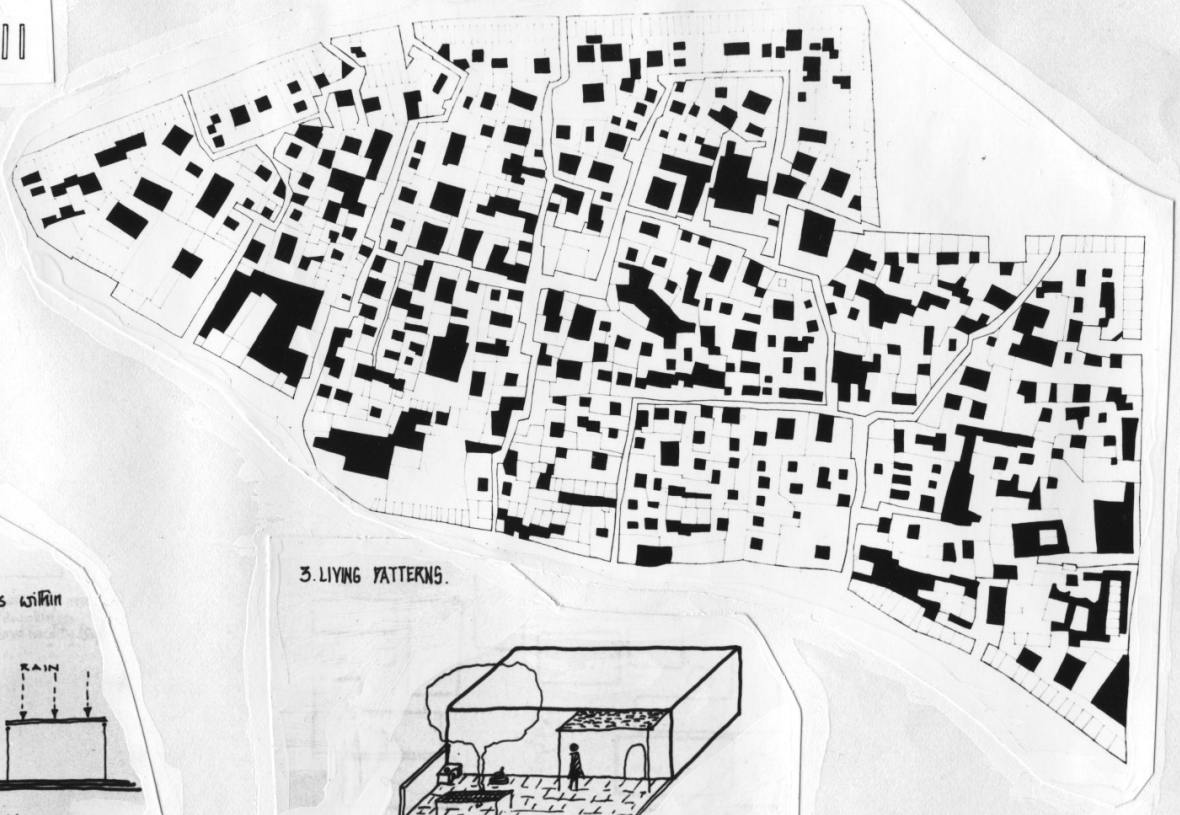
FACTORS AFFECTING INDIGENOUS PATTERNS

PLAN - OLD DELHI NEIGHBOURHOOD



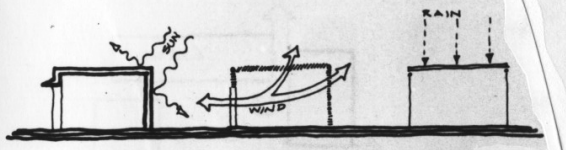
1. CLIMATE

Composite. Three distinct seasons.

i) Hot Dry ii) Hot Humid iii) Monsoon.

2. MATERIALS ~ CLIMATE ~ COSTS.

Difficult to design for comfort in all three seasons within one enclosure.



Hot - Dry.

Requires heavy construction, maximum cover

Stabilised soil, mud brick, brick, insitu concrete slab, concrete blocks. On ascending scale of costs.
mud construction cheapest and best heat insulator, needs special treatment against rain.
brick, concrete favoured when income allows largely for prestige & confidence reasons.

Hot - Humid.

Requires light construction maximum ventilation & shade.

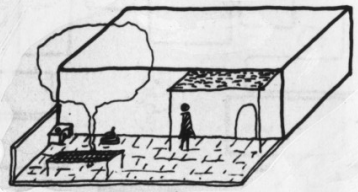
Rush matting, bamboo thatch, hessian, timber planks, short life, adopted mainly for cost reasons. often free, salvaged urban waste.

Monsoon.

Requires shelter.

timber board, asbestos sheets, tin sheets, corrugated iron, tarpaulin ~ cheap but very bad heat insulator, and no ventilation.

3. LIVING PATTERNS.



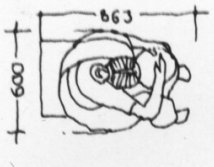
Internal & External spaces.

Equal use of internal and external spaces. ~ more o outside living if anything. thus dwelling of heavy construction for use during hot-dry seasons, for privacy and security (storage) shelter during rain.

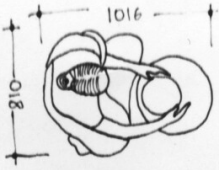
Some definition of own external space - wall, paving etc. for sleeping, cooking, entertaining ~ tree, lean-to for shelter and shade.

Suitable for most of hot-humid, monsoon season.

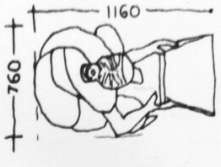
PRE-COOKING



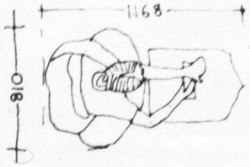
1. PICKING



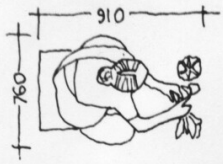
2. SIEVING



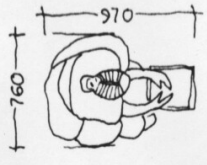
3. WINNOWING



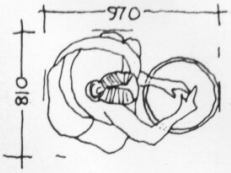
4 GRINDING



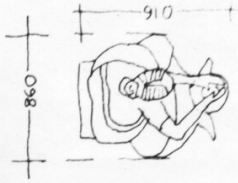
5. WASHING



6. TAKING OUT

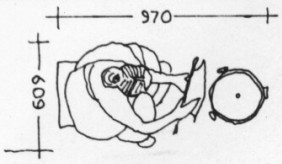


7. MIXING

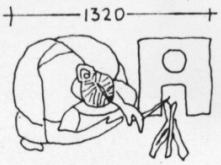


8. CHURNING

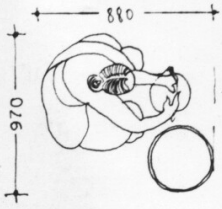
COOKING



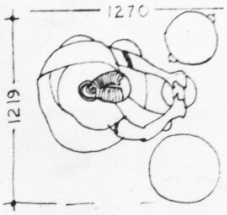
9. LIGHTING *ANGITHI*



10. LIGHTING *CHULLAH*



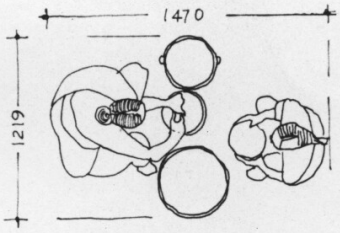
11. **ROLLING**



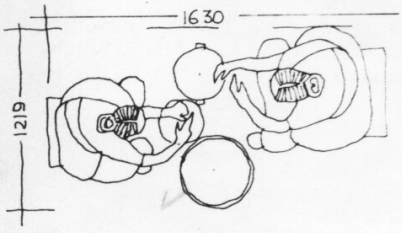
12 COOKING

SQUATTING

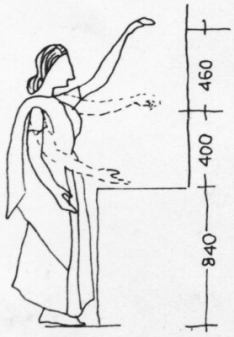
13 REACH EXTENTS



14 COOKING SERVING



15 ASSISTED COOKING



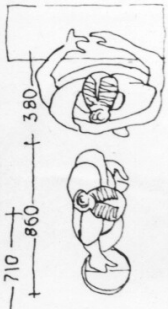
STANDING

16. LIMITING DIMENSIONS

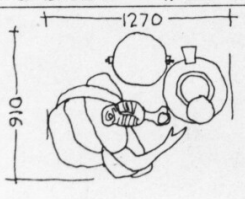
17. USING LOWER SHELF

18. LIGHTING STOVE

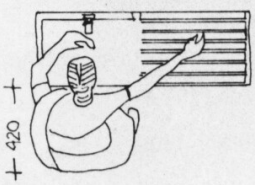
19. COOKING



20. ROLLING



21 WASHING-UTENSILS



22 USING SINK

23.

CLEANING

SQUATTER SETTLEMENT

Reference:
'Study of Squatter Communities in Delhi.' G. Payne.

1. EXISTING WALL LEADS TO A LEAN-TO BEING CONSTRUCTED AGAINST IT AS FIRST RUDIMENTARY SHELTER.

i) Use of existing available elements –
a. wall as main, firm support
b. Lean-to materials – bamboo, stick support, scrap cloth, gunny sacks, tin sheet roofing.
c. second make-shift wall added to one provided.

SUGGESTED PROPOSAL.
could provide a wall and some cheap materials for clients to set up for themselves. (within a rationalised layout and professional advice readily available?)

2. STAGES OF DWELLINGS' DEVELOPMENT.

Urban Waste building → Institutionalised building

on stick/bamboo frame → mud, wash brick → brick, concrete – houses built once occupant earning and secure.

rush matting, gunny sack, thatch, corrugated, asbestos, card board, packing case – roofs & walls.

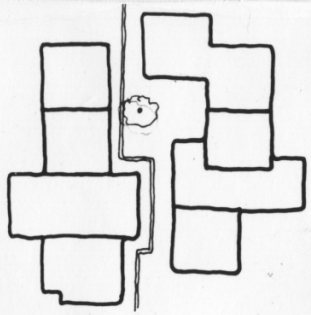
3. TOTAL LIVING OCCURS AS MUCH IN THE EXTERNAL SPACES AS IN THE INTERNAL SPACES.

1. Composite climate with three distinct seasons – hot-dry, hot-humid (monsoon) and cold winters. allows external living to be comfortable for 3/4 of the year.

ii Limited shelter naturally encourages external space to be used. hence the observed phenomenon of less use of external spaces as income and thus dwelling size increases.

iii Communal use of facilites lend themselves easily to external communal spaces.

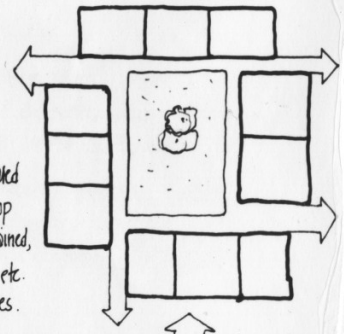
iv. maximisation of the use of external spaces.
sit, chat, play, wash, cook, eat, work (light industry, cobbler, mat weaving, chair-poy (bed) making,) sleep etc.



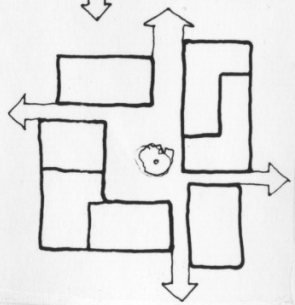
4. HIERARCHY OF SPACES & CIRCULATION.

short, narrow, passages – 1 metre or less, often with an open drain running through the middle – opens into a larger, communal space shared and used by the six or seven houses grouped around it. perhaps a tree in the middle.

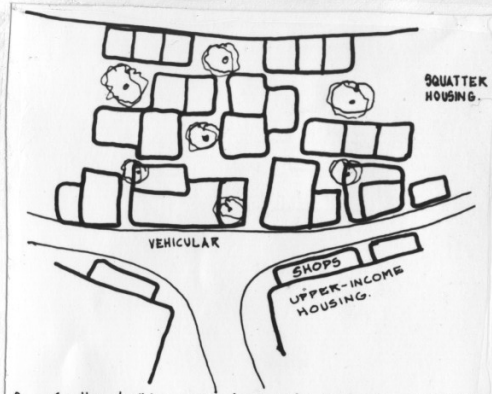
5. SIZE OF EXTERNAL-COMMUNAL SPACES CAN BE CRITICAL TO THE WAY THEY ARE USED.



i) large 'green parks', often anonymous spaces unrelated to any identifyiable group of dwellings lie unmaintained, used for buffalo grazing etc. though designed as play spaces.

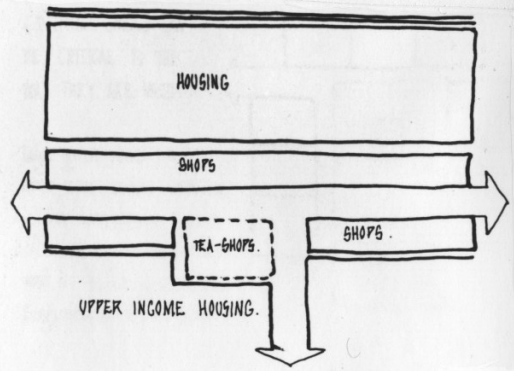


ii) smaller, communal space to which surrounding dwellings can readily relate are fully maintained and used – including any public thoroughfare that may form a part.



6. Smaller dwellings away from main road use communal external spaces while larger dwellings along main road have personal private yards.
IMPLIED TREND :- less use of communal spaces by richer inhabitants – have private yards.
CONTRADICTION :- if older inhabitants began against back wall they should be the wealthier inhabitants.
RESOLUTION? private yards along main road as external spaces less secure and less private along there.

7.



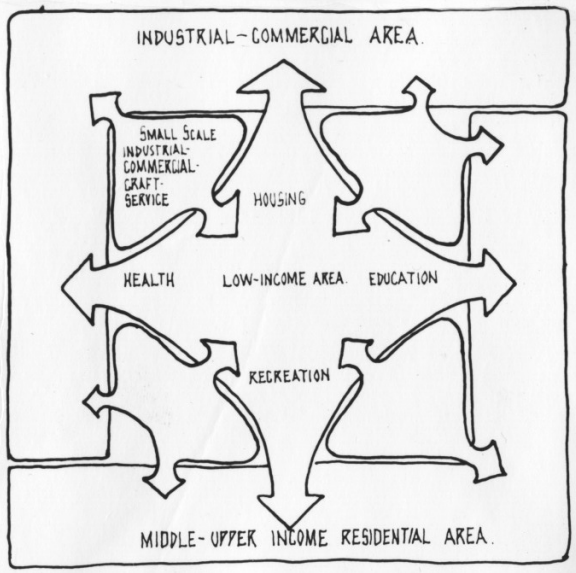
HOUSING
stretches equidistant from main line of circulation.

SHOPS
Line the main circulation – best situation for selling and servicing both to colony and upper income housing

TEA-SHOPS - DHOBI (laundry)
Locate themselves at intersections – combine well with bus-stops

LOCATION & LAYOUT

FACTORS INFLUENCING LOCATION AND LAYOUT



INDUSTRIAL-COMMERCIAL AREA.

A major source of employment easy access important.

MIDDLE-UPPER INCOME RESIDENTIAL AREA.

A major source of employment-particularly for women as domestics. potential market for services generated by low income area.

SMALL SCALE INDUSTRIAL-COMMERCIAL-CRAFT SERVICES.

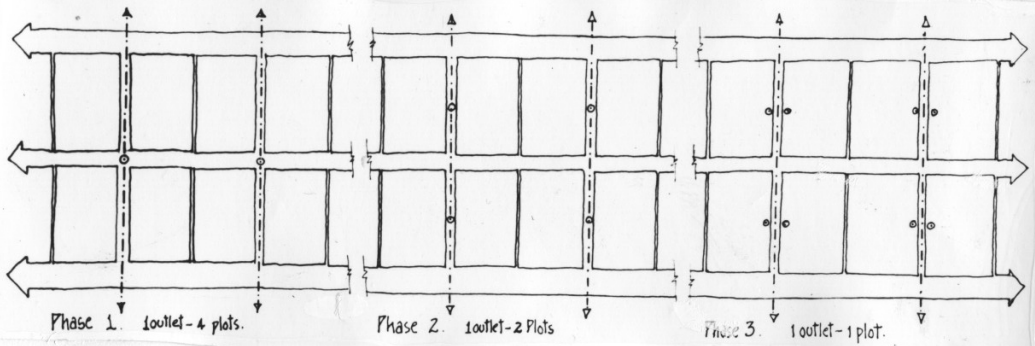
Services generated by low income area in response to needs of upper income groups and their own needs.
ex stalls, shops, Laundry, lunches for offices etc.

HOUSING-EDUCATION-HEALTH-RECREATION SERVICES COMMUNITY SERVICES.

these act as catalyst within the low income area, aiding its development.

the services may be combined in one community centre or housed apart.

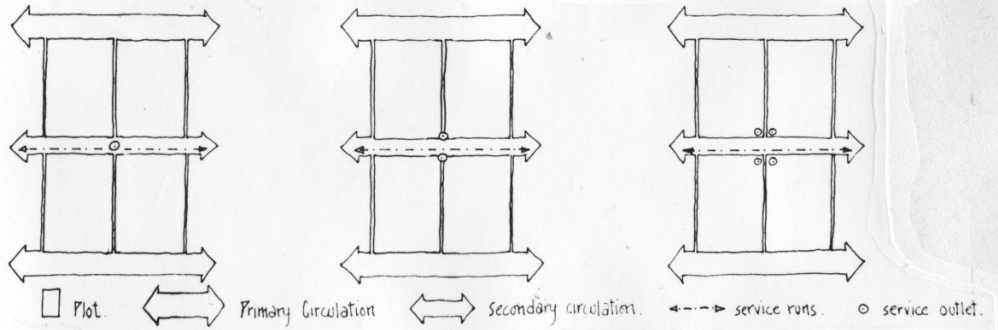
LAYOUT A.



SITE & SERVICES. DISTRIBUTION AND DEVELOPMENT.

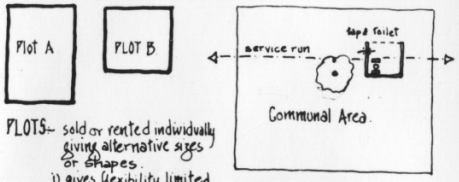
Layout B is preferable minimises service runs combining it with secondary circulation routes.
Danger lies in transferring diagrammatic solutions unaltered to site layout design solutions Resulting sterile, alienating layouts that ignore kinship groupings & clustering space use preferred by settlers

LAYOUT B.



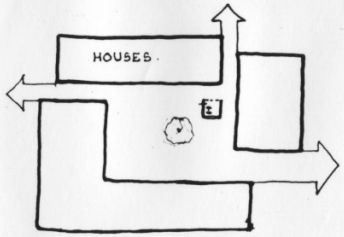
GROUPING SCALE & GROWTH

ELEMENTS



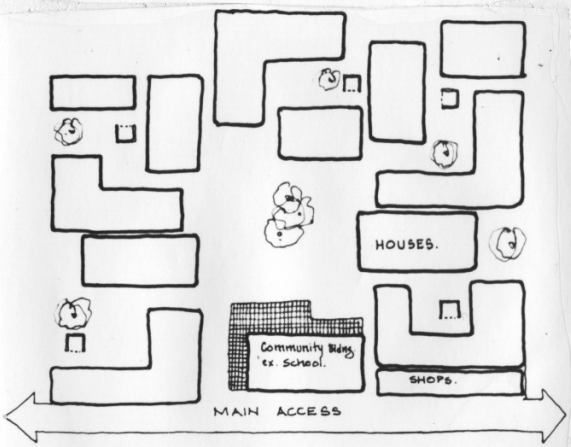
PLOTS:- sold or rented individually giving alternative sizes or shapes.
i) gives flexibility limited within plot.
ii) size choice relates to pocket, not to need.

COMMUNAL AREA:- shared by one cluster of plots/dwellings contains a communal facility (tap)



UNIT: Plots formed around and sharing a communal area form one unit.

Unit land held by a group of households - co-op ownership, say 5 households, preferably of one extended family, caste, affiliation! Allows greater flexibility of land use within one unit. Also consistent with observed grouping patterns of low income groups. Communal facility - tap & toilet for use of co-op unit only and maintenance their responsibility.



BLOCK: Several units interlinked by a major communal area and facility - school, clinic for ex.

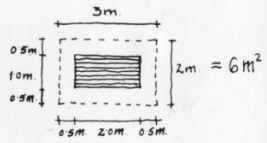
Maintenance of this area is the responsibility of the government

A PLOT SIZING.

Needs a detailed survey of the market - traditional densities, existing house sizes, aspirations for space, future anticipated requirements etc. Technical problems should also be considered, such as sufficient size of plot required to absorb effluent if pit latrines or septic tanks are being used. Even so it is difficult not to be arbitrary to some degree.

i) One Method.

Per person - per bedspace + walk around space!



ii) Recommendations.

a. City Centre sites per household of 5 persons = $30m^2$ [1]

b. Suburban sites " " " = $40m^2$ [2].

In the final analysis Land values unfortunately are often a major determinant in plot sizing.

B PROPORTIONS

Narrow frontage plots seem to be most economical with regard to spans, costs, utilities, densities and shared wall areas[3].

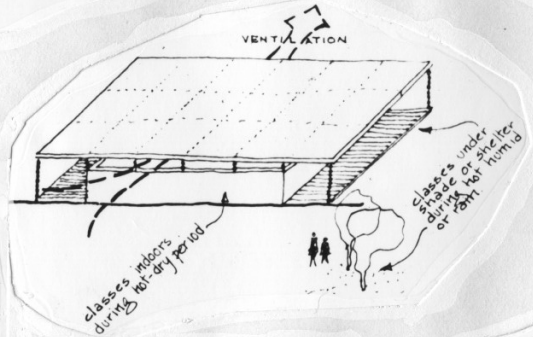
Square plots appear to be socially more desirable and flexible in design.

3 metre frontage, economic optimum.

1. Suburban site. 3m × 13m = $39m^2$

2. city centre site. 3m × 10m. = $30m^2$

3. proportions more flexible for interior layout. 4 metre spans usually uneconomical. 4m × 10m = $40m^2$



BUILDING DEVELOPMENT (ex school)

In size + type of material used.

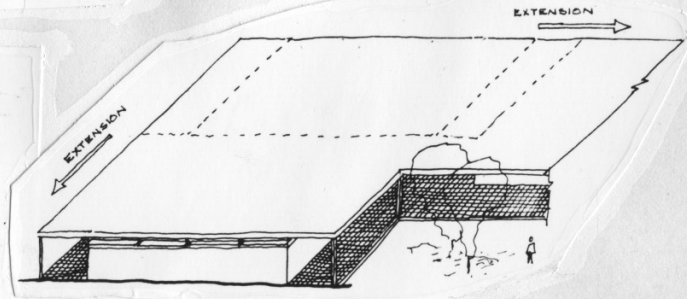
Phase 1.

Walls could be of mud, or mud-brick, with high level ventilation and light openings - no need for refinements like windows till later.

Bamboo frame structure supporting a roof composite of sheet board with mud packed between to give required insulation. etc.

Phase 2.

With more people and money entering community the basic school unit could be extended and/or rebuilt with more permanent, 'superior' materials. Latter should not be considered inevitable - if simple, cheap innovative use of local materials do the job well.

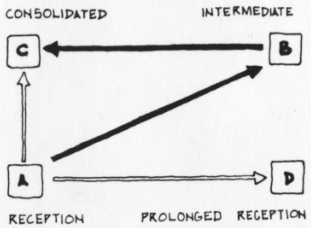


COMMUNAL BUILDINGS

Development in Time.

MOVEMENT & CONSOLIDATION

MOVEMENT PATTERNS.

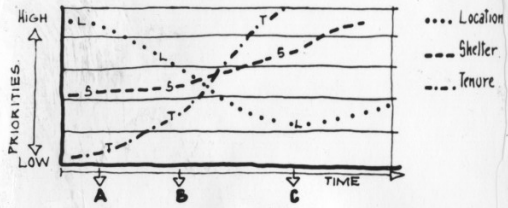


A. RECEPTION: Newcomer, unskilled needs maximum accessibility to casual jobs. Need for shelter minimal. Usually arrives without family and belongings on back.

Environment is usually street where he sleeps on the pavement. May be fortunate and have friends or relatives to live temporarily with in city centre slum.

B. INTERMEDIATE: Migrant integrated into city insofar as he has a regular job or a contact for regular casual labour. Can rent shelter. Location ie closeness to job still very important. Family with him, contributing to income. Rents shelter in city centre slum.

PRIORITIES DURING MOVEMENT.



C. CONSOLIDATED: Job and income stable. Earning enough to look for and spend on, invest in, a permanent home. Could live further from place of work and pay for transport costs.

Will squat on land that he hopes he can own and develop.

D. PROLONGED RECEPTION: Migrant fails to integrate, get job with rising income. Reception conditions prevail- street sleeping institutionalised, on doorsteps, or lean-to sheds with families working menially, beggars.

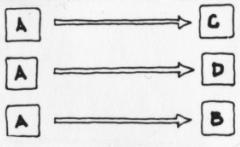
OPTIMAL CONSOLIDATION – South American Experience.

The resulting environment has great potential in terms of physical needs of a transitional city. As situation changes there are adequate resources to meet needs and make environmental changes. This made possible by -

i) available open land.
ii) transportation at low cost.
iii) little police protection for public and municipal land
iv) well organised and politicised associations who can put pressure and plan moves
v) Good income increasing opportunities.

Environment: Well planned move. Organised community. Structured in layout, streets, paths, service supplys and flexibility for future development

PREMATURE CONSOLIDATION – Asian Experience.



unplanned, haphazard move to unprepared vacant plots

cul-de-sac situations

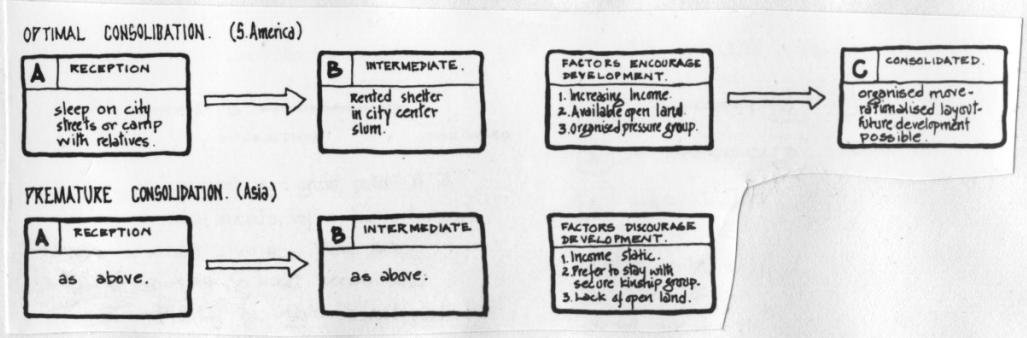
Here the migrant reaches a dead end at any of the earlier stages – or may move on to a vacant site in an unplanned manner and incapable of developing it suitably.

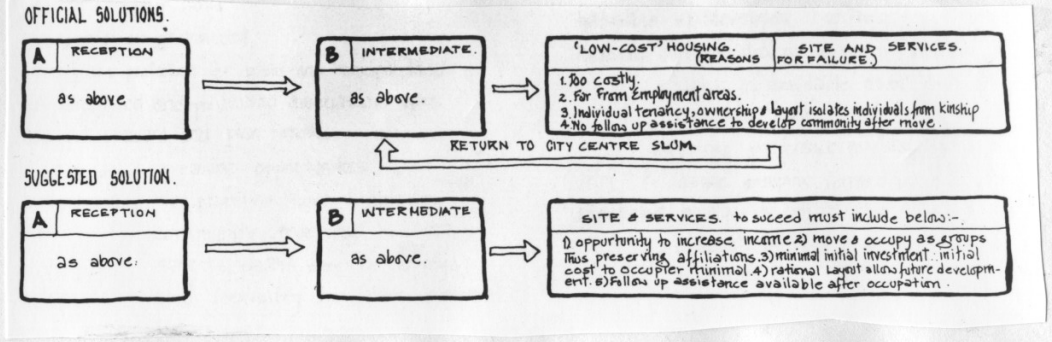
Reasons i) Income does not increase steadily
ii) Lack of available open land within economic reach.
iii) Strong preference to stay within family, caste grouping formed in city centre slum

Environment usually city centre slums which continue to absorb increasing numbers who unable to move out.

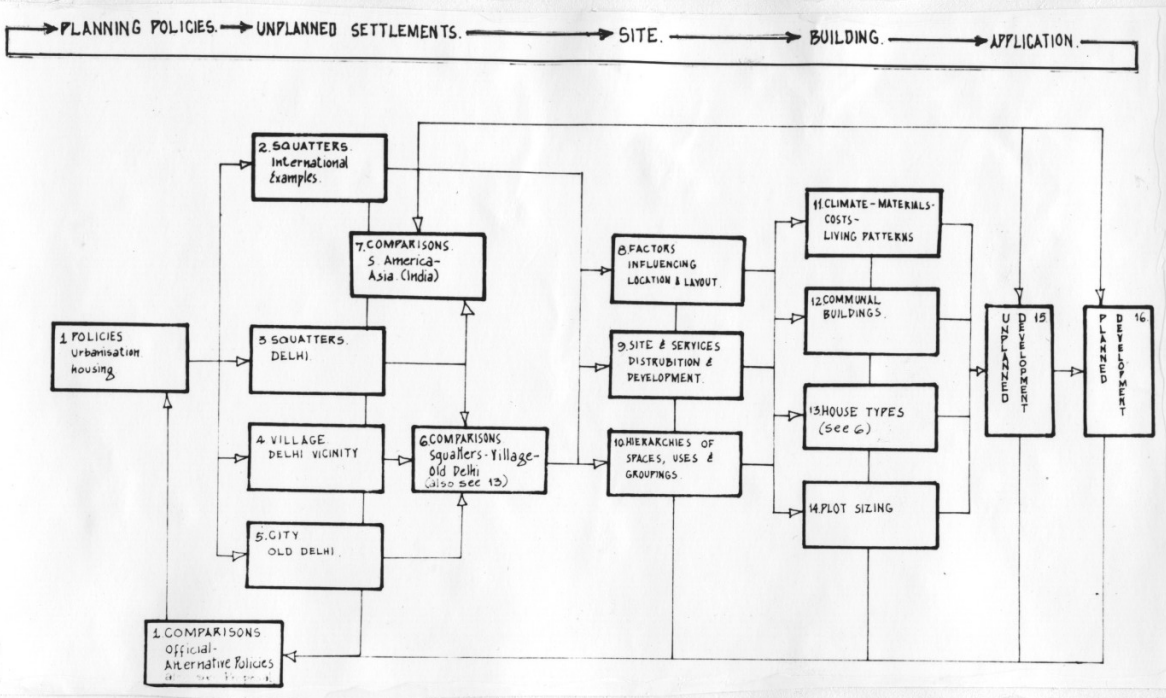
Reference

"Models of Habitat Mobility in Transitional Economies." J. Turner & C. Beninger. Ekist: s Jan. '72.


OPTIMAL CONSOLIDATION. (S.America)
A
RECEPTION
sleep on city streets or camp with relatives.
B
INTERMEDIATE.
Rented shelter in city center slum.
FACTORS ENCOURAGE DEVELOPMENT.
1. Increasing Income.
2. Available open land.
3. Organised pressure group.
C
CONSOLIDATED.
organised more-rationalised layout-future development possible.
PREMATURE CONSOLIDATION. (Asia)
A
RECEPTION
as above.
B
INTERMEDIATE
as above.
FACTORS DISCOURAGE DEVELOPMENT.
1. Income static.
2. Prefer to stay with secure kinship group.
3. Lack of open land.


OFFICIAL SOLUTIONS.
A
RECEPTION
as above
B
INTERMEDIATE.
as above.
'LOW-COST' HOUSING. (REASONS FOR FAILURE.)
SITE AND SERVICES.
1. Too costly.
2. Far from employment areas.
3. Individual tenancy, ownership & layout isolates individuals from kinship
4. No follow up assistance to develop community after move.
RETURN TO CITY CENTRE SLUM.
SUGGESTED SOLUTION.
A
RECEPTION
as above.
B
INTERMEDIATE
as above.
SITE & SERVICES. to succeed must include below:-
1) opportunity to increase income 2) move & occupy as groups thus preserving affiliations. 3) minimal initial investment. initial cost to occupier minimal. 4) rational layout allows future development. 5) Follow up assistance available after occupation.

METHODOLOGY



PHASE 1.

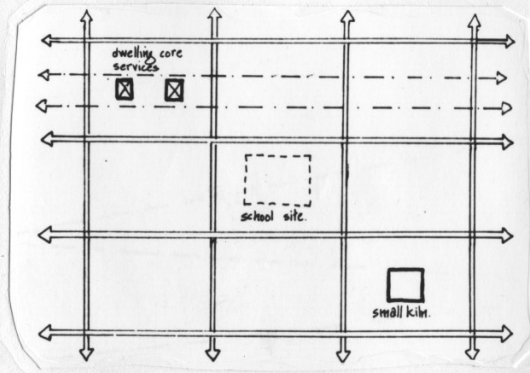
Design Matrix expressing:-

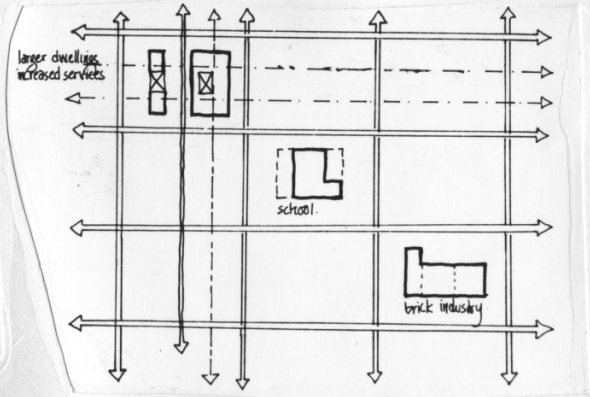
1. Rational supply of services
   i)
   ii) " layout of elements. ex. location of school to dwellings.
   iii) Cultural influences. ex clustering to reflect kinship.
2. Water supply, drainage, roads, landscape, trees? etc.
3. Locate site of future public facilities.
4. Encourage/Build income generating elements. ex brick kilns,
5. Offer cheap building materials + proffesional, technical advice. (could be related to 4..

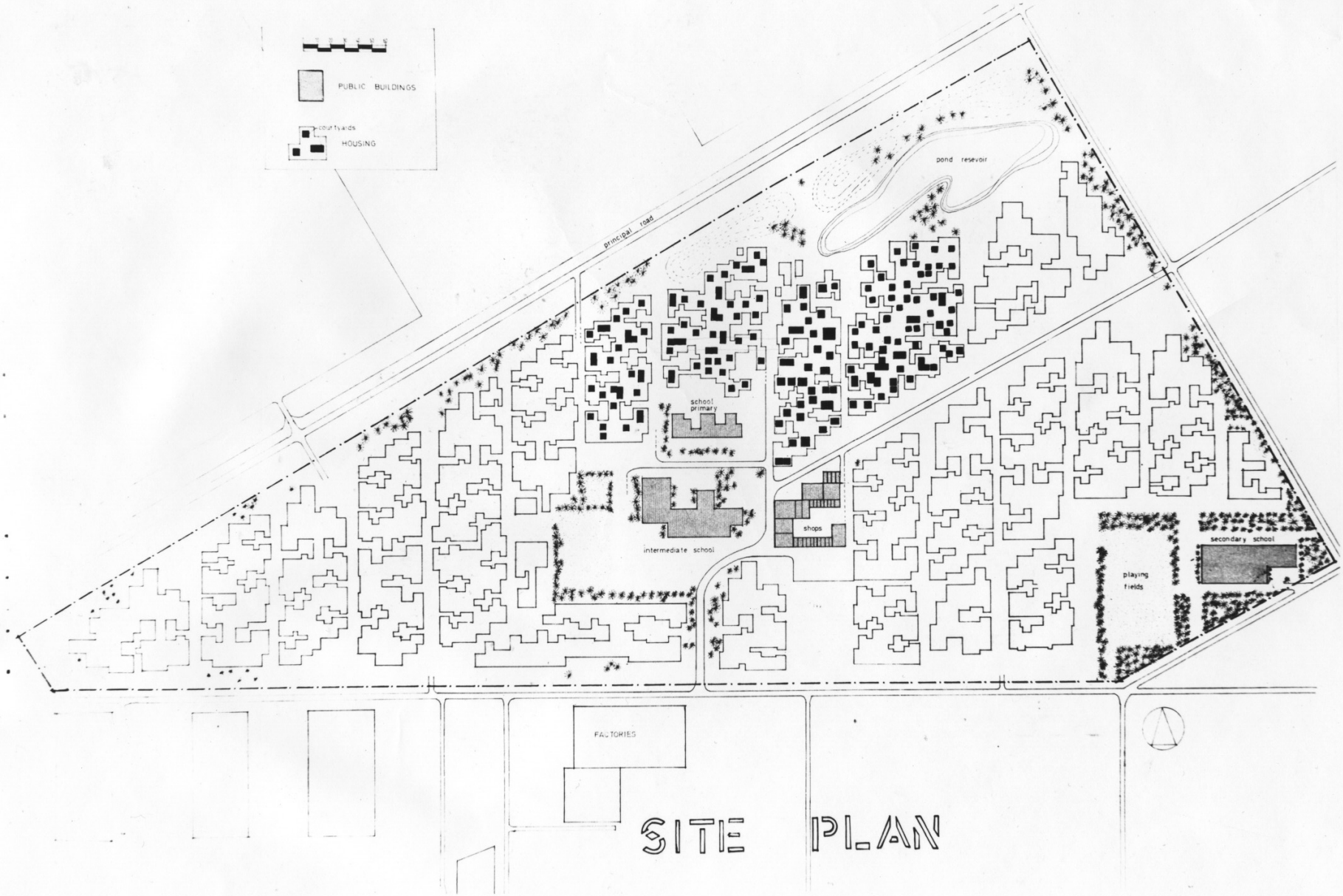
PHASE 2.

1. Extend site and services, infrastructural facilities.
2. Build public facilities - 1st stage of a school for example.
3. Develop income sources Extend brick making or add crafts workshop for example.
4. Dwellings develop and increase - need for technical and design help increases accordingly.

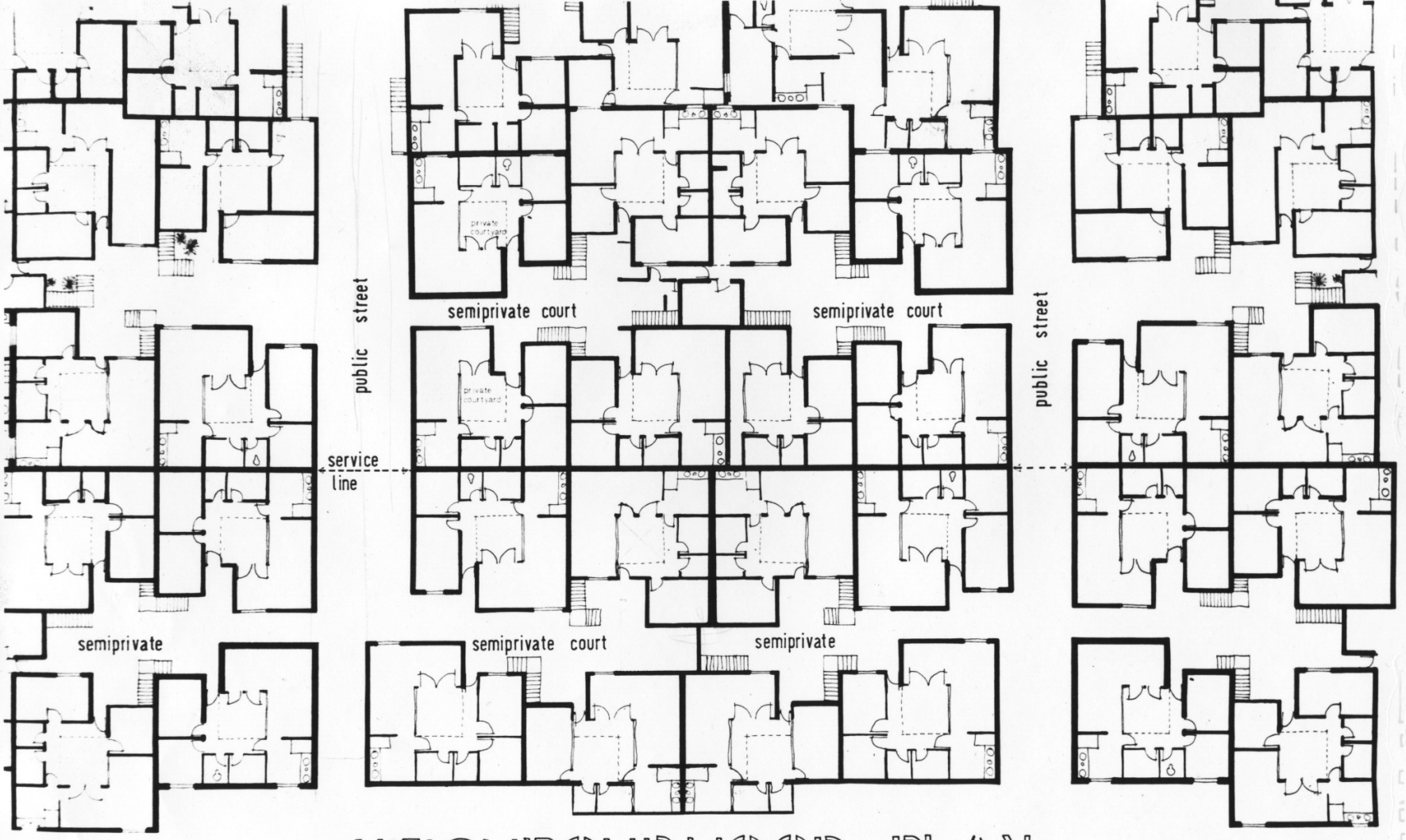
SQUATTERS. INTERNATIONAL EXAMPLES.
Site Development. (diagrammatic)



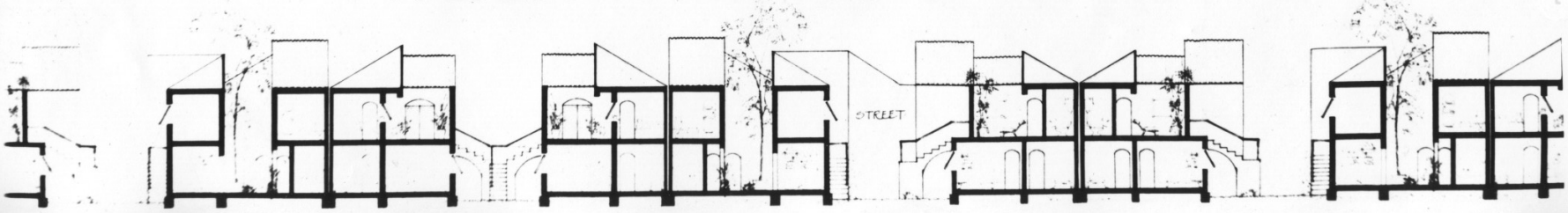


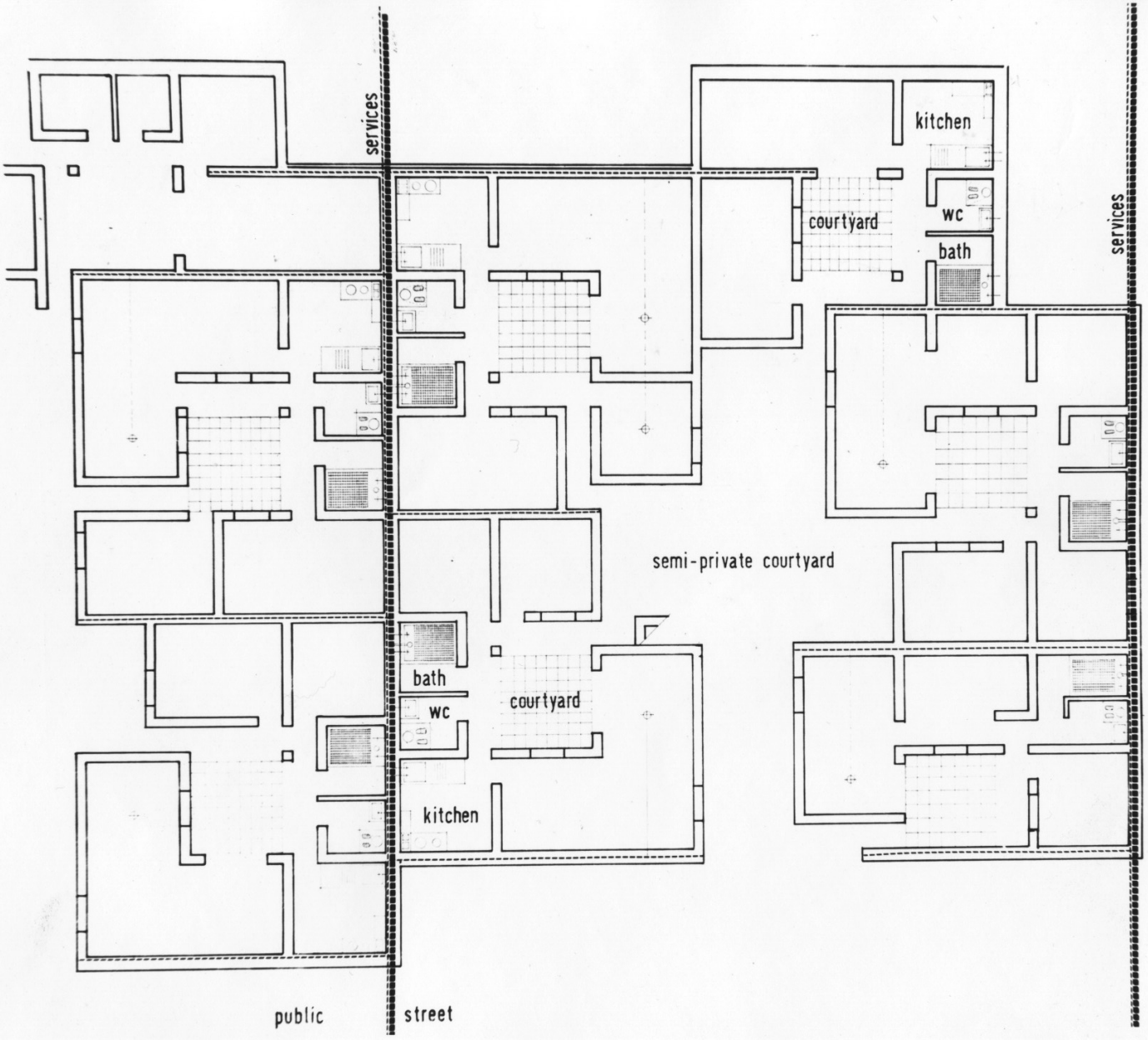

PUBLIC BUILDINGS
courtyards
HOUSING
principal road
pond resevoir
school primary
intermediate school
shops
playing fields
secondary school
FACTORIES

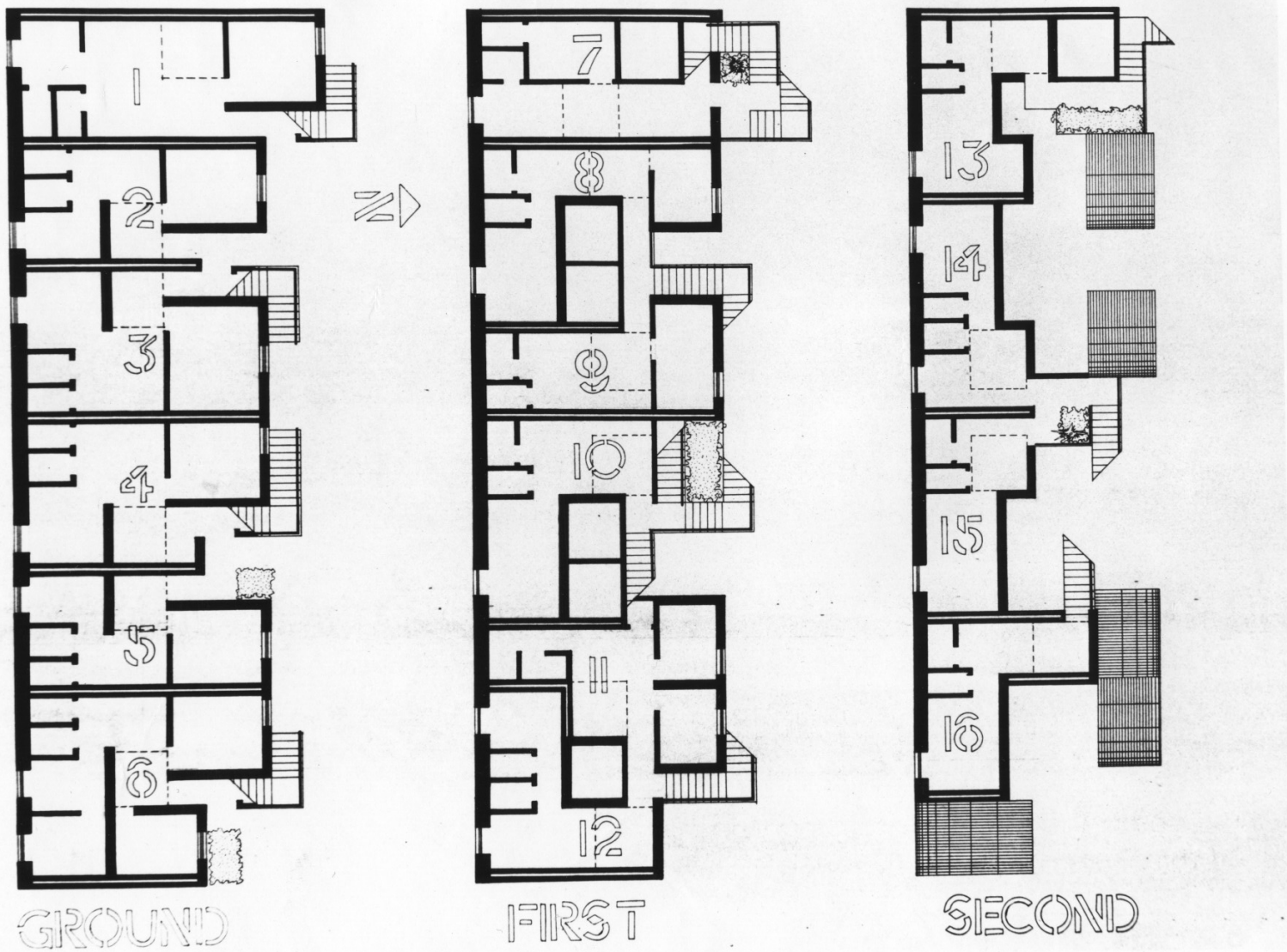
SITE PLAN



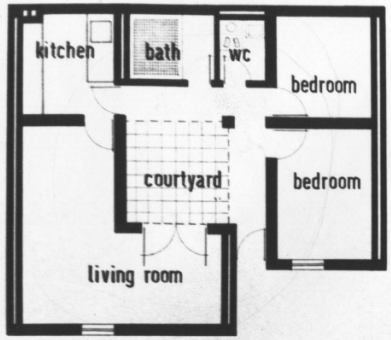
NEIGHBOURHOOD PLAN



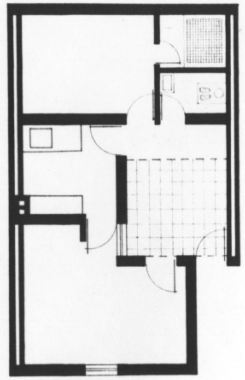

services
kitchen
courtyard
wc
bath
services
semi-private courtyard
bath
wc
courtyard
kitchen
public
street


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
GROUND
FIRST
SECOND

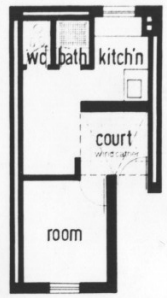
UNIT PLANS



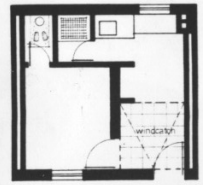
82 sq.m.



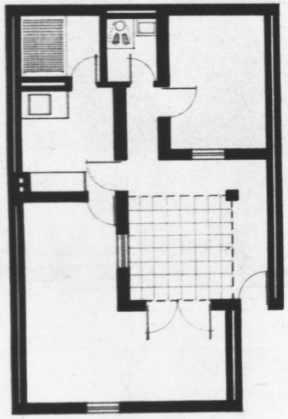
57 sq.m.



29 sq.m.

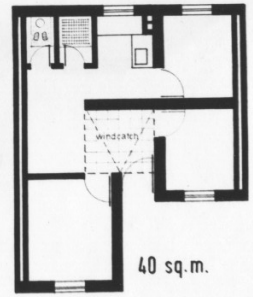


25 sq.m.

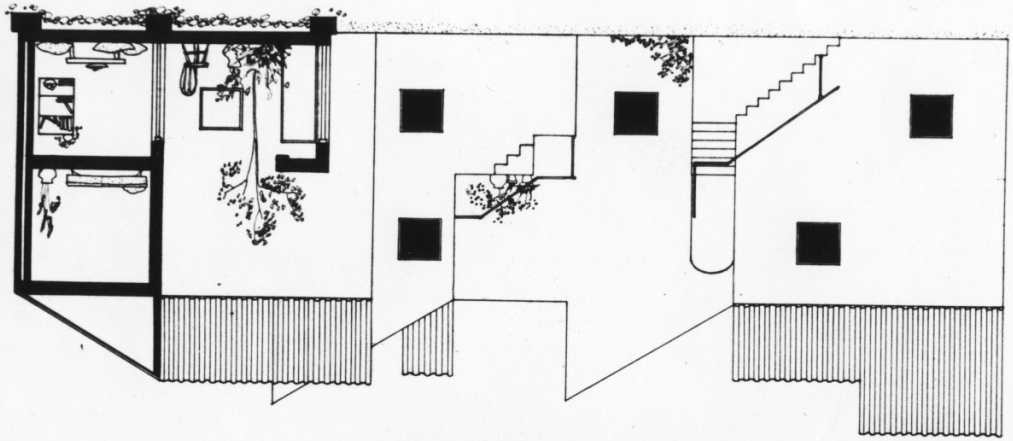


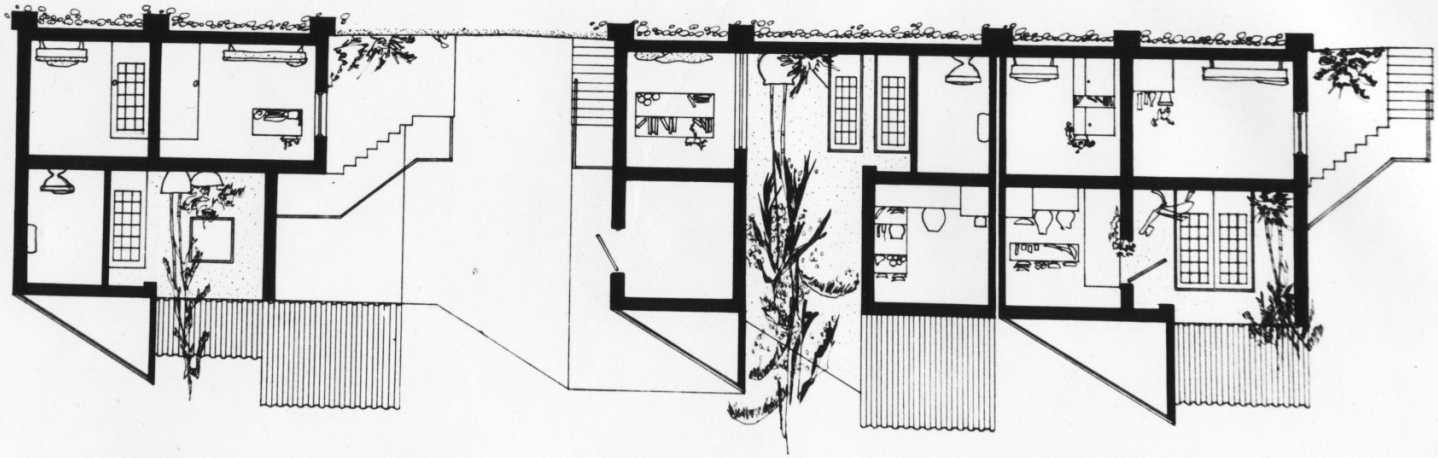
74 sq.m.

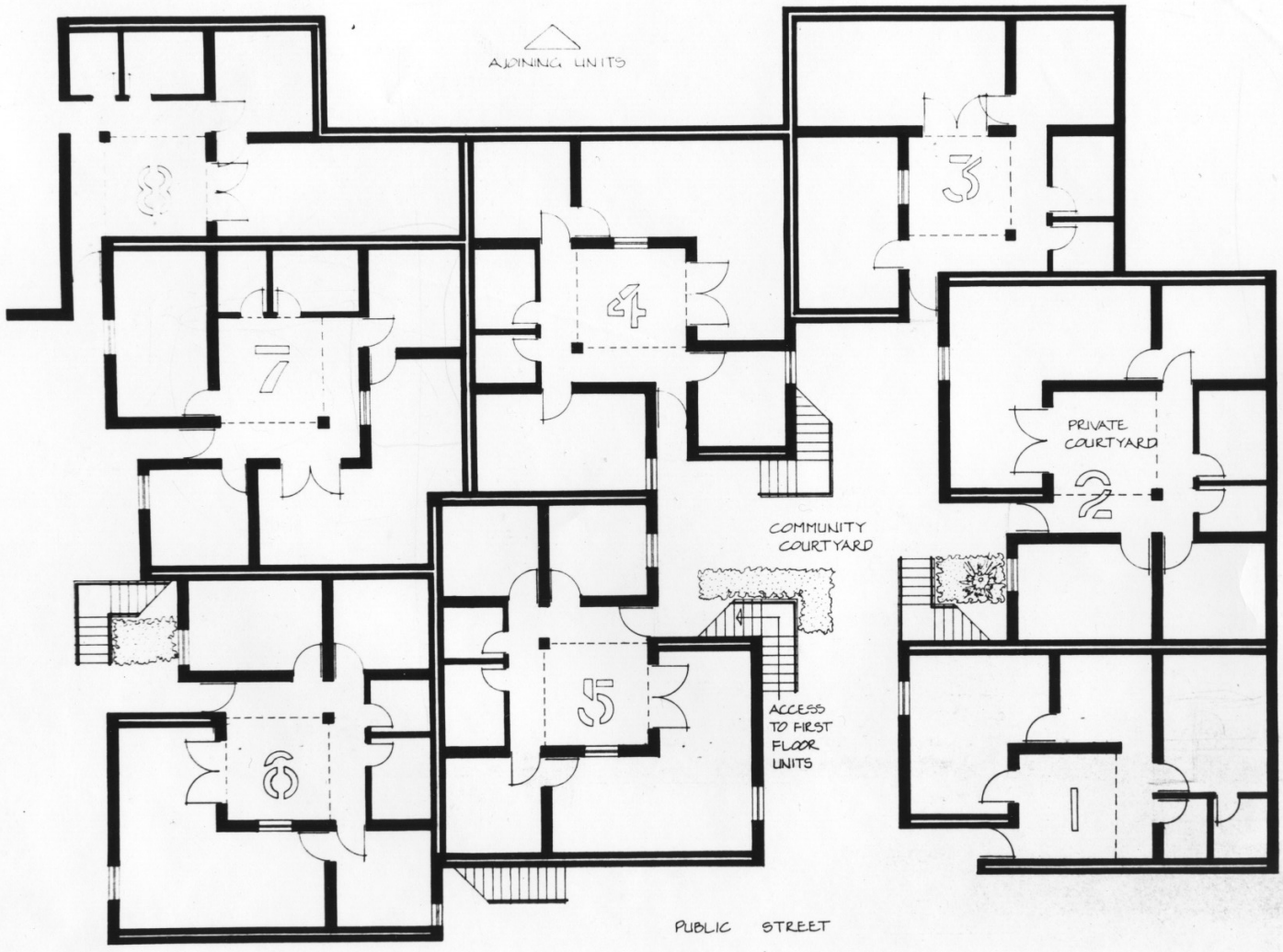
52 sq.m.

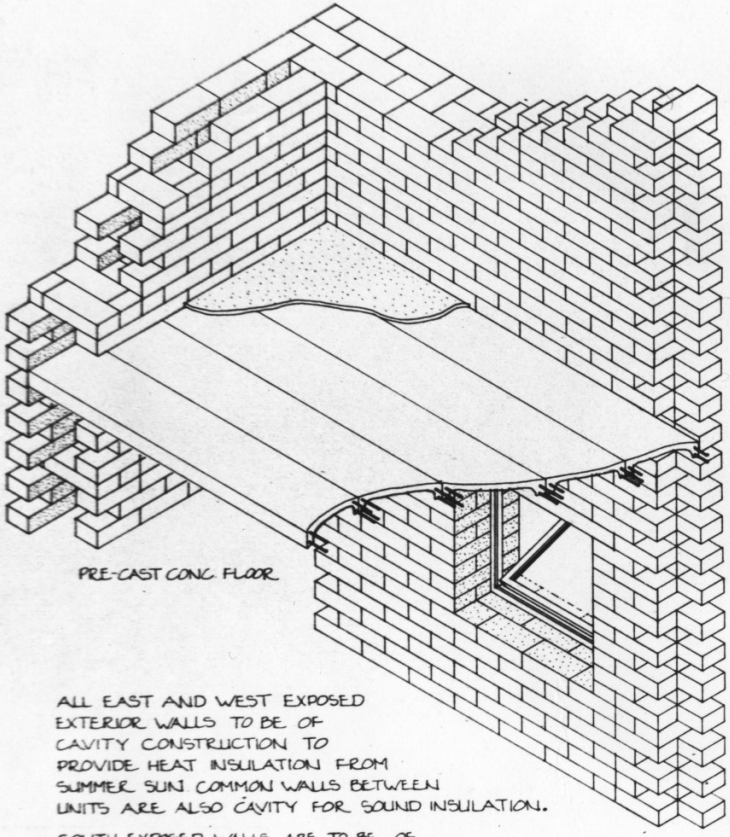


40 sq.m.





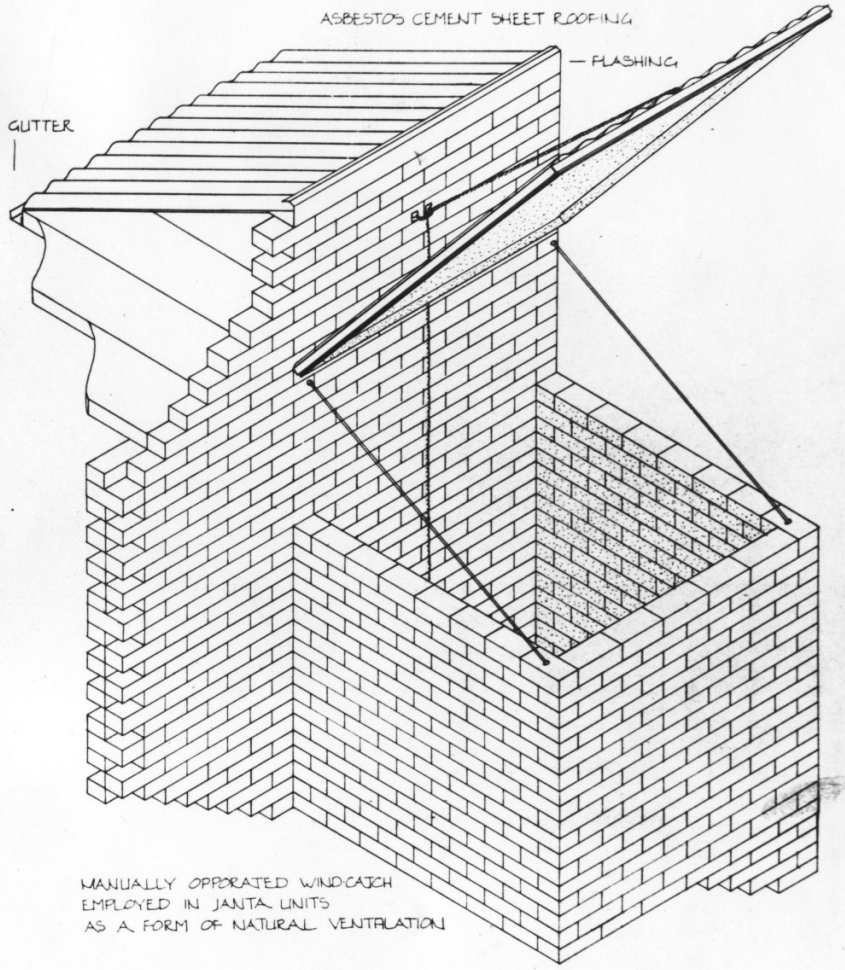

ADJOINING UNITS
8
7
4
3
2
1
5
6
PRIVATE COURTYARD
COMMUNITY COURTYARD
ACCESS TO FIRST FLOOR UNITS
PUBLIC STREET



ALL EAST AND WEST EXPOSED EXTERIOR WALLS TO BE OF CAVITY CONSTRUCTION TO PROVIDE HEAT INSULATION FROM SUMMER SUN. COMMON WALLS BETWEEN UNITS ARE ALSO CAVITY FOR SOUND INSULATION.

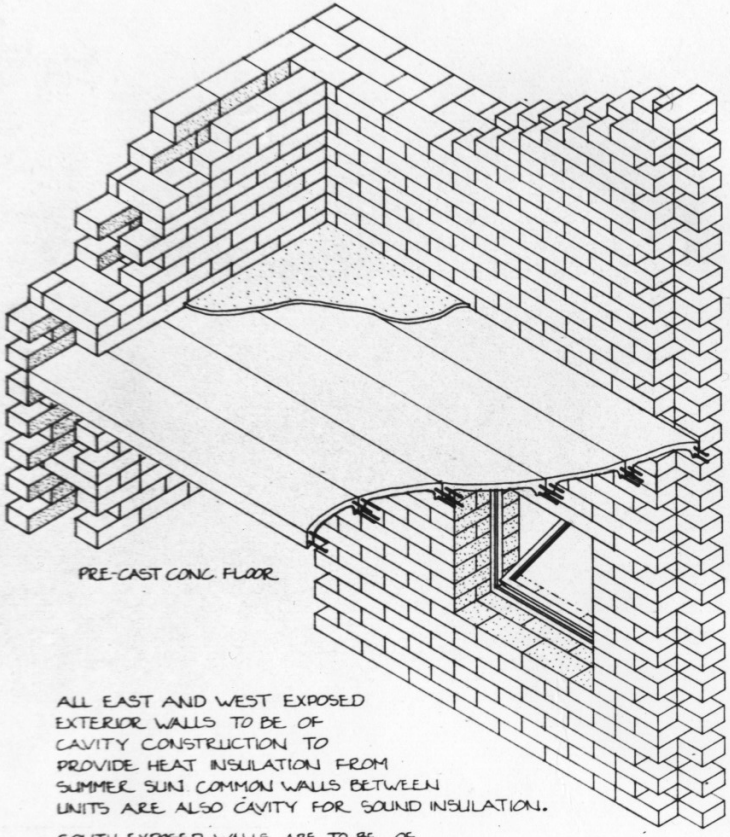
SOUTH EXPOSED WALLS ARE TO BE OF HEAVY MASONRY, THEIR THERMAL CAPACITY EMPLOYED AS 'HEAT SINK' FOR NIGHT TIME RERADIATION OF HEAT FROM WINTER SUN.

STRUCTURAL SYSTEM



MANUALLY OPPERATED WIND-CATCH EMPLOYED IN JANTA UNITS AS A FORM OF NATURAL VENTILATION

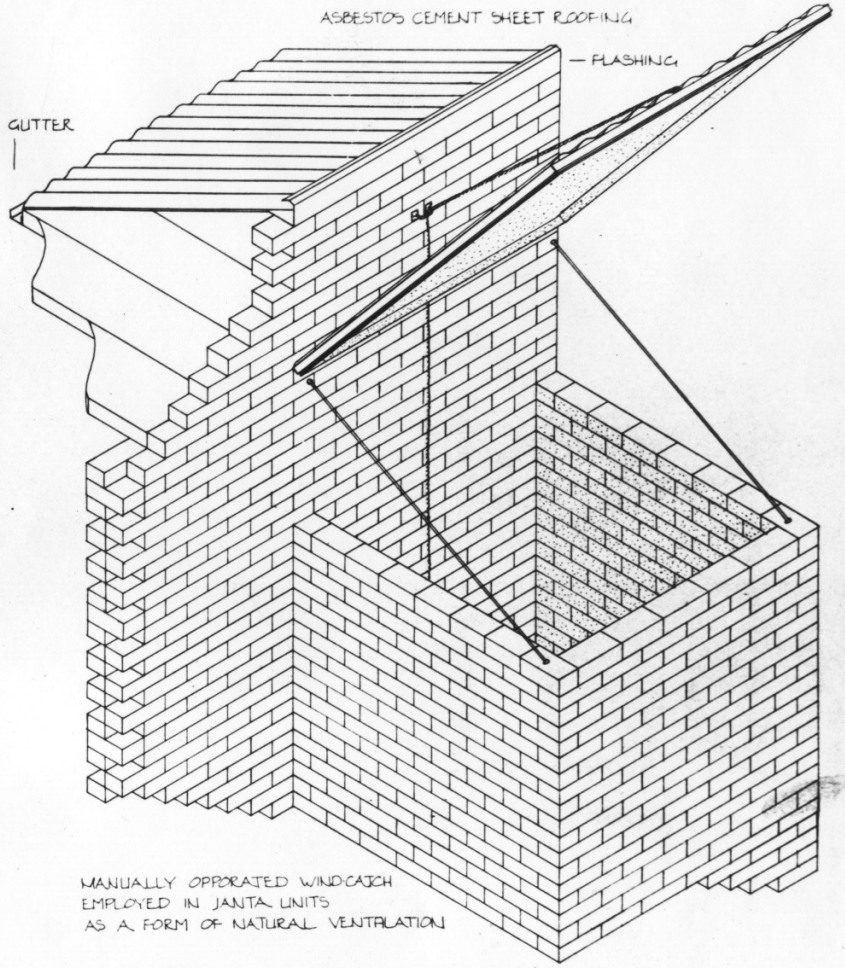
WIND-CATCH + ROOF DETAIL



ALL EAST AND WEST EXPOSED EXTERIOR WALLS TO BE OF CAVITY CONSTRUCTION TO PROVIDE HEAT INSULATION FROM SUMMER SUN. COMMON WALLS BETWEEN UNITS ARE ALSO CAVITY FOR SOUND INSULATION.

SOUTH EXPOSED WALLS ARE TO BE OF HEAVY MASONRY, THEIR THERMAL CAPACITY EMPLOYED AS 'HEAT SINK' FOR NIGHT TIME RERADIATION OF HEAT FROM WINTER SUN.

STRUCTURAL SYSTEM



MANUALLY OPPERATED WIND-CATCH EMPLOYED IN JANTA UNITS AS A FORM OF NATURAL VENTILATION

WIND-CATCH + ROOF DETAIL