Design Checklist

For Road Projects

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Jabatan Kerja Raya

Cawangan Kejuruteraan Jalan & Geoteknik

ATJ 28/2013

DESIGN CHECKLIST FOR ROAD PROJECTS

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KERAJAAN MALAYSIA

DESIGN CHECKLIST FOR ROAD PROJECTS

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FOREWORD

There has been tremendous progress in the road design methodology and process within JKR which are underlined in the numerous revised Technical Design Guides produced by JKR and REAM that update the latest road design requirements in line with the current international standards and practices worldwide. In addition, JKR Malaysia has also implemented a new set of Contract Forms revision Year 2010 as well as a series of new Specifications for Roadwork.

The checklist refers to them in the respective items and the designers are expected to use and familiarise themselves with the relevant Technical Design Guides and specifications to help them understand the requirements as stated in the checklist.

This **Arahan Teknik (Jalan) 28/2013**, hereinafter called **ATJ 28/2013 Design Checklist for Road Projects** is organised based on an integrated design process flowchart, which shows the various key milestones and deliverables to mark the stages of the road design process. This document had also been presented and approved in the *Mesyuarat Jawatankuasa Pemandu Pengurusan* Bil. 17/2013 on 21st August 2013.

This checklist is never intended to be exhaustive although there is always a tendency to overload checklists when preparing them, as every individual road designer will have their own priorities in the list of items to check.

It is essentially a collation of checklists by various functional units within JKR reflecting their respective checking processes currently being practised when designing or managing road design as an organisation in JKR.

This document is intended to help young engineers to familiarise themselves with the processes and requirements by JKR when undertaking road design.

It is also useful for experienced road design engineers to update themselves in line with the latest requirements by JKR not only in terms of technical expectations but also their new organisational functions and processes.

This document will be reviewed and updated from time to time to cater for the changes on policies and current requirements. In this respect any comments and feedback regarding this document should be forwarded to Unit Standard & Spesifikasi, Cawangan Kejuruteraan Jalan & Geoteknik.

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1.0 INTRODUCTION

Jabatan Kerja Raya (JKR) is a premier road implementation agency, managing over thousands of kilometer of road in Malaysia. To execute the role as an infrastructure provider for the country, JKR is responsible for planning, designing and implementing the project smoothly in accordance to a given set of cost, time and quality requirement. Some design works are out-sourced to private consulting firms while others are done internally.

1.1 Purpose of Design Review

At various stages of the design works, a design review is normally carried out by the respective principal designer or JKR's Head of Design Team (HODT). The main purpose of design review is to check and ensure design deliverables consisting of drawings, Bill of Quantities (BQ), specification, reports and other relevant documents are satisfactory with particular reference to the following general aspects:

a. Safety: complying with all relevant JKR *Arahan Teknik* and codes of practice with respect to adequate Factor of Safety (FOS) against all modes of failure and durability requirements.

b. Functional: adequate road and junction capacity for the designed life; road profile above designed flood level etc.

c. Cost effectiveness: optimum cost and within budget

d. Aesthetic: all structures and road side furniture should be pleasing and aesthetic in appearance.

e. Constructability: ease of construction; minimum temporary/abortive works; skills and machines/plants easily available.

f. Maintainability: no problem to access for maintenance; minimum maintenance.

g. Environmental: minimum inconvenience and hazard to road users during construction and operation; minimum community severance and minimum disturbance to flora and fauna.

h. Land acquisition and local access: Optimisation of land takes and access for local community needs careful planning right from the start of the project.

i. Legal/statutory: comply with all local bylaws and regulations set by authorities.

j. Government and departmental policy: comply with the latest government & department policy.

Due to inter-discipline design complexities that are involved at various stages of design works, it is a necessity for JKR to have a high quality standard of design deliverables for ensuring a project success. To ensure the above quality objective is fully addressed and established, a design process flowchart is established to guide designers on the right and smooth sequencing of design flows starting from project inception to tendering process. As a tool to control and monitor the quality of design processes, a set of design review checklists is prepared for selected major design processes.

1.2 Abbreviations

The following abbreviation shall be used throughout this guideline:

Serial	Abbreviation	Description
a.	KPKR	Ketua Pengarah Kerja Raya
b.	TKPKR	Timbalan Ketua Pengarah Kerja Raya
c.	PB	Pengarah Berkenaan (Pengarah Cawangan Ibu Pejabat JKR Malaysia, Pengarah JKR Negeri, Pengarah JKR Persekutuan, Pengarah JKR Pembangunan Persekutuan, Pengarah Unit Khas JKR)
d.	KUB	Ketua Unit Berkenaan (Ketua Unit di cawangan, Ketua Bahagian di negeri, Jurutera Daerah, Jurutera Jajahan, Pengurus Tapak Projek)
e.	HOPT	Head of Project Team (Pegawai yang dilantik oleh Pengarah Berkenaan untuk mengetuai Pasukan Pelaksanaan projek)
f.	HODT	Head of Design Team (Pegawai yang dilantik oleh Pengarah Berkenaan untuk mengetuai pasukan Rekabentuk/Perolehan mengikut disiplin kerja yang berkaitan dengan pelaksanaan projek)

Serial	Abbreviation	Description
g.	PRB	Pasukan/Pegawai rekabentuk
h.	PD	Pengarah Projek
i.	WPD	Wakil Pengarah Projek
j.	PP	Pegawai Penguasa
k.	WPP	Wakil Pegawai Penguasa
l.	SST	Surat Setuju Terima (Letter of Acceptance)
m.	Q-Plan	Project Quality Plan
n.	D-Plan	Design Quality Plan
o.	C-Plan	Construction Quality Plan
p.	D&B	Design and Build
q.	RSA	Road Safety Audit
r.	EIA	Environmental Impact Assessment

2.0 DESIGN PROCESS

2.0.1 Process Flow Chart

The overall design process is guided through a design process flowchart as shown in **APPENDIX 1.** The flowchart is prepared based on the process flow for a new road project. The flows are adopted mostly based on JKR's *"Sistem Pengurusan Kualiti (SPK)"* and other inputs from various parties involved in the preparation of this guideline.

2.0.2 Design Phases

Generally, the design works is grouped into three main design phases and can be organised into 18 main works processes as follows:

Serial	Phase	Works Processes	Major Design Processes
A	Planning Phase	A1. Project Initiation	1. Project Identification and Finalisation of Project Brief 2. Identify EIA Requirements 3. Decide on Method of Implementation
		A2. Conceptual	4. Perform Conceptual Design 5. Prepare Q-Plan and Cost Estimation 6. Perform Survey Works 7. Prepare Design Corridor and Land Acquisition Plan (Section 4) 8. Carry Out RSA Stage 1
B	Preliminary Design Phase		9. Perform Preliminary Design and Prepare Design Quality Plan (D-Plan) 10. Perform S.I Works 11. Carry out RSA Stage 2
C	Detailed Design Phase	C1- Detailed Design Stage 1	12. Perform Detailed Design 13. Carry out RSA Stage 3 14. Design Verification & Validation report 15. Prepare Right of Way (ROW) and Land Acquisition Plan (Section 8)
		C2- Detailed Design Stage 2	16. Prepare Final Design Report 17. Prepare Tender Table Document (TTD) 18. Prepare Engineer's Cost Estimate

2.1 PLANNING PHASE

Planning phase is important because most of the major decision making process is done during this phase. Generally, the phase is divided into two main design processes, namely the project initiation and conceptual design.

2.1.1 Project Initiation

The design processes include project identification, assessment of EIA requirements and decision on method of implementation.

a. Project Identification

Project identification means the identification of the need to have a road joining from one point to another or to improve or upgrade an existing road between two points. The following guidelines are taken into consideration when identifying of road project:

i. Guidelines in this section are intended to help the HOPT/HODT consider a road project in a broad context before advancing to the specifics of road design presented in the next sections. It is important to consider how a particular project fits into the overall JKR's infrastructure program objective.

ii. After receiving a list of Federal Road Projects from other Ministries/Agencies (JKR's client), JKR shall ensure that a project brief has been prepared properly. A Checklist as indicated in **CHECKLIST 1** shall be used as a guide for checking the completeness of project inception documentation.

b. Assessment of EIA Requirements

It is prudent to check the requirements of environmental aspect early in the planning process. Should Environmental Impact Assessment (EIA) is required, a considerable time and budget should be set aside to enable a specialist to conduct the study. Refer to **CHECKLIST 2** for a checklist.

c. Method of Project Implementation

i. JKR top management shall strategise the project implementation method *(Kaedah Pelaksanaan)* and give instruction to the relevant *Pengarah Berkenaan (PB)* for further action. *PB* shall appoint HOPT to start planning the execution of a given project. HOPT shall do the following:

1) Appoint HODT.

2) Identify Project team members.

3) Review Project brief.

4) Check the requirement of Value Management.

ii. HOPT/HODT shall analyse the following documents in order to make final recommendation on the type of project implementation method:

1) Customer's Project brief.

2) Customer's Asset Verification.

3) Resource allocation.

4) Review EIA requirements.

iii. The output of the above process shall decide on the final project implementations method which consist of as following options;

1) Conventional:

a) Design out-sourced to consulting firm.

b) Design internally by JKR's Design Department (HODT)

2) Design and Build:

a) Based on tender.

b) Based on direct negotiation

iv. For a conventional method whereby the design part shall be undertaken by a consulting firm, HOPT shall appoint the consultant based on the procedure as stipulated in **Procedure JKR.PK(P).10**.

v. As for Design & Build (D&B) contractor upon receiving approval from Treasury, HOPT shall issue Letter of Intention/*Surat Niat* (LOI) to the successful D&B contractor. The consultant firms for the D&B team have to be vetted through to screen the capability of each of the design firm.

vi. HOPT/HODT shall prepare a 'Project Need Statement' for D&B projects.

2.1.2 Conceptual Design

After the project has been planned and programmed for implementation, it moves into the Conceptual Design stage. In this stage, JKR commits its resources by performing design works. Should JKR decide to out-source this function to private consultancy firm, a selection and appointment of the consultant shall take place. The Conceptual Design stage generally constitutes the following:

a. Desk Study

Before embarking on data collection activities, designers shall:

i. Review the existing data available in the Local Authorities or through other sources/agencies. This data may include previous documentation (reports, plans, files, surveys etc.).

ii. Review on road asset inventory such as utilities, drainage, structures or adjacent developments.

iii. Topographical and geology maps.

iv. Land acquisition cost data.

v. Local sources of material (quarry products, source of sand, etc.)

b. Site Reconnaissance

Site reconnaissance study should be carried out as early as possible to make an appreciation of the existing site condition. The team shall study on the scope and issues pertaining to the initial work that needs to be done including the study area, logistics to gauge the resources required to undertake the conceptual design works and other subsequent design works.

c. Data Collection

Data will be collected on a wide range of existing infrastructure facilities and services within the project site. The designer shall collect, review, organise, document, interpret, assess and evaluate of appropriate data that shall include, but not be limited to:

i. Past and present studies related to the Project(s) (Roads, junction, signals, pavements, poles, lightings, buildings, excavation and fill of soil or sands and any structures etc).

ii. Information regarding new projects connecting or close to the project area.

iii. Present traffic volume data and patterns and travel demand characteristics.

iv. Road accident data collection.

v. Engineering data including information on existing and planned utilities (cables, pipes, ducts, etc) at Project's site.

vi. Hydrological data, existing drainage/sanitary network and future plan for drainage and storm water.

vii. Natural environmental and meteorological data, water quality & wastewater treatment and water treatment plant, wild life, vegetation, hazard lands, etc.

viii. Existing topographical data and geological data.

ix. Property boundaries based on revenue sheets.

Besides collecting data for road networks, data will also be collected on potential constraints to development, including flood risk zones, religious sites, archaeological and conservation areas.

d. Field Studies

The next level is to undertake field works as early as possible for the following studies:

i. Traffic Study (Refer to **CHECKLIST 3**)

ii. Environmental Impact

e. Data Analysis

From the data collected, desk studies carried out and result of field surveys, the designers shall analyse the information and propose possible options for consideration, as part of the road alignment study.

f. Project Documentation

The designers shall prepare, for distribution, minutes of Project Team meetings and correspondence with the local authorities, utility authorities and other interest groups and document the study for reference during future design stages including the photographic records of current conditions.

g. Route Selection Study

i. The objective of this exercise is to present feasible and technical alternative solutions with comments on advantages and disadvantages of each alternative. Based on the detail desk studies and examination of relevant topographical maps, revenue sheets, geological maps, etc., the designers shall develop selected alignment options in sufficient detail for comparison purposes.

ii. The designers shall make a comparison matrix between the possible alignment options. The criteria of the study shall be based on geometrics, estimated construction cost, construction time, encumbrances, land acquisition, impact on environment, etc. A preferred option shall be established at this point. A comparison matrix is used to evaluate the preferred option of the proposed alignments.

iii. **CHECKLIST 4** shall be used to check the completeness of route selection study.

h. Compilation of Conceptual Design Documents. Refer to **CHECKLIST 5**

i. Documents that are required to be submitted to the client are as follows:

ii. Inception Report

iii. Traffic Study Report (if required) or Traffic Count Report

iv. Alignment Option Study

v. Scope of Survey works

vi. Scope of S.I works

i. Road Safety Audit Stage 1

Road Safety Audit (RSA) Stage 1 shall be carried out by a qualified Road Safety Auditor. Engineers shall make necessary adjustments to the preferred alignment based on the comments from RSA. Refer to **CHECKLIST 6.**

j. Conceptual Design Report. Refer to **CHECKLIST 7A**

For the preferred alignment, the designers shall prepare a conceptual design report and drawings based on JKR *Arahan Teknik Jalan*. The report shall include:

i. Road plan and profile.

ii. Typical road cross-sections.

iii. Major junction schematics.

iv. Drainage catchments.

v. Bridges & major culverts location and schematics.

vi. Pavement thickness design.

vii. Basic R.O.W Plan as a corridor planning.

viii. Geological study

The designers shall also prepare a preliminary project cost estimate and preliminary construction schedule.

Refer to **CHECKLIST 7B** for a checklist of Design and Build Tender.

k. Preparation of Project Quality Plan (Q-Pan)

i. HOPT shall prepare a project Quality Plan at this stage. For a D&B project, the contractor shall prepare the same. Before the project can proceed further, a review on the client's requirements shall be done to check the adequacy of documents being produced. Any errors or changes shall be rectified prior to final approval from PB.

ii. All relevant information would be uploaded into SKALA system and the Q-Pan shall be distributed to the relevant parties including the client.

iii. Survey works shall commence immediately after the appointment of accredited/licensed land surveyor and the design corridor plan (Section 4 of Land Acquisition Act 1960) shall be issued to JKPTG/Land Office as soon as possible.

l. Land Survey Works

This process will involve the appointment of Land Surveyor. Refer to **CHECKLIST 8**

i. Scope of Works

It is very important to ensure the scope of survey works is fully addressed to ensure the sufficiency of survey data. The scope may include the following:

1) Strip Survey.

2) Site Survey for bridge, junction/interchange and river areas.

3) Marking of BH locations.

4) ROW setting out.

5) Utility mapping

ii. Budget For Survey Works

In many instances, the budget for survey works is very limited and this has imposed problems later during the detailed design stage where a slight shift in alignment could provide substantial savings but this is not possible due to lack of survey data. The designers shall properly plan the survey corridor and its cost should be properly estimated. Before a land surveyor could be appointed, *Cadangan Teknikal & Kewangan (CTK)* should be agreed and approved by the relevant parties.

iii. Survey Data

Most Licensed Surveyors have been trained to produce survey data as per JKR's survey Terms of Reference since JKR has started to use digital data in the late 1980's. The format requires representing the ground features in the form of 'digital strings'. Should the alignment traverses into more than 2 states whereby the coordinate origin differs, use of integration coordinate system is vital. The designer is to ensure that coordinate systems are properly integrated.

m. Land Acquisition Plan (Section 4 of Land Acquisition Act)

The preferred alignment is overlaid on to the revenue sheet to determine the lots affected by the proposed alignment. At this stage, the assessment is made more to quantify the number of lots and area of land to be identified as the proposed road corridor area under Section 4 of the Land Acquisition Act 1960. Refer to **CHECKLIST 9**.

2.2 PRELIMINARY DESIGN PHASE

2.2.1 Pre-Design Meeting

HOPT/HODT shall arrange for a meeting to start with the preliminary design phase. Based on conceptual design proposal, project cost estimate, project brief and Q-Plan, the designer shall start the design process immediately.

2.2.2 Preparation of a D-Plan.

D-Plan should be prepared as soon as possible after conducting the pre-design meeting.

2.2.3 Scope of Preliminary Design

Preliminary Design entails producing the basic layout of the road alignment using the detailed ground survey as the base data. During the preliminary design, designer should take into the consideration of:

a. The horizontal and vertical alignments are tweaked to take into account the geometric requirements making sure they fulfil or exceed the minimum standards as specified. Main geometric emphasis shall be on the turning radius, sight distances and overtaking opportunities within the overall project.

b. The earthworks shall be computed and the mass haul diagram produced to analyse the overall economics of the road profile.

c. A basic layout of the various junctions or interchanges are produced to outline the concept of the road and to see whether they needs further refinement.

d. The general layouts of the bridges are produced to check if they fit into the scheme and detailed hydraulics analysis are performed to confirm all the previous assumptions made. The same is done for the major culverts. For railway crossings and other road crossings, reference shall be made to KTM and JKR for their review and approvals.

e. Based on the above plans, the SI location plan shall then be prepared. The scope for the SI works shall be prepared and tender document produced for tender exercise. Location of BH and other investigation requirements shall be marked and its coordinate indicated on the drawings. Refer to **CHECKLIST 10.**

2.2.4 Preliminary Design Documents

Preliminary Design Documents shall be compiled and submitted for approval. Refer **CHECKLIST 11**.

2.2.5 Road Safety Audit Stage 2

At this point the Road Safety Auditor shall undertake **RSA Stage 2** (Refer to **CHECKLIST 12**) of his work to see if the schemes work out and whether there are major issues related to safety point of view.

2.2.6 Value Engineering

Any major issues discovered until now shall be deliberated and if need be, small sections of the alignment may need extra surveys and redesign to get an optimised scheme. Value engineering may be performed to further enhance the decisions made during this stage.

2.3 DETAILED DESIGN PHASE

Detailed design phase is divided into two stages. Stage 1 includes the preparation of detailed design drawings and design calculations whereas stage 2 consists of final design reports and tender documentation including project construction cost estimate.

2.3.1 Detailed Design Stage 1

This process is a continuation of the preliminary design phase. At this stage, the following tasks shall be done before tender documents could be finalised.

a. **Detailed Design Works**

i. At this stage, soil investigation work should have been completed and the initial result (BH Log) shall be furnished by the S.I contractor. The designers shall start designing the geotechnical aspects as soon possible on getting the initial results from the soil investigation works. Adjustments to the vertical profile may be done to reduce embankment heights or increase them to reduce cuts should the initial soil results show the need to do so.

ii. As soon as the plan and profile and road cross-sections have been finalised, other disciplines shall start working on the details of other road design elements such as drainage, geotechnical, structures, road marking and furniture's, Environmental Monitoring Plan

(EMP), Traffic Management Plan, street lighting and other road features as required by the client. Design work shall also include schemes for temporary diversion and work zones according to the anticipated stages of the construction works.

iii. The next major effort in this last stage of the design is a massive task of producing all the relevant drawings as a main part of the tender documents. From these drawings, quantities are measured and documented in Taking-Off Sheets and its quantities transferred into the Bill of Quantities (BQ).

iv. **CHECKLIST 13** shows the overall checklist for detailed design stage. It is a combined checklist with various inputs from the geometric, drainage, geotechnical up to street lighting design components.

b. **Road Safety Audit Stage 3**

Road Safety Auditor shall undertake **RSA Stage 3** and the designer shall refine the detailed design according to the comments as the need arise. The RSA shall include the landscaping works that may affect line of sight at junctions. Please refer to **CHECKLIST 14**.

c. **Design Verification and Design Validation**

This is a process where JKR would gather all project stakeholders (if required) to verify the design as per client requirements. Should design validation is required, the process also takes place at this stage.

d. **Land Acquisition Plans (Section 8 of Land Acquisition Act)**

The plans are prepared for submission once the above processes have been completed. By this stage, the designers should be able to optimise land areas that need to be acquired. Refer to **CHECKLIST 15**.

e. **Detailed Design Proposal**

The following documents shall be forwarded to JKR for approval:

i. Detailed Design Calculation.

ii. Detailed Drawings.

iii. Specifications.

iv. Bill of quantities

v. Taking off sheets

2.3.2 Detailed Design Stage 2

Final design report, cost estimate and tender table document shall be prepared during this stage. For checking these works, the following checklists have been prepared:

a. Final Design Report - **CHECKLIST 16**

b. Tender Table Document - **CHECKLIST 17**

c. Engineer's Cost estimate - **CHECKLIST 18**

3.0 CONCLUSION

Using the checklists is not an end in itself. Rather, the checklists are starting points from which to explore solutions to design a road project of the highest standard. Designers are encouraged to improve the checklist from time to time for a better design solution and to facilitate first-time road designers, especially in carrying out road design works assigned to them.

DESIGN PROCESS FLOW CHART

APPENDIX 1

A - PROSES KERJA PERANCANGAN

A1 - PROSES KERJA PROJEK *INITIATION*

SPK 6.1 PROSES KERJA PERANCANGAN PELAKSANAAN PROJEK

Checklist No 1

A1-1 : Pejabat KPKR / TKPKR Kenalpasti Projek

INPUT:

1. Senarai Project Persekutuan daripada Kementerian / Jabatan Pelanggan

A1-2 : Pejabat KPKR / TKPKR

Rancang Strategi Pelaksanaan & Arah PB ambil Tindakan

A1-3 : Pejabat PB

1. Terima Arahan Pelaksanaan.
2. Lantik HOPT

INPUT:
1. Brif Projek

A1-4 : Pejabat HOPT

1. Semak Brif Projek.
2. Kenalpasti Pasukan Projek
3. Lantik HODT dengan persetujuan PB
4. Semak Keperluan VM

Checklist No 2

A1-5 : HOPT/HODT

1. Analisa Brif Projek. Borang JKR.PK(O).01-1
2. Verifikasi Harta Pelanggan (Jika Berkaitan). Borang JKR.PK(O).01-2
3. Analisa Sumber (Rujuk SPK Perenggan 6.1.1)
4. Laporkan Hasil kepada PB
5. Semak Keperluan EIA dalam Perancangan Projek

A1-6 : Pejabat PB

1. Bincang dengan KPKR/TKPKR (Jika Berkenaan)
2. Dapatkan Keputusan Kaedah Pelaksanaan

- Konvensional (Dalaman)
- Konvensional (Perunding)
- Reka & Bina R&B (Tender)
- Reka & Bina R&B (Rundingan Terus)

A1-7 : Pejabat HOPT

1. Lantik Perunding Prosedur JKR.PK(P).10

A1-8 : Pejabat HOPT

1. Keluar Surat Niat
2. Semak Kelayakan Perunding

A1-9 : HOPT/HODT

1. Kenalpasti Skop Projek
2. Sedia 'Need Statement' (bagi projek R&B)

A1-10 : HOPT

1. Kendali Taklimat Skop Kerja & Arahan Pelaksanaan Kepada Semua HODT terlibat

INPUT:
1. Brif Projek
2. Pelan Lokasi Tapak
3. Siasatan tapak (Site Visit - jika perlu)

A2 - PROSES KERJA REKABENTUK KONSEP

SPK 6.1.2 PROSES KERJA PENYEDIAAN REKABENTUK KONSEP - DILAKSANAKAN JURUPERUNDING/UNIT R EKABENTUK JKR

Checklist No 3

A2-1 : Laksana *Desk Study*

1. Road category
2. Design standard
3. Level of Service

A2-2 : Analisa Trafik & Kesan Alam Sekitar

INPUT:
1. Data Collection
2. HPU Traffic Cencus report

A-2-3 : Kenalpasti

1. Road category
2. Design standard
3. Level of Service

A2-4 : Lawatan Tapak Rujuk Borang JKR.PK(O).01-3

Kaji Penemuan

Checklist No 4

A2-5 : Kenalpasti Jajaran

INPUT:
1. Report from Specialist
2. State UPEN
3. Feedbacks from DOE

Checklist No 5

A2-6 : Rekabentuk Konsep

OUTPUT:
1. Conceptual Design Report

Checklist No 6

A2-7 : Road Safety Audit (RSA) Stage 1 / EIA Requirements

Adakah Rekabentuk Konsep Memenuhi RSA Stage 1/EIA?

Ya

Tidak

Checklist No 7A Conceptual Stage Output

Checklist 7B Design & Build Tender

A2-8 : Output Peringkat Konsep

1. Inception Report
2. Conceptual Design Report
3. Feasibility Report (If Applicable)
4. Scope for Survey Works
5. Scope for SI Works
6. Penyediaan Kos Awalan (PDA)

PROSES TENDER REKA & BINA

SPK 6.1.3 PROSES KERJA PENYEDIAAN PELAN KUALITI PROJEK

A2-9 : HOPT/HODT

Kajisemula Rekabentuk Konsep

Rujuk Borang JKR.PK(O).01-5

A2-10 : HOPT/HODT

Penyediaan Kos Awalan

A2-11 : HOPT/HODT

Sediakan pelan Kualiti (Q-Plan) Rujuk SPK Perenggan 6.1.3

INPUT:
1. Maklumat Asas
2. Skop Projek
3. Analisa Sumber
4. Anggaran Tempoh pelaksanaan
5. Pelan Kualiti Kontraktor (R&B Rundingan Terus)

A2-12 : HOPT

Kendali Mesyuarat Kajian Semula Keperluan Pelanggan

INPUT:
1. Brif Projek Pelanggan
2. Konsep Projek
3. Rekabentuk Konsep
4. Anggaran Kasar Kos Projek

A2-13 : HOPT/HODT

Laksana Pindaan Di Mana Perlu Mengikut Keputusan Mesyuarat

A2-14 : PB

SAHKAN:
1. Brif Projek
2. Rekabentuk Konsep
3. Q-Plan
4. Kos Awalan

PASTIKAN:

1. Maklumat di daftarkan di dalam SKALA
2. Q-Plan diedarkan kepada Pelanggan

Checklist No 8

A2-15 : Laksanakan Kerja Ukur

Checklist No 9

A2-16 : Penyediaan Pelan ROW Penyediaan Pelan PBT Sek 4

B - PROSES KERJA REKABENTUK AWALAN

DILAKSANAKAN OLEH JURUPERUNDING/JKR

B-1 : HOPT/HODT Kendali Mesyuarat Pra-Rekabentuk

INPUT:

1. Brief Projek
2. Q-Plan
3. Rekabentuk Konsep
4. Kos Awalan (PDA)

B-2 : Kenal pasti cara Pembinaan & keperluan kefungsian

INPUT:
1. ATJ
2. Piawaian/Spesifikasi
3. Peraturan/Perundangan
4. Arahan Jabatan

Maklumbalas Penambahbaikan: JKR.PK(P) 05, JKR.PK(P) 06, JKR.PK(P) 07 , JKR.PK(P) 11

B-3 : Rekabentuk Awalan Geometric & Penyediaan D-Plan (Borang JKR PK(O) .02-1

Checklist No 10

B-4 : Kerja S.I

B-5 : Kenal pasti Sistem / Ciri Rekabentuk & Kenal pasti bahan dan spesifikasi produk

Checklist No 11

B-6 : Sedia Rekabentuk Awalan

B-7 : Dapat kelulusan Rekabentuk dari pihak Berkuasa Berkenaan **dimana perlu**

Adakah Rekabentuk Awalan Memenuhi Kehendak ?

Tidak

Ya

B-8 : Semak /Kajian Semula Rekabentuk Awalan

Checklist No 12

B-9 : Road safety Audit (RSA) Stage 2

B-10 : Pindaan Rekabentuk Awalan

B-11 : HOPT/HODT

Kendali Mesyuarat Penyelarasan Rekabentuk Awalan

B-12 : HOPT/HODT

Dapatkan Persetujuan pelanggan **dimana perlu**

C - PROSES KERJA REKABENTUK TERPERINCI

C1 - PROSES KERJA REKABENTUK TERPERINCI PERINGKAT 1

DILAKSANAKAN OLEH JURUPERUNDING/JKR

C1-1 : Kenalpasti Sistem/Ciri Rekabentuk yang dipilih

INPUT:
1. Brief Projek
2. Q-Plan
3. Rekabentuk Awalan
4. Kos Awalan (PDA)

C1-2 : Kenalpasti bahan dan spesifikasi yang dipilih

C1-3: Pengiraan Rekabentuk & Sedia spesifikasi jika perlu

INPUT:
1. ATJ
2. Piawaian/Spesifikasi
3. Peraturan/Perundangan
4. Arahan Jabatan

Checklist No 13

C1-4: Sedia rekabentuk terperinci & spesifikasi termasuk no.lukisan

Adakah Rekabentuk Terperinci Memenuhi Kehendak ?

Ya

Tidak

Checklist No 14

C1-6: Road safety Audit (RSA) Stage 3 & Designer's Compliance & Auditor's Compliance

C1-7 : Verifikasi Rekabentuk

Rujuk Borang JKR PK(0).02-2 Tentukan no. indeks lukisan

C1-8 : Validasi Rekabentuk **dimana perlu** Rujuk Borang JKR PK(0).02-2

Adakah Rekabentuk Terperinci Memenuhi Kehendak ?

Ya

Tidak

C1-10 : Luluskan Lukisan & Spesifikasi jika perlu Pastikan penyediaan daftar lukisan oleh HOPT

C1-11 : Penyediaan Pelan PBT Sek 8

C1-9 : Pindaan Rekabentuk dimana perlu Rujuk Borang JKR PK(0).02-3

C1-5 : Kajian Semula Rekabentuk Rujuk Borang JKR PK(0).02-2

Checklist No 15

C2 - PROSES KERJA REKABENTUK TERPERINCI PERINGKAT 2

DILAKSANAKAN OLEH JURUPERUNDING/JKR

C2-1 : Sediakan 'Final Design Report'

Checklist No 16

C2-2 : Sediakan 'Tender Table Document'

Checklist No 17

C2-3 : Sediakan 'Engineer's Estimates'

Checklist No 18

Adakah Dokumen-Dokumen yang Disediakan Memenuhi Kehendak ?

Ya

Tidak

PROSES TENDER

Project Title:	Revision	
	Date	
	HOPT	
	Checker	

CHECKLIST 1 - PROJECT INITIATION

		YES	NO	N/A	REMARKS
1.0	Have the client submitted the following documents?				
1.1	List of projects approved from Economic Planning Unit	☐	☐	☐	
1.2	Project Site	☐	☐	☐	
1.3	Scope of works	☐	☐	☐	
1.4	Project cost based on scope of works	☐	☐	☐	
1.5	Approved project ceiling	☐	☐	☐	
1.6	Approved project allocation	☐	☐	☐	

Project Title:	Revision	
	Date	
	HOPT/HODT	
	Checker	

CHECKLIST 2 - IDENTIFYING ENVIRONMENTAL REQUIREMENT

	YES	NO	N/A	REMARKS
1. Fill up **SPB Forms JKR.PK(O).04E-1** Senarai Semakan Keperluan Pengurusan Pembangunan Lestari Di Peringkat Perancangan Projek				

Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 3 - TRAFFIC STUDY

	YES	NO	N/A	REMARKS
1. Traffic data from HPU	☐	☐	☐	
2. Traffic survey/count proposal	☐	☐	☐	
3. Traffic projection	☐	☐	☐	
4. Level of service of the existing road through out design life	☐	☐	☐	
5. Level of service of the propose new/upgrading road through out design life	☐	☐	☐	
6. Recommendation of lanes configuration	☐	☐	☐	

Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 4 - DETERMINATION OF ALIGNMENT OPTIONS

	YES	NO	N/A	REMARKS
1.0 Desk Study				
1.1 Information on the proposed road corridor based on Feasibility Study gathered (if any)	☐	☐	☐	
1.2 Overall existing road network data gathered	☐	☐	☐	
1.3 Data on the future and committed road network surrounding the project gathered	☐	☐	☐	
1.4 Existing topography data gathered and studied	☐	☐	☐	
1.5 Geological data gathered and studied	☐	☐	☐	
2.0 Field Investigation				
2.1 Site reconnaisance visit conducted	☐	☐	☐	
2.2 Settlement/populated area identified	☐	☐	☐	
2.3 Road geometric constraints identified	☐	☐	☐	
2.4 Sensitive area identified (eg. Orang Asli reserve, cemetry, religious etc.)	☐	☐	☐	
2.5 Flood level information from site visit and/or JPS gathered and studied	☐	☐	☐	
2.6 Surrounding land status and activities studied (eg. Forest reserve, Malay reserve, Mining certificate, etc.)	☐	☐	☐	

Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 4 - DETERMINATION OF ALIGNMENT OPTIONS

		YES	NO	N/A	REMARKS
2.7	Data on the existing land use, socio-economic and committed development gathered and studied	☐	☐	☐	
3.0	**Determination of alignment options**				
3.1	Determination of road hierarchy	☐	☐	☐	
3.2	Determination of road design standard and design speed	☐	☐	☐	
3.3	Defined road geometric parameters which in line with road standard	☐	☐	☐	
3.4	Defined road cross section elements which in line with road standard	☐	☐	☐	
3.5	Alignment options				
a.	Option 1	☐	☐	☐	
b.	Option 2	☐	☐	☐	
c.	Option 3	☐	☐	☐	
d.	……	☐	☐	☐	
3.6	Compliance of the proposed alignment options to geometric design guidelines	☐	☐	☐	

Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 5 - CONCEPTUAL DESIGN

DESIGNERS ARE TO FILL UP THE FOLLOWING SUB-CHECKLIST AS FOLLOWS:

	YES	NO	N/A	REMARKS
1. Geometric - Checklist 5A	☐	☐	☐	
2. Drainage - Checklist 5B	☐	☐	☐	
3. Pavement - Checklist 5C	☐	☐	☐	
4. Geotechnical - Checklist 5D	☐	☐	☐	
5. Structure - Checklist 5E	☐	☐	☐	
6. Environmental - Checklist 5F	☐	☐	☐	
7. Electrical Works - Checklist 5G	☐	☐	☐	
8. Conceptual Design Report - Checklist 5H	☐	☐	☐	

Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 5A - GEOMETRIC

	YES	NO	N/A	REMARKS
1. Road alignment options	☐	☐	☐	
2. Information on the routing of each alignment options	☐	☐	☐	
3. Design parameters comparison of alignment options	☐	☐	☐	
4. Construction cost of each alignment options	☐	☐	☐	
5. Ranking matrix for each alignment options	☐	☐	☐	
6. Preferred alignment	☐	☐	☐	
7. Advantages and disadvantages of preferred alignment	☐	☐	☐	

Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 5B - DRAINAGE

	YES	NO	N/A	REMARKS

1.0 **INCEPTION / CONCEPTUAL DESIGN**

1.1 **Desk Study**

a. Location (name of stream/river, district etc) ☐ ☐ ☐ _____

b. Catchment Characteristics (catchment area, catchment slope, soil type, land use, lake/swamp storage, future change, etc) ☐ ☐ ☐ _____

c. River Details (River slope, material of of stream bed, type of debris, flow control, existing bridges) ☐ ☐ ☐ _____

d. Topography

1.2 **Field Investigation**

a. Existing drainage system ☐ ☐ ☐ _____

b. Land use ☐ ☐ ☐ _____

c. Discharge point ☐ ☐ ☐ _____

1.3 **Proposed Concept Design**

a. Type of drainage system to be used. ☐ ☐ ☐ _____

b. Typical drawings of drainage system. ☐ ☐ ☐ _____

c. Location map / strip map / sketch. ☐ ☐ ☐ _____

Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 5C - PAVEMENT

	YES	NO	N/A	REMARKS
1. Type of Construction				
a. New Road	☐	☐	☐	
b. Rehabilitation/upgrading	☐	☐	☐	
2. Type of Pavement				
a. Flexible	☐	☐	☐	
b. Rigid	☐	☐	☐	
c. Semi Rigid	☐	☐	☐	
3. Pavement Structure				
a. Conventional	☐	☐	☐	
b. Stabilisation	☐	☐	☐	
c. Recycling	☐	☐	☐	

Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 5D - GEOTECHNICAL

	YES	NO	N/A	REMARKS
1.0 **INCEPTION / CONCEPTUAL DESIGN**				
1.1 **Desk Study**				
a. Geology maps study	☐	☐	☐	
b. Existing SI reports of adjacent area	☐	☐	☐	
c. Geological study report of adjacent area	☐	☐	☐	
1.2 **Field Investigation**				
a. Site Visit/Site Reconnaissance	☐	☐	☐	
1.3 **Proposed Concept Design**	☐	☐	☐	

Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 5E - BRIDGE

	YES	NO	N/A	REMARKS

1.0 INCEPTION / CONCEPTUAL DESIGN

1.1 Desk Study

i. Topography

Topography Map Search ☐ ☐ ☐ _____

ii. Road Network/Traffic Report

a. TIA (Traffic Impact Assessment) ☐ ☐ ☐ _____

b. HYPO (Traffic Generation) ☐ ☐ ☐ _____

c. Capacity Analysis on existing roads / junctions ☐ ☐ ☐ _____

d. Traffic Projection ☐ ☐ ☐ _____

e. Proposals : the need of street lighting / traffic light ☐ ☐ ☐ _____

iii. Geological ☐ ☐ ☐ _____

a. Geological Map Search (If any)

iv. Bridge Inventory Card (if any) ☐ ☐ ☐ _____

v. Proposed Road Alignment Drawing/Map ☐ ☐ ☐ _____

vi. Social impact study ☐ ☐ ☐ _____

1.2 Field Study

i. Soil Investigation Report ☐ ☐ ☐ _____

ii. Land survey Drawing ☐ ☐ ☐ _____

Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 5E - BRIDGE

	YES	NO	N/A	REMARKS
iii. Hydrographic survey (inclusive of Highest Flood Level Record)	☐	☐	☐	
iv. Local Authorities Requirements				
a. Vertical & Horizontal Clearance	☐	☐	☐	
vi. Visual assessment of existing structure	☐	☐	☐	
1.3 Structure Conceptual Design Report				
1.3.1 Conceptual Proposals				
i. Numbers of new structures	☐	☐	☐	
ii. Numbers of structures to be replaced/refurbished/widened	☐	☐	☐	
iii. Estimated bridge/structure width required	☐	☐	☐	
iv. Estimated bridge/structure length required	☐	☐	☐	
v. Environmental aspect /impact	☐	☐	☐	
vi. Social aspect/impact	☐	☐	☐	
1.3.2 Evaluation matrix for Conceptual Proposal	☐	☐	☐	
1.3.3 Recommendation for Conceptual Proposal	☐	☐	☐	
1.4 Design Criteria/Design Brief	☐	☐	☐	

Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 5F - EIA PROJECT SCREENING

	YES	NO	N/A	REMARKS
1. Fill up **SPB Forms JKR.PK(O).04E-2** Semakan Tapisan Keperluan Alam Sekitar	☐	☐	☐	

Project Title	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 5G - ELECTRICAL WORKS

	YES	NO	N/A	REMARKS
1.0 Background				
1.1 Project information	☐	☐	☐	
1.2 Strip map for electrical work	☐	☐	☐	
1.3 Class of roads , traffic category	☐	☐	☐	
1.4 Target tender	☐	☐	☐	
1.5 Operation And Maintenance Authority Involved	☐	☐	☐	
1.6 Site visit report	☐	☐	☐	
1.7 Relocation/ protection of utility services	☐	☐	☐	
2.0 Scope of Electrical Works				
2.1 Road lighting (RL)	☐	☐	☐	
2.2 Green Technology				
a. Energy efficient lighting	☐	☐	☐	
b. Energy saving equipment	☐	☐	☐	
2.3 Traffic signal light system	☐	☐	☐	
2.4 Pedestrian bridge	☐	☐	☐	
2.5 Pedestrian crossing	☐	☐	☐	
2.6 Bus stop	☐	☐	☐	
2.7 Tunnel Lighting	☐	☐	☐	

Project Title	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 5G - ELECTRICAL WORKS

	YES	NO	N/A	REMARKS
3.0 Concept Design				
3.1 Existing System (Road Lighting/Traffic Signal Light)	☐	☐	☐	
a. Photograph on existing system/road	☐	☐	☐	
b. Type of pole and mounting height	☐	☐	☐	
c. Existing Feeder Pillar	☐	☐	☐	
3.2 Cross Section of Road	☐	☐	☐	
3.3 Proposed Design	☐	☐	☐	
a. Lighting Class	☐	☐	☐	
b. Type of Columns (with/without arm)	☐	☐	☐	
c. Luminaire (Type & Wattage)	☐	☐	☐	
d. Energy efficient luminaire (green Technology)	☐	☐	☐	
e. Type of Cables	☐	☐	☐	
f. Feeder Pillar	☐	☐	☐	
g. Earthing system	☐	☐	☐	
h. Light Pollution Control	☐	☐	☐	
j. Proposed Power Supply System	☐	☐	☐	
k. Block Diagram for Electrical System	☐	☐	☐	
l. Traffic Signal Light System	☐	☐	☐	

Project Title	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 5G - ELECTRICAL WORKS

	YES	NO	N/A	REMARKS
m. Fully Vehicle Actuated	☐	☐	☐	
n. Traffic Control Strategy eg. CMS, SCATS, SCOOT, MITS	☐	☐	☐	
4.0 Estimated Life Cycle Cost				
4.1 Preliminary Project Estimation				
a. Capital cost	☐	☐	☐	
b. TNB Contribution/Connection Charges	☐	☐	☐	
4.2 Maintenance Estimate	☐	☐	☐	
4.3 Operational Cost (Energy & communication)	☐	☐	☐	
4.4 Agency responsible for electricity bill	☐	☐	☐	
5.0 Constraint				
5.1 Geometric Constraints	☐	☐	☐	
5.2 Maintenance Constraints	☐	☐	☐	
5.3 Road surface	☐	☐	☐	
5.4 Local Authority Requirement	☐	☐	☐	
6.0 Organisation				
6.1 Design team & propose site supervision team (HODT, PRB, etc.)	☐	☐	☐	

Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 5H - CONCEPTUAL DESIGN REPORT

	YES	NO	N/A	REMARKS
1. Project background and scopes	☐	☐	☐	
2. Existing conditions				
2.1 Existing topography and geography	☐	☐	☐	
2.2 Existing horizontal alignment	☐	☐	☐	
2.2 Existing vertical alignment	☐	☐	☐	
2.2 Physical constraint and encumbrances	☐	☐	☐	
2.2 Junction and access control	☐	☐	☐	
2.3 Environmental and socioeconomic	☐	☐	☐	
3. Traffic analysis				
3.1 Traffic data from HPU	☐	☐	☐	
3.2 Traffic survey /count proposal	☐	☐	☐	
3.3 Traffic projection	☐	☐	☐	
3.4 Roadway capacity of the existing road through out design life	☐	☐	☐	
3.5 Roadway capacity of the propose upgrading lane configuration through out design life	☐	☐	☐	
3.6 Recommendation of lane configuration	☐	☐	☐	
4. Conceptual proposal				
4.1 Geometric design standard and design speed	☐	☐	☐	
4.2 Parameter on design control and criteria	☐	☐	☐	
4.3 Parameter on cross sectional elements	☐	☐	☐	

Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 5H - CONCEPTUAL DESIGN REPORT

		YES	NO	N/A	REMARKS
4.4	Parameter on geometric design	☐	☐	☐	
4.5	Pavement design	☐	☐	☐	
4.6	Intersections and U-turns	☐	☐	☐	
4.7	Climbing lanes	☐	☐	☐	
4.8	Overtaking lanes	☐	☐	☐	
4.9	Bridge, structure and box culvert	☐	☐	☐	
4.10	Drainage	☐	☐	☐	
4.11	Geotechnical	☐	☐	☐	
4.12	Environmental	☐	☐	☐	
4.13	Electrical works	☐	☐	☐	
5.	Alignment options				
5.1	Alternative alignments approach and category	☐	☐	☐	
5.2	Detail decription/explanation of each alternative alignment option	☐	☐	☐	
5.3	Comparison between alternative alignment	☐	☐	☐	
5.4	Cost estimate of alignment option	☐	☐	☐	
5.5	Recommendation of alignment	☐	☐	☐	
6.	Conclusion and recommendation	☐	☐	☐	

Project Title :	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 6 - ROAD SAFETY AUDIT STAGE 1

	YES	NO	N/A	REMARKS
INFORMATION REQUIRED TO BE GIVEN TO AUDITOR				
1. Maps/Plans of the region and road Network	☐	☐	☐	
2. Traffic reports showing existing and projected Traffic Flow information on the arterial road network	☐	☐	☐	
3. Details of any proposed local and area wide traffic management strategies	☐	☐	☐	
4. Maps/Plans showing existing and proposed land-usage strategies	☐	☐	☐	
5. Planning reports and associates plans, typical cross-sections, proposed gradelines etc comprising the plans to be audited	☐	☐	☐	
REPORT TO BE PREPARED BY DESIGNER AS PART OF RSA PROCESS *(refer to flowchart RSA Stage 1 Process)*				
6. Designer's Response Report	☐	☐	☐	

Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 7A - CONCEPTUAL STAGE OUTPUT

	YES	NO	N/A	REMARKS
1. Feasibility Report	☐	☐	☐	
2. Inception Report	☐	☐	☐	
3. Conceptual Design Report	☐	☐	☐	
4. Scope for Survey Works	☐	☐	☐	
5. Scope for SI Works	☐	☐	☐	
6. Preliminary Detail Abstract (PDA)	☐	☐	☐	

Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 7B - PREPARATION OF PRE BID DOCUMENT (DESIGN & BUILD)

		YES	NO	N/A	REMARKS
1.0	**CHECKLIST FOR TENDERERS (which shall not form part of the Pre Bid Document)**				
1.1	Notice of invitation to tender	☐	☐	☐	
	i) Amount of pre bid document	☐	☐	☐	
	ii) Place, date and time of submission of tender	☐	☐	☐	
	iii) Notice to Tenderers for breaching the rules	☐	☐	☐	
1.2	Checklist for Content of Pre Bid Document	☐	☐	☐	
1.3	Submission checklist for the use of Tenderers	☐	☐	☐	
1.4	Tenderer's Information Forms				
	Borang A *Surat Pengakuan Kebenaran Maklumat Dan Keesahan Dokumen Yang Dikemukakan Oleh Petender*	☐	☐	☐	
	Borang B *Maklumat Am Dan Latar Belakang Petender*	☐	☐	☐	
	Borang C *Data-Data Kewangan*	☐	☐	☐	
	Borang CA *Laporan Bank/Institusi Kewangan Mengenai Kedudukan Kewangan Petender*	☐	☐	☐	

Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 7B - PREPARATION OF PRE BID DOCUMENT (DESIGN & BUILD)

		YES	NO	N/A	REMARKS
	Borang D *Rekod Pengalaman Kerja*	☐	☐	☐	
	Borang E *Kakitangan Teknikal*	☐	☐	☐	
	Borang F *Keempunyaan Loji Dan Peralatan Pembinaan Utama*	☐	☐	☐	
	Borang G *Senarai Kerja Kontrak Semasa*	☐	☐	☐	
	Borang GA *Laporan Penyelia Projek Atas Prestasi Kerja Semasa Petender (Bukan Projek JKR)*	☐	☐	☐	
	Borang GA1 *Laporan Jurutera Projek Atas Prestasi Kerja Semasa Petender*	☐	☐	☐	
	Borang H *Sijil SCORE dari CIDB*	☐	☐	☐	
1.5	Checklist for *'Dokumen Wajib'.*	☐	☐	☐	
1.6	Bank Guarantee Forms / Insurance Guarantee for Performance Bond	☐	☐	☐	
1.7	Advance Payment Guarantee Forms / Insurance Guarantee for Advance Payment	☐	☐	☐	
1.8	Bank Guarantee Forms for Design Guarantee	☐	☐	☐	
1.9	List of Drawings (if any)	☐	☐	☐	

Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 7B - PREPARATION OF PRE BID DOCUMENT (DESIGN & BUILD)

		YES	NO	N/A	REMARKS
1.10	List of Drawings which given for Tenderers (if any)	☐	☐	☐	
1.11	Pre Bid Document	☐	☐	☐	
2.0	**PRE BID DOCUMENT**				
2.1	COVER FOR PRE BID DOCUMENT Standard Colour is Yellow - Autofinish Golden Yellow (ICI 456) or equivalent	☐	☐	☐	
	Ensure the following information of Pre Bid's Covers :-				
	a) Coat of Arms of Malaysia (Jata Negara)	☐	☐	☐	
	b) Words of "Kerajaan Malaysia"	☐	☐	☐	
	c) Words of "Jabatan Kerja Raya Malaysia"	☐	☐	☐	
	d) Word of "Dokumen Tender"	☐	☐	☐	
	e) Ensure the Project Title similar as regitstered in SKALA.	☐	☐	☐	
	f) Tender registration number (if any)	☐	☐	☐	
	g) Volume and section of Pre Bid's Document	☐	☐	☐	
	h) JKR symbol	☐	☐	☐	
	i. Month and year of tender is stated under 'JKR Symbol'.	☐	☐	☐	

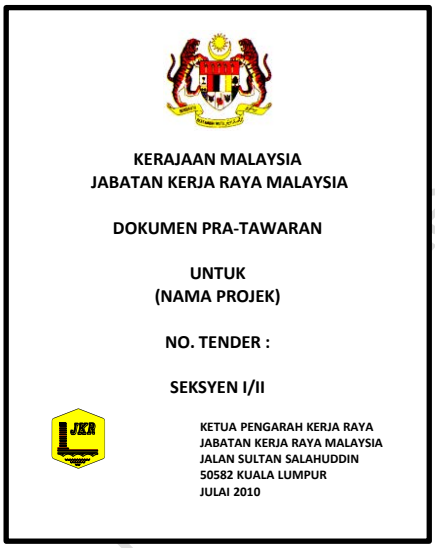
Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 7B - PREPARATION OF PRE BID DOCUMENT (DESIGN & BUILD)

	YES	NO	N/A	REMARKS
ii. KPKR's address at the left bottom of pre Bid's cover	☐	☐	☐	

KETUA PENGARAH KERJA RAYA
JABATAN KERJA RAYA MALAYSIA
JALAN SULTAN SALAHUDDIN
50582 KUALA LUMPUR

Cover sample :-



2.2 CONTENT OF PRE BID DOCUMENT

2.2.1 SECTION 1

(A) INSTRUCTION TO TENDERERS (Use Standard)

i) Maximum completion Period (In weeks)	☐	☐	☐	
ii) Place and time Tender Table Document is displayed.	☐	☐	☐	

Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 7B - PREPARATION OF PRE BID DOCUMENT (DESIGN & BUILD)

	YES	NO	N/A	REMARKS
iii) Office's address which issue the tender if any discrepancies, queries and objection arises	☐	☐	☐	
iv) Appendices to the Instruction to Tenderers (if any)	☐	☐	☐	
Appendix A				
a) Maximum completion period approved by HOPT	☐	☐	☐	
b) Harga Inginan Jabatan	☐	☐	☐	
c) Sijil SCORE dari CIDB	☐	☐	☐	
Appendix B Guidelines for preparation of 'Environmental Management Plan' by Contractor approved by HODT	☐	☐	☐	
Appendix C *Dasar Pengagihan Kerja Kepada Kontraktor Bumiputera Kelas E dan F (Gred I & II CIDB)*				
i) Lampiran A Deed Of Assignment (Security For Direct Payments To Third Party)	☐	☐	☐	
ii) Lampiran B Consent By Government For Direct Payment To Third Party Through Deed of Assignment	☐	☐	☐	
iii) Lampiran C Surat Jaminan Tanggung Rugi Dari Subkontraktor Kepada Kerajaan	☐	☐	☐	

Project Title:	Revision	
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CHECKLIST 7B - PREPARATION OF PRE BID DOCUMENT (DESIGN & BUILD)

	YES	NO	N/A	REMARKS
Appendix D Pelaksanaan Integrity Pact / Surat Akuan Pembida				
i) Lampiran 1 A Surat Akuan Pembida	☐	☐	☐	
ii) Lampiran 1B Surat Akuan Pembida Berjaya	☐	☐	☐	
(B) NEED STATEMENT (CONTRACTUAL REQUIREMENT) Use the need statement which approved by HOPT	☐	☐	☐	
Ensure the following :-				
1 - Appendix 1 - Location map	☐	☐	☐	
2 - Appendix 2 - Facilities for PD	☐	☐	☐	
3 - Appendix 3 - List of Contractor's *Consultants*	☐	☐	☐	
(C) FORM OF TENDER (PWD DB/T - A2002)				
i) Use latest Form of Tender (PWD DB/T-A2002)	☐	☐	☐	
ii) Check the Project Title is correct	☐	☐	☐	
iii) State the office's address which will received the tender	☐	☐	☐	
(D) LETTER OF ACCEPTANCE (JKR 203D)				
i) Use latest standard Letter of Acceptance (JKR 203D) (pind. 1/2011)	☐	☐	☐	

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CHECKLIST 7B - PREPARATION OF PRE BID DOCUMENT (DESIGN & BUILD)

	YES	NO	N/A	REMARKS

(E) PWD FORM DB (Rev. 2010)

Use standard Conditions of Contract P.W.D FORM DB (REV. 2010) ☐ ☐ ☐ _____

Addendum to the COC ☐ ☐ ☐ _____

Page 1
Fill in the following informations:-

i) Category & Sub Category, year ☐ ☐ ☐ _____

ii) Paragraph A - Project's name ☐ ☐ ☐ _____
** Leave blank in others*

Page 3
Clause (q) "P.D."
Fill in the Officer's Designation ☐ ☐ ☐ _____
Refer to 'Surat Arahan KPKR Bil. 1/2010 or latest 'Arahan KPKR'.

Page 63 - APPENDIX 1
Klausa 8.6(a)
State the officer's designation who authorised to approve the Variation of Works. ☐ ☐ ☐ _____

State the financial limit for Variation of Works ☐ ☐ ☐ _____

State the financial limit for Variation of Works ☐ ☐ ☐ _____

Refer to 'Surat Pekeliling Perbendaharaan Bil. 7 Tahun 2007 dated 14 Mei 2007 and 'Surat Arahan KPKR Bil. 5/2008 dated 24 Oktober 2008. or the latest.

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CHECKLIST 7B - PREPARATION OF PRE BID DOCUMENT (DESIGN & BUILD)

	YES	NO	N/A	REMARKS
Clause 8.6 (b) State the officer's designation who authorised to take actions on the particular clauses **Refer to 'Surat Arahan KPKR Bil. 1/2010 or latest "Surat Arahan KPKR'.**	☐	☐	☐	
Clause 5.5 Fill in the date when the tender closed	☐	☐	☐	
Clause 10 Amount Of Guarantee - Fill in "RM 5% of Contract Sum"	☐	☐	☐	
Page 64 - APPENDIX 1 **Klausa 39 - Public Liability Insurance** Fill in the amount as per circulars '- Refer 'Surat KPKR BIL.(28)dlm.JKR.KPKR:020.050/03 Klt.5 dated 9 Februari 2003	☐	☐	☐	
Clause 43 - Sectional Completion a) Fill in the information of sectional completion (if any)	☐	☐	☐	
b) If none, state " Not Applicable"	☐	☐	☐	
Clause 45 - LAD Fill in Liquidated Ascertain Damages (LAD) in %. (refer latest BLR) (BLR/365 days x 100% = x %)	☐	☐	☐	
Clause 48 - Defects Liability Period Fill in Twenty Four (24) months	☐	☐	☐	
Clause 53.3 - Minimum amount for interim payment Fill in RM1000.00 '- Refer 'Surat KPKR BIL.(28)dlm.JKR.KPKR:020.050/03 Klt.4 dated 15.10.2001	☐	☐	☐	

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CHECKLIST 7B - PREPARATION OF PRE BID DOCUMENT (DESIGN & BUILD)

	YES	NO	N/A	REMARKS

Page 65 - APPENDIX 1

Clause 53.5 - Period of honouring the payment

- Fill in "Thirty (30) days" ☐ ☐ ☐

ADDENDUM TO THE CONDITIONS OF CONTRACT (IF ANY)

Insert the addendum to the Cconditions of Contract (if any) ☐ ☐ ☐

APPENDIX 2 - SCHEDULE PAYMENT

Insert flysheet and state *'not applicable'* ☐ ☐ ☐

APPENDIX 3 - GOVERNMENT REQUIREMENTS

Government's requirement consisting of two (2) sections :-

1 - Contractual requirement
Insert flysheet and state 'refer to Part B of Volume I' ☐ ☐ ☐

2 - Technical requirement
Insert flysheet and state 'refer to Part A of Volume II' ☐ ☐ ☐

APPENDIX 4 - CONTRACTOR'S PROPOSAL

Insert flysheet and state 'refer to Part B of Volume II' ☐ ☐ ☐

APPENDIX 5 - TENDER SUM ANALYSIS

- Use colour paper (green colour is the normal colour been used) ☐ ☐ ☐

** - *Put the foot note stated that the tender sum analysis is only a guidelines to the tenderers.*

APPENDIX 6 - SCHEDULE OF RATES

Insert flysheet and state 'to be inserted' ☐ ☐ ☐

APPENDIX 7 - DESIGN GUARANTEE FORM

Slot in Design Guarantee Forms as per 'Pekeliling KPKR Bil 7/2011 ☐ ☐ ☐

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CHECKLIST 7B - PREPARATION OF PRE BID DOCUMENT (DESIGN & BUILD)

		YES	NO	N/A	REMARKS
	APPENDIX 8 - GOVERNMENT MULTIMODAL TRANSPORT OPERATORS Ensure the 34 multimodal companies as per Treasury Instruction	☐	☐	☐	
(F)	**BILL OF QUANTITIES** Insert flysheet and state 'to be inserted'	☐	☐	☐	
(G)	**SCHEDULE OF PARTICULARS** Slot in the standard forms for plants & dayworks	☐	☐	☐	
(H)	**SCHEDULE OF PROGRAMME OF WORKS** Insert flysheet and state 'to be inserted' by tenderers	☐	☐	☐	
(J)	**SCHEDULE OF CONTRACTORS ORGANISATIONS CHARTS** Insert flysheet and state 'to be inserted' by tenderers	☐	☐	☐	
(K)	**SCHEDULE OF CONSULTANTS SUPERVISION CHARTS** Insert flysheet and state 'to be inserted' by tenderers	☐	☐	☐	
(L)	**LIST OF DRAWINGS** Insert flysheet and state 'to be inserted' by tenderers	☐	☐	☐	
2.2.2	**SECTION II - SPECIFICATION** Covers similar to Section II	☐	☐	☐	
(A)	**Government's Requirement (Technical Requirement)** Use the *'Technical Requirement'* which has been approved by HOPT	☐	☐	☐	
	Ensure the followings *appendices* included:-				
	i) App. A1 - General Layout	☐	☐	☐	

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CHECKLIST 7B - PREPARATION OF PRE BID DOCUMENT (DESIGN & BUILD)

	YES	NO	N/A	REMARKS
ii) App. A2 - JKR Design Guidelines	☐	☐	☐	
iii) App. A3 - Road Safety Audit Proposal	☐	☐	☐	
iv) App. A4 - Terms of Reference for Bridges	☐	☐	☐	
v) App. A5 - Geotechnical Design Requirement	☐	☐	☐	
vi) App. A6 - Technical Requirement for Road Design	☐	☐	☐	
vii) App. A7 - Facilities for Project Director	☐	☐	☐	
(B) Technical Proposal Insert flysheet and state 'to be inserted' by tenderers	☐	☐	☐	
(C) Standard Specification (used standard specification which has been approved by HODT)				
i) JKR/SPJ/2008-S8 Traffic Signal System - SAKPKR Bil.15/2011	☐	☐	☐	
ii) JKR/SPJ/2008-S9 Concrete - SAKPKR Bil. 1/2011	☐	☐	☐	
iii) JKR/SPJ/2008-S4 Flexible Pavement - SAKPKR Bil. 14/2011	☐	☐	☐	
iv) JKR/SPJ/1988 whichever relevant and still valid	☐	☐	☐	

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CHECKLIST 7B - PREPARATION OF PRE BID DOCUMENT (DESIGN & BUILD)

	YES	NO	N/A	REMARKS
Ensure the specification for the bridge works and geotechnical works (if any) :				
i) Prestressing works	☐	☐	☐	
ii) Structural Steel Works	☐	☐	☐	
iii) Bridge Bearings	☐	☐	☐	
iv) Expansion Joints	☐	☐	☐	
v) Parapets	☐	☐	☐	
vi) Slope Stabilisation	☐	☐	☐	
vii) Rock Stabilisation.	☐	☐	☐	
(B) ADDENDUM TO THE SPECIFICATION (used addendum specification which has been approved by HODT)	☐	☐	☐	
(C) SPECIAL PROVISION TO THE SPECIFICATION (used special provision to the secification which has been approved by HODT)	☐	☐	☐	
(D) ADDITIONAL SPECIFICATION (IF ANY)	☐	☐	☐	

2.2.3 SECTION III - DRAWINGS

This section is not necessary	☐	☐	☐	

Drawings and list of drawings will be submitted by the Tenderers

Project Title:	Revision	
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	Checker	

CHECKLIST 8 - SURVEY WORKS

	YES	NO	N/A
1.0 Appointment of surveyor			
1.1 Preparation of Terms of Reference (TOR) for survey works	☐	☐	☐
1.2 Scope of works			
a. Determine land survey corridor	☐	☐	☐
b. Determine site survey location	☐	☐	☐
i. Bridge/River	☐	☐	☐
ii. Junction	☐	☐	☐
c. Marking of SI location (estimate borehole location)	☐	☐	☐
d. ROW marker	☐	☐	☐
e. Utility mapping (if any)	☐	☐	☐
1.3 Financial and technical proposal	☐	☐	☐
2.0 Data submission			
a. Data submission as per TOR	☐	☐	☐
b. Sufficiency & accuracy of survey data	☐	☐	☐

REMARKS

Project Title:	Revision	
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CHECKLIST 9 - LAND ACQUISITION SECTION 4

	YES	NO	N/A	REMARKS
1. Cadastral plan gathered	☐	☐	☐	
2. Minimum freezing zone width determined and agreed	☐	☐	☐	
3. *Mukim* and *Daerah* boundary defined	☐	☐	☐	
4. Drawing presentation and format as agreed by *Jabatan Ketua Pengarah Tanah dan Galian* (JKPTG)/*Pejabat Tanah dan Galian Negeri* (PTG)	☐	☐	☐	
5. Proposed freezing zone line and lots effected indicated on plan and land acquisition (LA) schedule	☐	☐	☐	
6. Appropriate copies of LA plan prepared as directed by JKPTG/PTG	☐	☐	☐	

Project Title :	Revision	
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CHECKLIST 10 - SCOPES OF SOIL INVESTIGATION WORKS

		YES	NO	N/A	REMARKS
1.0	**SI Scope:**				
1.1	Is the type and quantity of Soil Investigation described? (e.g. Bored Hole, Vane Shear, JKR Probe)	☐	☐	☐	
1.2	Are the termination criteria explained in the scope?				
1.2.1	For Cut Area	☐	☐	☐	
1.2.2	For Fill Area	☐	☐	☐	
1.2.3	For propose Bridge Area (if any)	☐	☐	☐	
1.3	Is the estimated time of Soil Investigation work carried out stated?	☐	☐	☐	
1.4	Is the cost estimated for SI Works provided?	☐	☐	☐	
2.0	**SI Specification**				
2.1	Is the SI Specification provided?	☐	☐	☐	

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	Checker	

CHECKLIST 10 - SCOPES OF SOIL INVESTIGATION WORKS

		YES	NO	N/A	REMARKS
3.0	**Drawing for Soil Investigation Scope:**				
3.1	Are the locations of proposed field test clearly draw in the drawing? (BH, JP, Vane shear, etc)	☐	☐	☐	
3.2	Are the coordinates of suggested Soil Investigation location clearly the drawing? (BH, JP, Vane shear, etc)	☐	☐	☐	
3.3	Are the contour/spot height of the existing ground shown?	☐	☐	☐	
3.4	Are the legends of the proposed field test clearly shown?	☐	☐	☐	
3.5	Are the existing road and proposed road shown in the drawing (if necessary i.e: for road widening)?	☐	☐	☐	

Project Title:	Revision	
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CHECKLIST 11 - PRELIMINARY DESIGN

DESIGNERS ARE TO FILL UP THE FOLLOWING SUB-CHECKLIST AS FOLLOWS:

	YES	NO	N/A	REMARKS
1. Geometric - Checklist 11A	☐	☐	☐	
2. Drainage - Checklist 11B	☐	☐	☐	
3. Pavement - Checklist 11C	☐	☐	☐	
4. Geotechnical - Checklist 11D	☐	☐	☐	
5. Structure - Checklist 11E	☐	☐	☐	
6. Environmental - Checklist 11F	☐	☐	☐	
7. Electrical Works - Checklist 11G	☐	☐	☐	

Project Title:	Revision	
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	Checker	

CHECKLIST 11A - GEOMETRIC

	YES	NO	N/A	REMARKS
1.0 HORIZONTAL AND VERTICAL ALIGNMENT				
1.1 Compliance of minimum horizontal radius, spiral length and SE for each horizontal curve	☐	☐	☐	
1.2 Widening at horizontal curve (if required)	☐	☐	☐	
1.3 Overtaking / climbing lane	☐	☐	☐	
1.4 Compliance of vertical gradient	☐	☐	☐	
1.5 Compliance of K value for vertical curve	☐	☐	☐	
1.6 Compliance of minimum freeboard and clearance from culvert/bridge are designed in accordance with JPS/TNB/KTMB etc. requirement.	☐	☐	☐	
1.7 Compliance of combination of horizontal and vertical curve	☐	☐	☐	
1.8 Adequacy of sight distances	☐	☐	☐	
2.0 CROSS SECTION				
2.1 Cross sectional elements defined and adequate width				
a. Lane	☐	☐	☐	
b. Paved shoulder	☐	☐	☐	
c. Usable shoulder	☐	☐	☐	
d. Median	☐	☐	☐	

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	Checker	

CHECKLIST 11A - GEOMETRIC

	YES	NO	N/A	REMARKS
e. Verge	☐	☐	☐	
f. Walkway	☐	☐	☐	
g. Minimum Right-of-Way	☐	☐	☐	
h. Bridge cross section	☐	☐	☐	
i. Utility reserve (if required)	☐	☐	☐	
j.	☐	☐	☐	
2.2 Special lane for motorcycle and bicycle	☐	☐	☐	
2.3 Consistency of road cross section along the alignment	☐	☐	☐	
3.0 INTERSECTIONS				
3.1 Control of access	☐	☐	☐	
3.2 Proposed intersection location and configuration	☐	☐	☐	
3.3 Basic intersection layout which include of auxiliary lane, accellaration lane, decellaration lane, through lane, etc	☐	☐	☐	
3.4 Turning radius caters for suitable type of vehicle (PU/SU design vehicle)	☐	☐	☐	

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	Checker	

CHECKLIST 11A - GEOMETRIC

	YES	NO	N/A	REMARKS
4.0 **DRAWING PRESENTATION**				
4.1 Drawing presentation shall be in accordance with ATJ 6/85 Tables, figures and illustrations are correctly refered	☐	☐	☐	
4.2 Units are consistent	☐	☐	☐	
4.3 Drawing title, number, scale are correct.	☐	☐	☐	
4.4 The design output satisfies all specific regulatory (JKR, LLM, DBKL, etc) and client requirements, EIA report, TIA report, RSA report, etc	☐	☐	☐	
4.5 All standard drawings meet with clients and regulatory requirements	☐	☐	☐	

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	Checker	

CHECKLIST 11B - DRAINAGE

	YES	NO	N/A	REMARKS
1.0 PRELIMINARY DESIGN				
1.1 **Assessment report on existing drainage system**	☐	☐	☐	_____
1.2 **Determination of Design Criteria**				
a. Minimum size of culvert for main crossing, acccess culvert, balancing culvert etc.	☐	☐	☐	_____
b. Design Flood Level	☐	☐	☐	_____
c. Determine Average Recurrence Interval (ARI) for design.	☐	☐	☐	_____
d. Min /max water velocity	☐	☐	☐	_____
e. Gradient	☐	☐	☐	_____
1.3 **Hidrology Analysis**				
a. Calculate catchment area	☐	☐	☐	_____
b. Determination of design method	☐	☐	☐	_____
c. Determination of surface runoff	☐	☐	☐	_____
1.4 **Hydraulic Analysis**				
a. Determine type and size of drain	☐	☐	☐	_____
b. Determine type and size of culvert	☐	☐	☐	_____
c. Determine type of inlet and outlet structure of culvert.	☐	☐	☐	_____
d. Determine flow direction of water.	☐	☐	☐	_____

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	Checker	

CHECKLIST 11B - DRAINAGE

	YES	NO	N/A	REMARKS
1.5 Approval from Authority Agencies (JPS /…/)	☐	☐	☐	
1.6 **Preliminary Design Drawings**				
a. Preliminary Drainage layout plan	☐	☐	☐	
b. Typical drawings of surface drainage & culvert.	☐	☐	☐	

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	Checker	

CHECKLIST11C - PAVEMENT

	YES	NO	N/A	REMARKS
1. Traffic Estimation				
a. Current ADT	☐	☐	☐	_____
b. No of lane	☐	☐	☐	_____
c. % Heavy vehicles	☐	☐	☐	_____
d. Growth rate	☐	☐	☐	_____
e. Type of terrain	☐	☐	☐	_____
f. Carriageway width	☐	☐	☐	_____
g. Structural layer coefficient	☐	☐	☐	_____
h. CBR value				
i. Existing	☐	☐	☐	_____
ii. Designed	☐	☐	☐	_____
2. Material Properties				
a. Asphalt concrete	☐	☐	☐	_____
b. Cement stabilised crusher run	☐	☐	☐	_____
c. Sand, laterite	☐	☐	☐	_____
d. Crushed aggregate	☐	☐	☐	_____
e. Cement stabilised subbase	☐	☐	☐	_____

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	Checker	

CHECKLIST11C - PAVEMENT

	YES	NO	N/A	REMARKS
3. Additional information for				
a. Type of mixes:				
i. Porous asphalt	☐	☐	☐	_____
ii. Stone mastic asphalt	☐	☐	☐	_____
iii. Gap graded asphalt	☐	☐	☐	_____
iv. Hot in place recycling	☐	☐	☐	_____
v. Cold in place recycling	☐	☐	☐	_____
vi. Polymer modified asphalt	☐	☐	☐	_____
vii Surface treatment	☐	☐	☐	_____
b. Existing pavement thickness				
i. Asphalt layer	☐	☐	☐	_____
ii. Roadbase	☐	☐	☐	_____
iii. Subbase	☐	☐	☐	_____
c. Pavement evaluation report	☐	☐	☐	_____

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	Checker	

CHECKLIST 11D - GEOTECHNICAL

DESIGNERS ARE TO FILL UP THE FOLLOWING SUB-CHECKLIST AS FOLLOWS:

	YES	NO	N/A	REMARKS
Geotechnical Scope:				
1. SI Result - Sub-Checklist 11D-1	☐	☐	☐	
2. Centreline Cuts and embankments (for normal ground) - Sub-Checklist 11D-2	☐	☐	☐	
3. Embankments over soft ground - Sub-Checklist 11D-3	☐	☐	☐	
4. Retaining Structures - Sub-Checklist 11D-4	☐	☐	☐	
5. Structures Foundation - Sub-Checklist 11D-5	☐	☐	☐	
6. Ground Improvement - Sub-Checklist 11D-6	☐	☐	☐	
7. Drawing - Sub-Checklist 11D-7	☐	☐	☐	

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	Checker	

CHECKLIST 11D-1 - RESULTS OF SOIL INVESTIGATION

		YES	NO	N/A	REMARKS
1.0	**Geotechnical Report Text:**				
1.1	Is the general location of the investigation described?	☐	☐	☐	
1.2	Is scope and purpose of the investigation summarized?	☐	☐	☐	
1.3	Is concise description given of geologic setting and topography of area?	☐	☐	☐	
1.4	Are the field explorations and laboratory tests on which the report is based listed?	☐	☐	☐	
1.5	Is the general description of subsurface soil, rock, and groundwater conditions given?	☐	☐	☐	
1.6	Is the submitted SI Report complete with the geotechnical report (typically included in the report appendices):				
	a. Test hole logs	☐	☐	☐	
	b. Field test data?	☐	☐	☐	
	c. Laboratory test data?	☐	☐	☐	
	d. Photographs (if pertinent)?	☐	☐	☐	
1.7	Is the SI work on site carried out arcordance to the MS 2038?	☐	☐	☐	

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CHECKLIST 11D-1 - RESULTS OF SOIL INVESTIGATION

		YES	NO	N/A	REMARKS
1.8	Is the Soil Investigation Report signed by Profesional Engineer?	☐	☐	☐	
2.0	**Plan and Subsurface Profile:**				
2.1	Is the subsurface profile of the investigation site provided?	☐	☐	☐	
2.2	Does the conducted site investigation meet minimum criteria outlined as per Soil Investigation Scope explained?	☐	☐	☐	
2.3	Are the exploration plotted and correctly numbered on the profile at their true elevation and location?	☐	☐	☐	
2.4	Does the subsurface profile contain a word description and/or graphic depiction of soil and rock types?	☐	☐	☐	
2.5	Are groundwater levels and date measured shown on the subsurface profile?	☐	☐	☐	
3.0	**Subsurface Profile or Field Boring Log:**				
3.1	Are sample types and depths recorded?	☐	☐	☐	
3.1	Are SPT blow count, percent core recovery, and RQD values shown?	☐	☐	☐	

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	Checker	

CHECKLIST 11D-1 - RESULTS OF SOIL INVESTIGATION

		YES	NO	N/A	REMARKS
3.2	If cone penetration test were made, are plots of cone resistance and friction ratio shown with depth?	☐	☐	☐	
4.0	**Laboratory Test Data:**				
4.1	Were lab soil classification tests such as natural moisture content, gradation, Atterberg limits, performed on selected representative samples to verify visual soil identification?	☐	☐	☐	
4.2	Are laboratory test results such as shear strength, consolidation, etc., included and/or summarized?	☐	☐	☐	

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CHECKLIST11D-2 - CENTRELINE CUTS AND EMBANKMENTS (FOR NORMAL GROUND)

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
1.0	**Is the following information provided?**				
1.1	Existing surface and subsurface drainage?	☐	☐	☐	
1.2	Evidence of spring and excessively wet areas?	☐	☐	☐	
1.3	Slides, slump and faults noted along the alignment?	☐	☐	☐	
2.0	**General Soil Cut or Fill :**				
2.1	Specific surface/subsurface drainage recommendations?	☐	☐	☐	
2.2	Excavation limits of unsuitable materials?	☐	☐	☐	
2.3	Erosion protection measures for back slope, side slopes and ditches including riprap recommendations or special slope treatment?	☐	☐	☐	
2.4	Is the slope design limited to maximum 6 nos of berm?	☐	☐	☐	
3.0	**Fill Slopes / Embankments :**				
3.1	Is fill slope design 1:2 with minimum 2.0m berm width and maximum 6.0m berm height?	☐	☐	☐	

Project Title :	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST11D-2 - CENTRELINE CUTS AND EMBANKMENTS (FOR NORMAL GROUND)

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
3.2	Will untreated fill slope design provide minimum FOS=1.25?	☐	☐	☐	
3.3	Special usage of fill slope stabilization (such as geogrid/geotextiles reinforcement, reinforced concrete retaining structure, reinforced fill structure, replacing the fills with elevated structures)? If YES, please states the method used.	☐	☐	☐	
3.4	Are reinforced/stabilized fill slopes for minimum FOS=1.5?	☐	☐	☐	
4.0	**Soil Cuts :**				
4.1	Is cut slope designed 1:1.5 to 1:2 with minimum 2.0m berm width and maximum 6.0m berm height?	☐	☐	☐	
4.2	Are untreated cut slopes designed for minimum FOS=1.25?	☐	☐	☐	
4.3	Special usage of excavated soils (such as soil nailing with slope surface protection/guniting, permanent ground anchors, retaining wall, etc)? If YES, please states the method used.	☐	☐	☐	
4.4	Estimated shrink-swell factors for excavated materials?	☐	☐	☐	

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	Checker	

CHECKLIST11D-2 - CENTRELINE CUTS AND EMBANKMENTS (FOR NORMAL GROUND)

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
4.5	Are reinforced/stabilized cut slopes designed for minimum FOS=1.5?	☐	☐	☐	
5.0	**Rock Slopes :**				
5.1	Rock slope design 4:1 with minimum 2.0m berm width and maximum 6.0m berm height?	☐	☐	☐	
5.2	If answer to 16 is NO, are rock slope designed based on orientation of major rock jointing?	☐	☐	☐	
5.3	Is the need for special rock slope stabilization measures, e.g., permanent rock anchors, rock dowels, rock bolting, rockfall catch ditch, wire mesh slope protection, shotcrete, rock bolts, addressed?	☐	☐	☐	
5.4	Have effects of blast induced vibrations on adjacent structures been evaluated?	☐	☐	☐	

Project Title :	Revision	
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CHECKLIST 11D-3 - EMBANKMENTS OVER SOFT GROUND

Notes : Preliminary design based on field SI results

Where embankments must be built over soft ground (such as soft clays, organic silts or peat), stability and settlement of the fill should be carefully evaluated.

		YES	NO	N/A	REMARKS
1.0	**Embankment Stability :**				
1.1	Has the shear strength of the foundation soil been determined from lab testing and/or field vane shear or cone penetrometer tests?	☐	☐	☐	
1.2	Has the bearing capacity of the embankment been evaluated for min FOS=1.4 (short term)?	☐	☐	☐	
1.3	Has the stability of the embankment been evaluated for minimum FOS=1.3 (short term) and FOS=1.2(long term)?	☐	☐	☐	
1.4	If the proposed embankment does not provide minimum factors of safety given above, are recommendations given or feasible treatment alternates, which will increase factor of safety to minimum acceptable (such as change alignment, lower grade, use stabilizing counterberms, excavate and replace unsuitable material, lightweight fill, geotextile fabric reinforcement, etc)? If YES, please states the alternative used.	☐	☐	☐	

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CHECKLIST 11D-3 - EMBANKMENTS OVER SOFT GROUND

Notes : Preliminary design based on field SI results

Where embankments must be built over soft ground (such as soft clays, organic silts or peat), stability and settlement of the fill should be carefully evaluated.

		YES	NO	N/A	REMARKS
1.5	Are technical-cost-time-constructibility comparisons of treatment alternates given and a specific alternate recommended? If YES, please list out the treatment alternates.	☐	☐	☐	
2.0	**Fill Slopes / Embankments :**				
2.1	Have consolidation properties of fine-grained soils been determined from laboratory consolidation test?	☐	☐	☐	
2.2	Have the settlement of embankments over soft ground follow the design criteria below :	☐	☐	☐	
2.3	Have the settlement of embankment over soft ground designed for 90% consolidation settlement during construction?	☐	☐	☐	

5 years post construction :

- Within 50m from structures approach < 100mm } Differential
- Within 100m remote from structures < 150mm } Settlement
- Road < 250mm (Total settlement)

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CHECKLIST 11D-3 - EMBANKMENTS OVER SOFT GROUND

Notes : Preliminary design based on field SI results

Where embankments must be built over soft ground (such as soft clays, organic silts or peat), stability and settlement of the fill should be carefully evaluated.

		YES	NO	N/A	REMARKS
2.4	For bridge approach embankments, are recommendations made to get the settlement out before the bridge abutment is constructed (stage construction, surcharge, pile embankment, PVD, etc)? If YES, please states the recommendation made.	☐	☐	☐	
2.5	If geotechnical instrumentation is proposed to monitor fill stability and settlement, are detailed recommendations provided on the number, type and specific locations of the proposed instruments?	☐	☐	☐	
3.0	**Ground Improvement Techniques :**				
3.1	For PVD, do recommendations include the coefficient of consolidation for horizontal drainage, c_h, and the length and spacing of PVD?	☐	☐	☐	
3.2	For lightweight fill/EPS, do recommendations include the material properties (f,c,g), permeability, compressibility and drainage requirements	☐	☐	☐	

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CHECKLIST 11D-3 - EMBANKMENTS OVER SOFT GROUND

Notes : Preliminary design based on field SI results

Where embankments must be built over soft ground (such as soft clays, organic silts or peat), stability and settlement of the fill should be carefully evaluated.

		YES	NO	N/A	REMARKS
3.3	For vibro-compaction, do the recommendations include required degree of densification (e.g., relative density, SPT blow count, etc), settlement limitations and quality control?	☐	☐	☐	
3.4	For dynamic compaction, do the recommendation include required degree of densification (e.g. relative density, SPT blow count, etc), settlement limitations and quality control?	☐	☐	☐	
3.5	For stone columns, do the recommendations include spacing and dimensions of columns, bearing capacity, settlement characteristics and permeability (seismic applications)?	☐	☐	☐	
3.6	For grouting do the recommendations include the grouting method (permeation, compaction, etc), material improvement criteria, settlement limitations and quality control?	☐	☐	☐	

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CHECKLIST 11D-3 - EMBANKMENTS OVER SOFT GROUND

Notes : Preliminary design based on field SI results

Where embankments must be built over soft ground (such as soft clays, organic silts or peat), stability and settlement of the fill should be carefully evaluated.

		YES	NO	N/A	REMARKS
4.0	**Construction Considerations :**				
4.1	If excavation and replacement of unsuitable shallow surface deposits (peat, muck, top soil) is recommended, are vertical and lateral limits of recommended excavation provided?	☐	☐	☐	
4.2	Where a surcharge treatment is recommended, are plan and cross-section of surcharge treatment provided in geotechnical report for benefit of the roadway designer?	☐	☐	☐	
4.3	Are instructions or specifications provided concerning instrumentation, fill placement, rates and estimated delay times for the contractor?	☐	☐	☐	
4.4	Are recommendations provided for disposal of surcharge material after the settlement period is complete?	☐	☐	☐	
4.5	If answer for #19 is YES, the method used is :				
	a. Asaoka method.	☐	☐	☐	
	b. Hyperbolic method.	☐	☐	☐	
	c. Others.	☐	☐	☐	

Project Title :	Revision	
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CHECKLIST 11D-4 - RETAINING STRUCTURES

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
1.0	**Is the following information provided?**				
1.1	Recommended soil strength parameters and groundwatr elevations for use in computing wall design lateral earth pressures and factor of safety for overturning, sliding and external slope stability.	☐	☐	☐	
1.2	Are acceptable reasons given for the choice and/or exclusion of certain wall types?	☐	☐	☐	
1.3	Is an analysis of the wall stability included with minimum acceptable factors of safety against :				
	a. Overturning with FOS ≥ 1.8	☐	☐	☐	
	b. Sliding with FOS ≥ 1.6	☐	☐	☐	
	c. Bearing with FOS ≥ 2.0	☐	☐	☐	
	d. Global slope stability with FOS ≥ 1.5	☐	☐	☐	
1.4	If wall will placed on compressible foundation soils, are these informations given?				
	a. Estimated total settlement.	☐	☐	☐	
	b. Differential settlement.	☐	☐	☐	
	c. Time rate of settlement.	☐	☐	☐	
1.5	Will wall types selected for compressible foundation soils allow differential movement without distress?	☐	☐	☐	

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CHECKLIST 11D-4 - RETAINING STRUCTURES

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
1.6	If wall allow to move, are these requirement follows?				
	a. Max permissible vertical movement 15mm along face of wall.	☐	☐	☐	
	b. Max permissible lateral movement 15mm along face of wall.	☐	☐	☐	
	c. Max permissible differential movement 1:150 along face of wall.	☐	☐	☐	
1.7	Are the external and internal stability of retaining wall design as per BS 8006 requirement?	☐	☐	☐	
1.8	Are wall drainage details, including materials and compaction provided?	☐	☐	☐	
2.0	**Construction Considerations :**				
2.1	Are excavation requirements covered including safe slopes for open excavations or need for sheeting or shoring?	☐	☐	☐	
2.2	Fluctuation of groundwater table?	☐	☐	☐	
2.3	For soil nail and anchor walls are the following included in the report?				
	a. Design soil parameters : f, c, g	☐	☐	☐	
	b. Monimum bore size (soil nail)?	☐	☐	☐	
	c. Design pullout resistance (soil nails)?	☐	☐	☐	
	d. Ultimate anchor capacity (anchors)?	☐	☐	☐	
	e. Corrosion protection requirements?	☐	☐	☐	

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CHECKLIST 11D-5 - STRUCTURE FOUNDATION

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
1.0	**STRUCTURE FOUNDATIONS - DRIVEN PILES**				
1.1	Is the recommended pile type given (displacement, non-displacement, steel pipe, concrete, H-Pile, etc.) with valid reasons for choice and/or exclusion?	☐	☐	☐	
1.2	Is the recommended pile type(s) to be the most suitable and economical?	☐	☐	☐	
1.3	Are estimated pile lengths and estimated tip elevations is stated for the for the recommended allowable pile design loads?	☐	☐	☐	
1.4	Is the recommended design loads to be reasonable?	☐	☐	☐	
1.5	Has pile group settlement been estimated (only of practical significant for friction pile groups ending in cohesive soil)?	☐	☐	☐	
1.6	If a specified or minimum pile tip elevation is recommended, is clear reasons given for the required tip elevation, such as underlying soft layers, scour, downdrag, pile uneconomically long, etc,?	☐	☐	☐	
1.7	Has design analysis (wave equation analysis) verified that the recommended pile section can be be driven to the estimated or specified tip elevation without damage (especially applicable where dense gravel-cobble-boulder layers or other obstructions have to be penetrated)?	☐	☐	☐	

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CHECKLIST 11D-5 - STRUCTURE FOUNDATION

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
1.8	Where scour piles are required, have pile design and driving criteria been established based on mobilizing the full pile design capacity below the scour zone?	☐	☐	☐	
1.9	Where lateral load capacity of large diameter piles is an important design consideration, are p-y curves (load vs. deflection) or soil parameters given in the geotechnical report to allow the structural engineer to evaluate lateral load capacity of all piles?	☐	☐	☐	
1.10	For pile supported bridge abutments over soft ground:				
	a. Has abutments downdrag load been estimated and solutions such bitumen coating been considered in design? Not generally required if surcharging of the fill is being performed.	☐	☐	☐	
	b. Is bridge approach slab recommended to moderate differential settlement between bridge end and fill?	☐	☐	☐	
	c. If the majority of subsoil settlement will not be removed prior to abutment construction (by surcharging), has estimate been made of abutment rotation that can occur due to lateral squeeze of soil subsoil?	☐	☐	☐	
	d. Does the geotechnical report specially alert the structural designer to the estimated horizontal abutment movement?	☐	☐	☐	

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CHECKLIST 11D-5 - STRUCTURE FOUNDATION

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
1.11	If bridge project is large, has pile load test program been recommended?	☐	☐	☐	
1.12	For major structure in high seismic risk area, has assessment been made of liquefaction potential of foundation soil during design earthquake (only loose saturated sands and silts are susceptible to liquefaction)?	☐	☐	☐	
	Construction Considerations				
1.13	Pile driving detail such as: boulders or obstructions which may be encountered during driving; need for preaugering, jetting, spudding; need for pile tip reinforcement; driving shoes, etc?	☐	☐	☐	
1.14	Excavation requirements: safe slope for open excavation; need for sheeting or shoring; fluctuation of groundwater table?	☐	☐	☐	
1.15	Have effects of pile driving operation on adjecent structures been evaluated such as protection againts damage caused by footing excavation or pile driving vibrations?	☐	☐	☐	
1.16	Is preconstruction condition survey to be made of adjecent structures to prevent unwarranted damage claims?	☐	☐	☐	
1.17	On large pile driving projects, have other methods of pile driving control been considered such as dynamic testing or wave equation method analysis?	☐	☐	☐	

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CHECKLIST 11D-5 - STRUCTURE FOUNDATION

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
1.18	Is the pile settlement follows these criteria	☐	☐	☐	
	▪ Max 12.5mm along axis of pile at pile head at design load.	☐	☐	☐	
	▪ 38mm or 10% pile size at pile head at twice design load.	☐	☐	☐	
	▪ Residual setllement at working load not exceed [(diameter of pile or diagonal width for non-circular pile /120) + 4]mm whichever is the lower value	☐	☐	☐	

2.0 STRUCTURE FOUNDATIONS - DRILLED SHAFTS

2.1	Are recommended shaft diameter(s) and length(s) for allowable design loads based on an analysis using soil parameters for side friction and end bearing?	☐	☐	☐	
2.2	Settlement estimated for recommeded design load?	☐	☐	☐	
2.3	Where lateral load capacity of shaft is an important design consideration, are p-y (load vs deflection) curves or soils data provided in geotechnical report that will allow structural engineer to evaluate lateral load capacity of shaft?	☐	☐	☐	
2.4	Is static load test (to plunging failure) recommended?	☐	☐	☐	
2.5	Are the FOS of individual pile resistance (under axial loads) design as below: a. Shaft Resistance FOS = 2.0 b. Base Resistence FOS = 2.0	☐	☐	☐	

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CHECKLIST 11D-5 - STRUCTURE FOUNDATION

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
2.6	Are the FOS of individual pile resistance (under lateral & bending loads perpendicular to axis of pile) design as below: a. Ultimate Resistance FOS = 2.5	☐	☐	☐	
2.7	Are the FOS of group pile capacity design as below: a. Block bearing Capacity FOS = 2.0	☐	☐	☐	
	Construction Considerations				
2.8	Have construction methods been evaluated, i.e., can less expensive dry method or slurry method be used or will casing be required?	☐	☐	☐	
2.9	If casing will be required, can casing be pulled as shaft is concreted (this can result in significant cost saving on very large diameter shafts)?	☐	☐	☐	
2.10	If artesian water was encountered in explorations, have design provissions been included to handle it (such as by requiring casing and tremie seal)?	☐	☐	☐	
2.11	Will boulders be encountered? (if boulders will be encountered, then the use of shafts should be seriously questioned due to construction installation difficulties and resultant higher cost to boulders can cause.)	☐	☐	☐	
2.12	Is the pile settlement follows these criteria	☐	☐	☐	
	a. Max 12.5mm along axis of pile at pile head at design load.	☐	☐	☐	

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CHECKLIST 11D-5 - STRUCTURE FOUNDATION

Notes : Preliminary design based on field SI results

	YES	NO	N/A	REMARKS
b. 38mm or 10% pile size at pile head at twice design load.	☐	☐	☐	
c. Residual setllement at working load not exceed [(diameter of pile or diagonal width for non-circular pile /120) + 4]mm whichever is the lower value	☐	☐	☐	

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CHECKLIST 11D-6 - GROUND IMPROVEMENT

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
1.	For wick drains, do recommendation include the coefficient of consolidation for horizontal drainage, c_h, and the length and spacing of wick drains?				
2.	For lightweight fill, do recommendations include the material properties (f, c, g), permeability, compressibility, and drainage requirements?				
3.	For vibro compaction, do the recommendations include required degree of densification (e.g: realtive density, SPT blow count, etc.), settlement limitations, and quality control?				
4.	For dynamic compaction, do the recommendations include required degree of densification (e.g: realtive density, SPT blow count, etc.), settlement limitations, and quality control?				
5.	For stone column, do the recommendations include spacing, diameter & depth of columns, bearing capacity, settlement characteristics, and permeability?				
6.	For grouting, do the recommendations include the grouting method (permeation, compaction, etc.), material improvement criteria, settlement limitations, and quality control?				

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CHECKLIST 11D-7 - GEOTECHNICAL DRAWINGS

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
1.0	**General :**				
1.1	Has the appropriate geotechnical engineer reviewed the drawing to ensure that the design and construction recommendations have been incorporated as intended and that the subsurface information has been presented correctly? **This is absolutely necessary!**	☐	☐	☐	
1.2	Are the finished profile exploration logs and locations included in the plans?	☐	☐	☐	
1.3	Have geotechnical designs prepared by designer been reviewed and aproved by the Senior Geotechnical Engineer?	☐	☐	☐	
2.0	**Centreline Cuts and Embankments :**				
2.1	Where excavation is required, are excavation limits and description of unsuitable organic soils shown on the plans?	☐	☐	☐	
2.2	Are special provisions included for fill materials requiring special treatment, such as nondurable shales, lightweight fill, etc?	☐	☐	☐	
2.3	Are special provisions provided for any special rock slope excavation and stabilization measures called for in plans, such as controlled blasting, wire mesh slope protection, rock bolts, shotcrete, etc?	☐	☐	☐	
3.0	**Embankments Over Soft Ground :**				
3.1	Where excavation is required, are excavation limits and description of unsuitable soils clearly shown on the plans?	☐	☐	☐	

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CHECKLIST 11D-7 - GEOTECHNICAL DRAWINGS

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
3.2	Where settlement waiting period will be required, has estimated settlement time been stated in the special provisions to allow contractor to fairly price the project?	☐	☐	☐	
3.3	If instrumentation will be used to control the rate of fill placement, do special provisions clearly spell out how this will be done and how the readings will be used to control the contractor's operation?	☐	☐	☐	
4.0	**Embankments Over Soft Ground :**				
4.1	Are limits of required selected backfill zones clearly detailed on the plans?	☐	☐	☐	
4.2	Are excavation requirements sepcified, e.g., safe slopes for excavations, need for sheeting, etc.?	☐	☐	☐	
4.3	Is R.O.W limit or easements shown on plans where anchors are to be installed?	☐	☐	☐	
4.4	For soil nail and anchor walls are following included in the provisions :				
	a. Construction tolerances?	☐	☐	☐	
	b. Minimum drill-hole size?	☐	☐	☐	
	c. Material requirements?	☐	☐	☐	
	d. Load testing procedures and acceptable criteria?	☐	☐	☐	
	e. Construction monitoring requirements?	☐	☐	☐	

Project Title:	Revision	
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	Checker	

CHECKLIST 11E - BRIDGE

	YES	NO	N/A	REMARKS
Structural Preliminary Design Report				
1.0 Assessment report for existing bridge/other structure (If any)				
i. Assessment of bridge/other structure	☐	☐	☐	
ii. Assessment of others (ie. R.E Wall, R.C Wall, slope protection, etc)	☐	☐	☐	
iii. Proposal	☐	☐	☐	
2.0 Type of Crossing				
i. Information of crossing type (Roadway, Waterway, Viaduct & Railway)	☐	☐	☐	
ii. Authority requirement				
a. Waterway(JPS, Jabatan Laut, Jabatan Perikanan, etc)	☐	☐	☐	
b. Roadway & Viaduct (JKR Federal/ State, LLM, local authority)	☐	☐	☐	
c. Railway (Suruhanjaya Perkhidmatan Awam Darat - SPAD, KTMB, Monorel, ERL, etc)	☐	☐	☐	
3.0 Preliminary Proposal				
i. Bridge Configuration				
a. Determination of horizontal & vertical alignment	☐	☐	☐	
b. Determination carriageway width	☐	☐	☐	

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CHECKLIST 11E - BRIDGE

	YES	NO	N/A	REMARKS
c. Determination of skew angle				
ii. Structure type:				
a. Functionality				
b. Constructability				
c. Safety				
d. Maintainability, Accessibility and Serviceability				
e. Environment Impact Assessment				
f. Aesthetic				
iii. Foundation system				
iv. Design Calculation :				
a. Hydraulic & hydrology (waterway crossing)				
b. Preliminary Structure Design				
v. Specification				

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CHECKLIST 11F - EIA REPORTS

	YES	NO	N/A	REMARKS
1. Fill up **SPB Forms JKR.PK(O).04E-3** Kajian Semula Alam Sekitar bagi item 1.0 hingga 3.0	☐	☐	☐	

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	Checker	

CHECKLIST 11G - ELECTRICAL WORKS

	YES	NO	N/A	REMARKS
1.0 ROAD PROFILE				
1.1 Road Type (R#s/ U#s)	☐	☐	☐	
1.2 No.of Lane , Road Width, Median	☐	☐	☐	
1.3 Road Surface	☐	☐	☐	
1.4 Elevated Structure, max height	☐	☐	☐	
1.5 Scope of electrical works	☐	☐	☐	
1.6 Builder's work in connection with services				
a. Location of road crossing	☐	☐	☐	
b. Location of sub station	☐	☐	☐	
c. Requirement at parapet/ NJB	☐	☐	☐	
d. Size of verge (adequate for electrical services)	☐	☐	☐	
2.0 PROPOSED ROAD LIGHTING DESIGN				
2.1 Computer simulation for Lighting level calculation for:	☐	☐	☐	
a. Main road (for different type of road profile and lighting arrangement)	☐	☐	☐	
b. Conflict area (e.g. Junction, bridges, interchanges)	☐	☐	☐	
c. Tunnel	☐	☐	☐	
d. High mast	☐	☐	☐	

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	Checker	

CHECKLIST 11G - ELECTRICAL WORKS

	YES	NO	N/A	REMARKS
3.0 DRAWINGS				
3.1 List of Proposed Drawings	☐	☐	☐	
3.2 Proposed Design Criteria	☐	☐	☐	
3.3 Block Diagram for Electrical distribution system c/w source of supply	☐	☐	☐	
3.4 Strip Map c/w limit of projects and scope of Elec. Works	☐	☐	☐	
3.5 Detailing for RSA (Stage 3) submission				
a. Typical Cross Section	☐	☐	☐	
b. Location of poles	☐	☐	☐	
4.0 OTHERS				
4.1 Electrical supply application (TNB, SESB & SESCO)	☐	☐	☐	
4.2 Provide at least 1 no. road lighting at bus stop	☐	☐	☐	
4.3 Provide with road lighting at Pedestrian bridge	☐	☐	☐	

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	Designer	
	Checker	

CHECKLIST 12 - RSA STAGE 2

	YES	NO	N/A	REMARKS
INFORMATION REQUIRED TO BE GIVEN TO AUDITOR				
1. Details of any Stage 1 (Planning stage) Audit, including decisions made on the matters raised in that audit	☐	☐	☐	
2. Planning and 'Route Adoption' reports, on which the Preliminary Design has been based	☐	☐	☐	
3. Traffic Reports containing existing and predicted traffic flows, including design flows, for all movements at intersections and interchanges:	☐	☐	☐	
4. Preliminary layout Plans, Cross sections, Gradelines etc to be audited	☐	☐	☐	
REPORT TO BE PREPARED BY DESIGNER AS PART OF RSA PROCESS *(refer to flowchart RSA Stage 2 Process)*				
5. Designer's Response Report	☐	☐	☐	

Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 13A - GEOMETRIC

	YES	NO	N/A	REMARKS
1.0 HORIZONTAL AND VERTICAL ALIGNMENT				
1.1 Compliance of horizontal alignment design				
a. Radius	☐	☐	☐	_____
b. Spiral length	☐	☐	☐	_____
c. Superelevation	☐	☐	☐	_____
d. SE rate of change	☐	☐	☐	_____
e. Length of curve	☐	☐	☐	_____
f.	☐	☐	☐	_____
1.2 Widening at horizontal curve (if required)	☐	☐	☐	_____
1.3 Compliance of vertical alignment design				
a. Road gradient	☐	☐	☐	_____
b. Critical grade length	☐	☐	☐	_____
c. K sag	☐	☐	☐	_____
d. K crest	☐	☐	☐	_____
e. Embankment above 25years ARI	☐	☐	☐	_____
f. Bridge soffit 1m above 100years ARI	☐	☐	☐	_____
g. Embankment above 50 years ARI for drainage culvert crossing inclusive sufficient cover	☐	☐	☐	_____
h. Vehicular box culvert with sufficient cover	☐	☐	☐	_____
i. Rail crossing	☐	☐	☐	_____
j. Overhead crossing	☐	☐	☐	_____

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CHECKLIST 13A - GEOMETRIC

	YES	NO	N/A	REMARKS
k. Pylon/utility crossing	☐	☐	☐	
l. Level match for existing road to be remained	☐	☐	☐	
m. Pavement evaluation of existing road	☐	☐	☐	
n. Maximum no of berm/bench	☐	☐	☐	
o.	☐	☐	☐	
1.4 Adequacy of sight distances a. Stopping sight distance	☐	☐	☐	
b. Passing sight distance	☐	☐	☐	
1.5 Climbing lane location	☐	☐	☐	
1.6 Overtaking lane	☐	☐	☐	
1.7 Combination of horizontal and vertical curve	☐	☐	☐	
1.8 Distruption to local traffic movement	☐	☐	☐	
1.9 Access to property & houses	☐	☐	☐	
1.10 Crossing for pedestrian / wildlife	☐	☐	☐	
2.0 **CROSS SECTION**				
2.1 Cross sectional elements defined and adequate width with proper type provided a. Lane width	☐	☐	☐	
b. Paved shoulder width	☐	☐	☐	
c. Usable shoulder width	☐	☐	☐	
d. Median width	☐	☐	☐	

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CHECKLIST 13A - GEOMETRIC

	YES	NO	N/A	REMARKS
e. Verge width	☐	☐	☐	
f. Drain reserve	☐	☐	☐	
g. Walkway width	☐	☐	☐	
h. Minimum Right-of-Way width	☐	☐	☐	
i. Max berm height of 6m	☐	☐	☐	
j. Berm width of 2.0m	☐	☐	☐	
k. Typical cut slope of 1:1.5	☐	☐	☐	
l. Typical fill slope of 1:2	☐	☐	☐	
m. Ramp width	☐	☐	☐	
o. Kerb type	☐	☐	☐	
p. Median type	☐	☐	☐	
q. Parapet type (bridge)	☐	☐	☐	
r. Street lighting pole	☐	☐	☐	
s. Bridge cross secion	☐	☐	☐	
t. Utility reserve (if required)	☐	☐	☐	
u. Road furniture	☐	☐	☐	
2.2 Special lane for motorcycle and bicycle	☐	☐	☐	
2.3 Consistency of road cross section along the alignment	☐	☐	☐	

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CHECKLIST 13A - GEOMETRIC

	YES	NO	N/A	REMARKS
3.0 **INTERSECTIONS**				
3.1 Control of access	☐	☐	☐	
3.2 Proposed intersection location and configuration	☐	☐	☐	
3.3 Design speed for through road, entering road and intersection	☐	☐	☐	
3.4 Intersection horizontal and vertical alignment comply to required standard (refer to item 9-15)	☐	☐	☐	
3.5 Number of lane determined and accepted (with reference to traffic study if any)	☐	☐	☐	
3.6 Cross sectional elements defined for				
a. Lane width	☐	☐	☐	
b. Paved shoulder width	☐	☐	☐	
c. Usable shoulder width	☐	☐	☐	
d. Kerb type	☐	☐	☐	
e. Pedestrian crossing / walkway	☐	☐	☐	
f. Parapet type (bridge/ramp)	☐	☐	☐	
g. Bridge cross section	☐	☐	☐	
h. Traffic signal pole and controller (if any)	☐	☐	☐	
i. Road lighting	☐	☐	☐	
3.7 Intersection elements provided and comply to standard				
a. Lane balance	☐	☐	☐	

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CHECKLIST 13A - GEOMETRIC

	YES	NO	N/A	REMARKS
b. Decelaration length	☐	☐	☐	
c. Acceleration length	☐	☐	☐	
d. Taper length	☐	☐	☐	
e. Right turn lane	☐	☐	☐	
f. Nose angle (Interchange)	☐	☐	☐	
g. Nose length (Interchange)	☐	☐	☐	
h. Turning radius as per required type of vehicle (PU, SU or WB40)	☐	☐	☐	
i. Intersection spacing	☐	☐	☐	
3.8 Island type and shape				
a. Size of island checked and suitable island type determined	☐	☐	☐	
b. Island deflection angle provided and accepted	☐	☐	☐	
3.9 Left turn lane				
a. Radius comply to design speed	☐	☐	☐	
b. Lane width comply to adopted radius	☐	☐	☐	
3.10 Adequacy of sight distances				
a. Approach sight distance (ASD)	☐	☐	☐	
b. Entering or crossing sight distance (ESD)	☐	☐	☐	
c. Safe intersection sight distance (SISD)	☐	☐	☐	
d. Sight distance to queue vehicle	☐	☐	☐	

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CHECKLIST 13A - GEOMETRIC

	YES	NO	N/A	REMARKS
4.0 **U-TURN**				
4.1 U-turn location and type	☐	☐	☐	_____
4.2 Distance between u-turn	☐	☐	☐	_____
4.3 median width (for direct u-turn)	☐	☐	☐	_____
5.0 **ROAD FURNITURE**				
5.1 Guide sign				
a. Lettering size & font	☐	☐	☐	_____
b. Location (wording) on sign	☐	☐	☐	_____
c. Continuation of new destination sign along the road	☐	☐	☐	_____
d. Continuation of new and existing destination sign at project connection	☐	☐	☐	_____
e. Location of destination sign	☐	☐	☐	_____
f. Destination sign face as per JKR requirement	☐	☐	☐	_____
g.	☐	☐	☐	_____
5.2 Warning sign				
a. Sign size	☐	☐	☐	_____
b. Location of sign	☐	☐	☐	_____
c. Sign face as per JKR requirement	☐	☐	☐	_____
d.	☐	☐	☐	_____

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CHECKLIST 13A - GEOMETRIC

	YES	NO	N/A	REMARKS
5.3 Regulatory sign				
a. Sign size	☐	☐	☐	
b. Location of sign	☐	☐	☐	
c. Sign face as per JKR requirement	☐	☐	☐	
d.	☐	☐	☐	
5.4 Road marking and delineation				
a. Road marking type and width being used	☐	☐	☐	
b. Type and location of road marking comply to standard	☐	☐	☐	
c. RRPM	☐	☐	☐	
d. Delineator post	☐	☐	☐	
e.	☐	☐	☐	
5.5 Barrier				
a. Type of barrier	☐	☐	☐	
b. Post spacing of guardrail	☐	☐	☐	
c. End treatment of guardrail	☐	☐	☐	
d. Location of guardrail along the alignment	☐	☐	☐	
e. Concrete barrier type accepted (NJB/H type)	☐	☐	☐	
f. barrier height and impact load type	☐	☐	☐	
g. Location of barrier along the alignment	☐	☐	☐	
h.	☐	☐	☐	

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CHECKLIST 13A - GEOMETRIC

	YES	NO	N/A	REMARKS
6.0 **TRAFFIC MANAGEMENT**				
6.1 Define working & construction area	☐	☐	☐	
6.2 Transition area for diverted traffic	☐	☐	☐	
6.3 Buffer space between transition area and construction area	☐	☐	☐	
6.4 No destruption to traffic flow	☐	☐	☐	
6.5 Existing access for local traffic movement remained	☐	☐	☐	
6.6 Overall number of phases accepted	☐	☐	☐	
6.7 Traffic management devices location, type and function accepted				
a. Signs	☐	☐	☐	
b. Channelising devices	☐	☐	☐	
c. Markings	☐	☐	☐	
d. Lighting devices	☐	☐	☐	
e. Flagging	☐	☐	☐	
f.	☐	☐	☐	
7.0 **DRAWING PRESENTATION**				
7.1 Drawing presentation shall be in accordance with ATJ 6/85	☐	☐	☐	
7.2 Tables, figures and illustrations are correctly referenced.	☐	☐	☐	

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CHECKLIST 13A - GEOMETRIC

		YES	NO	N/A	REMARKS
7.3	Units are consistent	☐	☐	☐	
7.4	Drawing title, number, scale are correct.	☐	☐	☐	
7.5	All interfacing with others has been sorted out.	☐	☐	☐	
7.6	The design output satisfies all specific regulatory (JKR, LLM, DBKL, etc) and client requirements, EIA report, TIA report, RSA Stage 2 report, etc.	☐	☐	☐	
7.7	All standard drawings meet with clients and regulatory requirements.	☐	☐	☐	
8.0	**OTHERS**				
8.1	Provision of Rest and Service area	☐	☐	☐	

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CHECKLIST 13B - DRAINAGE

	YES	NO	N/A	REMARKS

1.0 DETAILED DESIGN

1.1 Design Report

a. Summary of Design Criteria ☐ ☐ ☐ _____

b. Summary of Design Constraints ☐ ☐ ☐ _____

c. Summary of changes in design ☐ ☐ ☐ _____

d. Design Effectiveness:

i. Functionality ☐ ☐ ☐ _____

ii. Constructibility ☐ ☐ ☐ _____

iii. Safety ☐ ☐ ☐ _____

iv. Maintainability, Accessibility and Serviceability ☐ ☐ ☐ _____

v. Asthetic ☐ ☐ ☐ _____

1.2 Design Calculations

a. Hydrological Analysis ☐ ☐ ☐ _____

b. Hydraulic Design :

i. Surface Drainage ☐ ☐ ☐ _____

ii. Sub-surface Drainage ☐ ☐ ☐ _____

iii. Culvert ☐ ☐ ☐ _____

iv. Foundation of culvert ☐ ☐ ☐ _____

c. Check Hydrological calculations ☐ ☐ ☐ _____

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CHECKLIST 13B - DRAINAGE

	YES	NO	N/A	REMARKS
d. Check Hydraulic calculations	☐	☐	☐	
e. Check Structural calculations (where necessary)	☐	☐	☐	
1.3 Detailed Drainage Design Drawings	☐	☐	☐	
a. **Culvert :**				
i. Type of bedding	☐	☐	☐	
ii. Height of fill	☐	☐	☐	
iii. Size and slope	☐	☐	☐	
iv. For project involving of an existing road, ensure that the existing culvert is extended sufficiently	☐	☐	☐	
v. Discharge points of culvert and where they lead to.	☐	☐	☐	
b. **Surface Drainage:**				
i. Location of drainage - cut section, embankment section etc.	☐	☐	☐	
ii. Discharge points	☐	☐	☐	

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CHECKLIST 13C - PAVEMENT

	YES	NO	N/A	REMARKS
1.0 Design Calculation Input				
1.1 Design life	☐	☐	☐	
1.2 Current ADT	☐	☐	☐	
1.3 No of lane	☐	☐	☐	
1.4 % Heavy vehicles	☐	☐	☐	
1.5 Growth rate	☐	☐	☐	
1.6 Type of terrain	☐	☐	☐	
1.7 Carriageway width	☐	☐	☐	
1.8 Structural layer coefficient	☐	☐	☐	
1.9 CBR value				
a. Existing	☐	☐	☐	
b. Designed	☐	☐	☐	
2.0 Material Properties				
2.1 Asphalt concrete	☐	☐	☐	
2.2 Cement stabilised crusher run	☐	☐	☐	
2.3 Sand, laterite	☐	☐	☐	
2.4 Crushed aggregate	☐	☐	☐	
2.5 Cement stabilised subbase	☐	☐	☐	

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CHECKLIST 13C - PAVEMENT

	YES	NO	N/A	REMARKS

3.0 Additional Information For Upgrading Works

3.1 Type of mixes:

a. Porous asphalt	☐	☐	☐	
b. Stone mastic asphalt	☐	☐	☐	
c. Gap graded asphalt	☐	☐	☐	
d. Hot in place recycling	☐	☐	☐	
e. Cold in place recycling	☐	☐	☐	
f. Polymer modified asphalt	☐	☐	☐	
g. Surface treatment	☐	☐	☐	

3.2 Pavement evaluation report

a. Crack type	☐	☐	☐	
b. IRI	☐	☐	☐	
c. Rut depth	☐	☐	☐	
d. Asphaltic layer thickness	☐	☐	☐	
e. Roadbase layer thickness	☐	☐	☐	
f. Subbase layer thickness	☐	☐	☐	
g. Strength of existing asphaltic layer	☐	☐	☐	
h. Strength of existing roadbase layer	☐	☐	☐	
j. Strength of existing subbase layer	☐	☐	☐	
k. Strength of existing subgrade	☐	☐	☐	

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CHECKLIST 13C - PAVEMENT

	YES	NO	N/A	REMARKS
4.0 Design Output				
Design Thickness (check for minimum thickness)				
4.1 Wearing course	☐	☐	☐	_____
4.2 Binder course	☐	☐	☐	_____
4.3 Base course				
a. Bituminous (Min. 50mm)	☐	☐	☐	_____
b. Crusher aggregate (Min. 200mm)	☐	☐	☐	_____
c. Cement treated (Min. 100mm)	☐	☐	☐	_____
4.4 Subbase course				
a. Granular (Min. 100mm)	☐	☐	☐	_____
b. Cement treated (Min. 150mm)	☐	☐	☐	_____

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CHECKLIST 13D - GEOTECHNICAL

DESIGNERS ARE TO FILL UP THE FOLLOWING SUB-CHECKLIST AS FOLLOWS:

	YES	NO	N/A	REMARKS
Geotechnical Scope:				
1. SI Result - Sub-Checklist 13D-1	☐	☐	☐	_____
2. Centreline Cuts and embankments (for normal ground) - Sub-Checklist 13D-2	☐	☐	☐	_____
3. Embankments over soft ground - Sub-Checklist 13D-3	☐	☐	☐	_____
4. Retaining Structures - Sub-Checklist 13D-4	☐	☐	☐	_____
5. Structures Foundation - Sub-Checklist 13D-5	☐	☐	☐	_____
6. Ground Improvement - Sub-Checklist 13D-6	☐	☐	☐	_____
7. Drawing - Sub-Checklist 13D-7	☐	☐	☐	_____

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CHECKLIST 13D-1 - RESULTS OF SOIL INVESTIGATION

		YES	NO	N/A	REMARKS
1.0	**Geotechnical Report Text:**				
1.1	Is the general location of the investigation described?	☐	☐	☐	
1.2	Is scope and purpose of the investigation summarized?	☐	☐	☐	
1.3	Is concise description given of geologic setting and topography of area?	☐	☐	☐	
1.4	Are the field explorations and laboratory tests on which the report is based listed?	☐	☐	☐	
1.5	Is the general description of subsurface soil, rock, and groundwater conditions given?	☐	☐	☐	
1.6	Is the submitted SI Report complete with the geotechnical report (typically included in the report appendices):				
	a. Test hole logs	☐	☐	☐	
	b. Field test data?	☐	☐	☐	
	c. Laboratory test data?	☐	☐	☐	
	d. Photographs (if pertinent)?	☐	☐	☐	
1.7	Is the SI work on site carried out arcordance to the MS 2038?	☐	☐	☐	

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CHECKLIST 13D-1 - RESULTS OF SOIL INVESTIGATION

		YES	NO	N/A	REMARKS
1.8	Is the Soil Investigation Report signed by Profesional Engineer?	☐	☐	☐	
2.0	**Plan and Subsurface Profile:**				
2.1	Is the subsurface profile of the investigation site provided?	☐	☐	☐	
2.2	Does the conducted site investigation meet minimum criteria outlined as per Soil Investigation Scope explained?	☐	☐	☐	
2.3	Are the exploration plotted and correctly numbered on the profile at their true elevation and location?	☐	☐	☐	
2.4	Does the subsurface profile contain a word description and/or graphic depiction of soil and rock types?	☐	☐	☐	
2.5	Are groundwater levels and date measured shown on the subsurface profile?	☐	☐	☐	
3.0	**Subsurface Profile or Field Boring Log:**				
3.1	Are sample types and depths recorded?	☐	☐	☐	
3.1	Are SPT blow count, percent core recovery, and RQD values shown?	☐	☐	☐	

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CHECKLIST 13D-1 - RESULTS OF SOIL INVESTIGATION

		YES	NO	N/A	REMARKS
3.2	If cone penetration test were made, are plots of cone resistance and friction ratio shown with depth?	☐	☐	☐	
4.0	**Laboratory Test Data:**				
4.1	Were lab soil classification tests such as natural moisture content, gradation, Atterberg limits, performed on selected representative samples to verify visual soil identification?	☐	☐	☐	
4.2	Are laboratory test results such as shear strength, consolidation, etc., included and/or summarized?	☐	☐	☐	

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CHECKLIST13D-2 - CENTRELINE CUTS AND EMBANKMENTS (FOR NORMAL GROUND)

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
1.0	**Is the following information provided?**				
1.1	Existing surface and subsurface drainage?	☐	☐	☐	
1.2	Evidence of spring and excessively wet areas?	☐	☐	☐	
1.3	Slides, slump and faults noted along the alignment?	☐	☐	☐	
2.0	**General Soil Cut or Fill :**				
2.1	Specific surface/subsurface drainage recommendations?	☐	☐	☐	
2.2	Excavation limits of unsuitable materials?	☐	☐	☐	
2.3	Erosion protection measures for back slope, side slopes and ditches including riprap recommendations or special slope treatment?	☐	☐	☐	
2.4	Is the slope design limited to maximum 6 nos of berm?	☐	☐	☐	
3.0	**Fill Slopes / Embankments :**				
3.1	Is fill slope design 1:2 with minimum 2.0m berm width and maximum 6.0m berm height?	☐	☐	☐	

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CHECKLIST13D-2 - CENTRELINE CUTS AND EMBANKMENTS (FOR NORMAL GROUND)

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
3.2	Will untreated fill slope design provide minimum FOS=1.25?	☐	☐	☐	
3.3	Special usage of fill slope stabilization (such as geogrid/geotextiles reinforcement, reinforced concrete retaining structure, reinforced fill structure, replacing the fills with elevated structures)? If YES, please states the method used.	☐	☐	☐	
3.4	Are reinforced/stabilized fill slopes for minimum FOS=1.5?	☐	☐	☐	
4.0	**Soil Cuts :**				
4.1	Is cut slope designed 1:1.5 to 1:2 with minimum 2.0m berm width and maximum 6.0m berm height?	☐	☐	☐	
4.2	Are untreated cut slopes designed for minimum FOS=1.25?	☐	☐	☐	
4.3	Special usage of excavated soils (such as soil nailing with slope surface protection/guniting, permanent ground anchors, retaining wall, etc)? If YES, please states the method used.	☐	☐	☐	
4.4	Estimated shrink-swell factors for excavated materials?	☐	☐	☐	

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CHECKLIST13D-2 - CENTRELINE CUTS AND EMBANKMENTS (FOR NORMAL GROUND)

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
4.5	Are reinforced/stabilized cut slopes designed for minimum FOS=1.5?	☐	☐	☐	
5.0	**Rock Slopes :**				
5.1	Rock slope design 4:1 with minimum 2.0m berm width and maximum 6.0m berm height?	☐	☐	☐	
5.2	If answer to 16 is NO, are rock slope designed based on orientation of major rock jointing?	☐	☐	☐	
5.3	Is the need for special rock slope stabilization measures, e.g., permanent rock anchors, rock dowels, rock bolting, rockfall catch ditch, wire mesh slope protection, shotcrete, rock bolts, addressed?	☐	☐	☐	
5.4	Have effects of blast induced vibrations on adjacent structures been evaluated?	☐	☐	☐	

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CHECKLIST 13D-3 - EMBANKMENTS OVER SOFT GROUND

Notes : Preliminary design based on field SI results

Where embankments must be built over soft ground (such as soft clays, organic silts or peat), stability and settlement of the fill should be carefully evaluated.

		YES	NO	N/A	REMARKS
1.0	**Embankment Stability :**				
1.1	Has the shear strength of the foundation soil been determined from lab testing and/or field vane shear or cone penetrometer tests?	☐	☐	☐	
1.2	Has the bearing capacity of the embankment been evaluated for min FOS=1.4 (short term)?	☐	☐	☐	
1.3	Has the stability of the embankment been evaluated for minimum FOS=1.3 (short term) and FOS=1.2(long term)?	☐	☐	☐	
1.4	If the proposed embankment does not provide minimum factors of safety given above, are recommendations given or feasible treatment alternates, which will increase factor of safety to minimum acceptable (such as change alignment, lower grade, use stabilizing counterberms, excavate and replace unsuitable material, lightweight fill, geotextile fabric reinforcement, etc)? If YES, please states the alternative used.	☐	☐	☐	

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CHECKLIST 13D-3 - EMBANKMENTS OVER SOFT GROUND

Notes : Preliminary design based on field SI results

Where embankments must be built over soft ground (such as soft clays, organic silts or peat), stability and settlement of the fill should be carefully evaluated.

		YES	NO	N/A	REMARKS
1.5	Are technical-cost-time-constructibility comparisons of treatment alternates given and a specific alternate recommended? If YES, please list out the treatment alternates.	☐	☐	☐	
2.0	**Fill Slopes / Embankments :**				
2.1	Have consolidation properties of fine-grained soils been determined from laboratory consolidation test?	☐	☐	☐	
2.2	Have the settlement of embankments over soft ground follow the design criteria below :	☐	☐	☐	
2.3	Have the settlement of embankment over soft ground designed for 90% consolidation settlement during construction?	☐	☐	☐	

5 years post construction :

- Within 50m from structures approach < 100mm } Differential
- Within 100m remote from structures < 150mm } Settlement
- Road < 250mm (Total settlement)

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CHECKLIST 13D-3 - EMBANKMENTS OVER SOFT GROUND

Notes : Preliminary design based on field SI results

Where embankments must be built over soft ground (such as soft clays, organic silts or peat), stability and settlement of the fill should be carefully evaluated.

		YES	NO	N/A	REMARKS
2.4	For bridge approach embankments, are recommendations made to get the settlement out before the bridge abutment is constructed (stage construction, surcharge, pile embankment, PVD, etc)? If YES, please states the recommendation made.	☐	☐	☐	
2.5	If geotechnical instrumentation is proposed to monitor fill stability and settlement, are detailed recommendations provided on the number, type and specific locations of the proposed instruments?	☐	☐	☐	
3.0	**Ground Improvement Techniques :**				
3.1	For PVD, do recommendations include the coefficient of consolidation for horizontal drainage, c_h, and the length and spacing of PVD?	☐	☐	☐	
3.2	For lightweight fill/EPS, do recommendations include the material properties (f,c,g), permeability, compressibility and drainage requirements	☐	☐	☐	

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CHECKLIST 13D-3 - EMBANKMENTS OVER SOFT GROUND

Notes : Preliminary design based on field SI results

Where embankments must be built over soft ground (such as soft clays, organic silts or peat), stability and settlement of the fill should be carefully evaluated.

		YES	NO	N/A	REMARKS
3.3	For vibro-compaction, do the recommendations include required degree of densification (e.g., relative density, SPT blow count, etc), settlement limitations and quality control?	☐	☐	☐	
3.4	For dynamic compaction, do the recommendation include required degree of densification (e.g. relative density, SPT blow count, etc), settlement limitations and quality control?	☐	☐	☐	
3.5	For stone columns, do the recommendations include spacing and dimensions of columns, bearing capacity, settlement characteristics and permeability (seismic applications)?	☐	☐	☐	
3.6	For grouting do the recommendations include the grouting method (permeation, compaction, etc), material improvement criteria, settlement limitations and quality control?	☐	☐	☐	

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CHECKLIST 13D-3 - EMBANKMENTS OVER SOFT GROUND

Notes : Preliminary design based on field SI results

Where embankments must be built over soft ground (such as soft clays, organic silts or peat), stability and settlement of the fill should be carefully evaluated.

		YES	NO	N/A	REMARKS
4.0	**Construction Considerations :**				
4.1	If excavation and replacement of unsuitable shallow surface deposits (peat, muck, top soil) is recommended, are vertical and lateral limits of recommended excavation provided?	☐	☐	☐	
4.2	Where a surcharge treatment is recommended, are plan and cross-section of surcharge treatment provided in geotechnical report for benefit of the roadway designer?	☐	☐	☐	
4.3	Are instructions or specifications provided concerning instrumentation, fill placement, rates and estimated delay times for the contractor?	☐	☐	☐	
4.4	Are recommendations provided for disposal of surcharge material after the settlement period is complete?	☐	☐	☐	
4.5	If answer for #19 is YES, the method used is :				
	a. Asaoka method.	☐	☐	☐	
	b. Hyperbolic method.	☐	☐	☐	
	c. Others.	☐	☐	☐	

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CHECKLIST 13D-4 - RETAINING STRUCTURES

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
1.0	**Is the following information provided?**				
1.1	Recommended soil strength parameters and groundwatr elevations for use in computing wall design lateral earth pressures and factor of safety for overturning, sliding and external slope stability.	☐	☐	☐	
1.2	Are acceptable reasons given for the choice and/or exclusion of certain wall types?	☐	☐	☐	
1.3	Is an analysis of the wall stability included with minimum acceptable factors of safety against :				
	a. Overturning with FOS ≥ 1.8	☐	☐	☐	
	b. Sliding with FOS ≥ 1.6	☐	☐	☐	
	c. Bearing with FOS ≥ 2.0	☐	☐	☐	
	d. Global slope stability with FOS ≥ 1.5	☐	☐	☐	
1.4	If wall will placed on compressible foundation soils, are these informations given?				
	a. Estimated total settlement.	☐	☐	☐	
	b. Differential settlement.	☐	☐	☐	
	c. Time rate of settlement.	☐	☐	☐	
1.5	Will wall types selected for compressible foundation soils allow differential movement without distress?	☐	☐	☐	

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CHECKLIST 13D-4 - RETAINING STRUCTURES

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
1.6	If wall allow to move, are these requirement follows?				
	a. Max permissible vertical movement 15mm along face of wall.	☐	☐	☐	
	b. Max permissible lateral movement 15mm along face of wall.	☐	☐	☐	
	c. Max permissible differential movement 1:150 along face of wall.	☐	☐	☐	
1.7	Are the external and internal stability of retaining wall design as per BS 8006 requirement?	☐	☐	☐	
1.8	Are wall drainage details, including materials and compaction provided?	☐	☐	☐	
2.0	**Construction Considerations :**				
2.1	Are excavation requirements covered including safe slopes for open excavations or need for sheeting or shoring?	☐	☐	☐	
2.2	Fluctuation of groundwater table?	☐	☐	☐	
2.3	For soil nail and anchor walls are the following included in the report?				
	a. Design soil parameters : f, c, g	☐	☐	☐	
	b. Monimum bore size (soil nail)?	☐	☐	☐	
	c. Design pullout resistance (soil nails)?	☐	☐	☐	
	d. Ultimate anchor capacity (anchors)?	☐	☐	☐	
	e. Corrosion protection requirements?	☐	☐	☐	

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CHECKLIST 13D-5 - STRUCTURE FOUNDATION

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
1.0	**STRUCTURE FOUNDATIONS - DRIVEN PILES**				
1.1	Is the recommended pile type given (displacement, non-displacement, steel pipe, concrete, H-Pile, etc.) with valid reasons for choice and/or exclusion?	☐	☐	☐	
1.2	Is the recommended pile type(s) to be the most suitable and economical?	☐	☐	☐	
1.3	Are estimated pile lengths and estimated tip elevations is stated for the for the recommended allowable pile design loads?	☐	☐	☐	
1.4	Is the recommended design loads to be reasonable?	☐	☐	☐	
1.5	Has pile group settlement been estimated (only of practical significant for friction pile groups ending in cohesive soil)?	☐	☐	☐	
1.6	If a specified or minimum pile tip elevation is recommended, is clear reasons given for the required tip elevation, such as underlying soft layers, scour, downdrag, pile uneconomically long, etc,?	☐	☐	☐	
1.7	Has design analysis (wave equation analysis) verified that the recommended pile section can be be driven to the estimated or specified tip elevation without damage (especially applicable where dense gravel-cobble-boulder layers or other obstructions have to be penetrated)?	☐	☐	☐	

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CHECKLIST 13D-5 - STRUCTURE FOUNDATION

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
1.8	Where scour piles are required, have pile design and driving criteria been established based on mobilizing the full pile design capacity below the scour zone?	☐	☐	☐	
1.9	Where lateral load capacity of large diameter piles is an important design consideration, are p-y curves (load vs. deflection) or soil parameters given in the geotechnical report to allow the structural engineer to evaluate lateral load capacity of all piles?	☐	☐	☐	
1.10	For pile supported bridge abutments over soft ground:				
	a. Has abutments downdrag load been estimated and solutions such bitumen coating been considered in design? Not generally required if surcharging of the fill is being performed.	☐	☐	☐	
	b. Is bridge approach slab recommended to moderate differential settlement between bridge end and fill?	☐	☐	☐	
	c. If the majority of subsoil settlement will not be removed prior to abutment construction (by surcharging), has estimate been made of abutment rotation that can occur due to lateral squeeze of soil subsoil?	☐	☐	☐	
	d. Does the geotechnical report specially alert the structural designer to the estimated horizontal abutment movement?	☐	☐	☐	

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CHECKLIST 13D-5 - STRUCTURE FOUNDATION

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
1.11	If bridge project is large, has pile load test program been recommended?	☐	☐	☐	
1.12	For major structure in high seismic risk area, has assessment been made of liquefaction potential of foundation soil during design earthquake (only loose saturated sands and silts are susceptible to liquefaction)?	☐	☐	☐	
	Construction Considerations				
1.13	Pile driving detail such as: boulders or obstructions which may be encountered during driving; need for preaugering, jetting, spudding; need for pile tip reinforcement; driving shoes, etc?	☐	☐	☐	
1.14	Excavation requirements: safe slope for open excavation; need for sheeting or shoring; fluctuation of groundwater table?	☐	☐	☐	
1.15	Have effects of pile driving operation on adjecent structures been evaluated such as protection againts damage caused by footing excavation or pile driving vibrations?	☐	☐	☐	
1.16	Is preconstruction condition survey to be made of adjecent structures to prevent unwarranted damage claims?	☐	☐	☐	
1.17	On large pile driving projects, have other methods of pile driving control been considered such as dynamic testing or wave equation method analysis?	☐	☐	☐	

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CHECKLIST 13D-5 - STRUCTURE FOUNDATION

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
1.18	Is the pile settlement follows these criteria				
	▪ Max 12.5mm along axis of pile at pile head at design load.				
	▪ 38mm or 10% pile size at pile head at twice design load.				
	▪ Residual setllement at working load not exceed [(diameter of pile or diagonal width for non-circular pile /120) + 4]mm whichever is the lower value				

2.0 STRUCTURE FOUNDATIONS - DRILLED SHAFTS

2.1	Are recommended shaft diameter(s) and length(s) for allowable design loads based on an analysis using soil parameters for side friction and end bearing?				
2.2	Settlement estimated for recommeded design load?				
2.3	Where lateral load capacity of shaft is an important design consideration, are p-y (load vs deflection) curves or soils data provided in geotechnical report that will allow structural engineer to evaluate lateral load capacity of shaft?				
2.4	Is static load test (to plunging failure) recommended?				
2.5	Are the FOS of individual pile resistance (under axial loads) design as below: a. Shaft Resistance FOS = 2.0 b. Base Resistence FOS = 2.0				

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CHECKLIST 13D-5 - STRUCTURE FOUNDATION

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
2.6	Are the FOS of individual pile resistance (under lateral & bending loads perpendicular to axis of pile) design as below: a. Ultimate Resistance FOS = 2.5	☐	☐	☐	
2.7	Are the FOS of group pile capacity design as below: a. Block bearing Capacity FOS = 2.0	☐	☐	☐	
	Construction Considerations				
2.8	Have construction methods been evaluated, i.e., can less expensive dry method or slurry method be used or will casing be required?	☐	☐	☐	
2.9	If casing will be required, can casing be pulled as shaft is concreted (this can result in significant cost saving on very large diameter shafts)?	☐	☐	☐	
2.10	If artesian water was encountered in explorations, have design provissions been included to handle it (such as by requiring casing and tremie seal)?	☐	☐	☐	
2.11	Will boulders be encountered? (if boulders will be encountered, then the use of shafts should be seriously questioned due to construction installation difficulties and resultant higher cost to boulders can cause.)	☐	☐	☐	
2.12	Is the pile settlement follows these criteria	☐	☐	☐	
	a. Max 12.5mm along axis of pile at pile head at design load.	☐	☐	☐	

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CHECKLIST 13D-5 - STRUCTURE FOUNDATION

Notes : Preliminary design based on field SI results

	YES	NO	N/A	REMARKS
b. 38mm or 10% pile size at pile head at twice design load.	☐	☐	☐	
c. Residual setllement at working load not exceed [(diameter of pile or diagonal width for non-circular pile /120) + 4]mm whichever is the lower value	☐	☐	☐	

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CHECKLIST 13D-6 - GROUND IMPROVEMENT

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
1.	For wick drains, do recommendation include the coefficient of consolidation for horizontal drainage, c_h, and the length and spacing of wick drains?				
2.	For lightweight fill, do recommendations include the material properties (f, c, g), permeability, compressibility, and drainage requirements?				
3.	For vibro compaction, do the recommendations include required degree of densification (e.g: realtive density, SPT blow count, etc.), settlement limitations, and quality control?				
4.	For dynamic compaction, do the recommendations include required degree of densification (e.g: realtive density, SPT blow count, etc.), settlement limitations, and quality control?				
5.	For stone column, do the recommendations include spacing, diameter & depth of columns, bearing capacity, settlement characteristics, and permeability?				
6.	For grouting, do the recommendations include the grouting method (permeation, compaction, etc.), material improvement criteria, settlement limitations, and quality control?				

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CHECKLIST 13D-7 - GEOTECHNICAL DRAWINGS

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
1.0	**General :**				
1.1	Has the appropriate geotechnical engineer reviewed the drawing to ensure that the design and construction recommendations have been incorporated as intended and that the subsurface information has been presented correctly? **This is absolutely necessary!**	☐	☐	☐	
1.2	Are the finished profile exploration logs and locations included in the plans?	☐	☐	☐	
1.3	Have geotechnical designs prepared by designer been reviewed and aproved by the Senior Geotechnical Engineer?	☐	☐	☐	
2.0	**Centreline Cuts and Embankments :**				
2.1	Where excavation is required, are excavation limits and description of unsuitable organic soils shown on the plans?	☐	☐	☐	
2.2	Are special provisions included for fill materials requiring special treatment, such as nondurable shales, lightweight fill, etc?	☐	☐	☐	
2.3	Are special provisions provided for any special rock slope excavation and stabilization measures called for in plans, such as controlled blasting, wire mesh slope protection, rock bolts, shotcrete, etc?	☐	☐	☐	
3.0	**Embankments Over Soft Ground :**				
3.1	Where excavation is required, are excavation limits and description of unsuitable soils clearly shown on the plans?	☐	☐	☐	

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CHECKLIST 13D-7 - GEOTECHNICAL DRAWINGS

Notes : Preliminary design based on field SI results

		YES	NO	N/A	REMARKS
3.2	Where settlement waiting period will be required, has estimated settlement time been stated in the special provisions to allow contractor to fairly price the project?	☐	☐	☐	
3.3	If instrumentation will be used to control the rate of fill placement, do special provisions clearly spell out how this will be done and how the readings will be used to control the contractor's operation?	☐	☐	☐	
4.0	**Embankments Over Soft Ground :**				
4.1	Are limits of required selected backfill zones clearly detailed on the plans?	☐	☐	☐	
4.2	Are excavation requirements sepcified, e.g., safe slopes for excavations, need for sheeting, etc.?	☐	☐	☐	
4.3	Is R.O.W limit or easements shown on plans where anchors are to be installed?	☐	☐	☐	
4.4	For soil nail and anchor walls are following included in the provisions :				
	a. Construction tolerances?	☐	☐	☐	
	b. Minimum drill-hole size?	☐	☐	☐	
	c. Material requirements?	☐	☐	☐	
	d. Load testing procedures and acceptable criteria?	☐	☐	☐	
	e. Construction monitoring requirements?	☐	☐	☐	

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CHECKLIST 13E - BRIDGE

	YES	NO	N/A	REMARKS
1.0 DETAIL DESIGN				
1.1 General Requirement				
i. Functionality	☐	☐	☐	_____
ii. Constructability	☐	☐	☐	_____
iii. Safety	☐	☐	☐	_____
iv. Maintainability, Accessibility and Serviceability	☐	☐	☐	_____
v. Environment Impact Assessment	☐	☐	☐	_____
v. Aesthetic	☐	☐	☐	_____
1.2 Approval from Relevant Authority				
i. Waterway(JPS, Jabatan Laut, Jabatan Perikanan, etc)	☐	☐	☐	_____
ii. Roadway & Viaduct (JKR Federal/ State, LLM, local authority)	☐	☐	☐	_____
iii. Railway (Jabatan Keretapi, KTMB, Monorel, ERL, etc)	☐	☐	☐	_____
iv. Others	☐	☐	☐	_____
1.3 Design Calculation				
i. Structural analysis	☐	☐	☐	_____
ii. Design calculation of critical member	☐	☐	☐	_____
iii. Other components	☐	☐	☐	_____

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CHECKLIST 13E - BRIDGE

	YES	NO	N/A	REMARKS
1.4 Detail Drawings				
i. Configuration and geometry	☐	☐	☐	
ii. Reduced levels	☐	☐	☐	
iii. Foundation system	☐	☐	☐	
iv. Superstructure	☐	☐	☐	
v. Substructure	☐	☐	☐	
vi. Bridge accessories detailing	☐	☐	☐	
vii. Drainage	☐	☐	☐	
viii. Approach road	☐	☐	☐	
ix. Builder's work in connection with services	☐	☐	☐	
x. Others	☐	☐	☐	
1.5 Method of Construction (where relevant)	☐	☐	☐	
1.6 Method statements for construction specialist work (where relevant)	☐	☐	☐	
2.0 FINAL DESIGN REVIEW				
i ICE Report /Internal Checker's Report	☐	☐	☐	
ii. Designer's Response	☐	☐	☐	
iii. Final Checker's Acceptance	☐	☐	☐	

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CHECKLIST 13F - ENVIRONMENTAL PROJECT REVIEW

	YES	NO	N/A	REMARKS
1. Fill up **SPB Forms JKR.PK(O).04E-3** Kajian Semula Alam Sekitar bagi item 4.0 hingga 5.0	☐	☐	☐	_____

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CHECKLIST 13G - ELECTRICAL WORKS

	YES	NO	N/A	REMARKS
1.0 Existing Road Lighting				
1.1 Type of Column	☐	☐	☐	
1.2 Mounting Height	☐	☐	☐	
1.3 Wattage of lantern/luminaire	☐	☐	☐	
1.4 Type of Lamp/light source	☐	☐	☐	
1.5 Indicate: Relocate/ dismantle	☐	☐	☐	
1.6 Source of Supply	☐	☐	☐	
1.7 Location of Existing FP	☐	☐	☐	
2.0 Road Lighting System (LS-20)				
2.1 Input from road designer				
a. Road furniture layout	☐	☐	☐	
b. Cross section of road - lighting column location	☐	☐	☐	
2.2 Input from KJEN, local council / municipal				
a. Requirement from maintenance office	☐	☐	☐	
b. List of spare parts - features of the controller	☐	☐	☐	
c. Confirmation on electricity bill paymaster (Federal Road = KJEN, State Road = JD)	☐	☐	☐	
d. Special requirement of Local council / municipal (MPHTJ, MBMB ,MBJB etc)	☐	☐	☐	

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CHECKLIST 13G - ELECTRICAL WORKS

	YES	NO	N/A	REMARKS
e. Declaration / agreement for electricity bill from local council	☐	☐	☐	
2.3 Confirmation on source of electrical supply (TNB/SESB/SESCO)	☐	☐	☐	
2.4 Proposed Design:				
a. Choice of Lighting Class as per MS 825 and BS EN 13201-3	☐	☐	☐	
b. Choice of Luminaire	☐	☐	☐	
2.5 Tunnel/Underpass Lighting				
a. Length (m)	☐	☐	☐	
b. No. of lanes	☐	☐	☐	
c. Width of Tunnel/ underpass	☐	☐	☐	
d. Height of Tunnel/ underpass	☐	☐	☐	
e. Design/ Drawing provided	☐	☐	☐	
f. Schematic: alternate circuit	☐	☐	☐	
g. Separate DB	☐	☐	☐	
h. Emergency Supply for long tunnels	☐	☐	☐	
j. Ventilation system	☐	☐	☐	
3.0 Pedestrian Bridge, Bus Stop				
3.1 Fitting: vandal proof type fluorescent	☐	☐	☐	
3.2 Low Loss Ballast for fluorescent fitting: 6W	☐	☐	☐	

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CHECKLIST 13G - ELECTRICAL WORKS

	YES	NO	N/A	REMARKS
3.3 Alternate circuit	☐	☐	☐	
3.4 Time switch controlled	☐	☐	☐	
3.5 Separate DB	☐	☐	☐	
3.6 Separately metered	☐	☐	☐	
3.7 Lightning protection system & earthing system	☐	☐	☐	
3.8 Bus Stop/Bay: at least 1 no. of road lighting.	☐	☐	☐	
4.0 High Mast Lighting				
4.1 Design/ Drawing provided	☐	☐	☐	
4.2 Winch System	☐	☐	☐	
4.3 Separate DB/FP	☐	☐	☐	
4.4 Lightning protection system & earthing system	☐	☐	☐	
5.0 Lighting Column				
5.1 Type of column	☐	☐	☐	
5.2 Decorative /Normal column	☐	☐	☐	
5.3 Frangible type column	☐	☐	☐	
5.4 Double slot hinged service door: Composite	☐	☐	☐	
5.5 Temination box: modular type, IP54	☐	☐	☐	
5.6 Bitumen coated for acidic soil/ coastal area	☐	☐	☐	

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CHECKLIST 13G - ELECTRICAL WORKS

	YES	NO	N/A	REMARKS
5.7 Accessories:				
a. flag holder, bunting holder, hook for festive lights,light box, pot holder, socket outlet, cable opening, etc.	☐	☐	☐	_____
b. Pole reflective sticker : 1500mm FGL	☐	☐	☐	_____
6.0 Cabling system				
6.1 Type & size of Cable: column-column (2C/4C): ≤ 25 mm² AL Cable	☐	☐	☐	_____
6.2 Type & size of Cable: FP - column (2C/4C): ≤ 25 mm² AL Cable	☐	☐	☐	_____
6.3 Type & size of Cable: Meter kiosk/panel/Main FP to SL FPs (2C/4C): mm² AL Cable	☐	☐	☐	_____
6.4 Provide voltage drop calculation (Voltage Drop From Feeder Pillar to the last column ≤ 20V)	☐	☐	☐	_____
7.0 Ducting				
7.1 Location of ducting	☐	☐	☐	_____
7.2 Type of Ducting	☐	☐	☐	_____
7.3 Horizontal Direct Drilling(HDD) / Open cut / pipe jacking	☐	☐	☐	_____
8.0 Feeder Pillar				
8.1 ELR : Adjustable time delay & sensitivity	☐	☐	☐	_____
8.2 MCCB/ Switch fuse	☐	☐	☐	_____

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CHECKLIST 13G - ELECTRICAL WORKS

		YES	NO	N/A	REMARKS
8.3	Earthing (Each FP shall be earthed)	☐	☐	☐	
8.4	Facilities for maintenance: Heater & Fluo. Lamp c/w 100mA RCCB, 13A S/S/O c/w 30mA RCCB	☐	☐	☐	
8.5	Photo Elec.Ctrl Unit / RF Module	☐	☐	☐	
8.6	Location :	☐	☐	☐	
	a. load center	☐	☐	☐	
	b. above flood level	☐	☐	☐	
8.7	Lockable, Stainless Steel / Hot-dipped galvanised/ Electrogalvanised, IP54	☐	☐	☐	
8.8	Separate Compartment with two separate door	☐	☐	☐	
8.9	Internal pocket for document	☐	☐	☐	
8.10	Plinth: Duct for cable access, hollow section to be filled with sand, anchor bolt	☐	☐	☐	
8.11	Paved platform for maintenance : 600mm	☐	☐	☐	
8.12	JKR identification stripe (golden yellow & black)	☐	☐	☐	
8.13	**Anti Vandalism features:**				
	a. 2 sets of embracing steel bars with external padlocking facilities c/w anti chemical, weatherproof padlock	☐	☐	☐	
	b. Anti Sticker Paint	☐	☐	☐	

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CHECKLIST 13G - ELECTRICAL WORKS

	YES	NO	N/A	REMARKS
8.14 Avoid cascading of FP. Direct from TNB source	☐	☐	☐	
8.15 Type of meter panel/kiosk : centralize / individual	☐	☐	☐	
8.16 Cable reticulation : type & scope	☐	☐	☐	
8.17 Substation: type & Location	☐	☐	☐	
8.18 Booster Transformer	☐	☐	☐	
8.19 Energy Saving Equipment / After midnight dimming	☐	☐	☐	

9.0 Traffic Signal Light System (JKR/SPJ/2008-S8)

9.1 Input from road designer				
a. Layout of traffic signal location and controller	☐	☐	☐	
b Traffic Phasing & Timing	☐	☐	☐	
9.2 Input from KJEN office				
a. Information on centralize control and monitoring system	☐	☐	☐	
b. List of spare part - features of the controller	☐	☐	☐	
9.3 No. and type of signalised junction	☐	☐	☐	
9.4 Coordination Road Lighting & Traffic signal light column	☐	☐	☐	

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CHECKLIST 13G - ELECTRICAL WORKS

	YES	NO	N/A	REMARKS
9.5 Signal Heads (MS 2478:2012)**:**				
a. Signal head arrangement (Standard drawing)	☐	☐	☐	_____
b. Height of Signal head (min 2.5m, max 3.5m above the carriageway level, 5.5m≤ Overhead ≥6.5/8.5m above carriageway)	☐	☐	☐	_____
c. Type of signal head (full moon/arrow head/ flashing amber)	☐	☐	☐	_____
d. Fully Vehicle Actuated	☐	☐	☐	_____
9.6 Pedestrian Crossing				
a. Pedestrian push button	☐	☐	☐	_____
b. Signal head c/w count down & Buzzer	☐	☐	☐	_____
9.7 Traffic signal Pole :				
a. Type of pole	☐	☐	☐	_____
b. Height of Pole	☐	☐	☐	_____
c. Alternate Band: Black And Orange	☐	☐	☐	_____
d. Pit at each traffic light pole	☐	☐	☐	_____
e. Cable Pit size	☐	☐	☐	_____
9.8 Cabling:				
a. Schematic Diagram of Controller	☐	☐	☐	_____

Project Title	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 13G - ELECTRICAL WORKS

	YES	NO	N/A	REMARKS
b. Dedicated Circuit for each signal pole (Controller to Signal head/ Loop Detector).	☐	☐	☐	
c. Power Cable (Controller to Pole (Aspect)): Multicore PVC/SWA/PVC (5C, 9C, 12C, 15C, 19C, etc)	☐	☐	☐	
d. Loop Cable (Signal Cable): 50 strands UV heat resistance	☐	☐	☐	
e. Detector loop for each lane	☐	☐	☐	
f. Distance from stop lane	☐	☐	☐	
g. Detector Loop Pit	☐	☐	☐	
h. Detector Pit Size	☐	☐	☐	
9.9 Controller:				
a. Microprocessor based	☐	☐	☐	
b. Separate Compartment with two separate doors	☐	☐	☐	
c. Type of enclosure	☐	☐	☐	
d. ELR : Adjustable time delay & sensitivity, with/without auto reclosure	☐	☐	☐	
e. MCCB/ Switch fuse	☐	☐	☐	
f. Earthing (Each F/P shall be earthed) < 1ohm	☐	☐	☐	
g. Surge protection device	☐	☐	☐	

Project Title	Revision	
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	Designer	
	Checker	

CHECKLIST 13G - ELECTRICAL WORKS

	YES	NO	N/A	REMARKS
h. Controller: Lockable Weatherproof Housing (IP55)	☐	☐	☐	
9.10 **Anti Vandalism features:**				
a. 2 sets of embracing steel bars with external padlocking facilities c/w anti chemical, weatherproof padlock	☐	☐	☐	
b. Grilled	☐	☐	☐	
c. Anti Sticker Paint	☐	☐	☐	

Project Title :	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 14 - RSA STAGE 3

		YES	NO	N/A	REMARKS
INFORMATION REQUIRED TO BE GIVEN TO AUDITOR					
1.	Audit Report and decisions on earlier stage audits				
2.	Locality plan showing road network and general topographic details in the region of the project				
3.	Statement of Design Criteria				
4.	Relevant traffic demand information				
5.	Horizontal and Vertical Alignment Plans				
6.	Cross sections				
7.	Grading and Drainage plans showing the location and general details of drainage structures				
8.	Bridge layout plans including cross sections and details of barrier systems				
9.	Interchange and / or intersection layouts				
10.	Traffic signal layout and design information				
11	Traffic signing and road marking plans				
12.	Street lighting layouts and design information				
13.	Landscaping and beautification plans and tree planting details				
14.	Plans showing relevant overhead services/utilities				
15.	Traffic Management Plan				

Project Title :	Revision	
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	Checker	

CHECKLIST 14 - RSA STAGE 3

	YES	NO	N/A	REMARKS
REPORT TO BE PREPARED BY DESIGNER AS PART OF RSA PROCESS (refer to flowchart RSA Stage 3 Process)				
16. Designer's Response Report	☐	☐	☐	
17. Designer's Compliance Report	☐	☐	☐	

Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 15 - LAND ACQUISITION SECTION 8

		YES	NO	N/A	REMARKS
1.0	**Cadastral plan and certified plan gathered**	☐	☐	☐	
2.0	**Determination of the proposed Right of Way (ROW) and area acquired**				
2.1	Sufficient buffer zone provided between slope edge to proposed ROW	☐	☐	☐	
2.2	ROW take into account replacement of local access (if any)	☐	☐	☐	
2.3	ROW take into account the future access of each individual lot	☐	☐	☐	
2.4	Acquisition area has considered the existing government land/reserve (eg. Existing road reserve)	☐	☐	☐	
2.5	ROW take into account the non productive land after acquisition	☐	☐	☐	
2.6	ROW take into account the splitting of existing land into pieces	☐	☐	☐	
3.0	***Mukim* and *Daerah* boundary defined**	☐	☐	☐	
4.0	**Drawing presentation**				
4.1	Index drawing prepared	☐	☐	☐	
4.2	Drawing scale as per agreed by state JKPTG	☐	☐	☐	
4.3	Drawings are legible	☐	☐	☐	
4.4	Road centerline with chainage and horizontal IP data shown	☐	☐	☐	

Project Title:	Revision	
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	Checker	

CHECKLIST 15 - LAND ACQUISITION SECTION 8

		YES	NO	N/A	REMARKS
4.5	ROW line with proper line type shown	☐	☐	☐	
5.6	Mukim and Daerah boundary line with proper line type shown	☐	☐	☐	
4.7	Lot line and number clearly shown	☐	☐	☐	
4.8	State Cassini coordinate system being adopted	☐	☐	☐	
4.9	ROW IP points shown on both sides of the carriageway where details coordinates stated on the schedule (State Cassini)	☐	☐	☐	
4.10	Standard sheet number shown	☐	☐	☐	
4.11	Acquisition schedule for the affected lots (subject to format required by JKPTG)				
	a. Lot number	☐	☐	☐	
	b. Certified Plan (CP) number	☐	☐	☐	
	c. *Mukim* and *Daerah*	☐	☐	☐	
	d. Area of the existing lots	☐	☐	☐	
	e. Area to be acquired	☐	☐	☐	
	f. Remaining area of the lots at both side of carriageway	☐	☐	☐	
	g. Type and number of affected building/structure shown	☐	☐	☐	
	h.	☐	☐	☐	

Project Title:	Revision	
	Date	
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	Checker	

CHECKLIST 15 - LAND ACQUISITION SECTION 8

	YES	NO	N/A	REMARKS
j. Summary of acquisition area (subject to format required byJKPTG)				
i. Overall private land to be acquired	☐	☐	☐	
ii. Overall government land to be acquired	☐	☐	☐	
iii. Overall building affected	☐	☐	☐	
iv. Overall acquisition area	☐	☐	☐	
v.	☐	☐	☐	
k. Plan coloured with colour scheme as directed by JKPTG				
i. Private lot to be acquired as road reserve	☐	☐	☐	
ii. Government lot to be acquired as road reserve	☐	☐	☐	
iii. Existing road reserve within ROW	☐	☐	☐	
l. Legend is shown	☐	☐	☐	
m. Drawings endorsed by Consultant	☐	☐	☐	
n. Drawings endorsed by the licensed surveyor	☐	☐	☐	
p. Drawings endorsed by client or implementation agency (eg. JKR)	☐	☐	☐	
5.0 Copy of land title search for efected lots submitted	☐	☐	☐	
6.0 Appropriate copies prepared as directed by the JKPTG	☐	☐	☐	

Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 16 - FINAL DESIGN REPORT

	YES	NO	N/A	REMARKS
1.0 Introduction				
1.1 Purpose of project	☐	☐	☐	
1.2 Background & project brief	☐	☐	☐	
1.3 Scope of project	☐	☐	☐	
2.0 Technical proposal				
2.1 Methodology	☐	☐	☐	
2.2 Program	☐	☐	☐	
2.3 Main technical	☐	☐	☐	
2.4 Traffic studies	☐	☐	☐	
2.5 EIA	☐	☐	☐	
2.6 Scope of Survey & SI	☐	☐	☐	
2.7 Manual of maintenance & operation	☐	☐	☐	
3.0 Design Checklist/Certification	☐	☐	☐	
4.0 Geometric & Pavement Design Report, Calculation & Analysis	☐	☐	☐	
5.0 Drainage Design Report, Calculation & Analysis	☐	☐	☐	
6.0 Geotechnical Design Report, Calculation & Analysis	☐	☐	☐	
7.0 Bridge / Structure Design Report, Calculation & Analysis	☐	☐	☐	

Project Title:	Revision	
	Date	
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	Checker	

CHECKLIST 16 - FINAL DESIGN REPORT

		YES	NO	N/A	REMARKS
8.0	EMP Design Report, Calculation & Analysis	☐	☐	☐	
9.0	Road Safety Audit Report	☐	☐	☐	
10.0	Electrical Works Design Report, Calculation & Analysis	☐	☐	☐	
11.0	Services / Utilities Relocation	☐	☐	☐	
12.0	Material Source Study Report	☐	☐	☐	
12.0	Land Acquisition Report	☐	☐	☐	
13.0	List of Drawings	☐	☐	☐	
14.0	Bill of Quantities & Taking Off	☐	☐	☐	

Project Title:	Revision	
	Date	
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	Checker	

CHECKLIST 17 - PREPARATION OF TENDER DOCUMENT (CONVENTIONAL)

	YES	NO	N/A	REMARKS
1.0 CHECKLIST FOR TENDERERS (which shall not form part of the Tender Document				
1.1 Notice of Invitation to tender	☐	☐	☐	
i) Amount of tender document (RM)	☐	☐	☐	
ii) Place, Date and time of submission of tender	☐	☐	☐	
iii) Notice to Tenderers for breaching the rules	☐	☐	☐	
1.2 Checklist for Content of Tender Document	☐	☐	☐	
1.3 Submission checklist for the use of Tenderers	☐	☐	☐	
1.4 Tenderer's Information Forms				
Borang A - Surat Pengakuan Kebenaran Maklumat Dan Keesahan Dokumen Yang Dikemukakan Oleh Petender	☐	☐	☐	
Borang B - Maklumat Am Dan Latar Belakang Petender	☐	☐	☐	
Borang C - Data-Data Kewangan	☐	☐	☐	
Borang CA - Laporan Bank/Institusi Kewangan Mengenai Kedudukan Kewangan Petender	☐	☐	☐	
Borang D - Rekod Pengalaman Kerja	☐	☐	☐	
Borang E - Kakitangan Teknikal	☐	☐	☐	
Borang F - Keempunyaan Loji Dan Peralatan Pembinaan Utama	☐	☐	☐	
Borang G - Senarai Kerja Kontrak Semasa	☐	☐	☐	

Project Title:	Revision	
	Date	
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	Checker	

CHECKLIST 17 - PREPARATION OF TENDER DOCUMENT (CONVENTIONAL)

	YES	NO	N/A	REMARKS
Borang GA - Laporan Penyelia Projek Atas Prestasi Kerja Semasa Petender (Bukan Projek JKR)	☐	☐	☐	
Borang GA1 - Laporan Jurutera Projek Atas Prestasi Kerja Semasa Petender	☐	☐	☐	
Borang H - Sijil SCORE dari CIDB	☐	☐	☐	
1.5 Checklist for *'Dokumen Wajib'.*	☐	☐	☐	
1.6 Bank Guarantee Forms / Insurance Guarantee for Performance Bond	☐	☐	☐	
1.7 Advance Payment Guarantee Forms / Insurance Guarantee for Advance Payment	☐	☐	☐	
1.8 Bank Guarantee Forms For Design Guarantee	☐	☐	☐	
1.9 List of Drawings	☐	☐	☐	
1.10 List of drawings which given for Tenderers	☐	☐	☐	
1.11 Tender Document	☐	☐	☐	

2.0 TENDER DOCUMENT/TENDER TABLE DOCUMENT

2.1 COVER FOR TENDER DOCUMENT Standard Colour is Yellow - Autofinish Golden Yellow (ICI 456) or equivalent	☐	☐	☐	
Ensure the following information of Tender Document's Covers :-				
a) Coat of arms of Malaysia *(Jata Negara)*	☐	☐	☐	
b) Name of *"Kerajaan Malaysia"*	☐	☐	☐	
c) Name of *"Jabatan Kerja Raya Malaysia"*	☐	☐	☐	

Project Title:	Revision	
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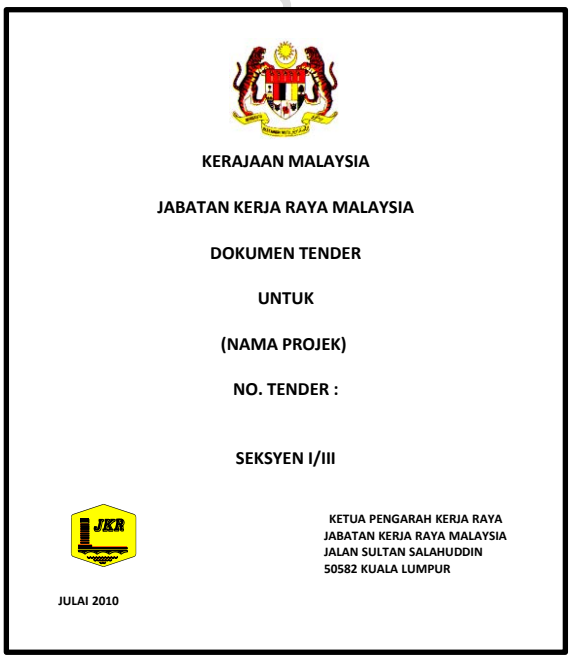
	Checker	

CHECKLIST 17 - PREPARATION OF TENDER DOCUMENT (CONVENTIONAL)

	YES	NO	N/A	REMARKS
d) Word of *"Dokumen Tender"*	☐	☐	☐	
e) Ensure the Project Title similar as registered in SKALA	☐	☐	☐	
f) Tender registration number (if any)	☐	☐	☐	
g) Volume and section of Tender Document	☐	☐	☐	
h) JKR logo	☐	☐	☐	
- Month and year of tender is stated under 'JKR Logo'.	☐	☐	☐	
- KPKR's address at the left bottom of tender document's cover	☐	☐	☐	

KETUA PENGARAH KERJA RAYA
JABATAN KERJA RAYA MALAYSIA
JALAN SULTAN SALAHUDDIN
50582 KUALA LUMPUR

Cover Sample :



Project Title:	Revision	
	Date	
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CHECKLIST 17 - PREPARATION OF TENDER DOCUMENT (CONVENTIONAL)

	YES	NO	N/A	REMARKS

2.2 **CONTENT OF TENDER DOCUMENT/TENDER TABLE DOCUMENT**

SECTION 1

(A) INSTRUCTION TO TENDERERS (Use Standard)

i) Maximum completion Period (In weeks) ☐ ☐ ☐ _____

ii) Place and time Tender Table Document is displayed. ☐ ☐ ☐ _____

iii) Office's address which issue the tender if any discrepancies, queries and objection arises ☐ ☐ ☐ _____

iv) Appendices to the Instruction to Tenderers ☐ ☐ ☐ _____

Appendix A

a) Maximum completion period approved by HOPT ☐ ☐ ☐ _____

b) *Harga Inginan Jabatan* ☐ ☐ ☐ _____

c) Sijil SCORE dari CIDB ☐ ☐ ☐ _____

Appendix B

Guidelines of preparation for 'environmental management plan' by Contractor approved by HODT ☐ ☐ ☐ _____

Appendix C

Dasar Pengagihan Kerja Kepada Kontraktor Bumiputera Kelas E dan F

i) Lampiran A

Deed Of Assignment (Security For Direct Payments To Third Party) ☐ ☐ ☐ _____

Project Title:	Revision	
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CHECKLIST 17 - PREPARATION OF TENDER DOCUMENT (CONVENTIONAL)

	YES	NO	N/A	REMARKS
ii) Lampiran B Consent By Government For Direct Payment To Third Party Through Deed of Assignment	☐	☐	☐	
iii) Lampiran C *Surat Jaminan Tanggung Rugi Dari Subkontraktor Kepada Kerajaan*	☐	☐	☐	
Appendix D *Pelaksanaan Integrity Pact / Surat Akuan Pembida* *i) Lampiran 1 A - Surat Akuan Pembida*	☐	☐	☐	
ii) Lampiran 1B - Surat Akuan Pembida Berjaya	☐	☐	☐	
(B) FORM OF TENDER (J.K.R 203B)	☐	☐	☐	
i) Use latest Form of Tender (J.K.R 203B)	☐	☐	☐	
ii) Project Title	☐	☐	☐	
iii) State the Document's Section which List of Drawings are used for preparation of Bill of Quantities	☐	☐	☐	
iv) State the office's address which will received the tender	☐	☐	☐	
(C) LETTER OF ACCEPTANCE (JKR 203D)				
i) Use standard latest Letter of Acceptance (JKR 203D) (pind. 1/2011)	☐	☐	☐	
(D) P.W.D FORM 203A (Rev. 2010)				
i) Use standard latest Conditions of Contract (P.W.D 203A) (rev 2010)	☐	☐	☐	

Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 17 - PREPARATION OF TENDER DOCUMENT (CONVENTIONAL)

	YES	NO	N/A	REMARKS
Page 1 Fill in the following informations:- i) Kategori, Sub Kategori and Year	☐	☐	☐	_____
ii) Paragraph A - Project's name	☐	☐	☐	_____
iii) Paragraph B - List of drawings (as listed in section ___)	☐	☐	☐	_____
Page 2 **Clause 1(b) "Contract Documents"** Add the followings for Special Conditions to the Conditions of Contract:- (i) Variation In Prices Of Materials For Civil Works; (Fill in the quantities for VOP)	☐	☐	☐	_____
(ii) ……	☐	☐	☐	_____
Clause 1(j) "Officer Named" Fill in the particular clauses 50, 51, 52, 53, 58, & 66;	☐	☐	☐	_____
Page 3 **Clause (n) "S.O."** Fill in the Officer's Designation **Refer to 'Surat Arahan KPKR Bil. 1/2010 or latest 'Arahan KPKR'.**	☐	☐	☐	_____
Page 51 - APPENDIX 1 **Clause 4.1 (a)** State the officer's designation who authorised to approve the Variation of Works.	☐	☐	☐	_____
State the financial limit for Variation of Works **Refer to 'Surat Pekeliling Perbendaharaan Bil. 7 Tahun 2007 dated 14 Mei 2007 and 'Surat Arahan KPKR Bil. 5/2008 dated 24 Oktober 2008. or the latest.**	☐	☐	☐	_____

Project Title:	Revision	
	Date	
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	Checker	

CHECKLIST 17 - PREPARATION OF TENDER DOCUMENT (CONVENTIONAL)

	YES	NO	N/A	REMARKS
Clause 4.1(b) Fill in the particular clauses 50, 51, 52, 53, 58, & 66;	☐	☐	☐	
State the officer's designation who authorised to take actions on the above clauses **Refer to 'Surat Arahan KPKR Bil. 1/2010 or latest "Surat Arahan KPKR'.**	☐	☐	☐	
Page 51 (cont') **Appendix To The Conditions Of Contract** **Clause 13** Amount of Guarantee - Fill in "RM 5% of Contract Sum"	☐	☐	☐	
Clause 15 - Amout of Public Liability Insurance Fill in the amount as per circulars - Refer 'Surat KPKR BIL.(28)dlm.JKR.KPKR:020.050/03 Klt.5 dated 9 Februari 2003	☐	☐	☐	
Page 52 - Date of tender closed **Clause 21.2** Fill in the date when the tender closed	☐	☐	☐	
Clause 28.1 - Minimum amount for interim payment Fill in RM1000.00 - Refer 'Surat KPKR BIL.(28)dlm.JKR.KPKR:020.050/03 Klt.4 dated 15.10.2001	☐	☐	☐	
Clause 28.2 - Minimum amount for interim payment Fill in RM1000.00 - Refer 'Surat KPKR BIL.(28)dlm.JKR.KPKR:020.050/03 Klt.4 dated 15.10.2001	☐	☐	☐	
Clause 28.6 - Period of honouring the payment - Fill in "Thirty (30) days"	☐	☐	☐	

Project Title:	Revision	
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	Checker	

CHECKLIST 17 - PREPARATION OF TENDER DOCUMENT (CONVENTIONAL)

	YES	NO	N/A	REMARKS
Clause 34.4 - PC. Sums allowable to participate by main contractor - Fill in " Only for works the Contractor has the requisite Category & Sub Category of registration with CIDB	☐	☐	☐	
Clause 40.2 - LAD Fill in Liquidated Ascertain Damages (LAD) in %. (refer latest BLR) (BLR/365 days x 100% = x %)	☐	☐	☐	
Page 53 **Clause 41.1 - Sectional Completion** a) Fill in the information of sectional completion (if any)	☐	☐	☐	
b) If none, state " Not Applicable"	☐	☐	☐	
Clause 48.1(a) - Defects Liability Period Fill in Twelve (12) months	☐	☐	☐	
(E) ADDENDUM TO THE CONDITIONS OF CONTRACT - Addendum No. 1	☐	☐	☐	
- Addendum No. 2	☐	☐	☐	
- ……..	☐	☐	☐	
(G) APPENDIX 2 - SPECIAL PROVISIONS TO THE CONDITIONS OF CONTRACT FOR CIVIL ENGINEERING WORKS Use 'Lampiran B/CW/K-B (2008) as per Pekeliling Perbendaharaan SPP 3/2008'	☐	☐	☐	
Use 'Lampiran C/ME/K-B (2008) as per 'Pekeliling Perbendaharaan SPP 3/2008'	☐	☐	☐	

Project Title:	Revision	
	Date	
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	Checker	

CHECKLIST 17 - PREPARATION OF TENDER DOCUMENT (CONVENTIONAL)

	YES	NO	N/A	REMARKS
(H) APPENDIX 3 - GOVERNMENT MULTIMODAL TRANSPORT OPERATORS				
Slot in the divider which referred to latest Treasury Instruction	☐	☐	☐	
(J) APPENDIX 4 - DESIGN GUARANTEE FORM				
Slot in Design Guarantee Forms as per Pekeliling KPKR Bil 7/2011	☐	☐	☐	
(K) METHOD OF MEASUREMENT & PREAMBLES TO THE BILLS OF QUANTITIES				
- Ensure the following are tally with the Bill Of Quantities				
a) Unit	☐	☐	☐	
b) Item coverage	☐	☐	☐	
- Make sure each 'item coverage' has been checked and tally with all items in BQ	☐	☐	☐	
(L) TENDER SUMMARY				
- Use colour paper (green colour is the normal colour been used)	☐	☐	☐	
- Ensure the space for Contractor's and witness signature	☐	☐	☐	
(M) BILL OF QUANTITIES				
BILL NO 1. - PRELIMINARIES	☐	☐	☐	
BILL NO 2. - SITE CLEARING AND DEMOLITION	☐	☐	☐	
BILL NO 3. - EARTHWORKS	☐	☐	☐	
BILL NO 4. - DRAINAGE	☐	☐	☐	
BILL NO 5. - PAVEMENT	☐	☐	☐	

Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 17 - PREPARATION OF TENDER DOCUMENT (CONVENTIONAL)

	YES	NO	N/A	REMARKS
BILL NO 6. - ROAD FURNITURES	☐	☐	☐	
BILL NO 7. - GEOTECHNICAL	☐	☐	☐	
BILL NO 8. - STRUCTURES	☐	☐	☐	
BILL NO 9. - TRAFFIC MANAGEMENT & PROTECTION WORKS	☐	☐	☐	
BILL NO 10. - ENVIRONMENTAL MANAGEMENT & CONTROL	☐	☐	☐	
BILL NO 11. - ROUNTINE MAINTENANCE WORKS	☐	☐	☐	
BILL NO 12. - ELECTRICAL WORKS	☐	☐	☐	
BILL NO 13. - PROVISIONAL SUMS	☐	☐	☐	
(J) SCHEDULE OF DAYWORK RATES	☐	☐	☐	
(K) LIST OF DRAWINGS WHICH USED IN PREPARATION OF BILL OF QUANTITIES	☐	☐	☐	
SECTION II				
(A) STANDARD SPECIFICATIONS FOR ROAD WORKS JKR SPJ (used standard specification which has been approved by HODT)	☐	☐	☐	
1. JKR/SPJ/2008-S8 Traffic Signal System - SAKPKR Bil.15/2011	☐	☐	☐	
2. JKR/SPJ/2008-S9 Concrete - SAKPKR Bil. 1/2011	☐	☐	☐	
3. JKR/SPJ/2008-S4 Flexible Pavement - SAKPKR Bil. 14/2011	☐	☐	☐	

Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 17 - PREPARATION OF TENDER DOCUMENT (CONVENTIONAL)

	YES	NO	N/A	REMARKS
4. JKR/SPJ/1988 whichever relevant and still valid	☐	☐	☐	
Ensure the specification for the bridge works, geotechnical works and slopes (if any) ;-	☐	☐	☐	
i) Prestressing works	☐	☐	☐	
ii) Structural Steel Works	☐	☐	☐	
iii) Bridge Bearings	☐	☐	☐	
iv) Expansion Joints	☐	☐	☐	
v) Parapets	☐	☐	☐	
vi) Slope Stabilisation	☐	☐	☐	
vii) Rock Stabilisation.	☐	☐	☐	
(B) ADDENDUM TO THE SPECIFICATION (used addendum specification which has been approved by HODT)	☐	☐	☐	
(C) SPECIAL PROVISION TO THE SPECIFICATION (used special provision to the secification which has been approved by HODT)	☐	☐	☐	
(D) ADDITIONAL SPECIFICATION (IF ANY)	☐	☐	☐	

SECTION III

(A) DRAWINGS AND LIST OF DRAWINGS - ensure the drawings and list of drawings are similar which listed in Section I.	☐	☐	☐	

Project Title:	Revision	
	Date	
	Designer	
	Checker	

CHECKLIST 18 - PREPARATION OF ENGINEER'S ESTIMATE

	YES	NO	N/A	REMARKS
1.0 DOCUMENT				
1.1 Use the final Bill of Quantities concurred by HOPT	☐	☐	☐	
1.2 Use the following documents for reference to price the BQ :-				
a. *Unit price from Jabatan Perangkaan Negara (on line Publications for Variation of Price material for civil engineering works)*	☐	☐	☐	
b. Historical data from similar and nearest project	☐	☐	☐	
c. Quotation from Suppliers/Contractors	☐	☐	☐	
2.0 PRICING THE BILL OF QUANTITIES				
2.1 Make sure all the Bill are priced				
BILL NO 1. - PRELIMINARIES	☐	☐	☐	
BILL NO 2. - SITE CLEARING AND DEMOLITION	☐	☐	☐	
BILL NO 3. - EARTHWORKS	☐	☐	☐	
BILL NO 4. - DRAINAGE	☐	☐	☐	
BILL NO 5. - PAVEMENT	☐	☐	☐	
BILL NO 6. - ROAD FURNITURES	☐	☐	☐	
BILL NO 7. - GEOTECHNICAL	☐	☐	☐	
BILL NO 8. - STRUCTURES	☐	☐	☐	

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	Designer	
	Checker	

CHECKLIST 18 - PREPARATION OF ENGINEER'S ESTIMATE

	YES	NO	N/A	REMARKS
BILL NO 9. - TRAFFIC MANAGEMENT & PROTECTION WORKS	☐	☐	☐	
BILL NO 10. - ENVIRONMENTAL MANAGEMENT & CONTROL	☐	☐	☐	
BILL NO 11. - ROUTINE MAINTENANCE WORKS	☐	☐	☐	
BILL NO 12. - ELECTRICAL WORKS	☐	☐	☐	
BILL NO 13. - OCCUPATIONAL SAFETY AND HEALTH	☐	☐	☐	
BILL NO 14. - PROVISIONAL SUMS/ PRIME COST SUMS	☐	☐	☐	
2.3 Provisional Sums/Prime Cost Sums				
a. Confirms the amounts of Provisional Sums/ Prime Cost Sums with HOPT/HODT	☐	☐	☐	
2.4 Checking squaring and transferring of amount				
a. Rates & Amount for each items are correct	☐	☐	☐	
b. Sum amount in total for each BQ pages are correct	☐	☐	☐	
c. Transferred amount are correct between BQ pages and collection page	☐	☐	☐	

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CHECKLIST 18 - PREPARATION OF ENGINEER'S ESTIMATE

	YES	NO	N/A	REMARKS
d. Transferred amount are correct in collection page and summary	☐	☐	☐	
e. Transferred amount are correct in summary page and grand summary	☐	☐	☐	

3.0 CHECKING THE NORMS

3.1 Cross check the cost per km for roads	☐	☐	☐	
3.2 Cross check the cost per m2 for bridges * *Use deck slab/tack coat area for quick checking for the area of bridges*	☐	☐	☐	