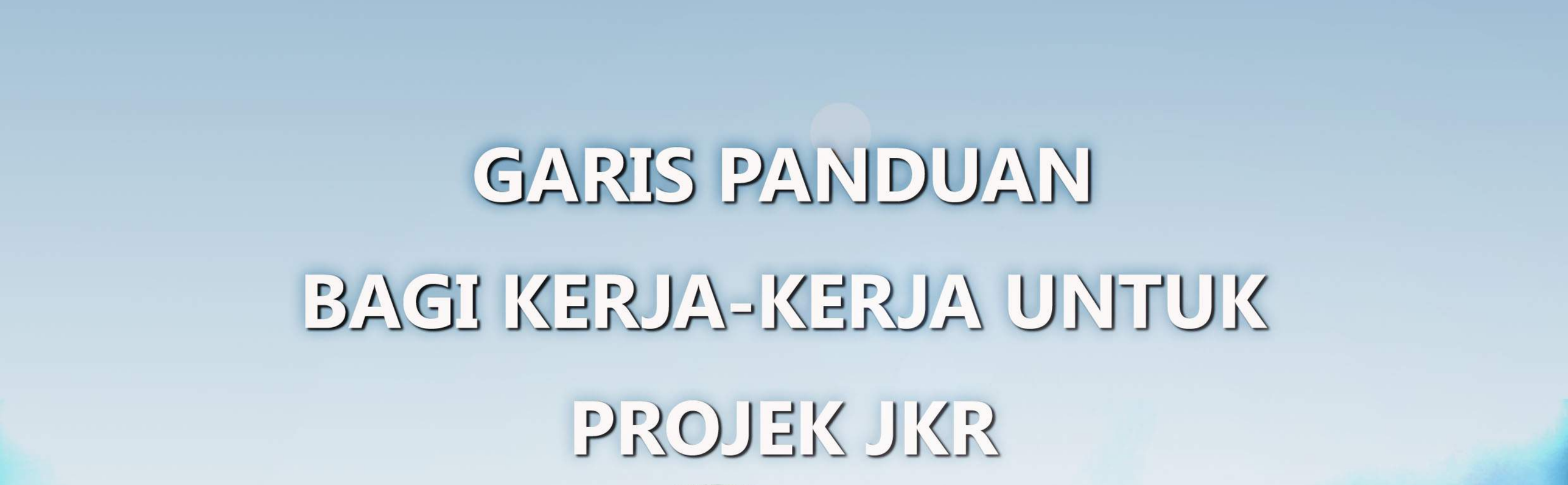
JKR 20710-0009-15

1st EDITION 2012 : VERSION 1
2nd EDITION 2013 : VOLUME 2
3rd EDITION 2015 : VERSION 2

JABATAN KERJA RAYA
MALAYSIA

INSPECTION AND TESTING PLAN
3rd EDITION 2015 : VERSION 2

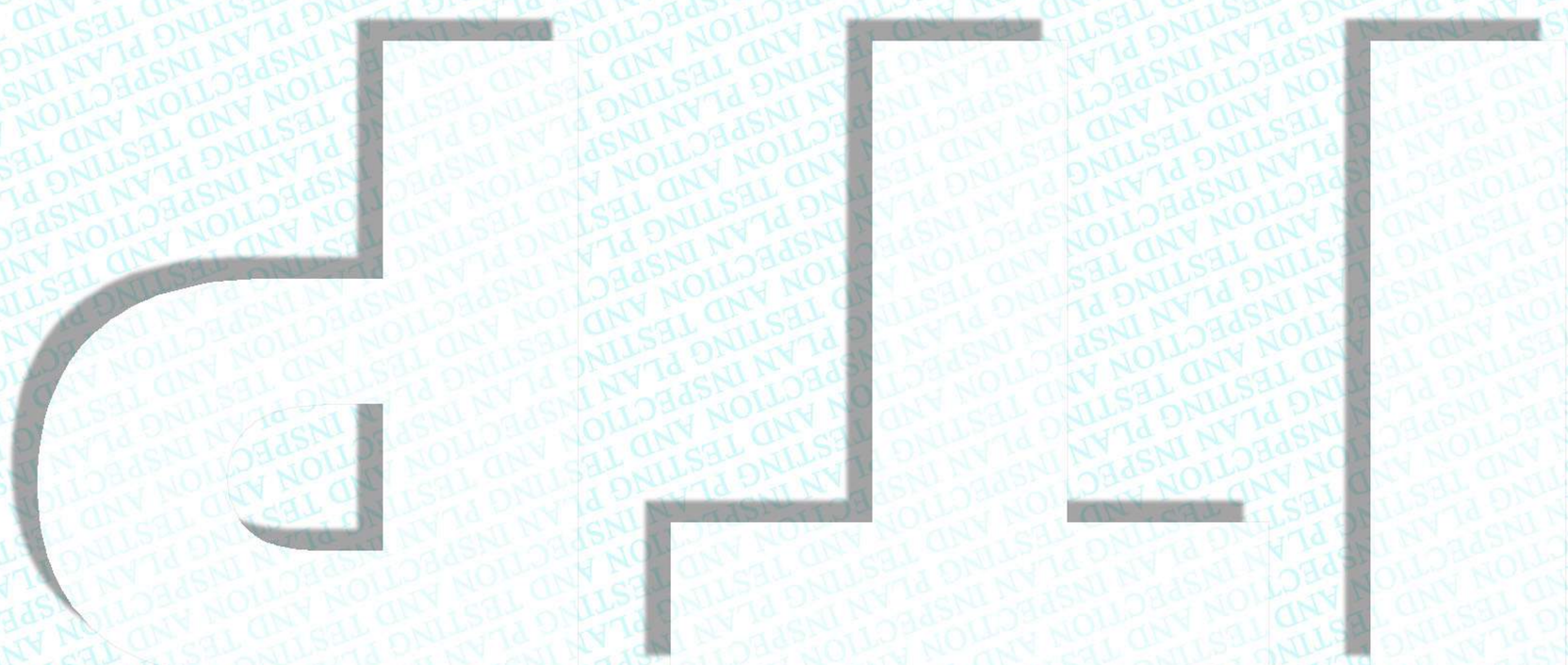
GARIS PANDUAN
BAGI KERJA-KERJA UNTUK
PROJEK JKR



INSPECTION AND TESTING PLAN

3rd Edition 2015 : Version 2

GARIS PANDUAN BAGI KERJA-KERJA UNTUK PROJEK JKR



SENARAI KANDUNGAN		
BIL.	**BIDANG KERJA / TRADE**	**MUKA SURAT**

PRAKATA

Jabatan Kerja Raya (JKR) sebagai jabatan teknikal terunggul komited dalam memastikan kehendak pelanggan dapat direalisasikan melalui penghasilan produk yang berkualiti. Pelan Pemeriksaan dan Pengujian (*Inspection and Testing Plan, ITP*) terhadap bahan dan kaedah pemasangan/pembinaan merupakan salah satu proses yang penting dalam mencapai maksud tersebut.

Dokumen ITP ini merupakan dokumen rujukan dan dokumen sokongan bagi membantu staf JKR di dalam melaksanakan projek dan ia tidak terikat dengan peraturan kontrak. ITP bagi pelaksanaan projek yang dinyatakan di dalam SPB JKR di mana kontraktor perlu mengemukakan Senarai ITP di dalam C-Plan. Walau bagaimanapun, pembangunan ITP ini adalah untuk membantu staf JKR dan sebagai panduan bagi menyemak ITP yang diserahkan oleh pihak kontraktor.

ITP merupakan satu alat (*tool*) program *Quality Assurance* di mana diskripsi secara terperinci mengenai *Quality Control* dan aktiviti-aktiviti yang perlu dilakukan di tapak bina berpandukan standard yang ditetapkan. Aktiviti pemeriksaan dan ujian dalam ITP merangkumi semua aktiviti sebelum, semasa dan selepas *(i.e : manufacturing, fabrication, construction and installation)* proses penzahiran sesuatu produk. Ini bertujuan memastikan kualiti sesuatu produk itu memenuhi kriteria dan standard yang dimaksudkan.

Penghasilan ITP Edisi 2012 : Versi 1 & ITP Edisi 2013 : Volume 2 telah membantu JKR untuk memenuhi keperluan dan kehendak Seksyen 7.1 Manual Pengurusan Sistem Bersepadu (MPSB) : Perancangan Bagi Penzahiran Produk iaitu “Keperluan verifikasi, validasi, pemantauan, pemeriksaan serta pengujian ke atas proses/aktiviti tertentu dalam penzahiran produk serta ciri-ciri produk yang diterima”.

Kesinambungan daripada kejayaan pembangunan ITP Edisi 2012 : Versi 1 dan ITP Edisi 2013 : Volume 2 telah mendorong JKR untuk mengambil inisiatif dalam penambahbaikan ITP dengan membentuk pasukan penggubal berdasarkan *Subject Matter Expert* (SME) untuk membangunkan ITP Edisi 2015 : Versi 2. Selaku Urus Setia, Bahagian Pengurusan Kualiti, Cawangan Dasar Dan Pengurusan Korporat telah mengatur beberapa siri mesyuarat dan bengkel dalam memastikan kejayaan pembangunan ITP Edisi 2015 : Versi 2 ini.

Dokumen ITP Edisi 2015 : Versi 2 ini mengandungi gabungan ITP Edisi 2012 : Versi 1 dan ITP Edisi 2013 : Volume 2 yang telah dibuat penambahbaikan serta pembangunan trade-trade baru yang keseluruhannya merangkumi sembilan (9) bidang kerja utama iaitu Geoteknik, Kerja Jalan, Kerja Sivil, Kerja Struktur, Kerja Arkitek, Kerja Lapangan Terbang,

Kerja Marin, Kerja Mekanikal, dan Kerja Elektrik. Jumlah keseluruhan *trade* yang telah dibangunkan adalah sebanyak lapan puluh dua (82) trade berbanding dua puluh lapan (28) *trade untuk ITP Edisi 2013 : Volume 2 dan tiga puluh tiga (33) trade untuk ITP Edisi 2012 : Versi 1 sebelum ini*. Selain itu, setiap *trade* Dokumen ITP yang dibangunkan mengandungi *Description Of Works, Point Of Inspection/Test, Standard/Requirement, Tools/Equipment* serta *Stage/Frequency* dan penambahbaikan di dalam ITP Versi 2 Tahun 2015 dengan penyeragaman kepada jadual trade di ruangan *Evidence*, *Responsibility* dan *Remarks* bagi ITP Edisi : Versi 1 dan trade terkini.

Dengan terhasilnya Dokumen ITP Edisi 2015 : *Versi* 2, adalah diharapkan ianya dapat membantu staf JKR untuk melaksanakan projek dan seterusnya menyumbang ke arah mencapai objektif JKR iaitu “Menyerahkan projek yang menepati kualiti, masa dan kos yang telah ditetapkan”.

Disediakan oleh:
Urus Setia Sistem Pengurusan Bersepadu (SPB)
Bahagian Pengurusan Kualiti, Cawangan Dasar Dan Pengurusan Korporat JKR Malaysia

PENGHARGAAN

Setinggi-tinggi penghargaan dan terima kasih kepada semua yang terlibat seperti berikut:

Penasihat : Ir. Hj. Mohd Jamal Bin Sulaiman
(Pengarah Cawangan Dasar Dan Pengurusan Korporat)

Pengerusi : Ir. Hajah Ruhani Binti Haji Ali
(Ketua Bahagian Pengurusan Kualiti, CDPK)

Fasilitator : Ir. Abdul Hadi Bin Abdul Aziz
Ir. Hj. Mohamad Sharip Bin Wahijan

Penggubal :

1) Bidang Kerja Geoteknik

CKG
En. Mohd Khair Bin Nordin
Pn. Eng Boon Cheng
Pn. Hani Nadzrah Binti Razali

CKC
Ir. Zainal Arsad Bin Md Amin
Pn. Siti Zarina Binti Ngajam
Pn. Sakinah Binti Dahrawi Edrus

2) Bidang Kerja Jalan

CJ
Ir. Wan Abdul Rahman Bin Wan Hassan
Ir. Abdul Rahman Bin Baharuddin
Ir. Abdul Mutalif Bin Abdul Hameed
Ir. Hj. Othman Bin Ibrahim
Ir. Asraruddin Bin Jaafar
Ir. Lai Khin Onn
En. Shahrul Nizam Bin Siajam
En. Mohd Azral Bin Mat Jusoh

3) Bidang Kerja Sivil

CKAS
Ir. Wan Sohaimi Bin Wan Mohamed
Pn. Norhayati Binti Khairudin
Ir. Ismail Bin Abd Rahman
Pn. Aiedah @ Noraidah Binti Nadzri
En. Amir Asrol Bin Ahmad Bangi
En. James Anak Musa
Pn. Nurzalisa Binti Abd Rahim
Pn. Haslina Binti Salim

CKAS

En. Shaiful Munir Bin Leman
En. Mohd Fariz Adlan Bin Jasri
En. Mohd Firdaus Bin Barjumin

4) Bidang Kerja Struktur

Ir. Norazman Bin Ismail
Hj. Ahmad Rosli Bin Abd Rahman
Ir. Mohd Azhari Bin Mohd Salleh
Ir. Noraidah Binti Yahya
Ir. Mohd Zamri Bin Abdullah
Ir. Hilmi Bin Md. Tahir
Pn. Melati Binti Mudzaffar Ali
En. Mohd Fairuz Bin Muhamad
Ir. Zamilah Binti Said
Pn. Siti Radiah Binti Yunus
En. Saiful Azzuan Bin Aznam
Pn. Lee Choon Siang
Pn. Durrah Munierahhannies Binti Azizan
En. Megat Kamarulzaman Bin Megat Yusoff

CA

5) Kerja Arkitek

En. Saiful Fazli Bin Ramli
En. Muhammad Zaki Bin Abd Manaf
Pn. Nur Liyana Binti Amer Hamzah
En. Somphob Charenchit
En. Jabez Ho Chen Kwang

CPUM

6) Kerja Lapangan Terbang

En. Muhammad Khazani Bin Abd Rahman
En. Mohd Noh Bin Karim
En. Samri Haji Embong
En. Mahalil Bin Mohtar

7) Kerja Marin

En. Azarul Azlan Bin Mohd Radhi
En. Anuar Bin Pawan
Cik.Syuhaida Binti Suaib
En. Adam Bin Ali

CKM **8) Kerja Mekanikal**

Ir. Zulkifli Abdul Rashad
Ir.Mohamad Azly Abdul Aziz
Ir. Wan Shah Waliallah B.Wan Senik
En. Muhammad Nazri B.Omar
En. Izzat Zumairi Che Harun
Ir.Hisham B. Mokhtar
Pn. Warnida Bt. Abu Bakar
En. Ahmad Fadzli Bin Mohamed Yusoff

CKE **9) Kerja Elektrik**

Ir. Hj. Mohd Jahini Bin Mohd Dom
Pn. Noor Hafiza Binti Noor Kassim
Pn. Nur Hafizah Binti Bahari
En. Ahmad Noor Ikmal Bin Mohamad
En. Johari Bin Husin

10) Urus Setia SPB

Ir. Hajah Ruhani Binti Haji Ali
En. Ramlan Bin Hamzah
En. Mohd Nor Sahrul Bin Md Ali
Pn. Nurul Syifaa' Binti Ahmad
En. Ismail Najmuddin Bin Abdul Hadi
En. Puspanathan A/L Periasamy
En. Mohamad Azhari Zarzali Shah

KERJA GEOTEKNIK

TRADE

3.1 Site Investigation / Soil Investigation

3.2 Earthworks (Revised Version 1_Road)

3.3 Ground Improvement (New Trade)

3.4 Slope Stabilization - CKC

3.4.1 Retaining Structure (New Trade)

3.4.2 Rock Bolt And Rock Dowel (New Trade)

3.4.3 Reinforced Soil Slope (New Trade)

3.4.4 Reinforced Soil Wall

3.4.5 Reinforced Soil Structure (New Trade)

3.4.6 Tie Back Wall (New Trade)

3.4.7 Ground Anchor (New Trade)

3.4.8 Soil Nailing (New Trade)

3.4.9 Geocell (New Trade)

3.4.10 Guniting (New Trade)

3.4.11 Horizontal Drain (New Trade)

3.4.12 Hydroseeding (New Trade)

3.5 Kerja Asas / Foundation - CKG

3.5.1 Shallow Foundation (Revised Volume 2 CKAS)

3.5.2 Deep Foundation / Piling Works (New Trade)

3.5.2.1 Pre-Cast Driven / Jacked – In Pile (New Trade)

3.5.2.2 Cast-insitu Bored Pile / Micro Pile (New Trade)

TRADE : SITE INVESTIGATION

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Deep Boring	Number of borehole/ Locations	Refer to drawings (design requirement) & scope of SI Federal Aviation Administration (FAA) AC 150/5320-6E CI 202	Coordinates & Reduce Level	Every test location	Contractor/ Supervising Engineer	As built plan	Federal Aviation Administration (FAA) AC 150/5320-6E CI 202 for Airport Construction
		Method Of Drilling	JKR/SPJ/2013-S17 Clause 17.2	Visual inspection	Every test location	Contractor/ Supervising Engineer	Photos & SI Report	
		Sampling	JKR/SPJ/2013-S17 Clause 17.3	Visual inspection	Every test location	Contractor/ Supervising Engineer	Photos & SI Report	
		Termination Depth	SI Scope Of Work	Tools to measure depth	Every test location	Contractor/ Supervising Engineer	Borelog	
		Ground Water Level	JKR/SPJ/2013-S17 Clause 17.4.7	Tools to measure depth	Beginning & End Of Shift	Contractor/ Supervising Engineer	Borelog	
2	JKR/ Mackintosh Probe	Number of probe/ Locations	Refer to drawings (design requirement) & scope of SI Federal Aviation Administration (FAA) AC 150/5320-6E CI 202	Coordinates & Reduce Level	Every test location	Contractor/ Supervising Engineer	As built plan	
		Setting up	JKR/SPJ/2013-S17 Clause 17.4.5	Visual inspection	Every test location	Contractor/ Supervising Engineer	Photos & SI Report	
		Termination Depth	JKR/SPJ/2013-S17 Clause 17.4.5	Digital Counter	Every test location	Contractor/ Supervising Engineer	Probe log	
3	Standard Penetration Test	Testing procedures	JKR/SPJ/2013-S17 Clause 17.4.1	Digital Counter & Measurement Tools	Every 1.5m depth	Contractor/ Supervising Engineer	Borelog	
4	Trial Pit	Number of trial pit/locations	Refer to construction drawings (design requirement) Federal Aviation Administration (FAA) AC 150/5320-6E CI 202	Coordinates & Reduce Level	Every test location	Contractor/ Supervising Engineer	As built plan	Federal Aviation Administration (FAA) AC 150/5320-6E CI 202 for Airport Construction
		Quantity of samples condition/quality of sample	JKR/SPJ/2013-S17 Clause 17.3.8	Weighing Scale	Every layer of soil	Contractor/ Supervising Engineer	Trial Pit Log	

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : SITE INVESTIGATIONS (LAPANGAN TERBANG)

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQIUREMENT	TOOL/ EQIUPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	SOIL BORING							
	a. Runway & Taxiway	i) Spacing Random along pavement at min 60 m intervals	Federal Aviation Administration (FAA) AC 150/5320 -6E CI 202	Visual, testing and measurement	Once per project/source	Project Manager/ Contractor	Inspection Form/SI Report	
	b. Other Areas Of Pavement	i) Spacing 1 boring per 930 sq m of area	Federal Aviation Administration (FAA) AC 150/5320 -6E CI 202	Visual, testing and measurement	Once per project/source	Project Manager/ Contractor	Inspection Form/SI Report	
	c. Borrow Areas	i) Spacing Sufficient tests to clearly define the borrow material ii) Depth To depth of borrow excavation	Federal Aviation Administration (FAA) AC 150/5320 -6E CI 202	Visual, testing and measurement	Once per project/source	Project Manager/ Contractor	Inspection Form/SI Report	
2	SOIL STRENGTH TESTS							
	a. CBR test	Sufficient Test to clearly to defined soil strength	Federal Aviation Administration (FAA) AC 150/5320 -6E CI 205	Visual, testing and measurement	As per requirement	Project Manager/ Contractor	Inspection Form	
	b. Plate Bearing test	Sufficient Test to clearly to defined soil strength	Federal Aviation Administration (FAA) AC 150/5320 -6E CI 205 ICAO A. Manual Part 2	Visual, testing and measurement	As per requirement	Project Manager/ Contractor	Inspection Form	

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TRADE : EARTHWORKS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Site clearing	Area to be cleared	JKR/SPJ/2013-S2: Clause 2.1.2.1 Refer to construction drawings	Survey equipment	The whole site	Contractor/ Project Manager	Setting out plan	
		Depth of grubbing	Refer to construction drawings or at least 0.5m below ground level	Tools to measure depth			Survey plan	
		Removal of topsoil	Refer to construction drawings or at least 0.1m below ground level	Tools to measure depth			Survey plan	
2	Excavation	Dimensional tolerance (depth)	Width < 300mm than the dimensions shown on the drawings	Tools to measure depth	When required	Contractor/ Project Manager	Survey plan	
		Unsuitable material (If any)	JKR/SPJ/2013-S2: Clause 2.2.1 (d) or JKR 20800-0183-14 Section B Cl. 5.2.3	Trial pit	When required		Material laboratory test	
		Grading of replacement materials	JKR/SPJ/2013-S2: Table 2.1 or JKR 20800-0183-14 Section B Cl. 5.7, Table B1	Particle Size Distribution (Gradation analysis)	When required		Material laboratory test	
		Excavation of hard materials/ rock	JKR/SPJ/2013-S2: Clause 2.2.1 (f) and (g) or JKR 20800-0183-14 Section B Cl. 5.2.5, Cl. 5.2.6, Cl. 5.10	Trial excavation	When required		Trial excavation record	
		Rock blasting	JKR/SPJ/2013-S2: Clause 2.2.3.8 or JKR 20800-0183-14 Section B Cl. 5.1.2	Trial blasting	When required		Trial blasting record	
3	Fill materials	Suitability of materials	JKR/SPJ/2013 - Cl. 2.2.4.1 and 2.2.4.2 or JKR 20800-0183-14 Section B Cl. 5.2.4 or Federal Aviation Administration (FAA) AC 150/5320-6E CI 205	Atterberg limit test	One test/ 1500 m^3 of the material to be used	Contractor/ Project Manager	Material laboratory test	Federal Aviation Administration (FAA) AC 150/5320-6E CI 205 & ICAO A. Manual Part 2 for Airport Construction
				Gradation analysis				
				Compaction test (MS 1056)				
				Soaked CBR test				
			Federal Aviation Administration (FAA) AC 150/5320-6E CI 205 & ICAO A. Manual Part 2	Plate Bearing Test				

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TRADE : EARTHWORKS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
4	Construction of embankments	Trial compaction thickness	Maximum loose depth = 300mm; minimum area = 8m x 15m; not required if volume of fill < 100m^3 with approval from SO	Compaction test (MS 1056)	One test/ 1500m^3 of the material to be used	Contractor/ Project Manager	Trial compaction record	
		Degree of compaction for placement of fill materials	> 95% for cohesive material > 100% for cohesionless material Air voids < 5%	Compaction test (MS 1056)	One test/ 500m^2 of every compacted layer		Compaction records	
		California Bearing Ratio for subgrade	CBR values as per specified in the drawing or CBR > 10%	Soaked CBR test	One test/ 4000m^2 of compacted subgrade			
		Shape, super elevation, level, and grade	Within +10mm and -30mm of the required level.	Survey equipment	Completion of work		As built drawings	

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TRADE : GROUND IMPROVEMENT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Remove and Replace of Unsuitable Materials	Identification of unsuitable material	Refer to SI report	N/A	N/A	Contractor/ Supervising Engineer	Lab test results & drawing	
		Depth of removal and replacement material	MS 1056 : Part 2 : 2005 or JKR/SPJ/2013-S2: Clause 2.2.1 (d) (Criteria for unsuitable materials) or JKR 20800-0183-14 Section B Cl. 5.2.3	Tools to measure depth	Before and after removal work	Contractor/ Supervising Engineer	SI Report & Lab test results & survey records	
2	Piled Embankment	Refer to ITP for Piling Works (Driven/ Jacked-in)	Refer to ITP for Piling Works (Driven/ Jacked-in)	Refer to ITP for Piling Works (Driven/ Jacked-in)	Refer to ITP for Piling Works (Driven/ Jacked-in)	Contractor/ Supervising Engineer	As built plan	
3	Surcharging	Thickness of filling materials and compaction works	Construction drawing & JKR/SPJ/2013 Clause 2.2.3.5 & Clause 2.2.2.1(e)	Refer to ITP for Earthworks	Refer to ITP for Earthworks	Contractor/ Supervising Engineer	As built plan	
		Surcharging period	Refer to construction drawings	Degree of consolidation & Time	As per engineer's instruction	Contractor/ Supervising Engineer	Settlement records	
4	Prefabricated Vertical Drain (PVD)	Approval of materials, storage and installation equipment	Refer to engineer's specification, manufacturer's instruction and approved method statement	Visual inspection, lab test on samples	Prior to PVD installation	Contractor/ Supervising Engineer	Quality records, Lab test result	
		PVD installation and depth of driving	Refer to construction drawings	Visual inspection, installation record verification	Every installation point	Contractor/ Supervising Engineer	Quality records	
		Method of testing/acceptence criteria	Refer to engineer's specification, manufacturer's instruction and approved method statement	Visual inspection, installation record verification	Every installation point	Contractor/ Supervising Engineer	Quality records	
5	Basal Reinforcement with High Strength Geotextile / Geogrid	Approval of materials, storage and installation equipment	Refer to engineer's specification, manufacturer's instruction and approved method statement	Visual inspection, lab test on samples	Prior to installation	Contractor/ Supervising Engineer	Quality records, Lab test result	
		Installation method and coverage	Refer to construction drawings, engineer's specification, manufacturer's instruction and approved method statement	Visual inspection, installation record verification	Every installation point	Contractor/ Supervising Engineer	Quality records	
		Method of testing/acceptence criteria	Refer to construction drawings, engineer's specification, manufacturer's instruction and approved method statement	Visual inspection, installation record verification	Refer to construction drawings & method statement	Contractor/ Supervising Engineer	Borelog	

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TRADE : GROUND IMPROVEMENT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
6	Stone column	Approval of materials, storage and installation equipment	Refer to engineer's specification, manufacturer's instruction and approved method statement	Visual inspection, any test specified by Engineer	Prior to installation	Contractor/ Supervising Engineer	Quality records, Lab test result	
		Installation method and depth	Refer to construction drawings, engineer's specification, manufacturer's instruction and approved method statement	visual inspection, installation record verification	Every installation point	Contractor/ Supervising Engineer	Quality records	
		Method of testing/acceptence criteria	Refer to construction drawings, engineer's specification, manufacturer's instruction and approved method statement	Visual inspection, load test	Refer to construction drawings & method statement	Contractor/ Supervising Engineer	Borelog	
7	Instrumentation	Installation of instrumentation	Refer to construction drawings & JKR/SPJ/2013 Clause 2.2.6.3	Visual inspection, any test specified by Engineer	Prior to installation	Contractor/ Supervising Engineer	Quality records, Lab test result	
		Location of monitoring instruments	At location and level as shown on drawings and protected from disturbances especially from being run down by construction machineries	Visual inspection, installation record verification	Every installation point	Contractor/ Supervising Engineer	Quality records	
		Monitoring record	Refer to construction drawings & JKR/SPJ/2013 Clause 2.2.6.4	visual inspection, installation record verification	Refer to construction drawings & method statement	Contractor/ Supervising Engineer	Monitoring reports	
		Acceptance criteria	Refer to construction drawings	Settlement monitoring results	Refer to construction drawings & method statement	Contractor/ Supervising Engineer	Settlement records	

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SLOPE STABILIZATION - ROCK BOLT AND ROCK DOWEL

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Testing Instrument	i. Testing Method ii Suitability Apparatus iii Testing Procedure	i. JKR/SPJ/2013-S16 Cl. 16.5 ii. Construction drawing		Construction drawing	Contractor / SO	i. Method of Statement ii. Instrument Certificate iii. Testing records & Certificate of conformance iv. RFI v. Drilling Record	
2	Material	i. Physical Condition ii. Structural Capacity	i. JKR/SPJ/2013-S16 Cl. 16.5 ii. Construction drawing	JKR/SPJ/2013-S16 Cl.16.5	Material on site	Contractor / SO	i. Method of Statement ii. Instrument Certificate iii. Testing records & Certificate of conformance iv. RFI v. Drilling Record	
3	Installation	Termination of Drilling	i. JKR/SPJ/2013-S16 Cl. 16.5 ii. Construction drawing	Drilling record	Construction drawing	Contractor / SO	i. Method of Statement ii. Instrument Certificate iii. Testing records & Certificate of conformance iv. RFI v. Drilling Record	

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

SLOPE STABILISATION - REINFORCED SOIL SLOPE

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Material	i) Physical condition ii) Strength	i. JKR/SPJ/2013- S16 Cl.16.7 ii. Construction Drawing	i. Visual ii. Measurement iii. Testing	Initial and Construction Stage	Contractor / SO	i. Method statement ii. Certificate of conformance	
2	Handling and Storage	i) Visual ii) Measurement	i. JKR/SPJ/2013- S16 Cl.16.7 ii. Construction Drawing	i. Visual ii. Measurement iii. Testing	Initial and Construction Stage	Contractor / SO		
3	Installation	Level and Location	i. JKR/SPJ/2013-S16Cl. 16.7 ii. Construction Drawing	i. Visual ii. Measurement iii. Testing	Initial and Construction Stage	Contractor / SO		
4	Backfill and Compaction	Refer to ITP for Earthwork	Refer to ITP for Earthwork	Refer to ITP for Earthwork	Refer to ITP for Earthwork	Refer to ITP for Earthwork	Refer to ITP for Earthwork	

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SLOPE STABILIZATION : REINFORCED SOIL WALL

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	EVIDENCE	REMARKS
1	Approval Materials:						
	i) Facing materials ii) Reinforcing element and connections iii) Hot-dip galvanising iv) Joint filler and sealant V) Fill material	Receiving of materials / Visual inspection and manufacturer records	Specification for Reinforced Soil Structures and Slopes	BS 8006	Every panels/no	-	-
2	Construction	Foundation soil / bearing capacity	Specification for Reinforced Soil Structures and Slopes & Construction drawings	BS 8006	Initial stage		
		Erection of elemental facing / verticality and horizontally	Specification for Reinforced Soil Structures and Slopes & Construction drawings	BS 8006	Every layer		
		Fill materials	Specification for Reinforced Soil Structures and Slopes, Construction drawings & Manufacturer recommendation	BS 8006	Every layer	-	-
		Placement of reinforcing elements - tensile test / pull out test	Specification for Reinforced Soil Structures and Slopes, Construction drawings & Manufacturer recommendation	BS 8006	Every layer		
		Connections	Specification for Reinforced Soil Structures and Slopes, Construction drawings & Manufacturer recommendation	BS 8006	Every layer		

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

SLOPE STABILIZATION - REINFORCED SOIL STRUCTURE

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Material	i) Physical condition ii) Structure capacity	i. JKR/SPJ/2013- S16 Cl.16.7 ii. Construction Drawing	i. Visual ii. Measurement iii. Testing	Initial and Construction Stage	Contractor / SO	i. Method statement ii. Certificate of conformance	
2	Handling and Storage	i) Visual ii) Measurement	i. JKR/SPJ/2013- S16 Cl.16.7 ii. Construction Drawing	i. Visual ii. Measurement iii. Testing	Initial and Construction Stage	Contractor / SO		
3	Installation	i) Interlocking ii) Alignment	i. JKR/SPJ/2013-S16Cl. 16.7 ii. Construction Drawing	i. Visual ii. Measurement iii. Testing	Initial and Construction Stage	Contractor / SO		
4	Backfill and Compaction	Refer to ITP for Earthwork	Refer to ITP for Earthwork	Refer to ITP for Earthwork	Refer to ITP for Earthwork	Refer to ITP for Earthwork	Refer to ITP for Earthwork	

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

SLOPE STABILIZATION – TIE BACK WALL

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Material	As per submission	JKR/SPJ/2013- S16 Cl.16.8	As per submission	Initial Stage	Contractor / SO	Test Report	
2	Packaging/Storage	As per submission	JKR/SPJ/2013- S16 Cl.16.8	As per submission	Initial Stage	Contractor / SO	Method Statement	
3	Installation	As per submission	JKR/SPJ/2013- S16 Cl.16.8	As per submission	Initial Stage	Contractor / SO	i. Drawing ii. Method Statement	
4	Testing	As per submission	JKR/SPJ/2013- S16 Cl.16.8	As per submission	Initial Stage	Contractor / SO	Test Report	

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

SLOPE STABILIZATION – GROUND ANCHOR

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Material i. Tendons ii. Cement Grout iii. Greases iv. Plastics v. Metal Ducting vi. Rubber Rings	Material approval	JKR/SPJ/2013-S16 Cl. 16.6.10.1 – 16.6.10.7	i. Visual ii. Measurement iii. Testing	Once per project	Contractor / SO	Results Report	
2	Handling And Storage	Physical Condition	JKR Specification	i. Visual ii. Measurement	Initial and Construction Stage	Contractor / SO	i. Method Statement ii. Certificate of conformance	
3	Installation	i. End of bore ii. Insertion of tendon iii. Grouting	JKR/SPJ/2013-S16 Cl.16.6.18	i. Visual ii. Measurement iii. Testing	Once per project	Contractor / SO	Records	
4	Anchor Testing	i. Proving tests ii. On-site suitability tests iii. On-site acceptance tests	JKR/SPJ/2013-S16 Cl. 16.6.21	i. Visual ii. Measurement iii. Testing	Once per project	Contractor / SO	Test Report	
5	Monitoring	Monitoring Records submitted within 72 hours of completion of monitoring	JKR/SPJ/2013-S16 Cl. 16.6.22	Visual	During construction	Contractor / SO	Reports	

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

SLOPE STABILIZATION – SOIL NAILING

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Materials i. Reinforcement ii. Cement Grout iii. Centralizers iv. Corrugated HDPE Sheath	Material approval	JKR/SPJ/2013-S16 Cl. 16.3.3.1 to 16. 3.3.4	i. Visual ii. Measurement iii. Testing	Once per project	Contractor / SO	Results Report	
2	Handling And Storage	Physical Condition	JKR/SPJ/2013-S16 Cl. 16.3.3.5	i. Visual ii. Measurement	Initial and Construction Stage	Contractor / SO	i. Method Statement ii. Certificate of conformance	
3	Installation	i. Drilling ii. Inserting reinforcement iii. Grouting iv. Nail Head Construction	JKR/SPJ/2013-S16 Cl. 16.3.4	i. Visual ii. Measurement iii. Testing	Once per project	Contractor / SO	Records	
4	Pull-Out Tests	Checking : i. Equipment ii. Calibration Certificate iii. Competent Installer iv. Test Results	JKR/SPJ/2013-S16 Cl. 16.3.8	i. Visual ii. Measurement iii. Testing	Once per project	Contractor / SO	Test Report	

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

REINFORCED SOIL SLOPE - GEOCELL

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Materials	i. Physical condition ii. Technical Properties	i. JKR/SPJ/2013- S16 Cl. 16.2 ii. Refer Table 16.2.1 and 16.2.2	i. Visual ii. Measurement iii. Testing	Initial Stage	Contractor / SO	i. Inspection Form ii. Consignment Certificate by Manufacturer iii. Test report iv. Method Statement	
2	Packaging/Storage	Visual	JKR/SPJ/2013- S16 Cl. 16.2.4	Visual	Initial and Construction Stage	Contractor / SO	Method Statement	
3	Installation	i. Location ii. Size iii. Infill Material	JKR/SPJ/2013- S16 Cl. 16.2.5	i. Visual ii. Measurement	During construction	Contractor / SO	i. Mock Up ii. As Built Drawing	

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

SURFACE PROTECTION - GUNITING

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Materials	i. Physical condition ii. Technical Properties	JKR/SPJ/2013- S16 Cl. 16.4.2	i. Visual ii. Measurement iii. Testing	Initial Stage	Contractor / SO	i. Inspection Form ii. Consignment Certificate by Manufacturer iii. Test report iv. Method Statement	
2	Packaging/Storage	Visual	JKR/SPJ/2013- S16 Cl. 16.4.2	Visual	Initial and Construction Stage	Contractor / SO	Method Statement	
3	Installation	i. Location ii. Thickness iii. Reinforcement Bar	JKR/SPJ/2013- S16 Cl.16.4.3,16.4.6,16.4.7, 16.4.8,16.4.9	i. Visual ii. Measurement	During construction	Contractor / SO	i. Mock Up ii. As Built Drawing	
	Testing	i. Rebound Hammer ii. Coring Test	JKR/SPJ/2013- S16 Cl. 16.4.4	Rebound Hammer Coring Machine	During construction	Contractor / SO	Test Report	

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

HORIZONTAL DRAIN

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Material	Physical condition	i. JKR/SPJ/2013-S16 Cl. 16.1 ii. Construction Drawing	Visual and Measurement	Initial and Construction Stage	Contractor / SO		
2	Drilling and Installation	Termination of drilling	i. JKR/SPJ/2013- S16 Cl.16.1 ii. Construction Drawing	Drilling Record	Initial and Construction Stage	Contractor / SO	Drilling record	
3	Concrete Lined Chutes	Water Flow	i. JKR/SPJ/2013-S16Cl. 16.1 ii. Construction Drawing	Visual and Measurement	Initial and Construction Stage	Contractor / SO		

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

SURFACE PROTECTION - HYDROSEEDING

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Materials	Visual	JKR/SPJ/2013- S16 Cl. 16.11.2, 16.11.3	Visual	Initial Stage	Contractor / SO	Photograph	
2	Installation	Visual	JKR/SPJ/2013- S16 Cl. 16.11.4 to 16.11.10	Visual	Initial and Construction Stage	Contractor / SO	Progress Photograph	

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

TRADE : SHALLOW FOUNDATION

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Excavation	Verify the founding depth	Refer to construction drawings (design requirement)	Measurement Tape	Every column position	Contractor/ Site Engineer	N/A	
		Verify the soil bearing capacity	Refer to construction drawings (design requirement)	JKR Probe/ Mackintosh Probe or Plate Bearing Test	Every column position (Probe)/ As per specified (PBT)	Contractor/ Site Engineer	Probe record/ Plate bearing test record	
2	Concreting works	Refer to ITP for concrete works	Refer to ITP for concrete works	Refer to ITP for concrete works	Refer to ITP for concrete works	Contractor/ Project Manager	Refer to ITP for concrete works	

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : PILING WORKS - PRE CAST (DRIVEN/ JACKED - IN PILE)

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Piling equipments (Type/ hammer weight/ pressure requirement)	Approval of piling equipments	Refer to construction drawings & Method statement	Visual inspection	Prior to pile installation	Contractor/ Project Manager	Equipment specification & calibration records	
2	Set criteria (End bearing piles)	Set criteria calculation by contractor	Less than 10 Blows/25mm/ Required pressure (psi) equavalent to 2.5x WL	Hiley's formulae (Driven pile) or equivalent approved by S.O./ Correlation chart (Jacked-in)	Prior to pile installation	Contractor/ Project Manager	Set calculation	
3	Piles	Physical condition of piles (Type/ dimension/ shoes/ defects)	Refer to construction drawings & JKR 20800-0183-14 Section C Cl. 2.2.13 & Cl. 2.2.14	Visual inspection	3 specimens for each batch of delivery or every 40 piles whichever is larger.	Contractor/ Project Manager	Record and defects marking	
		Structural capacity of piles	Refer to construction drawings	Concrete and reinforcement testing equipment	Production stage in factory/ Each batch of delivery		Pile materials testing records & certificate of comformance	
				Pile bending strength test equipment	Material on site/ If necessary		Pile bending test report	
		Handling and storage of piles	JKR 20800-0183-14 Section C Cl. 2.2.15	Visual inspection	Material on site/ If necessary		Construction progress report	
4	Installation of piles	Number of preliminary pile	Refer to construction drawings	Contract document	Prior ro installation of preliminary pile	Contractor/ Project Manager	As built drawing & piling records	
		Pile deviation	< 75mm	Survey equipments	Every pile		As built drawing/ Survey record/ pins/ pegs/ markers	
		Verticality of pile	< 1:75	Survey equipments/ plumb bob			As built drawing	
		Pile extension	JKR 20800-0183-14 Section C Cl. 2.2.16	Visual inspection	Every extension of pile		Welding records	
		Termination of pile	Set criteria (end bearing pile)/ penetration depth as specified in the drawings (friction pile)	Visual inspection	Every pile		Pile driving record	

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : PILING WORKS - PRE CAST (DRIVEN/ JACKED - IN PILE)

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
5	Pile testing (Static load test)	Test method	Refer to construction drawings, Method Statement	Document review	Prior to commencement of testing	Contractor/ Project Manager	Method statement	
		Number of test	Refer to construction drawings	Contract document & Method Statement	Prior to commencement of testing		Load test report	
		Suitability of apparatus	JKR/SPJ/2010-S10: Section 10.9.4 or JKR 20800-0183-14 Section C Cl. 2.9.4	Document review	Prior to commencement of testing		Calibration certificate	
		Testing procedures	JKR/SPJ/2010-S10: Section 10.9.5 or JKR 20800-0183-14 Section C Cl. 2.9.5	Document review	Every pile test		Method statement	
		Allowable capacity of pile (Acceptance of piles)	Residual settlement after removal of test load < (D/120+4)mm or 6.5mm, whichever the lowest	Load Settlement Graph	Every pile test		Load test report	
			Total settlement under design load < 12.5mm					
			Total settlement under 2xWL < 38mm Or 10% x pile diameter; whichever is the lower value.					

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : PILING WORKS - CAST INSITU (BORED PILE/ MICROPILE)

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Concrete and reinforcement	Approval of materials	Refer to ITP for concrete works	Refer to ITP for concrete works	Refer to ITP for concrete works	Refer to ITP for concrete works	Refer to ITP for concrete works	
2	Support fluid (Bentonite)	Consistency and batching process	JKR 20800-0183-14 Section C Cl. 2.5.2.4 & MS 28	Visual inspection & consistency test	When required	Contractor/ Project Manager	Manufacturer's certificate & mix propotion	
3	Boring/ drilling operation	Dimension of drilled hole.	Tolerance of +5% to 0%	Measurement tools	Every pile	Contractor/ Project Manager	Boring/ drilling record	
		Depth of boreholes	Refer to construction drawings	Measurement tools	Every pile	Contractor/ Project Manager		
		Depth of rock socket (if required). (Sokected Length)	Refer to construction drawings	Measurement tools	Every pile	Contractor/ Project Manager		
		Level of support fluid	> 1m above the external ground water level.	Measurement tools	Every pile	Contractor/ Project Manager		
		Continuity of construction	Time interval between completion of boring and placing of concrete shall be < 6 hours.	Time measurement tools	Every pile	Contractor/ Project Manager		
		Enlarged pile bases (if any)	Concentric within 10% of shaft diameter.	Measurement tools	Every pile	Contractor/ Project Manager		
			Sloping surface of frustum > 55°					
			Minimum height of base = 150mm					
		Position of reinforcement	If temporary casings are employed, longitundinal reinforcement shall be > 1.0m below the bottom of the casing.	Measurement tools	Every pile	Contractor/ Project Manager		
4	Concreting operations	Workability	JKR/SPJ/2010-S10: Table 10.2 or JKR 20800-0183-14 Section C Cl. 2.5.5.2	Slump test equipment	Refer to ITP for concrete works	Contractor/ Project Manager	Refer to ITP for concrete works	
		Volume of Concrete	Refer to construction drawings	Measurement tools	Every pile	Contractor/ Project Manager	bored pile log	
		Bleeding test on grout	Max. bleed < 5% (BS EN 480-4:2005)	Bleeding test equipment	Every batch of grout	Contractor/ Project Manager	Grouting record	

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : PILING WORKS - CAST INSITU (BORED PILE/ MICROPILE)

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
5	Pile testing (Static load test)	Test method	Refer to construction drawings	Document review	Prior to commencement of testing	Contractor/ Project Manager	Method statement	
		Number of test	Refer to construction drawings	Contract document & Method Statement	Prior to commencement of testing	Contractor/ Project Manager	Load test report	
		Suitability of apparatus	JKR/SPJ/2010-S10: Section 10.9.4 or JKR 20800-0183-14 Section C Cl. 2.9.4	Document review	Prior to commencement of testing	Contractor/ Project Manager	Calibration certificate	
		Testing procedures	JKR/SPJ/2010-S10: Section 10.9.5 or JKR 20800-0183-14 Section C Cl. 2.9.5	Document review	Every pile test	Contractor/ Project Manager	Method statement	
		Allowable bearing capacity of pile	Residual settlement after removal of test load < (D/120+4)mm or 6.5mm, whichever the lowest	Load Settlement Graph	Every pile test	Contractor/ Project Manager	Load test report	
			Total settlement under design load < 12.5mm					
			Total settlement under 2xWL < 38mm Or 10% x pile diameter; whichever is the lower value.					

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE

4.1 Flexible Pavement (Revised Versi 1)

4.2 Specialty Mix 1 - Porous Asphalt

4.3 Specialty Mix 2 - Stone Mastic Asphalt

4.4 Specialty Mix 3 - Gap Graded Asphalt

4.5 Specialty Mix 4 - Hot In-Place Recycling

4.6 Specialty Mix 5 - Cold In - Place Recycling

4.7 Specialty Mix 6 - Polymer Modified Asphaltic Concrete

4.8 Road Shoulders

4.9 Road Furniture (Revised Versi 1)

4.9.1 Corrugated Sheet Steel Beam Highway Guardrail (Revised Versi 1)

4.9.2 Concrete Kerb (Revised Versi 1)

4.9.3 Wire Rope Safety Fence (Revised Versi 1)

4.9.4 Road Marking (Revised latest – SPJ)

4.9.5 Traffic Signs (Revised Versi 1)

TRADE : FLEXIBLE PAVEMENT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Approval of Sub Base Material	Material Suitability : Gradation Limits Laboratory Compaction : Soaked CBR Test Mechanical Properties : Plasticity Index, Pi 10% Fines Value Passing of No. 4 (4.75 mm) sieve	JKR/SPJ/2008-S4 - Cl 4.2.2.2 Table 4.2.2 JKR/SPJ/2008-S4 - Cl 4.2.2.2.i JKR/SPJ/2008-S4 - Cl 4.2.2.2.ii Not more 12 Not less than 30 kN Not less than 45%	BS1377 : Part 2 : 1990 BS1377 : Part 4 : 1990 (4.5 kg rammer method) BS1377 : Part 2 : 1990 MS 30 : Part 9 : 1995 ASTM D2419	1. Initial stage 2. One test per 750 cu metre stockpile or laid Initial Stage 1. Initial Stage 2. One test per 750 cu metre stock pile or laid	Project Manager / Construction Manager / QAQC	Inspection Form/ Certificate /Catalogue	
2	Sub Base Construction	Thickness In Situ Compaction Test Surface Finishes - Shape, Super elevation, Level, Grade	JKR/SPJ/2008-S4 - Cl 4.2.2.3 & Table 4.5.1 JKR/SPJ/2008-S4 - Cl 4.2.2.3 Not less than 95% max dry density JKR/SPJ/2008-S4 - Cl 4.2.2.3 within tolerance as Table 4.5.1	Dipping method BS1377 : Compaction Test Relevant construction drawings	Over any 100 metre length One test per 500 sq metre of each layer laid	Contractor/ Supervision Engineer	Inspection Form/ Record/ Certificate	

TRADE : FLEXIBLE PAVEMENT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
3	Approval of Roadbase Material	Physical & Mechanical Properties:-	JKR/SPJ/2008-S4 - Cl 4.2.3.2		1. Initial stage 2. One (1) test per 750 cu.m supplied	Project Manager / Construction Manager / QAQC	Inspection Form/ Certificate /Catalogue	
		Plasticity Index	Not more than 6	BS 1377 : Part 2 : 1990				
		Agreggate Crushing Value	Not more than 25%	MS 30 : Part 8 : 1995				
		Flakiness Index	Not more than 25%	MS 30 : Part 5 : 1995				
		Loss of weight in magnesium sulphate soundness tests	Not more than 18%	AASHTO Test Method T 104				
		Soaked CBR Test	Not less than 80% when compacted to 95% max dry density	BS 1377 : Part 4 : 1990 (4.5 kg rammer method)				
		Passing of the No. 4 (4.75mm) sieve	Not less than 45%	ASTM D 2419				
		Sieve Analysis	Table 4.2.3	BS 1377 : Part 2 : 1990				
4	Roadbase Construction	Thickness	JKR/SPJ/2008-S4 - Cl 4.2.3.3 within tolerance as Table 4.5.1	Dipping	Average thickness over any 100 metre length not less than the required thickness	Contractor/ Supervision Engineer	Inspection Form/ Record/ Certificate	
		In-Situ Compaction Test	JKR/SPJ/2008-S4 - Cl 4.2.2.3 Not less than 95% max dry density	BS1377 : Compaction Test	One test per 500 sq metre of each layer laid			
		Surface Finishes - Shape, Super elevation, Level, Grade	JKR/SPJ/2008-S4 - Cl 4.2.3.3 within tolerance as Table 4.5.1	Relevant Construction drawings				
5	Approval of Prime Coat Material	Material Suitability : Cutback Emulsion	JKR/SPJ/2008-S4 - Cl 4.3.1.2 Table 4.3.1 Table 4.3.2	 MS 159 MS 161	1. Initial Stage 2. Each delivery	Project Manager / Construction Manager / QAQC	Inspection Form/ Certificate /Catalogue /Method of Inspection Form/ Record	
	Prime Coat Construction	Spray Test : Tray Test Spraying Temperature	JKR/SPJ/2008-S4 - Cl 4.3.1.4c Between 0.5 to 1.0 litres per sq metre Between 25°C–45°C		One test per16,000 sq.m covered Daily Operation covered	Contractor/ QAQC/ Supervision Engineer		
		Curing & Opening to Traffic	JKR/SPJ/2008-S4 - Cl 4.3.1.4d Left undisturbed for at least 24 hours					

TRADE : FLEXIBLE PAVEMENT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
6	Tack Coat Material Tack Coat Construction	Material Suitability Emulsion Spray Test : Tray Test Spraying Temperature	JKR/SPJ/2008-S4 - Cl 4.3.1.2 Table 4.3.2 JKR/SPJ/2008-S4 - Cl 4.3.1.4c Between 0.25 to 0.55 litres per sq metre Between 25°C–45°C	MS161	InitialStage One test per16,000 sq.m covered Daily Operation covered	Contractor/ QAQC/ Supervision Engineer	Inspection Form/ Record	
7	Approval of Binder Course Material (Asphaltic Concrete)	Aggregates Grading Coarse Aggregate Properties:- Los Angeles Abrasion Value Magnesium sulphate soundness test Flakiness Index Water Absorption Fine Aggregates:- Passing of the No. 4 (4.75mm) sieve Fine aggregate angularity Methylene Blue value magnesium sulphate soundness test Water Absorption	JKR/SPJ/2008-S4 - Cl 4.3.3.2 Table 4.3.3 JKR/SPJ/2008-S4 - Cl 4.3.3.2a Not more than 25% Not more than 18% Not more than 25% Not more than 2% JKR/SPJ/2008-S4 - Cl 4.3.3.2 Not less than 45% Not less than 45% Not more than 10mg/g Not more than 18% Not more than 2%	BS1377 : Washing and Sieving Method ASTM C 131: 1996 AASHTO Test Method T 104 MS 30 : Part 5 : 1995 MS 30 ASTM D 2419 ASTM C 1252 Ohio Department of Transportation Standard Test Method AASHTO Test Method T 104 MS 30	i. Initial stage or any change of aggregates source ii. One (1) test per 1,000 cu.m or at least one (1) test for each plant operation session. i. Initial stage ii. One (1) test per 200 tons produced or each plant operation	Project Manager / Construction Manager / QAQC	Inspection Form/ Certificate /Catalogue /Method of Statement	

TRADE : FLEXIBLE PAVEMENT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
8	Approval of Mix Design	Job Mix Formula Marshall Properties : Bulk Specific Gravity, SG Stability, S Flow, F Stiffness, S/F Air Voids in Mix, VIM Voids in aggregate filled with bitumen, VFB Bitumen Contents Bitumen Extraction Plant Trial Compliance	JKR/SPJ/2008-S4 - Cl 4.3.3.3a Table 4.3.5 Not less than 8000N 2.0 – 4.0mm Not less than 2000N/mm 3.0 – 7.0% 65 – 75% JKR/SPJ/2008-S4 - Cl 4.3.3.3 Table 4.3.4 JKR/SPJ/2008-S4 - Cl 4.3.3.b Minimum of 20 tonnes JKR/SPJ/2008-S4 - Cl 4.3.3.c Table 4.3.6	 ASTM D 2726 ASTM D 1559 ASTM D 1559 ASTM D 2172	i. Initial stage ii. One (1) test per 200 tonsproducedor at least one (1) test for eachplant operation session. i. Initial stage ii.One (1) test per 200 tonsproducedor eachplant operation Initial Stage Initial stage	Project Manager / Construction Manager / QAQC	Inspection Form/ Certificate	
9	Approval of Construction Method	Longitudinal Joints Traverse Joints Compaction In Situ Density Test Thickness Surface Finishes - Shape, Super elevation, Level, Grade Opening to traffic	JKR/SPJ/2008-S4 - Cl 4.3.3.5h Overlap by at least 100mm Overlap by at least 500mm JKR/SPJ/2008-S4 - Cl 4.3.3.5i 95 – 100% Marshall density JKR/SPJ/2008-S4 - Cl 4.3.3.5j i. Average thickness over any 100 metre length ≥ required thickness ii. Minimum thickness at any point ≥ required thickness minus 5mm JKR/SPJ/2008-S4 - Cl 4.2.3.5j JKR/SPJ/2008-S4 - Cl 4.2.3.5k	Observation ASTM Test Method D 1188 or ASTM Test Method D 2726 Measurement Relevant Construction drawings Observation	Every completed section or daily operation. One (1) sample per 500 sq.m of mix laid, but not less than two (2) samples for the work completed in each paving session	Project Manager / Construction Manager / QAQC	Inspection Form/ Certificate /Catalogue	

TRADE : FLEXIBLE PAVEMENT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
10	Approval of Wearing Course Material (Asphaltic Concrete)	Aggregates Grading	JKR/SPJ/2008-S4 - Cl 4.3.3.2 Table 4.3.3	BS1377 : Washing and Sieving Method	i. Initial stage or any change of aggregates source ii. One (1) test per 1,000 cu.m or at least one (1) test for each plant operation session.	Project Manager / Construction Manager / QAQC	Inspection Form/ Certificate /Catalogue /Method of Statement	
		Coarse Aggregate Properties Los Angeles Abrasion Value Magnesium sulphate soundness test Flakiness Index Water Absorption	JKR/SPJ/2008-S4 - Cl 4.3.3.2a Not more than 25% Not more than 18% Not more than 25% Not more than 2%	 ASTM C 131: 1996 AASHTO Test Method T 104 MS 30 : Part 5 : 1995 MS 30	 i. Initial stage ii. One (1) test per 200 tons produced or each plant operation			
		Fine Aggregates Passing of the No. 4 (4.75mm) sieve Fine aggregate angularity Methylene Blue value magnesium sulphate soundness test Water Absorption	JKR/SPJ/2008-S4 - Cl 4.3.3.2 Not less than 45% Not less than 45% Not more than 10mg/g Not more than 18% Not more than 2%	 ASTM D 2419 ASTM C 1252 Ohio Department of Transportation Standard Test Method AASHTO Test Method T 104 MS 30				
11	Approval of Mix Design	Job Mix Formula Marshall Properties : Bulk Specific Gravity, SG Stability, S Flow, F Stiffness, S/F Air Voids in Mix, VIM Voids in aggregate filled with bitumen, VFB Bitumen Contents Bitumen Extraction	JKR/SPJ/2008-S4 - Cl 4.3.3.3 Table 4.3.5 Not less than 8000N 2.0 – 4.0mm Not less than 2000N/mm 3.0 – 5.0% 70 – 80% JKR/SPJ/2008-S4 - Cl 4.3.3.3 Table 4.3.4	 ASTM D 2726 ASTM D 1559 ASTM D 1559 ASTM D 2172	 i. Initial stage ii. One (1) test per 200 tonsproducedor at least one (1) test for eachplant operation session. i. Initial stage ii.One (1) test per 200 tonsproducedor eachplant operation	Project Manager / Construction Manager / QAQC	Inspection Form/ Certificate	

TRADE : FLEXIBLE PAVEMENT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
12	Approval of Construction Method	Longitudinal Joints	JKR/SPJ/2008-S4 - Cl 4.3.3.5h Overlap by at least 100mm	Observation	Every completed section or daily operation.			
		Traverse Joints	Overlap by at least 500mm					
		Compaction In Situ Density Test	JKR/SPJ/2008-S4 - Cl 4.3.3.5i 95 – 100% Marshall density	ASTM Test Method D 1188 or ASTM Test Method D 2726	One (1) sample per 500 sq.m of mix laid, but not less than two (2) samples for the work completed in each paving session	Project Manager / Construction Manager / QAQC	Inspection Form/ Certificate /Catalogue /Method of Statement	
		Thickness	JKR/SPJ/2008-S4 - Cl 4.3.3.5j i. Average thickness over any 100 metre length ≥ required thickness ii. Minimum thickness at any point ≥ required thickness minus 5mm	Measurement				
		Surface Finishes - Shape, Super elevation, Level, Grade	JKR/SPJ/2008-S4 - Cl 4.3.3.5j	Relevant Construction drawings				
		Opening to traffic	JKR/SPJ/2008-S4 - Cl 4.3.3.5k	Observation				
13	Determination of Surface Regularity	International Roughness Index (IRI)	JKR/SPJ/2008-S4 - Cl 4.5.3.2 Less than 2m/km for each 100m	ARRB Walking Profiler as outlined in AUSTROAD PAT 01:2001	Before open to traffic	Contractor/ QAQC/ Supervision Engineer	Inspection Form/ Record	

TRADE : SPECIALTY MIX 1 - POROUS ASPHALT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Material		JKR/SPJ/2008-S4 - Cl. 4.6.2					
	a. Course Aggregate			Visual, testing and measurement	Once per project/source	Project Manager	Inspection Form/Certificate	
		Course Aggregate Properties :						
		i. Abrasion Loss Los Angeles	Not more than 25% ASTMC 131					
		ii. Water Absorption	Not more than 2% MS 30					
		iii. Flakiness Index	Not more than 25% MS 30					
		iv. Polished Stone Value	Not less than 40 MS 30					
		v. 5 cycles Magnesium Sulphate Soundness test, wt. loss	Not more than 18% AASHTO T 104					
	b. Fine Aggregate			Visual, testing and measurement	Once per project/source	Project Manager	Inspection Form/Certificate	
		Fine Aggregate Properties :						
		i. Aggregate fraction passing the No.4 Sieve	Not less than 45% ASTM D 2419					
		ii. Aggregate Angularity	Not less than 45% ASTM C 1252					
		iii. Methylene Blue Value	Not more than 10mg/g					
		iv. 5 cycles Magnesium Sulphate Soundness test, wt. loss	Not more than 20% AASHTO T 104					
		v. Water Absorption	Not more than 2% MS 30					

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : SPECIALTY MIX 1 - POROUS ASPHALT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1 (cont)	c. Mineral Filler	Measurement	i. Passing 75um sieve : Not less than 70% by weight ii. Amount : Not less than 2% by weight of combined aggregates. If hydrated lime is used, it shall not exceed 2% by weight of combined aggregates	Visual, testing and measurement	Once per project/source	Project Manager	Inspection Form/Certificate	
	d. Bituminous Binder (PG76)		JKR/SPJ/2008-S4, Cl. 4.6.2.4 Refer to Table 4.6.1	Visual, testing and measurement	Once per project/source	Project Manager	Inspection Form/Certificate	
		i. Prior to Rolling Thin Film Oven Test	i. Viscosity, max. 3 Pa.s, test temperature C. : 135 ASTM 4402 ii. Dynamic shear, G/sin d min. 1.00 kPa, 10 rad/s, test temperature C : 76 AASHTO T 315 iii. Penetration, 100 g, 5 s, 25 C, 0.1 mm. ASTM D 5 iv. Ring and Ball softening point, min. C : 60 ASTM D 36 v. Flash Point, min ^{o}C : 230 AASHTO T 48 vi. Moisture sensitivity test, greater than (%) : 80 AASHTO T 283					
		ii. After Rolling Thin Film Oven Test	i. Mass loss, max % : 1.00 AASHTO T 240 ii. Dynamic shear, G/sin d min. 2.20 kPa, 10 rad/s, test temperature C : 76 AASHTO T 315					
	e. Tack Coat Grade RS-3K	Spraying Rate	Spray at a rate of 0.5 to 1.0 litre/m^2 MS161	Visual, testing and measurement	200 litres/test	Project Manager	Inspection Form	

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : SPECIALTY MIX 1 - POROUS ASPHALT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
2	Mix Design	Marshall Test : i. Air Void ii. Binder Drain-Down iii. Cantabro iv. Binder Content v. Grading (sieve analysis)	JKR/SPJ/2008-S4 - Cl. 4.6.4 Design and in-place air voids shall be between 18 - 25%. ASTM D 1559 Not more than 0.3% by weight of the total mix ASTM D 2041 Average loss in mass shall not be more than 15% In the range of 4.0-6.0% Design aggregate gradation that comply with Table 4.6.4	Visual, testing and measurement	Once per project/source	Project Manager	Inspection Form/Certificate	
3	Trial Lay	 - Quantity - Record -Laying and compaction Marshall Test : i. Air Void ii. Binder Drain-Down iii. Cantabro iv. Binder Content v. Grading (sieve analysis)	 20 tonnes Record as listed in JKR/SPJ/2008-S4 - Cl 4.6.4.6 Refer **Construction Works** JKR/SPJ/2008-S4 - Cl. 4.6.4.6 Design and in-place air voids shall be between 18 - 25% Not more than 0.3% by weight of the total mix. Average loss in mass shall not be more than 15% In the range of 4.0-6.0% Design aggregate gradation that comply with Table 4.6.4	Visual, testing and measurement Visual, testing and measurement	Initial stage Once per project	Project Manager Project Manager	Inspection Form and Record Inspection Form/Record	

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : SPECIALTY MIX 1 - POROUS ASPHALT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
4	Construction Works		JKR/SPJ/2008 - S4 - Cl. 4.6.6					
	a. Tack Coat	Tray/Sponge	Refer to Table 4.6.2 and Table 4.6.3 MS 161 0.5– 1.0 liter/sq.m	Visual, testing and measurement	1 test per 200 liter	Project Manager	Inspection Form/Record	
	b. Laying	Min. thickness	JKR/SPJ/2008-S4 - Cl. 4.6.6.2 50mm	Visual, testing and measurement		Project Manager	Inspection Form/Record	
	c. Compaction	i. Rollers used	JKR/SPJ/2008 - S4 - Cl. 4.6.6.3 Static steel tandem rollers only	Visual, testing and measurement	1 coring per 500m^2 or min 2	Project Manager	Inspection Form/Record	
		ii. Rolling temperature	Not less than 110^oC					
		iii. Rolling pattern	In accordance to trial lay record					
		iv. Compaction density	Not less than 97% of the laboratory mix design density					
		v. Thickness	Average over any 100m length not less than specified thickness and minimum thickness at any point shall be not less than the specified thickness minus 5mm.					
5	Surface regularity	International Roughness Index (IRI)	The lane IRI measured for the whole road length and each 100 m section shall be less than 2.0m/km.	Visual, testing and measurement	Each 100 m section	Project Manager	Inspection Form/Record	
6	Opening to traffic	Time	JKR/SPJ/2008-S4 - Cl. 4.6.6.8 Not less than 4 hours.	Visual, testing and measurement	Prior to opening	Project Manager	Inspection Form/Record	

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : SPECIALTY MIX 2 - STONE MASTIC ASPHALT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Materials							
	a.Coarse Aggregate		JKR/SPJ/2008-S4 - Cl 4.7.2.1	Visual, testing and measurement	Once per project/source	Project Manager	Inspection Form/Certificate	
		i. Loss by abrasion	Not more than 25% ASTM C 131					
		ii. Flakiness Index	Not more than 25% MS 30					
		iii. Polished Stone Value	Not less than 40 MS 30					
		iv. Magnesium Sulfate Soundness Test (5 cycles)	Not more than 18% AASHTO T 104					
		v. Water Absorption	Not more than 2% MS 30					
	b.Fine Aggregate		JKR/SPJ/2008-S4 - Cl 4.7.2.2	Visual, testing and measurement	Once per project/source	Project Manager	Inspection Form/Certificate	
		i. Magnesium Sulfate Soundness Test (5 cycles)	Not more than 20% AASHTO T 104					
		ii. Water Absorption	Not more than 2% MS 30					
		iii. Aggregate Fraction	Not less than 45% ASTM D 2419					
		iv. Aggregate Angularity	Not less than 45% ASTM C 1252					
		v) Methylene Blue Value	Not more than 10 mg/g Ohio Department of Transportation Standard Test Method					

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : SPECIALTY MIX 2 - STONE MASTIC ASPHALT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1 (cont)	c.Mineral Filler		JKR/SPJ/2008-S4 - Cl 4.7.2.3	Visual, testing and measurement	Once per project/source	Project Manager	Inspection Form/Certificate	
		i. Passing 75um sieve	Not less than 70% by weight					
		ii. Amount	Not less than 8% by weight of combined aggregates. If cement is used, it shall not exceed 2% by weight of combined aggregates.					
	d.Bitumen Binder (PG76)		JKR/SPJ/2008-S4 - Cl 4.7.2.4	Visual, testing and measurement	Once per project/source	Project Manager	Inspection Form/Certificate	
		i. Properties	Refer to Table 4.7.1					
		ii. Fuel Resistance Test Immersion in Octane 97 for 24 hours	JKR/SPJ/2008-S4 - Cl 4.7.2.4 (d)					
			Loss of weight after immersion not more than 4%					
	e.Stabilising agent		JKR/SPJ/2008-S4 - Cl 4.7.2.5	Visual, testing and measurement	Once per project/ source	Project Manager	Inspection Form/Certificate	
		i. Dosage	0.3% by weight of total mix (± 10%)					
		ii. Properties	Refer to Table 4.7.2 or Table 4.7.3					
	f. Tack Coat		Grade RS-1K MS161	Visual, testing and measurement	Once per project/ source	Project Manager	Certificate	
2	Gradation	Gradation of Combined Aggregate	JKR/SPJ/2008-S4 - Cl 4.7.3 Refer to Table 4.7.4	Visual, testing and measurement	Once per project/source	Project Manager	Inspection Form/Certificate	

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : SPECIALTY MIX 2 - STONE MASTIC ASPHALT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
3	Mix Design	i. Marshall Properties	JKR/SPJ/2008-S4 - Cl 4.7.4 Refer to Table 4.7.5 ASTM D 2726 ASTM D 1559 i. VIM : 3% - 5% ii. VMA : Min 17% iii. Stability : Min 6200 N iv. Flow : 2 – 4 mm v. Draindown test : Max 0.30%	Visual, testing and measurement	Once per project/source	Project Manager	Inspection Form/Certificate	
		ii. Trial Lay - Quantity - Record -Laying and compaction	 20 tonnes Record as listed in JKR/SPJ/2008-S4 - Cl 4.7.4.4 Refer **Construction Works**	Visual, testing and measurement	Initial stage	Project Manager	Inspection Form and Record	
		iii. Compliance	Refer to Table 4.7.6	Visual, testing and measurement	Initial stage	Project Manager	Report	
4	Construction Works a. Surface Preparation	Visual	JKR/SPJ/2008-S4 - Cl 4.7.6.1 Surface clean from loosematerials	Visual, testing and measurement	Prior to spraying of the tack coat	Project Manager	Inspection Form/ Record	
	b. Spray Tack Coat	Spray application	JKR/SPJ/2008-S4 - Cl 4.7.6.1 MS 161 0.25 – 0.55 liter/sq.m + 10% @ 25°C – 45°C during spray	Visual, testing and measurement	1 spraying test per 200 liters of asphalt emulsion	Project Manager	Inspection Form/ Record	
	c. Laying and Compaction			Visual, testing and measurement		Project Manager	Inspection Form/ Record	
		i. Temperature	120°C -150°C during laying & not less than 116°C during rolling		Every load			
		ii).Grading	JKR/SPJ/2008-S4 - Cl 4.7.3 Refer to Table 4.7.4		1 test per 1000 cu.m or at least 1 test for each plant operation session			
		iii. Binder contents	± 0.3% at OBC of JMF		1 test per 200 tons or at least 1 test/day			

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : SPECIALTY MIX 2 - STONE MASTIC ASPHALT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
4 (cont)		iv. Marshall properties	JKR/SPJ/2008-S4 - Cl 4.7.4 Refer to Table 4.7.5 ASTM1559 BS594 i. VIM : 3% - 5% ii. VMA : Min 17% iii. Stability : Min 6200 N iv. Flow : 2 – 4 mm v. Draindown test : Max 0.30%	Visual, testing and measurement	1 test per 200 tons or at least 1 test/day	Project Manager	Inspection Form/ Record	
		v. Compaction	JKR/SPJ/2008-S4 - Cl 4.7.6.5 Minimum 94% Maximum Theoretical density	Visual, testing and measurement	1 coring per 500m^2 per lane or min 2 cores, whichever is greater	Project Manager	Inspection Form/ Record	Frequency of coring need to be incorporated in JKR/SPJ/2008-S4 Cl. 4.7.4
		vi. Layer Thickness	JKR/SPJ/2008-S4 - Cl 4.7.6.6 Average over any 100m length not less than specified thickness and minimum thickness at any point shall be not less than the specified thickness minus 5mm.	Visual, testing and measurement	1 coring per 500m2 per lane or min 2 cores, whichever is greater	Project Manager	Inspection Form/ Record	
5	Surface regularity	International Roughness Index (IRI)	JKR/SPJ/2008-S4 - Cl 4.7.6.6 The lane IRI measured for the whole road length and each 100 meter section shall be less than 2.0m/km	Visual, testing and measurement	Each 100 m section	Project Manager	Inspection Form/Record	
6	Opening to Traffic	Temperature	JKR/SPJ/2008-S4 - Cl 4.7.6.7 Traffic should not be placed on newly compacted surface until the material has cooled to 60°C or lower.	Visual, testing and measurement	Prior to opening	Project Manager	Inspection Form	

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : SPECIALTY MIX 3 - GAP GRADED ASPHALT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Materials		JKR/SPJ/2008-S4 - Cl 4.8.2					
	a. Coarse Aggregate			Visual, testing and measurement	Once per project/source	Project Manager	Inspection Form/Certificate	
		i. Loss by abrasion	Not more than 25% ASTM C 131					
		ii. Flakiness Index	Not more than 25% MS 30					
		iii. Polished Stone Value	Not less than 40 MS 30					
		iv. Magnesium Sulfate Soundness Test (5 cycles)	Not more than 18% AASHTO T 104					
		v. Water Absorption	Not more than 2% MS 30					
	b. Fine Aggregate			Visual, testing and measurement	Once per project/source	Project Manager	Inspection Form/Certificate	
		i. Magnesium Sulfate Soundness Test (5 cycles)	Not more than 20% AASHTO T 104					
		ii. Water Absorption	Not more than 2% MS 30					
		iii. Aggregate Fraction Passing 4.75mm sieve	Not less than 45% ASTM D 2419					
		iv. Aggregate Angularity	Not less than 45% ASTM C 1252					
		v. Methylene Blue Value	Not more than 10 mg/g Ohio Department of Transportation Standard Test Method					

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : SPECIALTY MIX 3 - GAP GRADED ASPHALT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1 (cont)	c. Mineral Filler	Hydrated lime		Visual, testing and measurement	Once per project/source	Project Manager	Inspection Form/Certificate	
		i. Passing 75um sieve	Not less than 70% by weight					
		ii. Amount	Approximately 2% by weight of combined aggregates.					
	d. Bituminous Binder (PG76)		JKR/SPJ/2008-S4 - Cl 4.8.2.4	Visual, testing and measurement	Once per project/source	Project Manager	Inspection Form/Certificate	
		i. Properties	Refer to Table 4.8.1					
		ii. Fuel Resistance TestImmersion in Octane 97 for 24 hours	JKR/SPJ/2008-S4 - Cl 4.8.2.4 (d) Loss of weight after immersion not more than 4%					
	e. Gradation	Gradation of Combined	JKR/SPJ/2008-S4 - Cl 4.8.3	Visual, testing and measurement	Once per project/source	Project Manager	Inspection Form/Certificate	
		Aggregate	Refer to Table 4.8.2					
2	Mix Design		JKR/SPJ/2008-S4 - Cl 4.8.4.1	Visual, testing and measurement		Project Manager		
	a. Job Mix Formula	i. Design Properties	Refer toTable 4.8.3 ASTM D 2726 ASTM D 1559 i. Marshall Stability : > 6200 N ii. Marshall Flow : 2 – 4 mm iii. Stiffness : > 1550 N/mm iv. Voids in mix : 3 - 5 % v. Voids filled with bitumen : 76-82 %		Once per project/source		Inspection Form/Certificate	
		ii. Optimum Binder Content	The aggregate gradation selected and the optimum binder content determined shall be proposed to the S.O					
		iii.Trial Lay			Initial stage		Inspection Form and Record	
		- Quantity	20 tonnes					
		- Record	Record as listed in JKR/SPJ/2008-S4 -Cl 4.8.4.3					
		-Laying and compaction	Refer **Construction Works**					
		iv. Compliance	Refer to Table 4.8.4		Initial stage		Report	

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : SPECIALTY MIX 3 - GAP GRADED ASPHALT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
3	Construction Works		JKR/SPJ/2008-S4 - Cl 4.8.6	Visual, testing and measurement		Project Manager		
	a. Laying and Compaction	i. Temperature	Not less than 150°C during laying & not less than 120°C during rolling		Every load		Inspection Form/ Record	
		ii. Compaction	120°C -150°C during laying & not less than 116°C during rolling		1 coring/500m^2 or min 2 cores per paving session		Inspection Form/ Record	
		iii. Density	At least 98% of Marshall density				Inspection Form/ Record	
		iv. Thickness	Average over any 100m length not less than specified thickness and min thickness at any point shall be not less than the specified thickness minus 5mm				Inspection Form/ Record	
4	Surface regularity	International Roughness Index (IRI)	JKR/SPJ/2008-S4 - Cl 4.8.6.7 The lane IRI measured for the whole road length and each 100 meter section shall be less than 2.0m/km	Visual, testing and measurement	Each 100 m section	Project Manager	Inspection Form/ Record	
5	Opening to Traffic	Temperature	JKR/SPJ/2008-S4 - Cl 4.8.6.8 Traffic should not be placed on newly compacted surface until the material has cooled to 60°C or lower.	Visual, testing and measurement	Prior to opening	Project Manager	Inspection Form	

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : SPECIALTY MIX 4 - HOT IN-PLACE RECYCLING

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Materials							
	1.1 Recycled Asphalt Mixture		JKR/SPJ/2008-S4 - Cl 4.9.2.1					
	a. Coarse Aggregate for Fresh Bituminous Mix	i. Loss by abrasion	Not more than 25% ASTM C 131	Visual, testing and measurement	Once per project/source	Project Manager	Inspection Form/Certificate	
		ii. Aggregate Crushing Value	Not more than 25% BS 812					
		iii. Flakiness Index	Not more than 25% MS 30					
		iv. Polished Stone Value	Not less than 40 MS 30					
		v. Magnesium Sulfate Soundness Test	Not more than 18% AASHTO T 104					
		vi. Water Absorption	Not more than 2% MS 30					
	b. Fine Aggregate for Fresh Bituminous Mix	i. Magnesium Sulfate Soundness Test	Not more than 20% AASHTO T 104	Visual, testing and measurement	Once per project/source	Project Manager	Inspection Form/Certificate	
		ii. Water Absorption	Not more than 2% MS 30					
		iii. Aggregate Fraction	Not less than 45% ASTM D 2419					
		iv. Aggregate Angularity	Not less than 45% ASTM C 1252					
		v. Methylene Blue Value	Not more than 10 mg/g Ohio Department of Transportation Standard Test Method					

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : SPECIALTY MIX 4 - HOT IN-PLACE RECYCLING

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1 (cont)	c.Aggregate Properties for Existing Pavement	Physical	Not deviate by more than 20% from values specified in Item a and b	Visual, testing and measurement	Once per project	Project Manager	Inspection Form/Certificate	
	d.Binder	i. Fresh bituminous binder	80 -100 and 50-70 penetration grade bitumen MS 124	Visual, testing and measurement	Once per project/source	Project Manager	Inspection Form/Certificate	
		ii. Bitumen recovered from the recycled asphalt after laying.	50 - 70 penetration grade bitumen	Visual, testing and measurement	Once per project	Project Manager		
	1.2 Marshall Properties for fresh Bituminous Mix	Marshall Properties	JKR/SPJ/2008-S4 - Cl 4.9.2.2	Visual, testing and measurement	Once per project	Project Manager	Inspection Form/Certificate	
		Grading	To comply with Table 4.9.1					
	1.3 Rejuvenating Agent	Physical properties	JKR/SPJ/2008-S4 - Cl 4.9.2.3 The blended binder shall comply to Table 4.9.1	Visual, testing and measurement	Once per project	Project Manager	Inspection Form/Certificate	
2	Mix Design	Propose mix design	Shall comply with JKR/SPJ/2008-S4 - Cl 4.9.3	Visual, testing and measurement	Once per project	Project Manager	Inspection Form/Record	
3	Job Mix Formula	i. Trial Lay	JKR/SPJ/2008-S4 - Cl 4.9.4 over a section of min 150m length	Visual, testing and measurement	Once per project	Project Manager	Inspection Form/Record	
		ii. Gradation	Shall comply withTable 4.9.1					
		iii. Marshall Properties	Shall comply with Table 4.9.2					

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : SPECIALTY MIX 4 - HOT IN-PLACE RECYCLING

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
4	Construction Works			Visual, testing and measurement	Once per project	Project Manager	Inspection Form	
	a.Heating	Temperature	JKR/SPJ/2008-S4 - Cl 4.9.6.3 120 ≤ °C ≤ 180					
	b.Scarifying	Depth	JKR/SPJ/2008-S4 - Cl 4.9.6.3 Within 20mm of the alignment of the grade and slope of the finished pavement					
	c.Laying and Compaction	Density	JKR/SPJ/2008-S4 - Cl 4.9.7 Not less than 98%					
	d.Joints	Heating	JKR/SPJ/2008-S4 - Cl 4.9.8 Heating shall extend at least 100 mm into the adjacent previous mat.					
5	Finished HIPR Surface	i. Thickness	JKR/SPJ/2008-S4 - Cl 4.9.9 i. Average thickness over 100m length shall be not less than the specified thickness ii. Minimum thickness at any point shall be not less than the specified thickness minus 5mm.	Visual, testing and measurement	One core per 250 m per lane length or a min of 3 cores	Project Manager	Inspection Form/Record	
		ii. Acceptance Criteria	i) Remixing with additional thickness IRI less than 2.0m/km	Visual, testing and measurement	Each 100 m section	Project Manager	Inspection Form/ Record	
			ii) Remixing only IRI less than 2.5m/km	Visual, testing and measurement	Each 100 m section	Project Manager	Inspection Form/ Record	
6	Opening to Traffic	Time	JKR/SPJ/2008-S4 - Cl 4.9.10 Not less than 4 hours after commencement of rolling.	Visual, testing and measurement	Prior to opening	Project Manager	Inspection Form	

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : SPECIALTY MIX 5 - COLD IN - PLACE RECYCLING

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Cold In-Place Recycling Testing of materials to be recycled	 i. Sieve Analysis ii. Plasticity Index iii. Aggregate Crushing Value iv. Flakiness Index v. CBR	JKR/SPJ/2008-S4 - Cl 4.10.3.2 i. Refer to Table 4.10.2 JKR/SPJ/2008-S4 ii. Plasticity index < 6 for unbound material iii. ACV < 25% MS 30 iv. Flakiness Index < 25% MS 30 v.CBR > 80% when compacted to 95% of max. dry density -soaked 4 days under surcharge 4.5 kg BS 1377	Visual, testing and measurement	Early stage/Once per project	Lab Assistant/Project Manager/SOR	Certified test result/report	
2	Stabilising agent material a) Cement	Cement use	Ordinary portland cement MS 522	Visual, testing and measurement	Early stage	SOR	Inspection Form	
	b) Bitumen Emulsion	Parameters i. Viscosity, Saybolt Furol at 25° C (sec) ii. Settlement, 5 days (%) iii. Storage stability test, 24hr (%) iv. Sieve test (%) v. Cement mixing test (%) vi. Distillation for oil, by volume of bitumen emulsion (%): vii. Distillation for residue (%) viii. Penetration for residue (%): ix. Ductility of residue, 25° C, 5cm/min (cm) x. Solubility in trichloroethylene(%) xi. Particle charge test	JKR/SPJ/2008-S4 - Cl. 4.10.2.3,c Refer to Table 4.10.1 i. Min 20 sec, Max 100 sec MS 161 ii. Min 0 %, Max 5 % iii. Min 0 %, Max 1 % iv. Min 0 %, Max 0.1 % v. Min 0 %, Max 2 % vi. Min 0 %, Max 5 % vii. Min 60 % viii. Min 60 %, Max 200 % ix. Min 40 cm x. Min 97.5 % xi. Positive	Visual, testing and measurement	Once per project	Lab Assistant/Project Manager/SOR	Certified test result/report	
	c) Foamed Bitumen	Properties i. Expansion Ratio ii. Half Life	JKR/SPJ/2008 - S4 - Cl. 4.10.2.3 (d) MS 124 Min 8 times Min 8 seconds	Visual, testing and measurement	Once per project	Lab Assistant/ Project Manager/ SOR	Certified test result/report	

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : SPECIALTY MIX 5 - COLD IN - PLACE RECYCLING

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
3	Mix design a) Cement		JKR/SPJ/2008-S4 - Cl. 4.10.3.3 (b) Refer to Table 4.10.3	Visual, testing and measurement	Once per project	Lab Assistant/Project Manager/SOR	Certified test result/report	
		i. Unconfined Compression Strength Test (UCS)	i. Range (Minimum-Maximum Strength) 2 - 5 Mpa BS 1881					
		ii. Indirect Tensile Test (ITS)	ii. Min 0.2 Mpa					
		iii. Maximum cement content by weight	iii. 5 %					
	b) Bitumen Emulsion or Foamed Bitumen		JKR/SPJ/2008-S4 - Cl. 4.10.3.3 (c) Refer to Table 4.10.4/ Table 4.10.5	Visual, testing and measurement	Once per project	Lab Assistant/Project Manager/SOR	Certified test result/report	
		i. Unconfined Compressive Strength	i. Min Strength 0.7 Mpa BS 1881					
		ii. Indirect Tensile Test (ITS) (Unsoaked)	ii. Min Strength 0.2 MPa					
		iii. Indirect Tensile Test (ITS) on cured briquettes, soaked for 24 hours	iii. Min Strength 0.15 Mpa					
		iv. Sieve test (%)						
		v. Maximum cement content by weight	v. 2 %					

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : SPECIALTY MIX 5 - COLD IN - PLACE RECYCLING

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
4	Trial Section	Parameters i. Gradation of the recycled material ii. Compaction requirements including type of roller and rolling pattern to be employed to achieve the required density; iii. Strength of the recycled layer material in terms of UCS and ITS iv. Recycling depth and compacted thickness of new recycled layer material as specified in detailed pavement design report; v. In-situ moisture content in order to determine the application rate of water to achieve the OMC; vi. Percentage by weight of the stabilising agent used vii. Speed of advance of the recycler machine	JKR/SPJ/2008-S4 - Cl 4.10.3.4 Refer to Table 4.10.2 Refer to Table 4.10.8 BS 1377 Refer to Table 4.10.8 Refer to Table 4.10.8 Refer to Table 4.10.8 BS 1377 Refer to Table 4.10.8 Refer to Table 4.10.8	Visual, testing and measurement	Early stage/Once per project (150m)	SOR	Trial result report/record	
5	Construction Works	 i. Time Limitation between mixing and final compaction ii. Compaction -Initial Compaction -Trimming and Final Compaction iii. Joints iv. Quality of Materials and Workmanship	JKR/SPJ/2008-S4 - Cl 4.10.5 Refer to Table 4.10.8 Refer to Table 4.10.6 JKR/SPJ/2008-S4 - Cl. 4.10.5.3 (a) Refer to Table 4.10.7 JKR/SPJ/2008-S4 - Cl. 4.10.5.3 (b) JKR/SPJ/2008-S4 - Cl. 4.10.5.4 JKR/SPJ/2008-S4 - Cl 4.10.5.6 Refer to Table 4.10.8 & Table 4.10.9	Visual, testing and measurement	Once per project	SOR	Inspection Fom	

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : SPECIALTY MIX 6 - POLYMER MODIFIED ASPHALTIC CONCRETE

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Materials		JKR/SPJ/2008-S4 - Cl 4.11.2					
	a. Aggregate			Visual, testing and measurement	Once per project/source	Project Manager	Inspection Form/	
		i. Los Angeles Abrasion	Not more than 25% ASTM C 131				Certificate	
		ii. Flakiness Index	Not more than 25% MS 30					
		iii. Polished Stone Value	Not less than 40 MS 30					
		iv. Magnesium Sulfate Soundness Test (5 cycles)	Not more than 18% AASHTO T 104					
		v. Water Absorption	Not more than 2% MS 30					
	b. Fine Aggregate			Visual, testing and measurement	Once per project/source	Project Manager	Inspection Form/	
		i. Magnesium Sulfate Soundness Test (5 cycles)	Not more than 20% AASHTO T 104				Certificate	
		ii. Water Absorption	Not more than 2% MS 30					
		iii. Aggregate Fraction Passing 4.75mm sieve iv, Aggregate Angularity	Not less than 45% ASTM D 2419 Not less than 45% ASTM C 1252					
		v. Methylene Blue Value	Not more than 10 mg/g Ohio Department of Transportation Standard Test Method					

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : SPECIALTY MIX 6 - POLYMER MODIFIED ASPHALTIC CONCRETE

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1 (cont)	c. Mineral Filler	Hydrated lime		Visual, testing and measurement	Once per project/source	Project Manager	Inspection Form/	
		i. Passing 75um sieve	Not less than 70% by weight				Certificate	
		ii. Amount	Approximately 2% by weight of combined aggregates.					
	d. Gradation	Gradation of Combined	JKR/SPJ/2008 - S4 - Cl 4.11.2	Visual, testing and measurement	Once per project/source	Project Manager	Inspection Form/	
		Aggregate	Shall comply with Table 4.11.1				Certificate	
	e. Polymer Modified Binder	i. Properties	Refer to Table 4.11.2	Visual, testing and measurement	Once per project/source	Project Manager	Inpection Form/	
	(PG 76) or higher		AASHTO - Std M320-02 MS 124 Sampling - MS 539				Certificate	
2	Mix Design a. Job Mix Formula	**-Stage 1**	JKR/SPJ/2008-S4 - Cl 4.11.3	Visual, testing and measurement	Once per project/source	Project Manager	Inspection Form/	
		i. Gradation	Shall comply with Table 4.11.1				Certificate	
		ii. Polymer Modified Binder	Shall comply withTable 4.11.3					
		iii. Compliance	Shall comply with Table 4.11.4					
		-Stage 2						
		i. Indirect tension test for resilient modulus;	ASTM D 4123					
		Total resilient modulus	> 2500 MPa					
		Test temperature	25 °C					
		Applied load	20 N/mm of specimen thickness (max. 1500 N)					
		Loading frequency	1 Hz					
		Loading time	0.1 s					
		Rest period	0.9 s					
		Rise time	70 ms					
		Poisson's ratio	0.35					
		No. of preconditioning pulses	50					
		No. of test pulses	5					
		Rotation of specimen	90°					

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : SPECIALTY MIX 6 - POLYMER MODIFIED ASPHALTIC CONCRETE

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
2 (cont)		ii. Dynamic, unconfined, compressive creep test ; Dynamic creep modulus Slope at steady state Specimen end treatment Silicone based lubricant + graphite dust Pre-conditioning; Test temperature Applied axial stress Loading frequency Loading time Rest period No. of load cycles Testing; Test temperature Applied axial stress Loading frequency Loading time Rest period No. of load cycles	EN 12697-25 Dynamic creep modulus > 75 MPa Slope at steady state < 0.25 40 °C 150 kPa 0.5 Hz 0.2 s 1.8 s 30 Testing; 40 °C 300 kPa 0.5 Hz 0.2 s 1.8 s 3600	Visual, testing and measurement	Once per project/source	Project Manager	Inspection Form/ Certificate	
	b. Plant trials	- Quantity - Record -Laying and compaction iii. Compliance	20 tonnes JKR/SPJ/2008-S4 - Cl 4.11.3(b) Refer **Construction Works** Refer to Table 4.11.5	Visual, testing and measurement Visual, testing and measurement	Initial stage Initial stage	Project Manager Project Manager	Inspection Form and Record Report	

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : SPECIALTY MIX 6 - POLYMER MODIFIED ASPHALTIC CONCRETE

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
3	Construction Works Laying and Compaction	 i. Temperature ii. Paving Layer iii. Compaction iv. Density - Wearing course - Binder course v. Thickness	JKR/SPJ/2008-S4 - Cl 4.11.5 Not less than 150°C during laying Compacted Thickness not less than twice aggregate size or not more than 100mm JKR/SPJ/2008-S4 - Cl 4.11.5 Refer to Table 4.11.6 ASTM - Test Method D2726 98 - 100% of Marshall density 95 - 100% of Marshall density Average over any 100m length not less than specified thickness and Min thickness at any point shall be not less than the specified thickness minus 5mm.	 Visual, testing and measurement Visual, testing and measurement Visual, testing and measurement	 Every load Every layer 1 coring/500m^2 or min 2 cores per paving session	Project Manager Project Manager Project Manager	 Inspection Form/ Record Inspection Form/ Record Inspection Form/Record Inspection Form/ Record	
4	Surface regularity	International Roughness Index (IRI)	JKR/SPJ/2008-S4 - Cl 4.11.5 (j) The lane IRI measured for the whole road length and each 100 meter section shall be less than 2.0m/km	Visual, testing and measurement	Each 100 meter section	Project Manager	Inspection Form/Record	
5	Opening to Traffic	Time	JKR/SPJ/2008-S4 - Cl 4.11.5 (k) Not less than 4 hours after commencement of rolling.	Visual, testing and measurement	Prior to opening	Project Manager	Inspection Form	

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : SHOULDERS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Types of shoulders i. Paved Shoulders	Refer to Paved Roads JKR/SPJ/2008-S4 - Cl. 4.2	As per drawing JKR/SPJ/2008-S4 - Cl. 4.4.2.1 and Cl. 4.4.3	Visual, testing and measurement	All stages	Project Manager	Inspection Record	
	ii. Gravel Shoulders a) Detemining the suitability of materials	 i. Liquid Limit, LL ii.Plasticity Index, PI iii. Aggregate crushing value iv.Gradation shall conform to one of the envelopes v. Passing of No. 4 (4.75 mm) sieve	JKR/SPJ/2008-S4 - Cl. 4.1.3.2 Not more than 35% BS 1377 Shall be in the range 4 to 10 BS 1377 Not more than 35% MS 30 Refer to Table 4.1.3 Fraction passing the BS 75 um sieve not greater than 2/3 of the fraction passing the BS 425 um sieve Shall be not less than 45% ASTM D 2419	Visual, testing and measurement	i. Initial Stage ii. One test per 750 cu.m supply	Contractor's QA/QC / Project Manager	Inspection Record	

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : SHOULDERS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1 (cont)	b) Construction of gravel surfacing	i. Thickness Dipping Test ii. In-Situ Compaction Test iii. Surface Finishes - shape, super elevation, level, grade	JKR/SPJ/2008 - S4 - Cl. 4.1.3.3 Within tolerance as Table 4.5.1 Not less than 95% max dry density BS1377 : Compaction Test Refer to relevant construction drawings Within tolerance as Table 4.5.1	Visual, testing and measurement	Average thickness over any 100 m length not less than the required thickness One test per 500 sq metre of each layer laid	SOR	Inspection Record	
	iii. Earth Shoulders a) Detemining the suitability of materials		Refer to Sub-section 2.2.1 (e)	Visual, testing and measurement	Initial Stage	Contractor's QA/QC / Project Manager	Inspection Record	Refer to **Trade Earthwork** Item 1
	b) Earth Shoulder Construction	i. Thickness Dipping Test ii. In Situ Compaction Test iii. Surface Finishes - shape, super elevation, level, grade	JKR/SPJ/2008-S4 - Cl 4.4.3 Not less than 95% max dry density BS1377 : Compaction Test Refer to relevant construction drawings	Visual, testing and measurement	Over 100m length One test per 150 sq. m of each layer laid	Project Manager	Inspection Record	

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : ROAD FURNITURE (CORRUGATED SHEET STEEL BEAM HIGHWAY GUARDRAIL)

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Approval of Guardrail Material	Beam Element	JKR/SPJ/1988-S6-Cl 6.1.2.1, effective length 3810mm (12 feet 6 inches)	AASHTO Specification M180 for Class A Type II(galvanised)	1 sample every 200	Project Manager / Construction Manager / QAQC	Inspection Form/ Certificate /Catalogue /Method of Statement	
		Steel Posts	JKR/SPJ/1988-S6-Cl-6.1.2.2(a) and drawing Block Out(Packer) shall be channel section futher test on the material supplied (if needed)	B.S. 449, Part 1 Grade 43	1 sample every 200			
		Timber Posts	JKR/SPJ/1988-S6-Cl-6.1.2.2(b)	Malaysian Timber Industry Board	1 sample every 200			
			Block Out(Packer) - treated timber >16kg/cu.m preservative	M.S 733				
		Medium harwood	futher test on the material supplied(if needed) M.S 733					
		Heavy Hardwood		approval of S.O				
2.	Installation of Guardrail	Setting Post (Timber/steel)	JKR/SPJ/1988-S6-Cl-6.1.3.1	relevant construction drawing	Every completion section	Contractor/ Supervision Engineer	Inspection Form/ Record	
			Post Holes backfilled- concrete grade 20/20					
		Placing Beams	JKR/SPJ/1988-S6-Cl-6.1.3.2	relevant construction drawing	Every completion section			
		Anchorages	JKR/SPJ/1988-S6-Cl-6.1.3.3	relevant construction drawing	Every completion section			

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

TRADE : ROAD FURNITURE (CORRUGATED SHEET STEEL BEAM HIGHWAY GUARDRAIL)

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
3.	Determination of Marking and Storage	Marking Storage	JKR/SPJ/1988-S6-Cl-6.1.4.1 JKR logo on each beam element JKR/SPJ/1988-S6-Cl-6.1.4.2 1) stored under a cover 2) > 300mm space between lowest element and ground surface	AASHTO Specification M180 Observation	Every completion section After each delivery	Contractor/ Supervision Engineer	Inspection Form/ Record	

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

TRADE : ROAD FURNITURE (CONCRETE KERB)

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Approval of Material		Refer to JKR/SPJ/1988-S6 - Cl 6.4.2			Project Manager / Construction Manager / QAQC	Inspection Form/ Certificate /Catalogue /Method of Statement	
		Concrete Kerb	Grade 25/20 concrete	Relevant Construction Drawing	Initial Stage			
		Bedding	Grade 10/20 concrete					
2.	Installation of Kerb	Excavation	Refer to 'JKR/SPJ/1988-S6 - Cl 6.4.3.1 - Required depth and bedding thickness as shown on drawing -Suitable material refer JKR/SPJ/1988 : Section 2	Relevant Construction drawing	Every completion section or daily operation	Contractor/ Supervision Engineer	Inspection Form/ Record	
		Cast In Situ Kerb	Refer to 'JKR/SPJ/1988-S6 - Cl 6.4.3.2 -Expension Joint performed joint filler 10mm thickness refer JKR/SPJ/1988 : Section 26 -Concreting refer JKR/SPJ/1988 : Section 9 -Formed removed after 24 hours -Minor defect repared with mortar 1:2 -Curing for a period of 7 days	Relevant Construction Drawing - -	Every completion section or daily operation	Contractor/ Supervision Engineer	Inspection Form/ Record	

TRADE : ROAD FURNITURE (CONCRETE KERB)

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
		Precast Concrete Kerb	JKR/SPJ/1988 : Section 6 - Cl 6.4.3.3 - Steel mould as shown on drawing - Joints kerb filled with mortar 1:2 - Expansion joints shall be 20mm width	Relevant Construction Drawing	Initial Stage & Every Completion Section or Daily Operation	Contractor/ Supervision Engineer	Inspection Form/ Record	
		Slipforming for Concrete Kerb	Refer to JKR/SPJ/1988 : S6 - Cl 6.4.3.4	Relevant Construction Drawing '-Approved automatic kerbing machine	Initial Stage & Every Complition Section or Daily Operation	Contractor/ Supervision Engineer	Inspection Form/ Record	
		Backfilling	Refer to JKR/SPJ/1988 : S6 - Cl 6.4.3.5 -Tamped layer not more than 150mm -Finished level within ± 10mm	Relevant Construction Drawing	Every completion section or daily operation	Contractor/ Supervision Engineer	Inspection Form/ Record	

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

TRADE : ROAD FURNITURE (WIRE ROPE SAFETY FENCE)

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Approval of Wire Rope Safety Fence Component	Galvanised mild steel posts:	REAM -GL 9/2006 -S6-Cl 6.3			Project Manager / Construction	Form/ Certificate	
			a)OIV (Occupant Impact Velocity)-12m/s (43.2 kph) max	NCHRP 350 Test Level 3 (TL-3)	Initial Stage			
			b)ORA (Occupant Ridedown Accelaration) 20g max Height of post : 690mm to 710mm					
			Shape of post refer to REAM -GL 9/2006 -S6-Cl 6.3(iii) Double Curve - form from 6mm thick mild steel		Initial Stage			
		Interwoven wire ropes (Gavanised Pre-tensioned steel)	Refer to REAM -GL 9/2006 -S6-Cl 6.3(iv)	NCHRP 350 Test Level 3 (TL-3)				
			19mm diagram 3x 7 contruction breaking load: > 17.7 tonnes unfitted > 16.7 tonnes fitted		Initial stage			
			Minimun modulus of elasticity: 8300kg/mm2 on the area of 283mm2 after pre-stressing		Initial stage			
		Anchors	Detail end anchor refer to Appendix 6A	NCHRP 350 Test Level 3 (TL-3)	Intial Stage			
2	Installation		Refer to REAM - GL9/2006 : Cl 6.3(i)	Measurement	Every complition section or daily operation	Contractor/ Supervision Engineer	Inspection Form/ Record	
		Wire Rope	upper ropes 600mm±10mm from ground lower interwoven ropes 500mm±10mm from ground Refer to REAM - GL9/2006 : Cl 6.3 (ii)					
		Post	Embedded 400mm into concrete foundation of 950mm Post spacing 2.4 m Minimum post spacing 1m	Measurement	Initial stage			
		Anchors	Refer to REAM -GL 9/2006 -S6-Cl 6.3 1) length of wire rope between anchor < 627mm 2) Detail end anchor refer to Appendix 6A	NCHRP 350 Test Level 3 (TL-3)	Initial stage Intial Stage			

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

TRADE : ROAD FURNITURE (ROAD MARKING)

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Approval of Road Marking Material		JKR/SPJ/2012-S6-6.3.2, 6.3.3 Standard Material		-	Project Manager / Construction Manager / QAQC	Inspection Form/ Certificate /Catalogue /Method of Statement	
		Thermoplastic Material : Thermoplastic	Supplied in block form (broken into pieces, each weighing not more than 4kg) or powder. Hydrocarbon resins shall be used within 6 hours Wood and gum resins shall be used within 4 hours	BS EN 1871, BS EN 1436				
		Thermoplastic Material : Glass Bead	To be incorporated in marking materials to road surface application.	CLASS A Glass beads, Table 1 of B.S 6088 (Table 6.1)				
			Additional surface reflectorisation.	CLASS B Glass beads, Table 2 of B.S 6088 (Table 6.2)				
		Road Marking Paint	Standard Material Stirred before application to keep the pigments in uniform suspension, Tinners or other additives not be permitted					
2.	Site Preparation	Clean and dry surface	JKR/SPJ/2012-S6-6.3.4 Not be laid over loose detritus, mud, or extraneous matter or over old material or paint marking incompatible with the paint	-	-	Contractor/ Supervision Engineer	Inspection Form/ Record	
		Tack coat Primer or undercoat	Refer manufacturer's instructions to avoid bleeding and discoloration , to ensure proper adhesion.					

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

TRADE : ROAD FURNITURE (ROAD MARKING)

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
3.	Laying Roadmarking	Center, lane & edge lines Other marking	JKR/SPJ/2012-S6-6.3.5	Mechanical means Brush, spray, screed, hand-propelled or self propelled machines	-	Contractor/ Supervision Engineer	Inspection Form/ Record	
		Thickness Thickness of Thermoplastic Material : Synthetic Hydrocarbon Resin Binder	JKR/SPJ/2012-S6-6.3.7 Screed lines ; 2 mm < x < 5 mm and Extruded line; 2 mm < x < 5 mm Sprayed lines other than yellow lines ; <1.5 mm Sprayed yellow edge lines (for 'No Parking', 'No Waiting' and etc.) ; < 0.8 mm		Carried out on laid road marking at an interval of 250m on each line & on each other marking			
		Thickness of Thermoplastic Material : Gum or wood resin binder	Screed lines ; 3 mm < x < 5 mm and Extrude lines; 2mm < x < 5mm Sprayed lines other than yellow lines ; < 2.0 mm Sprayed yellow edge lines (for 'No Parking', 'No Waiting' and etc.) ; 2.0 mm < x < 3.0 mm					
		Thickness of Road Marking Paint	Shall be laied to give a wet film thickness ; 315 micron < x < 400 micron					
		Width Tolerance	Within the range of + 10% and - 0 %					
4.	Protection of Marking	Marking	JKR/SPJ/ 2012-S6-6.3.6 Must be dried and protected from traffic.			Contractor/ QAQC/ Supervision Engineer	Inspection Form/ Record	
5.	Defective Material / Workmanship	Incorrect dimension and wrong location	JKR/SPJ/2012-S6-6.3.11 Must be removed by approved chemical or mechanical means.			Contractor/ QAQC/ Supervision Engineer	Inspection Form/ Record	
6.	Clearing Up	Clean up all spatters, splashes and smirches of marking materials.	JKR/SPJ/2012-S6-6.3.13 Satisfaction of the S.O			Contractor/ QAQC/ Supervision Engineer / SO/ SOR	Inspection Form/ Record	

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TRADE : ROAD FURNITURE (ROAD MARKING)

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
7	Retroreflectivity	Coefficient of retroreflected luminance, R_L	JKR/SPJ/2012-S6-6.3.9 For retroreflection under car headlamp illumination in dry condition; min 300 mcd/m^2/lx For retroreflection under car headlamp illumination in wet condition; min 75 mcd/m^2/lx	BS EN 1424, BS EN 1423, BS EN 1436 Annex B	7 days laying, interval of 250m on each line & on each other marking	Contractor/ QAQC/ Supervision Engineer	Inspection Form/ Record/ Certificate	
8	Skid Resistance	Effects of traffic & weathering	JKR/SPJ/2012-S6-6.3.10 Both permanent & temporary road marking, skid resistance > 45SRT	BS EN 1436	Applicable for road marking with 300mm width or more Carried out not more than 7day after laying	Contractor/ QAQC/ Supervision Engineer	Inspection Form/ Record	
9	Opening of traffic	Completed road marking	JKR/SPJ/2012-S6-6.3.13 Shall not be opened to traffic until material has fully set. Usually > 1 hour after material has been laid			Contractor/ Supervision Engineer	Inspection Form/ Record	
10	Removal	Unwanted road marking	JKR/SPJ/2012-S6-6.3.14 Removal type: a) Burning off is not recommended b) Painted over with paint is not allowed c) Blasting, grinding, scraping Satisfaction of the S.O.			Contractor/ Supervision Engineer/ SO/ SOR	Inspection Form/ Record	

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TRADE : ROAD FURNITURE (TRAFFIC SIGNS)

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Permanent Traffic Signs - General Requirements	Luminance	JKR/SPJ/1988-S6 - Cl 6.2.5.1 Category 1 luminance	B.S. 873	Initial Stage	Project Manager / Construction Manager / QAQC	Inspection Form/ Certificate /Catalogue /Method of Statement	
2.	Permanent Traffic Signs - Material					Contractor/ Supervision Engineer	Inspection Form/ Record/ Certificate	
	(i)Posts	Tubular hollow section steel	JKR/SPJ/1988-S6 - Cl 6.2.5.3 - Not less than 50mm outside diameter	B.S.1387 and B.S. 873	Initial Stage			
	(ii)Sign Plates		JKR/SPJ/1988-S6 - Cl 6.2.5.4	Drawings and B.S. 873	Initial Stage			
		Thickness	- Made of 10 S.W.G sheets of alluminium alloy HS 30-WP with min. thickness 3mm	B.S 1470				
		Size	- Not exceeding 1.2m height & 2.4m width shall made from single sheet					
	(iii)Sign Faces	(i) Plastic Sheeting	JKR/SPJ/1988-S6 - Cl 6.2.5.5	BS 873 / MS 1216				
		Faces	Accordance with the manufacturer's instructions	BS 873 / MS 1216	Initial Stage			
			Up to 1 m in size and no joint.					
		Joint	Lapping less than 6mm	MS 1216	Construction Stage			
		Colour uniformity	Refer to addendum no.2 S 2.1.7	MS 1216	Initial Stage			
			Refer to addendum no.2 S 2.1.13	MS 1216	After installation			
	(iv)Backing Frames		JKR/SPJ/1988-S6 - Cl 6.2.5.6					
		Material	made from aluminium alloy HE9-TE	B.S 1474	Initial Stage			
		Size	> 600mm ,<1000mm height/width stiffened by angles > 1000 mm height/width use 40mm X 40mmX3mm angles	B.S 1474	Initial Stage			
			Built in section 8 mm diameter bolt at not more than 200 mm centres					

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TRADE : ROAD FURNITURE (TRAFFIC SIGNS)

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
3.	Fluoresent Orange	(i) Photometric-Coefficient or Retroreflection RA Aluminium Test Panels	ASTM E 810 table 1.		Initial Stage	Contractor/ QAQC/ Supervision Engineer	Inspection Form/ Record	
		ii)Daytime colour ASTM 1991	ASTM E 991, ASTM E 308 (for 2° observer) & Table 2		Initial Stage	Contractor/ QAQC/ Supervision Engineer	Inspection Form/ Record	
		iii) Nigthtime Color	ASTM E 811(calculated the u') ASTM E 308 (calculated the v') & Table 3		Initial Stage	Contractor/ QAQC/ Supervision Engineer	Inspection Form/ Record	
		iv) Resistance to Accelerated Weathering	ASTM G 26 Type B Method A		Initial Stage	Contractor/ QAQC/ Supervision Engineer	Inspection Form/ Record	
		v) Impact Resistance	Refer Sheeting manufacturers recommendations Test Panel of alloy 601-T6 , 0.040" (o.10cm) by 3" (7.6cm) by 5"(12.7cm) and conditioned for 24 hour Shall show no cracking outside the impact area when the face of the panel is subject to an impact of 100 inch-pounds (11.3 Nm) using a weigth with a 5/8 in . (15.8 mm) diameter rounded tip dropped from a height necessary to generate an impact of 100 inch-pounds, at test temperatures of both 32° F (O° C and 72° F (22 ° C)		Initial Stage	Contractor/ QAQC/ Supervision Engineer	Inspection Form/ Record	
		vi) Resistance to Heat	ASTM G 26 Type B Method A . exposed to 170 + 5° F (77 + 3°) for 24 hours minimum 70% of the original coefficient.	Air circulating oven	Initial Stage	Contractor/ QAQC/ Supervision Engineer	Inspection Form/ Record	
		vii) Field Performance	Refer Sheeting manufacturers recommendations Coefficient of retroreflection is less than 100 when measured at 0.2° observation and -4° entrance at 90° rotation	Moving vehicle under normal day and night driving conditions	After installation	Contractor/ QAQC/ Supervision Engineer	Inspection Form/ Record	

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TRADE : ROAD FURNITURE (TRAFFIC SIGNS)

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
4.	Permanent Traffic Signs - Construction and Assembly	Traffic signs Spacing of rivets	JKR/SPJ/1988-S6 - Cl 6.2.5.7 or as shown on drawing JKR/SPJ/1988-S6 - Cl 6.2.5.7 -Not exceed 150mm around the outside edge of any sheet -Not exceed 300mm on cross braces	Construction Drawings and B.S. 873	Every completion section	Contractor/ QAQC/ Supervision Engineer	Inspection Form/ Record	
5.	Permanent Traffic Signs - Location and Erection	Posts	JKR/SPJ/1988-S6 - Cl 6.2.5.8 -Distance from the centre of the post to the edge of the sign plate 300mm diameter -Erected plumb to check verticality - Grade of 20/20 concrete - Within 450mm of the ground surface		Every completion section	Contractor/ QAQC/ Supervision Engineer	Inspection Form/ Record	
6.	Permanent Traffic Signs - Covering of permanent traffic signs	Covering Thickness Cover Plates	JKR/SPJ/1988-S6 - Cl 6.2.5.9 - 1.5mm (16 S.W.G) thickness JKR/SPJ/1988-S6 - Cl 6.2.5.9 - Stainless steel bolts, washers & nuts use 5mm dia bolts not more than 600mm apart. - Non-ferrous rivet use 12mm dia. bolts not more than 600mm apart - 5mm thick plastic distance pieces between the sign face & cover plate.	Observation	Every completion section	Contractor/ QAQC/ Supervision Engineer	Inspection Form/ Record	
7.	Temporary Traffic Signs	Location and erection Covering	JKR/SPJ/1988-S6 - Cl 6.2.6 - Comply with JKR/SPJ/1988-S6 - Cl 6.2.5.8 JKR/SPJ/1988-S6 - Cl 6.2.6 - Comply with JKR/SPJ/1988-S6 - Cl 6.2.5.9	ARAHAN TEKNIK (JALAN) 2C/85	Every completion section	Contractor/ QAQC/ Supervision Engineer	Inspection Form/ Record	

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TRADE : ROAD FURNITURE (TRAFFIC SIGNS)

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
8.	Traffic Signs On Gantries	Faces of sign plates	JKR/SPJ/1988-S6 - Cl 6.2.7	B.S. 873	Initial / Construction Stage	Contractor/ QAQC/ Supervision Engineer	Inspection Form/ Record	
		Steel backing frames,fitting and purlins	JKR/SPJ/1988-S6 - Cl 6.2.7	B.S. 873				
		Steel posts and post housing	JKR/SPJ/1988-S6 - Cl 6.2.7	B.S. 873				
9.	Temporary Signs for the work zone	(i) Photometric-Coefficient or Retroreflection RA	ASTM E 810 Test panel complied with Addendum No.3 Table 1		Initial Stage	Contractor/ QAQC/ Supervision Engineer	Inspection Form/ Record	
		ii)Daytime color	ASTM E 991, ASTM E 308 (for 2° observer) & Test panel complied with Addendum No.3 Table II		Initial Stage			
		iii) Nigthtime Color	ASTM E 811(calculated the u') ASTM E 308 (calculated the v') Test panel complied with Addendum No.3 Table III		Initial Stage			
		iv) Resistance to Accelerated Weathering	ASTM G 26 Type B Method A		Initial Stage			
		v) Impact Resistance	Refer Sheeting manufacturers recommendations Addendum No.3-3.1.1 (v) Test Panel of alloy 601-T6 , 0.040" (0.10cm) by 3" (7.6cm) by 5"(12.7cm) and conditioned for 24 hour		Initial Stage			

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TRADE : ROAD FURNITURE (TRAFFIC SIGNS)

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
		vi) Resistance to Heat vii) Field Performance	Refer Sheeting manufacturers recommendations Addendum No.3-3.1.1 (vi) . Refer Sheeting manufacturers recommendations Addendum No.3-3.1.1 (vi)	Air circulating oven Moving vehicle under normal day and night driving conditions	Initial Stage After installation			
10.	Permanent Traffic Signs - Foundations	Type and size of foundations	JKR/SPJ/1988-S6 - Cl 6.2.5.2 Single Post - Installed centrally in 300mm diameter or as shown on drawing - Grade of 20/20 concrete - Depth Within 450mm of the ground surface - Min. three (3) days after placing concrete - Backfilling at least 48 hours after placing the concrete - Pockets plan dimensions shall be 100mm larger	Relevant Construction drawings JKR/SPJ/1988-Section 9 Observation	Initial / Construction Stage	Contractor/ QAQC/ Supervision Engineer	Inspection Form/ Record	

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TRADE

5.1 Drainage Works (Revised Volume 2)

5.2 Sewerage Works (Revised Volume 2)

5.3 External Water Reticulation (Revised Volume 2)

5.4 Internal Road And Hard-standing (Revised Volume 2)

TRADE : DRAINAGE WORKS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Drainage and Culvert Excavation	- Check alignment (position of pegs)	- Construction Drawing and survey record	- Survey equipment/pegs/ markers/TBM/		Kontraktor/ Perunding/PP/WPP/ PTB	Borang Pemeriksaan Kerja-kerja Saliran ; manufacturer's Certificate	
		Upon completion of excavation:						
		- Check depth of excavation (150mm less than depth in the drawing)	- Standard Specification For Building Works 2014 (SSBW 2014) Section S : Cl. 2.2.3	- Survey equipment/pegs/ markers/TBM/ measurement equipment	1 in every 20m run or change in direction or gradient			
		- Excavation through rock - backfill rock excavation to required level with concrete or suitable materials	- "Ditto" (Cl. 2.2.1)	- Survey equipment/pegs/ markers/TBM/ measurement equipment	- Excavation to required level			
		- Check alignment (position of pegs)	- Construction Drawing and survey record	- Survey equipment/pegs/ markers/TBM/ measurement equipment				
		Upon completion of excavation:						
		- Check depth of excavation (600 mm above the top of culverts design levels or to the top of subgrade levels, whichever is lower)	- SSBW 2014 Section S : Cl 2.2.4 - 2.2.6	- Survey equipment/pegs/ markers/TBM/ measurement equipment	- Excavation to required level			
2	Backfilling	- Backfilling in 150 mm layers of approved materials on both sides of the drain and compacted with mechanical rammers.	SSBW 2014 Section S : Cl. 2.3	- Survey equipment/pegs/ markers/TBM/ measurement equipment	- Immediately after completion of drain laying or installation of culverts	Kontraktor/ Perunding/PP/WPP/ PTB	Borang Pemeriksaan Kerja-kerja Saliran ; manufacturer's Certificate	

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TRADE : DRAINAGE WORKS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
3	(i) Cast in-situ Concrete Drain	- Check concrete grade and length of cast in-situ concrete drain	- SSBW 2014 Section S : Cl. 4.4.3	- Visual inspection	- Every delivery	Kontraktor/ Perunding/PP/WPP/ PTB	Borang Pemeriksaan Kerja-kerja Saliran ; manufacturer's Certificate	
	(ii) Cascade Drain	- "Ditto" (Laid stepping on 150mm mass concrete)	- SSBW 2014 Section S : Cl. 4.4.3	- Relevant Construction Drawing	- during construction			
	(iii) Precast Concrete Drain	Check concrete grade and length of precast drain unit	- SSBW 2014 Section S : Cl. 4.4.3 or manufacturer's instruction/brochure (for proprietry product)	- Visual inspection	- Every delivery			
		- Inspect dimension and overall integrity of precast drain unit.	- "Ditto"	- Delivery Order	- Every delivery			
4	Subsoil Drain	- Check minimum gradient and slope.	- SSBW 2014 Section S : Cl. 5.0	- Relevant Construction Drawing	- during construction	Kontraktor/ Perunding/ PP/WPP/ PTB	Borang Pemeriksaan Kerja-kerja Saliran ; manufacturer's Certificate	
5	Sumps	- Check invert level / sumps depth	- SSBW 2014 Section S : Cl. 6.0	- Relevant Construction Drawing	- during construction	Kontraktor/ Perunding/ PP/WPP/ PTB	Borang Pemeriksaan Kerja-kerja Saliran ; manufacturer's Certificate	

TRADE : DRAINAGE WORKS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
6	Culverts	**On delivery to site, check:**				Kontraktor/ Perunding/ PP/WPP/ PTB	Borang Pemeriksaan Kerja-kerja Saliran ; manufacturer's Certificate	
	(i) Pipe Culverts	- Class, type, dimension of pipe	- SSBW 2014 Section S : Cl. 7.4 ; Manufacturer's Specification	- Relevant Construction Drawing - N/A	- Each pipe culvert			
		- Date of manufacture	- MS 881		- Every delivery			
		- Approval / compliance of product and material	- Test Certificate	- Site daily	- Every delivery			
		- Cracks, chips and defects	- SSBW 2014 Section S : Cl. 7.4	- Visual inspection	- Every delivery			
		Laying of pipe culverts:						
		- Refer to SSBW 2014 Section S : Cl.7.4	- "Ditto"	- Survey equipment/pegs/markers/TBM/ measurement equipment	- Each pipe culvert			
	(ii) Precast Box Culverts	- Size, thickness	- Manufacturer's Specification / broucher - MS 1293	- Delivery order, Construction Drawing	- Every delivery			
		- Cracks, chips and defects	- SSBW 2014 Section S : Cl. 7.5	- Visual Inspection	- Every delivery			
		Laying of concrete boxes :						
		- Gap between laid section (<13mm)	- SSBW 2014 Section S : Cl. 7.5	- Survey equipment/pegs/markers/TBM/ measurement equipment	- Every laid section			
		- Difference in level (< 3mm)	- SSBW 2014 Section S : Cl. 7.5	- Survey equipment/pegs/markers/TBM/ measurement equipment	- Every laid section			
7	On - site Detention Pond	- constructed according to the drawing and conform to the requirement of MSMA.	- SSBW 2014 Section S : Cl. 8.0	- Relevant Construction Drawing	- during construction	Kontraktor/ Perunding/ PP/WPP/ PTB	Borang Pemeriksaan Kerja-kerja Saliran ; manufacturer's Certificate	

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TRADE : SEWERAGE WORKS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION/TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Selection of Product and Materials	Approval of Product and Material before delivery to site	-Malaysian Sewerage Industry Guidelines Volume III: Section 2; '-Suruhanjaya Perkhidmatan Air Negara (SPAN), current approved material and product list '-Standard Specification For Building Works 2014 (SSBW 2014) Section F : Cl. 2.0		'-Before construction	Kontraktor/ Perunding / PP/WPP/ PTB	Borang Pemeriksaan Sistem Pembetungan, SPAN's approval certificate/ document, Manufacturer's Certificate, SIRIM Certificate	ITP shall be read in conjuction with SSBW 2014 : Section F - Sewerage Works, BQ descriptions, Construction Drawings, Manufacturer's Instruction and relevant approving authorities' guidelines/ documents
2	Product and Materials (i) Pipe (ii) Manhole	**Delivery on site:** - Check for defects - Check against the construction drawings and the delivery docket. - Stacking / storage arrangement	- SSBW 2014 Section F : Cl. 2.0 - Malaysia Sewerage Industries Guidelines (MSIG) Volume III: Section - Manufacturer's instruction	- Visual Inspection - Construction Drawing - Refer to manufacturer's instruction	-Every delivery			
3	Trench excavation and pipe laying	- Check pipe size, pipe type, fittings, alignment, gradient, depth, pipe connection, and width of trench - Check pipe bedding, haunching, concrete surround	- SSBW 2014 Section F : Cl. 3.0, Cl. 4.0, Cl. 5.0, Cl. 6.0, Cl. 7.0, Cl. 9.0 - MISG Volume III: Section 3 - SSBW 2014 Section F : Cl. 8.0 - Construction Drawing	- Survey equipment/ pegs/markers/ TBM/measurement equipment - Construction Drawing	1 in every 20m run or change in direction or gradient			

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TRADE : SEWERAGE WORKS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION/TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
4	Backfilling of trench	Backfilling in 150 mm layers of approved materials on both sides compacted with rammer up to 300 mm on top of pipe. Then, backfill in 300 mm layer to slightly higher than the top of trench compacted by mechanical vibrating tamper. - Compaction	- SSBW 2014 Section F : Cl. 14.0 - MSIG Volume III: Section 3	- Construction - Survey equipment/ pegs/markers/ TBM/ measurement equipment	1 in every 20m run or change in direction or gradient	Kontraktor/ Perunding/ PP/WPP/ PTB	Borang Pemeriksaan Sistem Pembetungan, SPAN's approval certificate/ document, Manufacturer's Certificate, SIRIM Certificate	ITP shall be read in conjuction with SSBW 2014 : Section F - Sewerage Works, BQ descriptions, Construction Drawings, Manufacturer's Instruction and relevant approving authorities' guidelines/ documents
5	Manhole, Inspection Chamber	- Check manhole type, internal lining, concrete surround, manhole size, manhole cover and frame	- SSBW 2014 Section F : Cl. 10 - MSIG Volume III: Section 3	- Construction Drawing	- Each Manhole			
6	Septic Tank, Small Sewage Treatment System (SSTS) and Sewage Treatment Plant (STP)	- Construction and Installation	- SSBW 2014 Section F : Cl. 11 - System Provider specification on construction and installation of the System	- System Provider specification on construction and installation of the	- During Construction and Installation			

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TRADE : SEWERAGE WORKS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION/TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
7	Connection to Public Sewerage Line	- Letter of approval from relevant authority - SO Approval	- SSBW 2014 Section F : Cl. 12 - MSIG Volume III: Section 4	- Construction Drawing	- During Construction	Kontraktor/ Perunding/ PP/WPP/ PTB	Borang Pemeriksaan Sistem Pembetungan, SPAN's approval certificate/ document, Manufacturer's Certificate, SIRIM Certificate	ITP shall be read in conjuction with SSBW 2014 : Section F - Sewerage Works, BQ descriptions, Construction Drawings, Manufacturer's Instruction and relevant approving authorities' guidelines/ documents
8	Testing & Commissioning	a) Gravity Sewer i. Exfiltration test (low pressure air or water test) ii. Check for straightness, obstruction and grade iii. Infiltration test (when required) iv. CCTV test (when required) b) Force Main i. Exfiltration test (when required) ii. High pressure leakage test iii. High pressure leakage test (following high pressure water test) iv. Check for straightness, obstruction and grade v. CCTV test (when required) c) Manhole and others i. Visual inspection ii. Water tightness test (when required)	- SSBW 2014 Section F : Cl. 13 MSIG Volume III: Section 4	Refer to MSIG Volume III: Section 4	- before backfilling			

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TRADE : EXTERNAL WATER RETICULATION

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	General	Employment of Permitted Personnel	SSBW 2014 Section L : Cl. 1.0/SPAN Guidelines	Visual Inspection	-Before Construction	Kontraktor/ Perunding/PP/WPP/ PTB	Borang Pemeriksaan Sistem Retikulasi Air ; Valid Permits issued by Suruhanjaya Perkhidmatan Air Negara (SPAN)	Borang Pemeriksaan Sistem Retikulasi Air & *Manufacturer's Certificate*
2	Selection of Product and Material	**Before delivery to site, check:** - registration of supplier - approval / compliance of product and material	SSBW 2014 Section L : Cl. 2.2 & 4.4.2/SPAN Guidelines/State Water Authority	-Visual Inspection	-Before Construction		Certificate of Registration issued by SPAN / SIRIM	
3	Product and materials: (i)- Pipe, Fitting, Valve and Pipe Special (ii)- Storage Tank	**On delivery to site, check :** - dimension and defects - Stacking arrangement **On delivery to site, check :** - dimension and defects	- Construction drawing - SSBW 2014 Section L : Cl. 4.1 /SPAN Guidelines - SSBW 2014 Section L : Cl. 4.4.2 /SPAN Guidelines	- Visual inspection; manufacturer's Certificate - Visual inspection, survey record - Visual inspection	- Every delivery - Every 10 m intervals - Every delivery			ITP shall be read in conjuction with BQ, Construction Drawing, manufacturer's Instruction and relevant approving authorities' guidelines/ documents **Note :** Pumping System & Cold Water Plumbing works are covered under Mechanical Scope of Works

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : EXTERNAL WATER RETICULATION

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
4	Trench excavation and pipe laying	- Check lines, grades and dimensions of the pipe alignment	- SSBW 2014 Section L : Cl. 4.1 /SPAN Guidelines	- Survey equipment/pegs/markers/TBM	- 1 in every 20m run or change in direction or gradient		Borang Pemeriksaan Sistem Retikulasi Air and Manufacturer's Certificate	ITP shall be read inconjunction with BQ, Construction Drawing, Manufacturer's Instruction and relevant approving authorities guideline/ documents. **Note:** * Pumping system and cold water plumbing works are covered under mechanical scope of works
		- Check pipe bedding and foundation - Backfilling in 150 mm layers of approved materials on both sides compacted with rammer up to 300 mm on top of pipe. Then, backfill in 300 mm layer to slightly higher than the top of trench compacted by mechanical vibrating tamper	- Construction drawing	- "ditto"	- Every pipe laying			
		- Density test for compaction	- SSBW 2014 Section L : Cl. 4.2.7 /SPAN Guidelines/SPAN Guidelines	- "ditto"	- Excavation to required level			
			- Not less than 95% of dry density	BS 1377	- Average thickness over any 100 metre length not less than the required thickness			
5	Road Reinstatement	- Backfilling with approved sand in 225 - Density test for compaction - Check reinstatement works	- SSBW 2014 Section L : Cl. 4.2.9 /SPAN Guidelines	Construction Drawings	Refer to JKR Specification for Water Reticulation, Internal Plumbing System and Sanitary Fittings/SPAN Guidelines		Borang Pemeriksaan Sistem Retikulasi Air and Manufacturer's Certificate	

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : EXTERNAL WATER RETICULATION

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
6	Valve Chamber	Check: - Thickness and size - Concrete grade for foundation - Brickwork and finishing works - Manhole / chamber cover - Wrought iron steps	SSBW 2014 Section L : Cl. 4.3.4 & 4.3.5 /SPAN Guidelines	Construction Drawing	-Where ever applicable		Borang Pemeriksaan Sistem Retikulasi Air and Manufacturer's Certificate	Borang Pemeriksaan Sistem Retikulasi Air and Manufacturer's Certificate
7	Scour Valve Chamber Location	- Chamber location: - Enable outlet pipe to discharge to drain / water courses	- S.O Instruction	survey and construction drawing and site inspection	-Where ever applicable		Borang Pemeriksaan Sistem Retikulasi Air and Manufacturer's Certificate	Borang Pemeriksaan Sistem Retikulasi Air and Manufacturer's Certificate
8	Hot Tapping	- Hot tapping equipment: - Tapping machine to be cleaned and disinfected before attaching to tapping valve and saddle	- SSBW 2014 Section L : Cl. 4.3.9, SPAN Guidelines , State Water Authority	Approved method statement and equipment (semak BS standard)	-Where ever applicable		Borang Pemeriksaan Sistem Retikulasi Air and manufacturer's Certificate	ITP shall be read in conjuction with BQ, Construction Drawing, manufacturer's Instruction and relevant approving authorities' guidelines/ documents **Note:** * Pumping system and cold water plumbing works are covered under mechanical scope of works

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : EXTERNAL WATER RETICULATION

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
9	Pipe Jacking	Check: - Placement of pipe - pipe jacking equipment and operation	- SSBW 2014 Section L : Cl. 4.3.8, SPAN Guidelines , State Water Authority	Approved method statement	- Where ever applicable		Borang Pemeriksaan Sistem Retikulasi Air and manufacturer's Certificate	ITP shall be read in conjuction with BQ, Construction Drawing, manufacturer's Instruction and relevant approving authorities' guidelines/ documents **Note:** * Pumping system and cold water plumbing works are covered under mechanical scope of works
10	Tank Installation	Check: - installation by approved installer - Watertightness test - Disinfection	-SSBW 2014 Section L : Cl. 4.2.9 /SPAN Guidelines	Construction Drawings	-Where ever applicable		Borang Pemeriksaan Sistem Retikulasi Air and manufacturer's Certificate	
11	Testing & Commissioning	- Pressure test - Leakage test (minimum one test for every 1000m of pipeline); - Joints shall be exposed to detect leakages Flushing and Disinfection	- Water Authority's Approval - manufacturer's Method statement and SSBW 2014 Section L : Cl. 4.3.2 /SPAN Guidelines SSBW 2014 Section L : Cl. 4.3.3 /SPAN Guidelines/SPAN Guidelines	Approved method statement and equipment	-After completion of construction / installation of pipelines and tanks -Before commisioning		Borang Pemeriksaan Sistem Retikulasi Air and manufacturer's Certificate, Testing Record	

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : INTERNAL ROAD AND HARDSTANDING

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Subgrade Earthfill / Cut Area	- In-Situ Density Test (Top 300mm)	Standard Specification For Building Works 2014 (SSBW 2014) Section P : Cl. 2.1.2 (CBR not less than 5% when compacted to 95% maximum dry density)	BS 1377 : Part 9 : 1990	- Minimum one test per 500 sq metre of each layer compacted	Kontraktor/ Perunding/ PP/WPP/ PTB	Borang Pemeriksaan Kerja Pavemen, Trial Mix Record, Calibration Equipment Certificate	
2	Subgrade Surface Finishes	- Shape, super elevation, level , grade	SSBW 2014 Section P : Cl. 2.1.6 (Shall be within +10mm and -30mm of the required level)	- Survey record/pegs/markers/TBM	- Immediately after completion of the works	Kontraktor/ Perunding/ PP/WPP/ PTB	Borang Pemeriksaan Kerja Pavemen, Trial Mix Record, Calibration Equipment Certificate	
3	Sub Base Material	Material Suitability : - Gradation Limits	SSBW 2014 Section P : Cl. 2.3.2, Table P2	BS 1377 : Part 2 : 1990	1 Initial stage 2 One test per 750 cu metre stockpile or laid	Kontraktor/ Perunding/ PP/WPP/ PTB	Borang Pemeriksaan Kerja Pavemen, Trial Mix Record, Calibration Equipment Certificate	
4	Sub Base Construction	- Thickness - Surface finishes - shapes, super elevation, level, grade	SSBW 2014 Section P : Cl. 2.3.8 with tolerances as Table P5 SSBW 2014 Section P : Cl. 2.3.8 with tolerances as Table P5	- Relevant construction drawing - Relevant construction drawing	- Over any 100 metre length - One test per 500 sq metre	Kontraktor/ Perunding/ PP/WPP/ PTB	Borang Pemeriksaan Kerja Pavemen, Trial Mix Record, Calibration Equipment Certificate	

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : INTERNAL ROAD AND HARDSTANDING

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
5	Crushed Aggregate Base Course	Physical & Mechanical Properties :	SSBW 2014 Section P : Cl. 2.4.2		1) Initial stage			
		- Plastic Index	- Not more than 6		2) One test per 750 cu metre stockpile or laid			
		- Aggregate crushing value - Flakiness Index - Soaked CBR Test	- Not more than 25% - Not more than 25% - Not less than 80% when compacted to 95% max dry density	- BS 1377:Part2:1990 - MS 30 : Part 8 - MS 30 : Part 5				
		- Gradation Limits	- Table P3	- BS 1377:Part 4: 1990 (4.5 kg rammer)				
		- Thickness	SSBW 2014 Section P : Cl. 2.4.4 - 2.4.6	- BS 1377:Part 2:1990	Average thickness over any 100 metre length not less than the required thickness	Kontraktor/ Perunding/ PP/WPP/ PTB	Borang Pemeriksaan Kerja Pavemen, Trial Mix Record, Calibration Equipment Certificate	
	Base Course Construction	- In-situ compaction test	SSBW 2014 Section P : Cl. 2.4.7	- Dipping method				
			- Not less than 95% max dry density	- BS 1377 : Compaction Test	- One per test 500 sq metre of each layer laid			
		- Surface finishes - shape, super elevation, level, grade	SSBW 2014 Section P : Cl. 2.4.12, with tolerances asTable P5	- Relevant construction drawing				
6	Binder and Wearing Course	- Aggregate, bitumen and method of construction	- Refer to Standard Specification for Asphaltic Concrete for Road Pavement for Building Works (JKR 20401-0029-97 & JKR 20401-0030-97)	- Relevant construction drawing	- Immediately laying after the application of tack coat	Kontraktor/ Perunding/ PP/WPP/ PTB	Borang Pemeriksaan Kerja Pavemen, Trial Mix Record, Calibration Equipment Certificate	

Nota : For high volume road (more than 1 million ESA) - refer to ITP for Road Project and JKR Standard Specification for Roadworks

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TRADE

6.1 Concrete Works (Revised Volume 2)

6.2 Roof Structure

6.2.1 Pre-Fabricated Cold Formed Steel Roof Truss (Revised Volume 2)

6.2.2 Pre-Fabricated Timber Roof Truss (New Trade)

6.3 Steel Structure (Revised Volume 2)

TRADE : CONCRETE WORKS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS/ EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	CONCRETE MATERIALS	Manufacturers certificate of test.*(types & composition of cement)*	SIRIM approved cement; Table D1, MS EN 197-1.	SPB Tools JKR.PK(O).04-SKC.ST.1A	Before mixing concrete and at change of producer/supplier	Contractors producer/ supplier	certificate	
	Cement	Storage	Protected against water					
	Aggregates (Fine and Course)	Approved Source., Aggregate test results	Preferably Granite, No marine aggregates.	SPB Tools , JKR/QC/A02/04	Before mixing concrete and at change of source/ producer/ supplier	Contractors producer/ supplier	JKR/QC/A02/04	
		Aggregates test results	Elongation,flakiness, clay slit content, soundness etc. Table D2 , MS EN 12620, MS 30					
		Grading or Sieve Anaysis test results.	Within Grading envelope.; Table D3, D3A, MS EN 12620, MS 30					
	Water	Source of water.	Approved source -clean, free chloride and sulphate		Before mixing concrete and at change of soured/ producer/ supplier	Contractors producer/ supplier	Sampling test	
		Sampling test results	MS EN 1008					
	Admixture	Admixtures specifications/catalog	Free chloride, suitability and compatibility data (for usage of 2 or more admixture)	SPB Tools	Before mixing concrete and at change of admixtures.		Manufacturers catalog and specification	
			Table D4, MS EN 934/BS EN 934-2					
2	STEEL REINFORCEMENT	Steel characteristic strength fy N/mm2	As design for use in the construction drawings	SPB Tools , JKR/QC/A03/04	Before delivery to site / Initial, Ramdom testing	Contractor	Mill certificates, tensile test results	
			MS 146, BS 4461, MS 144, MS 145					
		Storage	In clean and dry conditions		Initial stage/ throughout.	Contractor		
		Condition of steel reinforcement	Clean , free from rust, scalling, oil, grease, paint, dirt etc	SPB Tools	Before fixing and concreting.	Contractor		
		Cutting and bending of steel reinforcement	As per construction drawings. and BS 4449	SPB Tools	Before fixing and concreting.	Contractor		
		Fixing of steel reinforcement to formwork	As per drawing, JKR/QC/B04/04.	SPB Tools	Before concreting	Contractor		
			Comply design concrete cover					
			BS 1052					
		Welding of reinforcement	Welding carried out by certified welder	SPB Tools		Contractor		
			BS EN 1011 and BS EN 60974					

TRADE : CONCRETE WORKS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS/ EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
3	APPROVAL AND PRODUCTION OF CONCRETE MIXTURE (Prescribed or designed concrete)	Concrete grade /strength or mixture	As required in construction drawing or Approved by SO .MS 523-1, MS 523-2	SPB Tools JKR/QC/A06/04, JKR/QC/C01/04PM (7) JKR/QC/C01/04PM (28)	Initial stage or Regularly on production	Contractors supplier	Concrete testing from Initial test results or comformity test or identity test, and /or Delivery order	
		Cement content	JKR Building Specs 2014 (Table D5,D5A or D6, D6A)					
		Consistency / watercement ratio	Slump test, compacting test, Vebe test, flow test					
			Table D7, D7A,, D7B, D7C, D7D					
		Admixtures	Prescribed concrete : CEM 1 only . No admixture					
			Designed concrete : All cement type + Admixture (Table D6,D6A)					
		Total chloride content	Measurement of % chloride ion in mix.					
			BS 1881:Part 124, Table D7E					
		Max sulphate content	Measurement of sulphate content in mix					
			Not exceed 4 %, BS 1881:Part 124					
4	APPROVAL OF SITE MIXED.	Quantities of material	Cement, Aggregates, water, admixtures aremeasured by weight or volume	SPB tools	Initial Stage	S.O.		
		Calibration of equipment	Site calibrated with certificate from accredited lab.					
		Mixing of concrete	JKR Building Specs 2014.					
5	APPROVAL OF READY MIXED.	Supplier Information / Manufacturer certificate	Supplier name, Plant location, transportation duration, Plant's capacity production.		Initial Stage	S.O.	Manufacturers certificates and licencing.	
		Plant's setup	Proper material storage,QA/QC plan, ISO certified test lab with calibrated equipment		Initial Stage	S.O.		
		Mixing	All concrete materials mixed at plant (NO extra water/ admixtures added after leaving the plant)	SPB tools JKR/QC/A06/04	Regularly on production	Contractors supplier		
		Delivery	Delivery ticket and manufacturer's batching record					
			Check for grade, slump, temperature, Time < 2 hrs.					

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

TRADE : CONCRETE WORKS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS/ EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
6	CONCRETE TESTING (Compressive Strength : CUBES OR CYLINDER)	Initial test results	Samples: At least 3 specimens from each of 3 batches. (Average strength is used) Average Compressive strength > fck of Table D8, D9 by adequate margin (2x SD) : (At least 6 – 12 N/mm2) Historical data of batching plant can be used (exceed target mean strength at 28 days)	SPB Tools JKR/QC/B05/04	Initial stage /change in material or specified requirement	Contractor	JKR/QC/B05/04	1. EN 12390-2 (Curing) 2. Test result - average of 2 or more specimens made from 1 sample tested at same age. 3. Cube strength at 7 days- for prescribed mix : Specs (Table D12) ,for designed mix :2/3 of 28-days compressive strength. 4. concrete under production control certification (Specs (Table D13) 5. concrete NOT under production control certification (Specs (Table D11)
		Conformity test results	Rate of sampling for accessing comformity : (Table D10), 35 test results for initial roduction or 35 test results (within 12 months) for contonuous production. Test result from individual specimen or; average of 2 or more specimens made from 1 sample tested at 28 days. Criteria Acceptance : Table D11	SPB Tools JKR/QC/B05/04	Initial stage /change in material or specified requirement	Contractor	JKR/QC/B05/04	
		Identity test	Rate of sampling and testing to EN 12350-1 · critical structure : 1 sample per $10m^3$ or 10 batches · slab/beam :1sample per $20m^3$ or 20 batches · raft foundation/ mass concrete :1 sample per $50m^3$ or 50 batches · minimum 2 samples each concreting day per grade/structure · for designed mix : 4 samples (12 cubes) on first concreting day per grade and subsequently minimum 1 sample per source per day per grade	SPB Tools JKR/QC/B05/04	Random on production.	Contractor	JKR/QC/B05/04	
		Identity test for Slump and Flow test	Sampling and testing plan to comply with MS 26-1-1 (sampling),MS 26-1-2 (slump measurement),MS 26-1-5 (flow measurement) Slump measurement – Table D14, D15 , and MS 523:Part 1 Flow measurement – Annex B of MS 523-2	SPB Tools JKR/QC/B05/04	Initial stage / ramdom on production.	Contractor	JKR/QC/B05/04	

TRADE : CONCRETE WORKS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS/ EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
7	PLACEMENT OF CONCRETE	Site condition	Dry condition. No concreting in flowing water and underwater.	JKR/QC/A06/04	Throughout	Contractor	JKR/QC/A06/04	
		Placement and compaction	Time mixing and placement within 2 hrs., Temperature not exceed 36C					
			Concrete dropped no exceed 1.5m high.					
			Compacting in layer 300 mm to 450 mm.only.					
8	CURING AND PROTECTION	Curing method and duration.	Water curing (surface of concrete wetted by ponding with water)		Immediately after concrete set.	Contractor		
			Waterproofed curing paper or plastic sheeting					
			Duration Not less than :					
			· 5 days for F1 to F4 surfaces					
			· 3 days for F11 to F15 surfaces					
9	FORMWORK AND SCALFOLDING	Design Drawings and method statement	Certified by Professional Engineer. If scaffolding is necessary, appoint competent scaffolder (refer to Factories and Machinery Act with Regulations	Design /shop drawings	Before installation.	Contractor	Drawings, calculation certificate	
		Construction stage	Formwork and scalfolding in correct position, shape, profile and dimension (verticality, alignment and level), rigid and tight, clean.	visual	Before and during concreting	Contractor		
			Finishes: Formed and unformed surface finish to various classes.					
		Removal of formworks	Table D18 – minimum period between concreting and the removal of forms (for OPC)	SPB Tools JKR.PK(O).04-SKC.ST.1C,	After min strength achieved.	Contractor	JKR.PK(O).04-SKC.ST.1C	

TRADE : CONCRETE WORKS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS/ EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
10	SUPPORTING AND SPACER BLOCKS	size	NOT more than 50mm x50mm	SPB Tools	Throughout	Contractor		
		strength	At least the same strength and material source's as the concrete to be poured (with nominal aggregates size = 10 mm)	SPB Tools	Throughout	Contractor		
11	CONSTRUCTION JOINTS	Location	As per drawings; or if not indicated in the drawings, Contractor may proposed with SO approval	SPB Tools	Throughout	Contractor		
			NOT allowed at toilet/wet area	SPB Tools	Throughout	Contractor		
		Horizontal constructions joint	Placed 25mm gauge strip inside the forms along all exposed surface to ensure straight joint	SPB Tools	Throughout	Contractor		
		Constructions joint for wall/column	Construct 75mm height of kicker (starter stub) monolithically with the base concrete	SPB Tools	Throughout	Contractor		

TRADE : PRE FABRICATED COLD FORMED STEEL ROOF TRUSS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	a) Project Condition	Selection of Approved System Provider (S.P)	Web : http:/www.jkr.gov.my:- Registered with JKR Malaysia	PENGUMUMAN: Lampiran A (Senarai Pembekal Sistem Kekuda Bumbung)	Initial Stage	Contractor	Appendix 1: Rev:CKASJ/SKB/1 / 2010 Application Form (Lampiran C)	
	b) Identified project Location	Selection of Approved System Provider (S.P)	Coating Material i) AZ 150 - within 400meter from the sea with Fasterner Class 3 ii) Z200 - beyond 400meter from the sea with Fasterner Class 2	Lampiran A (Senarai Pembekal Sistem Kekuda Bumbung)	Initial Stage	contractor	(23)JKR.CKSGJ/02.500/ 030/LN/16 JLD4 bertarikh 7 Jun 2008	Truss system uses screws with corrosion protection class 3 in accordance with AS 3566 is only allowed its use in environments within the 400m of the ocean or other aggressive environmental influences
		Application Form	Specification:- JKR-20601-0186-11	Lampiran C	Initial Stage	Contractor	Appendix 1: Rev:CKASJ/SKB/1 / 2010	
		Approved Appointed System Provider (S.P)	Specification:- JKR-20601-0186-11	Lampiran C	Initial Stage	S.O	Appendix 1: Rev:CKASJ/SKB/1 / 2010	Issued approval letter to main contractor
2	Document Submission	Fabricator and installation works	All trusses shall be assembled by licensed fabricator by the S.P registered with CIDB and installation works shall be executed and supervised by qulified personel with valid certificated issued by CIDB clause 2 .3, 2.4 specification JKR-20601-0186-11	Verify the identification and qualification of the Installer prior to the installation with valid certificate issued by CIDB	Installation Stage	S.O	Appendix 1: Rev:CKASJ/SKB/1 / 2010 Application Form (Lampiran C)	
		Technical Spesification	Specification:- JKR-20601-0186-11	_	Installation Stage	Sistem Provider	Catalog	
		Method Statement	Specification:- JKR-20601-0186-11	Manufacturing SOP	Installation Stage	Sistem Provider	Manufacturer brochure	
		Quality Assurance	Specification:- JKR-20601-0186-11	Manufacturing SOP	Installation Stage	Sistem Provider	Inspection Checklist	

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

TRADE : PRE FABRICATED COLD FORMED STEEL ROOF TRUSS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
3	Cold-Formed steel roof truss with span more than 13m but not exceeding 20m	Special Provisions (to be submitted to Pengarah Kanan, Cawangan Kejuruteraan Awam Dan Struktur	Appendix 5 (JKR-20601-0186-11)	Inspection checklist for trusses pre-installation process	Before installation	Contractor, S.O & CKAS	Prior to Approval by CKAS	Analysis, design and drawing duly endorsed by PE
			Appendix 5 (JKR-20601-0186-11)	Inspection checklist for trusses post installation process	After installation	Contractor, S.O & CKAS		
4	Material Testing Requirements		Appendix 2 Specification:- JKR-20601-0186-11			System Provider/S.O	Testing Certificate from Accredited Laboratary	Testing are compulsory for Trusses members and and others Selection of Base Steel.
	i) Trusses Members (Base Steel)	i) Tensile Test	MS 1196: 2004	Approved Lab Test Result (SIRIM OR CREAM)	Initial Stage			
		ii) Adhesion Test	MS 1196: 2004, AS 1397					
		iii) Bend Test	AS 1397					
		iv) Chemical Composition of Base Metal	AS/NZS 1050/ ISO 9223					
		v) Point Bending Test	Verification of Section Properties					
	ii) Batten or Purlin (Base Steel)	i) Tensile Test	MS 1196: 2004	Approved Lab Test Result (SIRIM OR CREAM)	Initial Stage			
		ii) Adhesion Test	MS 1196: 2004, AS 1397					
		iii) Bend Test	AS 1397					
		iv) Chemical Composition of Base Metal	AS/NZS 1050/ ISO 9223					
		v) Point Bending Test	Verification of Section Properties					
	iii) Wall Plate (Base Steel)	i) Tensile Test	MS 1196: 2004	Approved Lab Test Result (SIRIM OR CREAM)	Initial Stage			
		ii) Adhesion Test	MS 1196: 2004, AS 1397					
		iii) Bend Test	AS 1397					
		iv) Chemical Composition of Base Metal	AS/NZS 1050/ ISO 9223					
		v) Point Bending Test	Verification of Section Properties					

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TRADE : PRE FABRICATED COLD FORMED STEEL ROOF TRUSS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
4	vii) Fasterner Class 2	i) Tensile Test	AS 3566.1-2002	Approved Lab Test Result (SIRIM OR CREAM)	Initial Stage	System Provider/S.O	Testing Certificate from Accredited Laboratary	A proof that the fasteners and anchor bolt were purchased from the above mention as manufacturer/ supplier/agent
		ii) Torsional Test	AS 3566.1-2002					
		iii) Surface Hardness	AS 3566.1-2002					
		iv) Shear Test	AS/NZS 4600: 2005					
		v) Salt Spray	AS 3566.2-2002					
		vi) Coating material analysis	AS 3566.2-2002					
		vii) Coating Thickness	AS 3566.2-2002					
	viii) Fasterner Class 3	i) Tensile Test	AS 3566.1-2002	Approved Lab Test Result (SIRIM OR CREAM)	Initial Stage			
		ii) Torsional Test	AS 3566.1-2002					
		iii) Surface Hardness	AS 3566.1-2002					
		iv) Shear Test	AS/NZS 4600: 2005					
		v) Salt Spray	AS 3566.2-2002					
		vi) Coating material analysis	AS 3566.2-2002					
		vii) Coating Thickness	AS 3566.2-2002					
	viii) Anchor Bolt	i) Pull Out Test	BS 5080: Part 1 : 1986	Approved Lab Test Result (SIRIM OR CREAM)	Initial Stage			
		ii) Coating Composition	AS 3566.2-2002					
		iii) Coating Thickness	AS 3566.2-2002					

TRADE : PRE FABRICATED COLD FORMED STEEL ROOF TRUSS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
5	Approval of material and types for Section Properties	i) Trusses Members	Min. thickness 1.0mm (unsymmetrical section)	Measuring Tape, Venear Caliper, Digital Gauge	During installation	System Provider/S.O	Mill certification by manufacturer, Invoice & measurement	
			Min. thickness 0.6mm symmetrical machine-manufactured box or closed cross member section					
			Minimum Height : 75mm					
			Minimum Width : 35mm					
			Lipped : 7mm					
		ii) Batten or purlin	Min. thickness 0.5mm					
		iii) Wall Plate	Min. thickness 1.2mm					
			Minimum Height : 75mm (Span ≤ 10meter)					
			Minimum Height : 100mm (Span > 10meter)					
		iv) Bracing	Min. thickness 1.0mm					
		v) Bracket	As per design					
		vi) Apec	As per design					
		vii) Triple-Grip	As per design					
		vii) Fasterner Class 2	Min. Coating 12 micron	Accredited lab test result material				
		viii) Fasterner Class 3	Min. Coating 25 micron (mechanically plated zinc-tin)	Accredited lab test result material				
		viii) Anchor Bolt	Hot Dipped Galvanized (minimum thickness 42 micron)	Accredited lab test result material				

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TRADE : PRE FABRICATED COLD FORMED STEEL ROOF TRUSS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
6	Storage & handling	Correct lifting equipment	Specification:- JKR-20601-0186-11 Clause 10.0 & Method Statement	Visual	Throughout	System Provider	Quality Assurance and Control Plan	Prior to inspection, Contactor must submit Request for Inspection (RFI) form. Inspection shall be carried out only after obtaining S.O. approval of RFI.
		Storage method	Specification:- JKR-20601-0186-11 Clause 8.2 & Method Statement	Visual	Throughout	System Provider	Quality Assurance and Control Plan	
7	Installation	i) Truss configuration	Specification:- JKR-20601-0186-11 Clause 10.3	Visual & Inspection checklist	Throughout	System Provider / S.O	Endorsed by P.E Approved System Provider (S.P)	
		ii) Truss Spacing	Maximum truss spacing of 1.2 meters with permitted deviation of ±0.05 metres	Measuring Tape & Inspection checklist	Throughout	System Provider / S.O	Endorsed by P.E Approved System Provider (S.P)	
		iii) Splicing / Box-up provied in design	Location and numbers of screws Specification:- JKR-20601-0186-11 Clause 9.6	Measuring Tape, visual & Inspection checklist	Throughout	System Provider / S.O	Endorsed by P.E Approved System Provider (S.P)	
		iv Bracing						
		a) Top Chord Bracing	Specification:- JKR-20601-0186-11	Visual & Inspection checklist	Throughout	System Provider / S.O	Endorsed by P.E Approved System Provider (S.P)	
		b) Bottom Chord Bracing	Bracing connections anchoring to structures members	Visual & Inspection checklist	Throughout	System Provider / S.O	Endorsed by P.E Approved System Provider (S.P)	
		c) Diagonal bracing	Bracing connections anchoring to structures members	Visual & Inspection checklist	Throughout	System Provider / S.O	Endorsed by P.E Approved System Provider (S.P)	
		v) Wall Plate	Specification:- JKR-20601-0186-11 Clause 10.5	Visual & Inspection checklist	Throughout	System Provider / S.O	Endorsed by P.E Approved System Provider (S.P)	

TRADE : PRE FABRICATED COLD FORMED STEEL ROOF TRUSS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
		vi) Anchor Bolt	Spacing of anchor bolt not exceeding 1.0 metres spacing centre to centre. (Effective Setting Depth according to manufacture requirement)	Measuring Tape, visual & Inspection checklist	Throughout	System Provider / S.O	Endorsed by P.E Approved System Provider (S.P)	
		vii) Any apparent gaps or space between the wall plate and supporting structure	To be packs and evented out by using approved non-shrink cement grout.	Visual & Inspection checklist	Throughout	System Provider / S.O		
		viii) Corrosion	Specification:- JKR-20601-0186-11	Visual & Inspection checklist	Throughout	System Provider / S.O		
		ix) No. of Screws	Roof truss members shall be connected with minimum of three (3) nos. of fasterners.	Visual & Inspection checklist	Throughout	System Provider / S.O	Specification:- JKR-20601-0186-11	
		x) Deflected members	Change to new members	Visual & Inspection checklist	Throughout	System Provider / S.O	Rectification works base on the recommendation made by the P.E. and to the approval of the S.O.	
		xii) Defects in truss members, wall plates etc	Exceeding the limits or permitted tolerances are detected. Specification:- JKR-20601-0186-11 Clause 11.0	Measuring Tape, Visual & Inspection checklist	Throughout	System Provider / S.O	Rectification works base on the recommendation made by the P.E. and to the approval of the S.O.	
8	M & E Services	The S.P. indicated on the drawing shall be installed using strap	i) Fixed on bottom chord member. Specification:- JKR-20601-0186-11 Clause 5.4.4	Visual & Inspection checklist	Throughout	System Provider, Contractor , S.O	Design Consideration by S.P.	
			ii) Installation on purlins is not allowed.	Visual & Inspection checklist	Throughout	System Provider, Contractor , S.O	Specification:- JKR-20601-0186-11	
			iii) Drilling is strictly prohibited on all truss members	Visual & Inspection checklist	Throughout	System Provider, Contractor , S.O	Specification:- JKR-20601-0186-11	

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

TRADE : PRE FABRICATED COLD FORMED STEEL ROOF TRUSS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
9	Water Tank	Shall not be placed on roof trusses	Supported independently Specification:- JKR-20601-0186-11 Clause 5.4.5	Visual & Inspection checklist	Visual & Inspection checklist	System Provider, Contractor , S.O	Specification:- JKR-20601-0186-11	
10	Installation of Roof Covering	i) Roof Tile	A palette only allowed to seat on the roof trusses provided not more than 40 tiles or 150 kg in weight	Visual & Inspection checklist	Visual & Inspection checklist	System Provider, Contractor , S.O	Specification:- JKR-20601-0186-11 Clause 10.9	
		ii) Lightweight Covering	Shall not be stacked on the roof trusses directly during laying out stage.	Visual & Inspection checklist	Visual & Inspection checklist	System Provider, Contractor , S.O	Specification:- JKR-20601-0186-11	
		iii) Time Frame Roof Covering	S.P. Method Statement	Visual	After installation	System Provider, Contractor , S.O	S.P. Method Statement	
11	Post Installation Document Submission	i) As-Build Drawing	Two (2) sets of drawing by System Provider and to be endorsed by P.E	Specification:- JKR-20601-0186-11	After installation	System Provider, Contractor , S.O	Endorsed by P.E Approved System Provider (S.P)	
		ii) System Provider Warranty	Statement the period of warranty shall not less than ten (10) year from date the of Certificate of Practical Completion (CPC) and expiry date of warranty shall be clearly written in the warranty certificated	Specification:- JKR-20601-0186-11 Appendix 4	After installation	System Provider, Contractor , S.O	Issued by Approved System Provider (S.P)	

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

TRADE : PRE FABRICATED TIMBER ROOF TRUSS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Sistem Provider	Selection of Approved System Provider (S.P)	Web : http:/www.jkr.gov.my:- Registered with JKR Malaysia	PENGUMUMAN: Lampiran A (Senarai Pembekal Sistem Kekuda Bumbung)	Initial Stage	Contractor	Appendix 1: Rev:CKASJ/SKB/1 / 2010 Application Form (Lampiran C)	
		Application Form	Specification:- JKR-20601-0190-12	Lampiran C	Initial Stage	Contractor	Appendix 1: Rev:CKASJ/SKB/1 / 2010	
		Approved Appointed System Provider (S.P)	Specification:- JKR-20601-0190-12	Lampiran C	Initial Stage	S.O	Appendix 1: Rev:CKASJ/SKB/1 / 2010	Issued approval letter to main contractor
2	Document Submission	Fabricator *	All trusses shall only be assembled by licensed fabricators by the S.P and registered with CIDB. A copy of CIDB registered certificated shall be submitted to the S.O for verification, **Specification JKR-20601-0190-12 clause 2 .3**	Verify the identification and qualification with valid certificate issued by CIDB	Installation Stage	S.O	Appendix 1: Rev:CKASJ/SKB/1 / 2010 Application Form (Lampiran C)	
		Installer *	Installation works shall be executed and supervised by qulified personel with valid certificated issued by CIDB, **Specification JKR-20601-0190-12 clause 2.4**	Verify the identification and qualification with valid certificate issued by CIDB	Installation Stage	S.O	Appendix 1: Rev:CKASJ/SKB/1 / 2010 Application Form (Lampiran C)	

TRADE : PRE FABRICATED TIMBER ROOF TRUSS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
3	Details Profile Timber (Dimension) & Section Properties :	Hip Rafter	proposed roof truss system specification JKR-20601-0190-12 clause 7.0	Measuring Tape	Installation Stage	S.O	FRIM Test Report	
		Rafter	proposed roof truss system specification JKR-20601-0190-12 clause 7.0	Measuring Tape	Installation Stage	S.O	FRIM Test Report	
		Batten	proposed roof truss system specification JKR-20601-0190-12 clause 7.0	Measuring Tape	Installation Stage	S.O	FRIM Test Report	
		Wall Plate (min. size 50mm x 100mm)	Standard required roof truss system specification JKR-20601-0190-12 clause	Measuring Tape (Min. grade of SG2)	Installation Stage	S.O	FRIM Test Report	
		'Bracing	proposed roof truss system specification JKR-20601-0190-12 clause 7.0	Measuring Tape	Installation Stage	S.O	FRIM Test Report	
4	Details Design profile drawing to be endorsed by P.E	Members, Bracing, Connection, Wall Plate and Truss Accessories	MS 544 - Part 1, Part 2 and Part 5	Appendix 3 - Checklist on the Contractor Submission	Installation Stage	SO	Checklist	
		Technical Spesification	Specification:- JKR-20601-0190-12	_	Installation Stage	System Provider	Catalog	
		Method Statement	Specification:- JKR-20601-0190-12	Manufacturing SOP	Installation Stage	System Provider	Manufacturer brochure	
		Quality Assurance	Specification:- JKR-20601-0190-12	Manufacturing SOP	Installation Stage	System Provider	Inspection Checklist	
5	Timber roof truss with span more than 12m but not exceeding 16m	Special Provisions (to be submitted to Pengarah Kanan, Cawangan Kejuruteraan Awam Dan Struktur	Specification:- JKR-20601-0190-12	Inspection checklist for trusses pre-installation process	Before installation	Contractor, S.O & CKAS	Prior to Approval by CKAS	Analysis, design and drawing duly endorsed by PE
			Specification:- JKR-20601-0190-12	Inspection checklist for trusses post installation process	After installation	Contractor, S.O & CKAS		

TRADE : PRE FABRICATED TIMBER ROOF TRUSS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
6	Material Testing Requirements for plate fasterner		Specification:- JKR-20601-0190-12 Appendix 2					C3 (medium corrosivity) Z450 or AZ150 for base metal plate fasterner
	Ai) Base Steel for AZ150 is only allowed its use in environments within the 400m of the ocean or other aggressive environmental influences or	i) Tensile Test	MS 1196	Approved Lab Test Result (Sirim or Cream)	Initial Stage	S.O	Testing Certificate from Accredited Laboratary	A proof that the fasteners and anchor bolt were purchased from the above mention as manufacturer/ supplier/agent
		ii) Adhesion of Aluminium-Zinc base coating (Bend Test)	MS 1196					
		iii) Mass of Aluminium-Zinc base coating	AS 1397					
		iv) Chemical Composition of Base Metal	AS/NZS 1050 / ISO 9223					
	Aii) Base Steel for Z200 is not allowed its use in environments within the 400m of the ocean or other aggressive environmental influences	i) Tensile Test	MS 1196					
		ii) Adhesion of Zinc base coating (Bend Test)	AS 1397					
		iii) Mass of zinc base coating	AS 1397					
		iv) Chemical Composition of Base Metal	AS/NZS 1050 / ISO 9223					
	B) Anchor Bolt	i) Pull Out Test	BS 5080: Part 1 : 1986	Approved Lab Test Result (Sirim or Cream)	Initial Stage			
		ii) Coating Composition	AS 3566.2-2002 (Hot Dipped Galvanized (minimum thickness 42micron)					
		iii) Coating Thickness						
	C) Nails	iv) Coated protectively by hot-dip galvanizing	AS 2334					

TRADE : PRE FABRICATED TIMBER ROOF TRUSS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
7	D) Material Testing Requirments for Timber.	i) Identification of species & visual grading	MS 1714	Approved Lab Test Result (Sirim or Cream)	Initial Stage	S.O	Appendix 2, Testing Certificate from Accredited Laboratary	As Per Project
		ii) Moisture content	BS373 & MS 837					
		iii) Density	BS373 & MS 837					
		iv) Specific gravity	BS373 & MS 837					
		v) Dry salt retention	MS 360, MS 821 & MS 544					
		vi) Depth of penetration	MS 360 & MS 544					
		vii)Static bending	BS 373					
		vii)Compression parallel to grain (Optional : where testing required for verification, the principal standard shall be selected, for S.O.'s approval.)	BS 373					
8	Drawing Inspection on material	ii) Truss Spacing	Maximum truss spacing of 1.2metres with permitted deviation of ±0.05 metres Specification:- JKR-20601-0190-12 Clause 2.2	Measuring Tape & Inspection checklist	Throughout	System Provider, Contractor , S.O	Endorsed by P.E Approved System Provider (S.P)	
9	Inspection on material	iii) Metal Plate Fasteners (Connecter)	As per design Specification:- JKR-20601-0190-12 Clause 7.2	Visual defects / Vernier Caliper (size & thickness)	Throughtout	System Provider & SO	manufacturer Certificate	
		iv) Nail Plate	As per design Specification:- JKR-20601-0190-12 Clause 7.2	Visual defects / Vernier Caliper (size & thickness)	Throughtout	System Provider & SO	manufacturer Certificate	
		v) Nails (7.2.2, 7.3)	As per design Specification:- JKR-20601-0190-12 Clause 7.2	Vernier Caliper	Throughtout	System Provider & SO	manufacturer Certificate	

TRADE : PRE FABRICATED TIMBER ROOF TRUSS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
10	Truss Fabrication	**i) Factory Fabrications**				System Provider & SO	Quality Assurance and Control Plan	Prior to inspection, Contactor must submit Request for Inspection (RFI) form. Inspection shall be carried out only after obtaining S.O. approval of RFI.
		a) Method Statement for Fabrications	Specification:- JKR-20601-0190-12 Clause 8.1	Factory inspection	Initial Stage	System Provider & SO		
		b) Method of transporting and handling of roof trusses to site.		Visual	Initial Stage	System Provider & SO		
		c) Quality Assurance document		Visual	Initial Stage	System Provider & SO		
		ii) On-Site Fabrication				System Provider & SO	Quality Assurance and Control Plan	
		a) Covered fabrication and storage facility	Specification:- JKR-20601-0190-12 Clause 8.2	Visual	Initial Stage	System Provider & SO		
		b) Fabrication equipment		Table Press, Jig- G Press	Initial Stage	System Provider & SO		
		c) Truss fabrication drawings		Visual	Initial Stage	System Provider & SO		
		d) Quality Assurance document		Visual	Initial Stage	System Provider & SO		
		e) Qualified S.P site fabrication team		Visual	Initial Stage	System Provider & SO		

TRADE : PRE FABRICATED TIMBER ROOF TRUSS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
11	Installation							
12	Trusses and Rafters (Timber - defects with permissible limits)	Knots (*Penyambung tidak rapat*)	Specification:- JKR-20601-0190-12 Clause 9.0	Visual Measuring Tape (Overall Length, Angle Length, width and Thickness)	Throughout	System Provider & SO	checklist for truss installation	
		Wane (*Size semakin kurang*)				System Provider & SO	checklist for truss installation	
		Checks and shakes (splits)				System Provider & SO	checklist for truss installation	
		Fractures				System Provider & SO	checklist for truss installation	
		Top Chord (members)				System Provider & SO	checklist for truss installation	
		Bottom Chord (members)				System Provider & SO	checklist for truss installation	
		Bracing				System Provider & SO	checklist for truss installation	
		Member Slicing				System Provider & SO	checklist for truss installation	

TRADE : PRE FABRICATED TIMBER ROOF TRUSS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
13	Truss joint	Damage to connector	Specification:- JKR-20601-0190-12	Visual	Throughout	System Provider & SO	checklist for truss installation	
		Missing connector				System Provider & SO	checklist for truss installation	
14	Workmenship - All trusses visually checked for obvious misalignment and incorrect spacing	Spacing of trusses	Specification:- JKR-20601-0190-12 Clause 2.2	Visual	Throughout	System Provider & SO	checklist for truss installation	
		Vertical alighment (misalignment)	Specification:- JKR-20601-0190-12 Clause 9.2	Plum bob and Visual		System Provider & SO	checklist for truss installation	
		Horizontal alighment (misalignment)				System Provider & SO	checklist for truss installation	
15	Wall Plate	Specified Size (min. size 50mm x 100mm)	Standard required roof truss system Specification JKR-20601-0190-12 clause 6.8.1	Measuring Tape	Throughout	System Provider & SO	checklist for truss installation	
		Grade Specified (min.grade of SG2)		FRIM Test Report		System Provider & SO	checklist for truss installation	
		No non permissible timber defect between anchor and truss.		Visual		System Provider & SO	checklist for truss installation	
		Size of anchor matches specification		Measuring Tape		System Provider & SO	checklist for truss installation	

TRADE : PRE FABRICATED TIMBER ROOF TRUSS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
16	Workmanship	Gap between wall plate and beam at truss / rafters position packed	Specification:- JKR-20601-0190-12	Visual	Throughout	System Provider & SO	checklist for truss installation	
		No knots at anchor bolt position		Visual		System Provider & SO	checklist for truss installation	
		If applicable, washers provided for anchor bolts		Visual		System Provider & SO	checklist for truss installation	
		If applicable, anchor bolts tightened		Visual		System Provider & SO	checklist for truss installation	
17	Truss Joint	Damage to connectors	Specification:- JKR-20601-0190-12	Visual	Throughout	System Provider & SO	checklist for truss installation	
		Missing connectors		Visual		System Provider & SO	checklist for truss installation	
18	M & E Services	The S.P. indicated on the drawing shall be installed using strap	i) Fixed on bottom chord member. Specification:- JKR-20601-0190-12 Clause 5.5.4	Visual & Inspection checklist	Throughout	System Provider, Contractor , S.O	Design Consideration by S.P.	
			ii) Installation on purlins is not allowed.	Visual & Inspection checklist		System Provider, Contractor , S.O	Specification:- JKR-20601-0190-12	
			iii) Drilling is strictly prohibited on all truss members	Visual & Inspection checklist		System Provider, Contractor , S.O	Specification:- JKR-20601-0190-12	
19	Water Tank	Shall not be placed on roof trusses	Supported independently Specification:- JKR-20601-0190-12 Clause 5.5.5	Visual & Inspection checklist	Visual & Inspection checklist	System Provider, Contractor , S.O	Specification:- JKR-20601-0190-12	

TRADE : PRE FABRICATED TIMBER ROOF TRUSS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
20	Installation of Roof Covering	i) Roof Tile	A palette only allowed to seat on the rrof trusses provided not more than 40 tiles or 150 kg in weight Specification:- JKR-20601-0190-12 Clause 9.8	Visual & Inspection checklist	Visual & Inspection checklist	System Provider, Contractor , S.O	Specification:- JKR-20601-0190-12	
		ii) Lightweight Covering	Shall not be stacked on the roof trusses directly during laying out stage.	Visual & Inspection checklist	Visual & Inspection checklist	System Provider, Contractor , S.O	Specification:- JKR-20601-0190-12	
21	Post Installation Document Submission	i) As-Build Drawing	Two (2) sets of drawing by System Provider and to be endorsed by P.E	Specification:- JKR-20601-0190-12	After installation	System Provider, Contractor , S.O	Endorsed by P.E Approved System Provider (S.P)	
		ii) System Provider Warranty	Statement the period of warranty shall not less than ten (10) year from date the of Certificate of Practical Completion (CPC) and expiry date of warranty shall be clearly written in the warranty certificated	Specification:- JKR-20601-0190-12 Appendix 4	After installation	System Provider, Contractor , S.O	Issued by System Provider (S.P)	

TRADE : STRUCTURAL STEEL

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION/TEST	STANDARD/ REQUIREMENT	TOOLS/EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Material	Qualities of Steel	JKR NO.20601-0191-12 Table A & B	N.A.	Initial stage	Manufacturer/ supplier	JKR.PK(O).04- SKC.ST.2A	
		Material Testing	JKR NO.20601-0191-12 Table A	Laboratory Test			Test Certificate	
		Surface condition - Steel Surface (Check against pitted and rust)	BS EN ISO 8501-1				JKR.PK(O).04- SKC.ST.2A	
		- Surface Defect	BS EN 10163					
		- Other defect	BS EN 10210-1					
		Structural fastener	JKR NO.20601-0191-12 Section 4 Clause 4.8				JKR.PK(O).04- SKC.ST.2A	
		Shear stud	JKR NO.20601-0191-12 Section 4 Clause 4.9	Laboratory Test			Test Certificate	
		Protective treatment materials	JKR NO.20601-0191-12 Section 4 Clause 4.10				JKR.PK(O).04- SKC.ST.2A	
2	Drawings	Design, fabrication and erection drawings	BS 1192-1 and BS 1192-2 BS 499-2 (Welding symbols)	N.A.	According to related stage	Contractor	Drawings	
		General arrangement drawings	JKR NO.20601-0191-12 Section 5 Clause 5.2		Initial stage	Contractor	Drawing submission	
		Foundation plan drawings	JKR NO.20601-0191-12 Section 5 Clause 5.3		Initial stage	Structural steelwork fabricator	Drawing submission	
		Fabrication drawings	JKR NO.20601-0191-12 Section 5 Clause 5.4		Prior fabrication		Drawing submission & Drawing Register	
		Erection drawings	JKR NO.20601-0191-12 Section 5 Clause 5.5		Prior erection	Contractor	Drawing submission	
		Submission of approval drawings	JKR NO.20601-0191-12 Section 5 Clause 5.6		According to related stage	S.O	Letter of approval	
		As-Built Drawings	JKR NO.20601-0191-12 Section 5 Clause 5.7		Completion	Contractor	Drawing submission	
3	Workmanship-Welding	Welder qualification	BS EN 287-1/BS EN 4872-1	N.A.	Before welding	S.O.	Certificate	
		Welding Inspector qualification	SIRIM/CIDB/other	N.A.	Before welding	S.O.	Certificate	
		Welding procedure			Before welding			
		- Approval of procedure	BS EN1011	Welding procedure		Independent Inspection Authority	Welding procedure	
		- Testing of procedure	BS EN ISO 15614-1	Welding procedure		Contractor		

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : STRUCTURAL STEEL

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION/TEST	STANDARD/ REQUIREMENT	TOOLS/EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
3	(Cont)	Assembly - Fit-up - Jigs - Tacks Welds - Weld Quality Acceptance Criteria R Corrective Actions - Extension pieces - Production test plates	JKR NO.20601-0191-12 Section 7 Clause 7.4 JKR NO.20601-0191-12 Table D	Welding procedure	Throughout	Contractor	JKR.PK(O).04- SKC.ST.2A	
		Non-destructive testing of welds - Visual Inspection -Surface flaw detection (i) Determine if closer examination of weld surface is required (ii) Timing	BS EN ISO 17637 JKR NO.20601-0191-12 Table C&D JKR NO.20601-0191-12 Table C JKR NO.20601-0191-12 Table C JKR NO.20601-0191-12 Section 7 Clause 7.5	Inspection procedure Magnetic Particle Inspection/Dye Penetrant Inspection Magnetic particle inspection (MPI)/Dye penetrant inspection (DPI)	Post welding Post welding	Inspecting authority A suitably qualifiy person A suitably qualifiy person	Inspection procedure and scope JKR.PK(O).04- SKC.ST.2C	
		Ultrasonic examination - Examiner qualification - Determine if ultrasonic examination is required - Procedure and timing	JKR NO.20600-0019-99 Section 7 Clause 7.5.4 JKR NO.20601-0191-12 Table C&D JKR NO.20600-0019-99 Section 7 Clause 7.5.4	JKR NO.20601-0191-12 Table C&D Ultrasonic device	Post welding	Inspecting authority	JKR.PK(O).04- SKC.ST.2C Certificate	
		Shear stud welding - Method following manufacturer recommendation - Trial - Testing - Removal of defective studs	Manufacturer recommendation Welding procedure JKR NO.20601-0191-12 Section 7 Clause 7.6 JKR NO.20601-0191-12 Section 7 Clause 7.7	N.A. Welding pocedure Bend Test by 6kg hammer JKR NO.20601-0191-12 Section 7 Clause 7.7	Before welding Before welding Post welding After testing	Contractor Contractor Contractor Contractor	JKR.PK(O).04- SKC.ST.2C	

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : STRUCTURAL STEEL

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION/TEST	STANDARD/ REQUIREMENT	TOOLS/EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
4	Workmanship-Bolting	Ordinary bolted assemblies - Bolt/Nut combination - Bolt grades - Bolt length - Washers - Galvanized nuts - Bolt tightening - Fitted bolts - Fit-up High Strength Friction Grip assemblies - Bolt/Nut/Washer combination - Tightening - Calibration of torque equipment - Fit-up	JKR NO.20601-0191-12 Section 8	JKR NO.20601-0191-12 Section 8	Throughout assembly	Contractor	JKR.PK(O).04- SKC.ST.2A	
5	Workmanship-Accuracy of fabrication	Permitted deviations	JKR NO.20601-0191-12 Section 9	Measuring tools	After fabrication	Contractor	JKR.PK(O).04- SKC.ST.2C	
6	Workmanship-Erection	Method statement submission	JKR NO.20601-0191-12 Section 10 Clause 10.1.1	N.A.	Latest by 2 weeks before erection	Contractor	Proof of submission	
		Certification of completion submission	JKR NO.20601-0191-12 Section 10 Clause 10.9	N.A.	After erection	Contractor	Certificate	
7	Workmanship-Accuracy of erected steelwork	Permitted deviations	JKR NO.20601-0191-12 Section 11.0	Measuring tools	After erection	Contractor	JKR.PK(O).04- SKC.ST.2C	
8	Protective treatment	Method statement submission	JKR NO.20601-0191-12 Section 12.0	Measuring tools	After receiving specification from S.O.	Contractor	JKR.PK(O).04- SKC.ST.2C	
9	Fire Protection	Materials - Minimum spray thickness according to hours of fire protection	JKR NO.20601-0191-12 Section 13.0 JKR NO.20601-0191-12 Table F	JKR NO.20601-0191-12 Section 13.1 JKR NO.20601-0191-12 Table F	Prior erection	Contractor	Manufacturere's Data Sheet JKR NO.20601-0191-12 Appendix 1	

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE

7.1 Flooring/Rendering Works (new trade)

7.2 Water Proofing (new trade)

7.3 Tiling Works (FLOOR/WALL TILES)

7.4 Plastering Works

7.5 Door, Window And Ironmongery

7.6 Ceiling Works

7.7 Roof Covering

7.8 Painting Works

7.9 Sanitary Ware & Fittings

7.10 Interior, Signage & Graphic

7.11 Softscape Works

7.12 Hardscape Works

TRADE : FLOORING

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Material delivered to the site	• Ensure the specification as specified in contract and approved by the HODT / S.O • Ensure type of material, sizes, thickness / oz, approved colour/ pattern and skirting if necessary	• As specified in contract document, drawings,manufacturer's catalogue, certification and as per approved proposal • Refer Standard Spesification for Building Works 2014 (clause 4.0 - K/8-14) • Refer Architectural Works Briefs User Manual Ver. 1:2012 (clause 5.13 - floors) • Refer SPP Bil. 7 Tahun 2002 - Penggunaan bahan / barangan / perkhidmatan tempatan dalam perolehan kerajaan	Sample, relevant certificates & catalogue	Before installation/ Upon material delivery	HODT, Contractor & SO	JKR.PK(0).04-SKA.4 & JKR.PK(0).04-SRA.1	•Inform SO if any discrepancy occurs •Refer to approved material document •Material must be same as proposed material and stored properly at site
2	Surface preparation	• Surface evenness and cleanliness •All the necessary works must be done before flooring works start (eg : water proofing, gradient etc.)	• As specified in contract document, drawings,manufacturer's catalogue, certification and as per approved proposal • Refer Standard Spesification for Building Works 2014 (clause 4.0 - K/8-14) • Refer Architectural Works Briefs User Manual Ver. 1:2012 (clause 5.13 - floors) • Refer SPP Bil. 7 Tahun 2002 - Penggunaan bahan / barangan / perkhidmatan tempatan dalam perolehan kerajaan	Visual, measuring	Before installation	Contractor, Installer, SO & PTB (penyelia tapak bina)	JKR.PK(0).04-Surface preparation must be checked and certified for approval by specialist	Refer to method statement from product manufacturer & approved material document
3	Installation of materials	• Pattern and arrangement of • Prepare mock-up area 3meter x 3meter (minimum) and determine by HODT/ SO / PTB (penyelia tapak bina) • Floor finish level upon completion	• As specified in contract document, drawings,manufacturer catalogue, certification and as per approved proposal • Refer Standard Spesification for Building Works 2014 (clause 4.0 - K/8-14) • Refer Architectural Works Briefs User Manual Ver. 1:2012 (clause 5.13 - floors) • Refer SPP Bil. 7 Tahun 2002 - Penggunaan bahan / barangan / perkhidmatan tempatan dalam perolehan kerajaan	Visual, measuring	During / Before	Contractor, Installer, SO & PTB (penyelia tapak bina)	Refer to JKR.PK(0).04-SKA.4 & JKR.PK(0).04-SRA.3 Installation must be done by specialist	Inform SO if delivery of installation is not satisfactory Refer to method statement from product manufacturer

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TRADE : FLOORING

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
4	Inspection	• To make sure any defect / unwanted marks on the surface to be rectified • To make sure all the spesification must be followed as per contract & approval	• As specified in contract document, drawings,manufacturer catalogue, certification and as per approved proposal • Refer Standard Spesification for Building Works 2014 (clause 4.0 - K/8-14) • Refer Architectural Works Briefs User Manual Ver. 1:2012 (clause 5.13 - floors)	Visual, measuring tools & water flow / pounding test	After installation	Contractor, Installer, SO & PTB (penyelia tapak bina)	Check according to requested specialist's standards Request specialist's undertaking letter to certify that the waterproofing system is workable	Inform SO if delivery of installation is not satisfactory

TRADE : WATERPROOFING

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Check the material delivered before installation.	Ensure the specification as specified in contract and approved by the HODT / S.O	• As specified in contract document, drawings,manufacturer's catalogue, certification and as per approved proposal • Refer Standard Spesification for Building Works 2014 (clause 5.4 - D/18) • Refer Architectural Works Briefs User Manual Ver. 1:2012 (clause 5.14 - waterproofing) • Refer SPP Bil. 7 Tahun 2002 - Penggunaan bahan / barangan / perkhidmatan tempatan dalam perolehan kerajaan	Sample, relevant certificates & catalogue	Before installation/ Upon material delivery	HODT, Contractor, SO	JKR.PK(0).04-SKA.4 & JKR.PK(0).04-SRA.1 Material must be same as proposed material and stored properly at site	Inform HODT /SO if any discrepancy occurs Refer to approved material document
2	Surface preparation	Surfaces to be waterproofed must be structurally safe, clean, dry and free of all surface contamination including form release agents, curing compounds, concrete finishing aids and all other forms of surface contamination.	• As specified in contract document, drawings,manufacturer's catalogue, certification and as per approved proposal • Refer Standard Spesification for Building Works 2014 (clause 5.4 - D/18) • Refer Architectural Works Briefs User Manual Ver. 1:2012 (clause 5.14 - waterproofing)	Visual & spirit level (gradient)	Before installation	Contractor, SO & PTB (penyelia tapak bina)	JKR.PK(0).04-SKA.4 & JKR.PK(0).04-SRA.2	Refer to approved material document & gradient

TRADE : WATERPROOFING

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
3	Installation of materials	Surface coverage meets the required number of layers / method statements preferred product	• As specified in contract document, drawings,manufacturer method statement • Refer Standard Spesification for Building Works 2014 (clause 5.4 - D/18) • Refer Architectural Works Briefs User Manual Ver. 1:2012 (clause 5.14 - waterproofing)	Visual,	During installation	Contractor, SO & PTB (penyelia tapak bina)	Refer to manufacturer's installation requirements and approved drawings JKR.PK(0).04-SKA.4 & JKR.PK(0).04-SRA.3 Installation must be done by specialist	Inform SO if delivery of installation is not satisfactory Refer to method statement from product manufacturer
4	Inspection	Upon completion of the waterproofing system installation, where possible, a water test should be carried out for a certain period of products to test the completeness of the application for the whole affected area.	• As specified in contract document, drawings,manufacturer method statement • Refer Standard Spesification for Building Works 2014 (clause 5.4 - D/18) • Refer Architectural Works Briefs User Manual Ver. 1:2012 (clause 5.14 - waterproofing)	Visual, measuring tools	After installation	Contractor, SO & PTB (penyelia tapak bina)	Check according to requested specialist's standards Request specialist's undertaking letter to certify that the waterproofing system is workable	Inform SO if delivery of installation is unsatisfactory

TRADE : TILING WORKS (FLOOR / WALL TILES)

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Submit sample / catalogue / colour scheme proposal	catalog / shop drawing / SIRIM cert. / sample material	• Submit at least one month from commencement of building works with client's approval • As specified in contracts document • To ensure only specified or equivalent paint are submitted for approval	mock-up / sample/certified material	Earlier construction works or after superstructure works finish At least one month before installation	Consultant, Contractor, SO Client	JKR.PK (0).04-SKA.3 (wall finishes) and JKR.PK (0).04-SKA.4 (floor finishes) Sample size must be same as propose material and stored properly in site office	Inform SO if any discrepancy occurs Obtain client's approval
2.	Check quality of tiles upon delivery	Random check	• As specified in contract document and as per approved proposal, and tile installation guideline • Check on tonality, crack, chip, wasp and surface unevenness	visual	Once material delivered on site	Consultant, Contractor, SO	Material must be same as proposed material and stored properly at site	Refer to approved material document
3.	Confirm tiles dimension	Sample / Mock-up	• As specified in contract document and drawing specification • Width and length tolerance to be +/- 1%, thickness +/- 10%	measurement tools / spirit level		Consultant, Contractor, SO	Material must be same as proposed material and stored properly at site Refer to construction drawing	Refer to approved material document
4.	Wall / surface preparation	Random check	• Make sure all surfaces are clear from dirt, ready to accept tiles and completely dry	visual		Consultant, Contractor, SO	Surface preparation must be checked and certified for approval by specialist	Refer to method statement from product manufacturer

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TRADE : TILING WORKS (FLOOR / WALL TILES)

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
5	Floor surface preparation	Random check	• Make sure all surfaces are clear from dirt, ready to accept tiles and completely dry	visual		Consultant, Contractor, SO	Surface preparation must be checked and certified for approval by specialist	Refer to method statement from product manufacturer
6	Tiles installation	Random check and Test	• Check mortar/glue thickness as stated in tiles installation guideline • As specified in contract document	visual		Consultant, Contractor, SO	Refer to manufacturer's installation requirements, method statement and approved drawings Installation must be done by specialist	Inform SO if delivery of installation is not satisfactory Refer to method statement from product manufacturer
7	Site inspection	Audit check list construction	• As specified in contract document and tiles installation guideline • As specified in Sistem Pengurusan Bersepadu (SPB) form	visual		Consultant, Contractor, SO	Check according to requested specialist's standards	Inform SO if delivery of installation is unsatisfactory

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TRADE : PLASTERING WORKS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Preparation for Plastering	check mock-up preparation / Random check	• at least 3 days after the completion of brickwall as specified in the construction drawing.	visual / laser equiment	once	Consultant, Contractor, SO	JKR.PK (0).04-SKA.3 (Mock Up) Refer to construction drawing	Inform SO if any discrepancy occurs
2.	Clean Surface	random check	• The surface shall be cleaned and wetted before plastering. • As specified in the contract document and Sistem Pengurusan Bersepadu (SPB) form	visual	ALL	Consultant, Contractor, SO	Mock Up/sample of minimum 9m2 (3m width x 3m height) done by contractor shall be supplied to SO for approval	Subjected to judgment of SO whether mock up/sample is of acceptable quality or not
3.	Plaster Mix	preparation / external test	• 1 part of cement to 6 parts of sand by volume. • All mixing of mortar for plaster shall be done by machine. Hand mixing shall only be allowed for small quantities and with the approval of the SO • As specified in the contract document.	visual / sample	ALL	Consultant, Contractor, SO	Sample done by contractor shall be supplied to SO for approval	Subjected to judgment of SO whether mock up/sample is of acceptable quality or not
4.	Aligment	Random Check.	• Set out aligments on brickwall surface before commencement of plastering works.	Measurement tools	ALL	Consultant, Contractor, SO	Mock Up/sample of minimum 9m2 (3m width x 3m height) done by contractor shall be supplied to SO for approval	Subjected to judgment of SO whether mock up/sample is of acceptable quality or not
5.	Apply the first coat	Random Check.	• Averaging 10 mm thick applied to the area having greater deviation from the intended finish surface. • As specified in the contract document.	Measurement tools	ALL	Consultant, Contractor, SO	Mock Up/sample of minimum 9m2 (3m width x 3m height) done by contractor shall be supplied to SO for approval	Subjected to judgment of SO whether mock up/sample is of acceptable quality or not

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TRADE : DOOR, WINDOW AND IRONMONGERY

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Submit sample / catalogue / shop drawing / method statement for approval and prepared mock up at site.	catalog / shop drawing / SIRIM cert. / sample material	• Submit at least one month from commencement of building works • As specified in contracts document • To ensure only specified item submitted for approval	shop drawing / certified material.	once before delivery	Consultant, Contractor, SO	JKR.PK (0).04-SKA.5 (Door & window) and JKR.PK (0).04-SKA.8 (Ironmongery)	Inform SO if any descrepency occurs
2.	Material delivered to site	lab material test	• As specified in contract document and as per approved proposal		ALL	Consultant, Contractor, SO	The tested result must achieve the specification requirements	Inform SO in case of system failure
3.	Contractor to measure opening provided at site for windows and doors.	random check	• Prior to fabrication, check of any deviation to the specified size and report to the SO	measuring tape/laser measure.	ALL	Consultant, Contractor, SO	Refer to construction drawing	Subjected to judgment of SO whether opening is acceptable or not
4.	Fix Sub frame in position	Random Check.	• As specified in contract document and method statement. • To fix sub frame before plastering and check the alignment with level before fixing in position.	Spirit level / laser measure	ALL	Consultant, Contractor, SO	Refer to manufacturer's installation requirements and approved drawings Installation must be done by specialist	Inform SO if delivery of installation is not satisfactory
5.	Fix frame in position	Random Check.	• Check defect on the frame if any, rectify or reject.	visual	ALL	Consultant, Contractor, SO	Refer to manufacturer's installation requirements and approved drawings Installation must be done by specialist	Inform SO if delivery of installation is not satisfactory
6.	Install door window panel / Install Ironmongery	Random Check.	• As specified in contract document and method statement. • As specified in Sistem Pengurusan Bersepadu (SPB) form	visual	ALL	Consultant, Contractor, SO	Installation must be done by specialist	Refer to method statement from product manufacturer

TRADE : CEILING WORKS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Receive and check shop drawings from supplier. Ceiling type : - plaster ceiling - suspended ceiling Fixed ceiling	catalog / drawings / sample	Check as per contract document and take into account factors such as: <u>Plaster & suspended ceiling</u> - Check the thickness, stiffness, weight and ceiling - Other components such as -'main T & cross T', `wall angle', `soffit cleat', `hanging C channel' and `cornice' <u>Fixed ceiling</u> - Check the thickness, stiffness, weight and ceiling - Other component such as- `cornice' Other requirement– SIRIM Certificate and warranty, fire rated and sound insulation (acoustic ceiling).	Contract Dokumen / SPK Tools / Shop Dwg.	Ealier / months before the ceiling installation works or after roof structure works done.	Consultant, Contractor, SO	JKR.PK (0).04-SKA.2 (Mock Up)	Inform SO if any discrepancy occurs
2.	Receive and check sample for approval	Sample material	Check as per contract document and shop drawings.	Visual	Earlier construction works or after superstructure works finish	Consultant, Contractor, SO	Sample size must be same as propose material and stored properly in site office	Inform SO if any discrepancy occurs
3.	Ceiling mock-up at site.	Set Mock-up	Check the mock-up as per construction drawings & shop drawings together with the sample that have been approved and verified.	Mock up / sample Material	3 months before ceiling work.	Consultant, Contractor, SO	JKR.PK (0).04-5 (Mock Up) and weight testing (50kg/point)	Inform SO in case of ceiling system failure
4.	Check material that is sent to site.	Random check by batch / lab test.	Check material whether it is the same as per approved sample. Store in an enclosed area that is free of dirt and moisture.	Measuring Tape / laser measure	All Stages.	Consultant, Contractor, SO	The tested result must achieve the specification requirements	Inform SO in case of ceiling system testing failure

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TRADE : CEILING WORKS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
5.	Ceiling Installation	Random check installation / similar to mock-up.	Check the ceiling installation as per construction drawings and for each space: - Installation technique as per approved mock-up. - Design and pattern of the ceiling shall be aligned with the roof fall. '- Floor to ceiling height must be enough to cater the ceiling space for mechanical and electrical wirings. 'ceiling manhole' for fix ceiling as required.	Visual	All Stages.	Consultant, Contractor, SO	Check according to approved specification and approved drawing	Inform SO if any discrepancy occurs
6.	After the installation	Check room by room / Audit before handing over	Final inspection for: - Electrical & mechanical fixtures such as air-cond diffusers, lightings, ceiling fans and fire requirements are not directly fix to the ceiling boards. - Finishes of the ceilings must be in good condition after the work is completed.	Visual	All Stages.	Consultant, Contractor, SO	Ensure workmanship is of acceptable quality and visually clean	Inform SO if delivery of workmanship is unsatisfactory

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TRADE : ROOF COVERING

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Sample	catalog / shop drawings / sample	• Submission of shop drawing and sample for approval prior to mock-up fabrication on site 2 months before commencement on site • As specified in contract document	shop drawing / certified material.	Once (before delivery)	Consultant, Contractor, SO	JKR.PK (0).04-SKA.1 (Mock Up)	Inform SO if any discrepancy occurs
2	Material Delivery	check material at random	• Ensure only approved items are delivered at site as specified in the contract document. • Items should be kept unexposed for long before installation process commences. • Reject all damage items and items that does not confirm to specifications. • Handling & storage of roofing sheets / tiles / related items shall comply to the approved Method Statement	visual	delivery stages	Consultant, Contractor, SO	Sample size must be same as propose material and stored properly in site office	Inform SO if any discrepancy occurs
3	Installation	Approved installer and Certified by roof Supplier	• Finishing - No stain marks shall be visible - Finishing shall be in good paint works • Falls - Roof fall shall look smooth with no tool marks - Even and level especially no potential in stripping - Falls in right direction • Physical Damage - No visible damage / defects eg. cracks, chip, etc - Joint / Sealant / Alignment shall be consistent, neat and aligned - Inspect exterior for continuity of roof covering, deterioration of fascias, gutters and soffits; and performance of flashings - Inspect interior finishes (ceilings and walls) for signs of water penetration, and structural distress • Chockage / Ponding - No sign of chockage or ponding • Construction - No sign of leaking - Proper dressing for protrusion if any - Neat and secured installation of fixtures	visual	ALL	Consultant, Contractor, SO	Acquire calculation endorsement for roof system from structural engineer . The result of installation must be in accordance with the supplier's standard requirements	Inform SO if any discrepancy occurs Refer back to the manufacturer's requirements
4.	Flat / Membrane Roof / water proofing installation.	Ponding test as per audit check list.	• No leaks or damp patches show on soffit • No blisters shall be on the roof (either broken or not), which may allow water to enter the roof • Look for depressions around vent pipes where water can collect and begin leaking through cracks in the surface. • No gap / separations of flashing by the parapet that rings the flat roof • Surface to level to avoid tripping • Proper dressing for any protrusion • Openings to be sealed to prevent pest invasion • Clean and no stain marks • No bubbles shall appear on the membrane surface • To ensure overlapping of membrance as per supplier's requirement • Ponding on flat roof shall be not more than 3mm high	visual & spirit level (to determine roof fall)	ALL	Consultant, Contractor, SO	The result of installation must be in accordance with the supplier's standard requirements.	Inform SO if any discrepancy occurs Refer back to the manufacturer's requirement

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TRADE : ROOF COVERING

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
5.	Sloped Roof Installation	audit check list	• All purlins are in the right level and none is out of line (structure tolerance shall meet roofing manufacturer recommendation) • Final coating of paint has been applied to roof structural members • Layers of insulation shall as specified in contract document, approved construction/shop drawings or other relevant documents. • Thickness (BST) of metal roofing sheet shall as specified in contract document, approved construction/shop drawings or other relevant documents. • Roof tiles in alignment • Roof tiles shall be nailed or screwed as recommended by manufacturer • Openings to be sealed to prevent pest invasion • Consistent colour tone • Proper dressing for any protrusion	visual	ALL	Consultant, Contractor, SO	JKR.PK (0).04-5 (Mock Up) Refer to manufacturer's requirements Refer to construction drawings	Inform SO if any discrepancy occurs
6	Roof Features - Fascia - Soffit - Flashing - Gutters / Drains / RWDP - Skylights - Vents - Others	Audit check list.	• No ponding and chokage • No cracks, chips and any other visible damage • RWDP inlet shall be lower than the surrounding gutter invert level • Gutter and RWDP inlet to be covered to prevent chokage where practical • Clean and no cement stains • No physical damage of all roof flashing and the flashing around vent stacks, roof edges, dormers, and skylights. • To ensure flashing has been installed as specified in contract documents, approved construction/ shop drawings or other relevant documents.	visual	ALL	Consultant, Contractor, SO	• JKR.PK (0).04-5 (Mock Up) • Refer to manufacturer's requirements • Refer to construction drawings	Inform SO if any discrepancy occurs

TRADE : PAINTING WORKS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Submit sample / catalogue / colour scheme proposal	catalog / shop drawing / sirim cert. / sample material	• Submit at least one month from commencement of building works with client's approval • As specified in contracts document • To ensure only specified or equivalent paint are submitted for approval	Colour scheme	once before delivery At least one month before installation	Consultant, Contractor, SO Client	JKR.PK (0).04-SKA.6 (Mock Up) Sample size must be same as propose material and stored properly in site office	Inform SO if any descrepency occurs Obtain client's approval
2.	Material delivered to site	Random check	• As specified in contract document and as per approved proposal	visual	ALL	Consultant, Contractor, SO	Material must be same as proposed material and stored properly at site	Refer to approved material document
3.	Wall / surface preparation	Random check	• Make sure all surfaces are clear from dirt, smoothly plastered and completely dry	visual	ALL	Consultant, Contractor, SO	Surface preparation must be checked and certified for approval by specialist	Refer to method statement from product manufacturer
4.	Site readiness	Random check	• Other construction works overlapped are well planned on site to avoid conflict • No other site activity to take place near painting area to disrupt painting quality	visual	ALL	Consultant, Contractor, SO	Refer to CPM for wall area that is ready for painting works	Subjected to judgment of SO whether site is ready or not

TRADE : PAINTING WORKS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
5.	Apply base coat	Random check	• To make sure wall surface is free from unevenness • Make sure base coat applied is as specified in contract document	visual	ALL	Consultant, Contractor, SO	Mock Up/sample of minimum 9m2 (3m width x 3m height) done by contractor shall be supplied to SO for approval	Subjected to judgment of SO whether mock up/sample is of acceptable quality or not
6.	Applying paint	Approved applicator and Certified by Paint Supplier	• To make sure walls are coated with 2 layers of emulsion acrylic paint for internal, and weather resistance acrylic paint with anti fungus for external • Paint must be in good condition, maintenance free with good aesthetics, APEO free (alkylphpnol ethoxylate) and low VOC (volatile organic compound) with green label by SIRIM • Minimum 5 years warranty	visual / certification	ALL	Consultant, Contractor, SO	Mock Up/sample of minimum 9m2 (3m width x 3m height) done by contractor shall be supplied to SO for approval Painting job must be done by specialist if necessary	Subjected to judgment of SO whether mock up/sample is of acceptable quality or not

TRADE : SANITARY WARE & FITTINGS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Submit sample / catalogue / shop drawing / method statement for approval and prepared mock up at site.	catalog / shop drawing / sirim cert. / sample material	• Submit at least one month from commencement of building works • As specified in contracts document • To ensure only specified item submitted for approval	shop drawing / certified material.	ONCE BEFORE DELIVERY	Consultant, Contractor, SO	JKR.PK (0).04-SKA.9 (Mock Up)	Inform SO if any discrepancy occurs
2	Site Readiness / Storage material	Random check	• Other construction works overlapped are well planned on site to avoid conflict • No other site activity to take place near painting area to disrupt painting quality	visual	ALL	Consultant, Contractor, SO	Refer to CPM for areas that are ready for sanitary ware and fittings installation	Subjected to judgment of SO whether site is ready or not
3	Check material that is sent to site.	Random check	• To check prior to fabrication of any deviation to the specified size and report to the SO • As stated in the specification	visual	ALL	Consultant, Contractor, SO		
4	Sanitary ware & Fittings installation	Random check	Check the sanitary installation as per construction drawings and for each space: - Installation technique as per approved mock-up.	visual	ALL	Consultant, Contractor, SO	Check according to approved specification and approved drawing	Inform SO if any discrepancy occurs
5	Sanitary after the installation	Audit check list before hand over	• As specified in contract document and method statement.	visual	ALL	Consultant, Contractor, SO	Check according to requested specialist's standards	Inform SO if delivery of installation is unsatisfactory

TRADE : INTERIOR, SIGNAGE AND GRAPHIC

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Submit sample / catalogue / colour scheme proposal	catalog / shop drawing / sirim cert. / sample material	• Submit within '6' month before installation of works. • As specified in contracts document • To ensure only specified or equivalent materials are submitted for approval	mock-up / sample	6 months before the completion work	Consultant, Contractor, SO	JKR.PK (0).04-SKA.10 (Signage & Graphic) and JKR.PK (0).04-SKA.11 (Interior)	Inform SO if any discrepancy occurs
2.	Factory visit / Fabricate material in factory / in situ / Mock – up for Furniture and signage.	Random Check / material	• Inspection the materials used and fabricate at factory • As specified in contract document and as per approved proposal • Mock – up for Furniture, signage and others related.	visual	3 months before the completion work	Consultant, Contractor, SO		
3.	Site readiness	Random check	• To make sure all materials delivered in good condition/inspect the materials on site. • Make sure the site is ready / clear for major work • Measured the site area to be constructed.	visual	All Stages	Consultant, Contractor, SO	Refer to CPM for areas that are ready for interior signages and graphic installation	Subjected to judgment of SO whether site is ready or not
4.	Material delivered to site / site preparation / confirms I.D works dimension.	Random check / Lab test	• To make sure all material approved delivered as specified and approve contract document. • Provide protection and secured storage.	lab cert / visual	All Stages	Consultant, Contractor, SO		
5.	Site Preparation	Random check	• Make sure the site is ready / clear for major work. • Measured the site area to be constructed.	visual	All Stages	Consultant, Contractor, SO		
6.	Installation materials	Random check	• To make sure all materials in good condition / inspect the material on site. • Check mortar / glue / carcass thickness in ID works and related works. • As specified in contract document	visual	All Stages	Consultant, Contractor, SO	Check according to approved specification and approved drawing	Inform SO if any discrepancy occurs
7.	Site Inspection	Audit check list construction	• As specified in contract document and installations guideline.		All Stages	Consultant, Contractor, SO	Check according to requested specialist's standards	Inform SO if delivery of installation is unsatisfactory

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

TRADE : SOFTSCAPE WORKS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Nursery visit	Approval of selected plant	• Check the specifications • Visit nursery and mark all selected plants with paint • Only select good quality plants	visual	Once before delivery	Consultant, Contractor, SO	JKR.PK (0).04-SKA.13 (Mock Up)	Inform SO if any discrepancy occurs
2.	Material Delivery	Randomly check the type, size and height of plants	• Ensure only approved and marked plants are delivered at site as specified in the contract document • Plants should be stored at shed or temporarily covered nursery • Plants should not be left under the sun on site more than 2 days. • Reject all damaged or unhealthy plants	visual / measurement tools	Delivery stages	Consultant, Contractor, SO		
3.	Planting preparation	Random check	• Ensure all holes are excavated as per specified in the drawing and left for one week to eliminate fungus and parasites. • Ensure soil mixture is from ratio of 3 topsoil : 1 organic compound.	visual	All	Consultant, Contractor, SO		
4.	Planting process	Random check	• For palms, make sure all fronds are tied to avoid moisture loss. • Water immediately after planting • Ensure mulching and stakes are provided as per detail drawing provided.	visual	All	Consultant, Contractor, SO		
5.	Maintenance	Audit Check List	• Ensure all plants are watered twice a day and fertilize fortnightly for first six months.	visual	All	Consultant, Contractor, SO		
			• Check and ensure all dead and unhealthy plants are replaced.	visual	All	Consultant, Contractor, SO		

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

TRADE : HARDSCAPE WORKS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Submit sample / catalogue / colour scheme proposal	catalogue/sample/color scheme/certificate	• Check the specifications as per detail drawing. • Inspect site to check any underground utility to be relocated • Check soil condition suitable to cater the design load • Prepare tools and material to execute work	Visual	Once before delivery	Consultant, Contractor, SO	JKR.PK (0).04-SKA.12 (Mock Up)	Inform SO if any discrepancy occurs
2.	Material Delivery	Random check	• Ensure only approved hardscape items are delivered at site as specified in the contract document. • Items should be kept unexposed for long before installation process commences. • Reject all damage items and items that does not conform to specifications.	Visual	All	Consultant, Contractor, SO		
3.	Excavation/Base preparation	Random check	• Ensure all surfaces are flexible, withstanding loads from traffic,wear & weather. • 100mm to 300mm of soil is first removed for the area. • Proper treatment of the underlaying soil & base as per detail drawing. • Ensure subsoil is compacted using a vibrating plate compactor. • Crushed rock aggregate is added & compacted thoroughly. • Additional aggregate is added & compacted to the required level. Installation of a bed of sand & screeded level.	Visual / measurement tools	All	Consultant, Contractor, SO		
4.	Installation	Random check	• Install approved hardscape paver pattern & sand swept in the joints. • Joints between pavers are filled with sand. • Ensure the plate compactor is used over the surface & additional sand is brushed in until all joints are completely filled • Ensure a sealant is applied to the surface after cleaning.	Visual	All	Consultant, Contractor, SO		
5.	Maintenance	Audit Check List	• Clean and treat hardscape if necessary	Maintenance checklist	All	Consultant, Contractor, SO		

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

TRADE

8.1 Rigid Pavement (new trade)

8.2 Flexible Pavement (new trade)

TRADE : RIGID PAVEMENT WORKS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQIUREMENT	TOOL/ EQIUPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Material							
	a. Concrete	Concrete Properties : i) Strength (cube test)	 At least grade 40 As per drawing/BQ	Visual, testing and measurement	As per requirement	Project Manager/ Contractor	Inspection Form/Certificate	
	b. Reinforcement bar	Reinforcement bar	Y type As Per drawing	Visual, testing and measurement	As per requirement	Project Manager/ Contractor	Inspection Form/certificate	
	c. BMC	BMC	At least R6 As per drawing					
	d. Concrete Testing	Flexural Strength Test	BS 1881: 1952 One group of 6 test beams is to be made for every 450 cubic metres of concrete produced 2 nos for 7 days and 4 nos for 28 days	Visual, testing and measurement	As per requirement	Project Manager/ Contractor	Inspection Form/certificate	
	e. Sealant Joint	Physical Requirements for Preformed Elastic Joint Sealer	BS 2752 ASTM D-2628	Visual, testing and measurement	As per requirement	Project Manager/ Contractor	Inspection Form/certificate	
	f. Finishing Surface Accuracy	PQC Surface	At 3m straight-edge placed anywhere in any direction on the surface, these is not to be a gap greater than 3mm between the bottom of the straight-edge and the surface of the pavement anywhere along the straight-edge.	Visual, testing and measurement	As per requirement	Project Manager	Inspection Form	
2	Surface regularity	Airfield Pavement Roughness	Survey area 3.05 m to 5.22m from runway centre line Boeing Bump Index (BBI) value below 1.0 AC 150/5380-9	Visual, testing and measurement	As per requirement	Project Manager/ Contractor	Inspection Form	

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TRADE : FLEXIBLE PAVEMENT WORKS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQIUREMENT	TOOL/ EQIUPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Material		M.S 30					
	a. Course Aggregate	Course Aggregate Properties: i) Abrasion Loss Los Angeles	 Not more than 30%	Visual, testing and measurement	As per requirement	Project Manager/ Contractor	Inspection Form/test result	
		ii) Water Absorption	Not more than 2%					
		iii) Flakiness Index	Not more than 30%					
		iv) 5 cycles Sodium Sulphate Soundness test,wt loss	Not more than 12% AASHTO T 104					
	b. Fine Aggregate	Fine Aggregate Properties: i) 5 cycles Sodium Sulphate Soundness test,wt loss	 Not more than 12% AASHTO T 104	Visual, testing and measurement	As per requirement	Project Manager/ Contractor	Inspection Form/test result	
		ii) Water Absorption	Not more than 2%					
	c. Filler	Fine Aggregate Properties: i) Aggregate fraction passing the No.200. B.S sieve	Not less than 60% passing	Visual, testing and measurement	As per requirement	Project Manager/ Contractor	Inspection Form/test result	

Nota : ITP ini adalah untuk memberikan panduan kepada SO/PP sebagai perancangan penyediaan ITP yang bersesuaian dengan kontrak yang berkaitan.

TRADE : FLEXIBLE PAVEMENT WORKS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQIUREMENT	TOOL/ EQIUPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1 (Con't)	d. Bitumen	Bitumen Properties: i) Penetration at 25˚ ii) Softhening Point ˚C iii) Solubility in Trichloroethylene % wt.* iv) Ductility at 25 ˚C 5 cm per min. (cm) v) Flash point Cleveland open cup ^{o}C vi) Retained penetration after thin-film oven test % ** or vii) Loss on heating % ** viii) Drop in penetration after heating %	 Min 80 and max 100 ASTM D5 Min 45 and max 52 ASTM 36 Min 90 ASTM D2042 Min 100 ASTM D113 Min 225 ASTM D92 Min 47 ASTM D1754 Max 0.5 ASTM D6 Max 20 ASTM D6/D5	Visual, testing and measurement	As per requirement	Project Manager/ Contractor	Inspection Form	* Carbon disulphide may be used in place of the trichloroethylene ** The choice shall be subjected to agreement betweenr the purchaser and the vendor
	e. Tack Coat Grade RS-1K or RS-2K	Spraying rate	Spray at a rate of 1.85 to 2.75 m2 per litre	Visual, testing and measurement	As per requirement	Project Manager	Inspection Form	
	f. Prime coat SS-1K	Spraying rate	Spray at a rate of 0.5 to 1.0 litre per m2	Visual, testing and measurement	As per reqiurement	Project Manager	Inspection Form	
	g. Finishing Surface Accuracy	Wearing Course	At 3m straight-edge placed anywhere in any direction on the surface, these is not to be a gap greater than 3mm between the bottom of the straight-edge and the surface of the pavement anywhere along the straight-edge.	Visual, testing and measurement	As per requirement	Project Manager	Inspection Form	

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TRADE

9.1 Fender (new trade)

9.2 Bollard (new trade)

9.3 Cathodic Protection (new trade)

9.4 Revetment (new trade)

9.5 Steel Pontoon (new trade)

KERJA MARIN

TRADE : FENDER

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Approval of material and types	Visual inspection and manufacturer records (inclusive of testing reports, technical data sheet, product catalogue and certificate)	Section 8 (fender) - JKR Marine Specs - Characteristics performance shall meet requirements indicated in the drawing - Deflection curve - Fender Performace Testing : Compression Test at the speed of 2 - 8 cm/min. The result from 2nd & 3rd compression cycle shall be less than the permitted maximum reaction and more than the permitted minimum energy absorption. - Sampling shall be 1 for each 10 Fenders.	Construction Drawing	Factory visit	COW/ Site Engineer / Designer	Certification by manufacturer & measurement	
2	On site visual inspection and handling	Prior commencement of work	Section 8 (fender) -JKR Marine Specs - Visual inspection and manufacturer records (inclusive of testing reports, technical data sheet, product catalogue and certificate) - Tolerance of Fender's Dimension : Length, Width & Height +4%,-2%. - Tolerance of Bolt Holes : Diameter & Pitch ± 3mm. Borang Pemeriksaan Fender dan Bollard - Borang JKR.PK(O).04-SKC.MT.9A (Peringkat Penerimaan)	camera, tape, Construction Drawing	upon delivery at site	COW/ Site Engineer	Delivery Order, Photographs & measurement	
3	Installation of fender	Prior commencement of work	Section 8 (fender) -JKR Marine Specs & Construction drawing (fender type, model and rubber grade, accessories type, sizes, lengths) Borang Pemeriksaan Fender dan Bollard - Borang JKR.PK(O).04-SKC.MT.9B (Semasa Pembinaan) & 9C (Produk siap)	Camera, tape, Construction Drawing	During installation	COW/ Site Engineer	Photographs, measurement	
4	Guarantee certification		Section 8 (fender) -JKR Marine Specs	-	After Installation	COW/ Site Engineer	As-built drawings & Guarantee certification by manufacturer	

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TRADE : BOLLARD

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Approval of material and types	Visual inspection and manufacturer records (inclusive of testing reports, technical data sheet, product catalogue and certificate)	Section 28 (bollard) - JKR Marine Specs Section 28.2a - Cast steel BS3100:1991 grade "A1" - anchor bolt, nut and washer are stainless steel grade 304	Construction drawing	Factory visit	COW/ Site Engineer	Certification by manufacturer, measurement & construction drawing	
2	On site visual inspection and handling	Prior commencement of work	Section 28 (bollard) -JKR Marine Specs - Visual inspection and manufacturer records (inclusive of testing reports, technical data sheet, product catalogue and certificate) - Allowable tollerance: Dimension ±2% - Allowable diameter of holes for bolt ±2% - Allowable pitch of holes ±4% Borang Pemeriksaan Fender dan Bollard - Borang JKR.PK(O).04-SKC.MT.9A (Peringkat Penerimaan)	Camera, tape, construction drawing	Upon delivery at site	COW/ Site Engimeer	Delivery Order, Photographs & measurement	
3	Installation of bollard	Position of bolt & bollard	Section 28 (bollard) -JKR Marine Specs/ Construction drawing - bolt must clear threads protruding above the nuts - nut and washer seated into the recess in the bollard - bollard body with grade 40/20 concrete Borang Pemeriksaan Fender dan Bollard - Borang JKR.PK(O).04-SKC.MT. 9B (Semasa Pembinaan)	Camera, tape, construction drawing	Before, during and after installation	Site Engineer	Photographs, measurement & construction drawing	
4	Completion of bollard installation	Position of bollard	Section 28 (bollard) -JKR Marine Specs/ Construction drawing Borang Pemeriksaan Fender dan Bollard (Produk siap) - Borang JKR.PK(O).04-SKC.MT.9C	Camera, tape	After Installation	Site Engineer	As-built drawings	

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TRADE : CATHODIC PROTECTION

	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Approval of material	Visual inspection and manufacturer records (inclusive of testing reports, technical data sheet, product catalogue and certificate)	Section 7 (Cathodic Protection) -JKR Marine Specs Section 7.2 NACE RP-01-76, AS 2239, BS7361 Part 1:1991, RP B401	-	Factory visit	COW/ Site Engineer / Designer	Certification by manufacturer	
2	On site visual inspection and handling	Prior commencement of work	Section 7 (Cathodic Protection) -JKR Marine Specs - Visual inspection and manufacturer records (inclusive of testing reports, technical data sheet, product catalogue and certificate) Borang Pemeriksaan Lapisan Pelindungan Kelului dan Katodik -Borang JKR.PK(O).04-SKC.MT. 10A (Peringkat Penerimaan)	camera, tape	Progressively	COW/ Site Engineer	Delivery Order, Photographs & measurement	
3	Installation of Anodes	Prior commencement of work	Section 7 (Cathodic Protection) -JKR Marine Specs - Number of anodes, anode sizes, weight - Coated steel surface located above mudline shall be 20mA/sq.m - Coated steel surface located above mudline and below HWL shall be 65mA/sq.m Borang Pemeriksaan Lapisan Pelindungan Kelului dan Katodik -Borang JKR.PK(O).04-SKC.MT. 10B (semasa Pembinaan)	Camera	During installation	COW/ Site Engineer	Photographs	
4	Testing and Commissioning		Section 7 (Cathodic Protection) -JKR Marine Specs - results testing Borang Pemeriksaan Lapisan Pelindungan Kelului dan Katodik -Borang JKR.PK(O).04-SKC.MT. 10C (Peringkat Siap)	-	After Installation	COW/ Site Engineer	As-built drawings & Certification and report by manufacturer	

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TRADE : REVETMENT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Approval of material							
	a) Geotextile	Visual inspection and manufacturer records (inclusive of testing reports, technical data sheet, product catalogue and certificate)	Section 5 (Revetment) -JKR Marine Specs Section 5.4.1 - ENISO 10319, ENISO 12236, ENISO 12956, EDIN 60500/4, EDIN 60500/7, ISO 9001 certified	-	Factory visit	COW/ Site Engineer	Certificate of compliance by supplier	
	b) Stone (Armour rock)	Visual inspection and manufacturer records (inclusive of testing reports, technical data sheet, product catalogue and certificate)	Section 5 (Revetment) -JKR Marine Specs - weight according to drawing Section 5.7.1 - AASHTO Method T-104	-	Quarry visit	COW/ Site Engineer	Certificate of compliance by supplier	
2	On site visual inspection and handling							
	a) Geotextile	Prior commencement of work	Section 5 (Revetment) -JKR Marine Specs Section 5.4.1 - ENISO 10319, ENISO 12236, ENISO 12956, EDIN 60500/4, EDIN 60500/7, ISO 9001 certified Borang Pemeriksaan Perlindungan Pantai - Borang JKR.PK(O).04-SKC.MT. 12A (Peringkat Penerimaan)	camera, tape	Progressively	COW/ Site Engineer	Delivery Order, Photographs & measurement	
	b) Stone (Armour rock)	Prior commencement of work	Section 5 (Revetment) -JKR Marine Specs Section 5.7- granite Borang Pemeriksaan Perlindungan Pantai - Borang JKR.PK(O).04-SKC.MT. 12A (Peringkat Penerimaan)	camera, tape	Progressively	COW/ Site Engineer	Delivery Order, Photographs & measurement	

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

TRADE : REVETMENT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
3	Installation							
	a) Geotextile	Prior commencement of work	Section 5 (Revetment) -JKR Marine Specs Section 5.6 - min overlap 0.5m (both directions) Borang Pemeriksaan Perlindungan Pantai - Borang JKR.PK(O).04-SKC.MT. 12B (Semasa Pembinaan)	camera, tape Setting Out Plan @ Survey Plan	Progressively	COW/ Site Engineer	Photographs, measurement	
	b) Stone (Armour rock)	Prior commencement of work	Section 5 (Revetment) -JKR Marine Specs Section 5.7- granite - rock weight Borang Pemeriksaan Perlindungan Pantai - Borang JKR.PK(O).04-SKC.MT. 12B (Semasa Pembinaan)	camera, tape Setting Out Plan @ Survey Plan	Progressively	COW/ Site Engineer	Photographs, measurement Check Existing level, platform level and crest level	
4	Completion of installation							
	a) Geotextile	-	Section 5 (Revetment) -JKR Marine Specs Borang Pemeriksaan Perlindungan Pantai - Borang JKR.PK(O).04-SKC.MT. 12C (Peringkat Siap)	-	After Installation	COW/ Site Engineer	As-built drawings & Certification and report by manufacturer	
	b) Stone (Armour rock)	-	Section 5 (Revetment) -JKR Marine Specs Section 5.7- granite - rock gradient, level, revetment dimension,, survey works - Thickness of layer - Arrangement of rock - tolerance layer shall be within 20% of layer thickness Borang Pemeriksaan Perlindungan Pantai - Borang JKR.PK(O).04-SKC.MT. 12C (Peringkat Siap)	camera, tape, diver	After Installation	COW/ Site Engineer	Photographs, measurement, As-built drawings & report by manufacturer	

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

TRADE : STEEL PONTOON

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Approval of plates and sections material	Manufacturer records - testing reports, technical data sheet, and mill certificate)	Section 13 - JKR Marine Specifications	-	Before deivery on site/fabrication yard	Site Engineer	Certification from manufacturer	
2	On site inspection and measurement for verification	Steel plates and sections	Section 13 - JKR Marine Specifications	Calipers	Upon delivery at site/fabrication yard	Technician	Delivery oder	
3	Welding consumable, welders certificates and welding procedure specifications (WPS)	Fabricator record and submission	Section 13 - JKR Marine Specifications	-	Before welding works	Site Engineer	Document submitted by fabricators/ contractor	
4	Non destructive test (NDT) on welds	Welding quality	Section 12 - JKR Marine Specifications	Radiographic (x-ray) equipment	After welding works	Fabricator/Site Engineer	QA/QC report by 3rd party inspector/ laboratory	
5	Air pressure leaking test	Each compartment on every welding joint and mainhole	Section 13 - JKR Marine Specifications	Pressure gauge equipment, soap liquid and torch light	After coating work	Fabricator/Site Engineer	Test report	

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

TRADE

10.1 Air-conditioning System

10.2 Fire Fighting System

10.3 Cold Water System

10.4 Sanitary Plumbing System

10.5 Lift System

10.6 Building Automation System (new trade)

10.7 Kitchen Equipment & Ancillary System (new trade)

10.8 LPG System (new trade)

TRADE : AIR-CONDITIONING SYSTEM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	**Piping**	Material Aceptance	Specification / Contract	Vernier Caliper / Visual / Delivery Order	Upon receiving material	S.O Rep	JKR. PK (O). 04-5 JKR. PK (O). 04-SKM.1-4	JKR. PK (O). 04: Prosedur Pembinaan Dan Penyeliaan Tapak Bina
		Installation (above ground and underground)	Malaysia Standard / British Standard / Specifcation i.e Flange, welding , screw subject to pipe size	-	Section by section	Contractor	JKR. PK (O). 04 JKR. PK (O). 04-SKM.1-4	JKR. PK (O). 04-5: Prosedur Borang Kelulusan Bahan/ Pemeriksaan Mock-Up
		Testing	Pressure test 1.5 working pressure for 48 hrs and pressure drop shall not below 10% from the pressure test	Dial Pressure gauge	Every section	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	JKR. PK (O). 04-SKM.1: Borang Semakan Penyeliaan Kerja Mekanikal.
2.	**Pump**	Material Aceptance	Specification / Contract	Delivery order/ Cataloque	Upon receiving material	S.O Rep	JKR. PK (O). 04-5 JKR. PK (O). 04-SKM 1-4	JKR. PK (O). 04-SKM 2: Borang Pemasangan Kerja Mekanikal.
		Installation	Approved JKR working drawing	-		Contractor	JKR. PK (O). 04 JKR. PK (O). 04-SKM 1-4	JKR. PK (O). 04-SKM 3: Borang Semakan Pengujian dan pentauliahan kerja mekanikal
		Testing	Capasity test - Total head against zero flowrate	Pressure gauge/Pump performance curve	Upon completion installation	JKR and Contractor	JKR. PK (O). 04-SKM 4 dan T&C Form	JKR. PK (O). 04-SKM 4: Borang Pemeriksaan Uji Saksi Pemasangan Kerja Mekanikal
3.	**Ductwork c/w insulation**	Material Acceptance	*Specification / Contract*	Vernier Caliper / template gauge / Delivery Order	Upon receiving material	S.O Rep	JKR. PK (O). 04 JKR. PK (O). 04-SKM 1-4	
	note : Pre-fabricated duct inspection is FAT	Installation	SMACNA, Specification, approved JKR working drawing	Measuring tape,Vernier caliper,knife, torch light, thickness gauge	All various duct sizes	Contractor	JKR. PK (O). 04 JKR. PK (O). 04 - SKM 1-4	
		Testing	Leakage test (ASHRAE), static pressure test (Specification) , condensation test (48 hrs)	Barometer	Upon completion installation	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	

TRADE : AIR-CONDITIONING SYSTEM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
4.	**Switch Board/Wiring** **L-S1 - (Specification for Low Voltage Internal Electrical Installation)**	Material Aceptance	Specification / Contract	Delivery order / Visual	Delivery on site	S.O Rep	JKR. PK (O). 04 JKR. PK (O). 04 - SKM 1-4	
		Installation	Specification (L-S1)	Visual	as per work progress	Contractor	JKR. PK (O). 04 JKR. PK (O). 04 - SKM 1-4	
		Testing	Specification (L-S1)	Clamp, Multi meter , Test pen	Upon completion	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	
5.	**Chiller/Compressor**	Material Aceptance	Specificaton / Contract	FAT	Upon receiving material	S.O Rep	JKR. PK (O). 04 SKM 1-4	(Cont')
		Installation	Manufacturer spesification / Approved JKR Working drawing		Upon plant room completion	Contractor	JKR. PK (O). 04 SKM 1-4	
		Testing	MS / specification / Performance testing	Chiller Control panel, Thermometer, pressure gauge, Visual for condensation	Upon completion of system	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	
6.	**AHU Room**	Material Aceptance	Specificaton / Contract	Visual	Delivery on site	S.O Rep	JKR. PK (O). 04 SKM 1-4	
		Installation	Specificaton / Contract / electrical and cold water requirement, Approved JKR Working Drawing	Visual, measuring tape, Vernier caliper for wall insulation thickness	50% Progress	Contractor	JKR. PK (O). 04 SKM 1-4	

TRADE : AIR-CONDITIONING SYSTEM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
7.	**AHU / FCU**	Material Aceptance	Specificaton / Contract	Delivery order / Visual		S.O Rep	JKR. PK (O). 04 SKM 1-4	
		Installation	Manufacturer recommendation / Standard JKR Mechanical drawing / actual size against space provided, Approved JKR working drawing	Visual & Measuring tape	Upon 75% completion room without front wall / Before ceiling T is constructed	Contractor	JKR. PK (O). 04 SKM 1-4	
		Testing	MS / specification / Performance testing	Anamometer, Tachometer, ammeter/clamp meter	Upon completion installation	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	
8.	**Cooling Tower**	Material Aceptance	Specificaton / Contract	Delivery order / Visual	Before T&C	S.O Rep	JKR. PK (O). 04 SKM 1-4	(Cont')
		Installation	Manufacturer recommendation / Approved JKR working drawing / actual size against space provided	-		Contractor	JKR. PK (O). 04 SKM 1-4	
		Testing	Specification / Performance testing	Tachometer, ammeter/clamp meter	Upon completion installation	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	

TRADE : FIRE FIGHTING SYSTEM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	**Automatic Sprinkler System**							
1.1	**Pump/jockey pump**	Material Aceptance	Specification / Contract	Visual / Delivery Order	Upon receiving material	S.O Rep	JKR. PK (O). 04 SKM 1-4	JKR. PK (O). 04: Prosedur Pembinaan Dan Penyeliaan Tapak Bina
		Installation	Manufacturer specification / Approved JKR Working drawing			Contractor	JKR. PK (O). 04 SKM 1-4	
		Testing	Capacity test - Total head against zero flowrate	Dial Pressure gauge	Upon completion installation	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	JKR. PK (O). 04-5: Prosedur Borang Kelulusan Bahan/ Pemeriksaan Mock-Up
1.2	**Electric motor**	Material Aceptance	Specification / Contract	Visual / Delivery Order	Upon receiving material	S.O Rep	JKR. PK (O). 04 SKM 1-4	JKR. PK (O). 04-SKM.1: Borang Semakan Penyeliaan Kerja Mekanikal.
		Installation	Manufacturer specification / Standard JKR Mechanical drawing	-		Contractor	JKR. PK (O). 04 SKM 1-4	
		Testing	Specification ; ampere, voltage	Clamp meter, volt meter/ multi meter	Upon completion installation and power ready	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	JKR. PK (O). 04-SKM 2: Borang Pemasangan Kerja Mekanikal.
1.3	**Valves , Fittings and switches**	Material Aceptance	Specification / Contract	Visual / Delivery Order	Upon receiving material	S.O Rep	JKR. PK (O). 04 SKM 1-4	JKR. PK (O). 04-SKM 3: Borang Semakan Pengujian dan pentauliahan kerja mekanikal
	(pressure gauge, breeching inlet, sprinkler heads, isolation valves, pressure switch etc)	Installation	Manufacturer specification / Approved working drawing	Visual	as per work progress	Contractor	JKR. PK (O). 04 SKM 1-4	
		Testing	Leak test for valves and fittings.	N/A (Tested once the system has completed)	Upon completion piping installation	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	JKR. PK (O). 04-SKM 4: Borang Pemeriksaan Uji Saksi Pemasangan Kerja Mekanikal
			Functional test for switches					

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

TRADE : FIRE FIGHTING SYSTEM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
2.	**Hose Reel System**	Installation	Specification (L-S1)	Visual	as per work progress	S.O Rep	JKR. PK (O). 04 SKM 1-4	
		Installation	Approved working drawing	-	when space and pipe ready	Contractor	JKR. PK (O). 04 SKM 1-4	
		Testing	Functional ; open and close	-	Upon installation completed	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	
2.2.	**Pump**	Material Aceptance	Specification / Contract	Visual / Delivery Order	Upon receiving material	S.O Rep	JKR. PK (O). 04 SKM 1-4	
		Installation	Manufacturer specification / Approved working drawing			Contractor	JKR. PK (O). 04 SKM 1-4	
		Testing	Capacity test - Total head against zero flowrate	Dial Pressure gauge	Upon completion installation	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	(Cont')
2.3	**Rubber Hose**	Material Aceptance	Specification / Contract	Visual / Delivery Order	Upon receiving material	S.O Rep	JKR. PK (O). 04 SKM 1-4	
		Installation	Manufacturer specification / Approved working drawing			Contractor	JKR. PK (O). 04 SKM 1-4	
		Testing	Specification / Contract	Visual	Upon completion installation	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	
2.4	**Water Tank**	Material Aceptance	Specification / Contract	Visual / Delivery Order		S.O Rep	JKR. PK (O). 04 SKM 1-4	
		Installation	Manufacturer specification / Approved working drawing	Vernier Caliper	Upon completion installation	Contractor	JKR. PK (O). 04 SKM 1-4	
		Testing	Specification / Contract- Visual Leak test	-		JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	

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TRADE : FIRE FIGHTING SYSTEM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
3. 3.1	**Wet Riser/Dry Riser System** **Pump**	Material Aceptance	Specification / Contract	Visual / Delivery Order	Upon receiving material	S.O Rep	JKR. PK (O). 04 SKM 1-4	
		Installation	Manufacturer specification / Approved working drawing			Contractor	JKR. PK (O). 04 SKM 1-4	
		Testing	Capacity test - Total head against zero flowrate	Dial Pressure gauge	Upon completion installation	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	
3.2	**Valves , Fittings and switches** **(pressure gauge, breeching inlet, landing valve, isolation valves, pressure switch , Alarm gong)**	Material Aceptance	Specification / Contract	Visual / Delivery Order	Upon receiving material	S.O Rep	JKR. PK (O). 04 SKM 1-4	(Cont')
		Installation	Manufacturer specification / Approved working drawing	Visual		Contractor	JKR. PK (O). 04 SKM 1-4	
		Testing	Leak test for pipe , fittings and functional	N/A		JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	
4.	**Fire Suppression System** **(Gas cylinder , Discharge nozzle, detector)**	Material Aceptance	Specification / Contract	Visual / Delivery Order	Upon receiving material	S.O Rep	JKR. PK (O). 04 SKM 1-4	
		Installation	Manufacturer specification / Approved working drawing	Measuring tape for nozzle distance	as per work progress	Contractor	JKR. PK (O). 04 SKM 1-4	
		Testing	Specification / Contract- Test until intermittant alarm and fire curtain drop down	Dummy test	Once	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

TRADE : FIRE FIGHTING SYSTEM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
5.	**Fire Alarm System**							
	Fire Alarm Panel , detector, alarm bell, sounder, manual call point and all accessories	Material Aceptance	Specificaton / Contract	Visual / Delivery Order	Upon receiving material	S.O Rep	JKR. PK (O). 04 SKM 1-4	
		Installation	Manufacturer specification / Approved working drawing	Visual	Upon plant room completion	Contractor	JKR. PK (O). 04 SKM 1-4	
		Testing	MS / specification / Performance testing	Multimeter, Test pen		JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	
6.	**Pipeworks And Fittings**	Material Aceptance	Specificaton / Contract	Visual / Delivery Order	Upon receiving material	S.O Rep	JKR. PK (O). 04 SKM 1-4	(Cont')
		Installation	Specificaton / Contract / Approved working drawing	Vernier caliper	as per work progress	Contractor	JKR. PK (O). 04 SKM 1-4	
		Testing	Specification- pressure test 1.5 from working pressure	Pressure gauge	Every section	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	
7.	**Electrical Works**	Material Aceptance	Specificaton / Contract	Visual / Delivery Order	Upon receiving material	S.O Rep	JKR. PK (O). 04 SKM 1-4	
	(Control panel / switchboard, wiring)	Installation	Specification, L-S1	Visual	Upon space ready	Contractor	JKR. PK (O). 04 SKM 1-4	
		Testing	L-S1	Clamp meter, multi meter, Test pen	Upon completion installation	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

TRADE : COLD WATER SYSTEM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Pipeworks And Fittings	Material Acceptance	Specificaton / Contract	Proof of document	Upon storage facility provided	S.O Rep / C.O.W	JKR. PK (O). 04-SKM 1-4	JKR. PK (O). 04: Prosedur Pembinaan Dan Penyeliaan Tapak Bina
	(Valves, Joints, Pipe Supports & Sleeves)	Installation	Specificaton / Contract / Approved Working Drawing	Proof of document / Manufacturer Recommendation / Method Statement	During Installation / Section by section	Contractor	JKR. PK (O). 04-SKM 1-4	JKR. PK (O). 04-5: Prosedur Borang Kelulusan Bahan/ Pemeriksaan Mock-Up
		TESTING: Pressure test	Specification - pressure test 1.5 from working pressure	Dial pressure gauge	Upon completion of pipeworks / Every section	JKR and Contractor	JKR. PK (O). 04-SKM 4 dan T&C Form	JKR. PK (O). 04-SKM.1: Borang Semakan Penyeliaan Kerja Mekanikal.
2	Domestic & Suction Tank	Material Acceptance	Specificaton / Contract	Proof of document	Upon storage facility provided	S.O Rep / C.O.W	JKR. PK (O). 04-SKM 1-4	JKR. PK (O). 04-SKM 2: Borang Pemasangan Kerja Mekanikal.
	(Water Tank Material, Tank Components & Accessories i.e: overflow & warning pipe, access manhole, level indicator and etc. & Water Tank Foundation)	Installation	Specificaton / Contract / Approved Working Drawing	Proof of document / Manufacturer Recommendation / Method Statement	Upon plinth / support ready	Contractor	JKR. PK (O). 04-SKM 1-4	JKR. PK (O). 04-SKM 3: Borang Semakan Pengujian dan pentauliahan kerja mekanikal
		TESTING: Leak test	Specification / Contract	Visual, Leak detector	Upon completion of pipeworks	JKR and Contractor	JKR. PK (O). 04-SKM 4 dan T&C Form	JKR. PK (O). 04-SKM 4: Borang Pemeriksaan Uji Saksi Pemasangan Kerja Mekanikal

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : COLD WATER SYSTEM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
3	Booster Pumps System & Hydropneumatic System	Material Acceptance	Specificaton / Contract: 1. *Single / multi stage centrifugal type*	Proof of document / Manufacturer Recommendation / Method Statement	Upon storage facility provided	S.O Rep / C.O.W	JKR. PK (O). 04-SKM 1-4	
	(Pumps, Controller & Devices, Electrical Works, Pipes, Fittings & Valves, Support Base & Pneumatic Tank)	Installation	Specificaton / Contract / Approved Working Drawing: 1. *The plinth shall raise the pumps to at least 6 inch*	Manufacturer Recommendation / Approved Working Drawing	During Installation	Contractor	JKR. PK (O). 04-SKM 1-4	
		TESTING: Capacity test - Total head against zero flowrate	Specification / Contract	Dial pressure gauge	Upon completion the whole system	JKR and Contractor	JKR. PK (O). 04-SKM 4 dan T&C Form	

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : SANITARY PLUMBING SYSTEM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Pipeworks And Fittings	Material Aceptance	Specificaton / Contract	Proof of document	Upon storage facility provided	S.O Rep / C.O.W	JKR. PK (O). 04-SKM 1-4	JKR. PK (O). 04: Prosedur Pembinaan Dan Penyeliaan Tapak Bina
	(PVC-U Soil, Waste Pipe, Vent Pipe, Pipe Supports & Expansion Joints)	Installation	Specificaton / Contract / Approved Working Drawing	Proof of document / Manufacturer Recommendation / Method Statement	During Installation / Section by section	Contractor	JKR. PK (O). 04-SKM 1-4	JKR. PK (O). 04-5: Prosedur Borang Kelulusan Bahan/ Pemeriksaan Mock-Up
		TESTING: Air Test, Water Test, Performance Test	Specification / Relevant British Standard	Relevant meter and gauge	Upon completion of pipeworks / Every section	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	JKR. PK (O). 04-SKM.1: Borang Semakan Penyeliaan Kerja Mekanikal.
2	Grease Interceptors / Waste Drain Trap	Material Aceptance:	Specificaton / Contract: 1. *The body of the interceptor & baffles shall be made of stainless steel material grade 316*	Proof of document	Upon storage facility provided	S.O Rep / C.O.W	JKR. PK (O). 04-SKM 1-4	JKR. PK (O). 04-SKM 2: Borang Pemasangan Kerja Mekanikal.
		Installation	Specificaton / Contract / Approved Working Drawing	Proof of document / Manufacturer Recommendation / Method Statement	Upon completion of pipeworks	Contractor	JKR. PK (O). 04-SKM 1-4	JKR. PK (O). 04-SKM 3: Borang Semakan Pengujian dan pentauliahan kerja mekanikal
		TESTING: Visual Leak test / Flow Test	Specification / Relevant British Standard	Visual	Upon completion the whole system	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	JKR. PK (O). 04-SKM 4: Borang Pemeriksaan Uji Saksi Pemasangan Kerja Mekanikal

Nota : ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan.

TRADE : LIFT SYSTEM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Lift machine (motor, sheave, brake)	Material acceptance	Specification / Contract	Visual / Proof of document	Upon storage facility provided	S.O Rep / C.O.W	JKR. PK (O). 04-5	JKR. PK (O). 04: Prosedur Pembinaan Dan Penyeliaan Tapak Bina
		Installation	Specification by manufacturer / Contractor Approved working drawing	Visual	Upon Lift Motor Room ready	Contractor	JKR. PK (O). 04-SKM 1-4	
2	Speed governor (steel rope, safety gear)	Material acceptance	Specification / Contract	Visual / Proof of document / Digital Vernier caliper	Upon storage facility provided	S.O Rep / C.O.W	1) JKR. PK (O). 04-SKM 1 -4 2) certificate of origin	JKR. PK (O). 04-5: Prosedur Borang Kelulusan Bahan/ Pemeriksaan Mock-Up
		Installation	Specification by manufacturer / Contractor Approved working drawing	Visual	Upon Lift Motor Room ready	Contractor	JKR. PK (O). 04-SKM 1 - 4	
3	Lift car (ventilation fan, lighting, COP, load weighing device, automatic self levelling device, finishes & flooring)	Material acceptance	Specification / Contract: 1. *Highest button < 1.4m.*	Visual / Proof of document	Upon storage facility provided	S.O Rep / C.O.W	JKR. PK (O). 04-SKM 1 -4	JKR. PK (O). 04-SKM.1: Borang Semakan Penyeliaan Kerja Mekanikal.
		Installation	Specification / Approved working drawing:	Visual / measuring tape	Upon lift shaft ready	Contractor	JKR. PK (O). 04-SKM 1 - 4	JKR. PK (O). 04-SKM 2: Borang Pemasangan Kerja Mekanikal.
4	Car door/Landing door (fire rating) (hall lantern, indicator, door sill, effective locking device, beam detector sensor/safety edge)	Material acceptance	Specification / Contract: 1. *Architraves colour to be selected by SO*	Visual / Proof of document	Upon storage facility provided	S.O Rep / C.O.W	JKR. PK (O). 04-SKM 1 - 4	JKR. PK (O). 04-SKM 3: Borang Semakan Pengujian dan pentauliahan kerja mekanikal
		Installation	Specification / Approved working drawing: 1. Lobby floor to slope away from lift well at gradient 1:10	Visual / spirit level / digital vernier caliper	Upon lift shaft ready	Contractor	JKR. PK (O). 04-SKM 1 - 4	

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TRADE : LIFT SYSTEM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
5	Guide rail (Fastening, guide shoes)	Material acceptance	Specification / Contract: 1. *Solid steel rails of "T" section*	Visual / Proof of document / measuring tape	Upon storage facility provided	S.O Rep / C.O.W	JKR. PK (O). 04-SKM 1 -4	
		Installation	Specification / Approved working drawing: 1. Minimum distance between fishplate & guide rail bracket = 200mm	Visual / measuring tape / plumb line	Upon lift shaft ready	Contractor	JKR. PK (O). 04-SKM 1 -4	JKR. PK (O). 04-SKM 4: Borang Pemeriksaan Uji Saksi Pemasangan Kerja Mekanikal
6	Wire ropes (Suspension ropes, compensating ropes)	Material acceptance	Specification / Contract: 1. *Suspension ropes: comply BS329*	Visual / Proof of document / Vernier caliper	Upon storage facility provided	S.O Rep / C.O.W	JKR. PK (O). 04-SKM 1 -4	
		Installation	Manufacturer recommendation / Specification / Approved working drawing: 1. For suspension ropes, not less than 3 ropes per lift car. Diameter not less than 10mm.	Visual / Proof of document / Vernier Caliper	During installation of lift machine	Contractor	JKR. PK (O). 04-SKM 1 -4	
7	Counterweight	Material acceptance	Specification / Contract: 1. *Cast steel and lead free metal*	Visual / Proof of document	Upon storage facility provided	S.O Rep / C.O.W	JKR. PK (O). 04-SKM 1 -4	(Cont')
		Installation	Specification / Approved working drawing: 1. *Clamp by tie rod with lock nut secured by cotter pins at both end*	Visual	Upon lift pit ready & before installation of lift car	Contractor	JKR. PK (O). 04-SKM 1 -4	
8	Buffer	Material acceptance	Specification / Contract	Visual / Proof of document	Upon storage facility provided	S.O Rep / C.O.W	JKR. PK (O). 04-SKM 1 -4	
		Installation	Specification / Approved working drawing: 1. *Located symmetrically with reference to the vertical centre line of car*	Visual / measuring tape	Upon lift pit ready & before installation of lift car	Contractor	JKR. PK (O). 04-SKM 1 -4	
9	Lift controller (Earthing, surge protection, limit switch)	Material acceptance	Specification / Contract: 1. *Microprocessor type*	Visual / Proof of document	Upon storage facility provided	S.O Rep / C.O.W	JKR. PK (O). 04-SKM 1 -4	
		Installation	Specification / Approved Working Drawing	Visual	Upon lift car & lift machine ready	Contractor	JKR. PK (O). 04-SKM 1 -4	

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TRADE : LIFT SYSTEM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
10	Automatic rescue device (wiring, battery & battery charger)	Material acceptance	Specification/Contract	Visual / Proof of document	Upon storage facility provided	S.O Rep / C.O.W	JKR. PK (O). 04-SKM 1 -4	
		Installation	Specification / Approved Working Drawing: 1. *Assembled in an independent box*	Visual	Upon lift car & lift machine ready	Contractor	JKR. PK (O). 04-SKM 1 -4	
11	Electrical switchboard (Isolator, cable, wiring,lighting & surge protector) L-S1 - (Specification for low voltage internal electrical installation	Material acceptance	Specification / Contract: 1. *Switchboard shall be self contained cubicle type, metal* clad, flush fronted	Visual / Proof of document	Upon storage facility provided	S.O Rep / C.O.W	JKR. PK (O). 04-SKM 1 -4	
		Installation	Specification / Electrical regulation & standard, L-S1	Visual	Upon lift car & lift machine ready	Contractor	JKR. PK (O). 04-SKM 1 -4	
12	Central supervisory panel (intercom, buzzer, wiring)	Material acceptance	Specification / Contract	Visual / Proof of document	Upon storage facility provided	S.O Rep / C.O.W	JKR. PK (O). 04-SKM 1 -4	(Cont')
		Installation	Specification / Approved working drawing	Visual	Upon lift car & lift machine ready	Contractor	JKR. PK (O). 04-SKM 1 -4	
13	Ventilation Fan /Air Conditioning for Lift Motor Room	Material acceptance	Specification / Contract	Visual / Proof of document	Upon storage facility provided	S.O Rep / C.O.W	JKR. PK (O). 04-SKM 1 -4	
		Installation	Specification / Approved working drawing	Visual	Upon Lift Motor Room ready	Contractor	JKR. PK (O). 04-SKM 1 -4	
14	Emergency Batery Operated Power Supply (EBOPS)	Material acceptance	Specification / Contract	Visual / Proof of document	Upon storage facility provided	S.O Rep / C.O.W	JKR. PK (O). 04-SKM 1 -4	
		Installation	Specification / Approved working drawing	Visual	Upon lift car & lift machine ready	Contractor	JKR. PK (O). 04-SKM 1 -4	
15	Complete system	TESTING : Power failure test / Fire mode test / Drop test / Functional test / Overload test / Noise Pressure level / Vibration test / Balance test / Insulation test	specification / All relevant BS standards	Visual/ Walkie talkie/Sound level meter / accelerometer / lux meter/ Stop watch/ Dead weight / Insulation resistance tester	Upon completion the whole system	JKR and Contractor	1) NSC - T&C Form; or 2) Contractor (Direct contract) - T & C Form	
		TESTING : Safety contact	Factories & Machinery Act (FMA) 1967	Visual / Walkie talkie	Upon completion the whole system	JKKP (DOSH)	1) PMA Certificate	

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TRADE : BUILDING AUTOMATION SYSTEM (BAS)

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Workstation - Computer, Printer, UPS, Dongle	Material Acceptance	Specification / Contract	Visual / Proof of document	Upon control room provided	S.O Rep	JKR. PK (O). 04 JKR. PK (O). 04-SKM 1-4	JKR. PK (O). 04: Prosedur Pembinaan Dan Penyeliaan Tapak Bina
		Installation	Approved Construction Drawing	Proof of document / Manufacturer Recommendation / Method Statement	During installation / Section by section	Contractor	JKR. PK (O). 04 JKR. PK (O). 04-SKM 1-4	
		Testing	Specification / Contract	Visual / Program	Upon completion the whole system	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	JKR. PK (O). 04-5: Prosedur Borang Kelulusan Bahan/ Pemeriksaan Mock-Up
2	Software - System Architecture, Antivirus	Installation	Approved Construction Drawing / IO point & Program	Proof of document / Manufacturer Recommendation / Method Statement	During installation / Section by section	Contractor	JKR. PK (O). 04 SKM 1-4	
		Testing : Program Interlocking / Interfacing	Specification / Contract / IO point No error / question mark / exclamation mark display	Visual / Program	Upon completion the whole system	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	JKR. PK (O). 04-SKM.1: Borang Semakan Penyeliaan Kerja Mekanikal.
3	Network Controller (NC) / Stand Alone Controller (SAC)	Material Acceptance	Specification / Contract	Visual Proof of document / Manufacture Certificate	Upon storage facility provided	S.O Rep	JKR. PK (O). 04 SKM 1-4	
		Installation	Approved Construction Drawing / IO point & Program	Proof of document / Manufacturer Recommendation / Method Statement	During installation / Section by section	Contractor	JKR. PK (O). 04 SKM 1-4	JKR. PK (O). 04-SKM 2: Borang Pemasangan Kerja Mekanikal.
		Testing : Program Interlocking / Interfacing	Specification / Contract / IO point No error / question mark / exclamation mark display	Visual / Program	Upon completion the whole system	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	JKR. PK (O). 04-SKM 3: Borang Semakan Pengujian dan pentauliahan kerja mekanikal

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

TRADE : BUILDING AUTOMATION SYSTEM (BAS)

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
4	Direct Digital Controller	Material Acceptance	Specification / Contract	Visual Proof of document / Manufacture Certificate	Upon storage facility provided	S.O Rep	JKR. PK (O). 04 JKR. PK (O). 04SKM 1-4	
		Installation	Approved Construction Drawing / IO point & Program	Proof of document / Manufacturer Recommendation / Method Statement	During installation / Section by section	Contractor	JKR. PK (O). 04 JKR. PK (O). 04-SKM 1-4	JKR. PK (O). 04-SKM 4: Borang Pemeriksaan Uji Saksi Pemasangan Kerja Mekanikal
		Testing : Program Interlocking / Interfacing	Specification / Contract / IO point No error / question mark / exclamation mark display	Visual / Program	Upon completion the whole system	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	
5	Control Device - Sensor & Signaling, Transducer, Switches, Actuator, Relay, Etc.	Material Acceptance	Specification / Contract	Visual Proof of document / Manufacture Certificate	Upon storage facility provided	S.O Rep	JKR. PK (O). 04 JKR. PK (O). 04-SKM 1-4	
		Installation	Approved Construction Drawing / IO point & Program	Proof of document / Manufacturer Recommendation / Method Statement	During installation / Section by section	Contractor	JKR. PK (O). 04 JKR. PK (O). 04-SKM 1-4	
		Testing : Program Interlocking / Interfacing	Specification / Contract / IO point No error / question mark / exclamation mark display	Visual / Program Functional	Upon completion the whole system	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	
6	Cabling And Wiring C/W Conduit, Trunking	Material Acceptance	Specification / Contract	Visual / Caliper Proof of document / Manufacture Certificate	Upon storage facility provided. For Fibre Optic - Special Storage Requirement needed	S.O Rep	JKR. PK (O). 04 JKR. PK (O). 04-SKM 1-4	
		Installation	Approved Construction Drawing Separate conduit / trunking for power and signal cable Identification code / tagging for each cable	Proof of document / Manufacturer Recommendation / Method Statement	During installation / Section by section	Contractor	JKR. PK (O). 04 JKR. PK (O). 04-SKM 1-4	
		Testing : i.e Continuity test	Specification / Contract	Visual / Network Cable Tester	Upon completion the whole system	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

TRADE : BUILDING AUTOMATION SYSTEM (BAS)

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
7	High Level Interfacing	Material Acceptance	Specification / Contract	Visual Proof of document / Manufacture Certificate	Upon storage facility provided	S.O Rep	JKR. PK (O). 04 JKR. PK (O). 04-SKM 1-4	
		Installation	Approved Construction Drawing	Proof of document / Manufacturer Recommendation / Method Statement	During installation / Section by section	Contractor	JKR. PK (O). 04 JKR. PK (O). 04SKM 1-4	
		Testing	Specification / Contract	Visual / Program	Upon completion the whole system	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	(Cont')
8	Control Panel	Material Acceptance	Specification / Contract	Visual Proof of document / Manufacture Certificate	Upon storage facility provided	S.O Rep	JKR. PK (O). 04 JKR. PK (O). 04-SKM 1-4	
		Installation	Approved Construction Drawing	Proof of document / Manufacturer Recommendation / Method Statement	During installation / Section by section	Contractor	JKR. PK (O). 04 JKR. PK (O). 04-SKM 1-4	
		Testing	Specification / Contract	Visual / Program	Upon completion the whole system	JKR and Contractor	JKR. PK (O). 04-SKM.4 dan T&C Form	

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TRADE : KITCHEN EQUIPMENT AND ANCILLARY SYSTEM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Kitchen Equipment e.g. kwali range, deep fryer, frying pan, baine marie, dish washer, water boiler	Material Acceptance	Specification / Contract (Type, Material & Thickness)	Proof of document e.g. Borang Kelulusan Bahan, Delivery Order, Vernier Caliper	Upon storage facility provided	S.O Rep / C.O.W	JKR. PK (O). 04-5 JKR. PK (O). 04 SKM 1-4	JKR. PK (O). 04: Prosedur Pembinaan Dan Penyeliaan Tapak Bina
		Installation	Specification / Contract / Approved Working Drawing	Manufacturer Installation Manual / Method Statement	• First Stage: Upon Completion of Infrastructure • Second Stage: Once Installation Completed	S.O Rep / C.O.W	JKR. PK (O). 04 JKR. PK (O). 04-SKM 1-4	JKR. PK (O). 04-5: Prosedur Borang Kelulusan Bahan/ Pemeriksaan Mock-Up
		Testing : Functional Test	Specification	Visual	Upon completion of works	S.O Rep / C.O.W	JKR. PK (O). 04-SKM.4 dan T&C Form	JKR. PK (O). 04-SKM.1: Borang Semakan Penyeliaan Kerja Mekanikal.
2	Cold Storage System e.g. cold room, freezer, chiller, refrigerator	Material Acceptance	Specification / Contract	Proof of document e.g. Borang Kelulusan Bahan, Delivery Order	Upon storage facility provided	S.O Rep / C.O.W	JKR. PK (O). 04-5 JKR. PK (O). 04 SKM 1-4	JKR. PK (O). 04-SKM 2: Borang Pemasangan Kerja Mekanikal.
		Installation	Specification / Contract / Approved Working Drawing	Manufacturer Installation Manual / Method Statement	• First Stage: Upon Completion of Infrastructure • Second Stage: Once Installation Completed	S.O Rep / C.O.W	JKR. PK (O). 04 JKR. PK (O). 04-SKM 1-4	JKR. PK (O). 04-SKM 3: Borang Semakan Pengujian dan pentauliahan kerja mekanikal
		Testing : Functional Test	Specification	Thermometer	Upon completion of works	S.O Rep / C.O.W	JKR. PK (O). 04-SKM.4 dan T&C Form	JKR. PK (O). 04-SKM 4: Borang Pemeriksaan Uji Saksi Pemasangan Kerja Mekanikal

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TRADE : KITCHEN EQUIPMENT AND ANCILLARY SYSTEM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
3	Kitchen Hood System (Stainless steel hood, Exhaust Fan, Grease Trap, Ducting)	Material Acceptance	Specification / Contract (Type, Material & Thickness)	Proof of document e.g. Borang Kelulusan Bahan, Delivery Order, Vernier Caliper	Upon storage facility provided	S.O Rep / C.O.W	JKR. PK (O). 04-5 JKR. PK (O). 04 SKM 1-4	
		Installation	Specification / Contract / Approved Working Drawing	Manufacturer Installation Manual / Method Statement	• First Stage: Upon Completion of Infrastructure • Second Stage: Once Installation Completed	S.O Rep / C.O.W	JKR. PK (O). 04 JKR. PK (O). 04-SKM 1-4	(Con't)
		Testing : • Functional Test • Flow Test • Noise Level Test	Specification	• Visual • Vane Anemometer • Sounds Level Meter	Upon completion of works	S.O Rep / C.O.W	JKR. PK (O). 04-SKM.4 dan T&C Form	
4	Wet Chemical System (Piping & Nozzle, Detector, Fusible Link, Wet Chemical Cylinder, Controller Panel, Manual Key Switch, Alarm System)	Material Acceptance	Specification / Contract	Proof of document e.g. Borang Kelulusan Bahan, Delivery Order	Upon storage facility provided	S.O Rep / C.O.W	JKR. PK (O). 04-5 JKR. PK (O). 04 SKM 1-4	
		Installation	Specification / Contract / Approved Working Drawing	Manufacturer Installation Manual / Method Statement	Upon completion of Works	S.O Rep / C.O.W	JKR. PK (O). 04 SKM 1-4	
		Testing : • Fire Simulation Test • Fire Alarm Signal Test	Specification	Simulated Heat Sources (e.g. Oxy Torch)	Upon completion of works	S.O Rep / C.O.W	JKR. PK (O). 04-SKM.4 dan T&C Form	

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TRADE : LPG SYSTEM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Storage Tank (Bulk Tank & Cylinder)	Material Acceptance	Specification / Contract / MS 830 & MS 930 / Pendaftaran Mesin Tekanan (PMT)	Proof of document e.g. Borang Kelulusan Bahan, Delivery Order	Upon storage facility provided	S.O Rep / C.O.W	JKR. PK (O). 04-5 JKR. PK (O). 04 SKM 1-4	JKR. PK (O). 04: Prosedur Pembinaan Dan Penyeliaan Tapak Bina
		Installation	Specification /Contract/Approved Working Drawing / Approval To Install (ATI)	Proof of Document / Manufacturer Recommendation / Method Statement	• First Stage: Upon Completion of Infrastructure • Second Stage: Once Installation Completed	SO Rep / Gas Competent Person	JKR. PK (O). 04 SKM 1-4	JKR. PK (O). 04-5: Prosedur Borang Kelulusan Bahan/ Pemeriksaan Mock-Up
		Testing	Pressure at tank as per pressure supply design.	Testing certificate from DOSH	Upon delivery to site.	Contractor (competent)	JKR. PK (O). 04-SKM 4	JKR. PK (O). 04-SKM.1: Borang Semakan Penyeliaan Kerja Mekanikal.
2	Pipeworks and Fittings	Material Acceptance	Specification / Contract	Proof of document e.g. Borang Kelulusan Bahan, Delivery Order	Upon storage facility provided	S.O Rep / C.O.W	JKR. PK (O). 04-5 JKR. PK (O). 04 SKM 1-4	JKR. PK (O). 04-SKM 2: Borang Pemasangan Kerja Mekanikal.
		Installation	Specification /Contract/Approved Working Drawing / Approval To Install (ATI)	Manufacturer Installation Manual / Method Statement	Upon completion of pipe works / Section by section	SO Rep / Gas Competent Person	JKR. PK (O). 04 SKM 1-4	JKR. PK (O). 04-SKM 3: Borang Semakan Pengujian dan pentauliahan kerja mekanikal
		Testing : Leak test	Specification – pressure test 1.5 from working pressure	Dial pressure gauge	Upon completion of pipe works / Section by section	SO Rep / Gas Competent Person	JKR. PK (O). 04-SKM 4 dan T&C Form	JKR. PK (O). 04-SKM 4: Borang Pemeriksaan Uji Saksi Pemasangan Kerja Mekanikal

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

TRADE : LPG SYSTEM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
3	Regulator (1ST & 2ND Stage), Manifold, Valve, Emergency Shut Off Valve, Pressure Gauge, Gas Meter, Gas Detector, Vaporiser, Terminal Outlet	Material Acceptance	Specification / Contract	Proof of document e.g. Borang Kelulusan Bahan, Delivery Order	Upon storage facility provided	S.O Rep / C.O.W	JKR. PK (O). 04-5 JKR. PK (O). 04 SKM 1-4	
		Installation	Specification / Contract / Approved Working Drawing / Approval To Install (ATI)	Manufacturer Installation Manual / Method Statement	Upon completion of pipe works / Section by section	SO Rep / Gas Competent Person	JKR. PK (O). 04 SKM 1-4	
		Testing	No leakage is allowed at any time.	Pressure gauges/ Gas Leak detector	Upon completion of the system.	SO Rep / Gas Competent Person	JKR. PK (O). 04-SKM 4 dan T&C Form	
4	System Level	Testing : • Pressure Drop Test (<10% From Supply Pressure) • Emergency Shut Off Test • Gas Leak Test	Specification / Contract / MS 830 & MS 930 / Approval To Operate (ATO)	Dial pressure gauge	Upon completion of System Installation	SO Rep / Gas Competent Person	JKR. PK (O). 04 SKM 1-4	

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TRADE

11.1 Low Voltage

11.1.1 Electrical Boards

11.1.2 Wiring System & Underground Cable

11.1.3 Lightning Protection System

11.1.4 Standby Generator Set

11.1.5 Road Lighting System

11.2 Extra Low Voltage

1.2.1 PA System

11.3 ICT & Telephone

11.3.1 External Installation For Ict & Telephone

11.3.2 External Installation For Ict: Active Equipment

11.3.3 Internal Installation For Passive Equipment And Ict Room

11.3.4 Internal Installation For Telephone

11.4 Medical Equipment

11.4.1 General Radiography (Outsource)

11.4.2 Examination Light (Outsource)

11.4.3 Surgical Light (Outsource)

11.4.4 Surgical Table (Outsource)

11.5 High Tension System

11.5.1 11kv DRY TYPE TRANSFORMER

11.5.2 HT Switchgear

11.6 Traffic Signal Light (new trade)

LOW VOLTAGE : ELECTRICAL BOARDS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	MSB / SSB / DB / AMF Board / PFC Board	1. Submission for material approval.	1. Shop Drawing. 2. Technical Submittal (i.e: Catalogue, Brand & Model). 3. Contract Document. 4. Specifications (L-S1, L-S2, L-S5, etc). 5. J-MAL.	N/A	Before manufacturing of the boards.	Contractor	JKR.PK(O).04-5 (Borang Pemeriksaan Mock-up)	
		2. Factory Acceptance Test (Routine Test) :			Prior of delivery to the site.			
		a) Visual Inspection.	1. Approved Shop Drawing. 2. Technical Submittal (i.e: Catalogue, Brand & Model). 3. Contract Document. 4. Specifications (L-S1, L-S2, L-S5, etc). 5. J-MAL.	Measuring Devices (Caliper, Measuring Tape, etc.).	Prior of delivery to the site. Once for each board.	Contractor/ S.O Rep	JKR.PK(0).O4-SKE.2B (Borang Pemeriksaan / Ujian Alatan di Kilang) Approved Shop Drawing CKE.ITP.01.23.(00).2011 (Checklist Visual Inspection for FAT of Electrical Boards)	
		b) Functional test.	1. Approved Shop Drawing. 2. Technical Submittal (i.e: Catalogue, Brand & Model). 3. Contract Document. 4. Specifications (L-S1, L-S2, L-S5, etc). 5. J-MAL.	N/A	Prior of delivery to the site. Once for each board.	Contractor	TEST REPORT (Functional Test)	
		c) Pressure Test / Injection Test 2500 VAC. (*Excluded DB)	1. Approved Shop Drawing. 2. Technical Submittal (i.e: Catalogue, Brand & Model). 3. Contract Document. 4. Specifications (L-S1, L-S2, L-S5, etc). 5. J-MAL.	LV Pressure Test Set	Prior of delivery to the site. Once for each board.	Contractor	TEST REPORT (Pressure Test) JKR.PK(O).04-4 (Borang Kalibrasi Peralatan) c/w Calibration Cert.)	
		d) Insulation Resistance Test 1000 VDC. (*Excluded DB)	1. Approved Shop Drawing. 2. Technical Submittal (i.e: Catalogue, Brand & Model). 3. Contract Document. 4. Specifications (L-S1, L-S2, L-S5, etc). 5. J-MAL.	1kV Insulation Resistance Test Set.	Prior of delivery to the site. Once for each board.	Contractor	TEST REPORT Insulation Resistance JKR.PK(O).04-4 (Borang Kalibrasi Peralatan) c/w Calibration Cert.)	
		3. Material on site inspection	1. Design Requirement. 2. Specification (L-S1, L-S2, L-S5, etc). 3. J-MAL.	N/A	Upon delivery to the site. Once for each delivery.	Contractor/ S.O Rep	JKR.PK(0).O4-SKE.2A (Borang Pengesahan Penerimaan Bahan di Tapak) DRAWING (Approved Shop Drawing) REPAIRED DEFECT LIST (from FAT - if applicable)	

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LOW VOLTAGE : ELECTRICAL BOARDS

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
		4. Installation of MSB / SSB / DB / AMF / PFC	1. Approved Shop Drawing. 2. Approved Method Statement. 3. Specification (L-S1, L-S2, L-S5, etc).	N/A	In-progress and upon completion of installation. Once for each board.	Contractor	JKR.PK(0).O4-SKE.4C (Borang Pemeriksaan Pemasangan PSU/PSK/Feeder Pillar) JKR.PK(0).O4-SKE.4D (Borang Pemeriksaan Pemasangan Papan Agihan)	
		5. Installation of Earthing System for LV Board.	1. Approved Shop Drawing. 2. Specification (L-S1, L-S2, L-S5, etc). 3. R < 1 Ohm	Earth Tester.	In-progress and upon completion of installation. Once for each installation.	Contractor	JKR.PK(0).O4-SKE.3B (Pemasangan Elektrod Bumi) JKR.EER (Record of Earth Electrode Resistance Test) JKR.PK(O).04-4 (Borang Kalibrasi Peralatan) c/w Calibration Cert.)	
		6. Inspection of Switch Room	1. Approved Shop Drawing. 2. Specification (L-S1, L-S2, L-S5, etc).	Measuring Devices (Caliper, Measuring Tape, etc.).	In-progress and upon completion of installation. Once for each room	Contractor	JKR.PK(0).O4-SKE.4B (Borang Pemeriksaan Bilik Suis)	
		7. Setting of Protection Relay	Setting value from designer.	Secondary Relay Test Set.	Upon completion of installation for all works at the board. Once for each relay.	Contractor / Competant Person	TEST REPORT (Borang H(JPE) from ST) JKR.PK(O).04-4 (Borang Kalibrasi Peralatan) c/w Calibration Cert.)	
		8. Functional test during Testing & Commissioning Session.	1. Design Requirement. 2. Specification (L-S1, L-S2, L-S5, etc). 3. Functioning.	N/A	Upon completion of other test above. Once for each board.	Contractor	JKR.PK(0).O4-SKE.5B (Borang Pemeriksaan Kefungsian Komponen Elektrik) JKR.PK(0).O4-SKE.6A (Borang Pemeriksaan Pengesahan Pentauliahan)	
		9. RCD Test	1. Design Requirement. 2. Specification (L-S1, L-S2, L-S5, etc). 3. Functioning.	RCCB Tester	Upon completion of DB, wiring and earthing installation. Once for each board.	Contractor	JKR.PK(0).O4-SKE.5A (Borang Pemeriksaan Ujian-Ujian Elektrikal) JKR.RCCB (Record of RCCB Test)	

MSB = Main Switch Board
SSB = Sub Switch Board
DB = Distribution Board
AMF = Automatic Main Failure

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LOW VOLTAGE : WIRING SYSTEM & UNDERGROUND CABLE

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Light Fittings/Fan	1. Submission of material for approval	1. Contract. 2. J-MAL. 3. Specifications (L-S1).	Measuring devices.	Before material delivery at site. Once for each material.	Contractor	JKR.PK(O).04-5 (Borang Pemeriksaan Mock-up)	
		2. Material on site inspection.	1. To conform as per approved material.	Measuring devices.	Upon delivery at site. Once for each delivery.	Contractor / S.O Rep	JKR.PK(O).04-SKE.2A (Borang Pengesahan Penerimaan Bahan)	
		3. Installation of conduit, trunking and accessories.	1. Specification (L-S1).	Measuring devices.	In-progress and upon completion of installation. Once for each zone / section / floor.	Contractor	JKR.PK(O).04-SKE.4A (Borang Pemeriksaan Pemasangan)	
		4. Installation of final circuit wiring.	1. Specification (L-S1).	N/A	In-progress and upon completion of installation. Once for each zone / section / floor.	Contractor	JKR.PK(O).04-SKE.4A (Borang Pemeriksaan Pemasangan)	
		5. Continuity test.	1. R < 1 Ohms.	Insulation & Continuity Tester.	Upon completion of wiring work. Once for each circuit.	Contractor	JKR.PK(O).04-SKE.5A (Borang Pemeriksaan Ujian-ujian Elektrikal) JKR.C&I (Record of Continuity and Insulation Resistance Test)	
		6. Insulation resistance test @ 500Vdc insulation test voltage.	1. R > 2 Mohms.	1. Insulation & Continuity Tester. 2. Insulation Tester.	Upon completion of continuity test. Once for each circuit.	Contractor	JKR.PK(O).04-SKE.5A (Borang Pemeriksaan Ujian-ujian Elektrikal) JKR.C&I (Record of Continuity and Insulation Resistance Test)	
		7. Polarity test.	1. Load connected correctly.	1. Insulation & Continuity Tester.	Upon completion of wiring work. Once for each circuit.	Contractor	JKR.PK(O).04-SKE.5A (Borang Pemeriksaan Ujian-ujian Elektrikal) JKR.POL (Record of Polarity Tset)	

LOW VOLTAGE : WIRING SYSTEM & UNDERGROUND CABLE

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
	(Con't)	8. Installation of fittings.	1. Panduan Kaedah Penggantungan Lampu. 2. Approved method Statement 3. Specifications (L-S1)	Measuring devices.	Upon completion of fitting installations. Once for each zone / section / floor.	Contractor	JKR.PK(O).04-SKE.4E (Borang Pemeriksaan Kelengkapan Elektrik)	
		9. Functional test.	1. Functional.	Measuring devices.	Upon completion of other test above. Once for each zone / section / floor.	Contractor	JKR.PK(O).04-SKE.5C (Borang Pemeriksaan Ujian Fungsi Pemasangan Elektrik)	
2	Switch Socket Outlet (SSO)	1. Submission of material for approval	1. Contract. 2. J-MAL. 3. Specifications (L-S1).	Measuring devices.	Before material delivery at site. Once for each material.	Contractor	JKR.PK(O).04-5 (Borang Pemeriksaan Mock-up)	
		2. Material on site inspection	1. To conform as per approved material	Measuring devices.	Upon delivery at site. Once for each delivery.	Contractor / S.O Rep	JKR.PK(O).04-SKE.2A (Borang Pengesahan Penerimaan Bahan)	
		3. Installation of conduit, trunking and accessories.	1. Specification (L-S1).	Measuring devices.	In-progress and upon completion of installation. Once for each zone / section / floor.	Contractor	JKR.PK(O).04-SKE.4A (Borang Pemeriksaan Pemasangan)	
		4. Installation of final circuit wiring.	1. Specification (L-S1).	N/A	In-progress and upon completion of installation. Once for each zone / section / floor.	Contractor	JKR.PK(O).04-SKE.4A (Borang Pemeriksaan Pemasangan)	
		5. Continuity test.	1. R < 1 Ohms.	Insulation & Continuity Tester.	Upon completion of wiring work. Once for each circuit.	Contractor	JKR.PK(O).04-SKE.5A (Borang Pemeriksaan Ujian-ujian Elektrikal) JKR.C&I (Record of Continuity and Insulation Resistance Test)	
		6. Insulation resistance test @ 500Vdc insulation test voltage.	1. R > 2 Mohms.	1. Insulation & Continuity Tester. 2. Insulation Tester.	Upon completion of continuity test. Once for each circuit.	Contractor	JKR.PK(O).04-SKE.5A (Borang Pemeriksaan Ujian-ujian Elektrikal) JKR.C&I (Record of Continuity and Insulation Resistance Test)	

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LOW VOLTAGE : WIRING SYSTEM & UNDERGROUND CABLE

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
	(Con't)	7. Polarity test.	1. Load connected correctly.	1. Insulation & Continuity Tester.	Upon completion of wiring work. Once for each circuit.	Contractor	JKR.PK(O).04-SKE.5A (Borang Pemeriksaan Ujian-ujian Elektrikal) JKR.POL (Record of Polarity Tset)	
		8. Installation of fittings.	1. Panduan Kaedah Penggantungan Lampu. 2. Approved method Statement 3. Specifications (L-S1)	Measuring devices.	Upon completion of fitting installations. Once for each zone / section / floor.	Contractor	JKR.PK(O).04-SKE.4E (Borang Pemeriksaan Kelengkapan Elektrik)	
		9. Functional test.	1. Functional.	Measuring devices.	Upon completion of other test above. Once for each zone / section / floor.	Contractor	JKR.PK(O).04-SKE.5C (Borang Pemeriksaan Ujian Fungsi Pemasangan Elektrik)	
3	Three Phase Point / Submain Cables	1. Submission of material for approval	1. Contract. 2. J-MAL. 3. Specifications (L-S1).	Measuring devices.	Before material delivery at site. Once for each material.	Contractor	JKR.PK(O).04-5 (Borang Pemeriksaan Mock-up)	
		2. Material on site inspection.	1. To conform as per approved material.	Measuring devices.	Upon delivery at site. Once for each delivery.	Contractor / S.O Rep	JKR.PK(O).04-SKE.2A (Borang Pengesahan Penerimaan Bahan)	
		3. Installation of conduit, trunking and accessories.	2. Specification (L-S1).	Measuring devices.	In-progress and upon completion of installation. Once for each zone / section / floor.	Contractor	JKR.PK(O).04-SKE.4A (Borang Pemeriksaan Pemasangan)	
		4. Installation of cables.	1. Specification (L-S1). 2. Approved method statement.	N/A	In-progress and upon completion of installation. Once for each zone / section / floor.	Contractor	JKR.PK(O).04-SKE.4A (Borang Pemeriksaan Pemasangan)	
		5. Continuity test.	1. CPC is continuous	Insulation & Continuity Tester.	Upon completion of wiring work. Once for each circuit.	Contractor	JKR.PK(O).04-SKE.5A (Borang Pemeriksaan Ujian-ujian Elektrikal) JKR.C&I (Record of Continuity and Insulation Resistance Test)	
		6. Insulation resistance test @ 500Vdc insulation test voltage.	1. R > 2 Mohms.	1. Insulation & Continuity Tester. 2. Insulation Tester.	Upon completion of continuity test. Once for each circuit.	Contractor	JKR.PK(O).04-SKE.5A (Borang Pemeriksaan Ujian-ujian Elektrikal) JKR.C&I (Record of Continuity and Insulation Resistance Test)	

LOW VOLTAGE : WIRING SYSTEM & UNDERGROUND CABLE

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
	(Con't)	7. Phase sequence test.	1. Phase sequence terminated correctly.	Phase sequence tester.	Upon completion of cable insulation test. Once for each circuit.	Contractor	JKR.PK(O).04-SKE.5A (Borang Pemeriksaan Ujian-ujian Elektrikal) Borang Phase Sequence Continuity	
4	Underground Cable	1. Submission of material for approval	1. Contract. 2. J-MAL. 3. Specifications (L-S1).	Measuring devices.	Before material delivery at site. Once for each material.	Contractor	JKR.PK(O).04-5 (Borang Pemeriksaan Mock-up)	
		2. Material on site inspection.	1. To conform as per approved material.	Measuring devices.	Upon delivery at site. Once for each delivery.	Contractor / S.O Rep	JKR.PK(O).04-SKE.2A (Borang Pengesahan Penerimaan Bahan)	
		3. Installation of cables.	1. Specification (L-S3). 2. Approved method statement.	Measuring devices.	In-progress and upon completion of installation. Once for each zone / section.	Contractor	JKR.PK(O).04-SKE.4A (Borang Pemeriksaan Pemasangan)	
		4. Continuity test.	1. CPC is continuous and reasonable (R ~ length x cable internal resistance)	Insulation & Continuity Tester.	Upon completion of cable installation. Once for each cable.	Contractor	JKR.PK(O).04-SKE.5A (Borang Pemeriksaan Ujian-ujian Elektrikal) JKR.IR&C (Insulation and Continuity test)	
		5. Insulation resistance test @ d.c voltage not less than twice (2x) the nominal voltage of the circuit concerned.	1. R > 2 Mohms	1. Insulation & Continuity Tester. 2. Insulation tester.	Upon completion of cable continuity test. Once for each cable	Contractor	JKR.PK(O).04-SKE.5A (Borang Pemeriksaan Ujian-ujian Elektrikal) JKR.IR&C (Insulation and Continuity test)	
		6. Phase sequence test.	1. Phase sequence terminated correctly.	Phase sequence tester.	Upon completion of continuity test. Once for each circuit.	Contractor	JKR.PK(O).04-SKE.5A (Borang Pemeriksaan Ujian-ujian Elektrikal) Borang Phase Sequence Continuity	

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LOW VOLTAGE : LIGHTNING PROTECTION SYSTEM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Lightning Protection System	1. Submission of material approval	1. Contract Document 2. Construction Dwg 3. J-MAL 4. Specification L-S9	N/A	Before material delivery at site / Once for each material	Contractor	JKR.PK(O).04-5 (Borang Pemeriksaan Mock-up)	
		2. Material on site inspection	As per material approval	N/A	Upon delivery at site / Once for each delivery	Contractor / S.O Rep	JKR.PK(O).04-SKE.2A (Borang Pengesahan Penerimaan Bahan)	
		3. Inspection on air termination system installation	1. Air terminals or vertical finials of annealed copper tape 25mm x 3mm or other approved material. 2. Fixing bracket intervals < 500mm (metallic / non-metallic roof). 3. Air termination rods min. 300mm (L), 16mm dia. with lock nut.	Measuring Equipment	In-progress and upon completion of installation / Once for each block	Contractor / S.O Rep	JKR.PK(O).04-SKE.4F (Borang Pemeriksaan Pemasangan Sistem Perlindungan Kilat)	
		4. Inspection on down conductor system installation	**A. Conventional (Exposed)** 1. Annealed copper tape 25mm x 3mm or other approved material. 2. Conductive fixtures at interval < 500mm. 3. Bending radii > 200mm and > 45°. **B. Structural Bonding (Encased in Concrete)** 1. Annealed copper tape 25mm x 3mm or other approved material. 2. Properly clamped down conductor to structural reinforcing bar at 1m intervals. **C. Structural Using Natural Component (e.g. Steel Structure)** 1. Vertical and horizontal bars welded over a length > 30mm.	Measuring Equipment	In-progress and upon completion of installation / Once for each down conductor	Contractor / S.O Rep	JKR.PK(O).04-SKE.4F (Borang Pemeriksaan Pemasangan Sistem Perlindungan Kilat)	
		5. Inspection on test joint installation	1. Joints and bonds by copper clamps or exothermic welding or brazing. 2. Height at 2.5m from finished floor level. 3. Copper clamp overlapping >20mm. 4. PVC casing for exposed down conductor between test joint and ground. 5. Flash counter height at 2.0m from floor finished level.	Measuring Equipment	In-progress and upon completion of installation / Once for each test joint	Contractor / S.O Rep	JKR.PK(O).04-SKE.4F (Borang Pemeriksaan Pemasangan Sistem Perlindungan Kilat)	

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LOW VOLTAGE : LIGHTNING PROTECTION SYSTEM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
	(Con't)	6. Inspection on earth termination and bonding installation	1. Annealed copper tape 25mm x 3mm between earth electrode interconnection, burried > 500mm(D) and distance about 1m around external walls. 2. Exothermic weld or brazing between down conductor and earth electrode. 3. Bonding conductor of annealed copper tape 25mm x 3mm for connection between earth termination and MEB. 4. Copper jacketed earth electrode with 16mm dia. 2 nos. 1.5(L). 5. Heavy duty type earth chamber 300mm (L) x 300mm (W) x 180mm (H) with removable cover (strength ≥6N/mm2). 6. Permanent label "Lightning Protection Earth-Do Not Remove" fixed at every connection of down conductor to earth termination and at every earth electrodes.	Measuring Equipment	In-progress and upon completion of installation / Once for each termination and bonding	Contractor / S.O Rep	JKR.PK(O).04-SKE.4F (Borang Pemeriksaan Pemasangan Sistem Perlindungan Kilat)	
		7. Continuity test : 1. Air termination system 2. Air termination and down conductor system 3. Down conductor system and earth termination 4. Earth termination 5. Earth termination and Main Earthing Bar (MEB)	1. All conductors are continuiously connected (Resistance < 1 Ω). 2. If natural component being used as down conductor system, overall electrical resistance between uppermost part and ground level < 0.2 Ω.	Continuity Tester	Upon completion of works / Once for each block	Contractor	JKR.PK(O).04-SKE.4F (Borang Pemeriksaan Pemasangan Sistem Perlindungan Kilat)	
		8. Resistance test : 1. Earth electrode 2. Earth termination	Entire system combine resistance < 10 Ω.	Earth Tester	Upon completion of installation / Once for each block	Contractor	JKR.PK(O).04-SKE.4F (Borang Pemeriksaan Pemasangan Sistem Perlindungan Kilat) ITP.01.31.(00).2012 (Borang 'Record of Earth Electrode Resistance Test')	

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LOW VOLTAGE : STANDBY GENERATOR SET

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Standby Generator Set.	1. Submission for material approval	1. Contract Document & Technical Submittal (i.e: Catalogue, Brand & Model). 2. EMAL. 3. Specification (L-S5). 4. Approved shop drawing for gen set room. 5. Certificate for country of origin.	N/A	Before Factory Acceptance Test (FAT) / Once for each material.	Contractor	JKR.PK(O).04-5 *(Borang Pemeriksaan Mock-up)*	
		2. Factory Acceptance Test (Routine Test) : a) Visual Inspection	1. Manufacturers Specification. 2. Design requirement. 3. Specification (L-5S) a) Works test. b) Fulfilling to conditioning of Engine Protective Devices. c) Sudden power increase/decrease. 4. Approved shop drawing for generator set. 5. To confirm as per material approved.	1. Inductive Load-bank at pf 0.8 lagging. 2. Measuring Equipment.	Before material delivery at site / Once for each material.	Contractor	JKR.PK(O).04-SKE.2B *(Borang Pemeriksaan Pemeriksaan / Ujian Alatan Dikilang)*	
		b) Cranking Test	1. Manufactures specification. 2. Specification (L-S5).	6 successive abortive start.	During testing and commissioning.		SPECIFICATION (L-S5: Section 12, System Starting)	
		3. Material on site inspection	To comform as per approved during material approval and FAT.	N/A	Upon delivery at site. Each delivery.	Contractor / S.O Rep	JKR.PK(O).04-SKE.2A *(Borang Pemeriksaan Pengesahan Penerimaan Bahan)*	
		4. Generator set room requirement.	1. Specification (L-S5).	N/A	By the end of construction or after generator set have been energized.	Contractor	JKR.PK(O).04-SKE.4B *(Borang Pemeriksaan Bilik Suis / Mesin Elektrik)*	
		5. Inspection on installation works.	1. Manufacturers specification manual. 2. Approved Shop drawing. 3. Specification (L-S5).	N/A	During installation and completion of installation.Throughout the installation.	Contractor / S.O Rep	JKR.PK(O).04-SKE.5C *(Borang Pemeriksaan Ujian Fungsi Pemasangan Elektrik)*	
		6. Fuel system test.	1. Jabatan BOMBA & Penyelamat Malaysia. 2. Jabatan Alam Sekitar (JAS). 3. Specification (L-S5)		Upon completion of installation. During testing and commissioning.	Contractor	SPECIFICATION (L-S5: Section 11, Engine Protective devices)	
		7. Noise level measurement	1. Jabatan Alam Sekitar (JAS). 2. Specification (L-S6) 3. <65 dBA Sound Pressure Level. Measured 1 metre away from the generator room.	Sound Pressure Level (SPL) Meter.	Upon completion of acoustic treatment. During testing and commissioning.	Contractor	SPECIFICATION (L-S6: Design Criteria)	
		8. AMF board.	1. Manufacturers specification. 2. Design requirement. 3. Specification (L-S5).	Insulation Tester.	Upon completion of installation. During testing and commissioning.	Contractor	SPECIFICATION (L-S5: Section 16, Generator Set Switchboard)	

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LOW VOLTAGE : STANDBY GENERATOR SET

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
2	Cabling work	1. Insulation resistance test	Ohm > 1 Mohms.	1. Insulation & Continuity Tester. 2. Insulation Tester.	Upon completion of continuity test. Once for each circuit.	Contractor	JKR.PK(O).04-SKE.5A (Borang Pemeriksaan Ujian-ujian Elektrikal) JKR.C&I (Record of Continuity and Insulation Resistance Test)	
		2. Insulation test voltage.	Volts (d.c).	1. Insulation & Continuity Tester. 2. Insulation Tester.	Upon completion of cable insulation test. Once for each circuit.	Contractor	JKR.PK(O).04-SKE.5A (Borang Pemeriksaan Ujian-ujian Elektrikal) JKR.C&I (Record of Continuity and Insulation Resistance Test)	
		3. Polarity test.	Ohm < 1 Ohms.	Insulation & Continuity Tester.	Upon completion of wiring work. Once for each circuit.	Contractor	JKR.PK(O).04-SKE.5A (Borang Pemeriksaan Ujian-ujian Elektrikal) JKR.POL (Record of Polarity Test)	

LOW VOLTAGE : ROAD LIGHTING SYSTEM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Feeder Pillar** Refer CKE.ITP.01.23.(00).2011	1. Anti-Vandalisme Features	1. Contract Document 2. J-MAL. 3. Specifications (L-S20, NTJ, Standard Drawing) 4. Shop Drawing	N/A	During FAT/ Once for each material.	Contractor	(Borang Pemeriksaan Ciri-Ciri Anti-Vandalisma)	
2	Underground Cable	1. Submission of material for approval	1. Contract. 2. JMAL. 3. Specifications (L-S3).	N/A	Before material delivery at site/ Once for each material or delivery	Contractor	**JKR.PK(O).04-5** (Borang Pemeriksaan Mock-Up)	
		2. Material On Site Inspection	To conform as per approved material	Measuring equipment	Once for each delivery	Contractor / SO rep	**JKR.PK(O).04-SKE.2A** (Borang Pengesahan Penerimaan Bahan)	
		3. Installation of cables	1. Specification (L-S3). 2. Approved method statement.	N/A	During installation/ Once for each zone / section / floor	Contractor	**JKR.PK(O).04-SKE.3A** (Borang Pemeriksaan Kabel Bawah Tanah)	
		4. Continuity test	CPC is continuous (R= reasonable value)	Insulation & Continuity Tester	Upon completion of cable installation/ Once for each cable	Contractor	**JKR.PK(O).04-SKE.5A** (Borang Pemeriksaan Ujian-ujian Elektrikal) **CKE.ITP.01.32.(00).2012** (Record of Insulation Resistance and Continuity Test)	
		5. Insulation resistance test @ d.c voltage not less than twice (2x) the nominal voltage of the circuit concerned	R > 2 MOhms	1. Insulation & Continuity Tester. 2. Insulation tester.	Upon completion of continuity test/ Once for each cable	Contractor	**JKR.PK(O).04-SKE.5A** (Borang Pemeriksaan Ujian-ujian Elektrikal) **CKE.ITP.01.32.(00).2012** (Record of Insulation Resistance and Continuity Test)	
		6. Phase sequence test	Phase sequence terminated correctly	Phase sequence tester	Upon completion of insulation test/ Once for each circuit	Contractor	**JKR.PK(O).04-SKE.5A** (Borang Pemeriksaan Ujian-ujian Elektrikal) **CKE.ITP.01.32.(00).2012** (Record of Insulation Resistance and Continuity Test)	

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LOW VOLTAGE : ROAD LIGHTING SYSTEM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
3	Column (c/w concrete footing)	1. Submission of material for approval	1. Contract Document. 2. JMAL 3. Specifications (L-S20, NTJ, Standard Drawing)	N/A	Before material delivery at site/ Once for each material	Contractor	**JKR.PK(O).04-5** (Borang Pemeriksaan Mock-Up)	
		2. Factory Acceptance Test (For Non-Standard Column).	1. Contract Document. 2. JMAL. 3. Specifications (L-S20, NTJ, Standard Drawing)	Measuring Devices (Caliper, Measuring Tape, etc.)	Approved of Fabrication / Shop Drawing./ Once for each Sample.	Contractor	**JKR.PK(O).04-SKE.2B** (Borang Pemeriksaan Pemeriksaan / Ujian Alatan Di Kilang)	
		3. Material on site inspection	To conform as per approved sample.	N/A	Upon delivery at site/ Once for each delivery	Contractor / SO rep	**JKR.PK(O).04-SKE.2A** (Borang Pengesahan Penerimaan Bahan)	
		4. Mock-up Inspection.	Specifications (L-S20, NTJ, Standard Drawing)	N/A	Prior to Installation./ Once for each type of installation.	Contractor / SO rep	**JKR.PK(O).04-5** (Borang Pemeriksaan Mock-Up)	
		5. Inspection of Installation.	Specifications (L-S20, NTJ, Standard Drawing)	N/A	In progress and upon completion of installation./ Periodically, Once upon completion.	Contractor / SO rep	(Borang Pemeriksaan Tiang Lampu Jalan)	
4	Road Lighting Luminaire	1. Submission of material for approval	1. Contract Document. 2. JMAL. 3. Specifications (L-S20, NTJ, Standard Drawing)	N/A	Before material delivery at site/ Once for each material	Contractor	**JKR.PK(O).04-5** (Borang Pemeriksaan Mock-Up)	
		2. Material on site inspection	To conform as per approved sample.	N/A	Upon delivery at site/ Once for each delivery	Contractor / SO rep	**JKR.PK(O).04-SKE.2A** (Borang Pengesahan Penerimaan Bahan)	
		3. Mock-up Inspection.	Specifications (L-S20, NTJ, Standard Drawing)	N/A	Prior to Installation / Once for each type of installation.	Contractor / SO rep	**JKR.PK(O).04-5** (Borang Pemeriksaan Mock-Up)	
		4. Inspection of Installation.	Specifications (L-S20, NTJ, Standard Drawing)	N/A	In progress and upon completion of installation / Periodically, Once upon completion.	Contractor / SO rep	(Borang Pemeriksaan Lampu Jalan)	
		5. Performance Test (Luminance & Illuminance).	1. Specifications (L-S20, NTJ, Standard Drawing) 2. MS 825. 3. CIE 140 4. BS EN 13201-3	1. Luminance meter 2. Illuminance meter.	Upon completion of installation (T&C)./ Every 6 mths (During DLP).	Contractor	L-S20	

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LOW VOLTAGE : ROAD LIGHTING SYSTEM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
5	Modular Termination Box. (L-S20-8.14- Loop-In Loop-Out Terminal Block)	1. Submission of material for approval	1. Contract Document. 2. Drawing 3. Specification (L-S20) 4. NTJ 5. JMAL.	N/A	Before material delivery at site/ Once for each material	Contractor	**JKR.PK(O).04-5** (Borang Pemeriksaan Mock-Up)	
		2. Material on site inspection	To conform as per approved sample.	N/A	Upon delivery at site/ Once for each delivery	Contractor / SO rep	**JKR.PK(O).04-SKE.2A** *(Borang Pengesahan Penerimaan Bahan)*	
		3. Mock-up Inspection.	Specification (L-S20).	N/A	Prior to Installation./ Once for each type of installation.	Contractor / SO rep	**JKR.PK(O).04-5** *(Borang Pemeriksaan Mock-Up)*	
		4. Inspection of Installation.	Specification (L-S20).	N/A	In progress and upon completion of installation./ Periodically, Once upon completion.	Contractor / SO rep	(Borang Pemeriksaan Modular Termination Box)	
6	Pit / Manhole	1. Inspection of Installation	To conform as per approved drawing & specification.	Measuring Tape	Pre-concreting/ Once for each Pre-cabling/Once for each	Contractor / SO rep	(Borang Pemeriksaan Pit/Lurang)	
7	Ducting - Pipe Jacking/HDD/ Open Cut (road crossing / elevated structure)	1. Inspection of Installation	To conform as per approved drawing & specification.	Measuring / Roller Tape.	Pre-concreting/ Once for each	Contractor / SO rep	**JKR.PK(O).04-SKE.3A** (Borang Pemeriksaan Kabel Bawah Tanah)	
8	New Jersey Barrier (NJB) Cover	1. Submission of material for approval	ATJ/NTJ, Drawing	N/A	Before material delivery at site/ Once for each material	Contractor	**JKR.PK(O).04-5** (Borang Pemeriksaan Mock-Up)	
		2. Material on site inspection	To conform as per approved sample.	N/A	Upon delivery at site/ Once for each delivery	Contractor / SO rep	**JKR.PK(O).04-SKE.2A** (Borang Pengesahan Penerimaan Bahan)	
		3. Mock-up Inspection.	To conform as per approved sample.	N/A	Prior to Installation./ Once for each type of installation.	Contractor / SO rep	(Borang Pemeriksaan Pemasangan Lampu Jalan)	
		4. Inspection of Installation.	To conform as per approved sample.	N/A	In progress and upon completion of installation./ Periodically, Once upon completion.	Contractor / SO rep	(Borang Pemeriksaan Pemasangan Lampu Jalan)	

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LOW VOLTAGE : ROAD LIGHTING SYSTEM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD/REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
9	Labelling	1. Submission of material for approval	1. Contract Document. 2. Specifications (L-S20, NTJ, Standard Drawing)	N/A	Before material delivery at site/ Once for each material	Contractor	**JKR.PK(O).04-5** (Borang Pemeriksaan Mock-Up)	
		2. Material on site inspection	To conform as per approved sample.	N/A	Upon delivery at site/ Once for each delivery	Contractor / SO rep	**JKR.PK(O).04-SKE.2A** (Borang Pengesahan Penerimaan Bahan)	
		3. Inspection of Installation.	To conform as per approved drawing.	N/A	In progress and upon completion of installation./ For zone / section.	Contractor / SO rep	(Borang Pemeriksaan Pemasangan Lampu Jalan)	

EXTRA LOW VOLTAGE : PA SYSTEM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Public Address System	1. Material submission approval	1. Contract Document 2. PA Syste, General Specification 3. Schedule of Technical Data	N/A	Before material deliver at project site. Once for each type of material.	Contractor	JKR.PK(O).04-5 (Borang Pemeriksaan Mock-up)	
		2. Incoming material inspection	1. To conform with material submission approval	N/A	Upon material delivered at project site. Once for each material delivery	Contractor / SO Rep	JKR.PK(O).04-SKE.2A (Borang Pengesahan Penerimaan Bahan)	
		3. Conduiting/Trunking & Cabling work	1. Specification(L-S1) 2. PA System General Specification	Measuring equipement	In-progress and upon completion of installation. Once for each zone / floor.	Contractor	JKR.PK(O).04-SKE.4A (Borang Pengesahan Pemeriksaan Pemasangan)	
		4. Continuity test	1. Resistance < 5 Ohms [Given the cable use is min. 18AWG twisted pair speaker cable with max. length of 100M]	Insulation & Continuity Tester	Upon completion of cabling work. Once for each zone/floor	Contractor	CKE.ITP.06.01(01).2011 (Senarai Semak Borang Pemeriksaan Ujian Keterusan Dan Rintangan Penebatan Bagi Sistem Siaraya)	
		5. Insulation test	1. Resistance > 1M Ohms	Insulation & Continuity Tester.	Upon completion of cabling work. Once for each zone/floor	Contractor	CKE.ITP.06.01(01).2011 (Senarai Semak Borang Pemeriksaan Ujian Keterusan Dan Rintangan Penebatan Bagi Sistem Siaraya)	
		6. Tapping wattage inspection	1. To confirm that the speaker tapping wattage conforms to shop drawing and schematic	N/A	Upon completion of speaker installation. Randomly chosen speakers installed.[Based in project size and/or as per WPP(E) consent]	Contractor / SO Rep	CKE.ITP.06.01(02).2011 (Senarai Semak Borang Pemeriksaan Ujian Pemasangan Speaker dan Tapping Wattage Bagi Sistem Siaraya)	

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EXTRA LOW VOLTAGE : PA SYSTEM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
	(Cont')	7. Speaker installation inspection	1. PA General Specification 2. e-PSMG	N/A	Upon completion of speaker installation. Randomly chosen speakers installed.[Based on project size and/or as per WPP(E) consent].	Contractor / SO Rep	CKE.ITP.06.01.(02).2011 (Senarai Semak Borang Pemeriksaan Ujian Pemasangan Speaker dan Tapping Wattage Bagi Sistem Siaraya)	
		8. Functional test of all equipments	1. All equipments shall operate as specify in the contract and manufacturer specifications.	N/A	Upon completion of PA System Installation. Once for each equipment installed	Contractor	CKE.ITP.06.01(03).2011 (Senarai Semak Borang Pemeriksaan Ujian Fungsi Untuk Semua Peralatan Bagi Sistem Siaraya)	
		9. Zoning test	1. To confirm that the zoning for each speaker installed conforms to shop drawing and schematic	N/A	Upon completion of PA System installation. Once for each speakers installed	Contractor	CKE.ITP.06.01(04).2011 (Senarai Semak Borang Pemeriksaan Ujian Sound Pressure Level Dan Zone Test Bagi Sistem Siaraya)	
		10. Sound pressure level test	1. To conform with PA System General Specification	Sound Pressure Level Meter	Upon completion of PA System installation. Once for each speaker installed	Contractor	CKE.ITP.06.01(04).2011 (Senarai Semak Borang Pemeriksaan Ujian Sound Pressure Level Dan Zone Test Bagi Sistem Siaraya)	

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EXTERNAL INSTALLATION FOR ICT & TELEPHONE

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	External Installation for ICT & Telephone	1. Submission of Material for approval.	1. Contract. 2. Specifications. Catalogue must be submit	N/A	Before material delivery at site. Once for each material.	Contractor	JKR.PK(O).04-5 (Borang Pemeriksaan Mock-up)	
		2. Material on site inspection.	1. As per approved material. Free from defect. Evidence/ photos. Catalouge	N/A	Upon delivery at site. Once for each delivery.	Contractor / SO Rep	JKR.PK(O).04-SKE.2A (Borang Pengesahan Penerimaan Bahan)	
		3. Inspection of Manhole/ Telephone Pit Installation	1. Contract. 2. LS-3 Specifications.	Measuring tape.	In-progress and upon completion of installation. Once for each zone / section / floor.	Contractor / SO Rep	JKR.PK(O).04-SKE.3A (Borang Pengesahan Pemeriksaan Kabel Bawah Tanah) *CKE.ITP.03.05.(00).2012 (Senarai Semak Pemeriksaan Pemasangan Manhole & Pit)*	
		4. Inspection of uPVC pipe & G.I pipe Installation	1. Contract. 2. LS-3 Specifications.	N/A	In-progress and upon completion of installation. Once for each zone /routing	Contractor / SO Rep	JKR.PK(O).04-SKE.3A (Borang Pengesahan Pemeriksaan Kabel Bawah Tanah) *CKE.ITP.03.06.(00).2012 (Senarai Semak Pemeriksaan Pemasangan uPVC Pipe & G.I Pipe)*	
		5. Testing & Commissioning; Clearence of ducting	1. Specification - General Practices for ICT Installation 2. TIA/ EIA standard	N/A	Upon completion of installation.. All pipe	Contractor	JKR.PK(O).04-9 (Senarai Semak Pengujian & Pentauliahan) *CKE.ITP.03.07.(00).2012 (Senarai Semak Pengujian & Pentauliahan Kelegaan G.I Pipe & uPVC Pipe)*	

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

EXTERNAL INSTALLATION FOR ICT & TELEPHONE

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
	(Con't)	6. Inspection of Fiber Optic & Jelly Filled Cable Installation	1. Specification - General Practices for ICT Installation & LS - 16 2. Approved Shop Drawing	N/A	In-progress and upon completion of installation. Once for each zone /routing	Contractor	JKR.PK(O).04-SKE.3A (Borang Pengesahan Pemeriksaan Kabel Bawah Tanah) *CKE.ITP.03.08.(00).2012 (Senarai Semak Pemeriksaan Pemasangan Interbuilding Cabling – Fiber & Jelly Filled)*	
		7. Testing & Commissioning; Fiber Optic cable	1. Specification - General Practices for ICT Installation 2. TIA/ EIA standard	Cable Analyzer	Upon completion of cabling work. All cable	Contractor	JKR.PK(O).04-9 (Senarai Semak Pengujian & Pentauliahan) *CKE.ITP.03.09.(00).2012 (Senarai Semak Pengujian & Pentauliahan Fibre Optic cable)*	
		8. Testing & Commissioning; Jelly Filled cable	1. LS - 16 Specification	Continuity Tester	Upon completion of cabling work. All cable	Contractor	JKR.PK(O).04-SKE.5A (Borang Pemeriksaan Ujian-Ujian Elektrikal) *CKE.ITP.03.10.(00).2012 (Senarai Semak Pengujian & Pentauliahan Interbuilding Jelly Filled cable)*	

INTERNAL INSTALLATION FOR ICT - ACTIVE EQUIPMENT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Internal Installation for ICT -Active Equipment	1. Submission of material for approval	1. Contract. 2. Specifications. Catalogue must be submit	N/A	Before material delivery at site.Once for each material.	Contractor	JKR.PK(O).04-5 (Borang Pemeriksaan Mock-up)	
		2. Material on site inspection.	1. As per approved material.	N/A	Upon material are delivered at project site.Once for each material / delivery.	Contractor / SO Rep	JKR.PK(O).04-SKE.2A (Borang Pengesahan Penerimaan Bahan)	
		3. Inspection & Testing of Access Switch	1. Contract. 2. Specifications.	N/A	Upon completion of installation.Once for each zone / section / floor.	Contractor / SO Rep	JKR.PK(O).04-9 (Senarai Semak Pengujian & Pentauliahan) *CKE.ITP.03.11.(00).2012* *(Senarai Semak Pemeriksaan, Pengujian & Pentauliahan Access Switch)*	
		4. Inspection & Testing of Distribution Switch	1. Contract. 2. Specifications.	N/A	Upon completion of installation.. All equipment	Contractor / SO Rep	JKR.PK(O).04-9 (Senarai Semak Pengujian & Pentauliahan) *CKE.ITP.03.12.(00).2012* *(Senarai Semak Pemeriksaan, Pengujian & Pentauliahan Distribution Switch)*	
		5. Inspection & Testing of Core Switch	1. Contract. 2. Specifications.	N/A	Upon completion of installation.. All equipment	Contractor / SO Rep	JKR.PK(O).04-9 (Senarai Semak Pengujian & Pentauliahan) *CKE.ITP.03.13.(00).2012* *(Senarai Semak Pemeriksaan, Pengujian & Pentauliahan Core Switch)*	
		6. Inspection & Testing of Wireless AP	1. Contract. 2. Specifications.	N/A	Upon completion of installation.. All equipment	Contractor / SO Rep	JKR.PK(O).04-9 (Senarai Semak Pengujian & Pentauliahan) *CKE.ITP.03.14.(00).2012* *(Senarai Semak Pemeriksaan, Pengujian & Pentauliahan Wireless Access Point)*	
		7. Inspection & Testing of Wireless Controller	1. Contract. 2. Specifications.	N/A	Upon completion of installation.. All equipment	Contractor / SO Rep	JKR.PK(O).04-9 (Senarai Semak Pengujian & Pentauliahan) *CKE.ITP.03.15.(00).2012* *(Senarai Semak Pemeriksaan, Pengujian & Pentauliahan Wireless Controller)*	

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

INTERNAL INSTALLATION FOR ICT - ACTIVE EQUIPMENT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
	(Con't)	8. Inspection & Testing of UPS	1. Contract. 2. Specifications.	N/A	Upon completion of installation.. All equipment	Contractor / SO Rep	JKR.PK(O).04-9 (Senarai Semak Pengujian & Pentauliahan) *CKE.ITP.03.16.(00).2012* *(Senarai Semak Pemeriksaan, Pengujian Dan Pentauliahan Un-Interruptible Power Supply (UPS)*	
		9. Inspection & Testing of Server	1. Contract. 2. Specifications.	N/A	Upon completion of installation.. All equipment	Contractor / SO Rep	JKR.PK(O).04-9 (Senarai Semak Pengujian & Pentauliahan) *CKE.ITP.03.17.(00).2012* *(Senarai Semak Pemeriksaan, Pengujian & Pentauliahan Server)*	
		10. Inspection & Testing of Firewall	1. Contract. 2. Specifications.	N/A	Upon completion of installation.. All equipment	Contractor / SO Rep	JKR.PK(O).04-9 (Senarai Semak Pengujian & Pentauliahan) *CKE.ITP.03.18.(00).2012* *(Senarai Semak Pemeriksaan, Pengujian & Pentauliahan Firewall)*	

INTERNAL INSTALLATION FOR PASSIVE EQUIPMENT & ICT ROOM

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Internal Installation for ICT ; Passive Equipment & ICT Room	1. Submission of Material for approval.	1. Specifications. Catalogue must be submit	N/A	Before material delivery at site. Once for each material.	Contractor	JKR.PK(O).04-5 (Borang Pemeriksaan Mock-up)	N/A
		2. Material on site inspection.	As per approved material. Free from defect. Evidence/ photos. Catalouge	N/A	Upon delivery at site. Once for each delivery.	Contractor/ SO rep	JKR.PK(O).04-SKE.2A (Borang Pengesahan Penerimaan Bahan)	N/A
		3. Inspection of Trunking, Cable Tray & Conduit ICT	1. LS-1 Specifications.	Measuring Equipment.	As work progress and upon completion of installation. For each zone/section/floor.	Contractor/ SO rep	*CKE.ITP.03.19.(00).2012* *(Senarai Semak Pemeriksaan Pemasangan Trunking, Cable Tray & Conduit ICT)*	N/A
		4. Inspection of Indoor Fibre Optic Cable Installation	1. Specification - General Practices for ICT Installation 2. TIA/ EIA standard	N/A	In-progress and upon completion of installation. Once for each zone /routing	Certified Installer Cable/ Contractor/SO rep	*CKE.ITP.03.20.(00).2012* *(Senarai Semak Pemeriksaan Pemasangan Indoor Fibre Optic Cable)*	N/A
		5. Testing & Commissioning; Internal fibre optic cable	1. Specification - General Practices for ICT Installation 2. TIA/ EIA standard	Cable Analyzer	Upon completion of installation. All cable	Certified Tester/ Contractor	JKR.PK(O).04-9 (Senarai Semak Pengujian & Pentauliahan) *CKE.ITP.03.09.(00).2012* *(Senarai Semak Pengujian & Pentauliahan Fibre Optic cable)*	N/A
		6. Inspection of Unshielded Twisted Pair (UTP) cable Installation	1. Specification - General Practices for ICT Installation 2. TIA/ EIA standard	N/A	In-progress and upon completion of installation. Once for each zone /routing	Certified Installer Cable/ Contractor/SO rep	CKE.ITP.03.21.(00).2012 (Senarai Semak Pemeriksaan Pemasangan Unshielded Twisted Pair (UTP) cable)	N/A
		7. Testing & Commissioning; UTP cable	1. Specification - General Practices for ICT Installation 2. TIA/ EIA standard 3. Without Marginal Pass	Cable Analyzer	Upon completion of cabling work. All cable	Certified Installer Cable/ Contractor/SO rep	JKR.PK(O).04-9 (Senarai Semak Pengujian & Pentauliahan) *CKE.ITP.03.22.(00).2012* *(Senarai Semak Pengujian & Pentauliahan UTP cable)*	N/A
		8. Inspection of Equipment Rack & Accessories	1. Specification - General Practices for ICT Installation 2. TIA/ EIA standard	N/A	Upon completion of cabling work. All rack	Contractor/ SO rep	*CKE.ITP.03.23.(00).2012* *(Senarai Semak Pemeriksaan Pemasangan Equipment Rack & Accessories)*	N/A
		9. Inspection of Telecommunication Closet Room (TCR)	1. Specification - General Practices for ICT Installation 2. TIA/ EIA standard	N/A	Upon completion of work. All TCR.	Contractor/ SO rep	*CKE.ITP.03.24.(00).2012* *(Senarai Semak Pemeriksaan Telecommunication Closet Room (TCR)*	N/A
		10. Inspection of Server Room	1. Specification - General Practices for ICT Installation 2. TIA/ EIA standard	N/A	Upon completion of work.	Contractor/ SO rep	*CKE.ITP.03.25.(00).2012* *(Senarai Semak Pemeriksaan Server Room)*	N/A
		11. Inspection of Data Center	1. Specification - General Practices for ICT Installation 2. TIA/ EIA standard - TIA 942	N/A	Upon completion of work.	Contractor/ SO rep	*CKE.ITP.03.26.(00).2012* *(Senarai Semak Pemeriksaan Data Center)*	N/A

Nota: ITP ini adalah untuk memberi panduan kepada Kontraktor, Perunding dan SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

INTERNAL INSTALLATION FOR TELEPHONE

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Internal Installation for Telephone	1. Submission of Material for approval.	1. Specifications. Catalogue must be submit	N/A	Before material delivery at site. Once for each material.	Contractor	JKR.PK(O).04-5 (Borang Pemeriksaan Mock-up)	N/A
		2. Material on site inspection.	As per approved material. Free from defect. Evidence/ photos. Catalouge	N/A	Upon delivery at site. Once for each delivery.	Contractor/ SO rep	JKR.PK(O).04-SKE.2A (Borang Pengesahan Penerimaan Bahan)	N/A
		3. Inspection of Trunking, Cable Tray & Conduit Telephone	1. LS-1 Specifications.	Measuring Equipment.	As work progress and upon completion of installation. For each zone/section/floor.	Contractor/ SO rep	*CKE.ITP.03.27.(00).2012* *(Senarai Semak Pemeriksaan Pemasangan Trunking, Cable Tray & Conduit Telephone)*	N/A
		4. Inspection of Indoor backbone Telephone Cable, 2 pair/ 0.63mm cable, Distribution Point (DP) Box, Sub/ Main Distribution Frame (SDF/ MDF)	1. LS16 Specification For Telephone Installation)	N/A	In-progress and upon completion of installation. Once for each zone /routing	Contractor/ SO rep	*CKE.ITP.03.28.(00).2012* *(Senarai Semak Pemeriksaan Pemasangan Indoor backbone Telephone Cable/ 2pair 0.63mm cable/ DP/ MDF)*	N/A
		5. Testing & Commissioning; Indoor backbone Telephone Cable and 2 pair/ 0.63mm cable	1. LS16 Specification For Telephone Installation)	Cable Analyzer	Upon completion of installation.. All cable	Certified Tester/ Contractor	JKR.PK(O).04-9 (Senarai Semak Pengujian & Pentauliahan) *CKE.ITP.03.29.(00).2012* *(Senarai Semak Pengujian & Pentauliahan Indoor backbone Telephone Cable and 2 pair/ 0.63mm cable)*	N/A
		6. Inspection of SDF, PABX & MDF Room	1. LS16 Specification For Telephone Installation)	N/A	In-progress and upon completion of work.	Contractor/ SO rep	*CKE.ITP.03.30.(00).2012* *(Senarai Semak Pemeriksaan SDF, PABX & MDF Room)*	N/A
		7. Inspection of Private Automatic Branch Exchange (PABX) equipment	1. LS16 Specification For Telephone Installation)	N/A	In-progress and upon completion of work.	Certified Pabx Installer/ Contractor/SO rep	*CKE.ITP.03.31.(00).2012* *(Senarai Semak Pemeriksaan Pemasangan (PABX) equipment)*	N/A
		8. Testing & Commissioning; PABX	1. LS16 Specification For Telephone Installation)	N/A	Upon completion of work.	Certified Pabx Installer/ Contractor/SO rep	JKR.PK(O).04-9 (Senarai Semak Pengujian & Pentauliahan) *CKE.ITP.03.32.(00).2012* *(Senarai Semak Pengujian & Pentauliahan PABX)*	N/A
		9. Testing & Commissioning; Direct line, Fax Line & Extension Line Functionality	1. LS16 Specification For Telephone Installation)	N/A	Upon completion of work.	Contractor	JKR.PK(O).04-9 (Senarai Semak Pengujian & Pentauliahan) *CKE.ITP.03.33.(00).2012* *(Senarai Semak Pengujian & Pentauliahan Direct line, Fax Line & Extension Line Functionality)*	N/A

Nota: ITP ini adalah untuk memberi panduan kepada Kontraktor, Perunding dan SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

MEDICAL EQUIPMENT : GENERAL RADIOGRAPHY

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	General Radiography System	1. Material approval submission	1. Contract Document 2. General Radiography Specification 3. Schedule of Technical Data Compliance 4. Approval Letter by MOH	N/A	Before materials deliver at project site Once for each system	Contractor	JKR.PK(O).04-5 (Borang Pemeriksaan Mock-up)	
		2. Material Inspection	1. To conform with material submission approval	N/A	Upon equipment delivery at project site Once for each system	Contractor/ SO Rep	JKR.PK(O).04-SKE.2A (Borang Pengesahan Penerimaan Bahan)	
		3. Pre-installation work	1. Specification (LS-1) 2. General Radiography Specification	N/A	Before equipment installation at project site	Contractor	JKR.PK(O).04-SKER.4A (Borang Pengesahan Pemeriksaan Pemasangan)	
		4. Functionality Test of the system	1. General Radiography specification 2. Ministry Of Health requirement	N/A	After the complete installation of the equipment	Contractor	JKR.PK(O).04-SKER.4A (Borang Pengesahan Pemeriksaan Pemasangan)	

MEDICAL EQUIPMENT : EXAMINATION LIGHT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Examination Light	1. Material approval submission	1. Contract Document 2. Examination Light Specification 3. Schedule of Technical Data Compliance	N/A	Before materials deliver at project site Once for each system	Contractor	JKR.PK(O).04-5 (Borang Pemeriksaan Mock-up)	
		2. Material Inspection	1. To conform with material submission approval	N/A	Upon equipment delivery at project site Once for each system	Contractor/ SO Rep	JKR.PK(O).04-SKE.2A (Borang Pengesahan Penerimaan Bahan)	
		3. Pre-installation work	1. Specification (LS-1) 2. Examination Light Specification	N/A	Before equipment installation at project site	Contractor	JKR.PK(O).04-SKER.4A (Borang Pengesahan Pemeriksaan Pemasangan)	
		4. Functionality Test of the system	1. Examination Light Specification 2. Ministry Of Health requirement	Lux meter	After the complete installation of the equipment	Contractor	JKR.PK(O).04-SKER.4A (Borang Pengesahan Pemeriksaan Pemasangan)	

Nota: ITP ini adalah untuk memberi panduan kepada Kontraktor, Perunding dan SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

MEDICAL EQUIPMENT : SURGICAL LIGHT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Surgical Light	1. Material approval submission	1. Contract Document 2. Surgical Light Specification 3. Schedule of Technical Data Compliance	N/A	Before materials deliver at project site Once for each system	Contractor	**JKR.PK(O).04-5** (Borang Pemeriksaan Mock-up)	
		2. Material Inspection	1. To conform with material submission approval	N/A	Upon equipment delivery at project site Once for each system	Contractor/ SO Rep	**JKR.PK(O).04-SKE.2A** (Borang Pengesahan Penerimaan Bahan)	
		3. Pre-installation work	1. Specification (LS-1) 2. Surgical Light Specification	N/A	Before equipment installation at project site	Contractor	**JKR.PK(O).04-SKER.4A** (Borang Pengesahan Pemeriksaan Pemasangan)	
		4. Functionality Test of the system	1. Surgical Light Specification 2. Ministry Of Health requirement	Lux meter	After the complete installation of the equipment	Contractor	**JKR.PK(O).04-SKER.4A** (Borang Pengesahan Pemeriksaan Pemasangan)	

Nota: ITP ini adalah untuk memberi panduan kepada Kontraktor, Perunding dan SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

MEDICAL EQUIPMENT : SURGICAL TABLE

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	Surgical Table	1. Material approval submission	1. Contract Document 2. Surgical Table Specification 3. Schedule of Technical Data Compliance	N/A	Before materials deliver at project site Once for each system	Contractor	**JKR.PK(O).04-5** (Borang Pemeriksaan Mock-up)	
		2. Material Inspection	1. To conform with material submission approval	N/A	Upon equipment delivery at project site Once for each system	Contractor/ SO Rep	**JKR.PK(O).04-SKE.2A** (Borang Pengesahan Penerimaan Bahan)	
		3. Pre-installation work	1. Specification (LS-1) 2. Surgical Table Specification	N/A	Before equipment installation at project site	Contractor	**JKR.PK(O).04-SKER.4A** (Borang Pengesahan Pemeriksaan Pemasangan)	
		4. Functionality Test of the system	1. Surgical Table Specification 2. Ministry Of Health requirement	Lux meter	After the complete installation of the equipment	Contractor	**JKR.PK(O).04-SKER.4A** (Borang Pengesahan Pemeriksaan Pemasangan)	

Nota: ITP ini adalah untuk memberi panduan kepada Kontraktor, Perunding dan SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

HIGH TENSION SYSTEM: 11kV DRY TYPE TRANSFORMER

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	11kV Dry Type Transformer	1. Submission of material for approval	1. Contract Document 2. Technical Submittal (i.e. Catalogue, Brand & Model) 3. Specification(L-S17). 4. J-MAL	N/A	Before Factory Acceptance Test (FAT). Each item.	Contractor	JKR.PK(O).04-5 (Borang Kelulusan Bahan)	N/A
		2. Factory Acceptance Test (FAT) - Routine Test			Before material delivery at site. Each item.	Contractor	CKE.PM(P).004-1 (Borang Tindakan Sebelum Ujian Penerimaan Bahan/Barangan Di Kilang)	N/A
		a) Visual Inspection	1. Approved Shop Drawing 2. Technical Submittal (i.e. Catalogue, Brand & Model No.) 3. Specification (L-S17). 4.J-MAL	N/A	During FAT. Each item.	Contractor / SO rep	JKR.PK(O).04.SKE.2B (Borang Pemeriksaan Alatan di kilang)	N/A
		b) Dimension Check	1. Approved Shop Drawing 2.Technical Submittal (i.e. Catalogue, Brand & Model No.) 3. Specification(L-S17). 4. JMAL	Measuring Devices (Caliper, Measuring Tape, etc)	During FAT. Each item.	Contractor / SO rep	JKR.PK(O).04.SKE.2B (Borang Pemeriksaan Alatan di kilang)	N/A
		c)Separate Source AC Withstand Voltage Test	1. Specification (L-S17)-Clause 5.2.5 2. J-MAL.	AC Withstand Voltage Tester	During FAT. Each item.	MANUFACTURER-Competent Person (Chargeman BO)	CKE.PM(P).004-1 (Factory Acceptance Test Report 11kV Dry- Type Distribution Transformer)	The full test voltage shall be applied for 60s between each winding, and all the remaining windings, core,frame connected to earth,No collapse test voltage shall occur.
		d) Induced AC Withstand Voltage Test	1. Specification (L-S17)-Clause 5.2.6 & Clause 12 of MS IEC60076-3 2. J-MAL.	Power Analyser	During FAT. Each item.	MANUFACTURER-Competent Person (Chargeman BO)	CKE.PM(P).004-1 (Factory Acceptance Test Report 11kV Dry- Type Distribution Transformer)	The test voltage will increased to twice rated voltage .The test duration not less than 15s. No collapse of the test voltage shall occur
		e) Measurement of No Load Loss and Current	1. Specification (L-S17)-Clause 5.2.4 2. J-MAL. 3.No load loss tolerance +15%	Power Analyser	During FAT. Each item.	MANUFACTURER-Competent Person (Chargeman BO)	CKE.PM(P).004-1 (Factory Acceptance Test Report 11kV Dry- Type Distribution Transformer)	Frequency of the test source should be within 0.5% of the rated frequency. The transformer will be supplied from LV side with rated voltage
		f) Measurement of Winding Resistance	1. Specification (L-S17)-Clause 5.2.1 2. J-MAL.	Transformer Resistance Test Instrument	During FAT. Each item.	MANUFACTURER-Competent Person (Chargeman BO)	CKE.PM(P).004-1 (Factory Acceptance Test Report 11kV Dry- Type Distribution Transformer)	1. The transformer shall be at rest in a constant ambient temperature for at least 3 hours before doing measurement. 2. Readings shall not be taken until current reaches a steady state condition & recommended maximun current value is 15% of In. 3. Winding Resistance and Winding temperature shall be measured at the same time.

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

HIGH TENSION SYSTEM: 11kV DRY TYPE TRANSFORMER

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
	(Con't)	g) Measurement of Load Loss	1. Specification (L-S17). Clause 5.2.3 2. J-MAL. 3. Load loss tolerance +15%	Power Analyser	During FAT. Each item.	MANUFACTURER-Competent Person (Chargeman BO)	CKE.PM(P).004-1 (Factory Acceptance Test Report 11kV Dry- Type Distribution Transformer)	The load loss shall be derived and corrected to reference temperature of 120° C Note: Total losses(No load & Load loss) tolerance +10%
		h) Measurement of short circuit impedance	1. Specification (L-S17). Clause 5.2.3 2. J-MAL.	Power Analyser	During FAT. Each item.	MANUFACTURER-Competent Person (Chargeman BO)	CKE.PM(P).004-1 (Factory Acceptance Test Report 11kV Dry- Type Distribution Transformer)	HV windings are supplied with 3 phase power, LV terminals are short circuits. Duration of the test should be as short as possible to avoid any siginificant heatings of the windings.The measured value of short circuit impedance in ohm per phase shall be corrected to reference temperature of 120°C
		i) Measurement of Voltage Ratio and Phase displacement	1. Specifications (L-S17).-Clause 5.2.2 & Sub Clause 10.3 MS IEC 60076-1 2. J-MAL	Transformer Turns Ratio Testing Instrument Meter	During FAT. Each item.	MANUFACTURER-Competent Person (Chargeman BO)	CKE.PM(P).004-1 (Factory Acceptance Test Report 11kV Dry- Type Distribution Transformer)	1. The deviation of the voltage ratio tolerance shall be ±0.5 % of declared ratio or ± 1/10 of actual % Impedance on the principal tapping, whichever is smaller. 2. The Voltage ratio are equals to 11/.433kV@.415kV 3. Vector Group Check(Dyn11) is correct.
		j) Partial Discharge Measurement	1. Specification (L-S17)-Clause 5.2.7 2. J-MAL. 3.The maximun level of partial discharge shall be 10pC.	Partial Discharge Tester	During FAT. Each item.	MANUFACTURER-Competent Person (Chargeman BO)	CKE.PM(P).004-1 (Factory Acceptance Test Report 11kV Dry- Type Distribution Transformer)	1. Phase to phase pre stress voltage of 1.8Ur shall be induced for 30 s followed without interruption by phase to phase voltage of 1.3Ur for 3 minute during which the partial discharge shall be measured. 2. Partial discharge measurement shall be carried out after all dielectric tests are completed.For imported transformer supplier has to show the copy of the test report from External Test Lab.
		3. Delivery Material On Site Inspection.	To conform as per approved material and FAT. (complete with enclosure). Transformer Enclosure-Standard MS IEC60529):-	N/A	Upon delivery at site. For each delivery.	Contractor / SO rep	JKR.PK(O).04-SKE.2A (Borang Pemeriksaan Pengesahan Penerimaan Bahan)	(i).The drawing of distance layout between enclosure and transformer for 1000kVA should be endorsed by manufacturer. (ii) De-rating factor if IP 23 or Higher Enclosure is installed.
		4. Transformer Room Requirement	1.Specification L-S17-Clause 11.0 2. Approved Shop Drawing	N/A	Before Installation.	Contractor	Borang Pemeriksaan Bilik Suis/Transformer. JKR.PK(0).04…	N/A

HIGH TENSION SYSTEM: 11kV DRY TYPE TRANSFORMER

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
	(Con't)	5. Installation of 11kV Dry Type Transformer (Site Testing)	1. Installation Manual given by Manufacturer. 2. Specification (L-S17). 3.Approved method of statement	Visual Inspection	In-progress and upon completion of installation. Each item.	Contractor	Borang Pemeriksaan Bilik Suis/Transformer. JKR.PK(0).04…	N/A
		a) 2000 V d.c Insulation Resistance Test	1. Manufacturer's Specifications 2.Specification(L-S17)- Clause 8.2 3. R ≥ 1000 M Ohm(Ω)	Insulation Tester(Megger Tester)	During Site Testing & Commissioning. Each item.	Contractor/ Competent Person (Chargeman BO)	JKR.C&I (Record of Continuity and Insulation Resistance Test)	N/A
		b) Measurement Of Winding Resistance	1. Manufacturer's Specifications 2. Specification (L-S17)-Clause 5.2.1	Transformer Resistance Test Instrument	During Site Testing & Commissioning. Each item.	Contractor/ Competent Person (Chargeman BO)	Manufacturer/Supplier Test Sheet	1. The transformer shall be at rest in a constant ambient temperature for at least 3 hours before doing measurement. 2. Readings shall not be taken until current reaches a steady state condition & recommended maximun current value is 15% of In. 3. Winding Resistance and Winding Temperature shall be measured at the same time.
		c) 24 kV a.c pressure test for 1.0 minute	1. Manufacturer's Specifications 2. Specification (L-S17)- Clause 8.2	Hi -Pot Pressure Tester	During Site Testing & Commissioning. Each item.	Contractor/ Competent Person (Chargeman BO)	Manufacturer/Supplier Test Sheet	N/A
		d) Testing and setting of safety devices and measuring gauges.	1. Manufacturer's Specifications 2. Specification (L-S17)- Clause 8.2	Measuring devices	Upon completion of Testing and setting of safety devices and measuring gauges. Each item.	Contractor/ Competent Person (Chargeman BO)	Manufacturer/Supplier Test Sheet	N/A
		e) Any other tests as recommended by the manufacturer and the supplier	1. Manufacturer's Specifications 2. Specification (L-S17)- Clause 8.2	Measuring devices	During Site Testing & Commissioning. Each item.	Contractor/ Competent Person (Chargeman BO)	Manufacturer/Supplier Test Sheet	N/A
		f) Measurement of voltage ratio	1.Specifications (L-S17).-Clause 5.2.2 & Sub Clause 10.3 MS IEC 60076-1	Transformer Turns Ratio Testing Intrument Meter	During Site Testing & Commissioning. Each item.	Contractor/ Competent Person (Chargeman BO)	Manufacturer/Supplier Test Sheet	1. The deviation of the voltage ratio tolerance shall be ±0.5 % of declared ratio or ± 1/10 of actual % Impedance on the principal tapping, whichever is smaller. 2. The Voltage ratio are equals to 11/.433kV@.415kV

HIGH TENSION SYSTEM: 11kV DRY TYPE TRANSFORMER

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
	(Con't)	g) Earthing Installation	1. Spesification L-S17- Clause 7.0 2. Earth Resistance ≤ 1 Ohm(Ω)	Earth Tester	In progress and upon completion of installation. Each Item	Contractor	Senarai Semak BILIK SUIS/TRANSFORMER/RMU dan Pengujian	1. The neutral point of the LV system of the transformer shall be solidly earthed. The frameworks and all non carrying metal parts of the transformer shall be earth similarly. 2. The copper tape/bar with dimension not less than 25mm x 6 mm shall be installed around 4 walls of the transformer room at a height of 300mm from finished floor level and shall be bolted to the frame earthing terminal of the transformer. 3. The neutral earthing and frame earthing of the transformer shall be separately connected to its own group of earth electrodes. 4. The neutral earthing & frame earthing shall be connected to its electrodes by means of green pvc insulated copper cable.
		h) Functional Test.	Functional and working properly complied to specification L-S17	Phase sequence tester (At MSB)	Upon completion of other tests above. Each item.	TNB Representative/ Contractor/ Competent Person	(i) USPM/P/CPS (ii) Borang JKR.PK(0).04-SKE.6A(Pengesahan Pentaulihan Pemasangan Elektrik)	Warranty Letter

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

HIGH TENSION SYSTEM : HT SWITCHGEAR

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1.	11 kV Switchgear	1. Material submission approval	1. Contract Document. 2. Shop Drawing. 3. Technical Submittal (i.e : catalogue, brand & model).	N/A	Prior to manufacture of switchgear / Once for each type of material	Contractor	JKR.PK(O).04-5 (Borang Pemeriksaan Mock-up/bahan)	
		2. Factory Acceptance test for 11kV Switchgear.	1. Manufacturer's Specification. 2. Design Requirement. 3. Specification (L-S15). 4. TNB requirement Calibration cert	N/A	Prior to delivery to site. / Upon completion of manufacturing.	Contractor	JKR.PK(O).04-SKE.2B (Borang Pemeriksaan/Ujian Alatan Di Kilang) Test Report	
		3. Material on site inspection	To confirm with material submisson as per approved	N/A	Upon material delivered at project site/Once for each material / delivery	Contractor / SO rep	JKR.PK(O).04-SKE.2A (Borang Pengesahan Penerimaan Bahan)	
		4. Switch Room Requirement.	1. Specification (L-S15).	N/A	Upon completion of the room. / Once for each room	Contractor	Senarai Semak BILIK SUIS/TRANSFORMER/RMU	
		5. Switchgear Installation.	1. Approved Shop Drawing 2. Approved Method Statement 3. Specification (L-S15).	N/A	In-progress and upon completion of installation. / Once for each installation	Contractor/Competant person	Senarai Semak PANEL SUIS	
		6. Earthing Installation.	1. Approved Shopdrawing 2. Specification (L-S15). 3. Resistance < 1 ohm	Earth Tester	In-progress and upon completion of installation. / Once for each installation	Contractor/Competant person	Senarai Semak BILIK SUIS/TRANSFORMER/RMU dan Pengujian	
		7. Protective Relay Test.	1. Manufacturer's Specification. 2. Specification (L-S15) 3. Functioning	Measuring Devices	Prior to energizing. / During Testing & Commisioning.	Contractor/Competant person	Senarai Semak PENGUJIAN	
		8. Insulation Resistance Test : a) Circuit Breaker b) Current Transformer c) Voltage/ Potential Transformer	1. Manufacturer's Specification. 2. Specification (L-S15) 3. Functioning	Insulation Tester	Prior to energizing. / During Testing & Commisioning.	Contractor/Competant person	Senarai Semak PENGUJIAN	
		9. Pressure Test. a) Circuit Breaker b) Voltage Transformer	1. Manufacturer's Specification. 2. Specification (L-S15) 3. Functioning	Power Frequency Test Set	Prior to energizing. / During Testing & Commisioning.	Contractor/Competant person	Senarai Semak PENGUJIAN	

HIGH TENSION SYSTEM : HT SWITCHGEAR

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE / FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
	(Con't)	10. Ratio Test : a) Current Transformer b)Voltage/ Potential Transformer Dielectric and Power Frequency Voltage Test : 	1. Manufacturer's Specification. 2. Specification (L-S15) 3. Functioning 1. Manufacturer's Specification. 2. Specification (L-S15) 3. Functioning	1.Current Injection Set 2. Voltage Injection Set 1. Insulation Tester 2. Power Frequency test set	Prior to energizing. / During Testing & Commisioning.	Contractor/Competant person	Senarai Semak PENGUJIAN	
		11. Funtional Test : a) VCB Auxiliary Relay,Mechanical ,Elektrical function b) Heater Circuit, indicators lightVoltage/ Potential Transformer	Functional	N/A	Upon completion of other test above. / During Testing & Commisioning.	Contractor/Competant person	Senarai Semak PENGUJIAN	
2	11 kV Cable	1. Material submission approval	1. Contract Document. 2. JMAL 3. Technical Submittal (i.e : catalogue, brand & model).	N/A	Prior to delivery to site. / Once for each type of material	Contractor	JKR.PK(O).04-5 (Borang Pemeriksaan Mock-up)	
		2. Material on site inspection	1. Manufacturer's Specification. 2. Design Requirement. 3. Specification (L-S13).	N/A	Upon delivery at site. / Once for each material / delivery	Contractor / SO rep	JKR.PK(O).04-SKE.2A (Borang Pengesahan Penerimaan Bahan)	
		3. Cable installation	1. Approved Method Statement 2. Specification (L-S13)	N/A	In-progress and upon completion of installation. / Once for each installation	Contractor/Competant person	Senarai Semak KABEL BAWAH TANAH VOLTAN TINGGI	
		4. Continuity Test	1. Approved Method Statement 2. Specification (L-S13)		Upon Completion of cable installation / Once for each cable	Contractor/Competant person	Senarai Semak PENGUJIAN	
		5. Insulation Resistance Test	Resistance	Insulation Tester	Upon Completion of continuity test / Once for each cable	Contractor/Competant person	Senarai Semak PENGUJIAN	
		6. Phase Sequence test	Phase sequence terminated correctly	Phase sequence tester	Upon Completion of insulation test / Once for each cable	Contractor/Competant person	Senarai Semak PENGUJIAN	
		7. D.C test	Phase sequence terminated correctly	Phase sequence tester	Upon Completion of above test / Once for each cable	Contractor/Competant person	Senarai Semak PENGUJIAN	

TRAFFIC SIGNAL LIGHT : TRAFFIC SIGNAL LIGHT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
1	Traffic Signal Controller	Submission of material list / brands for approval	1. Contract Document. 2. Specifications (JKR/SPJ/2008-S8). 3. Approved shop drawing		Before fabrication at factory	Contractor	JKR.PK(O).04-5 (Borang Kelulusan Bahan/Pemeriksaan Mock-up)	
		Factory Acceptance Test 1. Visual Inspection. 2. Functional test. 3. Routine test.	1. Approved shop drawing. 2. Technical Submittal (Catalogue,Brand & Model) 3. Contract Document. 4. Specifications (JKR/SPJ/2008-S8).	Measuring devices.	Approved of Fabrication/Shop Drawing	Contractor	1.JKR.PK(O).04-SKE.2B (Borang Pemeriksaan/Ujian Alatan Di Kilang). 2.Senarai Semak Pemeriksaan Lampu Isyarat 3. Test report	
		Material on site inspection.	To conform as per approved material / FAT.		Upon delivery at site. Once for each delivery.	Contractor/ SO Rep	JKR.PK(O).04-SKE.2A (Borang Pengesahan Penerimaan Bahan)	
		Inspection of Installation 1. Installation / Safety Aspect 2. Electrical Testing 3. Functional Safety Testing 4. Labelling / Circuit Tagging	1. Approved shop drawing. 2. Specifications (JKR/SPJ/2008-S8). 3. NTJ dan ATJ 13/87	Measuring devices.	In-progress and upon completion of installation. Once upon completion.	Contractor/ SO Rep	1. JKR.PK(O).04-SKE.4A (Borang Pemeriksaan Pemasangan) 2.Senarai Semak Pemeriksaan Lampu Isyarat	
2	Underground Cable Refer ITP 11.1.2							
3	Column (c/w concrete footing) Refer ITP 11.1.5							
4	Signal Head	Submission of material list / brands for approval	1. Contract Document. 2. Specifications (JKR/SPJ/2008-S8). 3. Approved shop drawing	N/A	Before material delivery at site.	Contractor	JKR.PK(O).04-5 (Borang Kelulusan Bahan/Pemeriksaan Mock-up)	
		Factory Acceptance Test 1. Visual Inspection. 2. Functional test.	1. Approved shop drawing. 2. Technical Submittal (Catalogue,Brand & Model) 3. Contract Document. 4. Specifications (JKR/SPJ/2008-S8).	Measuring devices.	Approved of Fabrication/Shop Drawing	Contractor/ SO Rep	1.JKR.PK(O).04-SKE.2B (Borang Pemeriksaan/Ujian Alatan Di Kilang). 2.Senarai Semak Traffic Signal Light 3. Test report	
		Material on site inspection.	To conform as per approved material.	N/A	Upon delivery at site. Once for each delivery.	Contractor/ SO Rep	JKR.PK(O).04-SKE.2A (Borang Pengesahan Penerimaan Bahan)	
		Inspection of Installation 1. Visual Inspection.	1. Approved shop drawing. 2. Technical Submittal (Catalogue,Brand & Model) 3. Contract Document. 4. Specifications (JKR/SPJ/2008-S8). 5. NTJ & ATJ 13-87	Measuring devices.	In-progress and upon completion of installation. Once upon completion.	Contractor/ SO Rep	1. JKR.PK(O).04-SKE.4A (Borang Pemeriksaan Pemasangan) 2.Senarai Semak Pengujian Lampu Isyarat.	

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TRAFFIC SIGNAL LIGHT : TRAFFIC SIGNAL LIGHT

ITEM	DESCRIPTION OF WORKS	POINT OF INSPECTION / TEST	STANDARD / REQUIREMENT	TOOLS / EQUIPMENT	STAGE/ FREQUENCY	RESPONSIBILITY	EVIDENCE	REMARKS
5	Cable Termination	Inspection of Installation.	1. Approved Shop Drawing. 2. Specification (LS-3 & JKR/SPJ/2008-S8).	N/A	In-progress of installation.	Contractor/ SO Rep	N/A	
6	Vehicle Detector *(Type 1 : Induction Loop Cable* *Type 2 : IRF (Infrared)* *Type 3 : Camera* *Type 4 : Wireless* *etc)*	Submission of material list / brands / sample for approval	1. Contract. 2. Drawings. 3..Specifications (JKR/SPJ/2008-S8).	Measuring devices.	Before material delivery at site. Once for each material.	Contractor	JKR.PK(O).04-5 (Borang Pemeriksaan Mock-up)	
		Material on site inspection.	To conform as per approved material.	Measuring devices.	Upon delivery at site. Once for each delivery.	Contractor/ SO Rep	JKR.PK(O).04-SKE.2A (Borang Pengesahan Penerimaan Bahan)	
		Inspection of Installation.	1. Approved Shop Drawing. 2. Specification (JKR/SPJ/2008-S8).	N/A	In-progress and upon completion of installation. Once for each zone / section.	Contractor/ SO Rep	Senarai Semak Pemeriksaan Lampu Isyarat.	
7	Cable & Detector Pit Refer ITP 11.1.5	Inspection of Installation.	To conform as per approved drawing and specification.	Measuring devices.	Pre-cast concreting	Contractor/ SO Rep	Senarai Semak Pengujian Lampu Isyarat.	
8	Earthing system	Submission of material list / brands for approval	1. Contract. 2. J-MAL. 3. Specifications (L-S1 etc.).	Measuring devices.	Before material delivery at site. Once for each material.	Contractor	JKR.PK(O).04-5 (Borang Pemeriksaan Mock-up)	
		Material on site inspection.	To conform as per approved material.	Measuring devices.	Upon delivery at site. Once for each delivery.	Contractor/ SO Rep	JKR.PK(O).04-SKE.2A (Borang Pengesahan Penerimaan Bahan)	
		Installation of earthing system.	1. Approved Shop Drawing. 2. Specification (L-S1 etc). 3. R < 1 Ohm	Earth Tester.	In-progress and upon completion of installation. Once for each zone / section.	Contractor	JKR.PK(0).O4-SKE.3B (Pemasangan Elektrod Bumi) JKR.EER (Record of Earth Electrode Resistance Test) JKR.PK(O).04-4 (Borang Kalibrasi Peralatan) c/w Calibration Cert.)	

LAMPIRAN 1 : SENARAI SEMAK PEMERIKSAAN LAMPU ISYARAT

BIL	PERKARA	Lampu Isyarat YA	Lampu Isyarat TIDAK	Tindakan / Catatan
1	**VISUAL INSPECTION : -**			
1.1	**Traffic Light Controller**			
1.1.1	Microprocessor-based	☐	☐	
1.1.2	Class IP 55 (MS IEC 60529)	☐	☐	
1.1.3	Coated with epoxy dry-powder and oven baked semi-gloss enamel grey (except for stainless steel)	☐	☐	
1.1.4	Log Book	☐	☐	
1.1.5	Lock & 2 Sets of Key (each controller)	☐	☐	
1.1.6	Anti Vandalism Features (2 set of steel bar, handle with lock etc)	☐	☐	
1.1.7	Vantilation louvre c/w wire mesh and protection	☐	☐	
1.1.8	Anti Sticker Paint	☐	☐	
1.1.9	Color Code :			
	a. Golden Yellow Stripe (No. 356 BS 381C)	☐	☐	
	b. Black (BS 873)	☐	☐	
1.1.10	Labelling sticker as per approved shop drawing	☐	☐	
1.2	**Signal Head**			
1.2.1	Nominal diameter 300mm	☐	☐	
1.2.2	Three optical arranged vertically	☐	☐	
1.2.3	Arrangment (upper = red, middle = amber, lower = green)	☐	☐	
1.2.4	Type A visor	☐	☐	
1.2.5	Height :			
	a. Post-Mounted = Centre of green optical shall be 2.5m above the carriageway	☐	☐	
	b. Overhead = lowest point of signal shall be not less than 5.5m or more than 6.5m above the carriageway	☐	☐	
1.3	**Column**			
1.3.1	Nominal diameter 100mm	☐	☐	
1.3.2	Twin service door	☐	☐	
1.3.3	Information Board "Aduan Kerosakan" as per approved shop drawing	☐	☐	
1.3.4	Alternate orange and black band	☐	☐	
1.3.5	Anti-vandalism locking device	☐	☐	
1.3.6	Double slot hinged service door	☐	☐	
1.4	**Vehicle Detector**			
1.4.1	Type of vehicle detector as approved shop drawing	☐	☐	
1.5	**Cable and Detector Pit**			
1.5.1	Heavy duty pre-cast concrete pit	☐	☐	
1.5.2	Cable pit size = 450mm (L) X 450mm (W) X 450mm (H)	☐	☐	
1.5.3	Detector pit size = 300mm (L) X 300mm (W)	☐	☐	
1.6	**Others**			
1.6.1	Plinth dimension	☐	☐	
1.6.2	Facility Switch	☐	☐	
1.6.3	Fittngs (Lamp, Switch Socket Outlet, Heater efc)	☐	☐	
1.6.4	Meter TNB	☐	☐	
1.6.5	Maintenance Tool (If Any)	☐	☐	

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LAMPIRAN 1 : SENARAI SEMAK PEMERIKSAAN LAMPU ISYARAT

BIL	PERKARA	Lampu Isyarat YA	Lampu Isyarat TIDAK	Tindakan / Catatan
2	**FUNCTIONAL INSPECTION :-**			
2.1	Green Conflict	☐	☐	
2.2	Double lamp conflict	☐	☐	
2.3	Sequence of phasing	☐	☐	
2.4	Time settings	☐	☐	
2.5	Pedestrian Facilities Test	☐	☐	
2.6	Buzzer	☐	☐	
2.7	Push Button	☐	☐	
2.8	Flashing Rate	☐	☐	
2.9	Vehicle Detector Test	☐	☐	
2.10	Green Wave (Integration of traffic light controller between two or more junction)	☐	☐	
2.11	Auto Reclosure RCCB	☐	☐	
2.12	Earthing Test	☐	☐	

ULASAN :

TERIMA / TIDAK TERIMA

DISEMAK OLEH : *(Kontraktor)*	**DISAHKAN OLEH : *(Pengurus Projek)***
Tandatangan :	Tandatangan :
Nama Pegawai :	Nama Pegawai :
Tarikh:	Tarikh:

Nota: ITP ini adalah untuk memberi panduan kepada SO/PP sebagai perancangan penyediaan ITP yang perlu disesuaikan dengan kontrak yang berkaitan

CATATAN

CATATAN

JABATAN KERJA RAYA
MALAYSIA