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IT DISASTER RECOVERY PLAN


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1. INTRODUCTION

1.1 Objective

The IT Disaster Recovery Plan ("IT DRP") documents the recovery procedures to restore IT systems to support MTD's business functions in the event of an IT disaster.


The recovery action are to achieve MTD's System Recovery Time Objectives (RTO) set forth to achieve MTD's established Mission Critical Activities (MCA). The primary audiences of the IT DRP are the members of the Disaster Recovery Team appointed by MTD.

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1.2 Structure of the IT DRP Document

The IT DRP is divided into 6 sections. The description of these 6 sections is as follows:

Section No.	Section Heading	Description
Section 1	Introduction	An overview of the DRP document, including terminologies used and the scope of the document.
Section 2	MTD IT DRP Organisation Structure	The DRP Organisation Structure that will be responsible for implementation and facilitation of activities pertaining to MTD's DRP.
Section 3	Incident Escalation & Activation Flow	These procedures are used as an indication or criteria to declare an IT disaster.
Section 4	Recovery Objectives for MTD IT Systems	These are the IT recovery objectives that have been agreed by the relevant Head of Departments in MTD.
Section 5	Recovery Procedures for IT Systems	These procedures are invoked once an IT disaster has been formally declared, including all relevant steps to recover the affected IT systems, infrastructure and/or communication facilities.
Section 6	Appendices	These appendices include internal and external contact lists to facilitate the execution of the IT DRP.

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1.3 Terminologies

IT DRP terminologies have been carefully selected from internationally recognized BCP institutions and respectable guidelines for a standardized understanding of IT DRP concepts in MTD. The following are the terminologies used:

- **IT Disaster Recovery Planning**

The advance planning and preparations that are necessary to minimize loss and ensure continuity of the IT infrastructure systems that supports the business functions of an organization in the event of a disaster.

- **Disaster**

A sudden, unplanned calamitous event causing great damage or loss.

- Any event that creates an inability on an organizations part to provide critical business functions for some predetermined period of time.
- Similar terms: Business interruptions; Outage; Catastrophe

(Disaster Recovery Institute International)


For MTD, there are two scenarios that are measured as an IT Disaster:

Scenario 1 :

Significant damage to the IT Data Centre that impacts IT systems for an extended period of time.

Scenario 2 :

Significant damage to the toll plaza system that impacts the IT Systems that handles toll operations for an extended period of time.

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- **Mission Critical Activities (MCA)**

The critical operational and/or business support activities (either provided internally or outsourced) required by the organization to achieve its objectives) i.e. services and/or products.

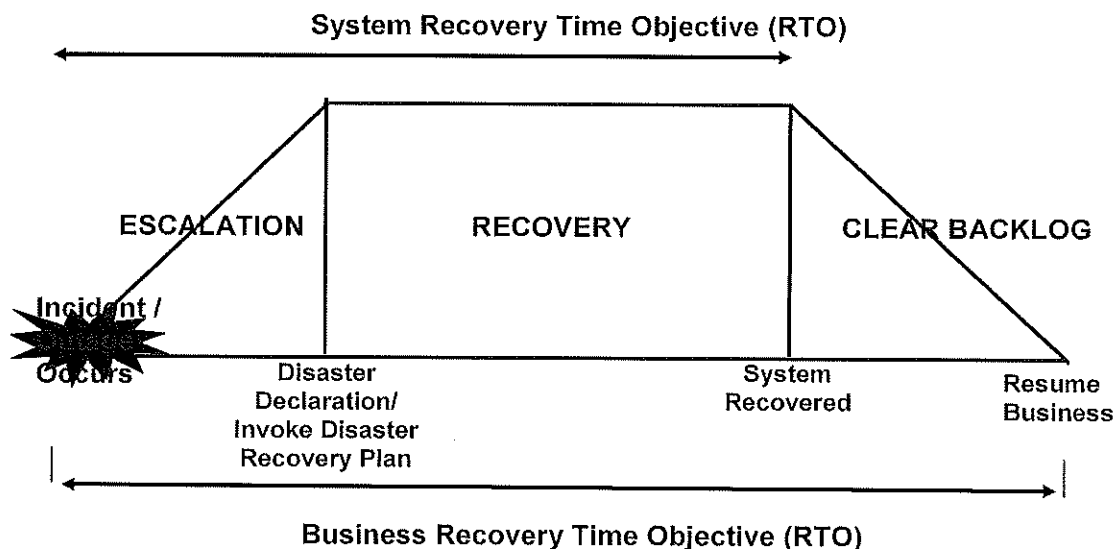
(Disaster Recovery Institute International)

- **Recovery Time Objectives (RTO)**

The period of time within which business functions, systems or applications, must be recovered after an outage. RTO starts from point of incident.

(Disaster Recovery Institute International)

* However, IT Disaster Recovery Plans are invoked when an IT Disaster is declared.



- **Recovery Point Objectives (RPO)**


The targeted point in time to which systems and data must be recovered after an outage as determined by the business unit.

(Disaster Recovery Institute International)

1.4 Scope of IT DRP

This document will document the IT recovery procedures for the following IT applications:

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HQ Systems


- AD (Active Directory)
- SAGE ERP
- Orisoft HR & Payroll
- IFCA (Contract Plus)
- IFCA.Net (Property)
- E-mail (Exchange)
- Internet Access
- Primavera
- TOMMS
- In-house Applications

Toll Systems

- TRACS (TnG & SmartTAG)
- Lane Controller System (LCS)
- HQSC System
- Plaza System

1.5 Assumptions

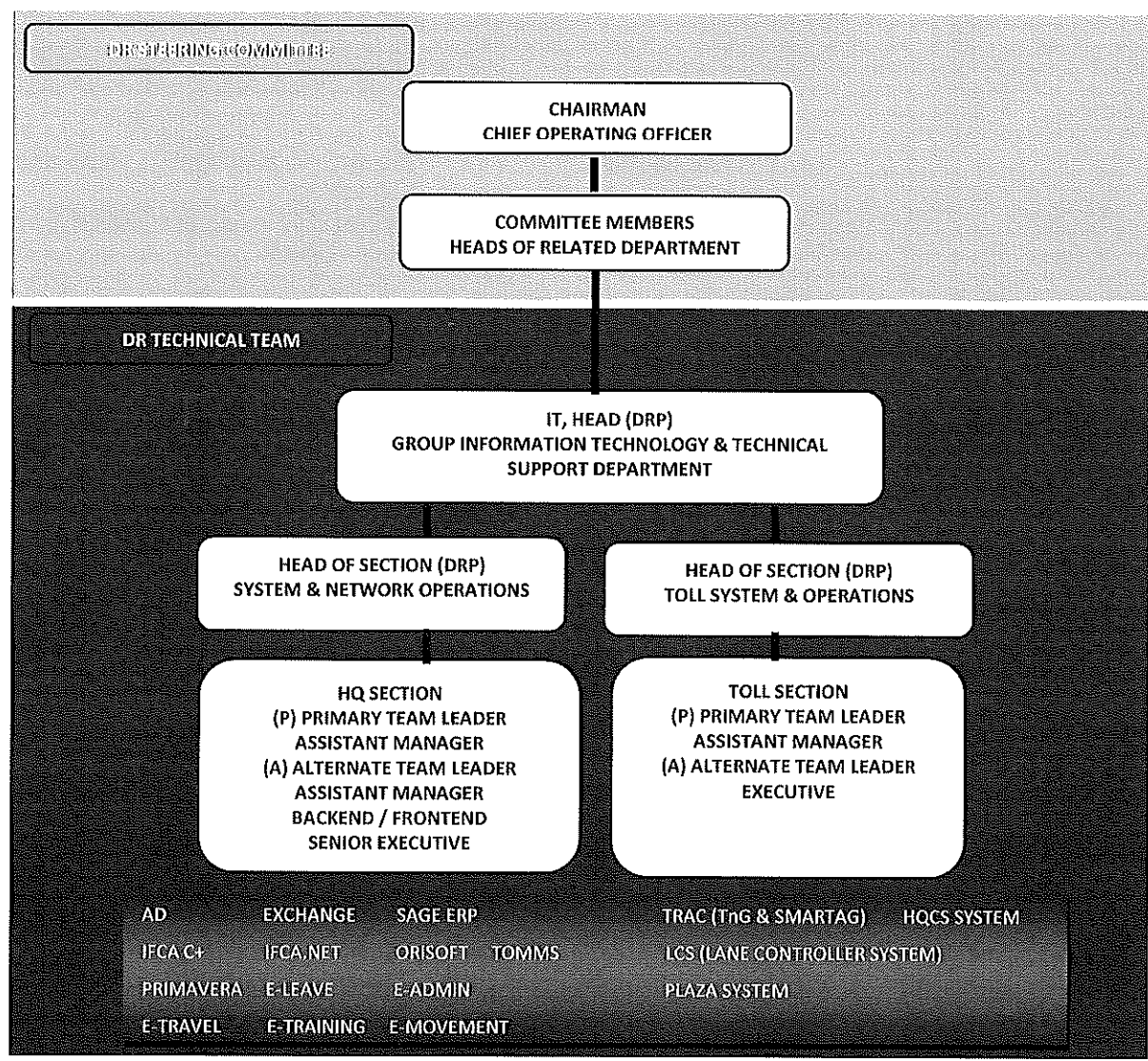
- The backup tapes are available, in good condition and kept offsite.
- Vendors and/or experienced external support personnel with the relevant technical expertise pertaining to MTD's infrastructure are available to assist in the recovery. These vendors are listed in page 17 and 18.


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2. MTD IT DRP ORGANISATION STRUCTURE

2.1 IT DRP Organisation Structure


The diagram below illustrates the IT DRP Organisation Structure for MTD. 'P' is the primary personnel responsible for the IT disaster recovery and 'A' is the alternate to the primary personnel if the primary personnel are not available to execute the IT disaster recovery.



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2.2 Roles & Responsibilities

Team Role	Timeline	Responsibilities
Disaster Recovery (DR) Steering Committee	Normal Operations 'Peace Time'	<ul style="list-style-type: none"> Owner of MTD's IT DRP programme; Provides leadership and direction to implement IT DRP policies and strategies; Approves overall IT DRP policies and strategies that is aligned to MTD business direction and risk management program; Approves budget and resources required for the development and maintenance of IT DRP; Decide on all major changes/issues associated with the development and implementation of DRP.
	Incident Escalation	<ul style="list-style-type: none"> Chairman to advise the IT Head whether to declare IT Disaster. Receive DR execution status updates from the Group IT Head.
	Activation of IT DRP	<ul style="list-style-type: none"> Receives input from the IT Head, when required.
Group IT Head (DRP)	Normal Operations 'Peace Time'	<ul style="list-style-type: none"> Supervise and monitor all activities of the development and implementation of the DRP; Ensures IT DRP programmed reflects new business initiatives and operational change; Make sure that the DRP is in line with the agreed objectives of the DR Steering Committee; Review DRP Strategy annually and present to the DR Steering Committee.
	Incident Escalation	<ul style="list-style-type: none"> Declares disaster in consultation with the Chief Operating Officer; Jointly with the DRP team to decide on overall recovery strategy, set response priorities and recovery teams to be activated; Monitors recovery activities and reports to the DRP Steering Committee on a regular basis.
	Activation of IT DRP	<ul style="list-style-type: none"> Make Decision to declare IT Disaster and invoke DRP; Assign and supervise tasks to all recovery teams under the DR Technical Support Team; Ensure all IT systems are recovered to business as usual.
Disaster Recovery (DR) Technical Team	Normal Operations 'Peace Time'	<ul style="list-style-type: none"> Review and maintain the incident management procedures; Review facilities requirements and specifications; Review system and data back-up policy (if


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Team Role	Timeline	Responsibilities
		necessary); <ul style="list-style-type: none"> • Review application & database recovery procedures; • Review network recovery procedures; • Test or walkthrough Disaster Recovery Plans annually; <ul style="list-style-type: none"> – Incident management procedures; – Facility recovery procedures; – System recovery procedures; – Application & database recovery procedures; – Network recovery procedures. • Provide recommendations to the IT Head on changes of current IT DRP Strategy.
	Incident Escalation	Incident Management <ul style="list-style-type: none"> • Perform the first level troubleshooting and initial damage assessment; • Escalate the incident handling steps to the appropriate responsible parties.


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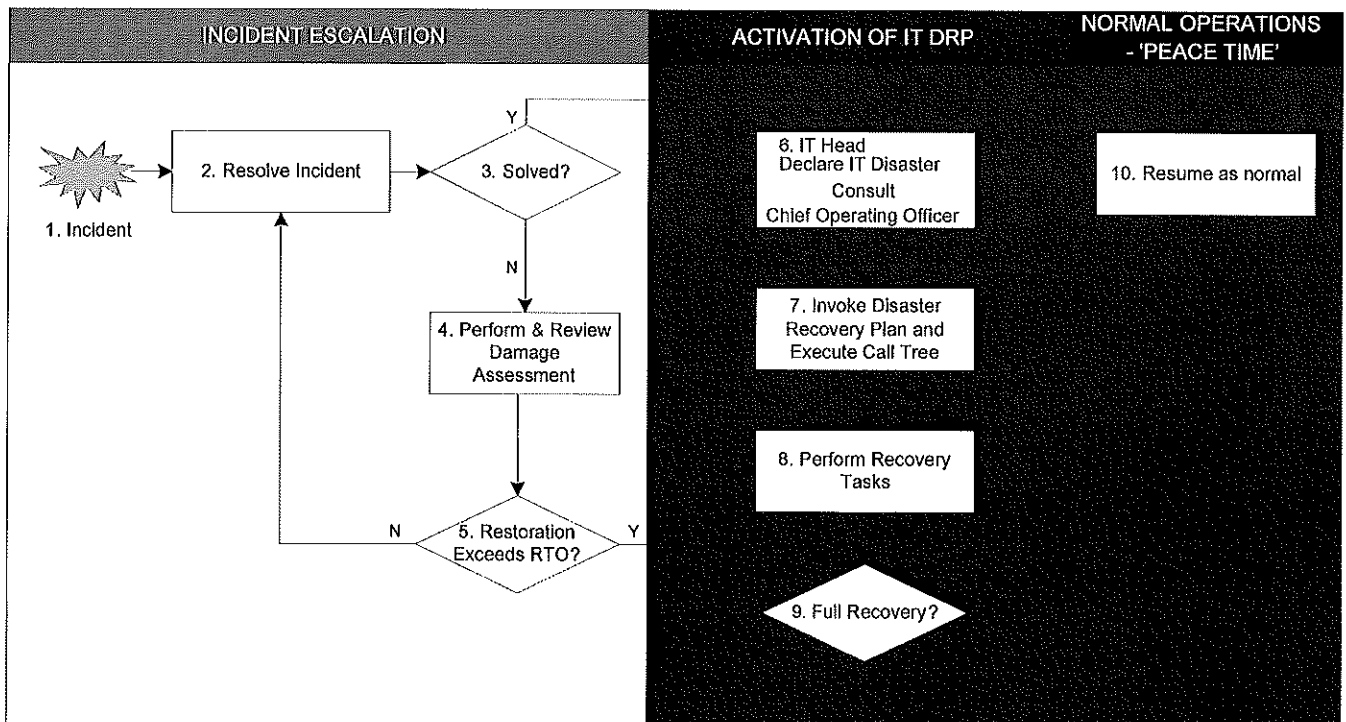
Team Role	Timeline	Responsibilities
	Activation of IT DRP	<ul style="list-style-type: none"> • Perform the first level troubleshooting and initial damage assessment; • Escalate the incident handling steps to the appropriate responsible parties; • Provide helpdesk assistance during DR execution; • Prepare the recovery site to accommodate the hardware, supplies, network equipment and personnel necessary for IT recovery at the DR site; • Prepare/restore servers and install the necessary operating systems for applications at the DR site; • Restore/configure applications, databases and data files for IT recovery at the DR site; • Restore/configure network equipment and connections for IT recovery at the DR site. • Provide regular status reports to the IT Head. <p>The specific roles for Disaster Recovery Technical Team are as follows:</p> <p>Incident Management</p> <ul style="list-style-type: none"> • Provide helpdesk assistance during DR execution. <p>Facility Recovery</p> <ul style="list-style-type: none"> • Prepare the recovery site to accommodate the hardware, supplies, network equipment and personnel necessary for IT recovery at the DR site; • Provide assistance to other recovery teams in recovering IT systems. <p>System Recovery</p> <ul style="list-style-type: none"> • Prepare/restore servers and install the necessary operating systems for applications at the DR site; • Provide assistance to other recovery teams in recovering IT systems. <p>Application & Database Recovery</p> <ul style="list-style-type: none"> • Restore/configure applications, databases and data files for IT recovery at the DR site; • Provide assistance to other recovery teams in recovering IT systems. <p>Network Recovery</p> <ul style="list-style-type: none"> • Restore/configure network equipment and connections for IT recovery at the DR site; • Provide assistance to other recovery teams in recovering IT systems.


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3. INCIDENT ESCALATION & IT DRP ACTIVATION FLOW

3.1 Overview

The flowchart below sets out the procedures for escalating incidents and activating the IT DRP in an IT disaster at MTD.




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3.2 Incident Escalation & IT DRP Activation Procedures


These procedures are used as an indication to declare an IT disaster.

Timeline	Process	Description
Incident Escalation	1. Incident	<ul style="list-style-type: none"> IT staff to assess and analyse incident; IT staff to inform IT Head of situation.
	2. Resolve Incident	<ul style="list-style-type: none"> IT staff assess and analyse incident; Troubleshoot and rectify problem based on operational procedures; IT staff inform IT Head of current status. IT staff to handle communication of system downtime to users.
	3. Solved?	<p>If 'Yes' :</p> <ul style="list-style-type: none"> Resume as normal. <p>If 'No' :</p> <ul style="list-style-type: none"> IT staff to carry out an assessment on the level of the damage.
	4. Perform & Review Damage Assessment	<ul style="list-style-type: none"> IT staff to prepare and provide damage assessment reports to IT Head; IT staff discuss with IT Head on assessment results; IT Head direct resolution efforts; IT staff to execute resolution efforts and to provide feedback to IT Head; IT Head to monitor progress of resolution and evaluate if restoration may exceed RTO; IT Head to update Chief Operating Officer or the DRP Steering Committee. If necessary, IT Head is to convene meeting with the DR Steering Committee to obtain direction.
	5. Restoration Exceeds RTO?	<p>If 'Yes' :</p> <ul style="list-style-type: none"> IT Head to declare IT Disaster, in consultation with the Chief Operating Officer. <p>If 'No' :</p> <ul style="list-style-type: none"> IT staff continue with resolution efforts; IT staff update resolution efforts to resolve issue; IT staff report assessment results to IT Head; IT Head to evaluate probability of restoration to exceed RTO.

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Activation of IT DRP	6. IT Head (DRP) Declare IT Disaster (Consult COO)	<ul style="list-style-type: none"> IT Head to activate DRP Technical Team to invoke IT DRP.
	7. Invoke Disaster Recovery Plan & Execute Call Tree	<ul style="list-style-type: none"> IT Head to activate DRP call tree. IT Head to instruct DRP Technical Team to execute procedures stated in the DRP.
	8. Perform Recovery Tasks	<ul style="list-style-type: none"> DRP Technical Team performs recovery tasks as stated in the DRP. DRP areas that have to be focused on are as follow: <ul style="list-style-type: none"> Incident management and helpdesk; Facility recovery; System recovery Application and database recovery; and Network recovery.
	9. Full Recovery?	<ul style="list-style-type: none"> IT Head monitors execution of DRP; IT Head to evaluate if the systems are fully recovered. <p>If 'Yes' :</p> <ul style="list-style-type: none"> IT Head to declare that the systems are fully recovered. <p>If 'No' :</p> <ul style="list-style-type: none"> DRP Technical Team continues with the execution DRP until systems are fully recovered.
Normal Operations "Peace Time"	10. Resume as Normal	<ul style="list-style-type: none"> DRP Technical Team to inform users that systems are operating as normal.

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4. RECOVERY OBJECTIVES FOR MTD IT SYSTEMS

4.1 Recovery Time Objective(s) for HQ Systems

IT Systems	Mission Critical Activities	RTO	RPO
Internet & Email	<ul style="list-style-type: none"> Business Communication 	2 days	2 Days
Orisoft (HR & Payroll System)	<ul style="list-style-type: none"> Payroll Processing. HRM Administration. 	5 days	7 days
SAGE ERP (Finance System)	<ul style="list-style-type: none"> Monthly Accounting Quarterly reporting to regulatory bodies for e.g. Bursa Malaysia. 	7 days	24 hours
IFCA CONTRACT PLUS	Procurement Department <ul style="list-style-type: none"> Generate Purchase Orders (Procurement Process) Business Analysis & Price Analysis Management Reporting. 	7 days	24 hours
	Finance Department <ul style="list-style-type: none"> Monthly & Quarterly Accounting Cash Flow Management Costing & Budgeting. 	7 days	24 hours
	Fixed Assets Department <ul style="list-style-type: none"> Accountability of Assets Assets Monitoring. 	7 days	24 hours
IFCA.Net (Property Plus)	<ul style="list-style-type: none"> Property Sales Management Monitor Buyers, Collection & Billing 	3 days	24 hours
In-House Applications	HR Department <ul style="list-style-type: none"> E-leave System 	7 days	1 day
	Admin Department <ul style="list-style-type: none"> Vehicle Management Information System (VMIS) E-Admin (Fleet, SimCard, Maintenance/repair, Meeting Room) 	7 days	1 day
	IT Department <ul style="list-style-type: none"> IT Support Management System (ITSMS) 	7 days	1 day

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	<ul style="list-style-type: none"> • IT Assets System • E-Notification System (ENS) • IT Monitoring System • Phone/Extension Directory 		
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4.2 Recovery Time Objective(s) for Tolls Systems

A. Tolls – KL Karak Highway

IT Systems (Intellects & TRACS at KL Karak Highway)	Mission Critical Activities	RTO	RPO
Lane Computer System	Toll Collection: Toll Collection: 10% Failed Lanes	7 days	-
	Toll Collection: 30% Failed Lanes	3 days (at least 1 lane)	-
	Toll Collection: 50% Failed Lanes	3 days (at least 2 lanes)	-
Plaza Computer System	Reconciliation and comparison of collection from toll lanes	14 days	24 hours
HQ Computer System	Generate daily toll collection reports	14 days	24 hours
Service Provider Computer System	Reconciliation of electronic toll collection data	14 days	24 hours

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4. RECOVERY PROCEDURES FORM

Recovery Procedures for <IT System>

<Sub-Procedures for IT System>

Objective :

No.	Responsibility	Tasks	Resources / Liaise With	Done
1.				<input type="checkbox"/>
2.				<input type="checkbox"/>
3.				<input type="checkbox"/>
4.				<input type="checkbox"/>
5.				<input type="checkbox"/>

Verified by:

.....

Name :

Position :

Approved by:


.....

Name :

Position :




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5. Appendices

Name	Position	Company	Office Phone No.	Mobile Phone No.
Zahidi Ali	Senior Manager, Head of IT	MTD Group – IT Group	Ext. 1104	012-4668383
Sahrul Mohamed Saleh	Senior Manager, IT	MTD Group – IT Group	Ext. 1148	019-2415347
Adrizal Jaafar	Manager, IT	MTD Group – IT Group	Ext. 1221	019-3872774
Nafiza Mat Ariffin	Asst. IT Manager	MTD Group – IT Group	Ext. 1300	018-2161129
Tan Wee Mee	Asst. IT Manager	MTD Group – IT Group	Ext. 1118	019-2827728
Norbisarman	Asst. IT Manager	MTD Group – IT Group	Ext. 2512	012-9173900
Suriyani Sabtu	Asst. IT Manager	MTD Group – IT Group	Ext. 1400	012-3455309
Dahlia Deris	Snr. Executive, IT	MTD Group – IT Group	Ext. 2511	012-3613363
Mohd Salleh Mustafa	Snr. Executive, IT	MTD Group – IT Group	Ext. 1378	016-3042575
Nur Zamnah	Snr. Executive, IT	MTD Group – IT Group	Ext. 2336	019-3136449
Mah Horng Liang	Snr. Executive, IT	MTD Group – IT Group	Ext. 2513	017-8873372
Mohd Fuad Yahya	Snr. Executive, IT	MTD Group – IT Group	Ext. 2512	019-2583242
Mohd Amir Aizat Ismail	Account Manager	Mesiniaga	603-56287712	019-6966636
David Chan	General Manager	IGS	603- 56312385	012-2737488
Angeline	Sales Specialist	GS Premium	603-21446133	012-3610193

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Yu Ki Wong	Client Manager	IFCA	03- 78053238	
Tan Poh Kien	Client Manager	IFCA	03- 78053238	
Tay Hong Meng	Project Manager	KDS	03- 80758819	
Albert	Project Manager	Peri Tech		016- 3399389
Azhan	Account Manager	Telekom		013-3402371
Chiu Ing	Sales Manager	Mitcom		016-2038860