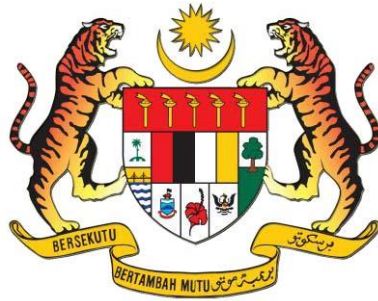




KERAJAAN MALAYSIA

***Master Service Agreement* Di antara
Kerajaan Malaysia Dengan Kumpulan Ikram Sdn
Bhd Berkaitan Perkhidmatan Kejuruteraan
Forensik (Cerun & Struktur Berkaitan Cerun)**

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KAEDAH PEROLEHAN KERAJAAN

PK 2.2 Master Service Agreement Kerajaan Malaysia Dengan Kumpulan Ikram Sdn Bhd Berkaitan Perkhidmatan Kejuruteraan Forensik (Cerun & Struktur berkaitan cerun)

1. Sumber Pembiayaan

- 1.1. Semua Kementerian, Jabatan, Institut, Suruhanjaya, Kerajaan Negeri, Pihak Berkuasa Tempatan dan Badan Berkanun (Agensi) yang diberi peruntukan/pembiayaan Kerajaan Persekutuan sama ada melalui geran atau pinjaman dan sama ada pembiayaan sepenuhnya atau sebahagian daripada kos projek/perbelanjaan, tidak kira Agensi mana yang melaksanakan projek atau melakukan perbelanjaan, adalah tertakluk kepada pemakaian pekeling ini.

2. Maklumat Syarikat Yang Dilantik dan Skop Perkhidmatan

- 2.1. Kumpulan Ikram Sdn. Bhd. (KISB) telah dilantik oleh Kerajaan dan diberi *Right of First Refusal* (ROFR) untuk melaksanakan **skop perkhidmatan kejuruteraan forensik (cerun & struktur berkaitan cerun) termasuk penyeliaan tapak bagi projek fizikal yang melibatkan:**
 - 2.1.1. **Cerun**
mana-mana permukaan tanah yang melebihi kecuraman lima belas (15) darjah dan purata ketinggian melebihi tiga (3) meter yang diukur daripada aras kaki cerun (*toe level*).
 - 2.1.2. **Struktur berkaitan cerun (*slope associated structures*)**
mana-mana struktur yang terdapat pada cerun yang berfungsi sebagai penstabil cerun seperti *soil nail*, dinding penahan (*retaining wall*), soil anchor dan sebagainya.
 - 2.1.3. **Struktur berdekatan yang terlibat (*slopes affected structures*)**
mana-mana struktur yang terkesan disebabkan kegagalan cerun. Contohnya ialah pagar perimeter di atas cerun, bangunan di lereng bukit, tangki simpanan air, utiliti bawah tanah, sistem perparitan dan lain-lain lagi.
 - 2.1.4. **Perkhidmatan lain-lain termasuk ujian di lapangan dan makmal yang diperlukan bagi perkhidmatan kejuruteraan forensik (cerun & struktur berkaitan cerun).**

- 2.2. Perkhidmatan kejuruteraan forensik (cerun & struktur berkaitan cerun) oleh KISB seperti di **perenggan 2.1** di atas adalah **meliputi semua kegagalan cerun di seluruh Malaysia kecuali:**
- 2.2.1. Semua jalan Persekutuan di Malaysia;
 - 2.2.2. Semua kontrak Kerajaan yang mempunyai skop perkhidmatan kejuruteraan forensik yang sedang berkuat kuasa ketika pekeliling ini dikeluarkan sehingga kontrak tersebut tamat. Setelah kontrak berkenaan tamat, Agensi adalah tertakluk kepada pemakaian pekeliling ini;
 - 2.2.3. Semua jalan bertol di bawah perjanjian konsesi penswastan; dan
 - 2.2.4. Projek-projek pembangunan baharu yang masih dalam peringkat pembinaan yang belum diserahkan kepada Agensi.
- 2.3. **Kerja fizikal untuk sebarang projek berkaitan cerun adalah di luar skop KISB dan perolehan tersebut hendaklah dilaksanakan oleh Agensi mengikut tatacara perolehan semasa yang sedang berkuat kuasa.**
- 2.4. Maklumat KISB adalah seperti berikut :
- 2.4.1. KISB adalah berdaftar dengan Suruhanjaya Syarikat Malaysia (SSM) dengan nombor pendaftaran adalah 360785-A;
 - 2.4.2. KISB adalah berdaftar dengan Kementerian Kewangan (MOF) dengan nombor pendaftaran adalah 357-02179864;
 - 2.4.3. KISB mempunyai ibu pejabat di alamat di Unipark Suria, Jalan Ikram-Uniten, 43000 Kajang, Selangor Darul Ehsan;
 - 2.4.4. KISB mempunyai lapan (8) buah cawangan iaitu di Alor Setar, Perai, Ipoh, Skudai, Kota Bharu, Kuala Terengganu, Kota Kinabalu dan Kuching;
 - 2.4.5. Nombor akaun rasmi KISB untuk tujuan pembayaran adalah 2-12022-4000505-0 (RHB Bank Cawangan Kajang); dan
 - 2.4.6. Nombor pendaftaran cukai *Goods & Services Tax* (GST) KISB dengan Jabatan Kastam Diraja Malaysia adalah 001198071808 yang mana telah berkuat kuasa pada 1 April 2015.
 - 2.4.7. Ikram Premier Consulting Sdn. Bhd. (IPCSB) yang merupakan anak syarikat kepada KISB adalah dilantik untuk menjalankan perkhidmatan perundingan.

3. Tempoh Kuat Kuasa *Master Service Agreement*

- 3.1. Tempoh kuat kuasa kontrak ini adalah selama tiga (3) tahun mulai 1 Januari 2016 sehingga 31 Disember 2018 dengan opsyen lanjutan selama dua (2) tahun tertakluk kepada prestasi baik.

4. Kebenaran Akses ke Tapak Oleh Agensi

- 4.1. Agensi hendaklah memberikan kerjasama sebaik mungkin kepada KISB terutamanya dalam memberi kebenaran memasuki tapak (termasuk kawasan larangan tertakluk mematuhi prosedur keselamatan yang ditetapkan) bagi memastikan pelaksanaan perkhidmatan dapat berjalan dengan lancar dan teratur.

5. Kadar Bayaran Bagi Perkhidmatan KISB

- 5.1. Agensi hendaklah memastikan bahawa sebarang pembayaran ke atas tuntutan KISB bagi perkhidmatan yang telah selesai disempurnakan adalah berdasarkan kadar-kadar yang ditetapkan di bawah *Master Service Agreement* seperti berikut:
- 5.1.1. **Skala Yuran Piawai** : *Board of Engineers Malaysia (BEM) Scale of Fees (Revised 1998) {PU (B) 548}* seperti di [Lampiran A](#);
- 5.1.2. **Input Masa dan Imbuhan Balik** : Bab 5 dalam Manual Perolehan Perkhidmatan Perunding Edisi 2011 (Pindaan Kedua) seperti di [Lampiran B](#); dan
- 5.1.3. **Jadual Kadar Harga** seperti di [Lampiran C](#).
- 5.2. Sekiranya kadar bagi sesuatu item baharu yang terlibat dengan pelaksanaan perkhidmatan kejuruteraan forensik (cerun & struktur berkaitan cerun) tidak dinyatakan dalam [Lampiran A](#), [Lampiran B](#) dan [Lampiran C](#), kadar bagi item tersebut hendaklah dirundingkan oleh Agensi dan KISB ke paras yang terendah dan munasabah dalam tempoh tujuh (7) hari daripada tarikh Surat Pelawaan.
- 5.3. Rundingan harga bagi item baharu yang terlibat hendaklah dibuat melalui satu jawatankuasa yang dilantik oleh Ketua Jabatan atau pegawai yang diturunkan kuasa di mana korum jawatankuasa hendaklah sekurang-kurangnya tiga (3) orang pegawai yang kompeten (termasuk pengerusi) di mana salah seorang ahli adalah daripada kumpulan Pengurusan & Profesional (P&P) dalam skim 'J'. Hasil rundingan harga tersebut hendaklah diminitkan dan dimuktamadkan oleh Lembaga Perolehan 'A' (LP'A') KKR.

- 5.4. Urusetia LP'A' KKR adalah bertanggungjawab melaksanakan *due diligence* bagi memastikan kadar harga bagi item baharu yang terlibat adalah tidak bertindih atau bercanggah dengan mana-mana kadar bagi item yang telah diluluskan sebelum ini oleh LP'A' KKR.
- 5.5. Sebarang kelulusan yang telah diberikan oleh LP'A' KKR bagi mana-mana item baharu hendaklah dengan segera dilampirkan dalam *Master Service Agreement* melalui *supplementary agreement* dan dimaklumkan kepada Kementerian Kewangan (MOF) untuk tujuan pengemaskinian ke atas Jadual Kadar Harga di **Lampiran C** untuk dikuatkuasakan kepada Agensi.

6. Surat Pelawaan

- 6.1. Agensi hendaklah memastikan Surat Pelawaan seperti di **Lampiran D** hendaklah dikeluarkan terlebih dahulu bagi mendapatkan perkhidmatan kejuruteraan forensik (cerun & struktur berkaitan cerun) dan penyeliaan tapak daripada pihak KISB. Sekiranya dalam tempoh empat belas (14) hari tiada maklum balas daripada KISB diperolehi, Surat Pelawaan tersebut adalah dengan sendirinya terbatal dan Agensi boleh menawarkan perkhidmatan yang sama kepada syarikat lain berdasarkan tatacara perolehan Kerajaan yang sedang berkuat kuasa.

7. Inden Kerja bagi pelaksanaan perkhidmatan kejuruteraan forensik (cerun & struktur berkaitan cerun)

- 7.1. Inden Kerja seperti di **Lampiran E** adalah merupakan dokumen rasmi untuk KISB memulakan perkhidmatan dan mengikat kedua-dua pihak. Sehubungan itu, Agensi hendaklah memastikan Inden Kerja ini adalah ditandatangani oleh pegawai Kerajaan yang telah diberi penurunan kuasa selaras dengan Akta Kontrak Kerajaan 1949 atau Akta Tubuh masing-masing.

8. Pelantikan Pengarah Projek dan Wakil Pengarah Projek bagi Pihak Agensi untuk Mengeluarkan Arahan atau Mengawal selia Perkhidmatan KISB

- 8.1. Ketua Setiausaha Kementerian atau Ketua Pengarah Jabatan hendaklah melantik seorang Pengarah Projek dan Wakil Pengarah Projek daripada kalangan kumpulan pengurusan dan profesional. Wakil Pengarah Projek hendaklah terdiri daripada kalangan pegawai berkeelayakan teknikal. Pengarah Projek dan Wakil Pengarah Projek yang dilantik adalah bertanggungjawab bagi pihak Agensi untuk melaksanakan obligasi Kerajaan termasuk mengeluarkan arahan dan mengawal selia perkhidmatan kejuruteraan forensik (cerun dan struktur berkaitan cerun) yang dilaksanakan oleh KISB.

- 8.2. Sebarang arahan yang dikeluarkan oleh Wakil Pengarah Projek sama ada secara lisan atau bertulis hendaklah mendapatkan persetujuan daripada Pengarah Projek terlebih dahulu. Sekiranya arahan/persetujuan telah dikeluarkan secara lisan, arahan/persetujuan tersebut hendaklah disusuli secara bertulis dalam tempoh tujuh (7) hari.

9. Tanggungjawab Pengarah Projek dan Wakil Pengarah Projek

- 9.1. Pengarah Projek dan Wakil Pengarah Projek adalah diberi kuasa untuk mengeluarkan arahan dan mengawal selia perkhidmatan KISB bagi memastikan Inden Kerja yang telah ditandatangani dapat dilaksanakan dengan teratur. Walau bagaimanapun, Wakil Pengarah Projek hendaklah mendapatkan persetujuan awal daripada Pengarah Projek sebelum arahan dikeluarkan.

10. Arahan yang dikeluarkan oleh Pengarah Projek atau Wakil Pengarah Projek

- 10.1. Semua arahan yang dikeluarkan oleh Pengarah Projek atau Wakil Pengarah Projek kepada KISB secara lisan hendaklah dengan segera disusuli secara bertulis tidak melebihi tujuh (7) hari dan direkodkan.
- 10.2. Semua arahan yang dikeluarkan oleh Pengarah Projek atau Wakil Pengarah Projek kepada KISB dalam mesyuarat hendaklah dengan segera diminitkan dan minit mesyuarat hendaklah disahkan oleh pengerusi mesyuarat dan wakil KISB yang hadir dalam tempoh tidak melebihi tujuh (7) hari serta direkodkan.

11. Penyerahan sepenuh atau sebahagian skop perkhidmatan oleh KISB kepada pihak ketiga (*subcontracting*)

- 11.1. ***Subcontracting* oleh KISB adalah tidak dibenarkan.** Agensi hendaklah melaporkan kepada JKR dan MOF sekiranya didapati berlaku sebarang *subcontracting* oleh KISB.
- 11.2. Walau bagaimanapun, KISB adalah dibenarkan untuk melantik kakitangan sementara bagi mengatasi kekangan kepakaran atau kekangan kakitangan untuk memastikan pelaksanaan perkhidmatan/projek tidak terganggu dan dapat berjalan dengan lancar. Namun demikian, sebarang kecuaiian atau kegagalan dalam melaksanakan perkhidmatan oleh mana-mana kakitangan tetap atau kakitangan sementara KISB adalah sepenuhnya di bawah tanggungjawab KISB.

12. Pentadbir MSA

- 12.1. KKR telah dilantik oleh Kerajaan selaku pentadbir *Master Service Agreement* di mana salah satu tanggungjawabnya adalah untuk menjalankan siasatan

pada bila-bila masa ke atas perkhidmatan yang dilaksanakan oleh KISB. Sehubungan itu, Bon Pelaksanaan (BP) dan *Professional Indemnity Insurance* (PII) bagi *Master Service Agreement* ini telah diletakkan di bawah pegangan KKR. KKR berhak memotong sebahagian/sepenuhnya amaun BP atau/dan PII tersebut sekiranya didapati melalui aduan Agensi, KISB gagal mematuhi, memenuhi dan melaksanakan obligasi yang telah ditetapkan dalam Inden Kerja.

- 12.2. Sebarang tuntutan ke atas BP atau/dan PII oleh Agensi akibat daripada kegagalan KISB melaksanakan obligasi yang ditetapkan dalam Inden Kerja, tuntutan tersebut hendaklah dibuat melalui permohonan rasmi kepada KKR untuk pertimbangan.

13. Proses pelaksanaan perkhidmatan kejuruteraan forensik (cerun & struktur berkaitan cerun) oleh KISB

- 13.1. Agensi hendaklah memastikan tatacara pelaksanaan perkhidmatan kejuruteraan forensik (cerun & struktur berkaitan cerun) KISB adalah mematuhi carta alir seperti di **Lampiran F**. Penjelasan ke atas carta alir tersebut adalah seperti di **Jadual 1** berikut:

Jadual 1

Perkara	Mengkaji Kestabilan Cerun	Kegagalan Cerun (Kecemasan)
Peringkat 1 : Surat Pelawaan oleh Agensi	<u>Surat Pelawaan</u> - Agensi hendaklah mengeluarkan Surat Pelawaan kepada KISB untuk mengenal pasti cerun yang dijangkakan akan gagal dengan melihat tanda-tanda awal kegagalan cerun seperti keretakan di cerun, keretakan di bangunan dan struktur berkaitan cerun, kehilangan air paip, paip bocor, kehilangan air dalam parit yang berpunca daripada pergerakan tanah.	<u>Inden Kerja</u> - Sekiranya Agensi mengenal pasti terdapatnya sebarang kegagalan cerun yang mengancam nyawa dan harta benda awam, Agensi hendaklah memaklumkan situasi tersebut dengan segera kepada KISB untuk membuat tinjauan tapak. Sekiranya arahan telah dikeluarkan secara lisan terlebih dahulu, arahan tersebut hendaklah disusuli dengan Inden Kerja dalam tempoh tujuh (7) hari.
Peringkat 2 : Tindakan oleh KISB	<u>Tinjauan Tapak</u> - KISB akan menjalankan <i>desk study</i> bagi mendapatkan data ukur, maklumat projek dan maklumat-maklumat lain yang berkaitan dan seterusnya membuat lawatan tapak. <u>Laporan Awal</u> - KISB akan menyediakan perkara-perkara berikut dalam tempoh empat belas (14) hari daripada Surat Pelawaan untuk semakan dan pertimbangan Agensi : - o Laporan Awal yang mengandungi	<u>Tinjauan Tapak</u> - KISB akan dengan segera menggerakkan kumpulan tindakan ke tapak untuk menentukan keselamatan dan kestabilan struktur yang dilaporkan oleh Agensi. - Masa tindakan (<i>response time</i>) oleh KISB untuk ke tapak adalah seperti berikut: - o Jarak tapak dari ibu pejabat/cawangan IKRAM berhampiran sehingga 50 km ▪ masa tindakan hendaklah dalam

Perkara	Mengkaji Kestabilan Cerun	Kegagalan Cerun (Kecemasan)
	rekod-rekod terdahulu seperti rekod geoteknikal, penyiasatan tapak, pemantauan instrumentasi, pelan tapak, reka bentuk cerun, dan lain-lain maklumat yang berkaitan; dan ○ Cadangan Teknikal dan Kewangan (CTK) yang turut mengandungi Jadual Pelaksanaan Kerja.	tempoh 3 jam dari arahan yang dikeluarkan oleh Pengarah Projek/ Wakil Pengarah Projek. ○ dari ibu pejabat/cawangan IKRAM berhampiran melebihi 50 km ▪ masa tindakan hendaklah dalam tempoh 24 jam (kecuali bagi kawasan terpencil adalah dalam tempoh 48 jam) dari arahan yang dikeluarkan oleh Pengarah Projek/ Wakil Pengarah Projek. Laporan Awal - KISB akan menyediakan perkara-perkara berikut: ○ Laporan Awal dalam tempoh tiga (3) jam selepas tiba di kawasan yang terjejas dengan menyediakan nota ringkas merangkumi: ▪ Lokasi dan masa kejadian; ▪ Punca-punca kejadian; ▪ Langkah-langkah yang telah diambil demi keselamatan orang awam; ▪ Peringatan kepada orang ramai mengenai keselamatan; dan ▪ Gambar-gambar awal. ○ CTK yang turut mengandungi Jadual Pelaksanaan Kerja.
Peringkat 3 : Keputusan Agensi	- Sekiranya Agensi bersetuju ke atas CTK yang dikemukakan oleh KISB, arahan memulakan perkhidmatan hendaklah dikeluarkan melalui Inden Kerja.	- Agensi membuat penilaian ke atas CTK dan mengarahkan KISB untuk memulakan perkhidmatan kejuruteraan forensik.
Peringkat 4 : Penyiasatan Forensik Tapak	- KISB akan melaksanakan perkara berikut: ○ penilaian ke atas struktur cerun yang gagal; ○ penyiasatan ke atas permukaan tanah; ○ penyiasatan di dalam tanah; ○ pemasangan instrumen-instrumen yang diperlukan bagi tujuan pemantauan cerun yang telah runtuh untuk mengenal pasti keadaan pergerakan cerun sama ada masih aktif atau sebaliknya; dan ○ melaksanakan ujian makmal ke atas sampel-sampel yang diperolehi daripada tapak.	
Peringkat 5 : Analisa Data dan Reka Bentuk oleh KISB	- KISB akan menganalisa data yang dikumpulkan untuk mencadangkan sekurang-kurangnya tiga (3) pilihan konsep reka bentuk berserta anggaran kos.	
Peringkat 6 : Pemilihan Reka Bentuk oleh Agensi	- Pengarah Projek bertanggungjawab membuat pilihan daripada 3 konsep reka bentuk yang dikemukakan.	

Perkara	Mengkaji Kestabilan Cerun	Kegagalan Cerun (Kecemasan)
Peringkat 7 : Penyediaan Reka Bentuk Terperinci & Dokumen Tender Kerja	- Setelah pemilihan konsep reka bentuk dibuat oleh Pengarah Projek, KISB akan melaksanakan kerja-kerja reka bentuk terperinci dan penyediaan Dokumen Meja Tender (TTD). TTD tersebut hendaklah dinyatakan dengan jelas keperluan pengemukaan sijil waranti bagi bahan-bahan pembinaan yang dibekalkan oleh kontraktor.	
Peringkat 8 : Laporan akhir dan tuntutan akhir	- Agensi hendaklah memastikan perenggan 24 adalah dipatuhi sebelum pembayaran tuntutan akhir KISB dibuat.	
Peringkat 9 : Peringkat Pemantauan oleh KISB	- Sekiranya kerja-kerja pembinaan diluluskan oleh Kerajaan dalam tempoh MSA berkuat kuasa, Agensi hendaklah mengeluarkan Inden Kerja kepada KISB. - Sebarang pembayaran ke atas tuntutan KISB bagi penyeliaan tapak yang dibuat hendaklah mematuhi perenggan 24 .	

13.2. Terma rujukan terperinci bagi pelaksanaan perkhidmatan kejuruteraan forensik (cerun & struktur berkaitan cerun) oleh KISB adalah seperti di **Lampiran G**.

14. Perkhidmatan reka bentuk

- 14.1. Agensi hendaklah melalui KISB memastikan IPCSB memberi jaminan bahawa reka bentuk yang disediakan adalah bersesuaian, berfungsi, selamat digunakan, mematuhi piawaian dan spesifikasi perkhidmatan yang ditetapkan serta mematuhi peraturan dan undang-undang yang berkaitan.
- 14.2. Agensi hendaklah melalui KISB memastikan semua reka bentuk, pengiraan, lukisan dan dokumen yang berkaitan adalah disahkan dan ditandatangani oleh pemilik/lembaga pengarah IPCSB yang berdaftar dengan Lembaga Jurutera Malaysia sebagai Jurutera Bertauliah.
- 14.3. Agensi hendaklah memastikan IPCSB tidak dibenarkan tanpa sebarang kelulusan awal oleh Agensi, membuat sebarang perubahan ke atas reka bentuk yang telah dipersetujui atau mengeluarkan arahan perubahan kerja yang boleh mengakibatkan pertambahan kos projek, kecuali arahan perubahan kerja tersebut adalah disebabkan oleh kecemasan dan sebarang kelewatan dalam melaksanakan perubahan kerja akibat kecemasan tersebut, akan mengakibatkan tuntutan ke atas Kerajaan atau membahayakan nyawa dan harta benda. Kelulusan arahan perubahan kerja yang dilaksanakan disebabkan kecemasan tersebut hendaklah diperolehi daripada Pengarah Projek secara bertulis dalam tempoh tujuh (7) hari daripada tarikh arahan dikeluarkan.

- 14.4. Sekiranya terdapat sebarang kecacatan/kerosakan ke atas kerja-kerja pembinaan yang memerlukan perubahan kerja disebabkan oleh kekurangan/kesilapan reka bentuk, Agensi hendaklah mengeluarkan notis pembaikan kecacatan/kerosakan tersebut dalam tempoh yang ditetapkan dan sebarang kos yang terlibat adalah ditanggung sendiri oleh KISB.
- 14.5. Sekiranya kerja pembaikan tersebut tidak dilaksanakan dan seterusnya telah mengakibatkan kerugian/kerosakan kepada Kerajaan, Agensi berhak membuat tuntutan kos yang terlibat daripada KISB.
- 14.6. Sekiranya kerja-kerja pembaikan tersebut telah diambil alih oleh Kerajaan, sebarang kos yang terlibat bagi membiayai pembaikan tersebut hendaklah dibuat penolakan daripada baki bayaran kemajuan perkhidmatan KISB. Jika penolakan tersebut tidak dapat dilaksanakan disebabkan baki bayaran tidak mencukupi, tuntutan seterusnya hendaklah diperolehi daripada PII melalui permohonan rasmi kepada KKR sekiranya melibatkan kecuai/kesilapan reka bentuk atau daripada BP sekiranya melibatkan selain daripada kecuai/kesilapan reka bentuk.

15. Pertukaran atau Penggantian Kakitangan KISB

- 15.1. Agensi hendaklah memastikan sebarang pertukaran/penggantian ke atas kakitangan KISB yang terlibat di dalam pelaksanaan perkhidmatan kejuruteraan forensik hendaklah mendapat kelulusan daripada Pengarah Projek atau Wakil Pengarah Projek dalam tempoh tujuh (7) hari.

16. Laporan Penilaian Prestasi Perkhidmatan KISB oleh Agensi

- 16.1. Pengarah Projek atau Wakil Pengarah Projek adalah bertanggungjawab untuk membuat penilaian ke atas prestasi perkhidmatan KISB sebaik sahaja perkhidmatannya telah selesai disempurnakan melalui Borang Penilaian Prestasi Perkhidmatan Syarikat di **Lampiran H** dan dikemukakan kepada Cawangan Kejuruteraan Cerun (CKC), JKR untuk tujuan rekod.
- 16.2. Sekiranya berlaku sebarang kegagalan selepas projek siap yang melibatkan perkhidmatan KISB, Agensi hendaklah mengeluarkan Surat Tunjuk Sebab dengan segera kepada KISB untuk mengemukakan laporan punca kegagalan dan kaedah mengatasi kegagalan tersebut. Sekiranya kegagalan tersebut adalah berpunca daripada kelemahan/kecuai/kesilapan daripada KISB, Agensi hendaklah melaporkan perkara tersebut kepada MOF melalui Borang Aduan (Borang KKM-BA 2010) yang boleh diperolehi daripada **PK8** dan disalinkan kepada Lembaga Profesional untuk tindakan tatatertib.

17. Laporan, dokumen, maklumat dan rekod (*Deliverables*)

- 17.1. Agensi hendaklah memastikan semua *deliverables* yang terlibat bagi sesuatu perkhidmatan yang dilaksanakan hendaklah sentiasa dikemas kini dan diserahkan oleh KISB kepada Agensi pada bila-bila masa ia diperlukan. Kerajaan berhak membuat semakan dan salinan ke atas rekod-rekod maklumat yang berkaitan dari masa ke semasa untuk tujuan auditan ke atas prestasi perkhidmatan KISB.

18. Penyeliaan tapak

- 18.1. Agensi hendaklah memastikan KISB bertanggungjawab untuk menyelia pelaksanaan kerja-kerja bagi projek pembangunan fizikal yang melibatkan pembinaan/pembaikan cerun. Sehubungan itu, sebarang urusan yang berkaitan hendaklah dibuat melalui Pegawai Penguasa (*Superintending Officer – SO*) atau Wakil SO bagi kontrak kerja tersebut.

19. Menahan Daripada Membuat Bayaran Kepada KISB

- 19.1. Agensi berhak menahan daripada membuat bayaran kepada KISB sekiranya perkhidmatan yang diberikan adalah didapati tidak sempurna sepertimana ditetapkan dalam Inden Kerja. Namun demikian, KISB adalah dibenarkan untuk membuat rayuan dalam tempoh empat belas (14) hari dengan disertakan dokumen sokongan sebagai bukti.

20. Ganti Rugi Tertentu Dan Ditetapkan (*Liquidated and Ascertained Damages - LAD*)

- 20.1. Sekiranya KISB gagal melaksanakan perkhidmatan yang diarahkan mengikut tempoh yang ditetapkan, Agensi hendaklah mengenakan LAD di mana kelewatan adalah dikira bermula dari tarikh akhir perkhidmatan perlu diselesaikan sehingga tarikh perkhidmatan sebenar siap dilaksanakan oleh KISB. Agensi hendaklah memastikan kelewatan/ kegagalan tersebut adalah bukan disebabkan oleh kelewatan di pihak Agensi atau *force majeure*.
- 20.2. LAD yang dikenakan tersebut hendaklah dikira secara harian bagi sekurang-kurangnya **tiga (3) peringkat yang melibatkan *initial report/preliminary report, tender documentation* dan *final report*** :

20.2.1. Kadar LAD sehari

$$\frac{\text{Base Rate} \times \text{Anggaran kos perkhidmatan di Inden Kerja}}{365}$$

(tertakluk kadar minimum sehari adalah RM100)

20.2.2. Kadar *Base Rate* yang digunakan

- (a) *Base Rate* yang digunakan adalah berdasarkan tarikh tandatangan di Bahagian A dalam Inden Kerja.

21. Lanjutan masa perkhidmatan

- 21.1. Agensi adalah dibenarkan untuk memberi pertimbangan terhadap lanjutan masa perkhidmatan sekiranya dipohon oleh KISB tertakluk kelewatan tersebut adalah tidak berpunca daripada pihak KISB. Walau bagaimanapun, jika Agensi bersetuju meluluskan lanjutan masa tersebut, KISB tidak berhak menuntut sebarang kerugian dan perbelanjaan (*loss & expense*) yang terlibat.

22. Penangguhan dan penyambungan semula perkhidmatan (*suspension and resumption of services*)

- 22.1. Sekiranya terdapat keperluan untuk menangguh sepenuhnya atau sebahagian skop perkhidmatan, Pengarah Projek atau Wakil Pengarah Projek hendaklah dengan segera memaklumkan perkara tersebut kepada KISB secara bertulis.
- 22.2. Sekiranya arahan penangguhan yang dikeluarkan adalah melibatkan sebahagian skop perkhidmatan sahaja, Agensi hendaklah memastikan KISB meneruskan obligasinya ke atas skop perkhidmatan lain yang tidak terlibat dengan arahan penangguhan tersebut.
- 22.3. Sekiranya arahan penangguhan berlanjutan melebihi 12 bulan, Agensi dan KISB boleh menamatkan Inden Kerja tersebut secara bersama dan bayaran hendaklah dibuat setakat mana perkhidmatan telah selesai disempurnakan.
- 22.4. Sekiranya arahan penyambungan semula dikeluarkan, Agensi hendaklah memastikan sebarang kos yang terlibat berkaitan *abortive work* yang perlu dibuat semula adalah ditanggung sepenuhnya oleh KISB.

23. Penamatan perkhidmatan KISB

- 23.1. Agensi berhak menamatkan Inden Kerja sekiranya KISB gagal mengambil tindakan remedi ke atas kemungkiran selepas tempoh empat belas (14) hari notis dikeluarkan oleh Agensi. Penamatan Inden Kerja tersebut hanya boleh dibuat sekiranya KISB tanpa justifikasi munasabah melaksanakan perkara-perkara berikut:
- 23.1.1. Menangguhkan pelaksanaan perkhidmatan dan gagal meneruskan kerja dengan tekun sebagaimana obligasi dalam Inden Kerja;

- 23.1.2. Gagal melaksanakan semua/ sebahagian perkhidmatan atau secara berterusan mengabaikan obligasi dalam Inden Kerja;
 - 23.1.3. Mungkir dalam melaksanakan tanggungjawab sebagaimana dinyatakan di pekeling; atau
 - 23.1.4. Tidak mematuhi sebahagian/semua obligasi yang ditetapkan dalam Inden Kerja.
- 23.2. Agensi hendaklah memastikan penamatan Inden Kerja tersebut hendaklah dilaporkan dengan segera kepada CKC, JKR. KISB tidak berhak menuntut sebarang kerugian termasuk kerugian ke atas kehilangan keuntungan, kerosakan, atau sebarang tuntutan lain selepas penamatan Inden Kerja tersebut.

24. Invois dan Terma Bayaran

- 24.1. Agensi hendaklah memastikan semua perkhidmatan yang telah sempurna diselesaikan oleh KISB hendaklah dibayar dalam tempoh tiga puluh (30) hari daripada tarikh invois bercukai (*tax invoice*) berserta dokumen sokongan berkaitan yang diterima oleh Agensi dan dibuat berdasarkan ketetapan berikut:
- 24.1.1. Mengikut kemajuan perkhidmatan yang telah disiapkan sehingga maksimum 95% termasuk laporan akhir yang telah disahkan oleh Pengarah Projek atau Wakil Pengarah Projek; dan
 - 24.1.2. Baki bayaran sebanyak 5% pula hanya boleh dilepaskan setelah semua dokumen berkaitan telah dilengkapkan dan diserahkan oleh KISB kepada JKR termasuk Borang Penilaian Prestasi Perkhidmatan Syarikat yang telah dinilai seperti di [Lampiran H](#). Bukti penyerahan dokumen kepada JKR hendaklah dilampirkan bersekali dengan tuntutan baki bayaran ini oleh KISB kepada Agensi.
- 24.2. Agensi hendaklah memastikan jumlah anggaran kos perkhidmatan yang dinyatakan di Bahagian A dalam Inden Kerja adalah tidak termasuk kenaan cukai barangan & perkhidmatan (*Goods & Services Tax - GST*). Walau bagaimanapun, GST hendaklah dikenakan bagi jumlah sebenar perkhidmatan yang dituntut oleh KISB seperti dinyatakan di Bahagian D dalam Borang Arahan Kerja.

25. Pertikaian di antara Kerajaan dengan KISB

- 25.1. Sebarang pertikaian di antara KISB dengan Pengarah Projek atau Wakil Pengarah Projek hendaklah cuba diselesaikan sebaik mungkin oleh kedua-

dua pihak. Sekiranya persetujuan tidak dapat dicapai oleh kedua-dua pihak dalam tempoh tujuh (7) hari, pertikaian tersebut hendaklah seterusnya dirujuk kepada CKC, JKR.

- 25.2. Sekiranya tiada keputusan diperolehi daripada CKC, JKR dalam tempoh tujuh (7) hari atau keputusan yang dibuat tidak dipersetujui oleh KISB, pertikaian seterusnya hendaklah dirujuk kepada *Contract Coordination Panel* (CCP) KKR.
- 25.3. Sekiranya tiada keputusan diperolehi daripada CCP KKR dalam tempoh empat belas (14) hari atau keputusan yang dibuat masih tidak dipersetujui oleh KISB, pertikaian tersebut hendaklah dirujuk kepada Timbangtara (*Arbitration*).

26. Perkhidmatan KISB setelah *Master Service Agreement* Tamat

- 26.1. Sekiranya tempoh perkhidmatan KISB yang ditetapkan dalam Inden Kerja telah melangkaui tarikh tamat *Master Service Agreement* ini, Agensi hendaklah meneruskan baki perkhidmatan KISB tersebut sehingga ianya selesai disempurnakan tertakluk kepada Inden Kerja telah dikeluarkan oleh Agensi sebelum tarikh tamat *Master Service Agreement*.

LAMPIRAN

**Board of Engineers Malaysia (BEM)
Scale of Fees
(Revised 1998) {PU (B) 548}**

P.U. (B) 548.**REGISTRATION OF ENGINEERS ACT 1967****NOTIFICATION OF SCALE OF FEES**

IN exercise of the powers conferred by paragraph 4(1)(d) of the Registration of Engineers Act 1967 [Act 138], the Board of Engineers, with the approval of the Minister, fixes the following scale of fees to be charged by registered Professional Engineers for professional advice or services rendered:

- (i) Subject to paragraph 2, every consulting engineer who is engaged by a client to perform any of the professional services described in Part A shall be paid in accordance with the scale of fees described in Part B in addition to the other payments described in Part C.
- (ii)
 - (1) Notwithstanding paragraph 1 and if the consulting engineer is being paid in accordance with sub-subparagraph 1(1)(a) of the scale of fees described in Part B, the scale of fees provided in Table A of sub- subparagraph 1(1)(e) of Part B shall not apply to buildings in housing development works.
 - (2) For housing development works, if the buildings are not more than four storeys high, the "Scale of Fees for Housing Development" published on 24th July 1997 under *Gazette* Notification No. P.U. (B) 288/1997 shall apply.
- (iii) In this Notification, unless the context otherwise requires -

"architect" means the architect appointed by the client to act as architect for the building works;

"builder's work drawings" means the drawings prepared by the contractor for approval by the consulting engineer which show details of work of a structural nature which is required to be carried out by a builder or other party to facilitate the execution of the engineering systems in the buildings;

"consulting engineer" means any Professional Engineer or body corporate, partnership or sole-proprietorship practising as consulting engineers engaged by the client to provide professional services;

"contractor" means any person, firm or company engaged under a contract with the client to perform any work or to supply goods in connection with the works or both, and includes a sub-contractor;

"cost of works" means the cost to the client of the works however incurred including-

- (a) any payment (before deduction of any amount of liquidated damages or penalties payable by the contractor to the client) made by the client to the contractor by way of bonus, incentive or ex-gratia payments or in settlement of claims;
- (b) a fair valuation of any labour, materials, manufactured goods, machinery or other facilities provided by the client, and of the full benefit accruing to the contractor from the use of any construction plant and equipment belonging to the client which the client has required the contractor to use in the execution of the works;
- (c) the market value, as if purchased new, of any second-hand materials, manufactured goods and machinery incorporated in the works;
- (d) the cost of geotechnical investigations; and
- (e) a fair proportion of the total cost to the client of any work executed in connection with the provision or diversion of public utilities systems which is carried out, other

than by the contractor, under arrangements made by the consulting engineer, assessed with reference to the cost incurred by the consulting engineer in making such arrangements,

but shall not include-

- (aa) the administration expenses incurred by the client;
- (bb) the costs incurred by the client under the agreement between the client and the consulting engineer for professional services for the works;
- (cc) the interest on capital during construction, and the cost of raising moneys for carrying out the construction of the works;
- (dd) the cost of land and wayleaves; and
- (ee) the price variation arising from the escalation of prices as may be provided in the works contract;

“engineering system” means all mechanical and electrical services, plant and equipment installed within a building lot, and comprises as may be required such items as are listed below:

- (a) the lighting, power and electrical distribution system;
- (b) the air-conditioning and mechanical ventilation system;
- (c) the fire-fighting and prevention system;
- (d) the stage lighting system and mechanism;
- (e) the hot and cold water system;
- (f) the steam generating system;
- (g) the gas distribution system;
- (h) the telephone distribution and intercommunication system;
- (i) the lightning protection system;
- (j) the electrical sub-station;
- (k) the public address system, personnel location and call system;
- (l) the radio and television system;
- (m) the security system;
- (n) the lift, hoist, dumbwaiter and escalator;
- (o) the standby generator;
- (p) the soil and waste water piping system;
- (q) the pumping installation within the building;
- (r) the integrated building management system;
- (s) the compressed air and vacuum system; and
- (t) the refrigeration and cooling water system;

“installation drawings” means the drawings, prepared by the contractor for approval by the consulting engineer, which show details of the contractor’s proposals for the execution of the engineering system;

“multiplier” means a factor derived from the elements covering -

- (a) the annual salary;
- (b) the fringe benefits including benefits from bonuses, the Employee’s Provident Fund, Social Security Organisation, staff savings fund, subscriptions to professional institutions, leave, medical aid and insurances, seminars, conferences and workshops;
- (c) the office administrative charges and expenses including rentals, telephone and telex, facsimile and postal charges, stationery, subscriptions to journals, promotion, training and scholarships, transport costs, legal and audit fees, bank charges and idle time; and
- (d) the profits;

and, in the case of site staff recruited especially for the project, the multiplier shall be derived from the elements covering the annual salary, gratuity, benefits from the Employee’s Provident Fund and Social Security Organisation, medical aid, insurance, overhead costs and profit only;

“project” means the project of which the works form a part;

“Memorandum of Agreement” means the Memorandum of Agreement entered into between the client and the consulting engineer in connection with the provision of professional services for the works;

“quantity surveyor” means the quantity surveyor appointed by the client to act as the quantity surveyor for the building works;

“record drawings” means drawings, prepared by the contractor for approval by the consulting engineer, which show clearly the general scheme and the details of the engineering system in the building as completed;

“salary cost” means the annual salary of a person employed by the consulting engineer divided by 1800 (this being deemed to be the average annual total of effective working hours of an employee) and multiplied by the number of working hours spent by the person in performing any of the services in respect of which payment is to be made to the consulting engineer upon the basis of salary cost; and for the purpose of this definition, the annual salary of a person for a period of less than a full year shall be calculated *pro rata* to the person’s salary for such lesser period;

“structural engineering works in buildings” means all works in structural reinforced concrete, prestressed concrete, steel, timber and other materials or a combination of any of these, which are designed to transmit the weight of, and the loads on, the building to the ground and includes the foundations and excavations connected with them;

“tender drawings” means the drawings prepared by the consulting engineer in sufficient detail to enable those persons tendering to interpret correctly the design of the works and to submit competitive tenders for the execution of the works;

“the works” means the works in connection with which the client has engaged the consulting engineer to perform professional services, and which may comprise -

- (a) Type A works, namely, civil and structural engineering works (other than structural engineering works in buildings), mechanical engineering works and electrical engineering works (other than the engineering systems in buildings);
- (b) Type B works, namely, structural engineering works in buildings of more than four storeys high; and/or
- (c) Type C works, namely, engineering systems in buildings of more than four storeys high.

PART A**PROFESSIONAL SERVICES****1. (1) Basic Professional Services (for civil and structural engineering works other than structural engineering works in buildings, mechanical engineering works and electrical engineering works other than the engineering systems in buildings)**

The professional services to be rendered by the consulting engineer in this paragraph comprise the provision of all technical advice and skills which are normally required for the works for which the consulting engineer has been engaged.

(a) Preliminary Stage

The professional services to be rendered by the consulting engineer in this paragraph comprise the provision of all technical advice and skills which are normally required for the works for which the consulting engineer has been engaged.

- (i) investigating data and information relevant to the works and considering any reports relating to the works;
- (ii) advising the client on making any further topographical survey of the proposed site of the works which may be necessary to supplement available topographical information;
- (iii) advising the client on the need to carry out any geotechnical investigation which may be necessary to supplement the available geotechnical information, arranging for the investigation, certifying the amount of any payments to be made by the client to the persons, firms or companies carrying out the investigation under the consulting engineer's direction, and advising the client on the results of the investigation;
- (iv) advising the client on the need for arrangements to be made, in accordance with subparagraph 2(1) of this Part, for the carrying out of special surveys, special investigations or model tests and advising the client of the results of any such surveys, investigations or tests carried out;
- (v) consulting any local or other approving authorities on matters of principle in connection with the works;
- (vi) consulting any architect appointed by the client in connection with the architectural treatment of the works; and
- (vii) preparing such reports and documents as are reasonably necessary to enable the client to consider the consulting engineer's proposals, including alternative proposals, for the construction of the works in the light of the investigations carried out by him at this stage, and to enable the client to apply for approval in principle from the appropriate authorities for the execution of the works in accordance with the proposals.

(b) Design Stage

The professional services to be provided by the consulting engineer at this stage comprise all or any of the following as may be necessary in a particular case:

- (i) preparing designs, including reinforced concrete and structural steel work designs, and tender drawings in connection with the works; and
- (ii) preparing such conditions of contract, specifications, schedules and bills of quantities as may be necessary to enable the client to obtain tenders or otherwise award a contract for carrying out the works.

(c) *Tender Stage*

The professional services to be provided by the consulting engineer at this stage comprise advising the client as to the suitability for carrying out the works of the persons, firms or companies tendering and as to the relative merits of the tenders, but excluding the relative merits of alternative tenders, prices and estimates received for carrying out the works.

(d) *Construction Stage*

The professional services to be provided by the consulting engineer at this stage comprise all or any of the following as may be necessary in a particular case:

- (i) advising on and preparing formal contract documents, including the letter of acceptance for carrying out the works or any part of them;
- (ii) inspecting and testing during manufacture and installation such electrical and mechanical materials, machinery and plant supplied for incorporation in the works as are necessary where the inspection and test are within the technical competence of the consulting engineer, and arranging and witnessing the acceptance test;
- (iii) advising the client on the need for a special inspection or test other than that referred to in sub-sub-paragraph 1(1)(d)(ii) of this Part;
- (iv) advising the client on the appointment of site staff in accordance with paragraph 3 of this Part;
- (v) preparing any further designs and drawings relating to the works;
- (vi) examining and approving the contractor's proposals and his working drawings relating to the works;
- (vii) making such visits to the site as the consulting engineer considers necessary to satisfy himself as to the performance of any site staff appointed pursuant to paragraph 3 of this Part and to satisfy himself that the works are executed generally according to contract or otherwise in accordance with good engineering practice;
- (viii) giving all necessary instructions relating to the works to the contractor;
- (ix) issuing all certificates as are required in the contract;
- (x) performing any duties which the consulting engineer may be required to carry out under any document which he has prepared for the execution of the works;
- (xi) delivering to the client on the completion of the works such records and manufacturer's manuals as are reasonably necessary to enable the client to operate and maintain the works; and

- (xii) deciding any dispute or difference arising between the client and the contractor in connection with the works and submitted to the consulting engineer for his decision, provided that this professional service shall not extend to advising the client following the taking of any step in or towards any arbitration or litigation in connection with the works.

1. (2) Basic Professional Services (for structural engineering works in buildings)

The professional services to be rendered by the consulting engineer in this paragraph comprise the provision of all technical advice and skills which are normally required for the works for which the consulting engineer has been engaged.

(a) Preliminary Stage

The professional services to be provided by the consulting engineer at this stage comprise all or any of the following as may be necessary in a particular case:

- (i) investigating data and information relevant to the works and considering any reports relating to the works;
- (ii) advising the client on making any further topographical survey of the proposed site of the works which may be necessary to supplement available topographical information;
- (iii) advising the client on the need to carry out any geotechnical investigation which may be necessary to supplement the available geotechnical information, arranging for the investigation, certifying the amount of any payments to be made by the client to the persons, firms or companies carrying out the investigation under the consulting engineer's direction, and advising the client on the results of such investigation;
- (iv) advising the client on the need for arrangements to be made, in accordance with subparagraph 2(2) of this Part, for the carrying out of special surveys, special investigations or model tests and advising the client of the results of any the surveys, investigations or tests carried out;
- (v) consulting any local or other approving authorities on matters of principle in connection with the works;
- (vi) consulting the architect appointed by the client in connection with the architectural treatment of the works;
- (vii) providing sufficient structural information to enable the architect to produce his sketch plans; and
- (viii) preparing such reports and documents as are reasonably necessary to enable the client to consider the consulting engineer's proposals, including alternative proposal, for the construction of the works in the light of the investigations carried out by him at this stage, and to enable the client to apply for approval in principle from the appropriate authorities for the execution of the works in accordance with the proposals.

(b) Design Stage

The professional services to be provided by the consulting engineer at this stage comprise all or any of the following as may be necessary in a particular case:

- (i) developing the design of the works in collaboration with the architect and others, preparing calculations, drawings and specifications for the works to enable a bill of quantities to be prepared by others, consulting any local or other approving authorities in connection with the design of the works, and preparing typical details and typical calculations; and
- (ii) preparing such calculations and details relating to the works as may be required for submission to any appropriate authority, preparing all other drawings in sufficient details to enable construction to be carried out, and advising on conditions of contract and specifications relevant to the works and on forms of tender and invitations to tender as they relate to the works.

(c) Tender Stage

The professional services to be provided by the consulting engineer at this stage comprise advising the client as to the suitability for carrying out the works of the persons, firms or companies tendering and as to the relative merits of tenders, but excluding relative merits of alternative tenders, prices and estimates received for carrying out the works.

(d) Construction Stage

The professional services to be provided by the consulting engineer at this stage comprise all or any of the following as may be necessary in a particular case:

- (i) advising on the preparation of formal contract documents relating to accepted tenders for the works;
- (ii) advising the client on the appointment of site staff in accordance with paragraph 3 of this Part;
- (iii) preparing any further designs, specifications and drawings to enable the contractor to carry out the works but shall not include the preparation of any shop details relating to the works or any part of them;
- (iv) examining and approving the contractor's proposals and working drawings relating to the works;
- (v) checking shop details for general dimensions and adequacy of members and connections;
- (vi) approving the contractor's testing procedures and inspecting the works on completion;
- (vii) advising the client or the architect as to the need to vary any part of the works;
- (viii) making such visits to site as the consulting engineer considers necessary to satisfy himself as to the performance of any site staff appointed pursuant to paragraph 3 of this Part and to satisfy himself that the works are executed generally according to contract or otherwise in accordance with good engineering practice;
- (ix) giving all necessary instructions relating to the works to the contractor;

- (x) advising on certificates of payment to the contractor;
- (xi) inspecting and testing during manufacture and installation such materials supplied for incorporation in the works as are necessary where the inspection and test are within the technical competence of the consulting engineer, and arranging and witnessing the acceptance tests;
- (xii) performing any duties which the consulting engineer may be required to carry out under any document which he has prepared for the execution of the works;
- (xiii) advising the client on the need for special inspection or test other than that referred to in sub-sub-subparagraph 1(2)(d)(xi) of this Part;
- (xiv) delivering to the client on completion of the works such records and manufacturer's manuals as are reasonably necessary to enable the client to operate and maintain the works; and
- (xv) deciding any dispute or difference arising between the client and the contractor in connection with the works and submitted to the consulting engineer for his decision, provided that this professional service shall not extend to advising the client following the taking of any step in or towards any arbitration or litigation in connection with the works.

1. (3) Basic Professional Services (for engineering systems in buildings)

The professional services to be rendered by the consulting engineer in this paragraph comprise the provision of all technical advice and skills which are normally required for the works for which the consulting engineer has been engaged.

(a) Preliminary Stage

The professional services to be provided by the consulting engineer at this stage comprise all or any of the following as may be necessary in a particular case:

- (i) consulting any local or other approving authorities on matters of principle in connection with the design of the works;
- (ii) providing sufficient preliminary information and approximate estimates (based on unit volume, unit surface area or similar bases of estimation) regarding the works to enable the client or the architect to prepare architectural sketch plans and budget estimates for the project;
- (iii) investigating data and information relevant to the works and considering any reports relating to them;
- (iv) consulting the architect and others appointed by the client in connection with the architectural treatment of the works; and
- (v) preparing such reports and documents as are necessary to enable the client to consider the consulting engineer's proposals, including the alternative proposals for the installation of the works in the light of the investigations carried out by him at this stage, and to enable the client to apply for approval in principle from the appropriate authorities for the execution of the works in accordance with the proposals.

(b) Design Stage

The professional services to be provided by the consulting engineer at this stage comprise all or any of the following as may be necessary in a particular case:

- (i) preparing designs and tender drawings, and providing information as to plant rooms, main service ducts and other similar elements to be incorporated in the building structure, and information as to the approximate weights of items of heavy plant and equipment which are to be incorporated in the works; and
- (ii) advising on conditions of contract, preparing specifications and schedules as may be necessary to enable the client to obtain tenders or otherwise award a contract for carrying out the works, and preparing such calculations and details relating to the works as may be required for submission to any appropriate authorities.

(c) Tender Stage

The professional services to be provided by the consulting engineer at this stage comprise advising the client as to the suitability for carrying out the works of the persons, firms or companies tendering and as to the relative merits of tenders, but excluding relative merits of alternative tenders, prices and estimates received for carrying out the works.

(d) Construction Stage

The professional services to be provided by the consulting engineer at this stage comprise all or any of the following as may be necessary in a particular case:

- (i) advising on the preparation of formal contract documents relating to accepted tenders for carrying out the works or any part of them;
- (ii) advising the client on the appointment of site staff for the purposes of paragraph 3 of this Part;
- (iii) providing the contractor with such further information as are necessary, in the opinion of the consulting engineer, to enable the installation drawings to be prepared;
- (iv) examining the contractor's proposals;
- (v) making such visits to the site as the consulting engineer considers necessary to satisfy himself as to the performance of any site staff appointed pursuant to paragraph 3 of this Part and to satisfy himself that the works are executed generally according to his designs and specifications or otherwise in accordance with good engineering practice;
- (vi) checking shop details and installation drawings;
- (vii) giving all necessary instructions to the contractor;
- (viii) advising the client or the architect as to the need to vary any part of the works;
- (ix) approving the contractor's commissioning procedures and performance tests and inspecting the works on completion;

- (x) advising on interim valuation, issuing certificates for payment to the contractor where appropriate and advising on the settlement of the contractor's final accounts;
- (xi) performing any services which the consulting engineer may be required to carry out under any document which he has prepared in relation to the works;
- (xii) delivering to the client on completion of the works, copies of record drawings, contractor's operating instructions, manufacturer's manuals, and, where appropriate, the certificate of works tests, and arranging for the delivery of spares and tools, if necessary;
- (xiii) deciding any dispute or difference arising between the client and the contractor in connection with the works and submitted to the consulting engineer for his decision, provided that this professional service shall not extend to advising the client following the taking of any step in or towards any arbitration or litigation in connection with the works;
- (xiv) inspecting and testing during manufacture and installation such materials and equipment supplied for incorporation in the works where the inspection and test are within the technical competency of the consulting engineer, and arranging and witnessing acceptance tests; and
- (xv) advising the client on the need for special inspection or test other than that referred to in sub-sub-subparagraph 1(3)(d)(xiv) of this Part.

2. (1) Additional Professional Services Not Included In Basic Services (for civil and structural engineering works other than structural engineering works in buildings, and mechanical engineering works and electrical engineering works other than engineering systems in buildings)

The additional professional services to be provided by the consulting engineer, if requested or consented to by the client, include the following:

- (a) (i) preparing any report or other additional documents required for consideration of proposals for the carrying out of alternative works;
- (ii) carrying out work consequent upon a decision by the client to seek or comply with amendments to existing laws affecting the works;
- (iii) carrying out work in connection with any application made by the client for any order, sanction, licence, permit or other consent, approval (not including the normal approval required from the relevant technical authorities, such as building authorities, water-works authorities, electricity authorities and telecommunications authorities) or authorisation necessary to enable the works to proceed;
- (iv) carrying out work arising from the failure of the client to award a contract in due time;
- (v) preparing details for shop fabrication of ductwork, metal, plastic and timber framework;

- (vi) carrying out work consequent upon any abandonment of a contract by the contractor or upon the failure of the contractor to properly perform any contract or upon delay by the client in fulfilling his obligations or in taking any other step necessary for the due execution of the works;
 - (vii) advising the client and carrying out work following the taking of any step in or towards any litigation or arbitration relating to the works;
 - (viii) carrying out work in conjunction with others employed to provide any of the services specified in sub-subparagraph 2(1)(b) of this Part;
 - (ix) providing project management services; and
 - (x) carrying out such other additional services, if any, as are specified in the Memorandum of Agreement.
- (b)
- (i) obtaining specialist technical advice on any abnormal aspects of the works;
 - (ii) obtaining architectural, legal, cost consultancy, financial and other professional services;
 - (iii) providing services in connection with the valuation, purchase, sale or leasing of land and the obtaining of wayleaves;
 - (iv) carrying out of marine, air and land surveys other than those referred to in sub-sub-subparagraph 1(1)(a)(ii) of this Part and making model tests or special investigations; and
 - (v) carrying out special inspection or test advised by the consulting engineer under sub-sub-subparagraph 1(1)(d)(iii) of this Part.

2. (2) Additional Professional Services Not Included In Basic Services (for structural engineering works in buildings)

The additional professional services to be provided by the consulting engineer, if requested or consented to by the client, include the following:

- (a)
- (i) preparing any report or other additional documents required for consideration of proposals for the carrying out of alternative works;
 - (ii) carrying out work consequent upon a decision by the client to seek or comply with amendments to existing laws affecting the works;
 - (iii) carrying out work in connection with any application made by the client for any order, sanction, licence, permit, consent, or other approval (not including the normal approval required from the relevant technical authorities such as the building authorities, waterworks authorities, electricity authorities and telecommunications authorities), or authorisation necessary to enable the works to proceed;
 - (iv) checking and advising on any part of the project not designed by the consulting engineer;
 - (v) carrying out work arising from the failure of the client to award a contract in due time;

- (vi) carrying out work consequent upon any abandonment of a contract by the contractor or upon the failure of the contractor to properly perform any contract or upon delay by the client in fulfilling his obligations or in taking any other steps necessary for the due execution of the works;
 - (vii) advising the client and carrying out work following the taking of any step in or towards any litigation or arbitration relating to the works;
 - (viii) preparing interim or other reports or detailed valuations including estimates or cost analysis based on measurement or forming an element of a cost planning service;
 - (ix) carrying out work in conjunction with any other persons employed to provide any of the services specified in sub-subparagraph 2(2)(b) of this Part;
 - (x) preparing preliminary estimates for the works which are normally prepared by others including such persons as the architects, quantity surveyors and contractors;
 - (xi) providing project management services; and
 - (xii) carrying out such other additional services, if any, as are specified in the Memorandum of Agreement;
- (b)
- (i) obtaining specialist technical advice on any abnormal aspects of the works;
 - (ii) surveying the site or existing works and installations;
 - (iii) providing investigation on the nature and strength of existing works and the making of model tests or special investigations;
 - (iv) providing services in connection with the valuation, purchase, sale or leasing of land and the obtaining of wayleaves;
 - (v) carrying out marine, air and land surveys and making model tests or special investigations; and
 - (vi) carrying out special inspection or tests advised by the consulting engineer under sub-sub-subparagraph 1(2)(d)(xiii) of this Part.

2. (3) Additional Professional Services Not Included In Basic Services (for engineering systems in buildings)

The additional professional services to be provided by the consulting engineer, if request or consented to by the client, include the following:

- (a) (i) preparing any report or other additional documents required for consideration of proposals for the carrying out of alternative works;

- (ii) carrying out work consequent upon a decision by the client to seek or comply with amendments to existing laws affecting the works;
- (iii) carrying out work in connection with any application made by the client for any order, sanction, licence, permit, consent, or other approval (not including the normal approval required from the relevant technical authorities such as building authorities, waterworks authorities, electricity authorities and telecommunications authorities), or authorisation necessary to enable the works to proceed;
- (iv) checking and advising upon any part of the project not designed by the consulting engineer;
- (v) negotiating and arranging for the provision or diversion of utility services;
- (vi) negotiating any contract or sub-contract with a contractor selected otherwise than by competitive tendering including checking and agreeing on the quantities and nett costs of materials and labour, arithmetical checking and agreeing on the added percentages to cover overhead costs and profit;
- (vii) carrying out work arising from the failure of the client to award a contract in due time;
- (viii) carrying out work consequent upon any abandonment of a contract by the contractor or upon the failure of the contractor to properly perform any contract or upon delay by the client in fulfilling his obligations or in taking any other step necessary for the due execution of the works;
- (ix) carrying out special cost investigations or detailed valuations including estimates or cost analysis based on measurement or forming an element of a cost planning service;
- (x) providing manuals and other documents describing the design, operation and maintenance of the works;
- (xi) advising the client and carrying out work following the taking of any step in or towards any litigation or arbitration relating to the works;
- (xii) carrying out work in conjunction with any other persons employed to provide any of the services specified in sub-subparagraph 2(3)(b) of this Part;
- (xiii) providing project management services;
- (xiv) preparing builder's work drawings, record drawings or any detailed schedules where necessary; and
- (xv) carrying out such other additional services, if any, as are specified in the Memorandum of Agreement;

- (b) (i) obtaining specialist technical advice on any abnormal aspects of the works;
- (ii) obtaining architectural, legal, cost consultancy, financial and other professional services;
- (iii) surveying the site or existing works and installations;
- (iv) providing services in connection with the valuation, purchase, sale or leasing of land and the obtaining of wayleaves;
- (v) making model tests or special investigations;
- (vi) carrying out special inspection or test advised by the consulting engineer under sub-sub-subparagraph 1(3)(d)(xv) of this Part; and
- (vii) carrying out commissioning procedures or performance tests.

3. Supervision On Site

- (1) Unless otherwise agreed to by the approving authorities concerned, the consulting engineer shall be in full control of, and be responsible for, construction supervision of the works on site.
- (2) If in the opinion of the consulting engineer the nature of the work including the carrying out of any geotechnical and other investigations, topographic survey, and tests warrants full-time or part-time supervision on site in addition to the site visits made by the consulting engineer under to sub-sub-subparagraphs 1(1)(d)(vii), 1(2)(d)(viii) and 1(3)(d)(v) of this Part, whichever is applicable, he shall advise the client of the fact and also the desired qualification and experience which the site staff shall possess.
- (3) All site staff shall be under the control of, and take instructions from, the consulting engineer only.

PART B
SCALE OF FEES

1. Scale Of Fees For Basic Professional Services

The consulting engineer in performing the professional services described in subparagraphs 1(1), 1(2) and 1(3) of Part A shall be paid in accordance with only one of the following modes of remuneration as described in subparagraphs 1(1) and 1(2) of this Part.

(1) Payment Depending Upon The Cost Of The Works

- (a) The fee to be paid to the consulting engineer shall be an amount equal to the product of the total cost of the works times the percentage determined from the Scale of Fees set out in sub-subparagraph 1(1)(b) of this Part.
- (b) The Scale of Fees referred to in sub-subparagraph 1(1)(a) of this Part shall be as follows:

Total Cost Of Components Of The Works In The Respective Type in RM	P(max)	P(min)
100,000 & below	10.00%	8.25%
250,000	8.65%	7.45%
500,000	7.60%	6.85%
1,000,000	6.80%	6.30%
2,500,000	6.00%	5.65%
5,000,000	5.50%	5.20%
10,000,000	5.00%	4.75%

Total Cost Of Components Of The Works In The Respective Type in RM	P(max)	P(min)
20,000,000	4.65%	4.25%
25,000,000	4.50%	4.10%
50,000,000	4.25%	3.80%
75,000,000	4.10%	3.70%
100,000,000	3.95%	3.60%
150,000,000	3.70%	3.40%
200,000,000	3.55%	3.25%
250,000,000	3.40%	3.10%
300,000,000	3.30%	3.00%
350,000,000	3.20%	2.90%
400,000,000	3.10%	2.80%
500,000,000	2.95%	2.70%
600,000,000	2.85%	2.60%
700,000,000	2.75%	2.50%
800,000,000	2.67%	2.40%
900,000,000	2.60%	2.33%
1,000,000,000 & above	2.54%	2.28%

Intermediate values shall be interpolated linearly from the adjacent percentages of P(max) or P(min), as the case may be.

The actual percentage to be used in sub-subparagraph 1(1) (a) of this Part shall be a value within the range P(min) to P(max), and shall be agreed to between the client and the consulting engineer prior to the engagement. Selection of the actual percentage shall be based on the complexity of the works.

- (c) If bar bending schedules for reinforced concrete work are prepared and furnished by the consulting engineer he shall be paid an additional fee calculated at 3/4 (three quarters) percent of the cost of the reinforced concrete work for which the bar bending schedules are prepared and furnished. In this context, reinforced concrete work comprises concrete, reinforcements, prestressing tendons and anchorages, formwork, inserts and all labour, together with the relevant portion of the preliminaries.
- (d) If the works are to be constructed in more than one phase and as a consequence the services which the consulting engineer has to perform under subparagraphs 1(1), 1(2) and 1(3) of Part A have to be undertaken by the consulting engineer separately in respect of each phase, then these provisions for payment shall apply separately to each phase as if the expression "the works" as used in this paragraph means the works comprised in each phase.
- (e) If the design of any unit of works is adopted again in the construction of subsequent units by the same client under one works contract or under other works contracts at the same site or other sites under the same consultancy agreement, and the consulting engineer's same drawings, specifications and other documents are used with or without modification of foundations to suit site conditions, the fees shall be reduced for each of the second and subsequent units in accordance with the following Tables A or B:

Table A : Applicable to Type A Works

Unit Concerned	Fees as % of the full fee for all stages for first Unit		
	For design copyright only	Up to & including tender stage	Up to & including construction stage
First Unit	(Apply subparagraph 1(1) or 1(2) of this Part, whichever is applicable)		
Second Unit	30	35	65
Third Unit	20	25	55
Fourth Unit	10	15	45
Each of the fifth and	Free of charge	5	35
Subsequent units			

Table B: Applicable to Type B and Type C Works

Unit Concerned	Fees A For Structural Engineering Works (As % of fee for First Unit)	Fees B For Engineering Systems (As % of fee for First Unit)
First Unit	100	100
Each of the Second to Fifth Units	75	75
Each of the Sixth to Tenth Units	50	50
Each of the Eleventh to Twentieth Units	40	40
Each of the Twenty First and Subsequent Units	30	30

- (f) The scale of fees for repetitive work mentioned in sub-subparagraph 1(1)(e) of this Part shall be applied subject to the following conditions:
- (i) a block of shops, flats, apartments or condominium shall be considered as a unit;
 - (ii) the cost of a single unit shall be computed by including the apportioned preliminaries;
 - (iii) if it is necessary to modify the design of the standard unit to accommodate the ground level for the substructure of any repetitive unit or part of any repetitive unit due to variation in site conditions or other reasons, the modified unit shall still be considered as a repetitive unit provided that the additional work involved in modifying the design and preparation of additional drawings is paid for by the client to the consulting engineer on a time basis (i.e. salary cost times a multiplier) together with relevant disbursements as provided in paragraphs 2 and 3 of Part C; and
 - (iv) if a development has units comprising different numbers of shops, flats, apartments or condominiums of similar designs in each unit (i.e. the intermediate shops, flats, apartments or condominiums of the units having identical or mirror plans each to each, and the end shops, flats, apartments or condominiums of the units having identical or mirror plans each to each), then for the purpose of application of the Scale for repeated works prescribed in sub-subparagraph 1(1)(e) of this Part, the cost of every one of the units shall be taken as equal to the average cost of all such units of similar design including apportioned preliminaries.

(2) Payment On The Basis Of Salary Cost Times Multiplier

- (a) In respect of the provision by the consulting engineer of professional services described in the following paragraphs:

Subparagraphs 1(1), 1(2)
And 1(3) of Part A

Basic Professional Services

Subparagraphs 2(1), 2(2)
And 2(3) of Part A

Additional Professional Services Not
Included In Basic Professional
Services

Part C

Other Payments,

the consulting engineer shall be paid:

- (i) salary cost times the multiplier in respect of the times spent in providing the services by partners, consultants, and technical supporting staff; and
 - (ii) the fee for the use of computers or other special equipment under paragraph 1 of Part C.
- (b) The consulting engineer shall not be entitled to any payment in respect of time spent by secretarial staff or by staff engaged on general accountancy or administration duties in the consulting engineer's office.

2. Scale Of Fees – Additional Professional Services Not Included In Basic Services Payment For Additional Services

The consulting engineer who has rendered any of the additional professional services described in subparagraphs 2(1), 2(2) and 2(3) of Part A shall be paid in accordance with the following scale of fees:

- (a) the input of partners and consultants shall be paid for at the hourly rate or rates agreed between the client and the consulting engineer or at rates derived from the salary cost times the appropriate multiplier;
- (b) the input of technical and supporting staff shall be paid for at the rates derived from the salary cost times the appropriate multiplier;
- (c) the time spent by partners, consultants, technical and supporting staff in travelling in connection with Additional Professional Services shall be paid for as provided in subparagraphs 2(a) and 2(b) of this Part;
- (d) consulting engineer shall not be entitled to any payment in respect of time spent by secretarial staff or by staff engaged on general accountancy or administration duties in the consulting engineer's office;
- (e) if the consulting engineer has obtained the advice of a specialist under sub-subparagraphs 2(1)(b), 2(2)(b) and 2(3)(b) of part A, the consulting engineer shall be paid by the client a co-ordinating fee of 5% of the specialist fee paid to the specialist by the client provided that such co-ordinating fee shall not be applicable when the method of payment for the professional services rendered is agreed between the consulting engineer and the client to be as described in subparagraph 1(2) of this Part.

3. Stages Of Payment Of Fees

The proportions of the total fee for the works to be paid to the consulting engineer against the relevant stages of professional services shall be as follows:

	Type A Works	Type B Works	Type C Works
1. Preliminary stage	20%	20%	20%
2. Design stage (i)	35%	35%	35%
3. Design stage (ii)	20%	20%	20%
4. Tender stage	5%	5%	5%
5. Construction stage	20%	20%	20%

Unless otherwise specified or mutually agreed beforehand between the client and the consulting engineer, the fee apportioned to each stage shall be paid in full even if, under the circumstances in a particular case, the consulting engineer is not required to perform some of the professional services listed under that stage in Part A.

PART C

OTHER PAYMENTS

1. Payment For Use Of Computer Or Other Special Equipment

If the consulting engineer is to be paid by the client -

- (a) in accordance with subparagraph 1(2) of Part B for the performance of his basic professional services described in subparagraphs 1(1), 1(2) and 1(3) of Part A or of any additional professional services described in subparagraphs 2(1), 2(2) and 2(3) of Part A; or
- (b) in accordance with subparagraph 1(1) of Part B for the performance of his basic professional services described in subparagraphs 1(1), 1(2) and 1(3) of Part A and with subparagraph 1(2) of Part B for the performance of any additional professional services described in subparagraphs 2(1), 2(2) and 2(3) of Part A,

and in both instances computers or other special equipment had been utilised for specialised designs and studies with the prior approval, or at the request, of the client, the consulting engineer shall be paid for:

- (i) the time spent in connection with the use of the computers or other special equipment, the development and writing of programmes, and the operation of the computers and other special equipment in trial and final runs, in accordance with subparagraph 1(2) of Part B, whenever applicable, or in accordance with the scale of fees described in paragraph 2 of Part B; and
- (ii) the actual hiring charge for the use of the computers or other special equipment.

2. Disbursements

The consulting engineer shall in all cases be reimbursed by the client for the disbursements actually incurred in connection with:

- (a) the printing, reproduction and purchase of all documents, drawings, maps and records;
- (b) telegrams, telex, facsimile, courier service and telephone calls other than local calls;
- (c) travelling, hotel expenses and other similar disbursements;
- (d) the advertisements for tenders and for site staff;
- (e) the provision of additional professional services to the client under sub-subparagraphs 2(1)(b), 2(2)(b) and 2(3)(b) of Part A;
- (f) the service tax as required by law for the professional fee; and
- (g) any fees, costs or charges paid by the consulting engineer to the local authority or other authorities in connection with the seeking and obtaining of statutory approvals.

3. Payment For Alteration or Modification To Design

If after the completion by the consulting engineer of his professional services under sub-subparagraphs 1(1)(a), 1(2)(a) and 1(3)(a) of Part A, whichever is applicable, any design whether completed or in progress or any specifications, drawings or other documents prepared in whole or in part by the consulting engineer is required to be modified or revised by reason of instructions received by the consulting engineer from the client, or by reason of circumstances which could not reasonably have been foreseen, the consulting engineer shall be paid an additional payment by the client as provided in subparagraph 1(2) of Part B calculated in accordance with paragraph 2 of Part B, and also any appropriate reimbursements provided in paragraphs 1 and 2 of this Part for making any necessary modification or revision and for any consequential reproduction of documents.

4. Payment For Site Supervision

- (1) In addition to any other payments to be made by the client to the consulting engineer under Part B, the consulting engineer shall be -
 - (a) reimbursed for all salary costs made by the consulting engineer to his own staff seconded to the site in the discharge of the consulting engineer's responsibilities under paragraph 3 of Part A times a multiplier; and
 - (b) reimbursed for all salaries and wage payments made by the consulting engineer to site staff specially recruited by the consulting engineer in the discharge of his responsibilities under paragraph 3 of Part A times a multiplier, and for all other expenditures actually incurred by the consulting engineer in connection with the selection, engagement and employment of the site staff.
- (2) The consulting engineer shall also in all cases be reimbursed for the actual cost of providing such site office accommodation, furniture, telephones, equipment and transport as shall be reasonably necessary for the use of the consulting engineer's site staff, and for the actual running costs of the site accommodation and other facilities including those of any stationery, telephone calls, telegrams, telex, facsimile, courier service and postage unless they are provided by the client.

5. Payment When Works Are Damaged Or Destroyed

If at any time before completion of the works, any part of the works or any materials, plant or equipment whether incorporated in the works or not are damaged or destroyed, resulting in additional work being required by the client to be carried out by the consulting engineer, then the consulting engineer shall be paid by the client on a time basis (i.e. salary cost times a multiplier) for the additional works together with any reimbursements as provided in paragraph 2 of this Part.

6. Payment Following Termination Or Suspension By The Client

- (1) In the event of a termination or suspension by the client of the works or of the consulting engineer's services (unless in the case of the latter where the termination or suspension had been occasioned by the default or negligence of the consulting engineer), the consulting engineer shall be paid the following sums (less the amount of payments previously made to the consulting engineer):
 - (a) a sum deducible from the stage of professional services completed at the time of termination or suspension;
 - (b) a disruption charge equal to one sixth of the difference between the sum, which would have been payable to the consulting engineer under subparagraphs 1(1) and 1(2) of Part B, whichever may be applicable (as if the full scope of professional services has been completed by the consulting engineer under the terms of his engagement), but for the termination or suspension, and the sum payable under sub-subparagraph 6(1)(a) of this Part, provided that the professional services have advanced beyond the preliminary stage; and
 - (c) amounts due to the consulting engineer under any other paragraphs of Part B.
- (2) If the consulting engineer is required to recommence his professional services for the works suspended by the client, the consulting engineer shall be paid for the performance of his professional services the sum payable to the consulting engineer under subparagraph 1(1) and/or subparagraph 1(2) of part B, whichever may be applicable, the payments under subparagraphs 6(1)(a) and 6(1)(c) of this Part being treated as payments on account, provided that the consulting engineer shall retain as an additional payment the disruption charge referred to in sub-subparagraph 6(1)(b) of this Part.
- (3) If tendering for the works (or any part of them) is or is likely to be delayed for more than nine months or postponed at the request of the client, then for the purpose of computing the fee to be paid to the consulting engineer for the performance of his professional services the cost of the works applicable shall be the estimated cost of the works (or any relevant part of them) at the time of completion of the design.
- (4) If the works are suspended or postponed after tenders have been called, the fees payable to the consulting engineer shall be as follows:
 - (a) for the preliminary stage, design stage and tender stage, the fees shall be computed on the lowest acceptable tender provided that if no acceptable tender is received then the fees shall be computed on the estimate made by the consulting engineer of the cost of the works at the date of calling for tenders;
 - (b) if the works subsequently resumed and the tenders recalled, the total fees payable to the consulting engineer, inclusive of the fees paid under sub-subparagraph 6(4)(a) of this Part, shall be as follows:
 - (i) for the preliminary stage, design stage and tender stage -the fees shall be as computed in sub-subparagraph 6(4)(a) of this Part; and

- (ii) for the construction stage - the fees shall be computed on the final contract sum of the works at the time of completion of the works.
- (5) If the consulting engineer is required to perform any additional services in connection with the resumption of his professional services in accordance with subparagraph 6(2) of this Part, the consulting engineer shall be paid for the performance of the additional professional services on a time basis (i.e. salary cost times a multiplier) and also any appropriate reimbursements in accordance with paragraph 2 of this Part.

7. Payment Following Termination By The Consulting Engineer

If there is a termination by the consulting engineer of his professional services (unless the termination had been occasioned by the default or negligence of the consulting engineer), the consulting engineer shall be entitled to be paid the sums specified in sub-subparagraphs 6(1)(a) and 6(1)(c) of this Part less the amount of payments previously made to the consulting engineer.

Made 7 December 1998.

[KKR/U/26/1; PN(PU²)47/V]

DATO' IR. HAJI OMAR BIN
IBRAHIM
*President,
Board of Engineers Malaysia*

Approved 7 December 1998.

[KKR/U/26/1; PN(PU²)47/V]

DATO' SERI S. SAMY VELLU
Minister of Works

Bab 5 dalam Manual Perolehan Perkhidmatan Perunding Edisi 2011 (Pindaan Kedua)

5.0 KOS PERKHIDMATAN PERUNDING

5.1 Definisi Kos Perkhidmatan Perunding

- 5.1.1 Kos perkhidmatan perunding adalah kos yang terdiri daripada yuran perunding dan kos imbuhan balik. Cukai yang dikenakan oleh Kerajaan tidak dikira sebagai sebahagian daripada kos perkhidmatan perunding.
- 5.1.2 Agensi adalah bertanggungjawab untuk menyediakan sejumlah peruntukan untuk bayaran GST yang akan dibayar oleh perunding kepada Jabatan Kastam Diraja Malaysia. Sekiranya terdapat penglibatan perunding asing, Agensi hendaklah memastikan potongan ke atas kos perkhidmatan perunding dibuat bagi bayaran cukai pegangan kepada Lembaga Hasil Dalam Negeri.

5.2 Yuran Perkhidmatan Perunding

Terdapat 2 kaedah bagi menentukan yuran perkhidmatan perunding iaitu Skala Yuran Piawai (*Scale of Fees* –SOF) dan Input Masa (*Man-month*). Rujuk perenggan 5.2.1 dan 5.2.2 untuk penerangan lanjut.

5.2.1 Skala Yuran Piawai (*Scale of Fees* - SOF)

- 5.2.1.1 SOF adalah kadar bayaran perkhidmatan perunding yang telah ditetapkan oleh Lembaga-Lembaga Profesional dan telah dipersetujui oleh Kementerian Kewangan;
- 5.2.1.2 SOF digunakan hanya bagi skop *Basic Services* untuk Arkitek, Kejuruteraan dan Ukur Bahan;
- 5.2.1.3 Pada masa ini, hanya 4 bidang perunding fizikal mempunyai SOF yang diluluskan oleh Kementerian Kewangan iaitu bidang Arkitek, Kejuruteraan, Ukur Bahan dan Ukur Tanah.
- 5.2.1.4 Bagi bidang perunding fizikal selain daripada bidang Arkitek, Kejuruteraan, Ukur Bahan dan Ukur Tanah, Agensi hendaklah menggunakan kaedah input masa bagi pengiraan yuran perkhidmatan perunding bagi bidang tersebut.

5.2.2 Input Masa (*Man-month*)

- 5.2.2.1 Kaedah penetapan yuran perunding secara input masa adalah berdasarkan *time basis* iaitu tempoh masa yang diperlukan bagi menyiapkan sesuatu projek/kajian Kerajaan. Tempoh ini hendaklah dinyatakan di dalam bentuk *man- month /man-day /man-hour* mengikut kesesuaian dari segi tempoh menyempurnakan projek/kajian seperti berikut :

Input Masa	Tempoh Menyempurnakan Projek/Kajian
<i>man-month</i> ²	melebihi 1 bulan
<i>man-day</i> ³	tidak melebihi 1 bulan
<i>man-hour</i>	tidak melebihi 1 minggu

5.2.2.2 Bagi perunding yang menawarkan bayaran secara *man-hour* atau *man-day*, Agensi hendaklah merundingkan kadar-kadar tersebut ke tahap yang paling minimum.

5.2.2.3 Kaedah bayaran input masa ini hendaklah digunakan bagi keadaan seperti berikut:-

(a) Projek pembangunan fizikal yang mana bidang perkhidmatan tersebut tidak mempunyai SOF yang diiktiraf oleh Kementerian Kewangan;

(b) Perkhidmatan perunding bagi skop seperti berikut:

Bil	Bidang Perunding	Skop Perkhidmatan
1	Arkitek	• <i>Additional Services</i>⁴; dan • <i>Special Services</i>¹
2	Kejuruteraan	• <i>Additional Services</i>⁵; dan • <i>Supervision On Site</i>²
3	Ukur Bahan	• <i>Additional Services</i>⁶

(c) Semua kajian;

(d) Projek/kajian yang melibatkan perunding asing; dan

(e) Projek/kajian yang dibiayai melalui pinjaman atau geran dari institusi kewangan antarabangsa/Kerajaan asing.

(f) Pengiraan yuran perunding mengikut kaedah Input Masa adalah dengan menggunakan formula berikut :

$$YP = GP \times FP \times IM$$

²Satu (1) bulan bersamaan dengan 173 jam bekerja (21.63 hari)

³Satu (1) hari bersamaan dengan 8 jam bekerja

⁴Definisi *Additional* dan *Special Services* bagi bidang Arkitek boleh dirujuk melalui dokumen perjanjian piawai Form CSA2014-Architectural (incl. SOF 2010)

⁵Definisi *Additional Services* dan *Supervision On Site* bagi bidang Kejuruteraan boleh dirujuk melalui dokumen perjanjian piawai Form CSA2014-Engineering (incl. SOF 1998); dan

⁶Definisi *Additional Services* bagi bidang Ukur Bahan boleh dirujuk melalui dokumen perjanjian piawai Form CSA2014-Quantity Surveying (incl. SOF 2004).

(g) Petunjuk bagi formula di atas adalah seperti berikut :

YP = Yuran Perunding (*consulting fee*);

GP=Gaji Pokok (*basic salary*);

FP = Faktor Pengganda (*multiplier factor*); dan

IM = Input Masa (*man-month, man-day, man-hour*).

5.2.3 Gaji Pokok (GP)

- 5.2.3.1 GP ialah gaji asas bulanan yang dibayar kepada setiap kakitangan ikhtisas dan separa ikhtisas perunding. Gaji pokok hendaklah tidak termasuk apa-apa elaun serta lain-lain bayaran kepada kakitangan perunding.
- 5.2.3.2 GP bagi kakitangan tetap firma adalah berdasarkan slip penyata gaji semasa kakitangan tersebut.
- 5.2.3.3 GP bagi kakitangan sementara firma hendaklah tidak melebihi skala gaji maksimum yang telah diluluskan oleh Kementerian Kewangan seperti di **Lampiran 5B sehingga 5C (Skala Gaji Baharu)**. **Pemakaian Skala Gaji Maksimum baharu ini adalah bagi projek fizikal atau kajian Kerajaan yang baharu iaitu berdasarkan tarikh iklan tender perunding atau tarikh surat pelawaan perunding mulai 1 Januari 2015;**
- 5.2.3.4 **Pemakaian Skala Gaji Maksimum baharu bagi kakitangan sementara perunding yang terlibat dalam pengawasan tapak projek fizikal Kerajaan sedia ada dan masih dalam peringkat pembinaan adalah boleh dipertimbangkan oleh Lembaga Perolehan 'A'. Lembaga Perolehan 'A' boleh memutuskan sama ada meluluskan atau menolak permohonan pelarasan gaji kakitangan sementara yang dikemukakan oleh firma perunding tertakluk kepada syarat:**
- (a) Permohonan pelarasan gaji yang dikemukakan oleh firma hendaklah terlebih dahulu disemak dan diperakukakan oleh JPP dan sekiranya dipersetujui oleh LP'A', pelarasan gaji hendaklah hanya bermula pada tarikh surat kelulusan LP'A';
 - (b) Hanya dibenarkan bagi kakitangan sementara yang terlibat di peringkat pengawasan tapak pembinaan dan kerja-kerja pembinaan yang masih berjalan/belum selesai;

- (c) Prestasi firma di peringkat pembinaan bagi projek tersebut adalah memuaskan;
- (d) Agensi mempunyai peruntukan semasa yang mencukupi untuk menampung pertambahan kos perunding akibat pelarasan gaji tersebut; dan
- (e) Pemakaian skala gaji baharu ini tidak boleh dijadikan sandaran oleh Agensi mahupun firma perunding untuk mendapatkan kelulusan peruntukan tambahan daripada MOF mahupun EPU.

5.2.3.5 Kakitangan sementara yang diambil di kalangan tenaga pengajar IPTA dan pegawai kerajaan yang telah bersara, GP bagi tenaga pengajar IPTA adalah berdasarkan slip gaji sebenar manakala GP bagi pegawai kerajaan yang telah bersara, adalah berdasarkan pengesahan/penyata/slip gaji terakhir.

5.2.3.6 *Remuneration* bagi Lembaga Pengarah/Rakan Kongsi adalah berdasarkan skala gaji maksimum yang telah diluluskan oleh Kementerian Kewangan seperti di [Lampiran 5A](#).

5.2.3.7 Kenaikan GP dibenarkan hanya bagi perkhidmatan perunding yang melebihi 12 *man-month* dan seterusnya mengikut kadar berikut:

- (a) Kakitangan Ikhtisas – 5% daripada GP asal yang telah diluluskan atau RM300, yang mana lebih rendah.
- (b) Kakitangan Separa Ikhtisas/Sokongan Teknikal – 8% daripada GP asal yang telah diluluskan atau RM150, yang mana lebih rendah.

5.2.3.8 Kenaikan GP tidak diperuntukkan untuk Lembaga Pengarah/Rakan Kongsi dan Perunding Asing.

5.2.4 Faktor Pengganda (FP)

5.2.4.1 FP adalah terdiri daripada komponen-komponen seperti di nyatakan di [Lampiran 5E](#) sehingga [Lampiran 5H](#).

5.2.4.2 Agensi hendaklah memastikan FP yang digunapakai oleh perunding hendaklah tidak melebihi pekali yang ditetapkan oleh Kementerian Kewangan seperti di [Lampiran 5D](#).

5.2.5 Input Masa (IM)

5.2.5.1 IM adalah tempoh/jangka masa yang diperlukan bagi menyempurnakan sesuatu projek atau kajian.

5.2.6 Penetapan yuran perkhidmatan perunding secara lump sum basis adalah tidak dibenarkan.

5.3 Kos Imbuhan Balik (IB)

5.3.1 Kos IB adalah lain-lain perbelanjaan (selain daripada yuran perunding) yang dibuat oleh perunding mengikut keperluan sesuatu projek/kajian. Kos IB adalah merupakan perbelanjaan sebenar yang dibuat oleh pihak perunding tertakluk kepada syarat-syarat berikut:-

5.3.1.1 Butiran serta kadar bayaran kos IB hendaklah berpatutan dan tuntutan hendaklah dikemukakan dengan resit/bil;

5.3.1.2 Bagi bayaran kos IB tanpa resit selain daripada kos IB secara pukal (*lump sum*) yang dibenarkan hendaklah mendapat kebenaran dan pengesahan Agensi;

5.3.1.3 Dokumen yang perlu disediakan oleh perunding yang akan dibayar balik oleh Kerajaan hendaklah dinyatakan dengan jelas di dalam Terma Rujukan (TOR). Bagi salinan dokumen yang telah dibuat dan diberikan kepada pihak lain tanpa arahan Agensi, tuntutan tersebut tidak akan dibayar oleh Kerajaan;

5.3.1.4 Butiran dan kadar IB tidak melebihi sebagaimana yang ditetapkan seperti di [Lampiran 5I](#);

5.3.1.5 Bagi butiran IB yang tidak termasuk di dalam item yang dibenarkan oleh Kementerian Kewangan tetapi merupakan perbelanjaan yang diperlukan oleh perunding bagi pelaksanaan projek/kajian berkenaan, Agensi hendaklah mendapatkan kelulusan Kementerian Kewangan ke atas butiran dan kadar IB tersebut terlebih dahulu;

5.3.1.6 **Agensi hendaklah memastikan tuntutan premium insuran bagi Professional Indemnity Insurance (PII) yang diambil oleh firma tidak termasuk di dalam kos imbuhan balik. Kos tersebut adalah ditanggung sendiri oleh perunding; dan**

5.3.1.7 Bagi pengendalian latihan Transfer of Technology/ Knowledge kepada pegawai Agensi (sekiranya diperlukan), Agensi hendaklah memastikan perunding telah mengambilkira kos pengendalian latihan tersebut di dalam cadangan kos perunding berkenaan. **Walau bagaimanapun, kos penginapan/lodging, perjalanan dan makan/minum bagi kakitangan Agensi hendaklah tidak termasuk di dalam kos perkhidmatan perunding.**

Agensi bertanggungjawab memastikan pembiayaan penginapan/lodging, perjalanan dan makan/minum kakitangan Agensi yang terlibat hendaklah dibuat melalui Vot Jabatan.

- 5.3.2 Kos IB boleh dibayar mengikut peringkat kemajuan atau secara bulanan berdasarkan persetujuan kedua-dua pihak. Agensi adalah bertanggungjawab menetapkan satu tempoh masa (*cut off date*) yang munasabah untuk membolehkan perunding membuat tuntutan kos IB. **Agensi hendaklah menyatakan dengan jelas kepada perunding bahawa tuntutan IB yang melebihi *cut off date* tidak akan dibayar.** Sebarang rayuan daripada perunding tidak wajar dilayan.
- 5.3.3 Walaupun Kerajaan membenarkan perunding membuat tuntutan imbuhan balik, Agensi adalah bertanggungjawab untuk memastikan keperluan tersebut adalah bersesuaian dengan projek/kajian berkenaan.

5.4 Bayaran Perkhidmatan Perunding Mengikut Peringkat Kemajuan Kerja

- 5.4.1 Bayaran perkhidmatan perunding hendaklah mengikut peringkat- peringkat kemajuan projek/kajian seperti berikut:-
- 5.4.1.1 Bagi projek pembangunan fizikal, bayaran kos perkhidmatan adalah mengikut jadual pembayaran berdasarkan kemajuan kerja seperti yang telah ditetapkan di dalam perjanjian yang berkaitan.
- 5.4.1.2 Bagi kajian, bayaran kos perkhidmatan perunding adalah mengikut peringkat kemajuan kajian tertakluk laporan yang dikemukakan oleh perunding disetujuterima oleh Agensi. Peratus pembayaran mengikut peringkat kemajuan kajian berikut boleh digunapakai sebagai **panduan**:

Bil	Peringkat Kemajuan Kajian	Peratus Pembayaran Dibenarkan
1	Laporan Awal/ <i>Inception</i>	10%
2	Laporan Kemajuan/Interim	40%
3	Draf Laporan Akhir	20%
4	Laporan Akhir	30%
Jumlah		100%

- 5.4.1.3 Bayaran pendahuluan adalah tidak dibenarkan sama ada bagi projek pembangunan fizikal mahupun kajian.

LAMPIRAN 5A**SKALA GAJI MAKSIMUM PENGARAH (PEMILIK FIRMA)/ RAKAN KONGSI
(SHAREHOLDERS)**

TAHUN PENGALAMAN	KADAR GAJI (RM)
5	6,000
6	6,300
7	6,600
8	6,900
9	7,200
10	7,500
11	7,800
12	8,100
13	8,400
14	8,700
15	9,000
16	9,300
17	9,600
18	9,900
19	10,200
20	10,500
21	10,800
22	11,100
23	11,400
24	11,700
25	12,000
26	12,300
27	12,600
28	12,900
29	13,200
30	13,500
31 dan ke atas	13,800

LAMPIRAN 5B

**SKALA GAJI POKOK MAKSIMUM KAKITANGAN IKHTISAS
(KAKITANGAN SEMENTARA – IJAZAH SARJANA MUDA DAN KE ATAS)**

TAHUN PENGALAMAN	KADAR GAJI POKOK (RM) (Sebelum 1 Januari 2015)	KADAR GAJI POKOK (RM) (Mulai 1 Januari 2015)
Kurang setahun	2,900	3,335
1	3,000	3,450
2	3,150	3,623
3	3,300	3,795
4	3,450	3,968
5	4,000	4,600
6	4,200	4,830
7	4,400	5,060
8	4,600	5,290
9	4,800	5,520
10	5,800	6,670
11	6,100	7,015
12	6,400	7,360
13	6,700	7,705
14	7,000	8,050
15	7,300	8,395
16	7,600	8,740
17	7,900	9,085
18	8,200	9,430
19	8,500	9,775
20	9,000	10,350
21	9,300	10,695
22	9,600	11,040
23	9,900	11,385
24	10,200	11,730
25	11,200	12,880
26	11,700	13,455
27	12,200	14,030
28	12,700	14,605
29	13,200	15,180
30 dan keatas	14,200	16,330

LAMPIRAN 5C

**SKALA GAJI MAKSIMUM KAKITANGAN SEPARA IKHTISAS/ CLERK OF WORK⁷ – COW
(KAKITANGAN SEMENTARA)**

TAHUN PENGALAMAN	KADAR GAJI 1 (TANPA DIPLOMA) (Sebelum 1 Januari 2015)	KADAR GAJI 1 (TANPA DIPLOMA)⁸ (Mulai 1 Januari 2015)	KADAR GAJI 2 (DENGAN DIPLOMA) (Sebelum 1 Januari 2015)	KADAR GAJI 2 (DENGAN DIPLOMA)⁹ (Mulai 1 Januari 2015)
Kurang setahun	1,800	2,250	2,100	2,625
1	1,890	2,363	2,190	2,738
2	1,980	2,475	2,280	2,850
3	2,070	2,588	2,370	2,963
4	2,160	2,700	2,460	3,075
5	2,250	2,813	2,550	3,188
6	2,340	2,925	2,640	3,300
7	2,430	3,038	2,730	3,413
8	2,520	3,150	2,820	3,525
9	2,610	3,263	2,910	3,638
10	2,700	3,375	3,000	3,750
11	2,830	3,538	3,300	4,125
12	2,930	3,663	3,400	4,250
13	3,030	3,788	3,500	4,375
14	3,130	3,913	3,600	4,500
15	3,230	4,038	3,700	4,625
16	3,330	4,163	3,800	4,750
17	3,430	4,288	3,900	4,875
18	3,530	4,413	4,000	5,000
19	3,630	4,538	4,100	5,125
20	3,730	4,663	4,200	5,250
21	3,880	4,850	4,600	5,750
22	4,000	5,000	4,720	5,900
23	4,120	5,150	4,840	6,050
24	4,240	5,300	4,960	6,200
25	4,360	5,450	5,080	6,350
26	4,480	5,600	5,200	7,080
27	4,600	5,750	5,320	7,280
28	4,720	5,900	5,440	7,470
29	4,840	6,050	5,560	7,670
30 dan keatas	4,960.00	6,200	5,680.00	7,860

⁷ Jadual di atas adalah untuk Clerk of Work (COW) dan bukannya untuk kerani pentadbiran. Kerani Pentadbiran adalah tidak dibenarkan dituntut oleh perunding dan perlu ditanggung sendiri oleh perunding kerana sebahagiannya telah dimasukkan di dalam komponen Faktor Pengganda.

⁸ Tanpa Diploma adalah bermaksud kakitangan yang memiliki kelayakan sama ada Sijil Politeknik atau setara/STPM/SPM

⁹ Dengan Diploma adalah bermaksud kakitangan yang memiliki kelayakan Diploma yang diiktiraf oleh Jabatan Perkhidmatan Awam.

LAMPIRAN 5D

**FAKTOR PENGGANDA (FP) MAKSIMUM PERUNDING BAGI PENETAPAN YURAN
SECARA KAEDAH INPUT MASA**

	KATEGORI KAKITANGAN/PERUNDING	FAKTOR PENGGANDA	PERINCIAN KOMPONEN
A	PERUNDING TEMPATAN		
1	Kakitangan Ikhtisas Firma Yang Dilantik (kakitangan tetap/sementara)	2.7	Jadual 1 di Lampiran 5E
2	Kakitangan Separa Ikhtisas/Sokongan Teknikal Firma Yang Dilantik (kakitangan tetap/sementara)	2.1	Jadual 2 di Lampiran 5E
3	Semua Kategori Tenaga Pengajar Universiti Awam/Swasta .	2.2	Lampiran 5F
B	PERUNDING ASING		
5	Perunding Asing ¹⁰ yang <i>dioutsource</i> oleh firma yang dilantik	1.0 (berdasarkan <i>Charge Rate</i>)	Lampiran 5G
C	PERUNDING INDIVIDU		
6	Perunding Individu tempatan yang dilantik terus oleh Agensi Kerajaan	1.6	Lampiran 5H
7	Perunding Individu Asing yang dilantik terus oleh Agensi Kerajaan	1.0 (berdasarkan <i>Charge Rate</i>)	Lampiran 5G

Nota: Pindaan seperti di Lampiran 5D (PINDAAN)

¹⁰ Takrifan perunding asing hendaklah dirujuk kepada **Perenggan 20.0**.

LAMPIRAN 5D (PINDAAN)**FAKTOR PENGGANDA (FP) BAGI PENETAPAN YURAN SECARA KAEDAH INPUT MASA**

	KATEGORI KAKITANGAN/PERUNDING	FAKTOR PENGGANDA YANG DIPERSETUJUI BAGI KONTRAK INI
A	PERUNDING TEMPATAN	
1	Kakitangan Ikhtisas Firma Yang Dilantik (kakitangan tetap/sementara)	2.5
2	Kakitangan Separa Ikhtisas/Sokongan Teknikal Firma Yang Dilantik (kakitangan tetap/sementara)	2.0
3	Semua Kategori Tenaga Pengajar Universiti Awam/Swasta .	2.1

LAMPIRAN 5E

JADUAL 1 : KOMPONEN FP BAGI KAKITANGAN IKHTISAS FIRMA

Component for Multiplier	Component Ratio
A. Benefits of Named Employee	
Salary	1.00
Bonus, Allowance, Perks & Leave	0.37
EPF/SPF	0.11
SOCSSO	0.01
Training	0.02
Subscription to professional bodies, permits and licenses	0.05
Health and medical benefits	0.03
Retirement/superannuation funds	0.03
B. Firm's Overhead	
Rental	0.10
Group Insurance	0.05
Utilities and office supplies	0.05
IT hardware/ network	0.03
Software	0.04
Systems (e.g. ISO, library)	0.02
Professional services including secretarial, audit and legal	0.04
Salaries of non-billable staff including administrative/directors	0.20
Research and development	0.02
Depreciation/amortization	0.07
Cost of capital	0.10
Profit before tax	0.20
Others	0.16
TOTAL	2.70

JADUAL 2 : KOMPONEN FP BAGI KAKITANGAN SEPARA IKHTISAS/SOKONGAN TEKNIKAL FIRMA

Component for Multiplier	Component Ratio
A. Benefits of Named Employee	
Salary	1.00
Bonus, Allowance, Perks & Leave	0.15
EPF/SPF	0.11
SOCSSO	0.02
Training	0.01
Health and medical benefits	0.02
B. Firm's Overhead	
Rental	0.04
Group Insurance	0.03
Utilities and office supplies	0.04
IT hardware/ network	0.01
Software	0.03
Systems (e.g. ISO, library)	0.01
Professional services including secretarial, audit and legal	0.02
Salaries of non-billable staff including administrative/directors	0.17
Depreciation/amortization	0.07
Cost of capital	0.10
Profit before tax	0.20
Others	0.07
TOTAL	2.10

LAMPIRAN 5F

**KOMPONEN FP BAGI SEMUA KATEGORI TENAGA PENGAJAR UNIVERSITI
AWAM/SWASTA**

Component for Multiplier	Component Ratio
A. Benefits of Named Employee	
<i>Salary</i>	1.00
<i>Incentive & Leave</i>	0.50
<i>Research and Development</i>	0.05
B. University Consultancy Bureau's fee	0.30
C. Firm's Overhead	
<i>Utilities and office supplies</i>	0.05
<i>IT hardware</i>	0.03
<i>Profit</i>	0.20
<i>Others</i>	0.07
TOTAL	2.20

NOT APPLICABLE

LAMPIRAN 5G

JADUAL 1 : KOMPONEN CHARGE RATE BAGI PERUNDING ASING

Component for Charge Rate¹	
1. Salary	
2. Social Charges	
3. Overhead	
4. Consultant's Fee	
5. Other Costs	
6. Leave	
TOTAL 1.00	

NOT APPLICABLE

¹ Sila rujuk **Lampiran 20A** bagi penetapan peratus kepada komponen-komponen *charge rate*.

LAMPIRAN 5H

**KOMPONEN FP BAGI PERUNDING INDIVIDU TEMPATAN YANG DILANTIK TERUS OLEH
AGENS KERAJAAN**

<i>Component for Multiplier</i>	<i>Component Ratio</i>
<i>Salary (based on current basic salary or last drawn basic salary for retiree)</i>	1.00
<i>Handling & Administratives</i>	0.50
<i>Research and Development</i>	0.05
<i>Others</i>	0.05
TOTAL	1.60

LAMPIRAN 5I

TUNTUTAN KOS IMBUHAN BALIK PERUNDING YANG DIBENARKAN

BUTIRAN		ASAS DAN KADAR BAYARAN
A	KOS PENGANGKUTAN/ PERJALANAN	
A1	Tiket Penerbangan Tempatan/Antarabangsa	1. Jumlah penerbangan hendaklah dihadkan kepada bilangan yang perlu sahaja, mengikut tugas khusus setiap perunding. Bagi tujuan ini Jadual Tugas (<i>manning schedule</i>) yang disediakan oleh perunding bolehlah dijadikan panduan bagi penetapan had jumlah penerbangan. 2. Pakar perunding asing yang semasa melaksanakan tugasnya dan perlu menginap di negara ini bagi tempoh 12 bulan atau lebih secara terus menerus, boleh dibenarkan membawa isteri dan tiga (3) orang anak yang berumur di bawah 18 tahun dengan syarat tempoh penginapan mereka di negara ini tidak kurang dari 3 bulan. Bagi tugas yang menjangkau tempoh 30 bulan secara terus menerus, perunding asing ini dibenarkan tambahan satu (1) penerbangan pergi-balik termasuk isteri dan tiga (3) orang anak mereka selepas menyempurnakan tempoh perkhidmatan 24 bulan. 3. Penerbangan hendaklah dihadkan kepada kelas ekonomi sahaja. Penerbangan hendaklah menggunakan jalan paling dekat (<i>the most direct route</i>) dan tambang termurah dengan menggunakan perkhidmatan syarikat penerbangan tempatan yang telah diluluskan oleh Kerajaan dari semasa ke semasa. 4. Bayaran adalah bagi penerbangan pergi balik (<i>local/or international-bound flights</i>) mengikut kadar tambang sebenar yang dikenakan oleh syarikat penerbangan berkenaan. Sekiranya terdapat diskaun pada harga pembelian (promosi dan sebagainya), harga diskaun tersebut hendaklah digunakan bagi tujuan pembayaran.

BUTIRAN		ASAS DAN KADAR BAYARAN
A2	Lain-lain Perbelanjaan Berkaitan Dengan Perjalanan	1. Lain-lain perbelanjaan yang berkaitan dengan para A1 boleh dibenarkan termasuk perbelanjaan tambang teksi dari rumah ke lapangan terbang (<i>vice-versa</i>), bayaran visa, permit perjalanan, tol, parkir dan lain-lain. 2. Kadar bayaran hendaklah mengikut kadar sebenar (<i>bill</i>) bagi setiap butiran. 3. Bagi tuntutan tol yang menggunakan Touch & Go dan Smart Tag, perunding tidak perlu mengemukakan resit, sebaliknya adalah memadai tuntutan tersebut dikemukakan bersama dengan surat-surat panggilan mesyuarat. Kadar tol boleh disemak melalui laman web pemegang konsesi lebuh raya (contohnya: PLUS, MEX dan lain-lain).
A3	Tuntutan Perjalanan Kenderaan (<i>Mileage Claims</i>)	1. Perunding dibenarkan menggunakan kenderaan sendiri dan membuat tuntutan perjalanan bagi tugas-tugas rasmi yang dibuat semasa pelaksanaan projek. Kemudahan ini perlu dihadkan kepada perjalanan jarak dekat sahaja, manakala bagi perjalanan jarak jauh perunding digalakkan menggunakan kemudahan pengangkutan awam yang mana lebih menjimatkan. 2. Perunding yang telah disediakan kemudahan kenderaan atau menyewa kenderaan, tidak dibenarkan untuk membuat tuntutan perjalanan kenderaan. 3. Tuntutan <i>mileage</i> perjalanan hendaklah tertakluk kepada kadar sebagaimana ditetapkan dalam peraturan semasa yang dikeluarkan oleh Kementerian Kewangan. 4. Perunding yang menggunakan kenderaan sendiri untuk bertugas di satu tempat sahaja yang jaraknya melebihi 240 km daripada Ibu Pejabatnya dan terdapat perkhidmatan terus kapal terbang atau kereta api layak menuntut tambang gantian mengikut kadar tambang pengangkutan yang sesuai dengan kelayakannya, iaitu Tambang Gantian tersebut hendaklah bersamaan dengan tambang kapal terbang atau kereta api, mengikut mana yang berkenaan dengan syarat dinyatakan di dalam baucar tuntutan yang ia telah menggunakan kenderaannya sendiri; dan 5. Perunding yang menuntut Tambang Gantian tidak layak menuntut apa-apa tambang atau bayaran tambahan yang bersabit dengan perjalanan kapal terbang atau kereta api seperti tambang dari rumah

BUTIRAN		ASAS DAN KADAR BAYARAN										
		ke lapangan terbang/stesen kereta api dan sebaliknya, tambang dari lapangan terbang/stesen kereta api ke tempat penginapan dan sebaliknya, bayaran Cukai Lapangan Terbang atau bayaran tempat tidur dalam kereta api (<i>berth charges</i>).										
A4	Tambang Teksi	1. Perunding dibenarkan menuntut tambang teksi mengikut keperluan projek. 2. Walau bagaimanapun, Agensi hendaklah memastikan tuntutan ini tidak bertindih dengan tuntutan perjalanan kenderaan seperti di A3. 3. Anggaran tuntutan tambang teksi hendaklah tidak melebihi RM1,000 sebulan.										
A5	Sewa Kenderaan	1. Sewaan kenderaan hanya dibenarkan sekiranya terdapat keperluan khusus mengikut kesesuaian projek dan mendapat persetujuan Agensi terlebih dahulu. 2. Jenis kenderaan adalah meliputi kereta, van, pacuan empat roda, bot, helikopter dan sebagainya mengikut kesesuaian dan keperluan projek. 3. Sewaan kenderaan boleh meliputi elaun pemandu, kos bahan api, kos penyelenggaraan dan sebagainya bergantung kepada rundingan yang diadakan, sebut harga bolehlah diminta untuk menentukan kos sewaan sebenar. 4. Bagi tujuan anggaran, kadar berikut (termasuk elaun pemandu, bahan api, penyelenggaraan dan sebagainya) hendaklah berdasarkan kadar maksimum berikut : <table><tr><td>Kereta</td><td>RM1,800-RM3,500 sebulan</td></tr><tr><td>Pacuan 4 roda</td><td>RM3,500-RM6,000 sebulan</td></tr><tr><td>Van</td><td>Kadar sebenar</td></tr><tr><td>Helikopter</td><td>Kadar sebenar</td></tr><tr><td>Bot</td><td>Kadar sebenar</td></tr></table>	Kereta	RM1,800-RM3,500 sebulan	Pacuan 4 roda	RM3,500-RM6,000 sebulan	Van	Kadar sebenar	Helikopter	Kadar sebenar	Bot	Kadar sebenar
Kereta	RM1,800-RM3,500 sebulan											
Pacuan 4 roda	RM3,500-RM6,000 sebulan											
Van	Kadar sebenar											
Helikopter	Kadar sebenar											
Bot	Kadar sebenar											
B	ELAUN PENGINAPAN DAN SARA HIDUP											
B1	Perunding Tempatan	1. Bagi perunding yang menjalankan tugas rasmi di luar kawasan yang (melebihi 25 km dari ibu pejabat firma) dan perlu menginap layak menuntut bayaran sewa hotel yang disokong dengan resit atau elaun lojing mengikut kadar-kadar seperti dalam jadual di bawah:										

BUTIRAN		ASAS DAN KADAR BAYARAN																											
		<table><tr><td rowspan="2"></td><td colspan="2">Ikhtisas</td><td colspan="2">Separa Ikhtisas</td></tr><tr><td>S.M'sia (RM)</td><td>Sbh/Swk (RM)</td><td>S.M'sia (RM)</td><td>Sbh/Swk (RM)</td></tr><tr><td>Hotel</td><td>250</td><td>270</td><td>190</td><td>210</td></tr><tr><td>Lojing</td><td>60</td><td>80</td><td>40</td><td>60</td></tr><tr><td>Elaun Makan</td><td>60</td><td>80</td><td>40</td><td>60</td></tr></table>					Ikhtisas		Separa Ikhtisas		S.M'sia (RM)	Sbh/Swk (RM)	S.M'sia (RM)	Sbh/Swk (RM)	Hotel	250	270	190	210	Lojing	60	80	40	60	Elaun Makan	60	80	40	60
			Ikhtisas		Separa Ikhtisas																								
			S.M'sia (RM)	Sbh/Swk (RM)	S.M'sia (RM)	Sbh/Swk (RM)																							
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		Lojing	60	80	40	60																							
		Elaun Makan	60	80	40	60																							
2. Kadar sewa hotel di atas adalah merupakan kadar maksimum yang dibenarkan. Bayaran kepada perunding hendaklah mengikut kadar sebenar yang dikenakan oleh pihak hotel, tertakluk kepada had maksimum yang ditetapkan. Sebagai tambahan kepada kadar berkenaan, perunding juga layak menuntut apa-apa cukai yang perlu dibayar berkaitan dengan sewaan hotel tersebut.																													
3. Bagi perunding yang menjalankan tugas di luar pejabat bagi tempoh yang melebihi 8 jam tetapi tidak mencapai tempoh 24 jam, mereka boleh dibayar elaun harian dengan kadar separuh daripada kelayakan elaun makan mereka.																													
4. Agensi hendaklah menasihati perunding agar mendapatkan kadar promosi/<i>internet rate</i> bagi penginapan hotel.																													
B2	Kakitangan Tapak	<u>ELAUN TAPAK</u> 1. Perunding tidak dibenarkan menuntut lain-lain kos imbuhan balik kecuali elaun tapak untuk kakitangan yang ditempatkan di tapak bagi menjalankan kerja-kerja pengawasan atau penyeliaan projek. Kadar elaun tapak adalah <u>ditetapkan</u> seperti berikut: <table><tr><td>Kakitangan</td><td>Sem. Malaysia (RM)</td><td>Sabah/ Sarawak (RM)</td></tr><tr><td>Ikhtisas</td><td>800 sebulan</td><td>950 sebulan</td></tr><tr><td>Separa Ikhtisas/ Sokongan</td><td>650 sebulan</td><td>800 sebulan</td></tr></table>				Kakitangan	Sem. Malaysia (RM)	Sabah/ Sarawak (RM)	Ikhtisas	800 sebulan	950 sebulan	Separa Ikhtisas/ Sokongan	650 sebulan	800 sebulan															
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BUTIRAN		ASAS DAN KADAR BAYARAN						
		<u>KOS PENGIKLANAN PENGAMBILAN KAKITANGAN TAPAK</u> 1. Perunding dibenarkan menuntut kos iklan bagi pengambilan kakitangan tapak. Kadar bayaran hendaklah mengikut kadar sebenar (bil) bagi setiap iklan.						
B3	Perunding Asing	1. Perunding asing boleh dibayar elaun <i>per diem</i> bagi tujuan menampung perbelanjaan penginapan dan sara hidup semasa menjalankan tugas di negara ini untuk tempoh tidak melebihi 3 bulan. Elaun ini dikira mulai dari hari pertama beliau tiba sehingga ke hari berlepas pulang selepas menyempurnakan tugas rasmi beliau dalam tempoh tersebut. 2. Kadar elaun <i>per diem</i> adalah seperti berikut: <table><tr><th>Tempoh</th><th>S.M'sia/Sabah/Sarawak (RM)</th></tr><tr><td>60 hari yang pertama</td><td>310 sehari</td></tr><tr><td>Hari-hari yang berikut</td><td>170 sehari</td></tr></table> 3. Dalam keadaan di mana perunding asing perlu berada di Negara ini untuk satu jangka masa yang panjang, kaedah yang lebih menjimatkan hendaklah digunakan sebagai alternatif kepada bayaran elaun <i>per diem</i>. Umpamanya, pihak agensi boleh menyediakan tempat tinggal dengan membayar sewa dan kos utiliti yang berkaitan. Pada kebiasaannya, ditetapkan secara rundingan. 4. Bagi perunding asing yang dikehendaki menjalankan tugas di luar daripada pejabat/tempat tinggal yang disediakan kepadanya, beliau boleh menuntut bayaran penginapan, perjalanan dan sebagainya mengikut kadar seperti yang dibenarkan kepada perunding tempatan. 5. Walau bagaimanapun, beliau tidak layak menerima elaun sara hidup kerana ia sudah termasuk di dalam elaun <i>per diem</i> yang diberikan.	Tempoh	S.M'sia/Sabah/Sarawak (RM)	60 hari yang pertama	310 sehari	Hari-hari yang berikut	170 sehari
Tempoh	S.M'sia/Sabah/Sarawak (RM)							
60 hari yang pertama	310 sehari							
Hari-hari yang berikut	170 sehari							
C	Kos Perhubungan	1. Termasuk perbelanjaan telefon, faks, emel dan perkhidmatan penghantaran (pos, kurier dsb). Kos yang dibenarkan hendaklah mengambil kira faktor-faktor seperti tempoh pelaksanaan projek,						

BUTIRAN		ASAS DAN KADAR BAYARAN
		kompleksiti projek dan keperluan perhubungan dalam dan luar negeri. 2. Kadar bayaran hendaklah berdasarkan bil sebenar setiap butiran berkaitan. Jumlah keseluruhan bagi kos perhubungan tertakluk kepada had bayaran maksimum sebanyak RM 1,500 sebulan. 3. Bayaran boleh dibenarkan secara <i>lump sum</i> di mana perunding tidak perlu mengemukakan bil bagi maksud pembayaran tertakluk kepada rundingan tetapi tidak melebihi RM750 sebulan.
D	Kos Dokumentasi Dan Penyediaan Laporan	1. Meliputi perbelanjaan bagi penyediaan dan percetakan dokumen atau laporan dan lain-lain berkaitan. 2. Jenis, kualiti dan bilangan laporan yang dikehendaki perlu dinyatakan secara jelas di dalam Terma Rujukan projek/kajian Kerajaan. Selain itu, saiz dokumen atau bilangan pelan yang perlu disertakan (di mana berkenaan) perlu juga diambil kira dalam penentuan kos ini. 3. Kos dokumentasi boleh juga ditentukan mengikut harga dokumen yang digunakan atau aktiviti yang terlibat seperti fotostat, lukisan, penjilidan dan lain-lain. Kadar hendaklah berdasarkan bil sebenar daripada syarikat percetakan atau pembekal di mana berkenaan. 4. Bagi dokumen yang memerlukan ciri khusus dari segi jenis (<i>hardcopy/softcopy</i>), warna, saiz dan bilangan, kadar hendaklah berdasarkan bil sebenar dengan persetujuan dan pengesahan Agensi. 5. Bagi dokumen yang disiapkan sendiri oleh perunding, kadar boleh ditetapkan mengikut kadar pasaran semasa. Harga pasaran semasa telah pun mengambil kira keperluan percetakan seperti kertas, toner, <i>binding</i> dan sebagainya. 6. Bagi laporan projek pembangunan fizikal yang perlu disertakan dengan model atau dalam bentuk multimedia dsb, kadar hendaklah berdasarkan bil sebenar dengan persetujuan dan pengesahan Agensi. 7. Bagi pelan yang perlu dikemukakan untuk kelulusan pihak berkuasa tempatan dan dikenakan bayaran, perunding boleh mengemukakan tuntutan tersebut berdasarkan bil sebenar.

BUTIRAN		ASAS DAN KADAR BAYARAN
E	Aset Projek	1. Pembelian aset termasuk peralatan dan kelengkapan projek tidak dibenarkan. Firma perunding yang dilantik sepatutnya mempunyai peralatan dan kemudahan asas yang mencukupi bagi mengendalikan projek Kerajaan. Ini bagi mengelakkan bayaran dua kali di mana kos ini merupakan sebahagian daripada <i>overhead</i> firma dan telah diambil kira dalam faktor pengganda. 2. Dalam keadaan yang amat memerlukan, peralatan dan kelengkapan projek hendaklah diperolehi (melalui pembelian atau sewaan) dan mesti diurus oleh agensi berkenaan mengikut tatacara perolehan yang berkuatkuasa dan dihadkan kepada jumlah yang diperlukan bagi maksud pelaksanaan projek berkenaan sahaja. Perunding perlu memulangkan semula semua aset dan peralatan ini kepada agensi pelaksana setelah tempoh perkhidmatan mereka tamat. Aset yang dibeli adalah hak milik Kerajaan. 3. Perunding tidak dibenarkan menguruskan sendiri perolehan bagi sebarang aset atau peralatan projek dan Kerajaan tidak akan membayar apa jua tuntutan bagi perolehan tersebut. 4. Pembelian perisian asas komputer (<i>basic computer software</i>) juga tidak dibenarkan. Bagi perisian komputer yang khusus umpamanya perisian teknikal (<i>technical software</i>), agensi bolehlah menimbangkan pembelian tersebut namun hendaklah dipertimbangkan dengan teliti dengan mengambil kira keperluan penggunaannya, kos belian atau sewaan, lesen atau yuran penggunaan tahunan (<i>copyright fee</i>) dan sebagainya. Pembelian ini mesti diuruskan oleh agensi. 5. Bagi perolehan data/peta/lukisan (sama ada dalam bentuk hardcopy/softcopy) yang akan digunakan untuk tujuan kajian/projek, perunding dibenarkan untuk memperolehinya sendiri dan membuat tuntutan daripada Agensi tertakluk persetujuan Agensi. Agensi hendaklah memastikan data/peta/lukisan yang diperolehi oleh perunding tersebut dikembalikan dan menjadi hak milik Kerajaan.
F	Ujian Teknikal Dan Lain-Lain Ujian	1. Ujian bahan (<i>material test</i>), ujian model (<i>modelling test</i>) dan lain-lain ujian teknikal boleh dibenarkan mengikut keperluan projek. Walau bagaimanapun, sekiranya dalam melaksanakan sesuatu ujian, perunding menggunakan khidmat kepakaran dari syarikat lain seperti ujian EIA dan lain-lain ujian makmal, perolehan perkhidmatan tersebut hendaklah

BUTIRAN		ASAS DAN KADAR BAYARAN
		diuruskan oleh Agensi mengikut dasar dan peraturan perolehan Kerajaan. 2. Bayaran bagi kos ujian (bahan dan sewaan) hendaklah disokong dengan bil dan dokumen belian di samping pengesahan dari agensi Kerajaan yang bertanggungjawab di dalam bidang berkenaan.
G	Kos Sewaan Pejabat Dan Utiliti	1. Keperluan ini hanya dibenarkan bagi pejabat di tapak projek dengan syarat ianya tidak disediakan oleh kontraktor atau bagi firma perunding asing yang dilantik bagi pelaksanaan sesuatu projek/kajian. 2. Tuntutan ini adalah merupakan sewa bulanan yang merangkumi kos sewaan pejabat dan bil-bil utiliti.
H	Kos Bagi Menjalankan Kajian Selidik	1. Bagi projek yang memerlukan kaji selidik, kos yang berkaitan dengan urusan ini boleh dibenarkan. Kadar bayaran bergantung kepada kaedah yang digunakan seperti berikut: i. Kadar mengikut bilangan soal selidik: -maksimum RM12 /soal selidik; atau ii. Kadar mengikut bilangan penemuduga (<i>enumerators</i>) : -maksimum RM60 sehari; atau iii. Bagi penemuduga terlatih/berjawatan tetap: -maksimum RM1,200 sebulan 2. Lain-lain kaedah (termasuk penggunaan multimedia), kadar boleh dirundingkan mengikut kadar sebenar, <i>lump sum</i> dan sebagainya. 3. Ketua penemuduga bergantung pada kelayakan dan pengalaman: - RM1,200 sehingga RM2,500 sebulan 4. Kaedah yang paling sesuai dan menjimatkan hendaklah digunakan dalam melaksanakan urusan kaji selidik ini.

LAMPIRAN 5J

**KATEGORI KOMPLEKSITI KERJA / PROJEK MENGIKUT BIDANG PERKHIDMATAN
KEJURUTERAAN AWAM**

Bil	Kategori	Jenis Kerja/Projek
1.	<u>Class I</u>	1. Airports with extensive terminal facilities 2. Water, waste water, and solid/liquid waste treatment and disposal plants 3. Bridges which are asymmetric or are otherwise complicated 4. Thermal/nuclear power plants 5. Large dams or complicated small dams, reservoirs and water towers 6. Urban and suburban arterial streets 7. Grade crossing eliminations 8. Highway and railway tunnels 9. Pumping stations 10. Major incinerators 11. Large intercepting and relief sewers 12. Marine works and terminal facilities, dry docks, jetties, quays and wharves 13. Heavy foundations, piling and coffer dams 14. Large sports stadia, swimming pools, grandstands, marinas and zoo 15. Large hangers 16. Major irrigation and drainage structures and large water distribution networks 17. Oil tanks, refineries and collieries 18. Off-shore installations, and satellite stations 19. Underground structures 20. Fortifications and defence works 21. Gantries 22. Silos and tall chimneys 23. Causeways 24. Shipyards 25. Bulk handling installations 26. Mass rapid transit works 27. Major and complicated coastal protection works 28. Barrages and other major hydraulic structures 29. Breakwaters
2.	<u>Class II</u>	1. Public and office buildings 2. Industrial buildings, warehouse, garages, hangers and comparable structures 3. Bridges and other structures of conventional design 4. Simple waterfront facilities 5. Railways 6. Rural roads JKR 01 standard and private streets 7. Embankments, flood walls and retaining walls 8. Small dams and small reservoirs 9. Sewers and water tunnels (free-air) 10. Storm sewers and drains 11. Sanitary sewers 12. Water distribution lines and hot/cold water services 13. Irrigation and drainage works, except pumping and major works under Class I 14. Airports except as classified in Class I works 15. Transmission and other towers 16. Light foundations including piling 17. Flood mitigation, urban drainage, river & coastal engineering works

Bil	Kategori	Jenis Kerja/Projek
3.	<u>Class III</u>	1. Mass earthworks and site clearing 2. Dredging reclamation works 3. Gravity retaining walls and gabions 4. Subsoil drainage and turfing 5. Road pavement, parade grounds and hardstands 6. Roadside furniture 7. Minor drainage culverts 8. Residential and shophouse buildings not exceeding 4 storeys in height 9. Standard sub-stations 10. Proprietary standard beams, trusses, etc 11. Prefabricated structures 12. Farm roads and village/estate roads

LAMPIRAN 5K

**KATEGORI KOMPLEKSITI KERJA / PROJEK MENGIKUT BIDANG PERKHIDMATAN
KEJURUTERAAN MEKANIKAL/ELEKTRIKAL**

Bil	Kategori	Jenis Kerja/Projek
1.	<u>Class I</u>	1. Fire fighting and prevention systems 2. Air-conditioning and mechanical ventilation systems 3. Refrigeration and cold stores system 4. Lighting, power and electrical distribution systems 5. Generating plant installations 6. Water treatment and filtration (mechanical & electrical systems) 7. Stage lighting systems 8. Design of pressure vessels 9. Pollution control (mechanical & electrical systems) 10. Plant and production systems including layout 11. Cable cars systems 12. Bulk liquid and solid handling storage systems
2.	<u>Class II</u>	1. Electrical load dispatching and control systems 2. Abattoir plants 3. Steam generating systems 4. Hot and cold water systems 5. Compressed air systems 6. Medical vacuum piping 7. Medical gas services 8. Cooling water systems 9. L.P. gas systems 10. Telephone distribution and intercommunication systems 11. Lighting protection systems 12. Electrical no break lighting systems 13. Stage mechanism 14. Heating and thermal installations 15. Electrical substations 16. Street lighting 17. Public address systems, personal location and call systems and radio and T.W. systems 18. Security systems 19. Food preparation, cooling, conveying and surveying systems 20. Transmission lines 21. Vacuum system
3.	<u>Class III</u>	1. Lifts, hoists, dumbwaiters and escalators 2. Laundry equipment and services 3. Sterilising and bed pan washing or disposal equipment 4. Standby generators 5. Clock installations 6. X-ray equipments 7. Pneumatics tube conveyor systems 8. Conveyors 9. Solid waste collection and disposal systems 10. Quarry and mining installations 11. Surgical lighting 12. Lighting fittings

LAMPIRAN 5L

**KATEGORI KOMPLEKSITI KERJA / PROJEK MENGIKUT BIDANG PERKHIDMATAN
ARKITEK**

Bil	Kategori	Jenis Kerja/Projek
1.	<u>Category 1</u> Building of exceptional character and complexity	1. Air Terminal buildings 2. Abbatoirs 3. Chancery Buildings 4. Embassy Buildings 5. Ferry terminal buildings 6. Hospital (service, teaching, central-support units or departments to hospitals) 7. Individually designed houses 8. Legislative buildings 9. Mausoleums 10. Memorials 11. Monuments 12. Museums 13. Observatories 14. Palaces
2.	<u>Category 2</u> Buildings of average complexity requiring a moderate degree of design and detailing	1. Aquaria 2. Art galleries 3. Assembly halls 4. Auditorium 5. Bakeries 6. Banks 7. Bowling alleys 8. Car parking structure (multi-storey) 9. Cinema halls 10. Club houses 11. College buildings 12. Concert halls and facilities 13. Court houses 14. Crematorium 15. Cafeteria & canteens 16. Civic centres 17. Community centres 18. Departments stores 19. Exhibitions/exposition buildings 20. Fire stations 21. Flats (block of)/Apartments buildings 22. Gymnasium 23. Hotels 24. Housing estates 25. Industrial buildings with manufacturing and packaging facilities 26. Kindergartens 27. Libraries 28. Marinas 29. Markets 30. Medical & Health clinics 31. Mixed Residential/Commercial Complexes 32. Motels 33. Nursing homes 34. Office buildings 35. Petrol service stations 36. Prisons 37. Post offices

Bil	Kategori	Jenis Kerja/Projek
		38. Police stations 39. Prefabricated structures 40. Power stations 41. Recreational building and facilities 42. Restaurants 43. Road transportation terminal buildings 44. Religious buildings 45. Research buildings 46. School buildings (other than Government Primary and Secondary where standard plans are used) 47. Shophouses 48. Shopping centres/complexes 49. Skating rinks (covered/ice/roller) 50. Sport buildings 51. Stadium 52. Supermarkets 53. Telephone exchange buildings 54. University buildings 55. Veterinary clinics
3.	<u>Category 3</u> Buildings of the simplest utilitarian character	1. Car ports (single storey) 2. Farm buildings 3. School buildings (Government where standard Primary and Secondary –plans are used) 4. Simple industrial type buildings 5. Storage or warehouse buildings

LAMPIRAN 5M**KATEGORI KOMPLEKSITI KERJA / PROJEK MENGIKUT BIDANG PERKHIDMATAN UKUR BAHAN****1. Untuk Kerja Bangunan/Senibina**

Bil	Kategori	Jenis Kerja/Projek
1.	<u>Category A</u>	1. Semi-detached and detached houses 2. Terrace and link houses 3. Cluster houses 4. Shophouses 5. Flats not exceeding 4½ storeys.
2.	<u>Category B</u>	1. Multi-storey flats 2. Maisonettes (over 4 ½ storeys) 3. Condominiums flats 4. Multi-storeys carparks 5. Hangars 6. Warehouses 7. Factories 8. Army camps and barracks 9. Hostels 10. Schools 11. Petrol service stations 12. Markets 13. Bakeries 14. Fire stations 15. Laundries 16. Packing and processing plants 17. Banks 18. Office buildings 19. Libraries 20. Hospitals and nursing homes 21. Sports complexes 22. Laboratories 23. Airport terminals and ancillary buildings 24. Halls (all types) 25. University and college buildings 26. Hotels 27. Motels 28. Abbatoir Crematoriums 29. Commercial complexes 30. Cinemas 31. Theatres 32. Prisons 33. Museums 34. Court houses 35. Bowling alleys 36. Breweries 37. Cold storage buildings 38. Health centres 39. Restaurants 40. Skating rinks 41. Individually designed houses 42. Private clubs 43. Transportation terminal buildings 44. Mosques

Bil	Kategori	Jenis Kerja/Projek
		45. Churches 46. Temples 47. Palaces 48. Mausoleums 49. Memorials 50. Monuments 51. Research buildings 52. Observatories and marinas 53. Other buildings of exceptional character and complexity
3	<u>Category C</u>	1. Extension, alteration, restoration and associated demolition works

2. Untuk Kerja Kejuruteraan Awam

Bil	Kategori	Jenis Kerja/Projek
1.	<u>Category I</u>	1. General Civil Engineering Works e.g. roads, drains, earthworks, water reticulation, etc.
2.	<u>Category II</u>	1. Reinforced concrete works, structural steel works and buildings forming part of the civil engineering contracts such as bridges, jetties, ports etc.

SCHEDULE OF RATES

- Bill 1 - General Conditions & Preliminaries**
- Bill 2 - Deep Boring With Boring Plants**
- Bill 3 - Deep Sounding And Piezocone**
- Bill 4 - Other Field Tests**
- Bill 5 - Collection of Soil And Water Samples In Bulk**
- Bill 6 - Laboratory Tests**
- Bill 7 - Material Testing**
- Bill 8 - Detailed Engineering Survey**
- Bill 9 - Geophysical Survey**
- Bill 10 - Surface Mapping**
- Bill 11 - Instrumentation & Monitoring**
- Bill 12 - Terrestrial Laser Scanner (TLS)**
- Bill 13 - Unmanned Aerial Vehicle (UAV)**

BILL 1: GENERAL CONDITION & PRELIMINARIES

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
1.0	<u>General Conditions and Preliminaries</u>		
1.1	Allow for compliance with the all the terms and conditions of Quotation and Specifications	LS	1,300.00
1.2	Allow for compliance with the following:- a Liaison with the relevant authorities b Prepare and arrange laboratory testing c Setting out d Safety and convenience of the public e Water Supply f Electrical Power Supply g Normal access h Storage facilities i Workmen's accommodation j Removal of improper plant k Damage of overhead and underground mains and services l Clearance of site on completion m Submission of report	LS	1,400.00
1.3	Allow for Licensed Survey for the purpose of setting out exploration location, reduce level, survey coordinate (x,y) and final survey of as built location.	No.	210.00
1.4	Extra over item 1.3 for survey over water	No.	320.00
1.5	Construction borehole markers, including exposed 50 mm diameter PVC pipe, concrete base 300mm x 300mm x 200mm, clear and permanent marking	No.	75.00
1.6	To provide tools, equipments and system for Central Database or Repository Centre for slopes	Prov. Sum	5.0 juta

BILL 2 : DEEP BORING WITH BORING PLANTS

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
	<u>NOTES : All tests are referred to MS 1056:2005 and MS 2038:2006, unless otherwise stated</u>		
2.0	<u>Mobilisation & demobilisation of boring plant</u>		
2.1	<u>Mobilisation of boring plant and ancillaries to the site and demobilisation upon completion</u>		
2.1.1	Up to 25km from nearest regional base	LS	1,500.00
2.1.2	Over 25km and up to 75km from nearest regional base	LS	2,800.00
2.1.3	Over 75km and up to 125km from nearest regional base	LS	3,400.00
2.1.4	Over 125km and up to 175km from nearest regional base	LS	4,000.00
2.1.5	Over 175km and up to 225km from nearest regional base	LS	4,500.00
2.1.6	Over 225km and up to 275km from nearest regional base	LS	5,000.00
2.1.7	Over 275km and up to 325km from nearest regional base	LS	5,500.00
2.1.8	Over 325km and up to 375km from nearest regional base	LS	6,000.00
2.1.9	Over 375km and up to 425km from nearest regional base	LS	6,500.00
2.1.10	Over 425km and up to 475km from nearest regional base	LS	7,000.00
2.1.11	Over 475km and up to 525km from nearest regional base	LS	7,500.00
2.1.12	Over 525km from nearest regional base	LS	8,000.00
2.1.13	Pulau Labuan	LS	6,500.00
2.1.14	Pulau Bangi	LS	14,000.00
2.1.15	Extra over items 2.1.1 to item 2.1.12 above for top drive boring plant.		
2.1.16	Extra over Item 2.1.1 for transportation from mainland if the sites are located other than the above two islands off the coast or within lakes in Sabah and Sarawak		
	At Cost plus 5% (Overhead) (Evidence in the form of receipts for cost incurred shall be submitted together with claims)	LS	Cost + 15%

BILL 2 : DEEP BORING WITH BORING PLANTS (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
2.1.17	<u>NOTES : All tests are referred to MS 1056:2005 and MS 2038:2006, unless otherwise stated</u> For Sarawak Only If the site is in the following areas which is accessible by boat/ship only :- 1) Sampadi / Lundu Area 2) Bako Area 3) Beliong / Samarahan Area 4) Sebuyau Area 5) Lingga Area 6) Maludam Area 7) Tg.Manis / Balawal Area 8) Mato / Daro Area 9) Song / Kapit Area 10) Tabau / Tatau Area 11) Balaga Area 12) Marudi Area 13) Long Lama Area 14) Limbang Area 15) Lawas Area	(per machine/team) LS LS LS LS LS LS LS LS LS LS LS LS LS LS	8,000.00 8,000.00 8,000.00 10,000.00 12,000.00 12,000.00 10,000.00 13,000.00 10,000.00 20,000.00 30,000.00 17,000.00 20,000.00 12,000.00 14,000.00
2.1.18	Extra over item 2.1 if work at the sites require the river transport to be stationed permanently at site during duration of the work for either Boreholes or CPT	per BH	600.00

BILL 2 : DEEP BORING WITH BORING PLANTS (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
2.2	Provision of staging over swampy ground / shallow water	No.	5,600.00
2.3	Provision of drum pontoon over water	No.	7,900.00
2.4	<u>Setting up and shifting of Boring Plant</u>		
	Move the boring plant to the test position including setting up and dismantling upon completion of borehole where the site is on:-		
2.4.1	Flat Land		
2.4.1.1	Distance up to 100m	No.	490.00
2.4.1.2	Distance over 100m up to 500m	No.	660.00
2.4.1.3	Distance over 500m	No.	960.00
2.4.2	Undulating Land		
2.4.2.1	Distance up to 100m	No.	720.00
2.4.2.2	Distance over 100m up to 500m	No.	1,200.00
2.4.2.3	Distance over 500m	No.	1,700.00
2.4.3	On Slope		
2.4.3.1	Distance up to 100m		
2.4.3.1.1	Degree 0-30	No.	1,200.00
2.4.3.1.2	Degree 31-45	No.	1,700.00
2.4.3.1.3	Degree 46 and above	No.	2,200.00
2.4.3.2	Distance over 100m up to 500m		
2.4.3.2.1	Degree 0-30	No.	1,800.00
2.4.3.2.2	Degree 31-45	No.	2,300.00
2.4.3.2.3	Degree 46 and above	No.	2,800.00
2.4.3.3	Distance over 500m		
2.4.3.3.1	Degree 0-30	No.	2,400.00
2.4.3.3.2	Degree 31-45	No.	2,900.00
2.4.3.3.3	Degree 46 and above	No.	3,400.00
2.4.4	Swampy Ground		
2.4.4.1	Distance up to 100m	No.	1,500.00
2.4.4.2	Distance over 100m up to 500m	No.	2,000.00
2.4.4.3	Distance over 500m	No.	2,900.00

BILL 2 : DEEP BORING WITH BORING PLANTS (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
	<u>NOTES : All tests are referred to MS 1056:2005 and MS 2038:2006, unless otherwise stated</u>		
2.4.5	Primary Jungle		
2.4.5.1	Distance up to 100m	No.	3,200.00
2.4.5.2	Distance over 100m up to 500m	No.	5,900.00
2.4.5.3	Distance over 500m	No.	9,800.00
2.4.6	Over Water / Swampy Ground		
2.4.6.1	with staging	No.	2,700.00
2.4.6.2	with drum pontoon	No.	1,900.00
2.5	<u>Boring in soil</u>		
2.5.1	Carry out boring in soil whether cased or uncased Rotary Boring (NW size):-		
2.5.1.1	Depth from existing ground level not exceeding 10m	m	50.00
2.5.1.2	Ditto exceeding 10m but n.e. 20m	m	65.00
2.5.1.3	Ditto exceeding 20m but n.e. 30m	m	66.00
2.5.1.4	Ditto exceeding 30m but n.e 40m	m	67.00
2.5.1.5	Ditto exceeding 40m but n.e 50m	m	78.00
2.5.1.6	Ditto exceeding 50m	m	150.00
2.5.2	Carry out boring in soil whether cased or uncased Rotary Boring (HW size):-		
2.5.2.1	Depth from existing ground level not exceeding 10m	m	50.00
2.5.2.2	Ditto exceeding 10m but n.e. 20m	m	67.00
2.5.2.3	Ditto exceeding 20m but n.e. 30m	m	67.00

BILL 2 : DEEP BORING WITH BORING PLANTS (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
	<u>NOTES : All tests are referred to MS 1056:2005 and MS 2038:2006, unless otherwise stated</u>		
2.5.2.4	Ditto exceeding 30m but n.e 40m	m	67.00
2.5.2.5	Ditto exceeding 40m but n.e 50m	m	78.00
2.5.2.6	Ditto exceeding 50m	m	160.00
2.5.3	Extra over item 2.6.1 to 2.6.2 for foam drilling, bentonite or other material deemed to be suitable for boring work	m	36.00
2.6	<u>Drilling in rock</u>		
2.6.1	Carry out diamond core drilling of 30.2 mm minimum diameter into any kind of rock including delivery of cores in standard boxes to the specified Laboratory:		
2.6.1.1	Depth from existing ground level not exceeding (n.e.) 10 m	m	170.00
2.6.1.2	Ditto exceeding 10 m but n.e. 20 m	m	190.00
2.6.1.3	Ditto exceeding 20 m but n.e. 30 m	m	220.00
2.6.1.4	Ditto exceeding 30 m but n.e. 40 m	m	250.00
2.6.1.5	Ditto exceeding 40 m	m	310.00

BILL 2 : DEEP BORING WITH BORING PLANTS (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
	<u>NOTES : All tests are referred to MS 1056:2005 and MS 2038:2006, unless otherwise stated</u>		
2.6.2	Extra over Items 2.6.1 if the core is of 52 mm minimum diameter, taken as directed by the S.O.	m	57.00
2.6.3	Extra over Items 2.6.1 if the rock (as analysis) by Jabatan Penyiasatan Kajibumi, Kuala Lumpur) is one of the following types: granite granodiorite, quartz - porphyry, rhyolite, vein-quartz, siliceous sandstone or quartzite	m	76.00
2.6.4	Extra over Item 2.6.2 if the rock types are those in Item 2.6.3	m	110.00
2.6.5	Reaming through rock when encountering cavities/boulders (NW casing)	m	100.00
2.7	<u>In-situ tests</u>		
2.7.1	Carry out Standard Penetration Test including provision of disturbed samples:-		
2.7.1.1	Depth from existing ground level not exceeding 10m	No.	29.00
2.7.1.2	Ditto exceeding 10m but n.e. 20m	No.	31.00
2.7.1.3	Ditto exceeding 20m but n.e. 30m	No.	32.00
2.7.1.4	Ditto exceeding 30m but n.e. 40m	No.	38.00
2.7.1.5	Ditto exceeding 40m	No.	46.00
2.7.2	Carry out Acker Vane Shear Test		
2.7.2.1	Depth from existing ground level not exceeding 10m	No.	51.00
2.7.2.2	Ditto exceeding 10m but n.e. 20m	No.	58.00
2.7.2.3	Ditto exceeding 20m but n.e. 30m	No.	66.00

BILL 2 : DEEP BORING WITH BORING PLANTS (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
	<u>NOTES : All tests are referred to MS 1056:2005 and MS 2038:2006, unless otherwise stated</u>		
2.7.2.4	Ditto exceeding 30m but n.e 40m	No.	75.00
2.7.2.5	Ditto exceeding 40m	No.	85.00
2.8	<u>Soil & Water Sampling</u>		
2.8.1	Obtain undisturbed samples with thin-walled sampler (60mm diameter)		
2.8.1.1	Depth from existing ground level not exceeding 10m	No.	41.00
2.8.1.2	Ditto exceeding 10m but n.e. 20m	No.	47.00
2.8.1.3	Ditto exceeding 20m but n.e. 30m	No.	53.00
2.8.1.4	Ditto exceeding 30m but n.e 40m	No.	59.00
2.8.1.5	Ditto exceeding 40m	No.	67.00
2.8.2	Extra over 2.8.1 if using 72mm diameter UD tube	No.	26.00
2.8.3	Extra over 2.81 if using piston sampler	No	130.00
2.8.4	Carry out Undisturbed 'Mazier' core sampling using 74mm dia. triple tube core barrel with retractable shoe		
2.8.4.1	Depth from existing ground level not exceeding 10m	No.	160.00
2.8.4.2	Ditto exceeding 10m but n.e. 20m	No.	180.00
2.8.4.3	Ditto exceeding 20m but n.e. 30m	No.	190.00
2.8.4.4	Ditto exceeding 30m but n.e 40m	No.	200.00
2.8.4.5	Ditto exceeding 40m	No.	240.00

BILL 2 : DEEP BORING WITH BORING PLANTS (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
	<u>NOTES : All tests are referred to MS 1056:2005 and MS 2038:2006, unless otherwise stated</u>		
2.9	<u>Other In-Borehole Tests</u>		
2.9.1	Carry out ground water level observation in borehole	No	90.00
2.9.2	Standpipe		
2.9.2.1	Supply & install slotted PVC standpipe in borehole	No	450.00
2.9.2.2	Supply & install PVC pipe up to 10 m depth	m	32.00
2.9.2.3	Supply & install PVC pipe exceeding 10 m depth	m	38.00
2.9.3	Standpipe Piezometer		
2.9.3.1	Supply & install piezometer tip in borehole	No	640.00
2.9.3.2	Supply & install PVC pipe up to 10 m depth	m	32.00
2.9.3.3	Supply & install PVC pipe exceeding 10 m depth	m	38.00
2.9.3.4	Supply & install protective cover	No.	350.00
2.9.4	Monitoring of water level in standpipe/standpipe piezometer after completion of field work	Trip	960.00

BILL 3 : DEEP SOUNDING AND PIEZOCONE

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
	<u>NOTES : All tests are referred to MS 1056:2005 and MS 2038:2006, unless otherwise stated</u>		
3.0	<u>Sounding and Piezocone Plant (10 Tonnes) - Mobilisation & Demobilisation</u>		
3.1	Bring the Deep Sounding or Piezocone Plant to the site and remove the same from the Site after completion of the work, including erecting the plant at the first sounding position, when the site is:		
3.1.1	Up to 25km from nearest regional base	LS	1,100.00
3.1.2	Over 25km and up to 125km from nearest regional base	LS	4,300.00
3.1.3	Over 125km and up to 225km from nearest regional base	LS	5,000.00
3.1.4	Over 225km and up to 325km from nearest regional base	LS	5,600.00
3.1.5	Over 325km and up to 425km from nearest regional base	LS	6,200.00
3.1.6	Over 425km and up to 525km from nearest regional base	LS	6,800.00
3.1.7	Over 525km from nearest regional base	LS	7,400.00
3.2	<u>Sounding and Piezocone Plant (20 Tonnes) - Mobilisation & Demobilisation</u>		
3.2.1	Bring the Deep Sounding or Piezocone Plant to the site and remove the same from the Site after completion of the work, including erecting the plant at the first sounding position, when the site is:		
3.2.1.1	Up to 25km from nearest regional base	LS	9,000.00
3.2.1.2	Over 25km and up to 125km from nearest regional base	LS	10,000.00
3.2.1.3	Over 125km and up to 225km from nearest regional base	LS	11,000.00
3.2.1.4	Over 225km and up to 325km from nearest regional base	LS	12,000.00
3.2.1.5	Over 325km and up to 425km from nearest regional base	LS	13,000.00
3.2.1.6	Over 425km and up to 475km from nearest regional base	LS	14,000.00
3.2.1.7	Over 525km from nearest regional base	LS	15,000.00

BILL 3 : DEEP SOUNDING AND PIEZOCONCONE (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
	<u>NOTES : All tests are referred to MS 1056:2005 and MS 2038:2006, unless otherwise stated</u>		
3.3	<u>Deep Sounding - Setting up & Dismantling within the Site</u>		
3.3.1	Move the Deep Sounding Plant from one sounding position to the next including dismantling it at the old position and erecting it at the new position on land	LS	460.00
3.3.2	Ditto but over swampy ground including the provision of staging and/or matting	LS	5,900.00
3.3.3	Extra over item 3.3.1 when the new position is at a site different from that of the old position but the two different sites are grouped together in the works on land	LS	3,200.00
3.3.4	Extra over item 3.3.2 when the new position is at a site different from that of the old position but the two different sites are grouped together in the works over swampy ground including the provision of staging and/or matting	LS	3,700.00
3.4	<u>Piezoccone - Setting up & Dismantling within the Site</u>		
3.4.1	Move the Piezocone Plant from one sounding position to the next including dismantling it at the old position and erecting it at the new position on land	LS	480.00
3.4.2	Ditto but over swampy ground including the provision of staging and/or matting	LS	6,500.00
3.4.3	Extra over item 3.4.1 when the new position is at a site different from that of the old position but the two different sites are grouped together in the works on land	LS	3,200.00
3.4.4	Extra over item 3.4.2 when the new position is at a site different from that of the old position but the two different sites are grouped together in the works over swampy ground including the provision of staging and/or matting	LS	4,000.00

BILL 3 : DEEP SOUNDING AND PIEZOCONE (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
	<u>NOTES : All tests are referred to MS 1056:2005 and MS 2038:2006, unless otherwise stated</u>		
3.5	<u>Deep Sounding Test</u>		
3.5.1	Carry out Deep Sounding test:-		
3.5.1.1	Depth from existing ground level not exceeding n.e. 10m	m	23.00
3.5.1.2	Ditto exceeding 10m but n.e. 20m	m	25.00
3.5.1.3	Ditto exceeding 20m but n.e. 30m	m	28.00
3.5.1.4	Ditto exceeding 300m but n.e. 40m	m	31.00
3.5.1.5	Ditto exceeding 40m	m	40.00
3.5.2	Extra over 3.5.1 if friction reducer is used	Hole	57.00
3.6	<u>Piezocone Test</u>		
3.6.1	Carry out Piezocone tests:-		
3.6.1.1	Depth from existing ground level not exceeding (n.e.) 10m	m	29.00
3.6.1.2	Ditto exceeding 10m but n.e. 20m	m	38.00
3.6.1.3	Ditto exceeding 20m but n.e. 30m	m	45.00
3.6.1.4	Ditto exceeding 300m but n.e. 40m	m	52.00
3.6.1.5	Ditto exceeding 40m	m	78.00
3.7	<u>Dissipation Test</u>		
3.7.1	Carry out dissipation test up to maximum of one hour	No.	190.00
3.7.2	Extra over item 3.7.1 for dissipation test exceeding one hour	No.	200.00

BILL 4 : OTHER FIELD TESTS

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
	<u>NOTES : All tests are referred to MS 1056:2005 and MS 2038:2006, unless otherwise stated</u>		
4.0	<u>Other Field Tests</u>		
4.1	<u>Mobilisation of personnel and equipment to site and demobilisation upon completion.</u>		
4.1.1	Up to 25km from nearest regional base	Sum	1,200.00
4.1.2	Over 25km and up to 225km from nearest regional base	Sum	1,700.00
4.1.3	Over 225km and up to 425km from nearest regional base	Sum	2,100.00
4.1.4	Over 425km from nearest regional base	Sum	2,400.00
4.2	<u>Mackintosh or JKR Probes</u>		
4.2.1	Carry out Mackintosh or JKR Probe test to depth not exceeding 15m below ground level or 400 blows per 0.30m penetration whichever achieved first	No.	150.00
4.3	<u>Hand Auger Boring</u>		
4.3.1	Carry out hand auger boring including provision of disturbed samples:-		
4.3.1.1	Depth from existing ground level not exceeding 2.5m	M	38.00
4.3.1.2	Ditto exceeding 2.5m but n.e 5.0m	M	46.00
4.3.1.3	Ditto exceeding 5.0m but n.e 7.5m	M	55.00
4.3.2	Allow for determining over-night water table in hand bores	hole	9.50
4.3.3	Obtain undisturbed sample using thin - walled tube sampler (60mm dia.) from bored hole:-		
4.3.3.1	Depth from existing ground level not exceeding 2.5m	No.	29.00
4.3.3.2	Ditto exceeding 2.5m but n.e 5.0m	No.	37.00
4.3.3.3	Ditto exceeding 5.0m but n.e 7.5m	No.	67.00

BILL 4 : OTHER FIELD TESTS (Contd')

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
	<u>NOTES : All tests are referred to MS 1056:2005 and MS 2038:2006, unless otherwise stated</u>		
4.4	<u>Trial Pit</u>		
4.4.1	Carry out trial pit excavation and backfilling of pit size 2m X 2m X 2m inclusive of small disturbed sample	No	410.00
4.4.2	Mapping and logging of pit faces	No.	260.00
4.4.3	Provision of shoring and dewatering	No.	1,300.00
4.5	<u>Penetration Vane Shear Test</u>		
4.5.1	Extra over item 4.1 for Mobilisation of Penetration Field Vane	Sum	1,000.00
4.5.2	Carry out Vane Shear Test using Penetration Vane samples:		
4.5.2.1	Depth from existing ground level not exceeding (n.e.) 10m	No.	93.00
4.5.2.2	Ditto exceeding 10m but n.e. 20m	No.	100.00
4.5.2.3	Ditto exceeding 20m but n.e. 30m	No.	110.00
4.5.2.4	Ditto exceeding 30m but n.e. 40m	No.	120.00
4.5.2.5	Ditto exceeding 40m	No.	130.00
4.6	<u>Plate Loading Test</u>		
4.6.1	Extra over item 4.1 for Mobilisation of Equipment	Sum	2,000.00
4.6.2	Carry out Plate Loading test (MS 2038:SECTION 5:2006)	No.	4,500.00

BILL 4 : OTHER FIELD TESTS (Contd')

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
	<u>NOTES : All tests are referred to MS 1056:2005 and MS 2038:2006, unless otherwise stated</u>		
4.7	<u>Permeability Test</u>		
4.7.1	To carry out permeability test in soil by Constant Head Method (MS 2038:SECTION 5:2006)	No.	620.00
4.7.2	To carry out permeability test in soil by Constant Variable Method (MS 2038:SECTION 5:2006)	No.	560.00
4.7.3	To carry out permeability test in rock by single or double Packer (MS 2038:SECTION 5:2006)	No.	1,100.00
4.8	<u>In situ California Bearing Ratio Tests</u>		
4.8.1	Provision of reacting load (lorry) Up to 3 tonnes	Day	1,200.00
4.8.2	Carry out In situ California Bearing Ratio Test (MS 2038:SECTION 5:2006)	No.	180.00
4.9	<u>Field Density Test</u>		
4.9.1	Carry out Field Density Tests:-		
4.9.1.1	Sand replacement method (Small Pouring Cylinder) (MS 2038:SECTION 5:2006)	No.	160.00
4.9.1.2	Sand replacement method (Large Pouring Cylinder) (MS 2038:SECTION 5:2006)	No.	190.00
4.9.1.3	Core cutter method (MS 2038:SECTION 5:2006)	No.	90.00
4.10	<u>Dynamic Cone Penetration Test (DCP)</u>		
4.10.1	Carry out 150mm diameter pavement coring	No.	130.00
4.10.2	Dynamic cone Penetration Test in pavement cored hole through the base course (crusher run), sub-base and sub-grade up to 1.2 m below the road surface	No.	140.00
4.10.3	Re-instate cored hole with bituminous premix or approved material	No.	51.00

BILL 4 : OTHER FIELD TESTS (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
	<u>NOTES : All tests are referred to MS 1056:2005 and MS 2038:2006, unless otherwise stated</u>		
4.11	<u>Inclinometer</u>		
4.11.1	Supply and install biaxial PVC inclinometer pipe in pre-bored borehole for the depth is not exceeding (n.e.) 10m from ground	No.	1,900.00
4.11.2	For depth exceeding 10m but n.e. 20m	m	200.00
4.11.3	For depth exceeding 20m but n.e. 30m	m	210.00
4.12	<u>Settlement Plate</u>		
4.12.1	Supply and install settlement plate of 600mm x 600mm x 10mm thick with 50mm ext. dia. G.I. pipes welded on the plate and 75mm int. dia. G.I. pipe as protective casing for depth not exceeding 5m	No.	530.00
4.12.2	For depth exceeding 5m but n.e. 10m	m	77.00
4.12.3	For depth exceeding 10m but n.e. 20m	m	82.00
4.13	<u>Pressuremeter Test</u>		
4.13.1	Perform Pressure meter Tests in soil(with two (2) unload / reload cycle) as per specification at specified borehole, location and depth :-		
4.13.1.1	At a depth from existing ground or water bed level to a depth not exceeding (n.e.) 10m	No.	620.00
4.13.1.2	- Ditto - but exceeding 10m to n.e. 20m	No.	630.00
4.13.1.3	- Ditto - but exceeding 20m to n.e. 30m	No.	670.00
4.13.1.4	- Ditto - but exceeding 30m	No.	720.00
4.13.1.5	Extra over Item 2.4.2 for perform Pressure Meter Test in rock	No.	1,000.00

BILL 4 : OTHER FIELD TESTS (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
	<u>NOTES : All tests are referred to MS 1056:2005 and MS 2038:2006, unless otherwise stated</u>		
4.13.2	Perform Pressure meter Tests (with three (3) unload / reload cycle) as per specification at specified borehole, location and depth :-		
4.13.2.1	At a depth from existing ground or water bed level to a depth not exceeding (n.e.) 10m	No.	700.00
4.13.2.2	- Ditto - but exceeding 10m to n.e. 20m	No.	720.00
4.13.2.3	- Ditto - but exceeding 20m to n.e. 30m	No.	750.00
4.13.2.4	- Ditto - but exceeding 30m	No.	800.00
4.13.2.5	Extra over item 2.4.3 for perform pressure meter test in rock	No.	1,300.00

BILL 5 : COLLECTION OF SOIL AND WATER SAMPLES IN BULK

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
	<u>NOTES : All tests are referred to MS 1056:2005 and MS 2038:2006, unless otherwise stated</u>		
5.0	<u>Collection of soil and water samples in bulk</u>		
5.1	<u>Soil samples</u>		
5.1.1	Collect representative disturbed samples in bulk at one location on the Site, at depths not exceeding 1.5m from existing ground level:-		
5.1.1.1	Not exceeding 5kg	No.	76.00
5.1.1.2	Extra over Item 5.1.1 for bulk quantities exceeding 5kg measured as a unit of 25kg or part thereof, up to a maximum of 100kg	Unit	38.00
5.1.1.3	Similar to Item 5.1.1 but at a location within 10km from the Site accessible by car or jeep:-		
5.1.1.3.1	Not exceeding 5kg	No.	150.00
5.1.1.3.2	Extra over Item 5.1.1 for bulk quantities exceeding 5kg measured as a unit of 25kg or part thereof, up to a maximum of 100kg	Unit	48.00
5.2	<u>Soil sample for natural moisture content</u>		
5.2.1	Collect a set of 2 sealed sample for the determination of natural moisture content at the laboratory (testing measured separately) in the course of sampling in Item 5.1	Set	19.00
5.3	<u>Water Sample</u>		
5.3.1	Collect 1 litre of representative ground water sample in a water sample in a water tight clean container from a hand bore or deep bore	No.	19.00
5.4	<u>Block Sample</u>		
5.4.1	Collect block sample of any material of 0.3mm x 0.3mm for carrying out laboratory testing including transport to approved laboratory	No.	420.00

BILL 6: LABORATORY TESTS

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
	<u>NOTES : All tests are referred to MS 1056:2005 and MS 2038:2006, unless otherwise stated</u>		
6.0	<u>Classification Tests</u>		
6.1	Moisture Content	No.	4.00
6.2	Atterberg Limits		
6.2.1	Liquid Limit - Cone Penetrometer Method (definitive method) / Cone-four point method	No.	8.00
6.2.2	Liquid Limit - One-point Cone Penetrometer Method	No.	3.00
6.2.3	Liquid Limit - Casagrande Apparatus Method / Casagrande-four point method	No.	8.00
6.2.4	Liquid Limit - One-point Casagrande Method	No.	3.00
6.2.5	Plastic Limit	No.	10.00
6.2.6	Plasticity Index - derivation	No.	2.00
6.3	Linear Shrinkage	No.	13.00
6.4	Bulk Density		
6.4.1	Linear measurement	No.	11.00
6.4.2	<u>Immersion in water</u>	No.	44.00
6.4.3	Water displacement	No.	44.00
6.5	Particle Density (specific gravity)		
6.5.1	Gas Jar	No.	86.00
6.5.2	<u>Small pycnometer</u>	No.	19.00

BILL 6: LABORATORY TESTS (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
	<u>NOTES : All tests are referred to MS 1056:2005 and MS 2038:2006, unless otherwise stated</u>		
6.6	Particle Size Distribution		
6.6.1	Particle size distribution for coarse-grained soils	No.	20.00
6.6.2	Particle size distribution for fine grained – pipette	No.	140.00
6.6.3	Particle size distribution for fine grained – hydrometer	No.	38.00
6.6.4	Dispersion Method (Double Hydrometer Test)	No.	53.00
6.6.5	Pinhole test	No.	190.00
6.7	Soil Classification Group Index	No.	11.00
6.8	Samples Logging and record		
6.8.1	Split UD, photograph and logging	No.	170.00
6.8.2	Provide small record samples	No.	14.00
6.90	Brightness Test	No.	72.00
6.10	Pilcon Hand Vane Tests	No.	10.00
6.11	Pinhole test	No.	190.00
6.12	Soil Compaction Tests		
6.12.1	Carry out compaction test on remolded samples, following the testing procedure as mentioned in the test numbers, but with only one specimen at a given moisture content:-		
6.12.1.1	2.5 kg hammer	No.	67.00
6.12.1.2	4.5 kg hammer	No.	76.00
6.12.1.3	With a vibrating hammer for granular soils	No.	110.00

BILL 6: LABORATORY TESTS (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
	<u>NOTES : All tests are referred to MS 1056:2005 and MS 2038:2006, unless otherwise stated</u>		
6.13	<u>Detailed compaction studies</u>		
6.13.1	Carry out compaction test with a 2.5kg hammer on remolded samples:-		
6.13.1.1	At least 5 specimens at difference moisture shall be compacted to obtain the curve of "dry density against moisture content"	Series	380.00
6.13.1.2	Firstly, compaction tests same as Item 6.13.1.1 shall be carried out. Secondly for each of the specimen compacted, unsoaked California Bearing Ratio shall be carried out, on both the top and bottom of the specimen. The curve of "CBR against moisture content shall also be reported.	Series	480.00
6.13.1.3	Ditto the 4 day soaked CBR test shall be carried out instead of the unsoaked CBR	Series	480.00
6.13.1.4	Ditto unsoaked CBR test shall be carried out on the top of the specimen and soaked CBR test shall be carried out on the bottom of the specimen.	Series	550.00
6.13.2	Carry out compaction test with a 4.5kg hammer on remolded samples:-		
6.13.2.1	At least 5 specimens at difference moisture shall be compacted to obtain the curve of "dry density against moisture content"	Series	400.00
6.13.2.2	Firstly, compaction tests same as Item 6.13.2.1 shall be carried out. Secondly for each of the specimen compacted, unsoaked California Bearing Ratio shall be carried out, on both the top and bottom of the specimen. The curve of "CBR against moisture content shall also be reported.	Series	520.00
6.13.2.3	Ditto the 4 day soaked CBR test shall be carried out instead of the unsoaked CBR	Series	520.00
6.13.2.4	Ditto unsoaked CBR test shall be carried out on the top of the specimen and soaked CBR test shall be carried out on the bottom of the specimen.	Series	600.00

BILL 6: LABORATORY TESTS (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
	<u>NOTES : All tests are referred to MS 1056:2005 and MS 2038:2006, unless otherwise stated</u>		
6.14	<u>Carry out compaction test with a vibrating hammer on remolded samples:-</u>		
6.14.1	At least 5 specimens at difference moisture shall be compacted to obtain the curve of "dry density against moisture content"	Series	420.00
6.14.2	Firstly, compaction tests same as Item 6.14.1 shall be carried out. Secondly for each of the specimen compacted, unsoaked California Bearing Ratio shall be carried out, on both the top and bottom of the specimen. The curve of "CBR against moisture content shall also be reported.	Series	520.00
6.14.3	Ditto the 4 day soaked CBR test shall be carried out instead of the unsoaked CBR	Series	520.00
6.14.4	Ditto unsoaked CBR test shall be carried out on the top of the specimen and soaked CBR test shall be carried out on the bottom of the specimen.	Series	600.00
6.15	<u>Soils Strength Tests</u>		
6.15.1	Carry out strength tests on undisturbed samples:-		
6.15.1.1	Unconfined compression strength		
6.15.1.1.1	38mm diameter, 1 specimen	No.	24.00
6.15.1.1.2	50mm diameter, 1 specimen	No.	34.00
6.15.1.1.3	70/72mm diameter, 1 specimen	No.	49.00
6.15.1.1.4	38mm diameter, 3 specimens	Series	54.00
6.15.1.1.5	50mm diameter, 3 specimens	Series	96.00
6.15.1.1.6	70/72mm diameter, 3 specimens	Series	140.00

BILL 6: LABORATORY TESTS (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
	<u>NOTES : All tests are referred to MS 1056:2005 and MS 2038:2006, unless otherwise stated</u>		
6.15.1.2	Unconsolidated undrained triaxial compression without pore water pressure measurement:-		
6.15.1.2.1	38mm diameter, 1 specimen	No.	35.00
6.15.1.2.2	50mm diameter, 1 specimen	No.	49.00
6.15.1.2.3	70/72mm diameter, 1 specimen	No.	59.00
6.15.1.2.4	38mm diameter, 3 specimens	Series	100.00
6.15.1.2.5	50mm diameter, 3 specimens	Series	140.00
6.15.1.2.6	70/72mm diameter, 3 specimens	Series	170.00
6.15.1.3	Unconsolidated undrained triaxial compression with pore water pressure measurement:-		
6.15.1.3.1	38mm diameter - 3 specimens	Series	420.00
6.15.1.3.2	50mm diameter - 3 specimens	Series	510.00
6.15.1.3.3	70/72mm diameter - 3 specimens	Series	590.00
6.15.1.4	Consolidated undrained triaxial compression test with pore water pressure		
6.15.1.4.1	38mm diameter - 3 specimens	Series	620.00
6.15.1.4.2	50mm diameter - 3 specimens	Series	930.00
6.15.1.4.3	70/72mm diameter - 3 specimens	Series	1,200.00

BILL 6: LABORATORY TESTS (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
	<u>NOTES : All tests are referred to MS 1056:2005 and MS 2038:2006, unless otherwise stated</u>		
6.15.1.5	Consolidated drained triaxial compression test with pore water pressure		
6.15.1.5.1	38mm diameter - 3 specimens	Series	1,000.00
6.15.1.5.2	50mm diameter - 3 specimens	Series	1,300.00
6.15.1.5.3	70/72mm diameter - 3 specimens	Series	1,700.00
6.16	<u>Carry out California Bearing Ratio test on one specimen of remold sample after compacting (Compaction measurement together) the sample to the procedure stated in Item 6.12.1.1 (2.5 kg hammer)</u>		
6.16.1	Unsoaked CBR on the top and bottom of the specimens	No	72.00
6.16.2	Soaked CBR on the top and bottom of the specimen	No	79.00
6.16.3	Unsoaked CBR on the top of the specimen and soaked CBR on the specimen	No	84.00
6.16.4	Extra over Item 6.16 when the compaction as in accordance with the procedure stated in Item 6.12.1.2 (4.5 kg hammer)	No	10.00
6.17	<u>Shear Box Test</u>		
6.17.1	Determination of Shear Strength by direct Shear (Small Shearbox) - 60mm square (MS 1056:PART 7:2005)	Series	320.00
6.17.2	Determination of Shear Strength by direct Shear (Small Shearbox) - 100mm square (MS 1056:PART 7:2005)	Series	450.00
6.17.3	Determination of Shear Strength by direct Shear (Large Shearbox) - 305mm square (MS 1056:PART 7:2005)	Series	650.00

BILL 6: LABORATORY TESTS (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
	<u>NOTES : All tests are referred to MS 1056:2005 and MS 2038:2006, unless otherwise stated</u>		
6.18	<u>Compressibility Tests</u>		
6.18.1	Oedometer Consolidation		
6.18.1.1	6 loadings and 3 unloadings	No.	240.00
6.18.1.2	Swelling pressure determination	No.	240.00
6.18.1.3	Measurement of swelling	No.	420.00
6.18.1.4	Settlement on saturation	No.	640.00
6.18.1.5	Additional loading to Item 6.18.1.1 (coefficient of secondary consolidation)	Day	33.00
6.19	<u>Other Total Stress Test</u>		
6.19.1	Pocket penetrometer	No.	22.00
6.20	<u>Permeability Tests</u>		
6.20.1	Carry out constant head permeability test for granular soils (MS 1056:PART 5:2005)	No.	230.00
6.20.2	Carry out falling head permeability test for granular soils (MS 1056:PART 5:2005)	No.	310.00
6.21	<u>Rock Core Tests</u>		
6.21.1	Core Compressive Strength	No	150.00
6.21.2	Ditto with Young Modulus	No	290.00
6.21.3	Ditto with Young Modulus & Poisson Ratio	No	430.00
6.21.4	Point Load Test	No	110.00

BILL 6: LABORATORY TESTS (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
	<u>NOTES : All tests are referred to MS 1056:2005 and MS 2038:2006, unless otherwise stated</u>		
6.22	<u>Soils chemical tests</u>		
6.22.1	Carry out chemical tests on soil or water samples:		
6.22.1.1	Organic matter content	No	51.00
6.22.1.2	Total sulphate content	No	49.00
6.22.1.3	Sulphate content of ground water	No	56.00
6.22.1.4	pH value	No	19.00
6.22.1.5	Chloride Content	No	45.00

Bill 7: MATERIAL TESTING

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
7.1	<u>Mobilization of personnel and equipment to site and demobilization respective for Field Testing/Sampling</u>		
7.1.1	Up to 25km from nearest regional base	Sum	1,200.00
7.1.2	Over 25km and up to 225km from nearest regional base	Sum	1,700.00
7.1.3	Over 225km and up to 425km from nearest regional base	Sum	2,100.00
7.1.4	Over 425km from nearest regional base	Sum	2,400.00
7.2	<u>UJIAN-UJIAN BATU BAUR</u>		
7.2.1	Sieve Analysis	No.	61.00
7.2.2	Ten percent Fines Value	No.	75.00
7.2.3	Aggregate Crushing Value	No.	75.00
7.2.4	Flakiness Index	No.	75.00
7.2.5	Elongation Index	No.	75.00
7.2.6	Angularity number	No.	75.00
7.2.7	Sp Gravity/Water Absorption	No.	75.00
7.2.8	Unconfined Compressive Strength of Rock Core	No.	75.00
7.2.9	Polished Stone Value	No.	75.00
7.2.10	Aggregate Stripping Test	No.	75.00
7.2.11	Soundness of Aggregate	No.	75.00
7.2.12	Los Angeles Abrasion value	No.	75.00
7.2.13	Silt/Clay Content	No.	75.00

Bill 7: MATERIAL TESTING (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
7.3	UJIAN-UJIAN BITUMIN		
7.3.1	Engler Viscosity	No.	75.00
7.3.2	Saybolt Furol viscosity	No.	75.00
7.3.3	Settlement	No.	75.00
7.3.4	Sieve Test	No.	92.00
7.3.5	Residue on sieving	No.	75.00
7.3.6	Particle charge	No.	75.00
7.3.7	Residue & oil distillate by Distillation	No.	75.00
7.3.8	Residue by Evaporation	No.	83.00
7.3.9	Penetration Test	No.	77.00
7.3.10	Flash point	No.	59.00
7.3.11	Kinematic Viscosity	No.	145.00
7.3.12	softening Point	No.	81.00
7.3.13	Ductility	No.	104.00
7.3.14	Water Content/Binder Content	No.	81.00
7.3.15	Loss on Heating of Oil and asphaltic Compounds	No.	109.00
7.3.16	Drop in Penetration	No.	83.00
7.3.17	Specific Gravity	No.	74.00
7.3.18	pH of Aqueous Solution	No.	40.00

Bill 7: MATERIAL TESTING (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
7.4	UJIAN-UJIAN PREMIX		
7.4.1	Marshall Test		
7.4.1.1	Making of test Specimen (permohonan hendaklah mengemukakan bahan-bahan seperti batu baur, filler dan binder)	No.	101.00
7.4.1.2	Density of test specimen	No.	42.00
7.4.1.3	Determination of voids	No.	323.00
7.4.1.4	Measurement of Flow & Stability	No.	49.00
7.4.2	Determination of binder content	No.	120.00
7.4.3	Grading of mineral Aggregate	No.	46.00
7.5	FIBREGLASS WATER TANK (tank less than 2000 Liters)		
7.5.1	Tensile Strength	No.	61.00
7.5.2	Glass content of glass-Reinforced Laminates		
7.5.2.1	Sample Containing no Filler & Colouring agent	No.	78.00
7.5.2.2	Sample Containing filler and coloring agent	No.	132.00
7.5.3	Barcol hardness	No.	42.00
7.5.4	Water Absorption	No.	59.00

Bill 7: MATERIAL TESTING (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
7.5.5	Lap Shear Strength of laminate	No.	70.00
7.5.6	Deflection	No.	113.00
7.5.7	Thickness, Sag and slope of Cover	No.	54.00
7.5.8	Hydrostatic Test	No.	40.00
7.6	UJIAN-UJIAN KONKRIT		
7.6.1	Slump Test (Permohonan dikehendaki mengemukakan bahan-bahan seperti simen, batu baur halus & kasar untuk ujian tersebut)	No.	56.00
7.6.2	Compacting Factor (Permohonan dikehendaki mengemukakan bahan-bahan seperti simen, batu baur halus & kasar untuk ujian tersebut)	No.	61.00
7.6.3	Concrete Cube Sampling (Permohonan dikehendaki mengemukakan bahan-bahan seperti simen, batu baur halus & kasar untuk penyediaan sampel tersebut)	No.	39.00
7.6.4	Concrete cube compressive strength test	No.	10.00
7.6.5	As received density of cube	No.	6.00
7.6.6	Concrete coring using thin wall diamond bits up to 300mm depth		
7.6.6.1	Coring through Reinforced concrete (50mm diameter)	No.	127.00
7.6.6.2	Coring through Reinforced concrete (100mm diameter)	No.	159.00
7.6.6.3	Coring through Reinforced concrete (150mm diameter)	No.	212.00
7.6.6.4	Coring through Reinforced concrete (200mm diameter)	No.	265.00

Bill 7: MATERIAL TESTING (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
7.6.7	Concrete Core Test		
7.6.7.1	Depth of Carbonation determination by spraying of phenolphthalein solution on concrete core.	No.	28.00
7.6.7.2	Concrete core density test	No.	53.00
7.6.7.3	Porosity & Absorption	No.	85.00
7.6.7.4	Core Compressive Strength (include trimming & capping)	No.	106.00
7.6.7.5	Compressive strength (exclude 'trimming & capping)	No.	60.00
7.6.8	Total Chloride Content Test		
7.6.8.1	Drilling for 3 depths (25mm each) to collect dust samples using 25mm diameter drill bit, include patching back with shrinkage compensated grout.	No.	107.00
7.6.8.2	Laboratory chloride content test using dust sample collected from site to obtain the chloride profile.	No.	107.00
7.7	UJIAN-UJIAN TANPA MUSNAH		
7.7.1	Surface Hardness By rebound Hammer (minimum satu set: 12 bacaan)	No.	25.00
7.7.2	Location and cover to reinforcing bars in concrete/per bar using Electromagnetic Cover meter.	No.	29.00
7.7.3	Ultrasonic Pulse Velocity Test		
7.7.3.1	Direct method	No.	49.00
7.7.3.2	Indirect method (5 points at 100mm c/c)	No.	59.00

Bill 7: MATERIAL TESTING (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
7.7.4	Corrosion Probability of Steel Reinforcement in Concrete		
7.7.4.1	Hacking of concrete for half-cell potential test, include patching back with shrinkage compensated grout.	No.	76.00
7.7.4.2	Measurement of corrosion probability of steel reinforcement bar in concrete using half-cell meter. (per bar connection per max 4m long)	No.	99.00
7.7.5	Concrete carbonation test by drilling of 25mm diameter hole for depth not exceeding 75mm; include patching back hole with shrinkage compensated mortar.	No.	53.00
7.7.6	Verification of lap length and lap location using Ground Penetration Radar.	No.	530.00
7.7.7	Thermo Lumine scene Test to determine the change to the microstructure of concrete.	No.	3,178.00
7.7.8	Petrographic Examination to assess the quality of concrete.	No.	3,178.00
7.8	UJIAN- UJIAN SIMEN		
7.8.1	Determination of Consistence of Standard Cement Paste	No.	42.00
7.8.2	Determination of Initial Land Final Setting Times	No.	39.00
7.8.3	Test for Compressive Strength of Cement Using Mortar Cube	No.	43.00
7.8.4	Cement Content Determination		
7.8.4.1	Drilling in concrete for depth not exceeding 100mm to collect dust samples using 25mm diameter drill bit, include patching back with shrinkage compensated grout.	No.	159.00
7.8.4.2	Laboratory cement content test using dust sample collected from site.	No.	212.00

Bill 7: MATERIAL TESTING (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
7.9	UJIAN-UJIAN LOGAM All rates for dimensions are for the first 10 dimensions for specimen weighing less than 50kg and measuring less than 1m. Additional charges will be added for subsequent 10 dimensions or part of it at the same rate.		
7.9.1	Dimensions (Metal)	No.	28.00
7.9.2	Dimensions (Steel Sections)	No.	29.00
7.9.3	Dimensions (Steel Fabric/Wire Mesh)	No.	29.00
7.9.4	Dimensions (Wire Strands)	No.	28.00
7.9.5	Mass Per Unit Length (per first 50kg/m)	No.	28.00
7.9.6	Mass Per Unit Area (per first 50kg/m ²)	No.	29.00
7.9.7	Tensile Test/Bend Test (untuk contoh bergaris pusat nominal ketebalan kurang daripada 20mm)	No.	93.00
7.9.8	Tensile Test/Bend Test (untuk contoh bergaris pusat no.minal ketebalan 20mm - 25mm)	No.	95.00
7.9.9	Tensile Test/Bend Test (untuk contoh bergaris pusat no.minal ketebalan lebih daripada 25mm)	No.	96.00
7.9.10	Tensile Test/Bend Test (for welded plate)	No.	47.00
7.9.11	Tensile Test Using Extensometer (untuk contoh bergaris pusat no.minal 16mm dan ke bawah)	No.	61.00
7.9.12	0.2% Proof Stress (untuk contoh bergaris pusat no.minal 16mm dan ke bawah)	No.	68.00
7.9.13	"Breaking Load" (untuk 'wire strands' bergaris pusat no.minal 16mm & ke bawah - Pemohon dikehendaki menyediakan contoh dengan 'grips' sekali untuk ujian tersebut.	No.	64.00
7.9.14	"Brinell Hardness"	No.	47.00

Bill 7: MATERIAL TESTING (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
7.9.15	"Zinc Coating	No.	53.00
7.9.16	"Izod Impact Test"	No.	65.00
7.9.17	"Charpy U-notch Impact Test"	No.	65.00
7.10	UJIAN-UJIAN BATA DAN BLOCK All rates for dimensions are for the first 10 dimensions for specimen weighing less than 50kg and measuring less than 1m. Additional charges will be added for subsequent 10 dimensions or part of it at the same rate.		
7.10.1	"Dimensions (Bricks)"	No.	33.00
7.10.2	"Dimensions (Blocks)"	No.	32.00
7.10.3	"Compressive Strength (without capping)"	No.	38.00
7.10.4	"Compressive Strength (with capping)"	No.	57.00
7.10.5	"Water Absorption (5-hour boiling test)"(untuk 10 bil. Satu set)	No.	328.00
7.10.6	"Water Absorption (24-hour cold immersion test)"	No.	51.00
7.10.7	Ketumpatan	No.	43.00
7.11	UJIAN-UJIAN PAIP		
7.11.1	"Dimensions (Steel/Galv. Steel/Ductile Iron/UPVC/Polybutylene)	No.	35.00
7.11.2	"Mass per unit length of pipe"	No.	43.00
7.11.3	"Dimensions" (Asbestos Cement/Cast Iron with Plain end)	No.	35.00
7.11.4	"Dimensions" (Cast Iron with Flanges)	No.	46.00
7.11.5	Hydrostatic Test	No.	122.00

Bill 7: MATERIAL TESTING (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
7.12	UJIAN-UJIAN "SPECIALS/PIPE FITTINGS" All rates for dimensions are for the first 10 dimensions for specimen weighing less than 50kg and measuring less than 1m. Additional charges will be added for subsequent 10 dimensions or part of it at the same rate.		
7.12.1	"Dimensions"(Steel/Galp Steel/Ductile Iron/UPVC)	No.	53.00
7.12.2	"Mass per unit of wrapping"	No.	36.00
7.12.3	"Thickness of wrapping"	No.	39.00
7.12.4	"Thickness of concrete lining"	No.	54.00
7.12.5	"Dimension" (Polybutylene/HDPE)	No.	47.00
7.12.6	Hydrostatic Test	No.	131.00
7.13	UJIAN-UJIAN BAHAN-BAHAN LAIN All rates for dimensions are for the first 10 dimensions for specimen weighing less than 50kg and measuring less than 1m. Additional charges will be added for subsequent 10 dimensions or part of it at the same rate.		
7.13.1	"Dimensions" (Taps/Stop Valves/Plastic Boll Valves)	No.	64.00
7.13.2	"Dimensions" (Air Valves)	No.	46.00
7.13.3	"Dimensions" (Floats)	No.	35.00
7.13.4	"Dimensions" (Ferrules)	No.	54.00
7.13.5	"Dimensions" (manhole covers)	No.	36.00
7.13.6	"Dimensions" (Bolt/nuts/rivets)	No.	35.00
7.13.7	"Dimensions" (roofing Sheets)	No.	36.00

Bill 7: MATERIAL TESTING (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
7.13.8	"Dimensions & Verification of Component Parts"	No.	47.00
7.13.9	"Dimensions" (Steel Water Tank)	No.	43.00
7.13.10	"Dimensions" (Guardrail)	No.	46.00
7.13.11	"Dimensions" (Steel Column)	No.	46.00
7.13.12	"Dimensions" (Standard Pillar/Underground Fire Hydrant)	No.	56.00
7.13.13	"Dimensions" (Adjustable Galvanized Louvre Windows)	No.	53.00
7.13.14	"Boiling Test" (Floats)	No.	47.00
7.13.15	"Performance Test" (Solar Water Heater)	No.	85.00
7.13.16	"Accelerated Wear Test" (Adjustable Galvanize Louvre windows) (Pemasangan Contoh Untuk ujian adalah dijalankan oleh pemohon)	No.	42.00
7.13.17	pH of Aqueous Solutions"	No.	40.00
7.13.18	Hydrostatic Test	No.	57.00
7.13.19	Marking	No.	25.00
7.13.20	Verification of thread	No.	28.00
7.14	TENTUKAN ALAT-ALAT		
7.14.1	"Calibrations by Dead Weight Tester"	No.	86.00
7.15	WATER METER TESTING		
7.15.1	Initial Verification	No.	16.00
7.15.2	Error Measurement	No.	13.00
	note: *Other tests not included above shall be determined on agreed basis.		

BILL 8: DETAILED ENGINEERING SURVEY

ITEM	DESCRIPTION OF WORK	UNIT	RATE
8.0	<u>Mobilisation of personnel and all equipment's necessary for execution of the site operations to site and demobilisation on completion:-</u>		
8.1	Work rates for mobilization and demobilization per party are as follow (Peninsular):		
8.1.1	i) 50 kilometres or less	Per day	Nil
8.1.2	ii) More than 50 kilometres but not exceeding 150 kilometres (1party/day)	Per day	743.00
8.1.3	iii) More than 150 kilometres but not exceeding 300 kilometres (2 party/day)	Per day	1,486.00
8.1.4	iv) More than 300 kilometres (3 party/day)	Per day	2,229.00
8.2	Work rates for mobilization and demobilization per party are as follow (Sabah/Sarawak):		
8.2.1	i) 50 kilometres or less	Per day	Nil
8.2.2	ii) More than 50 kilometres but not exceeding 150 kilometres (1 party/day)	Per day	966.00
8.2.3	iii) More than 150 kilometres but not exceeding 300 kilometres (2 party/day)	Per day	1,932.00
8.2.4	iv) More than 300 kilometres (3 party/day)	Per day	2,898.00
8.3	Preparatory Work Work rate for preparatory work is 1 party-day	Per day	743.00
8.4	Planimetric Control The accuracy for planimetric control and connection shall not be less than 1 in 4000. The planimetric control and connection includes:		
8.4.1	Connection to GPS Datum		
8.4.1.1	i)Peninsular		
	Flat and undulating area	km	2,000.00
	Hilly area	km	2,500.00
	Swampy area	km	2,500.00
	Built up area	km	2,500.00

Catatan: Kadar diatas adalah berdasarkan Jadual Bayaran Perkhidmatan Yang Dijalankan Oleh Jurukur Tanah Berlesen Yang Berdaftar Di Bawah Akta Jurukur Tanah Berlesen 1958 (AKTA 458) (Pindaan 1991).

BILL 8: DETAILED ENGINEERING SURVEY (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
8.4.1.2	ii)Sabah/Sarawak		
	Flat and undulating area	km	2,600.00
	Hilly area	km	3,250.00
	Swampy area	km	3,250.00
	Built up area	km	3,250.00
8.4.2	Along the proposed or existing routes or alignment		
8.4.2.1	i)Peninsular		
	Flat and undulating area	km	2,000.00
	Hilly area	km	2,500.00
	Swampy area	km	2,500.00
	Built up area	km	2,500.00
8.4.2.2	ii)Sabah/Sarawak		
	Flat and undulating area	km	2,600.00
	Hilly area	km	3,250.00
	Swampy area	km	3,250.00
	Built up area	km	3,250.00
8.5	Height Control and Connection		
	The height control and connection includes:		
8.5.1	Connection to JUPEM Bench Marks Flat and Undulating	km	464.00
8.5.2	Along the proposed or existing routes or alignment Flat and Undulating	km	464.00
8.6	Reimbursable		
8.6.1	Expenses for purchase of Property Model	Item	As per bill
8.6.2	Expenses for Communication	Item	As per bill
8.6.3	Hiring charge of special equipment/software as agreed with client	Item	As per bill

BILL 8: DETAILED ENGINEERING SURVEY (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
8.6.4	Expenses for Travel & Accommodation i) Travelling - Air Fare - Mileage ii) Hotel iii) Subsistence Allowance	Item km day day	As per bill 0.50 As per bill (max. RM 180.00++) 85.00
8.6.5	Expenses incurred in the use of special transportation e.g. helicopter, boat, etc as agreed with the client	Item	As per bill
8.7 8.7.1	Site Survey with Contour and Detail - 1m Contour Built-up	ha	743.00
8.8 8.8.1	Detail Site Survey - Grid Heighting - 10m Grid Interval Built-up	ha	4458.00
8.9 8.9.1	Cross Section Built up	section	186.00
SUB-TOTAL i			
8.10 8.10.1	Processing, Conversion and Translation of Digital Data (20% from SUB TOTAL i) Where the survey result is required to be submitted in a designated format, a charge of 20% of the total survey fees is applicable.		
SUB-TOTAL ii (Sub-total i + item 8.9.1)			
8.11	IKRAM Fees (10% from SUB-TOTAL ii)		10%
GRAND TOTAL (SUB-TOTAL ii + IKRAM Fees)			

Bill 9: GEOPHYSICAL SURVEY

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
9.1	<u>Mobilization</u>		
9.1.1	Mobilization of personnel and equipment to site demobilisation upon completion:-		
9.1.1.1	Up to 25 km from Kuala Lumpur	LS	1,200.00
9.1.1.2	Over 25 km and up to 225 km from Kuala Lumpur	LS	1,700.00
9.1.1.3	Over 225 km and up to 425 km from Kuala Lumpur	LS	2,100.00
9.1.1.4	Over 425 km from Kuala Lumpur	LS	2,400.00
9.2	<u>Setting Out</u>		
9.2.1	Setting out of geophysical survey lines at fixed sensor interval and taking the reduce level at each sensor position.	LS	1,250.00
9.3	<u>Geophysical Survey</u>		
9.3.1	Seismic Refraction Survey		
9.3.1.1	Carry out seismic survey within a 24 channel seismograph with geophone at maximum 5m interval measured along the slope and 7 sheets per spread, sledge hammer as energy source, and analysis of data with seismic tomographic software and incorporating borehole data where available. (minimum length per line is 72m)	Line	3,000.00
9.3.2	Multi-Channel Analysis of Surface Wave (MASW)		
9.3.2.1	Carry out surface wave investigation with 3m interval with 24 geophone for investigation depth up to 20m depth, using Sledge Hammer As Seismic Source to obtain the S-Wave tomogram. (minimum length per line is 72m)	Line	2,500.00

Bill 9: GEOPHYSICAL SURVEY (Cont'd)

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
9.3.3	2-D Resistivity Profiling		
9.3.3.1	Carry out 2D resistivity profiling using Schlumberger - Wenner configuration and roll-along technique within 40 electrodes at 5m Intervals, each Interval measured as the slope distance between adjacent electrodes, determine levels of each electrode, and process data to produce resistivity profiles. (minimum length per line is 120m)	Line	1,800.00
9.4	<u>Report</u>		
9.4.1	Prepare and submit report which shall include the compilation of all data including result from ground investigation and 3D model of the study area and surrounding area.	nos	300.00

BILL 10: SURFACE MAPPING

ITEM	DESCRIPTION OF WORK	UNIT	RATE (RM)
10.1	<u>Mobilization</u> Mobilization of personnel and equipment to site demobilization upon completion:-		
10.1.1	Up to 25 km from Kuala Lumpur.	LS	1,200.00
10.1.2	Over 25 km and up to 225 km from Kuala Lumpur.	LS	1,700.00
10.1.3	Over 225 km and up to 425 km from Kuala Lumpur.	LS	2,100.00
10.1.4	Over 425 km from Kuala Lumpur.	LS	2,400.00
10.2	<u>Geomorphological Mapping</u> The works carried out inclusive filling up primary area based proforma, structural proforma (if exist), collection of any visible evidences, data logging and expert judgement based on the site condition together with supporting illustration	ha	18,000.00
10.3	<u>Engineering Geological Mapping</u> The works carried out inclusive collection of data structural discontinuities for rock, distresses using Rock Proforma and/or structural proforma (if exist), structural/ kinematic analyses, determination of critical area, potential mode of failure and illustration of geological features on the slope.	ha	18,000.00
10.4	<u>Report</u> Prepare and submit report which shall include the compilation of all data and analyses of the study area.	nos	600.00

BILL NO 11: INSTRUMENTATION & MONITORING

ITEM	DESCRIPTION	UNIT	RATE (RM)
11.1	<u>Mobilization</u>		
11.1.1	Mobilization of personnel and equipment to site demobilization upon completion:-		
11.1.1.1	Up to 25 km from Kuala Lumpur	LS	1,200.00
11.1.1.2	Over 25 km and up to 225 km from Kuala Lumpur	LS	1,700.00
11.1.1.3	Over 225 km and up to 425 km from Kuala Lumpur	LS	2,100.00
11.1.1.4	Over 425 km from Kuala Lumpur	LS	2,400.00
11.2	<u>Instrument Installation (Supply & Install)</u>		
11.2.1	Building / column settlement marker	No.	130.00
11.2.2	Demec Gauge Station	No.	100.00
11.2.3	Ceramic Tilt Plate	No.	450.00
11.2.4	Brass Tilt Plate	No.	500.00
11.2.5	Avongard Standard Tell-Tale	No.	120.00
11.2.6	Setting up TBM	No.	1,250.00
11.3	<u>Monitoring of the Above Instrument</u>		
11.3.1	Up to 25 km from Kuala Lumpur	LS	1,200.00
11.3.2	Over 25 km and up to 225 km from Kuala Lumpur	LS	1,700.00
11.3.3	Over 225 km and up to 425 km from Kuala Lumpur	LS	2,100.00
11.3.4	Over 425 km from Kuala Lumpur	LS	2,400.00
11.4	<u>Report</u>		
11.4.1	Prepare and submit the report which shall include the compilation of all monitoring data of the study area and surrounding area.	nos	300.00

BILL 12 : TERRESTRIAL LASER SCANNING

ITEM	DESCRIPTION	UNIT	RATE (RM)
12.1	Mobilization of personnel and equipment to site demobilization upon completion:-		
12.1.1	Up to 25 km from Kuala Lumpur	LS	1,200.00
12.1.2	Over 25 km and up to 225 km from Kuala Lumpur	LS	1,700.00
12.1.3	Over 225 km and up to 425 km from Kuala Lumpur	LS	2,100.00
12.1.4	Over 425 km from Kuala Lumpur	LS	2,400.00
12.2	<u>a. Terrestrial Laser Scanning Works</u> Carry out Terrestrial Laser Scanning works using Laser Scanner Rental for Inclusive of : - Laser Scanner , - GPS Receiver, - Data Acquisition Software - Site staff for data acquisition using scanner System <u>b. Carry out data processing works by using Point Cloud Processing software including of Point Cloud Registration, Course registration, Multistation Adjustment, & Filtration of features for producing deliverable</u> - Point Cloud (LAS format) - Layout plan in autocad - Meshing (Hold failure area and adjacent) - Cross Section (10m interval) - 3D Fly Through (In Avi format) - 2m Contour <u>c. Carry out features extraction works that can be seen from TLS processed data</u> - Building - foot print - Lamp post - point location - Roads/Railway - Signage	day	9,000.00

BILL 12 : TERRESTRIAL LASER SCANNING (Cont'd)

ITEM	DESCRIPTION	UNIT	RATE (RM)
12.3	<u>a. Terrestrial Laser Scanning Works</u> Carry out Terrestrial Laser Scanning works using Laser Scanner Rental for Inclusive of : - Laser Scanner , - Data Acquisition Software - Site staff for data acquisition using scanner System - Scanning frequency every 2 hour (24 hours) <u>b. Carry out data processing works by using Point Cloud Processing software including of Point Cloud Registration, Course registration, Multistation Adjustment, & Filtration of features for producing deliverable</u> - Point Cloud (LAS format) comparing every scan - Meshing (Hold failure area and adjacent) - Cross Section (5m interval) - Update the officer in charge - 2m Contour	Days	13,900.00
12.4	<u>Carry out Target Control Survey using Total Station for determination of Ground Control Point</u> Control monument site inspection Coordinating Control RTK-GNSS ground Control / Levelling Planimetric Survey processing	LS	6,000.00

BILL 13 : UNMANNED AERIAL VEHICLE WORKS

ITEM	DESCRIPTION	UNIT	RATE (RM)
13.1	<u>Mobilization</u>		
13.1.1	Bring the UAV LiDAR equipment with to the site, and remove the same from the site after completion of scanning, including shifting to next scan location, when the site is :-		
13.1.2	Up to 25km from Kuala Lumpur	LS	1,200.00
13.1.3	Over 25km and up to 225km from Kuala Lumpur	LS	1,700.00
13.1.4	Over 225km and up to 425km from Kuala Lumpur	LS	2,100.00
13.1.5	Over 425km from Kuala Lumpur	LS	2,400.00
13.2	<u>Project Preparation</u> Flight Planning a) DCA Approval & Permit b) JUPEM Approval & Permit c) Execution table (flight path, area of interest, weather / environmental condition)	sum	As Per Bill As Per Bill 3,300.00
13.3	<u>a. Unmanned Aerial Vehicle Works</u> Carry out UAV LiDAR works for inclusive of : - Online waveform LiDAR sensor - IMU/GNSS Receiver, - Data Acquisition Software - Camera - Site staff for data acquisition using scanner System <u>b. Carry out data processing works by using processing software including of Point Cloud Registration, trajectory adjustment, georeferenced point cloud, combination and adjustment of laser scan data & Filtration of features for producing deliverable</u> - Point Cloud (LAS format) - DTM & DSM classification - Layout plan in autocad - Aerial Photo - Cross Section (5m interval) - 3D Fly Through (In Avi format) - 2m Contour	Day	20,000.00

BILL 13 : UNMANNED AERIAL VEHICLE WORKS (Cont'd)

ITEM	DESCRIPTION	UNIT	RATE (RM)
13.4	<u>c. Carry out features extraction works that can be seen from UAV processed data</u> - Building - foot print - Slope Structure - point location - Roads/Railway - Signage / Lamp Post - Other possible features	LS	6,000.00
	<u>Carry out Target Control Survey using Total Station for determination of Ground Control Point</u> Control monument site inspection Coordinating Control RTK-GNSS ground Control / Levelling Planimetric Survey processing		

Rujukan agensi :

Tarikh :

Kumpulan IKRAM Sdn. Bhd.
Unipark Suria
Jalan IKRAM-UNITEN
43000 KAJANG, SELANGOR

Tuan,

PELAWAAN MENGEMUKAKAN CADANGAN TEKNIKAL DAN KOS BAGI MELAKSANAKAN PERKHIDMATAN KEJURUTERAAN FORENSIK (CERUN & STRUKTUR BERKAITAN CERUN)

Dengan hormatnya saya merujuk kepada perkara di atas dan 1 Pekeliling Perbendaharaan Perolehan Kerajaan Bil. 2.2 (1PP/PK 2.2) adalah berkaitan.

2. Sukacita dimaklumkan bahawa Kerajaan berhasrat mempelawa tuan mengemukakan cadangan teknikal dan kos bagi melaksanakan perkhidmatan dengan ketetapan seperti berikut:

Bil	Perkara	Maklumat			
a.	Nama projek :				
b.	Lokasi :				
c.	Skop perkhidmatan :	Sila (✓) pada petak 'pilihan':			
		Pilihan	Skop	Jangkaan Tarikh Mula	Jangkaan Tarikh Siap
			Kejuruteraan Forensik (Cerun & Struktur Berkaitan Cerun)		
			Penyeliaan Tapak		
d.	Anggaran kos perkhidmatan (RM) :	(berdasarkan kadar-kadar yang ditetapkan di dalam 1PP/PK 2.2)			
e.	Perincian perkhidmatan termasuk terma rujukan :	(diperihalkan di ruang ini atau diperihalkan di Lampiran)			

3. Sekiranya tuan bersetuju dengan pelawaan ini, sila kemukakan Cadangan Teknikal dan Cadangan Kos (CTK) berasaskan ketetapan seperti di perenggan 2 di atas **dalam tempoh empat belas (14) hari**. Tuan adalah dikehendaki mengemukakan CTK tuan kepada pihak kami berdasarkan maklumat di bawah:

Bil	Perkara	Maklumat
a.	Nama agensi :	
b.	Alamat agensi :	
c.	Tarikh tutup pelawaan :	Tarikh Akhir :
		Waktu :
d.	Nama pegawai yang boleh dihubungi :	
e.	No. telefon, faks & e-mel :	No. Telefon :
		No. Faks :
		E-mel Rasmi :

4. Bersama-sama surat ini juga disertakan Surat Akuan Syarikat untuk dilengkapkan dan dikembalikan bersama-sama dengan CTK sekiranya tuan bersetuju dengan pelawaan ini.

5. Sekiranya tuan perlu mendapatkan sebarang penjelasan atau tidak bersetuju dengan mana-mana kandungan di dalam surat pelawaan ini, sila maklumkan kepada pihak kami dalam tempoh dua (2) hari agar penjelasan lanjut dapat dilaksanakan.

6. Sekiranya pihak kami tidak menerima sebarang maklum balas atau CTK daripada tuan dalam tempoh empat belas (14) hari, pihak kami akan beranggapan bahawa tuan tidak berminat dengan pelawaan ini dan seterusnya surat ini adalah terbatal dengan sendirinya.

7. Surat ini berserta kandungannya adalah merupakan rahsia Kerajaan dan tidak boleh disebarkan kepada mana-mana pihak lain.

8. Surat ini berserta kandungannya juga adalah hanya merupakan suatu pelawaan dan hendaklah tidak ditafsirkan dalam apa-apa cara jua sebagai mengikat Kerajaan.

Sekian, terima kasih.

“BERKHIDMAT UNTUK NEGARA”

Saya yang menurut perintah,

.....
(Nama Penuh Pegawai & Agensi)

Rujukan agensi :

Rujukan syarikat:

Tarikh :

.....(Nama Agensi).....

.....(Alamat Agensi).....

.....

.....

Tuan,

SURAT AKUAN SYARIKAT:**Pelaksanaan Perkhidmatan Kejuruteraan Forensik (Cerun & Struktur Berkaitan Cerun) Di**
Lokasi **Bagi Agensi****Pada** **Hingga**

Dengan hormatnya saya merujuk kepada perkara di atas dan surat tuan dengan no. rujukan di atas bertarikh adalah berkaitan.

2. Saya,.....nombor K.P.....
yang mewakili **Kumpulan Ikram Sdn. Bhd. (360785-A)** dengan ini mengisytiharkan bahawa saya atau mana-mana individu yang mewakili syarikat ini tidak akan menawar atau memberi rasuah kepada mana-mana individu dalam agensi ini atau mana-mana individu lain, sebagai sokongan untuk dipilih dalam perolehan ini.

3. Sekiranya didapati ada sebarang percubaan rasuah daripada mana-mana pihak, saya akan membuat aduan dengan segera ke pejabat Suruhanjaya Pencegahan Rasuah Malaysia atau balai polis berhampiran. Saya sedar bahawa kegagalan saya berbuat demikian adalah satu kesalahan di bawah Akta Suruhanjaya Pencegahan Rasuah 2009 [Akta 694].

Yang Benar,

.....
(Nama pegawai yang diberi kuasa oleh syarikat)

Jawatan:

No. Kad Pengenalan:

Cop syarikat :

**JKR 58 - MSA****INDEN KERJA**

Kumpulan IKRAM Sdn. Bhd. (KISB)
Unipark Suria
Jalan IKRAM-UNITEN
43000, Kajang
SELANGOR DARUL EHSAN

Vot :
Tajuk Kerja : Kejuruteraan Forensik (Cerun & Struktur Berkaitan Cerun) / Penyeliaan Tapak
Rujukan Fail :
No. Inden :
No. Tanggungan :
Kerani Kewangan :
Kod & Nama Agensi :

Bahagian A : Maklumat Perkhidmatan yang Perlu Dilaksanakan**NAMA PROJEK :**

Sila laksanakan perkhidmatan yang diperihalkan di bawah ini atau pada lampiran :

Untuk jumlah wang sebanyak anggaran Ringgit Malaysia : _____
(RM) mengikut syarat-syarat dan "Service Fees or Schedule of Rates" dalam MSA di antara KISB dan Kerajaan Malaysia. Perkhidmatan hendaklah dimulakan pada tarikh _____ dan disiapkan sebelum/ pada _____. Maklumat Pengarah Projek dan Wakil Pengarah Projek yang telah dilantik adalah seperti di lampiran.

Nama dan Tandatangan (Pegawai Agensi yang diberi kuasa)
Jawatan :

Tarikh :

Bahagian B : Perakuan Penerimaan oleh KISB

Dengan ini pihak KISB bersetuju/ tidak bersetuju dengan tawaran perkhidmatan tersebut.

Nama dan Tandatangan (Pegawai KISB yang diberi kuasa)
Jawatan :

Tarikh :

Waktu :

Bahagian C : Perakuan Penyiapan oleh KISB

Saya memperakui bahawa perkhidmatan berikut telah disiapkan dengan sempurna :
(Sila tandakan (✓) yang mana berkaitan)

1. ☐ Kejuruteraan Forensik (Cerun & Struktur Berkaitan Cerun)
2. ☐ Penyeliaan Tapak dari _____ hingga _____

Kos sebenar perkhidmatan ini ialah sebanyak Ringgit Malaysia (tidak termasuk 6% GST) : _____
(RM)).

Bersama-sama ini disertakan Inden Kerja ini dan lain-lain lampiran yang berkaitan sebagai dokumen sokongan.

Nama dan Tandatangan (Pegawai KISB yang diberi kuasa)
Jawatan :

Tarikh :

Cop Rasmi KISB :

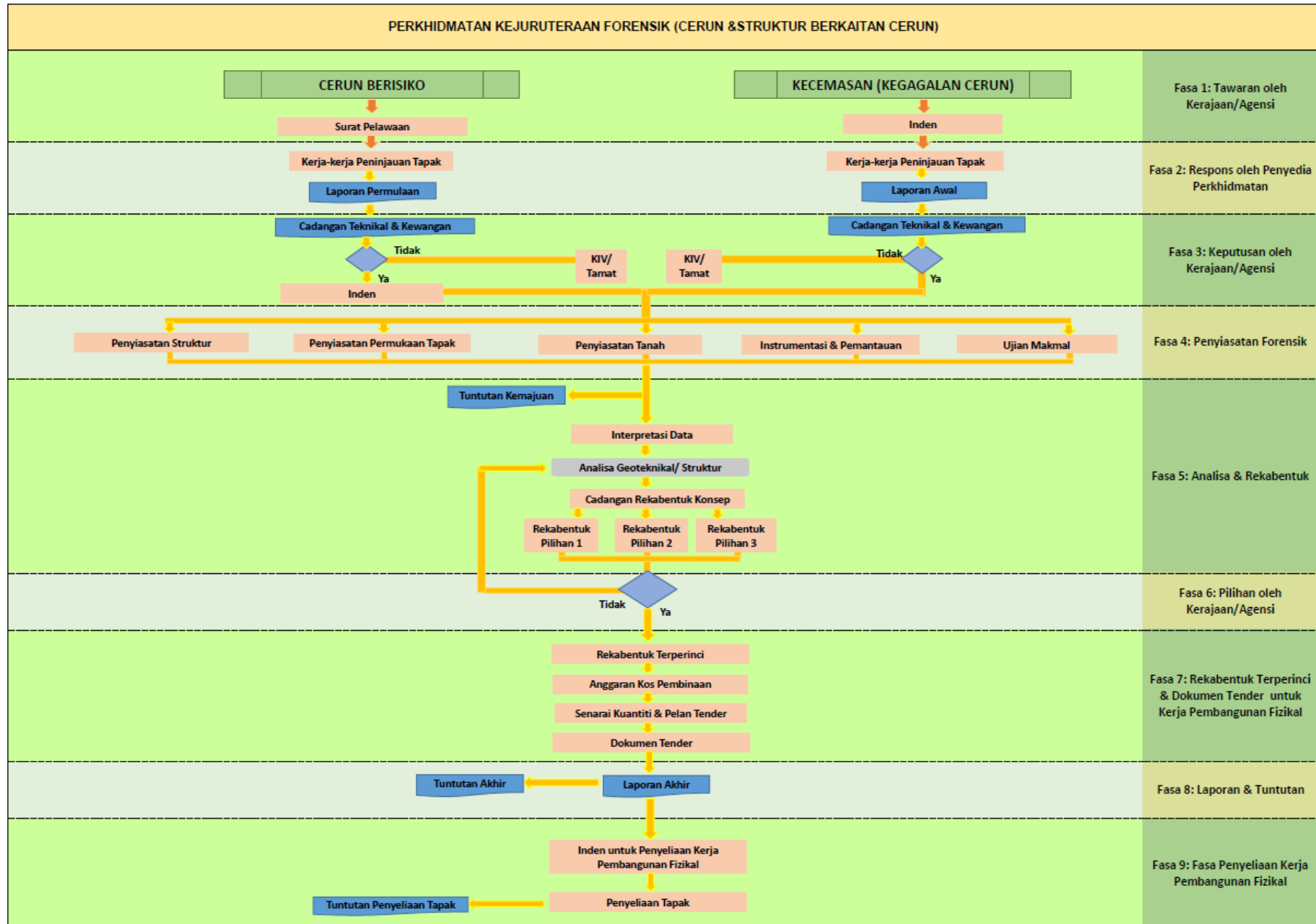
Bahagian D : Pengesahan Penyiapan oleh Agensi

Saya mengesahkan bahawa perkhidmatan yang tersebut di atas telah disiapkan dengan *sempurna dan memuaskan / tidak sempurna (senarai item tidak sempurna seperti di Lampiran). Dengan ini saya bersetuju dengan bayaran sebanyak Ringgit Malaysia : _____
(RM)).
dan kenaan 6% GST sebanyak (RM _____) untuk perkhidmatan yang telah disiapkan.

Nama dan Tandatangan (Pengarah Projek)
Jawatan :

Tarikh :

Cop Rasmi Agensi :



**TERMS OF REFERENCE
THE FORENSIC ENGINEERING SERVICES
(SLOPES & SLOPES RELATED OF STRUCTURES)
AND THE KISB SERVICES**

1.1. THE SCOPE OF SERVICES**1.1.1. The Forensic Engineering Services (Slopes & Slope Related Structures), including Site Supervision of Physical Works as follows:**

- i. Slopes;
- ii. Slope related (associated and affected) structures; and
- iii. Related services inclusive of field & laboratory testing which are needed **solely** for the **Forensic Engineering Services (Slopes & Slope Related Structures)**.

1.1.2. Any physical works are outside the scope of this Agreement.

1.2 AREAS COVERED BY THE SCOPE

1.2.1 The Services provided by the Service Provider shall cover all slopes failure throughout Malaysia **except**:

- (a) All Federal roads in Malaysia. In any event that the Public Works Department do not have the capacity to carry out the services, the right of first refusal as set out in Clause 4 applies;
- (b) All forensic engineering services that are currently being undertaken and pending completion by the Government/Agency either on its own or through its appointed consultants/contractors; and
- (c) All roads that are currently under privatized concession agreement (toll roads).

1.0 INTRODUCTION

1.1 This Terms of Reference (TOR) for Forensic Engineering Investigation (Slopes & Slope Related Structures) forms an integral part of the Master Service Agreement (MSA).

1.2 Cross reference to MSA may be necessary from time to time for clearer reference. This TOR forms the guideline for the Forensic Engineering Investigation process, which is part of the Activities of Forensic Engineering Services (Slopes & Slopes Related Structures).

1.2.1 Technical Definitions

- a) **‘Forensic Engineering & Failures’** has the meaning which include, without limitation:-
- i. Forensic Engineering means the engineering investigation of the causes of failures (materials, products, workmanships and design) of slopes and structures. The investigation will benchmark against existing codes, standards, statutory/regulatory requirements and best practices in the construction industry; and
 - ii. Failure means the ultimate manifestation of distress, resulting in an unacceptable difference between expected and observed performance. Failure can also mean the termination of the ability of a component or system to perform an intended or required function. Not all failures are catastrophic; most involve components that simply do not perform as expected. Failures may result from sudden events or slow process as referred to in *‘Forensic Structural Engineering Handbook (2nd Edition) –by Robert T. Ratay, Ph.D., P.E.’*;
- b) **‘Slope Associated Structures’** means any or all structural components which form(s) an integral part of the Slope and contribute(s) towards(s) its stability including but without limitation to soil nail, retaining wall, soil anchor, etc; and
- c) **‘Slope Affected Structures’** means any or all structures located in the vicinity of the Slope and is/ are affected by the Failure.

2.0 SCOPE OF SERVICES

2.1 The scope of the Services shall include this TOR for Forensic Engineering Services.

3.0 OBJECTIVES

3.1 The objectives of this TOR is to serve as a guiding reference to the implementation of the steps in the Forensic Engineering Services aimed to :

- (a) Determine the cause(s) of the failure:
 - (i) Identify failure or potential failure of the assets
 - (ii) Understand the key failure mechanisms in order to avoid them in the future
- (b) Provide short and long term preventive solutions:
 - (i) Propose immediate remedial measures to ensure safety to the public
 - (ii) Provide conceptual remedial design options for remedial works
- (c) Recommend solution to prevent the recurrence of the landslides :
 - (i) Provide detailed design inclusive of Bill of Quantities, Specifications and Drawings for the purpose of tendering for remedial works
 - (ii) Propose systematic routine maintenance to ensure the stability of the rehabilitated slope
- (d) Identify person/parties responsible, whenever applicable.
- (e) Control the quality of remedial works through supervision and QAQC of remedial construction works.

4.0 EMERGENCY RESPONSE**4.1 Response Time**

In the event of failure where the situation is in the state of emergency, the first critical step is to prevent further damage or loss of life and response time has become critical. KISB with its nine (9) branches throughout Peninsular Malaysia inclusive of Sabah and Sarawak shall respond to the reported failure situation upon directive of authority in the following manner:

1. If the failure location is within 50 km from its nearest branch office - the response time shall be within 3 hours.
2. If the failure location is more than 50 km from its nearest branch office - the response time shall be within 24 hours. In the case where the failure occurs in the remote area or location, the response time shall be within 48 hours. For the purpose of this clause, the phrase "remote" shall mean any area or location with no/difficult accessibility by proper road.

Figures 4.1 to 4.8 show the location of branch offices of KISB throughout Peninsular Malaysia, Sabah & Sarawak, and the relevant 50km radius.

IKRAM UTARA (ALOR SETAR)

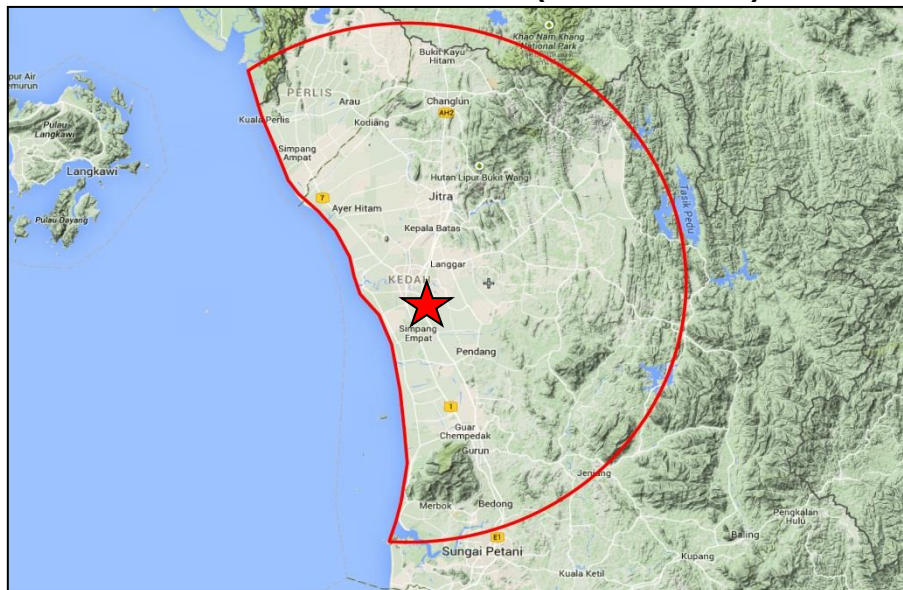


Figure 4.1 : Alor Setar Branch

IKRAM UTARA (PERAI)

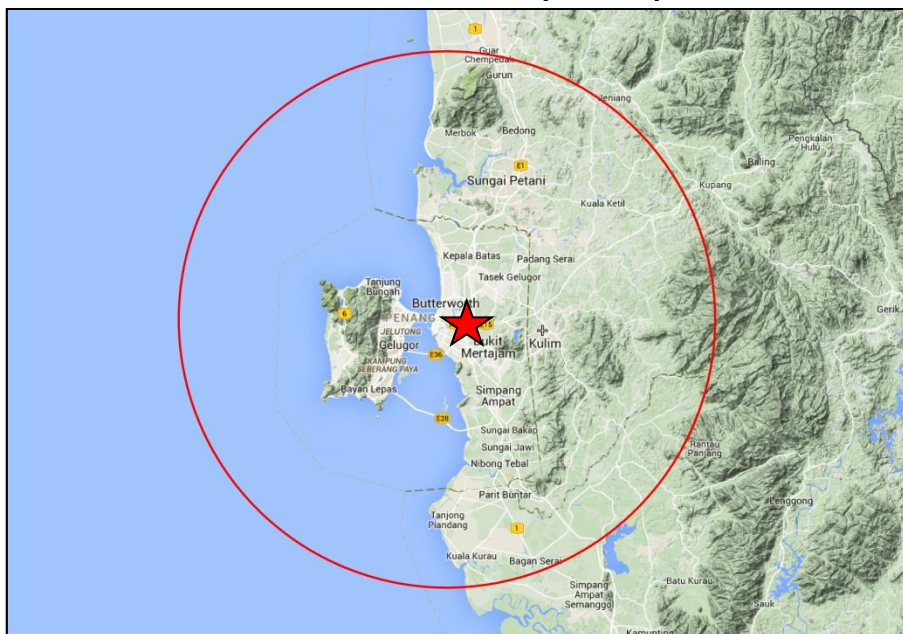


Figure 4.2 : Perai Branch

IKRAM UTARA (IPOH)

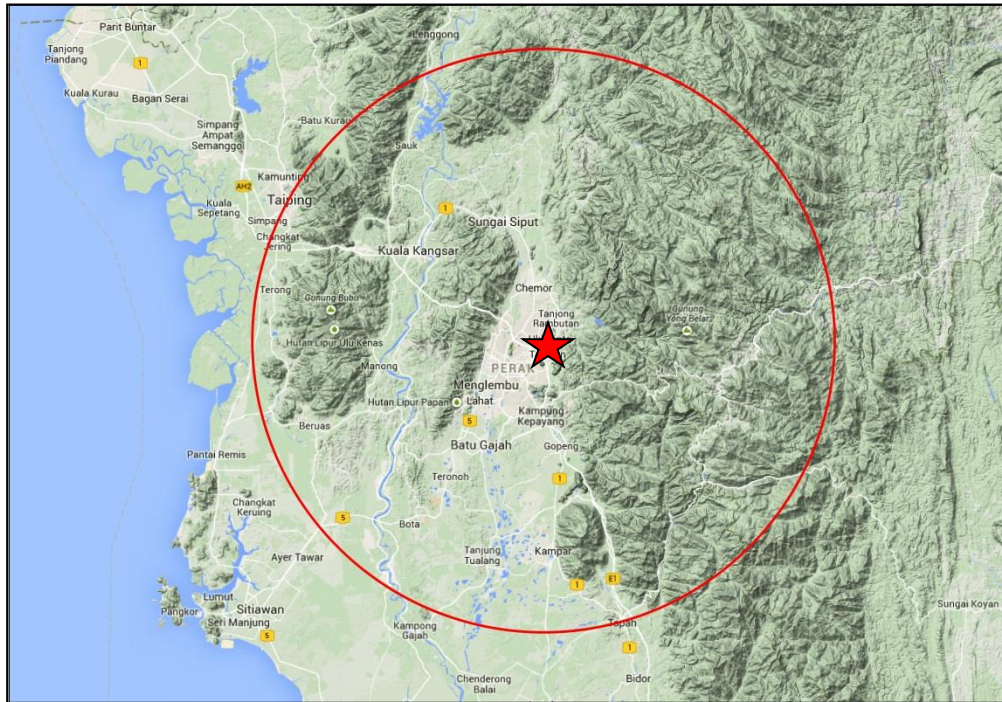
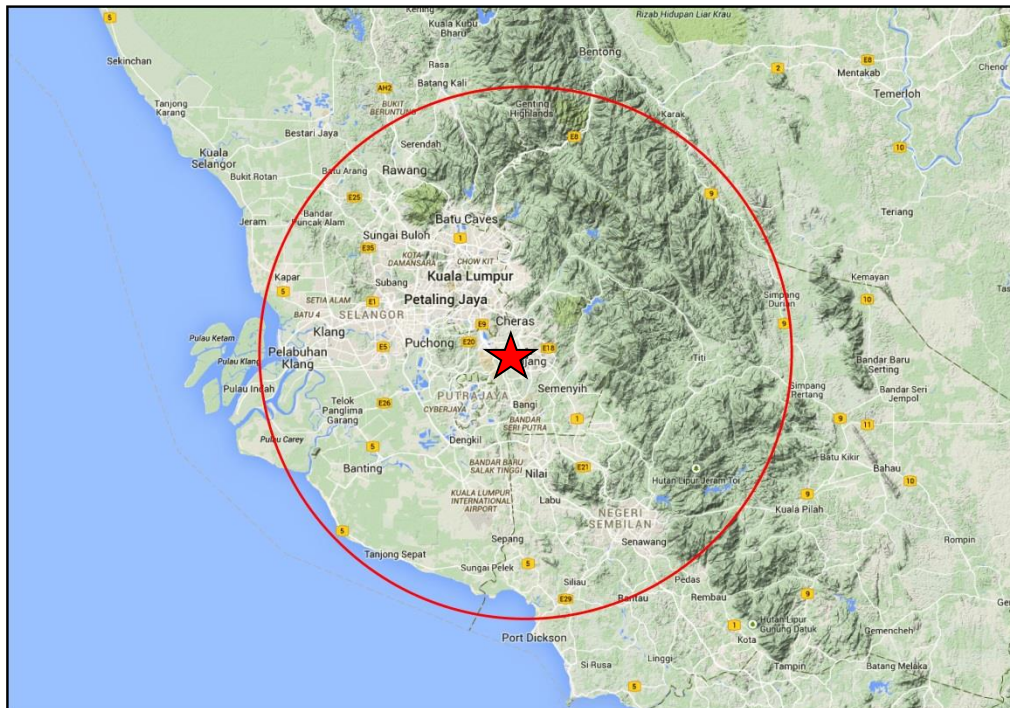


Figure 4.3 : Ipoh Branch



4.4 : Kajang Headquarters

IKRAM SELATAN (SKUDAI)

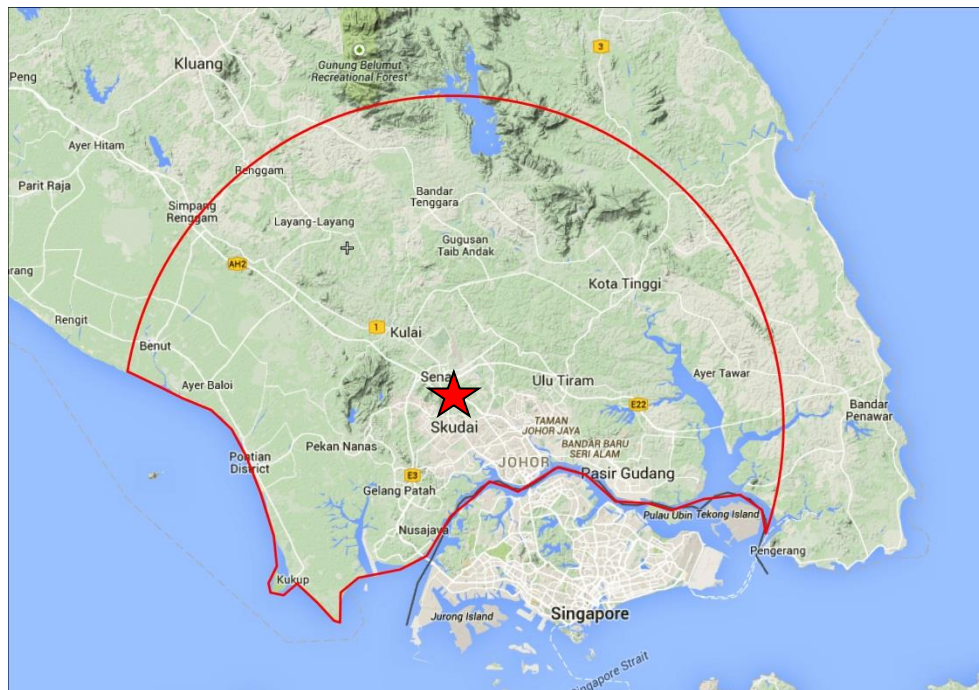
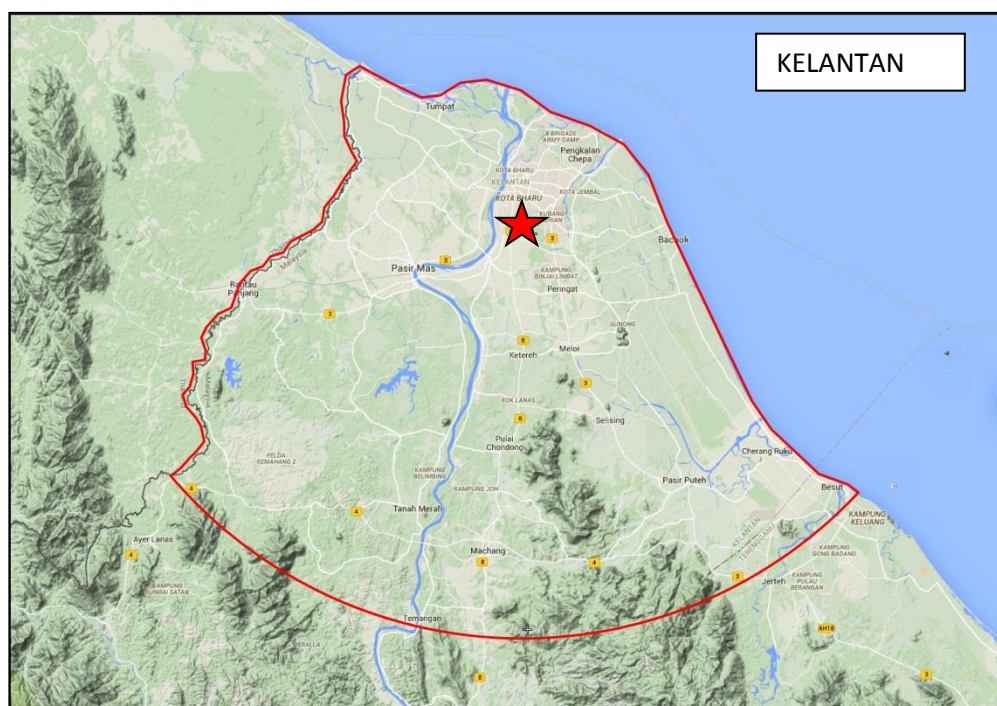


Figure 4.5 : Skudai Branch

IKRAM TIMUR



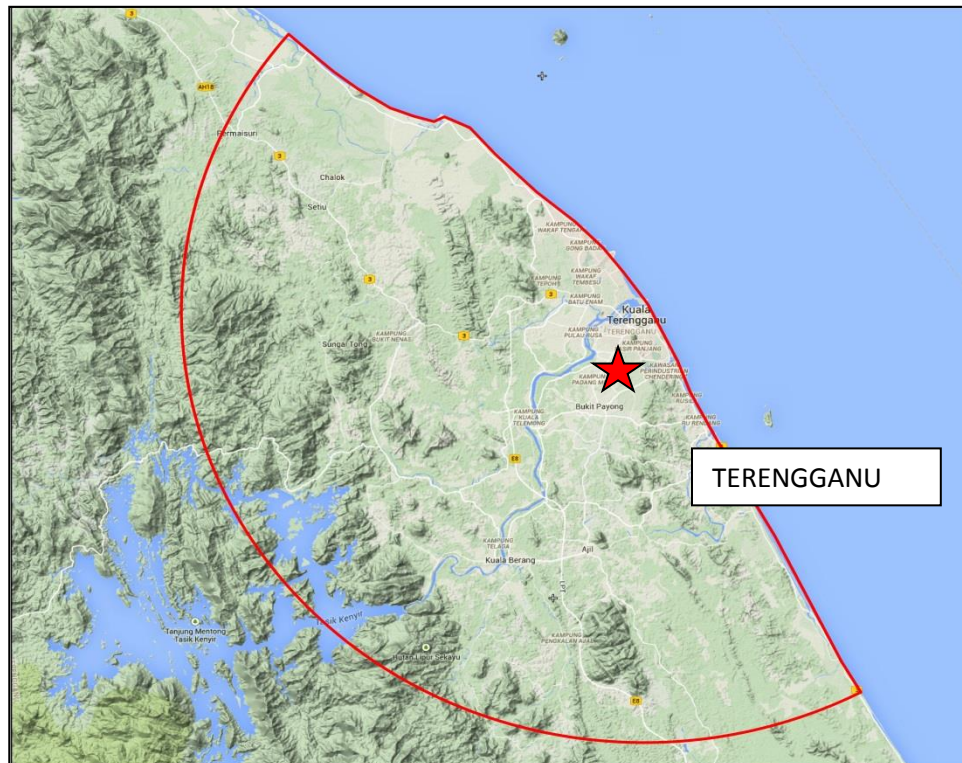
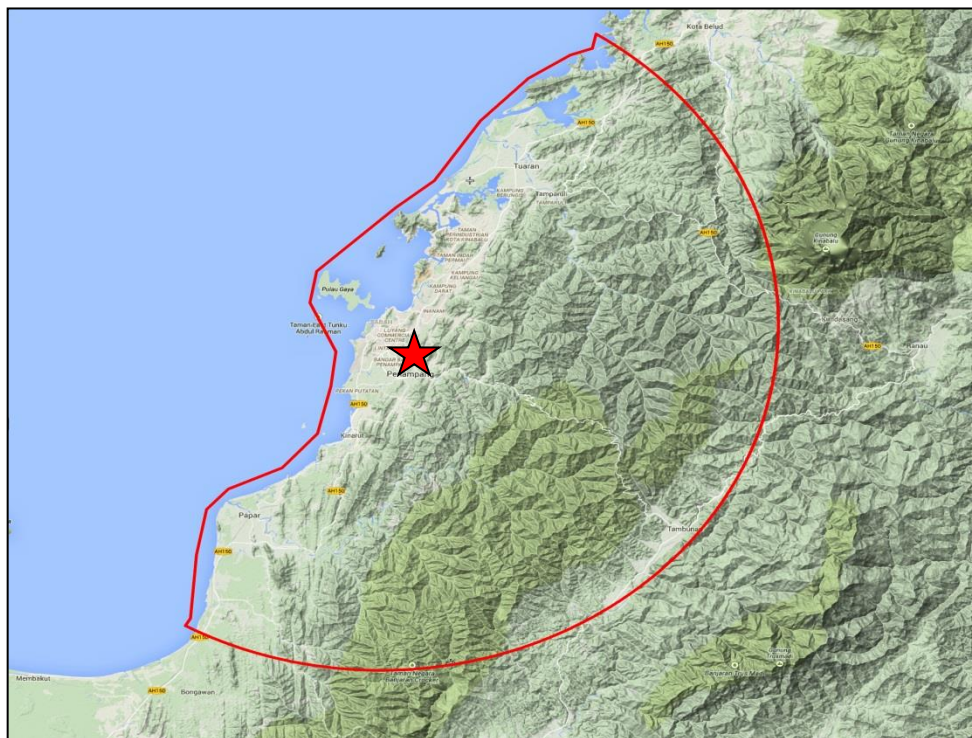


Figure 4.6 : Kota Bharu & Kuala Terengganu Branch (towards land side)

IKRAM SABAH



**Figure 4.7 Kota Kinabalu Branch
IKRAM SARAWAK**

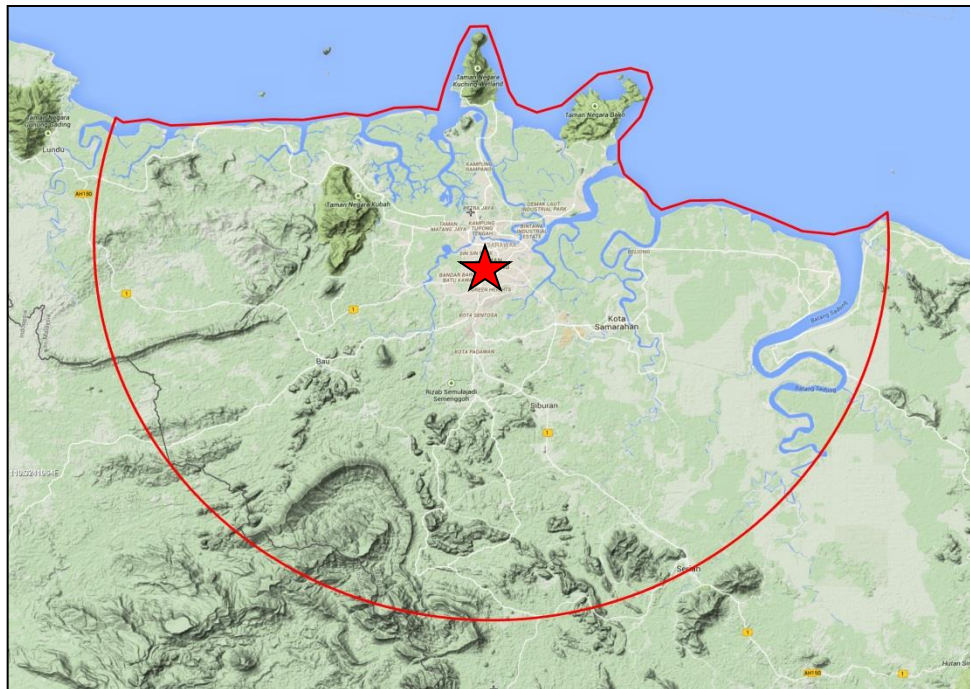


Figure 4.8 : Kuching Branch

4.2 Safety

KISB will assign a response team to the site of failure and determine the safety and stability of the slopes and slope related structures for a variety of possible purposes such as to:

- Identify the safest routes through the debris, or identifying areas that must be avoided until stabilized;
- Identify “pockets” within the debris where the victims might be sheltered or trapped;
- Identify the components that are in imminent danger of further failure;
- Evaluate methods of stabilizing the slopes and slope related structures such as by adding shoring, bracing, or tiebacks, etc;
- Determine the area of the failure needed to provide protection to the public, or restrict to the public access. Protection may include safety netting, sidewalk bridges, braced hoarding and other barriers;
- Evaluate the alternative demolition or dismantling sequence of failed slope related structures.

4.3 Reporting

- 4.3.1 For emergency cases, KISB will provide an initial report to the relevant authorities pertaining to the background of the slope failures and its consequences within 3 hours of

arrival. Key to the initial report will also include technical advices pertaining to safety issues as well as other information subject to the directive of the authority.

The initial report which will serve as “talking point”, amongst others, will cover:

- (i) Location and time of slope failure;
- (ii) The nature & probable cause/s of the slope failure;
- (iii) The measures taken and will be taken to ensure safety of the public;
- (iv) Reminders to the public especially pertaining to safety; and
- (v) Relevant photographs.

5.0 THE STEPS IN FORENSIC ENGINEERING INVESTIGATION (SLOPES & SLOPE RELATED STRUCTURES)

5.1 METHODOLOGY

For non-emergency events, the methodology for the implementation of Forensic Engineering Investigation (Slopes & Slope Related Structures) shall be undertaken in the following flow chart, as illustrated in Figure 5.1 below.

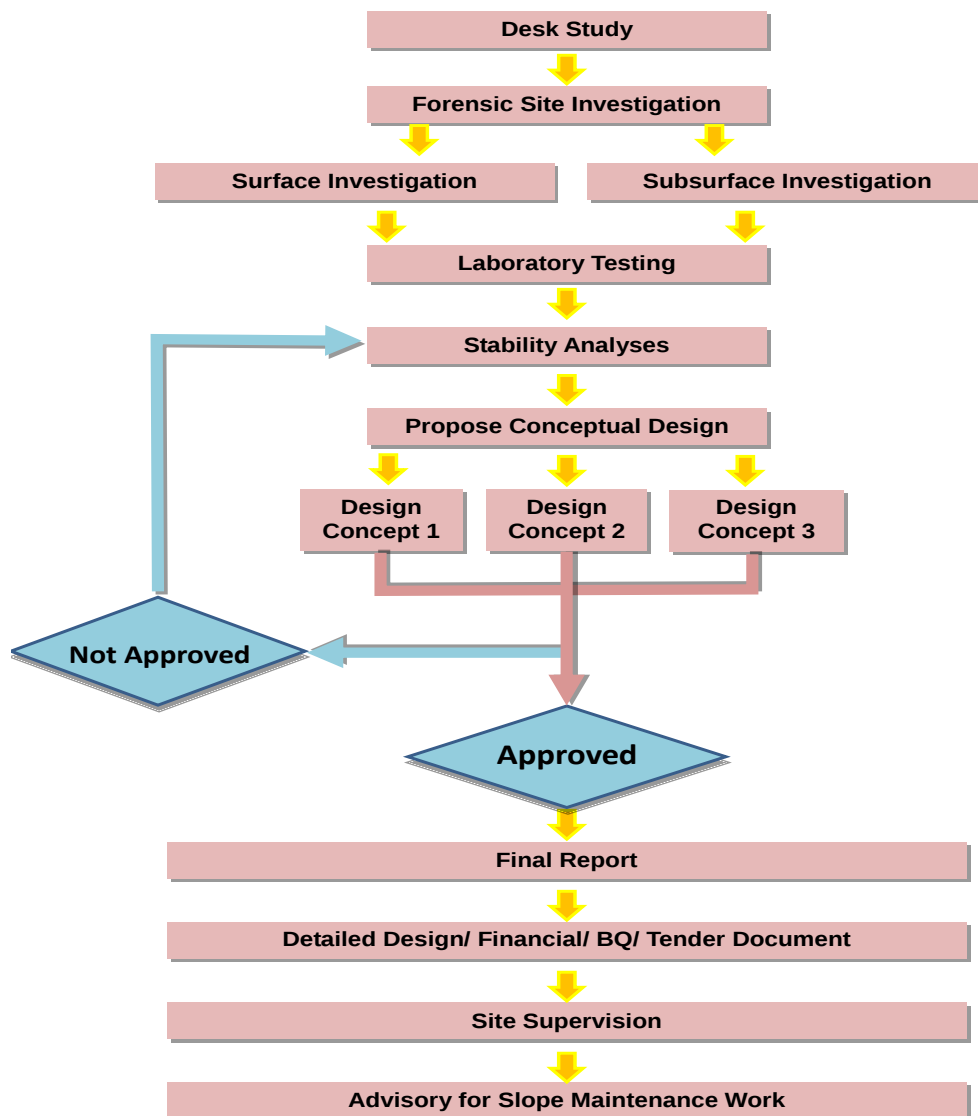


Figure 5.1 : Flow Chart of Forensic Engineering Investigation

5.2 STEPS IN FORENSIC ENGINEERING INVESTIGATION (SLOPES & SLOPE RELATED STRUCTURES)

The generic steps in the Forensic Engineering Investigation (Slopes & Slope Related Structures) are as outlined below in the Figure 5.2, and described in following sub-sections.

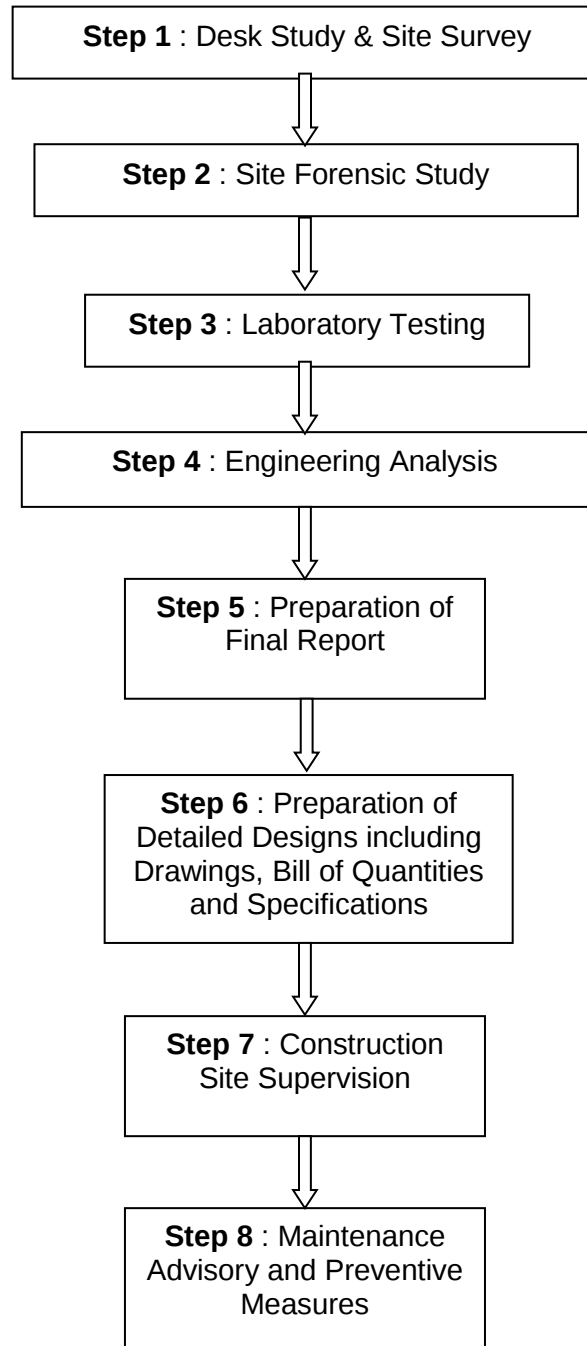


Figure 5.2 :Generic Steps in the Forensic Engineering Investigation (Slopes & Slope Related Structures)

5.2.1 Step1 : Desk Study & Site Survey

5.2.1.1 Preliminary site survey will be required to identify the study location and establish study objective and scope.

5.2.1.2 Types of information that are typically sought in this step specifically for slopes include:

- A. Assessment of the historical records (if available)
 - a. Geotechnical Report
 - b. Soil investigation records
 - c. Instrumentation monitoring records
 - d. Layout plan & Slope design reports
 - e. Development layout plan
- B. Preparation of Site Geology Map
- C. Compilation of rainfall records
- D. Preparation of basic thematic maps but not limited to :
 - a. Orthophotos
 - b. Satellite images
 - c. Digital terrain model
 - d. Slope angle
 - e. Slope drainage
 - f. Boundary lot
 - g. Road network
 - h. Other related thematic maps

5.2.1.3 Generally, the document review is necessary to track down all the relevant documents regarding the asset to understand how and when certain decisions and actions were taken that impacted the performance of the same.

The documents shall include but not limited to the followings:

- Original documents and calculations.
- Shop drawings.
- As-built drawings.
- Any documents that show subsequent modifications and maintenance.
- Inspection reports relating to fabrication and construction such as material testing reports and certification reports.
- Contracts, Specifications.
- Project correspondences.
- Daily field reports.
- Modifications to the contract documents.
- Documents which are related to the dead loads of the structures such as architectural, mechanical and electrical.

5.2.1.4 A preliminary evaluation of the data shall then be conducted in order to:

- a. Develop failure scenarios and mechanisms.
- b. Perform preliminary slope, structure and related components analyses.
- c. Develop a testing program.
- d. Identify areas where additional expertise may be required.
- e. Identify missing project documents.
- f. Identify additional field investigation and additional samples needed.
- g. Identify additional persons to interview and develop follow-up questions for previous interviewees.

5.2.2 Step 2 : Site Forensic Study

5.2.2.1 Scope of investigation

The core purpose of failure investigation of asset is to determine whether the demand on the asset exceeded the capacity of the same.

5.2.2.2 Steps in the Investigation

KISB will create an investigative plan and such plan shall be continuously revised to account for new information and theories. Notwithstanding that, the investigative plan shall cover, but not limited to:

1. Site Surface Investigation
 - a. Site reconnaissance survey
 - b. Site technical issues evaluation
 - c. Detailed Engineering survey
 - d. Slope cross section preparation
 - e. Terrestrial laser scanning
 - f. Site surface and subsurface utility survey
 - g. Geomorphological mapping
 - h. Slope sketches
2. Subsurface Investigation
 - a. Soil investigation
 - b. Mackintosh probings
 - c. Geophysical survey including seismic refraction survey and/or electrical resistivity survey
3. Instrumentation
 - a. Slope / site surface instrumentations
 - b. Inclinator for slope movement
 - c. Piezometer for underground water pressure monitoring

5.2.2.3 Field Investigation for Slope Related Structures

The purpose of the field inspection and investigation are to determine the actual as-built condition of the structure and related components and realistic environmental conditions or loads in place at the time of failure. It needs to be carried out for developing a plan to document the failure condition of the structure and related components. The photographs of the overall site as well as detailed photographs of critical elements should be taken. The locations and piece numbering system shall be identified and developed. Common field activities that require recording as shown in Table 5.2.1.

Table 5.2.1: Records of Field Activities

Sketches of overall failed configuration
Observation of behavior of adjacent construction during and subsequent to failure
Detailed sketches of critical members and connections
Inventory of construction materials to establish dead loads
Observation of deterioration
Records of detailed as-built conditions, including plan and detailed dimensions
Description of fracture surfaces
Records of samples removed
Procedures and results of fields tests
Indications of environmental conditions acting on facility at time of failure
Log of photographs
Records of conversation with others

5.2.2.4 Field Testing and Sample Collection for Structures

The purpose of the field testing is to obtain field information, such as in-situ material strength, quality of workmanship and other engineering properties required for the engineering and theoretical analyses. The types of field testing will depend on the approach of the investigation and other criteria, such as accessibility of the site, time availability, safety of test personnel, etc. Whenever the required field information are impossible to obtain by means of field testing, necessary and adequate size of material samples (including soil, concrete, steel, timber, masonry, etc.) shall be collected from the site and sent to accredited laboratory for further diagnosis. The commonly used field testing in the investigation but not limited to the followings as listed:

Table 5.2.2: List of Commonly Used Field Testing

Rebound hammer test
Ultrasonic pulse velocity measurement
Concrete pull-off/pull-out test
Windsor probe test
Half-cell potential corrosion test
Electricity resistivity corrosion test
Rebar scanning and verification test
Concrete carbonation test
Full scale static load test
Foundation system verification
Trial pits

5.2.2.5 Structural Monitoring

Some field information, for example like ground settlement, slope movement, vibration level, erosion process, etc. will require lengthier and constant observation to detect the changes and their effects on the performance of the structure and related components. Occasionally, such field information as crack propagation, column tilting, etc. may also provide an indication on the stability condition and possibility of further collapse of the structure and related components. This field information will require high-performance device to monitor their movement and changes, and the data shall be collected continuously at consistent interval over a desired time period.

5.2.3 Step 3 : Laboratory Testing

5.2.3.1 Laboratory analysis is to determine the actual soil / material properties. These would include the strength tests for the soils / materials as appropriate. The purpose of the tests is to determine actual soils / material properties at the time of failure as opposed to code-required minimum values. These tests should help to identify any time or environment dependent changes in soil / material properties.

Typical soil / rock / material tests include, but not limited to the following:

1. Soil / rock classification tests on collected samples
2. Soil / rock strength and compressibility tests
3. Soil general engineering properties tests such as porosity, erosivity and other hydraulic properties

5.2.3.2 Laboratory testing for related structures may be necessary and the list of common tests are as tabulated, but not limited to the followings:

Table 5.2.3: List of Commonly Used Laboratory Testing

Concrete compressive strength test
Steel tensile strength test
Cement content test
Chloride content test
Sulphate content test
Soil classification tests
Soil consolidation test

5.2.4 Step 4 : Engineering Analysis

5.2.4.1 Generally, the engineering analysis shall be carried out to determine the prevalent soil / material properties at failure of the slopes. The failure analysis must use the actual loads imposed on the slopes and the real world capacity of the same. Failure analysis should be based on demand-to-capacity ratios absent of any factoring.

5.2.4.2 The steps to be undertaken during this step for slope failure shall include:

- a. Slope stability back analyses on the failed slope
- b. Slope stability analyses for remedial works
- c. Conceptual design for three (3) slope remedial options
- d. Digital terrain modeling on the three (3) slope remedial options

5.2.4.3 Remedial Design for Failed Slope

The design shall be according to standards set up by *Cawangan Kejuruteraan Cerun, Jabatan Kerja Raya Malaysia* or any other related standards and specifications approved by the authorities.

5.2.5 Step 5 : Preparation of Final Report

5.2.5.1 Typical flow to be undertaken under this step shall include:

1. Preparation of draft final report on Forensic Engineering investigation
2. Modifications on draft final report
3. Finalisation of the Forensic Engineering investigation report
4. Submission of Final Report:
 - (a) Soft and hard copy to the respective Agency; and
 - (b) Soft copy of the Documents to JKR (editable data).

5.2.5.2 Reports

Report on the failure of slopes needs to be prepared to support all technical arguments and to give the technical outline for the forensic engineering investigations. Report should lay the facts found in the investigation, the likely key factors identified, the opinions of the expert and the supporting documentation.

The typical outline of the report as shown in **Table 5.2.4** below:

Table 5.2.4 : An Example of Typical Report Outline

Executive Summary
Table of Contents
1.0 Introduction
1.1 Objective
1.2 Scope
1.3 Background
1.4 Responsible Design and Construction Entities
1.5 As-Built Documents
2.0 Description of Forensic Engineering Investigation
3.0 Site Investigation
4.0 Laboratory Tests
5.0 Results of Engineering Analyses
6.0 Discussion of Site Investigation, Laboratory Tests and Results of Engineering Analyses
7.0 Conclusions
8.0 Recommendations

5.2.6 Step 6 : Preparation of Detailed Design including Drawings, Bill of Quantities and Specifications

5.2.6.1 Often times near the completion of a forensic engineering investigation, there is a need to plan and design remedy of the damaged or failed slopes, and then estimate the cost of the remedy. The remedy cost shall include the costs for design inputs, engineering supervision and inspection costs and cost of physical works.

5.2.6.2 This step shall include the followings:

1. Preparation of detailed design on the selected option
2. Preparation of detailed costing on the selected option
3. Preparation of specifications and bill of quantities
4. Preparation of tender document

5.2.7 Step 7 : Construction Site Supervision

During the construction of remedial works, KISB shall:

1. Act as Superintending Officer's representative
2. Ensure complete preparation of construction works documents
3. Rationalise the bill of quantities with pre-construction site condition
4. Ensure that all contract documents are completed within the stipulated time
5. Coordinate the remedial works so that work programs are adhered to
6. Institute cost control to avoid unnecessary cost escalation
7. Certify that all claims are according to work done

8. Enforce a proper construction quality control such as construction material testing, slope reinforcement system testing etc.
9. Supervise the construction to ensure strict adherence to the intended design option
10. Maintain the contractor's optimum works quality
11. Report the construction progress consistently to the client

5.2.8 Step 8 : Maintenance Advisory and Preventive Measures

5.2.8.1 Amongst other things, KISB's responsibility shall be to:

1. Prepare routine and periodic maintenance program on the remedied slopes;
2. Prepare suitable budget and manpower requirement for slope management program;
3. Prepare maintenance works program chart for proper implementation;
4. Prepare slope monitoring program (if necessary).

5.2.8.2 To prevent the re-occurrence and occurrence of the events and to ensure public safety, Preventive Forensic Engineering shall be implemented, in compliance with the statutory and regulatory requirements as in the footnote¹ below.

6.0 IMPLEMENTATION OF FORENSIC ENGINEERING SERVICES (SLOPES & SLOPE RELATED STRUCTURES)

- 6.1 In overall, KISB shall provide the KISB services to support and implement the process of Forensic Engineering Services (Slopes & Slope Related Structures).
- 6.2 The general flow of the implementation process is as illustrated below in Figure 6.1.

¹Footnote :
1. Akta Jalan, Parit dan Bangunan (Pindaan) 1994 (Akta 133)
2. Pekeliling Am Bilangan 1 Tahun 2009: Manual Pengurusan Aset Menyeluruh Kerajaan.
3. Akta 520 Lembaga Pembangunan Pembinaan Industri 1994
4. Akta 514 Akta Keselamatan Dan Kesihatan Pekerja 1994

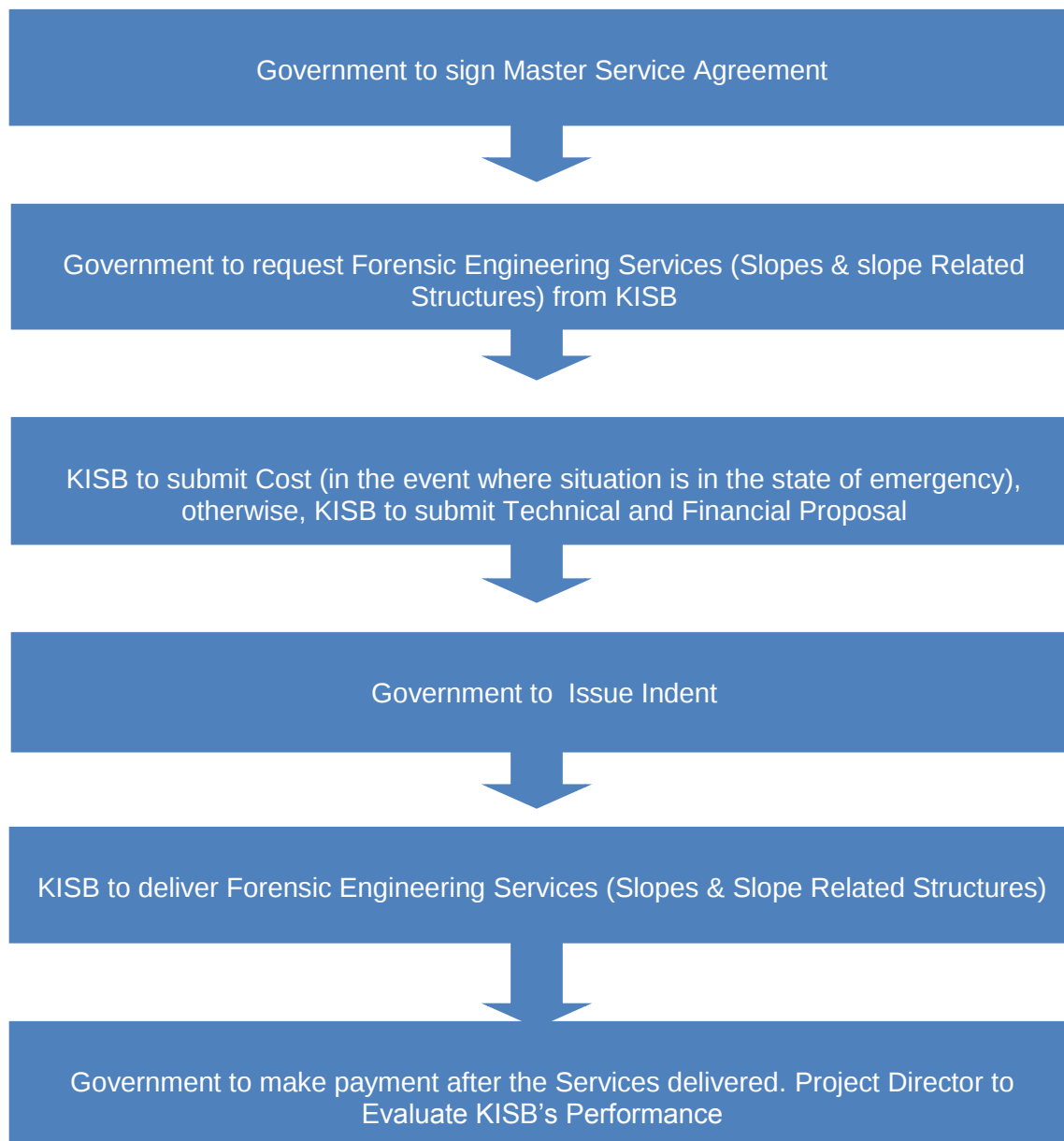


Figure 6.1 : OVERALL IMPLEMENTATION PROCESS OF THE FORENSIC ENGINEERING SERVICES (SLOPES & SLOPE RELATED STRUCTURES)

THE KISB SERVICES

KISB SERVICES

Related to

FORENSIC ENGINEERING SERVICES (Slopes & Slope Related Structures)

1.0 GEOTECHNICAL

The geotechnical division of KISB provides all geotechnical services as follows:

- 1.1 Slopes
- 1.2 Embankments
- 1.3 Retaining Structures
- 1.4 Slopes Stabilisation Works
- 1.5 Services in Slope Forensic Engineering – Investigation of probable causes of failure in geotechnical engineering and to propose suitable remedial measures.

2.0 STRUCTURAL AND MATERIAL TESTING

The structural and material testing division of KISB provides the following services:

- 2.1 Material Testing
 - 2.1.1 Raw materials
 - 2.1.2 Finished product
- 2.2 Quality Audit
- 2.3 Material Assessment
- 2.4 Failure Investigations pertaining to materials
 - 2.4.1 Material Testing
- 2.5 Material Specification Development
- 2.6 Structural Assessment and Surveillance
- 2.7 Construction Quality Assessment
- 2.8 Design Verification

2.9 Construction Records

2.10 Rehabilitation Proposal

3.0 REGIONAL LABORATORY

The regional laboratories of KISB provide the following services:

3.1 Site Investigations

3.2 Soil Test in the Field

3.3 Soil Test in the Laboratory

4.0 INSTRUMENTATION AND MONITORING IN GEOTECHNICAL ENGINEERING

4.1 Specifying scope of instrumentation and monitoring of works before, during and after construction

4.2 Installation of geotechnical instruments

4.3 Monitoring work

4.4 Documentation for contract instrumentation and monitoring works

4.5 Tendering of contract for instrumentation and monitoring works

4.6 Supervision of site work

4.7 Contract administration

4.8 Interpretation of monitoring data

BORANG LAPORAN PENILAIAN PRESTASI SYARIKAT**MAKLUMAT SYARIKAT**

Nama : Kumpulan IKRAM Sdn. Bhd. (KISB)
 Alamat : Unipark Suria, Jalan IKRAM – UNITEN, 43000, Kajang, Selangor Darul Ehsan
 No. Telefon : 03-8738 3388
 No. Fax : 03-8926 4008

MAKLUMAT PROJEK

Projek :
 Lokasi :
 Skop Perkhidmatan : Perkhidmatan Kejuruteraan Forensik (Cerun & Struktur berkaitan Cerun) / Penyeliaan Tapak
 Agensi Pelaksana :
 Nama Pengarah Projek / Wakil Pengarah Projek :
 No. Tel Pengarah Projek / Wakil Pengarah Projek :
 No. Faks :

Tarikh Sebenar Siap Kerja : Kemajuan Kerja Semasa : % (progress)
 Tarikh Mula Kerja :
 Tarikh Jangkaan Siap Kerja :

MAKLUMAT PENILAIAN PRESTASI SYARIKAT

Markah Keseluruhan (%)	Gred Keseluruhan	Ulasan
91 - 100	Sangat Baik	Syarikat Pilihan
76 - 90	Baik	Secara Umum Syarikat Boleh Diterima
61 - 75	Sederhana	Syarikat Boleh Diterima Dengan Syarat
0 - 60	Lemah	Syarikat yang Tidak Disyorkan

Kriteria	Markah Prestasi			
	Skala Prestasi = Lemah- 0, Sederhana - 1, Baik - 2, Sangat Baik - 3			
	Lemah	Sederhana	Baik	Sangat Baik
1) Mematuhi Jadual Pelaksanaan				
2) Mematuhi Skop Perkhidmatan				
3) Pengurusan Sumber				
4) Keupayaan Teknikal				
5) Kualiti Kerja				
6) Kerjasama				
7) Mematuhi Peruntukan Diluluskan				
8) Pengawasan/Penyeliaan				
JUMLAH KESELURUHAN				
PENILAIAN PRESTASI KESELURUHAN	Jumlah Keseluruhan / Markah Penuh* X 100			
*Markah Penuh kriteria 1 hingga 7 = 21; atau				
*Markah Penuh kriteria 1 hingga 8 = 24				

ULASAN :

(sila nyatakan)

DISYORKAN UNTUK PROJEK AKAN DATANG : YA / TIDAK

Tandatangan Pengarah Projek / Wakil Pengarah Projek

Jawatan :

Tarikh :