



WORKS IN JKR



PUSAT KECEMERLANGAN KEJURUTERAAN DAN TEKNOLOGI JKR (CREaTe)

MANUAL FOR CARRYING OUT RESEARCH WORKS IN JKR



PUSAT KECEMERLANGAN KEJURUTERAAN DAN
TEKNOLOGI JKR
(CREaTE)

MANUAL FOR RESEARCH WORKS

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ABBREVIATION

BIPPK	Bahagian Inovasi, Penyelidikan dan Pembangunan Kejuruteraan
CIDB	Construction Industry Development Board
CREaTE	Centre of Excellence for Engineering and Technology JKR
CREAM	Construction Research Institute of Malaysia
CUPI	Commercialised Use of Public Innovation
IP	Intellectual Property
JKPP	Jawatankuasa Kelulusan Projek Penyelidikan
JPA	Jabatan Perkhidmatan Awam
JTKP	Jawatankuasa Teknikal dan Kewangan Penyelidikan
MOSTI	Ministry of Science, Technology and Innovation
NBOS	National Blue Ocean Strategy
NGO	Non-Government Organization
R&D	Research and Development
SPPT	Seksyen Penyelidikan dan Pengurusan Teknikal

1.1 OBJECTIVE OF MANUAL

- i) To inform the researcher on the requirements and terms and conditions to carry out research works; and
- ii) To standardise all processes and procedures involved in carrying out research and usage of research funding.

1.2 DEFINITION

RESEARCH is defined as:

- i) a systematic investigation to establish facts or collect information on a subject

-Collin's English Dictionary-

- ii) a detailed study of a subject, especially in order to discover new information or reach new understanding

-Oxford Learner's Dictionary-

2.1 BACKGROUND OF BIPPK

Bahagian Inovasi, Penyelidikan dan Pembangunan Kejuruteraan (BIPPK) began its operation in September 2016 with a vision to be a world class centre of excellence in engineering and technology.

The office of BIPPK is located at Level 3, Block C, Centre of Excellence for Engineering and Technology JKR (CREaTE) in Alor Gajah.

2.2 FUNCTIONS OF BIPPK**2.2.1 DEVELOPING RESEARCH AND INNOVATION CULTURE**

- Execution of Strategic Plan under Dasar Inovasi JKR
- Execution of Research Projects (Departmentally)
- Execution of Research Projects through Collaboration leading to the conferment of Master and Doctoral degree

- Enhancing JKR into Innovative Organisation
- 2.2.2 RESEARCH AND INNOVATION MANAGEMENT
- Management of Research projects from inception till commercialisation
 - Consultancy service to researchers and innovators
 - Management of Research and Innovation Funding
 - Management of collaboration with IPTA/IPTS, private sectors and other agencies
 - Management of Research Data and Innovation Reports.
- 2.2.3 COMMERCIALISATION
- Publications and Documentation of Research Project and Innovation
 - Intellectual Property (IP) Protection or Rights of Research Programme and Innovation
 - Research and Innovation promotion programmes.

3.0 RESEARCH AREAS

All research and innovation work carried out are categorised to, but are not limited to the following:-

RESEARCH AREAS	ELABORATION
Construction and Infrastructure Engineering	<ol style="list-style-type: none"> 1. Development of indigenous materials 2. Engineering equipment - test and measurement apparatus 3. Engineering Technological aspects in the areas of <ul style="list-style-type: none"> ▪ Buildings ▪ Roads, harbours, ports, canals, airports, bridges, dams, tunnels, geotechnical works, waterworks, reclamation and slope works, ▪ Drainage and sewerage ▪ Earthquake engineering ▪ Standards and Quality Development 4. Hazard Assessment and Management 5. Traffic management during construction 6. Sustainability in Construction 7. Sustainable Infrastructure 8. Timber Engineering 9. Rock Mechanic Engineering 10. Railway Engineering

RESEARCH AREAS	ELABORATION
Mechanical Engineering	<ol style="list-style-type: none"> 1. Advanced Air-Conditioning and Ventilation System 2. Sustainable Energy and Green Technology 3. Advanced Fluid Engineering 4. Building Services Forensic Engineering 5. Vertical Transportation and Material Handling 6. Fire Engineering <ul style="list-style-type: none"> ▪ Fire Protection ▪ Fire Safety 7. Advanced Noise and Vibration Engineering Technology 8. Advanced Materials Engineering 9. Controls and Instrumentation Engineering 10. Workshop and Quarry Technology
Electrical Engineering	<ol style="list-style-type: none"> 1. Electrical power engineering - power quality, lightning and surge protection system, grounding and earthing system installations, electrical power distribution in building, electrical forensic and testing system in buildings, electrical engineering safety 2. Illumination engineering - outdoor and facade lighting system, port and aviation lighting system, stadium and sport lighting system, road and street lighting system, lighting for building 3. Energy management - Energy efficiency, renewable Energy 4. Acoustic - noise control, environmental acoustic, architectural acoustic 5. Extra low voltage - sound system, audio visual system, video conferencing, smatv/ fm system 6. System and monitoring control - traffic light system, security system (card access, cctv).
Architecture and Harmonisation	<ol style="list-style-type: none"> 1. Sustainable Architecture 2. Specialised Facility Planning and Design <ul style="list-style-type: none"> ▪ Health Facility ▪ Security and Correctional Facility ▪ Educational Facility 3. Architectural Building Material and Technology 4. Architectural Industrialised Building System 5. Urban Design and Environmental Planning 6. Cultural, Heritage and Conservation 7. Landscape Architecture 8. Interior Design and Product

RESEARCH AREAS	ELABORATION
	9. Universal Design
Forensic Engineering	<p>1. Defect, Repair/Remedial study or Failure investigation in engineering disciplines</p> <ul style="list-style-type: none"> ▪ Civil Works, Materials, Structures and Infrastructure ▪ Electrical Works ▪ Mechanical Works ▪ Geotechnics and Slopes <p>2. Rehabilitation Works</p> <ul style="list-style-type: none"> ▪ Road ▪ Structure
Project Management	<p>1. Procurement Process and Procedures</p> <p>2. Planning, Implementation and Monitoring</p> <p>3. Scope Management</p> <p>4. Cost Management</p> <p>5. Time Management</p> <p>6. Quality Management</p> <p>7. Procurement Management</p> <p>8. Risk Management</p> <p>9. Human Resource Management</p> <p>10. Communication Management</p> <p>11. Integration Management</p> <p>12. Construction Management (Supervision)</p> <p>13. Issue Escalation and Management</p> <p>14. Critical Path Work Programming/ Schedule Management</p> <p>15. Knowledge Management</p> <p>16. Project Management Maturity</p> <p>17. Procurement Methodology e.g. Relational Contracting</p> <p>18. Project Performance Measurement</p> <p>19. Project Management Critical Success Factors</p> <p>20. Value Management</p> <p>21. Project Delivery Strategy</p> <p>22. Program Management</p> <p>23. Project Portfolio Management</p> <p>24. Managing Complex Projects</p> <p>25. Governance of Projects/ Programs/ Portfolio</p> <p>26. Project/Program/Portfolio Management Office</p> <p>27. Effective Project Managers Competency Development</p> <p>28. Strategic Stakeholders Management in Project/ Program / Portfolio</p>

RESEARCH AREAS	ELABORATION
	<p>29. Knowledge Management in Projects</p> <p>30. Project Driven Culture</p> <p>31. Green Project Management</p> <p>32. Project Collaboration Tools</p> <p>33. Contract Management</p> <p>34. Change Management</p>
<p>Asset Management (Infrastructures/ Building)</p>	<p>1. Asset Management (Infrastructures/Building) :</p> <ul style="list-style-type: none"> ▪ Asset Life-Cycle ▪ Asset Management Information System ▪ Commercialised Use of Public Innovation (CUPI) and Disaster Recovery Management <p>2. Facilities Management (Infrastructures/Building) and Contract</p> <p>3. Maintenance Management (Infrastructures / Building)</p> <p>4. Building Maintenance</p> <p>5. Road Maintenance</p> <p>6. Bridge Maintenance</p> <p>7. Tunnel Maintenance</p> <p>8. Maritime Structure Maintenance</p> <p>9. Airport Runway Maintenance</p> <p>10. Public Health Engineering Maintenance</p> <p>11. Utility Pipes and Reticulation Fault</p> <p>12. Electrical Maintenance</p> <p>13. Power Quality Maintenance</p> <p>14. Illumination Engineering Maintenance</p> <p>15. Traffic Lighting Maintenance</p> <p>16. Acoustic and Sound Maintenance</p> <p>17. Structured Cabling Maintenance</p> <p>18. SCADA System Maintenance</p> <p>19. Steam Boiler Maintenance</p> <p>20. Lift and Escalator Maintenance</p> <p>21. Fire Fighting Maintenance</p> <p>22. HVAC Maintenance</p> <p>23. Kitchen Equipment Maintenance</p> <p>24. Central Gas System Maintenance</p>

RESEARCH AREAS	ELABORATION
Environment and Sustainability	<ol style="list-style-type: none"> 1. Environmental Engineering 2. Sustainable Design 3. Waste Management and Utilisation 4. Energy Efficiency 5. Green Technology 6. Renewable Energy 7. Sustainability Rating Tool for Infrastructures and Cities
Information and Communication Technology (ICT)	<ol style="list-style-type: none"> 1. Real-Time Data Management 2. Computer Aided Design 3. Artificial Intelligence and Expert Systems 4. Man-Machine Interfacing 5. Machine to Machine Interfacing 6. Software development 7. Passive, active ICT system 8. ICT security network system 9. Telephone system
Others	Other research topics as instructed by the Top Management

4.0

RESEARCH FUNDING

RESEARCH FUNDING IS AVAILABLE FROM:-

1. Ministry of Works (MoW)
<http://www.kkr.gov.my>
2. CIDB – CREAM
<http://www.cream.my>
3. Ministry of Energy, Science, Technology, Environment & Climate Change (MESTECC)
<http://www.mestecc.gov.my/web/>
4. Ministry of Finance (MoF)
<http://www.treasury.gov.my>
5. Others
 - Industries
 - Private Sectors
 - International Research Bodies.

Note: It is expected that researchers make efforts to seek for research fundings.

5.0 ELIGIBILITY FOR CARRYING OUT RESEARCH

Application for carrying out research is open to all permanent staffs of JKR who have been confirmed of their posting and have served JKR for at least three (3) years.

6.0 TYPES OF RESEARCH

- 6.1 Research shall be of APPLIED RESEARCH where original work undertaken is primarily to produce innovative design, system, process and/or to acquire new knowledge and new technology, new materials, or advancement of existing technology.
- 6.2 The Primary objective of the research project shall be that which prioritises problem solving and produces innovative technical solutions to improve project and service delivery in JKR. **As such, the objective of obtaining Masters or Doctorate degree shall become secondary priority to researchers.**
- 6.3 The works undertaken include to determine possible application of the research or to determine new ways of achieving specific and predetermined objectives.
- 6.4 Research topics shall be selected from those listed in the research areas as shown in 3.0.

7.0 DURATION OF RESEARCH

Duration of research work **SHALL NOT** be more than 24 months. Research work shall start according to the date as stipulated in the Letter of Award and shall only commence after funding for research has been confirmed.

8.0 EXTENSION OF TIME

Any request for a research project to be extended beyond its original approved completion date shall be made to BIPPK, for the approval of the Research Approval Committee (JKPP), at least three (3) months before the research project is due for completion. The maximum period of extension **SHALL NOT** be more than six (6) months and shall only be considered for unforeseen reasons such as illness etc.

9.0 MEMORANDUM OF AGREEMENT (MoA)

The respective MoA, for the purpose of payment, shall be signed within three (3) months of the issuance of the Letter of Award. Failure to do so, within the time allocated, BIPPK may revoke the approval to carry out the research.

10.0 REVOCATION OF RESEARCH FUNDING

- 10.1 Research funding shall be revoked if the research work fails to commence within one (1) month from the commencement date as stipulated in the Letter of Award.
- 10.2 If during the course of the research, the progress is delayed by more than 30% from the scheduled progress, and the delay is without any valid reason, the research funding shall be revoked and the research project shall be terminated.

11.0 METHODS OF CARRYING OUT RESEARCH

- 11.1 Research work shall be carried out:
 - 11.1.1 Entirely by JKR staffs; or
 - 11.1.2 Through collaborations between JKR and local universities, industrial players, government agencies through Blue Ocean Strategy (BOS), Non-Government Organisation (NGO), community; or
 - 11.1.3 By JKR staffs with partial input from Consultants of special expert areas.
- 11.2 JKR shall take the lead role where consultants or other parties are involved (whether through collaboration or by contract research).
- 11.3 Outsourcing of any portion of the research work to another party/other parties is **NOT** allowed unless with prior approval from BIPPK.

12.0 RESEARCH PROPOSAL

The scope of research proposal shall include, but is not limited to, the following:-

- a) Objectives;
- b) Problems identification;
- c) Literature review;
- d) Research scope;
- e) Outcome and benefits to the organization;

- f) Research design including method(s) and detailed procedures proposed to carry out the research;
- g) Project team presented in an organisation chart, Gantt chart showing research activities and work flow;
- h) List of specialised equipment, facilities and infrastructure required, whether new or existing;
- i) Duration of research work;
- j) Timeline of research work; and
- k) Cost to carry out research with detailed breakdown.

13.0

SCOPE OF FUNDING

13.1 The scope of funding covers activities involved from preliminary stage to the commercialisation stage. The costs for carrying out research must be clearly detailed out in accordance to the research methodology and activities.

13.2 The cost to carry out research shall be broken down according to the head of expenditures as listed below:

- a) Salary and Wages;
- b) Travel and Transportation;
- c) Rentals;
- d) Research Materials and Supplies;
- e) Special Services;
- f) Research and Development Equipment and Accessories; and
- g) Promotions and Publications.

13.3 Salary and Wages

It shall include salaries, wages and allowances for temporary and contract personnel who are directly engaged in the project.

13.4 Travel and Transportation

13.4.1 It includes travel and transportation expenses for domestic and overseas trips, which are directly related to the project.

13.4.2 Overseas trips must meet the following criteria:-

- a) conducting a portion of the required research when domestic facilities and expertise are inadequate; or
- b) attending conferences, seminars, or workshops to present and promote the results of the project; and
- c) the venue for the above must be suitable in terms of facilities, expertise and technology transfer.

13.4.3 Two (2) sets of report on research activities carried out overseas shall be submitted to BIPPK **NO LATER** than two (2) weeks after completion of research activities for record purposes.

13.5 Rentals

13.5.1 Only rental expenses for building space, equipment, transportation and any other items directly related to the project shall be included.

13.5.2 Rentals of vehicles for the purpose of transportation must be made from a licenced transportation company.

13.6 Research Materials, Tools, Basic Testing Equipment and Supplies

Only expenses for research materials such as books, journals, tools, basic testing equipment and supplies directly related to the project shall be included and must be approved by JKPP.

13.7 Research and Development (R&D) Equipment and Accessories

13.7.1 Special equipment and accessories required and purchased for carrying out of the research, including accessories to upgrade the capability of existing equipment directly related to the project.

13.7.2 Purchase of special equipment and accessories may only be made after application of the purchase is approved by JTKPP.

13.7.3 Purchase of software for carrying out research may only be made after application of the purchase is approved by JTKPP.

13.7.4 Upon completion of the research, all equipment purchased shall be inventoried and returned to BIPPK.

13.8 Special Services

13.8.1 Special services directly related to the project such as consultancy, expert services, payment for enumerators, usage of computer facilities,

chemical analysis, data processing and obtaining Intellectual Property (IP) protection or rights.

13.8.2 Engagement of expert(s) shall be considered on a case-by-case basis.

13.8.3 Include any payments of honorarium subject to the approval by JTKPP.

13.8.4 Include tuition fees and other related fees of obtaining Master or Doctorate degree from institution of higher learning subject to the approval by Jabatan Perkhidmatan Awam (JPA).

13.8.5 Conference fees, seminar fees, workshop and fees for related training and courses.

13.9 Promotions and Publications

13.9.1 Shall include cost for publishing and promoting research findings.

13.9.2 Shall include cost for promoting the findings at national and international level.

13.9.3 Shall include cost for Intellectual Property (IP) protection or rights (excluding IP maintenance cost).

13.10 All expenses and expenditure related to research activities shall be made in accordance to latest circulars and governing regulation by the Ministry of Finance or other related government bodies.

14.0 APPROVAL OF RESEARCH PROJECT

14.1 All research applications shall be made by using the 'APPLICATION FORM FOR RESEARCH PROPOSAL' – **Form No. SPPT_01**

14.2 All applications for research works and funding shall be evaluated and approved by:

- (i) Secretariat at BIPPK;
- (ii) Technical and Financial Research Committee; and
- (iii) Research Approval Committee (Jawatankuasa Kelulusan Projek Penyelidikan).

The Committee members of JKPP are appointed by the Ketua Pengarah Kerja Raya Malaysia.

14.3 RESEARCH APPROVAL COMMITTEE

1.	Timbalan Ketua Pengarah Kerja Raya Malaysia (Sektor Pakar)	Chairman
2.	Pengarah Kanan or Pengarah Cawangan Kejuruteraan Awam dan Struktur	Committee Member
3.	Pengarah Kanan or Pengarah Cawangan Jalan	Committee Member
4.	Pengarah Kanan or Pengarah Cawangan Perancangan Aset Bersepadu	Committee Member
5.	Pengarah Kanan or Pengarah Cawangan Kejuruteraan Mekanikal	Committee Member
6.	Pengarah Kanan or Pengarah Cawangan Kontrak dan Ukur Bahan	Committee Member
7.	Pengarah Kanan or Pengarah Cawangan Kejuruteraan Elektrik	Committee Member
8.	Pengarah Kanan or Pengarah Cawangan Arkitek	Committee Member
9.	Pengarah Cawangan Kejuruteraan Cerun	Committee Member
10.	Pengarah Cawangan Kejuruteraan Geoteknik	Committee Member
11.	Pengarah Cawangan Alam Sekitar dan Kecekapan Tenaga	Committee Member
12.	Pengarah Kanan Pusat Kecemerlangan Kejuruteraan dan Teknologi JKR (CREaTE)	Committee Member

14.4 LETTER OF AWARD

A letter of award shall be issued by BIPPK, to successful researchers only after the research project is approved by JKPP and funding is confirmed.

14.5 LETTER OF ACCEPTANCE

Successful researcher shall sign the Letter of Acceptance and return it to BIPPK within fourteen (14) days from the date of the Letter of Award.

15.0	CHANGES IN APPROVED RESEARCH PROPOSAL
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- 15.1 Request for any changes in the approved research proposal must be made to BIPPK by using **Form No. SPPT_08**.
- 15.2 Subject to approval by JKPP, changes may be made to research title, scope of works, personnel, duration and cost of research.

16.0	OWNERSHIP OF R&D EQUIPMENT, DATA AND INFORMATION
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- 16.1 All R&D equipment and reference materials, purchased under the project shall be the property of the government. They shall be returned to BIPPK at the end of the project.
- 16.2 All research data and information (raw or validated) shall be the property of BIPPK, CREaTE. Prior consent shall be obtained from BIPPK for the use of the data and information by any party.

17.0	PROGRESS REPORT AND FINAL REPORT OF RESEARCH PROJECT
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- 17.1 During the course of the research, a progress report shall be submitted to BIPPK every three (3) months. The progress report shall be submitted by using **Form No. SPPT_P_02**.
- 17.2 Upon completion of the research, three (3) sets of the Final Report shall be submitted to BIPPK (two sets of hard copy, and one set of soft copy) **NO LATER** than two (2) months after completion of the research project. The format of the Final report shall be in accordance with **Form No. SPPT_P_03**.

18.0	INTELLECTUAL PROPERTY RIGHT
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- 18.1 The ownership of Intellectual Property Right (IP) for research project carried out departmentally by JKR shall belong to JKR. When a research project is carried out through collaboration with third parties, then the IP shall be determined mutually and agreed upon between the parties.
- 18.2 BIPPK reserves the rights to apply for Intellectual Property (IP) protection or rights of the research works.

18.1 Application forms can be obtained from BIPPK office, or they can be downloaded from CREaTE website at <http://create.jkr.gov.my>

18.2 Any correspondence shall be forwarded to the following address:

PENGARAH

BAHAGIAN INOVASI, PENYELIDIKAN DAN PEMBANGUNAN KEJURUTERAAN

PUSAT KECEMERLANGAN KEJURUTERAAN DAN TEKNOLOGI JKR (CREaTE)

JALAN KEMUS, SIMPANG AMPAT

78000 ALOR GAJAH

MELAKA

Email: createjkr@jkr.gov.my

20.0	LIST OF WORK FLOWS AND STANDARD FORMS RELATED TO RESEARCH PROCESS
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BORANG URUSETIA PENYELIDIKAN

Permohonan dan Kelulusan

BIL	NAMA BORANG	NO. BORANG
1.	Borang Permohonan Projek Penyelidikan	SPPT_01
2.	Senarai Semakan Permohonan (Makmal)	SPPT_02
3.	<i>Evaluation Form</i> / Borang Penilaian Pakar	SPPT_03
4.	Senarai Semakan Permohonan (Urusetia)	SPPT_04
5.	Keputusan J/K Teknikal & Kewangan (JKTP)	SPPT_05
6.	Pengesyoran J/K Teknikal & Kewangan (JKTP)	SPPT_06
7.	Keputusan J/K Kelulusan Projek Penyelidikan (JKPP)	SPPT_07
8.	Borang Permohonan Pindaan Penyelidikan	SPPT_08

Pemantauan

BIL	NAMA BORANG	NO. BORANG
1.	Senarai Projek Penyelidikan	SPPT_P_01
2.	Laporan Piawai Kemajuan Penyelidikan	SPPT_P_02
3.	Laporan Piawai Akhir Penyelidikan	SPPT_P_03
4.	Senarai Projek Penyelidikan Bagi Mesyuarat JKPP (Baru dan Pindaan)	SPPT_P_04
5.	Lejer Kewangan Penyelidikan	SPPT_P_05

Surat Piawai Penyelidikan

BIL	NAMA SURAT	NO. SURAT
1.	Surat Akuan Penerimaan Permohonan	SPPT_SR_01
2.	Surat Tawaran Menjalankan Penyelidikan	SPPT_SR_02

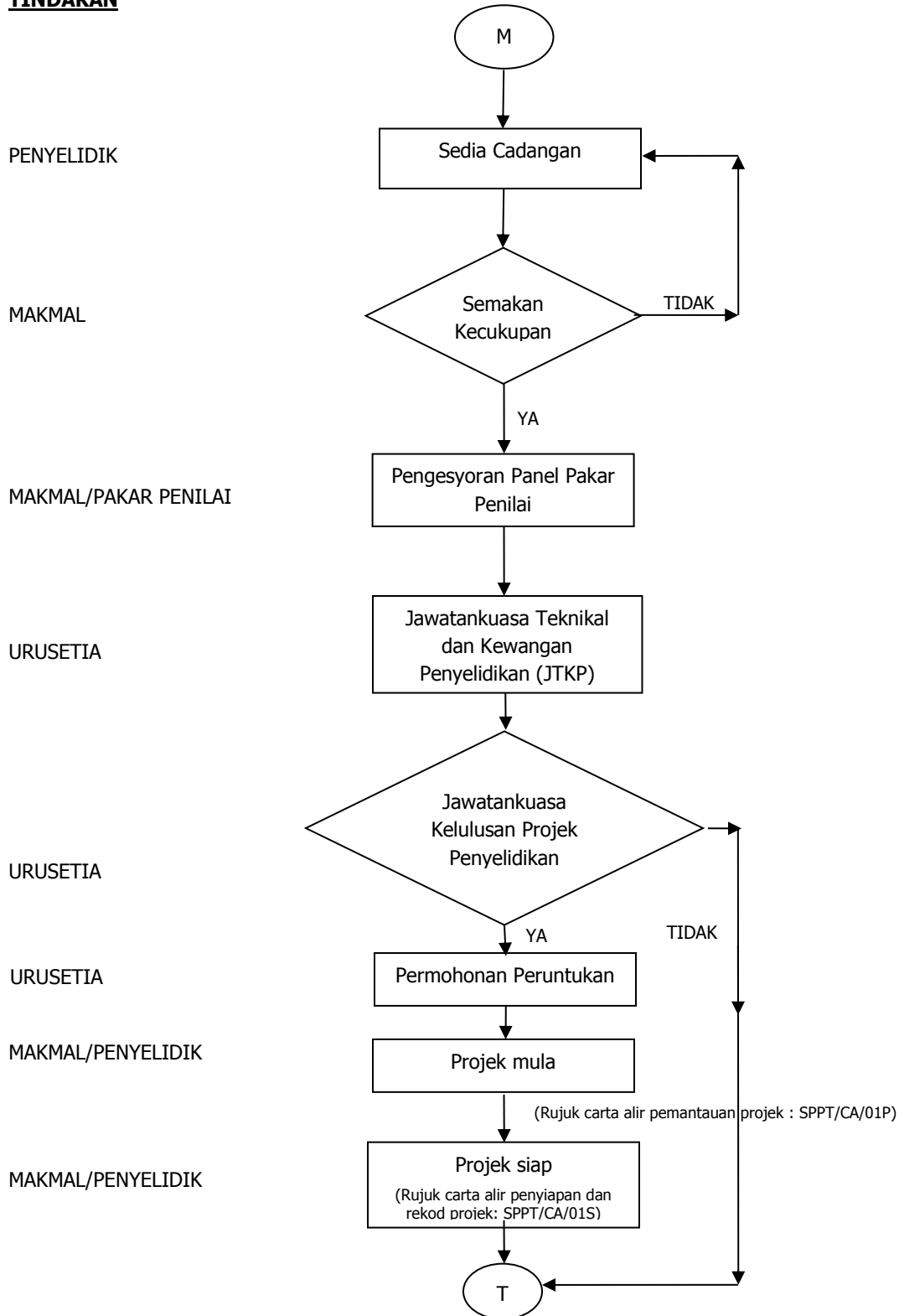
3.	Surat Akuan Penerimaan Tawaran Menjalankan Penyelidikan	SPPT_SR_03
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Projek penyelidikan siap

BIL	NAMA SURAT	NO. SURAT
1.	Pendaftaran Projek Siap	SPPT_PS_01
2	Pendaftaran Aset yang diperolehi melalui kajian penyelidikan	SPPT_PS_02
3	Pengurusan Data	SPPT_PS_03

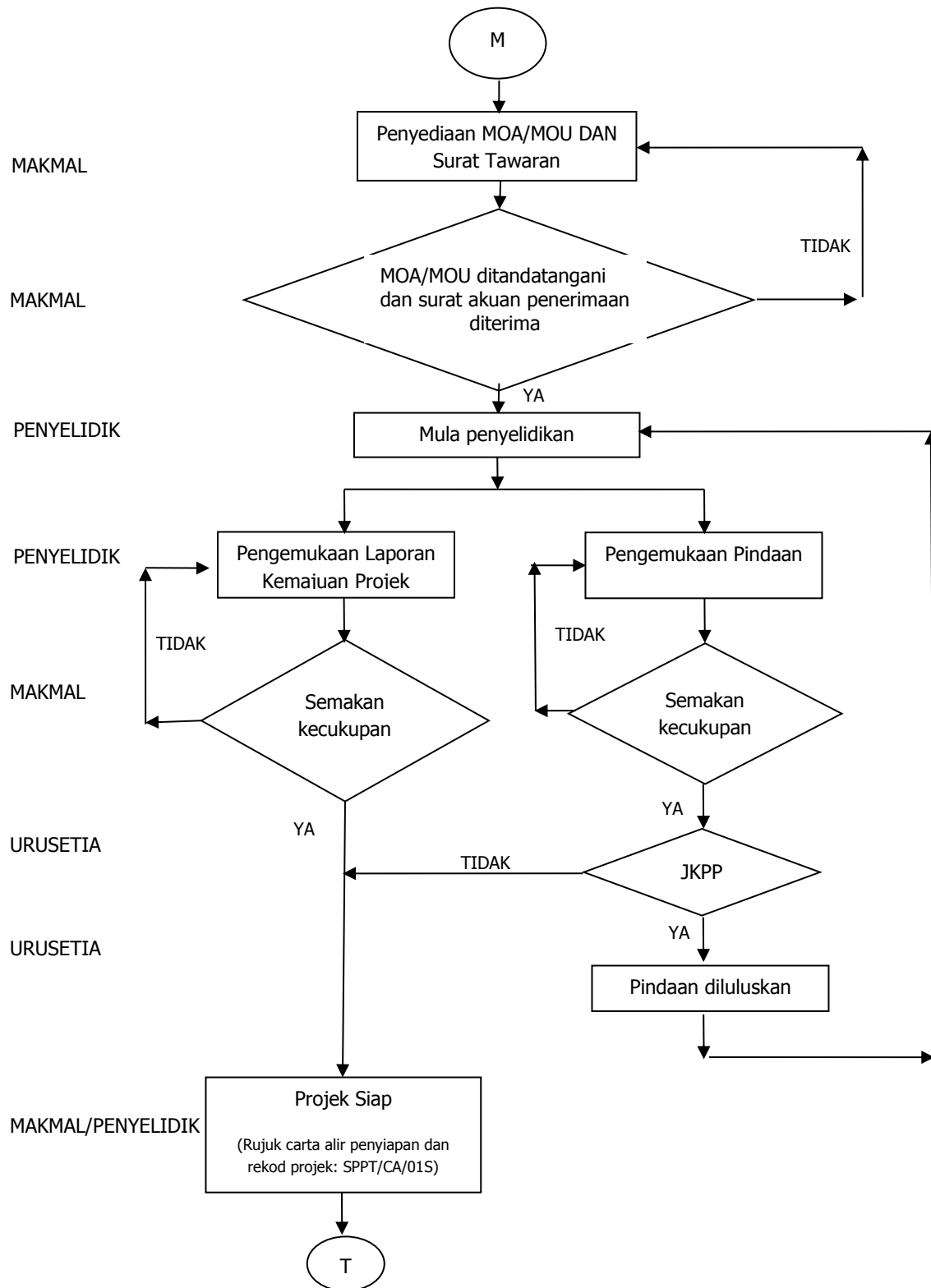
PROSES KERJA PROJEK PENYELIDIKAN JKR MALAYSIA

TINDAKAN

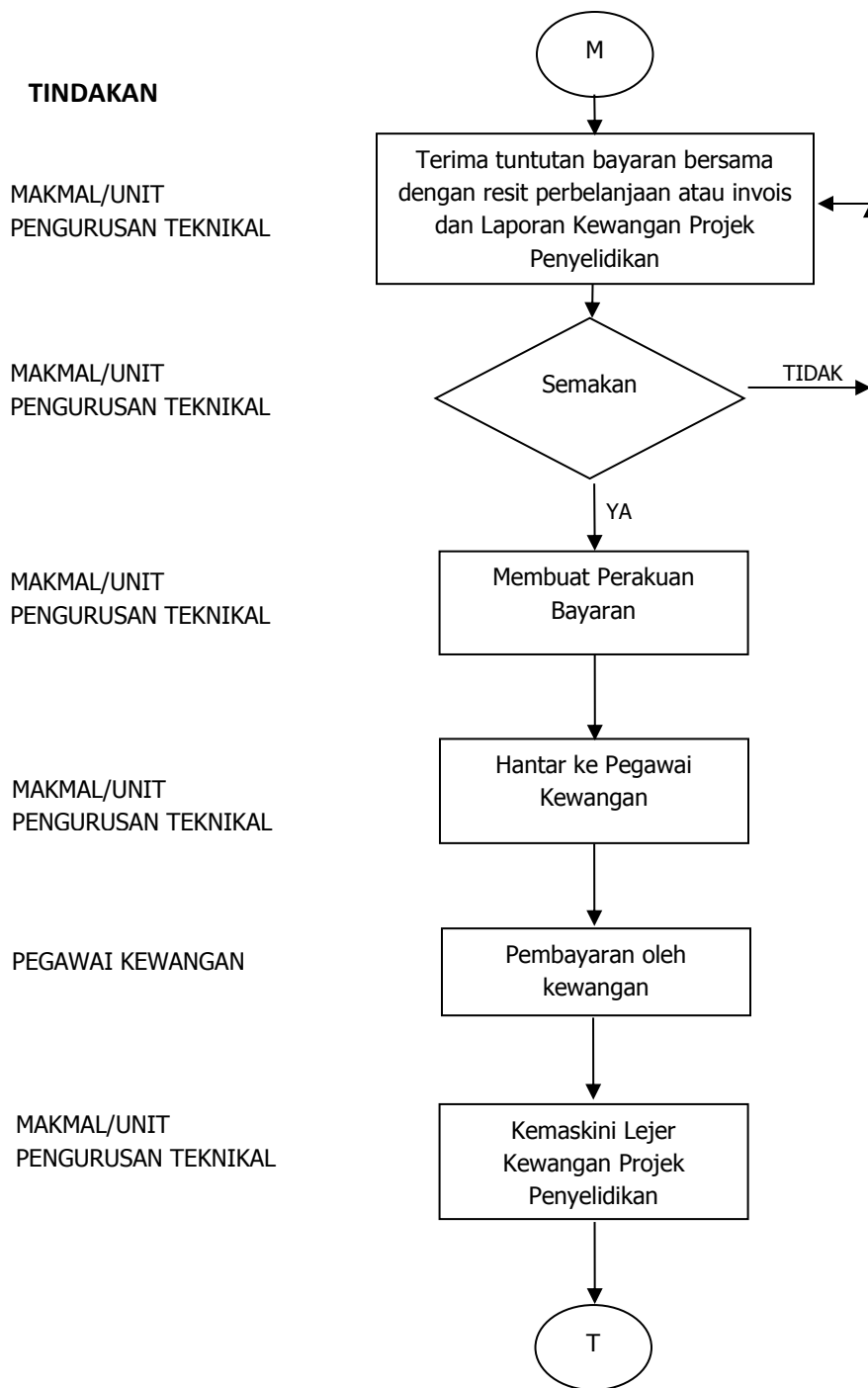


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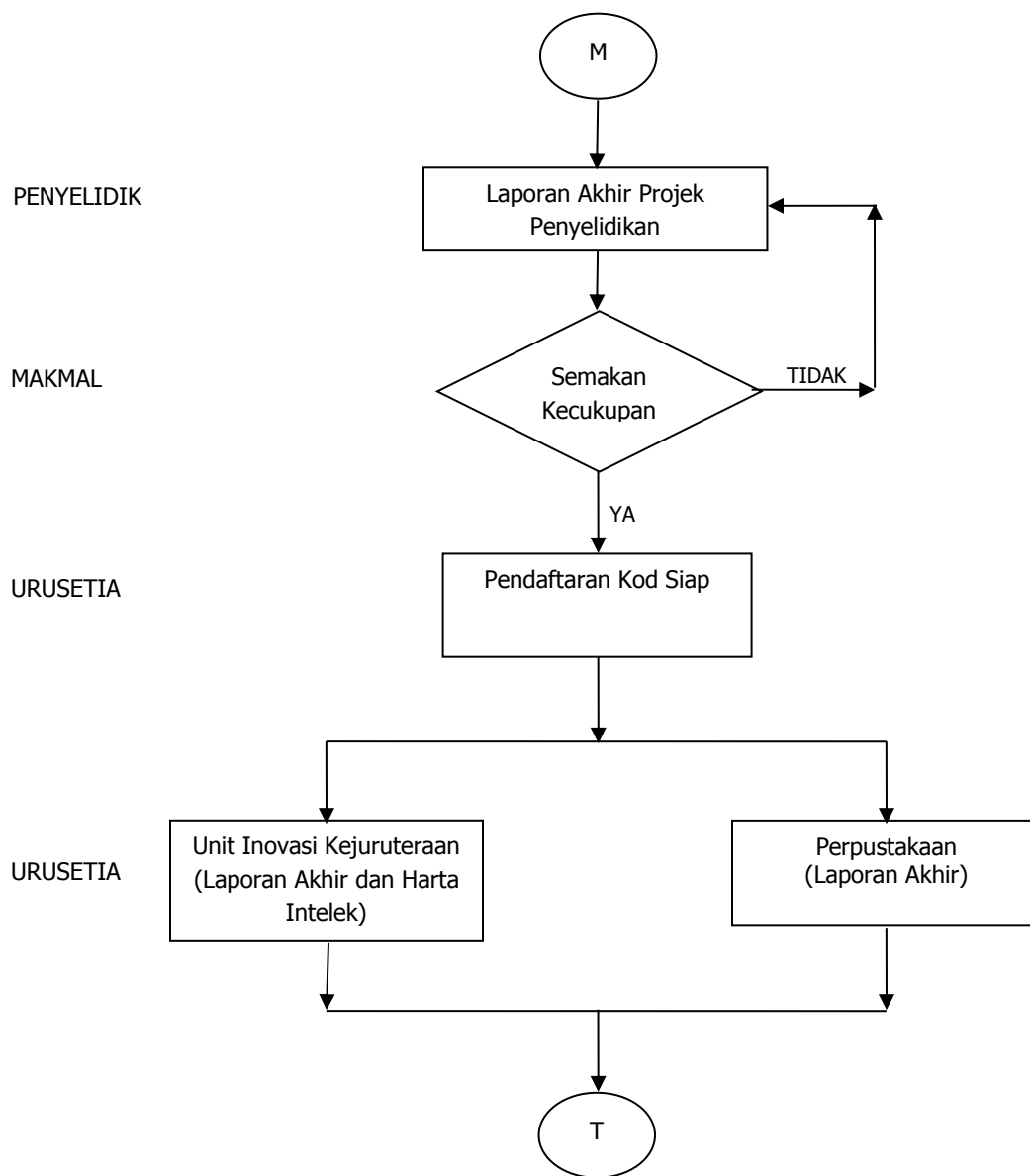
TINDAKAN



PROSES KERJA PROJEK PENYELIDIKAN JKR MALAYSIA: BAYARAN KEWANGAN

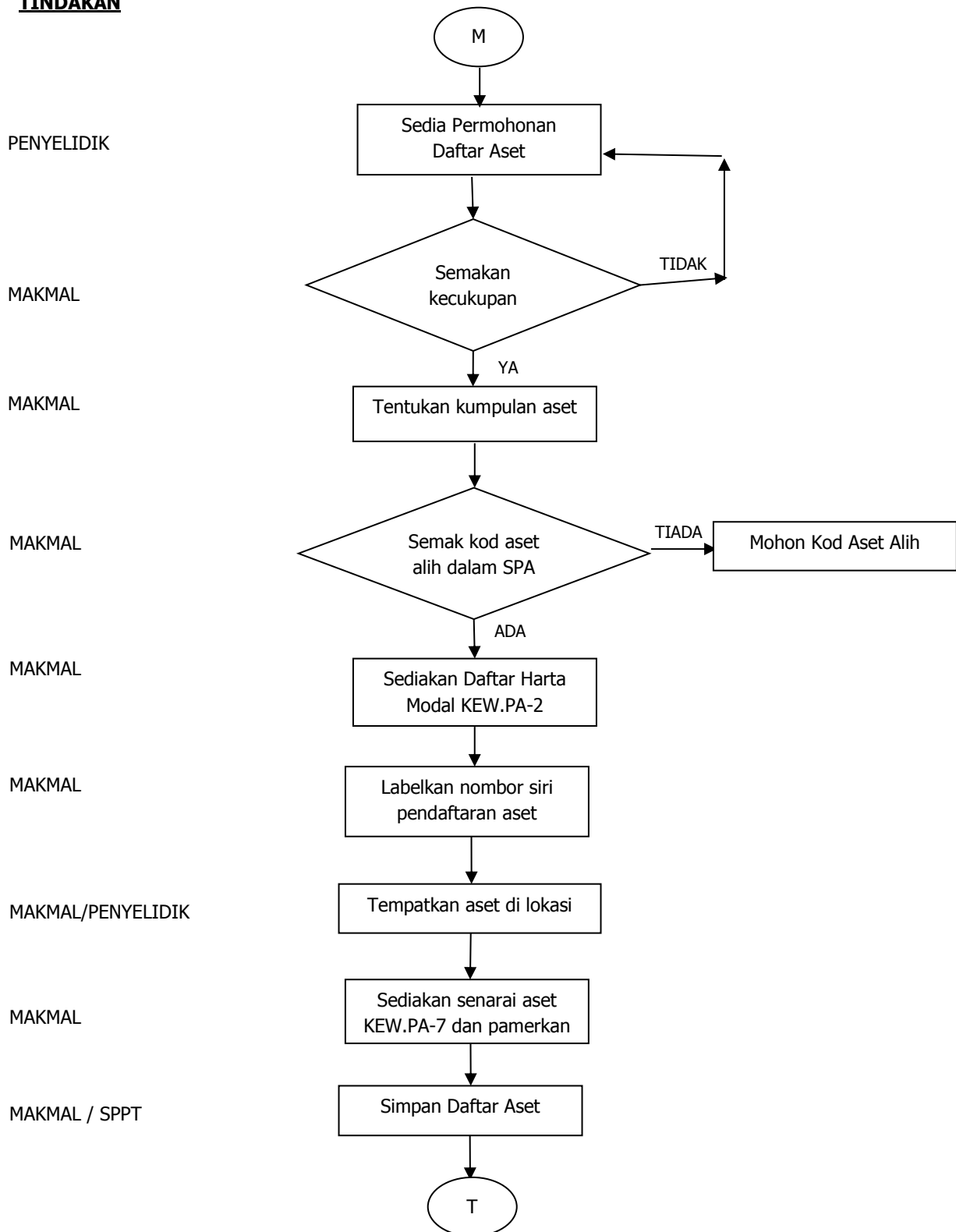


PROSES KERJA PROJEK PENYELIDIKAN JKR MALAYSIA: PENYIAPAN DAN REKOD



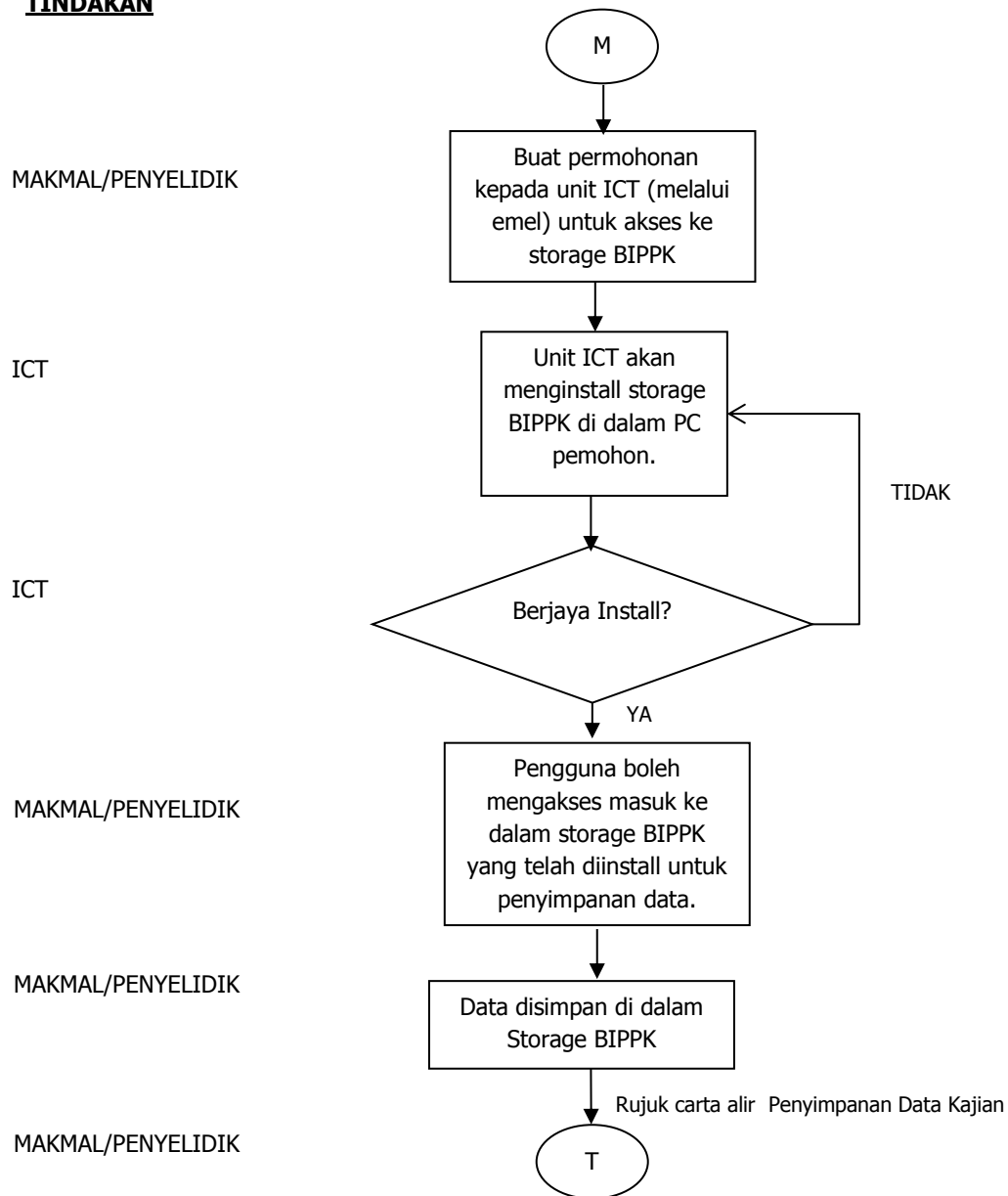
PROSES KERJA PENDAFTARAN ASET ALIH KERAJAAN

TINDAKAN



PROSES KERJA PENYIMPANAN DATA DI PUSAT DATA CREaTE

TINDAKAN



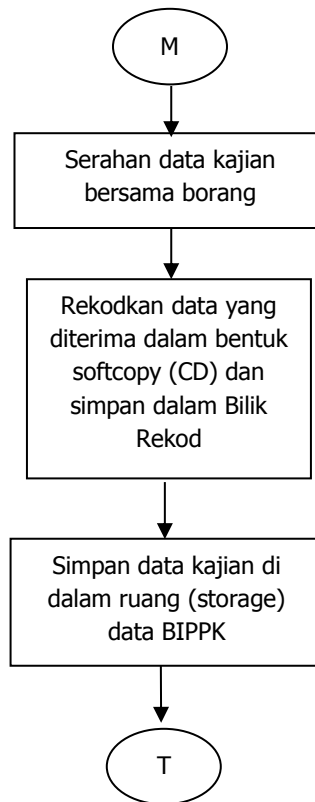
PROSES KERJA PENYIMPANAN DATA KAJIAN

TINDAKAN

PENYELIDIK

MAKMAL

ICT



ACKNOWLEDGEMENTS

COMMITTEE MEMBERS

- | | | |
|----|----------------------------------|--------------------------------------|
| 1. | Dr. Sherliza binti Zaini Sooria | Senior Superintendent Civil Engineer |
| 2. | Ir. Nik Ibrahim bin Nik Abdullah | Superintendent Electrical Engineer |
| 3. | Rosli bin Awang | Superintendent Mechanical Engineer |
| 4. | Ir. Romziah binti Azit | Senior Civil Engineer |
| 5. | Ir. Muhamad Yusri bin Zainal | Civil Engineer |
| 6. | Ir. Rasidi bin Senin | Civil Engineer |
| 7. | Mohd Idham bin Mokhtar | Civil Engineer |
| 8. | Shahril bin Azizi | Mechanical Engineer |

UNIT PENGURUSAN TEKNIKAL

- | | | |
|----|----------------------------------|----------------------------------|
| 1. | Sulaimi bin Nordin | Superintendent Quantity Surveyor |
| 2. | Aiman Darlina Akmar binti Rahman | Architect |
| 3. | Siti Norasikin binti Mohd Nasir | Mechanical Engineer |
| 4. | Mohd Zakuan bin Zabri | Mechanical Engineer |

UNIT PENGURUSAN PENGETAHUAN, TEKNOLOGI MAKLUMAT DAN PUSAT SUMBER

- | | | |
|----|-----------------------------|----------------------------------------|
| 1. | Siti Sabariah binti Mohamed | Penolong Pegawai Teknologi
Maklumat |
|----|-----------------------------|----------------------------------------|

COMMITTEE SECRETARY

- | | | |
|----|-----------------------|----------------|
| 1. | Izmazurin binti Ramli | Civil Engineer |
|----|-----------------------|----------------|



**BAHAGIAN INOVASI, PENYELIDIKAN DAN PEMBANGUNAN KEJURUTERAAN
PUSAT KECEMERLANGAN KEJURUTERAAN DAN TEKNOLOGI JKR
(CREaTE)**

