

## **Importance Of Relationship Between Built Forms Amidst Open Spaces In Historical Areas**

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All great architectural complexes derive their strength from the relationship they have been able to establish between their built masses and the open spaces they confront, encircle, lead to and led upon.

Both have veracity:

The character of open spaces, to a large extent, is dictated by the building masses surrounding them.

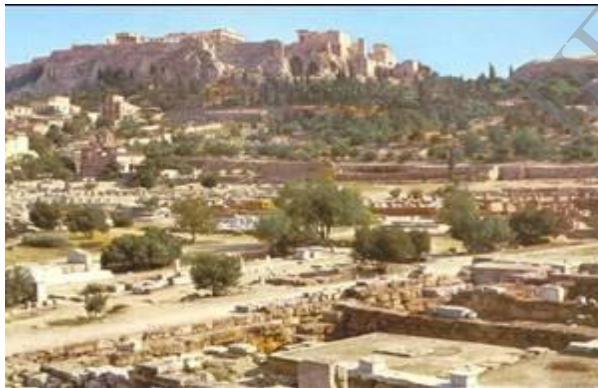
The character of the building masses can get enhanced or subdued by the open spaces.

Any worthwhile designer has to familiarize himself with the effects of this interdependent relationship.

It is only this familiarization which can enable the fulfillment of the intended aim of a building construct of building complex.

From time immemorial, great architectural complexes have been a product of the relationship of building masses with the open spaces buildings confront, encircle or enclose.

Right from the Greek agora to a Roman forum to the great historical places and piazzas of the Medieval and Renaissance period, even that of Baroque, till the making of many new capitals of modern era, be it an Edward Lutyen's New Delhi Capitol, Pierre Charles L' Enfant's Washington DC or Oscar Niemeyer's Brasilia, it has been the relationship between the open spaces and the surrounding buildings which have been the hallmark of the architectural accomplishments of their capitol complexes which have stood the test of time.



**Greek Agora**



**Roman Forum**

It is the genius of concepts of building masses articulating spaces or spaces articulating building masses which have been responsible for the totality of great architectural experiences we have come to cherish, admire and look up to.

In India, the examples of early temple like rock cut temples of Mahabalipuram during the Pallava period do not show the relationship of building form and the enclosed spaces because they were more engrossed with the iconography and ornamentation and probably is the main reason for their never being counted as architectural master pieces.



**Lutyen's New Delhi capitol complex**

It is the inherent potential of the totality of an architectural construct which has made an architect revere of Mandu, draw inspiration from Fatehpur Sikri time and again follow the inherent scale and proportion in a Jal Mahal, Udaipur.

Is not the aforesaid enough to give rise to the research question of the establishment of norms which govern the building–open space relationship?

Is not the aforesaid enough to prompt a search for evolving strategies for development of open spaces around built forms?

Is not the aforesaid enough to demonstrate the application of evolved strategies over the great HISTORICAL COMPLEXES where the lack of building open space relationship has been seen and made the complex so dull and devoid of interest? The key issues and the problems have to be studied and identified which have exploded or fragmented the HISTORICAL COMPLEX into various isolated standing Monumental built forms for e.g. HUSSAINABAD COMPLEX Lucknow, RESIDENCY COMPLEX Lucknow, Historical areas of Varanasi etc.



**Fatehpur Sikri, Agra**



**BADA IMAMBADA, LUCKNOW, one of the important buildings in Hussainabad Complex.**

### **BUILT FORM & OPEN SPACES- LAYOUT PATTERN**

A good urban space is not just an open space, it is a space formed by arrangement of many built forms, and to make such a space, it requires a conceptual leap from the individual components to a vision of the whole. The choices available in the history timeline represent various ways of assembling the built forms around such spaces.

The basic parts of any urban open space can be put together to make more than just basic parts: they can also make spaces, patterns, and domains around the built forms. The arrangements and the placement of the buildings dramatize the most elementary act which architecture has to perform. To make one plus one equal more than two, we must in doing any one thing we think important, do something else that we think important as well (make urban spaces to live, establish a meaningful pattern and realms which are beneficial for the social development).

1. People live outdoors as well as inside the building; therefore the outdoor environment should be as pleasant and comfortable as possible.
2. There are some considerations which relate to the creation of defined enclosed spaces in urban areas are
  - a. Integrating the spaces on a site into the existing urban structure.

- b. Making the spaces as interesting and comfortable as possible.
- c. Achieving a relationship between the spaces and the people who live in and use them -thus creating a sense of identity.
4. The building and the open spaces can be related to one another and organized into coherent patterns of form and space.
5. The spaces between buildings should stimulate the human senses.
6. The quality of each space, whether large, small, high, low, wide or narrow, has observable characteristics which can be related to human reactions and feelings.
7. Spaces can be consciously designed to produce specific feelings within the user.
8. A large urban space tends to create a grandiose feeling, with man becoming small and insignificant— in awe of the space.
9. The people are the important element; the spaces should be scaled for their use

### **TYPES OF LAYOUT PATTERN OF KINDS OF SPACES**

The manner in which these spaces are arranged can clarify their relative importance and functional or symbolic role in the organization of a building.

The decision as to what type of organization to use in a specific situation will depend on:

- a. Demands of the building program.
- b. Exterior conditions of the site.

#### **CENTRALISED**

A central, dominant space about which a number of secondary spaces are grouped

#### **LINEAR**

A linear sequence of repetitive spaces.

#### **RADIAL**

A central space from which linear organizations of space extend in a radial manner

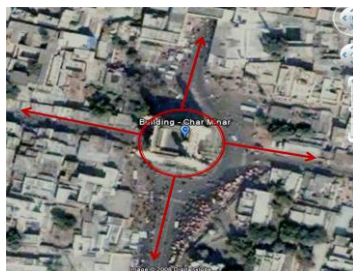
#### **CLUSTERED**

Spaces grouped by proximity or the sharing of a common visual trait or relationship

#### **GRID**

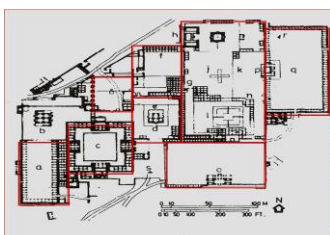
Spaces organized within the field of a structural grid or other three-dimensional framework

**Plan of Char Minar, Hyderabad**



**Plan of Fatehpur Sikri, Agra**

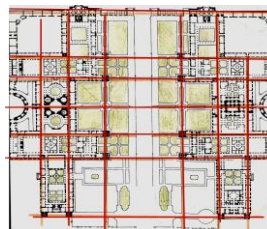
**Rajpath New Delhi**



**Plan of Connaught Place, New Delhi**



**Plan of Secretariat, New Delhi**





## PROPORTION

1. Proportion is one of the main features of various masses or spaces.
2. The primary properties of mass are height, width, and depth.
3. Proportion is the visual relationship of these properties with respect to each other.
4. The observer does not see these as individual, separate properties but as an entire mass.
5. Any mass can be identified by the geometric shape and the dimensions of the form.

## PROPORTIONING SYSTEMS

Though there are proportion restrictions imposed by the material, structural, and manufacturing processes, the designer's ability is the key to control the proportion of a building's form and space.

1. If space of a required area is to be designed, the length, width, and the height ratios depend on the:
  - i. Functionality of the space
  - ii. The nature of the activities to be performed in that space.
2. There is a visual relationship between the parts of the building and the building as whole .
3. There are many proportioning systems that help us to identify these visual relationships in buildings.

## DIFFERENT THEORIES

- a. The Golden Section
- b. Regulating Lines
- c. The Modular
- d. Anthropomorphic Proportions
- e. Scale
- f. Urban design Parameters

## THE GOLDEN SECTION

The Golden Section can be defined as the ratio between two sections of a line, or the two dimensions of a plane figure, in which the lesser of the two is to the greater as the greater is to the sum of both.

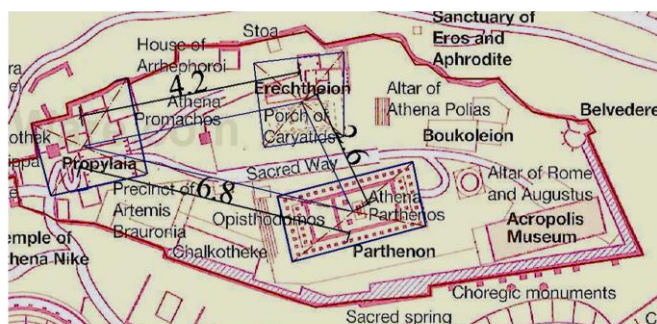


$$a/b = b/(a + b) = \text{Golden Section} = 0.618$$

E.g.- The ancient Greeks used this proportion of the golden section in the built forms around open spaces.

Le Corbusier, the renowned architect found that the golden ratio also exists in the proportions of the human body which he used in the planning of the Chandigarh.

E.g.: ACROPOLIS



$$2.6/4.2 = 4.2/6.8 = 0.618 = \text{GOLDEN RATIO}$$



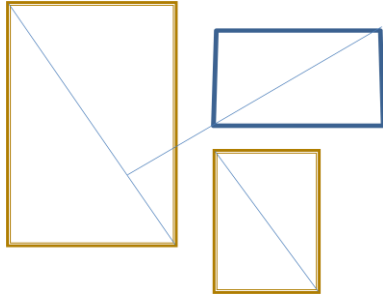
$$3/4.9 = 4.9/7.9 = \text{GOLDEN RATIO}$$

## REGULATING LINES

If the diagonals of two rectangles are either parallel or perpendicular to each other, they indicate that the two rectangles have similar proportions.

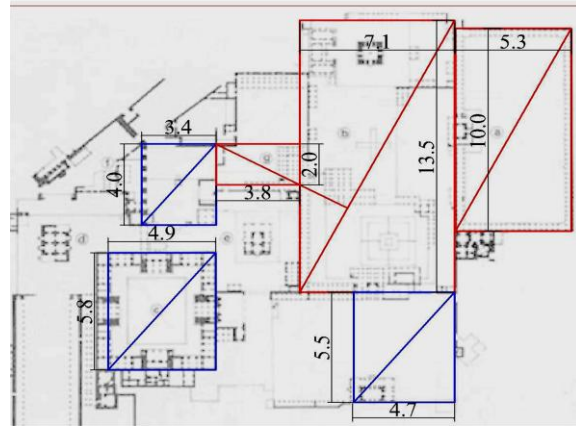
These diagonals as well as the lines that indicate the alignment of elements with one another are called regulating lines.

Regulating lines bring the form of mathematical order and helps in fixing the fundamental geometry of the work



$$\begin{aligned} 5.3/7.1 &= 10/13.5 &= \text{REGULATING LINES} \\ 2.0/7.1 &= 3.8/13.5 &= \text{REGULATING LINES} \\ 3.4/4.9 &= 4.0/5.8 &= \text{REGULATING LINES} \\ 4.7/4.9 &= 5.5/5.8 &= \text{REGULATING LINES} \end{aligned}$$

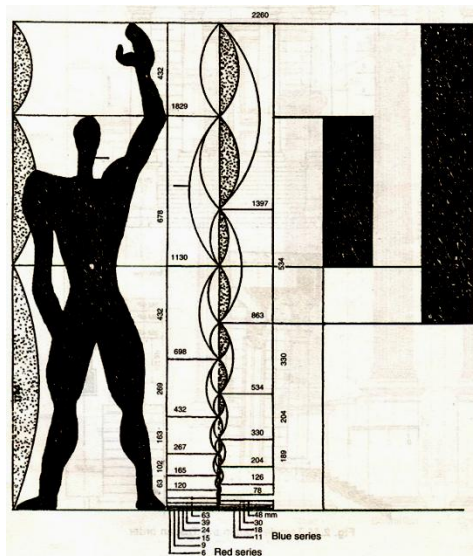
E.g.: FATEHPUR SIKRI, AGRA



## THE MODULAR

- Corbusier studied and invented the theory of MODULAR.
- It is a tool for harmonic dimensioning of all things of human use ,but more particularly of buildings and spaces.
- The modular theory works on the golden ratio and the Fibonacci series of numbers.
- The basic grid consists of three measures, 113 cm, 70 cm and 43cm.

E.g.:- Chandigarh city is planned to human scale. Each sector is of 800x1200 mts.



## SCALE

- i. When we see a large building, we are impressed by their size but they are due to their purpose like:
  - a. Palaces - awe their subject
  - b. Temples & Cathedrals -serve the power bigger than the man
  - c. Railway stations - because of the purpose
  - d. Some are made for their prestige purpose
- ii. The concentration of big buildings without any open spaces results in a cold and impersonal environment.
- iii. Low rise buildings with open spaces are more human in scale.
- iv. If we talk of urban scale we refer to the size of a project in the context of a city, or neighborhood scale when we judge a building appropriate to its locale within a city, or street scale then we note the relative sizes of elements fronting a roadway.



**INTIMATE SCALE**



**MONUMENTAL SCALE**



**URBAN SCALE**

## URBAN DESIGN PARAMETERS

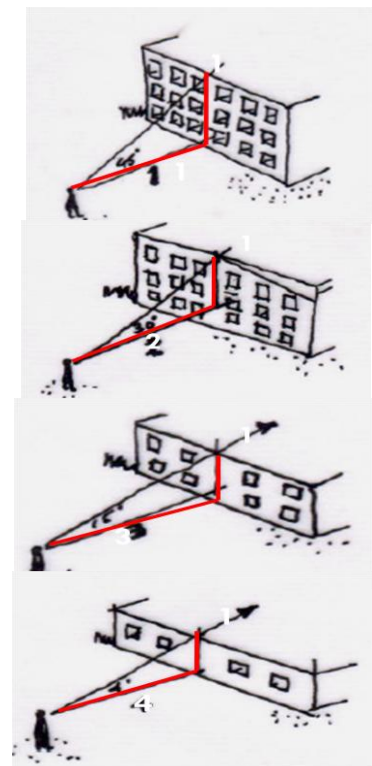
### 1. DISTANCE RELATION FOR SEEING FAÇADE DETAILS

1:1 (45 deg) is the ratio between the height of the building and the foreground in which the details of the façade can be seen intelligibly. It brings large buildings down to human scale and gives small ones an air of importance.

1:2 (30 deg) is the ratio between the height of the building and the foreground in which the whole façade and its detail can be seen simultaneously.

1:3 (18 deg) is the ratio between the height of the building and the foreground in which the threshold of distraction for distant vistas can be seen.

1:4 (14 deg) is the ratio between the height of the building and the foreground in which the façade act as an edge to the distant views



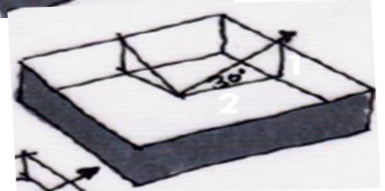


## 2. SENSE OF ENCLOSURE

1:1(45 deg) is the ratio when the façade height equals the distance we stand from the building. The building is considerably higher than the upper limit of our field of forward view, we feel well enclosed.



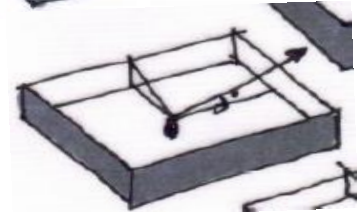
1:2 is the ratio when the façade height equals one half the distance we stand from a building it coincides with the 30 deg upper limit of our normal view. This is the threshold of distraction, the lower limit for creating a feeling of enclosure.



1:3 is the ratio when façade height equals one— third the distance from the building; we see the top at about an 18 deg angle. At this proportion we perceive the prominent objects beyond the space as much as we do the space itself.



1:4 is the ratio when the façade height is one fourth the distance away from the building we see the top at a 14deg angle, and the space loses its containing quality and peripheral facades function more as edges. The sense of space is all but lost & we are left instead with a sense of place.



## LANDSCAPING

**Attractive and well designed spaces are key to the creation of successful places and communities. In shaping new places, landscaping must be an integral part of the design process.**"Councillor Haines,Portfolio Holder for Strategic Planning

### OBJECTIVE

1. It helps to enhance the objective of the built form.
2. Adds to the aesthetic appeal of the place
3. Adds to the conviviality of the urban space
4. Fountains, sculptures, obelisk etc. create nodal center to attract people.
5. It helps in changing the microclimate of the open space.

### PRINCIPLE OF LANDSCAPING

1. It entails planning the space outside or surrounding a construction or building.
2. Landscaping should be done in a natural layout of a site to suit his uses and produce aesthetic pleasure.
3. The outdoor environment could be natural or artificial
  - a. Natural environment:
  - b. Derived from the natural habitat of the region constitutes a natural environment.
  - c. Such an environment exists even in man's absence.
  - d. Artificial environment:
    - i. Man alters the natural habitat by creating an artificial environment.
    - ii. Man designs his own environment:
      - i. Man designs the landscape outside the built environment or by creating parks and gardens.
      - ii. In doing so, he makes the environment pleasant to live in.

## **ELEMENTS OF LANDSCAPING**

1. Landscaping can also be defined as composition of masses and spaces.
2. There are various elements of landscape.
3. They are as follows:
  - a. Path
    - i. Stone
    - ii. Brick
    - iii. Concrete
    - iv. Asphalt
  - b. Rock gardens
  - c. Street furniture
  - d. Plant containers
  - e. Sculptures
  - f. Water body
  - g. Fences or walls
  - h. Lighting
  - i. Planting
  - j. Ground cover

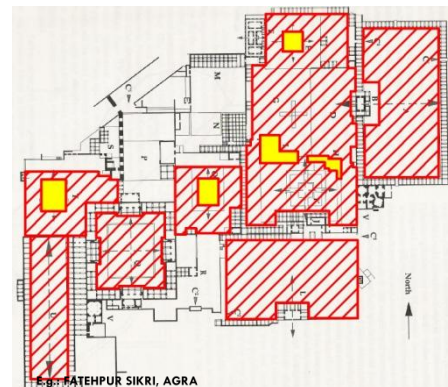


The reference of Historical complex which has the beautiful play of open spaces and built forms, proportions and scale, lively and harmonious environment the complex come into the mind is **FATEHPUR SIKRI, AGRA**.

## **BUILT FORM & OPEN SPACES –LAYOUT PATTERN** **CLUSTERED PATTERN**

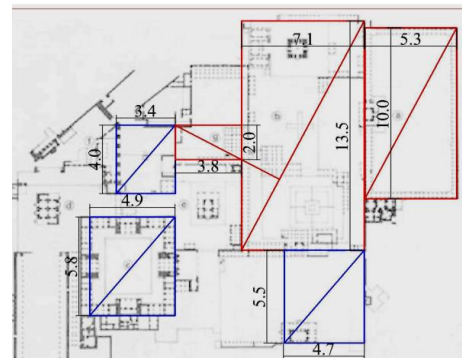
The type of layout pattern of Open spaces and Built form in Fatehpur Sikri complex is CLUSTERED.

Clustered pattern relies on the physical proximity as it does not originate from the rigid geometrical concept the form of the clustered pattern is flexible and can accept growth and change readily without affecting its character.



## **PROPORTION AND SCALE** **REGULATING LINE**

1. According to a theory propounded by Allilui Petruzzidi he explain the systems employed to layout of palace complex.
2. Starting from a basic rectangle other rectangles were propagated on site by making sure that their diagonals were either parallel or perpendicular.
3. This ensured a constant proportion between the sides of the rectangle.
4. This was a dynamic system of propagation allowing for a lot of flexibility at the same time.
5. The rectangles have golden proportion  $1:\sqrt{2}$  the





diagonal being  $\sqrt{3}$

$5.3/7.1 = 10/13.5 = \text{REGULATING LINES}; 2.0/7.1 = 3.8/13.5 = \text{REGULATING LINES}$

$3.4/4.9 = 4.0/5.8 = \text{REGULATING LINES}; 4.7/4.9 = 5.5/5.8 = \text{REGULATING LINES}$

### **GEOMETRY OF MULTIPLE AXES**

1. Fatehpur Sikri was and remains as one of the finest creations of urban spaces.
2. The city has a highly developed sequence of well modulated and interlinked spaces most suitable for the pedestrian.
3. The central great rectangular courtyard acts as the nucleus for the city-the heart of social, political and commercial life of the city.
4. The secret which makes this space so interesting and exciting and at the same time gives it the grandeur and dignity of a royal seat lies in the proportioning of space and its relationship to various buildings.
5. **"But nowhere is there a fixed center, no where a point from which the observer can dominate the whole. From the moment he steps within the urban core, a part of the scene which does not impose itself upon him but gradually disposes itself."**

**J.Tyrwhitt**

6. The wide employment of axes which are implied, denied and then rediscovered hold varying spaces together by providing visual links from one court to another.
7. In terms of morphology the great court of Fatehpur Sikri does not seem to have any set module because the placing of buildings relied heavily on the visual experience of the human eye.

A1 – Through Diwan – I – Khas

A2 – Through Diwan – I – Aam

A3 – Through Anup Talao

A4 – Through Jodh Bai Palace

B1 – Through Stables for Camels & Horses

B2 – Through Birbal bhavan

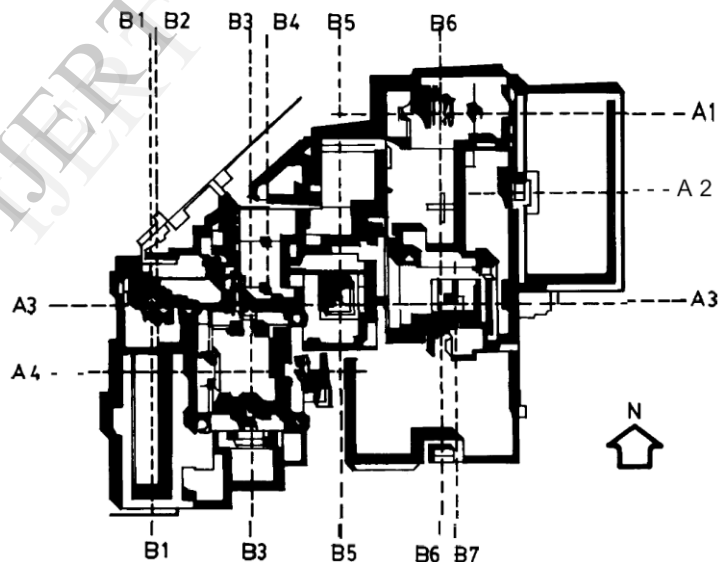
B3 – Through Jodh Bai Palace

B4 – Through Miriam's Garden

B5 – Through Miriam's House

B6 – Through Pachisi Court & Diwan – I – Khas

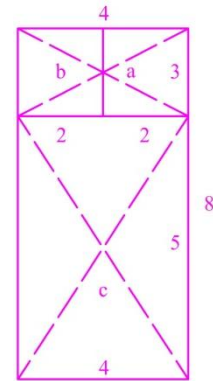
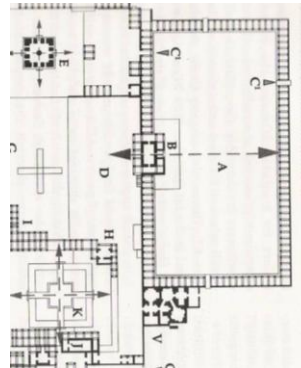
B7 – Through Anup Talao



In conclusion, therefore, axes connect the buildings visually giving a sense of unity and balanced co-existence within one ensemble.

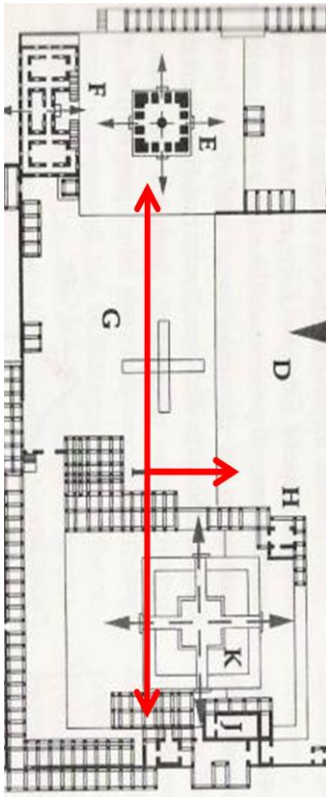
### PROPORTION IN INDIVIDUAL BUILDING

Outer Rectangle - 1:2  
 (Diwan – e – Am)  
 Rectangle 'a' - 2:3  
 ( 1/2 smaller Rectangle)  
 Rectangle 'b' - 3:4  
 (Full smaller Rectangle)  
 Rectangle 'c' - 4:5  
 ( Full bigger Rectangle)

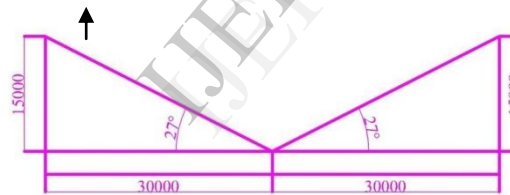


### Geometric Series used in Diwan – e – Am

### PROPORTION BETWEEN OPEN COURT AND BUILDING HEIGHT



DIWAN –I-KHAS



The biggest court in Fatehpur sikri is Pachisi court , where if we see the proportion of the building height to the open court ratio is 1:2 which is the most suitable ratio

Ratio :1:2

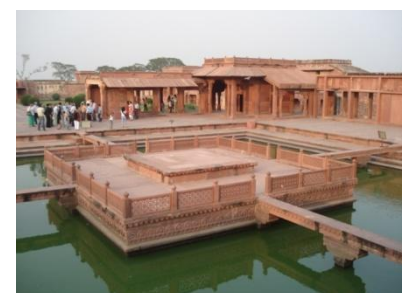


KHWABGRAH

### THRESHOLD OF ENCLOSURE

### LANDSCAPING

1. The landscape of Fatehpur Sikri bears a sleepy forlorn look.
2. The ridge is the most dominant element in the landscape.
3. Mughals emphasize on the layout of the entire grand complex.
4. The Mughal garden attempted to capture natural beauty



within a man made framework highlighting the contrast between the two.

5. Diwan-i-Am Courtyard

During Akbar's reign it was a large paved courtyard and not a garden. The present layout of the garden is a later development. Although it looks attractive, it is incongruous with the very nature of the space

## **CONCLUSION**

1. Complex should have unity which may be expressed in different ways such as:
  - i. Through Form
  - ii. Through Material
  - iii. Through Theory
  - iv. Through Landscaping
  - v. Through Axis
  - vi. Through Architecture
2. Any redevelopment that is proposed here should be planned by keeping climate in mind.
3. There should be a proper layout pattern in the proposed development which shall give coherency to the complex.
4. Buildings should be visually and physically connected to each other. Articulated use of open spaces and other built up spaces like haats, rest areas, sit outs, markets etc. shall help in this.
5. Pedestrian movement is an important aspect of any complex so it should be kept in consideration.
6. There should always be a play of scale and proportion which makes the complex attractive.
7. A landmark building in any complex leads to the direction.
8. Proportion in between heights and open spaces to be followed which give proper view to the building.
9. Landscape highlights each building of the complex and thus lends a proper viewing frontage to each monument.



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