

CADASTRE SURVEY (SBEU 3313)

WEEK 1 - INTRODUCTION TO CADASTRE SURVEY

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OUTLINE

- Definition of Cadastral Survey
- Cadastre and Cadastral
- Department of Survey and Mapping Malaysia (JUPEM)

DEFINITION OF CADASTRAL SURVEY

Definition

- ❑ Cadastral surveying is the term generally used to describe the gathering and recording of data about land parcels even though the records do not form part of an official cadastre.
- ❑ When properties are initially registered, government officials have traditionally undertaken the processes of cadastral surveying and land title adjudication.

Definition

Cadastral surveying is the definition, identification, demarcation, measuring and mapping of new or changed legal parcel boundaries. It usually includes the process of re-establishing lost boundaries and sometimes resolving disputes over boundaries or other interests in real property.

Definition

- ❑ Cadastres and cadastral surveys are aspects of land administration.
- The primary object of a cadastral is to determine for each land parcel, its location, the extent of its boundaries and surface area, and to indicate its separate identity, both graphically on a map or in a record as well as physically on the ground.
- Its secondary objective is to provide information for a multipurpose cadastre to fulfil the overall information requirements of land administration.
- Cadastral plans can fulfil many of the functions of large-scale topographic maps, not only serving such purposes as boundary control, registration of title and valuation but also forming a basis of planning and development.

Definition

□ The basic features that are recorded in a cadastre are the land parcels and their boundaries. Good practice will result in laws relating to parcels and their boundaries that:

- Provide a legal definition of a land parcel;
- Recognize that boundaries may be vertical or horizontal;
- Differentiate between the legal position of a boundary and the physical position of objects;
- Define the priority of evidence; and
- Avoid getting into detail over the precision with which boundaries should be surveyed for the purposes of land titling.

Definition

- ❑ In order to guarantee the accuracy of boundary surveys and to apply quality controls to the work of the cadastral survey, it is common for survey regulations and procedures to be introduced.
- ❑ These often prescribe the manner in which surveys are to be carried out as well as the standards that must be achieved.
- ❑ Survey regulations and procedures may also prescribe the necessary qualification for the granting of licence to undertake cadastral surveys.

Definition

- ❑ The objectives of cadastral surveys are to acquire information, process it, coordinate and finally to present the vital information.
- ❑ Cadastral surveying is an expensive process not only in its execution but also in the loss of capital from delays in development and investment which may arise owing to inefficiency.

Section 83 National Land Code 1965- Survey for purposes of alienation under final title.

Where any land is surveyed in accordance with the provisions of section 396 National Land Code 1965 for the purpose of its alienation under final title, the boundaries determined on the survey shall accord as nearly as may be with those indicated by the plan and description by reference to which the approval of the State Authority was given.

CADASTRE AND CADASTRAL

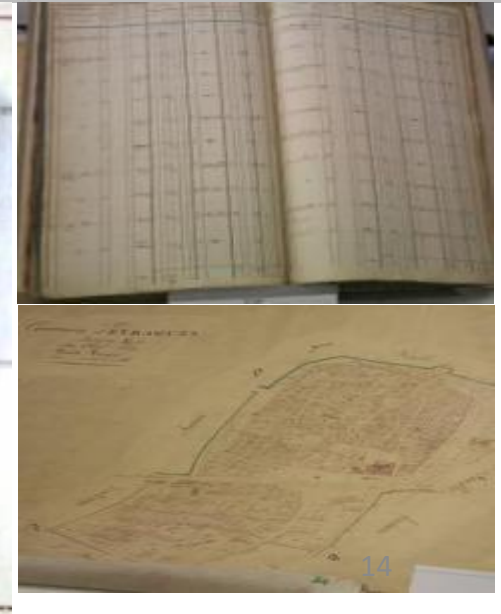
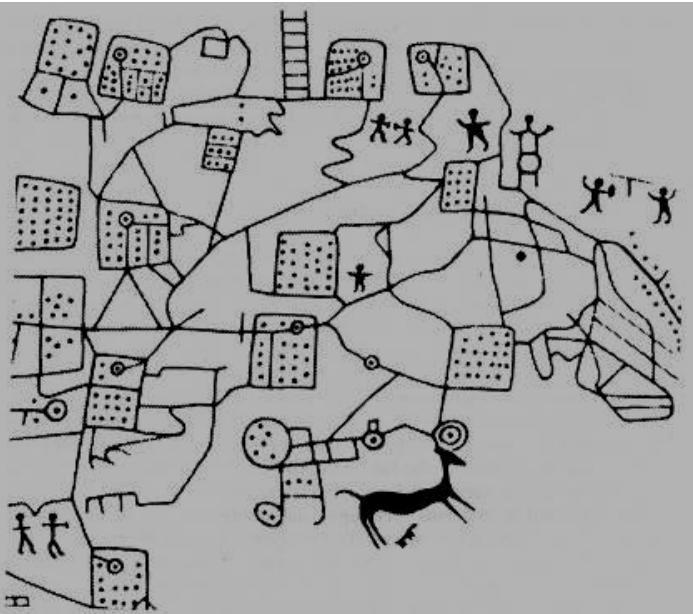
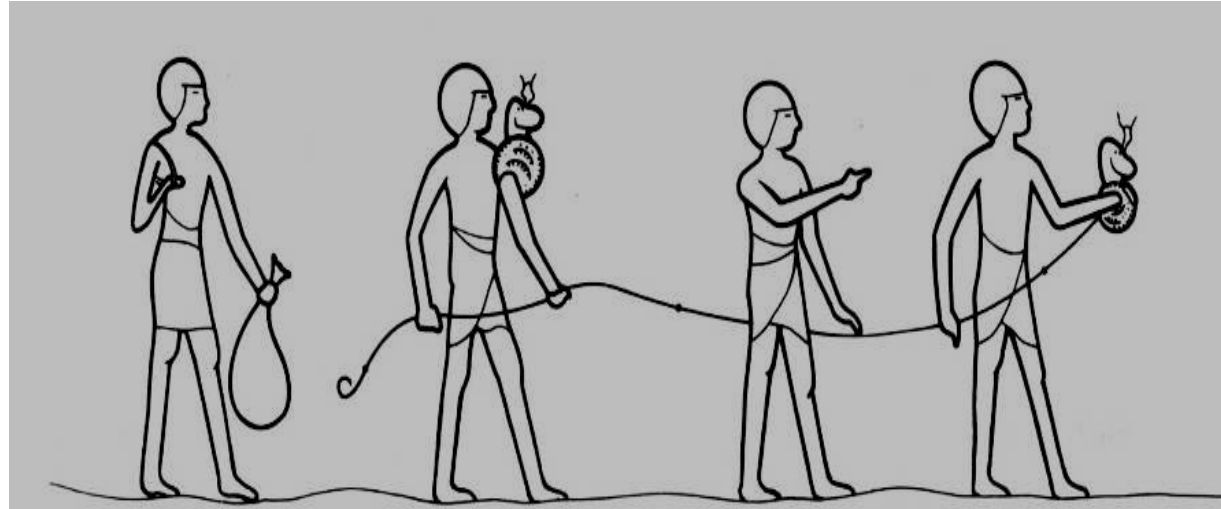
Objective

To understand the role of the cadastre in the administration of Federal or State or jurisdiction, its operation and components.

History of Cadastres

- Babylonian 4000 BC
- Egyptians 3000 BC
- Italy 1600 BC
- Roman Empire 300 AD
- Domesday Book 1076 AD
- Maria Theresa Cadastre 1792 AD
- Napoleonic Cadastre 1807 AD
- Computerized Cadastre 1980 AD
- Cadastre 2014

Geomatics Engineering (Kejuruteraan Geomatik), Surveying & Geomatics Science (Sains Ukur & Geomatik), Land Surveying & Geoinformatics, Engineering in Geospatial Surveying & Mapping, Engineering in Surveying, Spatial Science, Applied Science etc.



The Definition of Cadastre

- ❑ The Cadastre is a land information system, usually managed by one or more government agencies. Traditionally the Cadastre was designed to assist in land taxation, real estate conveyancing, and land redistribution.
- ❑ A cadastre is normally a parcel-based, and an up-to-date land information system containing a record of interests in land (e.g. rights, restrictions, and responsibilities).
- ❑ It usually includes a geometric description of land parcels linked to other records describing the nature of interests the ownership or control of those interests, and often the values of the parcel and its improvements.

The Definition of Cadastre

The International Federation of Surveyors Statement on the Cadastre highlights the importance of the cadastre as a land information system for social and economic development from an international perspective and recognises the central role that surveyors play in the establishment and maintenance of cadastre.

The Definition of Cadastre

□ Effective land management requires land information, for example information about land resource capacity, land tenure and land use. The cadastre is the primary means of providing information about land. The cadastre provides:

- Information identifying those people who have interest in parcels of land;
- Information about those interest, for example nature and duration of right, restriction of interest and responsibility;
- Information about the parcels, for example location, size, improvements and value.

Essential Elements of a Modern Cadastre

- Large scale maps
- Registers
- Cadastre must be complete
- Each parcel must have a unique identifier
- Cadastre must be dynamic
- Information must be correct
- Information must be public
- Cadastre must be supported by a coordinated survey system
- The cadastre must include an unambiguous definition of parcel boundaries both in map form and on the ground.

Cadastre

A successful CADASTRE should provide security of tenure, be simple and clear, be accessible, and provide current and reliable information at minimum cost

Types of Cadastre

Juridical/Legal Cadastre

Fiscal Cadastre

Multipurpose Cadastre

Juridical/Legal Cadastre

- ❑ Supports land rights.
- ❑ Is concerned with documenting rights and relating them to the land with which they are associated. It is concerned with all forms of property rights.
- ❑ As the information system which underpins land registration.
- ❑ A written record or register containing information about each parcel, such as the spatial information and the rights which appertain to the land.
- ❑ Contains a detailed description of the parcel, in the form of either survey maps or measurements.

Fiscal Cadastre

- ❑ An instrument for administering land tax and value policy.
- ❑ The information required to develop and maintain a fiscal cadastre may be collected directly or indirectly through surveys or from other sources, for instance details of land ownership and their property boundaries.

Multipurpose Cadastre

- ❑ Should be maps showing the location and different types of physical features.
- ❑ Concerned with physical attributes such as man-made objects and natural features associated with each land parcel, abstractions, surveying and mapping data can also be referenced to the parcel.

Multipurpose Cadastre

□ Advantages directly beneficial from multipurpose cadastre are:

- (i) an improved conveyancing system;
- (ii) an improved cadastral survey system;
- (iii) improved land use planning, land management and environment management;
- (iv) improved management of publicly owned lands,
- (v) reduction of duplication; and
- (vi) better control of land transactions.

Multipurpose Cadastre

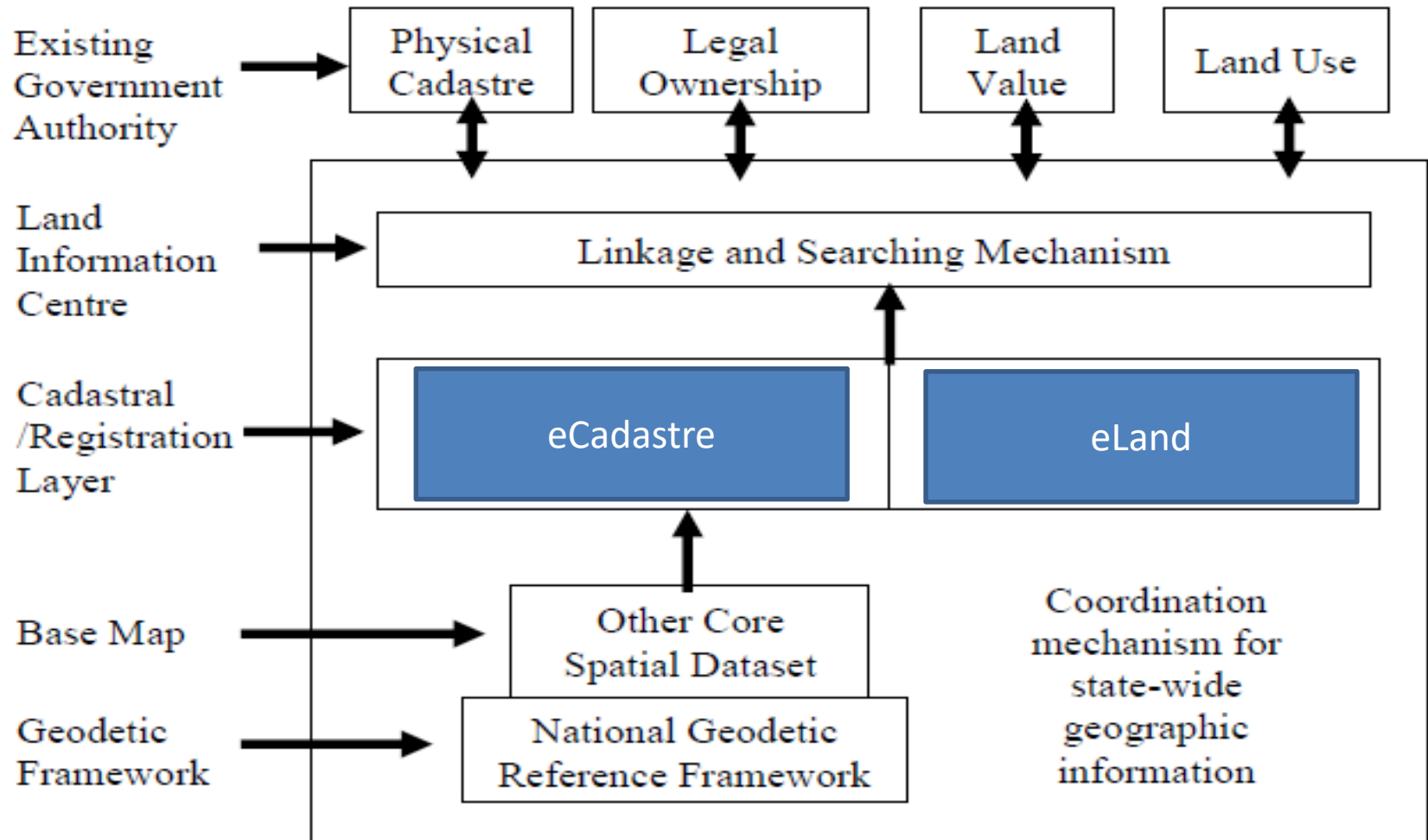
An extension of the basic cadastre, is an essential tool that can include other information from various databases or registers, and can be adapted for local needs. It is a basis for planning for utilities, land information and development management.

Benefits of Multipurpose Cadastre

□ A modern multipurpose cadastre can lead to improve:

- Conveyancing system.
- Cadastral survey system.
- Land use planning and land management.
- Sustainable development.
- Management of publicly owned lands.
- Reduction of duplication.
- Control of land transactions.

Multipurpose Cadastre Components



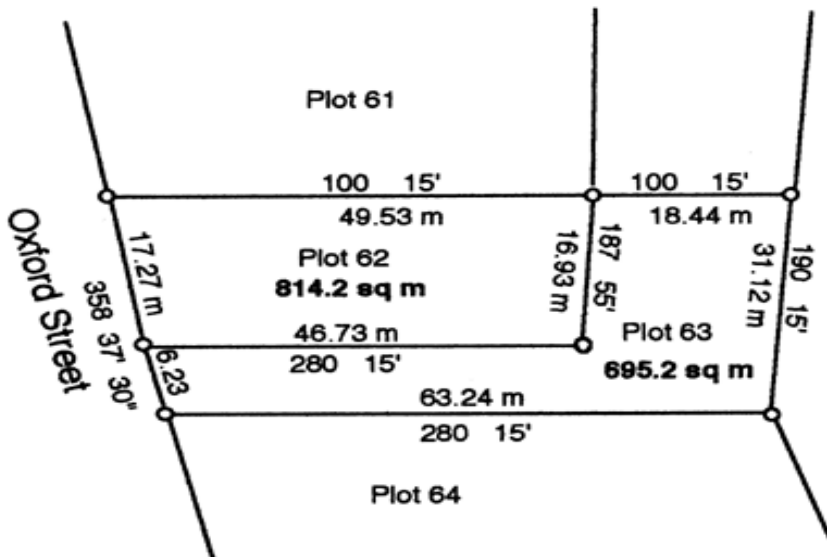
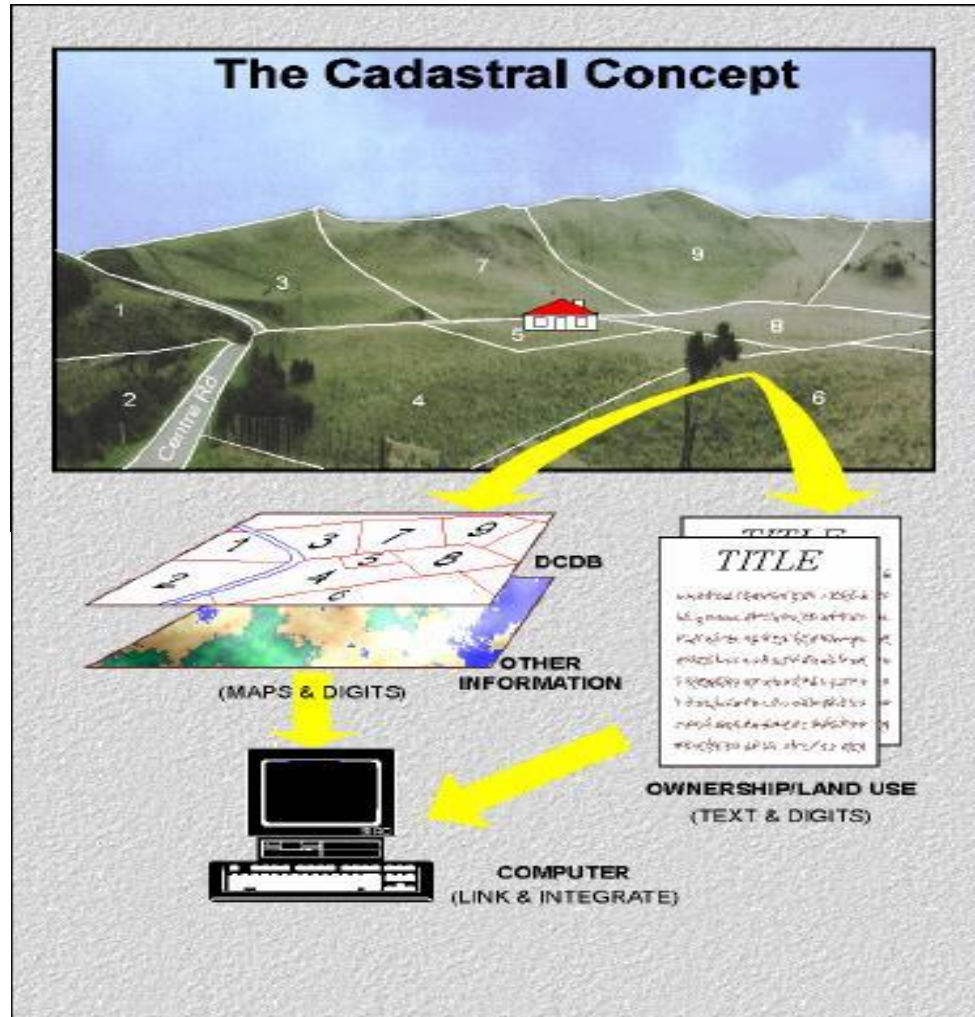
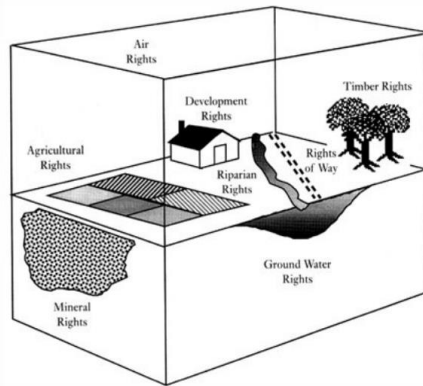
Cadastral

The basic building block in any land administration system is the cadastral parcel. The cadastre consists of two parts:

- Registers
- Maps

The Cadastral Parcel and Ownership Rights

The cadastral parcel and ownership rights



Cadastral Issues

- Documentation of informal or customary rights.
- Land registration (deeds, title or combinations).
- Land titling.
- Parcels and properties.
- Boundaries (fixed, graphical, general).
- Impact of technology.

The Future Cadastre

Cadastre 2014

Cadastre 2034

Cadastre 2.0

Cadastral Fabric

Cadastre 2014

- Statement 1: Show the complete legal situation of the land. Private and public rights and restrictions on the land will be systematically documented;
- Statement 2: The separation between maps and registers will be abolished;
- Statement 3: The cadastral mapping will be dead. Long live modelling;
- Statement 4: Paper and pencil-cadastre will be gone;
- Statement 5: Highly privatised. Public and private sectors will work closely together;
- Statement 6: Cost-recovering.

Cadastre 2034

- ❑ Cadastre 2034 outlines a vision for a broader cadastre where information is readily accessible and people have confidence in the spatial extent of the various rights, restrictions, and responsibilities related to their land and real property.
- ❑ Cadastre 2034 will guide the evolution of jurisdictional systems and ensure a coordinated and consistent approach to future policies, legislation, standards, models and research; and provide clear direction for the sector as a whole.

Cadastre 2034

- ❑ Fundamental to land and property ownership and is sustainably managed;
- ❑ Multipurpose, truly accessible, easily visualised, and readily understood and used;
- ❑ Fully integrated with broader legal and social interests on land;
- ❑ A representation of the real world, which is survey accurate, 3-dimensional and dynamic; and
- ❑ A national cadastre based on common nationwide standards.

Cadastre 2.0

- ❑ Be multipurpose in nature, meeting a wide range of needs beyond simply recording land ownership of defining parcels for taxation;
- ❑ Enable the full spectrum of rights and parcel definitions to be modelled and managed within the system;
- ❑ Be truly three-dimensional, to reflect better the real three-dimensional overlapping rights, and the registration of multi-level properties.

Cadastral Fabric

- A **cadastral fabric** (or parcel fabric) is a continuous surface of connected (map) parcels.
- Parcel polygons are defined by a series of boundary lines that store recorded dimensions as attributes in the lines table. Parcel polygons are also linked to each other by connection lines, for example, connection lines across roads.
- Because each and every parcel is either linked or connected, a seamless network.
- Parcel lines have endpoints, which are the parcel corners. Parcel corner points are common between adjacent parcel boundaries, establishing connectivity and maintaining topological integrity in the network.
- In the geodatabase, topology is the arrangement that defines how point, line, and polygon features share coincident geometry.

Cadastral Fabric

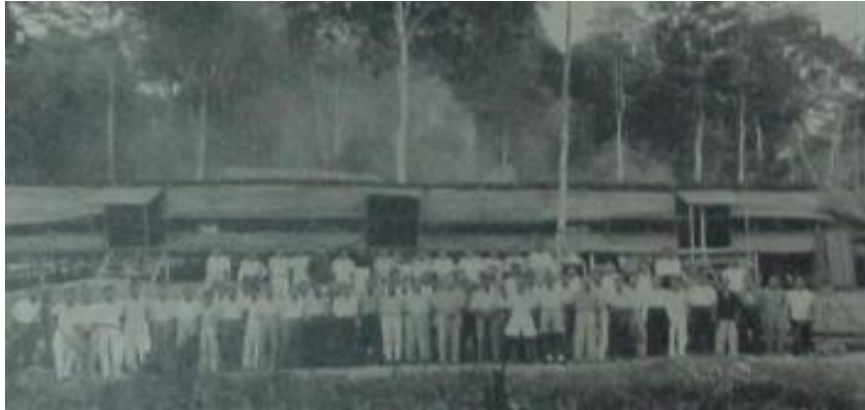
- A cadastral fabric is a representation of the record of survey for an area of land. Parcel boundary line dimensions in the cadastral fabric match the dimensions on the survey record. Dimensions in the cadastral fabric are edited in response to a change in the survey record, for example, a parcel split or resurvey. Parcels that are edited or replaced by new survey records are retained as historic, thus always preserving the original survey record.
- The cadastral fabric acts as a base map for overlying feature classes. Feature classes such as building polygons and utility lines are constructed in relation to parcel boundaries. Standard feature classes using parcel boundaries as a base map will fall out of alignment with an adjusting cadastral fabric.

National Land Code 1965

- ❑ The National Land Code 1965 (Act 56) was formulated based on existing practices in the 1950s until the pre-1965 era before it came into effect on 1st January 1966.
- ❑ Before this, all land dealings were governed by the Federated Malay States (Cap 138) Land Code 1926 that came into effect on 1st January 1928.
- ❑ Also being enforced at the time were five separate State legislations in each of the five Unfederated Malay States as well as the English Deeds System in the former Straits Settlements of Malacca and Penang.

JABATAN UKUR DAN PEMETAAN MALAYSIA (JUPEM)

Sejarah Penubuhan JUPEM



SEJARAH PENUBUHAN



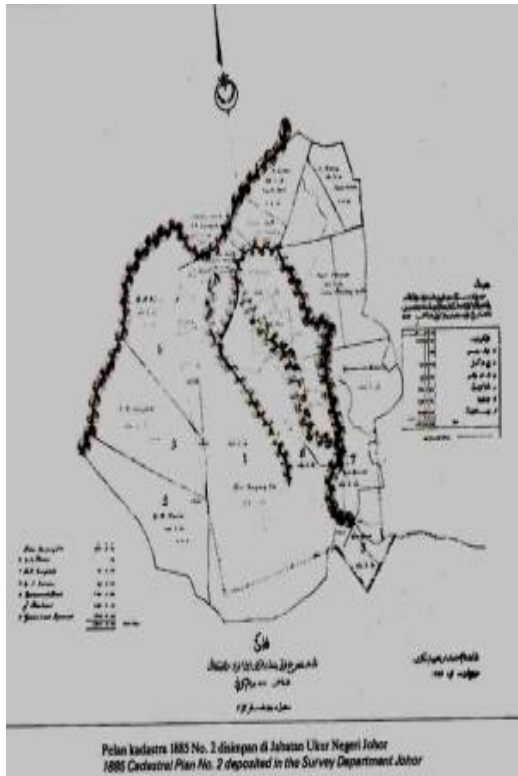
Sejarah Penubuhan JUPEM

JUPEM merupakan antara agensi kerajaan yang tertua di Malaysia di mana aktiviti pengukuran bermula pada tahun 1885 dengan tertubuhnya Jabatan Ukur Negeri Johor. Bertitik tolak dari tahun 1885 hingga 1957, Jabatan-Jabatan Ukur Negeri dan Topografi telah ditubuhkan sehingga membawa kepada penyatuan secara berperingkat kepada satu organisasi seperti hari ini. Pada tahun 1965, kerajaan telah meluluskan penubuhan Direktorat Pemetaan Negara Malaysia dengan mandat mengendalikan kerja-kerja ukur, pemetaan, topografi dan geodesi.

Penubuhan Jabatan diteruskan dengan penubuhan JUPEM Sabah (1983), JUPEM Wilayah Persekutuan Labuan (1984), JUPEM Sarawak (1989) dan diakhiri dengan penubuhan JUPEM Perlis pada tahun 1995.

Sejarah Penubuhan JUPEM

Bermula dengan Jabatan Ukur Negeri Johor dan Jabatan Ukur Trigonometri Negeri Perak pada tahun 1885 dan diikuti dengan negeri-negeri lain



- 1885 - JOHOR
- 1887 - PERAK
- 1889 - PAHANG
- 1891 - SELANGOR
- 1897 - NEGERI SEMBILAN
- 1909 - KEDAH
- 1920 - PULAU PINANG & MELAKA
- 1923 - KELANTAN
- 1926 - TERENGGANU
- 1972 - W.P. KUALA LUMPUR
- 1983 - SABAH
- 1984 - W.P. LABUAN
- 1989 - SARAWAK
- 1995 - PERLIS

Sejarah Penubuhan JUPEM



Khemah latihan Ukor, 1928



Bangunan Jabatan Ukor
Selangor, Jalan Tugu,
Kuala Lumpur
Tahun 1950

Carta Organisasi JUPEM

- ❑ Jabatan Ukur dan Pemetaan Malaysia (JUPEM) terletak di bawah Kementerian Sumber Asli dan Alam Sekitar (NRE). Ia diterajui oleh Ketua Pengarah Ukur dan Pemetaan (KPUP) yang juga selaku Pengarah Pemetaan Negara dan Pengarah Pemetaan Tentera.
- ❑ Struktur organisasinya telah dibentuk dalam penyusunan semula struktur organisasi JUPEM pada Oktober 2013, pada dasarnya terbahagi kepada dua bahagian iaitu kadaster dan pemetaan. Bahagian-bahagian pemetaan di ketuai oleh Timbalan Ketua Pengarah Ukur dan Pemetaan I. Manakala Bahagian Kadaster termasuk 13 JUPEM Negeri yang diletakkan terus di bawah Timbalan Ketua Pengarah Ukur dan Pemetaan II.
- ❑ Di bawah Pejabat KPUP di hubungkan terus dengan Bahagian Geospatial Pertahanan dan Unit Integriti.



**CARTA ORGANISASI
JABATAN UKUR DAN PEMETAAN MALAYSIA
KEMENTERIAN TENAGA DAN SUMBER ASLI**



Sr Hj. MOHAMMAD ZAKI BIN MOHD GHAZALI
Ketua Pengarah Ukur dan Pemetaan Malaysia
Jururukr JUSA A



NOR LINA BINTI ELIAS
Penasihat Undang-Undang, I&R



LIM SONG HUAT
Ketua Unit Integriti, M44



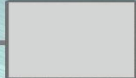
Sr WAN MOHAMAD DARANI BIN AB. RAHMAN, ANS
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BRIG. JEN. Sr DR. MOHD ZAMBRI BIN MOHAMAD RABAB
Pengarah
Bahagian Geospasial Pertahanan, ZA26



Sr HAZRI BIN HASSAN
Timbalan Ketua Pengarah Ukur dan Pemetaan II
Jururukr JUSA B



KOSONG
Pengarah Ukur, Bahagian
(Dasar dan Penyelarasn
Pemetaan)
Jururukr JUSA C



KOSONG
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(Rihal, Persempadanan)
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**Sr DR. AHMAD SANUSI
BIN CHE COB**
Pengarah Ukur Bahagian
(Ukur Geodetik)
Jururukr JUSA C



**Sr Hj. MOHAMAD AZMAR
BIN CHE MAT**
Pengarah Ukur Bahagian
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Sr SHABUDIN BIN SAAD
Pengarah Ukur Bahagian
(Pemetaan Topografi
Semenanjung)
Jururukr J54



TAN LEE CHENG
Pengarah Ukur Bahagian
(Khidmat Pengurusan)
Peg. Tadi. & Dlp. M54



**Sr SYLVESTER LUTA
ANAK BULI**
Pengarah Ukur Bahagian
(Pemetaan Topografi
Sarawak)
Jururukr J54



Sr SHAEFRI BIN BAUDI
Pengarah Ukur Bahagian
(Pemetaan Topografi Sabah)
Jururukr J54



**Sr ABDUL HALIM
BIN TUIRAN**
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Geospasial Negara)
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**Sr MUHAMMAD SALIM
BIN MOHAMMED ASARI, AMF**
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(Kadaster)
Jururukr JUSA C



Sr NAZRI BIN OTHMAN
Pengarah Ukur dan Pemetaan
JOHOR
Jururukr JUSA C



**Sr MOHAMED SOFIAN
BIN ABU TALIB**
Pengarah Ukur dan Pemetaan
PERAK
Jururukr JUSA C



**Sr AZLIM KHAN
BIN ABDUL RAOF KHAN**
Pengarah Ukur dan Pemetaan
PAHANG
Jururukr JUSA C



**Sr JAMIL FAISAL
BIN YUSOFF**
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KELANTAN
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Sr BERNARD SIA SIEW FANG
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SELANGOR
Jururukr JUSA C



Sr ROSLI BIN MOHAMMED
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TERENGGANU
Jururukr J54



Sr TSALIMY BIN ABDULLAH
Pengarah Ukur dan Pemetaan
KEDAH
Jururukr J54



Sr SAIFUL WAZLAN BIN WAHAB
Pengarah Ukur dan Pemetaan
W.P.K. LUMPUR & PUTRAJAYA
Jururukr J54



**Sr ENSKU MOHD ADLIN
BIN ENSKU HABIB**
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NEGERI SEMBILAN
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Sr ZULKAFLI BIN CHIHAT
Pengarah Ukur dan Pemetaan
PULAU PINANG
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Sr SIM CHING YEN
Pengarah Ukur dan Pemetaan
MELAKA
Jururukr J52



**Sr MOHD KHAIRANI
BIN MD. YUSOP**
Pengarah Ukur dan Pemetaan
PERLIS
Jururukr J48

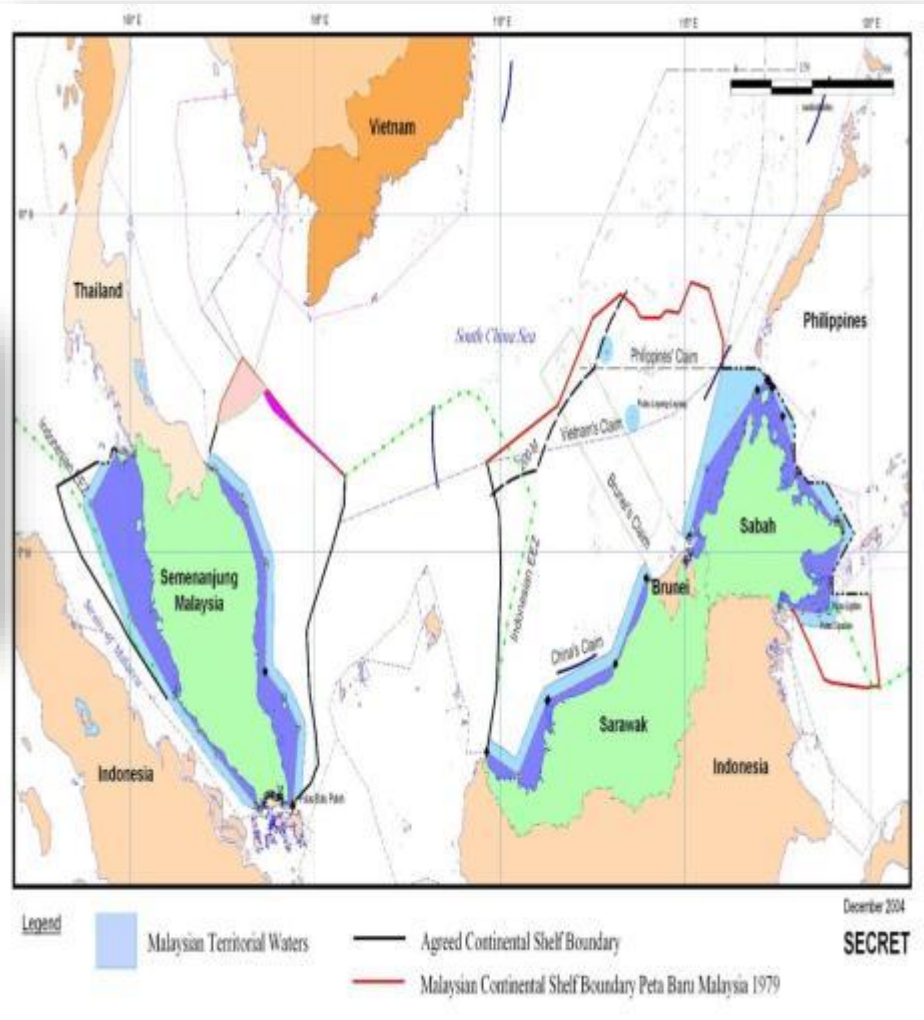


KOSONG
Pengarah Ukur dan Pemetaan
W.P. LABUAN
Jururukr J48

**JAWATAN
KADER JUPEM**

- Kementerian Tenaga dan Sumber Asli (KETA)
- Kementerian Perumahan dan Kerajaan Tempatan (KPKT)
- Kementerian Pertahanan Malaysia (MINDEF)
- Jabatan Ketua Pengarah Tanah dan Galian (JKPTG)
- Jabatan Perhubungan Semenanjung Malaysia (JPSM)
- Jabatan Kerja Raya Malaysia (JKR)
- Jabatan Mineral dan Geosains Malaysia (JMG)
- Jabatan Laut Malaysia (JLM)
- Jabatan Pendaftaran dan Pendaftaran Mera (JPPH)
- Pusat Geospasial Negara (PCN)
- Institut Tanah dan Ukur Negara (INSTUN)
- Majlis Kewilamban Negara (MKN)
- Suruhanjaya Pilihan Raya Malaysia (SPK)

Aktiviti JUPEM



Aktiviti JUPEM

□ Aktiviti utama Jabatan Ukur Dan Pemetaan Malaysia dalam menyediakan infrastruktur ukur di seluruh negara, adalah:

- i. Aktiviti GEOSPATIAL PERTAHANAN
- ii. Aktiviti UKUR PEMETAAN
- iii. Aktiviti UKUR KADASTER

DEPARTMENT OF SURVEY AND MAPPING MALAYSIA (DSMM)

Establishment History of JUPEM



Establishment history



Establishment History of JUPEM

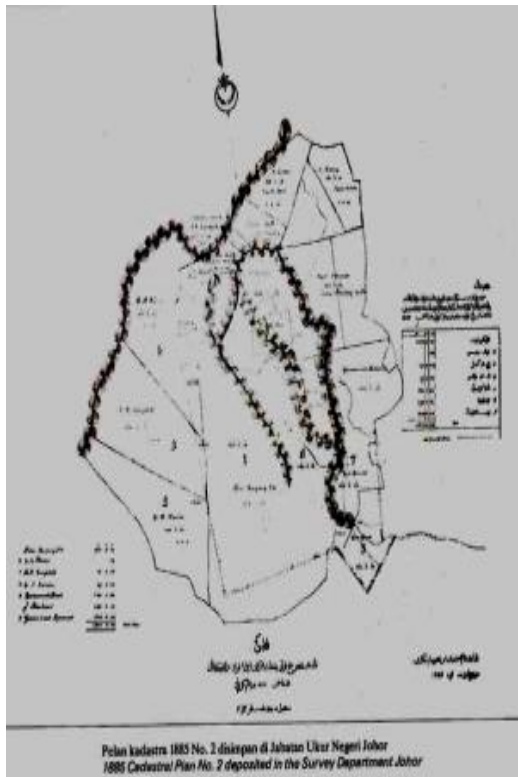
JUPEM is one of the earliest agencies in Malaysia that performs the survey and mapping activities which started in 1885 when the Department of Survey Johor was established. During the 1885 and 1957 period, the States Survey & Topographic Department were gradually, established one by one and later merged as one entity as it is now known. In 1965, the government approved the setting up of Directorate of National Mapping, Malaysia that was responsible in survey, mapping, topographic and geodetic activities.

Later, Sabah's JUPEM was found in 1983. Another branch was set up in the Federal Territory of Labuan in 1984. In 1989, Sarawak's JUPEM was created while Perlis's JUPEM was opened in 1995.

Establishment History of JUPEM

Starting with the Department of Survey and Mapping Johore, and Department of Trigonometry Survey Perak in 1885 and was followed by other states

- 1885 - JOHOR
- 1887 - PERAK
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Establishment History of JUPEM



Survey training camp, 1928



Building of Department of Survey and Mapping Selangor, Jalan Tugu, Kuala Lumpur year 1950

Organisation Chart of JUPEM

❑ Department of Survey and Mapping Malaysia (JUPEM) is under the Ministry of Natural Resources and Environment (NRE). It was led by the Director General of Survey and Mapping (DG) who is also the Director of National Mapping and Director of Military Mapping.

❑ This organizational structure has been set up in the organizational restructuring in October 2013, it is basically divided into two division, i.e. cadastre and mapping. Mapping division headed by Deputy Director General of Survey and Mapping I. While cadastre division and 13 JUPEM States are placed directly under the Deputy Director General of Survey and Mapping II.

❑ Di bawah Pejabat KPUP di hubungkan terus dengan Bahagian Geospatial Pertahanan dan Unit Integriti. Director General of Survey and Mapping office is connected directly with the Defense Geospatial and Integrity Unit.



**CARTA ORGANISASI
JABATAN UKUR DAN PEMETAAN MALAYSIA
KEMENTERIAN TENAGA DAN SUMBER ASLI**



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(Perancangan dan Korporat)
Jururukr J54



TAN LEE CHENG
Pengarah Ukur Bahagian
(Khidmat Pengurusan)
Peg. Tadi. & Dlp. M54

Sr SHABUDIN BIN SAAD
Pengarah Ukur Bahagian
(Pemetaan Topografi
Semenanjung)
Jururukr J54



Sr SHAEFRI BIN BAUDI
Pengarah Ukur Bahagian
(Pemetaan Topografi Sabah)
Jururukr J54

**Sr SYLVESTER LUTA
ANAK BULI**
Pengarah Ukur Bahagian
(Pemetaan Topografi
Sarawak)
Jururukr J54



**Sr ABDUL HALIM
BIN TUIRAN**
Pengarah Ukur Bahagian
(Pangkalan Data
Geospasial Negara)
Jururukr J54



Sr HAMSIAH BIN HASAN
Pengarah Ukur Bahagian
(Kartografi dan GIS)
Jururukr J54



**Sr ABD RAHMAN BIN
MOHD JAZULI @ MAHMOOD**
Pengarah Ukur Bahagian
(Pemetaan Utiliti)
Jururukr J54



**Sr MUHAMMAD SALIM
BIN MOHAMMED ASARI, AMF**
Pengarah Ukur Bahagian
(Kadaster)
Jururukr JUSA C

Sr NAZRI BIN OTHMAN
Pengarah Ukur dan Pemetaan
JOHOR
Jururukr JUSA C



**Sr AZLIM KHAN
BIN ABDUL RAOF KHAN**
Pengarah Ukur dan Pemetaan
PAHANG
Jururukr JUSA C

**Sr MOHAMED SOFIAN
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Sr TSALIMY BIN ABDULLAH
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Sr ROSLI BIN MOHAMMED
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Sr SAIFUL WAZLAN BIN WAHAB
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W.P.K. LUMPUR & PUTRAJAYA
Jururukr J54

**Sr ENGGU MOHD ADLIN
BIN ENGGU HABIB**
Pengarah Ukur dan Pemetaan
NEGERI SEMBILAN
Jururukr J54



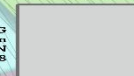
Sr ZULKAFLI BIN CHIHAT
Pengarah Ukur dan Pemetaan
PULAU PINANG
Jururukr J54

Sr SIM CHING YEN
Pengarah Ukur dan Pemetaan
MELAKA
Jururukr J52



**Sr MOHD KHAIRANI
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PERLIS
Jururukr J48

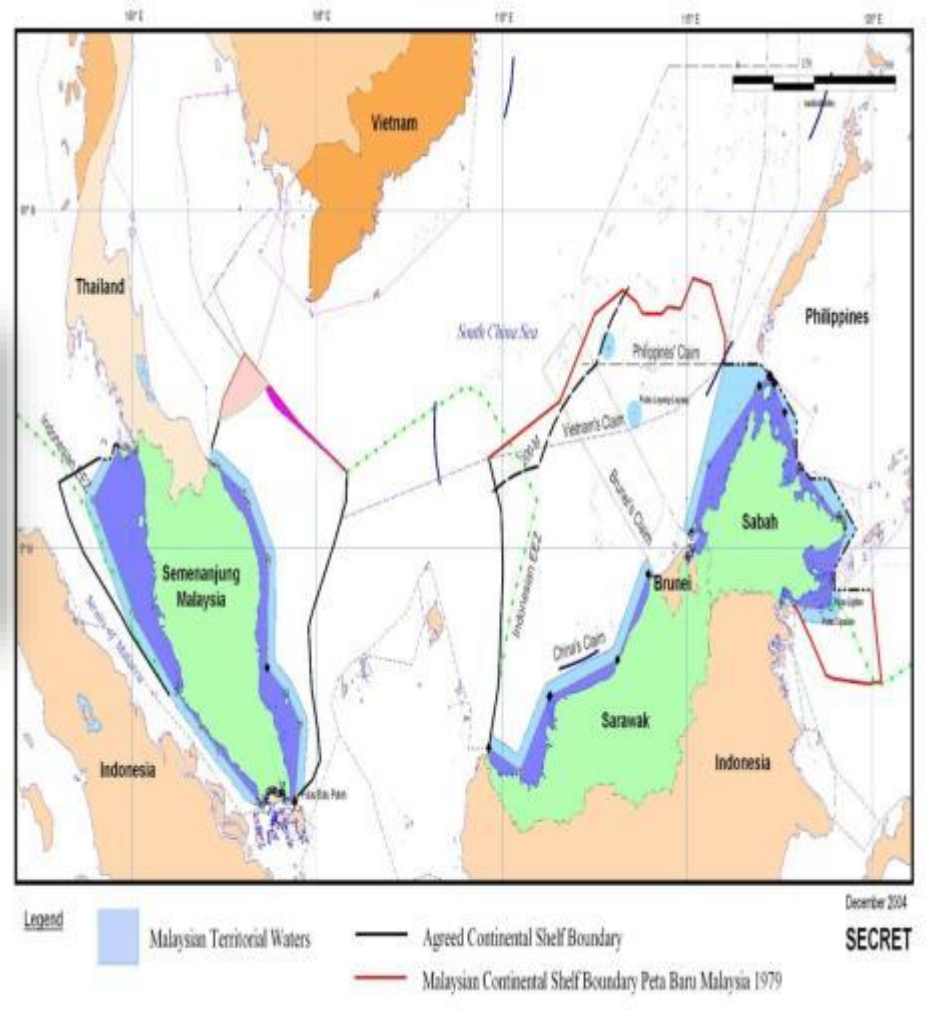
KOSONG
Pengarah Ukur dan Pemetaan
W.P. LABUAN
Jururukr J48



**JAWATAN
KADER JUPEM**

- Kementerian Tenaga dan Sumber Asli (KETA)
- Kementerian Perumahan dan Kerajaan Tempatan (KPKT)
- Kementerian Pertahanan Malaysia (MINDEF)
- Jabatan Ketua Pengarah Tanah dan Galian (JKPTG)
- Jabatan Perhubungan Semenanjung Malaysia (JPSM)
- Jabatan Kerja Raya Malaysia (JKR)
- Jabatan Mineral dan Geosains Malaysia (JMG)
- Jabatan Laut Malaysia (JLM)
- Jabatan Pendaftaran dan Pendaftaran Mera (JPPH)
- Pusat Geospasial Negara (PCN)
- Institut Tanah dan Ukur Negara (INSTUN)
- Majlis Kawilamban Negara (MKN)
- Suruhanjaya Pilihan Raya Malaysia (SPK)

Activities JUPEM



Activities JUPEM

□ Main activities JUPEM in providing survey infrastructure for country, i.e.:

- i. DEFENSE GEOSPATIAL activities
- ii. MAPPING SURVEY activities
- iii. CADASTRE SURVEY activities

THANK YOU