PROJECT QUALITY PLAN

PROPOSED FLAT DEVELOPMENT COMPRISING ONE BLOCK OF 15-STOREY RESIDENTIAL APARTMENTS (TOTAL 43 UNITS) WITH ONE BASEMENT CARPARK, A SWIMMING POOL & COMMUNAL FACILITIES ON LOT 2317 MK 26 AT BROOKE ROAD

For

M/S PACIFIC ROVER PTE LTD

Copy No.	1

Prepared By: Goh Soon Huat

Authorised By: Tan L S

Date: 24 November 1999

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SECTION 1

QUALITY PLAN CONTROL AND DISTRIBUTION

1.1 List of Copy Holders

Copy No.	Copy Holder	Date of Issue
1	1243-PQP File	24 November 1999
2	Goh Soon Huat	24 November 1999

1.2 Revision Record

Revision	Date of Issue	Section Reference	Page(s)	Remarks
0	24 November 1999	Section 1 to 10	26	1st Issue

SECTION 2

PROJECT INFORMATION

2.1 Project Description

Type of Development	Residential

Statistics of Development	
Site Area, m²	2,454.5
Nett Floor Area, m²	
Gross Floor Area, m²	5,154.45
Covered Carpark, m²	1,421.94
No. of Covered Carpark Lots	45
No. of Apartments/Houses	43
No. of Beds (for Hospitals)	N.A.
No. of Guestroom (for Hotels)	N.A.
No. of Blocks / No. of Storeys	1 / 15
No. of Phases	1

2.2 Project Cost

M&E Services Cost Plan (S$ x 1M)										
Services	EI	ACVI	LEI	FFAI	PSI	SPFI				
Estimate	No estimates done (Design & Build Contract)									
Awarded										

Total Project Construction Cost (S$ x1M)			
	Site Clearance	Piling Works	Main Contract
Estimate	Nil	Included in M C	9.00
Awarded			

Site Clearance shall include earth work, soil improvement, service diversion and termination.

2.3 Scope of Works

2.3.1 Scope of Consultancy Services

Conceptual/Schematic Design	✓
Detailed Design	✓
Tender Documentation	✓
Tender Evaluation	✓
Contract Supervision	✓
M&E Costing	✓
Submissions to Authority	✓

(✓ *where applicable*)

2.3.2 Scope of M&E Services

ELECTRICAL	✓	AIR CONDITIONING	✓	SPRINKLER	✓	SANITARY	✓
LIFT	✓	MECHANICAL VENTILATION	✓	FIRE ALARM	✓	COLD WATER	✓
ESCALATOR		MECHANICAL SMOKE EXTRACT	✓	HOSEREEL	✓	HOT WATER	✓
PABX		COMPUTER A/C		WET RISER		TOWN GAS	
SECURITY	✓	BST CARPARK EXH	✓	DRY RISER	✓	LPG GAS	✓
TELELIFT		HEATING		SWIMMING POOL	✓	MEDICAL GAS	
DATA COMM.		STEAM BOILER		FUEL STORAGE			
FLUSHFLOOR TRUNKING							

(✓ *where applicable*)

2.3.3 Submission to Relevant Authorities by Others

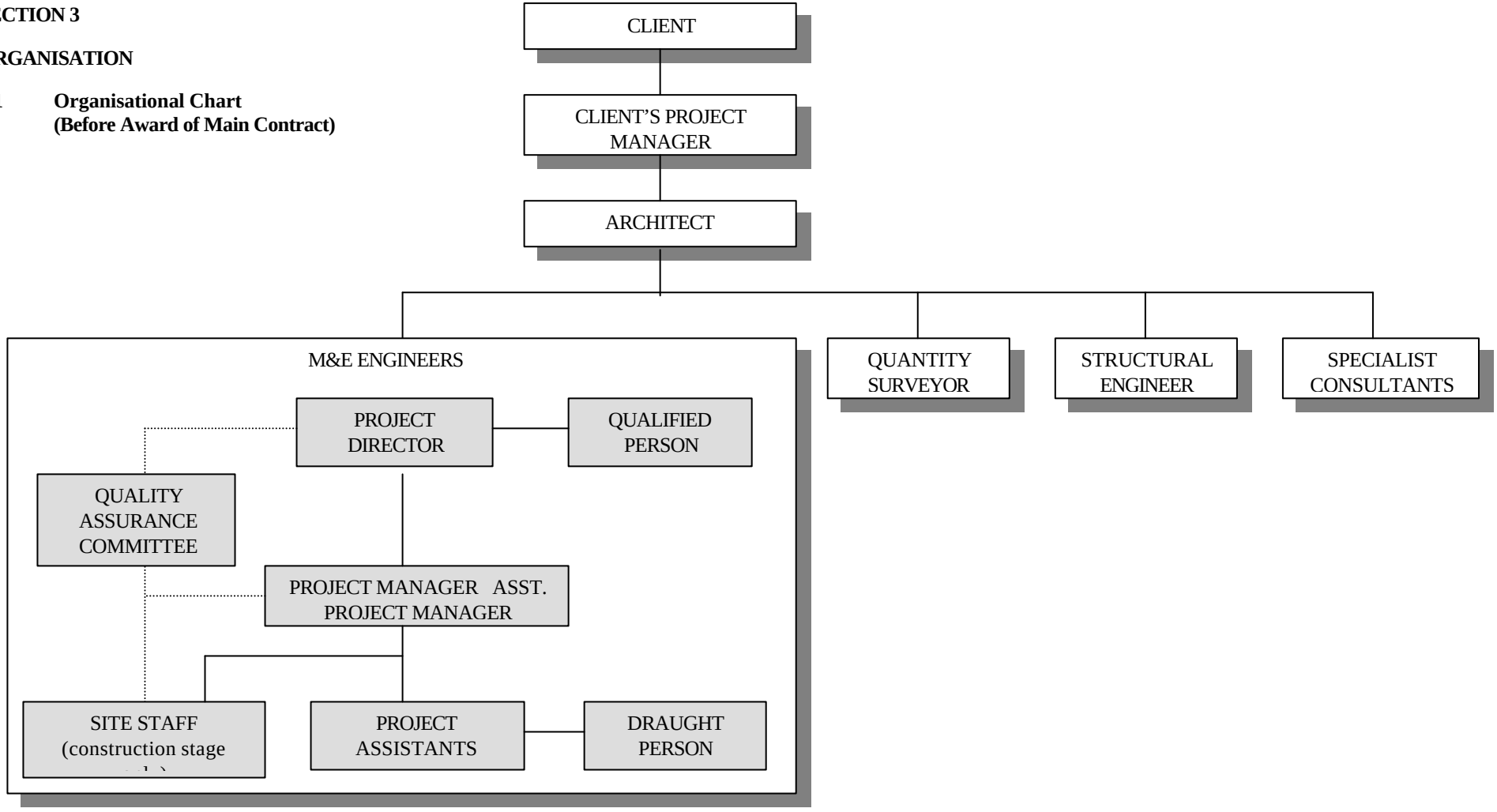
EJECTOR & DIVERTER	✓	SUMP PUMP	✓	FUEL OIL TANK		LIFT & ESCALATOR	✓	PRESSURE VESSEL		HOISTS		FOAM	

(✓ *where applicable*)

SECTION 3

ORGANISATION

3.1 Organisational Chart
(Before Award of Main Contract)



SECTION 3

ORGANISATION

3.2 AEC's Project Team Member

TITLE		NAME
Project Director		Tan L S (TLS)
Qualified Person	Mechanical	Andrew Loh (LCT)
	Electrical	Tan L S (TLS)
Project Manager		Goh S H (GSH)
Assistant Project Manager		Lee W C (LWC)
Project Assistant (Mech)		Ang Wee Loong (AWL)
Project Assistant (Elect)		Desmond Yeo (DY)
Draughtsperson		Common Pool
Resident Engineer (M&E)		-
Assistant Resident Engineer (M&E)		-
Clerk-of-Work (M&E)		-

3.3 Client/Client's Representatives

Client:- Pacific Rover Pte Ltd

Address:- 2 Soon Wing Road #06-06
Soon Wing Industrial Building
Singapore 347893

Tel:- 748 7522

Fax:- 745 9167

Client's Representatives:-

Name of Firm	Contact Person	Contact
Pacific Rover Pte Ltd	Name: Mr Soh Hwee Cheow Position: Director	Tel: 748 7522 Fax: 745 9167 Handphone:96170892 Email:
Pacific Rover Pte Ltd	Name: Mr Lum Hon Chew Position: Project Manager	Tel: 748 7522 DID : 843 0722 Fax: 745 9167 Email: lumhc@hobee.com
Pacific Rover Pte Ltd	Name: Mr Cher Soon Chye Position: Project Manager	Tel: 748 7522 Fax: 745 9167 Handphone: 97625761

3.4 Other Consultants (Local)

Function / Name of Firm	Contact Person	Contact
Architect **Axis Architects Planners Pte Ltd**	Name: Ms Chua Choon Geok Position:	Tel: 226 3003 Fax: 227 3003 Pager: Handphone: Email: axisarch@pacific.net.sg
Quantity Surveyor **Davis Langdon & Seah Singapore Pte Ltd**	Name: Miss Lim Li Ping Christine Position: QS	Tel: 222 3888 DID: 2398303 Fax: 224 7089 Pager: Handphone: Email:
Structural Engineer **MSE Engineering & Management Consultants**	Name: John Lim Position:	Tel: 225 2466 Fax: 221 1112 Pager: Handphone: Email:
Interior Designer Nil	Name: Position:	Tel: Fax: Pager: Handphone: Email:
Landscape Consultant **Site Concepts International Pte Ltd**	Name: Mr Mark S Mahan Position:	Tel: 221 8826 Fax: 221 8937 Pager: Handphone: Email:
Lighting Consultant Nil	Name: Position:	Tel: Fax: Pager: Handphone: Email:
Acoustic Consultant Nil	Name: Position:	Tel: Fax: Pager: Handphone: Email:

3.4 Other Consultants (Overseas)

NOT USED

3.5 Contractors/Sub-Contractors

Function / Name of Firm	Contract *	Contact Person	Contact
Main Contractor		Name: Position:	Tel: Fax: Pager: Handphone: Email:
Air Conditioning & Ventilation Installation Sub-Contractor		Name: Position:	Tel: Fax: Pager: Handphone: Email:
Plumbing & Sanitary Installation Sub-Contractor		Name: Position:	Tel: Fax: Pager: Handphone: Email:
Electrical Installation Sub-Contractor		Name: Position:	Tel: Fax: Pager: Handphone: Email:
Lift Installation Sub-Contractor		Name: Position:	Tel: Fax: Pager: Handphone: Email:
Fire Fighting & Alarm Installation Sub-Contractor		Name: Position:	Tel: Fax: Pager: Handphone: Email:
Swimming Pool Filtration Plant Installation Sub-Contractor		Name: Position:	Tel: Fax: Pager: Handphone: Email:
Carpark System Installation Sub-Contractor		Name: Position:	Tel: Fax: Pager: Handphone: Email:

** Type of Contract*
- *NSC (Nominated Sub-Contract)*
- *DSC (Domesticated Sub-Contract)*
- *DC (Direct Contract)*
- *NS (Nominated Supplier)*

3.6 Authorities

Authorities/Department	Contact Person	Tel/Fax Nos./E-mail
PowerGrid/Power Supply:		
(a) Customer Supply	Mr Francis Wong	831 8008 / 831 8239
(b) Sub-Station	Mr Francis Chang See Tong	831 8555 / 831 8564
(c) Installation		
(d) Meter Section		
(e) Road Lighting		
(f) Diversion		
Telecom:		
(a) Planning/Line Plant	Mr Chin Se Cheng	838 2505 / 733 9895
(b) Installation	Mr Roland Lim	825 6169
(c) Diversion		
BCD:		
(a) Building Plan		
FSB:		
(a) Building Plan		
(b) M&E Section		
PUB (Water)		
(a) Water Conservation		
(b) Plumbing Plan		
(c) Diversion		
PowerGas:		
(a) Planning/Submission		
(b) Installation/Inspection		
(c) Diversion		
ENV (Sewerage):		
(a) Building Plan		
(b) M&E Section		
(c) Diversion		
ENV (Pollution Control)		
(a) Planning/Submission		
(b) Inspection		

SECTION 4

PROGRAMME

4.1 Overall Programme

			1999												2000											
ID	TASK NAME	MONTHS	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
1.	Preliminary Planning	2																								
2.	Planning Submission	2																								
3.	Detail Design	5																								
4.	BP Submission	3																								
5.	BP Submission (Amendments)																									
6.	Tender Period	2																								
7.	Construction Period	18																								
8.	TOP	2																								
9.	CSC	6																								

SECTION 4

PROGRAMME

4.2 Authority Submission Status for M&E Services - 1st Submission

Service	Authority	Original Submission		Comments/Resubmission						Approval/ Clearance
		Scheduled	Actual	Comment	Resubmit	Comment	Resubmit	Comment	Resubmit	
Application for Electricity Supply	Power Supply Pte Ltd	04/10/99	04/10/99							13/10/99
Power Supply Substation	PowerGrid Pte Ltd	20/01/00								
Main Single Line Diagram	Power Supply Pte Ltd	28/07/00								
Consumer Switchroom Layout	PowerGrid Pte Ltd									
Metering Layout	PowerGrid Pte Ltd	29/09/00								
Sanitary Installation	ENV (Sewerage)	11/04/00								
Domestic Water Supply	PUB (Water)	28/07/00								
Gas Supply Installation	PowerGas Pte Ltd	N.A.								
Air Conditioning & Ventilation Inst.	Fire Safety Bureau	31/08/00								
Fire Fighting & Alarm Installation	Fire Safety Bureau	31/08/00								
Telephone Installation	Telecom (Broadband)	12/06/00								
	Telecom (TDCS)	N.A.								
	Telecom (Domestic Operation)	N.A.								
Fuel Storage	Fire Safety Bureau	N.A.								
	Pollution Control Department	N.A.								

SECTION 4

PROGRAMME

4.3 Authority Submission Status for M&E Services (Amendments) - 2nd Submission

NOT USED

SECTION 5

PROJECT RECORDS

5.1 List of Internal Files

Standard Files

File Ref:		File Ref:	
-CM/SM	✓	-QSP	
-PC	✓	-BD	✓
-AE	✓	-CC	✓
-AM	✓	-CF	✓
-AA	✓	-GC	✓
-PQP	✓		

Project Files to be initiated by PM as and when required

File Ref:		File Ref:		File Ref:	
-SM		-SR		-ET	
-SC		-QM		-MT	
-AI		-EC/MC	✓	-DF	
-SQ	✓			-EOT	
-CO	✓	-PP	✓		

Service Files to be initiated by PM as and when required

	Service										
File Ref:	ACVI	FFAI	PSI	EI	LI	SPFP					
-G	✓	✓	✓	✓	✓	✓					
-Q											
-VO											
-PP											
-AI											
-AD											
-CF											

SECTION 5

PROJECT RECORDS

5.2 Filing of Drawings

The following team members shall take charge of filing of drawings, stamping "SUPERSEDED" drawings, etc.

Description	Team Member
Incoming Architectural Floor Plans	DY
Incoming Architectural Sketches/Details	DY
Incoming Structural Drawings	DY
M&E Drawings	
- Electrical Installation	DY
- Lift & Escalator Installation	DY
- Air Conditioning & Ventilation Installation	AWL
- Fire Fighting & Alarm Installation	AWL
- Plumbing & Sanitary Installation	AWL
- Swimming Pool & Filtration Installation	AWL
Other Drawings	DY

SECTION 6

INTERFACING

6.1 Method of Interface

Description	Method of Interface	
Client's Review & Approval	M&E Design Report	✓
	Pre-planned meeting at fixed intervals	✓
	Telefax, letter and telephone	✓
	Email	✓
Interface With External Design Teams	M&E Design Report	✓
	Pre-planned meeting at fixed intervals	✓
	Telefax, letter and telephone	✓
	Email	✓
Interface Between Internal Design Teams	Telephone	✓
	Email	✓
	Internal Project Team Meeting	✓
	Circulation of Information	✓

(✓ *where applicable*)

SECTION 6

INTERFACING

6.2 Internal Design Interface

Item No.	Description*	Required From	Required By	Date Required	Remarks
1.	Mechanical equipment power requirement	LWC	GSH	Progressively	Design & Build (Depending on Contractor's proposals)
2.	Mechanical equipment essential load requirement	LWC	GSH	Progressively	
3.	Mechanical equipment control panel & isolator location	LWC	GSH	Progressively	
4.	Lift motor room heat load	GSH	LWC	Progressively	

** Information required by INTERNAL DESIGN TEAM MEMBERS*

SECTION 6

INTERFACING

6.3 Circulation of Documents to External Parties

	Code: A - Approval Required C - For Comments I - For Information Only	Client/ Client Rep.	Client's Project Manager	Architect	Structural Engineer	Quantity Surveyor	
1.	**Letters/Fax:**						
a.	Project Design	A		I	I	I	
b.	Project Administration	I		C	I	I	
c.	Project Cost Estimate/Contract Cost	C		I	I	C	
2.	**Drawings**						
a.	Outline Design Drgs.	C		C	I	I	
b.	Sketch Design Drgs.	C		C	I	I	
c.	Final Design Drgs.	A		C	I	I	
d.	Shop Drawings	I		C	C	-	
e.	As Built Drgs.	I		-	-	-	
3.	**Other Document**						
a.	Specification	I		-	-	-	
b.	Tender Document	I		-	-	-	
c.	Tender Evaluation Report	A,C		I	-	I	
d.	Design Report	A		C	C	C	
e.	Progress Report	I		I	-	-	
f.	Financial Report	-		-	-	-	
g.	Minutes of Meeting	-		-	-	-	
h.	Inspection Report	-		-	-	-	
i.	Testing & Comm. Report	I		I	-	-	
j.	O & M Manual	I		-	-	-	

SECTION 7

WORK AUTHORISATION

Activity \ Authorised Signatories	PD	QP	PM	SS
General Correspondences with Client	✓	✓	✓	
General Correspondences with Other Consultants	✓	✓	✓	
M&E Cost Estimate Report	✓		✓	
M&E Design Report	✓		✓	
Check Prints	✓	✓	✓	
Tender Drawing Approval	✓	✓	✓	
Tender Specification Approval	✓	✓	✓	
List of Tenderers	✓		✓	
Tender Questionaires	✓		✓	
Tender Reports	✓		✓	
Draft Letter of Award	✓		✓	
Review of Contractor's Shop Drawing	✓		✓	
Review of Contractor's Technical Submittal	✓		✓	
Review of Contractor's Sample Submittal	✓		✓	
Contractor's Request for Deviation	✓		✓	
Progress Payment Valuation Form	✓		✓	
Final Account Valuation	✓		✓	
Draft Variation Order	✓		✓	
Engineer/Architect's Instruction/Direction	✓		✓	
Site Instruction/Direction	✓		✓	
Correspondence/Submission to Authorities	✓	✓	✓	

(✓ *where authorised*)

Key to abbreviations:-

PD : Project Director
QP : Qualified Person
PM : Project Manager/Assistant Project Manager
SS : AEC Site Staff

SECTION 8

DESIGN INPUT & METHODOLOGY

8.1 List of Client's Standards, Reference Documents or Brief

ITEM	KEPT BY
Client's Design Checklist	File 1243-BD

8.2 List of Applicable Code of Practice and Regulations

Electrical Wiring	~~BS~~	SS	~~IEE~~	~~NFPA~~	
Lightning Protection System	~~BS~~	SS			
Air Conditioning & Ventilation Installation	~~BS~~	~~AS~~	~~NFPA~~	SS	~~MS~~
Lift Installation	~~BS~~	SS			
Sprinkler System	~~BS~~	SS	~~NFPA~~	~~AS~~	~~LPG~~
Dry Riser System	~~BS~~	SS	~~NFPA~~	~~AS~~	~~MS~~
Automatic Fire Alarm System	~~BS~~	SS	~~NFPA~~	~~AS~~	~~MS~~
Sanitary System	BS	SS	~~NFPA~~	~~AS~~	~~MS~~
Plumbing System	BS	SS	~~NFPA~~	~~AS~~	~~MS~~
Town Gas/LPG Supply System	~~BS~~	SS	~~NFPA~~	~~AS~~	
Mechanical Smoke Control System	BS	~~NFPA~~	~~AS~~		

(Delete where necessary)

SECTION 8

DESIGN INPUT & METHODOLOGY

8.3 List of Design Guide or Handbook Used

Carrier's Handbook of Air Conditioning System Design

ASHRAE Handbooks

Institute of Plumbing's Plumbing Services Design Guide

8.4 List of Applicable Quality System Procedures

Alpha Engineering Consultant's Quality System Procedures

Section	Title
A1	Documentation of Quality System Procedure
A2	Documentation of Project Quality Plan
A3	Administration Control
A4	Document Control
A6	Archive Control
A9	Feedback Reporting
A10	Computer Control
B1	Preparation of Consultancy Offer
B2	Project Commission and Service Agreement
B3	Design Control
B4	Design Change Control
B5	Drawing Control
B6	Specification Control
B7	Tender Process and Evaluation
C1	Construction Process Control
C2	Testing and Commissioning
D1	Quality System Audit

8.5 List of Software Used For Design/Analysis

DESCRIPTION/ PACKAGE NAME	VERSION	SUPPLIER/ SOURCE	PURPOSE	
Calculux	2.30	Philips	Lighting design	✓
Cophos	3.31	Zumtobel	Lighting design	
Carrier E20-II	3.21	Carrier	Programme for determination of heat load, duct size and its losses, etc.	
Gensize 2	2.1	Onan	Generator sizing	
Lift Traffic	-	Alpha Engineering	Lift traffic calculation	✓
Econdial	2.5	Merlin Gerlin	Design for low voltage network	
Hyena	4.00.1	ACADS-BSG	Fire Sprinkler & Hydrant Analysis	
Fault Level Calculation	-	Alpha Engineering	Calculation of voltage drop and fault level	✓

(✓ *where applicable*)

SECTION 9

CLIENT'S REQUIREMENTS

9.1 List of Output Required by Client:-

Item	* Remarks
M&E Design Report	A,C
M&E Cost Estimate Report	A,C
Pre-Qualification of Tenderers	-
Tender Documents	I
Tender Report	A,C
Payment Valuation for QS	C,I
Certificates of Supervision for TOP/CSC	I

** Remarks*

A: for approval C: for comment I: for Information Re: for record

Other purposes and for action: please specify.

9.2 Specific Procedures Required By Client *(If applicable)*

SECTION 10

LIST OF SUB-JOB

10.1 List of Sub-Job Numbers

NOT USED