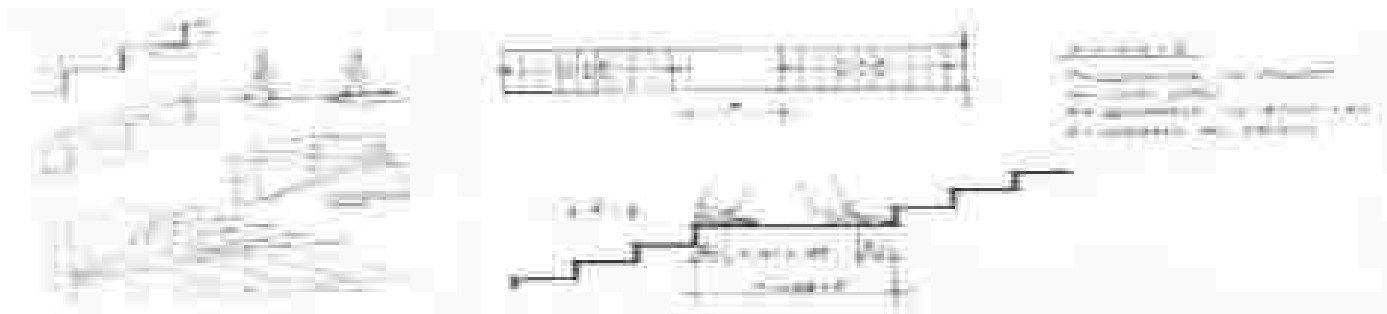


شكل رقم (11) مخرج الأبراج، الرتسية للخرج

How to Design a Stairs?

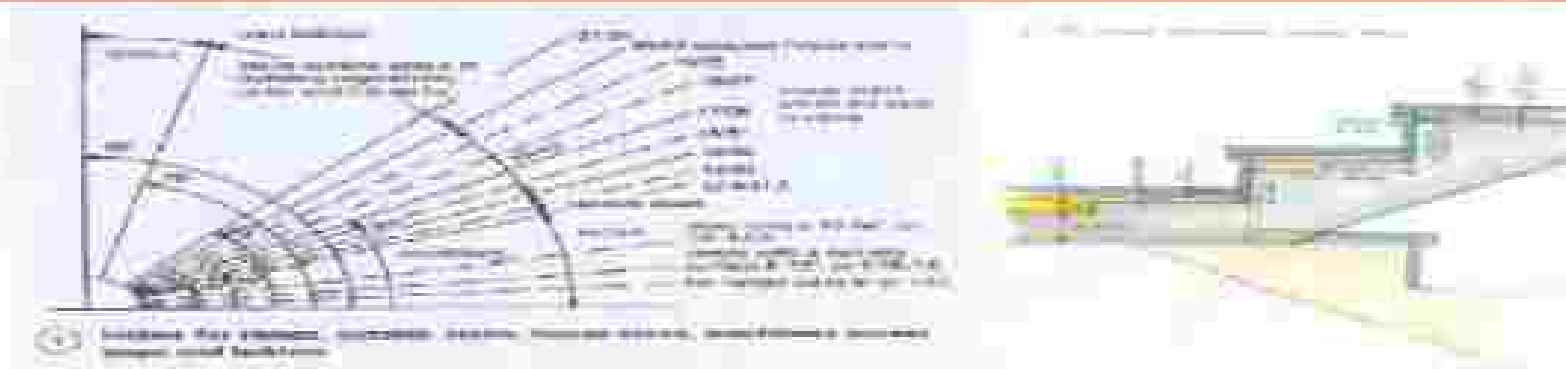
- $2r + g = 63 \text{ cm}$
- r : riser: (Rise of Step)
- g : going: (Going of Step) (tread)
- $2r + g = 63$
- $30 + g = 63$
- $g = 63 - 30 = 33 \text{ cm}$



شكل رقم (12) مخرج الأبراج، الرتسية للخرج (10-11) cm

The riser of step for several functions are:

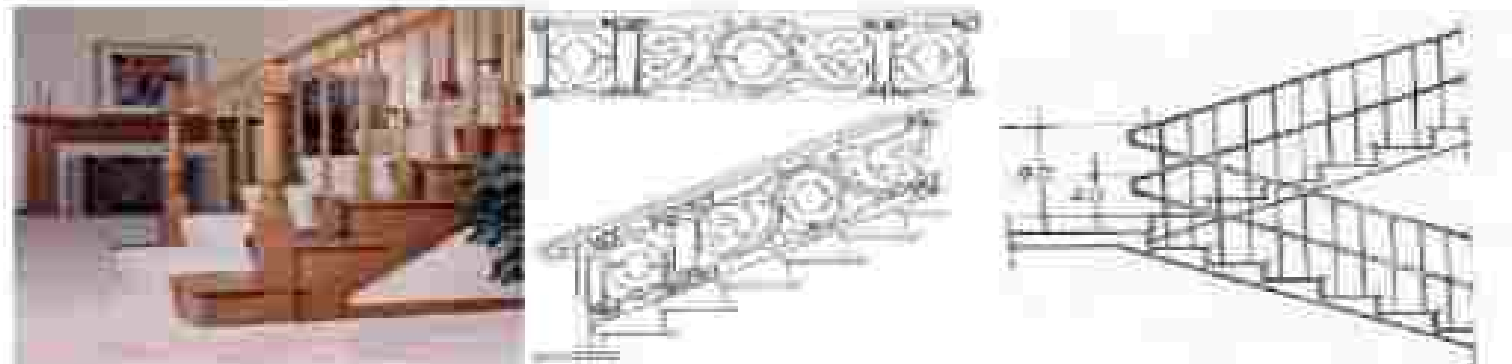
- 15-18 cm for Residential Buildings
- 16-17 cm for Educational Buildings
- 14-16 cm for Public spaces and Gardens
- 20-22 cm for Basement



شكل رقم (١٣) يظهر النسبة بين الارتفاع والعرض في السلالم المختلفة

Designing Considerations

- Normal Stairs landing after a max. of 14-step, min. of 3 steps.
- Height of handrail is (90-100 cm).



شكل رقم (١٤) يوضح الارتفاع المناسب (٩٠-١٠٠ سم) والارتفاع الذي يجب تجنبه (١٢٠ سم) في السلالم الخشبية

المصطلحات الفنية المرتبطة بالسلالم:

- الدرجة (step): هي إحدى القطوع المكونة منها مجموعة السلالم، لكل درجة مظهرين ظاهرين أحدهما أعلى وهو سطح المنحدر الممدد لبدء الصعود، والثاني والسفلي وهو المنحدر على الأخص، أو هي عودة من قفصال سطح الدرجة (الفتحة) مع الفتحة، تحت الدرجة بين هذين، أو فوق تتواج الفتحين ويسمى طرفها العروة من الفتحة باسم "نول" ويسمى الطرف الأخرى الحد الذي يزين باسم "زائين".
- الفتحة (Tread): هي سطح الدرجة الأعلى التي يوضع عليها القدم، و يرمز للفتحة عودة من عرض الدرجة.

- ج. القاذبة (Riser) الواقعة الصومية للترجحة. و هو السطح الرأسي العمودي على القاذبة و ارتفاعه هو ارتفاع الترححة.
- د. الحد العلوي (Gauge or rise) :مسافة الارتفاع بين أي نقطتين متاهتين.
- هـ. Run: المسافة الرأسية بين أي نقطتين متاهتين.
- ز. الحدوي (Bull-slope stop) هو عبارة عن أول مرحلة في السلم و يأخذ شكل منطقة مور حيث التسيب و ضعا للعرض حيث الأخطا الضمور و تكون مورجا ذات جبهة ميا تكور أو كذا من الضخمة و الجبهة ميا تكور أو جزء واحد. و تكون في أول مرحلة أو مرحلتين من الإسفل. و هذا النوع من التدرج يكون ممتد في اتجاه مرحلة.
- ح. قوة التدرج (Rising) هي عبارة عن القوة في الاتجاه الرأسي من القاعدة المرادفة و ليست الأسفندية و تكون الألف عند حافة قاعدة من حيث هو عرض السلم.
- ط. الإسفل أو زاوية ميل السلم (Pitch or slope) هو الزاوية بين خط السلم و الخط الأفقي المتصور، و حافة مثلثة ممتدة ميا القاذبة و القاذبة.
- ي. العوارض (Hand rail) عبارة عن حبل أو حديد القاذبة عند زوايا الترححات لتسهيل التسلق أو النزول من السلوف أو هو جزء مستمر على ارتفاع مناسب يوسع على التسلق والنزول العمود و الموازية للتدرجين.
- ك. حواجز التدرجين (Balusters) :أجزاء أفقية عند المراحل المرادفة و يكون بين الحواجز و العوارض.
- ل. الضاروي (Narrow or narrow point) الضواد الضخم في أسفل مرحلة و أعلى مرحلة و هي نقطة التحويل في السلوف لكي يثبت حد التدرجين.
- م. الحد الضخم (Soffit) لوح مسطحة من الخشب العرضي عند حبل مرحلة السلم و يترك لكل هذه من هذه السلم حواجز أو حواجز مسطحة أو مسطحة عند القاعدة و الذي عند حيز السام و يسمى بالحد الضخم.
- ن. السفل: عبارة عن الحد مسطح يكون قطاعه الضخم مجنبا مور قطاع الخشب الأسفلني و يوجد سطح واحد على الأقل في المتوسط المسافة بين القطبين الداخلي و الخارجي لتساعد في حبل الترححات المتوية.
- س. منتصف الترحح (المسطحة) (Landing) عبارة عن الجزء الأعلى يكون مورج الشكل عند و الذي يتغير عند نهاية السلم و هي نوعان: مسطحة متوسطة و مسطحة مائلة تسمى مسطحة الوستولد.
- ط. المسطحة في الجزء الأعلى و عند يكون مسطحة أو مائلة و مسطحة من الطرفين و هي كالمسطحات عند الاستراحة عند الجزء عند المسطحة موزعة مسطحة زاوية 90° و مسطحة زاوية 180°.
- ع. القاذبة (Flight) مسطحة من الترححات موجودة في مستوى مائل واحد و يعادل الأبعد عند الترححات في القاذبة الواقعة من الترححات و لا يزيد عن 7 أروحة في التيفي القاذبة.
- ف. ممر السلم: Stair well عبارة عن المسطح الذي يتألف من السلم ويكون على شكل مسطحة مائتة.

عوامل السلامة في النزاح

تعتبر السلامة من وسائل البروق الهامة التي يعتمد عليها تأسياً البروق الأشد الذين الموثوقين والأبواب الملائمة والبنية والملاحة وحيد أن يسهل لها المسيرة الكلية عند اختيار المكان أو التبريد عند حدوث حريق والسلام على نوع السلامة الداخلية والسلام الخارجية.

أولاً: السلامة الداخلية:

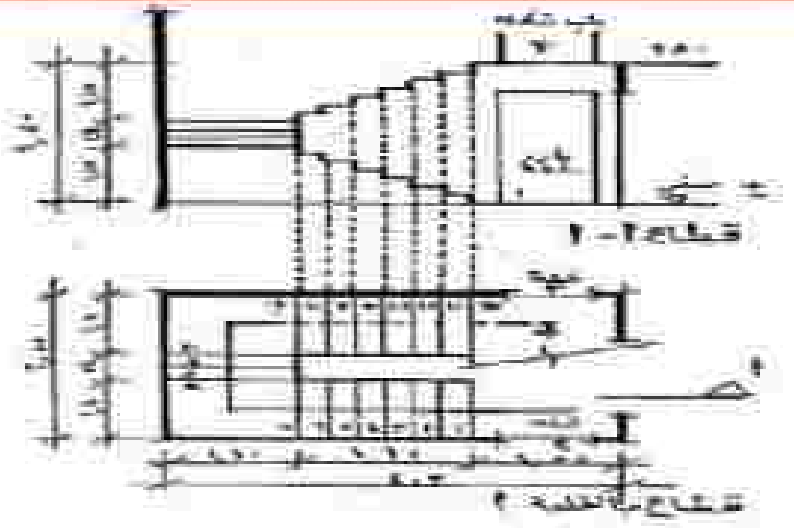
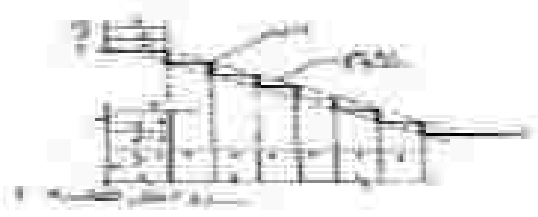
وهي السلامة التي توجد داخل المبنى وتتصل بمقاومة من طريق زواياها وفصلها بواسطة التي موانعهاا وبماجره تمنع مواقع هذه السلامة من خطر الحريق أن تكون مواد اشتعالها والمواد المشتعلة لتتصلن في وقتها والأسقف وما مواد مقاومة الحريق.

ويجب أن تكون الممرات المنسجمة بالسلامة من مادة مقاومة للحريق لفترة زمنية طويلة. أما بالنسبة للممرات الأبواب والزوايا المنسجمة بالسلامة يجب أن يكون لها أبواب مقاومة الحريق حتى لا يتعداها النار إلى مواقع السلامة وينتشر عند اشتعالها ويجب مراعاة التي هي حالة استعمال السلامة كوسائل خروج.

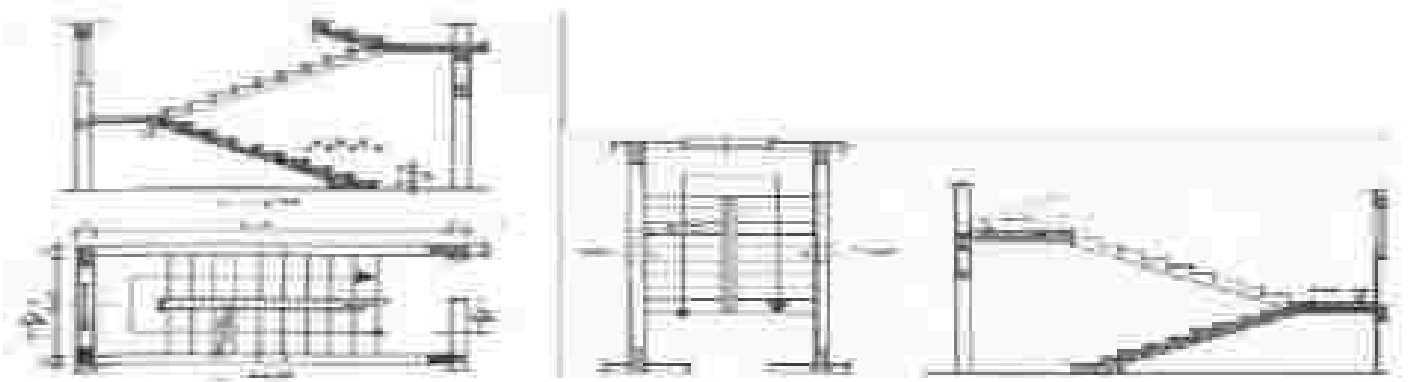
- i- أن يكون موقع السلامة مناسب مع مواضع المسالك المقطوعه للوصول إليها على سبيل المثال الدوارجين استعمالها لكونها لها أو متغير.
- ii- يجب أن يوجد السلامة التي تتخرج العمودي أو المائل المناسب بحيث الهواء تطلق.
- iii- أن تراسي الوحدات المظلومة لتتساح عرض السلم وعلى بعد الأسماس _ والوقت القارح للأحادي وسهل التعلق كما سبق ذكره.
- iv- أن يكون الزوايا والأمنيات والمنسجمة بمواقع السلامة وتتصل الامتداد المقدمه دوراً.
- v- تراعى التبريد الكلية التي لا تتسح بارتفاع يصل إلى السقف بمواقع السلامة وتتصل المقدمه .

vi- تراعى عند تركيب الدوارجين ما يلي:

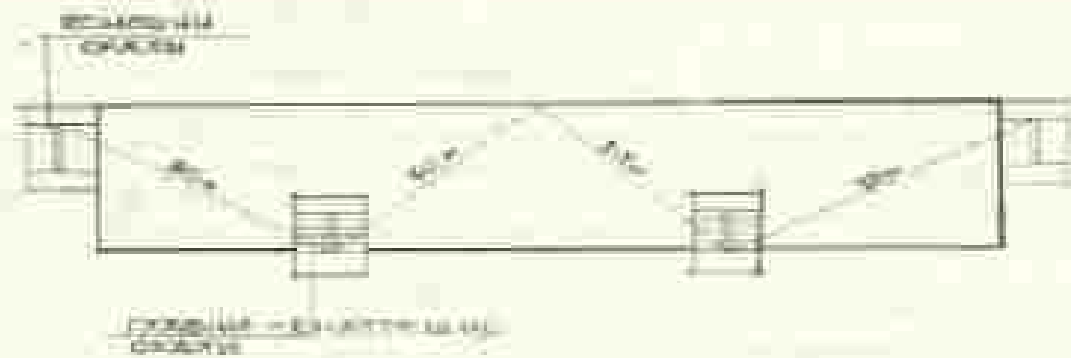
- i- ألا يقل ارتفاع الدوارجين عن 2 متره - 9 قدم حوالي 90 سم.
- ii- كل عرض السلم لا يزيد عن وحصلين مترين واحد على العكس العملي.
- iii- كل عرض السلم ثلاث وحدات مترين حوالي مترين على العكس.
- iv- زوايا السلم من أربع وحدات مترين مترين على الدوارجين على العكس.
- v- الدوارجين ثلاث متوسط السلم وأن يرتفع على السقف أو لا يقل ارتفاعه عن خمسة أقدام.
- vi- ألا يقل طول الدارج عن 10 مترات (30 سم) وألا يزيد ارتفاعه عن 7.5 متره حوالي (19) سم.
- vii- ألا يزيد عدد الدارج عن 16 ولا يقل عن ثلاثة في كل مشور من مسطتين.
- viii- ألا يقل ارتفاع السقف عن خمسة أقدام (150) سم.



شكل رقم (١٥) عرض طريقة رسم القناع للرجح



شكل رقم (١٦) بوضوح الرجح المثلثي بكسفة و القناع الذي يوضح أحد القناع للرجح بشكل حرفي
تأسيس على الهيكل المسبق



Ca/100 — Bir qishiq shtabni o'z ichiga olgan kanalning bir bo'limi.

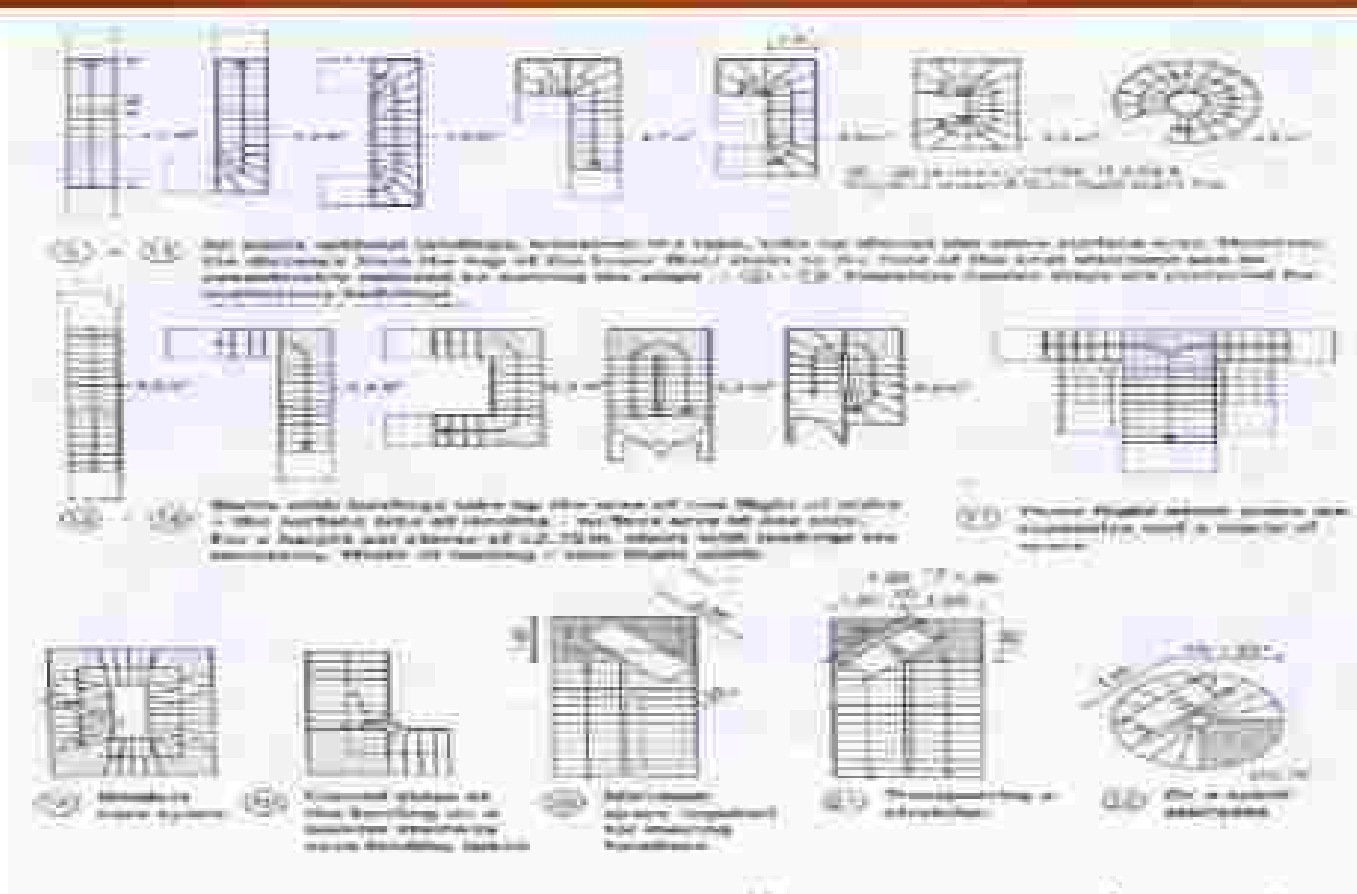
130)

130) 19) raqam (19) raqamli kesim tasviri (25 NI - 3) ni o'z ichiga olgan kanalning kesimini ko'rsatadi.

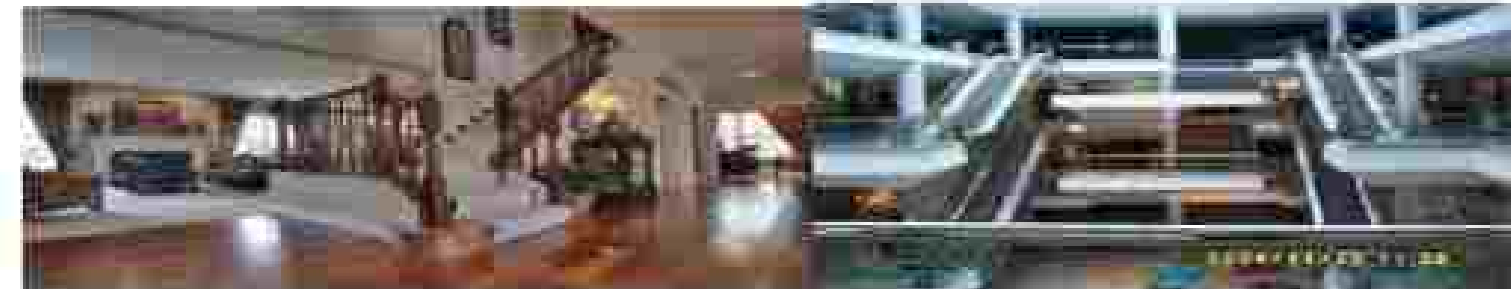


130) 19) raqam (19) raqamli kesim tasviri (25 NI - 3) ni o'z ichiga olgan kanalning kesimini ko'rsatadi.

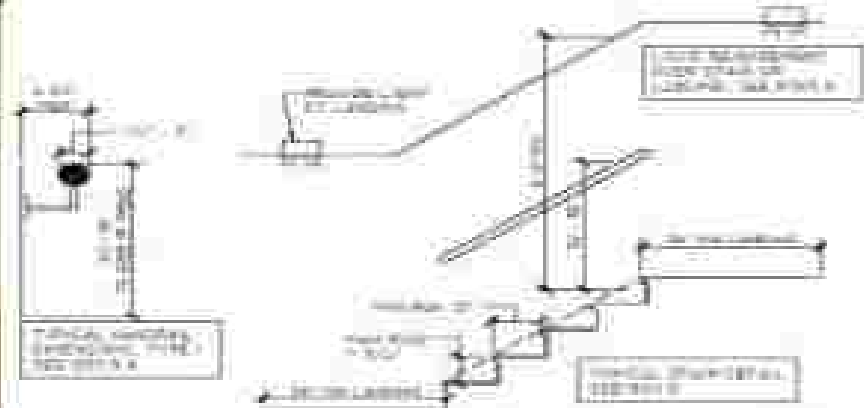
va o'z ichiga olgan kanalning kesimini ko'rsatadi.



شكل رقم (١٩) - بين أشكال العرج والسير والسلالم المتكاملة على شكل واحد



شكل رقم (٢٠) - يوضح استخدام العرج في أحد السلالم وظن الحائط المائل ويوضح العرج في المبنى السكنية



شكل رقم (٢١) يظهر بعض العناصر ونوعها وعكس ارتفاع الترابزين المستعمل للترج

ثانياً: السلالم الخارجية:

وهي السلالم التي ترتكز خارج المبنى وغالباً تكون مكتنفة للهواء الطلق، ولذا فهي ترتكز في حالة عدم كفاية السلالم الداخلية كوسائل للهروب وبشروطها بما يأتي:

- ١- أن تكون مواضعها مناسبة ومراعي المسافات المتوقعة للوصول إليها.
- ٢- أن تكون مواد إنشاء السلالم لها مقاومة للحريق ولا تذلل بتغيرات الجو من حيث الحرارة والرطوبة والرطوبة.
- ٣- يجب أن تكون بعيدة عن النوافذ وصحائف المبنى المحتمل خروج اللهب أو الدخان منها بمسافة لا تقل عن مترين.
- ٤- يجب أن ترتكز على هضبة أو فوق النوصة للسلالم أو في موضع التماسين ومفتوحة للحريق.
- ٥- مراعي إنشاء السلالم الخارجية حتى تكون واضحة أثناء الليل.
- ٦- مراعي النسب المثلثية تكرارها في السلالم الداخلية بالنسبة للترج والمسافة وارتفاع الترابزين.

Site Plans



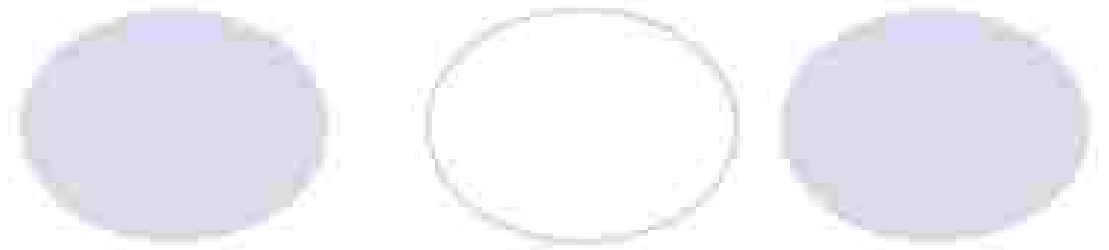
Site Plans

- Site plans are generally started very early in the process of preparing a set of construction documents.
- This helps the consultants on the job by providing them with information that is necessary for their work to progress.
- It also helps the architect by getting some of the drafting work done before the final phase of the project.
- Site plans generally do not contain a great deal of cross-references to other drawings in the document set, but they do contain references to a number of details that will need to be prepared for the detail sheet or book

Site Plans - General Information

- Site plans can be among the simplest or the most complex construction drawings to execute. The degree of difficulty will depend on the extent of work that the architect chooses to do personally.
- There are 3 distinct parts to a site plan
 - the architectural site plan
 - the landscape site plan
 - the grading site plan.
- One or all of these site plans may be done by the architect; separate sheets may be required.

architectural site plan



- The architectural site plan shows features of the site that are of **architectural importance**, as opposed to features that would be important for landscaping or grading purposes.
- Also included would be engineering features that would have an architectural impact, such as **transformers**, exterior **lighting**, **fire hydrants**, and so forth.

landscape site plan

- The landscape site plan shows features that are of importance to the landscaping contractor. A listing of all **plant materials** should be included that shows plant type, size, and quantity desired. Notes covering the **fates** of existing trees and shrubs should also be included.
- On some simpler projects this plan may be combined with the architectural site plan. Frequently, however, this drawing will be prepared by an outside consultant and will not be included as a construction document that is prepared by the architect

grading site plan

- The grading site plan shows the grading aspects of the site. On certain simpler projects this plan may be combined with the architectural site plan. Frequently, however, the grading site plan will be prepared by an outside consultant and will not be included as a construction document supplied by the architect.
- The grading site plan also must include **two** general notes.
 - The first note provides the date that the survey for the site was performed and the name of the group that did the work.
 - The second note makes reference to the soils report for the project, stating that the report, although not bound into the construction documents, is considered a part of the set.

Drawing the Site Plan - General

- When drafting a site plan, you should imagine taking an **aerial photograph of the site**. The exception to this view is the building itself.
- Although some architects like to draft the roof of the building onto the site plan and thus remove the need to draft a separate roof plan, it is preferable to separate the two drawings for a clearer presentation.
- When using this method, you should **draft a heavy outline of the building's footprint** onto the site plan

Drawing the Site Plan - Scale

- Site plans should be shown at a scale that will provide an adequate and clear presentation of all of the required information.
- You should note that site plans make use of engineers' scales instead of architects' scales.
- Appropriate scales include, but are not limited to, 1" = 20'-0" and 1" = 40'-0".

Drawing the Site Plan - Dimensioning

- In dimensioning site plans it is typical to **use decimal notation** rather than feet and inches.
- Using decimal notation will also make it easier for you to cross-reference the numerous types of site plans.
- Dimensions indicated should be the actual dimensions

Drawing the Site Plan - Orientation

- Site plans should always be oriented on a sheet in such a way that the **north arrow is pointing either up or to the right** (pointing up is the most typical orientation). This is the convention in the building and engineering professions.
- The site plan should be located slightly above and to the right of the center of the sheet. This allows space at the bottom of the sheet for notes to be added if necessary

Appropriate Notes and Symbols

These notes and symbols are broken into two categories: architectural site plan and grading site plan.

Architectural Site Plan

The property line for the site should be shown as a series of long heavy lines with two dashes. The information concerning the location of the property line should be taken from the site survey.

A heavy outline of the building's footprint should be shown.



The finished floor elevation of the ground level should be labeled inside of this footprint with a bullet.

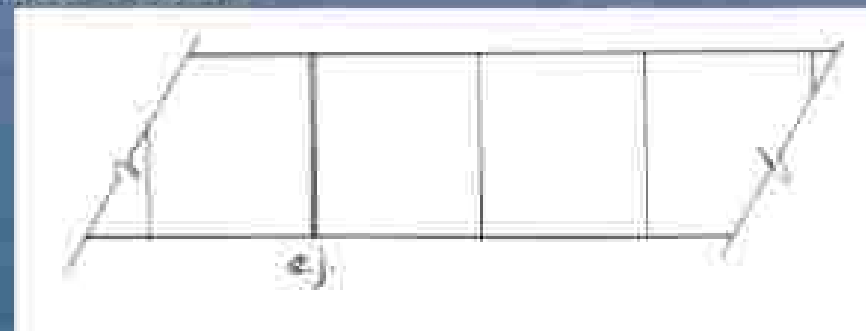


All names of streets that adjoin the property should be labeled.

All utility lines as well as power poles, transformers, traffic signals and manholes should be copied from the survey onto the site plan.

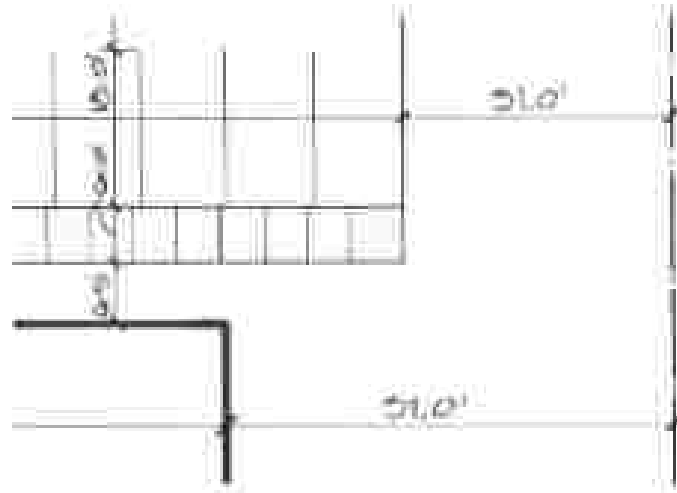
All concrete walks should have their expansion joints drafted labeled "EJ".

Contraction joints should also be drafted but need not be labeled.



Dimensions should be in generally continuous strings (ones that run for more or less the entire length of the drawing). Short strings should be avoided. **Dimension strings that are intended to locate the building should intersect the property lines** to give them a logical frame of reference.

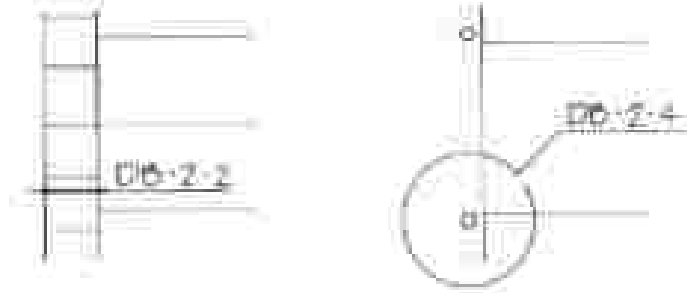
Dimension strings for other site features should intersect either the building or the property lines.



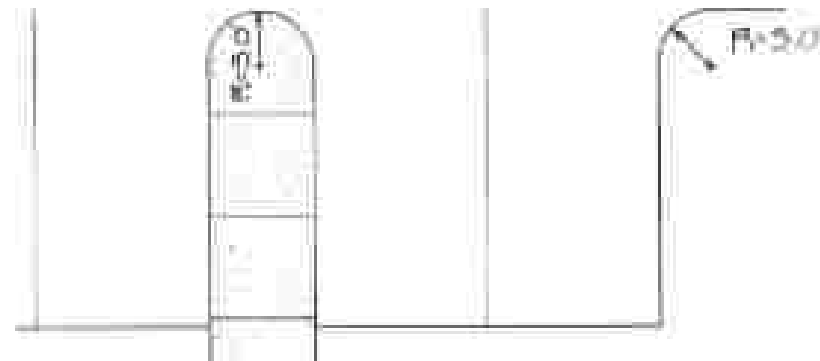
All exterior lighting, including lighting poles, columns, and any specialty lighting, should be shown and referenced to the appropriate consultant's drawings.



Other features that would be drawn on the architectural site plan include trees, gutters, curbs, signs, and so forth. All details should be referenced to the detail book by an arrow and a reference number. Some details, however, may be more appropriately referenced with a circle. The "DB" shown in the following drawings indicates that the marked detail has been included in the detail book. The first number refers to the section or chapter of the detail book that contains the detail, the second to the detail number within the specified chapter that shows the referenced detail.



Radius information for curved parts of the site, such as parking radii or drives, should be indicated by an arrow that shows the radius, as well as by a note "R-X," providing the length of the radius.



Existing Site Plan
Benchmark location and elevation should be clearly indicated with a bullet, the letters "BM," and the elevation in feet.



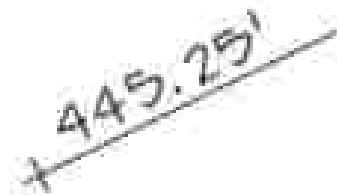
Existing grades should be shown. Existing grades should be marked upward as a series of light dashes.



All new grades should be shown. New grades are drafted freehand as a light line that is interrupted on occasion to indicate the elevation that it represents. Contour intervals will depend on the specific project site. A steep site would require more contours than would a level site.



All existing spot elevations should be shown. These elevations are typically indicated by a cross, with the intersection of the cross representing the point that is being referenced.



All new spot elevations should be shown. These elevations are typically indicated by an angular leader terminating with a heavy dot. The dot represents the point being referenced.

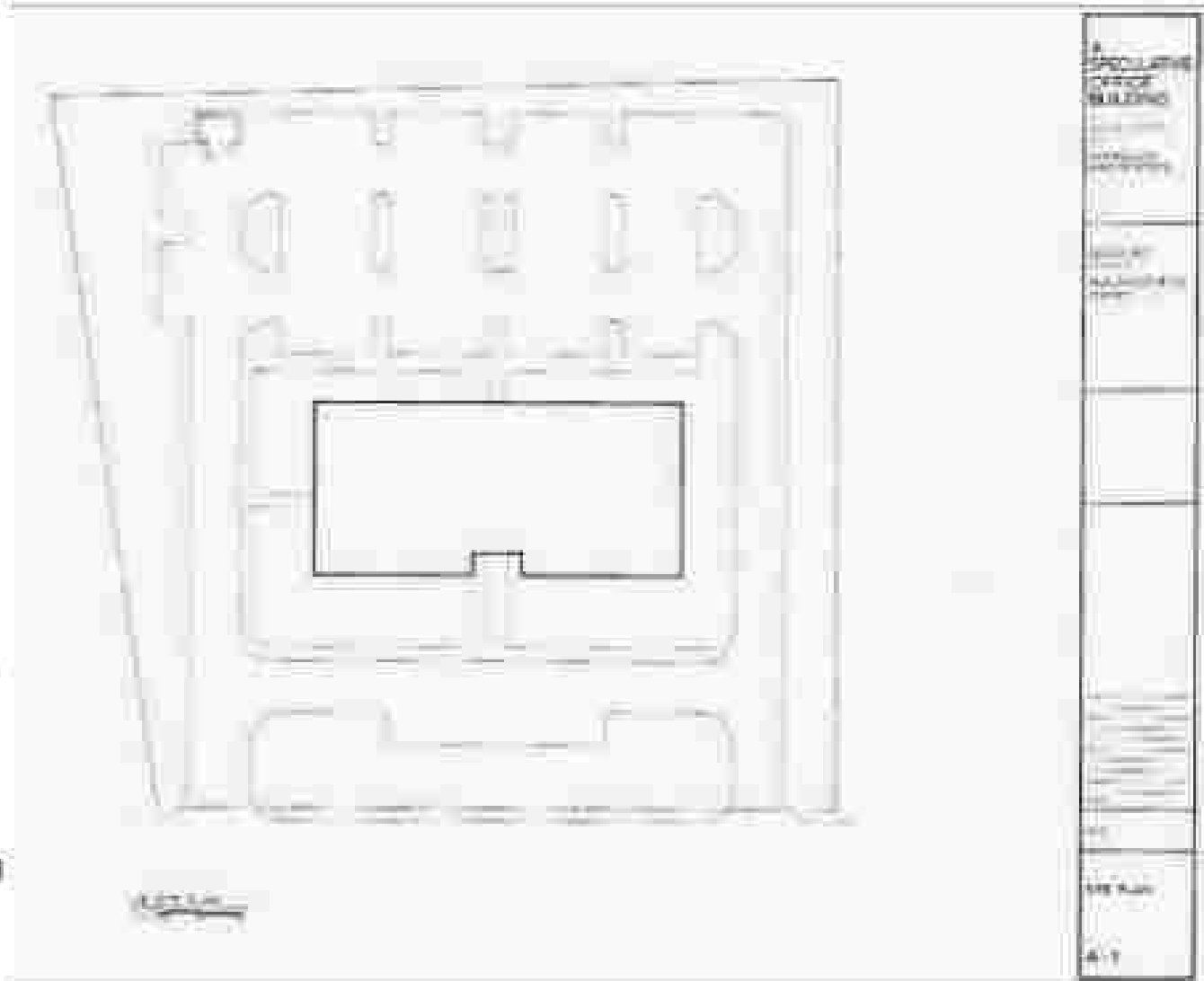


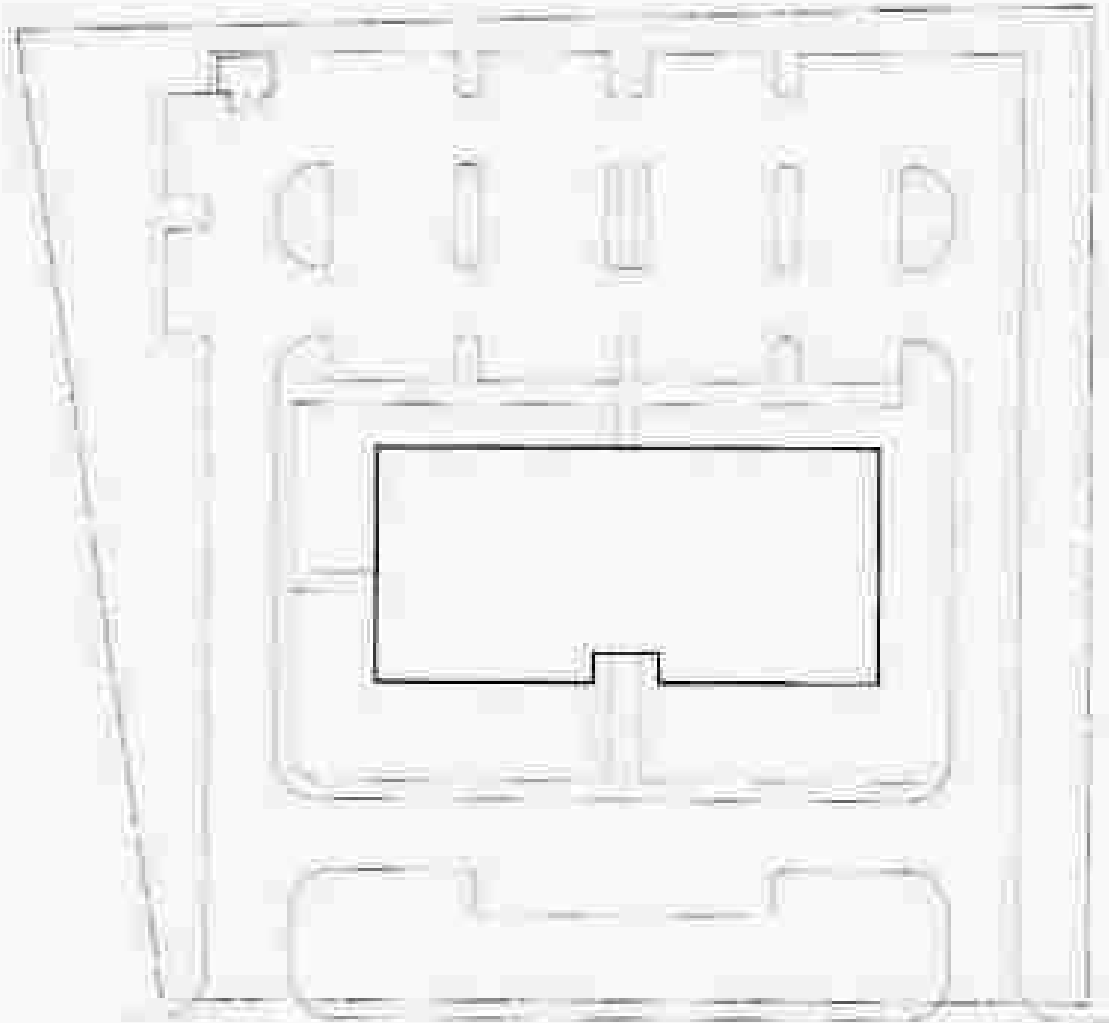
Phase I

As is the case with all construction documents, the first phase of the drawing usually requires the most actual drafting. The plus side of this is the fact that most of this initial work is relatively easy, as it is primarily an execution of known items from the design phase of the project.

The Phase I drawing shows the site and its property lines as well as the surrounding roadways. The general configuration of the parking is also shown. At this point the only architectural site feature shown is the preliminary outline of the concrete walk.

The drawing is next given its title and scale, and information in the title block is filled in properly. With this information complete, the site plan is now at a stage of completion that will allow the engineering consultants to begin more serious work on their parts of the construction document set.





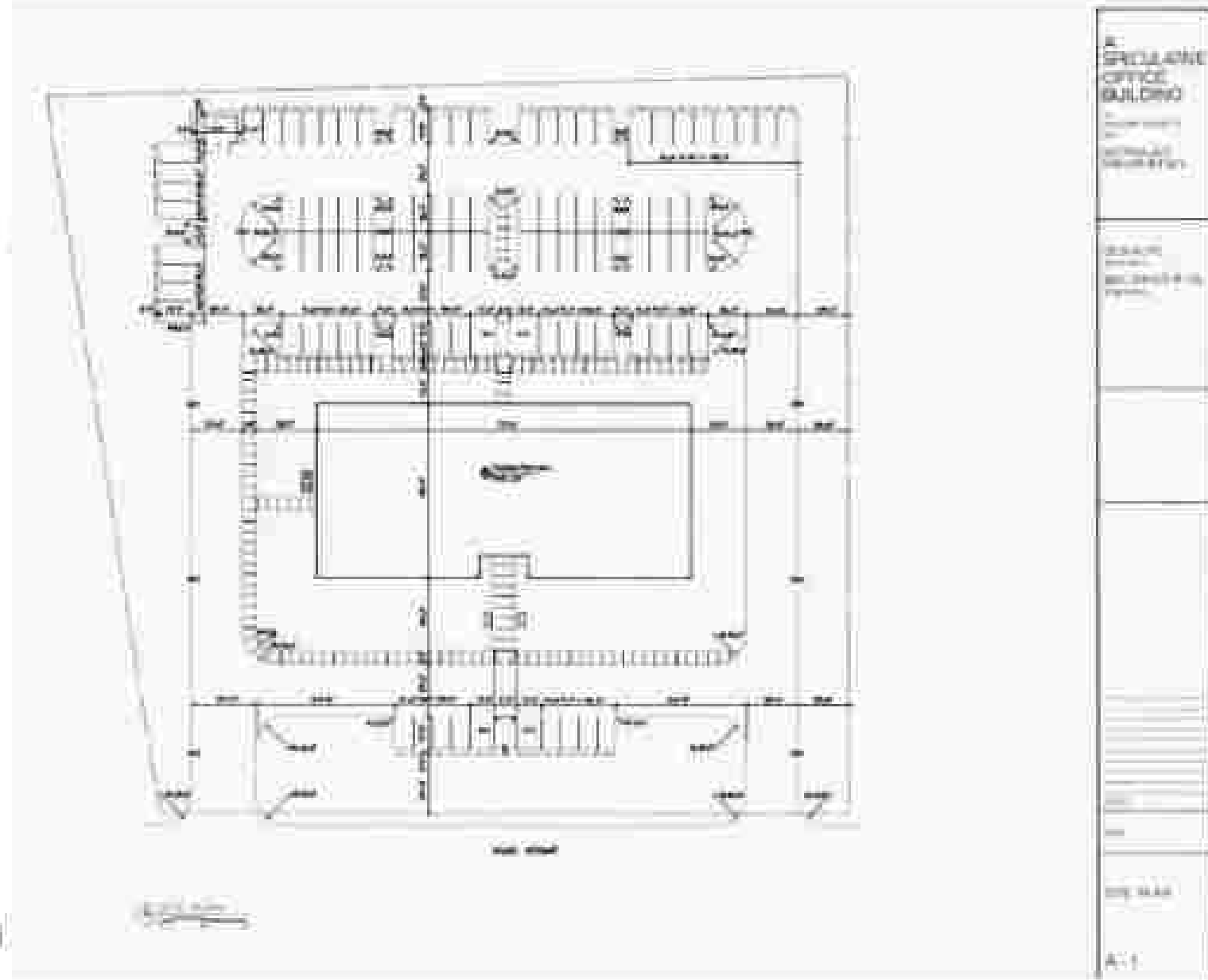
A. RESOLUTIVE OFFICE BUILDING <small>Scale: 1/8" = 1'-0"</small> NOVEMBER 1968
<small>Scale: 1/8" = 1'-0"</small> NOVEMBER 1968
NOV 1968 <small>1/8" = 1'-0"</small>
A-1

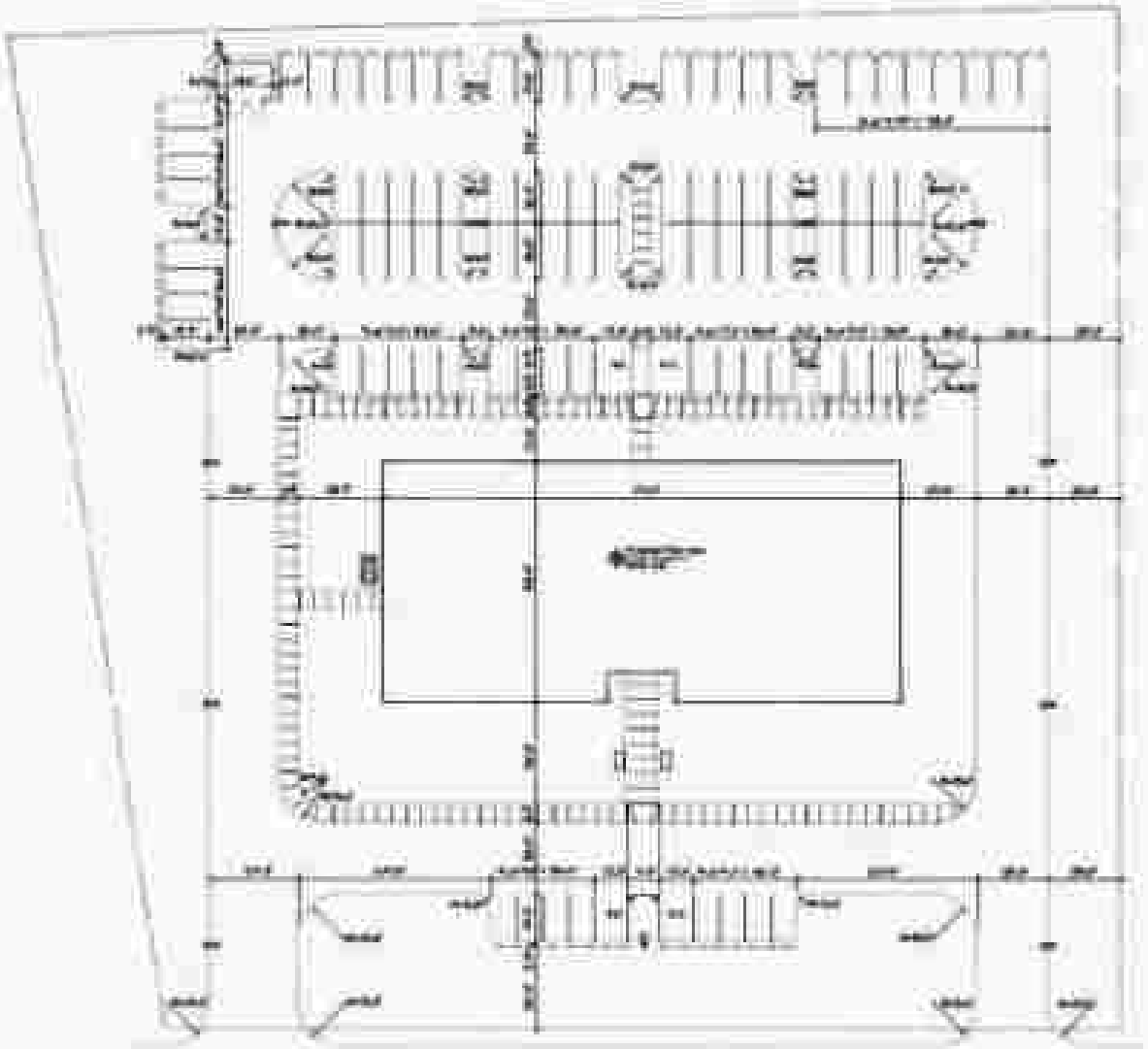
Phase 2

The second phase of the site plan documentation reflects a substantial step forward in terms of drawing refinement. The parking areas are completed and dimensioned (including radius information).

The concrete walks are dimensioned and noted, and some of the architectural features such as benches are added.

Engineering features that will have a direct impact on the architectural nature of the project are added to the drawing at this stage. These include the locations of the transformer as well as site lighting.





1 1

1 1

A
SPECULATIVE
OFFICE
BUILDING

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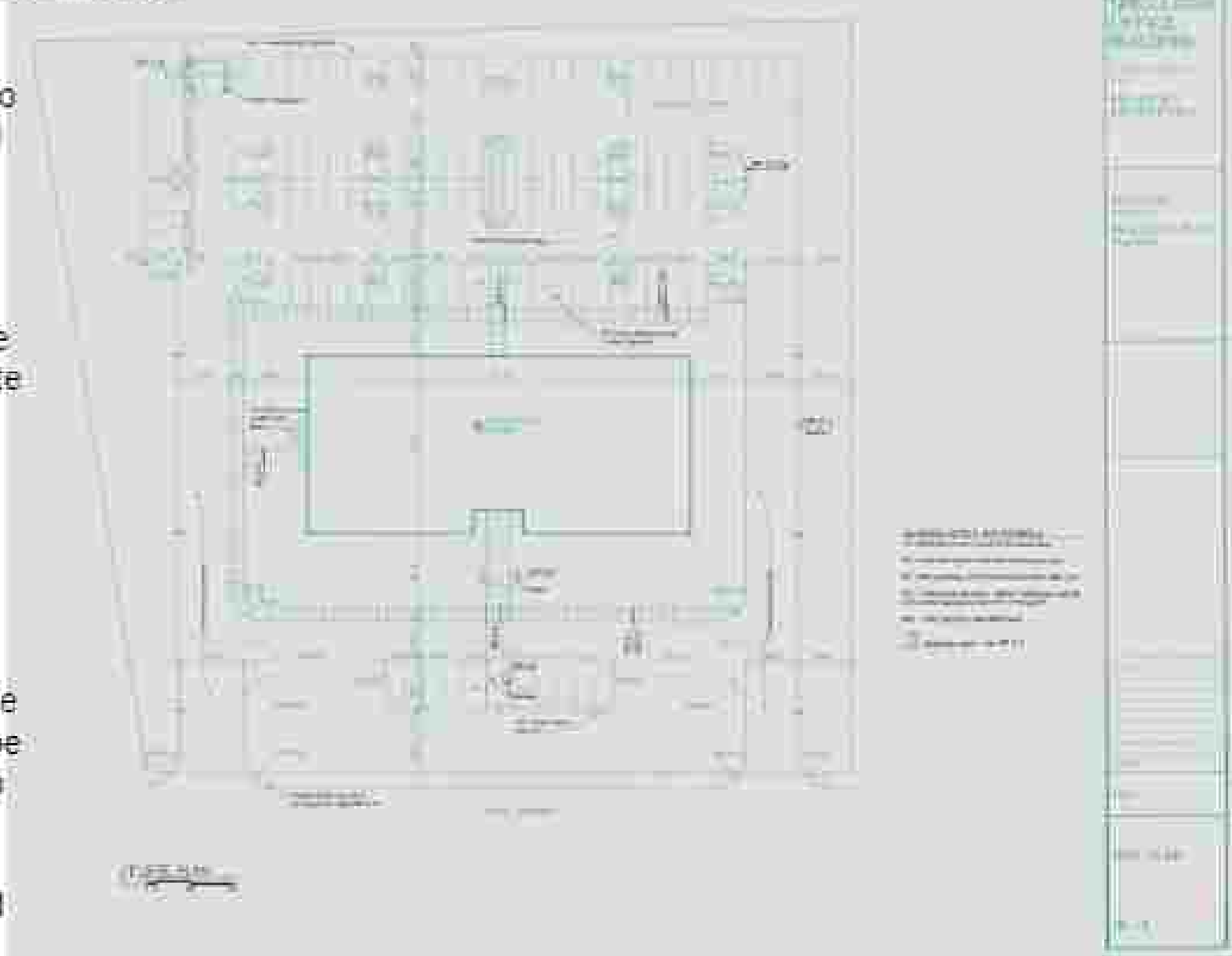
1 1

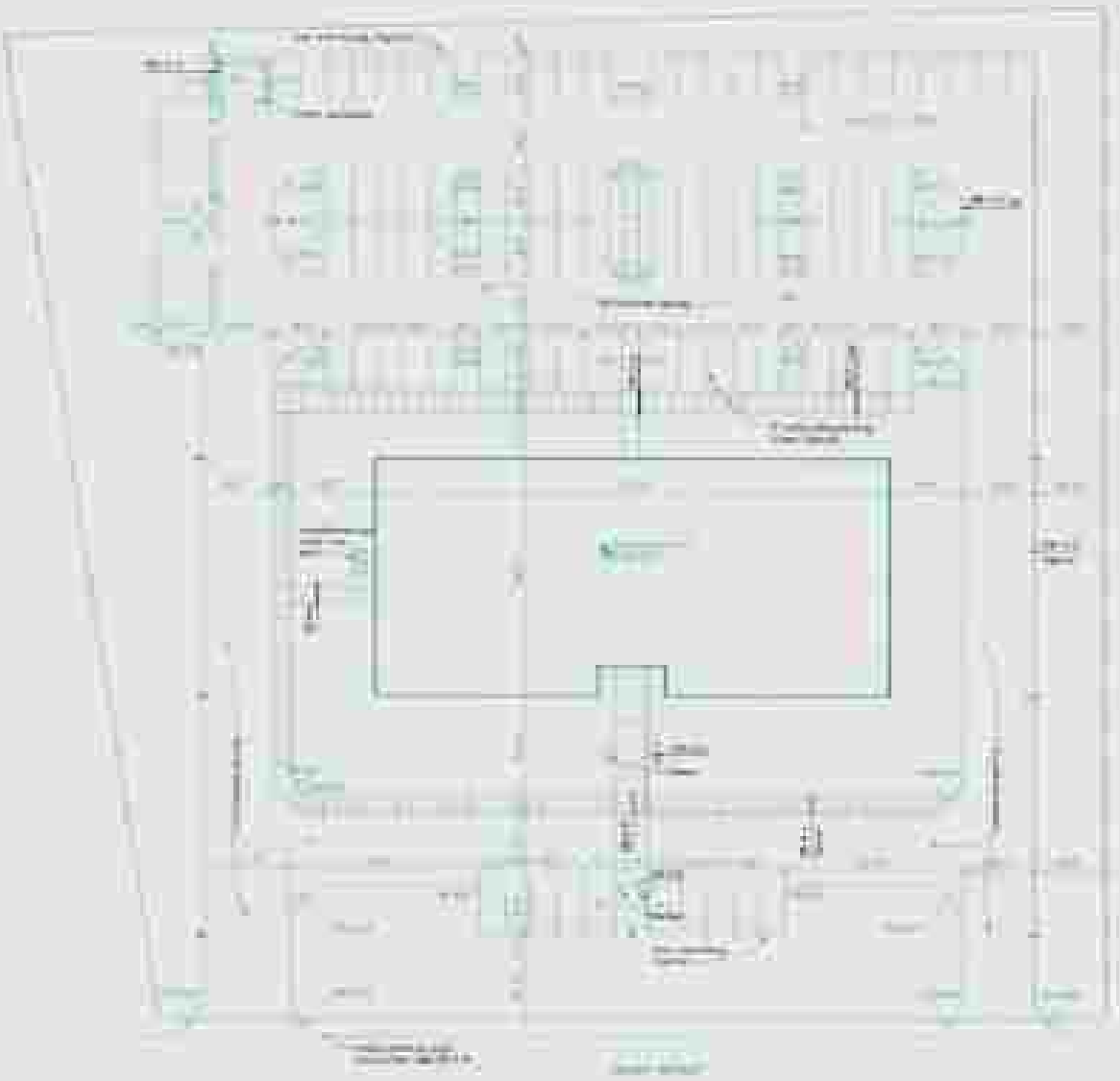
1 1

Phase III

Phase 3 reflects the addition of **notes**, **detail cuts**, and **material indications**. The amount of work needed to do material indications for a site plan is modest. If time is a constraint, material indications can be eliminated.

Detail cuts refer to details that would be drafted concurrent to the completion of the site plan. We are assuming that the grading for the site is by an outside consultant. Therefore, references to items such as manholes and catch basins are not included. If the grading were to be incorporated onto the architectural site plan, these items would need to be included.





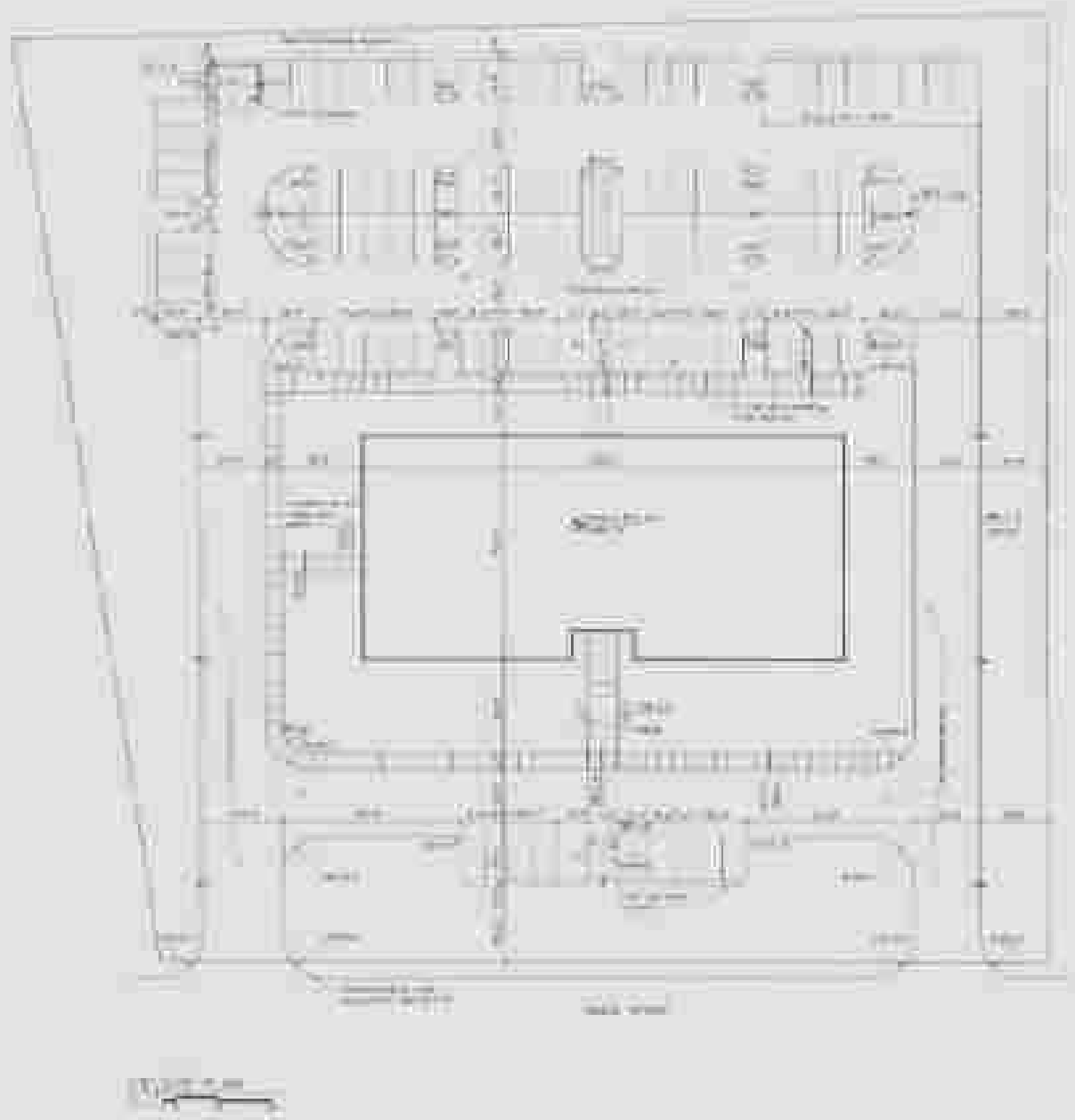
Hand-drawn floor plan of a building with a central hall and several rooms. The drawing is annotated with green lines and arrows, likely representing a fire evacuation route. A north arrow is located at the bottom left of the plan.

Room No.	Room Name	Area (sq. ft.)	Volume (cu. ft.)	Weight (kg)	Weight (lb)	Weight (ton)
1	Room 1	100	2700	1000	2200	1.1
2	Room 2	100	2700	1000	2200	1.1
3	Room 3	100	2700	1000	2200	1.1
4	Room 4	100	2700	1000	2200	1.1
5	Room 5	100	2700	1000	2200	1.1
6	Room 6	100	2700	1000	2200	1.1
7	Room 7	100	2700	1000	2200	1.1
8	Room 8	100	2700	1000	2200	1.1
9	Room 9	100	2700	1000	2200	1.1
10	Room 10	100	2700	1000	2200	1.1
11	Room 11	100	2700	1000	2200	1.1
12	Room 12	100	2700	1000	2200	1.1
13	Room 13	100	2700	1000	2200	1.1
14	Room 14	100	2700	1000	2200	1.1
15	Room 15	100	2700	1000	2200	1.1
16	Room 16	100	2700	1000	2200	1.1
17	Room 17	100	2700	1000	2200	1.1
18	Room 18	100	2700	1000	2200	1.1
19	Room 19	100	2700	1000	2200	1.1
20	Room 20	100	2700	1000	2200	1.1
21	Room 21	100	2700	1000	2200	1.1
22	Room 22	100	2700	1000	2200	1.1
23	Room 23	100	2700	1000	2200	1.1
24	Room 24	100	2700	1000	2200	1.1
25	Room 25	100	2700	1000	2200	1.1
26	Room 26	100	2700	1000	2200	1.1
27	Room 27	100	2700	1000	2200	1.1
28	Room 28	100	2700	1000	2200	1.1
29	Room 29	100	2700	1000	2200	1.1
30	Room 30	100	2700	1000	2200	1.1
31	Room 31	100	2700	1000	2200	1.1
32	Room 32	100	2700	1000	2200	1.1
33	Room 33	100	2700	1000	2200	1.1
34	Room 34	100	2700	1000	2200	1.1
35	Room 35	100	2700	1000	2200	1.1
36	Room 36	100	2700	1000	2200	1.1
37	Room 37	100	2700	1000	2200	1.1
38	Room 38	100	2700	1000	2200	1.1
39	Room 39	100	2700	1000	2200	1.1
40	Room 40	100	2700	1000	2200	1.1
41	Room 41	100	2700	1000	2200	1.1
42	Room 42	100	2700	1000	2200	1.1
43	Room 43	100	2700	1000	2200	1.1
44	Room 44	100	2700	1000	2200	1.1
45	Room 45	100	2700	1000	2200	1.1
46	Room 46	100	2700	1000	2200	1.1
47	Room 47	100	2700	1000	2200	1.1
48	Room 48	100	2700	1000	2200	1.1
49	Room 49	100	2700	1000	2200	1.1
50	Room 50	100	2700	1000	2200	1.1
51	Room 51	100	2700	1000	2200	1.1
52	Room 52	100	2700	1000	2200	1.1
53	Room 53	100	2700	1000	2200	1.1
54	Room 54	100	2700	1000	2200	1.1
55	Room 55	100	2700	1000	2200	1.1
56	Room 56	100	2700	1000	2200	1.1
57	Room 57	100	2700	1000	2200	1.1
58	Room 58	100	2700	1000	2200	1.1
59	Room 59	100	2700	1000	2200	1.1
60	Room 60	100	2700	1000	2200	1.1
61	Room 61	100	2700	1000	2200	1.1
62	Room 62	100	2700	1000	2200	1.1
63	Room 63	100	2700	1000	2200	1.1
64	Room 64	100	2700	1000	2200	1.1
65	Room 65	100	2700	1000	2200	1.1
66	Room 66	100	2700	1000	2200	1.1
67	Room 67	100	2700	1000	2200	1.1
68	Room 68	100	2700	1000	2200	1.1
69	Room 69	100	2700	1000	2200	1.1
70	Room 70	100	2700	1000	2200	1.1
71	Room 71	100	2700	1000	2200	1.1
72	Room 72	100	2700	1000	2200	1.1
73	Room 73	100	2700	1000	2200	1.1
74	Room 74	100	2700	1000	2200	1.1
75	Room 75	100	2700	1000	2200	1.1
76	Room 76	100	2700	1000	2200	1.1
77	Room 77	100	2700	1000	2200	1.1
78	Room 78	100	2700	1000	2200	1.1
79	Room 79	100	2700	1000	2200	1.1
80	Room 80	100	2700	1000	2200	1.1
81	Room 81	100	2700	1000	2200	1.1
82	Room 82	100	2700	1000	2200	1.1
83	Room 83	100	2700	1000	2200	1.1
84	Room 84	100	2700	1000	2200	1.1
85	Room 85	100	2700	1000	2200	1.1
86	Room 86	100	2700	1000	2200	1.1
87	Room 87	100	2700	1000	2200	1.1
88	Room 88	100	2700	1000	2200	1.1
89	Room 89	100	2700	1000	2200	1.1
90	Room 90	100	2700	1000	2200	1.1
91	Room 91	100	2700	1000	2200	1.1
92	Room 92	100	2700	1000	2200	1.1
93	Room 93	100	2700	1000	2200	1.1
94	Room 94	100	2700	1000	2200	1.1
95	Room 95	100	2700	1000	2200	1.1
96	Room 96	100	2700	1000	2200	1.1
97	Room 97	100	2700	1000	2200	1.1
98	Room 98	100	2700	1000	2200	1.1
99	Room 99	100	2700	1000	2200	1.1
100	Room 100	100	2700	1000	2200	1.1

Completed Site Plan

- Miscellaneous notes are also added during this phase of the drawing. Included are the references to the soils report and to the survey.
- It is important to include descriptions of any items that might not have been detailed previously due to time constraints. The reason for this is simple:
 - When a set of construction documents is released for **bid**, the contractor **estimates** how much the project will **cost** to build based on the construction documents and the project specification.
 - Typically, a contractor will be hired based on the bid that is given. Contractors are reluctant to "**give away**" items that were not originally included in the construction documents.
 - Neither are owners generally anxious to spend more than the amount that was originally set forth in the contractor's bid.
- By including notes about un-detailed items, the architect is assured that an **allowance** will be made for each item, and that items will not have to be eliminated because of an oversight.
- You should check all documents at their final phase of completion, verifying all dimension strings and detail references.

Completed Site Plan

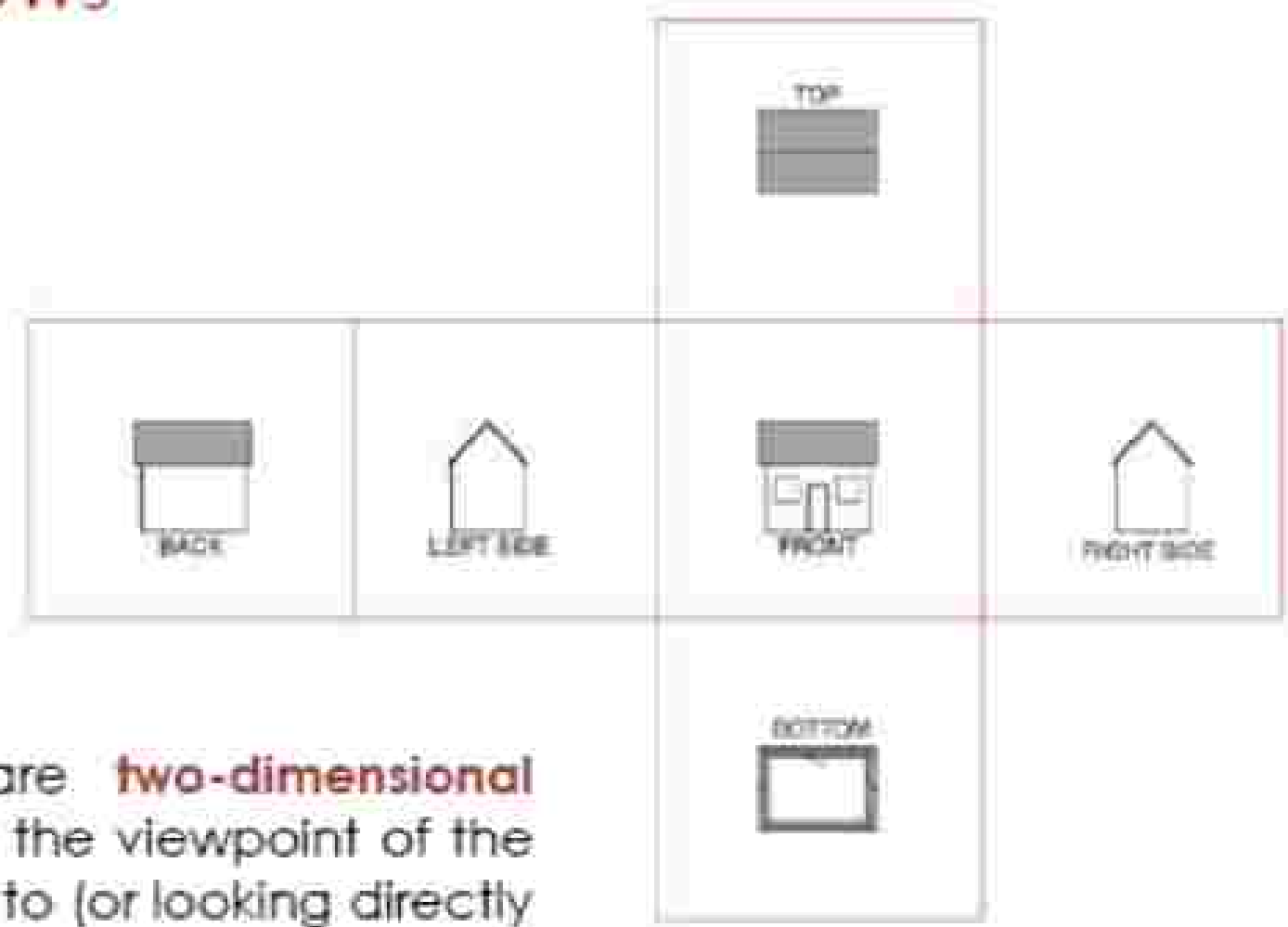


1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

| A. OPERATIVE SERVICE BUILDINGS | |
|---|--|
| 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. | |
| SHEET NO. | |
| DATE | |
| SCALE | |
| DRAWN BY | |
| CHECKED BY | |
| APPROVED BY | |
| TITLE | |
| PROJECT NO. | |
| SHEET NO. | |
| A-1 | |

Sections

Orthographic views



Orthographic Views are **two-dimensional views** of objects where the viewpoint of the object is at **right angles** to (or looking directly at) surfaces.

Orthographic views: 3d, section, elevation

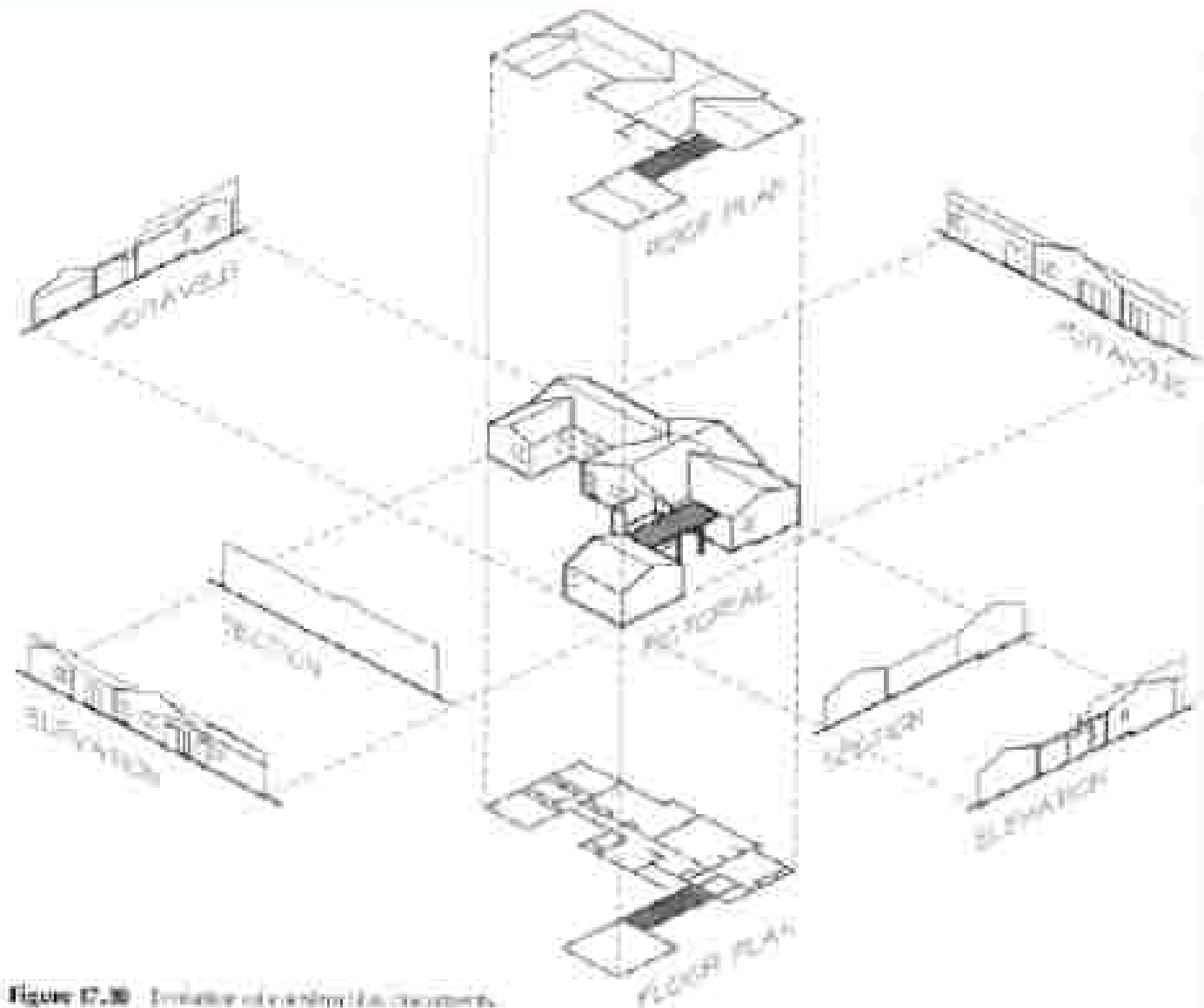
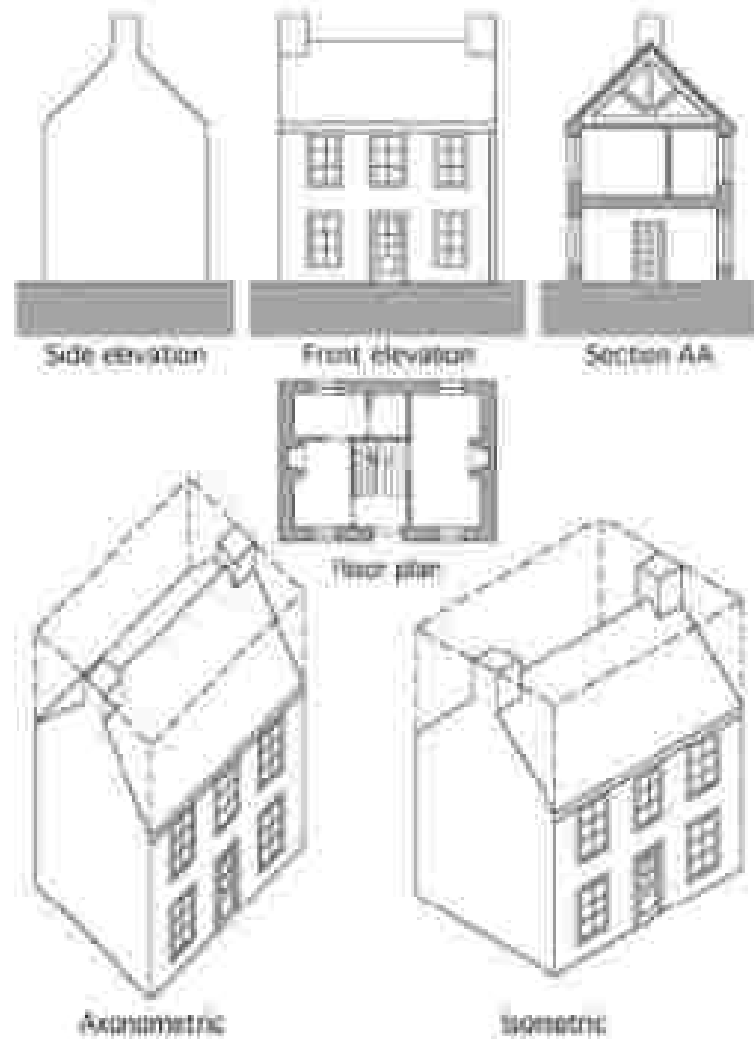


Figure 7.8 | Isometric view and its components.

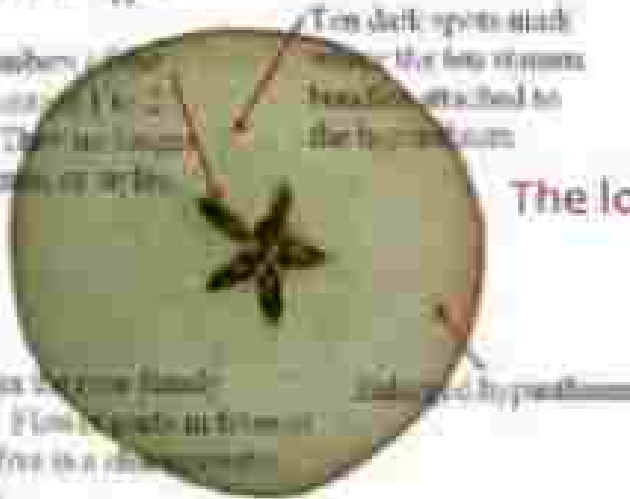
Orthographic views: 3d, section, elevation:



The Apple is classified as a Pome, which comes from the French word for apple

The five chambers (locules) of the fruit are attached to the receptacle. The locules are arranged in a star-like pattern.

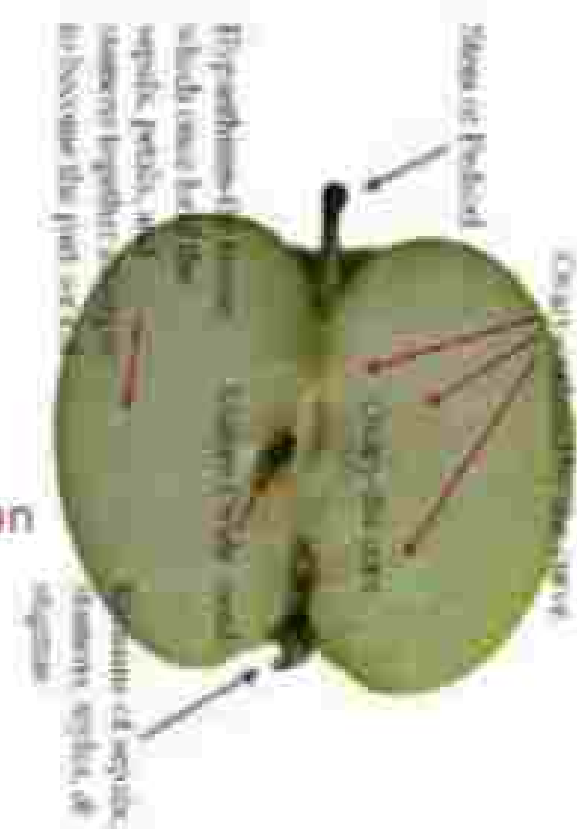
The apple is a member of the family Rosaceae. It is a member of the subfamily Maloideae. It is a member of the genus Malus.



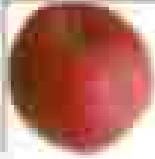
The longitudinal section

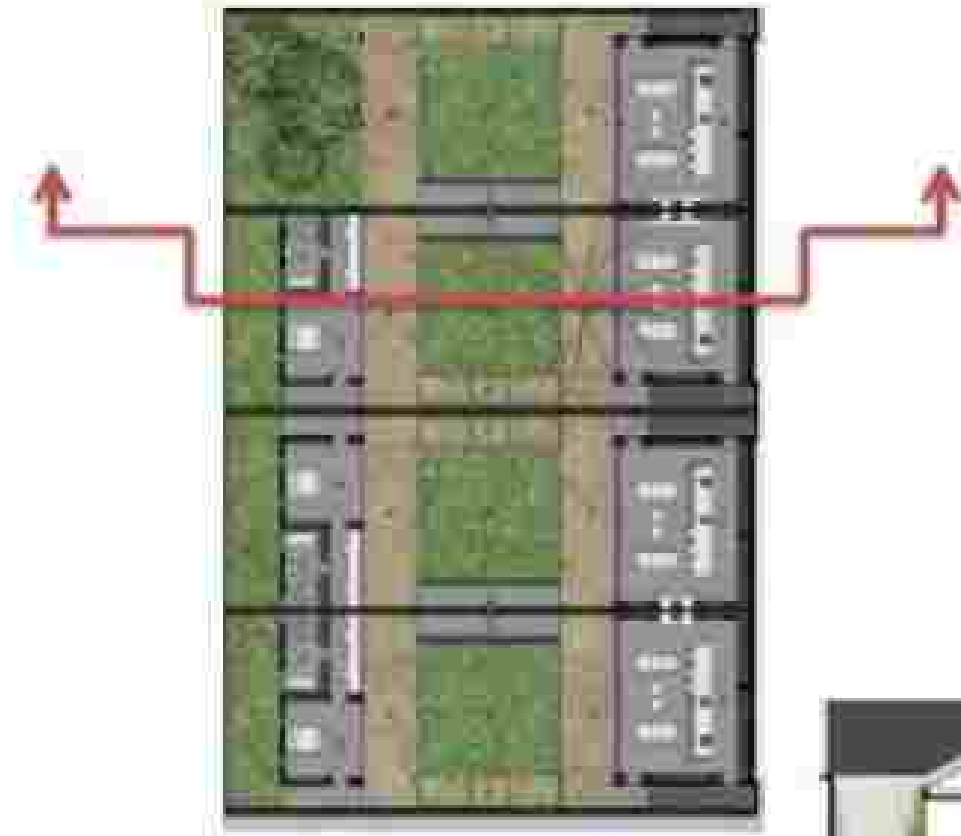


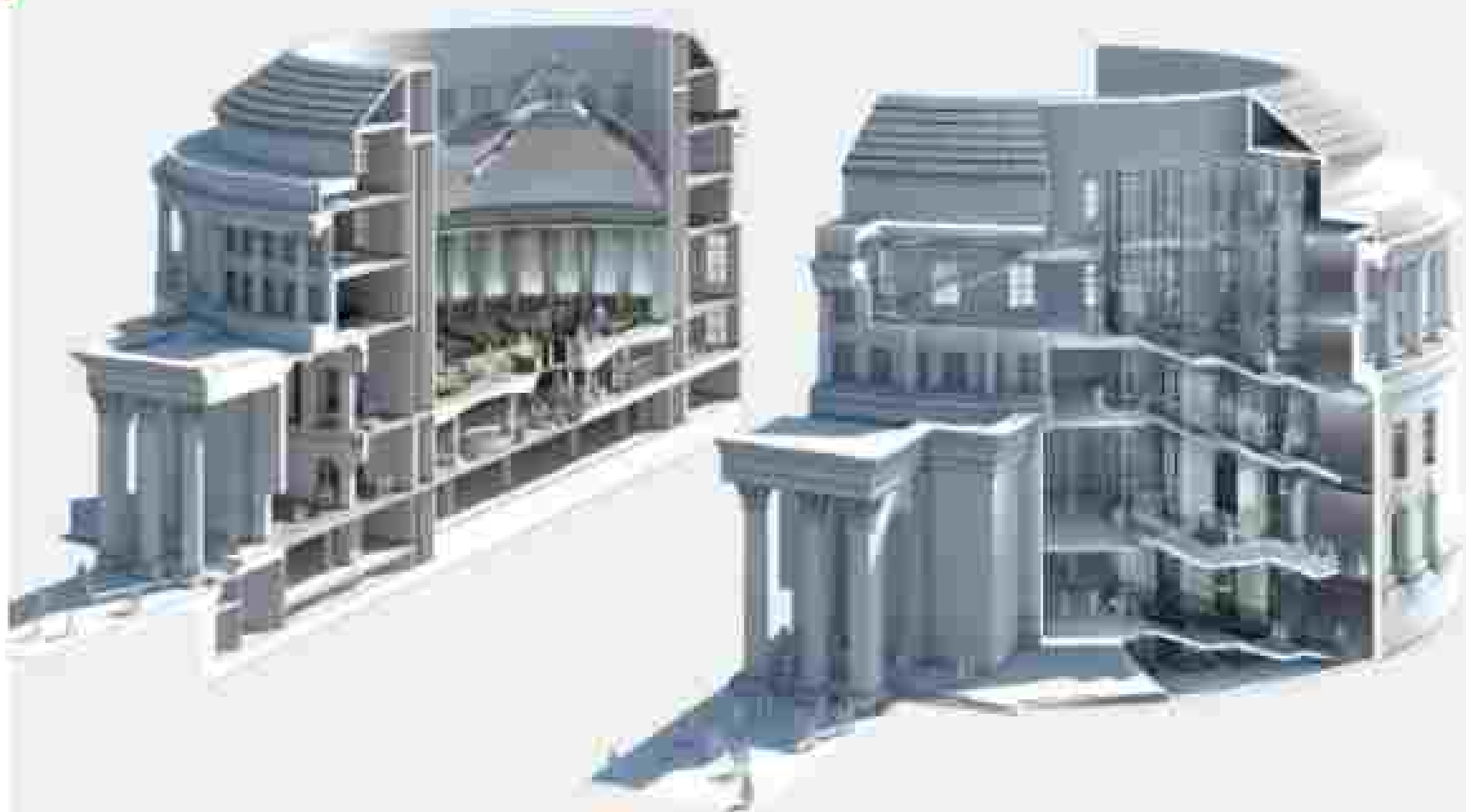
What is a cross-section?

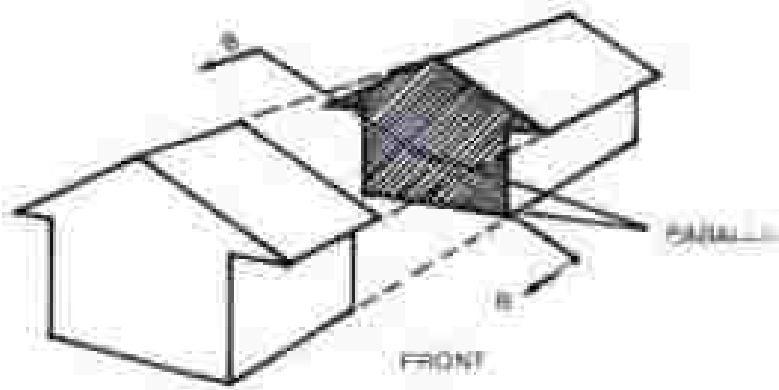
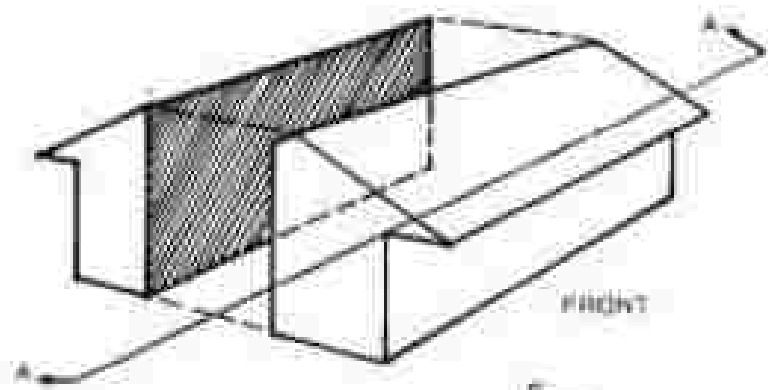


The cross section

From  to building...







Cross-section views

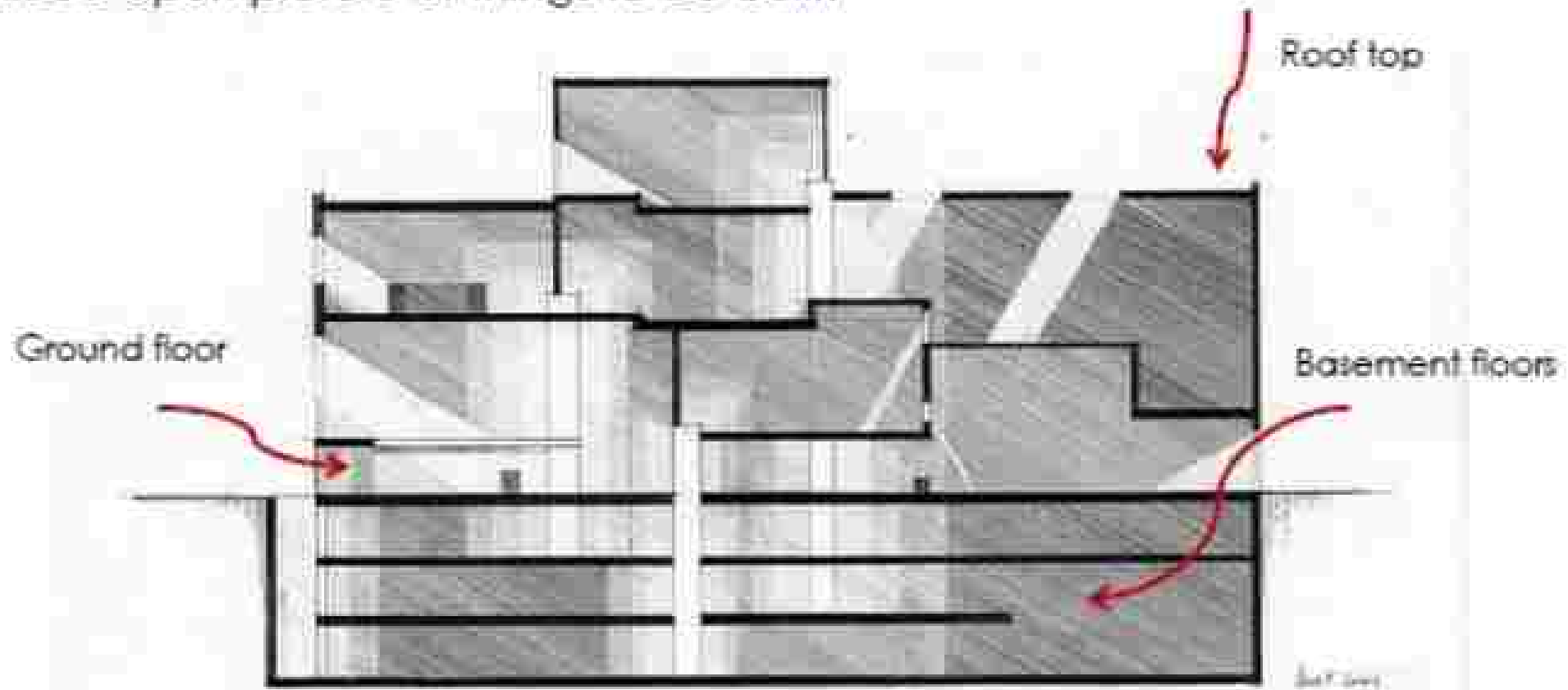


Definition

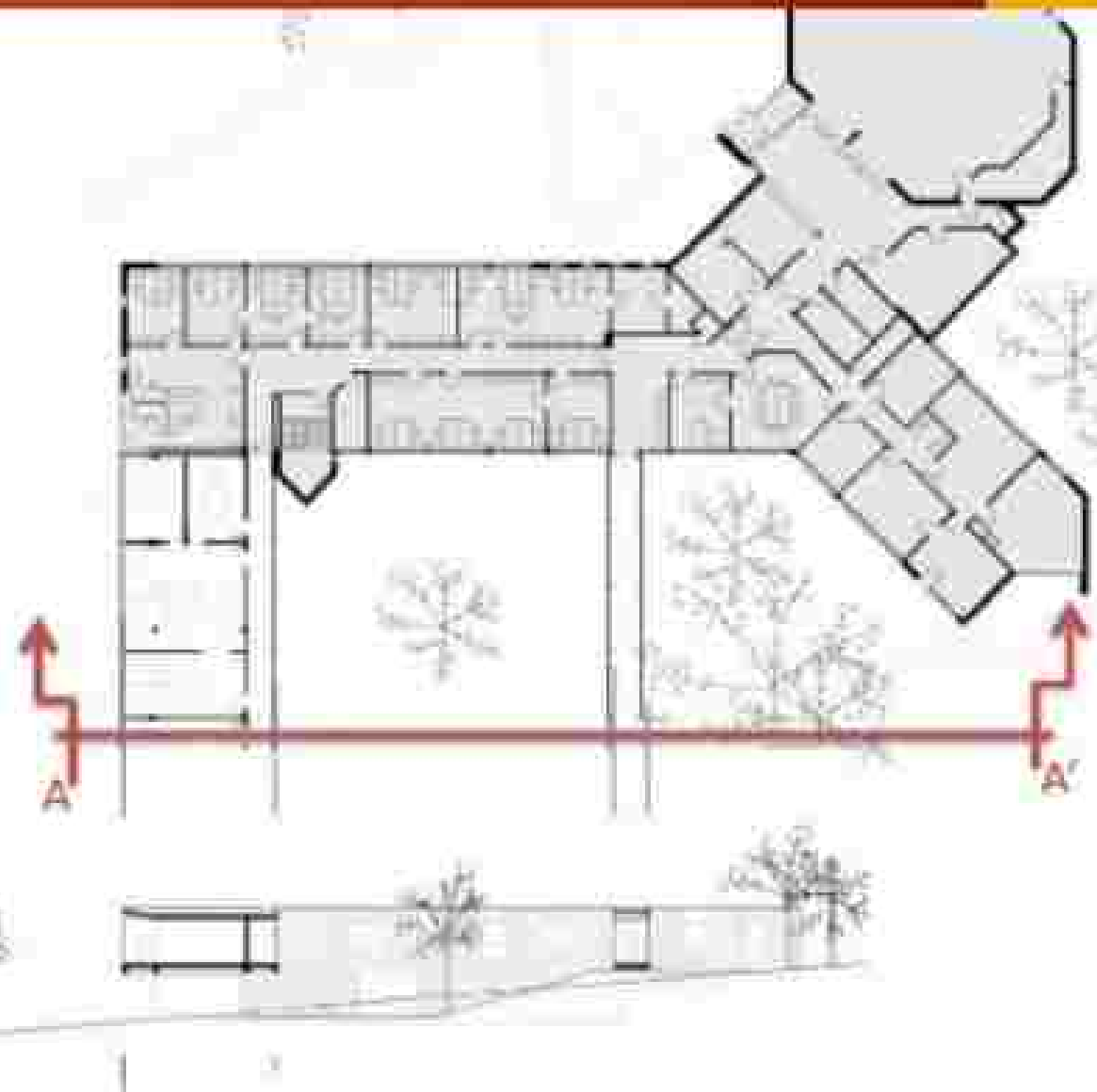
a representation of an object as it would appear if cut by a plane, showing its internal structure.

section

A cross sections, or, simply, section, or section view which diagram the sliced-open picture of things to-be-built.

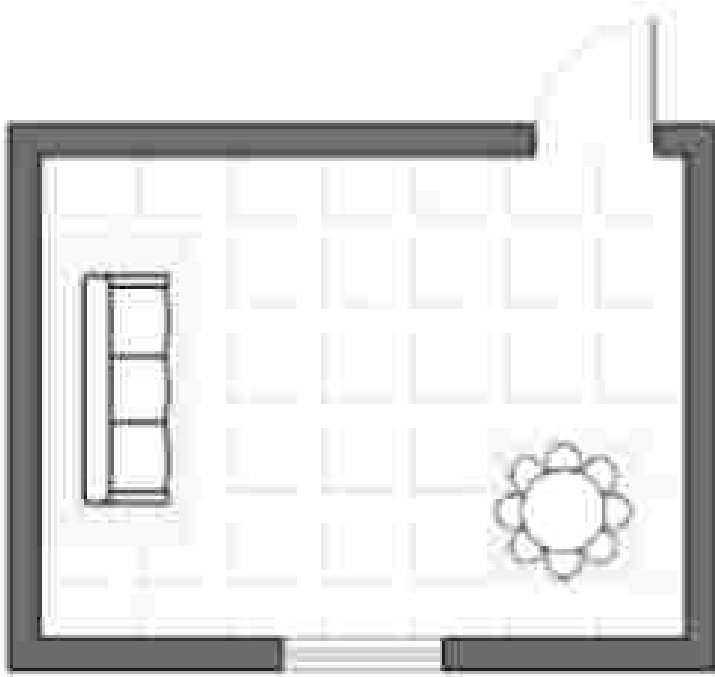


Drawing a section

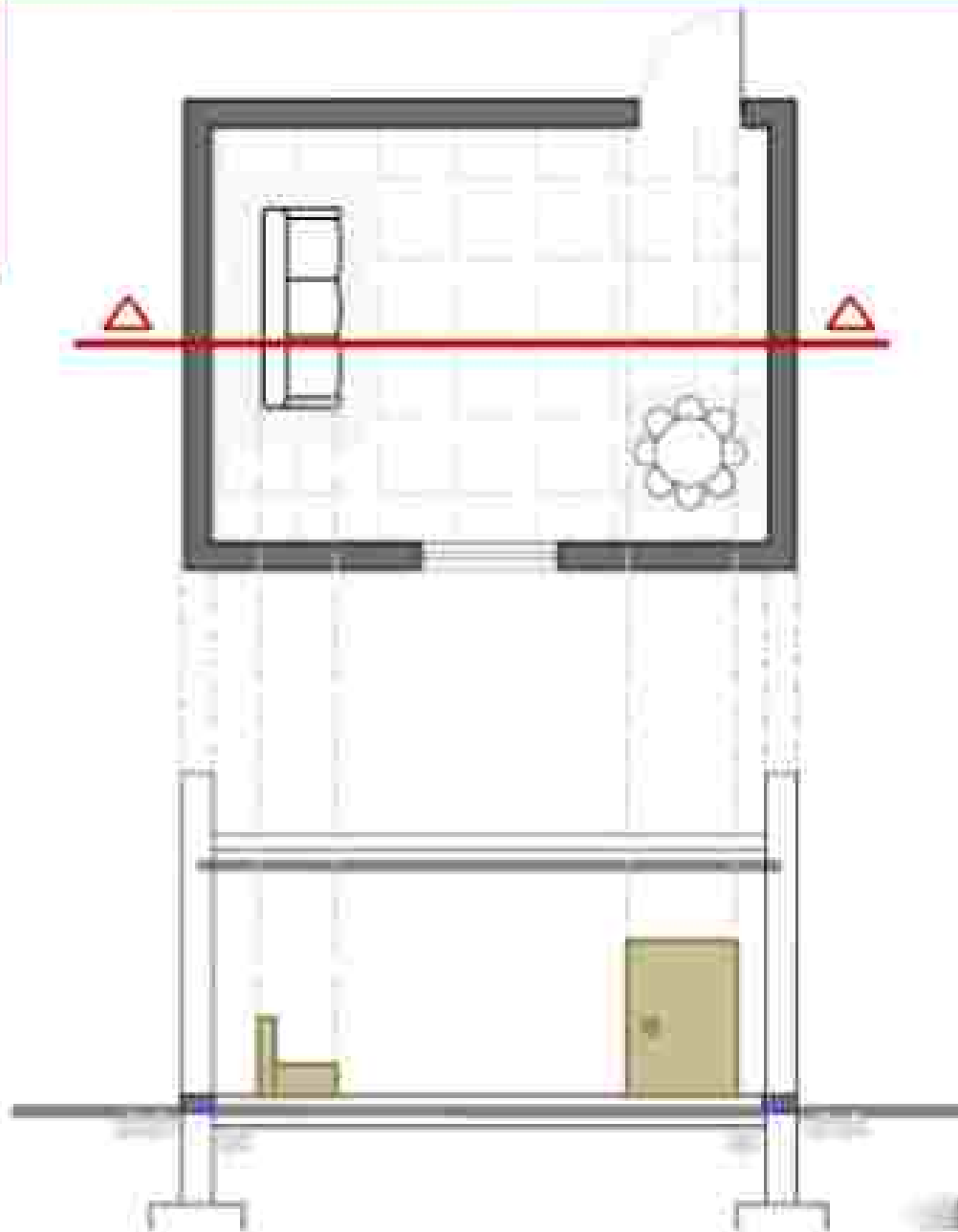


They are a way to, imaginary, cut through an object and create an orthographic view inside the object. It is as if the **object were cut in two**.

Drawing a section



Plan of a room



Decide the cutting plane

Depict the direction of the view with arrows

Take projection lines on GL.

Locate the height of the slab and parapet

Give foundation details

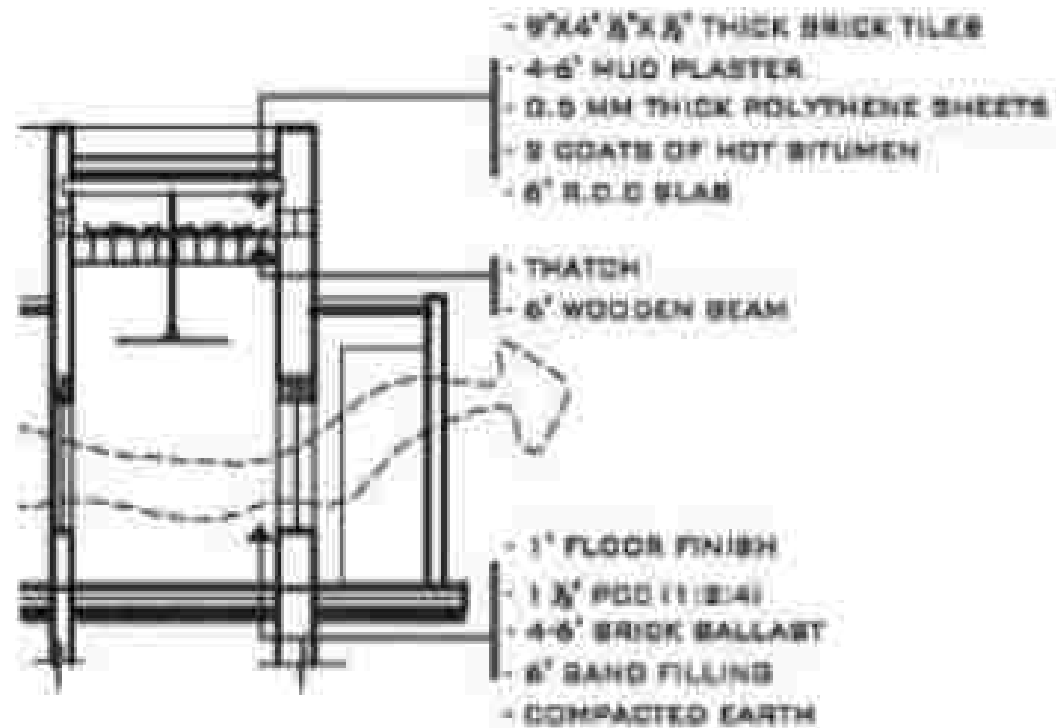
add floor and roof finishing details

Take construction lines for details

Darken the walls. Remove construction lines



Drawing a section



Typical floor and roof details

Graphics in a section drawing



All building components at section line are shown: *footings, foundations, walls, floors, ceilings, roofs, openings etc.*

All *areas of activity* are mentioned

Graphics in a section drawing

All the cut walls, roofs and surfaces are shown with darker lines

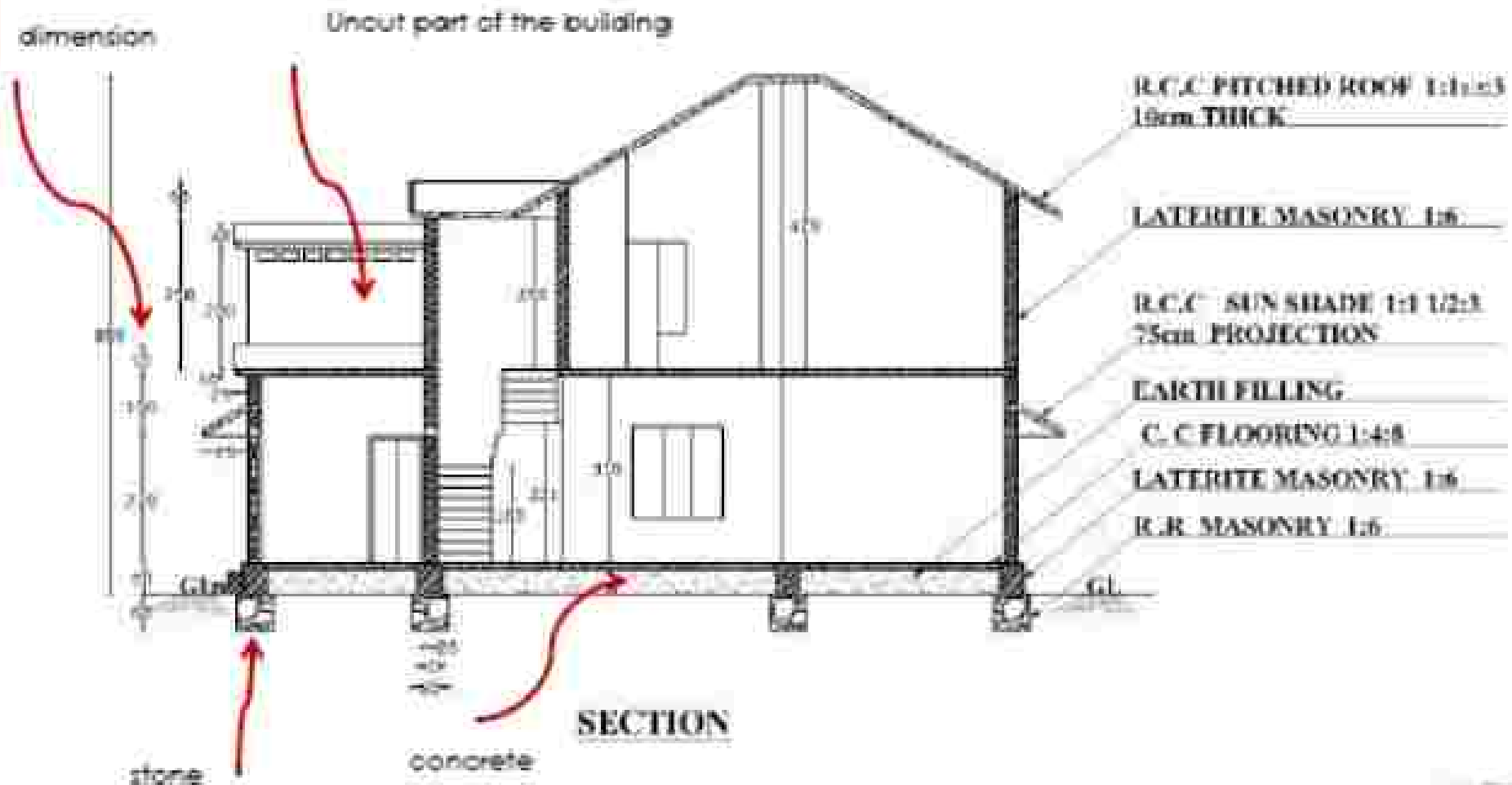
Necessary dimensions

Material depiction through hatching

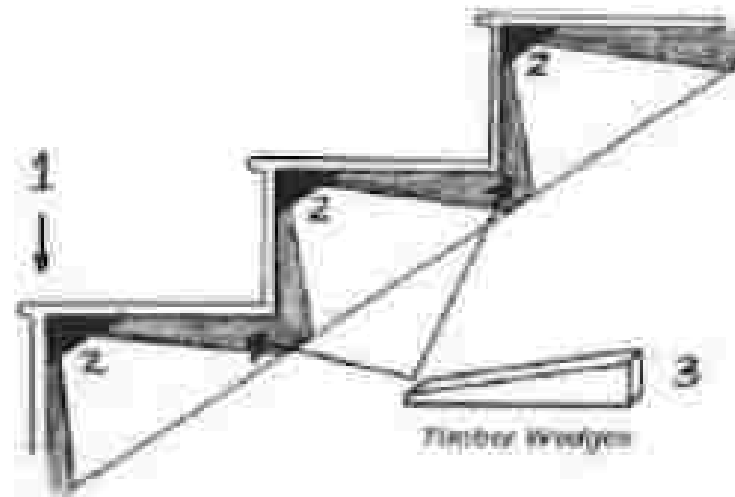
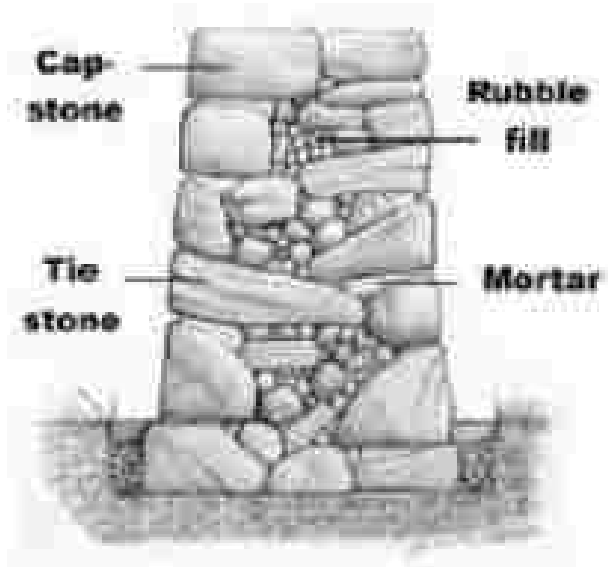
Interior details are shown with lesser line weight



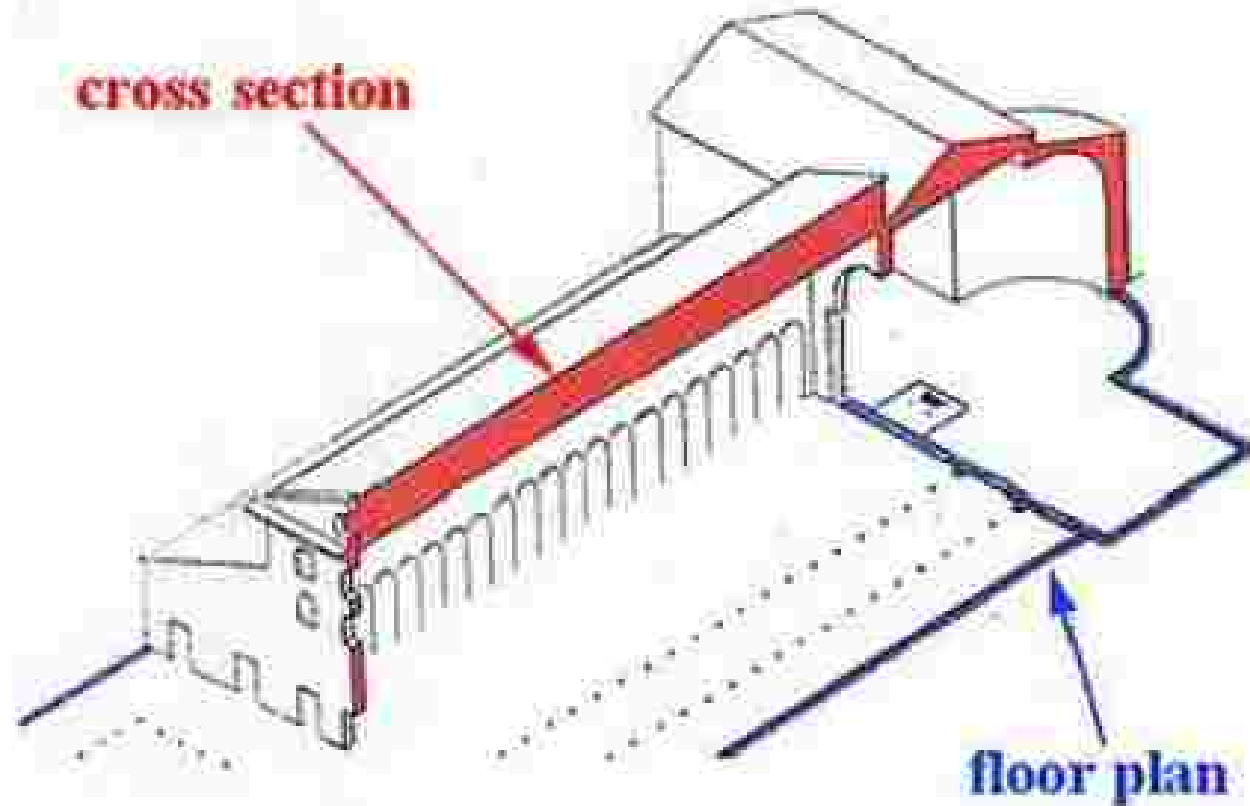
Graphics in a section drawing

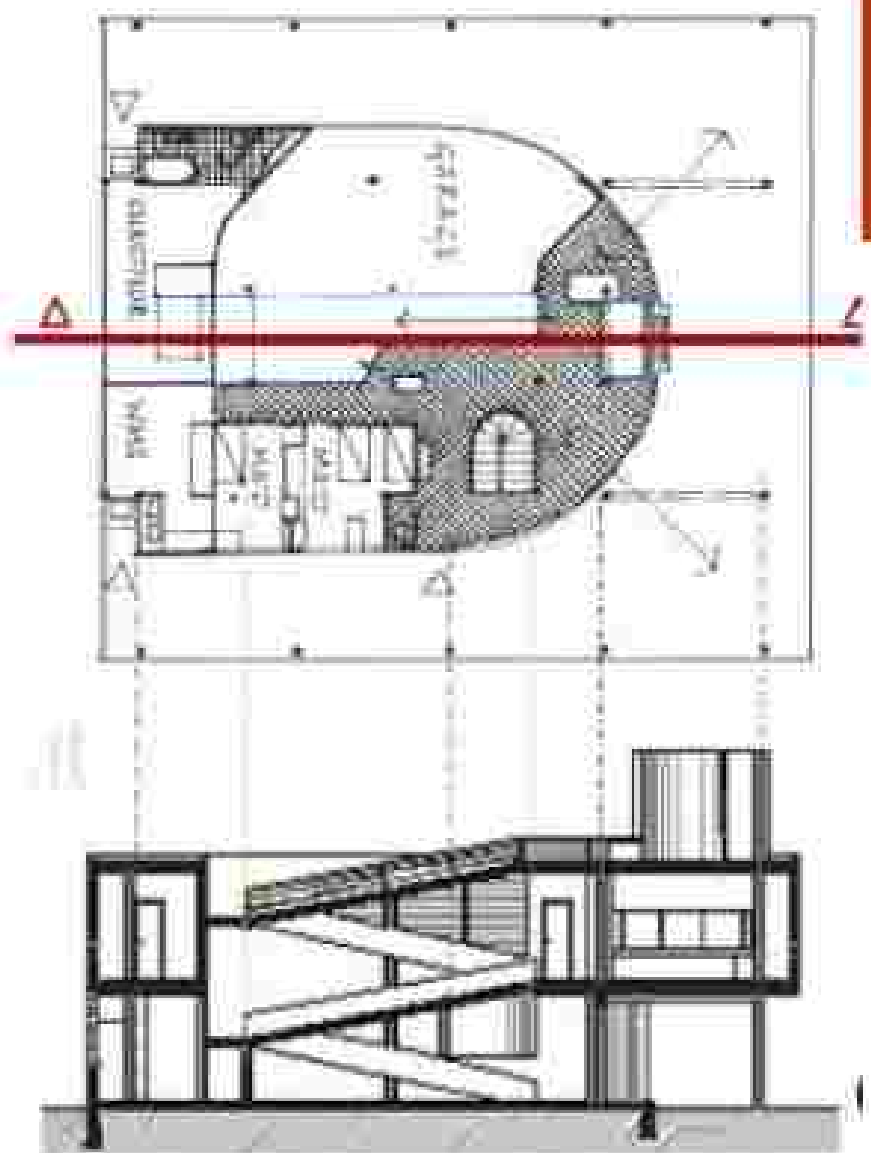


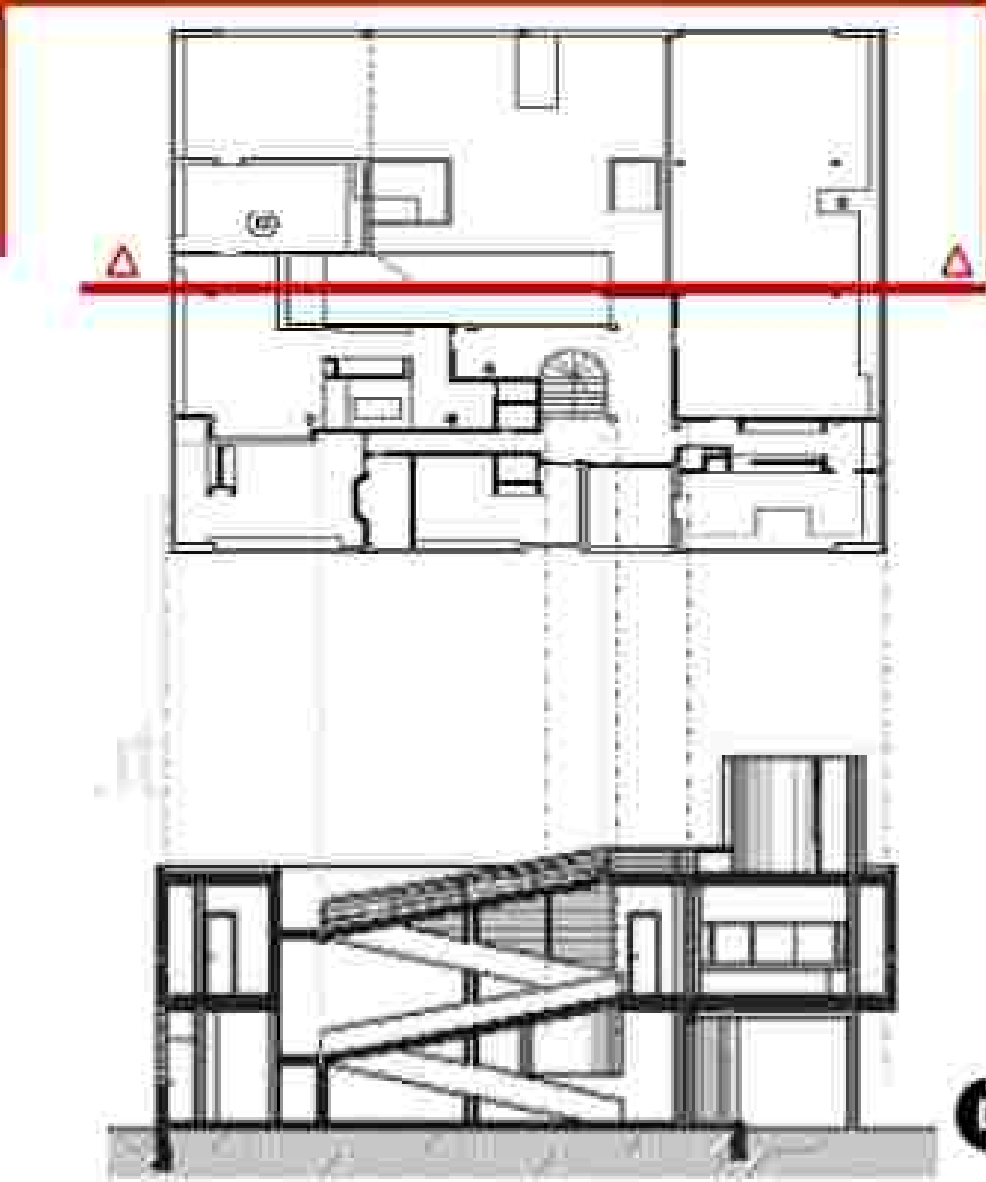
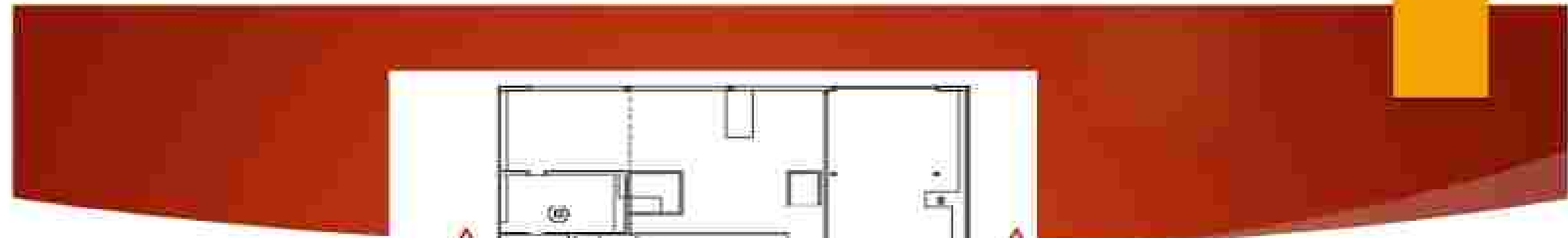
Detailed section

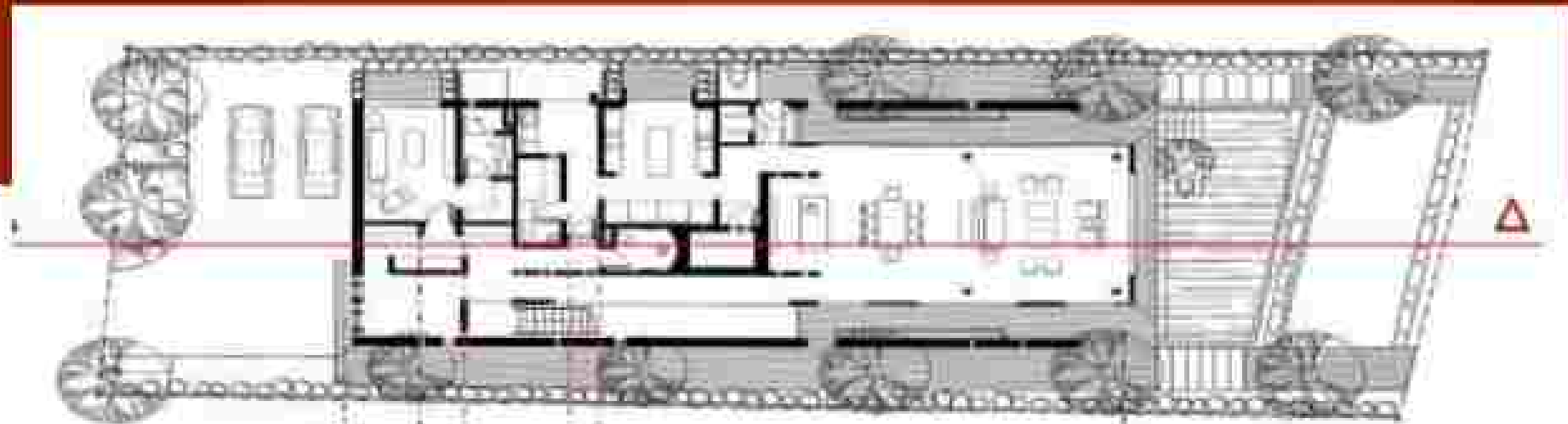


Section -examples





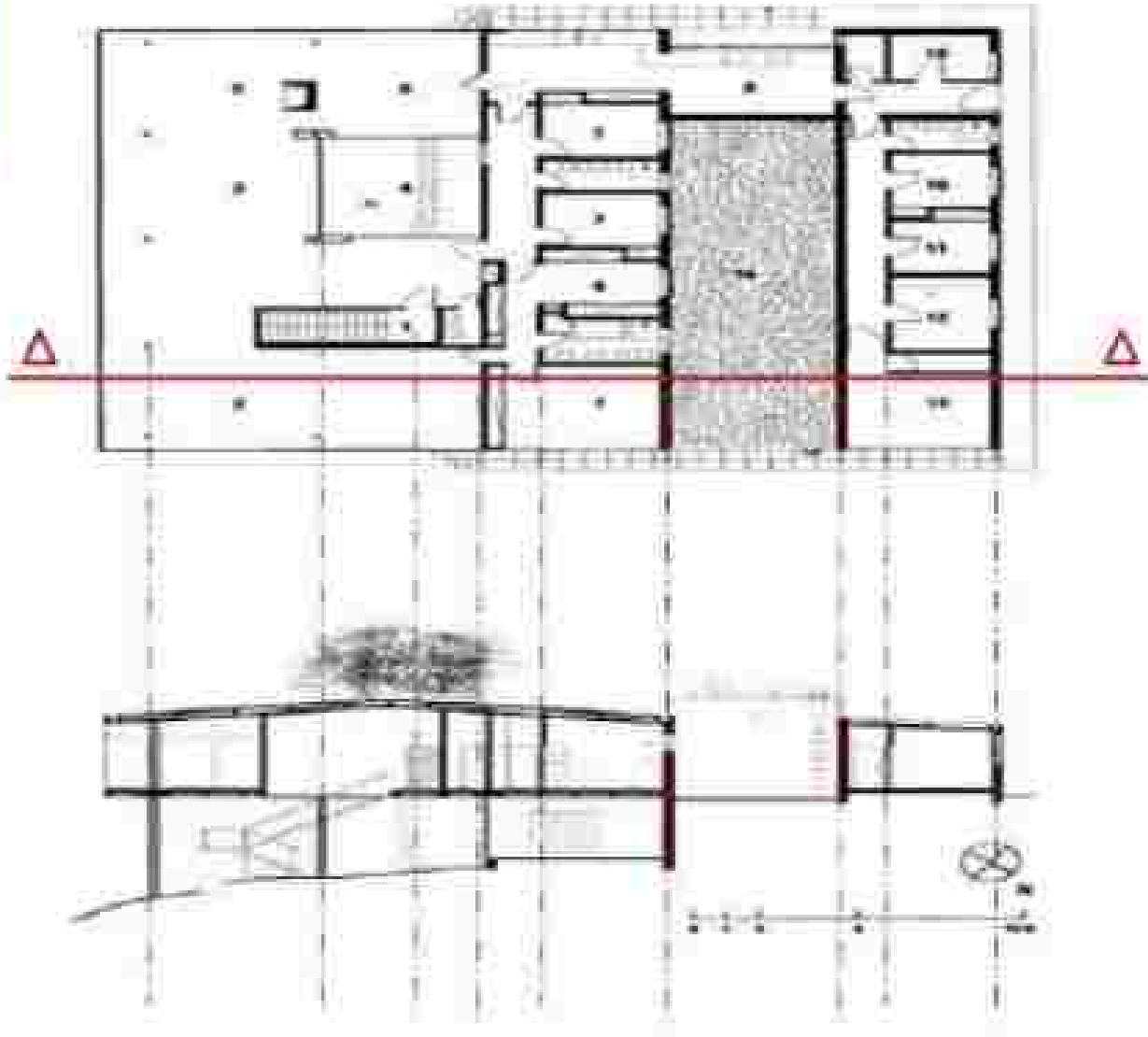




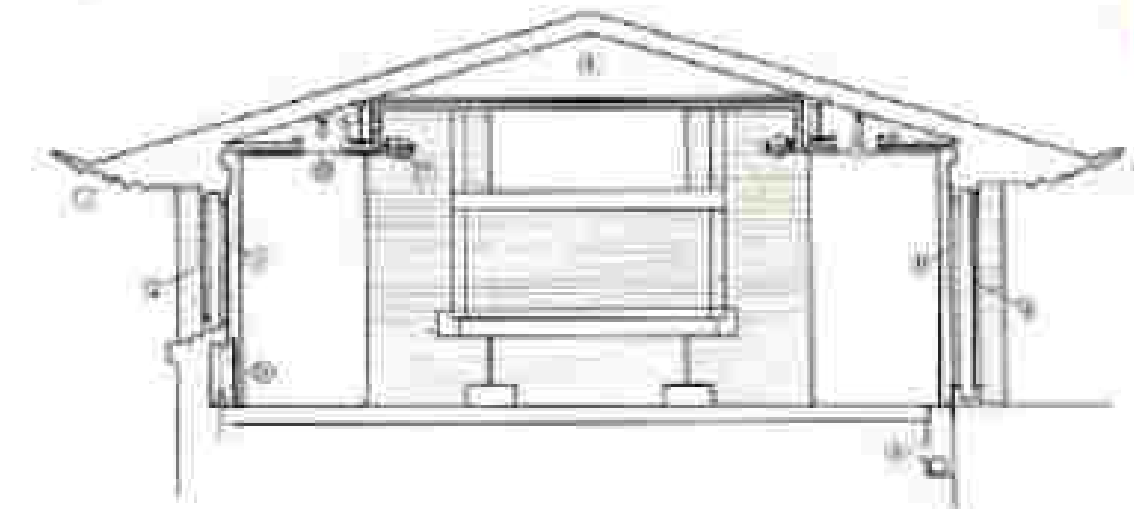
FIRST STOREY PLAN



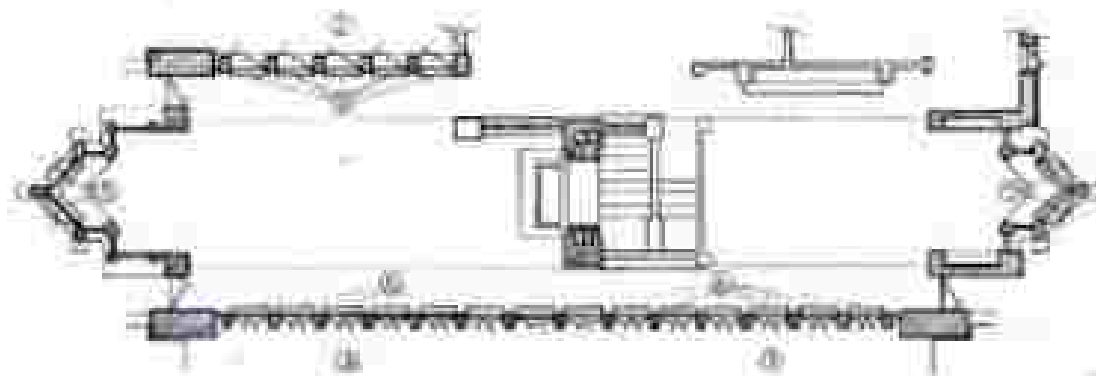
SECTION



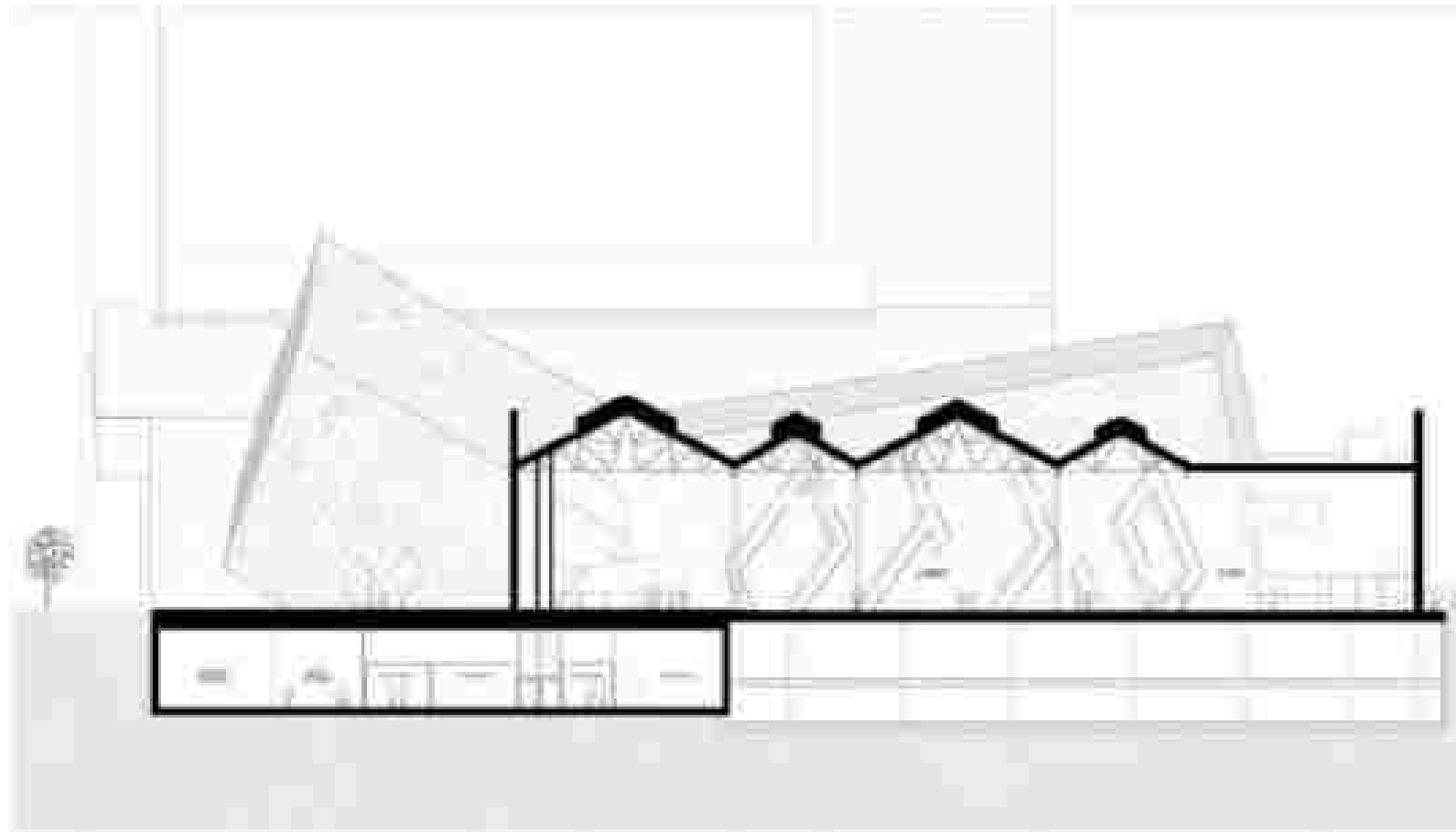
section - example



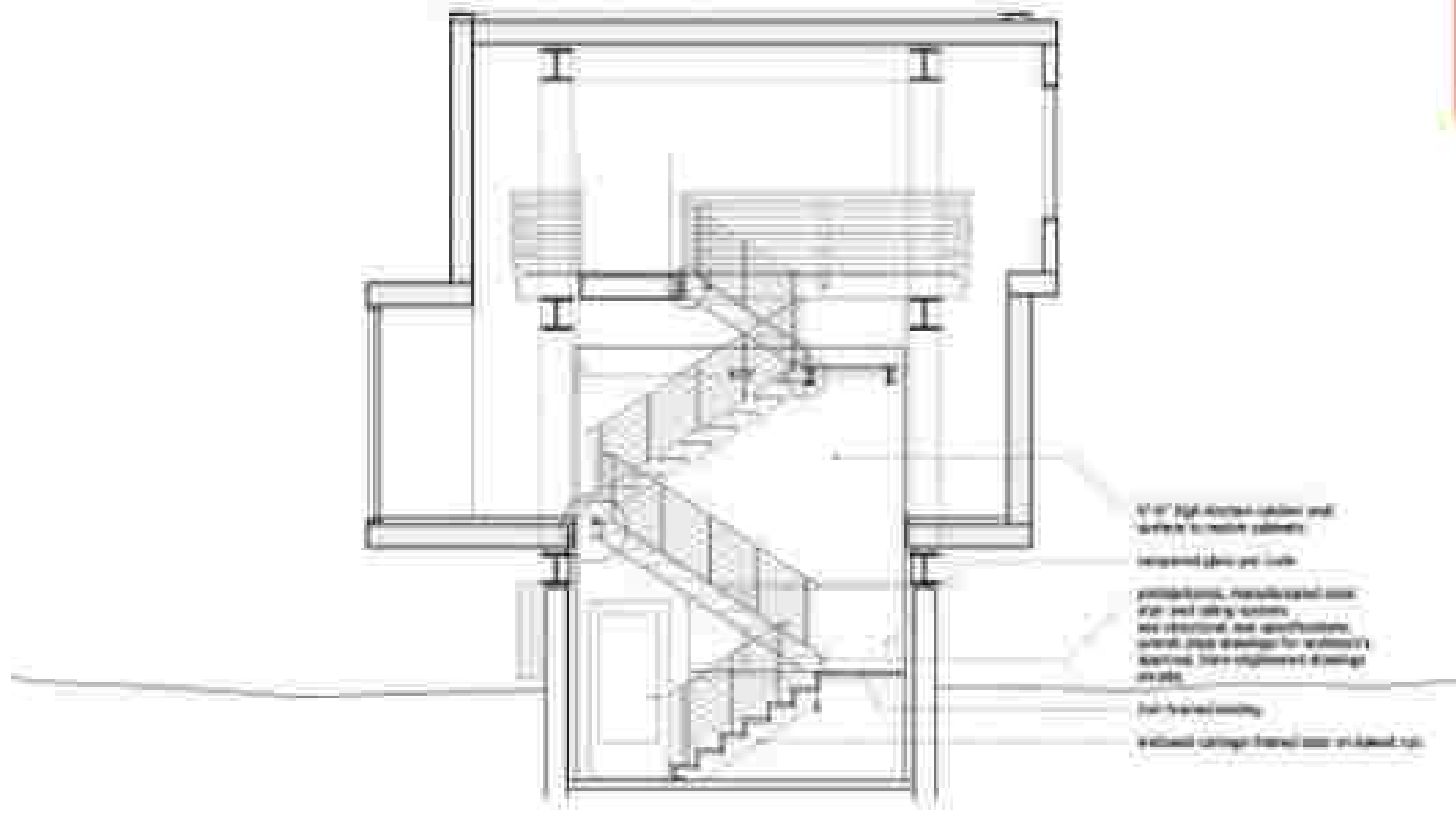
1:10
1/2" = 1'-0"



section - example

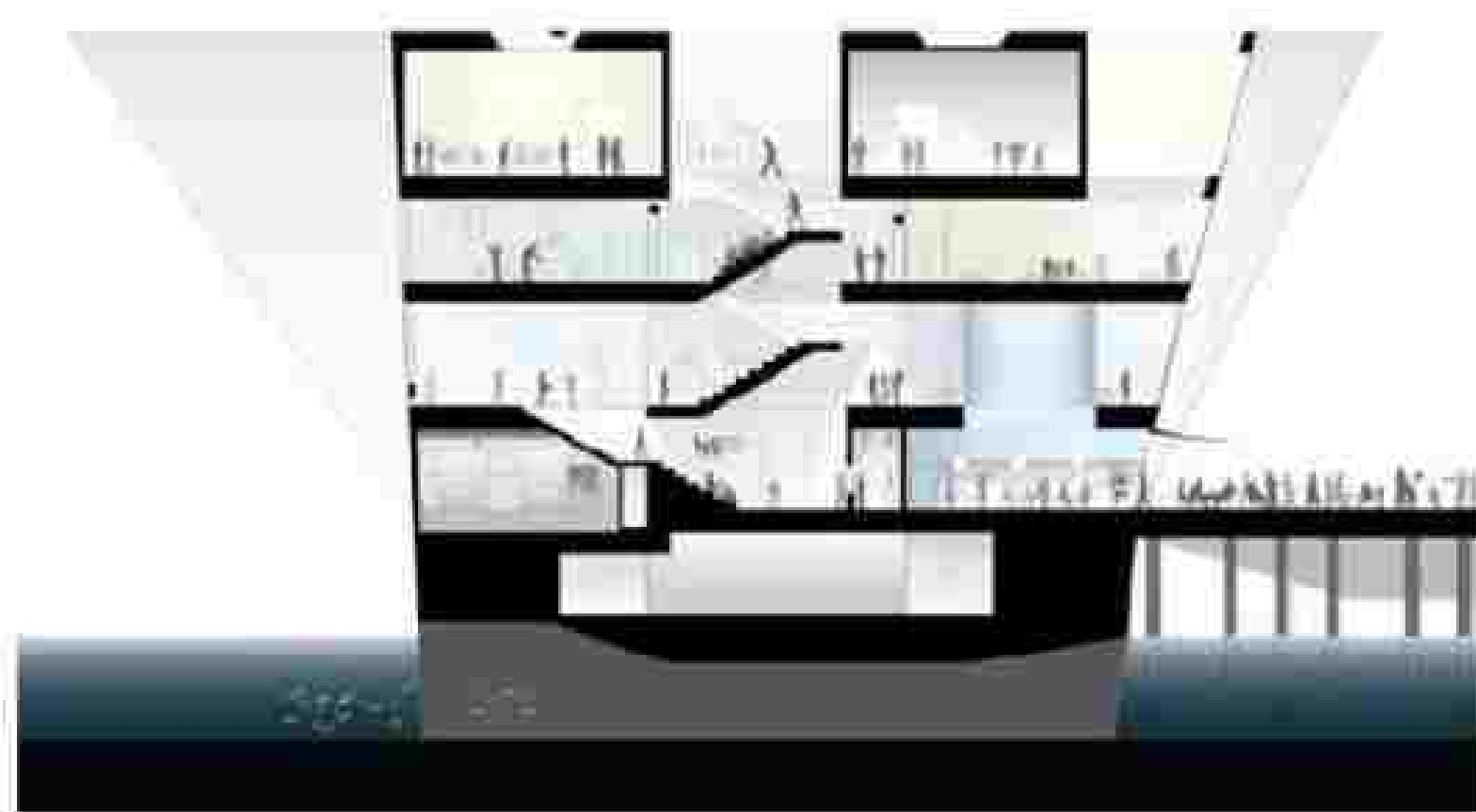


section - example



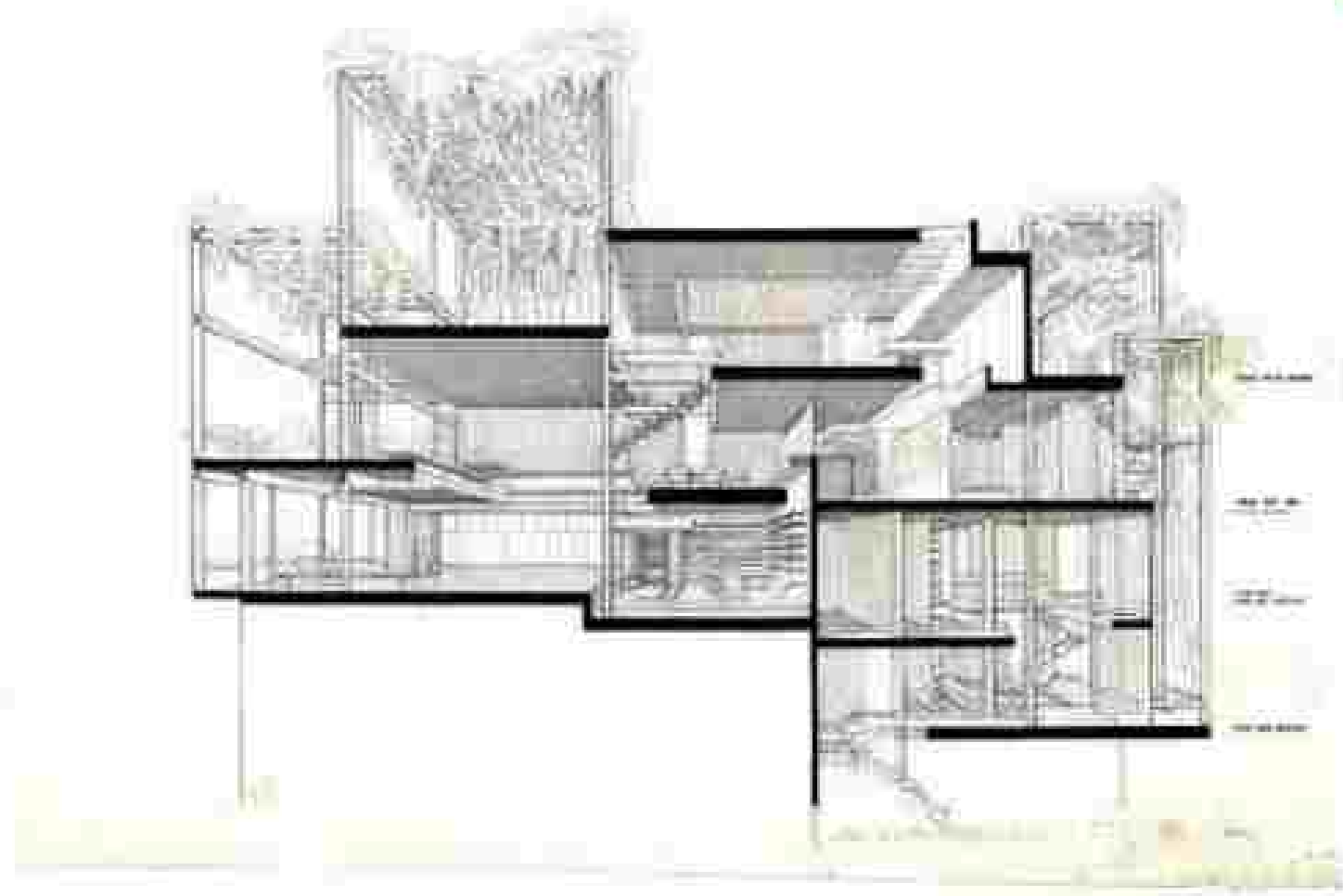
C-C SECTION
LOOKING NORTH THROUGH STAIR

site section - example



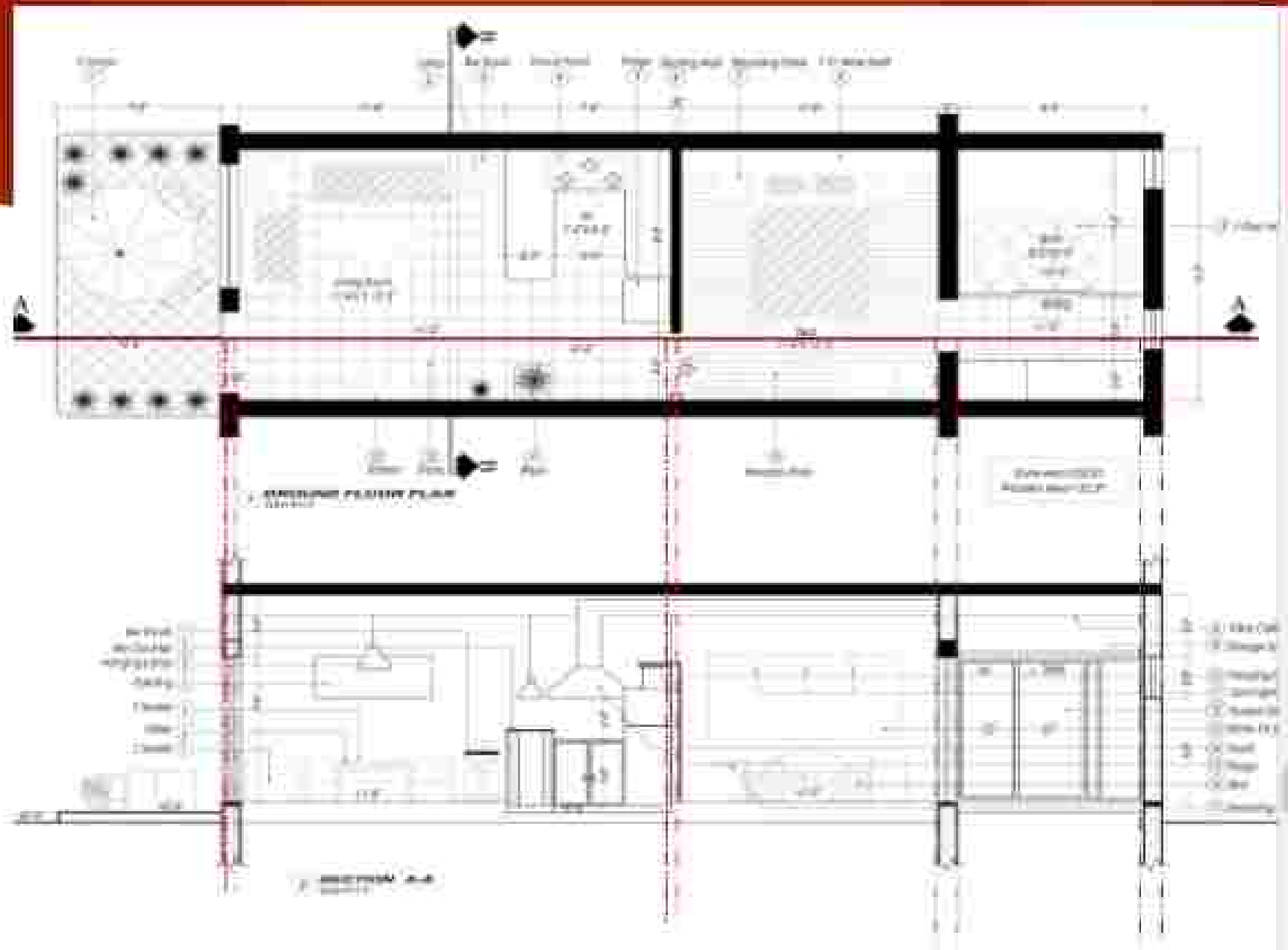
technical drawing introduction

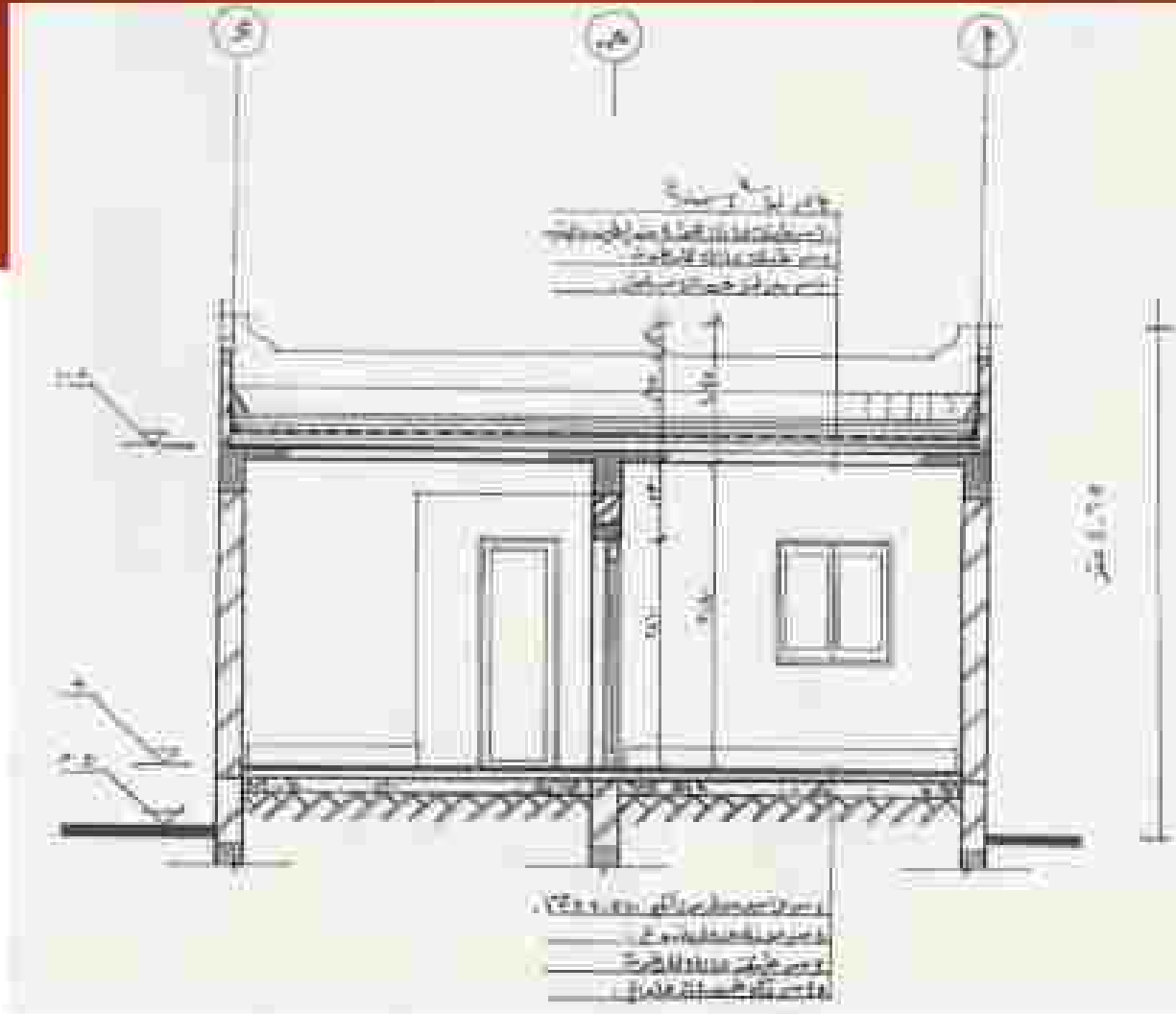
section - example



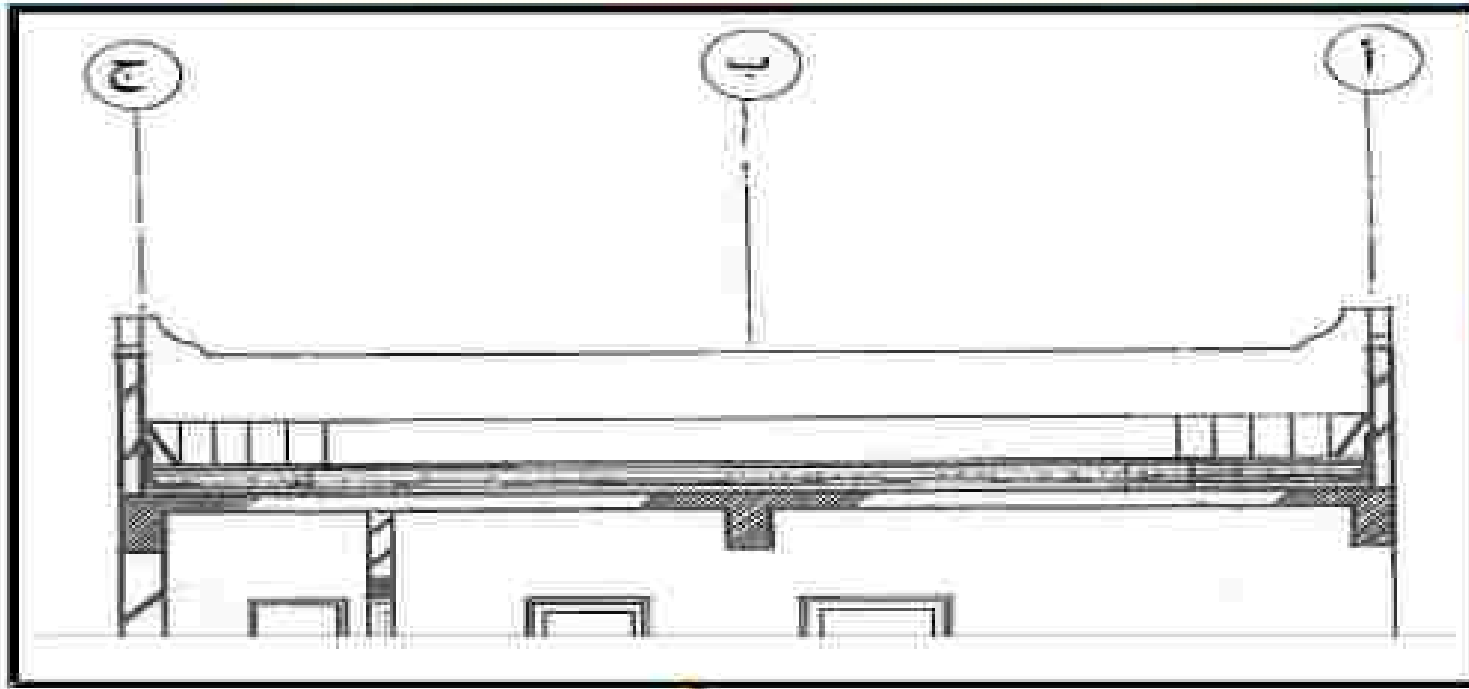
section - example



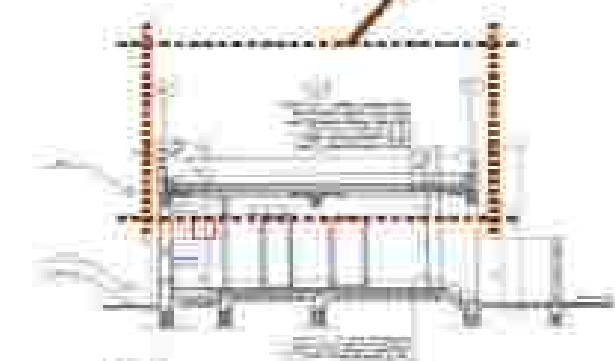




شكل رقم (67) مثال للرسومات التنفيذية للشطاعات

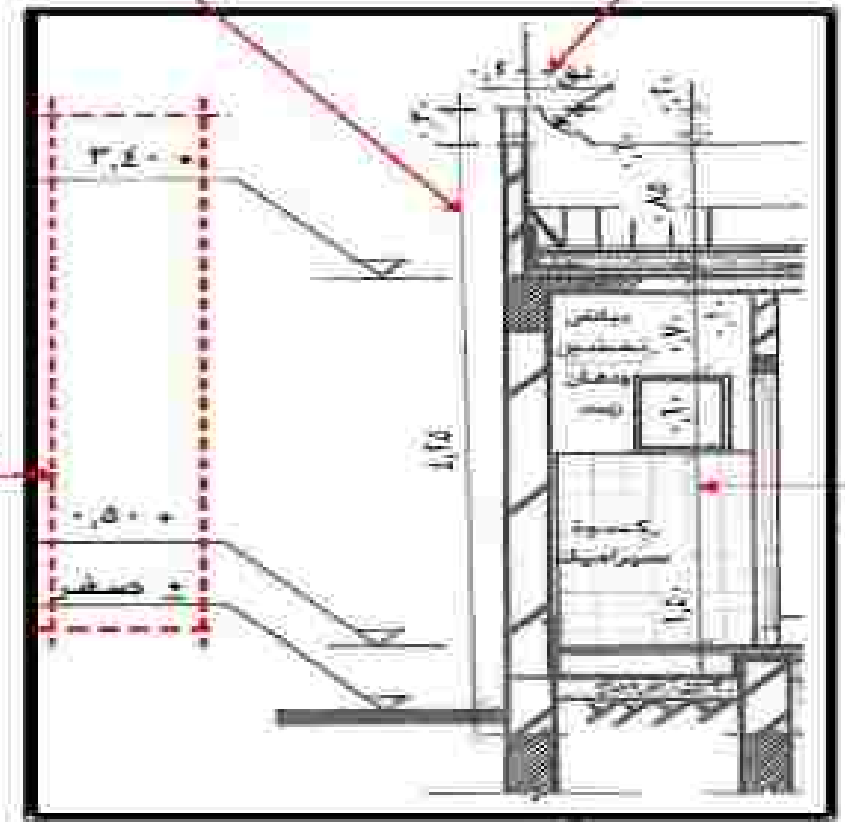


شكل رقم ١٧
 المعلومات الأساسية بلوحة التخطيط التفصيلي
 (وضع الحوائط على الختام)



وضع المقامات (17) بشكلها - المقامة (أو المقام)

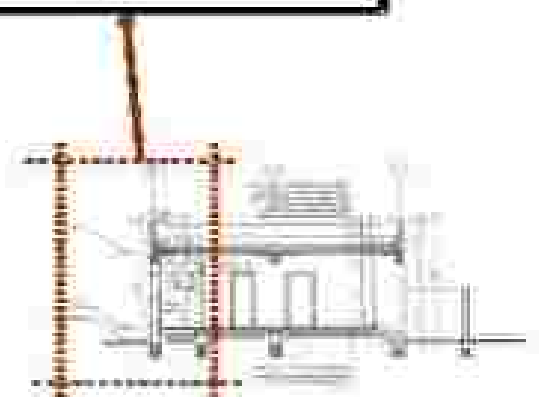
حاجب الزوايا حاد الزوايا

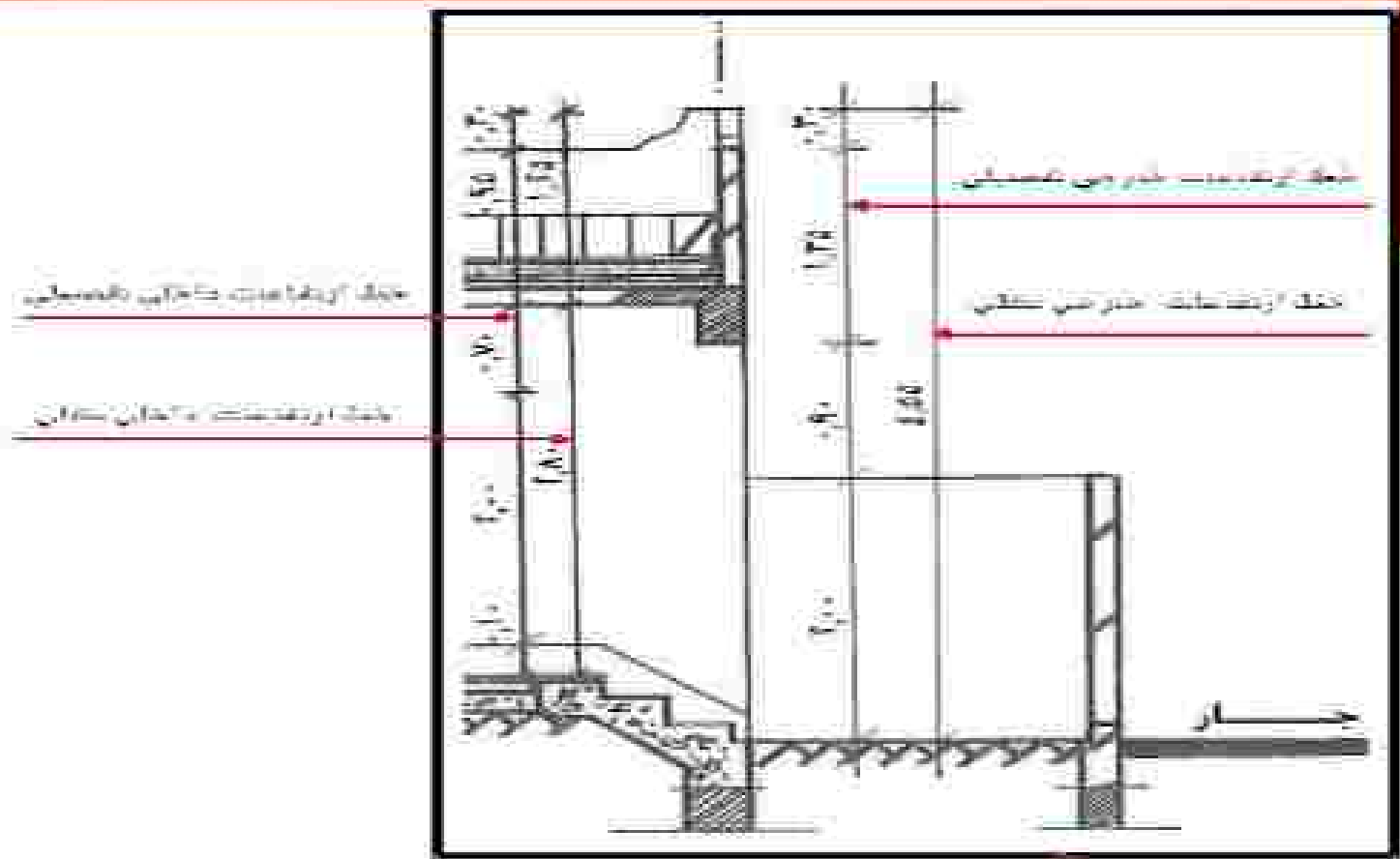


حاجب الزوايا حاد الزوايا

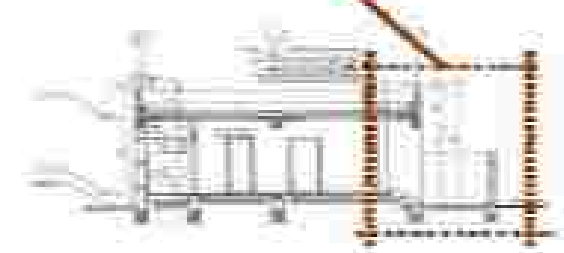
وضع المقامات (17) بشكلها - المقامة (أو المقام)

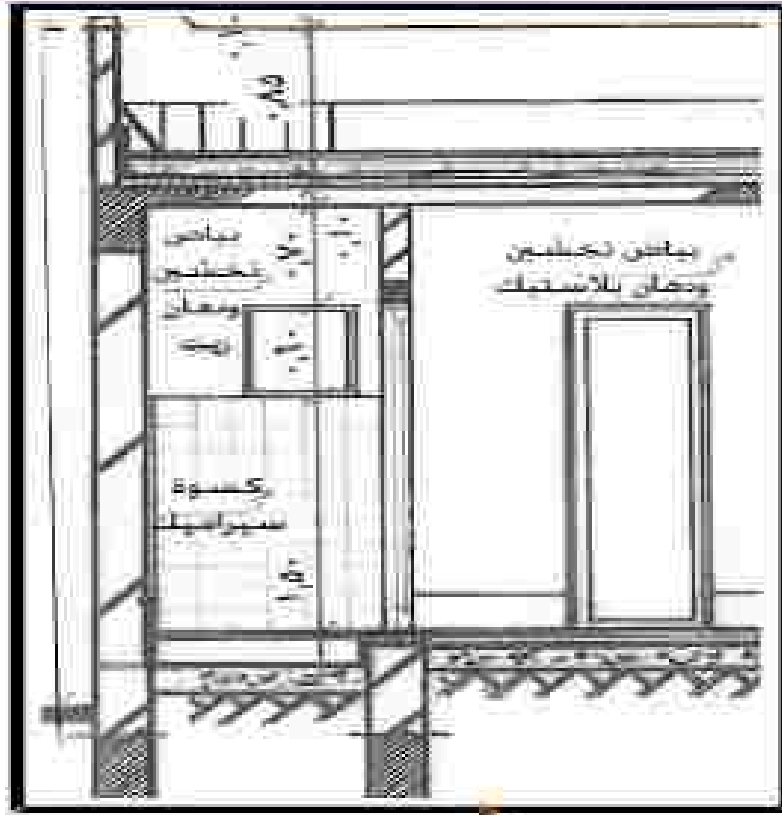
شامل رقم 10%
 المقامات الأمامية بالوجه المقامات الخلفية
 (وضع المقامات والأبعاد المقامات بالسطح)



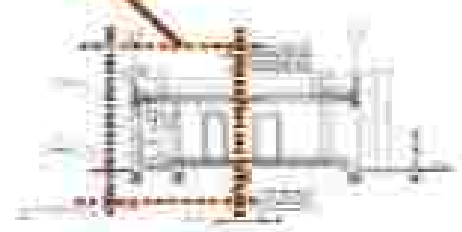


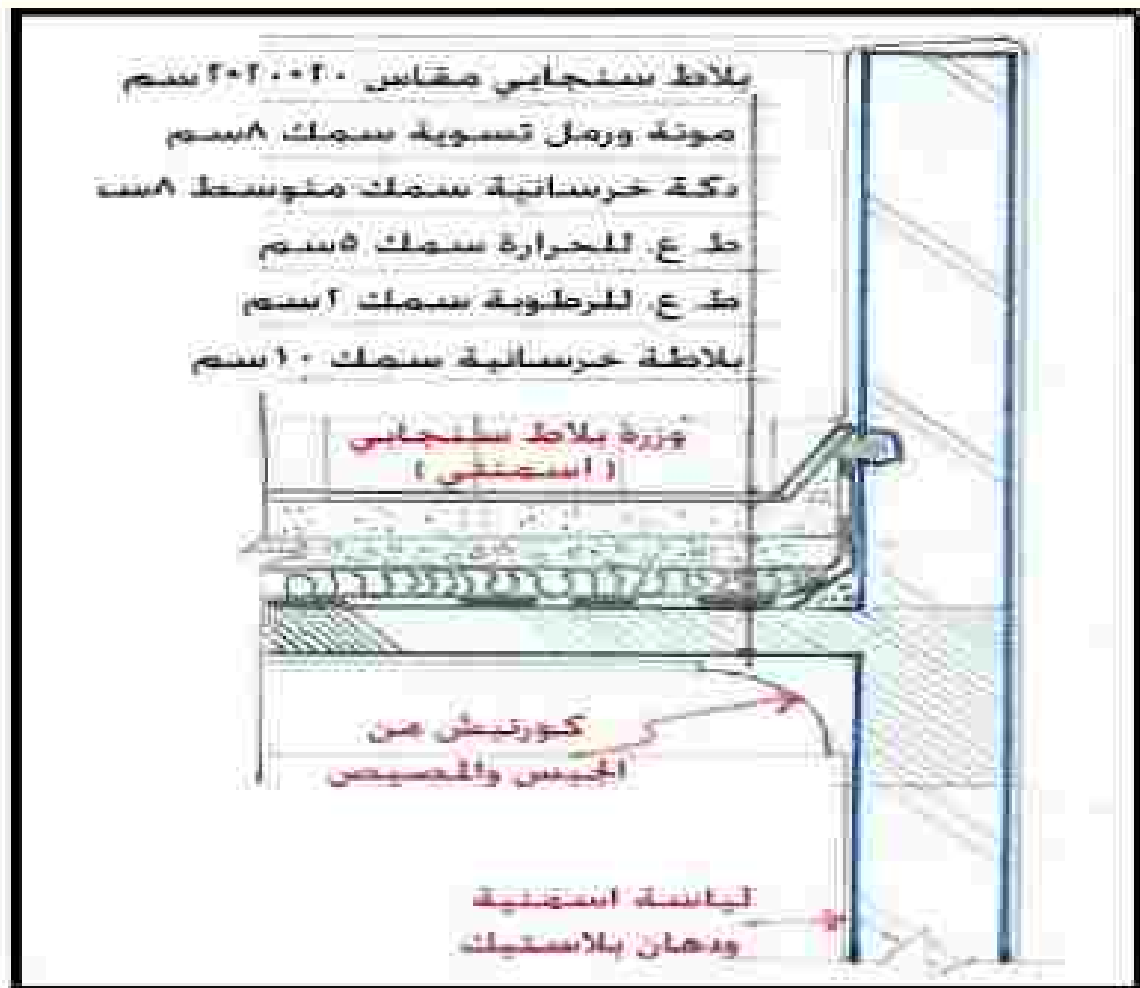
شكل رقم ١٥
 الموضات الأساسية لوحدة الشطاح التفاضلي
 (وضع الارتفاعات الخارجية والداخلية)





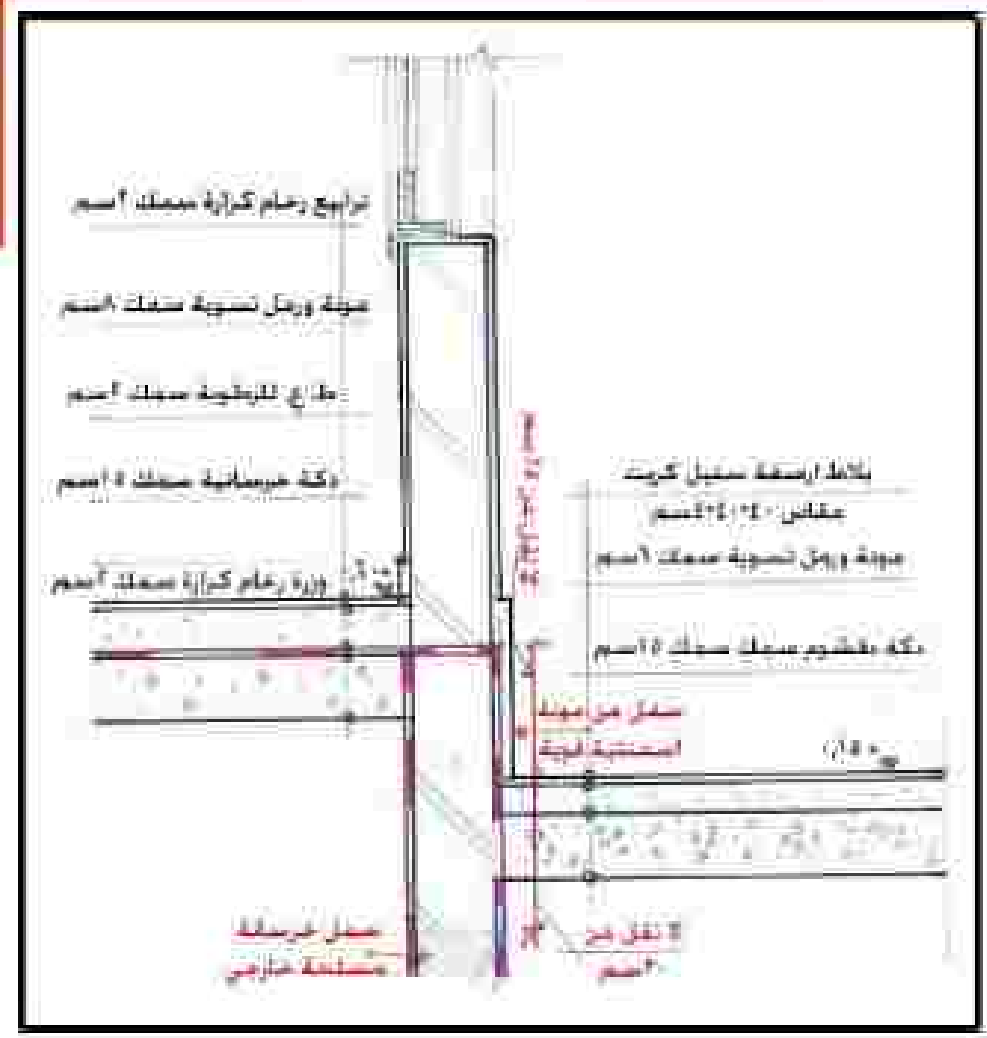
شكل رقم ٢٠
 المقادير الأساسية لوحدة التمدد القوي
 (وضع التعليلات الداخلية)





شكل رقم ٢١

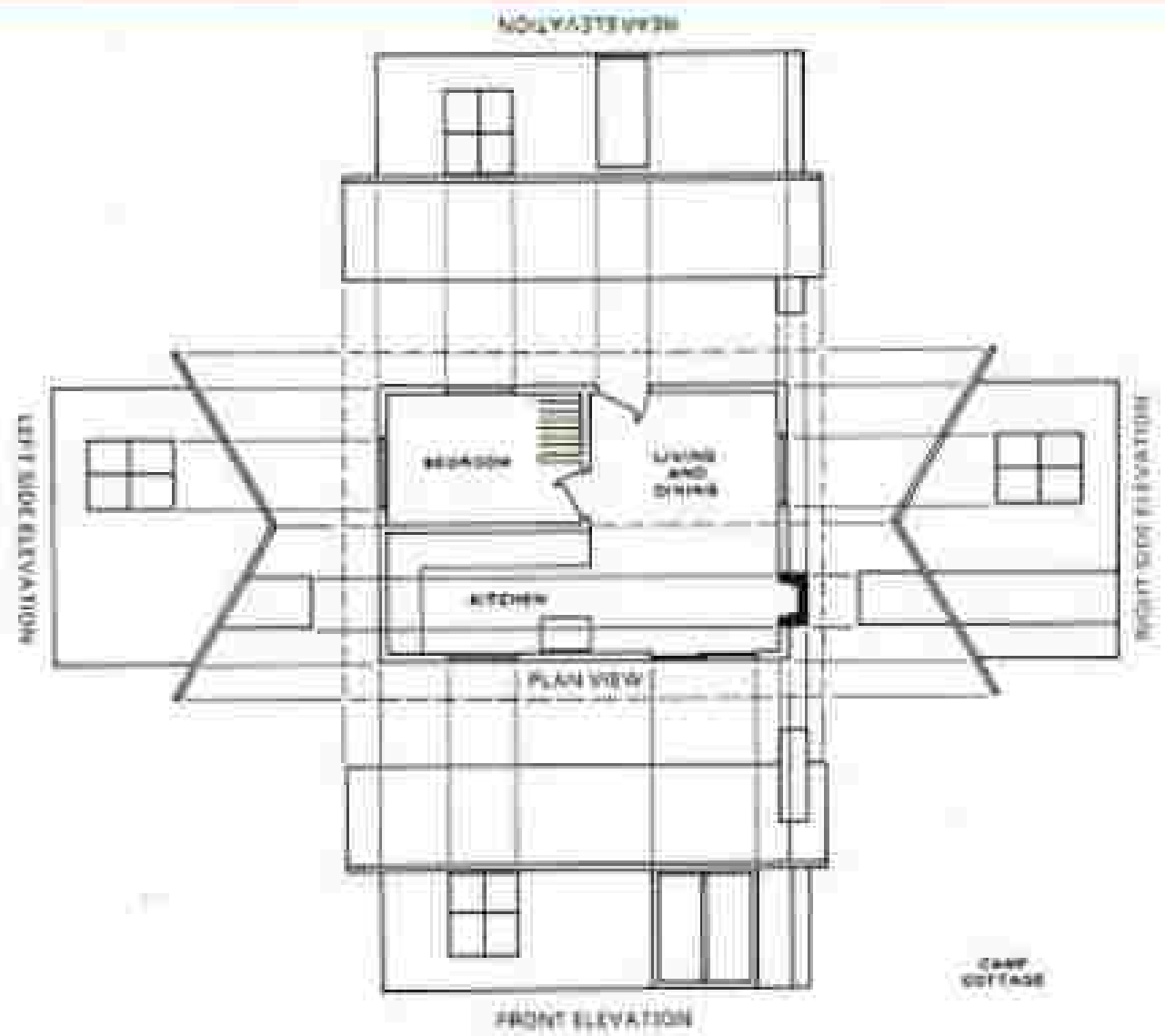
الليانات المكونة توضعها بلوحة الستشيع (الستشي)
 (عليقات الاستشيع وتحتفل العليقات العالقة فيها)

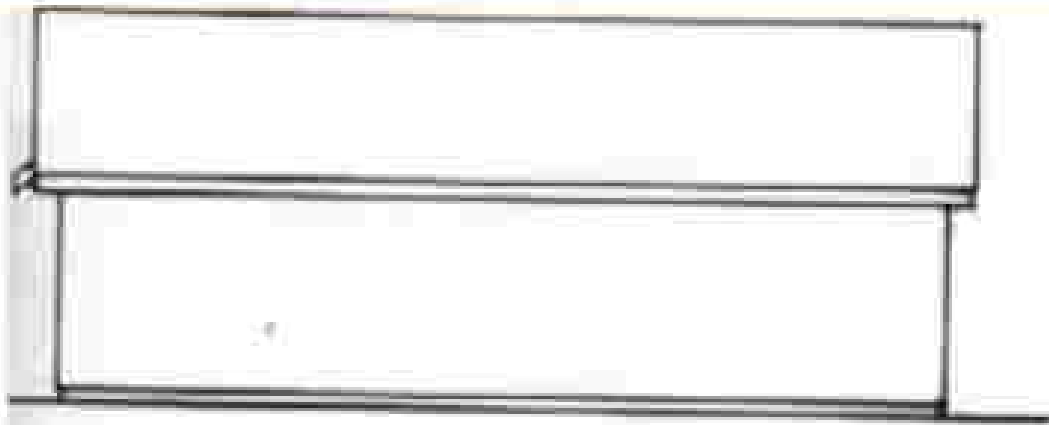


شعاع رقم ٢٢

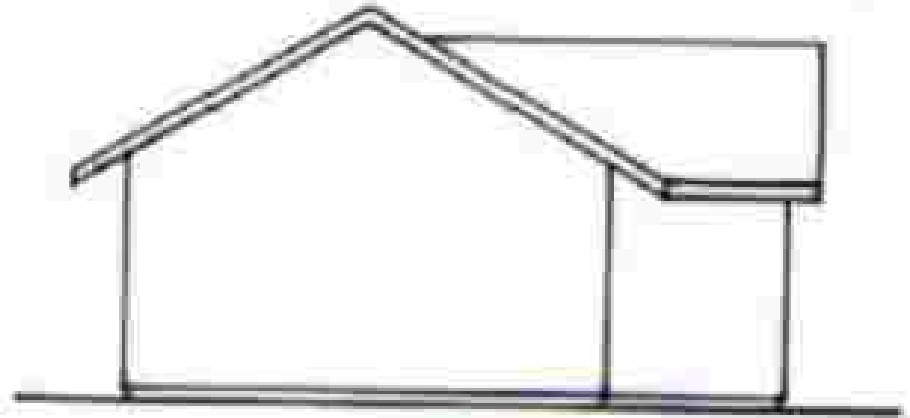
المباني الخشبية وتحتها باوحة التظليل المزدان
 الملائمة الأرصادات والحفاظ الطبقة الملائمة

Elevations

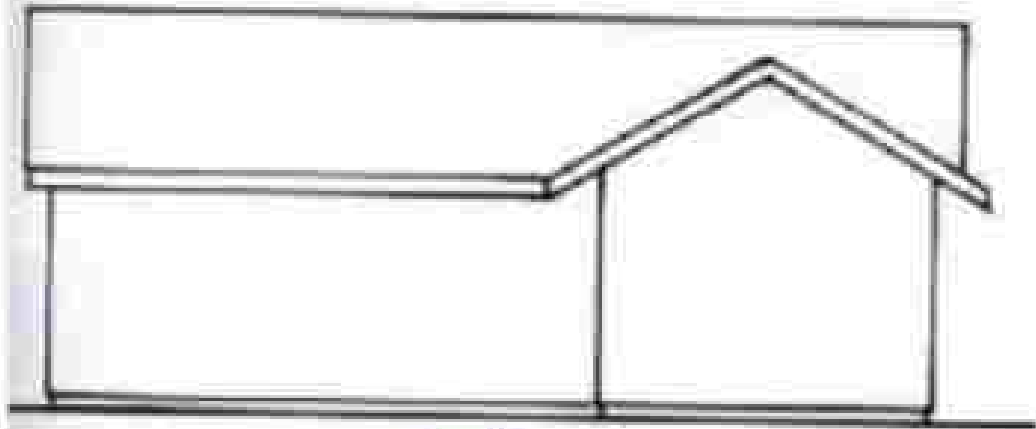




REAR



LEFT SIDE



FRONT



RIGHT SIDE

ELEVATION PLAN

An elevation drawing is an orthographic projection drawing that shows one side of the house. The purpose of an elevation drawing is to show the finished appearance of a given side of the house and furnish vertical height dimensions. Four elevations are customarily drawn, one for each side of the house.

An elevation plan ordinarily includes the following:

- Identification of the specific side of the house that the elevation represents
- Grade lines
- Finished floor and ceiling levels
- Location of exterior wall corners
- Windows and doors
- Roof features
- Porches, decks and patios
- Vertical dimensions of important features
- Material symbols

Grade Line, Floors & Ceilings

- The reference point for most elevations is the grade line.
- All features, which are below the grade line, should be drawn with hidden lines.
- Examples are: foundation walls, footers & window wells
- Drawing a centerline through the house where appropriate indicates the finished floor-to-finished ceiling height.
 - Common ceiling height in a garage is 8'-0"
 - Most codes require that the top of the foundation wall be at least 8" above the grade.

Wall, Windows & Doors

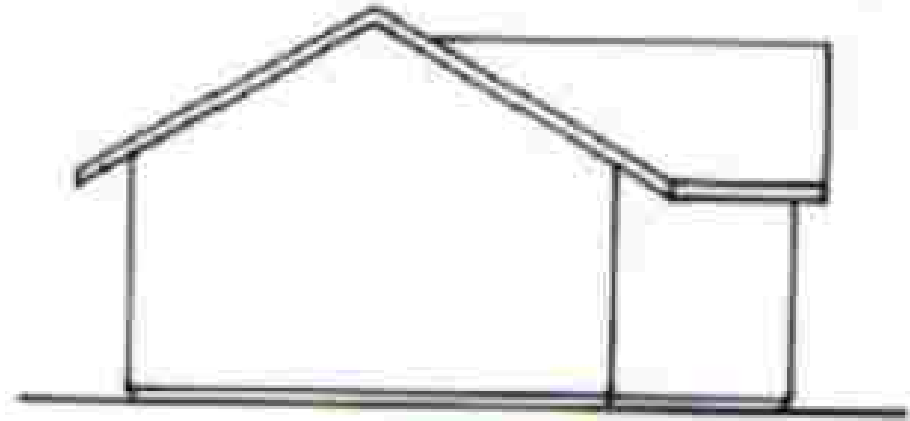
- All visible wall corners are shown on the elevation using object lines.
- Windows and doors located on the exterior wall must be included on the elevation.
 - It is customary to place tops of windows the same height as the tops of doors. This height is usually 6'-10"

Roof Features

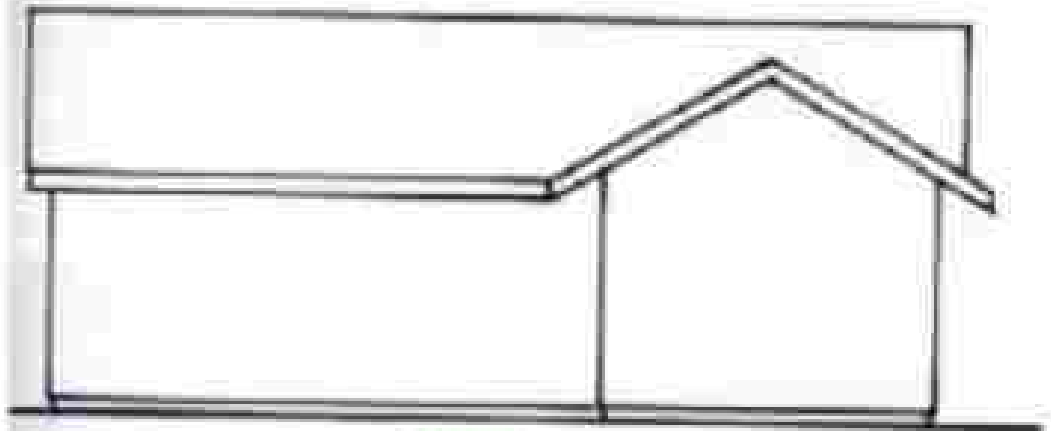
- The elevation drawing is where the roof style and pitch are shown, as well as chimney height and size. The roof pitch symbol is preferred when indicated the roof pitch.
- If more than one roof height is anticipated, the highest section should be drawn first.



BACK



LEFT SIDE



FRONT



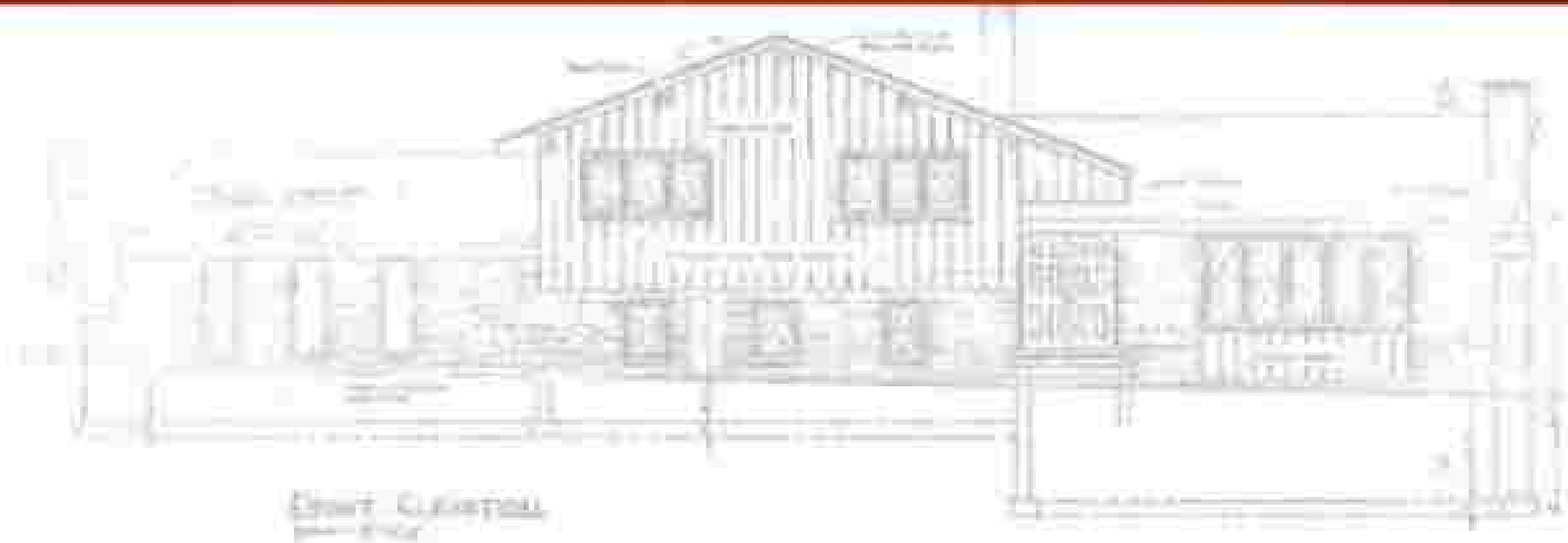
RIGHT SIDE

Dimensions, Notes & Symbols

- Dimensions on the elevation are mainly vertical height dimensions. Features that must be dimensioned are:
 - Thickness of the footer
 - Distance from the footer to the grade
 - Finished floor-to-finished ceiling distance
 - Overhang width
 - Height of the top of windows and doors
 - Height of the chimney above the roof
- Notes should be included where additional information is needed. Typical notes included are:
 - Grade info.
 - Exterior wall material notation
 - Roof covering material identification
 - Fascia material
 - Flashing material
- Many symbols may be used to further indicate specifics on the house.

The Procedure for Drawing an Elevation Plan

1. Place the floor plan directly above the space where the elevation is to be drawn. The exterior walls to be represented by the elevation should be facing down toward the elevation.
2. Project all points down to the free space.
3. Indicate the bottom of the footer and draw a horizontal line. Now measure in all vertical heights, basement ceiling height, floor joist height, first floor, etc... from this reference point.
4. Remove construction lines and determine if changes are desired in the overall design.
5. Add details such as railings, window muntins, trim, window wells, etc...
6. Add dimensions, notes and symbols.
7. Check drawing and be sure to print one copy to check.
8. Turn-in drawing



Side Elevation



Rear Elevation

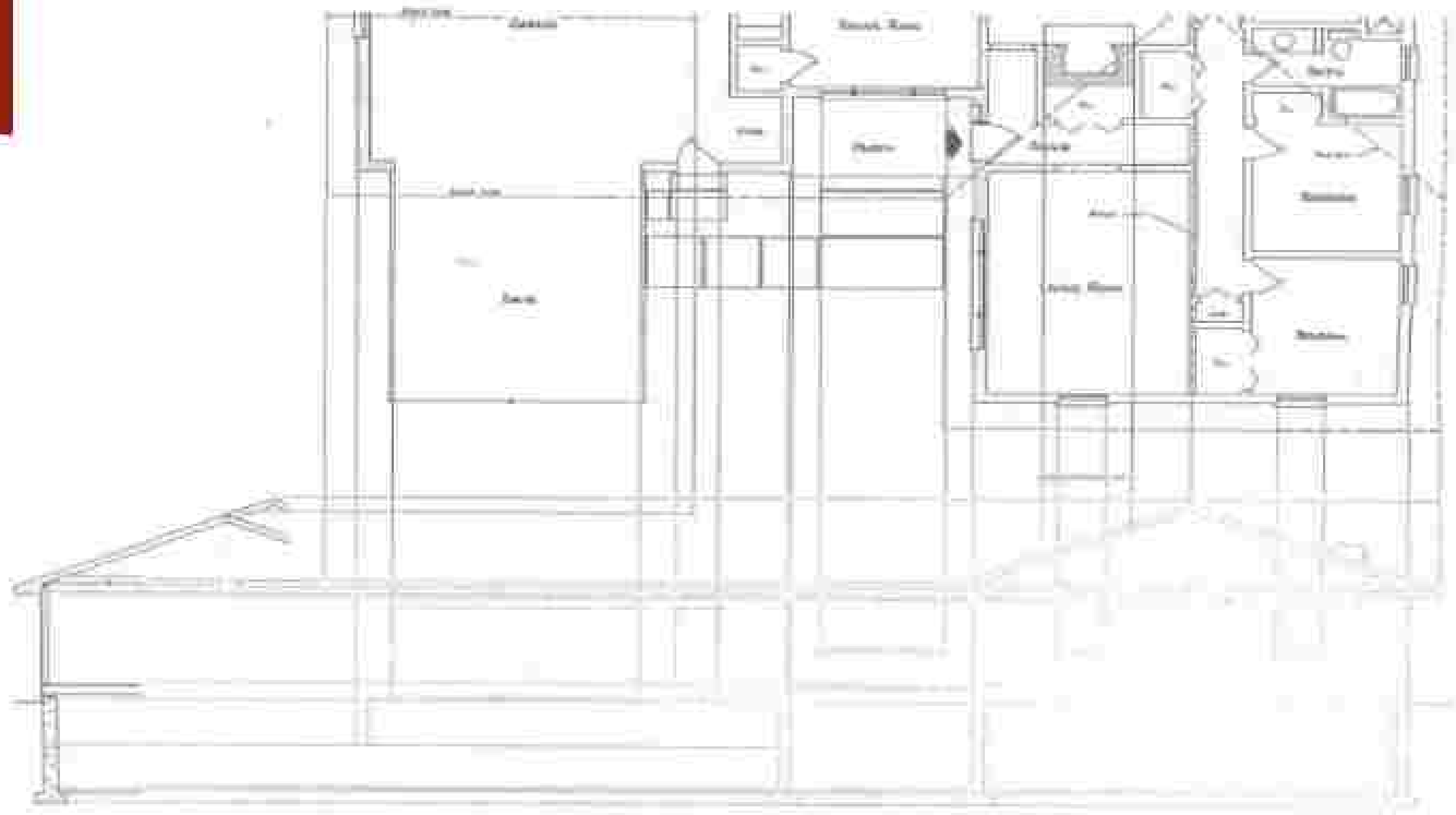
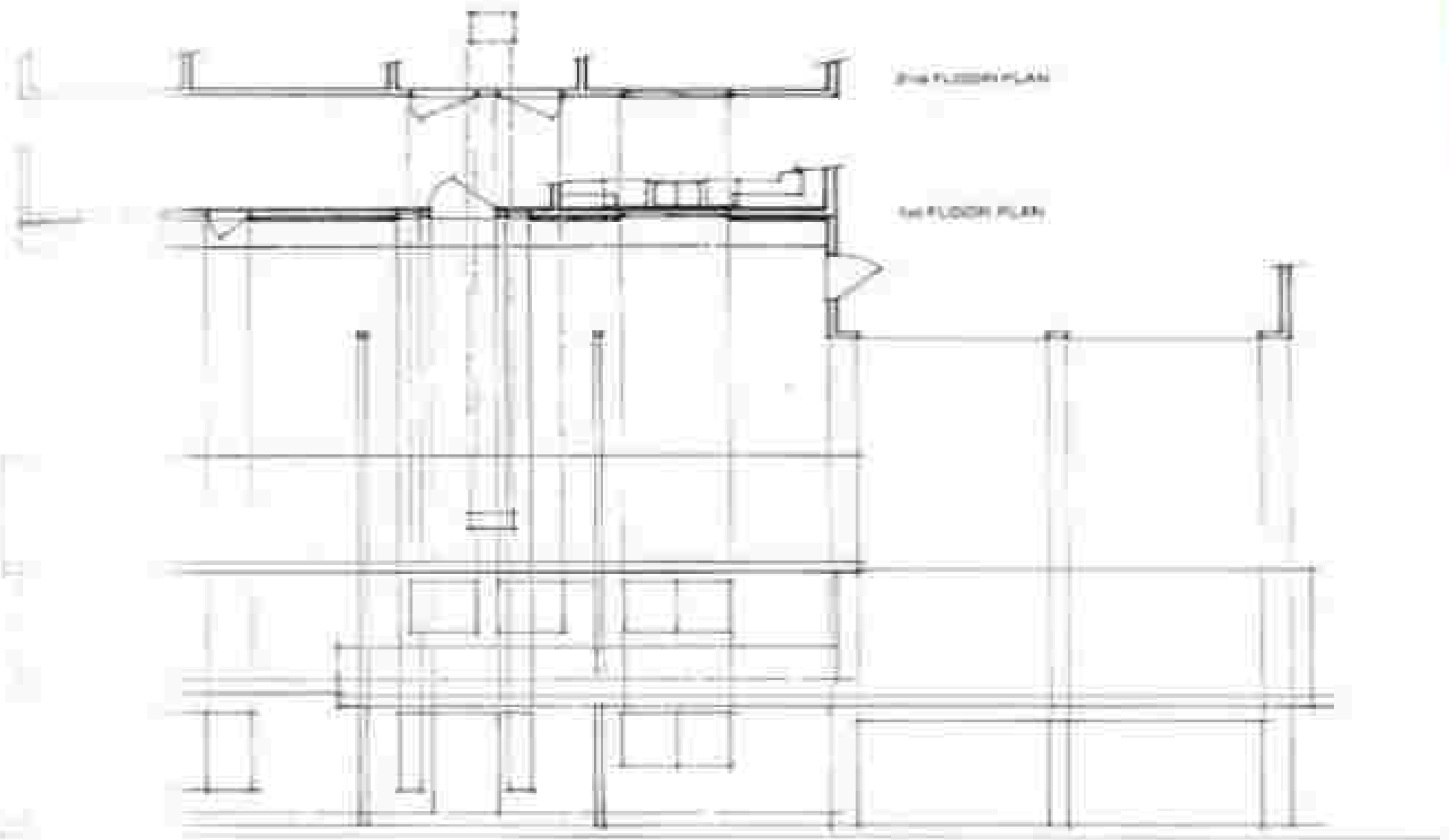
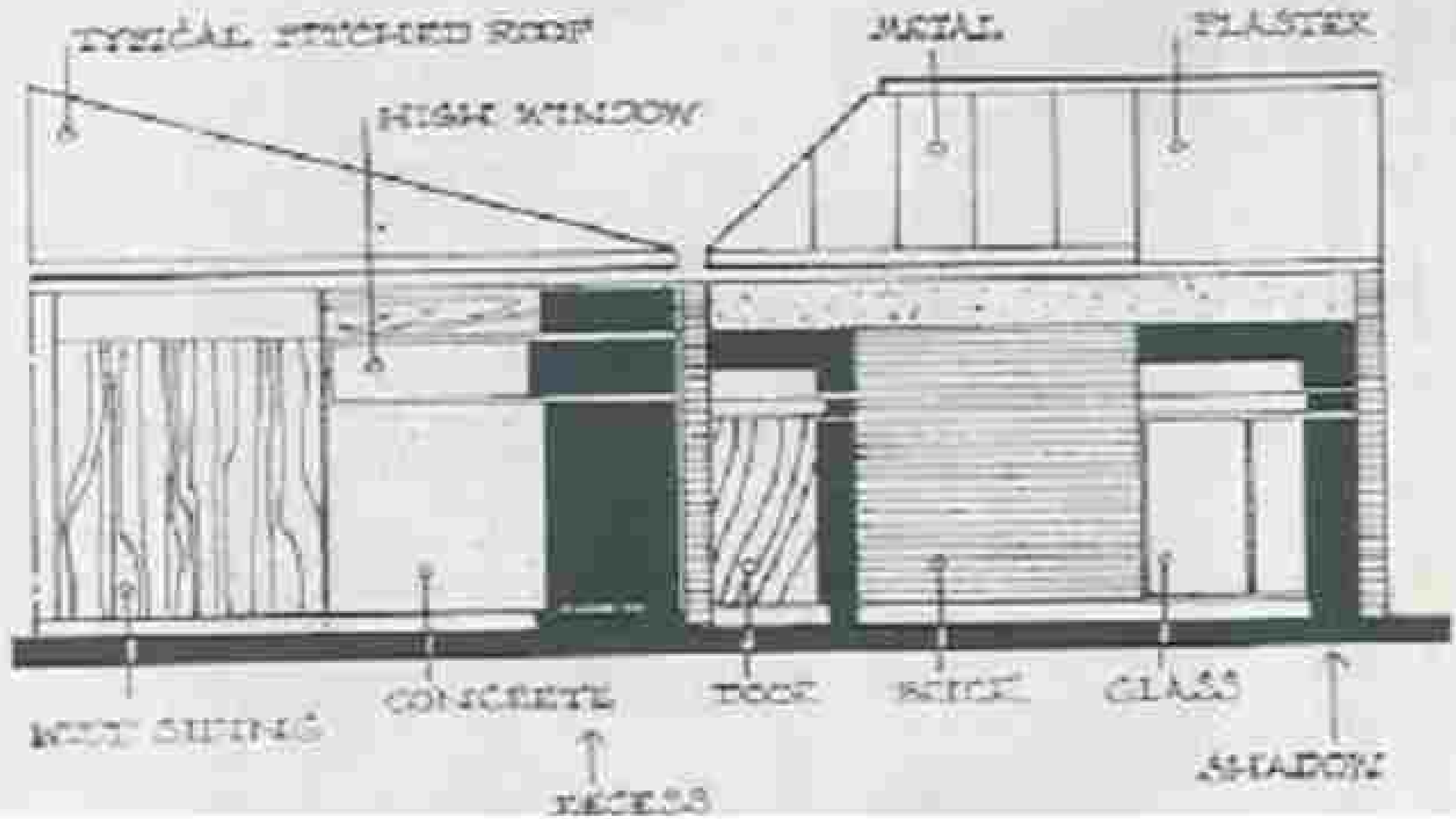


Fig. 1 B 16. Bed features of the house have been protected from the floor joist and centered to the location where the elevation is to be drawn. Light construction lines are used.









2ND FLOOR PLAN

3RD FLOOR PLAN



رموز والأشكال التي تظهر بالواجب:

| الرموز / الأشكال | المصطلح |
|--|-----------------|
|  | مباني بلاطة |
|  | مباني معجر تشيخ |
|  | مباني حجر |
|  | إرخام |
|  | كاشي |
|  | مباني |

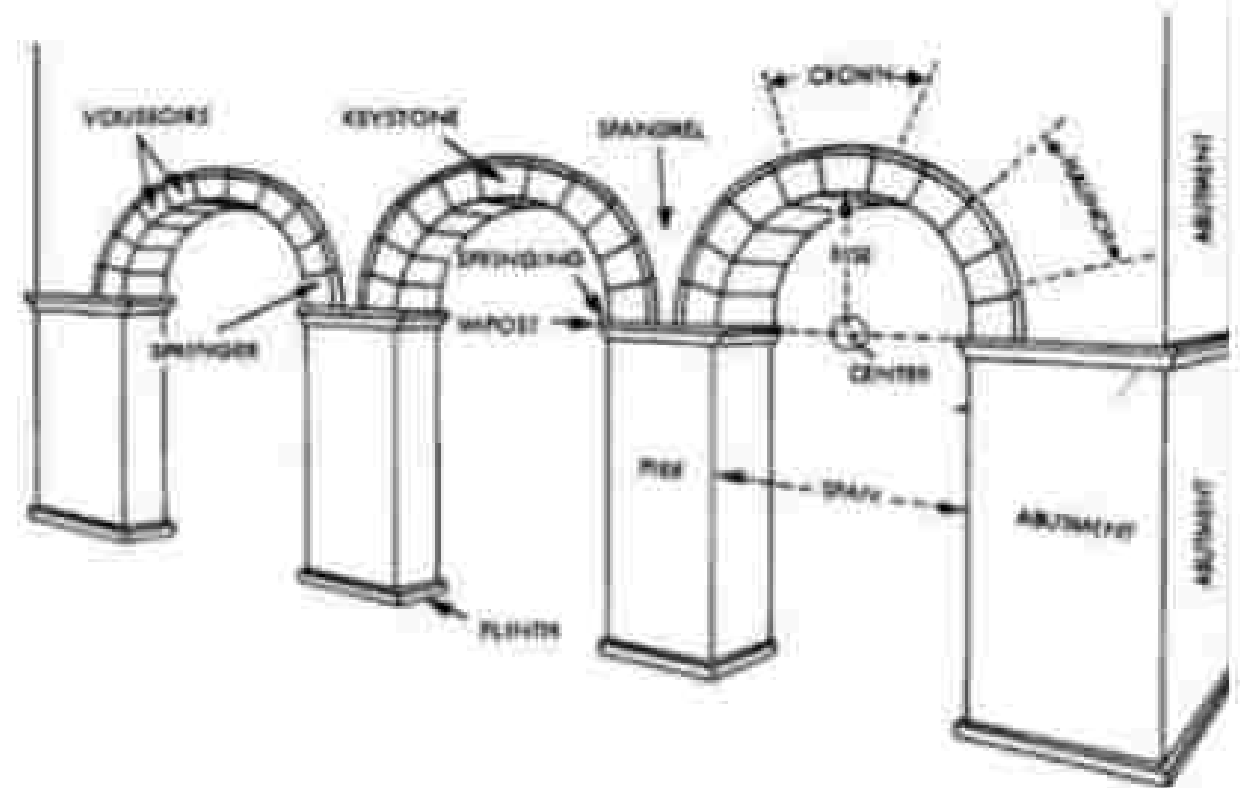
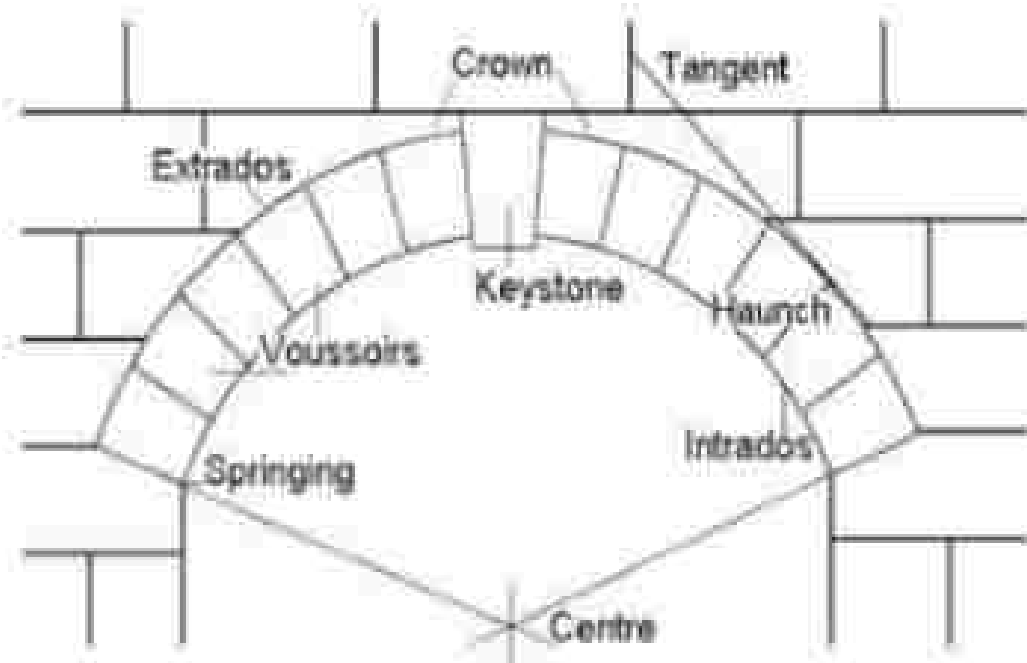
Arches and Domes

What is an Arch?

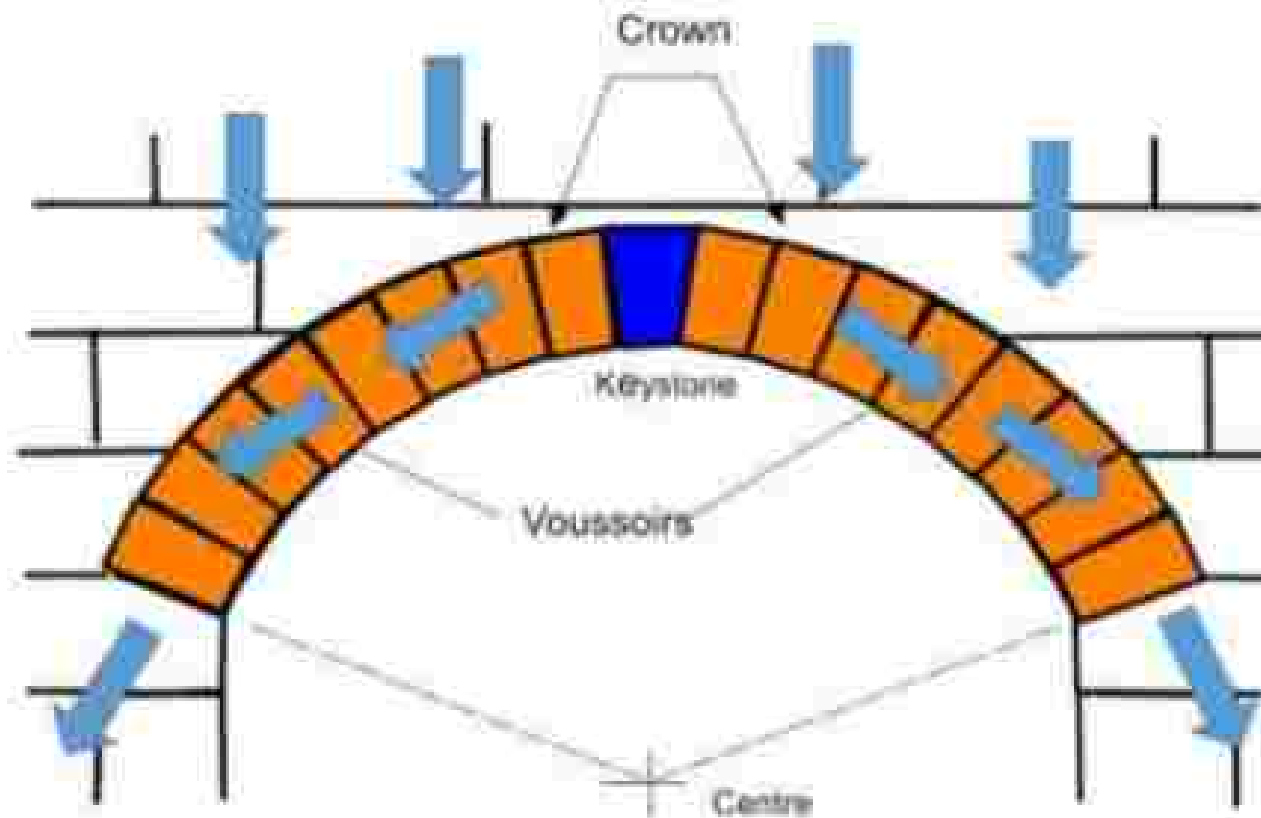
- ▶ Arch, in architecture, is a curved member that is used to span an opening and to support loads from above.
- ▶ It is constructed of wedge shape block of stones or bricks, joined together using mortar and provided across the opening to carry the weight of the structure above the opening.

Parts of arch

► The basic parts of an arch are as follows:




Loading in an arch

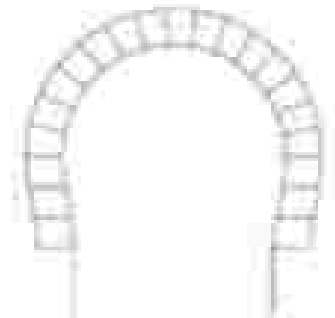


Types of arches

- ▶ Arches have many forms, but all fall into three basic categories:
 - ▶ *Circular*
 - ▶ *pointed*
 - ▶ *parabolic*

- 
- ▶ 1.Semi-circular arch -A roman arch is semi circular arch .It is made of brick masonry.
 - ▶ 2.Segmental arch - It forms a partial curve since it has a small rise in the center and semi - elliptical across the top.
 - ▶ 3.Flattened gothic arch - Also known as Tudor arches.Tudor arches have low rise because of which they are named flattened gothic arches .Gothic arches are generally narrower than flattened gothic arches.

- ▶ 4. Flat arch - It is also known as straight arch. The arch spans straight across the opening without any curvature. It is used in doorways and windows with voussoirs radiating from center below.
- ▶ 5. Gothic /lancet/pointed arches- These are narrow arches with a pointed opening. It was considered to be a more sinuous and elegant successor to the Roman arch style. It has been used in cathedrals of the Middle Ages across Europe.
- ▶ 6. Horseshoe arches- It is also called Moorish arch. It resembles the look of a horseshoe magnet. The curved line extends beyond the semi-circular line of the arch.



Application

- ▶ Arched bridges
- ▶ Aqueducts
- ▶ Large span openings



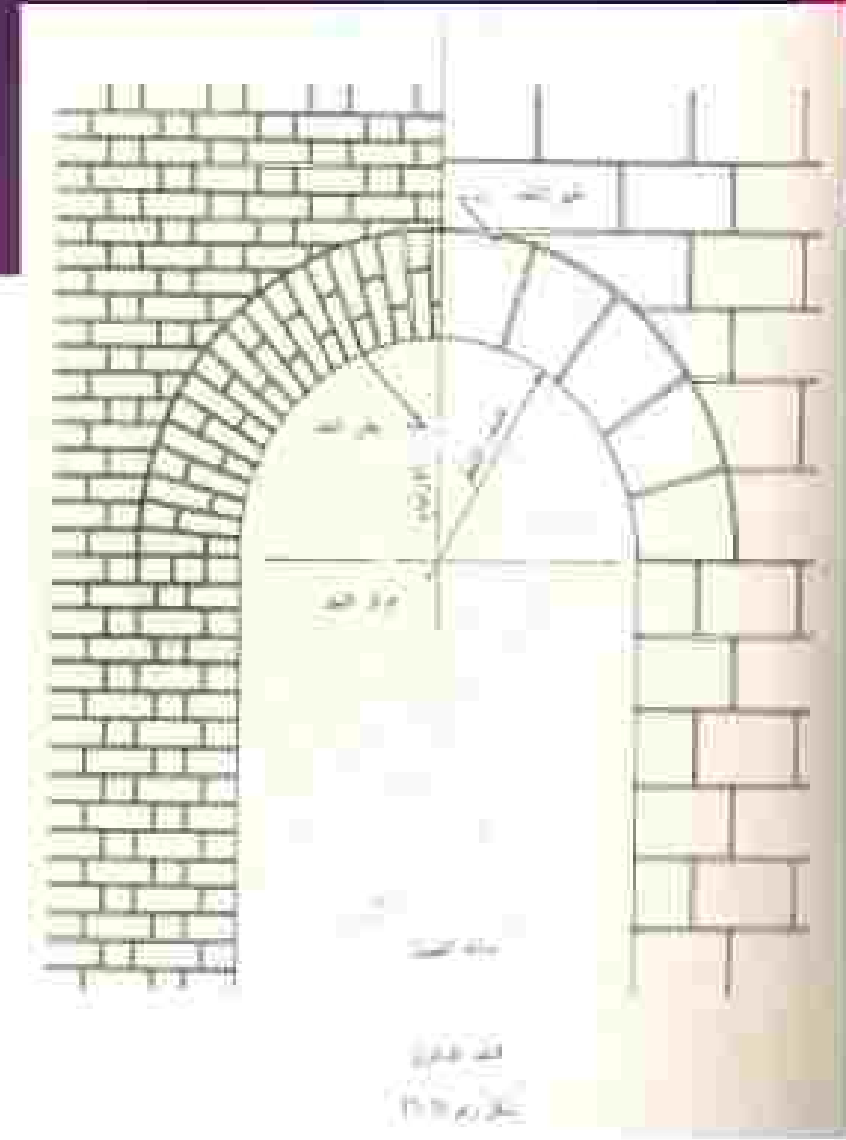
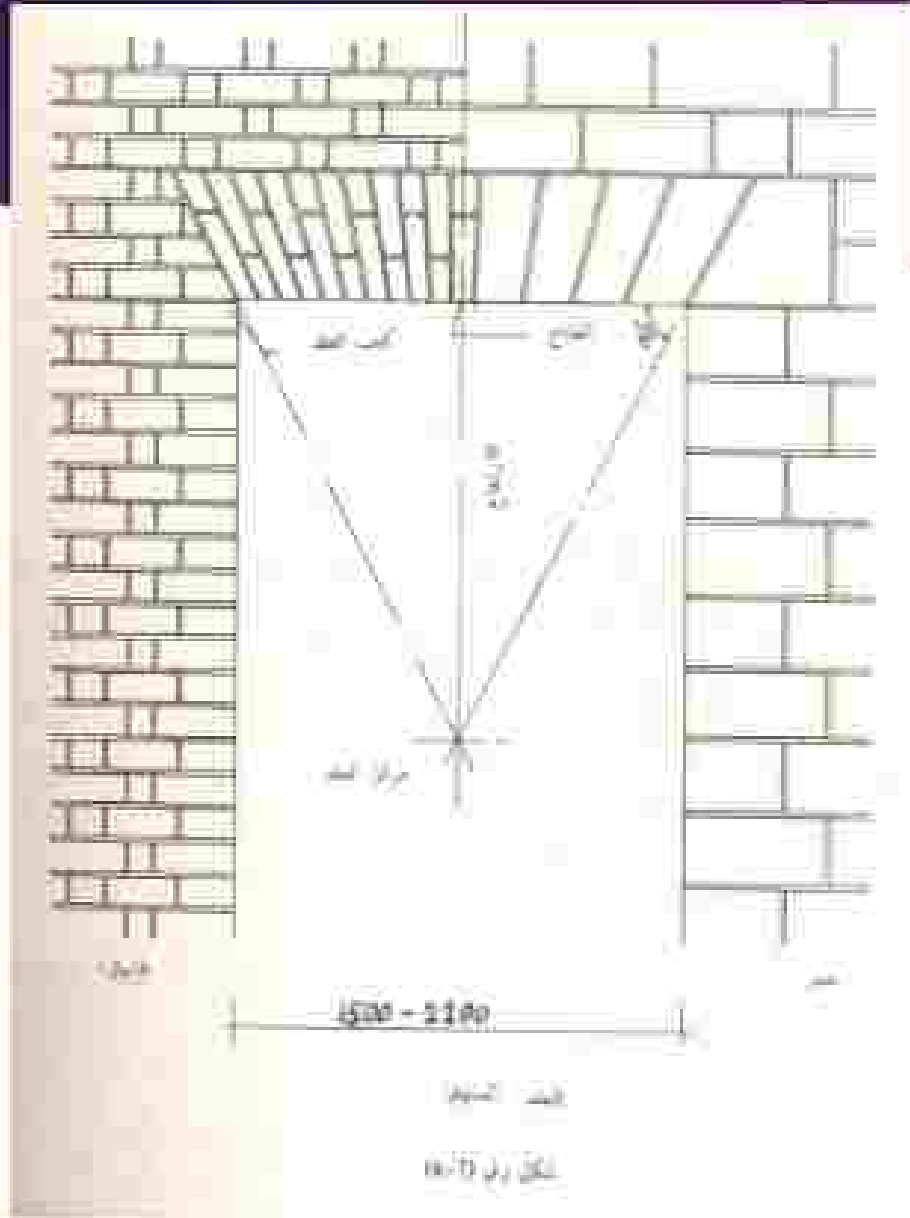
Roman Aquaducts

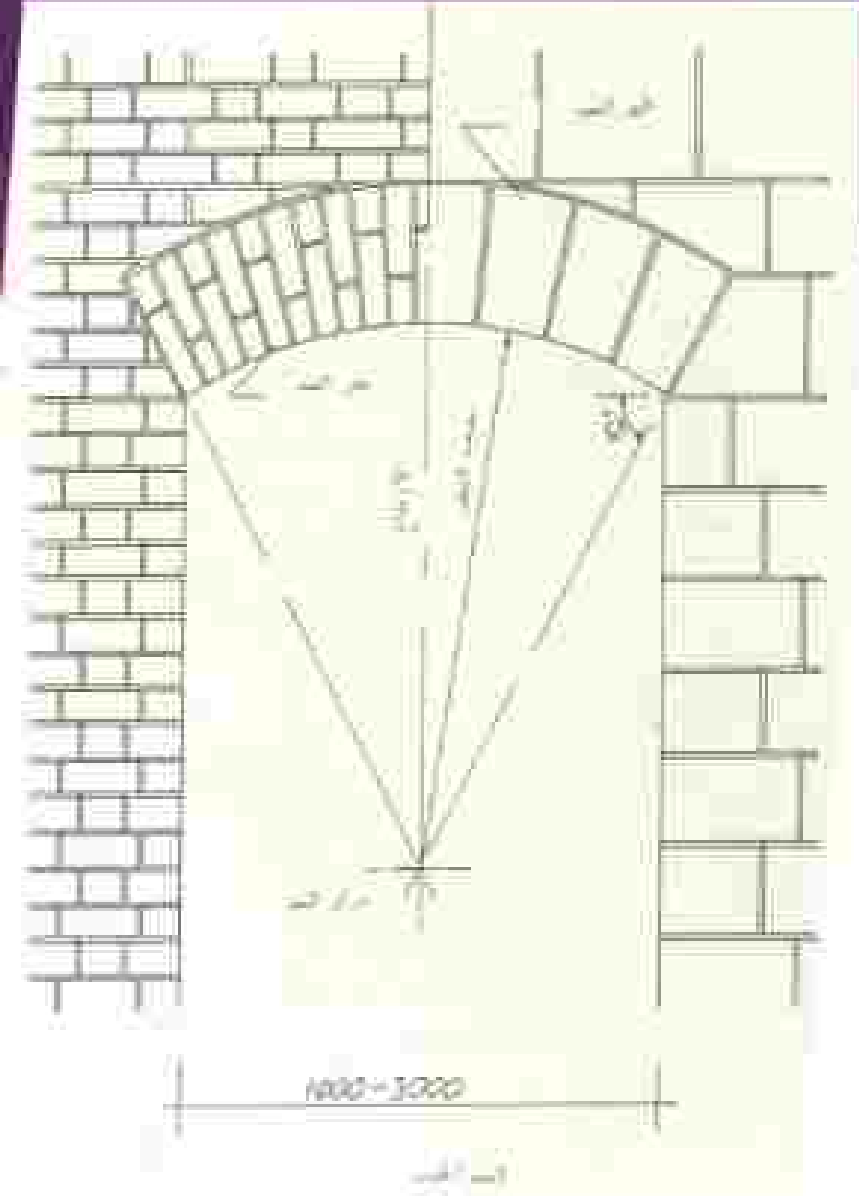
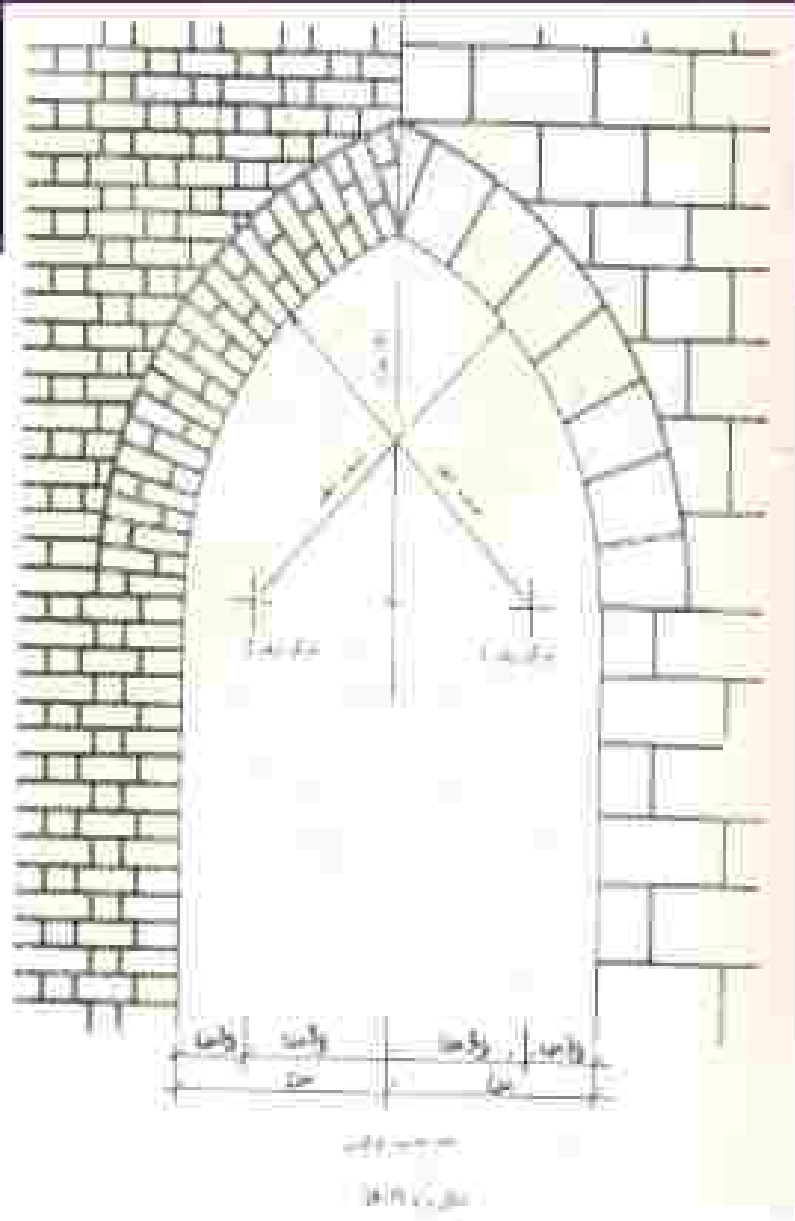


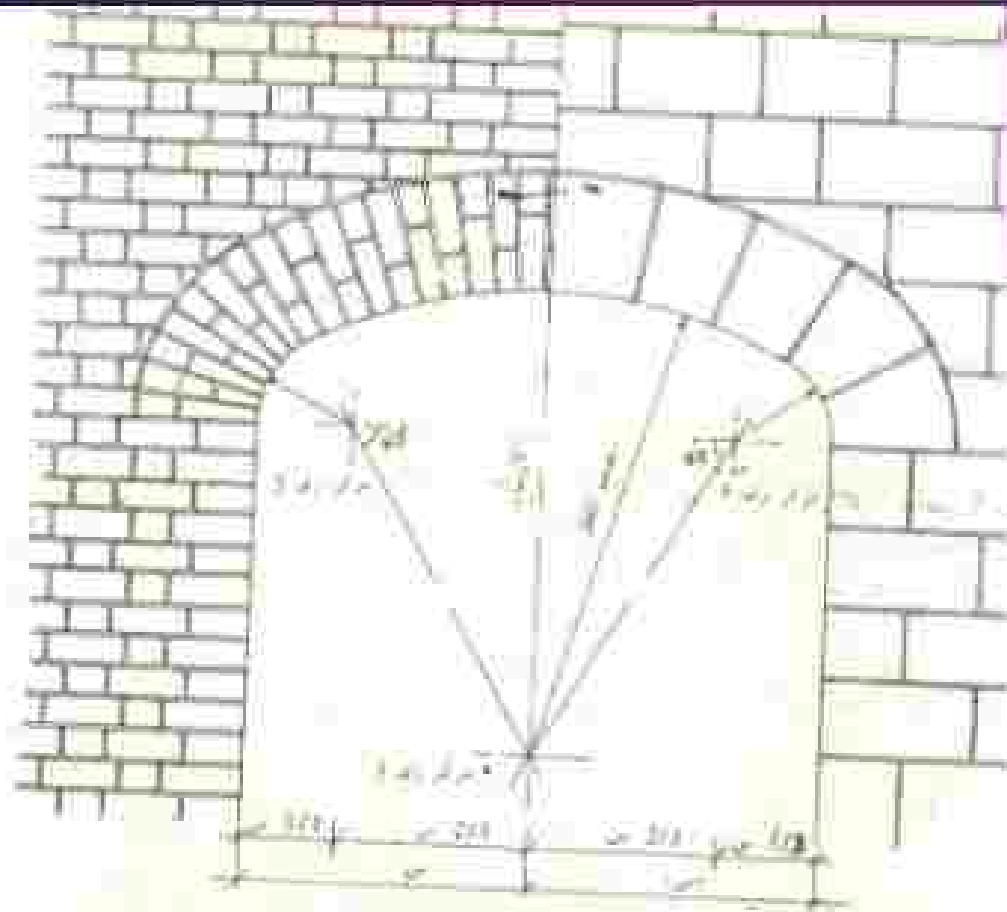
Church openings



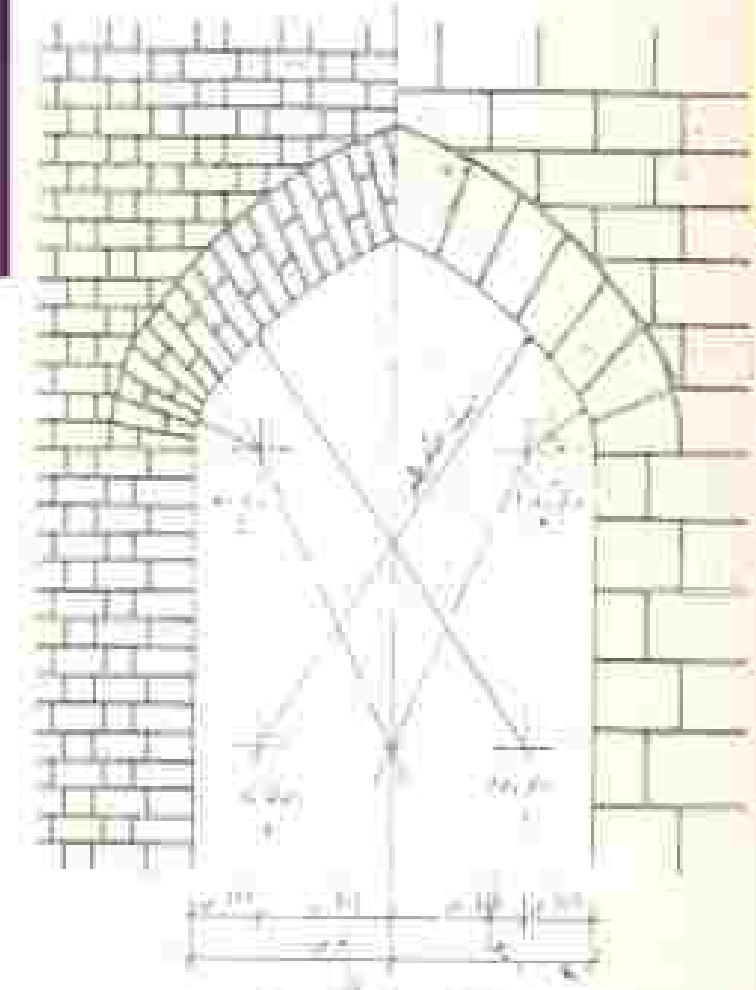
To span large span openings







شكل رقم 1



شكل رقم 2

What is a dome?

- ▶ A **dome** is an element of architecture that resembles the hollow upper half of a sphere.
- ▶ A dome is a rounded vault made of either curved segments or a shell of revolution, meaning an arch rotated around its central vertical axis.

loading

- ▶ A dome is composed of a series of rings, resting on each other
- ▶ A dome is characterized by a thrust, with pushes on the walls.
- ▶ Two forces acting in a dome are
- ▶ Thrust (T), which pushes down with an angle on the walls.
- ▶ The thrust (T) is composed of 2 forces:

A horizontal forces (HT), WHICH TENDS TO PUSH THE WALLS APART.

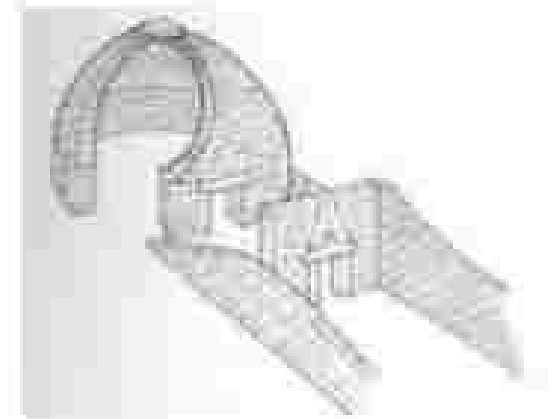
The weight (w), which is the weight of the masonry.

A concentric thrust (CT), which acts in every ring and compresses it.

Types

Beehive dome

- Also called a *corbelled dome*, or *false dome*, these are different from a 'true dome' in that they consist of purely horizontal layers.
- As the layers get higher, each is slightly cantilevered, or corbeled, toward the centre until meeting at the top.
- A famous Example is the Mycenaean Treasury of Atreus



Crossed-arch dome

- Rather than meeting in the centre of the dome, the ribs characteristically intersect one another off-centre, forming an empty polygonal space in the centre.
- Geometry is a key element of the designs, with the octagon being perhaps the most popular shape used.
- Whether the arches are structural or purely decorative remains a matter of debate.
- Examples are found in Spain, North Africa, Armenia, Iran, France, and Italy

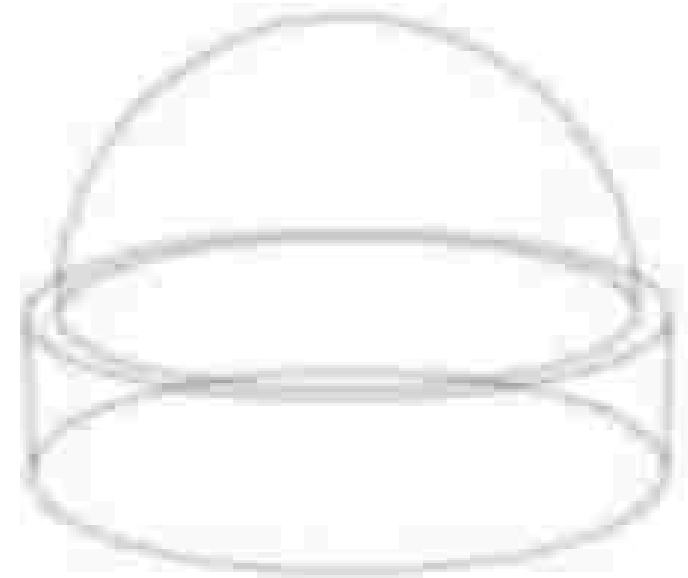


- **Geodesic dome**
- *Geodesic domes* are the upper portion of geodesic spheres.
- They are composed of a framework of triangles in a polyhedron pattern.
- The structures are based upon octahedrons or tetrahedrons.
- Such domes can be created using a limited number of simple elements and joints and efficiently resolve a dome's internal forces.
- Their efficiency is said to increase with size.



Hemispherical dome

- The *hemispherical dome* is half of a sphere.
- According to E. Baldwin Smith, it was a shape likely known to the Assyrians, defined by Greek theoretical mathematicians, and standardized by Roman builders.



- **Onion dome**
- An *onion dome* is a greater than hemispherical dome with a pointed top in an ogee profile.
- They are typically wooden, although masonry examples are found in late Mughal architecture.
- are found mostly in eastern architecture, particularly in Russia, Turkey, India, and the Middle East.
- An onion dome is a type of architectural dome usually associated with Russian Orthodox churches.
- Such a dome is larger in diameter than the drum it is set upon and its height usually



- **Oval dome**
- An *oval dome* is a dome of oval shape in plan, profile, or both.
- The geometry was eventually defined using combinations of circular arcs, transitioning at points of tangency.
- The Roman foundations of the oval plan Church of St. Gereon in Cologne point to a possible example.
- Domes in the Middle Ages also tended to be circular, although the church of Santo Tomás de las Ollas in Spain has an oval dome over its oval plan.
- The dome built for the basilica of Vicoforte by Francesco Gallo was one of the largest and most complex ever made.






- **Parabolic dome**
- A *parabolic dome* is a unique structure in which bending stress due to the uniformly distributed load of its dead load is zero.
- Hence it was widely used in buildings in ancient times, before the advent of composite structures.
- However if a point load is applied on the apex of a parabolic dome, the bending stress becomes infinite.
- Hence it is found in most ancient structures, the apex of the dome is stiffened or the shape modified to avoid the infinite stress.

- **Saucer dome**
- Also called a *calotte*, this is a low pitched, shallow dome that is described geometrically as having a circular base and a segmental section.
- Many of the largest existing domes are of this shape

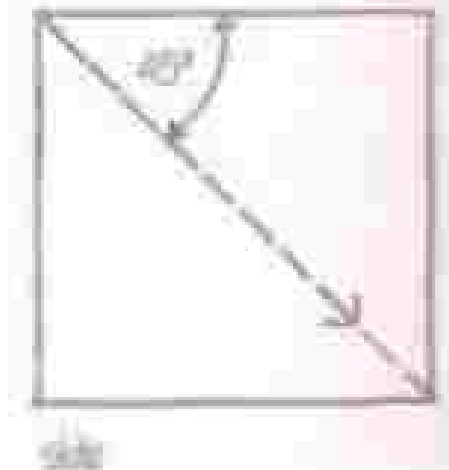
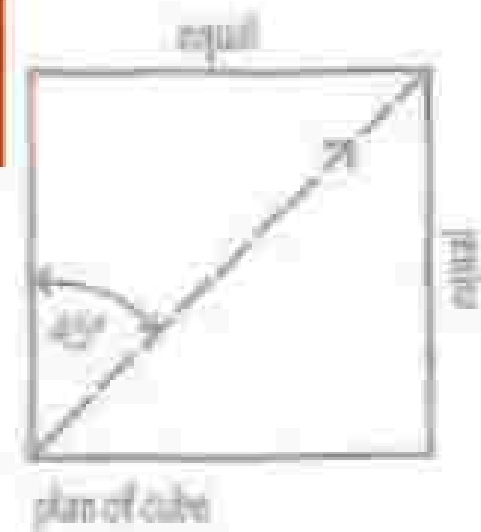


Shades And Shadows



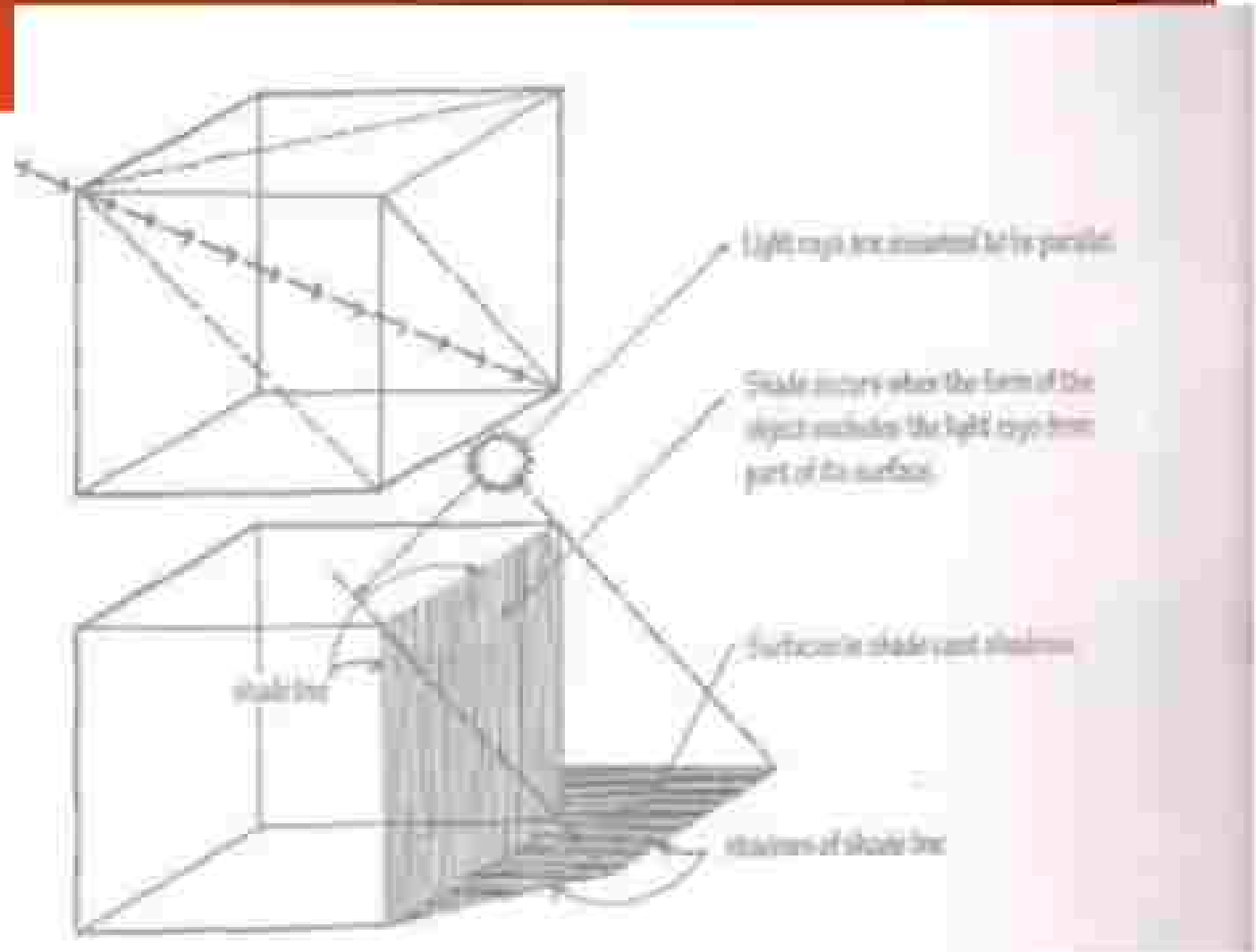
Shade and shadows are used in architectural graphics to make drawings more easily understood by expressing both the third dimension of depth and the form of surfaces, whether flat or rounded, slanted or vertical. ▶

- ▶ The conventional direction of light is the diagonal of a cube from the top left front corner to the bottom right rear corner, so in plan and elevation views the direction of light is seen as the diagonal of a square.
- ▶ This 45 degree direction of light results in shadows of widths equal to the projections from wall surfaces of vertical and horizontal shade lines.

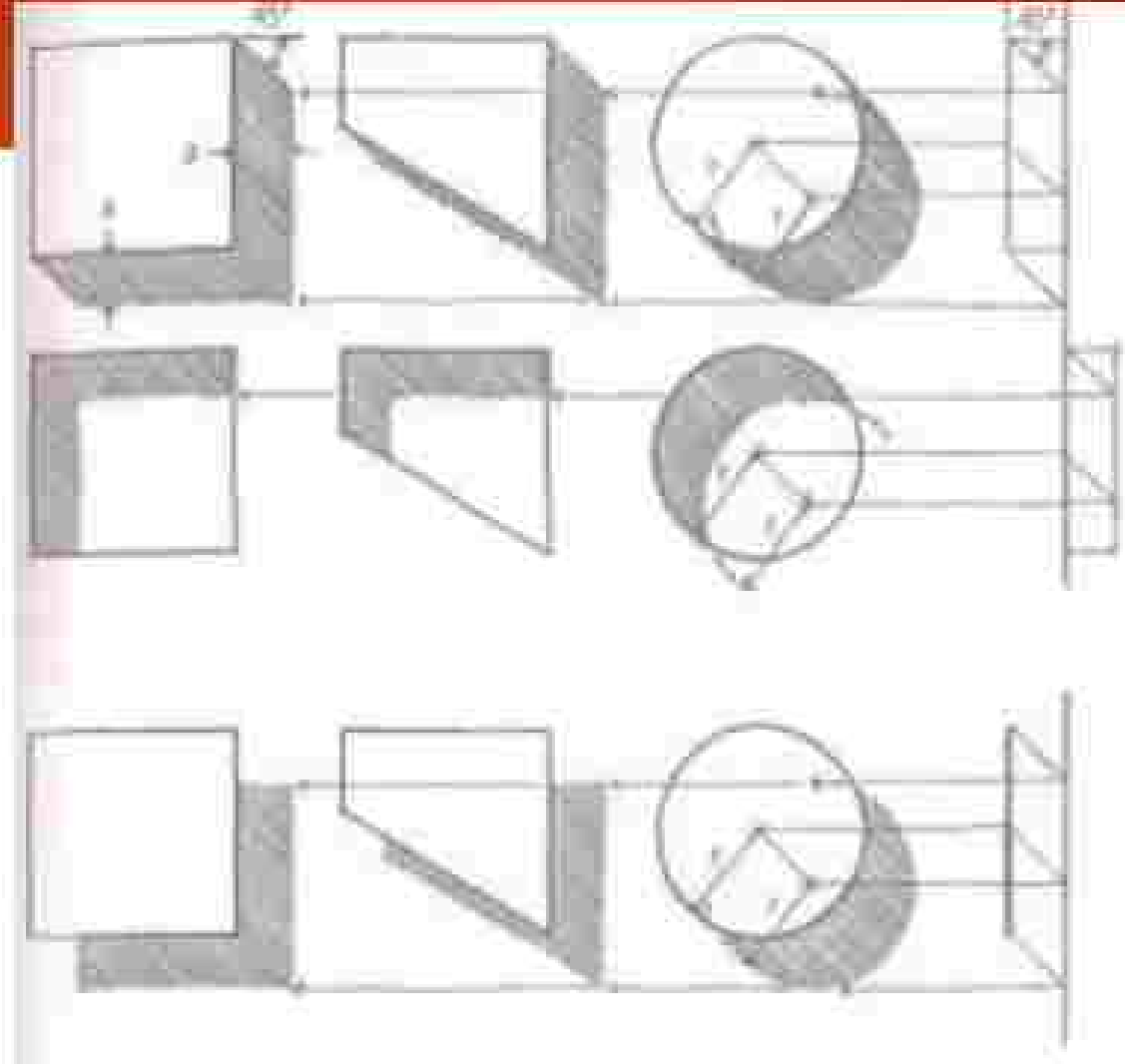


The shape of the shadow is dependent on:

- The position of the shade line.
- The position of the observer
- The direction of light
- The form of the surface on which the plane of the shadow falls. Shadows are parallel to the line making the shadow when the line is parallel to the plane receiving the shadow.



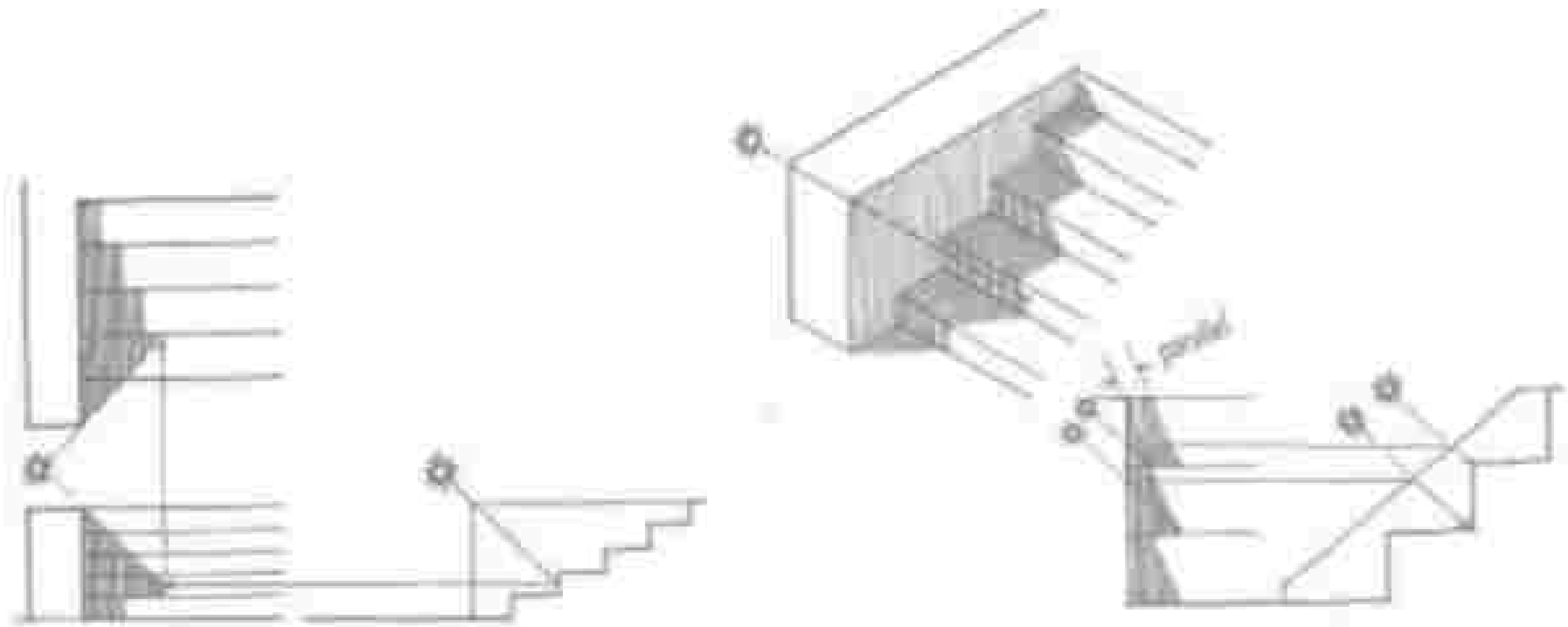
- ▶ The shadow of any plane figure on a parallel plane is identical in shape, size and orientation with the figure. Shadows of parallel lines are parallel when they fall on the same plane or parallel planes. To determine the shadow cast by a complex form:

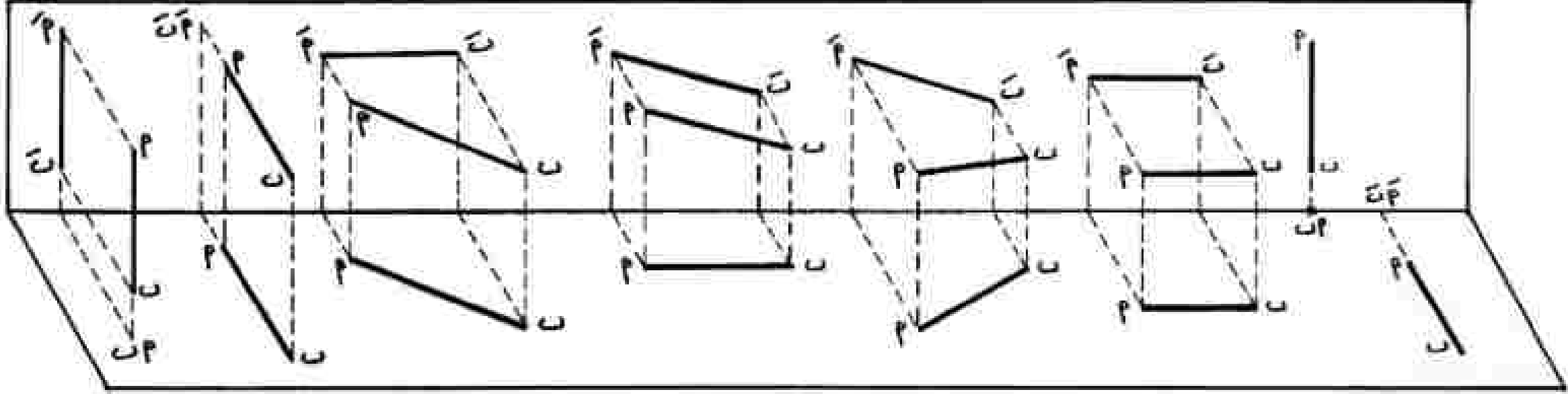


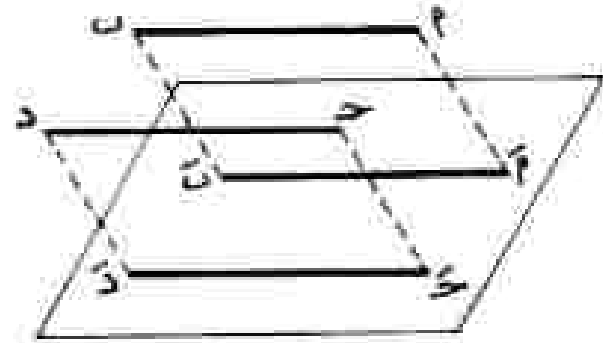
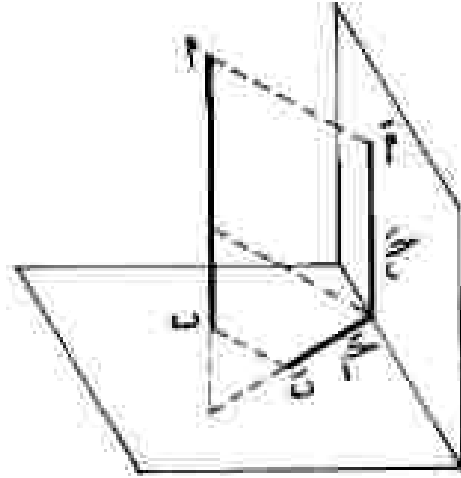
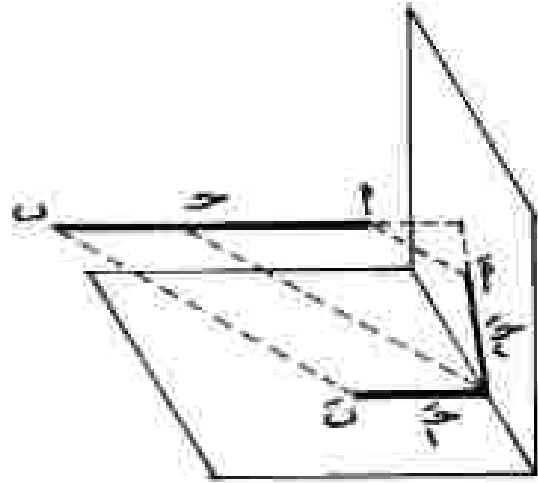
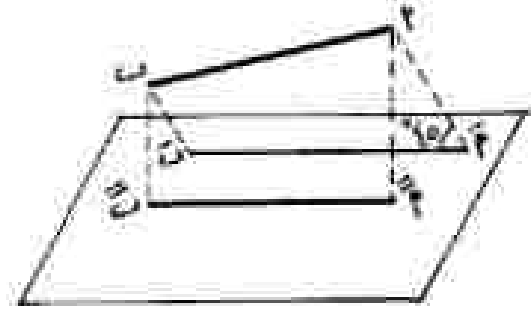
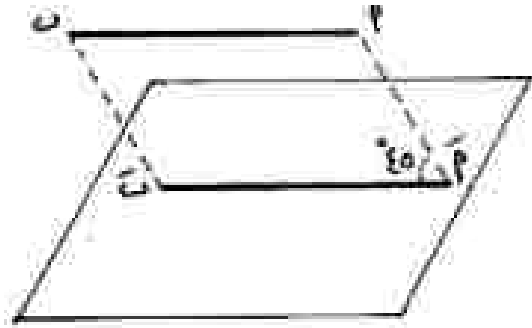
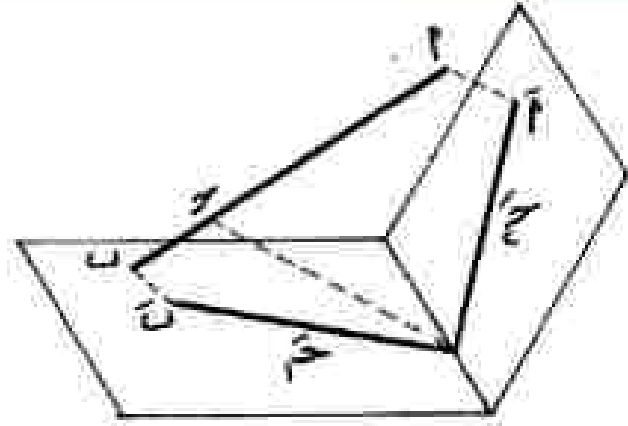
Shadows are parallel to the line making the shadow when the line is parallel to the plane making the shadow.

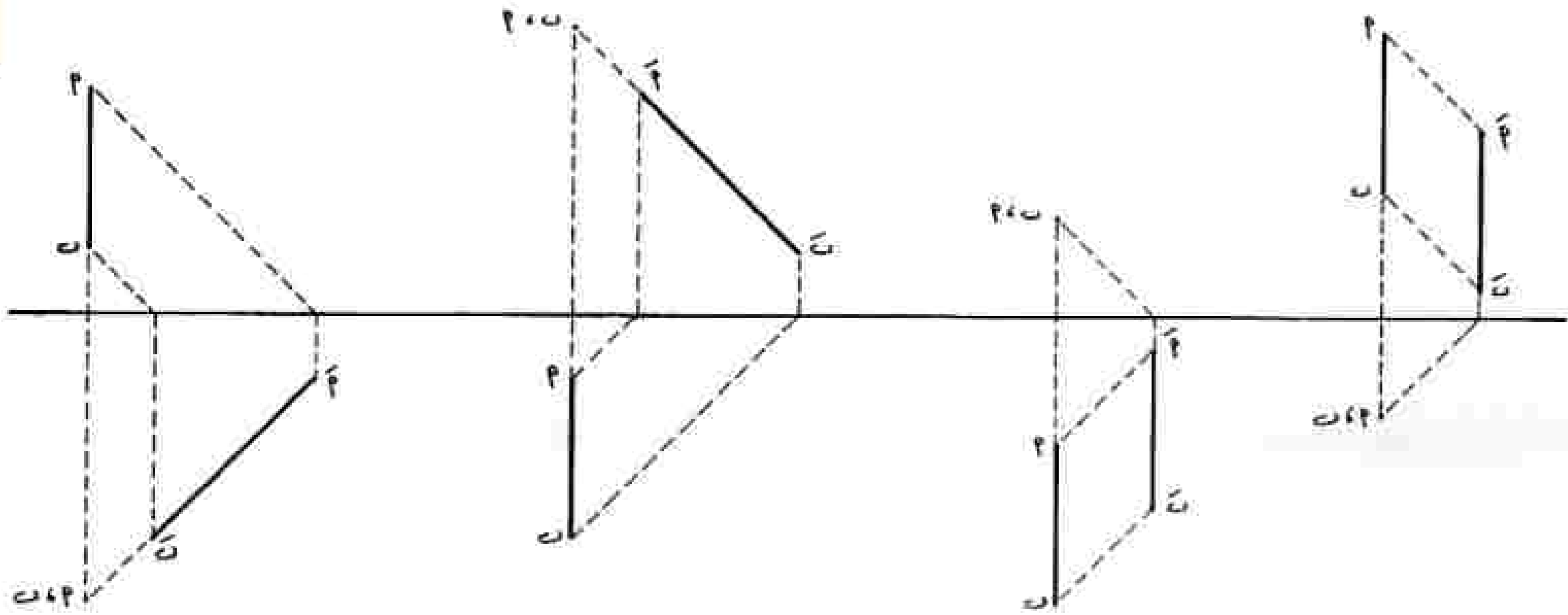
The shadow of any plane figure on a parallel plane is identical in shape, size, and orientation with the figure.

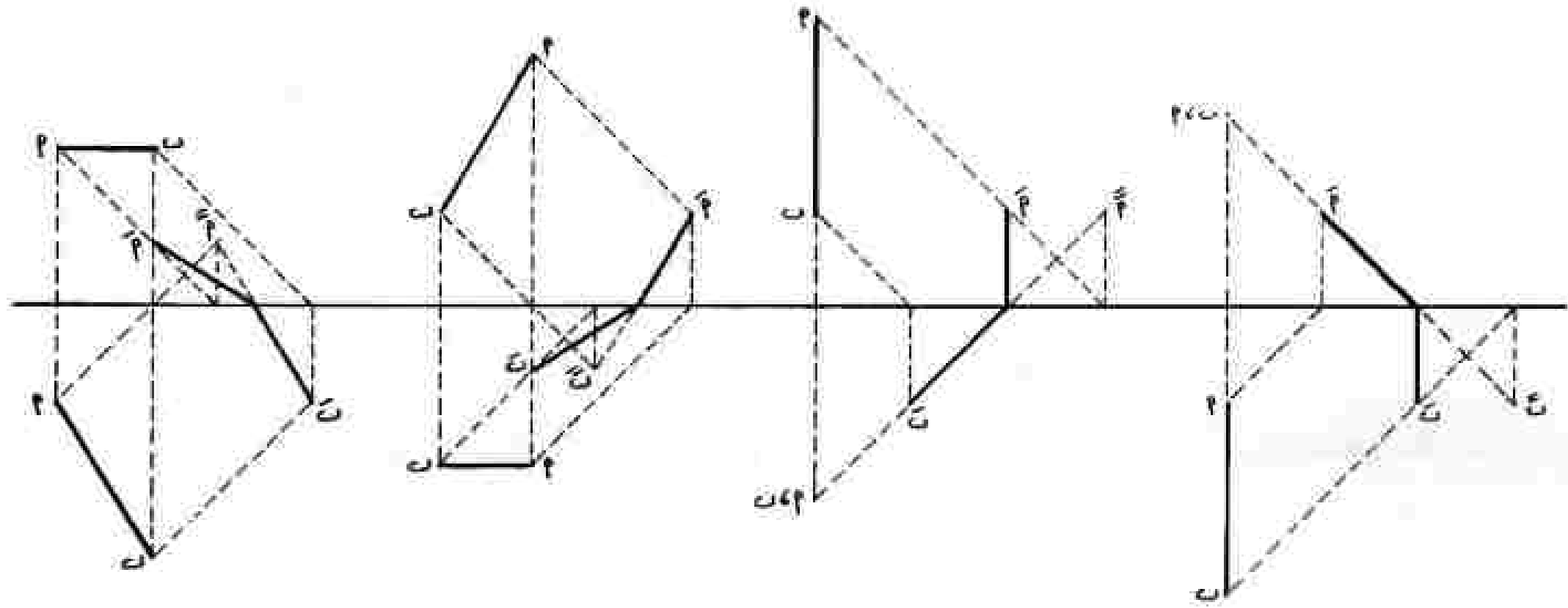
- ▶ The shadow of any straight line on a plane can be found by finding the shadows of the ends of that line.

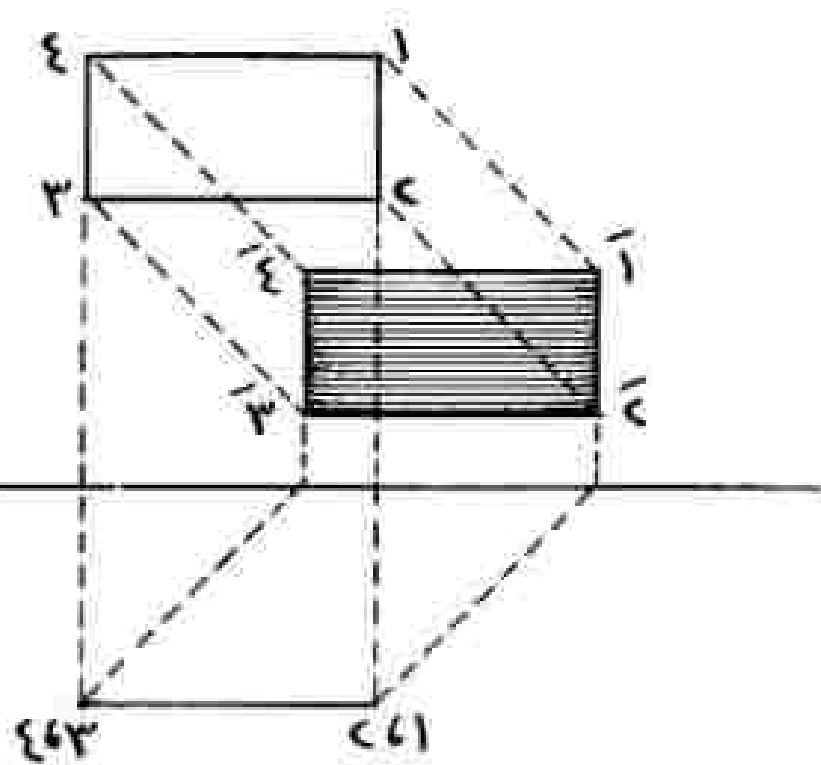
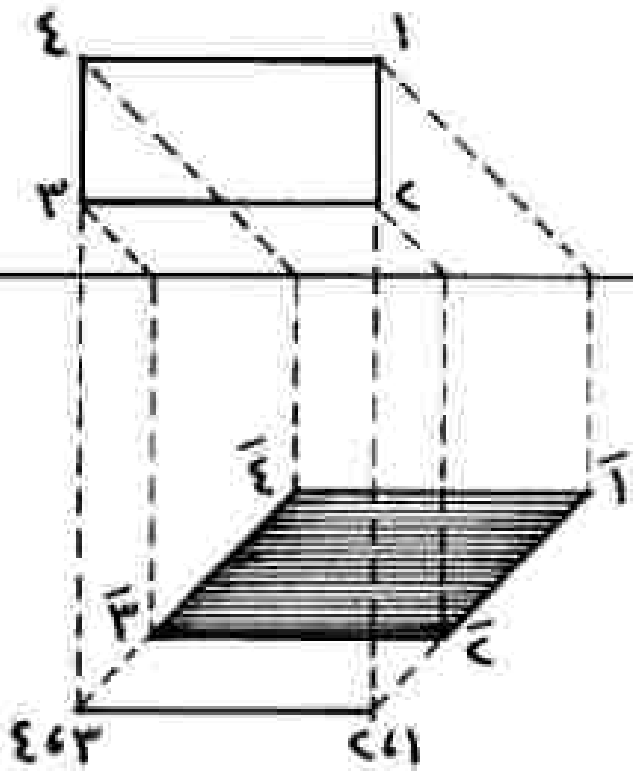
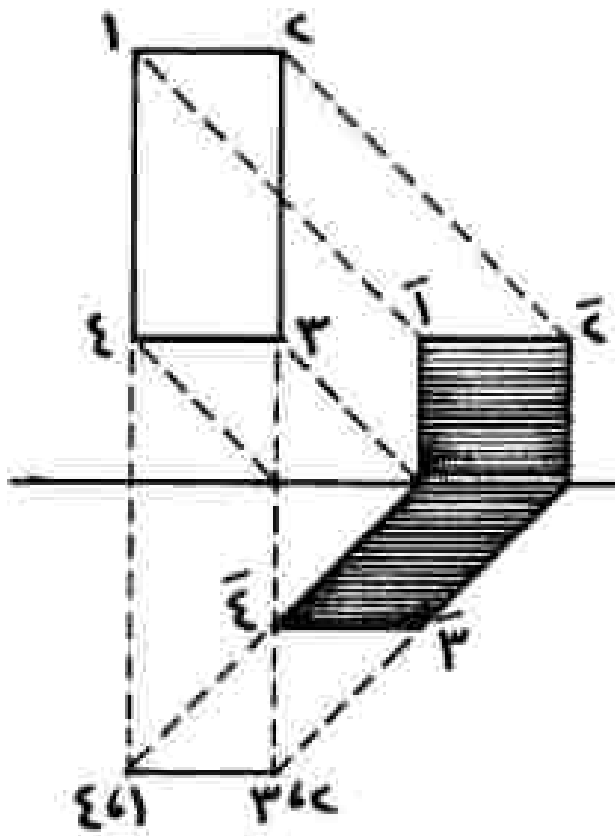


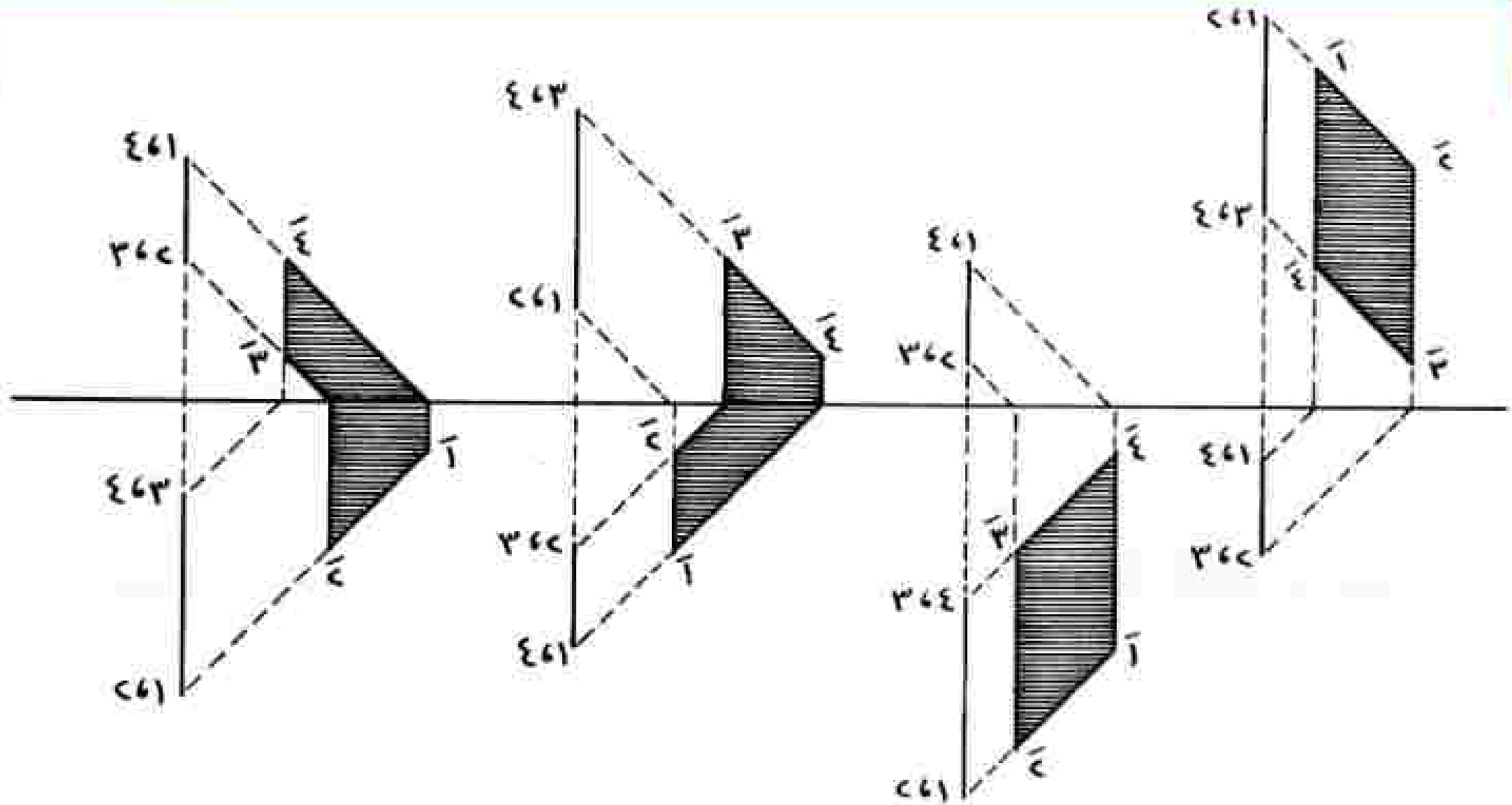


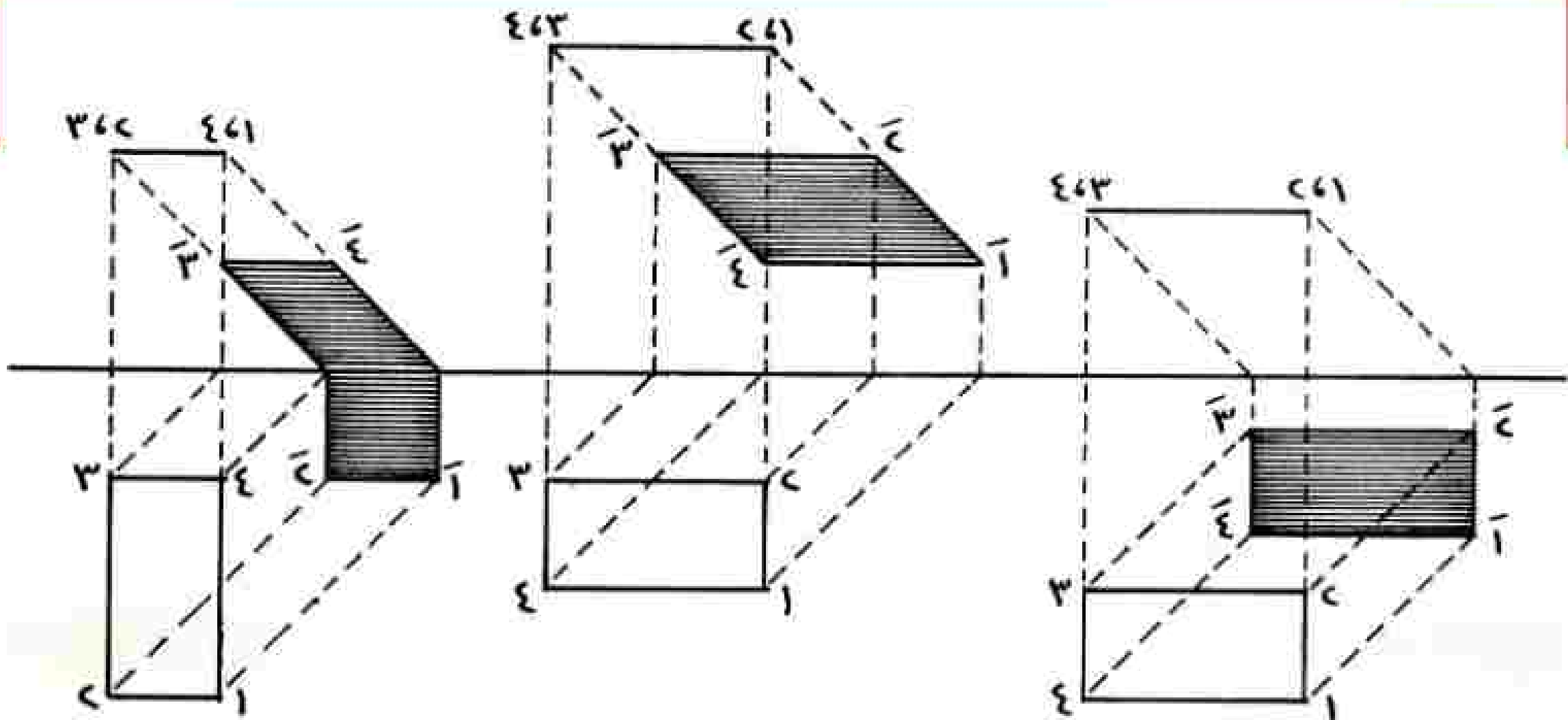





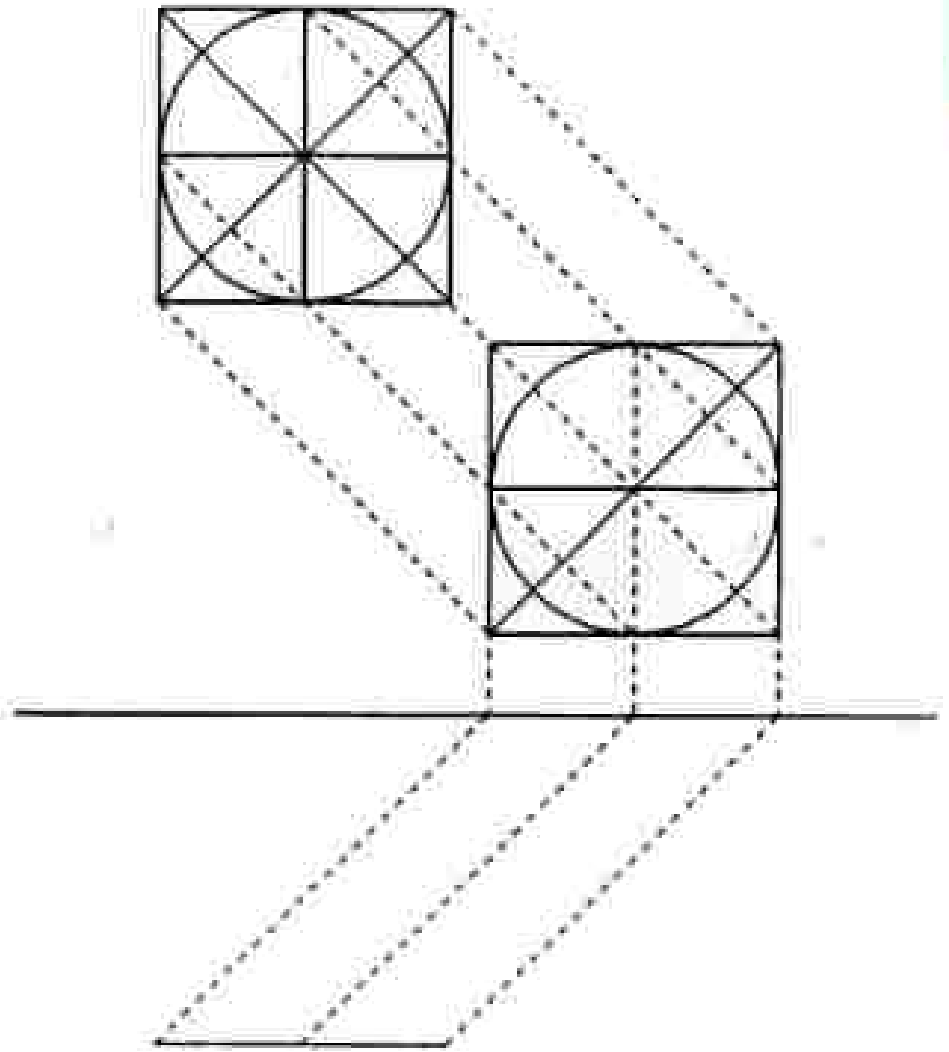
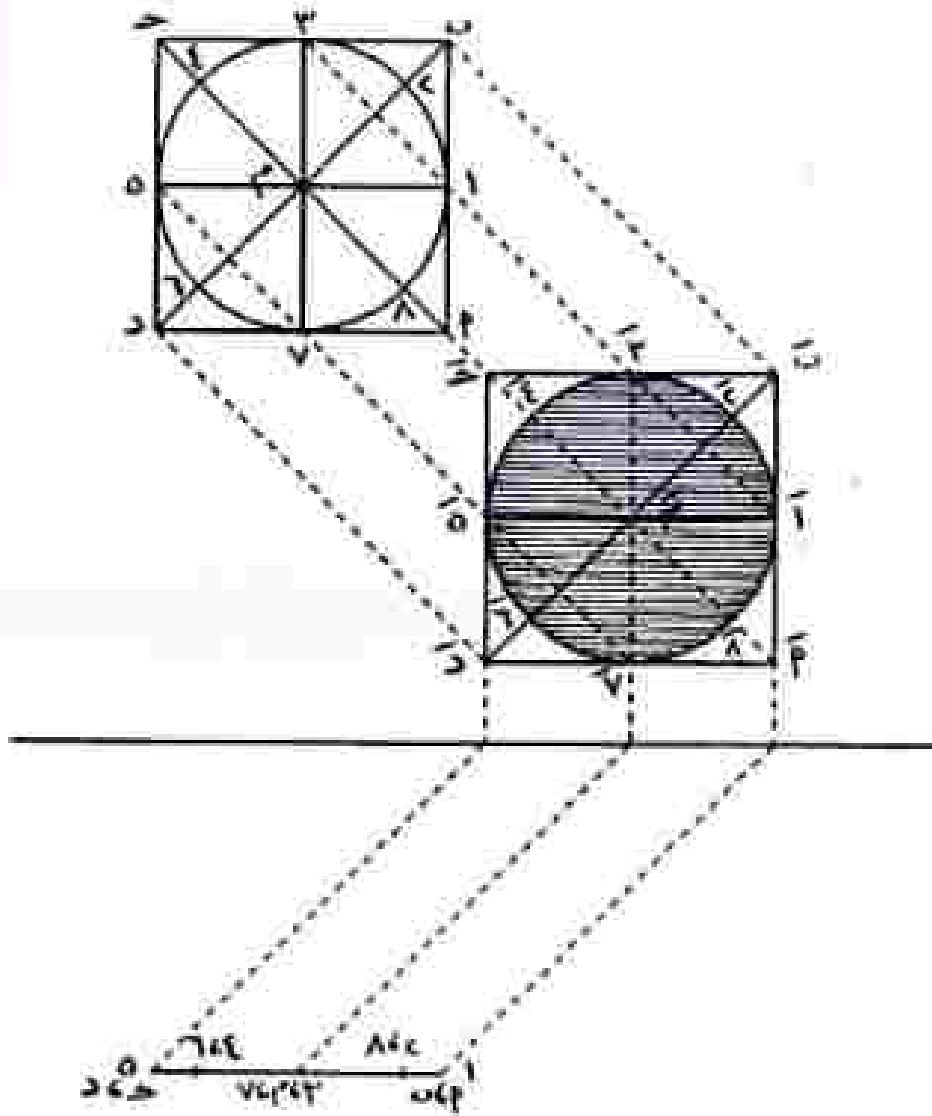




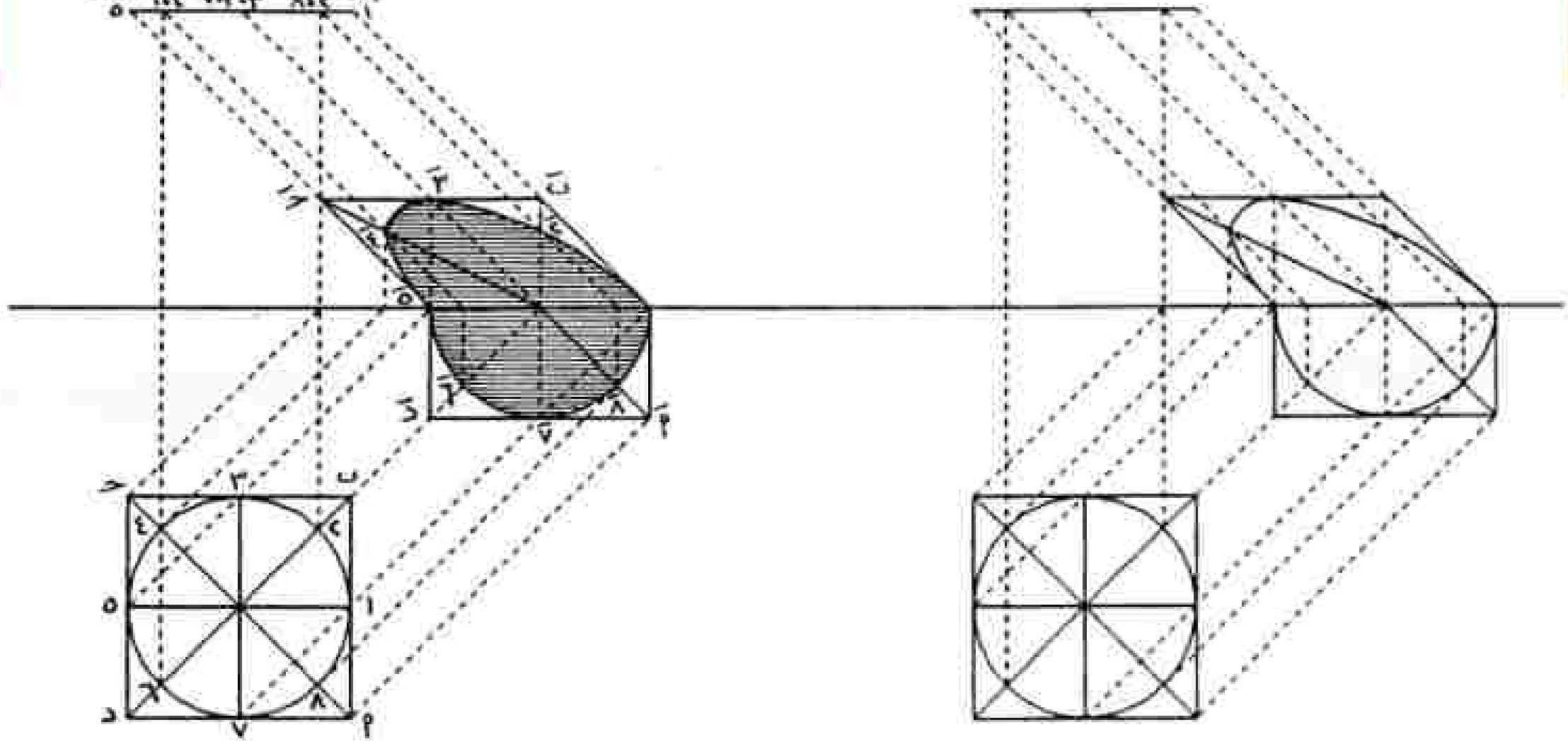


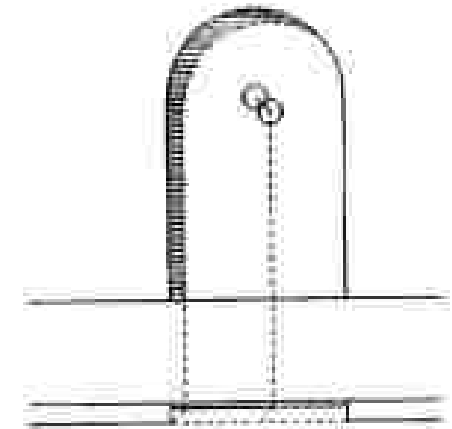
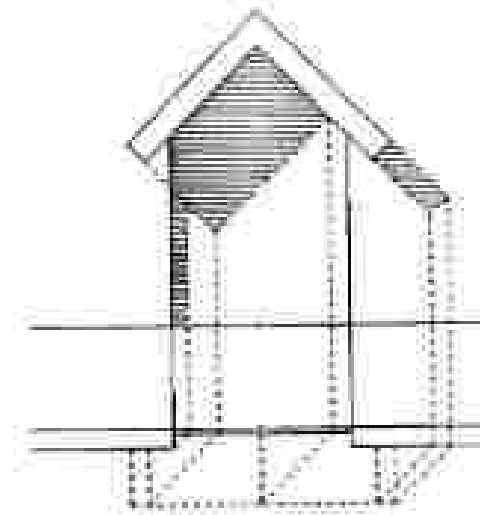
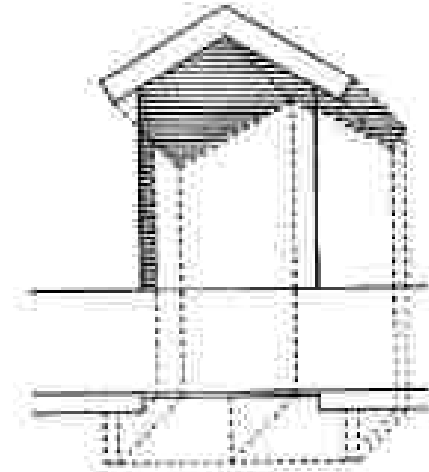
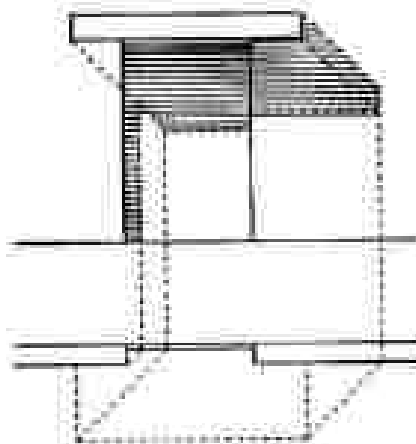
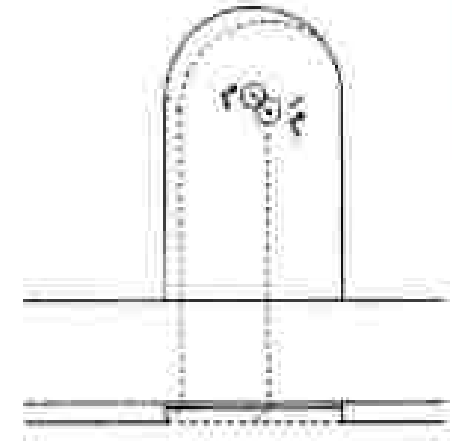
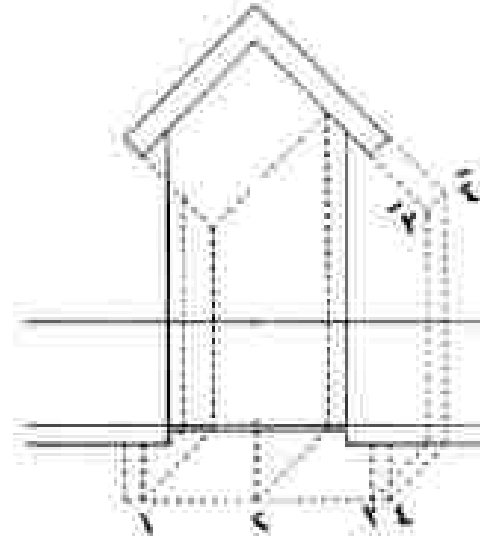
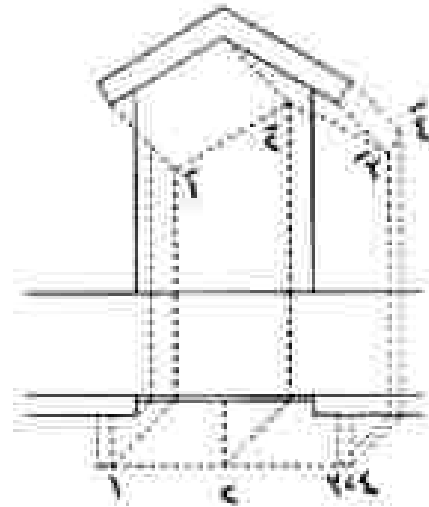
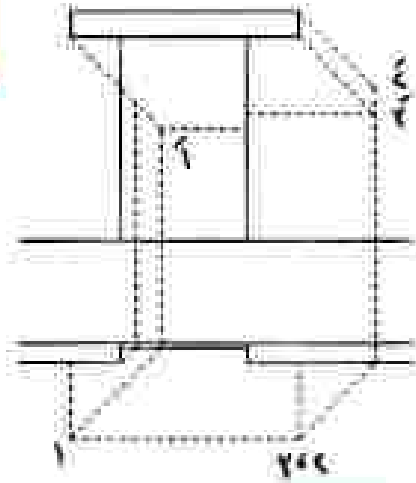



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- ▶ Shadows of curved lines can be determined by 45 degree projections of critical points. The purpose of shades and shadows in the rendition of site plans is threefold:
 - ▶ To indicate the height of masses above the ground plane
 - ▶ To provide a contrast in value to emphasize the building form
 - ▶ To indicate significant changes in topography.

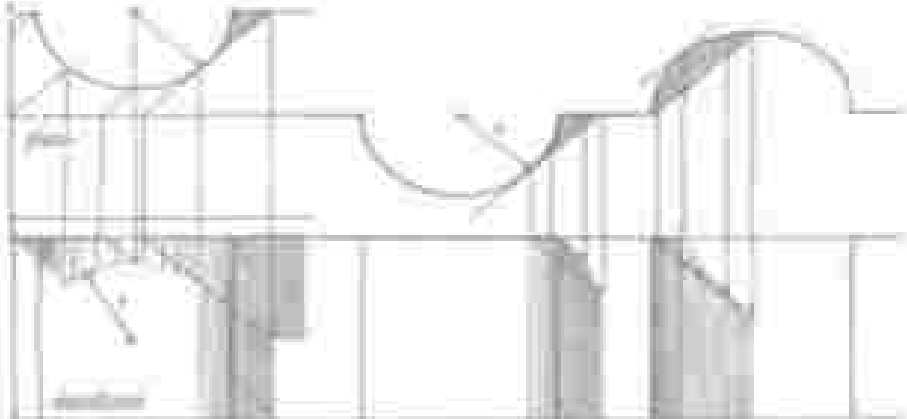
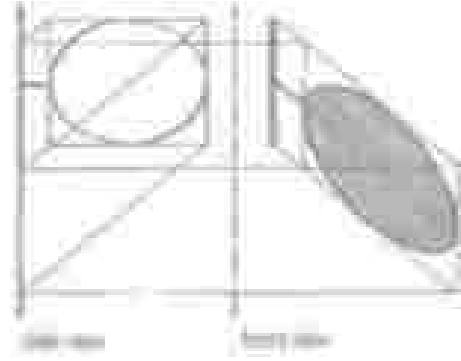
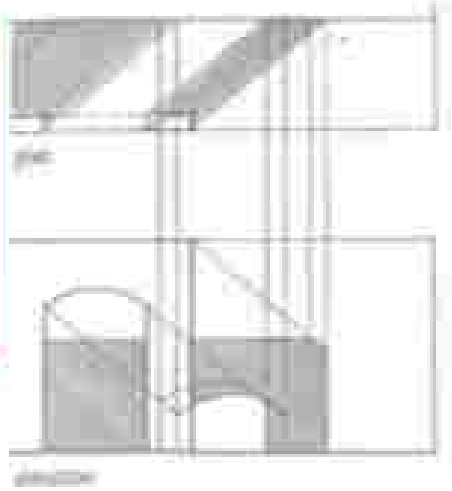


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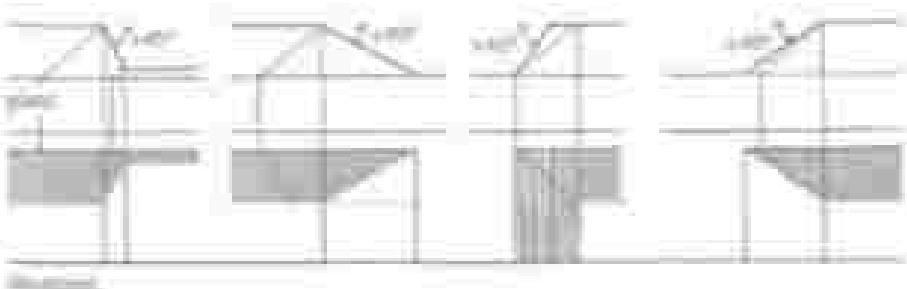


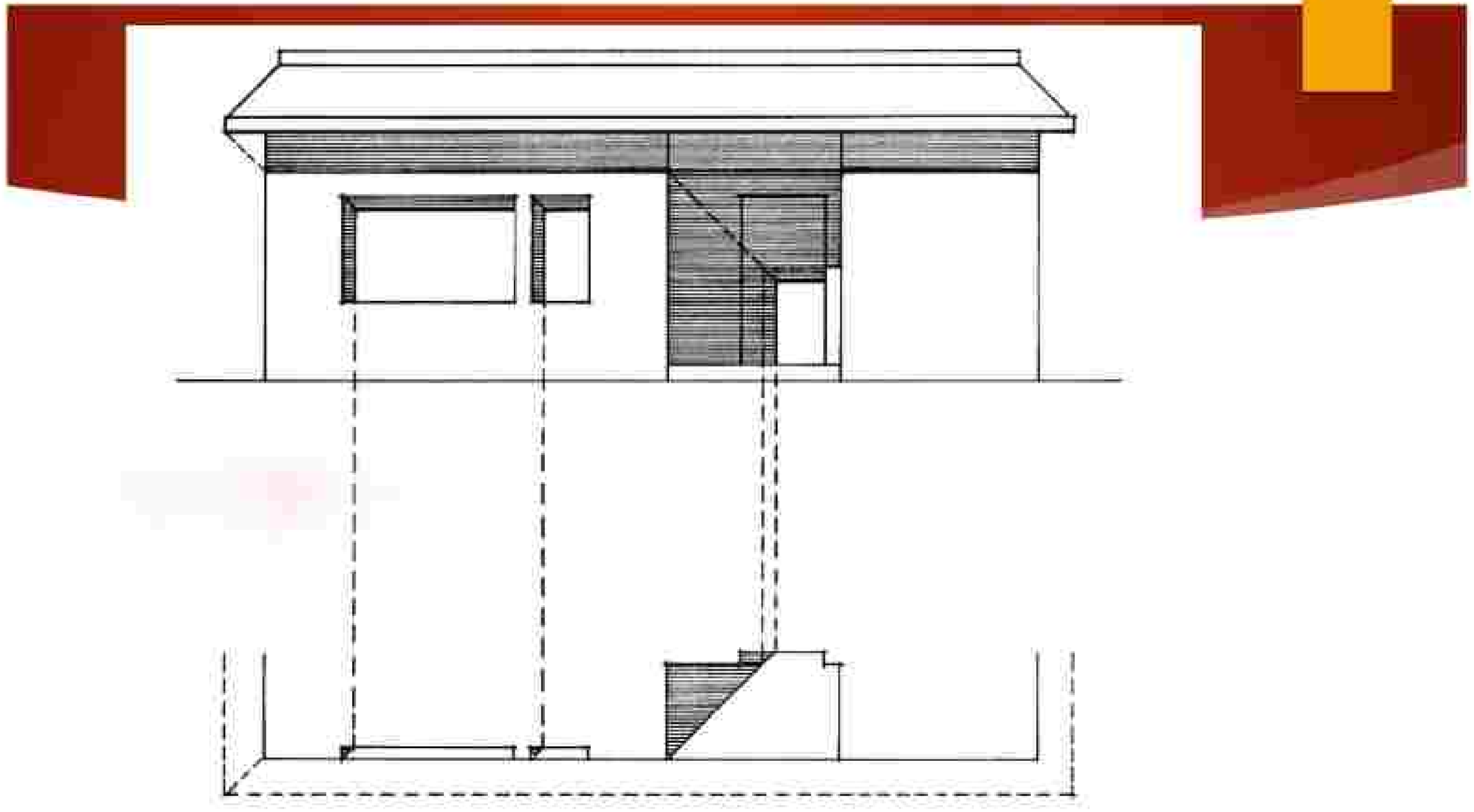


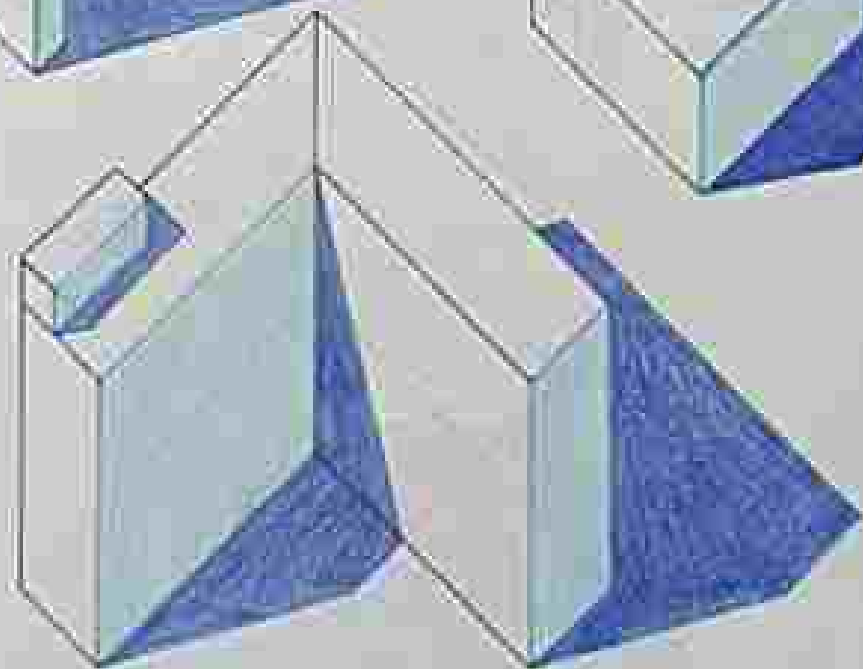
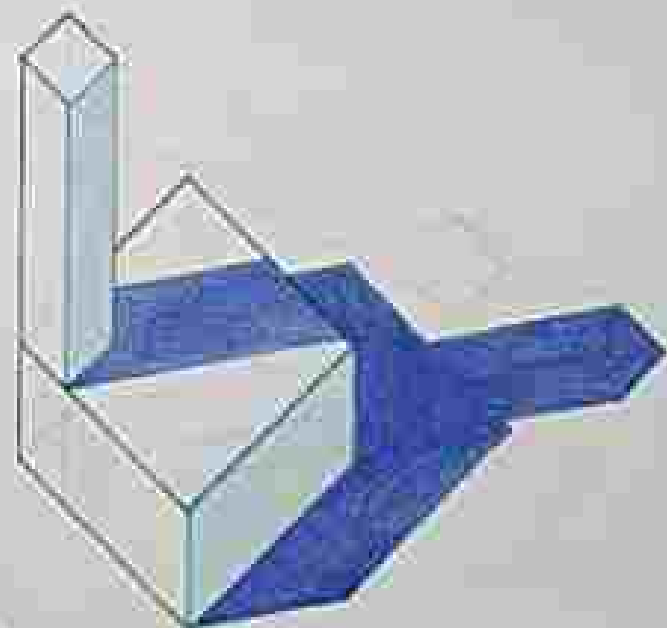
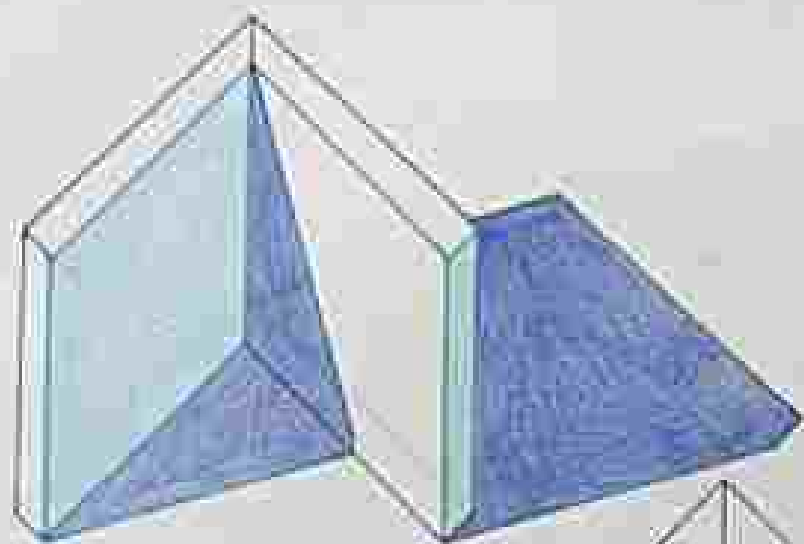
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- ▶ Shadows are used in plan drawings to aid our perception of the depth of the space being portrayed. The intent is not to render the actual condition of sunlight at a specific point in time. The shadows cast by the cut elements and objects within the space merely give us an indication of their height above the floor or ground plane.



Section of a wall must be determined by the position of the window (7.47, 7.48, 7.49)

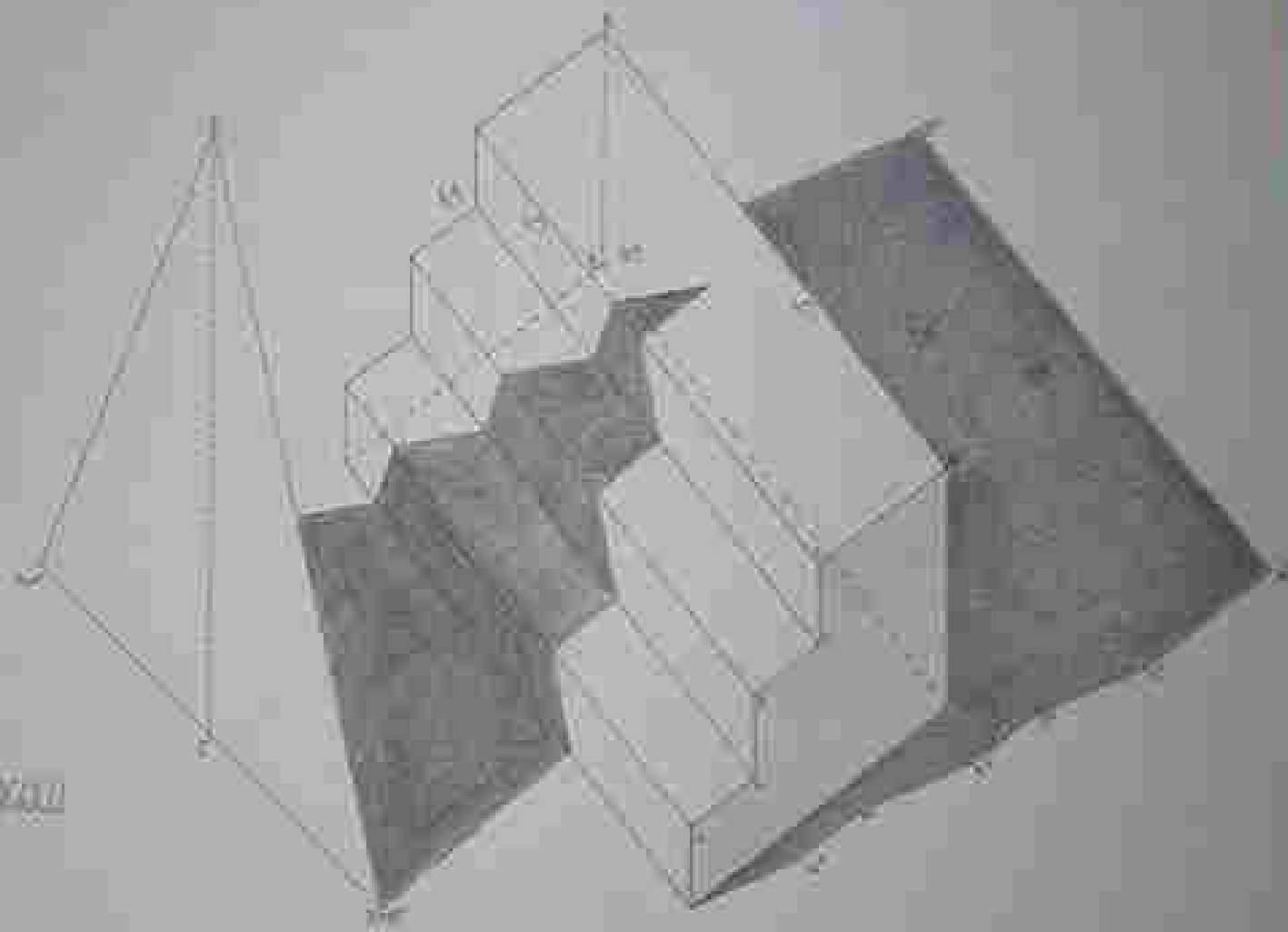
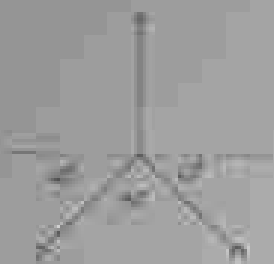






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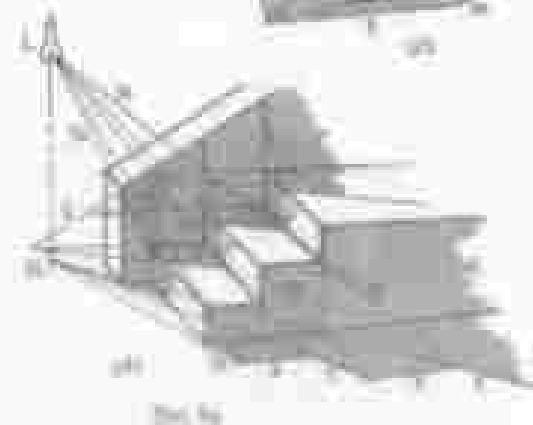
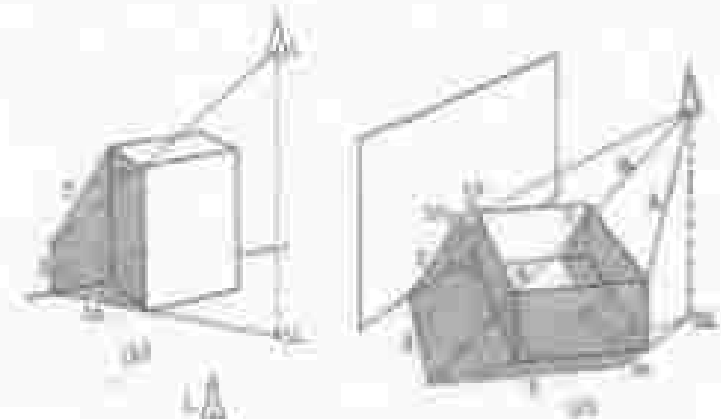
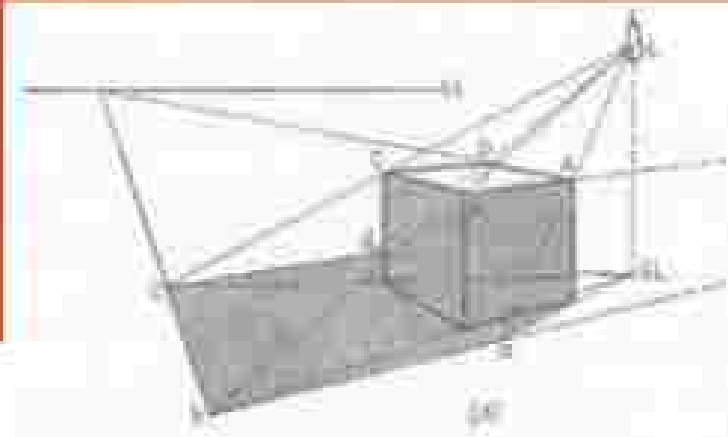
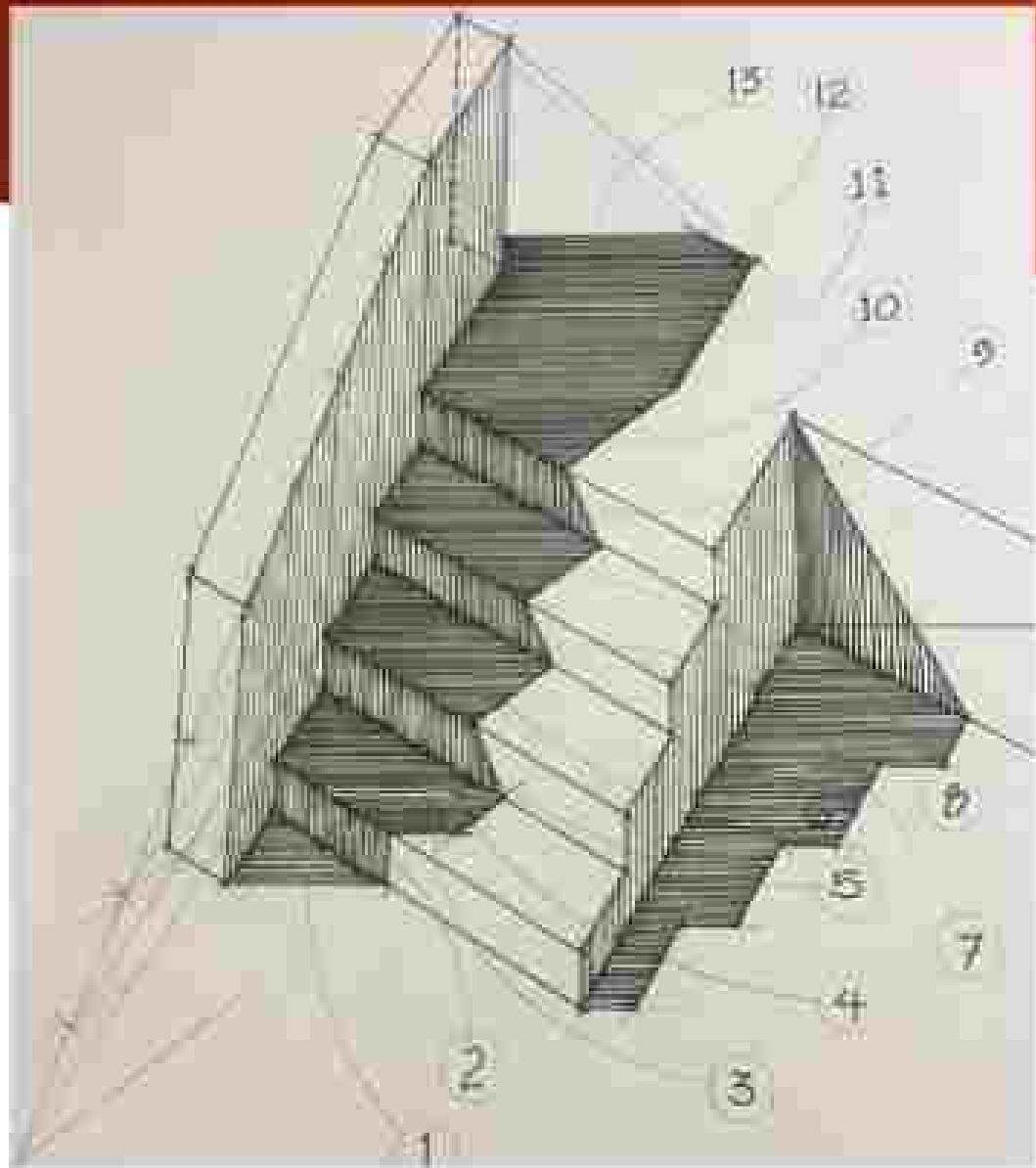
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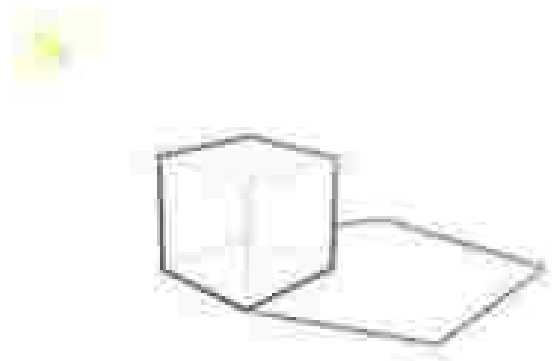
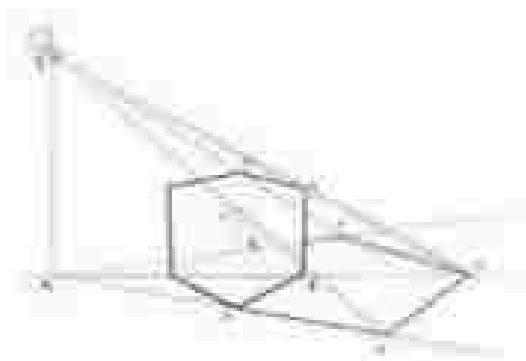
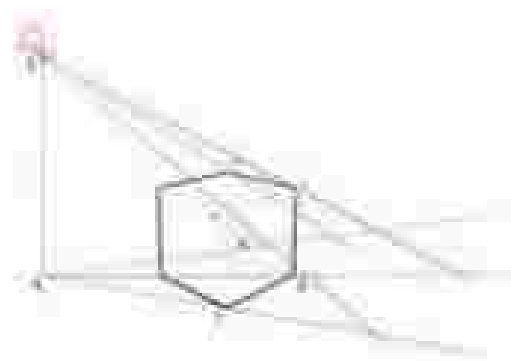


OPERA DI UN TRIANGOLO

SU UNA SCALA

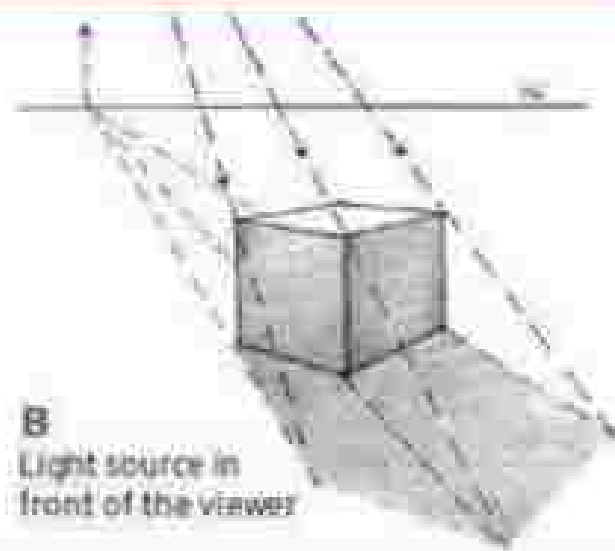
DAI TRIANGOLI 175



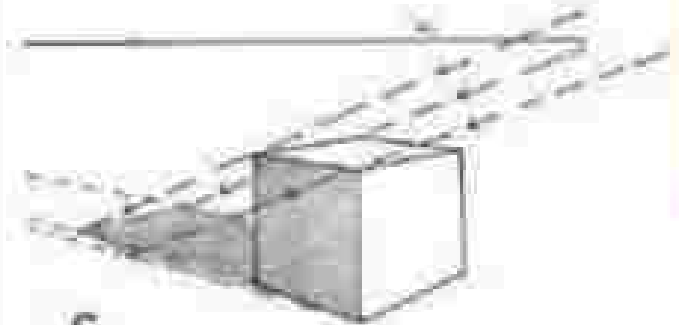




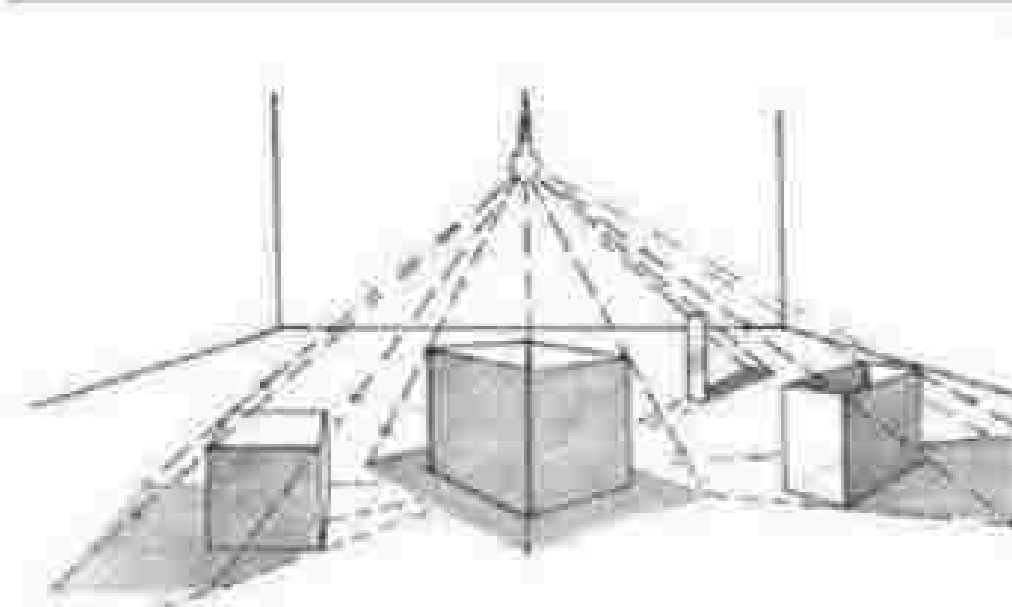
A
Light source parallel to
the picture plane



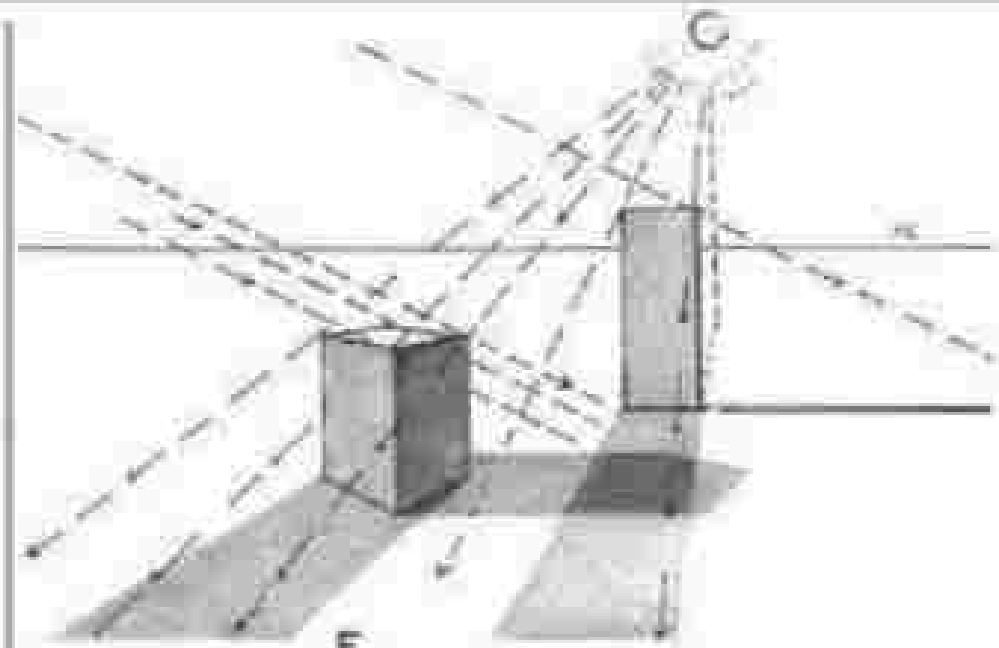
B
Light source in
front of the viewer



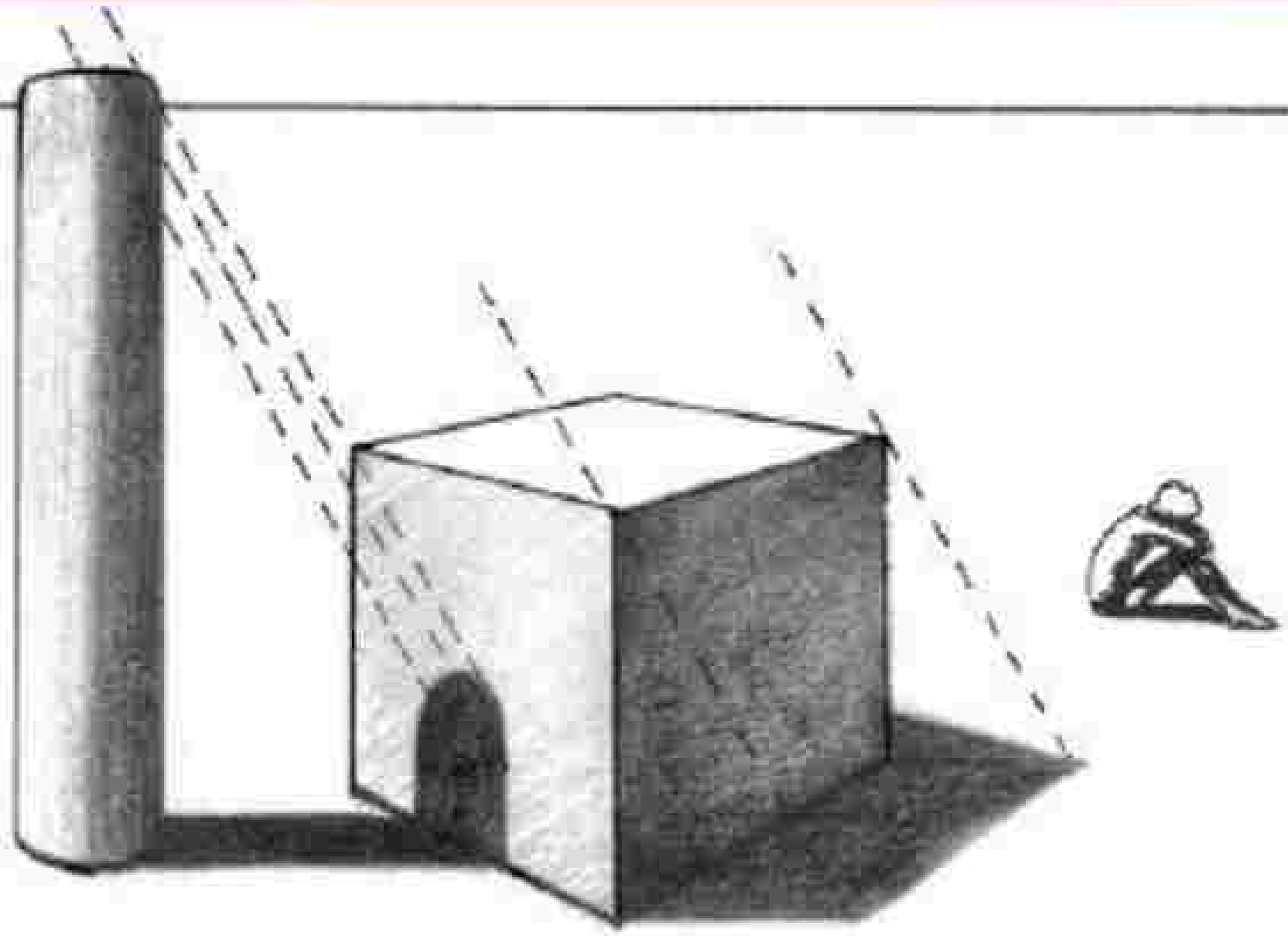
C
Light source
behind the viewer



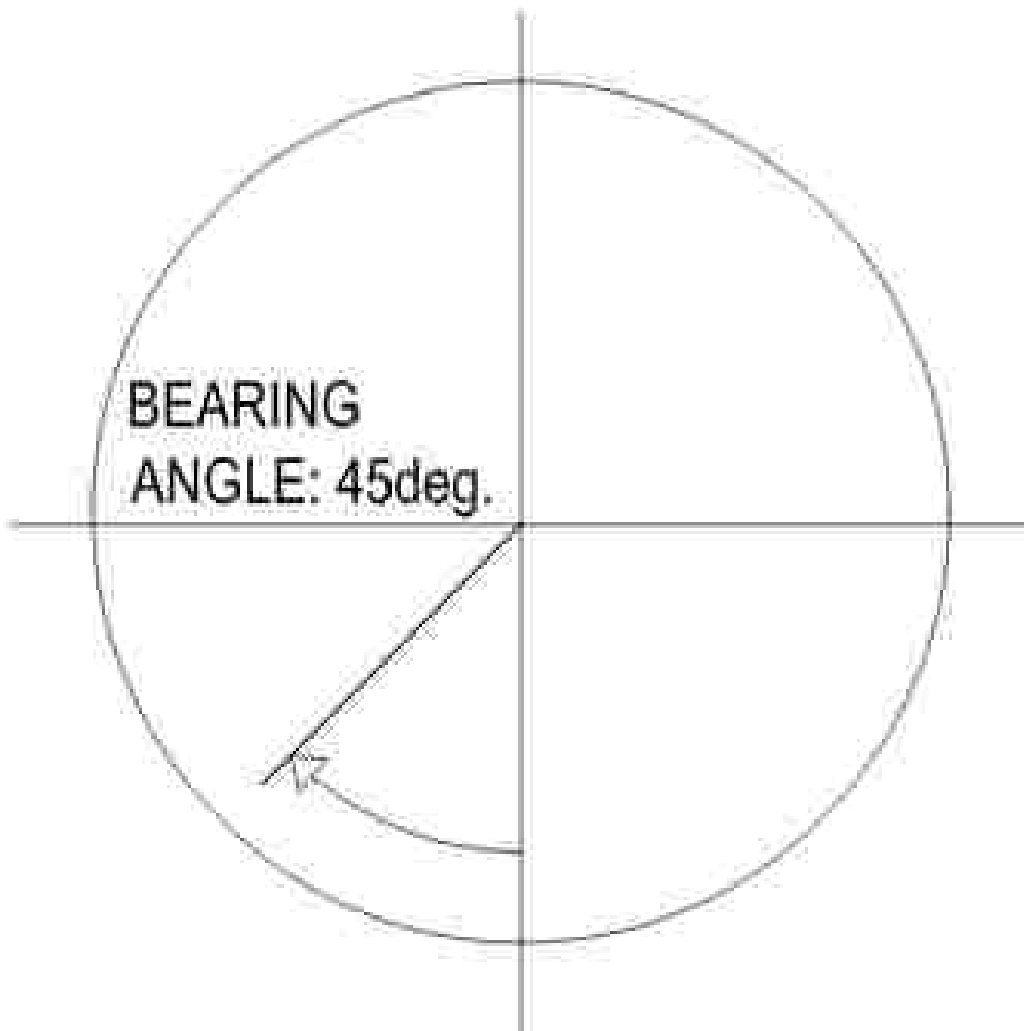
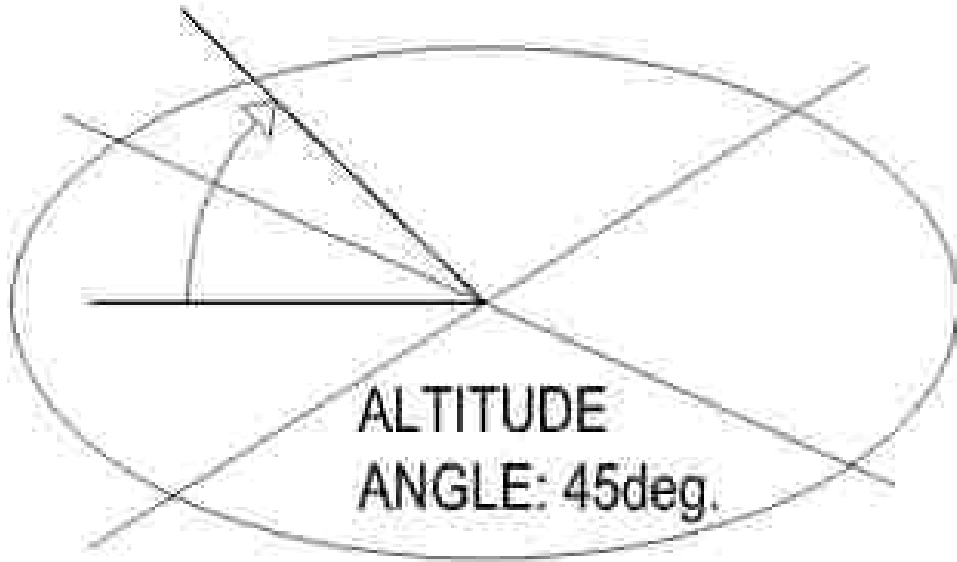
D
Light from a central radiating source



E
Light from multiple sources



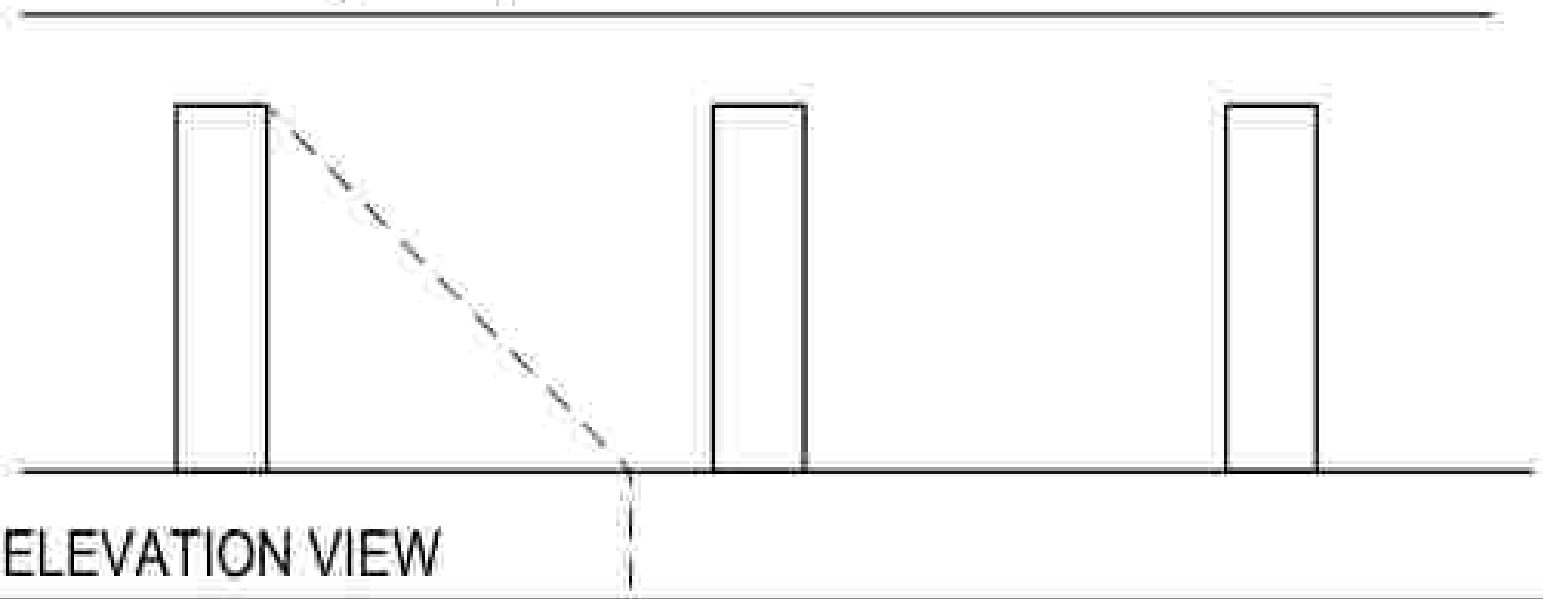
DETERMINE SOLAR EFFECTS





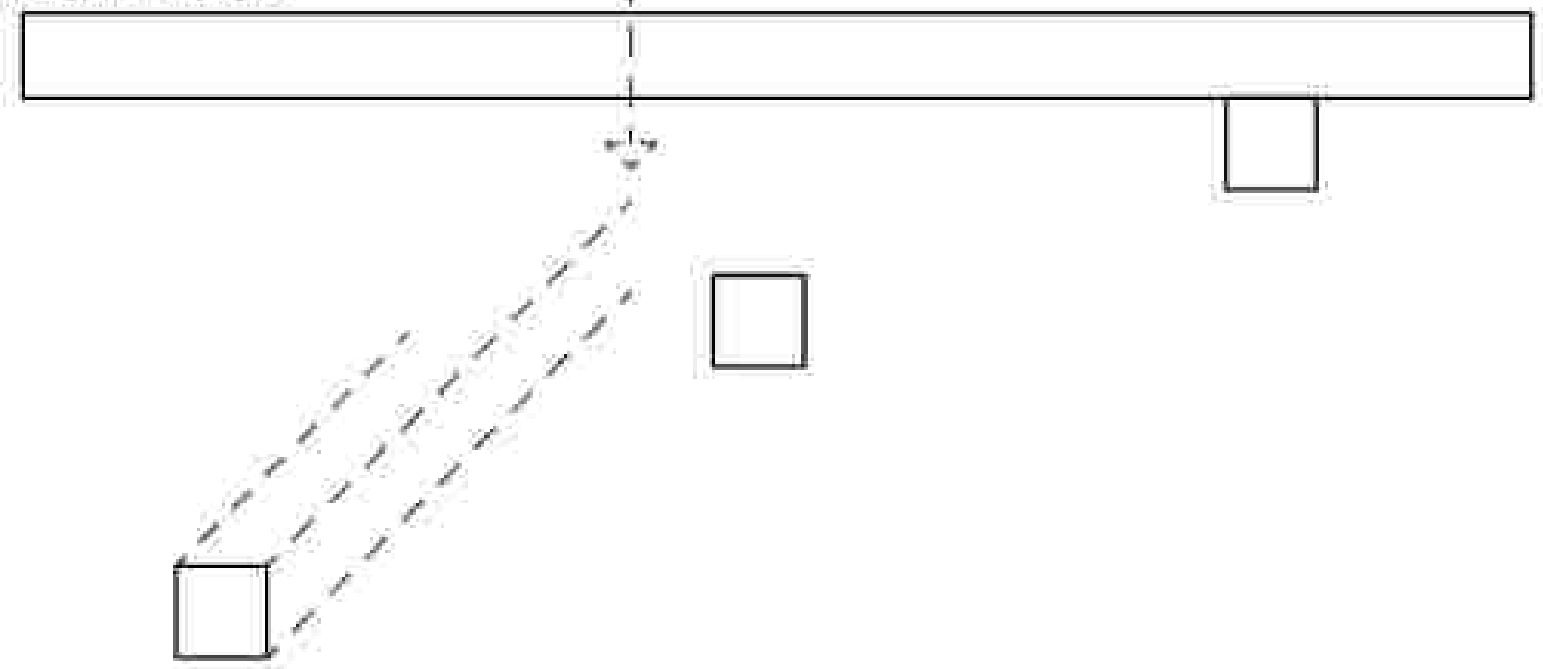
1

extend shadow in elevation to determine where it meets the ground plane



ELEVATION VIEW

PLAN VIEW



2

extend shadow lines in plan to determine angle of shadow on the ground plane