VAS – *to dwell* –

Bhumi
Harmyadivastu
Paryankadivastu

VID– *to understand, discover, experience*

STHAPATYA VAASTUVIDYA

KS60001

SHELTER

Camps near water (hunter-gatherers), caves

Wooden beams and posts

Twigs, saplings, leaves - upturned baskets

Mud and sun dried/kiln dried brick

Construction with wood influenced design

Style replicated in other materials – transforming cave spaces

Brick – earth, water, air, fire and ether

FUNDAMENTAL CONCEPTS

- Systematic approach for human habitation– planning, designing, constructing and decorating
- Different scales of settlement – grama – nagara
- **Sthapati** – **Master Builder**
- **Sutragrahi** – **Supervisor**
- **Vardhaka**
- **Taksaka**

builds and repair wooden things

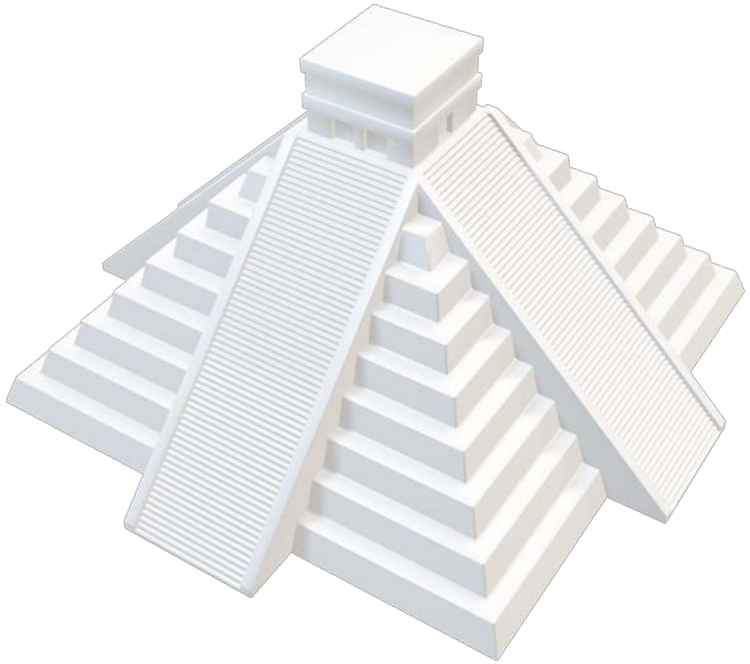
Craftsman

VASTUSHASTRA

- Sthapatyaveda (Atharvaveda)
  - Mathematics, Geometry, Graphic Arts, Structural Engineering, Astronomy, Sculptural Arts
- Matyapurana
  - Architecture, Sculpture
- Padmasamhita
  - Planning and Construction of temples
- Brhatsamhita by Varahamihira
- Natyashastra of Bharata
  - Design and construction of theatres

Mayamata

Manasara



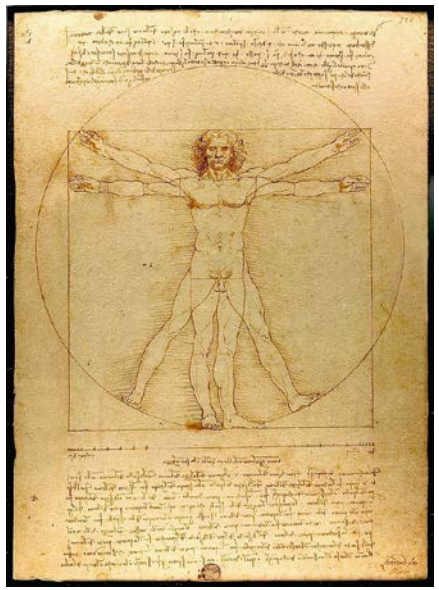
DIMENSIONAL SYSTEM

defines physical measures of a person's size, form, and functional capacities

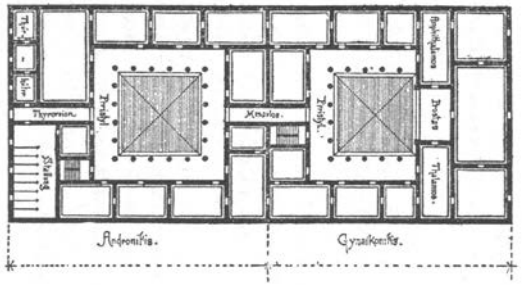
- **Anthropometrics**
- Measure of grain – size of human body
- **Pramana** – measurement of width, breadth or diameter
- **Parimana** – measurement of circumference/perimeter
- **Upamana** – measurement along slope
- **Lambamana** – measurement of height/depth
- **Yava** , one of the nine essential grains, was used as standard
- lateral width – 3.75 mm, length – 7.5 mm
- Three successive bisection $(\frac{1}{8})$ of Yava – **Tila** 0.47 mm

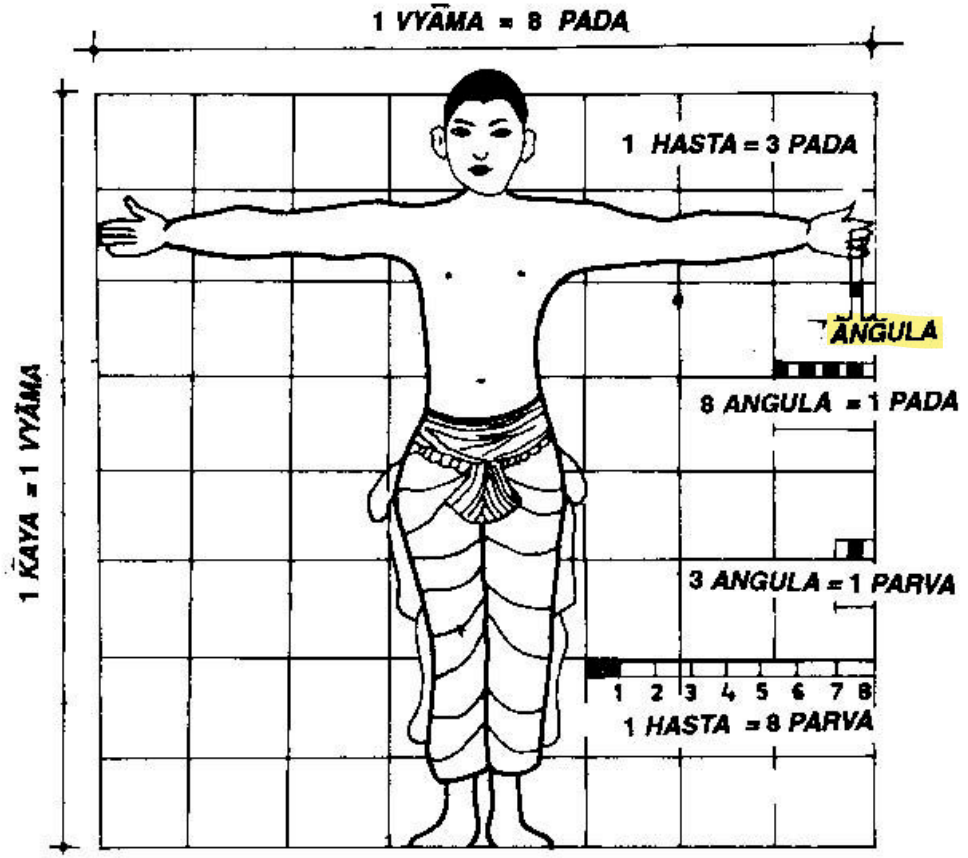
DIMENSIONAL SYSTEM

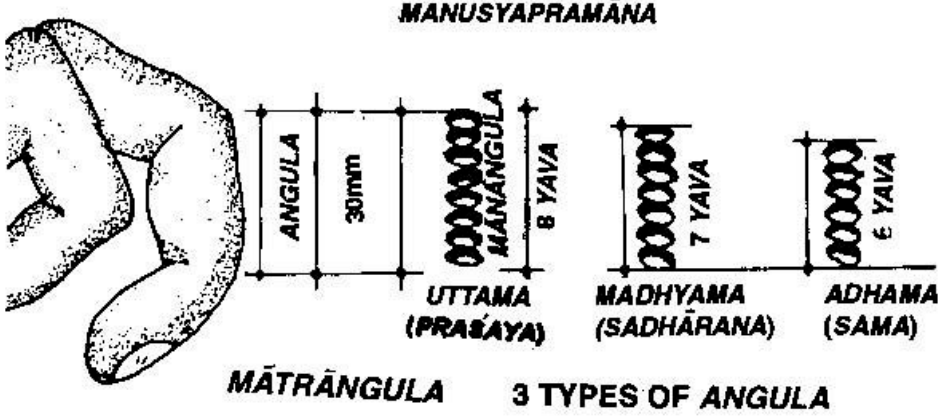
- Smallest dimension - Tila (0.47mm)
  - Thickness of a chisel line on wood, joinery
- **human figure as a reference system**



Vitruvius







DIMENSIONAL SYSTEM

Vitruvius
Leon Battista Alberti
Leonardo da Vinci
Michelangelo

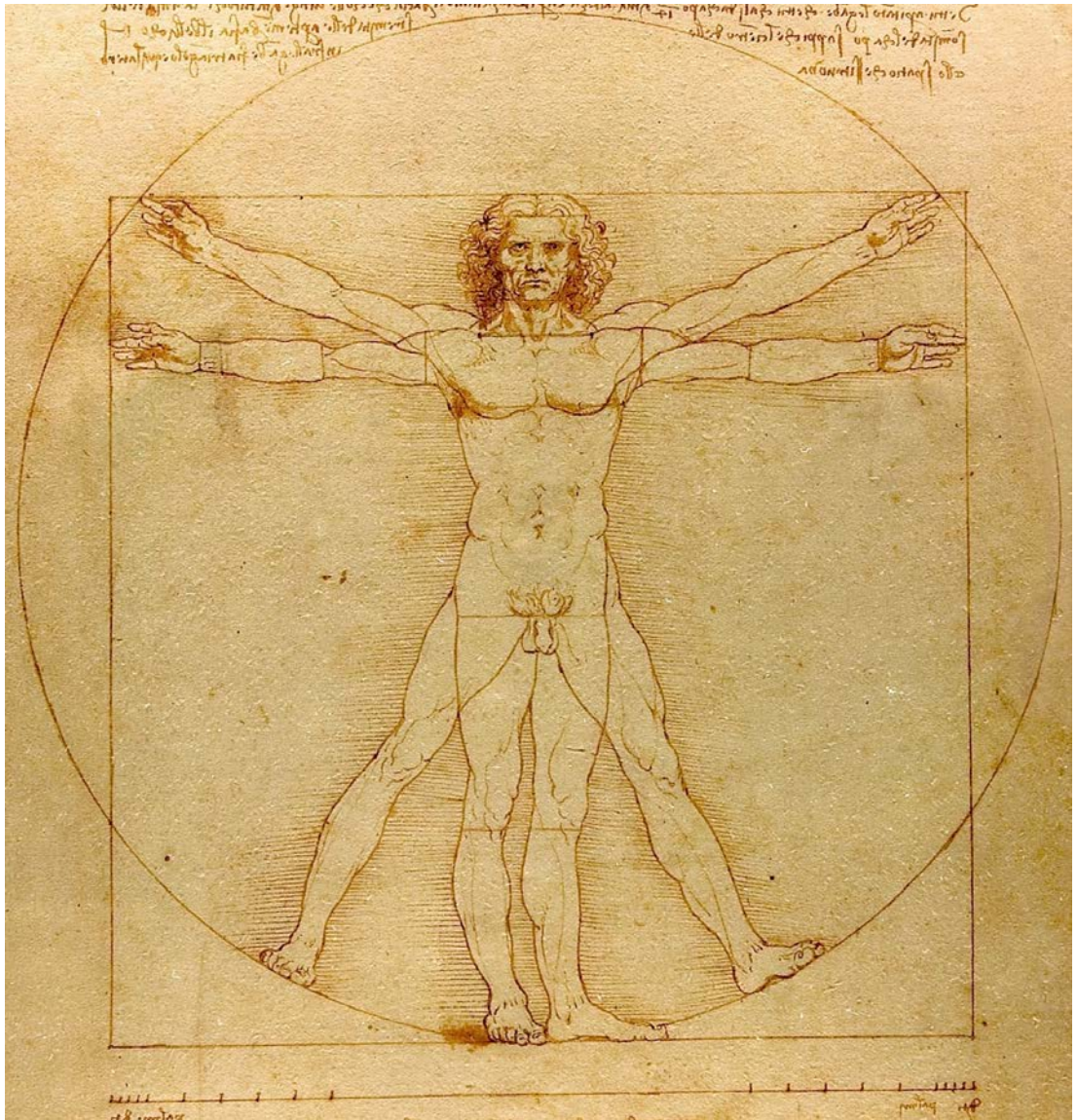
Danda = 4 Hasta

Rajju = 8 Danda

Yojana = 1000 Rajju

Krosa = 2000 Danda

1000 Danda can be covered by brisk walk in 1 nadika



Kaya = Vyama

Vyama = 8 Pada

Hasta = 3 Pada

Hasta = 2 Vitasti

Parva = 3 Angula

Single pace of walk **- Hasta**

Hasta + Parva = Dhanurgraha

Hasta + 2 Parva = Vaipulya

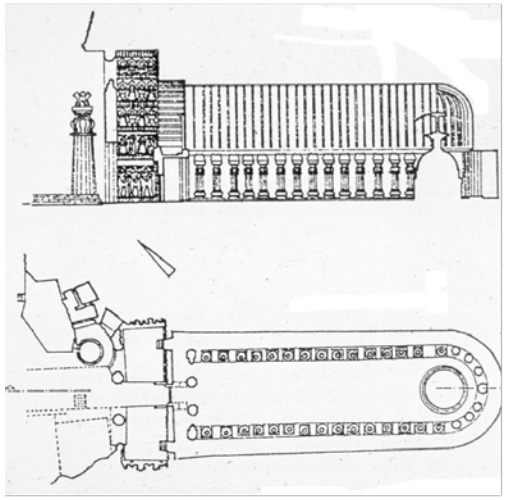
Nadika - 1/60 th of a day
24 minutes

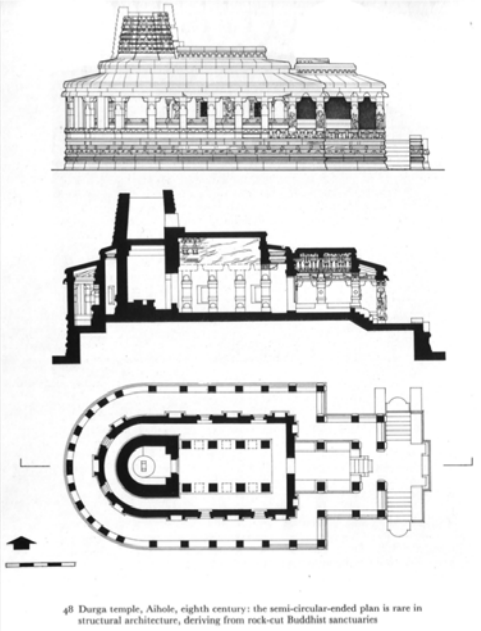
SCALES FOR DIFFERENT USES

Level of measurement	Scale	Sub-units
Distance, Large linear measurement	Yojana (23 km)	Nadika (2.88 km)
Measurement of Land	Rajju (23 m)	Danda (2.88 m)
Measurement of Plot	Danda (2.88 m)	Vitasti (36 cm)
Perimeter of Building	Vyama (192 cm)	Pada (24 cm)
Length of Elements	Hasta (72 cm)	Parva (9 cm)
Size of Components	Pada (24 cm)	Angula (3 cm)
Details of Sections	Angula (3 cm)	Yava (3.75 mm)
Fine Details	Yava (3.75 mm)	Tila (0.47 mm)

VAASTU-MANDALA: ELEMENTAL SHAPES

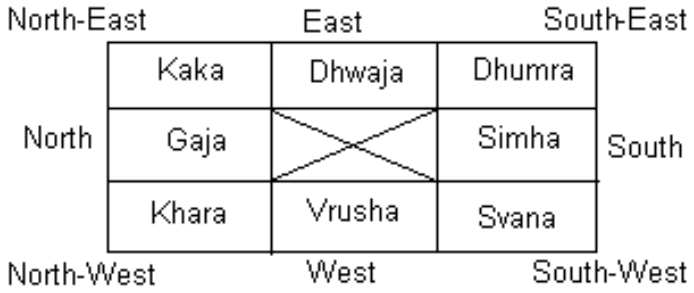
- **Circle** – preferred geometry - 22/7, Shiva
- **Triangle** – mystic geometry, sadarsa (hexagon)
- **Square** – Brahma-mandala
- **Octagon** – Vishnu-mandala, Astadikpalas
- Regular Polygon – 12 sides – Suryamandala,
  16 sides – Dwivajra,
  32 sides - Pralinaka
- Apsidal – square and semicircle - Gajaprastha
- Elongated Circle - Vrittayata



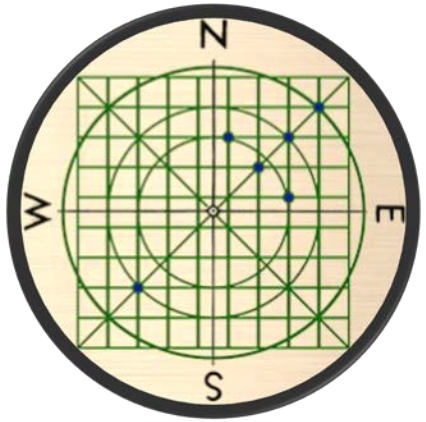


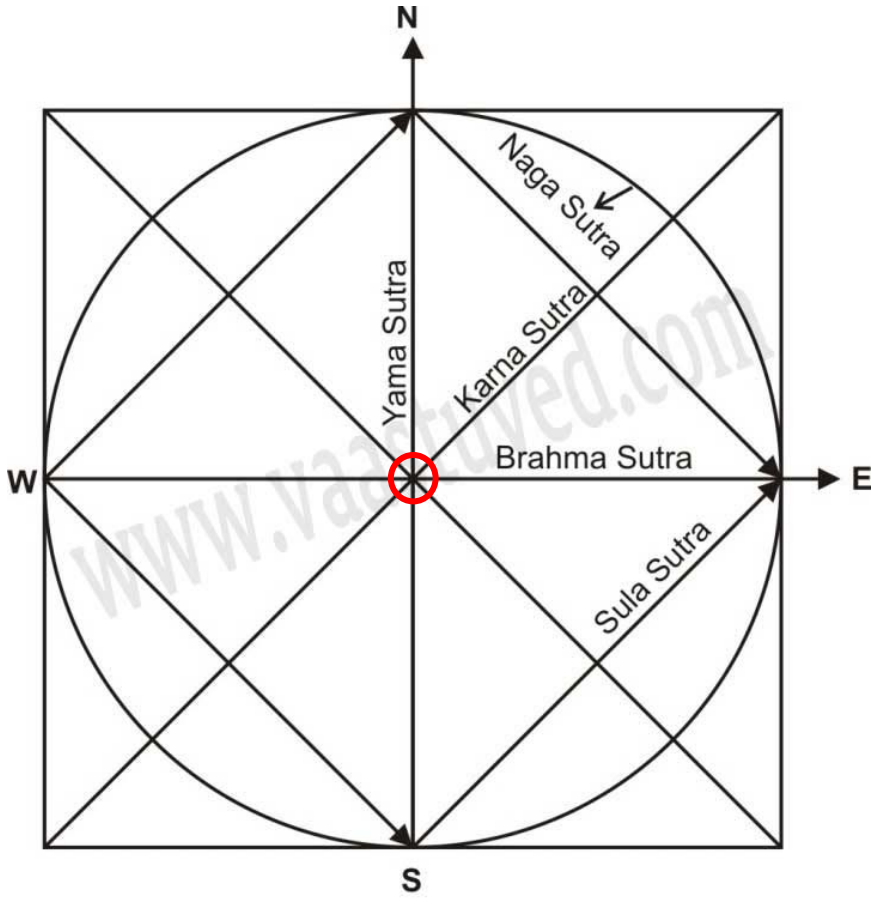
RECTANGLES: PROPORTIONS

* Basic Proportion of Width:Length - 1:2, 2:3, 3:5 Golden ratio
* Width : Length : Perimeter 1:3:8
* Angula : Musti : Pada ; Pada : Hasta : Vyama
* Length : Width Ratio of more than 6:1 is avoided generally as area efficiency decreases significantly
* Nominal width of boundary wall (1 pada)



BRAHMA MANDALA





- Sutra – axial lines
- Navi – intersection of axes
- Sakala Mandala – single cell – agni vedi
  - Bhanu, Akrin, Varuna, Soma
- Pecaka/Pitha – Seats (2x2, 3x3)
- Mahapitha-Ugrapitha – large seats (4x4, 6x6)
- Sthandila –Manduka – Paramsayika-Asana - Sthaniya - Mandapa and Prasad(7x7, 11x11)
- Desiya – Ganitha – Temple Complexes and Villages (12x12, 19x19)
- Suryavisalaka – Indrakanta – Towns and Cities (20x20, 32x32)
- Grama-Khetaka-Kharvata-Durga-Nagara
- Durga – Sibira, Sthaniya, Skandavara

SCALE

Scale and Human vision: two fields of view – general and detailed.

General vision - 30 deg up, 45 deg down,

65 deg to either side (with eye rotation), focus – 30 deg, -60 deg regular field

Object which is at distance, 3500 times times its size, from us – **cannot be identified/seen**

Facial details can be understood at 75-80 feet distance

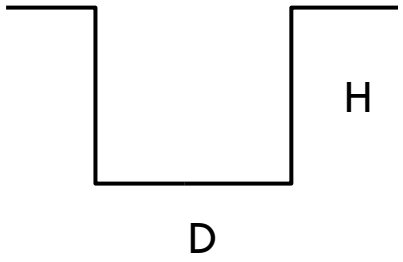
Gestures can be understood, a **person** can be **identified** till 450 feet distance

Human figures at more than 4000 feet - **cannot be identified/seen**

Proxemics -

ENCLOSURE

Feeling of enclosure

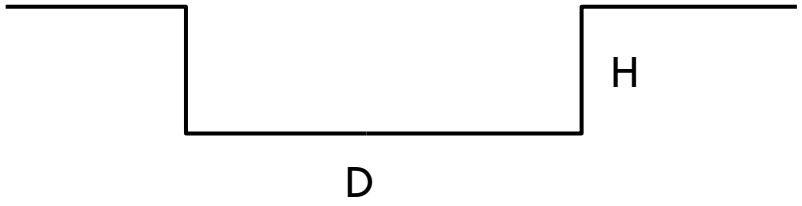


H:D = 1:1
Full sense of enclosure

Focus on façade geometry and details

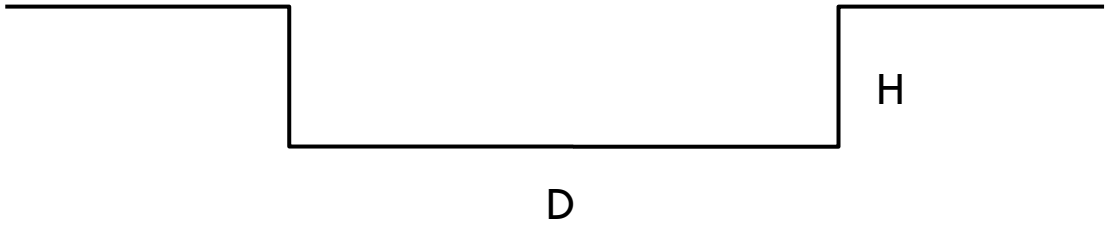
H:D = 1:2
Threshold of enclosure

Focus on façade geometry



H:D = 1:3
Minimal Enclosure

Façade geometry and Background Geometry



H:D = 1:4
Loss of enclosure

Focus on Background geometry, leaking of space

VAASTU PURUSHA MANDALA

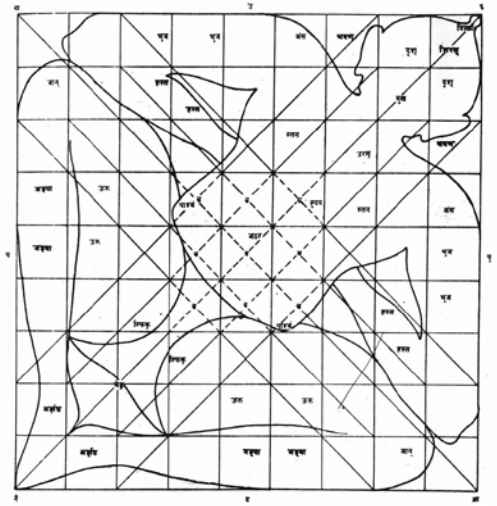
Centre – Brahma

12 Adityas

Nakshatra

Lokpala

25 VAYU	26 NAGA	27 MUKHYA	28 BHAL-LATA	29 SAUMYA	30 MRGA	31 ADITI	32 UDITI	1 ISA
24 PAPA-YAKSMA	RUDRA-JAYA						MITRA-JAYA	2 VATAPAR-JANYA
23 SOSA		RUDRA	PRTHIVIDHARA			APA-VATSA		3 JAYANTA
22 ASURA		MITRA	BRAHMA			ARYAMAN		4 MARUTA
21 VARUNA								5 MAHEN-DRA
20 PUSPA-DANTA								6 SATYAKA
19 SUGRIVA		INDRA	VIVASVAT			SAVITRI		7 BHRISA
18 DAU-VARIKA	INDRA-JAYA						SAVITRA	8 ANTA-RIKSA
17 NIRRTA	16 MRSA	15 BHRINGA-RAJA	14 GAND-HARVA	13 YAMA	12 GRHAK-SATA	11 VITATHA	10 PUSAN	9 AGNI



VAASTU PURUSHA MANDALA

Design of public and private buildings

Settlement Planning

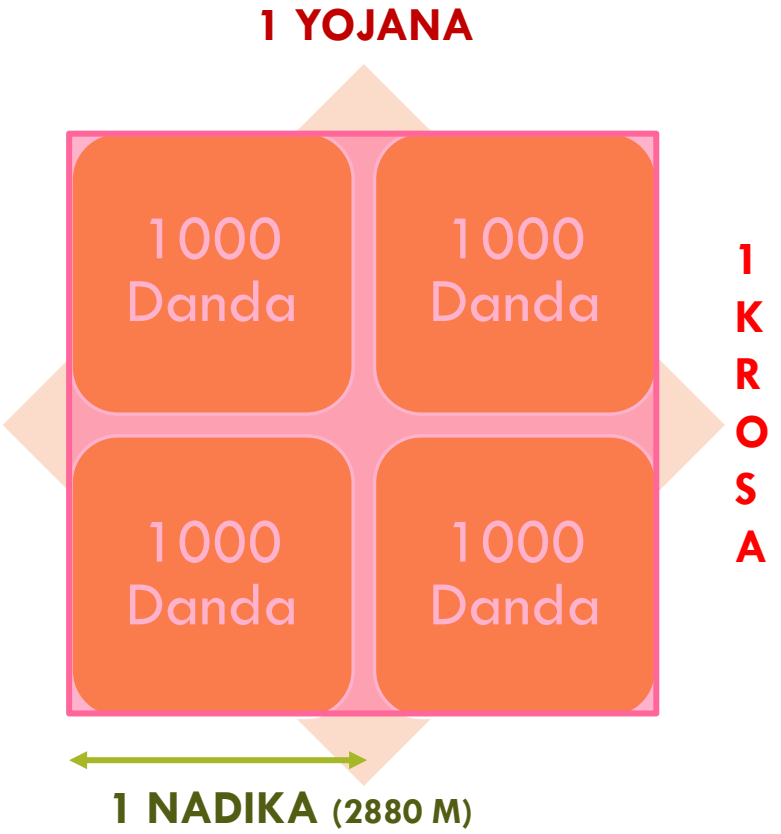
Nagara – large urban settlement

Satellite town/sub-urban development – sakhanagar

Commercial town – pattana

PURA

GROWTH OF SETTLEMENT

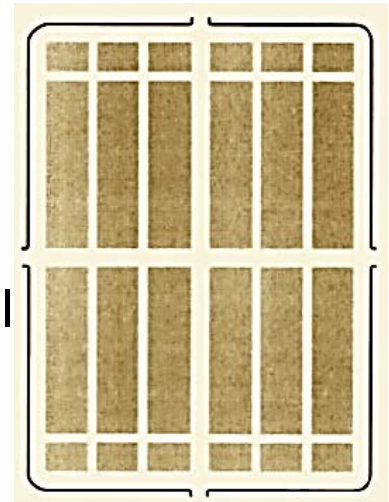


* TEMPLE – mahapitha (4x4)
* Focus – temple/sacred tank; sannidhivithi – prime axis, pradakshinavithi
* Small settlement – 256 Danda (16x16)
* Large town – 1 Yojana
* Size of individual building – 16 hasta – 32 hasta
* Min. width of a block – 8 Danda – 16 Danda
* Large Village (192x192), Module (64x64)
* Grama (1x1), Mahagrama (4x4), Durga (9x9), Pura (16x16), Nagara (25x25), Rajdhani (36x36)

SETTLEMENT PLANNING

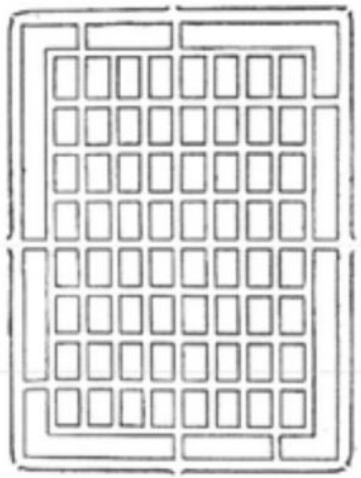
* **DANDAKA**

- linear village with one main street in W-E direction
- Two secondary streets parallel to main street
- Temple located in north
- Surroundings – agricultural fields and waterbodies



* **SARVATOBHADRA**

- Main gateways in four cardinal directions
- Temples, convents, math, pathshala, udyana, vyaparshala
- Provision for high walls and deep moats around the periphery

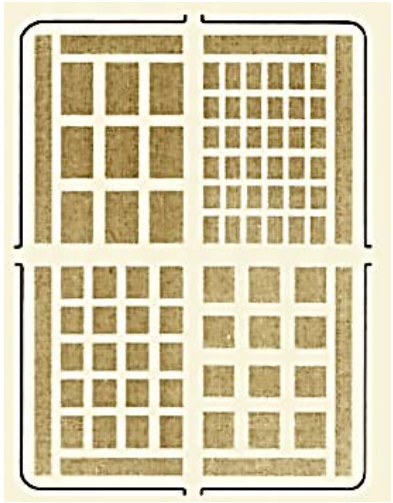


Sarvatobhadra

SETTLEMENT PLANNING

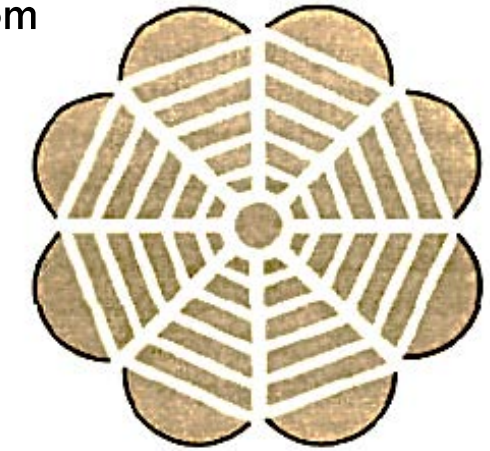
* PRASTARA

- Shrine at centre
- Variation in block size and street width
- Accommodates different socio-economic sectors



* PADMAKA

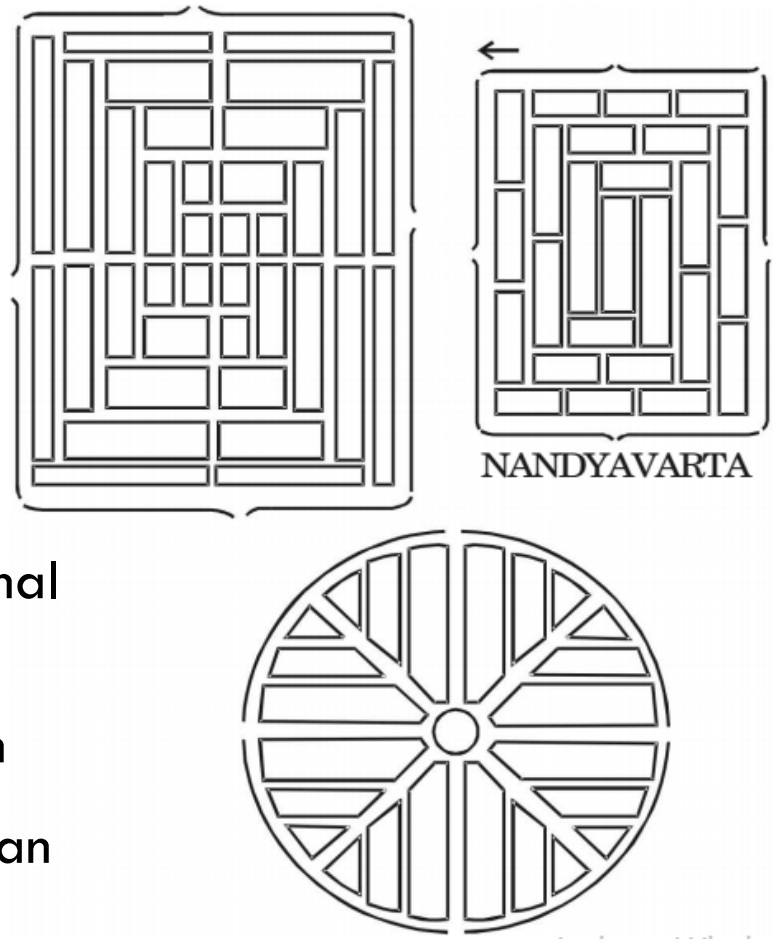
- Lotus flower, petals radiating from centre
- 8-16 sided polygon
- interior street in rectangular pattern
- palace and public buildings in north
- Markets along main streets
- Perishable products along W-E end
- Suitability for different use due to regularity of layout



SETTLEMENT PLANNING

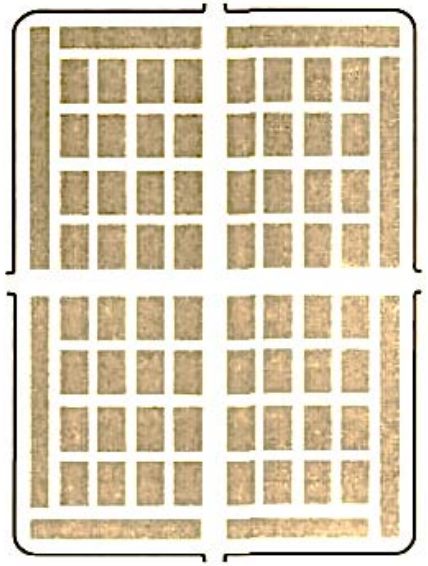
* **NANDYAVARTA**

- Flower – form, focus- temple
- Radial pattern, main street along cardinal directions
- frontage along diagonal street is avoided
- suited for circular plan
- Adopted for square plan

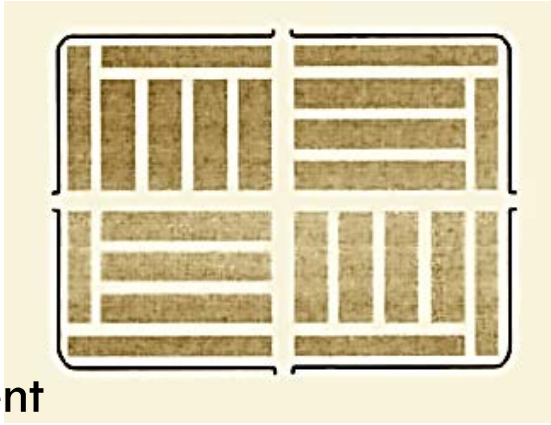


* **CHATURMUKHA**

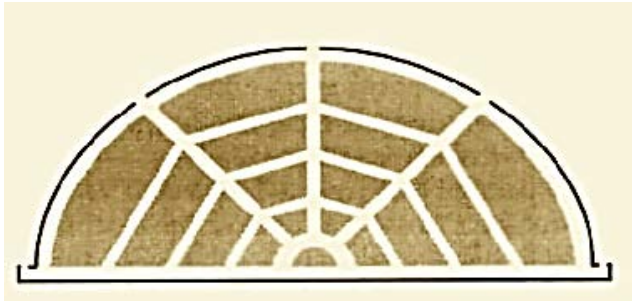
- villages and small towns
- four entry points
- concentric zones



SETTLEMENT PLANNING



* **SWATIKA**
  - Clockwise Movement
  - Main road along W-E and N-S
  - Circumferential roads originate from main roads
  - main temple at centre, secondary temples in different sectors
  - Ramparts and Moats provision



* **KARMUKHA**
  - Bow – form, sites along sea shore/river banks
  - Main street is perpendicular to water course
  - Axis is parallel to water course
  - cross roads/radian pattern
  - use of water for natural moat

SETTLEMENT PLANNING

* width of street – 1/12th of block width
* Junctions are enlarges to 1/8th of the pada

* Trees with thick and tall canopy on south and west of building
* Shade tree with low level foliage on east and north

Load bearing construction – width of a wall – related to areas/width of room/space

Material – stone, brick - 2 hasta (wall width) – 32 hasta (building width) 1/16

- Haveli

Material dictates relative proportions for enclosed space