TABLE: 1.3 SHELTER TYPE COMPARING CONSTRUCTION & MAINTENANCE COSTS & BENEFITS OVER BUILDING LIFE SPAN (FOR EXAMPLE 30 YEARS)[1]

SHELTER TYPE \ YEAR	CONSTRUCTION	MAINTENANCE → 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 etc
1. Kutcha Wall :- Mud or Sun-Dried Brick Roof :- Timber Thatch-mud	COSTS → Rs 5,000	Mud plaster (Annually) Rs 50 ; Lime wash Interior (Every Five years) Rs 300 ; Rs 50 ; Repair Roof (Every 5 years Lime wash Rs 1200 ; Rs 50 ; Lime Wash Interior Rs 300 ; Rs 50 ; Re Construction of House Rs 5000 ; BENEFITS →
2- Semi-Pucca Wall :- Part Mud, Brick, Part Fired Brick. Roof :- Timber Mud or Tiles	COSTS → Rs 20,000	Replaster mud wall (Annually) Rs 30 ; Replaster Brick Walls (Every 5 years Rs 1000 (cement) ; Replaster Brick Walls Rs 1000 ; Repair Roof (Every 15 yrs) Rs 5000 (Timber Tiles) ; Rs 1000 ; Rs 30 ; Replaster Brick Walls Rs 1000 ; Rs 30 ; BENEFITS →
3- Pucca Wall : Fired Brick Roof :- Steel Beam & Tiles R.C.Slab,	COSTS → Rs 35,000	Replaster Bricks Walls Rs 3000 (cement) ; Replaster Bricks Wall Rs 3000 ; Repair Roof Tiles & Ceiling (Every 5 yrs) Plaster Rs 1000 ; Rs 3000 ; Replaster Brick Walls Rs 3000 ; BENEFITS →

(1) Initial Construction Cost of Pucca units as quoted in National Housing Policy draft Document (81) Housing, Finance Section P.2 (Rs 70/sqft (x 500 sft built area) other maintenance requirements and costs are notional & serve only to indicate the type of information to be gathered. (2) Assessment of Benefits & differences in upgrading & maintenance - costs still to be integrated into table (3) All Costs & Benefits to be reduced to Net Present Values.

FIG: 5·1

BLDNG. CONSTRUCTION STAGES & INPUTS.

RESPONDENTS & ADDRESS: MOHD. ALI (MASON), ASHRAF (ENGINEER) MALKA HANS.

BLDNG & ADDRESS: 10 X 15 ROOM. NO OPENINGS: BAKED BRICK WALLS IN CEMENT MORTAR, R C C ROOF.

QUARE ADDING: AFSHAR

DATE: JUNE '82.

INPUTS / CONSTRUCTION STAGES	# OF DAYS (Hours)	MATERIALS TYPE	QTY	@ Rs	COST Rs	SOURCE & OBTAINING METHOD	LABOUR TYPE	QTY	@ Rs/day	COST Rs	SOURCE & OBTAINING METHOD.	TECHNOLOGY	COMMENTS
1. FOUNDATION													
2. WALLS	6	BRICKS	7512	315/1000	2366	LOCAL KILN ; TRUCK/ TRACTORS/ DONKEY CART	MASONS	3	50/day 6 days	900	PAKPATTAN		
		CEMENT (bag)	20	70/bag	1400	CEMENT DEPOT, PAKPATTAN; "	LABORERS	4	20/day 6 days	480	LOCAL		
		SAND (cu.ft)	155	1/cuft	155	FROM RIVER BED; "							
		SCAFFOLDING			50	LOCAL "							
		SUB-TOTAL	WALLS		3971	MATERIALS +	SUB-TOTAL	WALLS		1380	LABOUR/SKILLS	=	WALL TOTALS: 5351
3. ROOF	1												
3·1 FORM-WORK		PLANKS 6'x6"x1½"	60	9/day	126	RENTED FROM CONTRACTOR.	MASONS	1	50	50	PAKPATTAN.		
		BEAMS 15x6"x1'	1	·5/day	7		LABORERS	4	20	80	LOCAL		
		COLUMNS	1	·5/day	7								
		TRANSPORT MUDWORK	18·8 c.ft	8/cu ft	120 15	LOCAL							
		SUB-TOTAL	FORM WORK		275		SUB-TOTAL	FORMWORK		130			
3·2 STEEL WORK	1	½" Ø : 26 12'-8" in each ends ⅜" Ø : 17 Binding Wire				PAKPATTAN MERCHANT	SMITH	·75	60	45	PAKPATTAN		
							LABORER	4	20	80	LOCAL		
		SUB-TOTAL	338lbs	5·5/lb	2134		SUB-TOTAL	STEEL WORK		125			
3·3 CONCRETING	1	CEMENT: 1	13 bags	70/bag	910	PAKPATTAN.	MASON	4	50	200	PAKPATTAN		
		SAND: 2	33 cu ft	1/cu ft	33	RIVER BED.	CARPENTER	0·5	60	30			
		AGGREGATE: 4	66 cu ft	6/cu ft	396		LABORER	18	20	360			
		SUB-TOTAL	CONCRETING		1339		SUB-TOTAL	CONCRETING		590			
3·4 CURING	14	WATERING				LOCAL PIPED	MASON	·5	50	25	PAKPATTAN		
	1	MUD LAYER	32 cu ft		75	LOCAL	LABORER	3	18	54			
							LABOURER	4	20	80			
		SUB-TOTAL	CURING+ML		75		SUB-TOTAL	CURING		160			
		SUB-TOTAL	ROOF		3823	MATERIALS +	SUB-TOTAL	ROOF		1005	LABOUR/SKILLS	=	ROOF TOTALS: 4828
4. FLOOR													
		SUBTOTAL	FLOOR				SUB-TOTAL	FLOOR					
5. FINISHING													
		SUB-TOTAL	FINISHING				SUB-TOTAL	FINISHING					
	10	CONSTRUCTION											
	14	CURING.											
	24	TOTAL			7794	MATERIALS: WALL & ROOF	TOTAL			2385	LABOUR/SKILLS: WALL & ROOF		GRAND TOTAL: Rs 10179.

FIGURE 5.2 BUILDING MATERIALS INDUSTRIES: INPUTS, SOURCES, COSTS (PAYMENTS) & RECEIPTS

BUILDING MATERIALS INDUSTRY TYPE: BAKED BRICK KILN

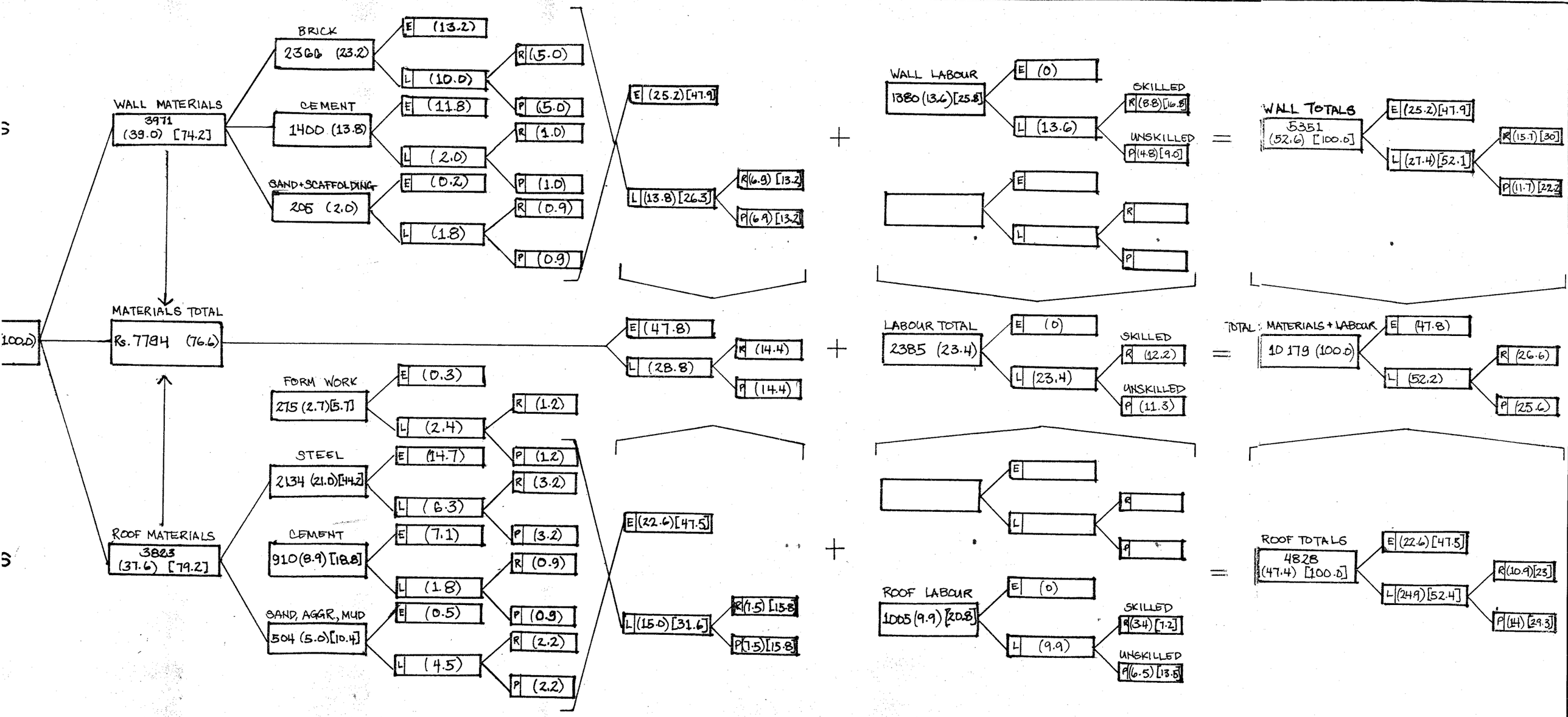
CHARACTERISTICS / INPUTS	UNIT COSTS & QUANTITIES	ANNUAL COSTS (PAYMENTS) in Rs.	Source: Materials source(s)/place(s) of purchase, Plant & Equipments' Place of Mftg. assembly & sale, Labour sources.	DISTRIBUTION OF RECEIPTS AS PAYMENTS TO INPUTS: (% to Total Receipts) EXTERNAL TO DISTRICT	LOCAL TO DISTRICT: TOTAL LOCAL	UPPER INCOME	LOWER INCOME	TOTAL	INPUTS
1. MATERIALS:									
COAL	48 trucks [10 tons ea.] @ Rs 9500/truck	456 000	Brought from Karachi and Quetta by truck and rail car.	56.0	-	-	-	56.0	COAL & OIL
FURNACE OIL	24 tanks [12000 gal.] @ Rs 16000/tank	384 000							
SAWDUST	72 stacks @ Rs 3000/stack	216 000	Local	-	14.7	12.0	2.7	14.7	WOOD & SAWDUST
WOOD	250 maunds @ Rs 20/maund	5 000							
SUB TOTAL		1 061 000		56.0	14.7	12.0	2.7	70.7	TOTAL MATERIALS
2. CAPITAL ASSETS									
LAND	For kiln: 1.25 acres @ Rs 1600/acre	2 000	Local	-	1.1	1.1	-	1.1	LAND
BUILDINGS	For clay: 2.5 acres @ Rs 6000/acre	15 000		-	0.1	.05	.05	0.1	KILN CONSIT.
EQUIPMENT / TOOLS	Kiln construction total cost 20,000 Rs	1 333		-	.1	.05	.05	.1	BUILDINGS
2.1 Brick making moulds	2 rooms for workers (Brick w/timber, cane)	866							
2.2 Coal tubs	50 @ Rs 40/year	2 000	Assumed 30% of cost of metal parts are external; 70%, local.	0.1	.2	.1	.1	.3	EQUIPMENT
2.3 Fire hole lids	2 @ Rs 750/year	1 500							
SUB TOTAL	40 @ Rs 40/2 years	800							
		23 499		0.1	1.5	1.3	0.1	1.6	TOTAL CAPITAL ASSETS
3. LABOUR									
BRICK MAKERS	50 @ Rs 25/1000 bricks	175 000	Muslim sheik clan						
BRICK STACKERS	2 @ Rs 500/month	10 000	Kumhaar clan } all from around Qabula						
MUD LAYERS	2 @ Rs 700/month	7 000	Bhatti clan						
BRICK UNLOADERS	6 @ Rs 500/month	42 000							
COAL CARRIERS	2 @ Rs 500/month	10 000							
KILN FIRERS	4 @ Rs 1000/month	40 000	Awan clan from Qabula						
CLEANERS	1 @ Rs 700/month	7 000							
SUB TOTAL		291 000		-	19.4	-	19.4	19.4	TOTAL LABOUR
TOTAL COSTS (1) to (3)		1375 499							
4. ENTREPRENEURSHIP	Payments to entrepreneur as profits	124 501			8.3	8.3	-	8.3	ENTREPRENEURSHIP
TOTAL RECEIPTS	5 million bricks sold/yr. @ Rs 300/1000	1500 000*		56.1	43.9	21.6	22.2	100.0	TOTAL RECEIPTS

NOTES: *(UCL '76) study sample showed 4.4 mill. bricks sold annually as Punjab average. (p20)

RECIPIENTS OF EXPENDITURES IN BUILDING CONSTRUCTION

TECHNOLOGY: BAKED BRICK WALLS IN CEMENT M
& STEEL REINFORCED CONCRETE R

INPUTS	MATERIALS			+	LABOUR			=	TOTAL		
	DISTRIBUTION OF EXPENDITURES Rs. (%)				DISTRIBUTION OF EXPENDITURES Rs				DISTRIBUTION OF EXPENDITURES		
	COMPONENTS	MATERIAL TYPES	SPATIAL	INCOMEGROUP	LABOUR TYPES	SPATIAL	INCOMEGROUP		Rs. (%) [%]	SPATIAL	INCOMEGRO



R = UPPER INCOME
P = LOWER INCOME

NOTES:
FIGURES IN ( ) ARE PERCENTAGES OF TOTAL EXPENDITURE (i.e., Rs. 10,179 = 100.0%)
FIGURES IN [ ] ARE PERCENTAGES OF TOTAL WALL OR ROOF CONSTRUCTION (i.e. Rs. 5351 AND Rs. 4828 each = 100.0%)
FOR EXAMPLE, COST OF WALL MATERIALS = Rs. 3971 WHICH IS (39%) OF TOTAL WALL AND ROOF CONSTRUCTION COSTS AND [74.2%] OF TOTAL WALL CONSTRUCTION COSTS.
PERCENTAGES FOR E, L, R AND P ARE DERIVED FROM COEFFICIENTS OF THEIR DISTRIBUTION IN THE RESPECTIVE MATERIALS INDUSTRIES (SHOWN IN RT. HAND TABLE →). REFER TO FIGURE 5.2 FOR METHOD OF DERIVING PERCENTAGES.

COSTS PER SQ. FT. AND COVERED AREA PER Rs. 100

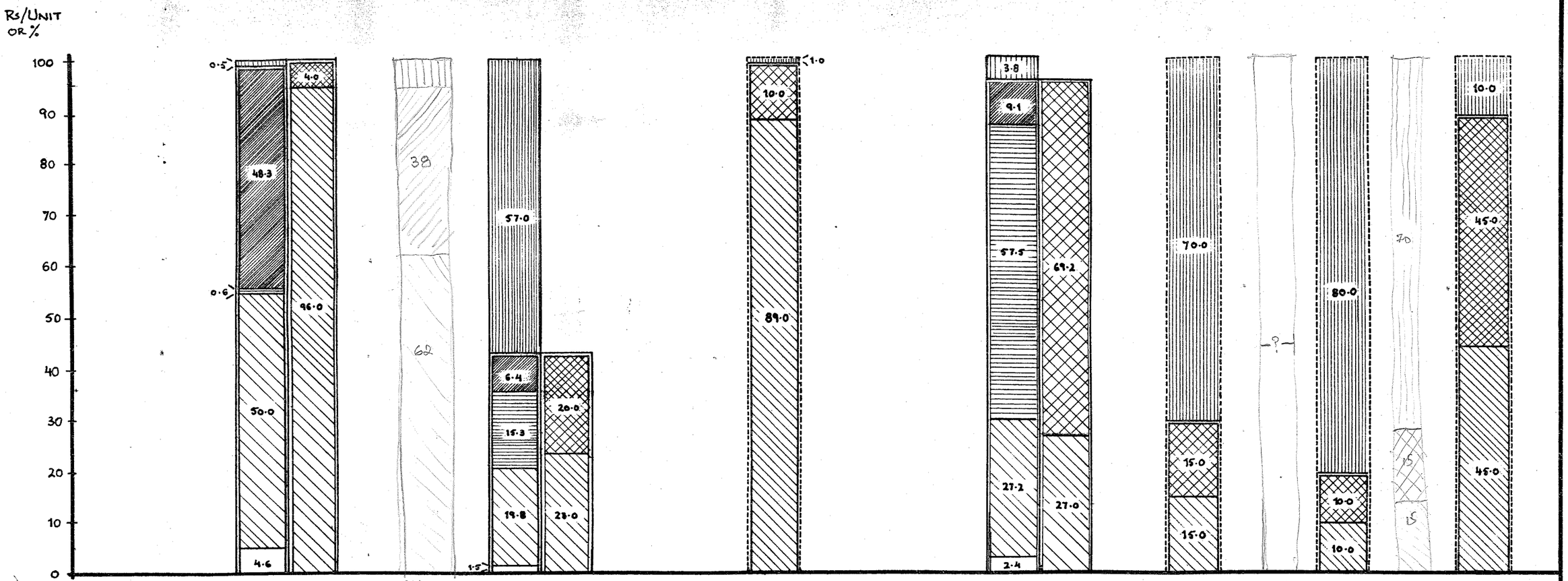
	Rs./Sq.ft.	Sq.ft./Rs.100
WALL	35.7	2.8
ROOF	32.2	3.1
TOTAL	67.9	1.5

RECIPIENTS AND SHARE OF MATERIALS PURCHASE EXPENDITURE (in %)

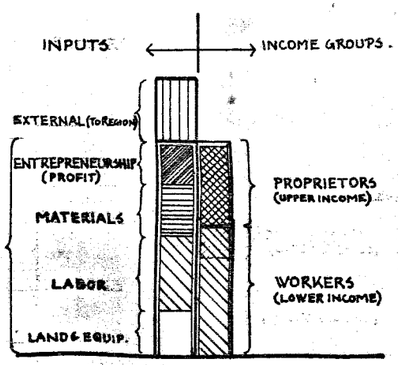
Item \ recipient	External	Local	Upper Y	Lower
BRICK	56	44	22	22
CEMENT	80	20	10	10
SAND	10	90	45	45
STEEL	70	30	15	15
FORMWORK	10	90	45	45

DISTRIBUTION OF RECEIPTS IN BUILDING MATERIALS INDUSTRIES.

(SPATIALLY, BETWEEN INPUTS & INCOME GROUPS)



KEY: DISTRIBUTION OF RECEIPTS AS PAYMENTS TO:-

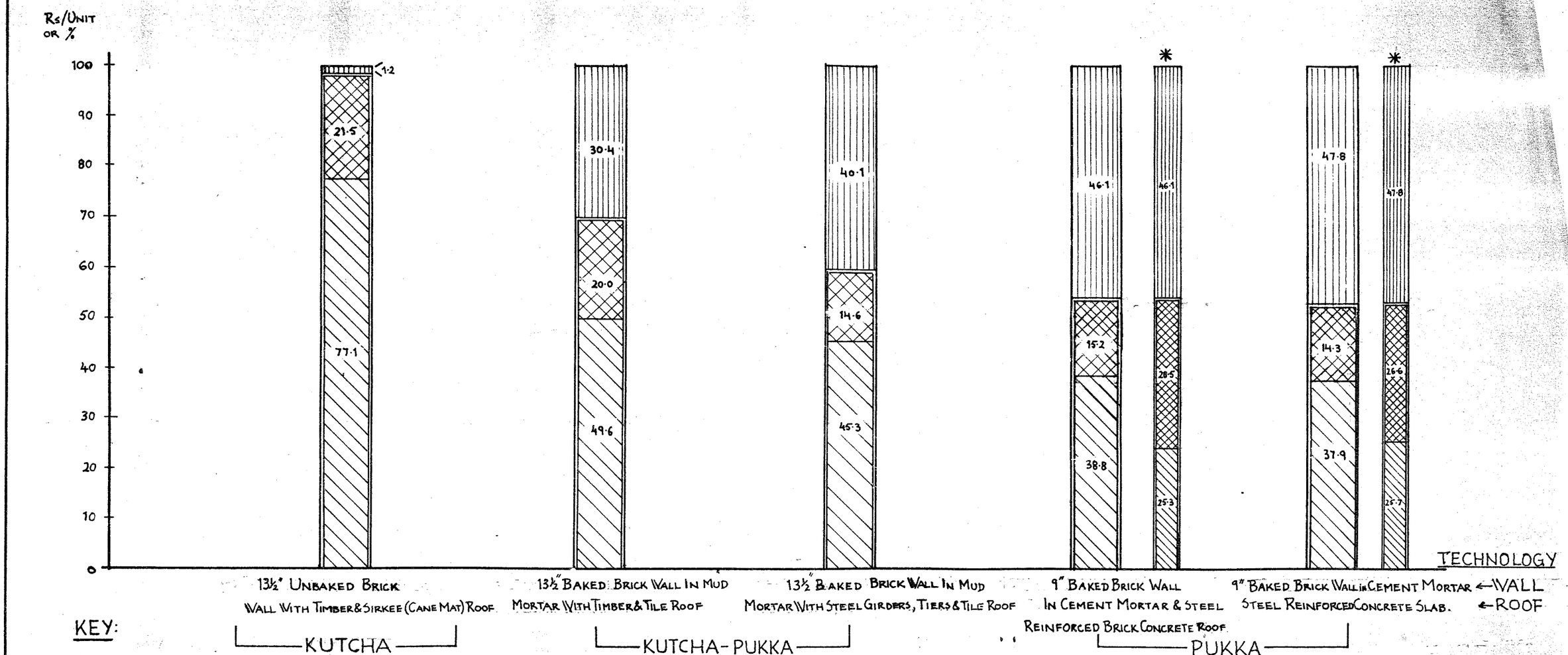


COMMENTS:

CALCULATED FROM INFORMATION ON LOCATION, INPUT COSTS & REVENUE FIGURES GIVEN BY INDUSTRY PROPRIETORS.
THOSE SHOWN IN DOTTED LINES ARE APPROXIMATE ESTIMATES FROM DESCRIPTIVE INFORMATION.

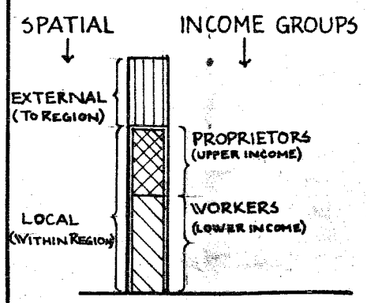
4.2. DISTRIBUTION OF CONSTRUCTION EXPENDITURE SPATIALLY & BETWEEN INCOME GROUPS.

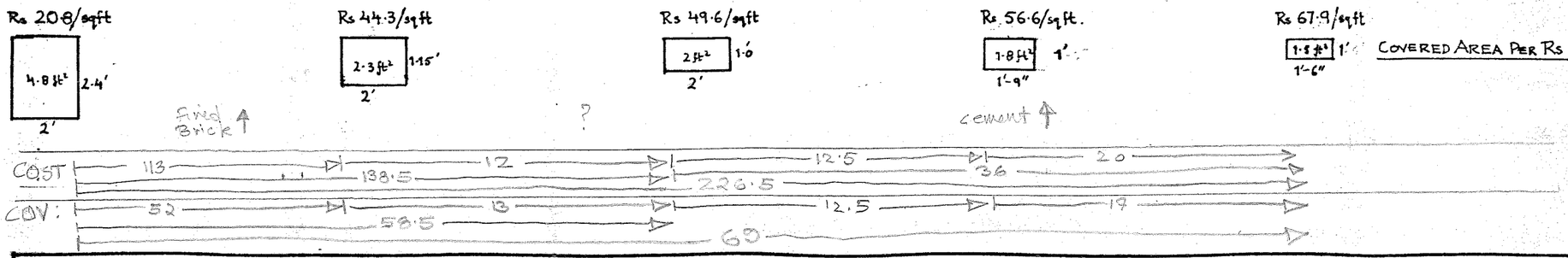
COMPARING BUILDING TECHNOLOGIES.



KEY:

DISTRIBUTION OF PAYMENTS:-





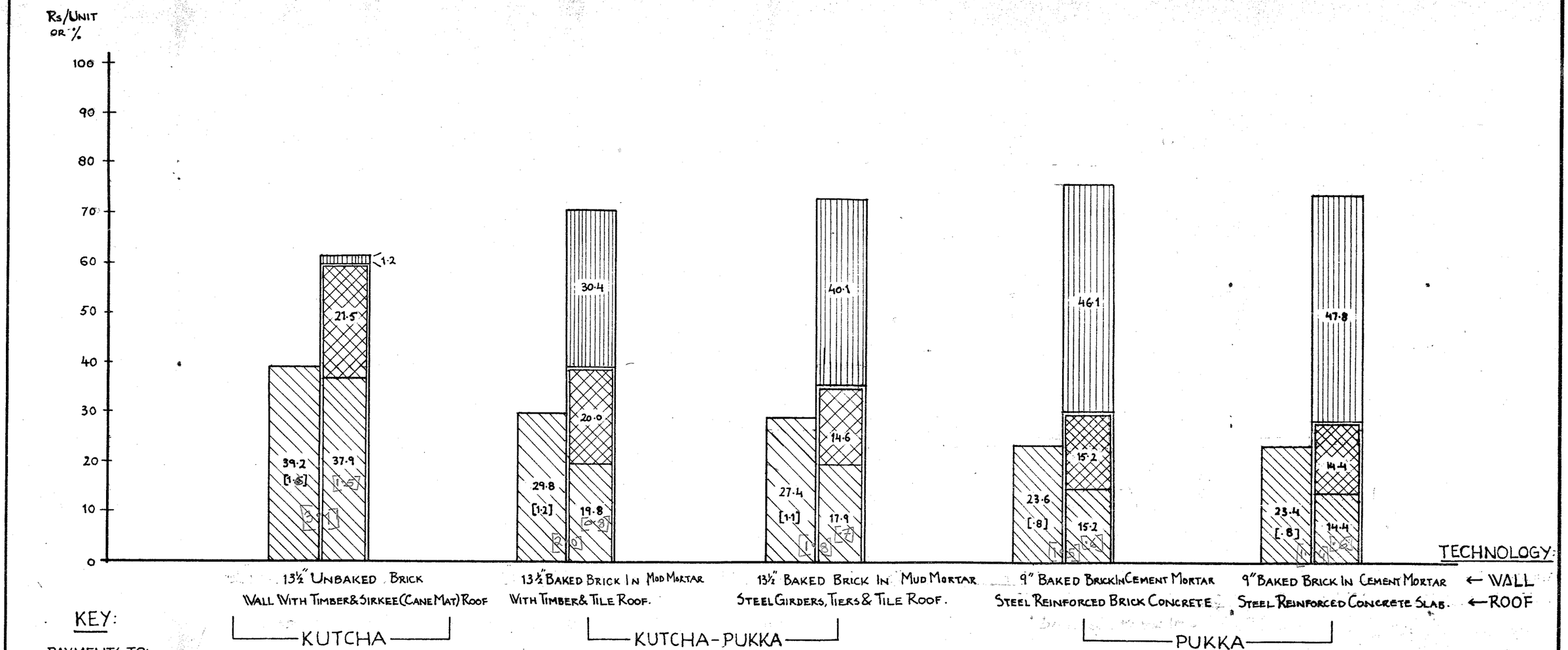
COMMENTS:

* Assuming Skilled Workers-Contractors, Masons, Smiths, Carpenters Are In The Upper Income Group.

4.3

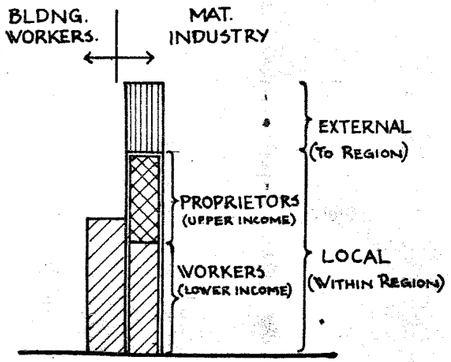
DISTRIBUTION OF CONSTRUCTION EXPENDITURE BETWEEN BUILDING WORKERS & BUILDING MAT. INDUSTRY.

COMPARING
BUILDING TECHNOLOGIES.



KEY:

PAYMENTS TO:-



COMMENTS:

Figure In [ ] Notes The Man-Days Of Employment In Construction Per Rs 100/- Of Expenditure. $\frac{\text{Payments to Wkrs.}}{\text{Av. Wage}} = \frac{\text{Payments to Wkrs.}}{25\text{Rs.}}$

2.1.

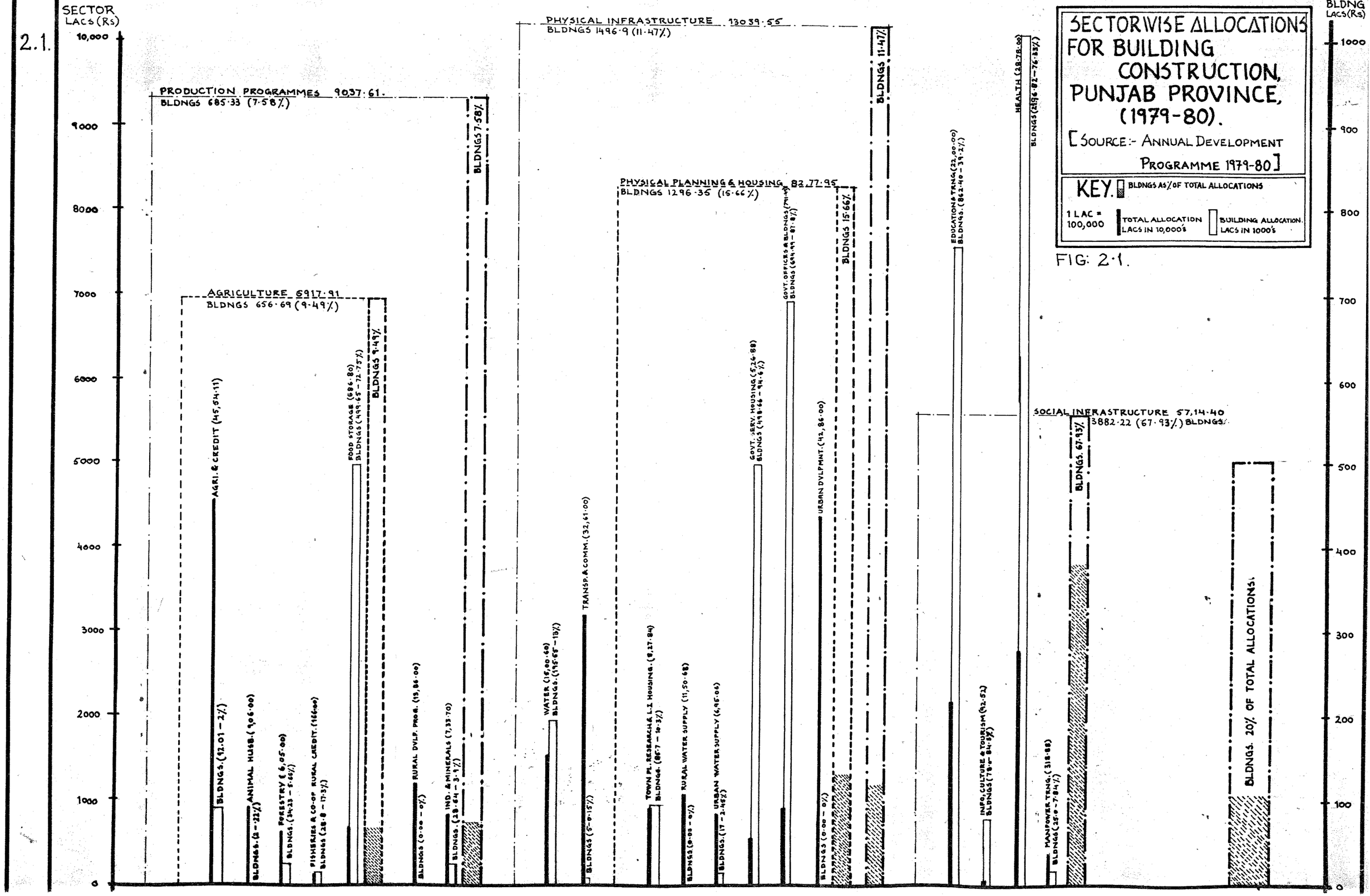
SECTORWISE ALLOCATIONS FOR BUILDING CONSTRUCTION, PUNJAB PROVINCE, (1979-80).

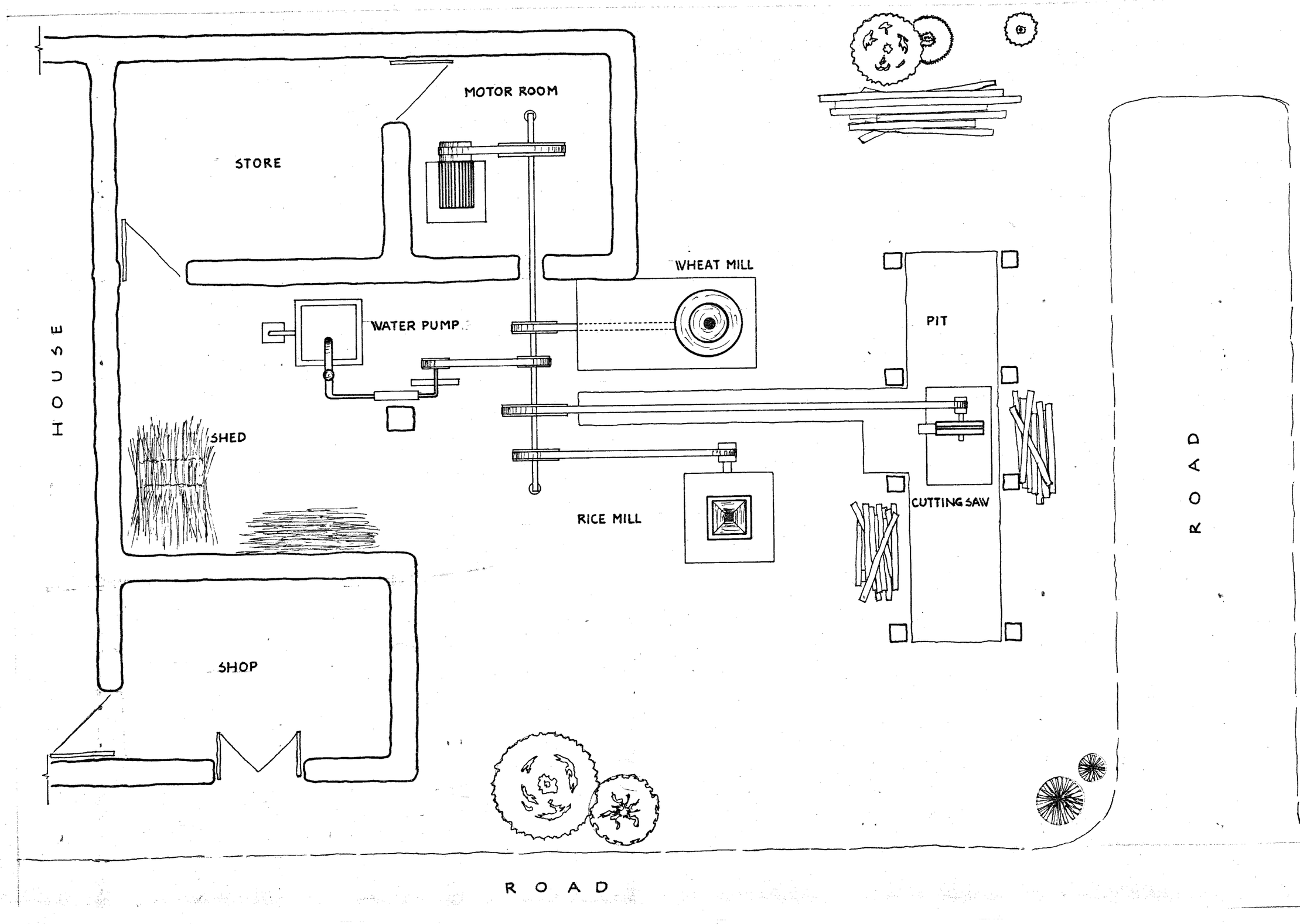
[SOURCE:- ANNUAL DEVELOPMENT PROGRAMME 1979-80]

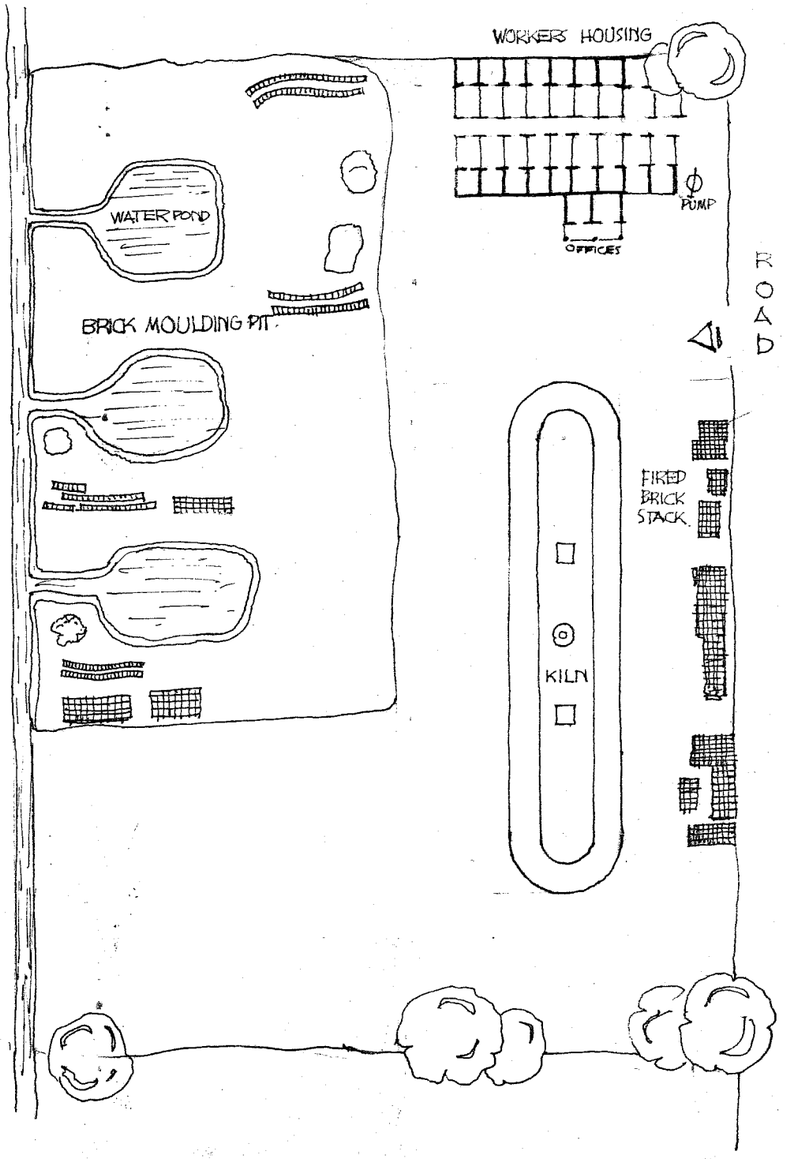
KEY. ▒ BLDNGS AS % OF TOTAL ALLOCATIONS

1 LAC = 100,000 | TOTAL ALLOCATION LACS IN 10,000's | BUILDING ALLOCATION LACS IN 1000's

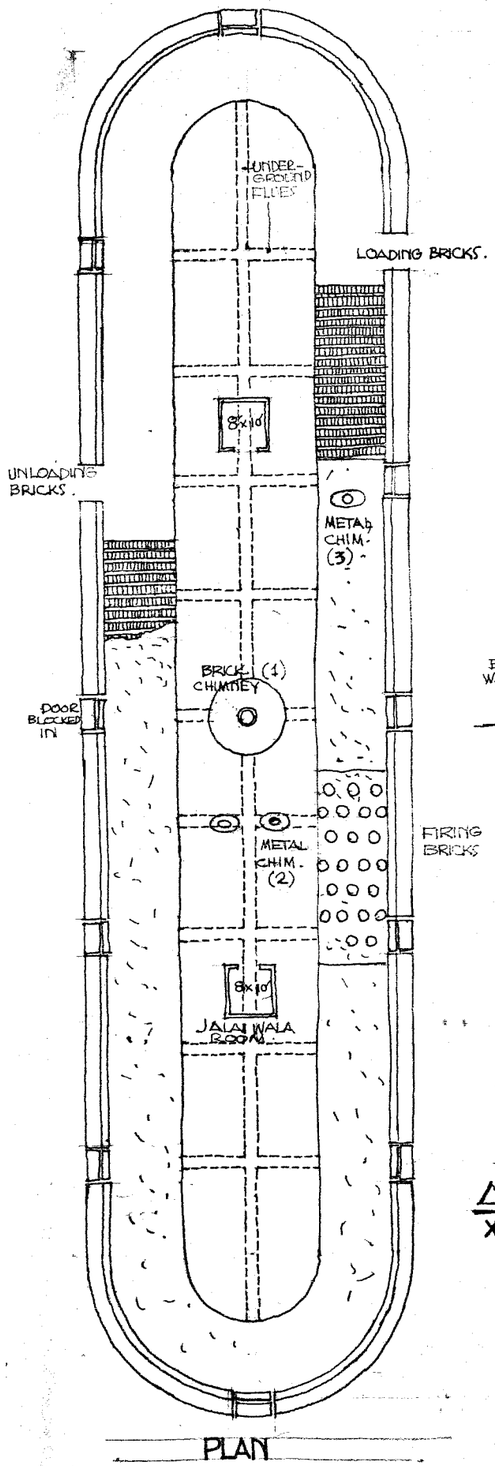
FIG: 2-1.



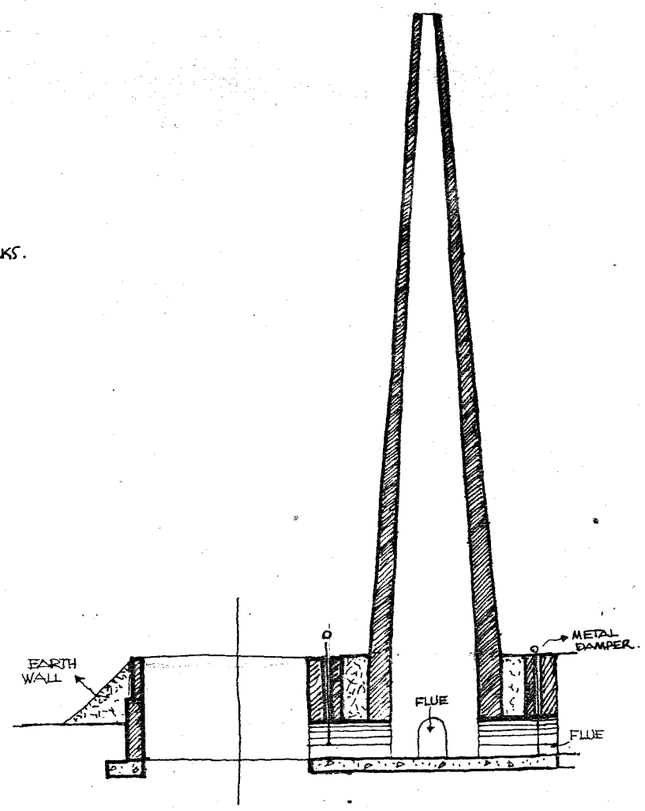

MOTOR ROOM
STORE
WHEAT MILL
WATER PUMP
PIT
SHED
RICE MILL
CUTTING SAW
SHOP
ROAD
ROAD
ROAD



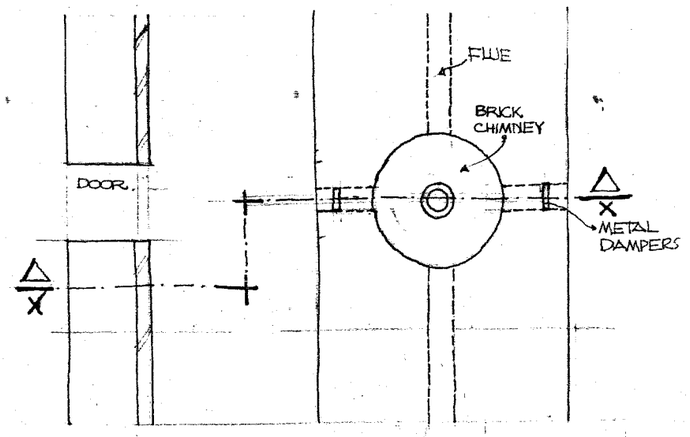
SITE PLAN



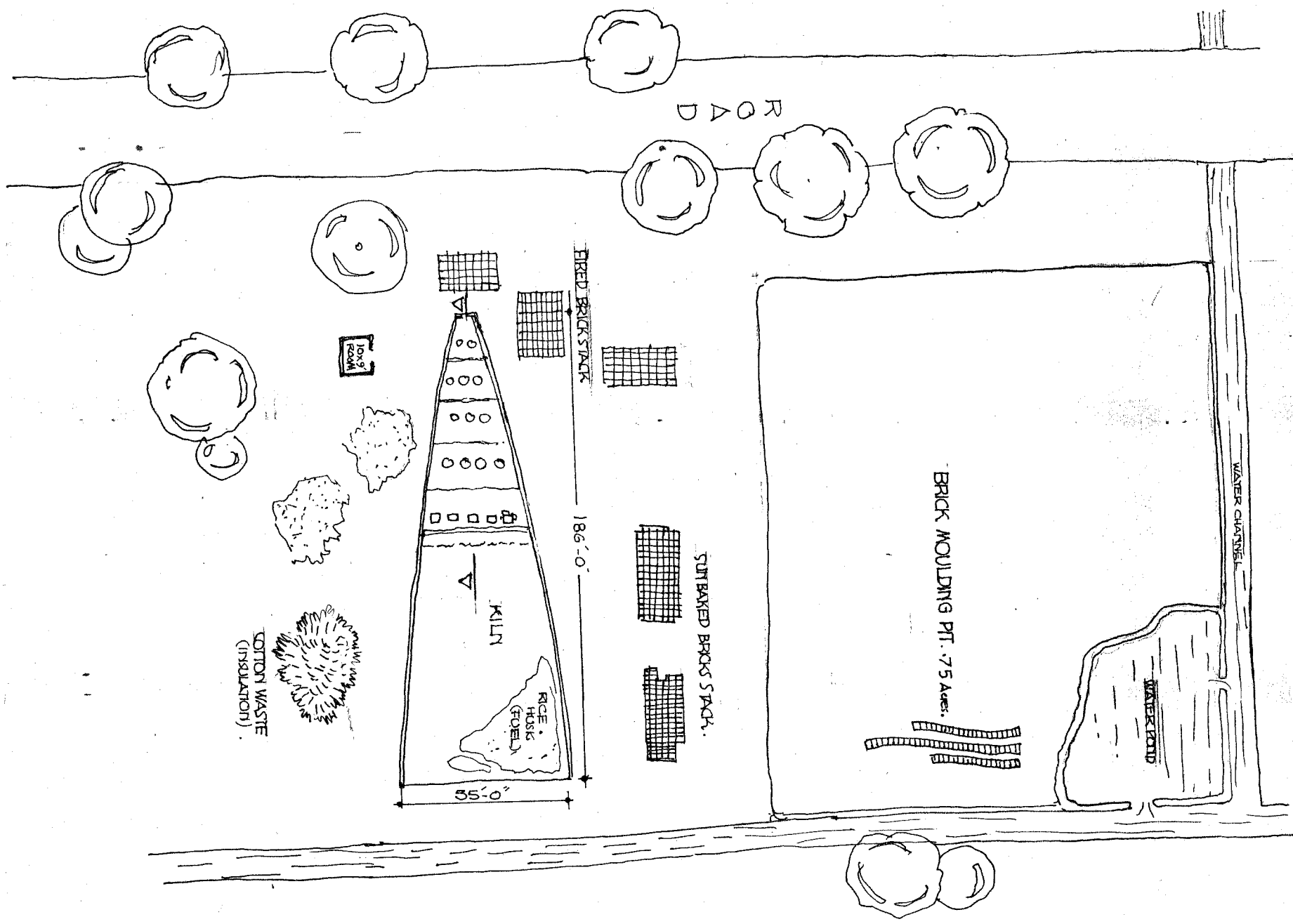
PLAN

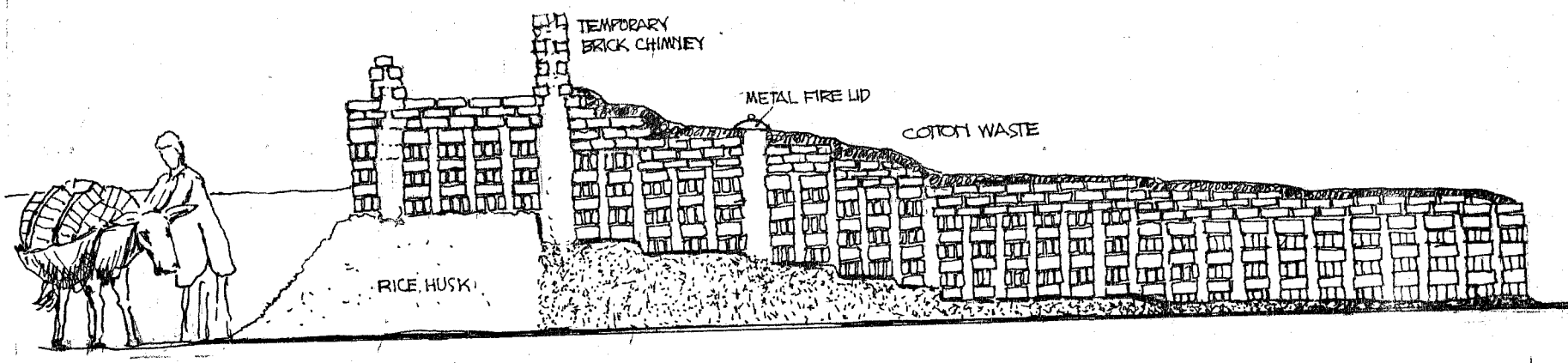


SECTION AT X-X

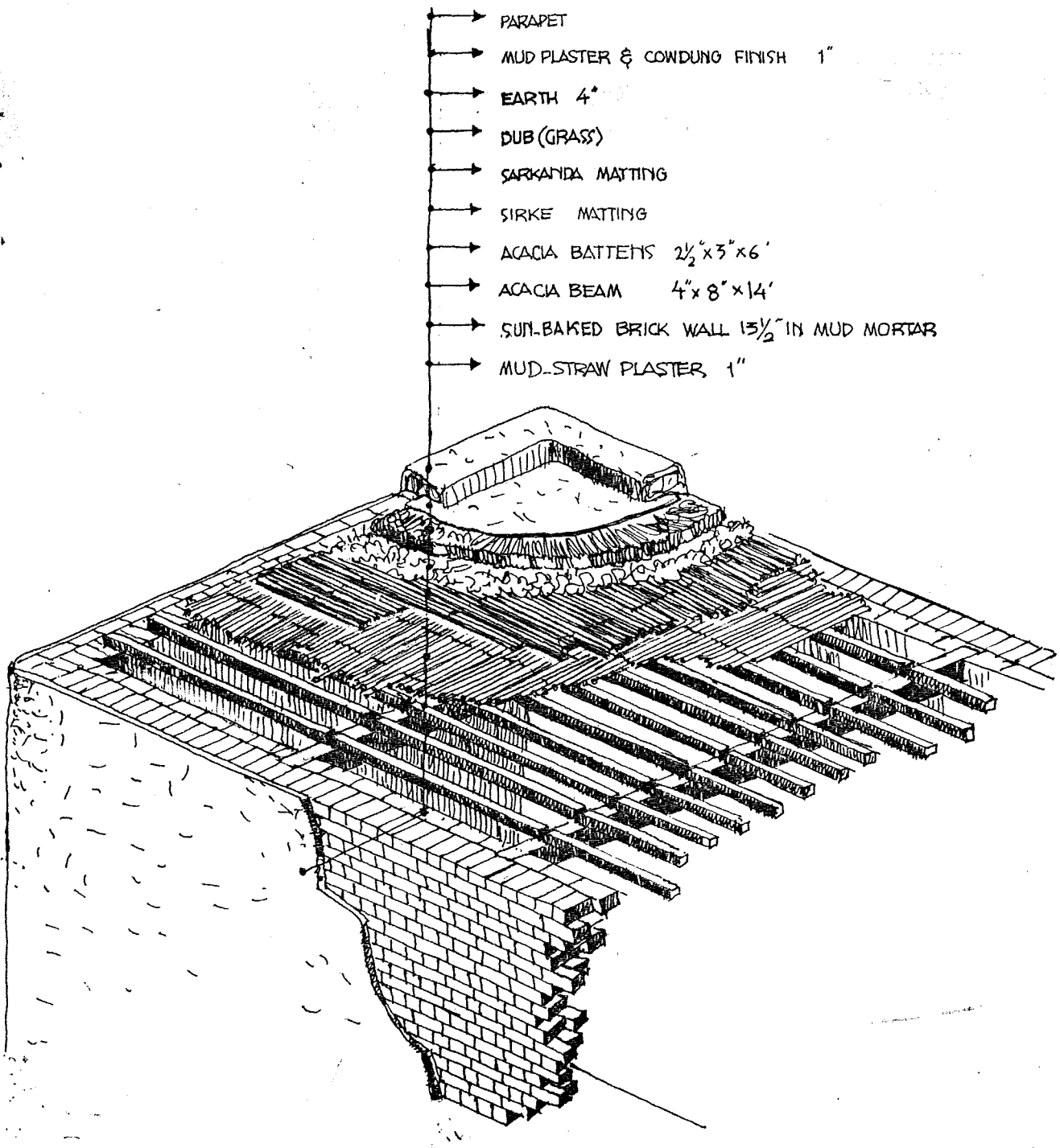


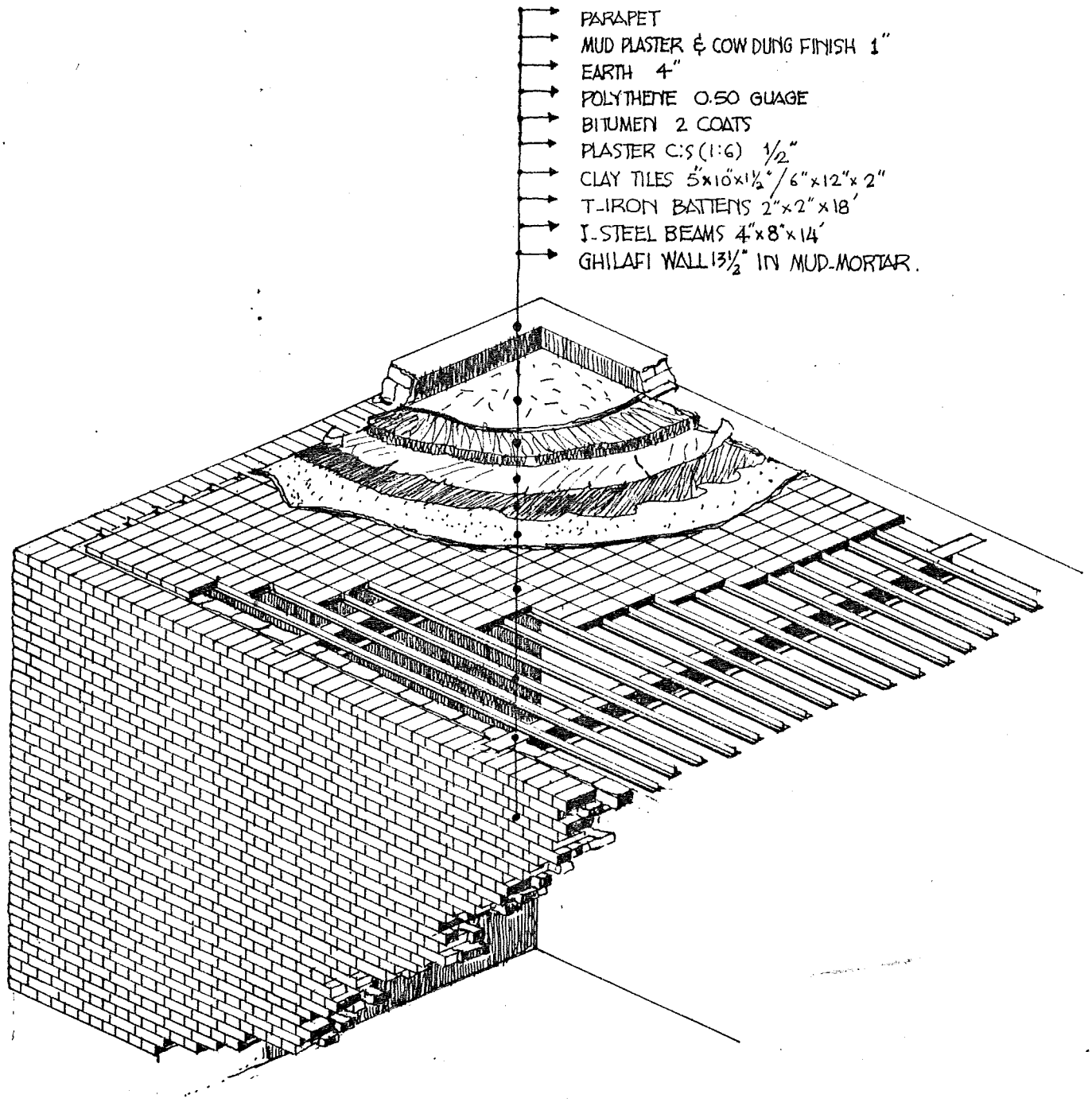
PART PLAN

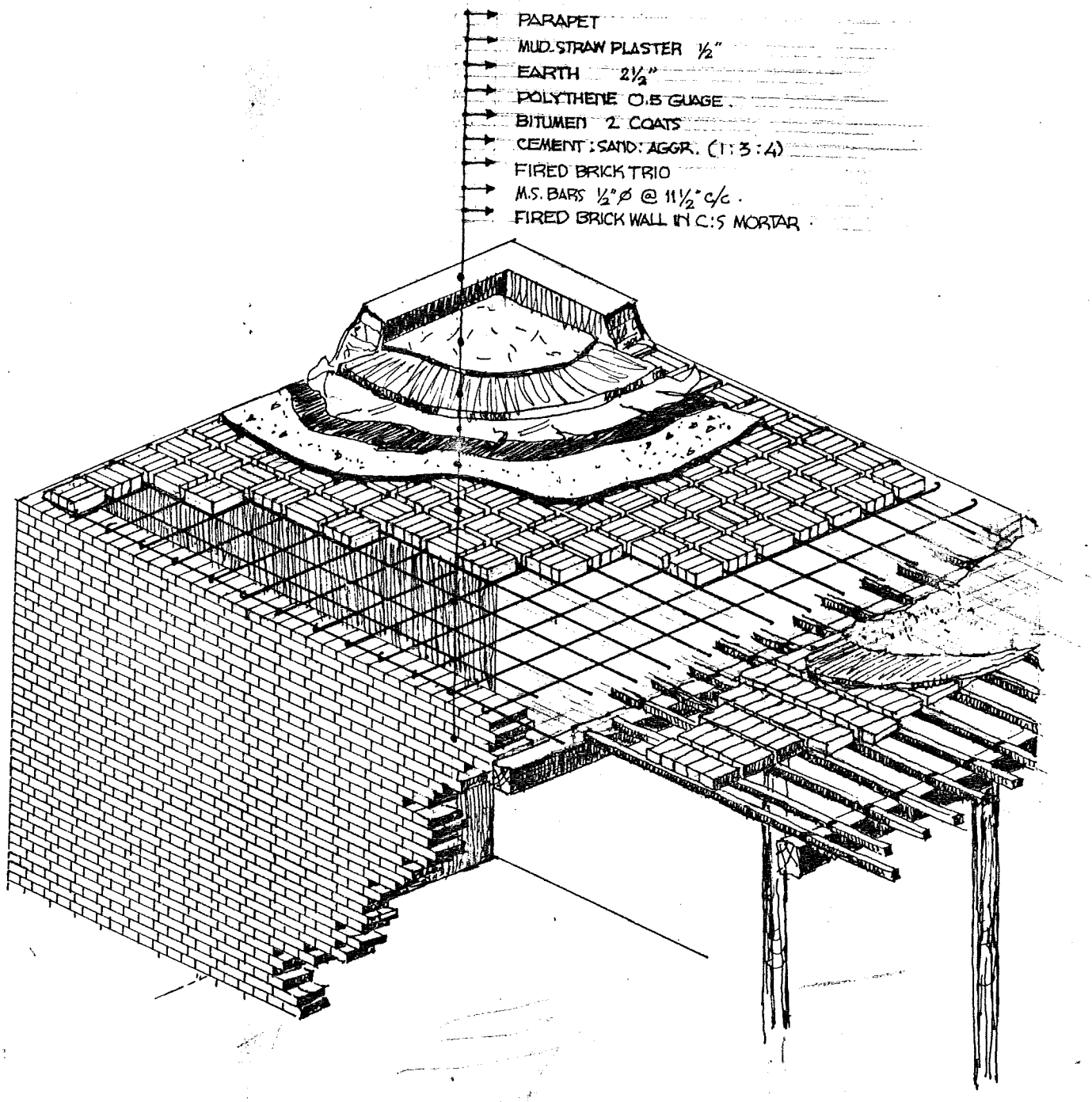




STACKING BRICKS FOR FIRING — FRESHLY FIRED BRICKS — FIRED BRICKS — BRICKS COOLING — BRICKS READY FOR UNLOADING


PARAPET
MUD PLASTER & COWDUNG FINISH 1"
EARTH 4"
DUB (GRASS)
SARKANDA MATTING
SIRKE MATTING
ACACIA BATTENS 2½"x3"x6'
ACACIA BEAM 4"x8"x14'
SUN-BAKED BRICK WALL 13½" IN MUD MORTAR
MUD-STRAW PLASTER 1"


PARAPET
MUD PLASTER & COW DUNG FINISH 1"
EARTH 4"
POLYTHENE 0.50 GUAGE
BITUMEN 2 COATS
PLASTER C:S (1:6) 1/2"
CLAY TILES 5"x10"x1 1/2" / 6"x12"x 2"
T-IRON BATTENS 2"x2"x18'
I-STEEL BEAMS 4"x8"x14'
GHILAFI WALL 13 1/2" IN MUD-MORTAR.


PARAPET
MUD STRAW PLASTER ½"
EARTH 2½"
POLYTHENE 0.5 GUAGE.
BITUMEN 2 COATS
CEMENT : SAND : AGGR. (1 : 3 : 4)
FIRED BRICK TRIO
M.S. BARS ½"ø @ 11½" c/c.
FIRED BRICK WALL IN C:S MORTAR.