

The Pakistan Authorities concerned shall be fully responsible for constructin and installing all outdoor facilities and equipment for power networks including final distribution lines to individual buildings.

## 2) Lighting Facilities

In principle, the main lighting sources shall be fluorescent lamps, but mercury quarts lamps for the workshop and seeds storages.

The expected luminous intensity for individual buildings is shown in the following table:

Table 5-15. Expected Luminous Intensity

<u>Buildings</u>	<u>Rooms</u>	<u>Exp. Lum. Intensity</u>
Administration Office	Office Room	400 - 500
	Laboratory	400 - 500
	Lecture Room	400 - 500
	Library	400 - 500
	Show Room	250 - 300
	Passways	100 - 150
	Bath Room	100 - 150
Guesthouses for Lecturer	Bedroom	100 - 150
	Dining Room	150 - 200
	Kitchen	100 - 150
	Lounge	150 - 200
Guesthouses for Trainees	Drawing Room	150 - 200
	Dining Room	150 - 200
	Kitchen	150 - 200
Garage		50
Chemical/Fertilizer Storage		100
Farm Machinery Workshop	Machine Room	150 - 200
	Workshop	400 - 500
Seeds Processing Plant	Office	200 - 300
	Plant	200 - 300
Seeds Storage		100

### 3) Air-conditioning Planning

Air-conditioning shall be made with window-type individual air-conditioners shall be equipped with the office rooms for high ranking/senior staffs and laboratory in the administration office building, and bedrooms for high ranking people, taking into consideration the meter aerological conditions, and operation and maintenance of the equipment.

### 4) Water Supply, Sewerage and Sanitation Facilities

#### a) Water Supply Facilities

Since Nasirabad District has no public water supply facilities, the Pilot Farm shall install its own facilities to be exclusively used. And the necessary water sources shall depend upon the canal conveying water to the Pilot Farm and the diversion works to be used exclusively for water supply shall be constructed. The water shall be transported to the specifically excavated pond through the conduction to be provided along the national road between Jatpat and Usta Muhammed. The water shall be pumped from the pond to an elevated storage tank made of concrete after treated in filtration similar to that of Animal Cattle Farm. The water stored in the tank shall be distributed by gravity to the respective buildings and facilities. PVC pipes shall be adopted for conduction pipelines.

#### b) Hot Water Supply Systems

Electric hot water suppliers shall be installed at every kitchen for hot water supply. The distribution pipes shall be copper pipes.

#### c) Sewerage

Sewerage from the bath rooms and kitchens shall be stored in septic tank for primary treatment, and underground sewerage shall be carried out. PVC pipes shall be used for the sewerage system.

d) Sanitation Equipment

Western style sanitation wares, washing basins, sinks for sweepers, etc. shall be tightly installed in respective places.

e) Kitchen Equipment

The kitchens shall provide dust-table sinks, working table, refrigerators, cookers, gas ranges, working-tables with shelf, bread racks, ice-making devices, etc.

5.2.6. Construction Materials Plan

The necessary members and materials have to be specifically studied taking into consideration their functions required, local meteorological condition, climatology, present construction business, construction period and costs required, maintenance costs of the buildings, etc.

(1) Structural Materials

Reinforced concrete pillars shall be employed in place of wood pillars used commonly in the Area and brickwalls shall be adopted. Since ready-mixed concrete is not locally available, concrete mixing shall be made in site.

(2) Finishing Materials

Finishing materials with longer life and easy to maintain shall be used as much as possible, in particular, major finishing materials for outside walls, roofings, etc. shall be used with such materials as having confirmed with long life and economical.

1) Roof

All the roofing slabs, except for the seeds processing plant having a gable roof, shall be made of reinforced concrete with

asphalt coating water-tightness concrete surfacing or paint coating where the asphalt coating is not possible, and water/heat proof structures. Such a complicated method, although ensuring high durability will have to be applied so as to prevent the waterproof layer from sunshine heat damages. And this method is widely applied in the other Japanese grant aid projects in a similar physical conditions. Other exterior roofing is water-proof mortar trowel finishing.

## 2) Exterior Walls

Only for the administration office, the exterior wall is concrete with mortar trowel finish. For lodging accommodation, staff housing, garage, storage, warehouse and repairshop, the exterior wall is brick with mortar trowel finish. The exterior wall of other buildings are brick piling only and columns and beams are mortar trowel finish. Because the concrete works and brick piling techniques are still primary, the foundation should be corrected as much as possible. Similar method is applied for other grant-aid project in Pakistan.

As regards finishing materials, administration office, lodging accommodation, garage, storage, warehouse and repairshop as well as staff housing are with color-sprayed tiles made. Other buildings are finishing with color-sprayed tiles only for concrete foundations of column and beam.

This color-sprayed tiles finishing will be more costly than with paint finishing; however, the former is superior in terms of durability against harsh climatic condition by saving the maintenance costs.

It was judged that the work condition and method of color-sprayed tiles finishing is easier than the other method from other grant-aid project in Islamabad.

### 3) Floor

the floor in the administration office is vinyl chloride sheet finishing except for poly-laboratory, etc. Because it is easy to maintain. Similarly, the floors of lodging accommodation are poly-vinyl chloride sheet finishing. For staff housing, the floor is artificial stone finishing because the carpet is commonly used in Pakistan. For other buildings, the floor is concrete slab bed with mortar trowel finish.

### 4) Interior Walls

Interior walls of the guesthouse for lecturer is vinyl cloth finishing while the administration office is mortar trowel finishing and painting because easy to maintain, and is similar to other public buildings of Baluchistan government. Interior walls of other working facilities are brick piling only except for mortar trowel finishing of columns and beams.

### 5) Ceiling

The ceiling of administration office, guesthouses, staff housing, etc. is plaster board with painting. The laboratory's ceilings are porous silica-calcium board and lecture rooms are porous plaster board. Sound insulating material is necessary for lecture room. The ceiling of bath room, etc. is silica-calcium board finishing. Glass wool is used as ceiling insulation for all buildings. Asbestos is not used because of its pollution.

## 6) Fittings

Aluminum sashes shall be used windows facing outfields. Aluminum sashes shall be adopted for the windows of the Project facilities so as to make the maintenance works easy, to secure air-tightness, and to protect from salt damages in particular, although wooden or iron sashes are locally available.

Inside doors shall be made with wood, but careful attention shall be given to moisture contents of wood materials before construction, because insufficient dry of wood materials will result in warping and/or twisting of the products while in use. Furthermore, in the commonly wetty portion like bath rooms, the wooden frames and other wooden parts are likely to be attacked by white ants, therefore, interior fittings are steel-made. Exterior doors are steel or aluminum-made and set the insect net where necessary.

### 5.2.7. Planning of On-Farm Roads and Other Facilities

On-farm facilities/structures to be constructed include roads, parking lots, green zone, fences, gates, etc. The construction works of the fences, gates, green zones shall be under the full responsibility of the Pakistan Authorities concerned.

#### (1) On-Farm Roads

The access road branching-off from the national road (Jatbad-Usta Muhammed) to the administrative office shall be constructed in simple asphalt pavement with the total width of 12 m and pedestrian walks. This road shall have the separate gates of "In" and "Out" to keep one way traffic. The other roads in the Farm shall have the total width of 6.0 m and effective width of 5.5m, to be located in the center of the road in simple asphalt pavement.

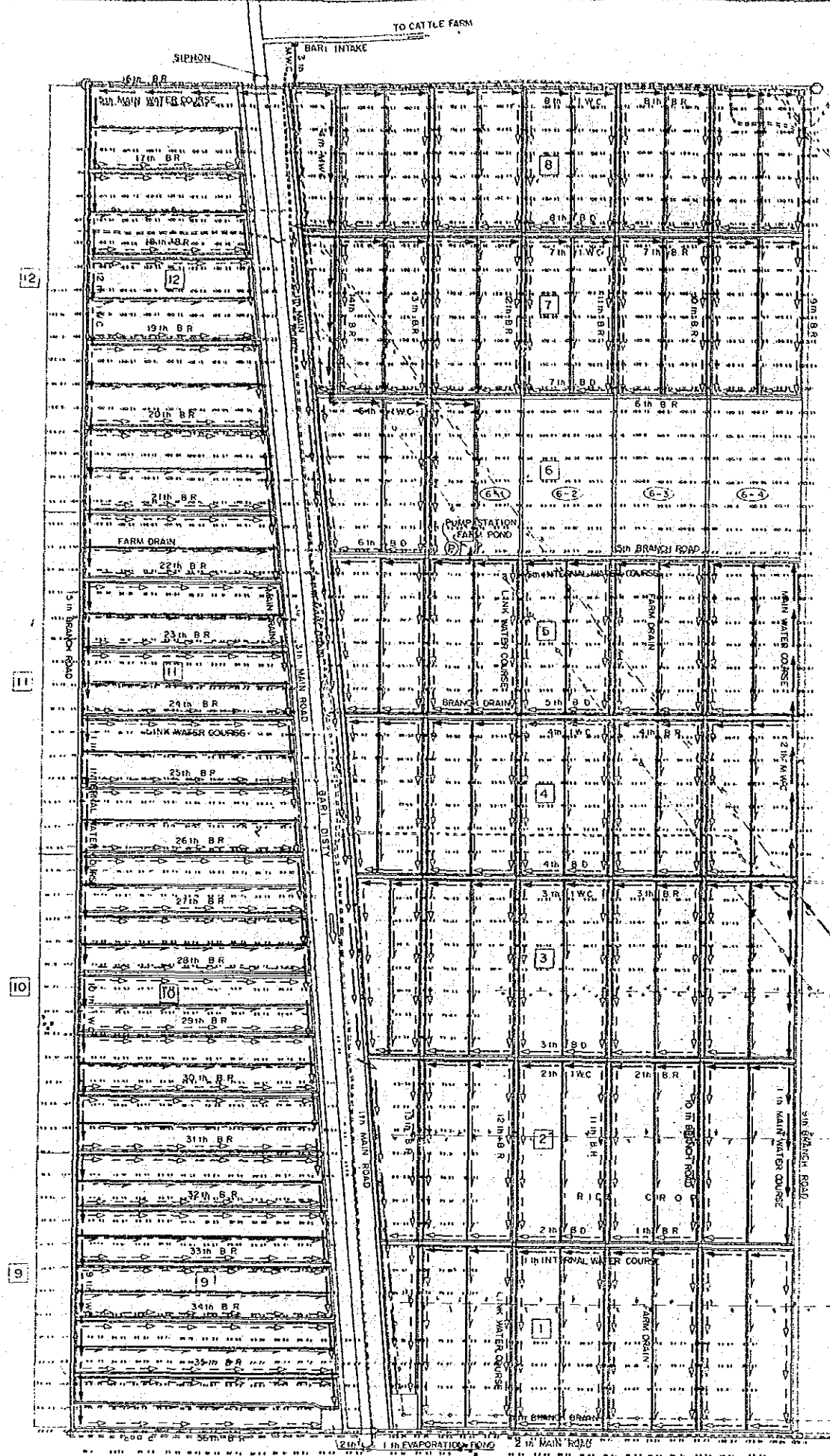
## (2) Parking Lots

The parking lots for vehicles of visitor to the Farm shall be provided closely to the administrative office building with surface by simple asphalt pavement.

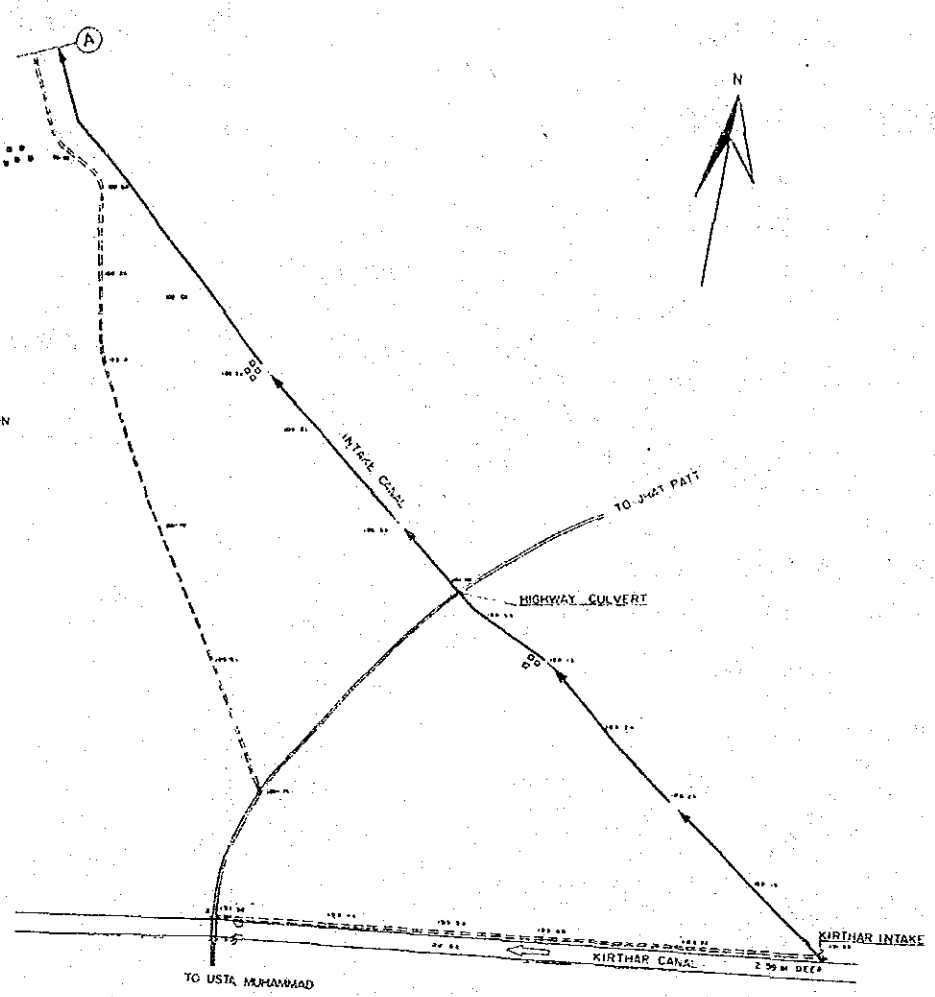
### 5.2.8. Basic Design Drawings

The following is a list of 22 sheets of basic design drawings:

- NB-1 General Layout of Pilot Project
- NB-2 Typical Cross-Section of Intake Canal
- NB-3 Longitudinal Section of Intake Canal
- NB-4 Intake of Khirthar Canal
- NB-5 Highway Culvert of Intake Canal
- NB-6 Culvert at Rd. 22+290 of Intake Canal
- NB-7 Distributary of Intake Canal
- NB-8 Plan of Pilot Farm
- NB-9 Typical Structure of On-Farm Facilities
- NB-10 Crossing Structure on Water Course of Pilot Farm
- NB-11 Siphon Structure
- NB-12 Demonstration of Irrigation Facilities(1) of Pilot Farm
- NB-13 Demonstration of Irrigation Facilities(2) of Pilot Farm
- NB-14 Site Plan of Buildings
- NB-15 Main Office Building(1)
- NB-16 Main Office Building(2)
- NB-17 Staff House
- NB-18 Dormitory
- NB-19 Guest House of Instructors
- NB-20 Seed Storage
- NB-21 Garage, Agro-Chemical Store and Fertilizer Store
- NB-22 Storage of Farm Machinery and Repair Shop



- MACHINERY IRRIGATION SYSTEM**
- 1 FARM POND B PUMPING STATION FOR IRRIGATION FACILITIES
  - 2 IRRIGATION FACILITIES
    - 6-1 FIXED SPRINKLER
    - 6-2 RAINGUN TRAVELLING
    - 6-3 PORTABLE SPRINKLER
    - 6-4 TRICKLE



**LEGEND**

- |                           |      |         |
|---------------------------|------|---------|
| WATER COURSE              | ———  |         |
| CANAL                     | ———  |         |
| ROAD                      | ———  |         |
| METALLED ROAD             | ———  |         |
| TELEPHON LINE             | ○——○ |         |
| ELECTRIC POLE LINE        | □——□ |         |
| BUSHES                    |      |         |
| HOUSES                    | ■    |         |
| BRIDGE                    | — —  |         |
| BOUNDARY PILLER           | ○    |         |
| BOUNDARY PILLER           | △    |         |
| AT ASSUMED DATUM 100.00 M |      |         |
| ROTATION AREA NUMBER      | [ ]  |         |
| MAIN WATER COURSE         | →→→  | (M.W.C) |
| INTERNAL WATER COURSE     | →→→  | (I.W.C) |
| LINK WATER COURSE         | →→→  | (L.W.C) |
| MAIN DRAIN                | ←←←  | (M.D)   |
| BRANCH DRAIN              | ←←←  | (B.D)   |
| FARM DRAIN                | ←←←  | (F.D)   |
| MAIN ROAD                 | ———  | (M.R)   |
| BRANCH ROAD               | ———  | (B.R)   |

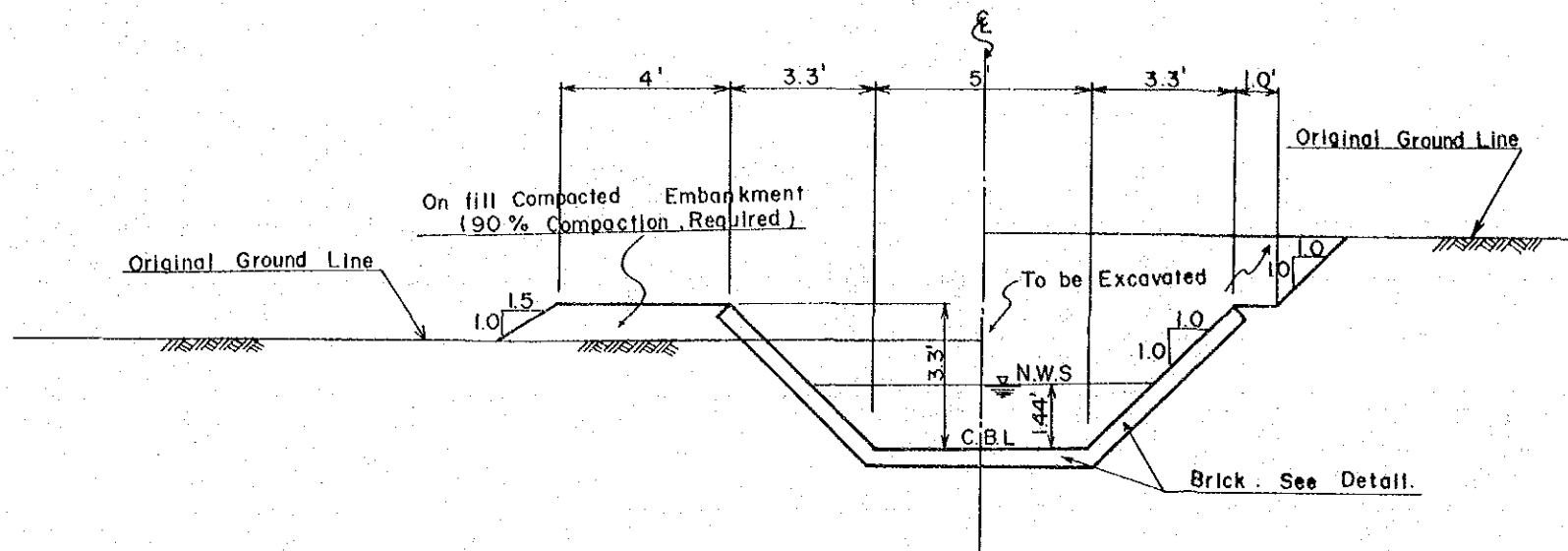
SCALE = 1:4000 0 50 100 200 300M

THE ISLAMIC REPUBLIC OF PAKISTAN THE PROJECT FOR AGRICULTURE DEVELOPMENT IN NASIRABAD	
GENERAL LAYOUT OF PILOT PROJECT	DWG. NO. NB-1
JAPAN INTERNATIONAL COOPERATION AGENCY	

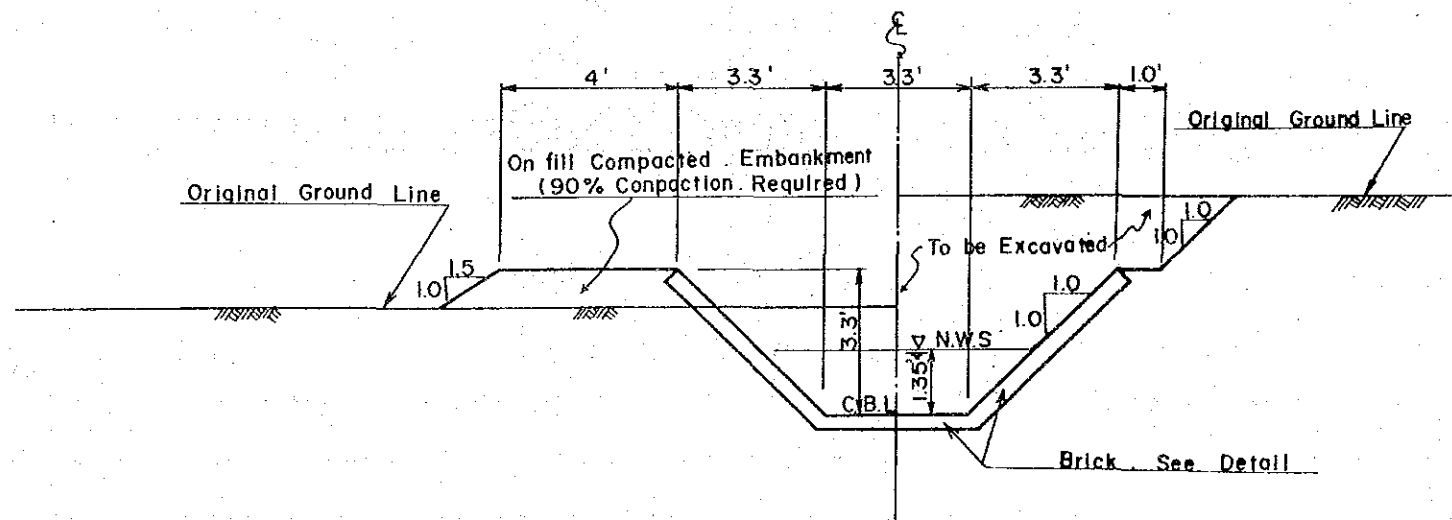


TYPICAL CROSS SECTION OF INTAKE CANAL

TYPE I Q = 8.0 (ft<sup>3</sup>/s)

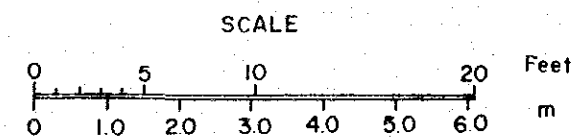


TYPE II Q = 5.0 (ft<sup>3</sup>/s)



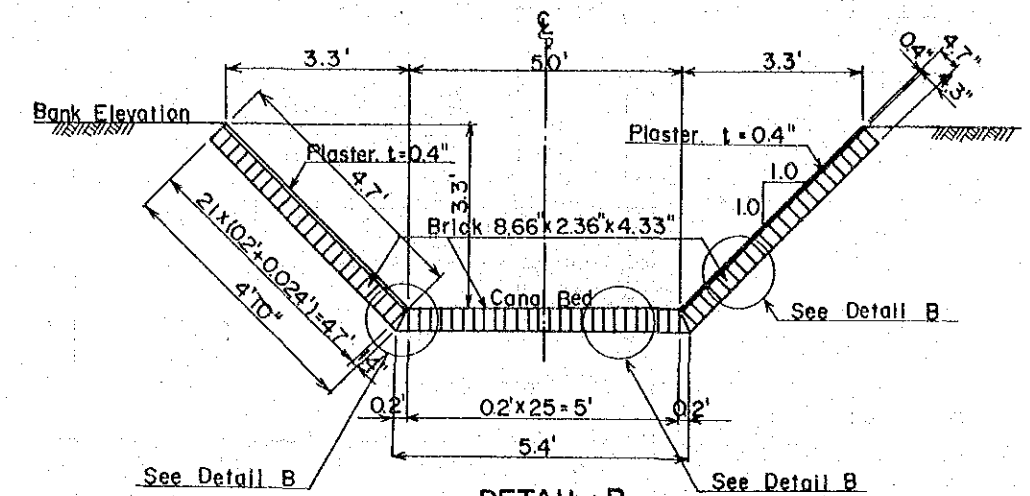
LEGEND  
 N.W.S : NORMAL WATER SURFACE  
 C.B.L : CANAL BED ELEVATION

NOTE : ALL DIMENSIONS ARE IN FEET  
 UNLESS OTHERWISE SPECIFIED

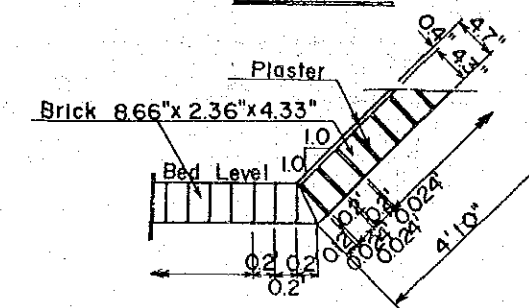


DETAIL

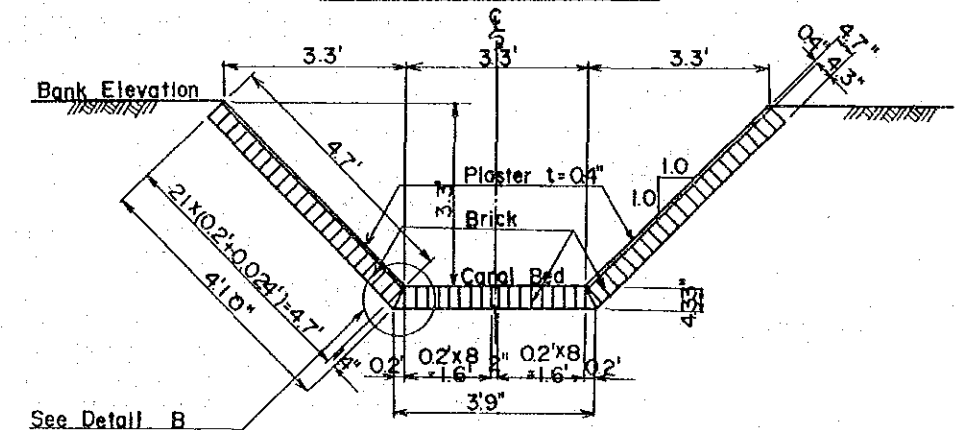
TYPE I Q = 8.0 (ft<sup>3</sup>/s)



DETAIL : B



TYPE II Q = 5.0 (ft<sup>3</sup>/s)



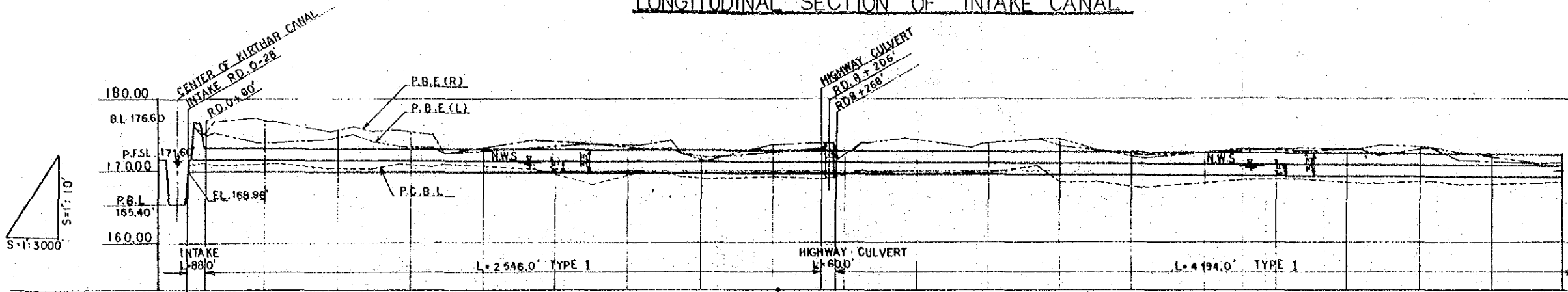
THE ISLAMIC REPUBLIC OF PAKISTAN  
 THE PROJECT FOR AGRICULTURE DEVELOPMENT  
 IN NASIRABAD

TYPICAL CROSS SECTION  
 OF INTAKE CANAL

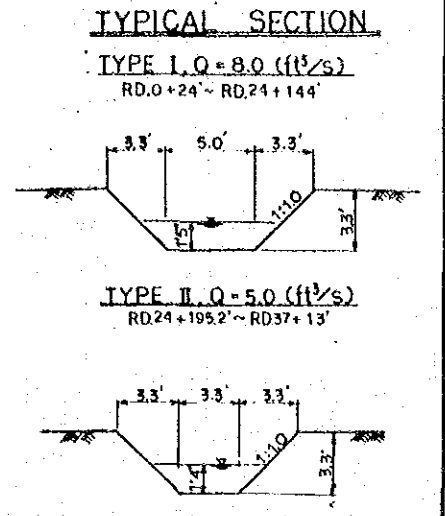
DWG. NO.  
 NB-2

JAPAN INTERNATIONAL COOPERATION AGENCY

# LONGITUDINAL SECTION OF INTAKE CANAL

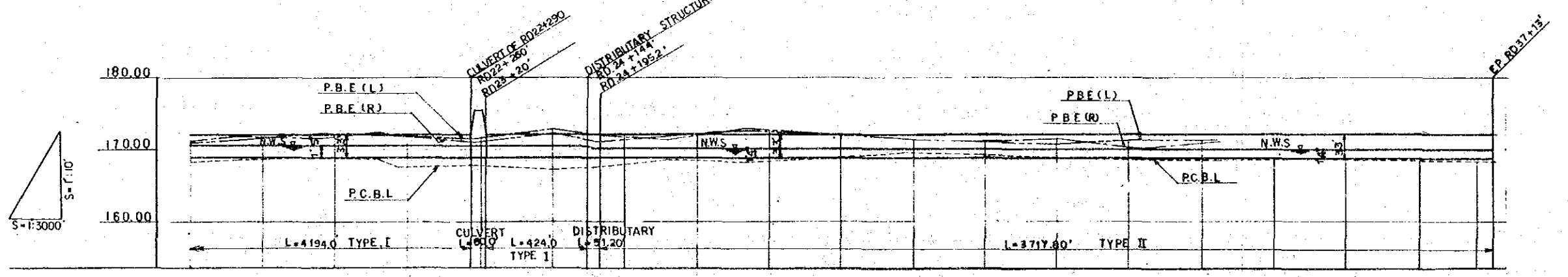


PLAN	PLAN																				
	BANK ELEVATION	172.36	173.26	173.26	173.25	173.21	173.18	173.15	173.13	173.10	173.08	173.02	172.99	172.97	172.94	172.92	172.88	172.86	172.81	172.79	
WATER SURFACE ELEVATION	171.52	171.42	171.40	171.37	171.35	171.32	171.29	171.27	171.24	171.22	171.16	171.13	171.11	171.06	171.03	171.00	170.98	170.95	170.93		
CANAL BED ELEVATION	168.98	169.98	169.96	169.93	169.91	169.88	169.86	169.83	169.80	169.78	169.72	169.69	169.67	169.64	169.62	169.59	169.56	169.54	169.49		
CANAL DIMENTION	Q = 8 CUSECS (ft <sup>3</sup> /s) 1-1/11500																				
PRESENT CONDITION	BANK ELEVATION	175.8	175.1	174.9	174.5	174.5	173.2	173.8	173.0	173.0	172.5	173.2	174.3	174.3	172.9	173.0	173.0	172.4	172.9	170.9	
	GROUND ELEVATION OF CANAL CENTER	171.3	170.9	171.0	170.5	170.4	170.2	168.4	168.1	168.8	169.6	169.3	169.3	170.7	168.5	168.5	168.8	168.0	168.3	168.3	
	ACCUMULATED DISTANCE	0	37	257	569	661	759	846	900	1033	1180	1276	1300	1308	1308	1308	1308	1308	1308	1308	
	DISTANCE	0	37	170	241	61	78	107	54	84	150	152	152	208	92	154	145	207	47	74	173
	STATION (RD IN 300 ft)	RD 0+00	RD 0+37	RD 0+257	RD 0+569	RD 0+661	RD 0+759	RD 0+846	RD 0+900	RD 0+1033	RD 0+1180	RD 0+1276	RD 0+1300	RD 0+1308	RD 0+1308	RD 0+1308	RD 0+1308	RD 0+1308	RD 0+1308	RD 0+1308	RD 0+1308



**LEGEND**

P.F.S.L : PROPOSED FULL SUPPLY LEVEL  
 P.B.L : PROPOSED BED LEVEL  
 N.W.S : NORMAL WATER SURFACE  
 P.C.B.L : PRESENT CANAL BED LEVEL  
 P.B.E(R) : PRESENT BANK ELEVATION (RIGHT)  
 P.B.E(L) : PRESENT BANK ELEVATION (LEFT)



PLAN	PLAN																				
	BANK ELEVATION	172.79	172.76	172.73	172.71	172.68	172.66	172.65	172.62	172.58	172.55	172.52	172.49	172.47	172.44	172.42	172.36	172.34	172.34	172.34	
WATER SURFACE ELEVATION	170.95	170.90	170.87	170.85	170.83	170.76	170.74	170.71	170.67	170.62	170.57	170.54	170.52	170.49	170.47	170.44	170.39	170.39	170.39		
CANAL BED ELEVATION	169.49	169.46	169.43	169.41	169.39	169.32	169.30	169.28	169.27	169.25	169.22	169.19	169.17	169.14	169.12	169.09	169.06	169.04	169.04		
CANAL DIMENTION	Q = 8 CUSECS (ft <sup>3</sup> /s) 1-1/11500											5 CUSECS (ft <sup>3</sup> /s) 1-1/11500									
PRESENT CONDITION	BANK ELEVATION	171.4	172.0	172.3	172.1	171.1	172.3	171.2	171.9	172.7	172.2	171.5	171.1	170.9	171.3	171.1	171.4	171.4	171.4	171.4	
	GROUND ELEVATION OF CANAL CENTER	168.7	168.8	168.8	168.6	167.9	167.1	167.5	168.4	168.2	168.7	168.3	168.3	168.8	168.4	168.6	168.3	168.3	168.3	168.3	
	ACCUMULATED DISTANCE	5700	5891	6000	6234	6300	6458	6562	6668	6766	6852	6930	6996	7065	7113	7151	7189	7227	7265	7303	
	DISTANCE	123	191	109	234	66	178	64	168	132	196	224	281	300	263	93	207	121	179	151	113
	STATION (RD IN 300 ft)	RD 0+19	RD 0+191	RD 0+300	RD 0+6234	RD 0+6300	RD 0+6458	RD 0+6562	RD 0+6668	RD 0+6766	RD 0+6852	RD 0+6930	RD 0+6996	RD 0+7065	RD 0+7113	RD 0+7151	RD 0+7189	RD 0+7227	RD 0+7265	RD 0+7303	RD 0+7341

NOTE : ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SPECIFIED

THE ISLAMIC REPUBLIC OF PAKISTAN  
 THE PROJECT FOR AGRICULTURE DEVELOPMENT  
 IN NASIRABAD

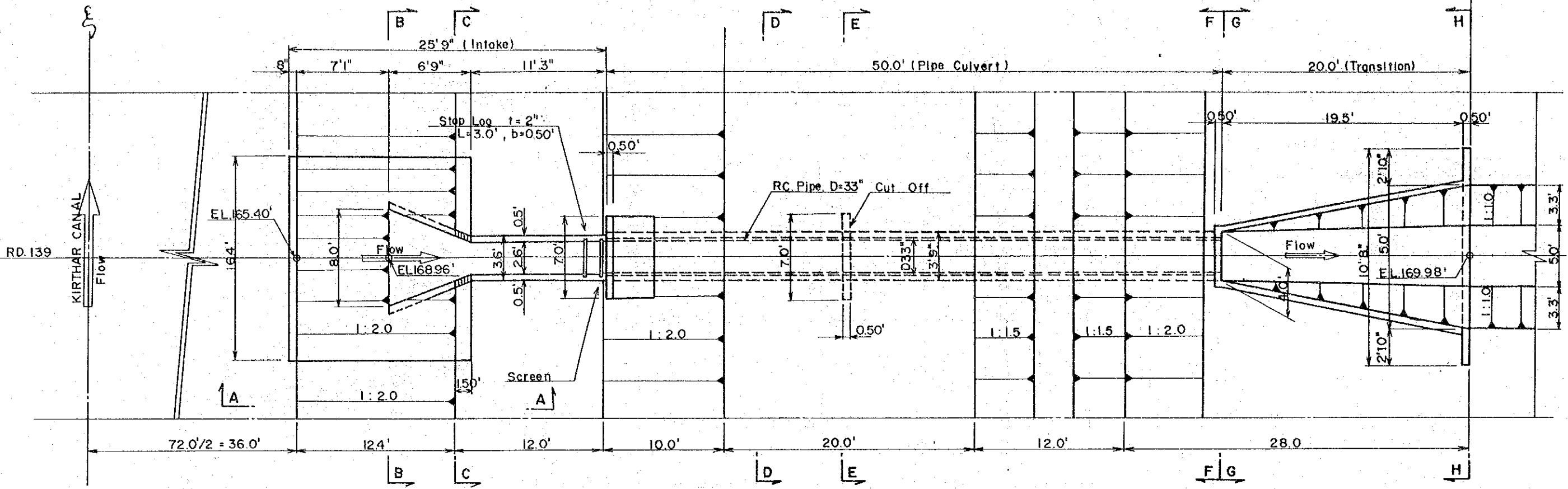
LONGITUDINAL SECTION  
 OF INTAKE CANAL

DWG. NO.  
 NB-3

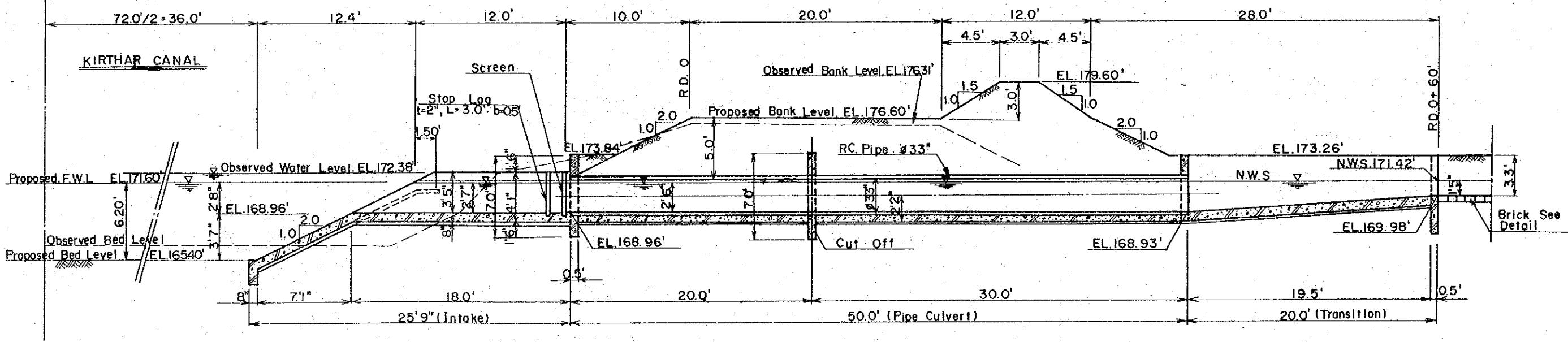
JAPAN INTERNATIONAL COOPERATION AGENCY

# INTAKE

PLAN  $s=1":50'$



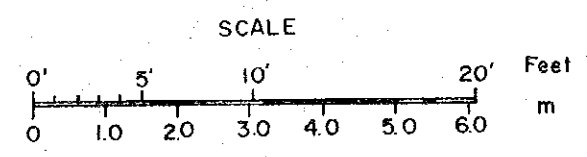
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**LEGEND**

P.F.W.L : PROPOSED FULL WATER LEVEL  
 N.W.S : NORMAL WATER SURFACE

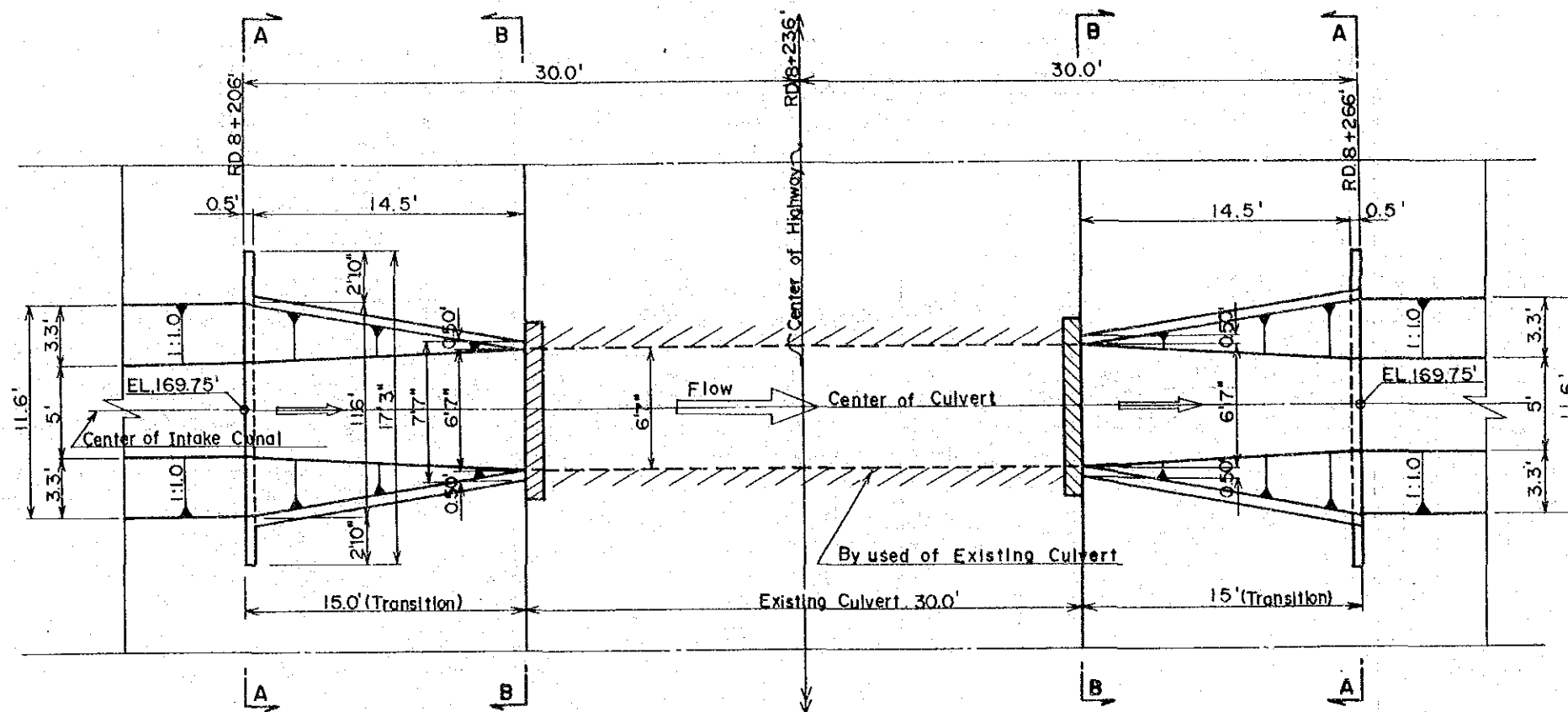
NOTE : ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SPECIFIED



THE ISLAMIC REPUBLIC OF PAKISTAN THE PROJECT FOR AGRICULTURE DEVELOPMENT IN NASIRABAD	
INTAKE OF KIRTHAR CANAL	DWG. NO. NB-4
JAPAN INTERNATIONAL COOPERATION AGENCY	

# HIGHWAY CULVERT

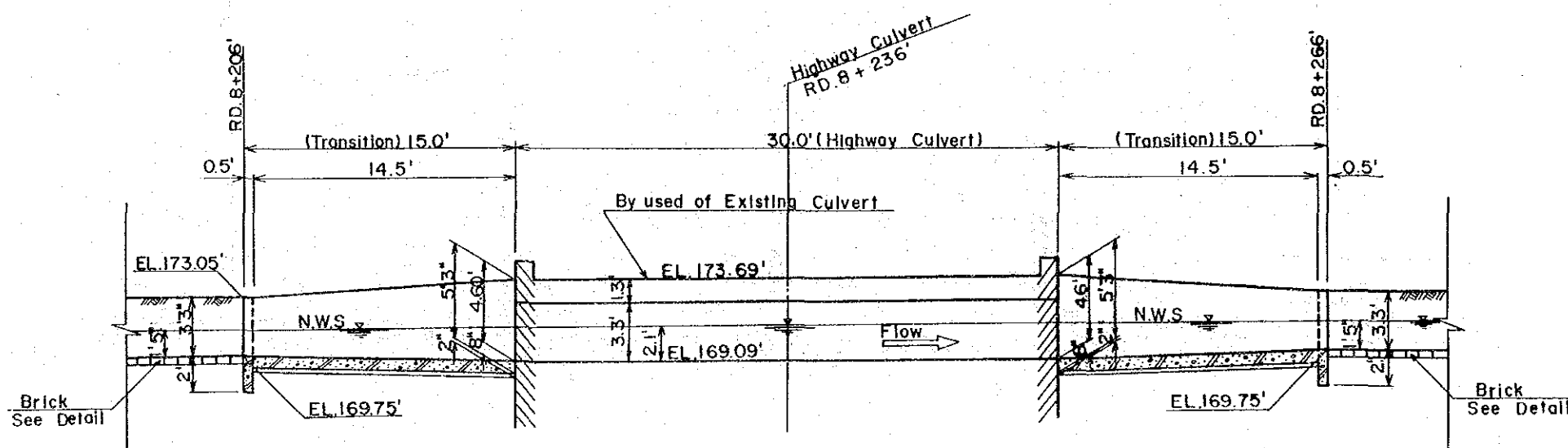
PLAN S=1" : 50'



## LEGEND

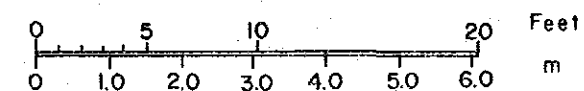
N.W.S : NORMAL WATER SURFACE

## PROFILE S=1" : 50'



NOTE : ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SPECIFIED

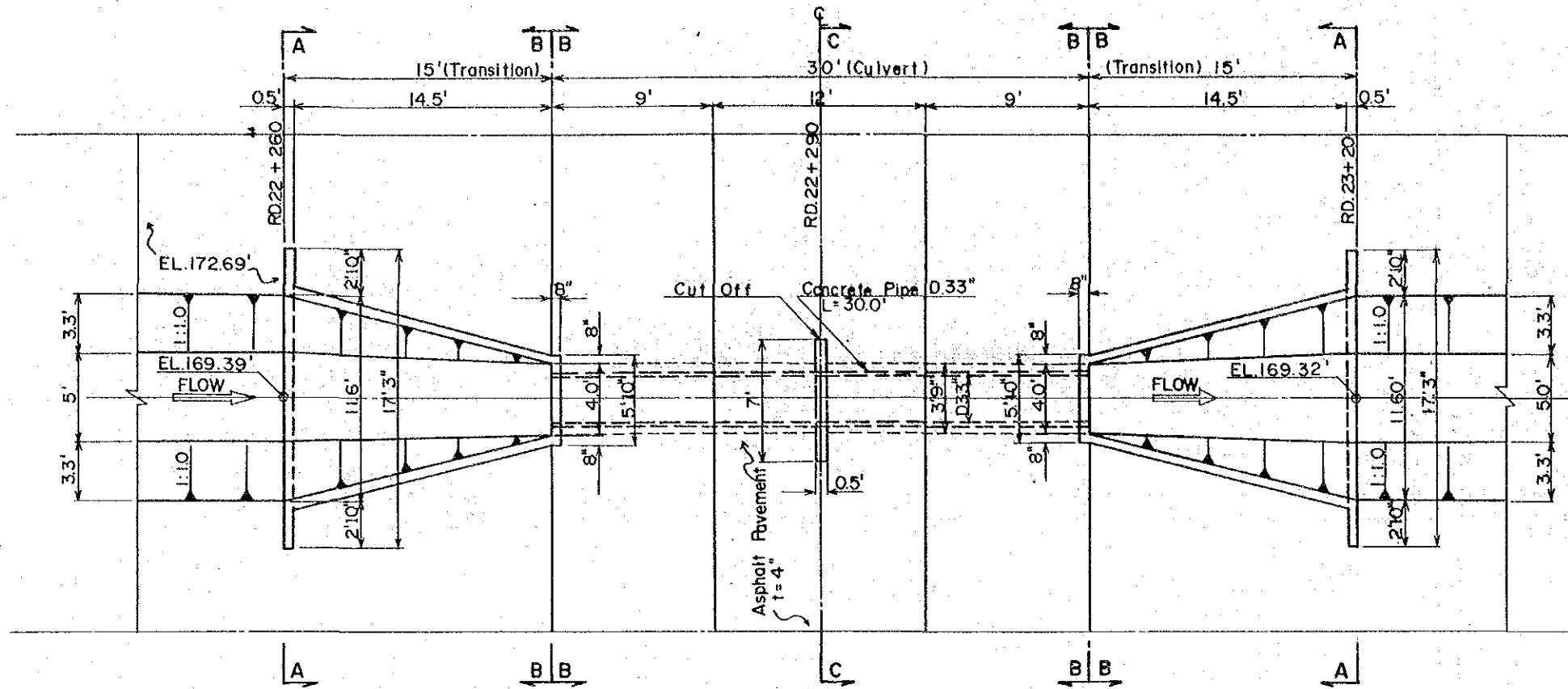
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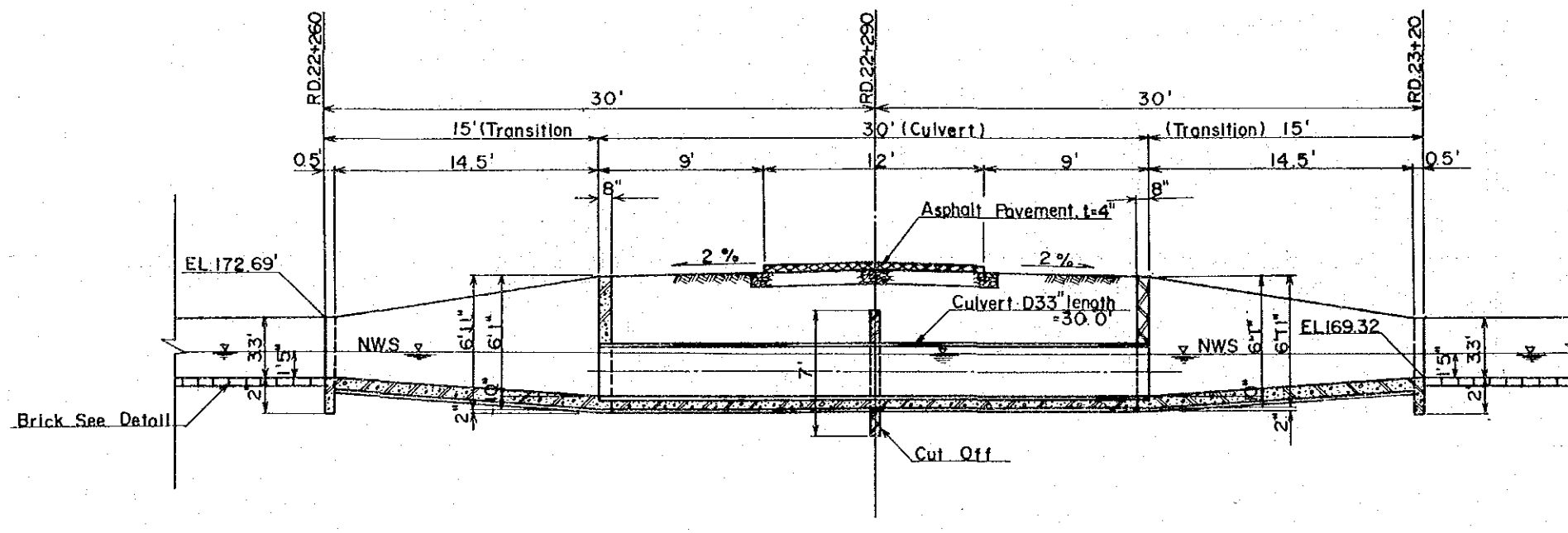
THE ISLAMIC REPUBLIC OF PAKISTAN THE PROJECT FOR AGRICULTURE DEVELOPMENT IN NASIRABAD	
HIGHWAY CULVERT OF INTAKE CANAL	DWG. NO. NB-5
JAPAN INTERNATIONAL COOPERATION AGENCY	

# CULVERT AT RD. 22 + 290

PLAN  $S=1":50'$

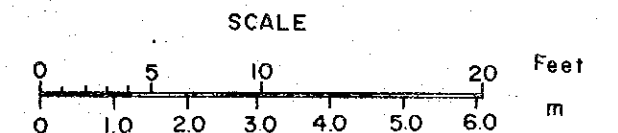


PROFILE  $S=1":50'$



LEGEND  
N.W.S : NORMAL WATER SURFACE

NOTE : ALL DIMENSIONS ARE IN FEET  
UNLESS OTHERWISE SPECIFIED

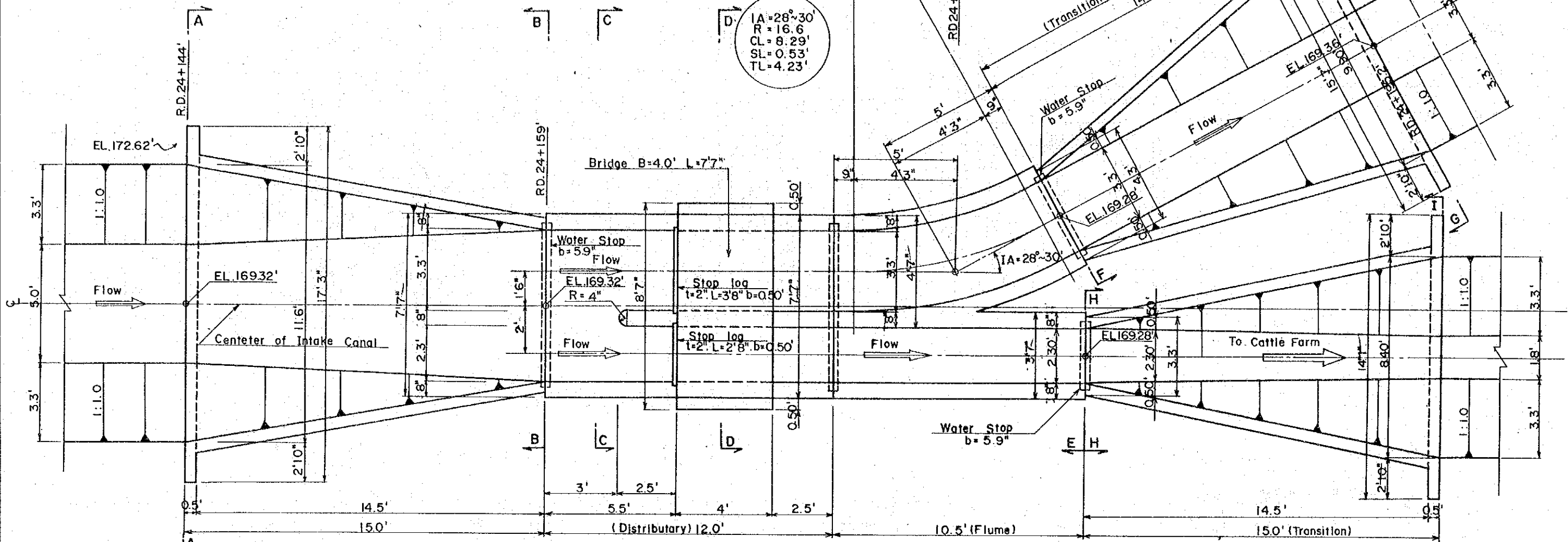


THE ISLAMIC REPUBLIC OF PAKISTAN THE PROJECT FOR AGRICULTURE DEVELOPMENT IN NASIRABAD	
CULVERT AT RD. 22 + 290 OF INTAKE CANAL	DWG. NO. NB-6
JAPAN INTERNATIONAL COOPERATION AGENCY	

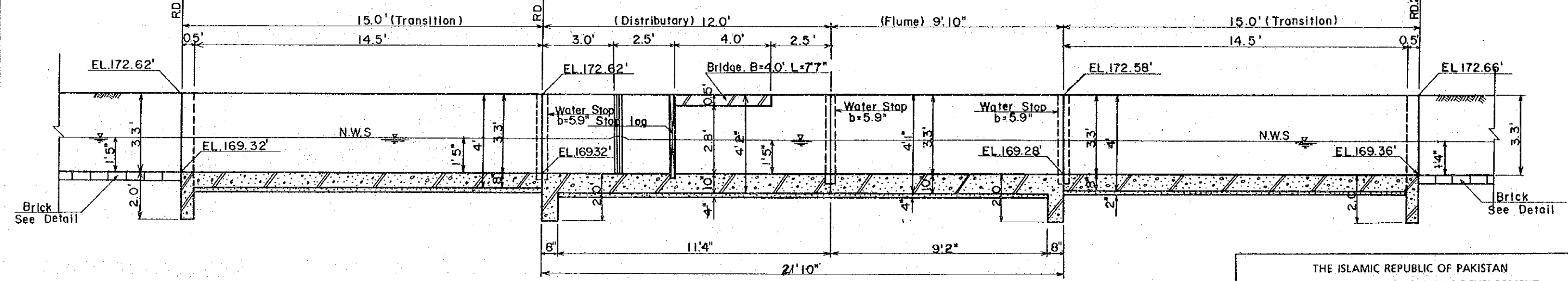
# DISTRIBUTARY

PLAN S=1" : 25

IA=28°30'  
R=16.6'  
CL=8.29'  
SL=0.53'  
TL=4.23'

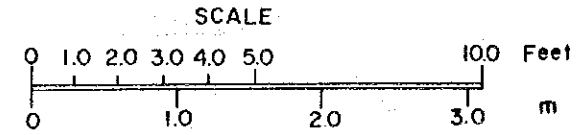


# PROFILE S=1" : 25



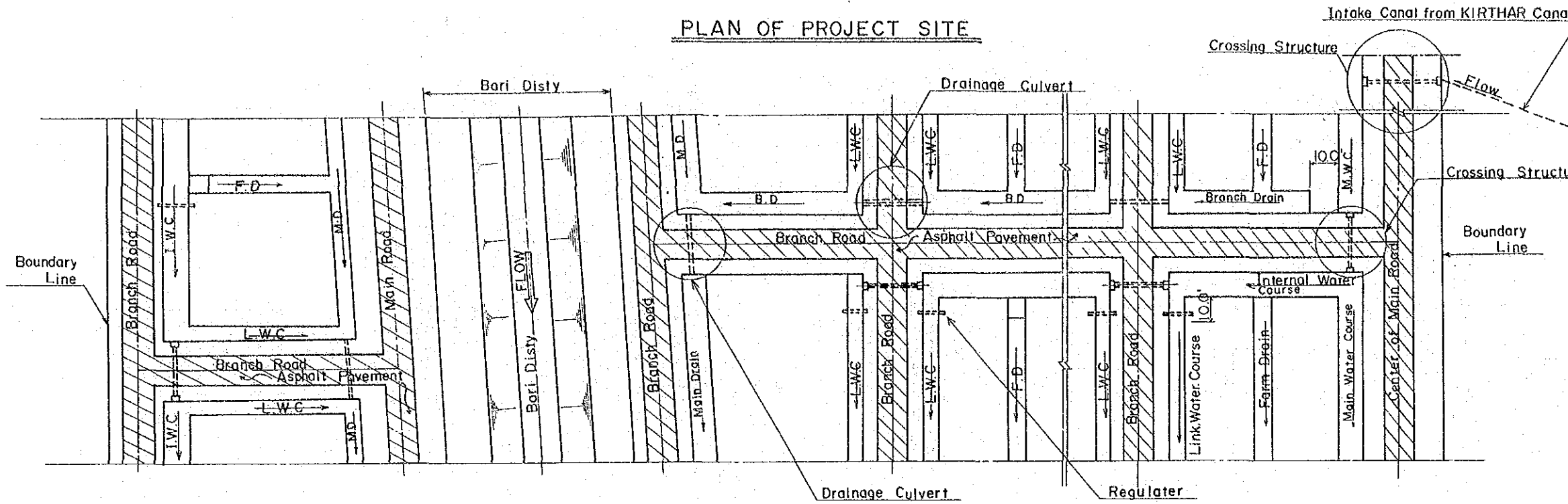
LEGEND  
N.W.S : NORMAL WATER SURFACE

NOTE : ALL DIMENSIONS ARE IN FEET  
UNLESS OTHERWISE SPECIFIED



THE ISLAMIC REPUBLIC OF PAKISTAN THE PROJECT FOR AGRICULTURE DEVELOPMENT IN NASIRABAD	
DISTRIBUTARY OF INTAKE CANAL	DWG. NO. NB-7
JAPAN INTERNATIONAL COOPERATION AGENCY	

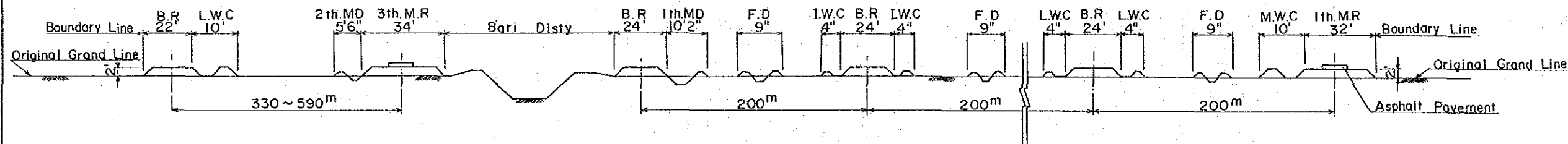
**PLAN OF PROJECT SITE**



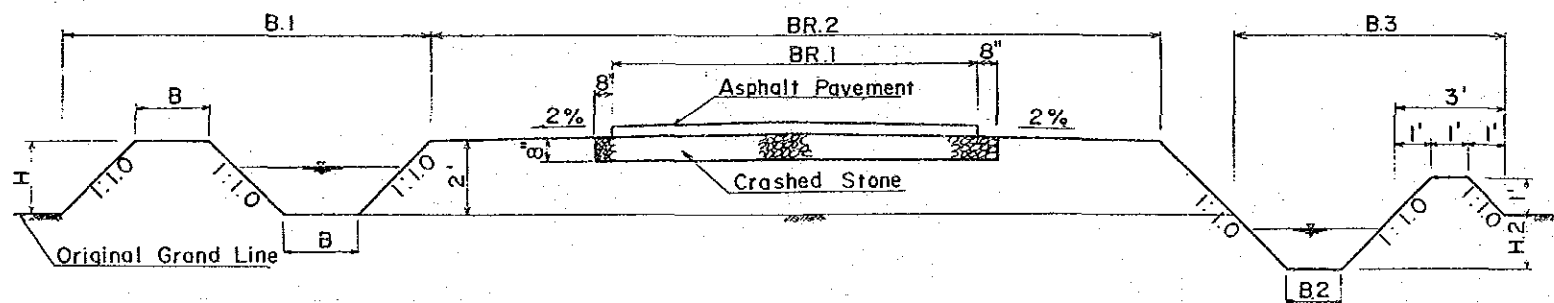
**LEGEND**

- M.W.C : MAIN WATER COURSE
- I.W.C : INTERNAL WATER COURSE
- L.W.C : LINK WATER COURSE
- M.D : MAIN DRAIN
- B.D : BRANCH DRAIN
- F.D : FARM DRAIN
- M.R : MAIN ROAD
- B.R : BRANCH ROAD

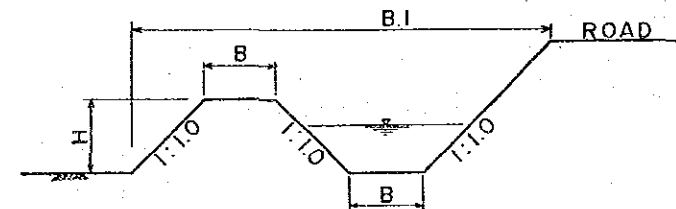
**PROFILE OF PROJECT SITE**



**TYPICAL CROSS SECTION FOR WATER COURSE, DRAIN, AND ROAD**



**TYPICAL CROSS SECTION OF LINK WATER COURSE**



NOTE : ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SPECIFIED

**DIMENSIONS OF WATER COURSE (unit = feet)**

WATER COURSE	B	B1	H
MAIN WATER COURSE	2	2	2
INTERNAL WATER COURSE	2	2	2
LINK WATER COURSE	1	6	1

**DIMENSION OF DRAIN (unit = feet)**

DRAIN	B2	B3	H2
1th MAIN DRAIN	2	10' 2"	2' 7"
2th MAIN DRAIN	1' 6"	8' 6"	2
BRANCH MAIN DRAIN	2	9	2
FARM DRAIN	1	6	1

**DIMENSION OF ROAD (unit = feet)**

ROAD	BR.1	BR.2
MAIN ROAD	12	30
BRANCH ROAD	12	20

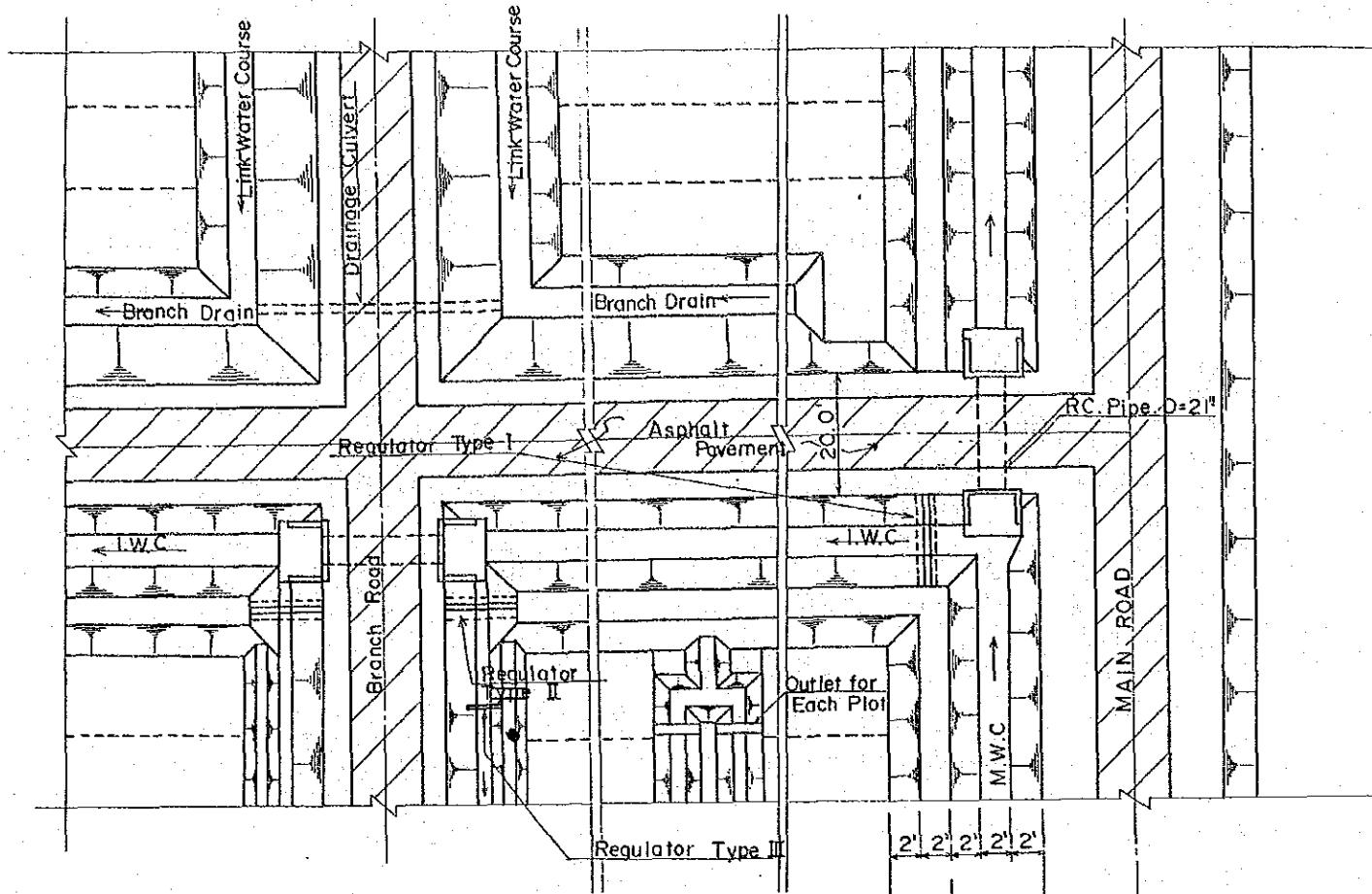
THE ISLAMIC REPUBLIC OF PAKISTAN  
THE PROJECT FOR AGRICULTURE DEVELOPMENT  
IN NASIRABAD

PLAN OF PILOT FARM

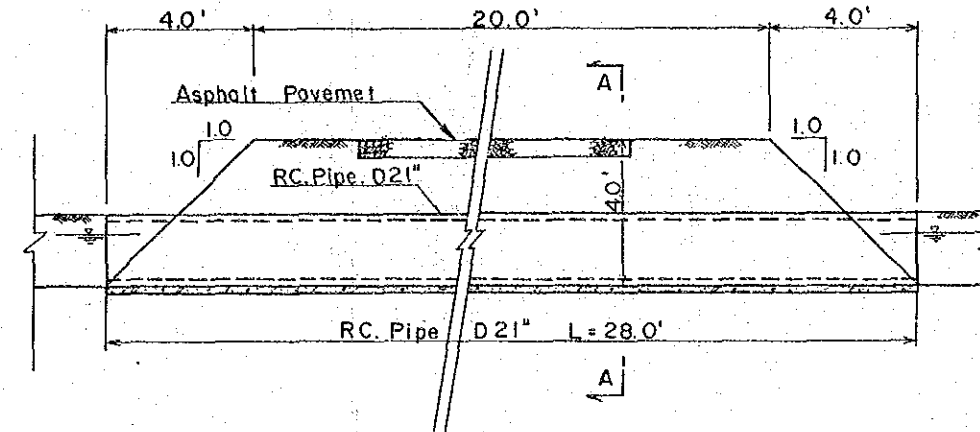
DWG. NO.  
NB-8

JAPAN INTERNATIONAL COOPERATION AGENCY

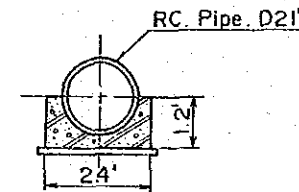
**DETAIL PROJECT SITE**



**DRAINAGE CULVERT**

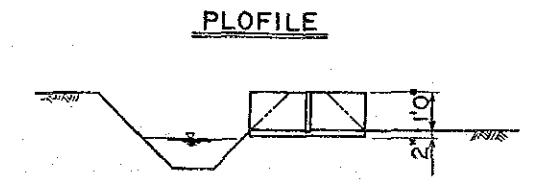
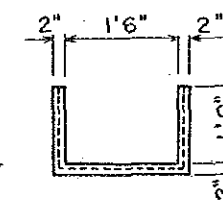
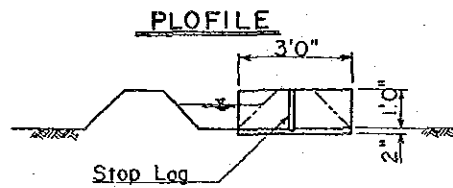
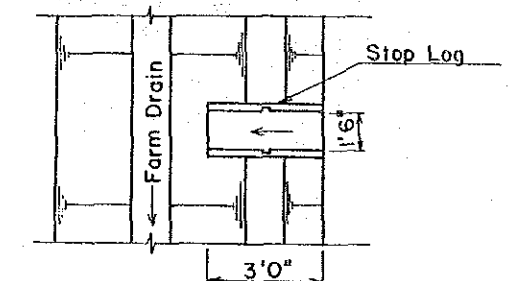
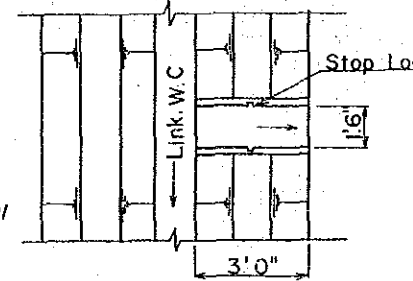


**Section A - A**

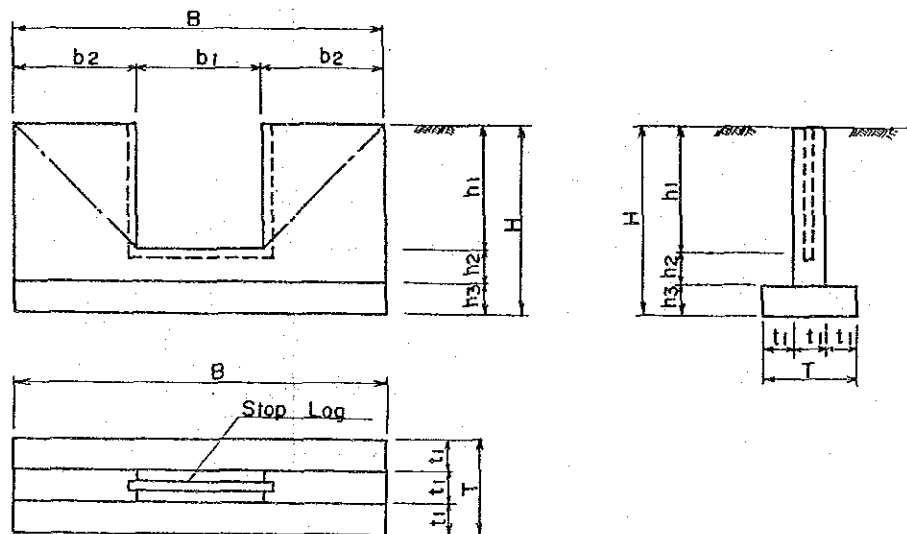


**INLET FOR EACH PLOT PLAN**

**OUTLET FOR EACH PLOT PLAN**



**REGULATOR**



**Dimensions of Regulator**

Water Course	B	b1	b2	H	h1	h2	h3	T	t1
TYPE I	6'	2'	2'	3'0"	2'	6"	6"	1'6"	6"
TYPE II	5'	1'	2'	3'0"	2'0"	6"	6"	1'6"	6"
TYPE III	3'	1'	1'	1.8"	1'	4"	4"	1'	4"

- TYPE I : Applied to Internal Water Course
- TYPE II : Applied to Link Water Course
- TYPE III : Applied to Link Water Course for Each Plot

NOTE : ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SPECIFIED

THE ISLAMIC REPUBLIC OF PAKISTAN  
THE PROJECT FOR AGRICULTURE DEVELOPMENT  
IN NASIRABAD

TYPICAL STRUCTURE  
OF ON-FARM FACILITIES

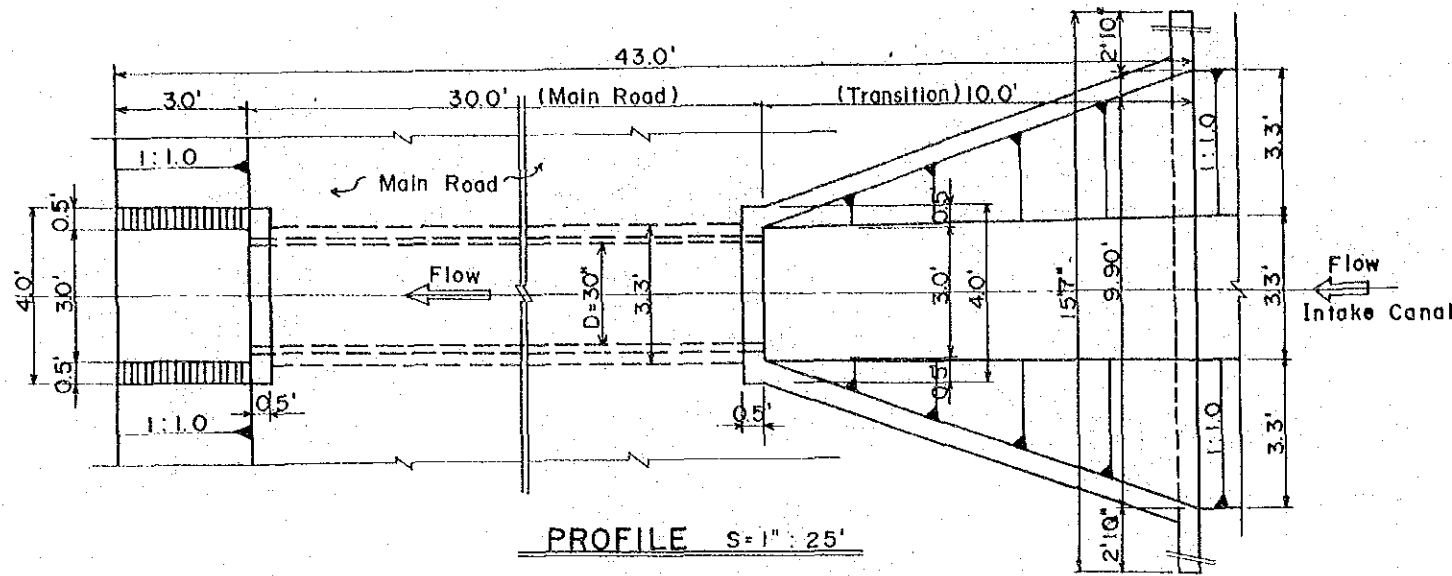
DWG. NO.  
NB-9

JAPAN INTERNATIONAL COOPERATION AGENCY

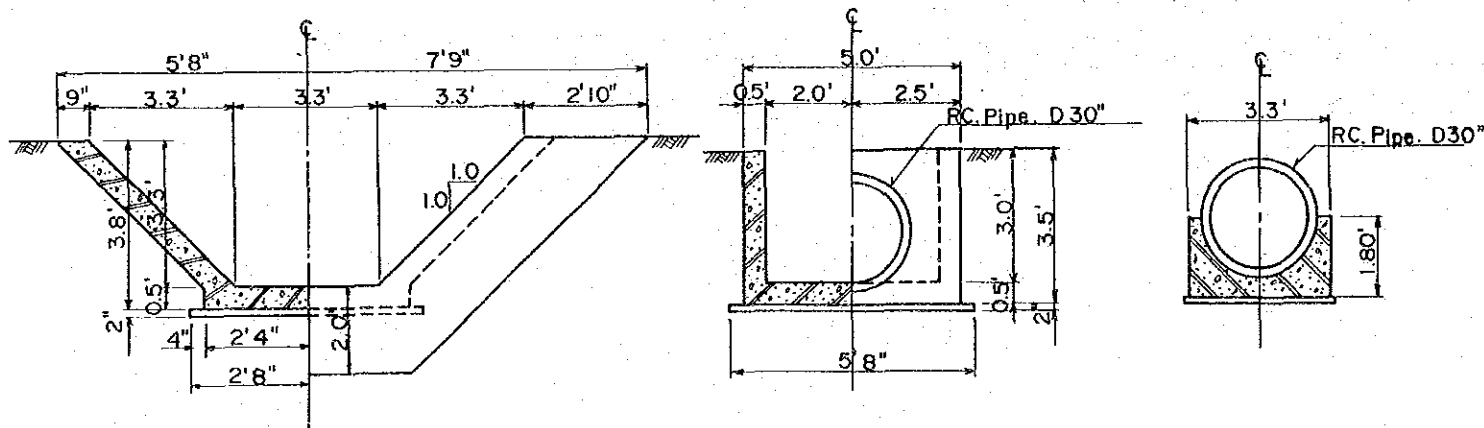
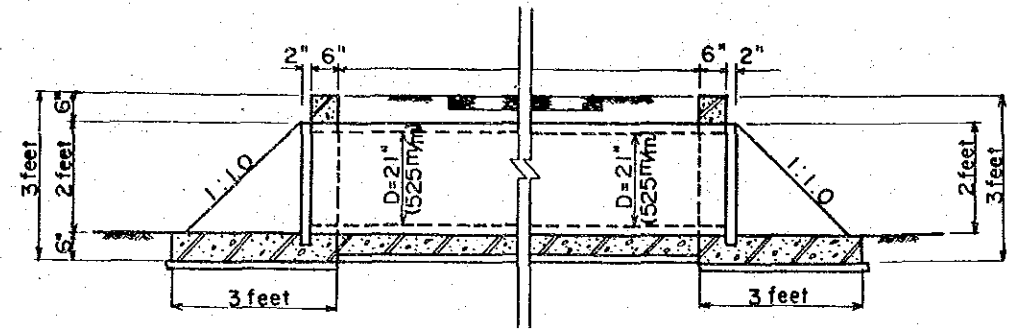
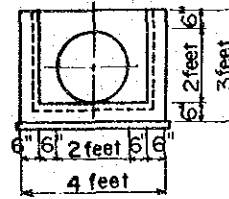
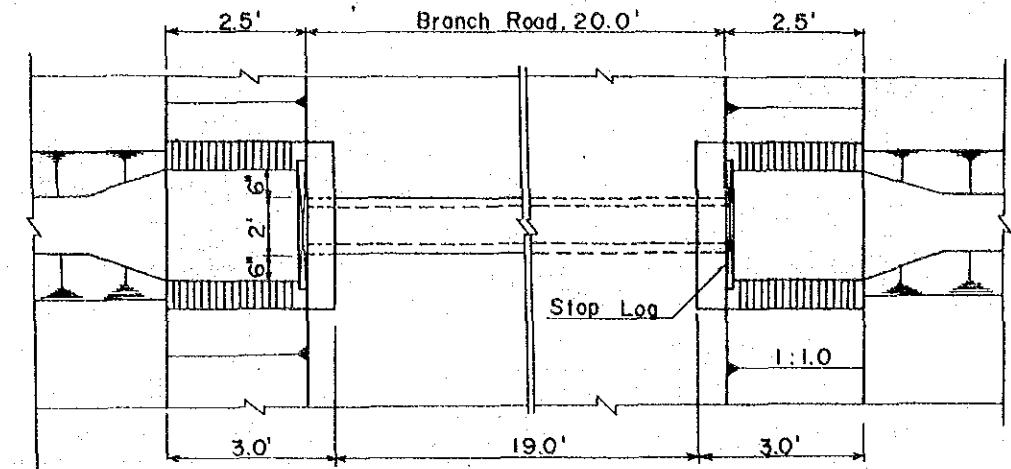
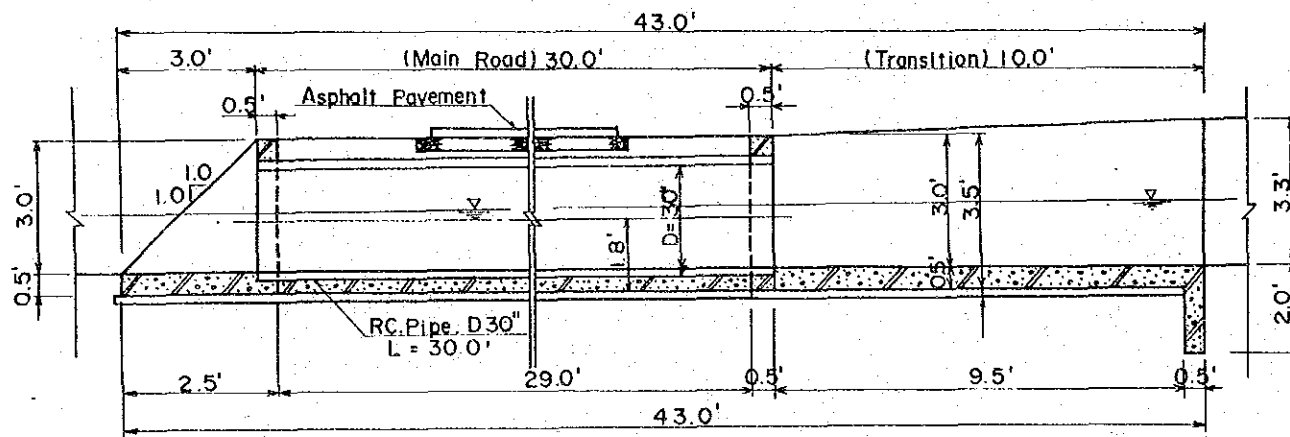


# CROSSING STRUCTURE

PLAN S=1" : 25'



PROFILE S=1" : 25'

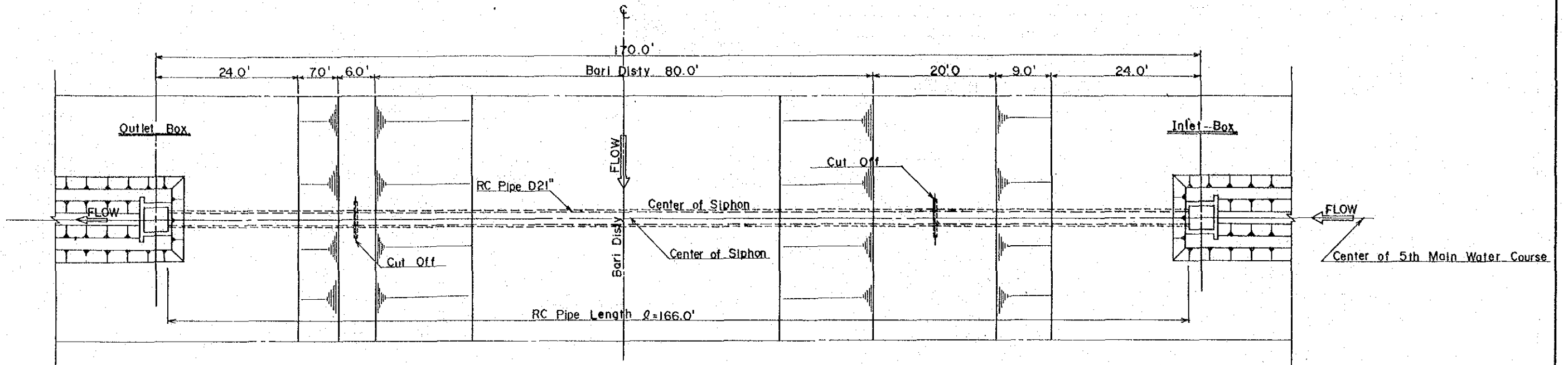


NOTE : ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SPECIFIED

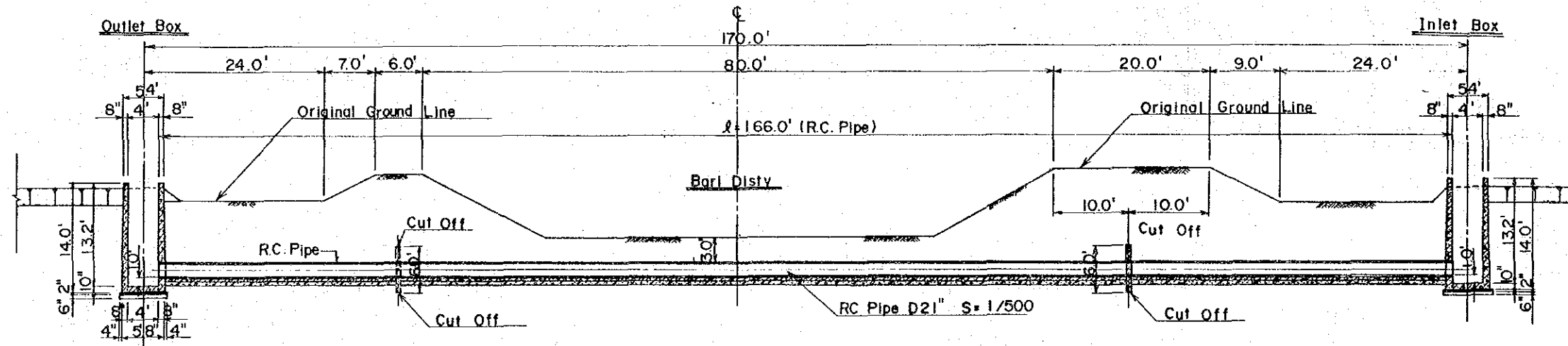
THE ISLAMIC REPUBLIC OF PAKISTAN THE PROJECT FOR AGRICULTURE DEVELOPMENT IN NASIRABAD	
CROSSING STRUCTURE ON WATER COUSE OF PILOT FARM	DWG. NO. NB-10
JAPAN INTERNATIONAL COOPERATION AGENCY	

# SIPHON FOR 5th MAIN WATER COURSE

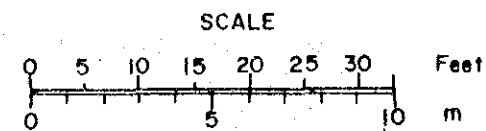
PLAN  $s = 1" : 100'$



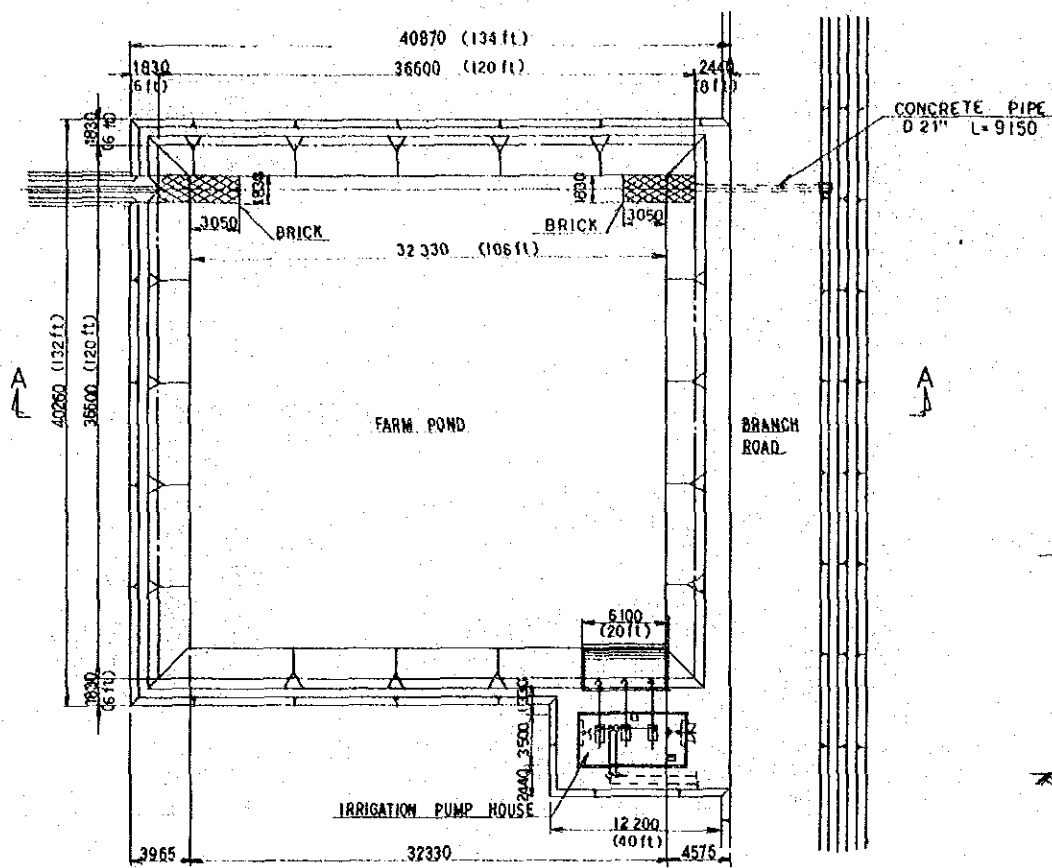
PROFILE  $s = 1" : 100'$



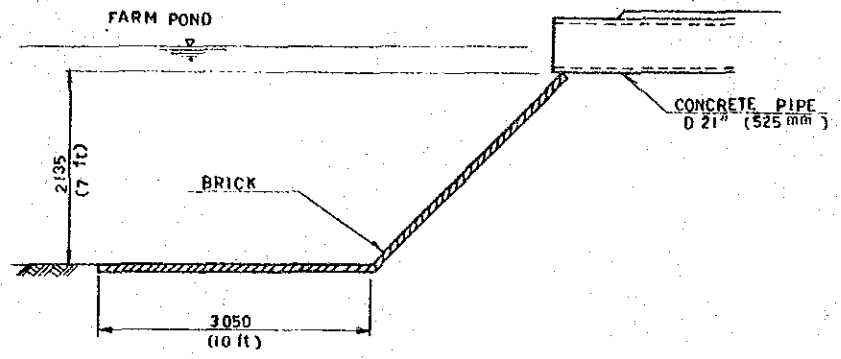
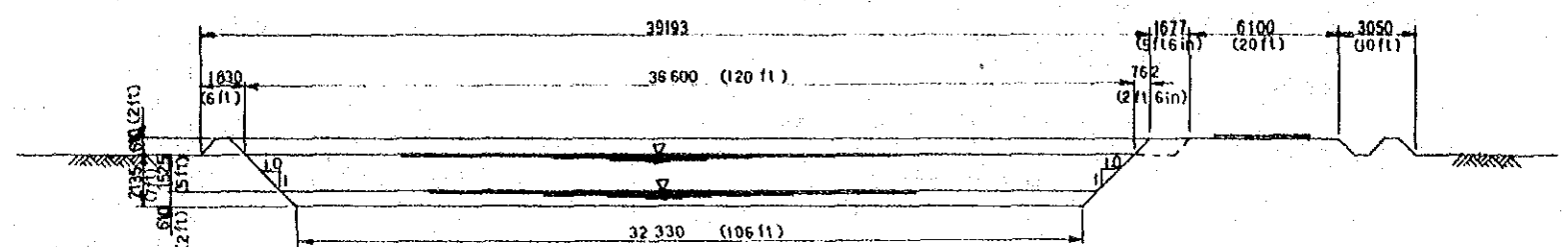
NOTE: ALL DIMENSIONS ARE IN FEET  
UNLESS OTHERWISE SPECIFIED



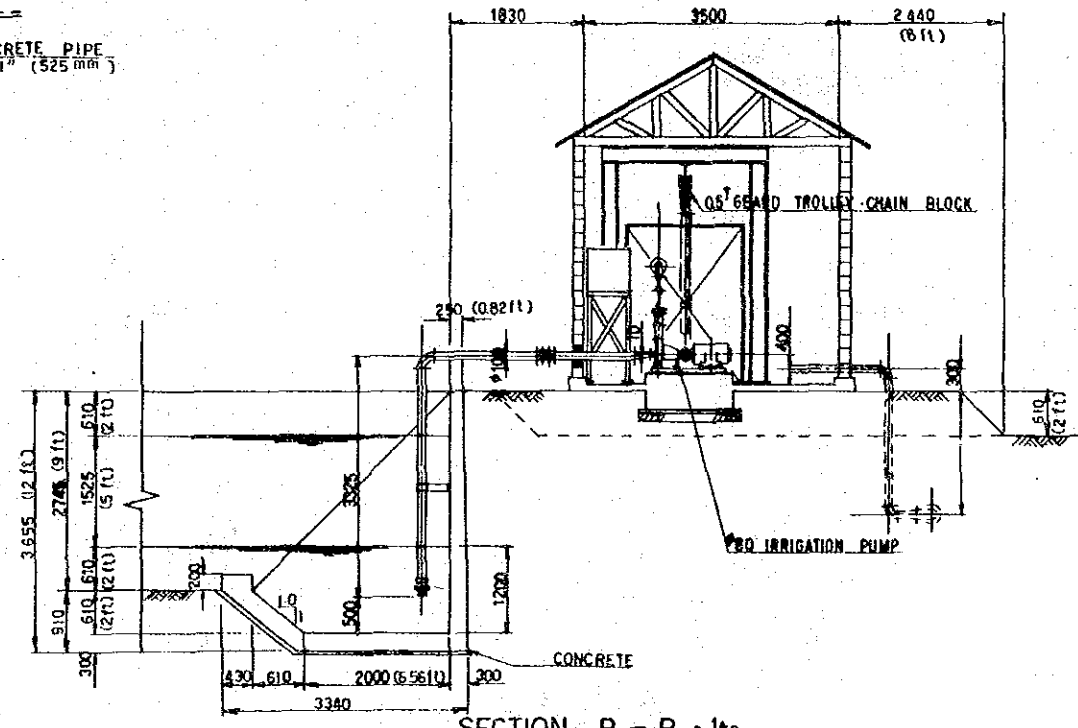
THE ISLAMIC REPUBLIC OF PAKISTAN THE PROJECT FOR AGRICULTURE DEVELOPMENT IN NASIRABAD	
SIPHON STRUCTURE	DWG. NO. NB-11
JAPAN INTERNATIONAL COOPERATION AGENCY	



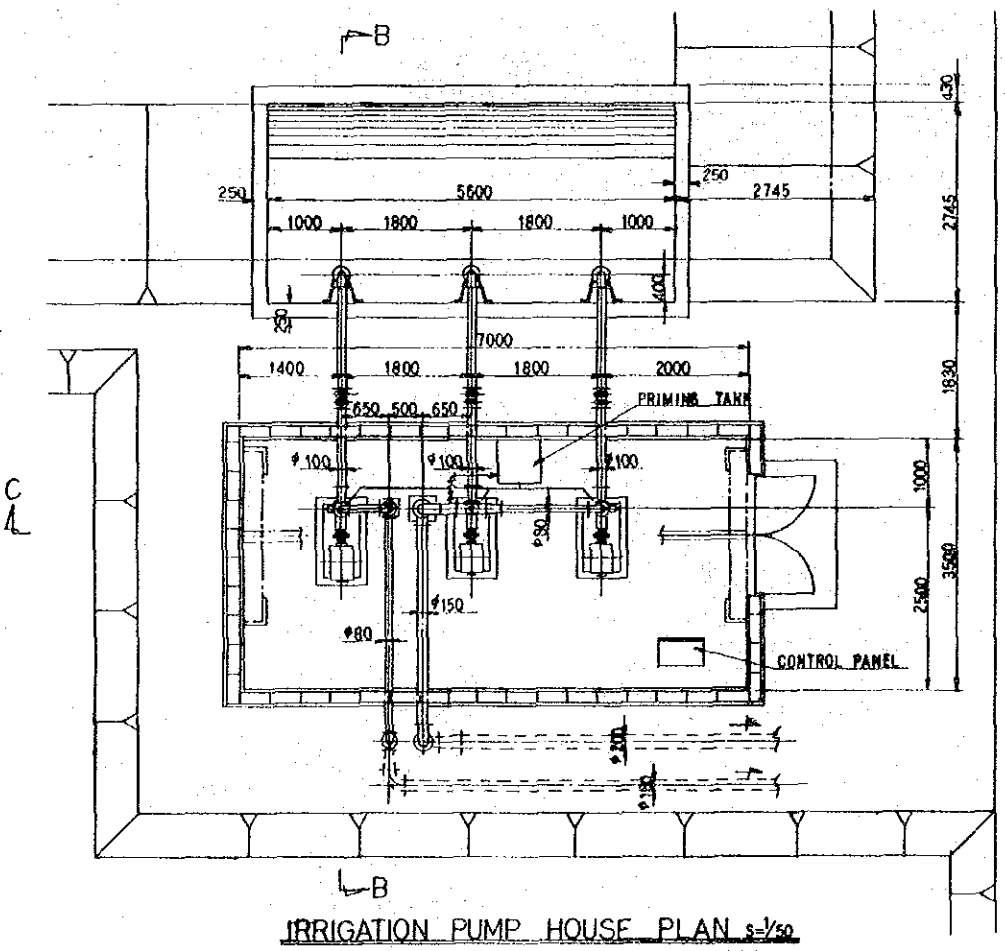
FARM POND PLAN s=1/250



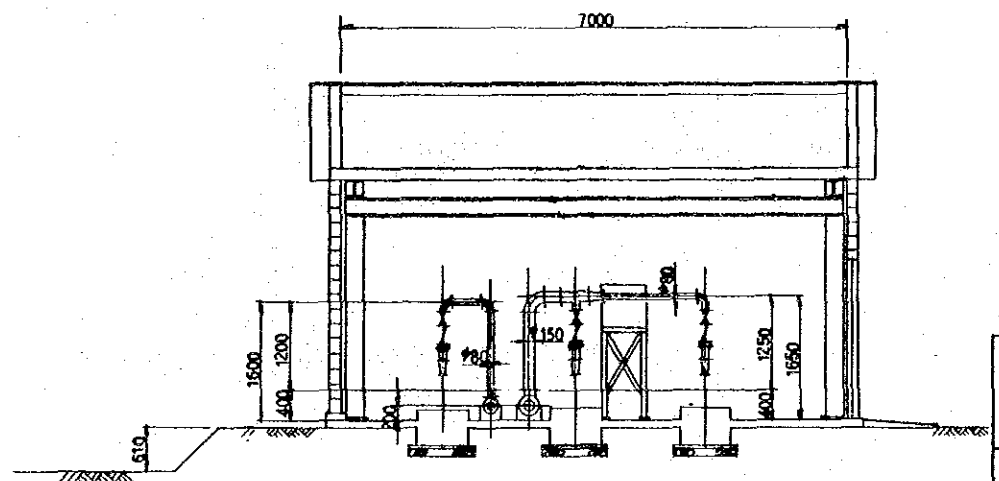
SECTION OF PIPE INLET s=1/40



SECTION B-B s=1/50



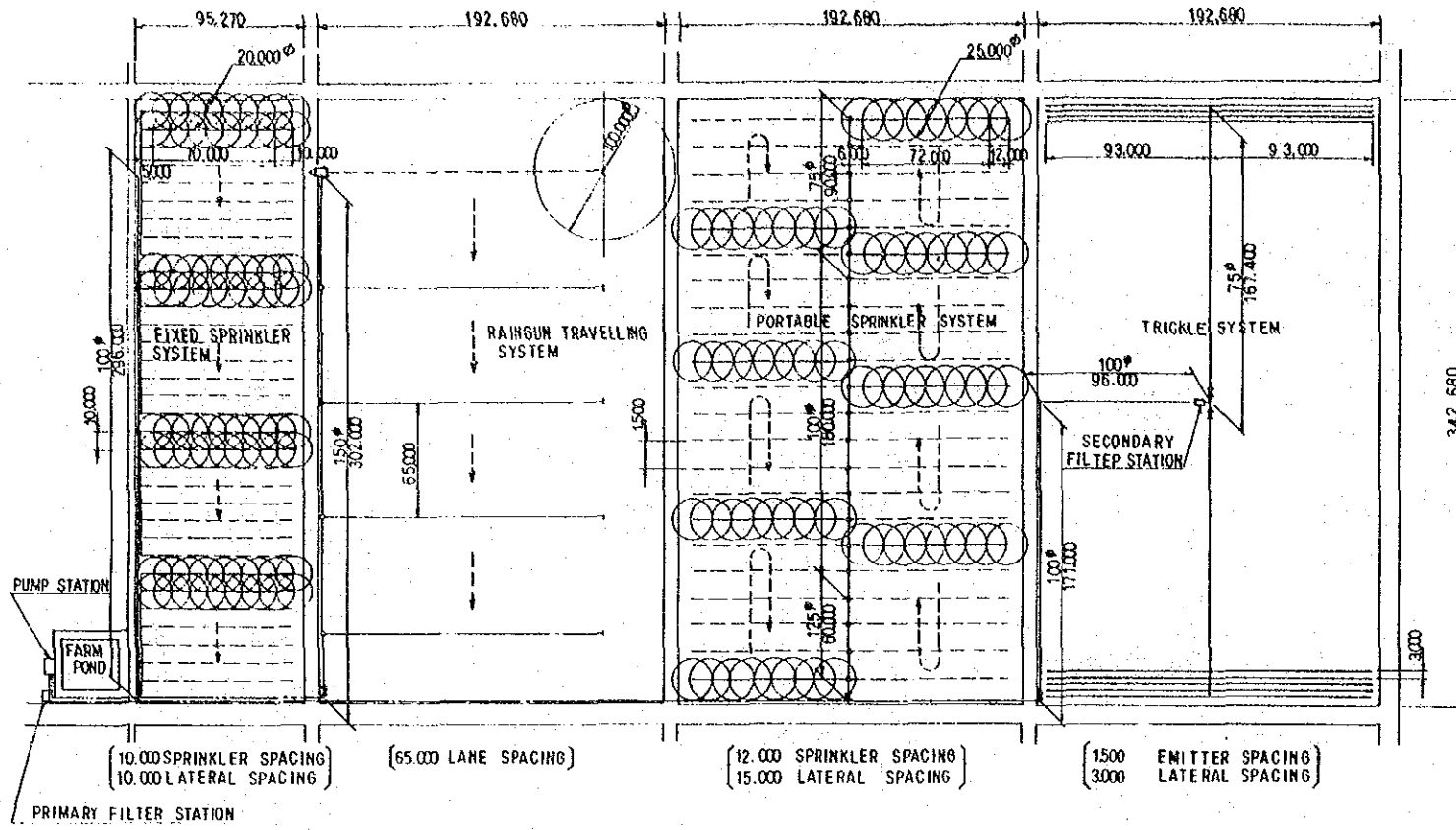
IRRIGATION PUMP HOUSE PLAN s=1/50



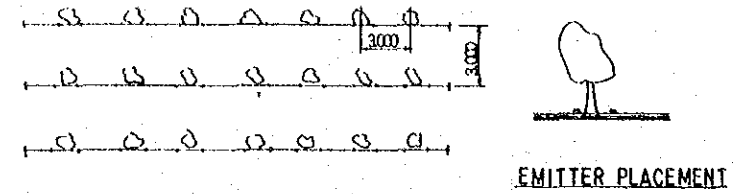
SECTION C-C s=1/50

NOTE: ALL DIMENSION ARE IN METER UNLESS OTHERWISE SPECIFIED.

THE ISLAMIC REPUBLIC OF PAKISTAN THE PROJECT FOR AGRICULTURE DEVELOPMENT IN NASIRABAD	
DEMONSTRATION OF IRRIGATION FACILITIES (1) OF PILOT FARM	DWG. NO. NB-12
JAPAN INTERNATIONAL COOPERATION AGENCY	

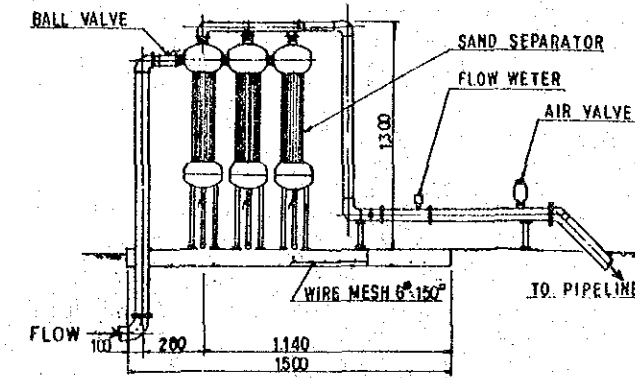


GENERAL PLAN OF IRRIGATION SYSTEMS (S = 1/2000)

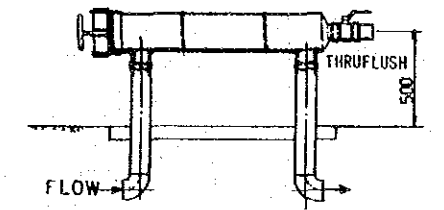


TRICKLE SYSTEM

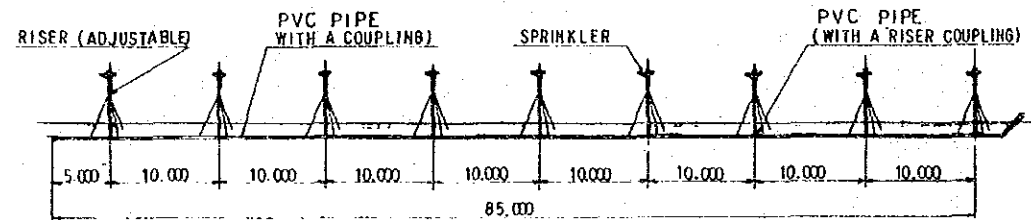
EMITTER PLACEMENT



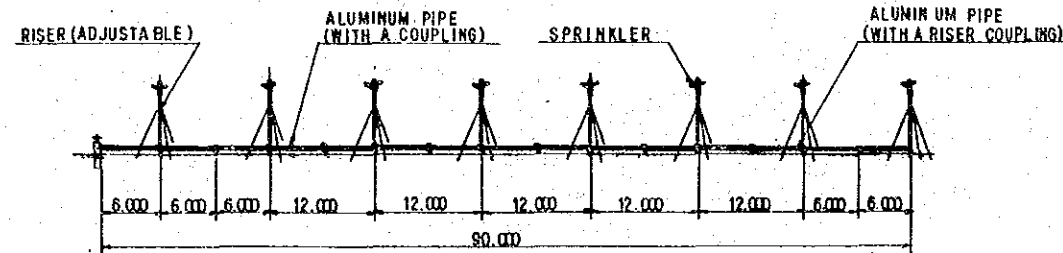
PRIMARY FILTER STATION FOR SPRINKLER AND TRICKLE SYSTEMS



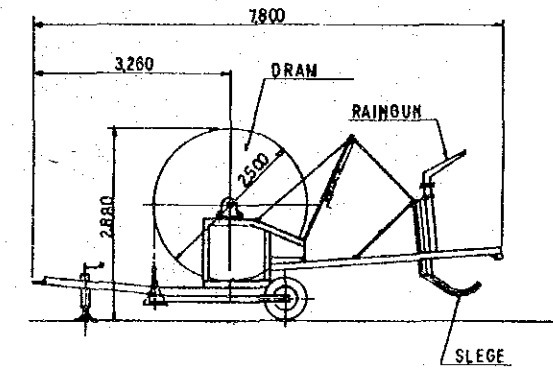
SECONDARY FILTER STATION FOR TRICKLE SYSTEM



FIXED SPRINKLER SYSTEM (NO SCALE)



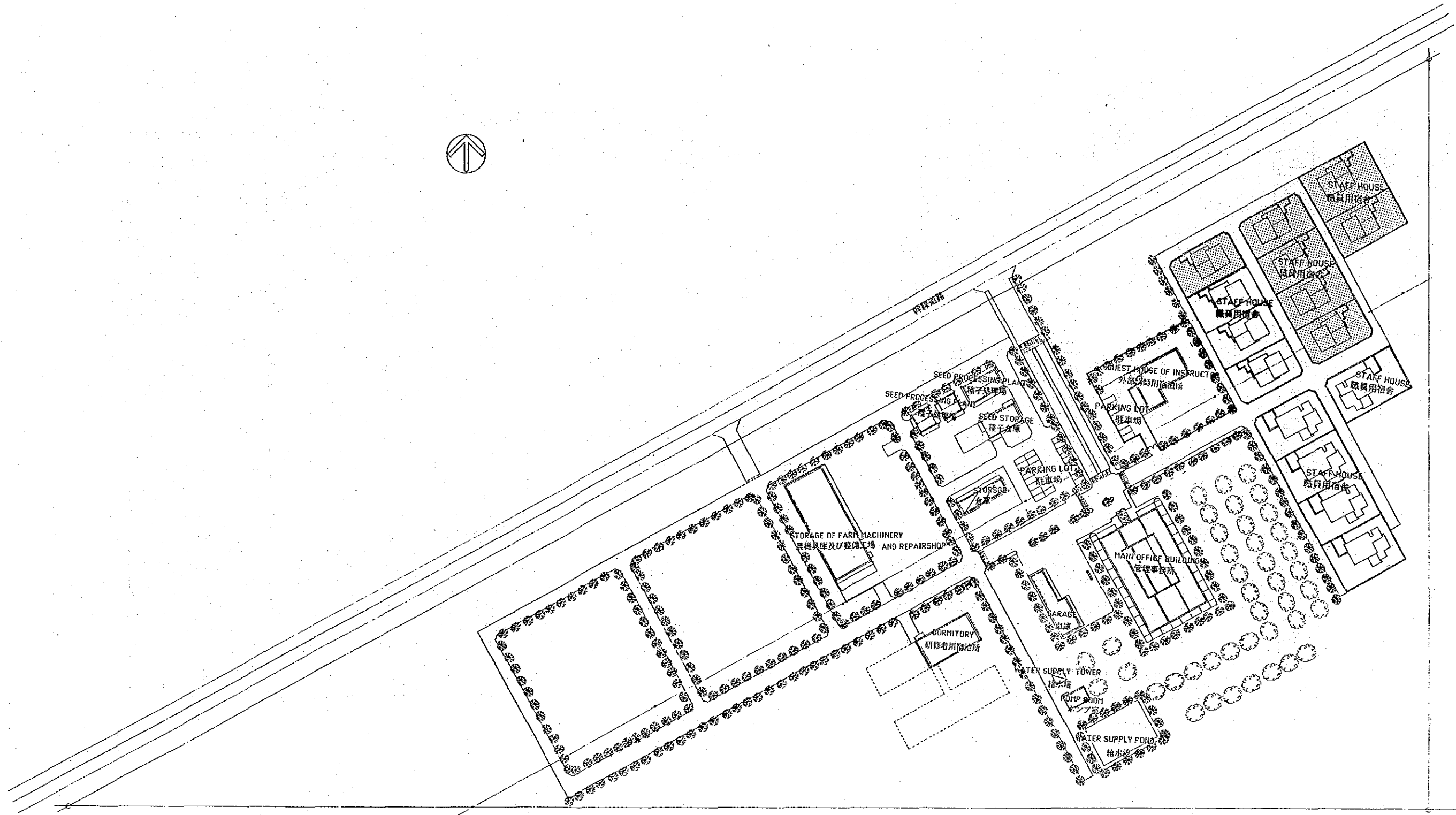
PORTABLE SPRINKLER SYSTEM (NO SCALE)



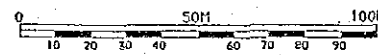
RAINGUN TRAVELLING SYSTEM (NO SCALE)

NOTE: ALL DIMENSION ARE IN METER UNLESS OTHERWISE SPECIFIED.

THE ISLAMIC REPUBLIC OF PAKISTAN THE PROJECT FOR AGRICULTURE DEVELOPMENT IN NASIRABAD	
DEMONSTRATION OF IRRIGATION FACILITIES (2) OF PILOT FARM	DWG. NO. NB-13
JAPAN INTERNATIONAL COOPERATION AGENCY	

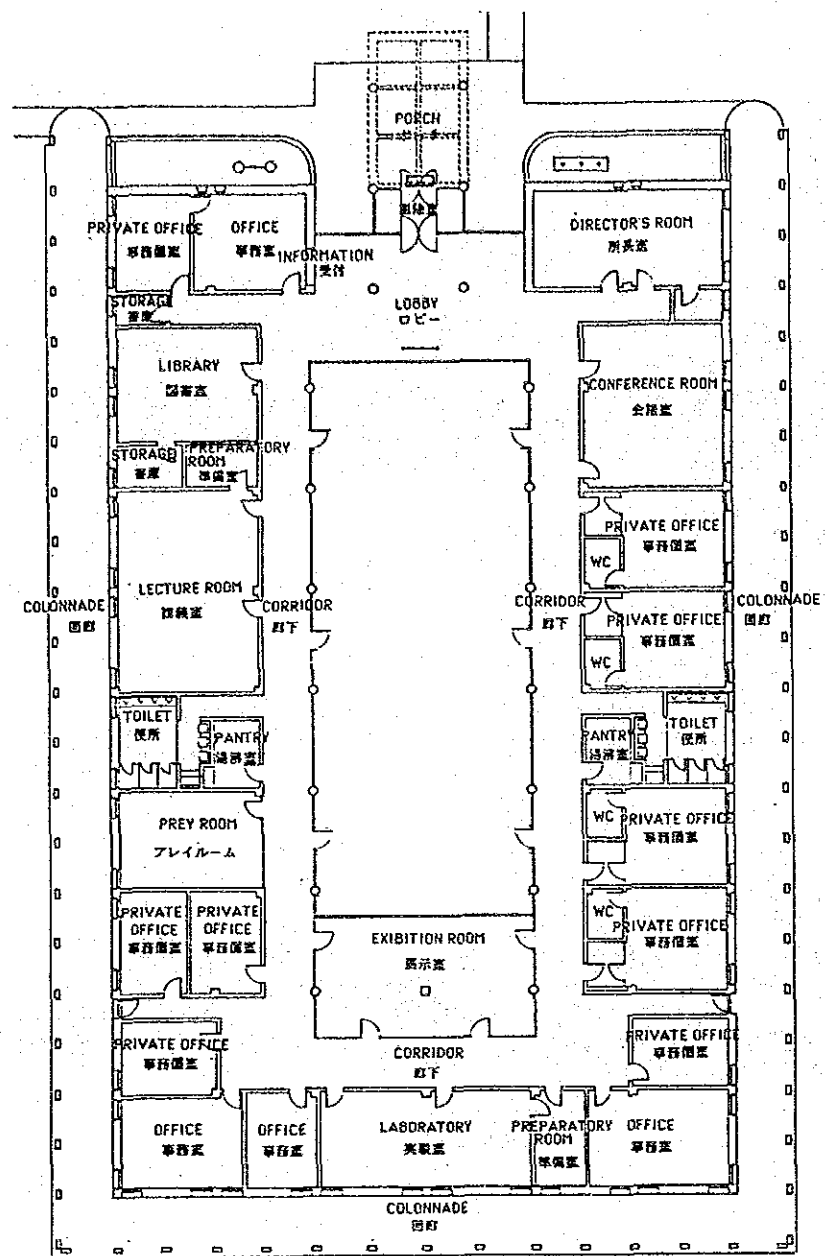


SITE PLAN  
配置図

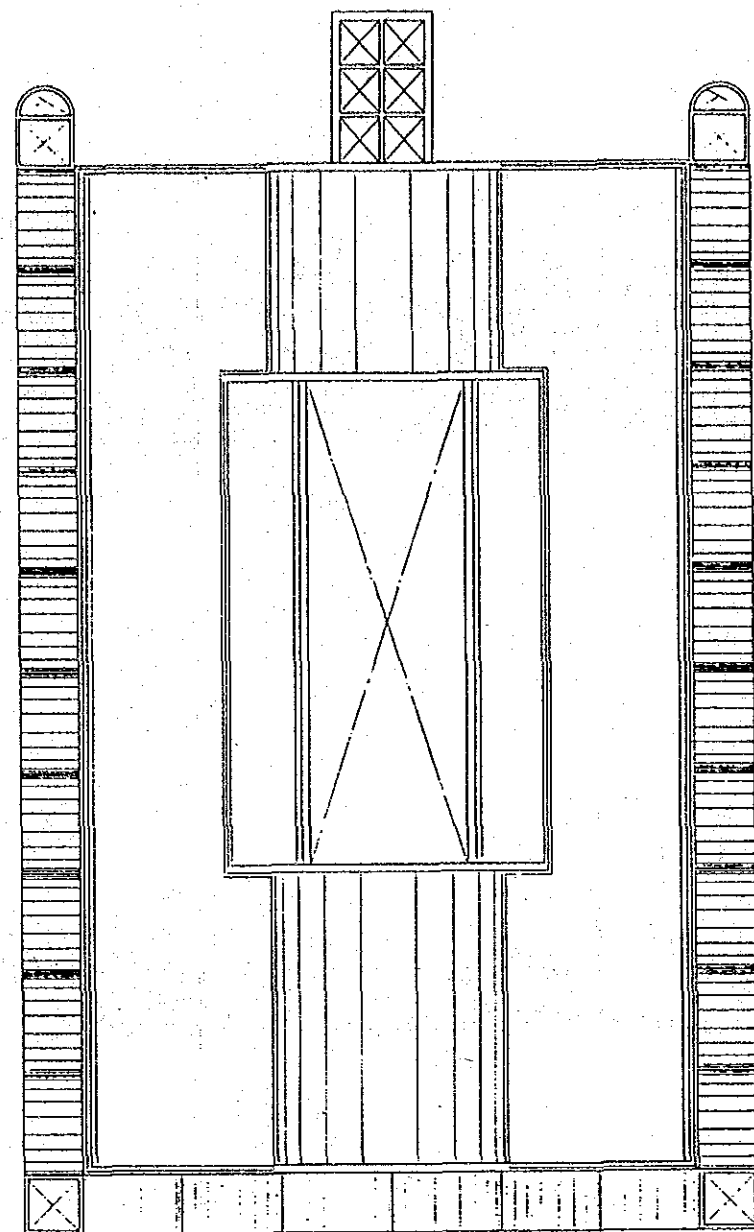


OUT OF SCOPE

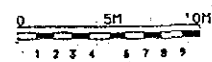
THE ISLAMIC REPUBLIC OF PAKISTAN THE PROJECT FOR AGRICULTURE DEVELOPMENT IN NASIRABAD	
SITE PLAN OF BUILDINGS	DWG. NO. NB-14
JAPAN INTERNATIONAL COOPERATION AGENCY	



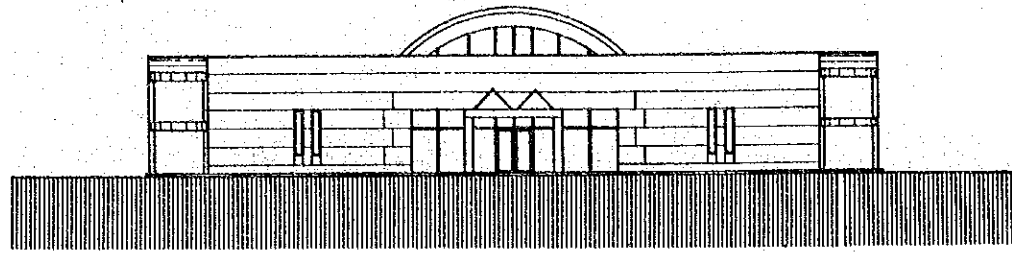
FLOOR PLAN  
平面図



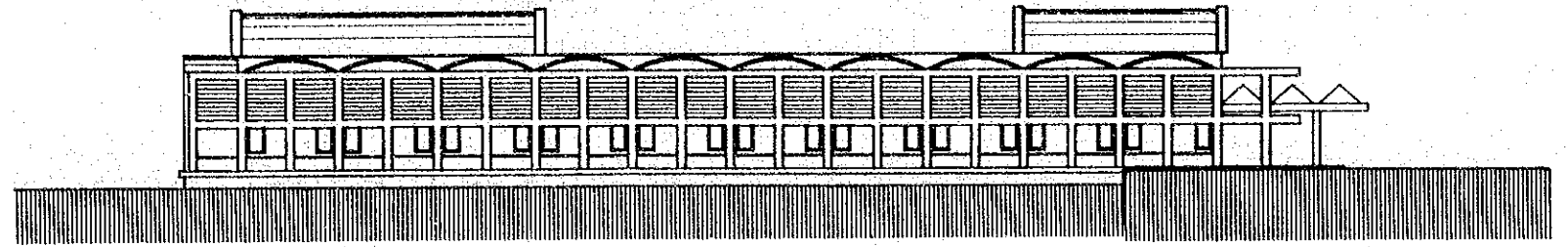
ROOF PLAN  
屋根平面図



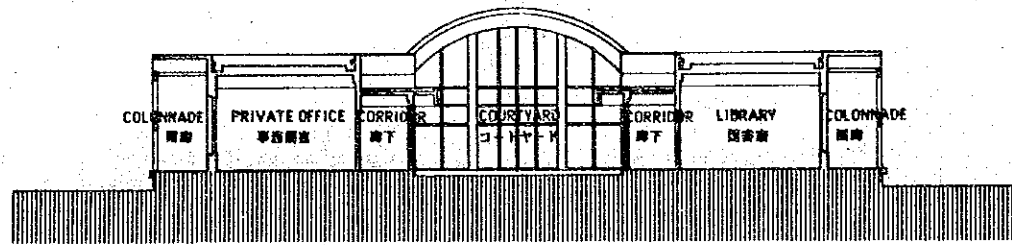
THE ISLAMIC REPUBLIC OF PAKISTAN THE PROJECT FOR AGRICULTURE DEVELOPMENT IN NASIRABAD	
MAIN OFFICE BUILDING (1)	DWG. NO. NB-15
JAPAN INTERNATIONAL COOPERATION AGENCY	



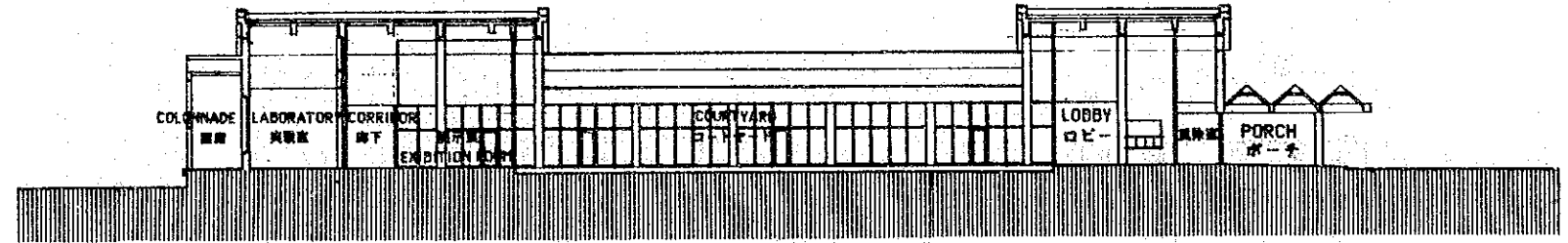
NORTH ELEVATION  
北立面图



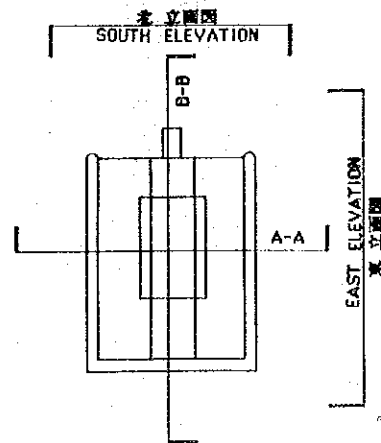
EAST ELEVATION  
东立面图



A-A SECTION  
断面图



B-B SECTION  
断面图

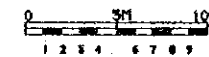
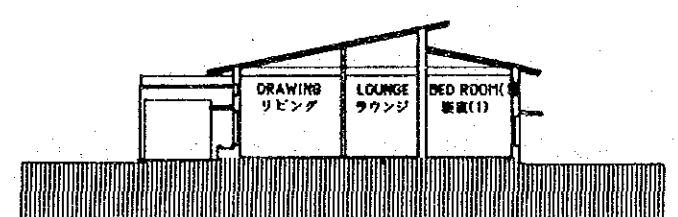
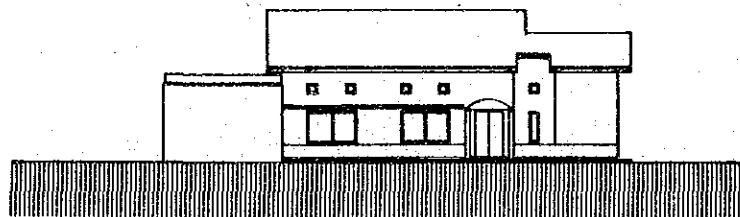
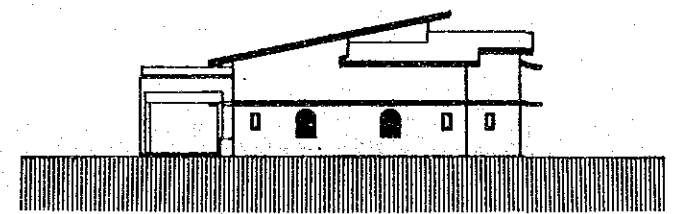
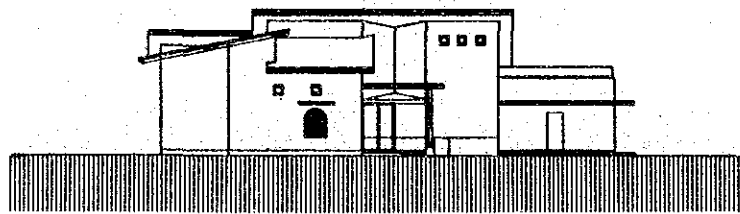
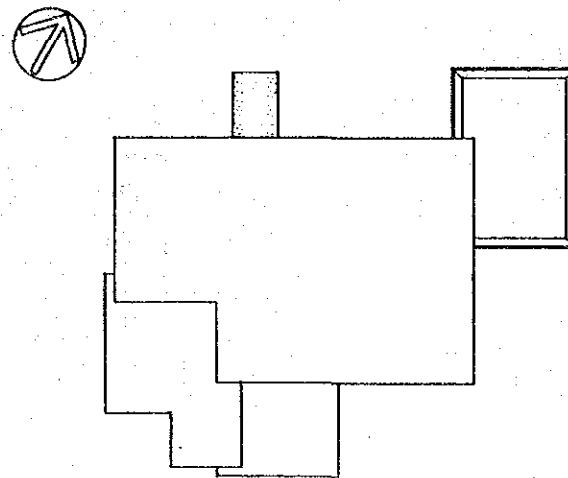
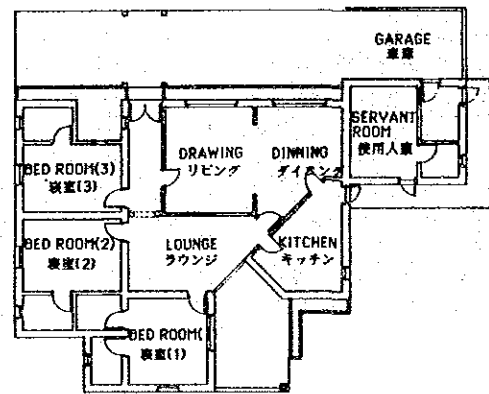
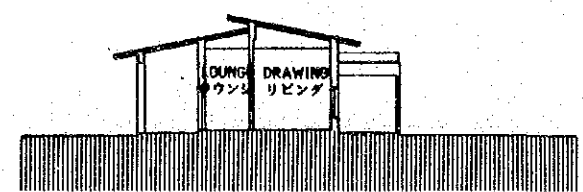
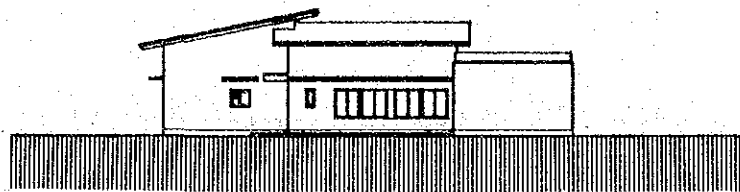
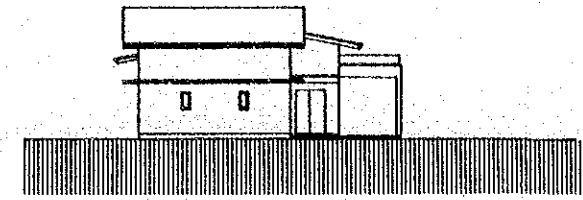
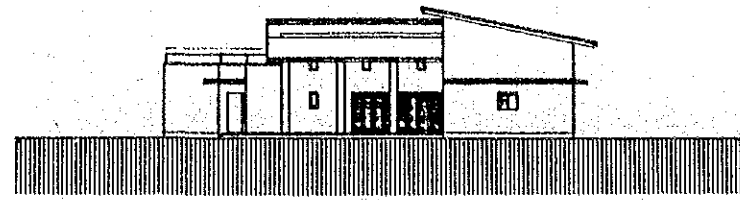
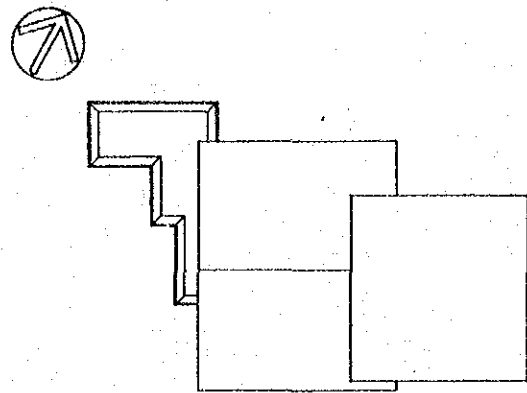
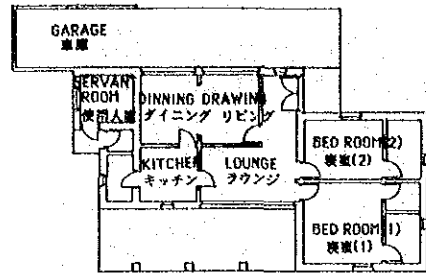


THE ISLAMIC REPUBLIC OF PAKISTAN  
THE PROJECT FOR AGRICULTURE DEVELOPMENT  
IN NASIRABAD

MAIN OFFICE BUILDING (2)

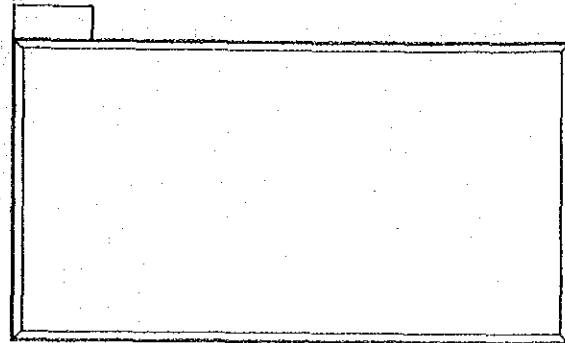
DWG. NO.  
NB-16

JAPAN INTERNATIONAL COOPERATION AGENCY

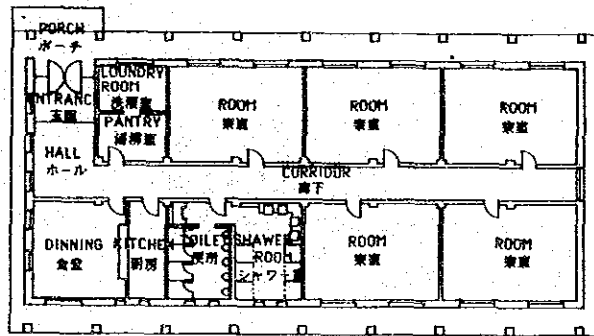


THE ISLAMIC REPUBLIC OF PAKISTAN THE PROJECT FOR AGRICULTURE DEVELOPMENT IN NASIRABAD	
STAFF HOUSE	DWG. NO. NB-17
JAPAN INTERNATIONAL COOPERATION AGENCY	

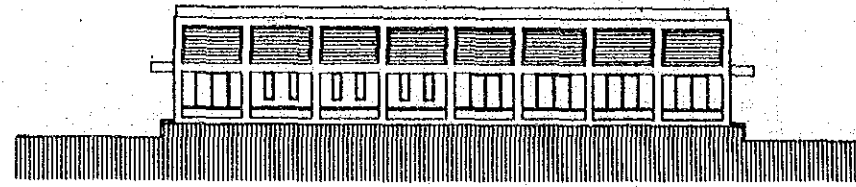




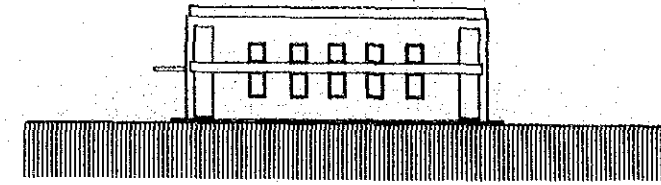
ROOF PLAN  
屋根伏図



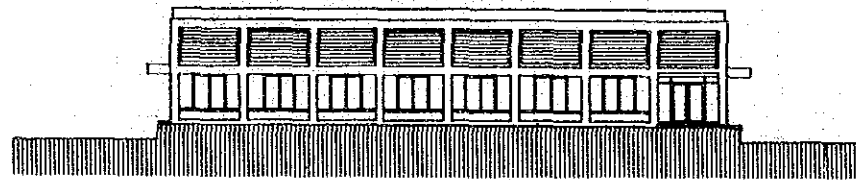
FLOOR PLAN  
平面図



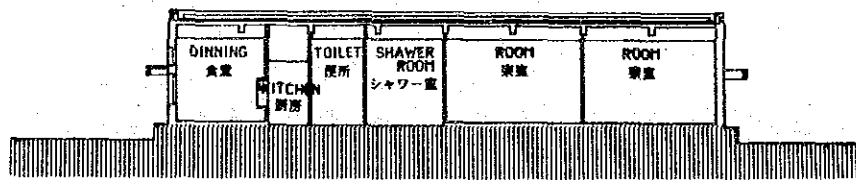
SOUTH ELEVATION  
南立面図



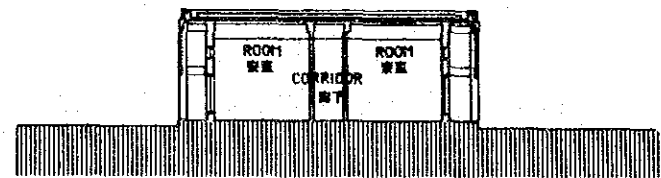
EAST ELEVATION  
東立面図



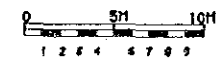
NORTH ELEVATION  
北立面図



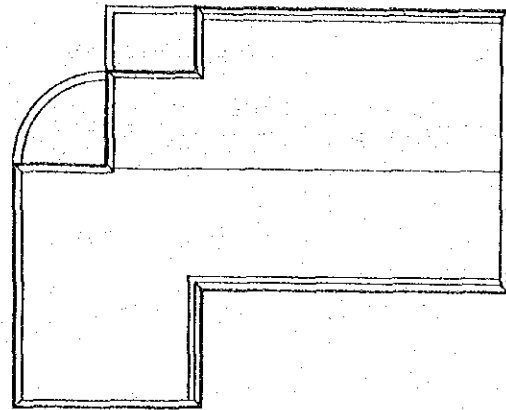
SECTION  
断面図



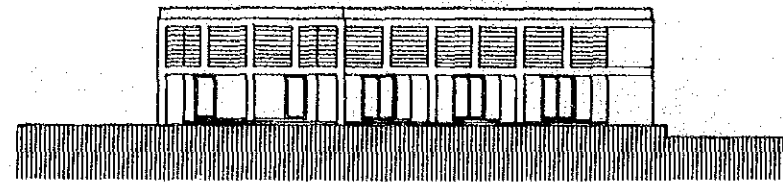
SECTION  
断面図



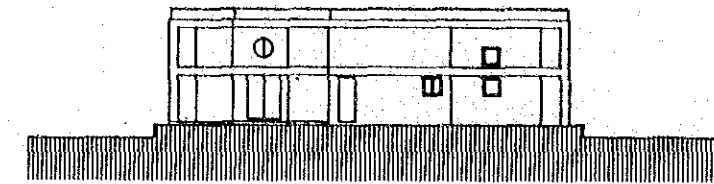
THE ISLAMIC REPUBLIC OF PAKISTAN THE PROJECT FOR AGRICULTURE DEVELOPMENT IN NASIRABAD	
DORMITORY	DWG. NO. NB-18
JAPAN INTERNATIONAL COOPERATION AGENCY	



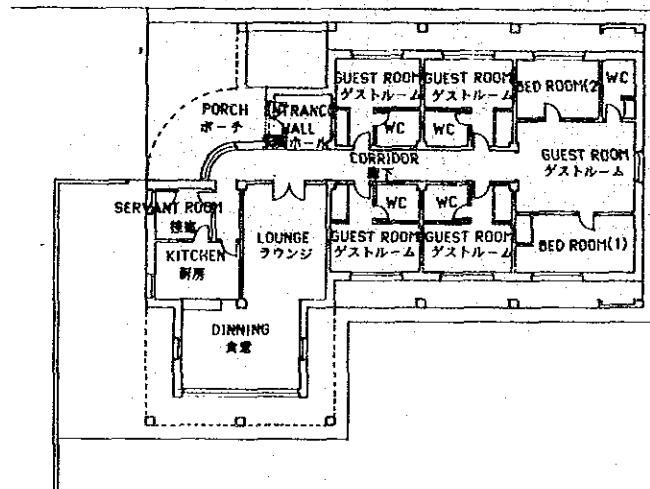
ROOF PLAN  
屋根伏図



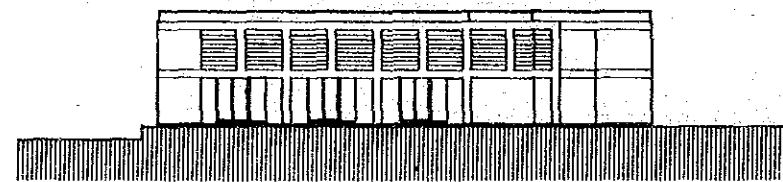
SOUTH ELEVATION  
南立面図



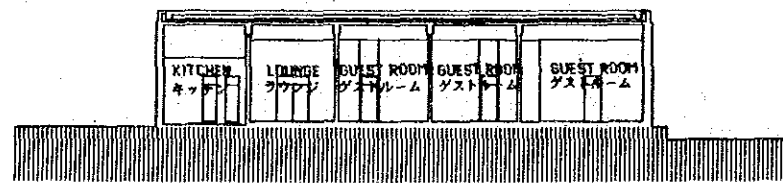
WEST ELEVATION  
西立面図



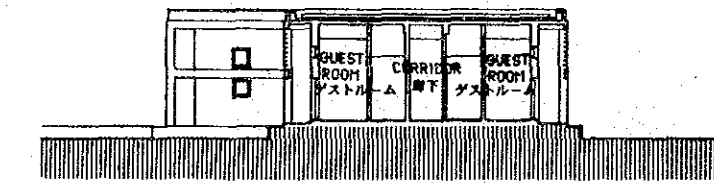
FLOOR PLAN  
平面図



NORTH ELEVATION  
北立面図



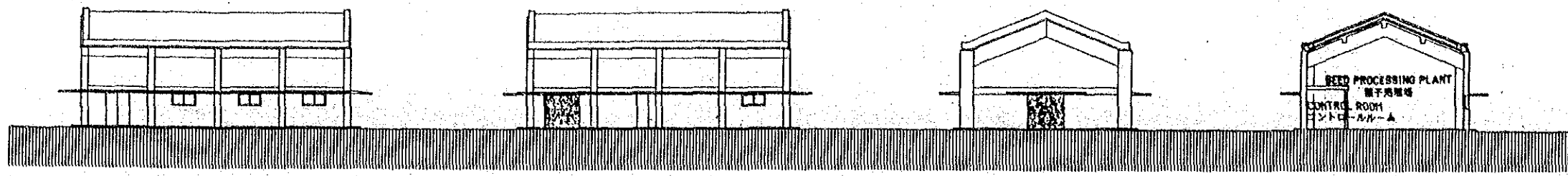
SECTION  
断面図



SECTION  
断面図



THE ISLAMIC REPUBLIC OF PAKISTAN THE PROJECT FOR AGRICULTURE DEVELOPMENT IN NASIRABAD	
GUEST HOUSE OF INSTRUCTS	DWG. NO. NB-19
JAPAN INTERNATIONAL COOPERATION AGENCY	

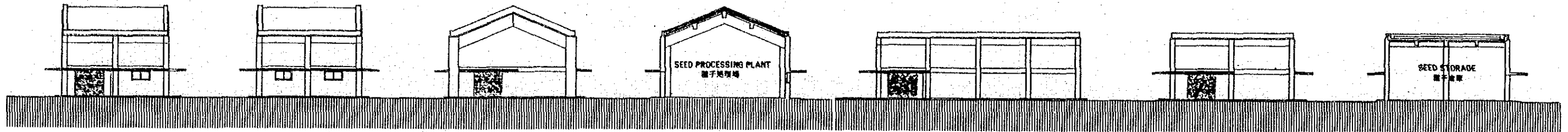


NORTH ELEVATION  
北立面図

SOUTH ELEVATION  
南立面図

EAST ELEVATION  
東立面図

SECTION  
断面図



SOUTH ELEVATION  
南立面図

NORTH ELEVATION  
北立面図

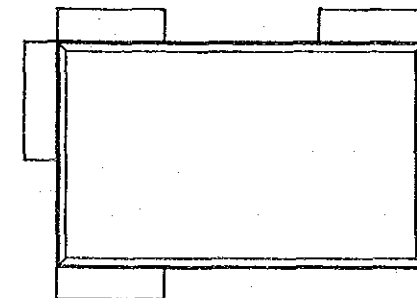
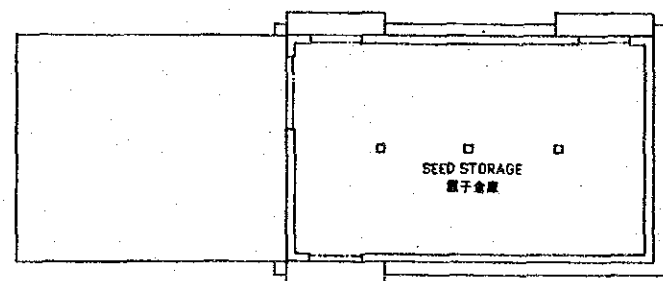
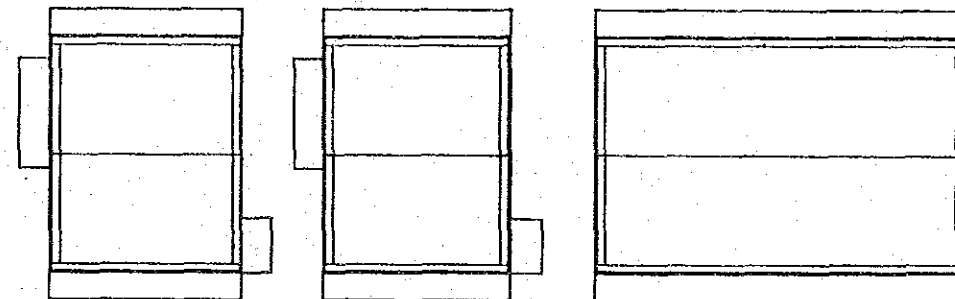
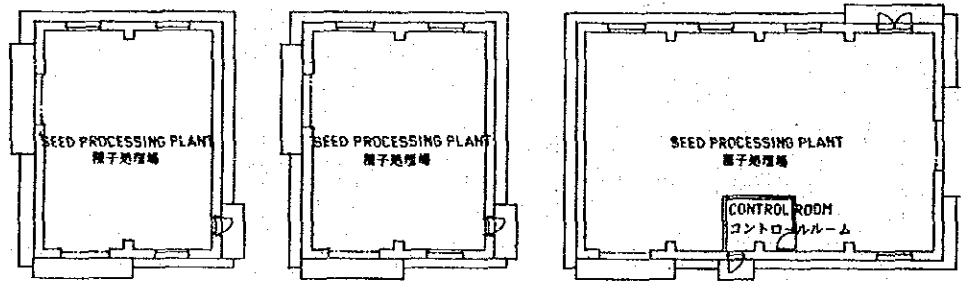
WEST ELEVATION  
西立面図

SECTION  
断面図

SOUTH ELEVATION  
南立面図

WEST ELEVATION  
西立面図

SECTION  
断面図

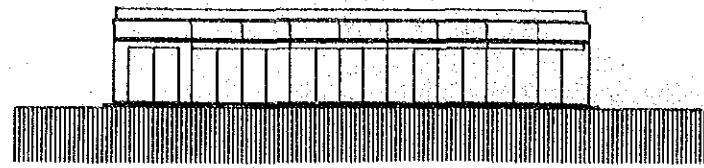


FLOOR PLAN  
平面図

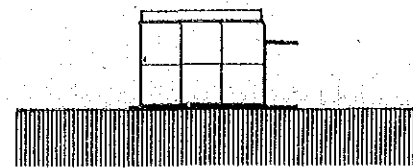
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屋根伏図



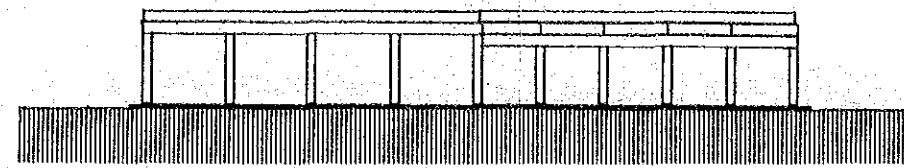
THE ISLAMIC REPUBLIC OF PAKISTAN THE PROJECT FOR AGRICULTURE DEVELOPMENT IN NASIRABAD	
SEED STRAGE	DWG. NO. NB-20
JAPAN INTERNATIONAL COOPERARION AGENCY	



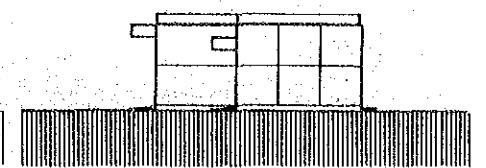
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EAST ELEVATION  
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WEST ELEVATION  
西立面図



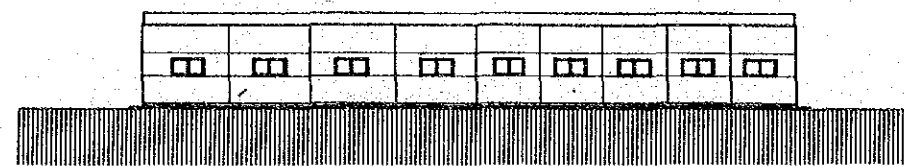
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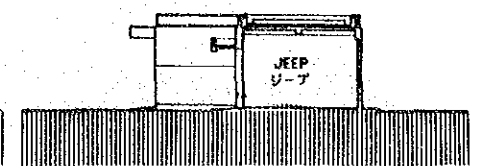
NORTH ELEVATION  
北立面図



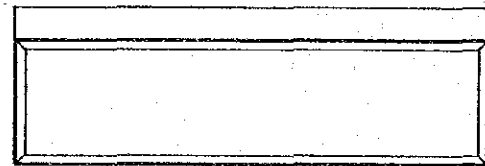
SECTION  
断面図



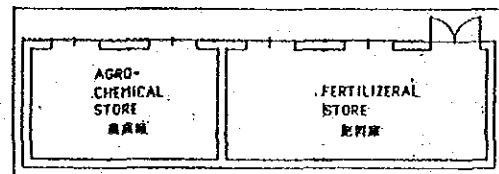
EAST ELEVATION  
東立面図



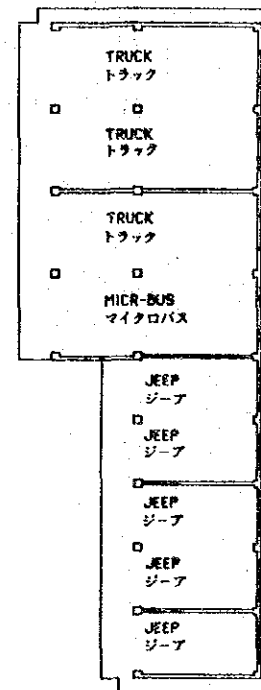
SECTION  
断面図



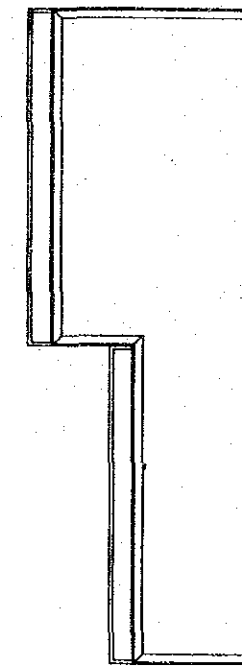
ROOF PLAN  
屋根伏図



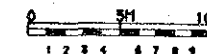
FLOOR PLAN  
平面図



FLOOR PLAN  
平面図



ROOF PLAN  
屋根伏図

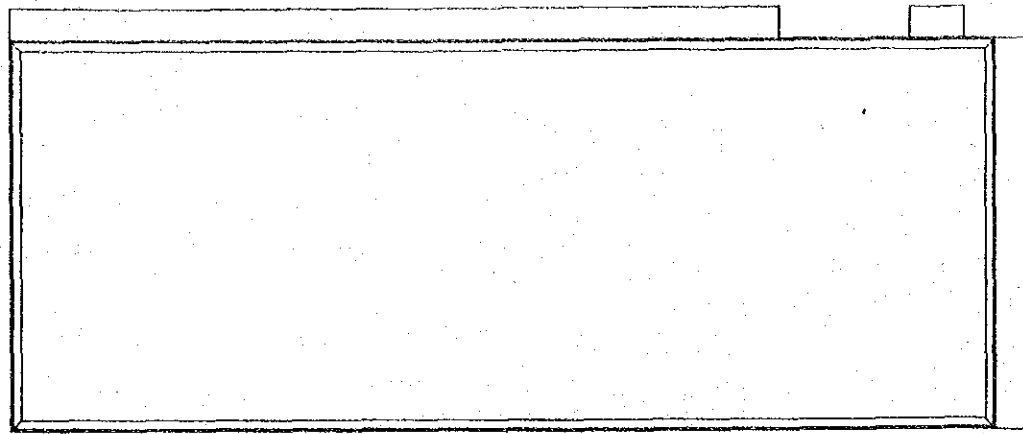


THE ISLAMIC REPUBLIC OF PAKISTAN  
THE PROJECT FOR AGRICULTURE DEVELOPMENT  
IN NASIRABAD

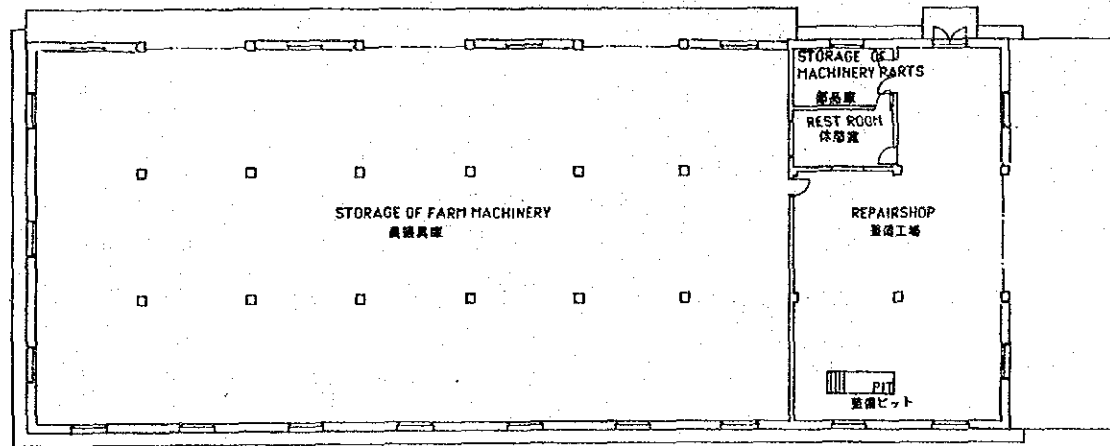
GARAGE, AGRO-CHEMICAL STORE,  
AND FERTILIZER STORE

DWG. NO.  
NB-21

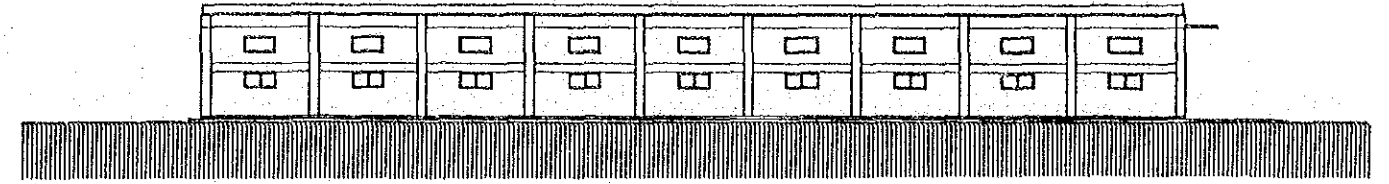
JAPAN INTERNATIONAL COOPERATION AGENCY



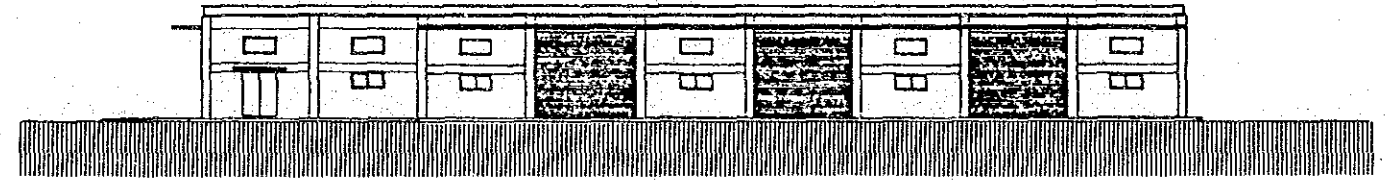
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屋根伏図



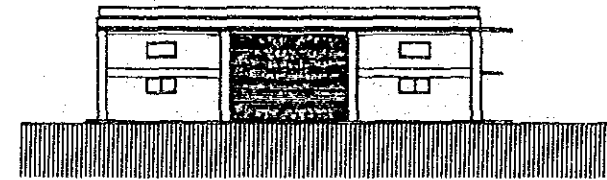
FLOOR PLAN  
平面図



WEST ELEVATION  
西立面図



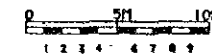
EAST ELEVATION  
東立面図



SOUTH ELEVATION  
南立面図



SECTION  
断面図



THE ISLAMIC REPUBLIC OF PAKISTAN  
THE PROJECT FOR AGRICULTURE DEVELOPMENT  
IN NASIRABAD

STRAGE OF FARM MACHINERY  
AND REPAIRSHOP

DWG. NO.

NB-22

JAPAN INTERNATIONAL COOPERARION AGENCY

### 5.3. Basic Planning for Provision of Equipment and Materials

#### 5.3.1. Provision Plan for Equipment and Materials

In a basic plan, provision of the equipment and materials required for the Project shall be roughly specified as follows:

- Laboratory equipment and materials.
- Audio-visual education equipment and materials
- Equipment/devices and materials for workshop and for training of repair works.
- Farming machineries
  - ° Vehicles
  - ° Meteorological observation equipment and materials

The specifications and quantity of the proposed equipment and materials are determined taking into consideration the following items:

- 1) All equipment and materials to be provided must meet the requirements of the Pilot Farm.
- 2) All equipment and materials must be free from troubles in operation, maintenance, etc. even under the local conditions, according to the results of field investigation.
- 3) All equipment and materials must be well-suited to the purpose of the training quantitatively and qualitatively.

In conclusion, it is proposed that the equipment/devices and materials in ordinary level of quality should be provided judging from the results of field investigation on the related facilities in the similar natured projects and should be utilized effectively in the future.

5-3-2. List of Equipment

A. LABORATORY EQUIPMENT

<u>No.</u>	<u>Name</u>	<u>Quantity</u>
<u>I. Soil</u>		
(1)	Soil Sample Cylinder, 100 ml. x 6	1
(2)	Soil Sieve Set	1
(3)	Soil Sedimentation Apparatus, Köhn type	1
(4)	Soil Tensiometer, 0 - 76 cm Hg	1
(5)	Kjeldahl Distillation Apparatus	1
(6)	Kjeldahl Digester, Electrically Heated	1
(7)	Kjeldahl Titration sets	1
(8)	EC Meter	1
(9)	PH Meter	1
(10)	Flame Photometer	1
(11)	ORP Meter	1
(12)	Soil Three Phases Meter	1
(13)	Moisture Equivalent Testing Centrifuge	1
(14)	Air Permeability Test Apparatus	1
(15)	Soil Boring Stick	1
(16)	Soil Hardness Tester	1
(17)	Soil Sampling Trowel Set	1
(18)	Drying Oven, Mechanical Convection	1
(19)	Spectrophoto Meter	1
(20)	Burette	3 sets
<u>II. Cultivation</u>		
(1)	Filling Hopper and Measures, for Grain	1
(2)	Wagner Pots, for Rice	1
(3)	Circulating Polisher, for Yield estimation (15 kg)	1
(4)	Drying Oven, Mechanical Convection	1
(5)	Soil and Plant Nutrient Tester	1
(6)	Grain Sieve Sets, slot perforation	1

<u>No.</u>	<u>Name</u>	<u>Quantity</u>
(7)	Green Leaf Area Meter	1
(8)	Quadrat Sampling Winnower	1
(9)	Seed Collecting Thresher	1
(10)	Grain Shape Tester	1
(11)	Daylight Incubators, 5 - 50°C	1
(12)	Venti-Circulation Oven	1
(13)	Beam Scale, 5 kg/2 g	1
(14)	Electronic Top-pan Balances	1
(15)	Direct Reading Analytical Balance	1
(16)	Precision Electronic Platform Balance	1
(17)	Hand Sugar Refractometers	1
<u>III. Plant Pathology and Entomology</u>		
(1)	Shaking Water Bath	1
(2)	Softening Autoclave	1
(3)	Aseptic Box	1
(4)	Knapsack Sprayer, semi-automatic	1
(5)	Knapsack Sprayer, automatic	1
(6)	Insect Rearing Box	1
(7)	Insect Killed Collecting Box, dry method	1
(8)	Nematode Handling Instruments set	1
(9)	Insect Specimen Implements	1
(10)	Inoculating Punch	1
(11)	Multi-shaking Incubator	1
(12)	Insect Collecting Implement	1
(13)	Binocular Microscope	1
(14)	Refrigerators	1
<u>IV. Seed</u>		
(1)	Thermostatic Germinators	1
(2)	Testing Husker	1
(3)	Testing Mill	1
(4)	Testing Thickness Grader	1
(5)	Testing Length Grader	1
(6)	Grain Trier	1



<u>No.</u>	<u>Name</u>	<u>Quantity</u>
(7)	Sample Divider	1
(8)	Rice Grain Counter	2
(9)	Grain Crusher	2
(10)	Handy Moisture Meter	2
(11)	Portable Moisture Meter	1
(12)	Grain Crack Inspector	2
(13)	Whiteness Meter	1
(14)	Handy Tachometer	2

B. AUDIO

(1)	Video Camera	1
(2)	Portable Video Camera	1
(3)	Video Player	1
(4)	Color TV Set	1
(5)	Overhead Projector	1
(6)	Screen (70' x 70')	1
(7)	Slide Projector	1

C. AGRI-MACHINE WORK SHOP

I. Engine

(1)	Diesel Compression Gauge	1
(2)	Gasoline Compression Gauge	1
(3)	Gasoline Vacuum Gauge	1
(4)	Nozzle Tester, 200 kg/cm <sup>2</sup>	1
(5)	Valve Seat Grinder	1
(6)	Valve Spring Lifter	1
(7)	Cylinder Gauge	1
(8)	Thermometer, 200°C	1
(9)	Cylinder Liner Puller	1
(10)	Piston Ring Tool	1
(11)	Radiator Cap Tester	1

<u>No.</u>	<u>Name</u>	<u>Quantity</u>
<b>II. <u>Chassis</u></b>		
(1)	Tire Gauge	1
(2)	Chassis Lubricator	1
(3)	Oil Bucket Pump	1
(4)	Garage Jack, 5 ton	1
(5)	Lining Rivetter	1
(6)	Toe-in Gauge	1
(7)	Brake Tester	1
(8)	Impact Wrench	1
<b>III. <u>Electric</u></b>		
(1)	Battery Hydrometer	1
(2)	Volt Ampere Meter	1
(3)	Battery Quick Charger	1
(4)	Battery Cell Tester	1
(5)	Regulator Tester	1
<b>IV. <u>Measurement and Scale</u></b>		
(1)	Steel Rule, 1 m	1
(2)	Digital Tachometer	1
(3)	Torque Wrench, 600 kg.cm, 1,300 kg.cm, 2,600 kg.cm	1
(4)	Magnetic Stand (with Dial Gauge)	1
(5)	Micrometer, 0 - 125 mm	1
(6)	Spring Tester	1
(7)	V Block	1
(8)	Crack Checker	1
(9)	Noise Checker	1
(10)	Hardness Check Files	1

<u>No.</u>	<u>Name</u>	<u>Quantity</u>
<b>V. <u>Supporting Equipment</u></b>		
(1)	Steam Cleaner	1
(2)	Chain Block, 2 ton	1
(3)	Hydraulic Press, 35 ton	1
(4)	Air Compressor, 0.75 KW	1
(5)	Parts Washer	1
<b>VI. <u>Machinery Equipment</u></b>		
(1)	Electric Drill, 10 $\phi$	1
(2)	Drilling Machine, 13 $\phi$	1
(3)	Electric Bench Grinder	1
(4)	Portable Sander, 150 $\phi$	1
(5)	Portable Grinder, 100 $\phi$	1
(6)	Painting Spray Gun	1
(7)	Arc Welder	1
(8)	Gas Welding Equipment	1
(9)	Engine Arc Welder, 150A	1
(10)	Electric Saw and Plating Tools	1
(11)	Forging Tools	1
(12)	Surface Plate, 900 x 900 mm	1
<b>VII. <u>General Tool</u></b>		
(1)	Measurement .....	1
(a)	Caliper	
(b)	Tape Measure	
(c)	Steel Tape Measure	
(d)	Thickness Gauge	
(e)	Pitch Gauge	
(f)	Surface Gauge	
(g)	Steel Square	

<u>No.</u>	<u>Name</u>	<u>Quantity</u>
------------	-------------	-----------------

(2) Assembling and disassembling..... 1

- |                          |                          |
|--------------------------|--------------------------|
| (a) Adjustable wrench    | (g) Universal Puller Set |
| (b) Open End Wrench      | (h) Driver Set           |
| (c) Pipe Wrench          | (i) Cupreous Hammer      |
| (d) Hollow Wrench Set    | (j) Single Hand Hammer   |
| (e) Double Offset Wrench | (k) Pliers Set           |
| (f) Socket Wrench        | (l) Penches Set          |
|                          | (m) Stud Remover         |

(3) Processing ..... 1

- |                             |             |
|-----------------------------|-------------|
| (a) Files Set               | (f) Punches |
| (b) Taps and Dies Set       | (g) Chisels |
| (c) Hacksaw                 | (h) Scraper |
| (d) Electric Soldering Iron |             |
| (e) Tinner Shears           |             |

(4) Others

- |                 |                      |
|-----------------|----------------------|
| (a) Grease Gun  | (f) Rigid Rack       |
| (b) Vice        | (g) Engine Cleaner   |
| (c) Extractor   | (h) Parts Caddy      |
| (d) Test Hammer | (i) Steel Rack       |
| (e) Nippers     | (j) Caddy Tool Stand |

D. FARM MACHINERY

- |                         |   |
|-------------------------|---|
| (1) Tractor, 70 PS      | 6 |
| (2) Tractor, 33 PS      | 5 |
| (3) Lime Sower, 800 l.  | 3 |
| (4) Lime Sower, 320 l.  | 2 |
| (5) Broadcaster, 750 l. | 3 |
| (6) Broadcaster, 480 l. | 2 |
| (7) Disc Plow           | 6 |
| (8) Rotary              | 6 |

<u>No.</u>	<u>Name</u>	<u>Quantity</u>
(9)	Disc Harrow	3
(10)	Rice Transplanter	3
(11)	Vacuum Seeder	4
(12)	Ridger	4
(13)	Tine Cultivator, 11 rows	6
(14)	Tine Cultivator, 7 rows	5
(15)	Chisel Plow	2
(16)	Sprayer	2
(17)	Knapsack Applicator	2
(18)	Cultivator	6
(19)	Tooth Harrow	5
(20)	Dump Trailer, 2 ton	6
(21)	Dump Trailer, 1 ton	5
(22)	Disc Harrow, 3 m	6
(23)	Disc Harrow, 1.8 m	5
(24)	Grain Drill	2
(25)	Axial-Flow Combine	3
(26)	Brush Cutter	5
(27)	Front Blade	2

E. VEHICLES

(1)	Microbus (25-seater)	1
(2)	4 WD Station Wagon	5
(3)	Truck, 4 ton	3

<u>No.</u>	<u>Name</u>	<u>Quantity</u>
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F. METEOROLOGICAL EQUIPMENT

- |      |                         |   |
|------|-------------------------|---|
| (1)  | Max. Mini-Thermometer   | 1 |
| (2)  | Thermometer             | 1 |
| (3)  | Hygrometer              | 1 |
| (4)  | Barometer               | 1 |
| (5)  | Anemometer              | 1 |
| (6)  | Wind Gauge              | 1 |
| (7)  | Radiation Gauge         | 1 |
| (8)  | Sunshine Gauge          | 1 |
| (9)  | Rain Gauge              | 1 |
| (10) | Evaporation Pan (Pan-A) | 1 |

5-3-3. Equipment List in Administration Office

<u>Room Name</u>	<u>Name of Equipment</u>	<u>Specs</u>	<u>Qty.</u>
Lobby	Information Board of Project	2000W x 3000H Tpt=12	1
	Building Information Board		1
	Sofa		2
Confer- ence Room	Office Desk and Chair		12
	Conference Desk		1
	Conference Chair		4
	Blackboard	2000W x 900H	1
	Information Board	2400W x 900H	2
	Closet of Papers	1800 x 500D x 1800H	4
Office	Blackboard	1800W x 900H	14
	Information Board	-do-	14
Prepara- tory Room	Closet	1800 x 450 x 1800	4
	Storage of Drug	900 x 500 x 900	1
Library	Movable Blackboard	2700 x 1800	1
	Information Board	1200 x 1200	2
	Table for Lecture's Experiment	3000 x 900 x 1000	1
	Table for Trainees Experiment	2100 x 900 x 800	4
	Chair		21
	Working Table	4500 x 750 x 850	1
	-do-	1800 x 750 x 850	1

<u>Room Name</u>	<u>Name of Equipment</u>	<u>Specs</u>	<u>Qty.</u>
Laboratory	Working Table	900 x 750 x 850	1
	Information Board	1800 x 900	4
	Dehumidifier		1
	Equipment for keeping the temperature constant		1
Exhibition Room	Table for Exhibition	1800 x 900 x 1000	8
	Screen for Exhibition	1800 x 1800	4
	-do-	4500 x 1800	1
Private	Counter		1
Lecture Room	Curved Blackboard	3600 x 1200	1
	Flat Blackboard	1800 x 900	2
	Information Board	1800 x 1200	2
	-do-	2700 x 900	2
	Movable Lecture Desk		1
	Table for Movie		1
	Lecture Table		1
	Sliding Screen	1800 x 1800	1
	Screen of Overhead Projector	1500 x 1500	1
	Picture Rail		38 m
Chair with table		20	
Preparatory Room	Closet	2500 x 450 x 1800	3



<u>Room Name</u>	<u>Name of Equipment</u>	<u>Specs</u>	<u>Qty.</u>
Library	Card Case	860 x 460 x 1360	2
	Book Rack	7200 x 450 x 2200	1
	Desk	2400 x 1200 x 700	2
	-do-	1600 x 1200 x 700	2
	Chair		20
	Book Information Table	1200 x 600 x 1000	1
	Newspaper Rack		1
	Magazine Rack		1
	Electric Copy Machine		1
Storage	Closet	1800 x 450 x 1800	2
	Table for Work	1200 x 1000 x 750	1
	Chair		1
	Blackboard	1800 x 900	1
	Information Board	2400 x 900	2
	Picture Rail		12 m
	Book Binding Machine		1
Toilet	Washbasin	2500L x 500D	2
	Mirror	2500 x 830	2
	Cover of light fixtures	AA-BE	2
Others	Named Card for Rooms		28
	Curtain Box	150 x 150	40m
	Curtain box for Darkscreen	200 x 150	12.8m

## **CHAPTER VI PROJECT IMPLEMENTATION PLAN**



## CHAPTER VI. PROJECT IMPLEMENTATION PLAN

### 6.1. Organization for Project Implementation

The executing body of the proposed Project is the Department of Agriculture of Baluchistan Province. The Department of Agriculture has established a project office to carry out the implementation works of the Pilot Farm Project. The project office plays a role of an executing body not only for construction period but also for operation and maintenance of the Project after completion.

The Department of Agriculture is a government agency which administers the operation and maintenance works. In general, the project implementation works including detailed designing and tendering are carried out by the Department of Communication and Works. For this project, however, the detailed design, tendering and construction supervision will be carried out by Japanese consultants because the project will be financed through the Japanese grant-aid.

After signing the Exchange of Notes between the governments of Pakistan and Japan, the Japanese consultants recommended by JICA, shall conclude the contract with the Department of Agriculture for consulting services of detailed design, tendering, and construction supervision.

The Japanese consultants who conclude the contract with the Department of Agriculture shall organize a project team consisting of detailed design group and construction supervision group.

A Japanese contractor will be selected through the tender prepared by the Japanese consultants after the approval of the Department of Agriculture and the verification by the Government of Japan.

The successful contractor will establish a field office in the Project Area for appropriate operation and management of the construction works; furthermore, a task force team will be organized in the headquarter to support the construction works of Nasirabad Pilot Farm Project, and shall be carried out under the responsibility of the Baluchistan Government.

## 6.2. Division of Project Works

The Project works shall be executed following the framework of the Japanese grant-aid cooperation under close cooperation of both governments. The Project works shall be divided into two parts; namely, works to be implemented under the full responsibilities of the Japanese and Pakistan governments.

### 6.2.1. Works by the Japanese Government

#### (1) First Stage

##### i) Main Water Course

The works from Kirthar Canal to terminal plots including culverts for road-crossing, diversions for domestic water supply to the Pilot Farm facilities, and diversions to the cattle farm plots.

##### ii) Consolidation of Farm Plots

Consolidation of plots with Area Nos. 3, 4 and 5 including irrigation/drainage ditches and roads running along the farm plots.

iii) Buildings

Construction of buildings as shown in warehouse for fertilizer and garage attached to this Basic Design Study Report.

iv) Roads and Parkings, etc.

Construction of roads, parking facilities, etc., as shown in Drawing NB-14 of this Report, excluding tree planting for green zones.

(2) Second Stage

i) Consolidation of Farm Plots

Farm plot consolidation for all the plots shown in 5-2-2 of this Report, except those completed in the First Stage.

ii) Buildings

Construction of buildings shown in 5-2-3 of this Report, except those completed in the First Stage.

iii) Roads, sidewalks, etc.

Construction of on-farm roads, sidewalks, etc. as shown in this Report, except those completed in the First Stage and tree planting.

iv) Equipment and Materials

Provision of equipment and materials as shown in item 5.3 of this Report.

v) Transportation of the Equipment and Materials

Packing, shipping procedures, cargoes' insurance, ocean freighting, loading and inland freighting.

6.2.2. Works by Pakistan Government

(1) Fundamental Works

i) Arrangement of the Project Site

Scrapping the existing buildings and structures in the Project site for land clearing.

ii) Power Supply

Installing distribution power lines of high/low voltage up to the respective buildings and facilities, and installation of switches at each distribution line in every working block.

iii) Telephone

Installing telephone cables in the Pilot Farm for immediate use.

iv) Others

Installing power lines and telephone cables to the temporary works or buildings for Project use.

(2) Buildings

Construction of buildings except those shown in item 5.2.3 of this Report.

(3) Access Roads, etc.

Construction of the access roads and gates, planting of trees for green zones, and fencing.

(4) Equipment and Materials

Provision of equipment and materials such as furniture and fixtures except those shown in item 5.4 of this Report.

(5) Payment of Taxes, Charges for Customs Clearance and Transportation of Equipment and Materials

Payments of taxes, duties, and other charges required for customs clearance of Pakistan ports/airports for the Project and for inland freight.

(6) Permission, Approval and Application

Obtaining of permission/approval and making application and banking transactions required for the Project and payment for the necessary fees/charges.

(7) Exemption of Taxes

Exemption of taxes, duties, etc. from Japanese staffs for their services and goods to Pakistan according to the contract concluded between the two countries for the Project.

(8) Provision of Services and Facilities for the Japanese Staffs

Provision of services and facilities by the Pakistan Government for the Japanese staffs assigned to the Project based on the contract in their entry/exits of Pakistan and in their activities for the Project.



(9) Others

All expenditures, other than those covered under the Japanese grant-aid, shall be borne by the Pakistan Government.

The following works shall be completed by the Pakistan Government before the commencement of construction works; they are Land Arrangement of the Project Site as described in item 1(i) and 1(iv) Obtaining of Permission for Commencement of the Work, and Banking Arrangement as described in item 6, etc. Other works under the responsibility of the Pakistan Government should be completed by the time the construction of works by Japanese Government have been also completed. Other works particularly the works specified in item 1(ii) shall be completed at least two months before the completion of the total works for inspection.

6.3. Implementation Plan

6.3.1. Basic Concept of Construction Works

The working efficiency will decrease during four months between June and September due to extremely high temperature in daytime at 40°C on an average, although year-round works are possible because of little rainy days in a year. Most labourers are Muslims and Ramadan is observed as fasting month. Under the conditions, the implementation program shall be worked out prudently so as to eliminate undue delay in the schedule.

Thorough discussion shall be made between the Department of Agriculture and the Japanese party concerned prior to commencement of the works, so that each work of both parties can be smoothly done. There are some imports of equipment and material inevitably required for the Project, however, the local procurement will be made as much as possible. Customs clearance procedures and tax exemption of goods to be imported to Pakistan shall be made under the regulations of Pakistan.

### 6.3.2. Construction Supervision Plan

The Japanese consultants, according to the Japanese grant-aid cooperation procedures, shall conclude the contract of the design of the Project with the Pakistani Government to carry out the construction supervision.

The construction supervision aims to fairly give guidances, advices, coordination, work quality control, etc. during the construction period in confirming the work progress to meet the schedule and the right performance of the construction works. And the consultants shall perform the following works:

#### (1) Cooperation in Tendering and Contracting

To prepare the tender documents and contract documents for Japanese contractors and suppliers, and to give proper advices to the Pakistan authorities concerned in concluding the contracts.

#### (2) Guidance, Advices and Coordination for Contracting

To give guidance, advices and coordination to the contractors as well as to inspect implementation plan and procedure.

#### (3) Check and Approval of Drawings of Construction and Manufacturing

To check and give approval on the drawings for construction and manufacturing by contractors.

#### (4) Confirmation and approval of construction equipment/materials and those to be newly procured

#### (5) Report of Work Progress

To report to the Pakistan authorities concerned on the progress of construction work with full understanding of the work process.

(6) Inspection

To inspect the facilities and equipment from the commencement up to the completion from time to time.

The consultants shall dispatch their resident engineers to the field during the whole construction period. The consultants shall be ready to dispatch the engineers to the fields when necessary, and establish the organization in the home office so as to support the field staffs. The consultants shall also report to the Japanese Authorities concerned on the progress of the works, payments, handover of the works, etc.

6.3.3. Procurement Schedule of Equipment and Materials

At present, Pakistan can produce sufficiently the construction materials and holds a considerable number of stocks. The prices of materials do not also fluctuate largely. Pakistan produces construction materials like iron bars, cement, etc. based on the U.S standards or British standards (BS). However, Pakistan-made iron bars have some defects when bent, although acceptable in strength. Domestic cement can be used for the Project but the volume should be increased by 20 percent more than the Japanese design component to ensure its strength.

The quality of tiles are good, however, the wooden furnitures are unstable in terms of quality. Many equipment and materials, such as PVC pipes, steel pipes, windows, air-conditioners, sanitary wares, etc., are available domestically, however, they are not stable.

Most of the machineries and devices are not available in Pakistan except for wooden working tables and shall therefore be imported from Japan.

(1) Equipment/Materials to be locally procured

Cement

Aggregates (sand/gravels)

Timber

Roofing tiles

Paints

Slate goods

Concrete pipes

Stone floor tiles

Covering (Vinyl cloth, etc.)

(2) Machineries and Materials to be procured from Japan

Iron bars

Steel trass

White cement

Aluminium fittings

Steel fittings

Shutters

Metal fittings

Glass

Color-sprayed tiles

Asphalt for water-tighting

Partition

Sliding doors

Manufactured metal goods

Glass wool

Sanitary ware

Veneer board

Wooden fittings

P-tiles

Wooden furniture

Electricity wires

Ceiling materials

Equipments

#### 6.3.4. Implementation Program

The Project implementation shall be divided into two stages; namely, Stage I and Stage II, both of which shall be carried out along with the programs below. The works shall be started with effectuation of the Exchange Notes on the Japanese grant-aid cooperation for the Project.

The Pakistani Government will execute a contract with the Japanese consultants for detailed design and construction supervision, after the aforesaid Exchange Notes are concluded, and the Pakistani Authorities concerned and the consultants will sign the contract for the services rendered. The major items of the consulting services are Detailed Design, Tendering, and Construction Supervision.

##### (1) Detailed Design

The detailed design works shall be commenced after approval of the consultant's contract by the Japanese Government. Based on the Basic Design Study Report, the detailed design works shall cover the preparation of a series of the detailed Design Drawings, Specifications, Tender Documents, Tender Drawings. During the detailed design works, the consultants shall have discussion meetings with the Pakistan Authorities concerned on the facilities, equipment/materials for the Project; and finally, to prepare the set of tender drawings to obtain approval from the Government of Pakistan.

##### (2) Tendering

The contractors for the Project including the supply of equipment/materials, shall be selected by tender. The tendering works will take about 2.5 months in following such procedures as announcement of the Tender, Pre-qualification of the bidding firms (Japanese corporations), Tendering, Tender Evaluation, Decision of the successful Tenderer, and conclusion of the contract with the successful Tenderer.

(3) Construction

The construction works shall commence after the verification of the contract of construction works by the Japanese Government. It is expected from the scale of construction works, local conditions of meteorology and capacity for construction works, that the total Project works shall be divided into two stages and will take seven months for the first stage and thirteen a half months for the second stage.

6.4. Construction Cost

The Pakistan Government shall bear an amount of Rs. 3,000,000.- in the construction of the following Project works, other than those costs covered by the Japanese grant-aid.

Electrical works (out-door)	Rs.	100,000.-
Fence and gate		1,000,000.-
Staffhouses		1,500,000.-
Telephone works		250,000.-
Others		<u>150,000.-</u>
Total	Rs.	<u>3,000,000.-</u>

Table 6-1 Tentative Implementation Schedule (1)

	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
E/N	▽																														
Consultant Contract	▽																														
Detail Design			▬	▬																											
Design Works			▬	▬																											
Construction Planning and Cost Estimate			▬	▬																											
Preparation of Tender Document			▬	▬																											
Approval of Tender Document				▬																											
Tender Announcement					▽																										
Tender Period					▬																										
Tender Evaluation								▬																							
Contract Negotiation									▬																						
Verification of Contract																															
Effective of Contract																															
Construction Works																															

Table 6-2 Tentative Implementation Schedule (2)

	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					
E/N	▽																																			
Consultant Contract	▽																																			
Detail Design																																				
Design Works																																				
Construction Planning and Cost Estimate																																				
Preparation of Tender Document																																				
Approval of Tender Document																																				
Tender Announcement																																				
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Construction Works																																				





**CHAPTER VII PLAN OF OPERATION AND  
MAINTENANCE OF THE PROJECT**



## CHAPTER VII. PLAN OF OPERATION AND MAINTENANCE OF THE PROJECT

### 7.1. Operation and Maintenance Organization

The operation and maintenance (O & M) of the Pilot Farm Project shall be conducted by the organizations shown in Figure 4-1, under the supervision of Director General Agriculture, in cooperation with the Quetta Agricultural Research Institute and the Quetta Agricultural Training Institute. The Project is planned taking into consideration easy O & M of the facilities and equipment/devices to be provided. When these project facilities and equipment, except buildings, facilities/devices of the Pilot Farm and Seeds Processing Plant, are completed, the training shall be given to the staffs in charge of those facilities and equipment for the operation and maintenance.

For the Seeds Processing Plant, trial operation with seeds shall be carried out, immediately after installation of the necessary facilities and equipment, together with the training of their O & M staff in charge.

The operation and maintenance manuals of the equipment and devices shall be submitted to the Pakistan Authorities concerned to ensure the transfer of knowledge/information, when the facilities are totally handed over to Pakistan Government after completion.

### 7.2. O & M Costs

The O & M costs required for the facilities and equipment of the Pilot Farm can be classified into two: direct salaries and operation costs. The successful operation of the Pilot Farm requires 62 staffs. Consequently, the direct salaries and the operation costs shall be estimated based on these 62 staffs and unit costs available in 1987; however, the expenditures for the living quarters shall not be included in the above costs.

(1) Direct Salaries

The staffs to be assigned to the Pilot Farm can be classified into two by salary grades: permanent staff and temporary staff. And the salary for both classes consists of the basic salary, regional allowances, housing allowance, travel allowances, etc. The annual pay raise has a fixed rate according to basic salary grades, and the annual pay raise rate can be roughly estimated as follows:

Table 7-1. Salary of Permanent and Temporary Staff

(Unit: Rupee)

<u>Year</u>	<u>Permanent Staff</u>	<u>Temporary Staff</u>	<u>Total</u>
1st year	394,680	443,551	838,231
2nd year	415,320	456,980	872,300
3rd year	435,960	470,409	906,369

(2) Operation Costs, etc.

Table 7-2. Operation Cost

(Unit: Rupee)

<u>Description</u>	<u>Amount</u>
Operation and maintenance	Rs. 450,000
Travelling allowance	75,000
Others	100,000
Total	<u>Rs. 625,000</u>

(3) Contingencies

10 percent of the direct salary and 10 percent of the operation cost were estimated as contingencies.

(4) Annual O & M Costs

The O & M costs of the Pilot Farm by years can be estimated as follows:

Table 7-3. Annual O & M Costs

<u>Year</u>	<u>Annual Costs</u>
1st yr.	Rs. 1,610,000
2nd yr.	Rs. 1,647,000
3rd yr.	Rs. 1,685,000



## CHAPTER VIII PROJECT EVALUATION





## CHAPTER VIII. PROJECT EVALUATION

### 8.1. Effects by Project Realization

The effects expected from realization of the Project cannot be given by figures in direct benefits. The Pilot Farm, however, will support the Pat Feeder Canal Improvement and Widening Project as the main objective, which will be widened at the starting point, in the first stage works, so as to discharge water of 6,700 cfs (190 cu.m/s) and to irrigate the cultivable commanded areas (CCA) of 458,370 acres (185,500 ha). And PC-1 prepared by WAPDA South shows the proposed cropping pattern as illustrated in Table 2-10 that more cash crops to increase the cash income should be grown without change in the annual cropping ratio, although water consumption is increased in its annual amount. At the completion of the Pat Feeder Canal Rehabilitation and Improvement Project in year 2006, about 630 million Rupees is projected as net incremental benefits (ref. to Table 2-11).

The construction costs for the Pat Feeder Canal Rehabilitation and Improvement Project are estimated at 2,916.8 million Rupees, including interests during construction works and contingency. The Economic Internal Rate of Return (EIRR) on the Project is calculated at 13.2 percent.

The Pilot Farm Project does not generate any direct benefits that can be shown in monetary terms or any figures, but one of the major supports of the Pat Feeder Project which can produce a considerable incremental benefit by agricultural development. In other words, the Pat Feeder Canal Rehabilitation and Improvement Project would not generate the planned benefits in the designed project year without support of the Pilot Farm Project, such as adoptability test of crop to the district, seed production, establishment of farming practices including on-farm water management, and training of field assistants.

## 8.2. Justification for Implementation

It is necessary to conduct a trial implementation and demonstration of the improved irrigated agricultural practice, on-farm water management, crop adoptability, extension services, etc. at the selected pilot farm before commencement of irrigation service from Pat Feeder Canal, which will be rehabilitated and improved under the co-financing of the ADB and OECF, and supply irrigation water to the vast agricultural zone in Baluchistan. In addition, the Pilot Farm Project will play important roles in agricultural development as a core project, training center and seed production plant, as well as a sub-station of the Agricultural Training Institute in Quetta, particularly in respect of arid zone agricultural training.

This Project is considered as significant for agricultural development in Nasirabad District. Therefore, construction of the Pilot Farm Project under the Japanese Grant-Aid program is appropriate and justifiable.

## **CHAPTER IX CONCLUSION AND RECOMMENDATIONS**



## CHAPTER IX. CONCLUSION AND RECOMMENDATIONS

### 9.1. Conclusion

The agricultural development in Nasirabad is considered to have extremely high potentiality in view of weather conditions, availability of irrigation water, etc. Also, the possibility of agricultural development in the area will be greatly raised by rehabilitation and improvement of the Pat Feeder Canal. The successful agricultural development, however, will require not only arrangement and consolidation of irrigation canal networks but provision of pilot farms indispensably.

The proposed Pilot Farm in Nasirabad District aims at (i) demonstration of modern farming method, (ii) establishment of effective water management system, (iii) carrying out crop adoptability, (iv) training of extension staffs and farmers, and (v) production of seeds of crops suited to the local conditions.

The Pilot Farm, therefore, must cover the following works and services to meet the requirements; namely, to establish a suitable farming method to the local soils conditions or an improvement method of the soils, to carry out crop adoptability tests, to establish the best-suited farm management method, to provide the best-suited on-farm facilities to the local conditions, to establish the most effective O & M techniques of the facilities and equipment, to give training to extension staffs and farmers, to carry out tests of mechanized farming on the demonstration farm, and to produce the seeds suitable to the local conditions.

In Nasirabad District, the farm land soils show alkali and saline, and the irrigation water has also slight alkaline. The successful agriculture on the alkaline soils requires not only sufficient supply of irrigation water but also such many supports as application of new technology for farming method suitable to local soils conditions or for soils improvement, introduction of the best-suited crops or crop varieties to the new farming techniques, soil conditions and local meteorological conditions, providing demonstration farms for a variety of new technology, and production of suitable crops.

These services to realize the aforesaid purposes cannot be rendered successfully if pursuing any profits therefrom. The Pilot Farm, however, is indispensable for agricultural development projects. It is quite justifiable, therefore, that construction of research/experimental facilities and provision of farming machines/equipment and seeds treatment plant shall be carried out for the Project under the Japanese grant-aid cooperation.

#### 9.2. Recommendations

The purpose of Pilot Farms is to generate more benefit through the support of the pilot farms in the cultivable commanded areas of agricultural development project. The success in pilot farm fully depends upon the operation and management after completion of the pilot farms. Thus, it is essential to secure well qualified human resources and to pay attention to assignment of best-suited personnel to pilot farms. Moreover, it is indispensable to hold the necessary and sufficient funds in the budgets of both the Federal and the Provincial Governments for the successful operation and management of pilot farms.

The proposed Pilot Farm site is located in the cultivable commanded areas of both the Pat Feeder Canal and the Kirthar Canal. The executing body of the Pat Feeder Canal Rehabilitation and Improvement Project is WAPDA which has prepared the plan and implemented the works.

Consequently, it is necessary to keep close contact with the WAPDA Team of Pat Feeder Canal Works for successful operation of the Pilot Farm.

The Pilot Farm completed with the technical back-up cannot be utilized best until the results obtained in various experiments/tests on the Pilot Farm are thoroughly transferred to the local farmer. Application of the transferred technology will make the farmers improve their farming methods.





## APPENDIX



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## APPENDIX 1. MEMBERS OF THE STUDY TEAM

### 1-1. Basic Design Study Team

<u>Titles</u>	<u>Names</u>
Leader	Mr. Nobuyoshi SAKINO
Water Control	Mr. Takeshi OHTA
Project Coordinator	Mr. Tadanori SUZUKI
Agricultural Development Planning	Mr. Hiroshi KONDO
Irrigation/Drainage	Mr. Yuichi MATSUMOTO
Facilities Designing	Mr. Tamio KAMATA
Architectural Planning	Mr. Yoshiyuki SAWAMOTO
Structural Designing	Mr. Takuji NAKAHATA

### 1-2. Mission for Draft Report Explanation

<u>Titles</u>	<u>Names</u>
Leader	Mr. Nobuyoshi SAKINO
Project Coordinator	Mr. Tadanori SUZUKI
Agricultural Development Planning	Mr. Hiroshi KONDO
Irrigation/Drainage Planning	Mr. Yuichi MATSUMOTO
Architectural Planning	Mr. Yoshiyuki SAWAMOTO

APPENDIX 2. ITINERARY OF THE TEAM

2-1. Basic Design Study

<u>Date/Day</u>	<u>Description</u>	<u>Place of Stay</u>
<u>1987</u>		
Sept. 7 (Mon.)	Left Narita for Beijing (stayed overnight at Beijing due to engine trouble.)	Beijing
8 (Tue.)	Left Beijing for Islamabad Meetings at JICA Office and EOJ.	Islamabad
9 (Wed.)	Left for Quetta.	Quetta
10 (Thu.)	Courtesy call and meeting with Department of Planning & Development, and Department of Agriculture, Baluchistan Province	"
11 (Fri.)	Survey on buildings in Quetta and Team meeting.	"
12 (Sat.)	Interview-survey at Agricultural Training Institute and Agricultural Research Institute.	"
13 (Sun.)	Courtesy call and meeting with Department of Irrigation.	"
14 (Mon.)	Left Quetta for Usta Muhammed	Usta Muhammed
15 (Tue.)	Survey on Proposed Pilot Farm Site and Veterinary Station.	"
16 (Wed.)	-ditto-. Survey at WAPDA (Electricity)	"
17 (Thu.)	Left for Quetta (Mr. Kondo & Mr. Sawamoto Soil Survey and Investigation for Surveying (Messrs. Kamata & Nakajima)	Quetta Usta Muhammed
18 (Fri.)	Mr. Sakino (Leader), and Messrs. Ohta & Suzuki's arrival at Islamabad. Left Quetta for Islamabad (Messrs. Kondo & Sawamoto). Surveying (Messrs. Matsumoto, Kamada, & Nakajima).	Islamabad Usta Muhammed

<u>Date/Day</u>	<u>Description</u>	<u>Place of Stay</u>
19 (Sat.)	Meetings with JICA Office and EOJ. Surveying & field works (Messrs. Matsumoto, Kamata, & Nakajima).	Islamabad Usta Muham- ammed
20 (Sun.)	Courtesy call and meeting with EAD of MOF, Agri. Dept. of MOP, and MOA. Surveying works and visited Irrigation Department Office (Messrs. Matsumoto, Kamata, & Nakajima).	Islamabad  Usta Mu- ammed
21 (Mon.)	Courtesy call and meeting with Ministry of Water and Power. Also courtesy call and meeting with EOJ. Surveying works and visited Irrigation Office (Messrs. Matsumoto, Kamata, and Nakajima).	Islamabad  Usta Muham- med
22 (Tue.)	Left for Quetta. Surveying works (Messrs. Matsumoto, Kamata & Najima). Left for Quetta.	Quetta
23 (Wed.)	Courtesy call and meeting with Dept. of Planning & Development, and Department of Agriculture. Data arrangement (Messrs. Matsumoto, Kamata & Nakajima).	Dera Murad Jamali  Quetta
24 (Thu.)	Visited Irrigation Dept. (Secretary absent) Left Quetta for Dera Murad Jamali Data arrangement (Messrs. Matsumoto, Kamata, & Nakajima).	Jamali Quetta
25 (Fri.)	Survey on proposed Pilot Farm site and Veterinary Station. Data arrangement (Messrs. Matsumoto, Kamata & Nakajima).	Dera Murad Jamali Quetta
26 (Sat.)	Left for Quetta. Survey on construction materials (Messrs. Matsumoto, Kamata & & Nakajima).	"
27 (Sun.)	Meeting with Irrigation Dept. and Agri- culture. Survey on construction materials (Messrs. Matsumoto, Kamata & Nakajima).	"
28 (Mon.)	Signing of the Minutes at Planning & Development Dept. Survey on costs of cons- truction and roads at Dept. of Communication & Works.	"



<u>Date/Day</u>	<u>Description</u>	<u>Place of Stay</u>
29 (Tue.)	Left for Islamabad. Reporting to JICA Office in presence of Attaché, Mr. Karimata.	Islamabad
30 (Wed.)	Reporting of EAD of MOF, and Agriculture Section of MOP.	"
Oct. 1 (Thu.)	Survey on materials. Survey on current architecture in Pakistan.	"
2 (Fri.)	Data Arrangement.	"
3 (Sat.)	-ditto- Survey on currenct architecture.	"
4 (Sun.)	Reporting to JICA and EOJ. Left for Karachi.	Karachi
5 (Mon.)	Survey at WAPDA South. Survey at Pipe Manufacturing Plant. Left Karachi for Tokyo.	"
6 (Tue.)	Arrived at Narita.	

2-2. Draft Report Explanation

<u>Date/Day</u>	<u>Description</u>	<u>Place of Stay</u>
Dec. 14 (Mon.)	Left Narita for Islamabad.	Islamabad
15 (Tue.)	Meetings at JICA Office and EOJ. Left for Quetta.	Quetta
16 (Wed.)	Courtesy call with Department of Planning & Development, and Department of Agriculture, Report explanation to Department of Agriculture.	"
17 (Thu.)	Discussion with Department of Agriculture. Signing of the Minutes at Department of Planning & Development.	"
18 (Fri.)	Team meeting.	"
19 (Sat.)	Left for Islamabad.	Islamabad
20 (Sun.)	Report to EOJ & JICA Office.	"
21 (Mon.)	Report to EAD.	"
22 (Tue.)	Left for Karachi.	Karachi
23 (Wed.)	Left for Tokyo.	"