

FIG
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**Presented at the FIG Congress 2018,
May 6-11, 2018 in Istanbul, Turkey**

6-11 May 2018
ISTANBUL

FIG Congress 2018

PROPOSED LEGISLATION FOR 3D CADASTRE IN MALAYSIA (9608)

**CHAN Keat Lim, TENG Chee Hua
and David Kean Beng LOO (Malaysia)**

**EMBRACING OUR SMART WORLD WHERE THE CONTINENTS CONNECT:
ENHANCING THE GEOSPATIAL MATURITY OF SOCIETIES**

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INTRODUCTION

- Land resource is finite; vs. increasing human demand on land
- Development on land resources will become more intense
- Need to establish 3D multi-layered land ownership to facilitate overlapping developments under or above existing structures
- Propose legislation for 3D air space title in Malaysia

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Current land legislation in Malaysia NOT able to accommodate such a development

The Standard Hotel
New York, USA

<http://www.topboxdesign.com/the-standard-hotel-in-new-york-united-states/>

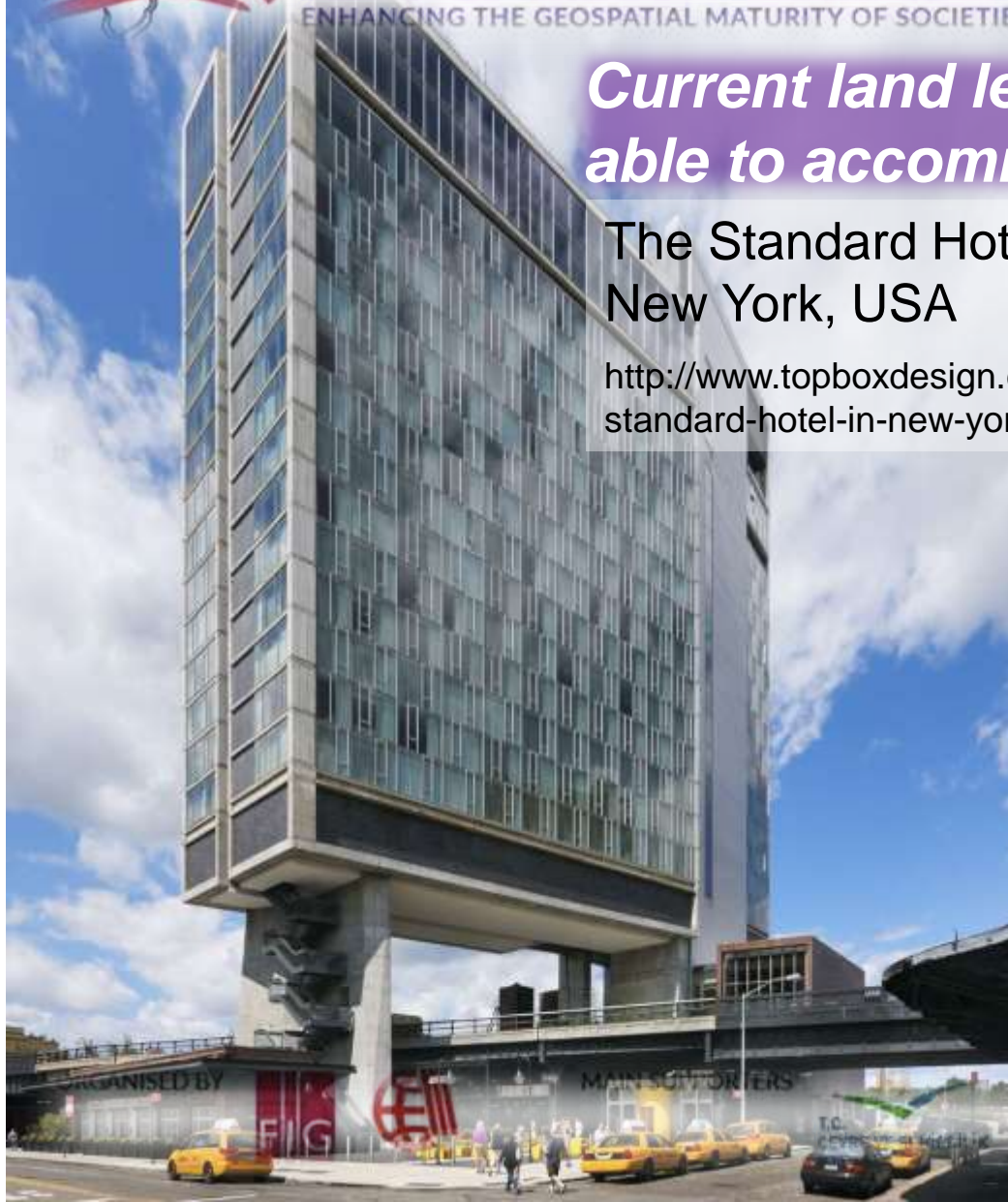


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Gate Tower Building Osaka, Japan

<http://forum.skyscraperpage.com/showthread.php?t=151423>



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The Hangover: Cantilevered Buildings of New York

<http://cdn.archinect.net/images/650x/a8/a87156746965e9d06a32fc9d4d4585c4.jpg>



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Unilever Building in Rotterdam, The Netherlands. Unilever was not permitted to tear down the traditional Dutch architecture so they built up and over it.

https://c1.staticflickr.com/3/2129/1541194486_ca07c2ad75_z.jpg?zz=1



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3Box on the rooftops in Paris by Malka Architecture
Nested on the edge of the river Seine in Paris, these housing units are now possible thanks to « la Loi Alur », a new legislation that allows urban heightening.

<https://www.stephanemalka.com/?portfolio=3box-i-on-the-roof-tops-i-paris-2016&lang=en>

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OBJECTIVES

- **Propose legislation for 3D air space title in Malaysia**
- **Introduce a new Part Five (B) to the National Land Code**
- **Serve as starting point for deliberation**

CURRENT SCENARIO

- 3D underground title introduced in 1990
- Part Five (A) inserted into the National Land Code
- Currently, there are 3 types of land titles in Malaysia:
 - Traditional or “normal” land lot
 - Strata parcel in a fully built-up environment, which is 2D based with height definition
 - Stratum lot, which is 3D (volumetric) based for underground land only

NEGERI JOHOR
DAERAH JOHOR BAHRU
BANDAR JOHOR BAHRU
LOT 46168 - 46170
SKALA 1 : 1000

Traditional or "normal" land lot (2D)

File UTM: PUB/L/430 - 2006

File Poly Tahan: PEMEL97/04

Lembar Peta: 66 C 1/3

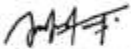
J. K. 2532 M 791, 796 A, K. 2593 M 791

IK 9608

Saya, **MR. SRI KUNO**, seorang Jurukur Tanah yang
dipilih di bawah Akta Jurukur Tanah Berlesen 1958 (Mata),
mempertahkannya bahawa pengiraan di atas ini telah dibuat
tanah di atasnya dan ditanda di atas tanah oleh saya atau di bawah
supervisi saya secara langsung di lapangan menurut
mengikut Peraturan-peraturan Jurukur Tanah Berlesen, dan telah
pilih di bawah saya untuk membuat pengiraan yang telah ditunjukkan
pada ini, bahawa — **DEKAT** — 20 **08**.

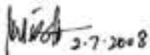
Saya bertanggungjawab atas setiap kesalahan di atas.

Burukan: 10, tarikh: April 2008.



Jurukur Tanah yang Dipilih di bawah Akta 1958

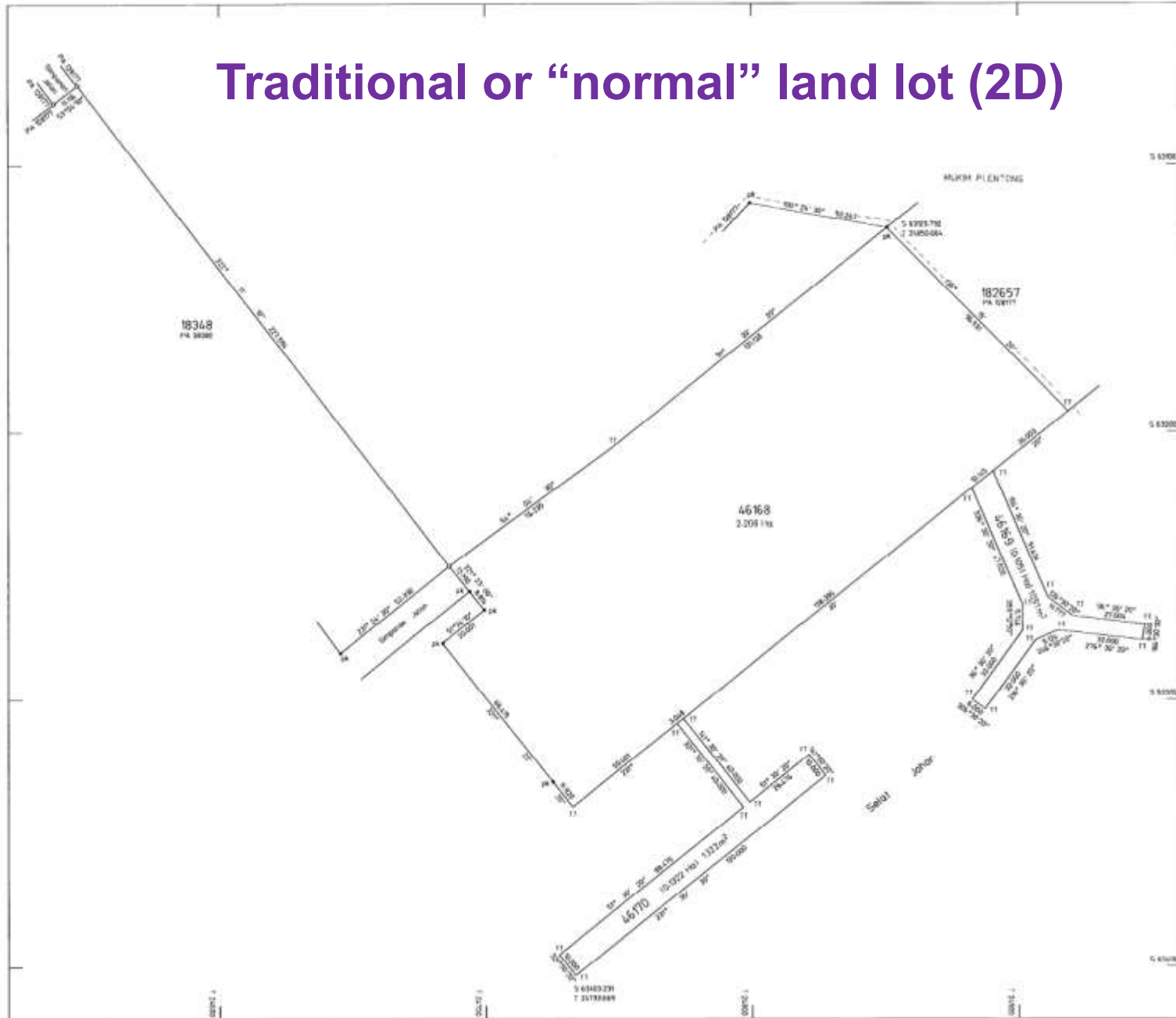
Dibuatkan oleh



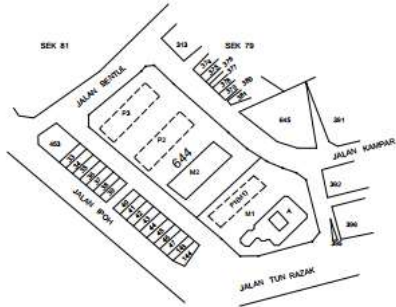
3-7-2008

[Jumlah ke Dataran]
Pengukur: Uth San Patekian
100

PA 128176



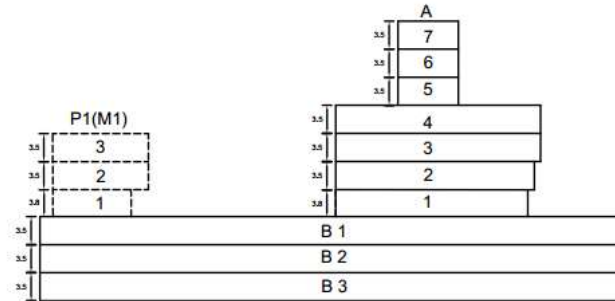
WILAYAH PERSEKUTUAN KUALA LUMPUR
BANDAR KUALA LUMPUR
SEKSYEN 47
LOT 644 (PA 100408)
NOMBOR HAKMILIK : GRN 73
KELUASAN LOT : 9482m²
NOMBOR SKIM 1234
SKALA 1:2000



PETUNJUK :

BLOK SEMENTARA

KERATAN TEGAK BANGUNAN M1
SKALA 1 : 400



5cm (Ruangan Dikosongkan)
10cm

Saya, seorang Juruukur Tanah yang dilesenkan di bawah Akta Juruukur Tanah Berlesen 1958 [Akta 458], memperakui bahawa pengukuran dari mana pelan ini telah disediakan, telah dijalankan dan ditanda di atas tanah oleh saya atau di bawah arahan saya sendiri secara langsung di lapangan semata-mata mengikut Peraturan-peraturan Juruukur Tanah Berlesen, dan bahawa pelan ini secara tepat mewakili pengukuran yang telah disempurnakan pada haribulan 20.....

Bahawa saya bertanggungjawab sepenuhnya ke atas salah betulnya ukuran ini.

Bertarikh haribulan 20.....

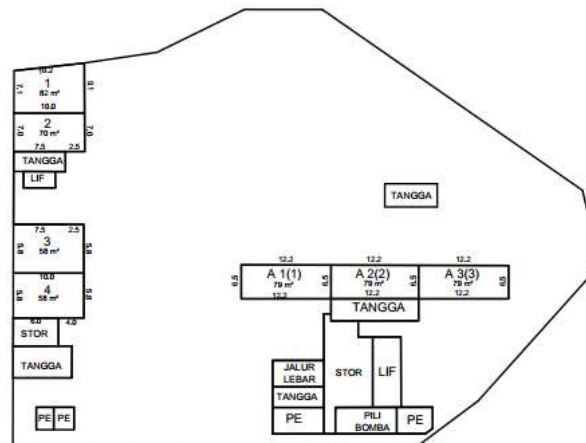
.....
Juruukur Tanah yang dilesenkan di bawah Akta 458

FAIL UKUR PUBLWP 90_2015
FAIL PTG WP 6/2345/15
LEMBAR PIAWAI 85-B
BK 2005

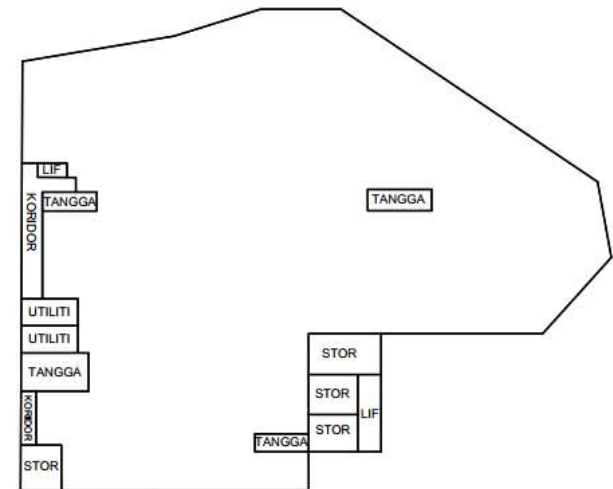
DILULUSKAN OLEH:

PELAN TINGKAT
BANGUNAN M1
TINGKAT B1

PETAK 1 HINGGA 4 DAN PETAK AKSESORI A1 HINGGA A3
SKALA 1 : 500



PELAN TINGKAT
BANGUNAN M1
TINGKAT B2
SKALA 1 : 500

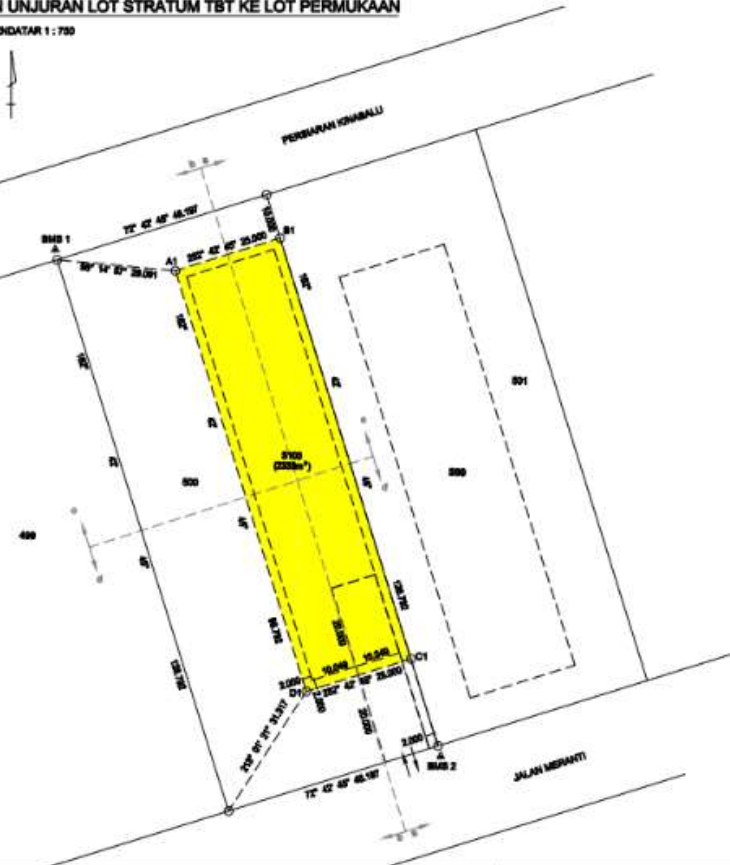


Strata parcel, which is 2D based with height definition

PELAN LOT STRATUM TBT

PELAN UNJURAN LOT STRATUM TBT KE LOT PERMUKAAN

SKALA MENDATAR 1 : 750



RAJAH ISOMETRIK LOT STRATUM TBT

SKALA MENDATAR 1 : 750
SKALA MENEGAK 1 : 1250



TITIK	KOORDINAT MENDATAR		ARAS LARAS (RL)	ISIPAJU m³
	U	T		
A	8 60878.883	T 22217.786	-40.0	-
B	8 60878.432	T 22240.786	-40.0	
C	8 60794.842	T 22248.828	-40.2	
D	8 60772.003	T 22248.818	-40.2	
A1	8 60878.883	T 22217.786	30.0	121,000
B1	8 60878.432	T 22240.786		
C1	8 60794.842	T 22248.828		
D1	8 60772.003	T 22248.818		
A2	8 60878.883	T 22217.786	-30.0	
B2	8 60878.432	T 22240.786		
C2	8 60794.842	T 22248.828		
D2	8 60772.003	T 22248.818		

TITIK	KOORDINAT MENDATAR		ARAS LARAS (RL)
	U	T	
BMS 1	8 60874.874	T 22431.572	-45.81
BMS 2	8 60798.367	T 22418.288	-45.81

- NOTA:-
- 1) Had kedalaman penggunaan tanah bagi LOT S100 stratum TBT adalah daripada 20.0m di atas APL sehingga 30.0m di bawah APL.
 - 2) Semua jarak adalah dalam ukuran meter.
 - 3) Aras laras adalah berdasarkan Aras Purata Laut (APL).
 - 4) Titik A1, B1, C1, D1, A2, B2, C2 dan D2 adalah sempadan beda tanda (T.T).
 - 5) Aras Koordinat adalah dalam GON2000 Cassini-Soldner.

WILAYAH PERSEKUTUAN KUALA LUMPUR
BANDAR KUALA LUMPUR
SEKSYEN 63
LOT S100
PETA KADASTER 93-8
PA(S)123456-3

Saya seorang Jurujuk Tanah yang dilesenkan di bawah Akta Jurujuk Tanah Berlesen 1968 (Akta 458) memperakui bahawa pengukuran dari mana pelan ini telah disediakan, telah dijalankan dan ditanda di atas dan di bawah tanah oleh saya atau di bawah arahan saya sendiri secara langsung di lapangan semata-mata mengikut Peraturan-peraturan Jurujuk Tanah Berlesen, dan bahawa pelan ini secara tepat mewakili pengukuran yang telah dispurnakan pada haribulan 20.....

Bahawa saya bertanggungjawab sepenuhnya ke atas salah betulnya ukuran ini.

Bertarikh..... haribulan 20.....

Juruujuk Tanah yang di.....

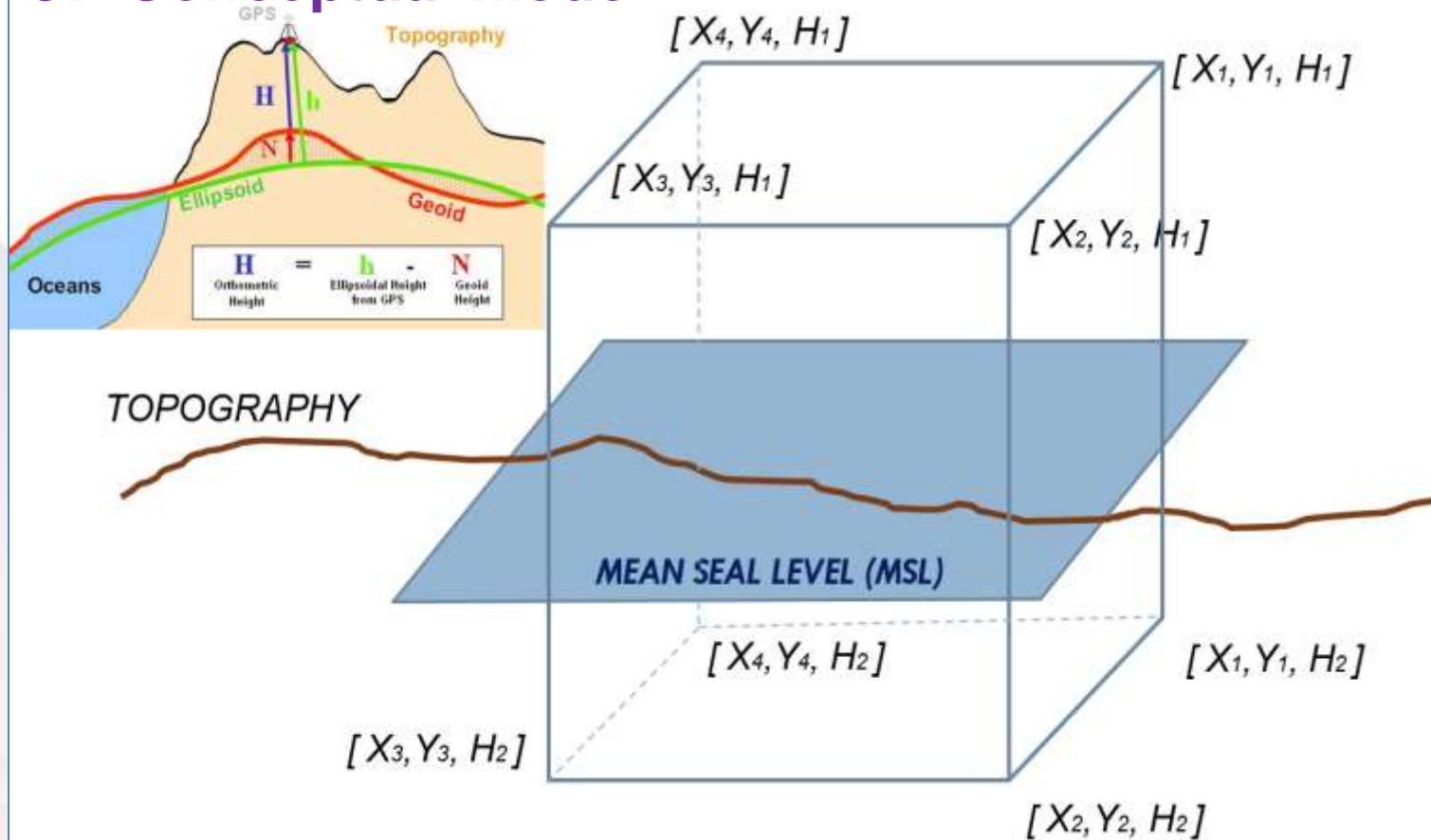
FAIL UKUR:
FAIL PEJABAT TANAH:
DILULUSKAN OLEH:

Stratum lot, which is 3D (volumetric) based for underground land only

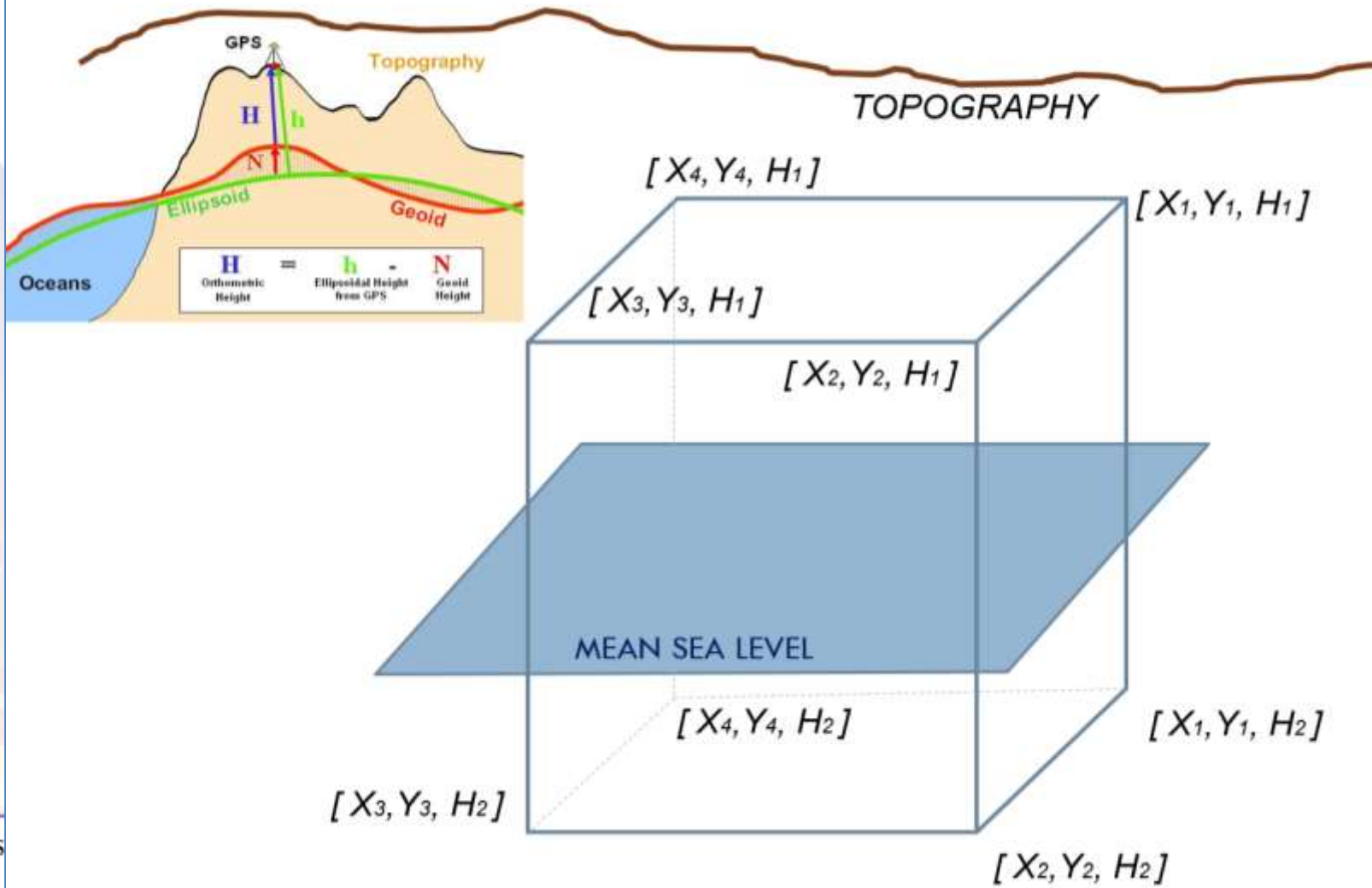
THE 3D CADASTRE CONCEPT

- 3D parcel having limitations in 3 dimensions duly registered with 3Rs
- 3D parcel may extend from a specified level and as far into the ground defined by its depth or upwards into the air define by its height

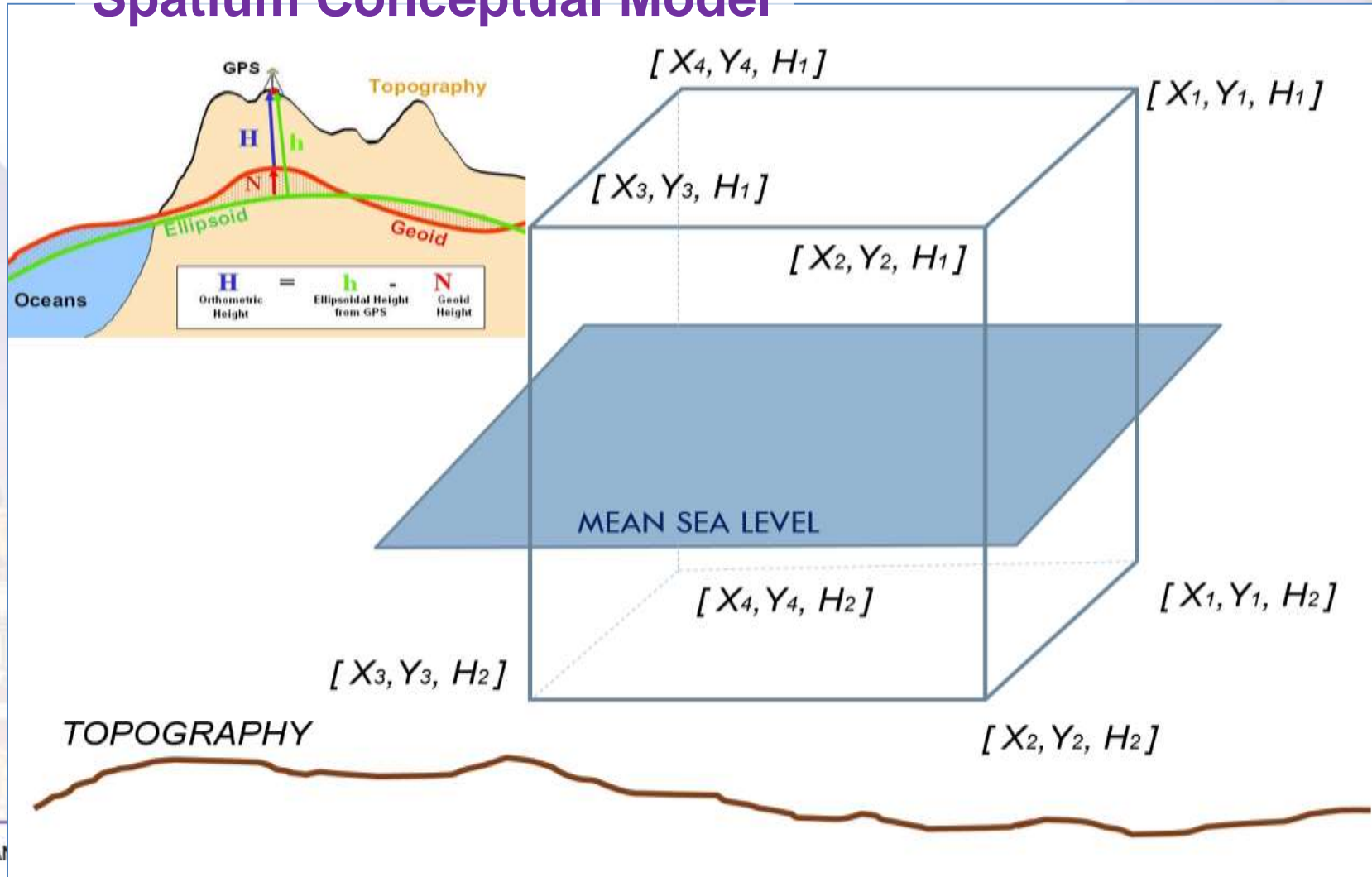
3D Conceptual Model



Stratum Conceptual Model



Spatium Conceptual Model





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Potential Application for Spatium Title



Spatium Lot only covers the airspace within a specified height, thereby allowing the surface land owner to own and utilise the space above and below the viaduct structures.

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Overlapping Development



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Topu ve Kadastro

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THE SCIENCE OF WHERE



Leica
Geosystems



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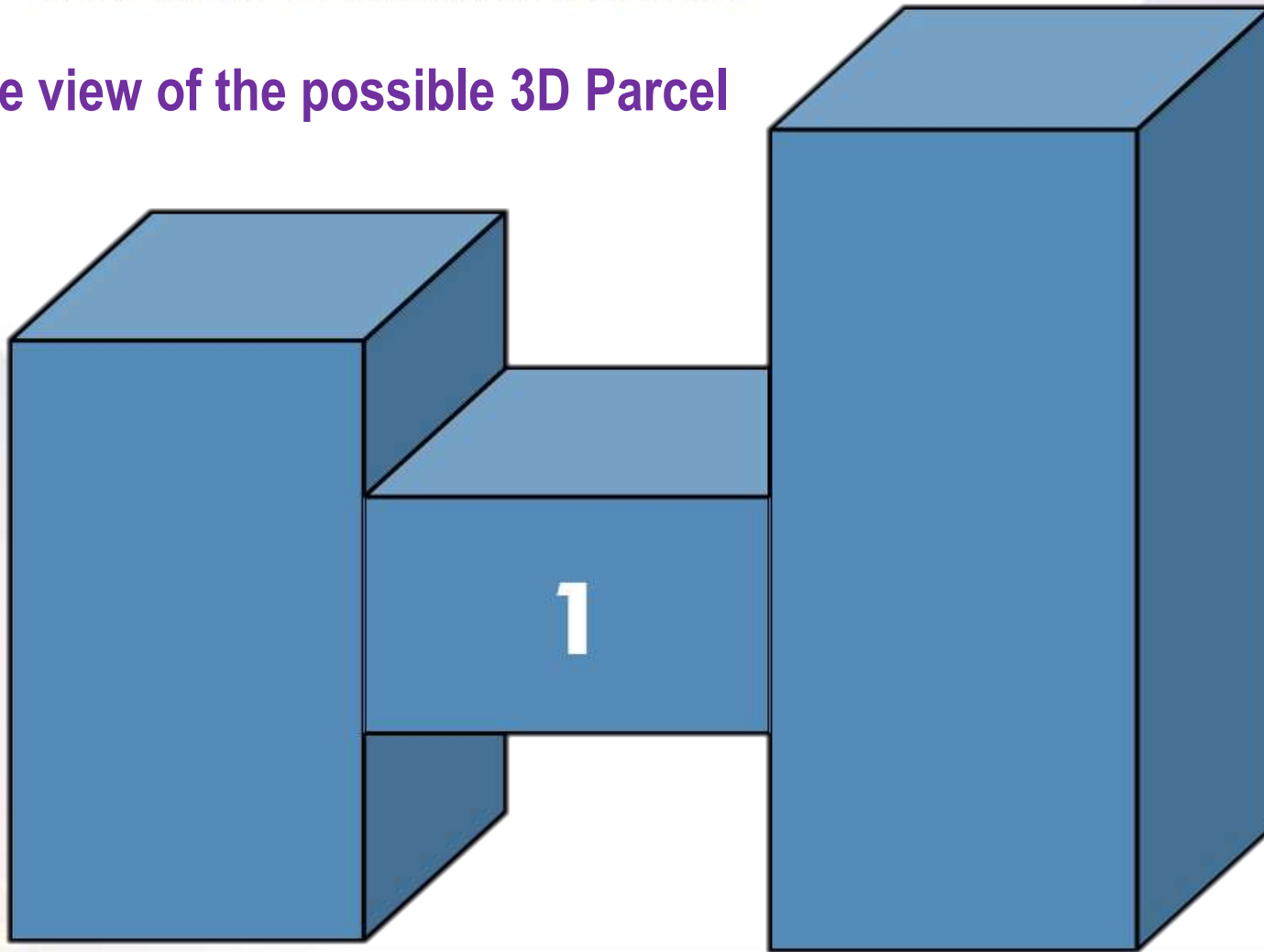
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Oblique view of the possible 3D Parcel



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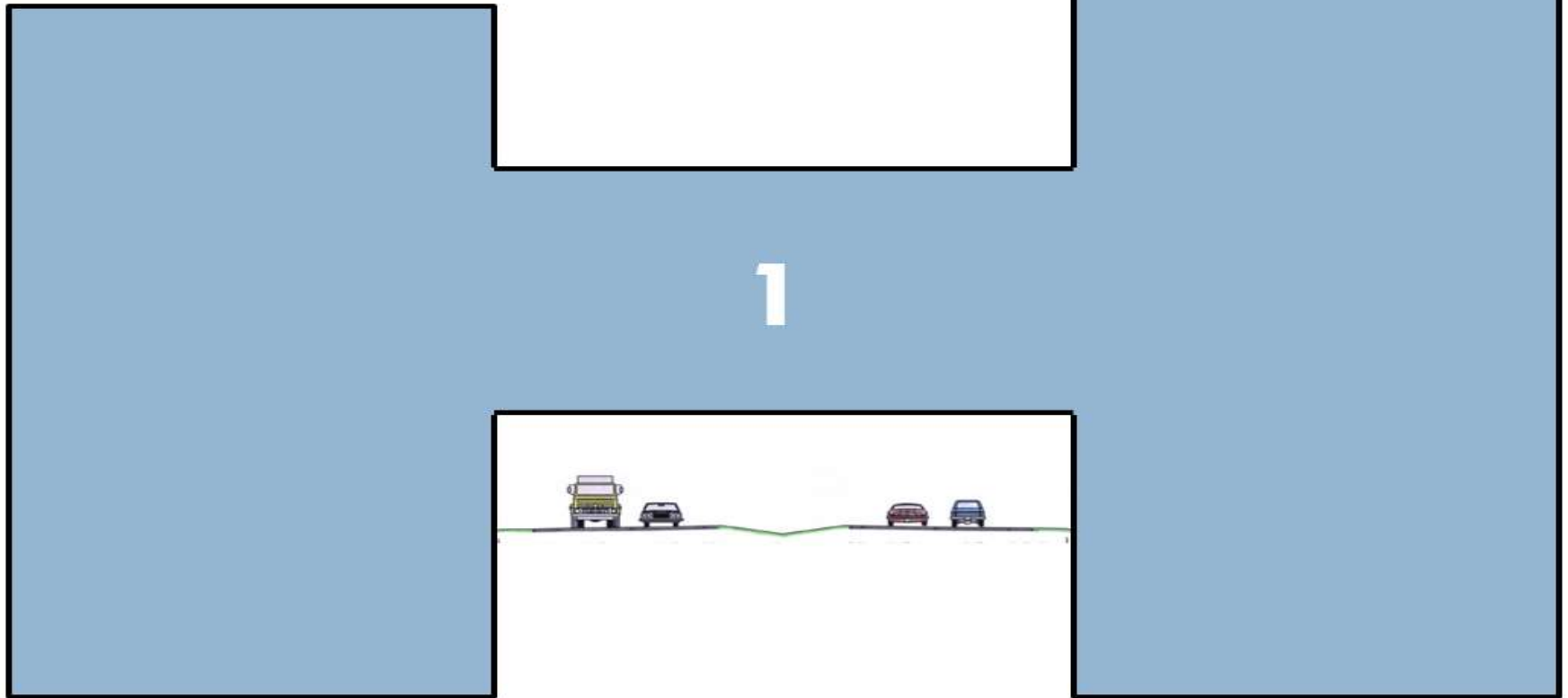


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Cross section of the 3D Parcel



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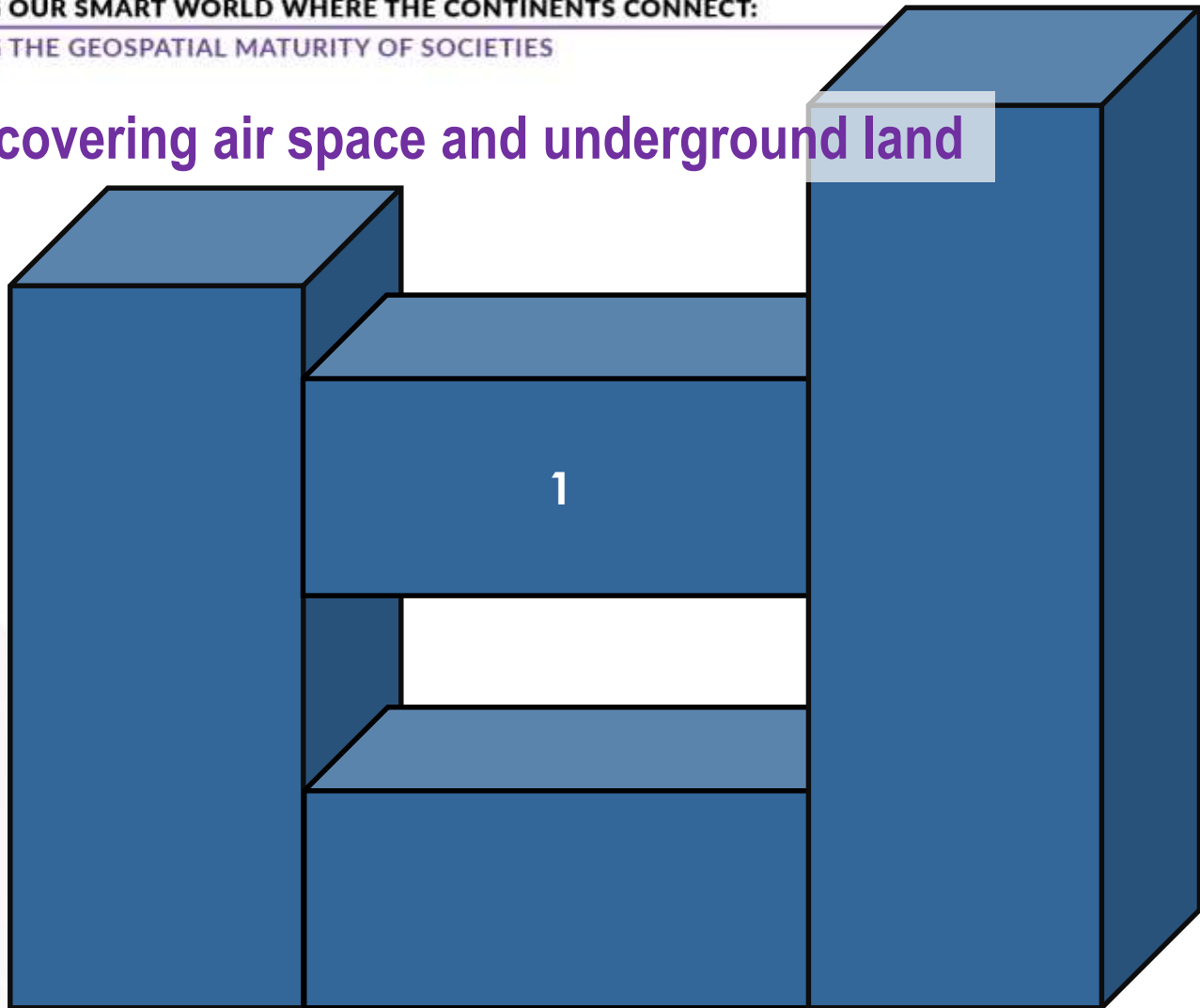
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3D Parcel covering air space and underground land



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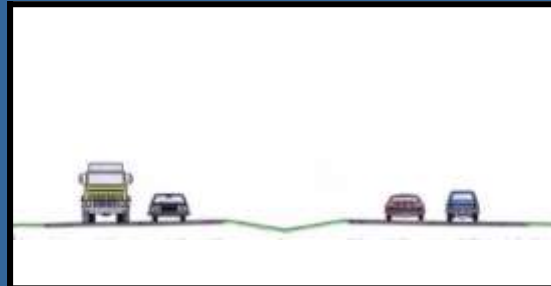
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Cross Section of 3D Parcel covering air space and underground land

1



RECENT DEVELOPMENTS ON STRATUM MATTERS

- Recent amendments to National Land Code and Land Acquisition Act 1960 came into force on 1 December 2017
- Allows for compulsory acquisition of a stratum or 3D lot of underground land
- Facilitated by various national infrastructure projects, such as the Kuala Lumpur – Singapore High Speed Rail, the East Cost Rail Link and the Klang Valley Mass Rapid Transit
- Early 1977, JUPEM took steps to prepare for a vertical control network
- Precise Levelling Network completed in 1999
- Peninsular Malaysia Geodetic Vertical Datum based on 10-year tidal observation (1984-93)

THE PROPOSED LEGISLATION

- ***Missing pieces to solve the 3D Cadastre jigsaw puzzle***
 - ***disposal of air space as spatium lot***
 - ***disposal of surface land with height and depth limitations***
- ***3D volumetric lot may consist wholly of air space, or air space and land, or possibly underground land which may take any shape or geometrically known as polyhedron***

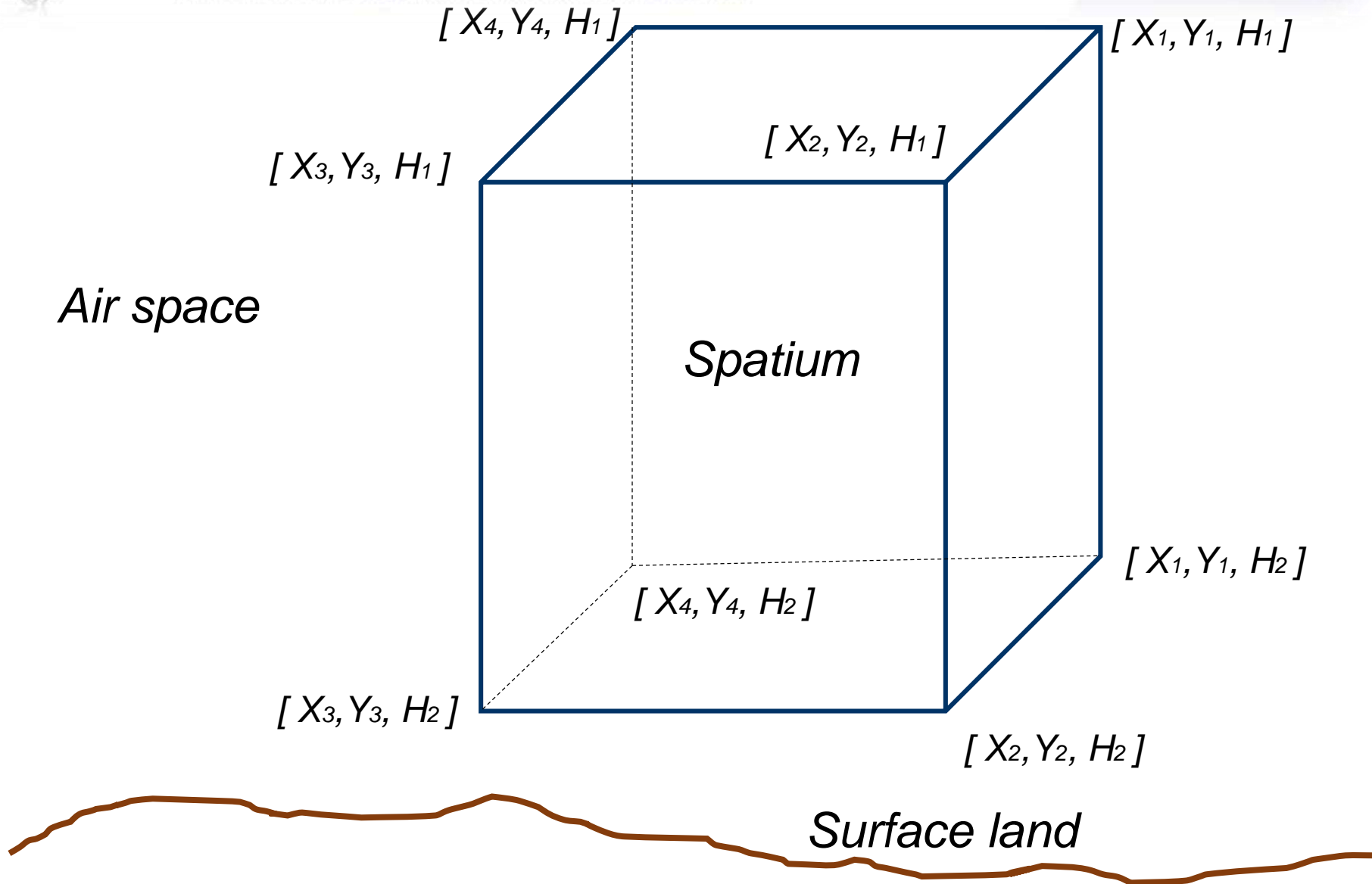


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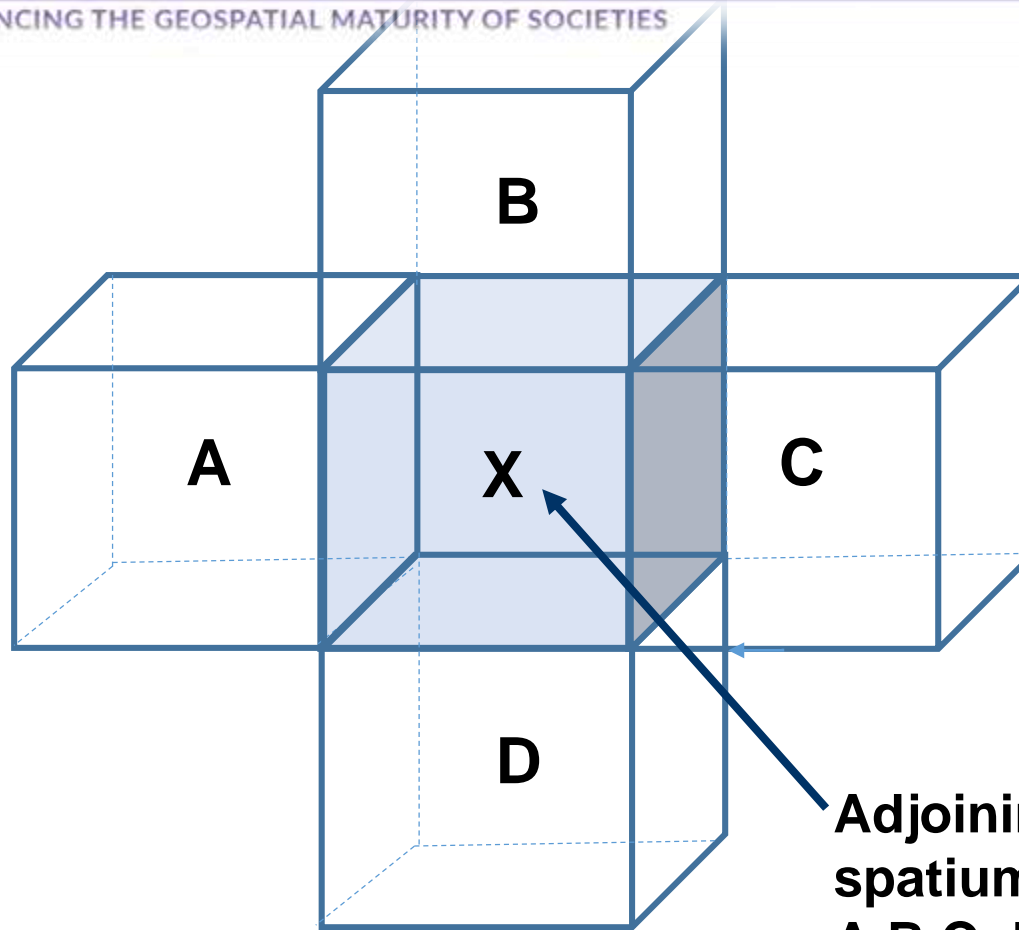


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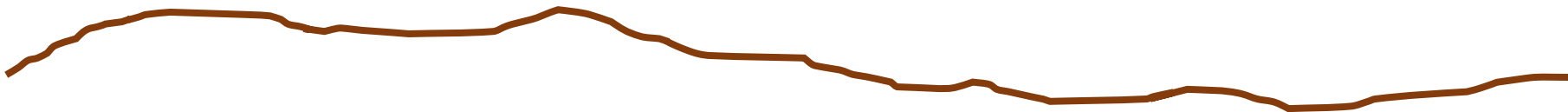
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Adjoining spatium for spatium lot X are spatium A,B,C dan D

Surface land





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