&W-behandeling inpassing station RAI (inclusief overboeking € 5 mln. vanuit risicofonds) (Raadsbesluit: 8-10-2003)	Openbaar

NR	DATUM	TITEL	STATUS
6.	16-9-2003	B&W-besluit overheveling € 10 mln. vanuit budget risicofonds naar VAT-kosten	Vertrouwelijk
7.	27-10-2003	Financiële rapportage ijkdatum augustus 2003 (inclusief overboeking budget verzekering na Raadsbesluit mei 2003): behandeling in B&W: 11-11-2003	Vertrouwelijk
E: Prognose tot 2012 (ijkdatum 4^e kwartaal 2003)			
1.	26-3-2004	Brief rekeningcommissie aan college	Openbaar
2.	31-3-2004	Brief college aan rekeningcommissie	Openbaar
3.	5-4-2004	Financiële prognose tot 2012 NZL (B&W-behandeling 6-4-2004	Vertrouwelijk
4.	8-4-2004	Brief wethouder aan Gemeenteraad Prognoses financiën tot 2012	Openbaar
5.	11-5-2004	Beantwoording ca 250 schriftelijke vragen raadsleden commissie VVI	Openbaar
6.	11-5-2004	Vier bijlagen risico-analyses bij beantwoording 250 vragen van de leden van de cie. VVI	Vertrouwelijk
7.	8-6-2004	Beantwoording aanvullende schriftelijke vragen Raadscommissie VVI	Openbaar
8.	8-6-2004	Zeven bijlagen bij aanvullende schriftelijke vragen Raadscommissie VVI: 1. brief dir. NZL aan weth. NZL dd.23-8-2002 2. vertr. Fin. rapp. 4 ^e kwart.2002 + 1 ^e kwart.2003 3. fin. strategische rapp. (stand per aug. 2003) dd. 27-10-2003 4. vertr. Fin. rapp. 3 ^e kwart.2003 (stand per sept. 2003, intern PB NZL) dd 9 december 2003 5. fin. prognose 2012 dd. 6 april 2004 6. brief minister VenW aan TK 25-8-2003 7. organisatie NZL 1,2,3,5, zitten in het dossier 4,6,7 zijn bijgevoegd	Vertrouwelijk

BIJLAGE G

**LIJST VAN DOOR HET PROJECTBUREAU NOORD/ZUIDLIJN AAN FAITHFUL & GOULD
VERSTREKTE DOCUMENTEN TIJDENS ONDERZOEK**

Lijst van documenten die vestrekt zijn door het Projectbureau.

Nr	Titel van het document in Nederlands	Document title in English
1	Geen Documentatie	No Document
2	Overeenkomst Gem. A'dam en Witteveen + Bos, dd 30 juni 1994	Agreement (contract) between the City of Amsterdam and Witteveen+Bos of 30 June 1994
3	Bijlage 1 t/m 4 behorende bij de overeenkomst Gem. A'dam en Witteveen en Bos, dd juni 1994	Appendices 1 to 4 to the Agreement between the City of Amsterdam and Witteveen+Bos, of June 1994
4	Bijlage 5 behorende bij de overeenkomst: vraagstelling voor en informatie tbv selectie ontwerpers	Appendix 5 to the Agreement between the City of Amsterdam and Witveen+Bos: Information request and submitted information on selection of designers
5	Bijlage 6: Aanbieding advieswerkzaamheden Definitiefase Witteveen + Bos, (ingekomen 29-12-00)	Appendix 6 to the Agreement between the City of Amsterdam and Witveen+Bos: Proposal of advisory activities by Witveen+Bos, Definite phase, (came in 29-12-2000)
6	Bijlage 7 t/m 10: samenwerkingsovk WB en De Weger, samenwerkingsovk AB NZL en IB A'dam, Lijst met functies en tarieven, polis beroepsaansprakelijkheidsverzekering	Appendices 7 to 10: a cooperation agreement between Advisory Bureau NZL and IB Amsterdam; List of functions with tariffs; Insurance polis for professional liability
7	Addendum op de "Nadere ovk inzake de advieswkzh voor de realisatie vd NZL, dd 16 dec 1998", dd 31 aug 2000, incl. bijlagen Beschikbare kopieën: 1. Addendum 2. Bijlage 1 bij brief "Clean Ship" (Schoon Schip" ref. nr. 00004.JB van 6 januari 2000 3. Bijlage 4 bij brief 90100L/B001636	Addendum to the "Further agreement regarding the advisory works on the realisation of North/South Line of 16 December 1998", dated 31 August 2000, including appendices Copies available of : 1. Addendum 2. 2. Appendix 1 to the letter "Clean Ship"(Schoon Schip", ref. number 00004.JB of 6 January 2000)) 3. Appendix 4 to the letter 90100L/B001636
8	Concept "Organisatie van het projectbureau Noord/Zuidlijn, nov. 2004, incl.: <ul style="list-style-type: none"> • organogram Gemeenteraad A'dam • organisatieschema PB NZL juni 2004 • Bijlage B4: Adviesbureau NZL • Bijlage C1: Project- en Adviesbureau NZL, stroomschema ontwerp, cluster Noord 	Draft Organisation of the Project Bureau North/South Line, November 2004, including: <ul style="list-style-type: none"> - Organisation chart of the City Council of Amsterdam - Organisation scheme of the Project Bureau North/South Line, as of June 2004 - Appendix B4 Advisory Bureau North/South Line - Appendix C1: Project and Advisory Bureau North/South Line, flowchart on design, cluster North

Nr	Titel van het document in Nederlands	Document title in English
9	Gemeentelijke richtlijnen over aanbesteden en inkopen (tekst Intranet)	Printout from intranet of the City of Amsterdam regarding the Municipal Regulations regarding public procurement
10	Agenda vergadering B&W 27 april 2004 incl. bijlagen (organisatie, verantwoordelijkheidsverdeling, taken etc.)	Agenda of the meeting of B&W of 27 April 2004, including appendices (organisation, division of responsibilities, tasks etc.)
11	Agenda vergadering B&W 8 januari 2002 met als onderwerp: verlaging Nieuwe Leeuwarderweg	Agenda of the meeting of B&W of 8 January 2002 discussing lowering of the Nieuwe Leeuwarderweg
12	Vooraankondiging aanbesteding Noord/Zuidlijn, september 1998	Preliminary Announcement of the Invitation to Tender for the Amsterdam North/South Metroline, September 1998
13	Protocol voor Opening van Inschrijvingen: <ul style="list-style-type: none"> • Bouygues/Koop (12 dec 2000) • BTC Noord/Zuidlijn v.o.f. (12 dec 2000) • Comol 2 (12 dec 2000) • Saturn (12 dec 2000) • Tubecon IV (12 dec 2000) • Brief Van Hattum aan Vlijm over Saturn dd 26 jan 2001 • Saturn (26 januari 2001) 	Protocol for the Opening of Registrations of: <ul style="list-style-type: none"> - Bouygues/Koop (12 Dec 2000) - BTC Noord/Zuidlijn v.o.f. (12 Dec 2000) - Comol 2 (12 Dec 2000) - Saturn (12 Dec 2000) - Tubecon IV (12 Dec 2000) - Letter of Van Hattum to Vlijm regarding Saturn, of 26 Jan 2001 - Saturn (26 Jan 2001)
14	Gunningsadvies werkzaamheden Tunnel en startschacht Open Havenfront/Natte Damrak Ref. 3.3/414/BJ011695, dd 28 okt. 2002	Tender Award Recommendation for the works on Tunnel and starting mine Open Havenfront / Natte Damrak, reference 3.3/414/BJ011695, dated on 28 October 2002
15	Gunningsadvies werkzaamheden Zinktunnel IJ, bouwdok en in situ tunnel Sixhaven Ref. 2.2/414/TS011714, dd 28 okt. 2002	Tender Award Recommendation for the works on Immersed Tunnel IJ, construction dock and in situ tunnel Sixhaven, reference 2.2/414/TS011714, dated 28 October 2002
16	Gunningsmachtiging contract 5.2, 6.2 en 7.2 Ref. 02638.AKI, dd 5 nov 2002	Awarding Authorisation for contracts 5.2, 6.2 and 7.2, reference 02638.AKI, dated 5 November 2002
17	Gunningsmachtiging contract 3.1 en 3.2, Ref. 02639.AKI, dd 5 nov. 2002	Awarding Authorisation for contracts 3.1 and 3.2, reference 02639.AKI, dated 5 November 2002
18	Gunningsmachtiging contract 4.2, geboorde tunnel en mitigerende maatregelen, Ref. 2003900848.AKL, dd 7 april 2003	Awarding Authorisation for contract 4.2 for the bored tunnel and mitigating measures, reference 2003900848.AKL, dated 7 April 2003
19	Contract 2.2 In-situ tunnel, bouwdok en zinktunnel, 7 nov 2002 (2.2/421/K0011893)	Contract 2.2. In-situ tunnel, construction dock and immersed tunnel, 7 November 2002 (2.2/421/K0011893)

Nr	Titel van het document in Nederlands	Document title in English
20	Contract 3.1/3.2 Centraal Station, tracédelen 24, 25 en 26, 7 nov 2002 (3.1-3.2/421/BJ011825) en brief met aanpassingen dd 19 dec 2002 (3.1-3.2/492/BJ013069)	Contract 3.1/3.2 Central Station, route parcels 24, 25, 26 of 7 November 2002 (3.1-3.2/421/BJ011825) and a Letter with modifications, dated 19 December 2002 (3.1-3.2/492/BJ013069)
21	Contract 3.3 Tunnel en startschacht Open Havenfront/Natte Damrak, 7 nov 2002 (3.3/421/BJ011971) en brief met aanpassingen dd 20 dec 2002 (2.2/492/BJ013067)	Contract 3.3 for Tunnel and starting mine Open Havenfront / Natte Damrak, of 7 November 2002 (3.3/421/BJ011971) and Letter with modifications dated 20 December 2002 (2.2/492/BJ013067)
22	Contract 4.2 Geboorde tunnels en mitigerende maatregelen dd 22 april 2003	Contract 4.2 Bored tunnels and mitigating measures dated 22 April 2003 (main documents)
23	Contracten 5.2, 6.2 en 7.2 Ruwbouw Stations Rokin, Vijzelgracht en Ceintuurbaan dd 7 nov 2002 (5.2-7.2/421/TS011788)	Contracts 5.2, 6.2 and 7.2 Raw construction of the Stations Rokin, Vijzelgracht and Ceintuurbaan, dated 7 November 2002 (5.2-7.2/421/TS011788)
24	6 dozen bestekken contract 5.2 Rokin, 1 ^e aanbesteding 2000	6 boxes with documentation for contract 5.2 Rokin, First tender 2000
25	Contract 4.2 Geboorde tunnels en mitigerende maatregelen en bijlagen	Appendices to the Contract 4.2 Bored tunnels and mitigating measures
25A	Contract monitoring contract 4.3	Contract documents for monitoring contract 4.3
A	Specificaties en tekeningen contract 7.2 Station Ceintuurbaan, 1 ^e aanbesteding 2000	Specifications and drawings of contract 7.2 Station Ceintuurbaan, 1 st tender 2000
26	Aanvraag rijksbijdrage kertracé noord/zuidlijn deel A: de planvorming, deel B: (technische) uitwerking project, deel C: de projectrealisatie, juni 1998	Request for Governmental Contribution for core route North/South Line, Part A: Formation of Plan, Part B: (technical) development of project, Part C: Project Realisation, June 1998
27	Sheet Kostenontwikkeling NZL	Costs Development NZL Sheet
28	Definitief Programma van Eisen Kertracé Noord/Zuidlijn, raadsbesluit 27 nov 1996	Definite Programme of Requirements Core Route North/South Line, Decision of the Council of 27 November 1996
29	Bijlage 42RAC, Risk Assessment Catalogue, 6 juni 2000 (R001673/01100L)	Appendix 42RAC, Risk Assessment Catalogue, 6 June 2000 (R001673/01100L)

Nr	Titel van het document in Nederlands	Document title in English
Ad 29	1. Risico catalogus contract 2.2 (28-01-2005); 2. Risk Assessment & Allocation Catalogue (RAAC) contract 2.2 (31-01-2005); 3. RAAC contract 5.2/6.2/7.2 (20-08-2003) 4. Risico Catalogus Contract 3.1 (27-01-2001) 5. Document A33-b02, Diversen Risico-inventarisatie (3.3/750/HG003519, 27 juni 2001) 6. Risico Catalogus contract 3.3 (27 juni 2001) 7. RAAC contract 5.2/6.2/7.2 (31-01-2005)	1. Risico catalogus contract 2.2 (28-01-2005); 2. Risk Assessment & Allocation Catalogue (RAAC) contract 2.2 (31-01-2005); 3. RAAC contract 5.2/6.2/7.2 (20-08-2003) 4. Risico Catalogus Contract 3.1 (27-01-2001) 5. Document A33-b02, Diversen Risico-inventarisatie (3.3/750/HG003519, 27 juni 2001) 6. Risico Catalogus contract 3.3 (27 juni 2001) 7. RAAC contract 5.2/6.2/7.2 (31-01-2005)
30	Def. Eindrapportage Voorfase onderzoek tbv de invulling van de Risk Control Plus functie bij het Schadebureau Noord/Zuidlijn Amsterdam, 27 juli 2004 (04005.011)	Final Report for the Preliminary Phase of Research regarding the Risk Control Plus function implementation by the Loss Bureau (Schadebureau) North/South Line Amsterdam, 27 July 2004 *04005.011)
31	Bijlagen bij rapport Risicoanalyse Noord/Zuidlijn Amsterdam 9 okt 1996	Appendices to the Report on Risk Analysis North/South Line Amsterdam, 9 October 1996 [to the
31A	Eindconcept RWS dir NH Opdrachtgeversbureau Noord/Zuidlijn, 9 okt 1996 (16622/JHR/LLI)	Final concept RWS Director NH, Principal's Bureau North/South Line (16622/JHR/LLI)
32	Risicomangement Noord/Zuidlijn, document Aanvraag Rijksbijdrage, 18 nov 1998 (R981138) Parts 1 & 2	Risk Management North/South Line, document Request for Governmental Contribution, 18 November 1998 (R981138) Parts 1 & 2
33	Map Plan van Aanpak Risicobewaking Directievoering en Toezicht in de uitvoeringsfase, 18 juni 2003 (100/HVO/018067) incl.: <ul style="list-style-type: none"> • Artikel "Risk management in the Amsterdam North/South Metroline • Presentatie Risicobeheersing/mgt NZL • Voorbeeld besteksvoorwaarden • Voorbeeld risicodatabase en –bewaking • Voorbeeld toetsing en toezicht op aannemer • Voorbeeld verslaglegging risicobewaking • Voorbeeld RAAC (Risk Assessment and Allocation Catalogue) 	Folder Action Plan for Execution of Risk Control, Management and Supervision in the implementation phase, 18 June 2003 (100/HVO/018067) including: <ul style="list-style-type: none"> • Article "Risk management in the Amsterdam North/South Metroline • Presentation on Risk Control and Management NZL • Example specifications conditions • Example risk database and monitoring • Example test and supervision of assignee (contractor) • Example reporting risk monitoring • Example of RAAC (Risk Assessment and Allocation Catalogue)

Nr	Titel van het document in Nederlands	Document title in English
34	Final report Probable maximum Loss Risk Information Research AON, 27 January 2003 (54973-00002)	Final report Probable maximum Loss Risk Information Research AON, 27 January 2003 (54973-00002)
35	Raadsvoordracht Verzekeringen project NZL, 7 mei 2003	Council recitation on Insurances for the project NZL, 7 May 2003
36	Definitief Second Opinion op schade scenario's tbv Raadsvoordracht Verzekeringen NZL, 21 mei 2003	Definite Second Opinion on Loss scenario on behalf of Council Decision on Insurances for the Project NZL, 21 May 2003
37	2e deel Risk Register risico's C en E, 2004	Second Part of Risk Register, risks C and E, 2004
38	<ul style="list-style-type: none"> • Budget breakdown Oct 2002 and June 2004 • Development in project costs 2002 and 2004 • Overviews of budget control • Delen van een raadsvoordracht waarin bedragen worden gemeld • Delen van een openbare rapportage 	<ul style="list-style-type: none"> • Budget breakdown October 2002 and June 2004 • Development in project costs 2002 and 2004 • Overviews of budget control • Excerpts from the Council recitation where the figures are specified • Excerpts from the public report
39	Quarterly project report Q1 2004	Quarterly project report Q1 2004
B	Raadsvoordracht Krediet voor wegfasingen en aanleg kruising Europaboulevard tgv de bouw van station RAI/Europaboulevard Noord/Zuidlijn; tevens uitvoering motie-Bijlsma van 9 oktober 2002 (nr. 545) onderdeel NZL, dd 28 aug 2003 (Afd. 1, nr. 419)	Council Decision on Credit for phasings and construction of junction Europaboulevard as part of the construction of station RAI/Europaboulevard North/South Line; also implementation of Motion Bijlsma of 9 October 2002 (nr. 545), part NZL, dated 28 August 2003 (Afd. 1, nr. 419)
C	Gemeentebld 2002, Verlaging van de Nieuwe Leeuwarderweg (tussen Johan van Hasseltweg en Nieuwe Purmerweg), 15 feb 2002 (Afd. 3A, Volgnr. 91/67)	Municipality Gazette 2002, Lowering of the Nieuwe Leeuwarderweg (between Johan van Hasseltweg and Nieuwe Purmerweg), 15 February 2002 (Afd. 3A, Volgnr. 91/67)
40	Artikel Gevorderd 4D FE Modelling supported by Full Scale Trials for challenging Tunneling Design Amsterdam North/Southline	Article 'Advanced 4D FE Modelling supported by Full Scale Trials for challenging Tunneling Design Amsterdam North/Southline'
41	"Tunneling in Soft Soil with a High Water Level and Pile Foundations, Towards the development of settlement-oriented and settlement-minimizing TBM operation", ITA World Tunnel Congress, Oslo	"Tunneling in Soft Soil with a High Water Level and Pile Foundations, Towards the development of settlement-oriented and settlement-minimizing TBM operation", ITA World Tunnel Congress, Oslo
42	"Advanced Modelling to support innovative developments in tunneling for Amsterdam North/Southline". (Keynote paper and speaker on DIANA World Conference, Tokyo, Japan)	"Advanced Modelling to support innovative developments in tunneling for Amsterdam North/Southline". (Keynote paper and speaker on DIANA World Conference, Tokyo, Japan)

Nr	Titel van het document in Nederlands	Document title in English
43	"Monitoring of the North-South Metroline in Amsterdam" (Proceedings CIRIA Conference: The response of buildings to excavation induced ground movement, 17-18 th July 2002, London).	Monitoring of the North-South Metroline in Amsterdam" (Proceedings CIRIA Conference: The response of buildings to excavation induced ground movement, 17-18 th July 2002, London).
44	Integrated plan to deliver project: Project Planning 2004	Integrated plan to deliver project: Project Planning 2004
45	Network Planning January 2004	Network Planning January 2004
46	Project Planning January 2004	Project Planning January 2004
47	18 Cluster and contract Plannings	18 Cluster and contract Plannings
48	Handboek Directievoering en Toezicht, definitief 2, dd 6 nov 2003 (100/HV024050) + beg. Brief dd 10 dec 2003	Handbook Execution of Management and Supervision, definite version 2, dated 6 November 2003 (100/HV024050); Including Explanatory Letter of 10 December 2003
49	Definitief Projectplan Adviesbureau Noord/Zuidlijn v.o.f., dd 24 juni 2003	Definite Project Plan Advisory Bureau North/South Line, dated 24 June 2003
50	Noord/Zuidlijn advies juridische analyse Stibbe, dd 3 september 2002	Advisory Legal Analysis on North/South Line by law firm Stibbe, dated 3 September 2002
51	Leidraad vergunningen, 17 jan 2005	Guideline Licences 17 January 2005
52	Overzicht vergunningen Noord/Zuidlijn, Milieu, waterstaat, RO, infra periode 13	Overview of the licences and permissions for North/South Line, Environment, Water Management, Zoning Management, infra period 13
53	Voorbeeld van de maandelijkse rapportage van de afd. Vergunningen aan het AB en aan het PB. Concept van 17 nov 2004.	Example of the monthly report of the Department on Licences to the Advisory Bureau and Project Bureau. Draft of 17 November 2004.
54	Plan van Aanpak Compliance Management Vergunningen, definitief, 27 sept 2004	Action Plan on Compliance Management Licences, Final version, 27 September 2004
55	6 uitdraaien VBS: oktober, november 2004	6 printouts of VBS: October, November 2004
56	Notitie Juridische risicoanalyse Stibbe (CB/pg-60045)	Note on Legal Risks Analysis by Stibbe (CB/pg-60045)
56A	De curriculum vitae van de directieleden van de Noord/Zuidlijn die bij het onderzoek zijn betrokken, brief van 26 januari 2005	Curriculum vitae of the Management Board members of North/South Line who are involved with the investigation, letter of 26 January 2005
57	Handgeschreven "Procedure for Proposals/Reports"	Handwritten "Procedure for Proposals/Reports"
57A	Jaarverslag Gemeente Amsterdam 2004	Annual Report Municipality of Amsterdam 2004
58	Stukken lunchbijeenkomst dIVV dd 040318 over organisatiemodellen: Toornend (1994), KPMG (1998) en dIVV (2002)	Sheets lunchbijeenkomst dIVV dd 040318 over organisatiemodellen: Toornend (1994), KPMG (1998) en dIVV (2002)

Nr	Titel van het document in Nederlands	Document title in English
58A	3 presentaties van Dr. Bert Flvbjerg, Denmark of 30-8-2004 betr. Internationale Ervaring met Grote Infrastructurele Projecten	3 presentations from Dr. Bert Flvbjerg, Denmark of 30-8-2004 regarding International Experience with Large Infrastructural Projects
59	Sheet contractrelaties AB (IS THE SAME AS 48)	Sheet contract relations Advisory Bureau
60	Kostensheet onderbouwing	Founding cost sheet
61a	Oplegbrief aan G. Reid (F&G) met toelichting van de stukken 61 t/m 65 (ref. 2005900820)	Letter to G. Reid (F&G) with explanation on sheets 61 t/m 65 (ref. 2005900820)
61	Brief: "Beantwoording vragen verzekering NZL" (5 februari 2004, ref. 2004/1941 van Gemeente Amsterdam Bestuursdienst aan de leden van Raadscommissies voor VVI en Financiën)	The answer to the questions on Insurances of NZL (letter of 5 February 2004, ref. 2004/1941 from the MA Administrative Service to the members of the Council Commissions for Infrastructure, Traffic and Transportation and for Finances)
62	Handboek Bouwschade Noord/Zuidlijn, 3e druk januari 2005	Handbook Construction Damages NZL, 3rd edition Januari 2005
63	"Cijfermatig overzicht 4 ^e kwartaal 2004" van Schadebureau NZL (18 januari 2005, ref. SB05/487)	"Overview in figures" Q4 2004 report from the Damage Bureau NZL (18 January 2005, ref. SB05/487)
64	Voortgangsnotitie risicobewaking contract 5.2-7.2 (7 december 2004, ref. 5.2-7.2/AW-4004101)	Progress Note on Risk Monitoring contract 5.2-7.2 (7 December 2004, ref. 5.2-7.2/AW-4004101)
65	Brief van ABN AMRO betreft Oordeel Verzekeringsfunctie Schadebureau NZL" Amsterdam 31-10-2003	Letter of ABN AMRO re Evaluation of the Insurance Function of the Damage Bureau NZL, Amsterdam 31-10-2003
66	Appendix to Annual Account 2004, as provided by Dick de Zwart at presentation of 23-2-2005	Appendix to Annual Account 2004, as provided by Dick de Zwart at presentation of 23-2-2005
67	Overeenkomst "GA en W+B "Nadere overeenkomst inzake de advieswerkzaamheden voor de realisatie van de NZL, gedateerd 16 december 1998	Agreement between the GA and Witteveen + Bos regarding "Further agreement on advisory Works for the realisation of the NZL, dated 16 Dec. 1998
68	Bijlage 5 behorende bij de overeenkomst: Toornend & Partners: vraagstelling voor en informatie tbv selectie ontwerpers (April 1994)	Appendix 5 to the Agreement between the City of Amsterdam and Witteveen+Bos: Toornend & Partners Information request and submitted information on selection of designers
69	Addendum op de "Nadere ovk inzake de advieswkzh voor de realisatie vd NZL, dd 16 dec 1998", dd 31 aug 2000, incl. bijlagen FULL COPY	Addendum to the "Further agreement regarding the advisory works on the realisation of North/South Line of 16 December 1998", dated 31 August 2000, including appendices FULL COPY
70	Bijlagen behorende bij ADDENDUM op de "Nadere overeenkomst inzake de advieswerkzaamheden voor de realisatie van de NZL, d.d. 16 december 1998	Appendices to Addendum to the "Further agreement regarding the advisory works on the realisation of North/South Line of 16 December 1998"

Nr	Titel van het document in Nederlands	Document title in English
71	Overeenkomst inzake vennootschap onder firma tussen W+B and de Weger [Royal Haskoning] d.d. 14-8-2001	Joint Venture Agreement between W+W and de Wegener (Royal Haskoning) of 14-8-2001
72	Organisatieschema AB NZL	Organisational chart AB NZL
73	Curricula Vitae of Advisory Bureau management and contractmanagers (Vlijm,Groot, De Boer, Hesen, Poldervaart, Kaalberg,Salet,De Klerk, Gorski)	Curricula Vitae of Advisory Bureau management and contractmanagers (Vlijm,Groot, De Boer, Hesen, Poldervaart, Kaalberg,Salet,De Klerk, Gorski)
74	Verslag van voortgangsoverleg Bouwmanager – Contractmanager nr. 8, betr. contract 2.2 Zinktunnel IJ, bouwdok en in situ tunnel Sixhaven, d.d. 18 nov 2003, reg. 2.2/RB025244	Minute from the progress meeting of Construct manager – Contractmanager number 8, re contract 2.2 Zinktunnel IJ, bouwdok en in situ tunnel Sixhaven, d.d. 18 nov 2003, reg. 2.2/RB025244
75	Aanbestedingskalender 2005 van Adviesbureau NZL	Tender Calendar 2005 of Advisory Bureau NZL
76	Cash-flow report 040806	Cash-flow report 040806
77	Opbouw opgave bouwkosten incl. risico's Contract 2.2	Formation of the construction costs including Risks for Contract 2.2
78	An example of correspondence with a Contractor (Heijmans Beton- en Waterbouw) about contractual dispute, incl. Brief van dIVV (PB NZL) betreft Ontwerpverantwoordelijkheid zandaanplemping en start bouw caisson 1, datum 23-12-2004, Contract 3.3	An example of correspondence with a Contractor (Heijmans Beton- en Waterbouw) about contractual dispute, Letter from the dIVV, Project Bureau NZL regarding the responsibility for design of the artificial islands for the sinking and start of construction of the pneumatic caissons, dated 23-12-2004; contract 3.3
79	Some typical examples of not approved variations, contract 2.2 (February 2005)	Some typical examples of not approved variations, contract 2.2 (February 2005)
80	A typical Example of variation procedure, including the documents: A- Contractor fills in Variation Report for approval by Contract Manager and Bouwmanager B-Contractor discusses variation with CM in Building Meeting C- CM reports the variation in four/weekly Progress Meeting D- CM and BM discuss Progress Report and (if necessary) variations in four-weekly Progress Meeting E- Contractor fills in Contract Mutation Form (CMF) for approval by CM F- After receiving and approving CMF BM fills in Order Form G- Project Controller makes Variation Order to Contractor signed by Project Director	A typical Example of variation procedure, including the documents± A- Contractor fills in Variation Report for approval by Contract Manager and Bouwmanager B-Contractor discusses variation with CM in Building Meeting C- CM reports the variation in four/weekly Progress Meeting D- CM and BM discuss Progress Report and (if necessary) variations in four-weekly Progress Meeting E- Contractor fills in Contract Mutation Form (CMF) for approval Overhandigd 050302by CM F- After receiving and approving CMF BM fills in Order Form G- Project Controller makes Variation Order to Contractor signed by Project Director

Nr	Titel van het document in Nederlands	Document title in English
81	Sub-consulting agreement between Advisory Bureau NZL and Mott MacDonald Ltd. of 13/12/1994 met oplegbrief d.d. 21-12-1994	Sub-consulting agreement between Advisory Bureau NZL and Mott MacDonald Ltd. of 13/12/1994 with the cover letter of 21 st December 1994
82	Appendix to the agreement between Adviesbureau NZL and Mott MacDonald Ltd. dated 7 March 2001 with the cover letter of 25 April 2001	Appendix to the agreement between Adviesbureau NZL and Mott MacDonald Ltd. dated 7 March 2001 with the cover letter of 25 April 2001
83	Station Ceintuurbaan, Contract 7.2, Plan van Aanpak, Fase: Bestek/Aanbesteding + Gunning/Detailengineering, gedateerd 21 april 2000	Station Ceintuurbaan, Contract 7.2, Plan of Action, Phase: Specification/Tender + Award/Detail Engineering, dated 21 April 2000
84	Werkadministratie Ceintuurbaan: Werkenlijst AB contract 7.2	Work administration for contract 7.2 Ceintuurbaan
84a	Werkenlijst AB: kopjes van het bestand	List of activities AB: headers of the file
85	Kosten baan en bovenbouw DO Noord/Zuidlijn (revisie april 2004) (kosten2004DONZlijn_var 4c_hajo)	Costs for definitive design of track North/South Line (revision April 2004) (costs2004DONZline_var 4c_hajo)
86	Voortgangsrapportage contract 1.1 met ref. 1.1/JG-5001651 d.d. 03-02-2005	Progress report on contract 1.1 with ref. 1.1/JG-5001651 d.d. 03-02-2005
87	Voortgangsrapportage contract 1.2 J met ref. 1.2/JG-5001652 d.d. 03-02-2005	Progress report on contract 1.2 J with ref. 1.2/JG-5001652 d.d. 03-02-2005
88	Voortgangsrapportage contract 1.3 met ref. 1.3/JG-5002391 d.d. 31-01-2005	Progress report on contract 1.3 with ref. 1.3/JG-5002391 d.d. 31-01-2005
89	Voortgangsrapportage contract 1.4 met ref. 1.1/JG-5003227 d.d. 22-02-2005	Progress report on contract 1.4 with ref. 1.1/JG-5003227 d.d. 22-02-2005
90	Invulling Risk Control, Horvat EHC03022.002 d.d. 04-09-2003	Interpretation Risk Control, Horvat EHC03022.002 dated 04-09-2003
91	Pagina's 36 t/m 38 van het Handboek Bouwschade, Hfdst. 3.5 Risk control	Pages 36 t/m 38 of Handbook Construction damage, Chapter 3.5 Risk control
92	Selectieleidraad Europese Aanbesteding Risk Control Plus functie, EG-aanbesteding 2004/S 61-052323	Selection guideline European Tender Risk Control Plus function, EG-tender 2004/S61-052323
93	Model 71.03 Toetsingsformulier: Lozingsvergunning (100/HV024050, Bijlage 10 behorende bij het Handboek Directievoering en Toezicht, 031106)	Model 71.03 Checking form: Discharge permit (100/HV024050, Appendix 10 to Handbook Execution of Management and Supervision, 031106)
94	Vragenlijst Identificatie vergunningen en publiekrechtelijke toestemmingen	List of questions identification permits and public law agreements
95	Overzicht vergunningen contract 2 t.b.v. bestekken (2/290/WM003277, d.d. 010622)	Overview permits contract 2 on behalf of specifications (2/290/WM003277, dated 010622)
96	Logboek vergunningen AB	Journal permits AB
97	Vergunningen Beheerssysteem C 2 (deel), d.d. 050225	Permits Management system C 2 (part), dated 050225
98	Sheets presentatie Noord/Zuidlijn vergunningen d.d. 050228	Sheets of presentation on NZL permits dated 28-2-2005

Nr	Titel van het document in Nederlands	Document title in English
99	Cost control system North/South Line, powerpoint presentation door Dick de Zwart	Cost control system North/South Line, powerpoint presentation by Dick de Zwart
100	Hoofdlijnen en mijlpalen (Master programme rolled up)	Headlines and milestones (Masterprogramme rolled up)
101	A0 Hoofdlijnen en mijlpalen (Critical Path Analysis between 4/5/6/7) Tijd Weg Diagram Boorproces NZLijn standlijn 01jan05 (Time Line TBM)	A0 Headlines and milestones (Critical Path Analysis between 4/5/6/7) Time Road Diagram Boring proces NZL standline 01jan05 (Time Line TBM)
102	Tijd Weg Diagram Boorproces NZLijn standlijn 01jan05 (Time Line TBM)	Time Road Diagram Boring process NZL standline 01jan05 (Time Line TBM)
103	C4 overall (Pert Chart relationships between activities)	C4 overall (Pert Chart relationships between activities)
104	Netwerkplanning binnenstad en zuid, peildatum December 2004 (13 december 2004)	Networkplanning city centre and South, reference date December 2004 (13 Dec.)
105	Bevindingen planning peildatum 1 november 2004 (100/270/cz), planningsrapportage	Findings on the planning as of 1 November 2004 (100/270/cz), planning report
106	Risicoreservering contract 1.1	Risicoreservation contract 1.1
107	Overzicht toegewezen en afgekeurde CMF's Excel sheet on Contract variations, for contracts 2.2, 3.1, 3.2, 3.3, 3.4.4.7a, 4.3, 5.1.1, 5.2, 6.2, 7.2, 8.1.1	Overview allocated and disapproved CMF's Excel sheet on Contract variations, for contracts 2.2, 3.1, 3.2, 3.3, 3.4.4.7a, 4.3, 5.1.1, 5.2, 6.2, 7.2, 8.1.1
108	Top sheet VAT-kosten: Kostenbewaking project Noord/Zuidlijn	Cost monitoring sheet for Project NZL
109	Advertentie Cobouw (d.d. 050221?) aankondiging contract 8.2, deel 8.4.1 (deel parkeergarage RAI)	Advertisement in Cobouw (dated 050221?) on invitation to tender for contract 8.2, part 8.4.1 (part on parking lot RAI)
110	DONZ vergaderpunt 7.1 van 040609: benchmark tarieven AB	DONZ meeting issue of 7.1 of 9 June 2004: benchmark tariffs of AB
111	Forecast detail on NZL Filled in financial spreadsheet for Mike MacKenzie	Forecast detail on NZL Filled in financial spreadsheet for Mike MacKenzieDick
112.	Adressen AB locaties 7.05, Verslag AB structuur & Organisatie	Addresses AB locations 7.05, Report on AB structure & Organisation
112a	Jaarplan communicatie en projectbegeleiding 2005	Yearplan communication and project support 2005
113	Overzicht van doelgroepen en middelen 2005	Overview on target groups and means 2005
114	Activiteitenoverzicht 2005 (externe communicatie)	Overview on activities 2005 (external communication)
115	Organisatie afdeling communicatie en project begeleiding	Organisation department of communication and project support

Nr	Titel van het document in Nederlands	Document title in English
116	Afspraken tussen het PB NZL en het stadsdeel Amsterdam Noord over de organisatie van de planvorming en de uitvoering van de NZL in Amsterdam Noord d.d. 30 maart 2001	Agreements between PB NZL and city borough Amsterdam Noord re. the organisation of the planning and the realisation of the NZL in Amsterdam Noord dated 30 March 2001
117	Werkafspraken tussen Stadsdeel Amsterdam Oud Zuid en het PB NZL inzake uitvoering van en besluitvorming over de NZL d.d. januari 2003	Work agreements between city borough Amsterdam Oud Zuid and PB NZL re. realisation of and decisionmaking of NZL dated Januari 2003
118	Werkafspraken NZL – dienst Binnenstad d.d. 20 augustus 2001	Work agreements NZL – section City centre dated 20 August 2001
119	Overeenkomst NZL en Benthem Crouwel architecten BV bna d.d. 9 mei 1996	Agreement NZL and Benthem Crouwel architecten BV bna dated 9 May 1996
120	Cash-flow planning correspondentie tussen PB NZL en Concern Financiën d.d. 030901, 030903, 031118 en 031119	Cash-flow planning correspondence between PB NZL and Concern Finances dated 030901, 030903, 031118 en 031119
121	Overzicht onherroepelijk vergunningen 2005, periode 2	Overview irrevocable permits 2005, period 2
122	Werkdocument vergunningen overzicht	Overview work document permits
123	Overzicht ontwikkeling (naamgeving) projectorganisatie NZL	Overview development (naming) project organisation NZL
124	Organisatieschema 1995 en 2003 NS (VOF Stationseiland)	Organisation chart 1995 and 2003 NS (VOF Station island)
125	Eindrapportage Audit Beheersing Advieskosten NZL (30-08-2002) (ref. 0233019-R-025)	Final reporting on Audit Control Advisory expenses NZL (30-08-2002) (ref. 0233019-R-025)
126	Overzichten contracten interne organisatie NZL (ref.zza8030-kuic-236mem-17-3-2005)	Overview contracts internal organisation NZL (ref.zza8030-kuic-236mem-17-3-2005)
127	7 juli 2000 presentatie	Presentation 7th July 2000
128	Contents list (only) of the TBM tender documents	Contents list (only) of the TBM tender documents
129	Bijlage C-b6 Handboek spoorontwerp + alignement (Noord/Zuidlijn alignement)	Appendix C-b6 Handbook rail design + alignement (Noord/Zuidline alignement)
130	Bijlage C-b6 Alignement tekeningen behorende bij «Handboek Spoortontwerp + alignement » (Noord/Zuidlijn alignement)	Appendix C-b6 Alignement drawings belonging to «Handboek Raildesign + alignement » (Noord/Zuidline alignement)
131	Procedure verspreiding vergunningen AB	Procedure distribution of AB permits
132	Overzicht van de vergunningenbijdrage t.b.v. beoordeling damwanden Stadspark Noord	Overview of contribution to permits on behalf of assessment of dam walls Stadspark Noord
133	Presentatie « Noord/Zuidlijn Vergunningen » zoals gehouden op 28 febr. 2005	CD with presentation 28/02/2005
134	Planning rapportage MPNZ. Alle deelcontracten gerelateerd aan elkaar. Concept 11-03-2005 (met CD)	Planning reporting MPNZ. All part contracts related to eachother. Concept 11-03-2005 (with CD)
135	Geen Documentatie	No Document

Nr	Titel van het document in Nederlands	Document title in English
136	Art 01 16 van Document A; Art 01 16 03 Constructie all risks / aansprakelijkheid (AVB)	Art 01 16 of Document A: Art 01 16 03 Construction all risks / liability (AVB)
137	Cijfermatig overzicht 4e kwartaal 2004	Overview in figures 4 th quarter 2004
138	Verzekeringsvoorwaarden en certificaat van verzekering van Witteveen+Bos (d.d. 11 januari 2005)	Insurance conditions and certificate of insurance of Witteveen+Bos (dated 11 Januari 2005)
139	CV's M. Kraneveld en E. Jonathans	CV's M. Kraneveld en E. Jonathans
140	Functietypering Projectdirecteur DIVV (NZL/IVV/050298)	Job description Project Director DIVV (NZL/IVV/050298)
141	Verdeling van verantwoordelijkheden in hoofdlijnen tussen Directeur dIVV en Projectdirecteur Noord/Zuidlijn (d.d. 6 november 2003)	Separation of responsibilities in main lines between Director dIVV and Project Director North/Southline (dated November 6, 2003)
142	Werkinstructie 160 Wijziging Definitief Programma van Eisen PBNZL (90530G/M976613; kwaliteitshandboek versie 0/7, d.d. 97-07-28)	Work instruction 160 Amendment Final Program of Requirements PBNZL (90530G/M976613: quality handbook version 0/7, dated 97-07-28)
143	Functiematrix DIVV (http://intranet/functiematrix/lijs.asp)	Function matrix DIVV (http://intranet/functiematrix/lijs.asp)
144	DIVV functietyperingen: Adjunct-directeur, Adjunct-directeur bouw, Hoofd stafbureau/ Projectsecretaris, Manager Financiën & Planning, Manager communicatie en projectbegeleiding	DIVV job profiles: Deputy Director, Deputy-Director construction, Head staff office/Project Secretary, Manager Finance & Planning, Manager Communication and Project support
145	Concept Atlas van de Organisatie PB NZL 2004	Concept Atlas of the Organisation of PB NZL 2004
146	11 verslagen van het overleg MT NZL KLEIN (8 jan. '04, 19 feb '04, 11 maart '04, 22 april '04, 13 mei '04, 10 juni '04, 29 juli '04, 12 aug. '04, 2 sept. '04, 13 okt. '04, 11 nov. '04)	11 reports of the MT meetings of NZL KLEIN (8 jan. '04, 19 feb '04, 11 maart '04, 22 april '04, 13 mei '04, 10 juni '04, 29 juli '04, 12 aug. '04, 2 sept. '04, 13 okt. '04, 11 nov. '04)
147	Concept Memo opdrachtlijnen PB/AB (90100L/M000617, 00-03-14)	Concept Memo instruction lines PB/AB (90100L/M000617, 00-03-14)
148	Deloitte & Touche Bakkenist correspondentie: brief (000024/NP/MK, 11 januari 2000) over verschillenanalyse besturingsmodellen PB/functiebeschrijvingen	Deloitte & Touche Bakkenist correspondence: letter (000024/NP/MK, 11 January 2000) about analysis of differences of the management models of PB/job descriptions
149	Brief F. Strik aan de projectwethouder met de bijlage: verdeling van verantwoordelijkheden in hoofdlijnen tussen Directeur dIVV en Projectdirecteur Noord/Zuidlijn (25-04-2000)	Letter F. Strik to project alderman with enclosure: separation of responsibilities in main lines between Director dIVV and Project Director North/Southline (25-04-2000)
150	Functiebeschrijvingen Projectbureau van Deloitte & Touch Bakkenist (16 maart 2000, 2000.0158/HJB/MK)	Job descriptions Project Bureau of Deloitte & Touche Bakkenist (16 maart 2000, 2000.0158/HJB/MK)
151	Handboek Administratieve Organisatie A&O Adviesbureau Noord/Zuidlijn v.o.f. (100/310/SL008822, d.d. 16 mei 2002)	Handbook Administrative Organisation A&O Advisory Bureau North/Southline v.o.f. (100/310/SL008822, dated 16 May 2002)

Nr	Titel van het document in Nederlands	Document title in English
152	Brief C. van Hassel aan J. Geluk (ZZW16000beet2/2915, d.d. 4 juli 2002) over de organisatie van het project NZL	Letter from C. van Hasselt to J. Geluk (ZZW16000beet2/2915, dated 4 July 2002) about the organisation of the NZL project
153)	Organisatiebeschrijving PB NZL 2002 (NZL.dIVV/030402	Description of organisation of PB NZL 2002 (NZL.dIVV/030402
154	Reactie AB aan J. Geluk op het auditrapport Horvat/Lloyds en organisatie project Noord/Zuidlijn	Reaction AB to J. Geluk on audit report Horvat/Lloyds and organisation project North/Southline
155	Notitie J. Geluk aan F. Strik over de organisatiestructuur NZL (4 oktober 2001)	Note from J. Geluk to F. Strik on organisational structure NZL (Oktober 2001)
156	Brief J. Geluk aan F. Strik over functiewaardering NZL (15 april 2002)	Letter from J. Geluk to F. Strik on job assessment of NZL (15 april 2002)
157	Brief J. Geluk aan C. van Hassel over organisatie project NZL (17 juli 2002)	Letter from J. Geluk to C. van Hassel on organisation project of NZL (17 juli 2002)
158	Brief J. Geluk aan C. van Hassel over de organisatie van het Adviesbureau NZL (24 september 2002)	Letter from J. Geluk aan C. van Hassel on the organisation of the Advisory Bureau of NZL (24 September 2002)
159	Brief J. Geluk aan T. Berk over functietyperingen en (her) waardering (29 januari 2002)	Letter from J. Geluk to T. Berk on position profiles and (re) evaluation (29 January 2002)
160	4 ^e kwartaal 2004 Noord/Zuidlijn Kwartaal verslag	4th quarter 2004 North/Southline Quarter Report
161	Voortgangsrapport op projectniveau 4 ^e kwartaal 2004 (100/HV-4005793, concept 2.0, d.d. 24 januari 2004)	Progress report on project level 4 th quarter 2004 (100/HV-4005793, concept 2.0, dated 24 January 2004)

EXTRA OPGEVRAAGDE STUKKEN

Nr.	Titel van het document in Nederlands	Document title in English
	CD Rom 2 ^e aanbestedingsronde (Engelstalig)	CD-ROM Second round tender in English
	<p>19 CD-roms:</p> <ol style="list-style-type: none"> 1. Contents contract 2.2 2. Translation of the Note of Information number 2, contract 2.2 3. Translated document of Contract 2.2 'Beoordeling aanvullend grondonderzoek en definitieve parameterset' 4. Contract 3.1 5. Contract 3.2 6. Contract 3.1/3.2-3.3 7. Contract 3.3 W33 en A33-b04.doc 8. contract 3.3 9. contract 5.2 Structural work Rokin Station Document A52 10. Contract 5.2 Rokin inventaris 11. Inventarisatie van vertaalde documenten Station Ceintuurbaan, contract 7.2 12. Station Ceintuurbaan Civiele constructies 13. Inventarisatie van vertaalde documenten Station Ceintuurbaan, contract 7.2 (?) 14. Station Vijzelgracht Civiele constructies 15. Inventarisatie van vertaalde documenten station Vijzelgracht, contract 6.2 16. Contract 1.5.4 vertalingen 2.2 t/m 7.2 cd met deellevering 16 17. Contracten 4.2, 5.2, 6.2 en 7.2 Inventarisatie van vertaalde documenten CD-rom algemenere tekst 	<p>19 CD-roms:</p> <ol style="list-style-type: none"> 1. Contents contract 2.2 2. Translation of the Note of Information number 2, contract 2.2 3. Translated document of Contract 2.2 'Judgement additional soil investigation and definitive parameterset' 4. Contract 3.1 5. Contract 3.2 6. Contract 3.1/3.2-3.3 7. Contract 3.3 W33 en A33-b04.doc 8. contract 3.3 9. contract 5.2 Structural work Rokin Station Document A52 10. Contract 5.2 Rokin inventory 11. Inventarisation of translated documenten Station Ceintuurbaan, contract 7.2 12. Station Ceintuurbaan Civiele constructions 13. Inventarisation of translated documents Station Ceintuurbaan, contract 7.2 (?) 14. Station Vijzelgracht Civiele constructions 15. Inventarisation of translated documents station Vijzelgracht, contract 6.2 16. Contract 1.5.4 translation 2.2 t/m 7.2 cd with part delivery 16 17. Contracts 4.2, 5.2, 6.2 en 7.2 Inventarisation of translated documents CD-rom more general text

BIJLAGE H
LIJST VAN CONTRACTEN EN CLUSTERS

Clusters

Noord (Contracts 1.1-1.4 and 2),

Zuid (Contracts 8, 9 and 10),

Stationsgebied (Contracts 3.1/3.3),

Binnenstad (Contracts 4, 5, 6 and 7), and

Transporttechniek (Baan en bovenbouw – Contracts 11, 12 and 13).

Contracten

Contractnummer	Algemene contractnaam
Contract 1.1	Station Buikslotermeerplein e.o.
Contract 1.2	Station Van Hasseltweg en omgeving
Contract 1.3	Nieuwe Leeuwarderweg
Contract 1.4	Insitu tunnel tot bouwdok
Contract 1.5	Sixhaven
Contract 2.2	Immersed Tunnel (Zinktunnel)
Contract 3.1	Centraal Station entrances (De Ruijterkade, Voorplein)
Contract 3.2	Passage below Centraal Station (Passage onder het Centraal Station)
Contract 3.3	Damrack Caissons (Open Havenfront en Startschacht)
Contract 3.4	Temporary measures Hendrikkade, De Ruijterkade, Voorplein (Tijdelijke maatregelen)
Contract 4.1	Temporary measures and emergency entrances (Tijdelijke maatregelen tbv MM en nooduitgangen)
Contract 4.2	Tunnel Boring and Tunnel Boring Machine (Geboorde tunnels en tunnelboormachine)
Contract 4.3	Settlement Monitoring (Monitoren)
Contract 5.1	Temporary Measures (Tijdelijke maatregelen)
Contract 5.2	Station Rokin
Contract 6.1	Temporary Measures (Tijdelijke maatregelen)
Contract 6.2	Station Vijzelgracht
Contract 7.1	Temporary Measures (Tijdelijke maatregelen)
Contract 7.2	Station Ceintuurbaan
Contracts 8.2	Station RAI & Europelein
Contract 9	Passage at Ring Road and temporary measures (Kruising t.p.v. A10 en tijdelijke maatregelen)
Contract 10	Station Zuid/WTC and viaduct Beethovenstraat
Contract 11.1	Electrification (Tractie)
Contract 11.2	Track (Baan & bovenbouw)
Contract 12	Signalling & telecom (Signalering en telecom)
Contract 13	Station fit out, including mechanical and electrical services, lifts and elevators (Installaties stations en tunnels, liften en roltrappen)
Contract 14	Temporary Measures (Tijdelijke maatregelen)

BIJLAGE I

**DOOR PROJECTBUREAU NOORD/ZUIDLIJN VERSTREKTE CD's MET TECHNISCHE
DOCUMENTATIE**

Onderzochte Documenten op CD-s

Contract	Onderzocht Document	Opmerkingen	CD Nr.	Bestands verwijzing
2.2	Specifications and Conditions, Immersion Tunnel under CS, Document C31f	Text and instruction listings	10	C31f_1GB ...
	Works Description - Construction Immersion Elements	Work items listing (3 volumes)	10	C31f_2GB.. C31f_34GB ... C31f_5GB ...
	Immersed Tunnel IJ and Construction Dock Sixhaven, Assessment of additional soil tests and definition of the definite set of parameters	Text which concludes results are consistent with previous studies	14	Hj001022...
	Immersed IJ Tunnel, Construction Dock and Sixhaven In-situ Tunnel - SPECIFICATIONS - Document A: General & Administrative Provisions, Lot A: Immersed IJ Tunnel, Construction Dock & Sixhaven, Lot B: construction of CS tunnel element (sunk in Contract 3.1/3.2)	RAW Tender List without quantities. Note tunnel sections built in sequence for placing, and in-situ tunnel to be built in the dock will also have emergency floodgates	17	01218-01-T...
	Document C22; general specifications and product classification	Detailed quantity listings and drawings lists	17	01218-02-a-T...
	Document C22: General data and product division	RAW Tender Lists with quantities but no rates	17	01218-02-b-T...
	Specification Document C - specifications and technical provisions	RAW Tender Lists without quantities	17	01218-03-T...
	Cost Price Composition List	No totals entered	17	01218-04-T...
	Appendix I to RAW Contract - Technical Description Sixhaven emergency water retaining structure	Text detailing floodgate requirements including M & E and control	17	01218-04-T English Tech Des..
	Health & Safety Plan Design Phase	Text including risk assessments. Note future "branch off" in Sixhaven	17	01218-06-T...
Tree felling permit details	94 trees to be replaced	17	01218-07b-T...	

Contract	Onderzocht Document	Opmerkingen	CD Nr.	Bestands verwijzing
	Overview of Permits for Contract Specifications	Forms an appendix to the specification for Contract 2	17	01218-07-T...
	Assessment of supplementary soil survey and definition of definitive parameter set	Text. Concludes some adjustments necessary to the parameters of layers 18, 19A & 19B (See Disk 14 above)	19	01278-eng-T...
	Document codes for soil types	Two lists	19	01278-eng-T Legenda 1 & 2...
3.1	Risk Catalogue Contract 3.1, Track Sections 24, 25 & 26	Table	10	A31-b02-ENG...
	Contract 3.1 & 3.3 Overview of Licences	Text	10	A31-b08...
	Cluster 3.1 Annex to Contract 3.1/3.2 Metro Station CS	Work items listing	10	C31a-c0...
	Station Island Definitive Design, Civil Engineering Structures, De Ruyterkade Building Phase 7 Sheet Pile Wall and Temporary Lock Basin IJ	Text describing sand layer, concreting and piles to -32m level	11	A31-bo1c2...
	Design Phase Health & Safety Plan relating to Specification 3.1, De Ruyterkade / Metro Station CS, De Ruyterkade and Tunnel under Central Station	Very useful text with risk assessments. Some works to be carried out by third parties. Note Working Conditions Decree (Bulletin of Acts and Decrees 1997, 60)	11	Hg003216-En...
	Geotechnical Foundation Report Contract 3.1	Text. Short interface document inviting contractor response	11	HG002851 ...
	Cluster 3.1 Design Phase Health & Safety Plan part of Specification 3.1, Amsterdam Central Station Forecourt, Station Island Metro Station Cs under the station forecourt	Very useful text with risk assessments.	11	HG002807 ...
3.2	Cluster 3.2 Mechanical & Electrical Specifications	Specification listings of electrical items and workmanship	9	J32E ENG...
	Cluster 3.2 Document J32p Structural Engineering	RAW Tender List (short)	9	J32PE...

Contract	Onderzocht Document	Opmerkingen	CD Nr.	Bestands verwijzing
	Cluster 3.2 Document J32w Mechanical systems and (Part 2) pipes for condensed steam	Text and blank quantity lists	9	J32w...
	Cluster 3.2 Cables and pipelines for underground infrastructure	Text and blank quantity lists	9	K32PE...
	Cluster 3.2 Cable and wiring - underground infrastructure	Text and quantity lists	9	K32s-ENG...
	Amsterdam Central Station, N-S Line Passage, Design Phase Health & Safety Plan	Very useful text with risk assessments. Note new tram link to be constructed!	11	A32-b01c-En...
	Amsterdam CS N-S Line Passage Main Phase, Contribution of Designer to demolition safety plan	Text describing work involved	11	Sloopveillg h...
3.1/3.2	Centraal Station Information Notice	Text and tables	4 & 18	GP005018 ...
	Miscellaneous Variant 4, Forecourt Accessibility	Text	4 & 18	HG005015 ...
	Centraal Station Information Memorandum No 3	Text and tables	4 & 18	K0004425 ...
	Specific Appendices Contract	Table	4	K0004863 ...
	Public Procedure, Specifications and Conditions for Metro Station CS	Text not complete	9	A32_ENG ...
	Amsterdam Central Station, De Ruyterkade, Passage & Voorplein, Statement of Prices of Credible Construction Items	Text. Very little substance	9	B32-b02...
	Contract Cluster 3.2, Structural Engineering	Text. Very little substance	9	B32PE-ok...
	Conditions for Structural / Building Works	Work item listings	9	B32-S-ENG...
	Amsterdam Central Station, De Ruyterkade, Passage & Voorplein, Excavation Wall	Text introduction and RAW Tender List. Covers interface with immersed tube tunnel	9	C32b-Bouw...
	Amsterdam Central Station, De Ruyterkade, Passage & Voorplein, Station Building	Blank Bill of Quantities	9	C32C-ENG...

Contract	Onderzocht Document	Opmerkingen	CD Nr.	Bestands verwijzing
	Station Building 1st Alteration Sheet	RAW Tender List without quantities	9	Doc C32c-m1...
	Emplacement / Building at IJ End	Bill of Quantities	9	C32D(1.0)-ENG...
	Emplacement / Building at IJ End, 1st Alteration Sheet	Listing of RAW specification items	9	C32d-m1 ok...
	Amsterdam Central Station, Trench Sunken Tunnel	Bill of Quantities	9	C32e-ENG...
	Trench Sunken Tunnel, 1st Alteration Sheet	Listing of RAW specification items	9	C32e-m1 ok...
	Amsterdam Central Station, Document C32s Specification	Listing of RAW specification items for demolition works	9	C32S-ENG...
	Amsterdam Central Station, De Ruyterkade, Passage and Voorplein	Description and specification listings of bore piles and jet grouting	9	C32Sm-1(1)...
	Public Procedure, Specifications and Conditions for Metro Station CS - Structural Work - architectural completion and building services	Text	10	A31_32-ENG
	Specifications and Conditions Alteration Sheet	Text	10	A3132-0_en...
	Specification and Conditions Metro Station Voorplein	Text and RAW Tender Lists (Parts 1-11)	10	C31a-en... (Parts 1-11)
	Specification and Terms and Conditions Underground Station CS, De Ruyterkade, Document C31a	Text and RAW Tender Lists	10	C31a MUT ENG...
	De contamination Plan for the NatteDamrak, Central Station Voorplein and De Ruyterkade	Text	10	C31-b41...
	Specification and Conditions Metro Station CS, De Ruyterkade, Document C31c	Text and work activity / specification listings	10	C31c-ENG...
	Alteration Sheet in preparation	List of work items	10	C31c-en...
	Public Tender Procedure, Specifications and Conditions, Immerded Tunnel under CS (Sinking), Document C31g	Text. General information and listing of work items	10	C31g_ENG ...

Contract	Onderzocht Document	Opmerkingen	CD Nr.	Bestands verwijzing
	Alteration Sheet	Text and descriptive listing	10	C31g-m1_en...
	Specification and Conditions, Technical Provisions, Document C31s	Text and listings	10	C31s eng...
	Specification and Conditions, Technical Stipulations, Document C31s	Text and listings (update of above)	10	C31s-up-v1...
	Engineering Provisions	Text giving requirements	10	C31s mut1.enl...
	Amsterdam Central Station, De Ruyterkade and Voorplein, Civil / Structural VoF Extra Work, Document C32a	RAW Tender List without quantities	11	C32a-En...
	Specific Appendices Contract Drawing Contract	Drawing Schedules	18	K0004863 ...
	Information Memorandum No 4	Further data / instructions	18	K0004863 ...
3.3	Tunnel and Start Shaft Information Memorandum	Tender queries. Text and tables	4 & 18	GP005019 ...
	Tunnel and Start Shaft Information Memorandum No 2	Text. Note Health & Safety Plans to be incorporated in Appendix 111 of the Contract Documents	4 & 18	K0004799 ...
	Contract 3.1 & 3.3 Overview of Licences	Text	10	A31-b08...
	Sequence Diagram, Opening disaster defences	Work description list	11	JJ00348bijl ...
	Appendix I specification item W33, Technical description, disaster defences Prins Hendrikkade	Detailed text giving specification of gates and operating machinery. Drawings and calculations requested from contractor	11	JJ003048-En...
	Geotechnical Foundation Study, Implementation Contract 3.3	Text. Short interface document inviting contractor response	11	HE001376..
	Disaster Defences - Gates	Sequence Diagrams and RAW Tender List	15	JJ003483bij l...

Contract	Onderzocht Document	Opmerkingen	CD Nr.	Bestands verwijzing
	Appendix I Specification item W33 Technical Description - disaster defences Prins Hendrickkade	Text describing work content including M & E	15	JJ003483-En...
	Geotechnical Foundation Study, Implementation Contract 3.3	Text. Note hierachy of GBR / GDR / GIR. Contractor's response encouraged. Appendices not provided	15	A33-b04...
	List of Drawings re: Station Island Contract 3.3 - Tendering Stage	List	16	List of Drgs Stationseiland...
	Document A33 - General and General and Administrative Provisions - Registration Form	Text. Includes product specific performance liabilities	16	A33_ENG...
	Health & Safety Plan Design Phase Associated with Specification 3.3, Caissons - Metro Tunnel in the Open Havenfront and Damrak Canal (starting shaft)	Text including risk assessments	16	A33-b01...
	Risk Catalogue Contract 3.3, Track Sections 27 & 28	Tables of detailed construction risks	16	A33_b02 ENG...
	Document A33 General & Administrative Provisions, Amendment to c0 version	Text	16	A33_Mutatie...
	Document C33a, Operations Description Draft c1	List of RAW work items	16	C33a ENG...
	Sand Fill Document C33a, Amendment to Draft c1 version	Update of above with new title	16	C33a mutatie...
	Decontamination Plan for the Natte Damrak, Central Station Voorplein and De Ruyterkade	Text. Good description of the works but no parameter values in tables of appendices	16	SanPlan Damrak..
	Alteration Sheet for Document C33s (Version c0)	Text including monitoring requirements	16	C33s-c0_en...
	Alteration Sheet for Document C33s (Version c1)	Text	16	C33s-c1_en...
	Document C33s - Technical Specifications - Draft c1 Parts 1 & 2	Lists of requirements	16	C33s-specs-Part1 C33s-specs-Part2
	Table of Contents – Specifications	List of subjects	16	index-EN...

Contract	Onderzocht Document	Opmerkingen	CD Nr.	Bestands verwijzing
	Bridges subject to diversion works or demolition	Lists of drawings	16	List of Drgs-Bridges...
4.2	Risk Assessment Catalogue for Tunnel Boring System	Text, part Dutch, identifying risks. Applies to previous tender	1	R001673...
	Tendering Instructions	Text, part Dutch. Applies to previous tender.	1	R001711...
5.2	Specification - Rokin Station Structure, Variant 3A construction phases, Traffic along half open construction pit	Text and tables, alternative for pricing Better access for vertical transport Use of more road transport	4 & 18	FG004709 ...
	Variant 3B construction phases, Grouted Prop	Initial construction arranged to observe behaviour of the strata after excavation	4 & 18	FG004712 ...
	Rokin Station, Questions and Answers	Text and tables Note there are to be no activities at the station while the tunnel builder is working	4 & 18	GP005011
	Rokin Station Information Memorandum No 2	Text	4 & 18	K0004422 ...
	Structural Work Rokin Station, Definitive Specification	RAW Tender List	12	C52-SPEC-EN...
	Document C52n, General Information and Assignment of Materials for structural work, Rokin Station	Text and RAW Listing. Detailed requirements without quantity entries	12	Voorteksten ...
	Dewatering and Discharging Aspects, Rokin Station	Text describing alternative possibilities	12	C52-b5-En...
	Environmental Study	Text. Site results awaited	12	annex C52-b4...
	Depollution Plan, Rokin Station	Text describing the removal of (seriously) polluted soil	12	Rokin CS-b1...
	Structural Work Rokin Station, Document C52s, Specifications and Technical Provisions	Text and RAW Tender List	12	C52s-Doc C...

Contract	Onderzocht Document	Opmerkingen	CD Nr.	Bestands verwijzing
	Health & Safety Plan, Design Phase accompanying Plan 5.2, Station Rokin	Text and several risk assessments	12	C52-Ab4-En...
	Specifications and Terms and Conditions Contract 5.2, Structural Work Rokin Station, Document A52 - General Part and General and Administrative Provisions	Text. Note Maximum allowable noise level is 65dBA at a distance of 15m from source	13	A52-ENG...
6.2	Vijzelgracht Station Information Memorandum Variants A, B & C re construction phasing	Text	4 & 18	K0004402 ...
	Vijzelgracht Station Information Notice, Introduction to Variants	Text	4	K0004838 ...
	"Absence of Exchange Excavation" Variant	Text. Reduction in cost if the exchange is deleted	18	K0004838 ...
	Vijzelgracht Station Answer Sheet 10/09/01	Text and tables. Note Client now does the monitoring. Little to be done by the Contractor	4 & 18	RJ004044 ...
	Structural Work Vijzelgracht Station	RAW Tender List	5	C62-EN...
	General information and assignment of materials for structural work, Vijzelgracht Station	Text and RAW Tender List	5	voor-en...
	Dewatering and Discharging Aspects, Vijzelgracht	Text	5	C62-b5-En...
	Environmental Study Vijzelgracht Station	Text	5	C62-b4-En...
	Draft Health and Safety Plan (Design)	Text	5	C62-Ab4-EN...
7.2	General information and assignment of materials for structural work at Centuurbaan Station	Text and work item tables	3 & 7	C72-EN...
	Dewatering and Discharging Aspects, Centuurbaan	Text	3 & 7	C72-b5...
	Environmental Study	Text	3 & 7	Annex c72-b4...
	Depollution Plan, Centuurbaan	Text	3 & 7	C72-b1...

Contract	Onderzocht Document	Opmerkingen	CD Nr.	Bestands verwijzing
	Structural Work, Centuurbaan Station	RAW Tender List	3 & 7	C72-Doc C...
	Draft Health & Safety Plan (Design)	Text	3 & 7	C72-Ab4...
	Centuurbaan Station Information Memorandum No 2	Text	4 & 18	K0004423 ...
	Centuurbaan Station Answer Sheet	Text	4	RJ004046..
	Structural Work Centuurbaan	RAW Tender List	5	C62s-Doc C...
	Rokin Station Answer Sheet 10/09/01	Text and tables	18	RJ004046..
2.2, 3.1/3.2	Conditions for a Specification Plan, Document C31f, Construction Emerging Element CS, Alteration File	Work item and specification listings	10	C31f-mut-c0...
2.2, 3.1/3.2, 3.3, 5.2, 6.2, 7.2	Tendering Guidelines for contracts listed	Text giving works description. Appendices not completed	2 & 14	Leidraad...
	Appendix 4 to Tendering Guidelines, Questionnaire: Screening and Monitoring Approach	Relates to financial standing issues. Text	4 & 18	K0004605 ...
	Form 4: Financial Requirements and Financial & Economic Backing		18	K0004697 ...
	Appendix 1 to Tendering Guidelines, Variants Description to 2.2, 3.1/3.2, 3.3, 5.5, 6.2, 7.2	Text. Relates to soil properties and working	4 & 18	K0004867 ...
	Appendix 2 to Tender Documents (Guidelines)	Contents of tender giving minimum submission requirements. Note also Surroundings Action Plan	4 & 18	K0004867 ...
	Annex 1 to Appendix 5, Assessment Scoring	Table	4 & 18	K0004868 ...
	Appendix 5 to Tendering Guidelines, Assessment / Award Model	Text	4 & 18	K0004868 ...
	Minutes of Pre-tender meeting 28/09/01	Text	4 & 18	K0005016 ...

Contract	Onderzocht Document	Opmerkingen	CD Nr.	Bestands verwijzing
3.1/3.2, 4.2, 5.2, 6.2, 7.2	Requirements for Hydraulic Transportation of Soil Water Mixture, Bentonite Slurry and Process Water	Text	2 & 14	PvE Hydraul... PvE(C-b8)
	Report on Pre-tender meeting 28 & 29/08/01	Text	4 & 18	K0005016 ...
4.2, 5.2, 6.2, 7.2	Geotechnical Foundation Study, Construction, Deep Stations and Bored Tunnel	Text, a short interface document	2	GBR (C-b3)...
	Appendices C52-b3, C62-b3, C72-b3, Co-operation Agreement, Soil Bank	Update of the Amsterdam Soil Bank scenario which first appeared in Jan 1997 regarding the re-cycling of contaminated material	2 & 14	Grondbank ...
5.2, 6.2, 7.2	Historical Research for Rokin, Vijzelgracht and Centuurbaan Stations	Text, refers to "Mammoths in Amsterdam"	2	Historisch ... (3 volumes)
	Fresh invitation for Tenders 2001-06-01 Change A	Text, short	18	Heraanbest ...

Algemene Documenten op CD-roms

Onderzocht Document	Opmerkingen	CD Nr	Bestands verwijzing.
1995 Standard RAW Provisions	Reference document	2 & 14	1995 RAW...
RAW 1998 Amendment	Reference document	2 & 14	Nov. 1998...
Permit Information (13 volumes)	Text	2	Vergunning en...
Project Office North / South Line, Site Management and Supervision Manual dated 14 May 2001	Text relating to achievement of quality	14	Handboek. eng...
Appendices to Site Management and Supervision Manual (34 No.)	Specific subjects	14	Appendix 1-3... Appendix 4-9... Appendix 10-15... Appendix 16-23... Appendix 24-29... Appendix 30-34...
Historical Research at Locations of Rokin, Vijzelgracht & Centuurbaan Stations	Text	14	Hist.Ond.1-A...
Sections through the City Centre	Text continuing on from 1-A	14	Hist.Ond.1-B...
Expectations of the Archaeological Survey during construction of NZL	Text continuing on from 1-B	14	Hist.Ond.1-C
Mammoths-1	Inventory of points of archaeological interest on NZL	14	Hist.Ond.2 ...
How old is "new"? Mammoths-2	Text continuing from above	14	Hist.Ond.2 ...
Mammoths Literature List	Lists	14	Hist.Ond.2
List of word translations		18	Appendix 1ok...

Tekeningen op CD-roms

Onderzocht Document	Opmerkingen	CD Nr	Bestands verwijzing.
Vijzelgracht Station Drawings	These drawings are the only ones examined as part of this investigation	6	...dwg
Centuurbaan Station Drawings		8	...dwg

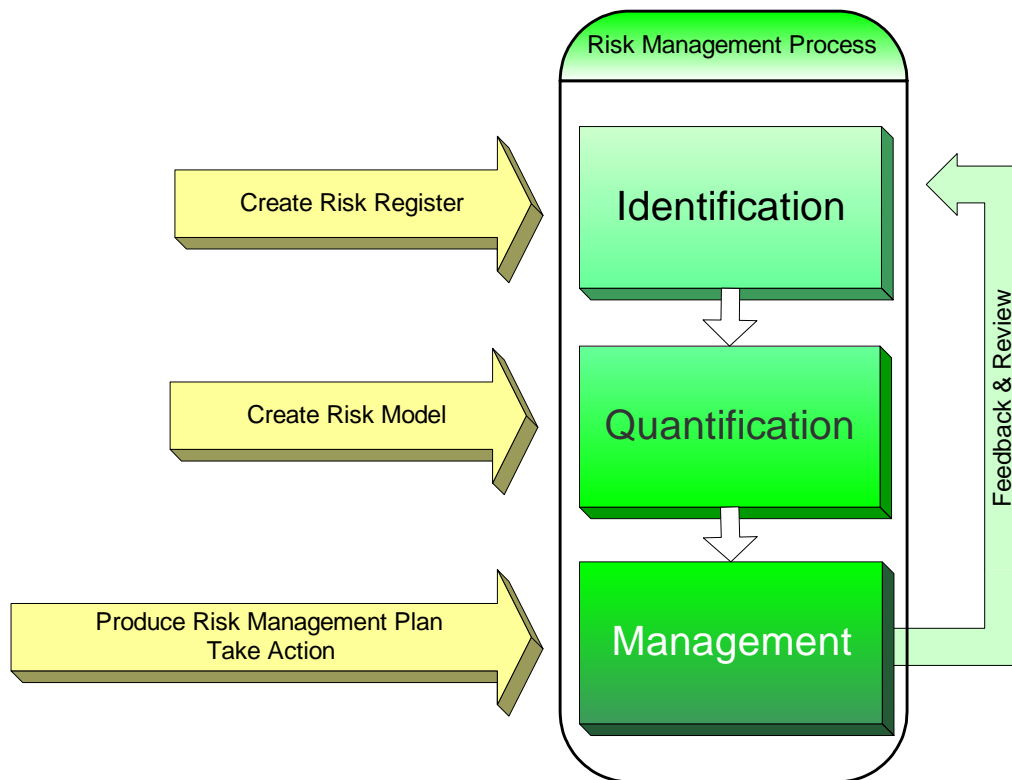
Andere Onderzochte Documenten, maar niet op CD-roms

Onderzocht Document	Auteur
Advanced 4D FE Modelling supported by Full Scale Trials for challenging Tunnelling Design Amsterdam North / South Line	F. J. Kaalberg & J. W. Bosch
Tunnelling in Soft Soil with a High Water Level and Piled Foundations Towards the development of Settlement-Orientated and Settlement-Minimising TBM Control	F. J. Kaalberg & V. Hentschel
Advanced modelling to support innovative developments in tunnelling for Amsterdam North / South Line	F. J. Kaalberg
Monitoring of the North / South Line in Amsterdam	H. Netzek & F. J. Kaalberg

BIJLAGE J
VOORBEELDEN VAN RISICOMANAGEMENT TECHNIEKEN

De hieronder volgende tabellen en schema's demonstreren de voorbeelden van de output van het Risicomanagement proces

Drie fasen van het Risicomanagement Proces



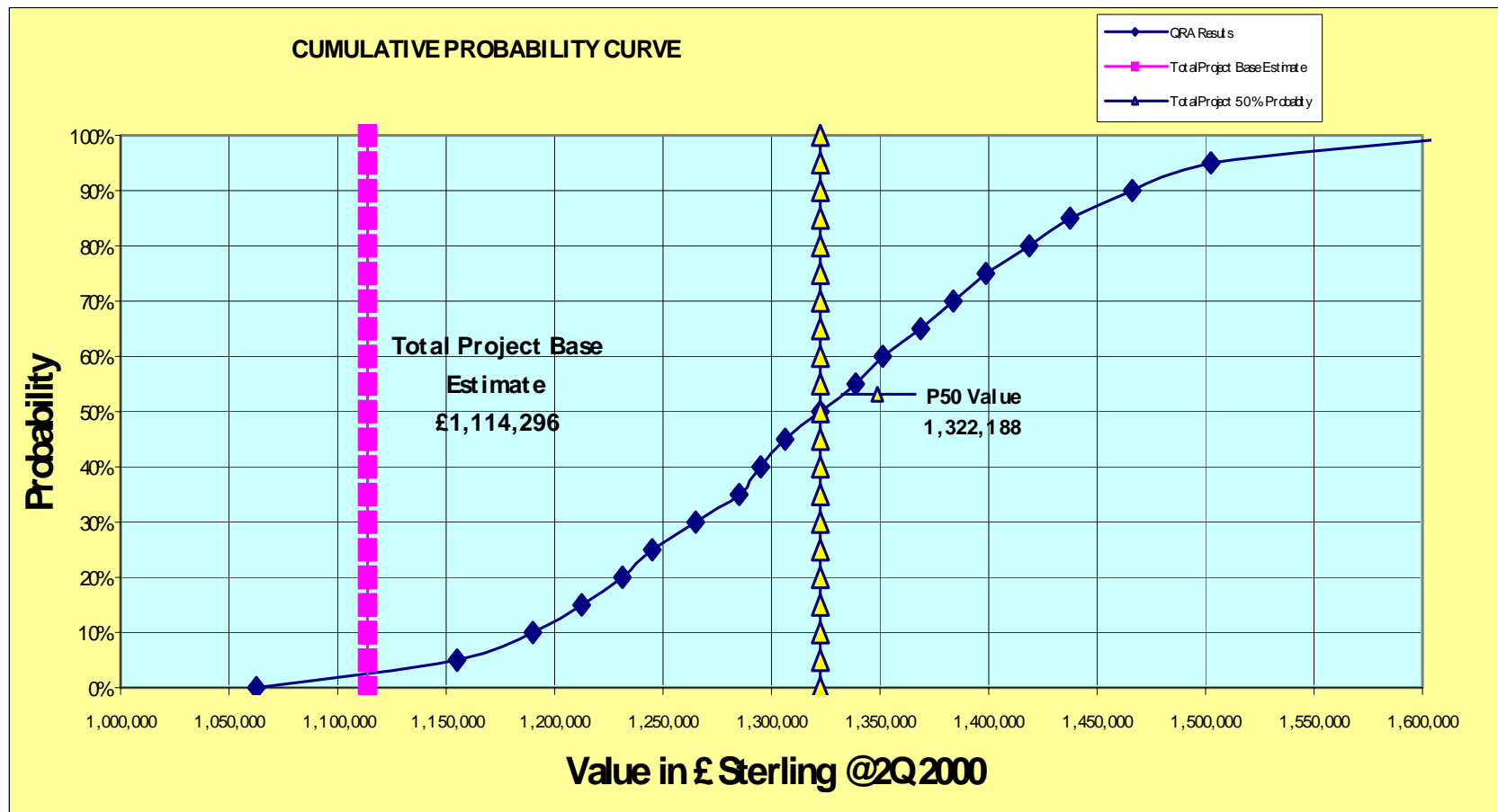
De Risico identificatie is gedaan gedurende een gestructureerde brainstorming workshops met de participatie van alle project stakeholders, en een kwalitatieve risicoregister werd de eerste output.

Mapeley
Project Sample Project
Risk Review Date 7th May 2003

Risk ID No	Risk Description	Consequence	Notes	Likelihood %	Cost	Time	Performance	Performance			Combined Ranking	Risk Owner	Actionee	Treatment - Plan for Avoidance	
								Cost Ranking	Time Ranking	Performance Ranking					
7	Finding contaminated material, disposing - excluding asbestos	may need to make up ground again - costs	The made ground may be an issue. Contaminated land act says we must pre-treat the contaminated soil before it leaves site!!!!	90%	5	4	4	1	High	High	Medium	High	Mike Twine		Find records information. Investigations. Consider capping it, a new location for works. Identify sites for disposal.
35	Poor integration with IPT		attitude and culture risks	70%	4	4	4	3	High	High	Medium	High	Paul Rasmussen		Develop relationships with the team. Map skills and competences etc. Team building workshops etc. Develop and alert regime.
3	Finding existing services - uncharted			60%	4	3	4	1	Medium	High	Low	High	Mike Twine		
27	Design development due the approvals process			60%	4	3	4	1	Medium	High	Low	High	Paul Rasmussen		
32	Service diversions		due to obstructions etc	60%	4	4	4	1	High	High	Low	High	Mike Twine		
2	Unforeseen ground conditions - floodplain, high water table		at the moment no allowance in the cost estimate	90%	5	3	2	1	High	Medium	Medium	High	Mike Twine		
33	Working around services			90%	5	3	2	1	High	Medium	Medium	High	Martin Heal		
40	Lack of timely client response to queries			90%	5	3	3	2	High	High	Medium	High	Paul Rasmussen		
94	Unforeseen ground conditions - hard and soft ground			80%	5	3	2	1	High	Medium	Medium	High	Mike Twine		
13	Changes in security status	may stop work.	for the contract.	70%	4	3	2	1	Medium	Medium	Low	Medium	Martin Heal		
6	Misinterpretation of clients requirements	Design costs as well as construction costs	Assuming it will not be major. The assumptions may not be right. May have over designed.	60%	4	3	1	1	Medium	Low	Low	Medium	Paul Rasmussen		
1a	Legislation changes - taxation			60%	4	3	1	1	Medium	Low	Low	Medium	Sheriden Sleep		
30	Changes in clients requirements			50%	3	2	4	1	Medium	Medium	Low	Medium	Paul Rasmussen		
42	Protected species		anti newt fencing!!	50%	3	3	4	1	Medium	Medium	Low	Medium	Martin Brock		
8	Planning approval - delay	missing one planning committee then have to wait for another - 4 weeks		40%	3	2	4	1	Medium	Medium	Low	Medium	Mike Twine		
1	Legislation changes - building regs		big regs, M&E, possible taxation changes also.	80%	5	2	1	1	Medium	Medium	Medium	Medium	Mike Twine		
10	Additional car parking spaces not available economically		have allowed for the cost, but there is no space at the moment. The extra over for fitting them in around the site.	50%	3	3	1	3	Medium	Low	Medium	Medium	PR/MT		Take over a section of the museum and park and ride for the museum may have to be provided.
46	Protest			50%	3	2	3	1	Medium	Medium	Low	Medium	Martin Heal		
19	Unavailability of construction labour		Premium costs to be paid	40%	3	3	3	3	Medium	Medium	Medium	Medium	Martin Heal		
63	Incorrect through life costing	affects core works maintenance	lots of unknowns. Review with core services. Maintenance issues may have to be covered by this project which currently have not been identified. Assume additional cost comes from core services.	40%	3	1	1	3	Low	Low	Medium	Medium	Sean Lockie		

Daarna is een risico kwantificatie uitgevoerd met de belangrijkste stakeholders van het project, om de kosten- en tijd kwantitatieve risico- en onzekerheidsmodellen en sensitiviteit vast te stellen

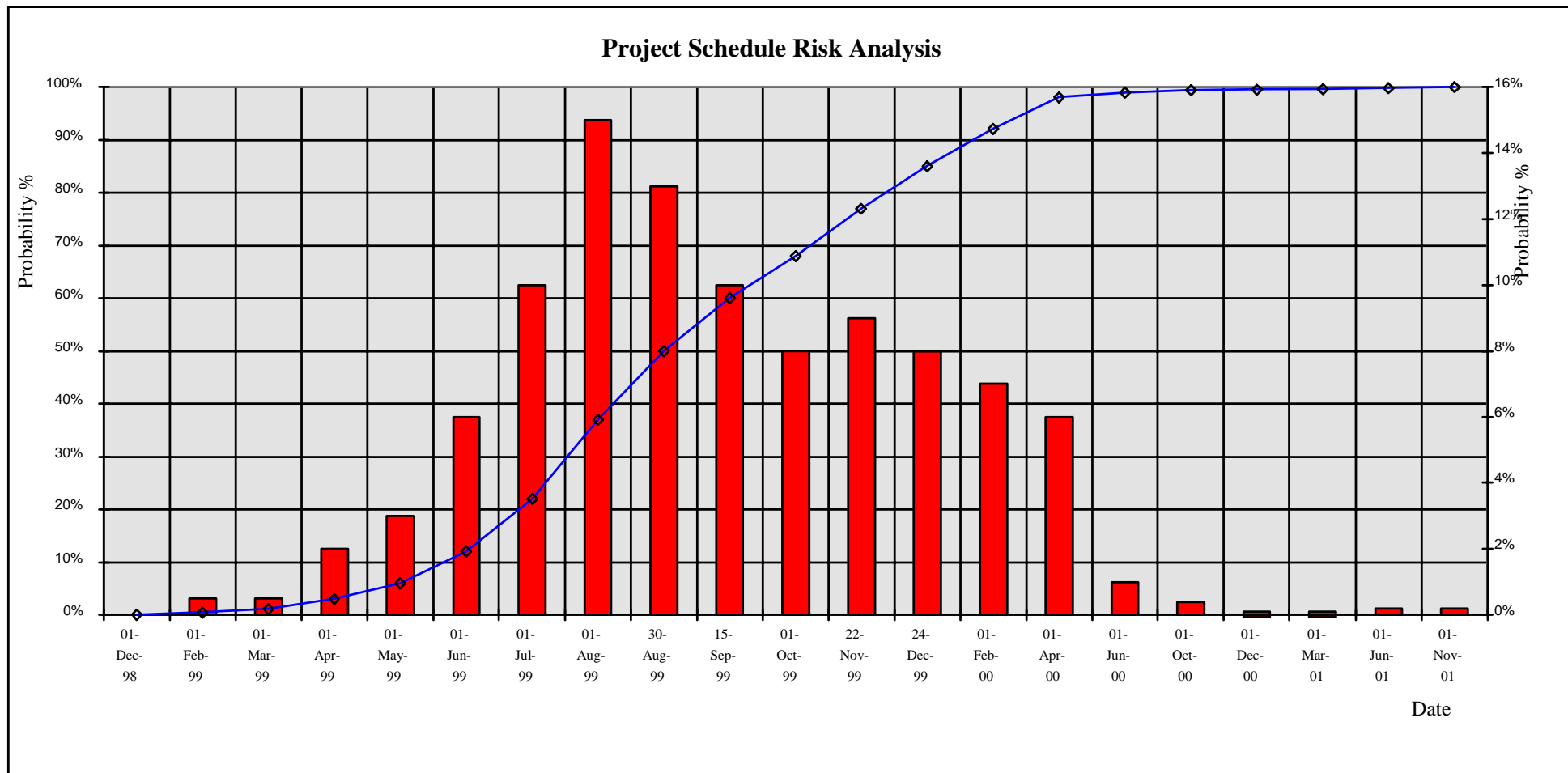
Typical Quantitative Cost Risk Analysis Output



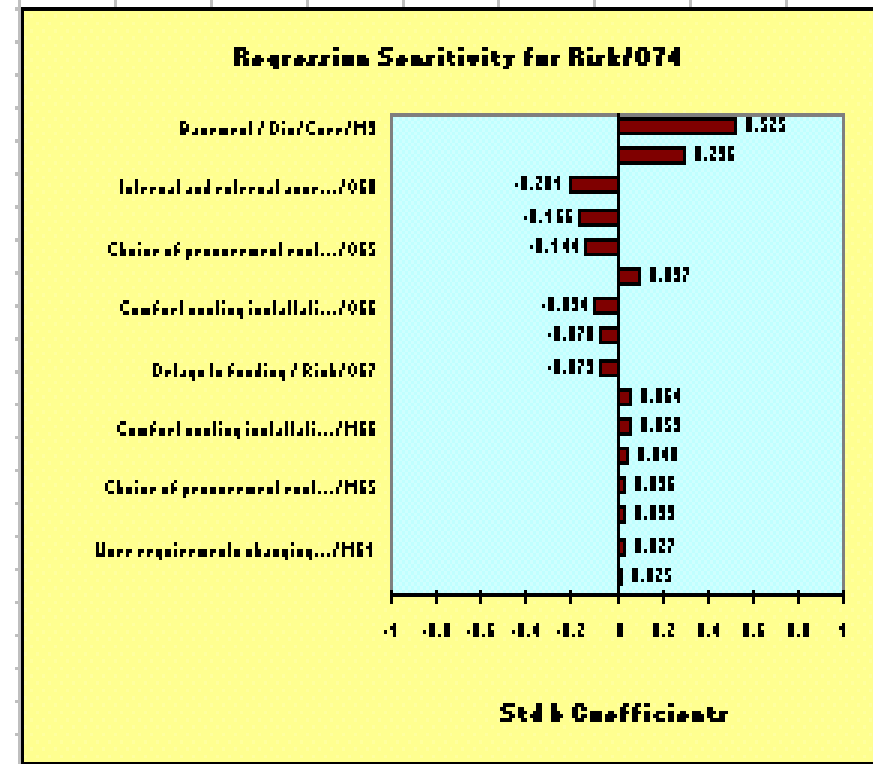
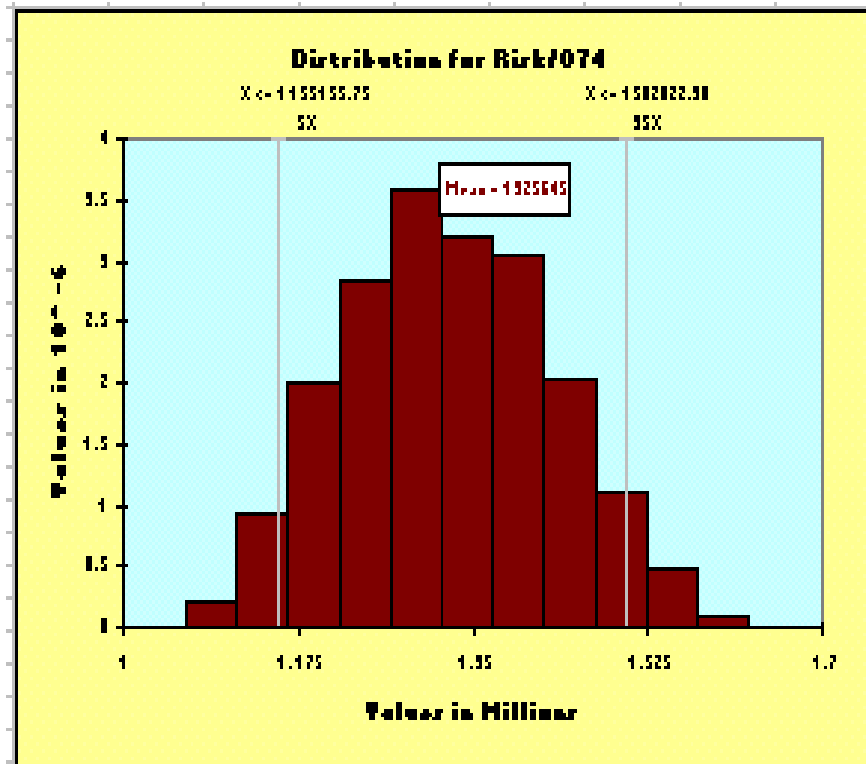
Een typische model van het tijd risico analyse

Risk Costs			Time Now	Risk Analysis		
Risk	Description	Type.		Opt	M/L	Pess
1.1	Info Availability	P/ I	100	120	140	
1.2	Local Authority	Fin	200	230	260	
1.3	Land Possession	Fin	150	200	250	
1.4	Cont. Available	P/ I	300	400	500	
1.5	Sanction / Appr.	Fin	180	250	300	
1.6	Plt/Equip.Failure	P / I	380	500	5000	
1.7	Contract Claims	Fin	0	1000	3000	

Een typische output van een tijd risico analyse



Cost Output Distribution and Sensitivity Analysis



Summary Risk Profile - Combined Scores

Project : Glasgow Harbour
Risk Review Date : 02/12/04

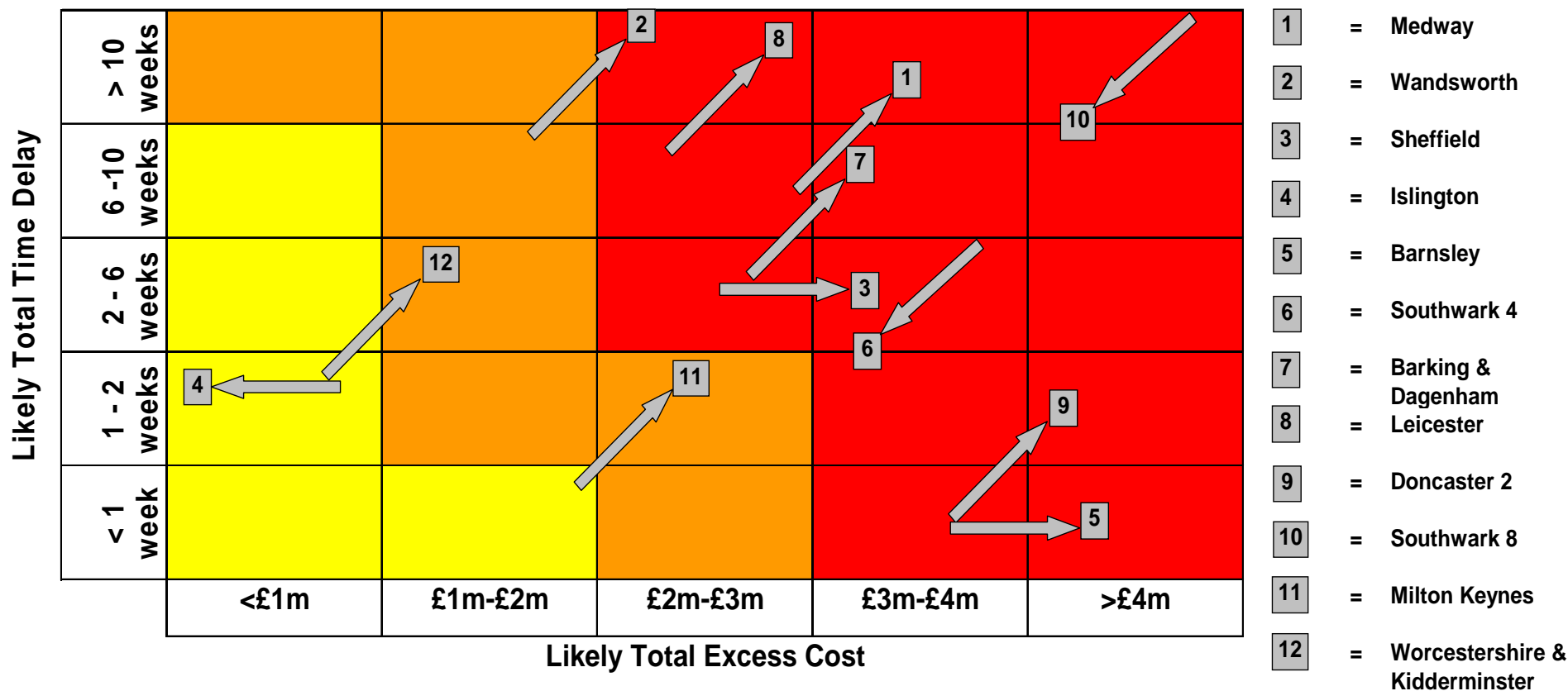
			Impact					Totals
			Very Low	Low	Medium	High	Very High	
			1	2	3	4	5	
Probability	Almost Certain	5	5	3	1	4	1	5
	Probable	4	1	3	1	1	3	3
	Possible	3	2	3	6	3	5	11
	Unlikely	2	2	1	1	3	3	5
	Remote	1	1	3	1	3	2	7
Totals			4	10	10	4	3	31

No. of risks identified in each category

Total Number of Risks	31
"Red" (High)	3
"Amber" (Medium)	19
"Green" (Low)	9

Eindelijk (en meest belangrijk), wordt het risicomanagement uitgevoerd, om te verzekeren dat de geïdentificeerde en gekwantificeerde risico's zijn beheerst en, als mogelijk, vermeed en overgedragen.

Example 'Heatmap' Showing Current Likely Risk Levels for Academy Projects (arrows indicate movement in previous month):

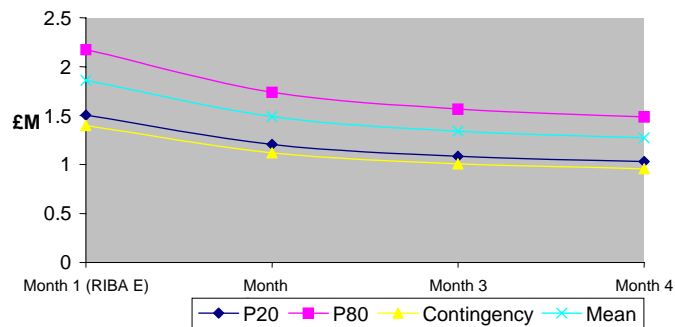


Academy Name	London	SCDT Architect	Steve Smith
CPM Name	J. Brown	SCDT QS	John Barnes
CPM Organisation	Consultants	Date of Report	30/03/2005
Design Team Organisation		Date of Risk Register	14/02/2005

Top Project Risks

Risk ID	Risk Description	Owner	Risk Mitigation Plans
23	Additions to Brief - Additional area requirements for specialists and external bodies.	OPM	High level brief from Sponsors by end of May.
26	Fundamental changes made to brief by Sponsor/DfES.	OPM / CPM	Clearly defined and signed off brief as early as possible, and at the latest by the end of Stage C. Strict Change Control system to be operated by CPM. No changes to be adopted by team unless signed off by Client.
44	Abnormals rejected by the SCDT	CPM	Design Team & Quantity Surveyor to produce a robust case for approval Dialogue opened with HBC Education, head of sport, re alternative site on Hackney Downs
6	Size of site and requirements of BB85. Sports provision may need to be provided off site	OPM	Design team to undertake area analysis to establish land requirements for school & sports facility. See also key worker housing & Child development centre risks

Risk Data



**Cost Impact
Summary Cost Risk Profile**

VH	2				
H	1				
M	2	8	12	1	
L	1	4	4		
VL			2		
	V	L	M	H	V
	L	Probability			

The graph above illustrates the value of the risk register over time. The contingency figure is that which is included within funding agreement, and should be compared with the mean which is the expected value of the risk register. The P80 and P20 figures represent the outturn cost of risk which could reasonably be expected if the project goes particularly badly or well.

The summary risk profile above illustrates the spread of risks within the risk register. It can be seen that Hackney has only one risk within the red zone.

Comments

In terms of actual risk management, risk is being managed in a vigorous manner on the project, with regular risk reviews being undertaken. The summary risk profile further illustrates the success of risk management within the project, with very few risks within the red high risk zone. The QRA results include a value of £725K which covers the risk of inflated tenders due to the market place overheating. This is a risk which is present on every academy which does not have a contractor on board at present. Without this risk the value of the risk register would actually be less than the contingency assigned to the project within the funding agreement.

BIJLAGE K
DANKWOORD

Bij deze willen wij onze dank en waardering uitspreken voor een aantal personen die ons hebben bijgestaan teneinde ons onderzoek succesvol af te ronden.

De voorbereidingscommissie tevens opdrachtgever onder leiding van de heer Auke Bijlsma, Raadslid, voor het vertrouwen in ons om deze bijzondere opdracht uit te mogen voeren.

De commissie van onafhankelijke deskundigen onder leiding van mevrouw mr. Winnie Sorgdrager voor advies en ondersteuning alsmede hun kritische én coachende rol.

De heer Mark van der Horst, Wethouder van Verkeer, Vervoer en Infrastructuur voor het faciliteren van het onderzoek en de actieve open bijdrage die zijn medewerkers hebben verleend aan dit onderzoek.

Mevrouw mr. Marijke Pe, Raadsgriffier, voor haar visie, begeleiding en ondersteuning van dit onderzoek.

De heer mr. Jacques van Berkel voor zijn inhoudelijke ondersteuning en advisering gedurende het gehele proces.

De medewerkers van het Projectbureau Noord/Zuidlijn, het Adviesbureau Noord/Zuidlijn waaronder de heer Laurens Haanen voor zijn functie als Liason Officer en mevrouw Pau Lian Staal-Ong.

Mevrouw Mi-Sun Wieringa en alle overige medewerkers van de Raadsgriffie voor de dagelijkse ondersteuning van het onderzoeksteam van Faithful & Gould.

Mevrouw mr. Anna van der Leeuw en mevrouw Joke Veldhuis, die als ondersteuning aan het onderzoeksteam beschikbaar zijn gesteld door de Raadsgriffie.

BIJLAGE L
VRAGEN OVER HET RAPPORT

Vragen ten aanzien van het Rapport

Alle vragen over dit rapport dienen tot worden gesteld aan Dhr. mr. Nick Gray:

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