

- 2) The objectives of the Project are the improvement of living standards by means of the increment of income by the introduction of irrigation facilities, the improvement of employment opportunity, a stable food supply, and the reduction of labor burden of women and children by a constant water supply. Such objectives comply with BHN (Basic Human Needs).
- 3) After the completion of project facilities, AGRITEX and DWD will be in charge of its management and operation/maintenance. Their ability, which has accumulated through long experience in similar irrigation projects in the country, is considered to be sufficient to execute the Project. In addition, the Zimbabwean side will secure the budget needed for the Project, and substantial problems on the implementation of the Project are not anticipated.
- 4) The Project complies with the purpose of the Second National Development Plan that aims at development in the Communal Lands.
- 5) The productivity derived from the Project is not so high. Different from the Large Scale Commercial Farms with good conditions, this agriculture is carried out in remote areas with bad land conditions, so high productivity is not expected. However, the Project surely contributes to the improvement of living standards and improvement of employment opportunity, and has the nature of a pilot scheme for the adjacent Communal Lands.
- 6) The environment to be affected by the realization of the Project may be noise caused by operation of pumps and occurrence of Malaria mosquitoes in the farm ponds. However, these will not be problems, since the pump stations are located at remote distance to the houses and the water in the farm ponds does not stay still and is drained off in a short time.
- 7) In the case that the Project will be implemented under Japan's Grant Aid, its execution will not have any difficulties since the construction skills of Zimbabwe are considerably high. Moreover, the construction materials will be procured in Zimbabwe except some special equipment, and it will make construction easier, as well.

4-3 Conclusion and Recommendation

As mentioned above, a huge benefit is expected by means of the implementation of the Project, and the Project will contribute to the improvement of BHN of the farmers in the proposed Communal Lands. So, it is judged that the implementation of the Project under

Japan's Grant Aid is appropriate. Moreover, concerning the management and operation/maintenance, the responsible organization of Zimbabwe has sufficient personnel and budget, and there are expected to be no problems.

It is considered, however, that if the following points were to be improved and maintained, the Project will be carried out more smoothly and effectively.

Technical Cooperation

In order to achieve the target agricultural products and transfer Japanese technology, it is considered effective to dispatch Japanese Experts and JOCV members.

Securing of Budget for the Project

Securing of the budget for the Project by the Zimbabwean side becomes important. Electrification of the Project site that was the most serious pending matter has already been solved by the effort of AGRITEX. However, securing of the budget for the staffs of AGRITEX and DWD during the implementation stage and the execution stage of the Project is necessary.

Establishment of Farmers Union

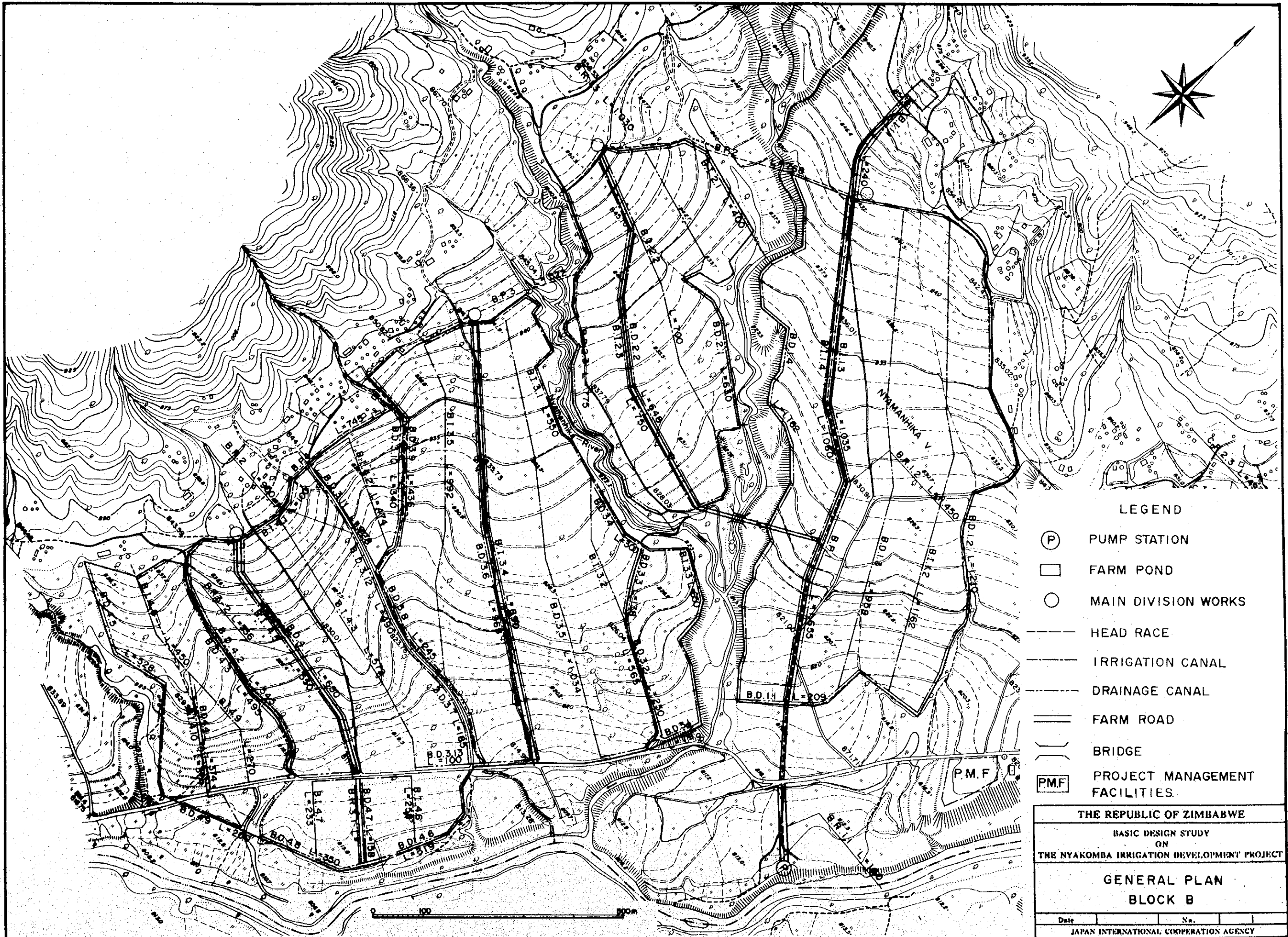
Other than the staff of AGRITEX and DWD, the representatives of a farmers organization shall be stationed at the Project Management Building and shall conduct guidance of farmers and management of farming. To do that, farmers organization is needed. Moreover, the present burden of 145 Z\$/ha/year will be surely increased in the future. To deal with such an occasion, the farmers organization, that can manage the Project properly and bear the operation and maintenance cost of the Project Management Office and the renewal cost of the facilities, shall be established

Table 4 - 1 BENEFIT WITH THE PROJECT

Present Problem	Disposition by the Project	Benefit with the Project
<p>1. The yield of maize that is the staple food in Zimbabwe is not stable due to rain-fed agriculture.</p> <p>The mean yield during the last 2.5 years is 5 t/ha, and it is about half of the yield compared with that of adjacent irrigation projects.</p>	<ul style="list-style-type: none"> • Supply of stable irrigation water by means of introduction of irrigation facilities • Introduction of cash crops by double cropping 	<ul style="list-style-type: none"> • Securing the staple food constantly by enlargement of annual yield of maize to 4.5 t/ha • Improvement of living standard by means of increase of agricultural income due to introduction of cash crops that will become possible by double cropping
<p>2. Lack of agricultural machines and maintenance equipment</p>	<ul style="list-style-type: none"> • Introduction of agricultural machines and maintenance equipment 	<ul style="list-style-type: none"> • Better productivity by effective operation and maintenance
<p>3. Low productivity</p>	<ul style="list-style-type: none"> • Execution of effective training for farmers by means of equipping a meeting room with P. M. F. 	<ul style="list-style-type: none"> • Better productivity due to introduction of high level guidance to the farmers by permanent staffs of AGRITEX
<p>4. Undeveloped farmer's organization</p>	<ul style="list-style-type: none"> • Proposal of establishment of farmer's organization in order to execute the direct management and operation & maintenance of the Project by the farmers with the guidance of AGRITEX and DWD 	<ul style="list-style-type: none"> • High productivity farming due to establishment of systematic farming by farmers
<p>5. Heavy labour of drawing water by women and children</p>	<ul style="list-style-type: none"> • Disposition of farm ponds and irrigation canals around the villages 	<ul style="list-style-type: none"> • Reduction of heavy labour by means of easy water drawing from farm ponds and irrigation canals
<p>6. Undeveloped farm roads in the Project area</p>	<ul style="list-style-type: none"> • Improvement of the farm roads in the area with gravel pavement 	<ul style="list-style-type: none"> • Easy access to the farm by agricultural machines to transfer agricultural materials and yielded crops

List of Drawings

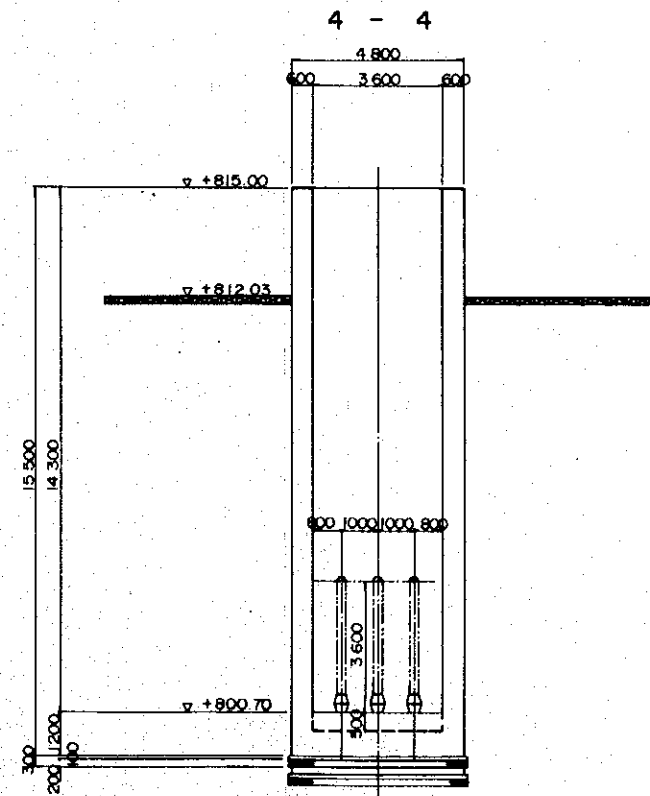
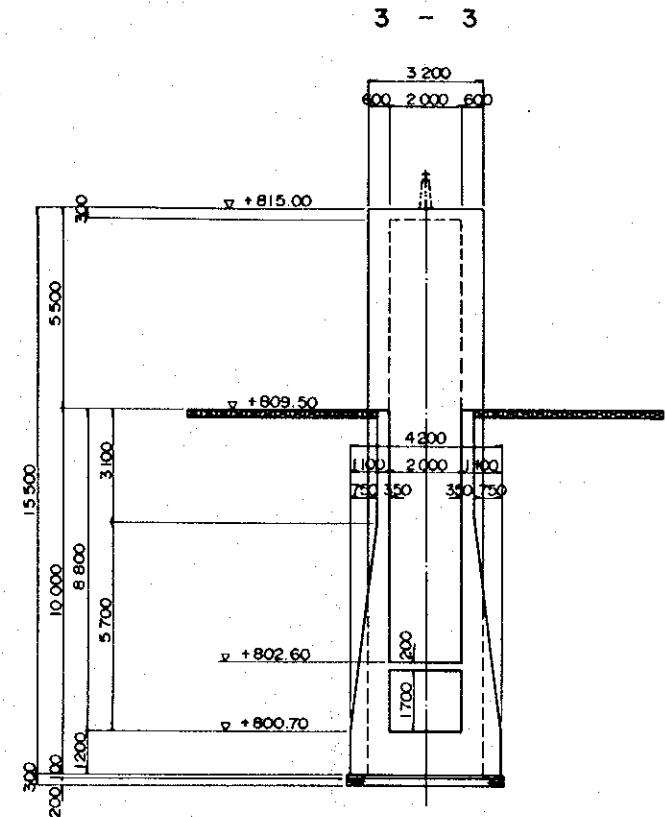
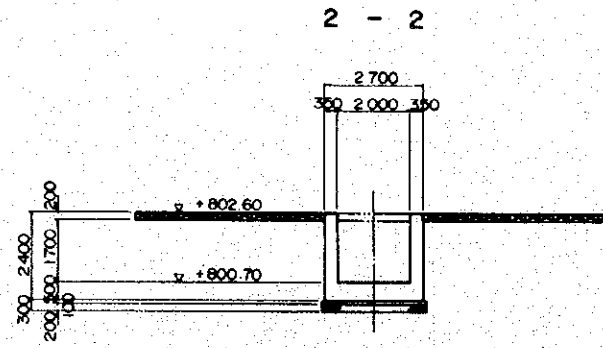
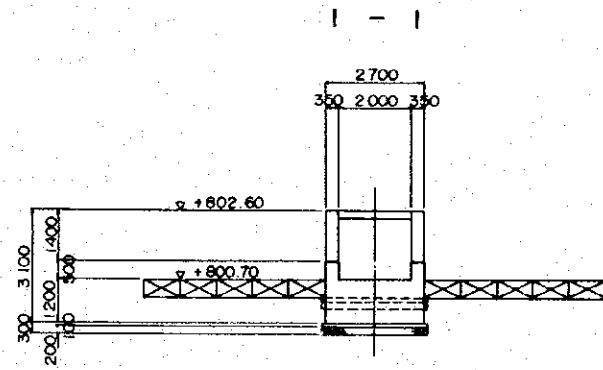
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3. " " PUMP STATION SECTION
4. " " PUMP STATION STRUCTURE (1)
5. " " PUMP STATION STRUCTURE (2)
6. " " PUMP STATION HOUSE
7. " " HEAD RACE (1) LONG SECTION B-P-1
8. " " HEAD RACE (2) LONG SECTION B-P-2, B-P-3, B-P-4, B-P-a
9. " " FARM POND PLAN
10. " " DETAILS OF FARM POND
11. " " IRRIGATION FACILITIES (1/3)
12. " " IRRIGATION FACILITIES (2/3)
13. " " IRRIGATION FACILITIES (3/3)
14. " " DRAINAGE FACILITIES (1/2)
15. " " DRAINAGE FACILITIES (2/2)
16. " " FARM ROADS
17. BLOCK - C GENERAL PLAN
18. " " PUMP STATION PLAN
19. " " PUMP STATION SECTION
20. " " PUMP STATION STRUCTURE (1)
21. " " PUMP STATION STRUCTURE (2)
22. " " PUMP STATION HOUSE
23. " " HEAD RACE (1) LONG SECTION C-P-1
24. " " HEAD RACE (2) LONG SECTION C-P-2, C-P-3
25. " " FARM POND PLAN
26. " " DETAILS OF FARM POND
27. " " IRRIGATION FACILITIES (1/3)
28. " " IRRIGATION FACILITIES (2/3)
29. " " IRRIGATION FACILITIES (3/3)
30. " " DRAINAGE FACILITIES (1/2)
31. " " DRAINAGE FACILITIES (2/2)
32. " " FARM ROADS
33. PROJECT MANAGEMENT FACILITIES
34. PROJECT MANAGEMENT BUILDING PLAN & SECTION
35. PROJECT MANAGEMENT BUILDING ELEVATION
36. WORKSHOP & GARAGE PLAN & SECTION
37. WORKSHOP & GARAGE ELEVATION
38. WAREHOUSE
39. FUEL STATION



LEGEND

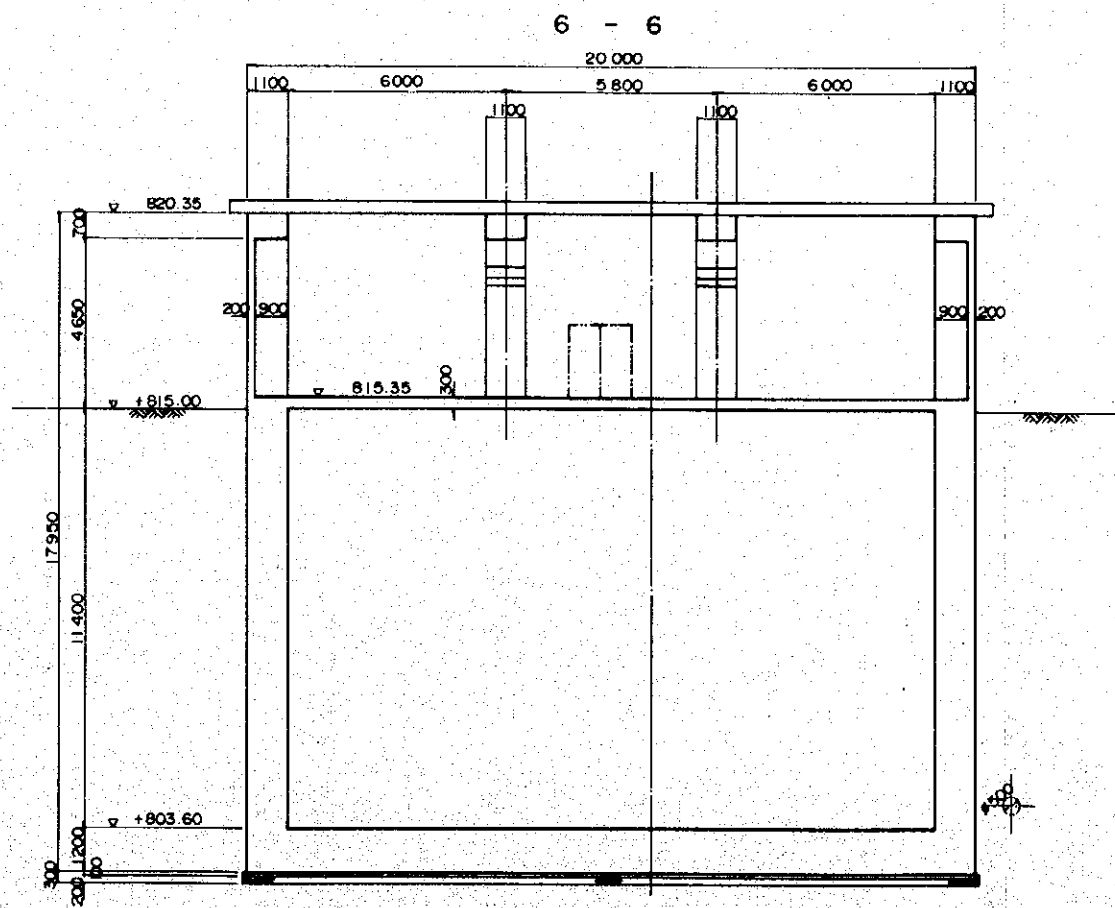
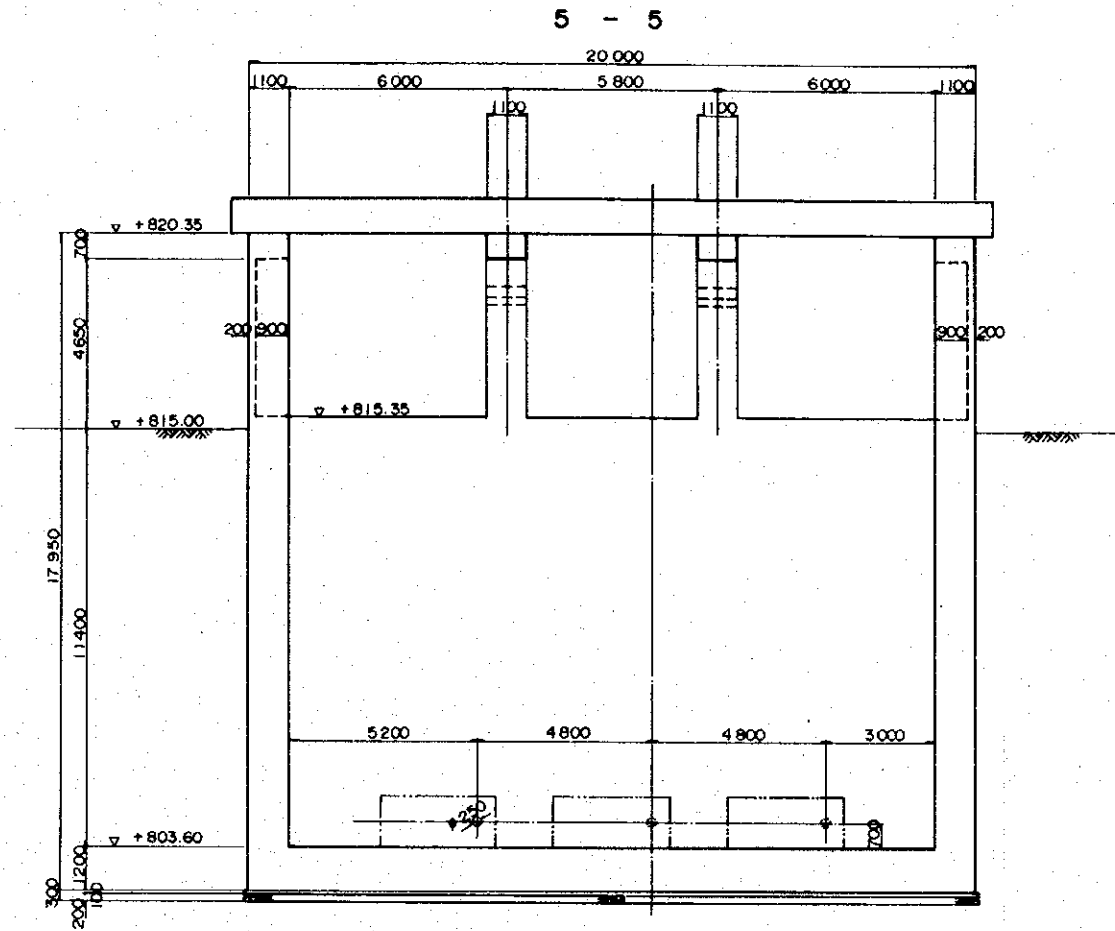
- P PUMP STATION
- FARM POND
- MAIN DIVISION WORKS
- HEAD RACE
- IRRIGATION CANAL
- DRAINAGE CANAL
- === FARM ROAD
- BRIDGE
- P.M.F. PROJECT MANAGEMENT FACILITIES.

THE REPUBLIC OF ZIMBABWE			
BASIC DESIGN STUDY ON THE NYAKOMBA IRRIGATION DEVELOPMENT PROJECT			
GENERAL PLAN BLOCK B			
Date		No.	
JAPAN INTERNATIONAL COOPERATION AGENCY			



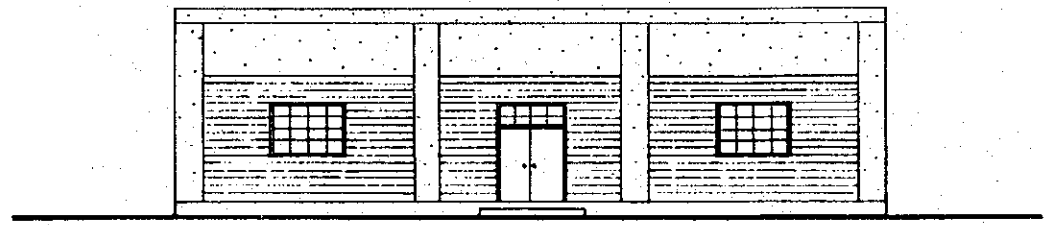
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THE REPUBLIC OF ZIMBABWE			
BASIC DESIGN STUDY ON THE NYAKOMBA IRRIGATION DEVELOPMENT PROJECT			
PUMP STATION (BLOCK B) STRUCTURES (I)			
Date	No.	4	
JAPAN INTERNATIONAL COOPERATION AGENCY			

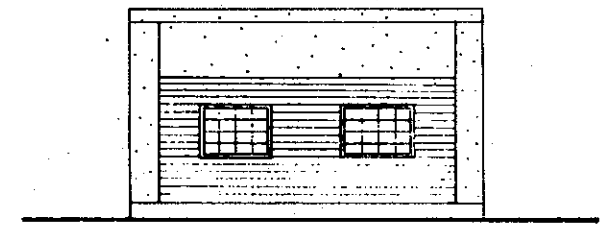


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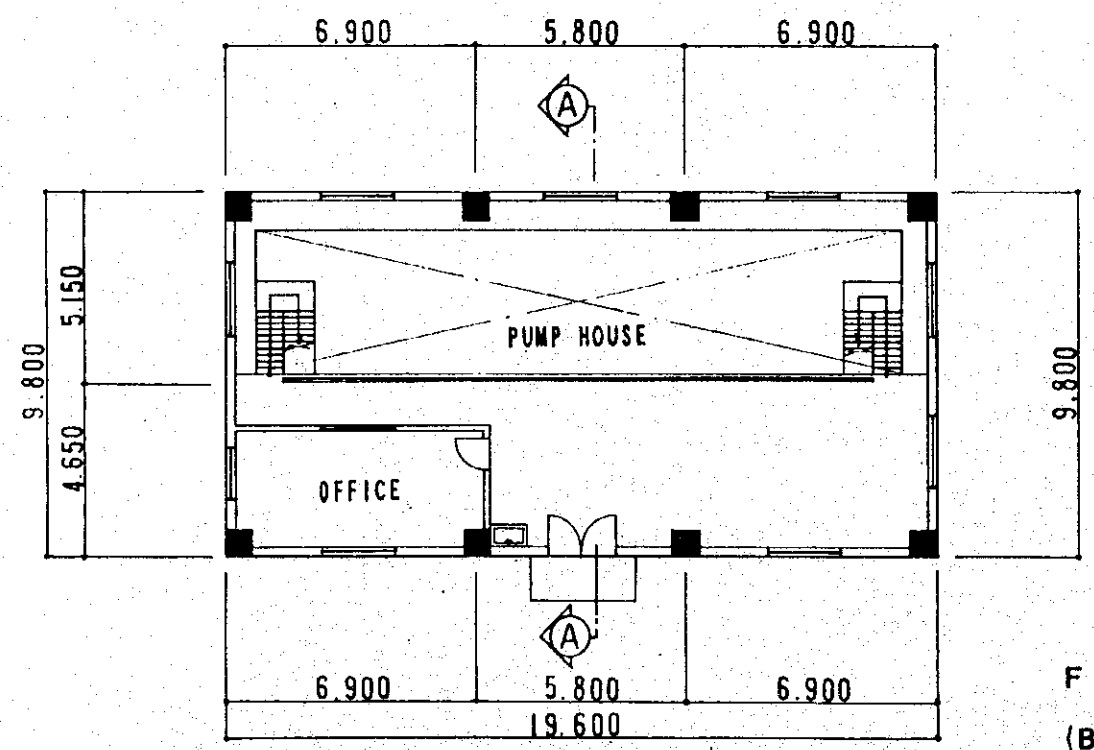
THE REPUBLIC OF ZIMBABWE			
BASIC DESIGN STUDY ON			
THE NYAKOMBA IRRIGATION DEVELOPMENT PROJECT			
PUMP STATION (BLOCK B) STRUCTURES (2)			
Date		No.	5
JAPAN INTERNATIONAL COOPERATION AGENCY			



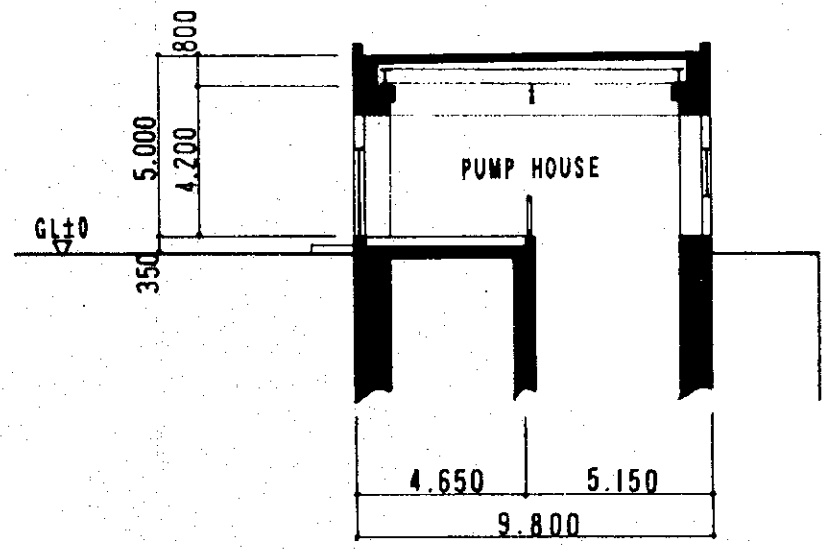
WEST ELEVATION



SOUTH ELEVATION



FLOOR PLAN
(B) (C) BLOCK



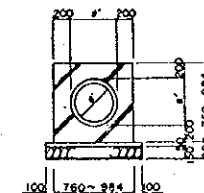
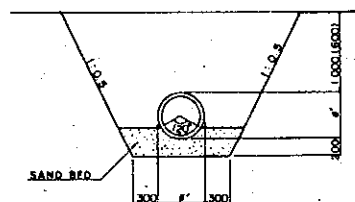
SECTION A-A

THE REPUBLIC OF ZIMBABWE			
BASIC DESIGN STUDY ON THE NYAKOMBA IRRIGATION DEVELOPMENT PROJECT			
PUMP STATION HOUSE			
Date	No.	6	
JAPAN INTERNATIONAL COOPERATION AGENCY			

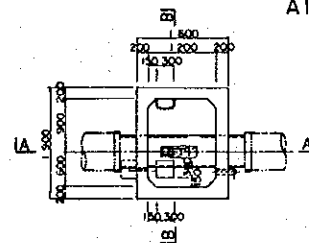
LONG SECTION
B-P-1 #500

TYPICAL SECTION

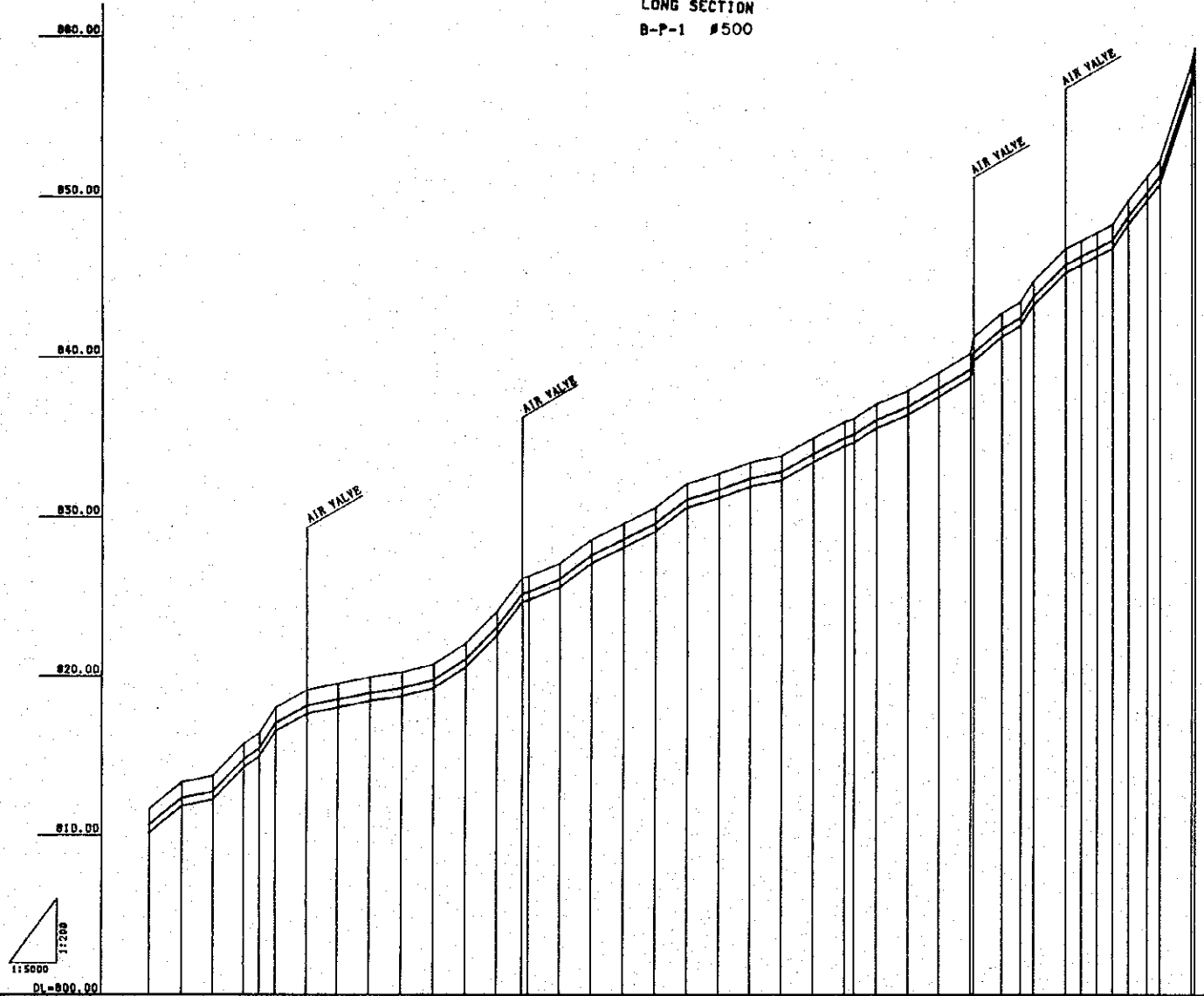
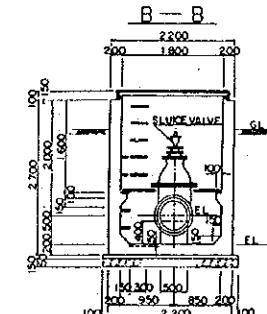
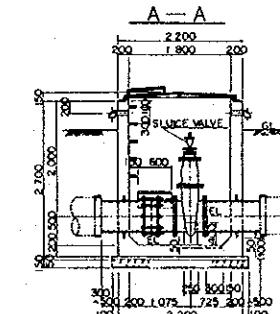
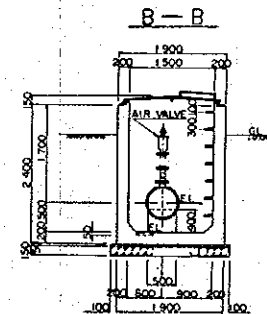
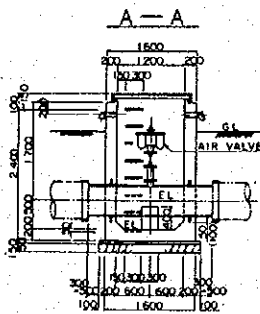
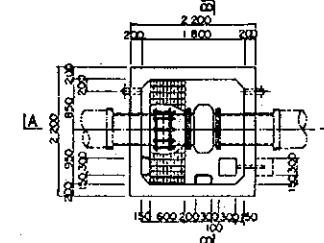
CONCRETE PROTECTION



AIR VALVE

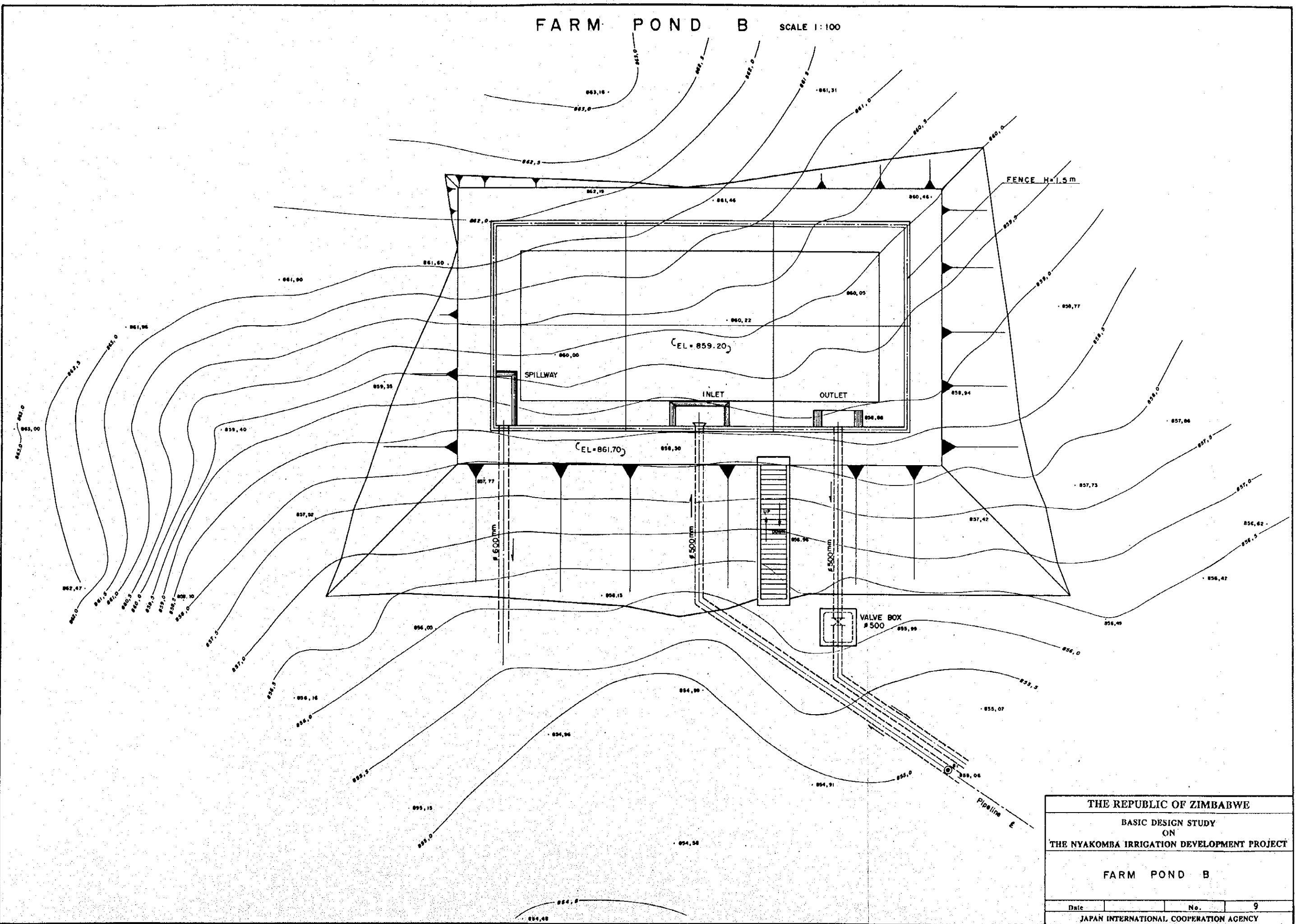


SLUICE VALVE
#400-#500



PIPE	DUCTILE CAST-IRON PIPE #500 L=1656 m																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
PIPE ELEVATION	811.80	813.350	814.90	816.45	818.00	819.55	821.10	822.65	824.20	825.75	827.30	828.85	830.40	831.95	833.50	835.05	836.60	838.15	839.70	841.25	842.80	844.35	845.90	847.45	849.00	850.55	852.10	853.65	855.20	856.75	858.30	859.85	861.40	862.95	864.50	866.05	867.60	869.15	870.70	872.25	873.80	875.35	876.90	878.45	880.00	881.55	883.10	884.65	886.20	887.75	889.30	890.85	892.40	893.95	895.50	897.05	898.60	900.15	901.70	903.25	904.80	906.35	907.90	909.45	911.00	912.55	914.10	915.65	917.20	918.75	920.30	921.85	923.40	924.95	926.50	928.05	929.60	931.15	932.70	934.25	935.80	937.35	938.90	940.45	942.00	943.55	945.10	946.65	948.20	949.75	951.30	952.85	954.40	955.95	957.50	959.05	960.60	962.15	963.70	965.25	966.80	968.35	969.90	971.45	973.00	974.55	976.10	977.65	979.20	980.75	982.30	983.85	985.40	986.95	988.50	990.05	991.60	993.15	994.70	996.25	997.80	999.35	1000.90	1002.45	1004.00	1005.55	1007.10	1008.65	1010.20	1011.75	1013.30	1014.85	1016.40	1017.95	1019.50	1021.05	1022.60	1024.15	1025.70	1027.25	1028.80	1030.35	1031.90	1033.45	1035.00	1036.55	1038.10	1039.65	1041.20	1042.75	1044.30	1045.85	1047.40	1048.95	1050.50	1052.05	1053.60	1055.15	1056.70	1058.25	1059.80	1061.35	1062.90	1064.45	1066.00	1067.55	1069.10	1070.65	1072.20	1073.75	1075.30	1076.85	1078.40	1079.95	1081.50	1083.05	1084.60	1086.15	1087.70	1089.25	1090.80	1092.35	1093.90	1095.45	1097.00	1098.55	1100.10	1101.65	1103.20	1104.75	1106.30	1107.85	1109.40	1110.95	1112.50	1114.05	1115.60	1117.15	1118.70	1120.25	1121.80	1123.35	1124.90	1126.45	1128.00	1129.55	1131.10	1132.65	1134.20	1135.75	1137.30	1138.85	1140.40	1141.95	1143.50	1145.05	1146.60	1148.15	1149.70	1151.25	1152.80	1154.35	1155.90	1157.45	1159.00	1160.55	1162.10	1163.65	1165.20	1166.75	1168.30	1169.85	1171.40	1172.95	1174.50	1176.05	1177.60	1179.15	1180.70	1182.25	1183.80	1185.35	1186.90	1188.45	1190.00	1191.55	1193.10	1194.65	1196.20	1197.75	1199.30	1200.85	1202.40	1203.95	1205.50	1207.05	1208.60	1210.15	1211.70	1213.25	1214.80	1216.35	1217.90	1219.45	1221.00	1222.55	1224.10	1225.65	1227.20	1228.75	1230.30	1231.85	1233.40	1234.95	1236.50	1238.05	1239.60	1241.15	1242.70	1244.25	1245.80	1247.35	1248.90	1250.45	1252.00	1253.55	1255.10	1256.65	1258.20	1259.75	1261.30	1262.85	1264.40	1265.95	1267.50	1269.05	1270.60	1272.15	1273.70	1275.25	1276.80	1278.35	1279.90	1281.45	1283.00	1284.55	1286.10	1287.65	1289.20	1290.75	1292.30	1293.85	1295.40	1296.95	1298.50	1300.05	1301.60	1303.15	1304.70	1306.25	1307.80	1309.35	1310.90	1312.45	1314.00	1315.55	1317.10	1318.65	1320.20	1321.75	1323.30	1324.85	1326.40	1327.95	1329.50	1331.05	1332.60	1334.15	1335.70	1337.25	1338.80	1340.35	1341.90	1343.45	1345.00	1346.55	1348.10	1349.65	1351.20	1352.75	1354.30	1355.85	1357.40	1358.95	1360.50	1362.05	1363.60	1365.15	1366.70	1368.25	1369.80	1371.35	1372.90	1374.45	1376.00	1377.55	1379.10	1380.65	1382.20	1383.75	1385.30	1386.85	1388.40	1389.95	1391.50	1393.05	1394.60	1396.15	1397.70	1399.25	1400.80	1402.35	1403.90	1405.45	1407.00	1408.55	1410.10	1411.65	1413.20	1414.75	1416.30	1417.85	1419.40	1420.95	1422.50	1424.05	1425.60	1427.15	1428.70	1430.25	1431.80	1433.35	1434.90	1436.45	1438.00	1439.55	1441.10	1442.65	1444.20	1445.75	1447.30	1448.85	1450.40	1451.95	1453.50	1455.05	1456.60	1458.15	1459.70	1461.25	1462.80	1464.35	1465.90	1467.45	1469.00	1470.55	1472.10	1473.65	1475.20	1476.75	1478.30	1479.85	1481.40	1482.95	1484.50	1486.05	1487.60	1489.15	1490.70	1492.25	1493.80	1495.35	1496.90	1498.45	1500.00	1501.55	1503.10	1504.65	1506.20	1507.75	1509.30	1510.85	1512.40	1513.95	1515.50	1517.05	1518.60	1520.15	1521.70	1523.25	1524.80	1526.35	1527.90	1529.45	1531.00	1532.55	1534.10	1535.65	1537.20	1538.75	1540.30	1541.85	1543.40	1544.95	1546.50	1548.05	1549.60	1551.15	1552.70	1554.25	1555.80	1557.35	1558.90	1560.45	1562.00	1563.55	1565.10	1566.65	1568.20	1569.75	1571.30	1572.85	1574.40	1575.95	1577.50	1579.05	1580.60	1582.15	1583.70	1585.25	1586.80	1588.35	1589.90	1591.45	1593.00	1594.55	1596.10	1597.65	1599.20	1600.75	1602.30	1603.85	1605.40	1606.95	1608.50	1610.05	1611.60	1613.15	1614.70	1616.25	1617.80	1619.35	1620.90	1622.45	1624.00	1625.55	1627.10	1628.65	1630.20	1631.75	1633.30	1634.85	1636.40	1637.95	1639.50	1641.05	1642.60	1644.15	1645.70	1647.25	1648.80	1650.35	1651.90	1653.45	1655.00	1656.55	1658.10	1659.65	1661.20	1662.75	1664.30	1665.85	1667.40	1668.95	1670.50	1672.05	1673.60	1675.15	1676.70	1678.25	1679.80	1681.35	1682.90	1684.45	1686.00	1687.55	1689.10	1690.65	1692.20	1693.75	1695.30	1696.85	1698.40	1699.95	1701.50	1703.05	1704.60	1706.15	1707.70	1709.25	1710.80	1712.35	1713.90	1715.45	1717.00	1718.55	1720.10	1721.65	1723.20	1724.75	1726.30	1727.85	1729.40	1730.95	1732.50	1734.05	1735.60	1737.15	1738.70	1740.25	1741.80	1743.35	1744.90	1746.45	1748.00	1749.55	1751.10	1752.65	1754.20	1755.75	1757.30	1758.85	1760.40	1761.95	1763.50	1765.05	1766.60	1768.15	1769.70	1771.25	1772.80	1774.35	1775.90	1777.45	1779.00	1780.55	1782.10	1783.65	1785.20	1786.75	1788.30	1789.85	1791.40	1792.95	1794.50	1796.05	1797.60	1799.15	1800.70	1802.25	1803.80	1805.35	1806.90	1808.45	1810.00	1811.55	1813.10	1814.65	1816.20	1817.75	1819.30	1820.85	1822.40	1823.95	1825.50	1827.05	1828.60	1830.15	1831.70	1833.25	1834.80	1836.35	1837.90	1839.45	1841.00	1842.55	1844.10	1845.65	1847.20	1848.75	1850.30	1851.85	1853.40	1854.95	1856.50	1858.05	1859.60	1861.15	1862.70	1864.25	1865.80	1867.35	1868.90	1870.45	1872.00	1873.55	1875.10	1876.65	1878.20	1879.75	1881.30	1882.85	1884.40	1885.95	1887.50	1889.05	1890.60	1892.15	1893.70	1895.25	1896.80	1898.35	1899.90	1901.45	1903.00	1904.55	1906.10	1907.65	1909.20	1910.75	1912.30	1913.85	1915.40	1916.95	1918.50	1920.05	1921.60	1923.15	1924.70	1926.25	1927.80	1929.35	1930.90	1932.45	1934.00	1935.55	1937.10	1938.65	1940.20	1941.75	1943.30	1944.85	1946.40	1947.95	1949.50	1951.05	1952.60	1954.15	1955.70	1957.25	1958.80	1960.35	1961.90	1963.45	1965.00	1966.55	1968.10	1969.65	1971.20	1972.75	1974.30	1975.85	1977.40	1978.95	1980.50	1982.05	1983.60	1985.15	1986.70	1988.25	1989.80	1991.35	1992.90	1994.45	1996.00	1997.55	1999.10	2000.65	2002.20	2003.75	2005.30	2006.85	2008.40	2009.95	2011.50	2013.05	2014.60	2016.15	2017.70	2019.25	2020.80	2022.35	2023.90	2025.45	2027.00	2028.55	2030.10	2031.65	2033.20	2034.75	2036.30	2037.85	2039.40	2040.95	2042.50	2044.05	2045.60	2047.15	2048.70	2050.25	2051.80	2053.35	2054.90	2056.45	2058.00	2059.55	2061.10	2062.65	2064.20	2065.75	2067.30	2068.85	2070.40	2071.95	2073.50	2075.05	2076.60	2078.15	2079.70	2081.25	2082.80	2084.35	2085.90	2087.45	2089.00	2090.55	2092.10	2093.65	2095.20	2096.75	2098.30	2099.85	2101.40	2102.95	2104.50	2106.05	2107.60	2109.15	2110.70	2112.25	2113.80	2115.35	2116.90	2118.45	2120.00	2121.55	2123.10	2124.65	2126.20	2127.75	2129.30	2130.85	2132.40	2133.95	2135.50	2137.05	2138.60	2140.15	2141.70	2143.25	2144.80	2146.35	2147.90	2149.45	2151.00	2152.55	2154.10	2155.65	2157.20	2158.75	2160.30	2161.85	2163.40	2164.95	2166.50	2168.05	2169.60	2171.15	2172.70	2174.25	2175.80	2177.35	2178.90	2180.45	2182.00	2183.55	2185.10	2186.65	2188.20	2189.75	2191.30	2192.85	2194.40	2195.95	2197.50	2199.05	2200.60	2202.15	2203.70	2205.25	2206.80	2208.35	2209.90	2211.45	2213.00	2214.55	2216.10	2217.65	2219.20	2220.75	2222.30	2223.85	2225.40	2226.95	2228.50	2230.05	2231.60	2233.15	2234.70	2236.25	2237.80	2239.35	2240.90	2242.45	2244.00	2245.55	2247.10	2248.65	2250.20	2251.75	2253.30	2254.85	2256.40	2257.95	2259.50	2261.05	2262.60	2264.15	2265.70	2267.25	2268.80	2270.35	2271.90	2273.45	2275.00	2276.55	2278.10	2279.65	2281.20	2282.75	2284.30	2285.85	2287.40	228

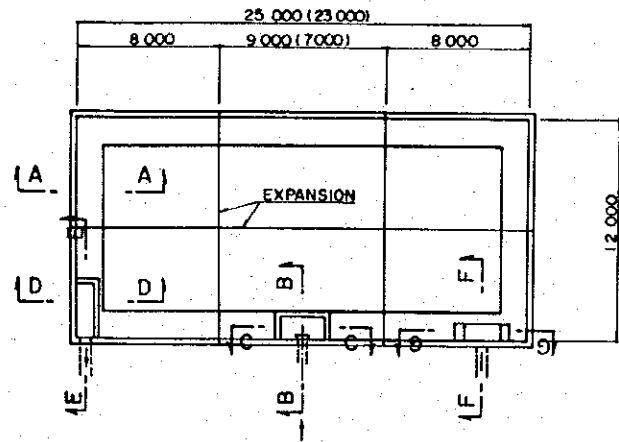
FARM POND B SCALE 1:100



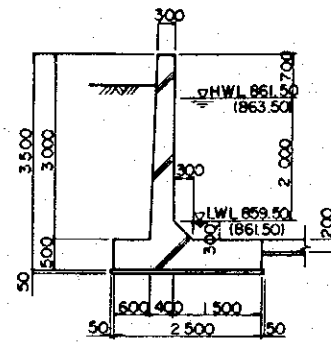
THE REPUBLIC OF ZIMBABWE			
BASIC DESIGN STUDY ON THE NYAKOMBA IRRIGATION DEVELOPMENT PROJECT			
FARM POND B			
Date		No.	9
JAPAN INTERNATIONAL COOPERATION AGENCY			

FARM POND

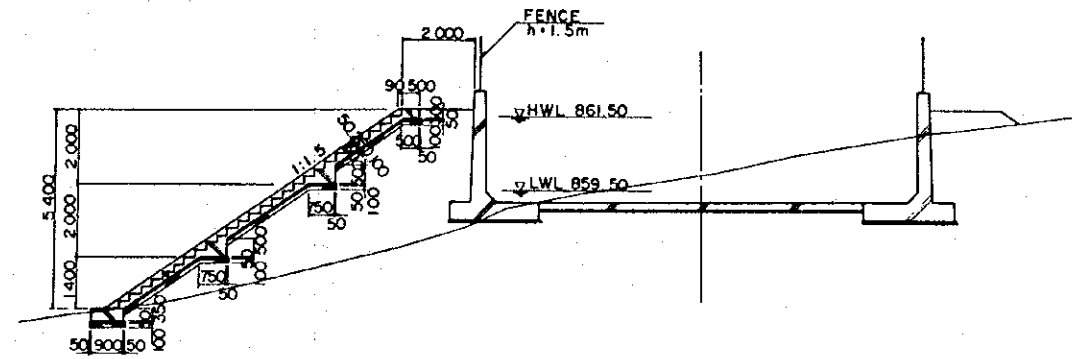
PLAN SCALE 1:200



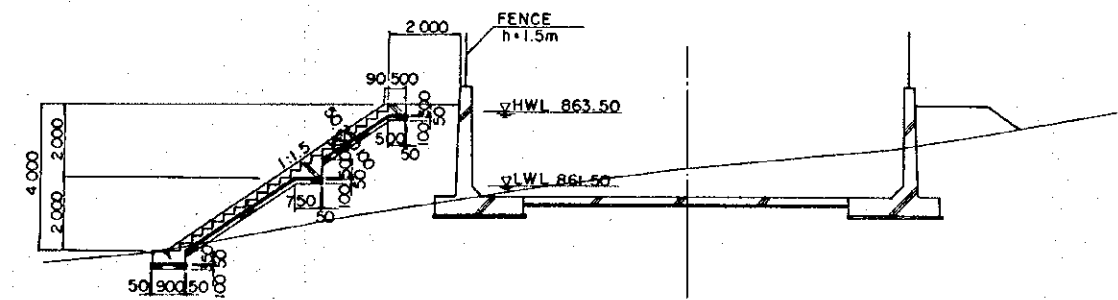
SECTION A-A SCALE 1:60



STAIR CASE SECTION (FARM POND B) SCALE 1:100



STAIR CASE SECTION (FARM POND C) SCALE 1:100

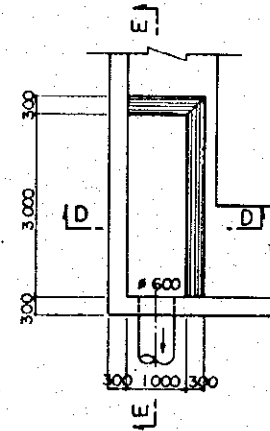
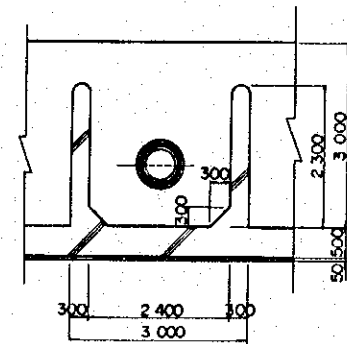
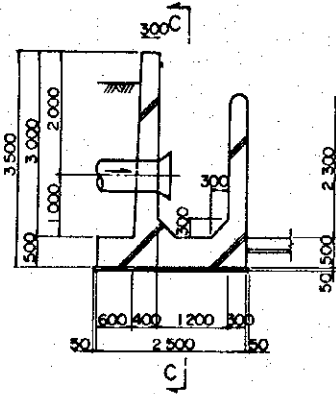


INLET SCALE 1:60

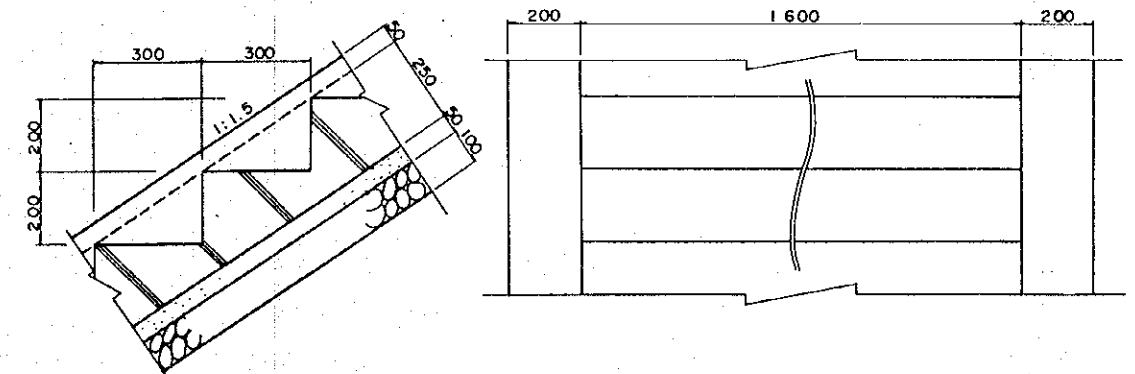
SPILL WAY SCALE 1:60

SECTION B-B

SECTION C-C



STAIR CASE DETAIL SCALE 1:10



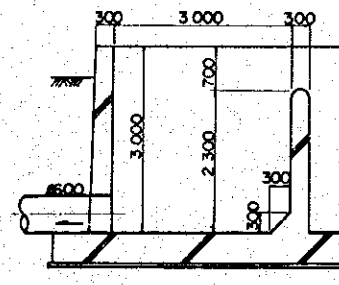
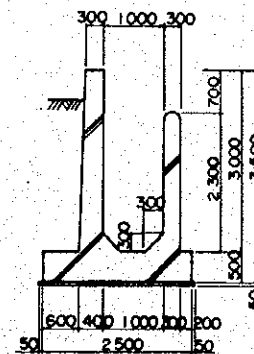
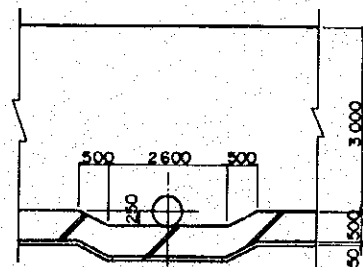
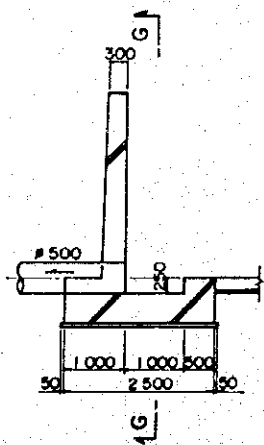
OUTLET SCALE 1:60

SECTION F-F

SECTION G-G

SECTION D-D

SECTION E-E



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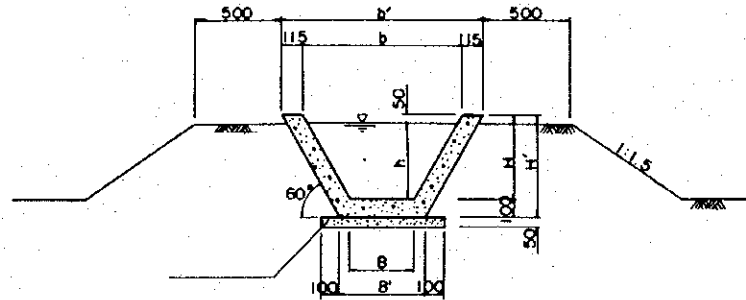
DETAILS OF FARM POND

Date _____ No. 10
JAPAN INTERNATIONAL COOPERATION AGENCY

IRRIGATION FACILITIES (1/3)

IRRIGATION CANAL SCALE 1:20

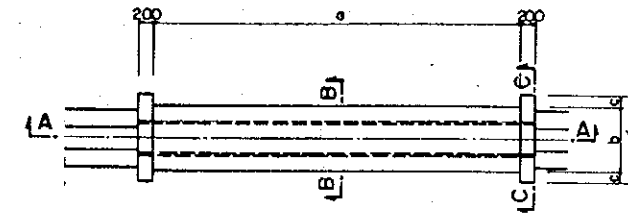
TYPICAL SECTION



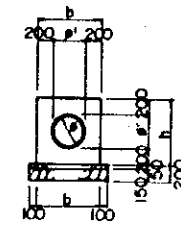
	B	B'	b	b'	H	H'	h
Type B	350	465	870	1100	450	550	400
Type C	300	415	762	992	400	500	350
Type D	250	364	654	884	350	450	300
Type E	200	314	546	776	300	400	250

CANAL CROSS CULVERT (ENTRANCE WORKS) SCALE 1:50

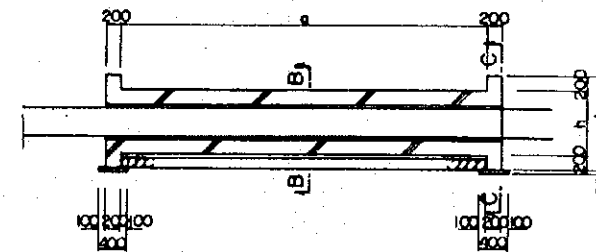
PLAN



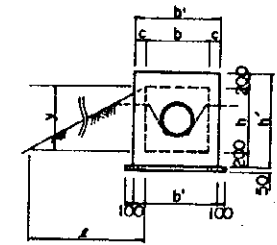
SECTION B - B



SECTION A - A



SECTION C - C

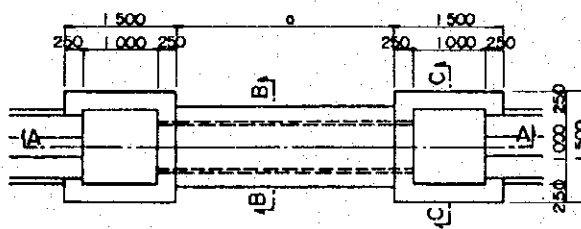


Canal Cross Culvert (Irrigation)
(Entrance Works)

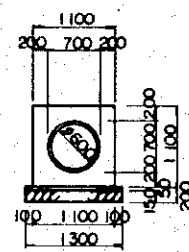
Canal Type	a	#	b	c	b'	#	h	h'	y	l	(l)
Type 1-3 B(B=350)	3,000	450	926	172	1,270	526	926	1,326	938	7,817	38
Type 1-5 B(B=350)	5,000	450	926	172	1,270	526	926	1,326	938	7,817	38
Type 2-3 C(B=300)	3,000	400	870	146	1,162	470	870	1,270	885	7,375	35
Type 2-5 C(B=300)	5,000	400	870	146	1,162	470	870	1,270	885	7,375	35
Type 3-3 D(B=250)	3,000	350	814	120	1,054	414	814	1,214	832	6,933	32
Type 3-5 D(B=250)	5,000	350	814	120	1,054	414	814	1,214	832	6,933	32
Type 4-3 E(B=200)	3,000	300	760	93	945	360	760	1,160	780	6,500	30
Type 4-5 E(B=200)	5,000	300	760	93	945	360	760	1,160	780	6,500	30

ROAD CROSS SIPHON SCALE 1:50

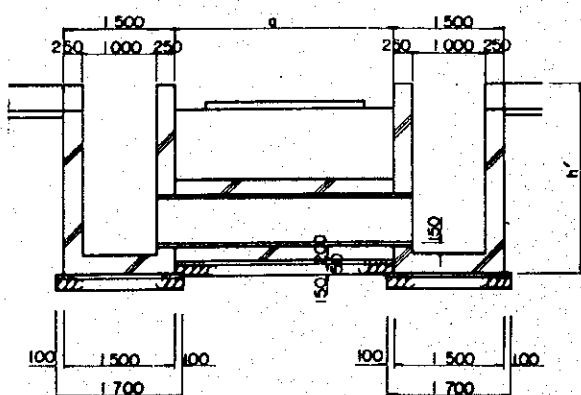
PLAN



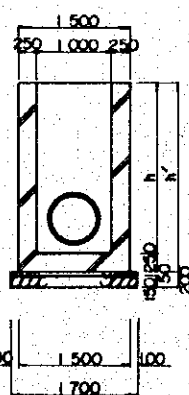
SECTION B - B



SECTION A - A



SECTION C - C

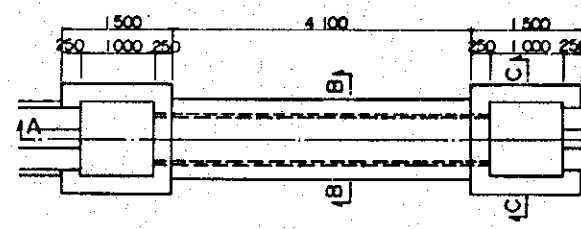


Road Cross Siphon (Irrigation)

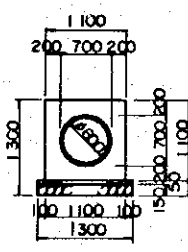
Type	a	#	h	h'	(l)
Type 1	3,000	600	2,400	2,650	50
Type 2	7,000	600	2,400	2,650	50
Type 3	10,000	600	3,150	3,400	50
Type 4	15,000	600	3,150	3,400	50
Type 5	19,000	600	3,150	3,400	50

CANAL CROSS SIPHON SCALE 1:50

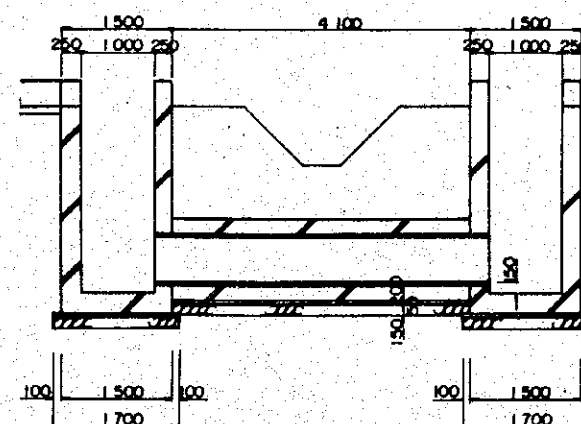
PLAN



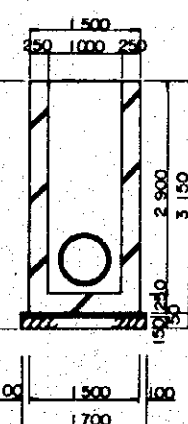
SECTION B - B



SECTION A - A



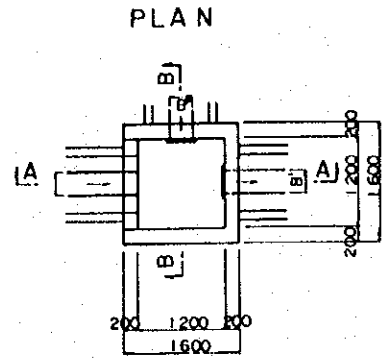
SECTION C - C



THE REPUBLIC OF ZIMBABWE			
BASIC DESIGN STUDY ON THE NYAKOMBA IRRIGATION DEVELOPMENT PROJECT			
IRRIGATION FACILITIES (1/3)			
Date		No.	11
JAPAN INTERNATIONAL COOPERATION AGENCY			

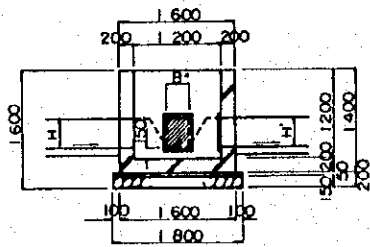
IRRIGATION FACILITIES (2/3)

DIVISION WORKS SCALE 1:50

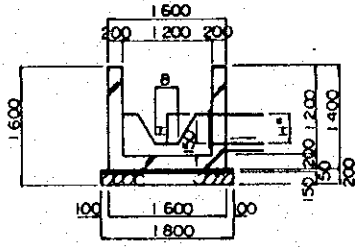


	B	H	B'	H'	GATE	B"	H"	GATE
TYPE 2	300	400	300	400	300x400 x 1	300	400	300x400 x 1
3	350	450	350	450	350x450 x 1	350	450	350x450 x 1
4	350	450	350	450	350x450 x 1	200	300	200x300 x 1
5	350	450	350	450	350x450 x 1	300	400	300x400 x 1
6	350	450	300	400	300x400 x 1	250	350	250x350 x 1
7	350	450	300	400	300x400 x 1	300	400	300x400 x 1
8	350	450	350	450	350x450 x 1	250	350	250x350 x 1
9	300	400	250	350	250x350 x 1	250	350	250x350 x 1

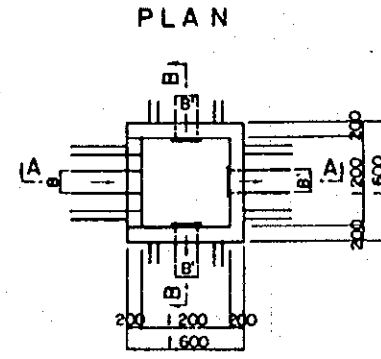
SECTION A-A



SECTION B-B

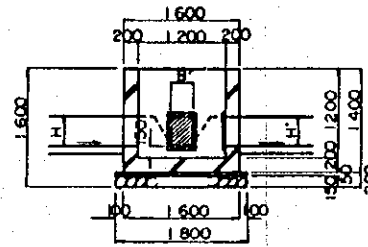


DIVISION WORKS SCALE 1:50

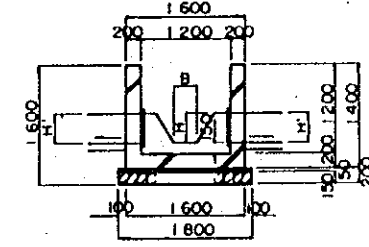


	B	H	B'	H'	GATE
TYPE I	300	400	300	400	300x400 x 3
TYPE IO	300	400	250	350	250x350 x 3

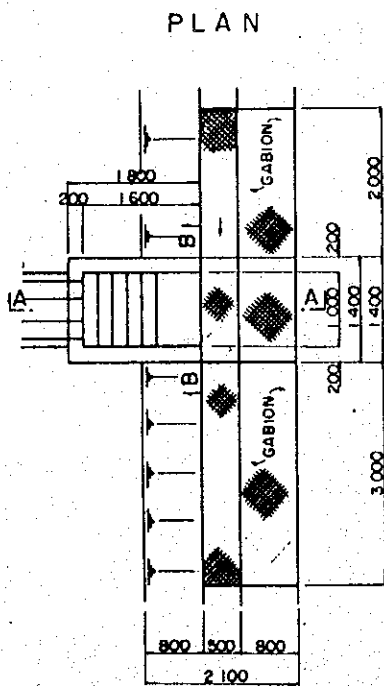
SECTION A-A



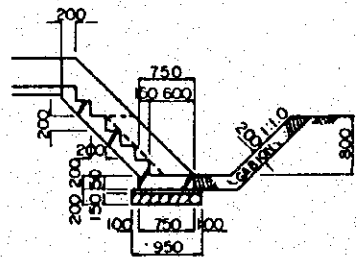
SECTION B-B



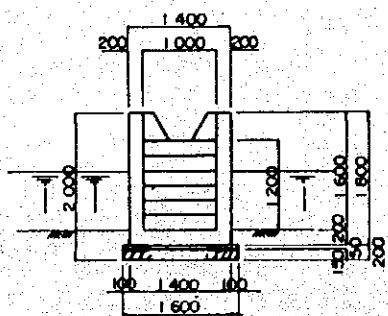
CHUTE SCALE 1:50



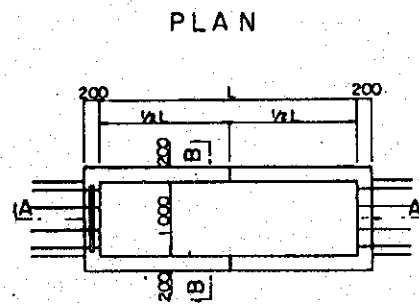
SECTION A-A



SECTION B-B

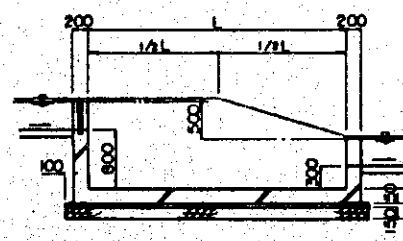


DROP SCALE 1:50

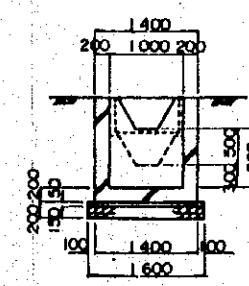


	L
Type B	3500
Type C	3500
Type D	3000
Type E	3000

SECTION A-A

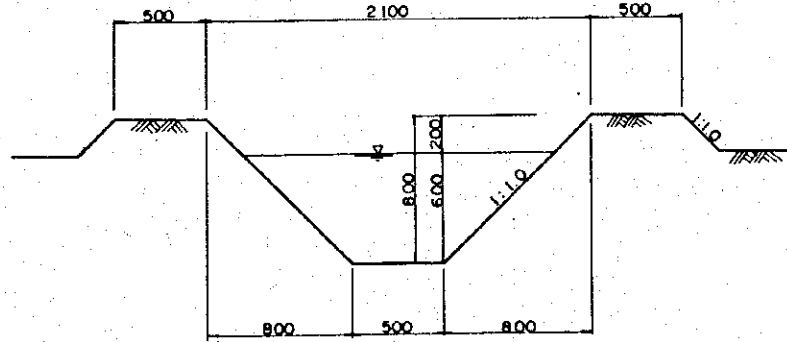


SECTION B-B

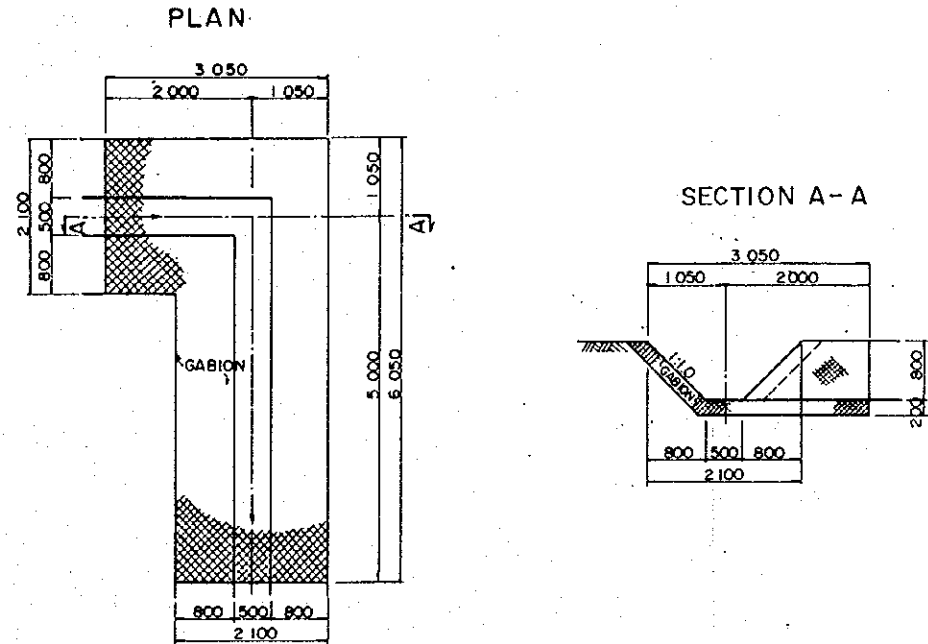


DRAINAGE FACILITIES (1/2)

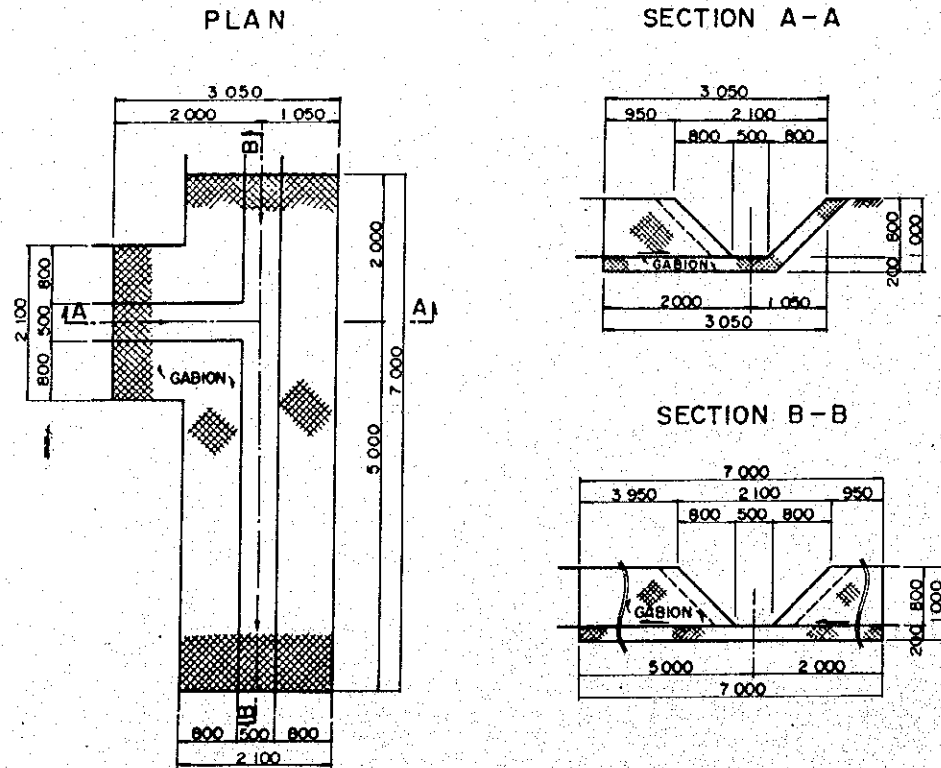
DRAINAGE CANAL TYPICAL SECTION SCALE 1:20



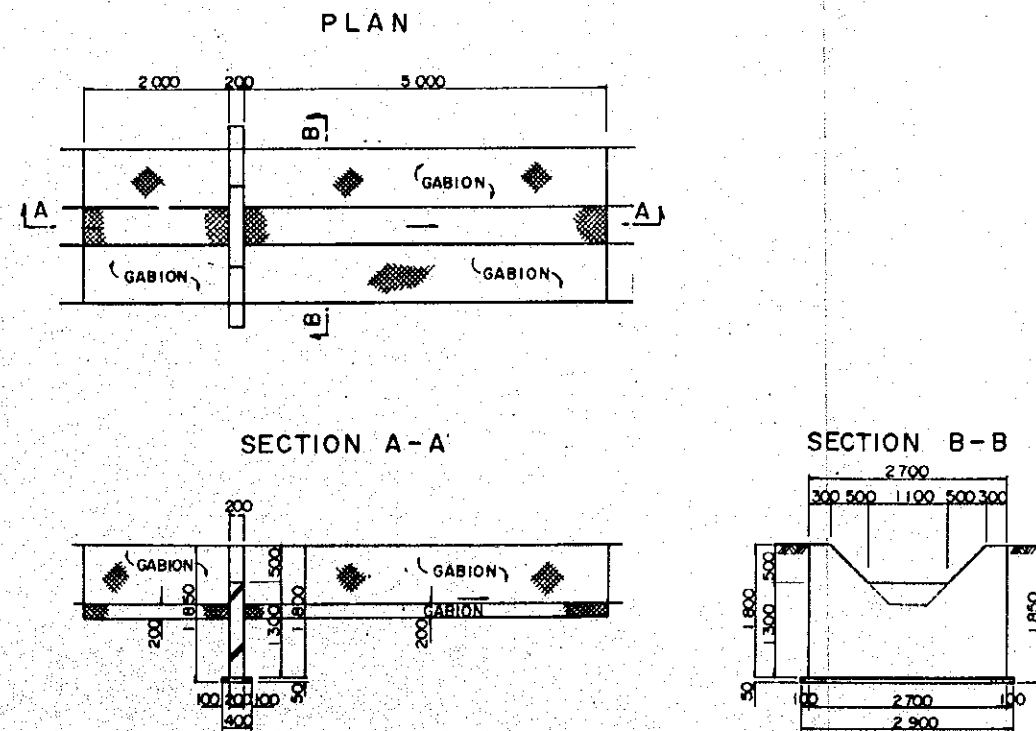
SLOPE PROTECTION SCALE 1:50



CONFLUENT FACILITIES SCALE 1:50



GROUND SILL SCALE 1:50

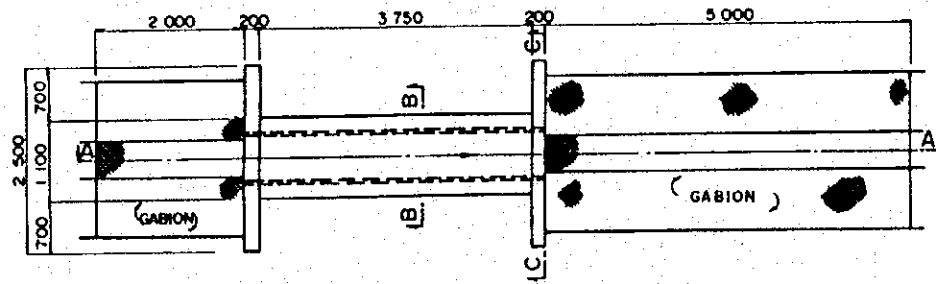


THE REPUBLIC OF ZIMBABWE			
BASIC DESIGN STUDY ON THE NYAKOMBA IRRIGATION DEVELOPMENT PROJECT			
DRAINAGE FACILITIES (1/2)			
Date	No.	14	
JAPAN INTERNATIONAL COOPERATION AGENCY			

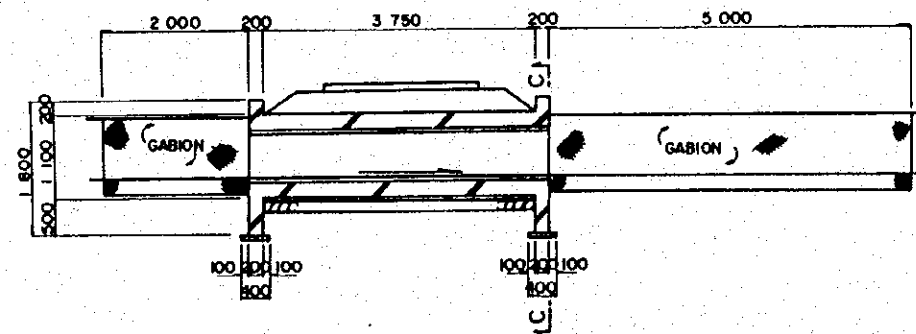
DRAINAGE FACILITIES (2/2)

ROAD CROSS CULVERT SCALE 1:50

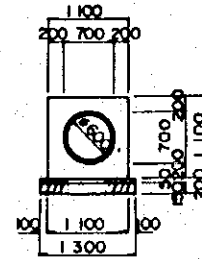
PLAN



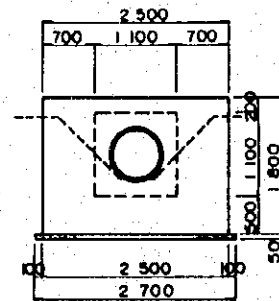
SECTION A - A



SECTION B - B

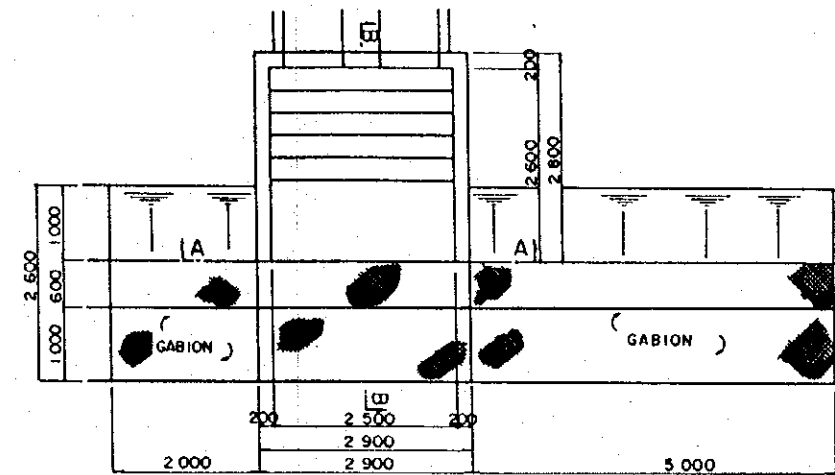


SECTION C - C

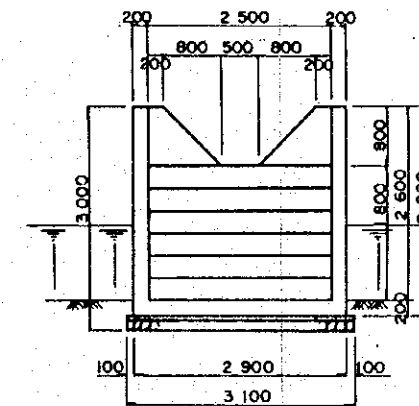


CHUTE SCALE 1:50

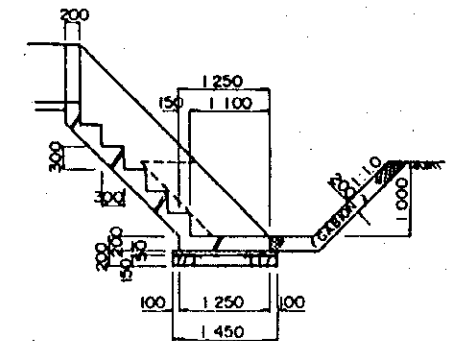
PLAN



SECTION A - A

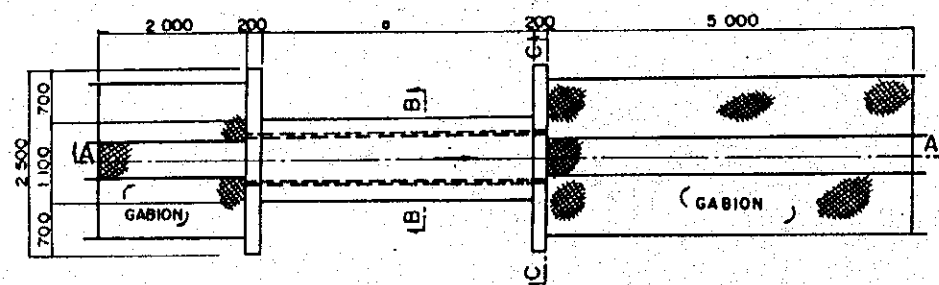


SECTION B - B

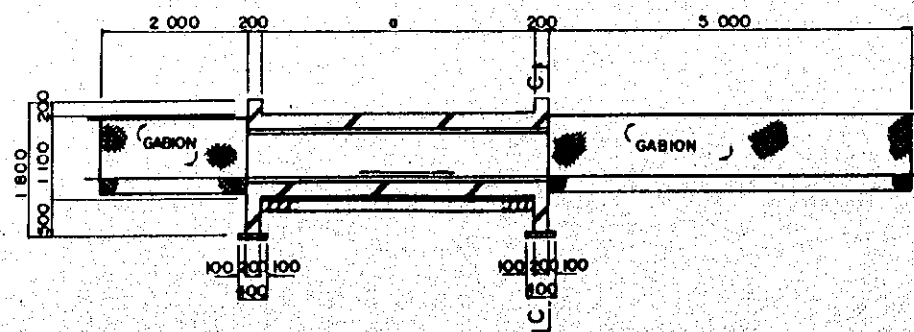


CANAL CROSS CULVERT (ENTRANCE WORKS) SCALE 1:50

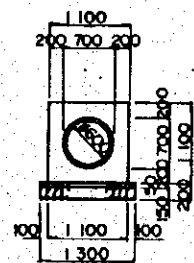
PLAN



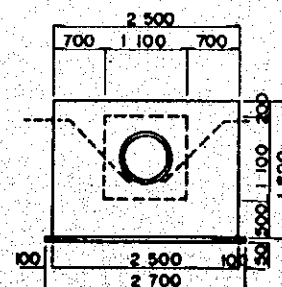
SECTION A - A



SECTION B - B



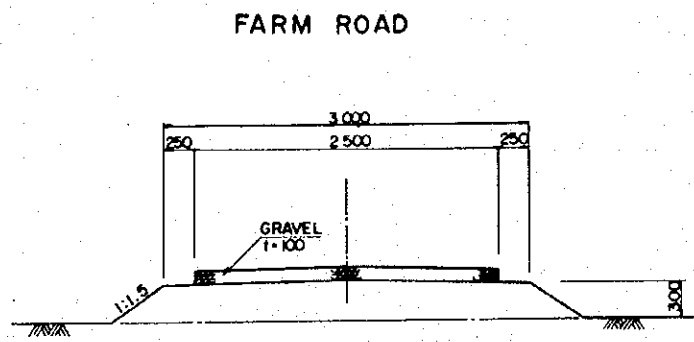
SECTION C - C



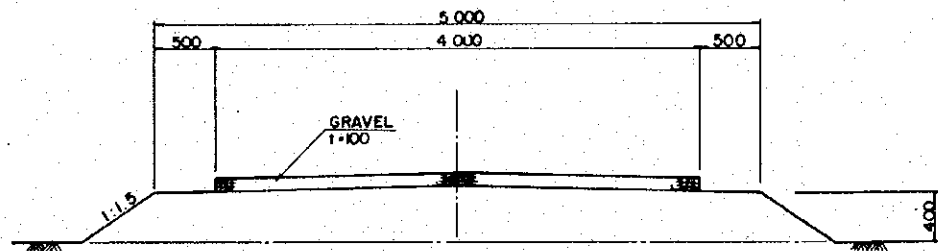
Canal Cross Culvert (Drainage)
(Entrance Works)

	Flood Type	a	#
Type 1	b=3	3,000	600
Type 2	b=5	5,000	600

FARM ROAD TYPICAL SECTION SCALE 1:30

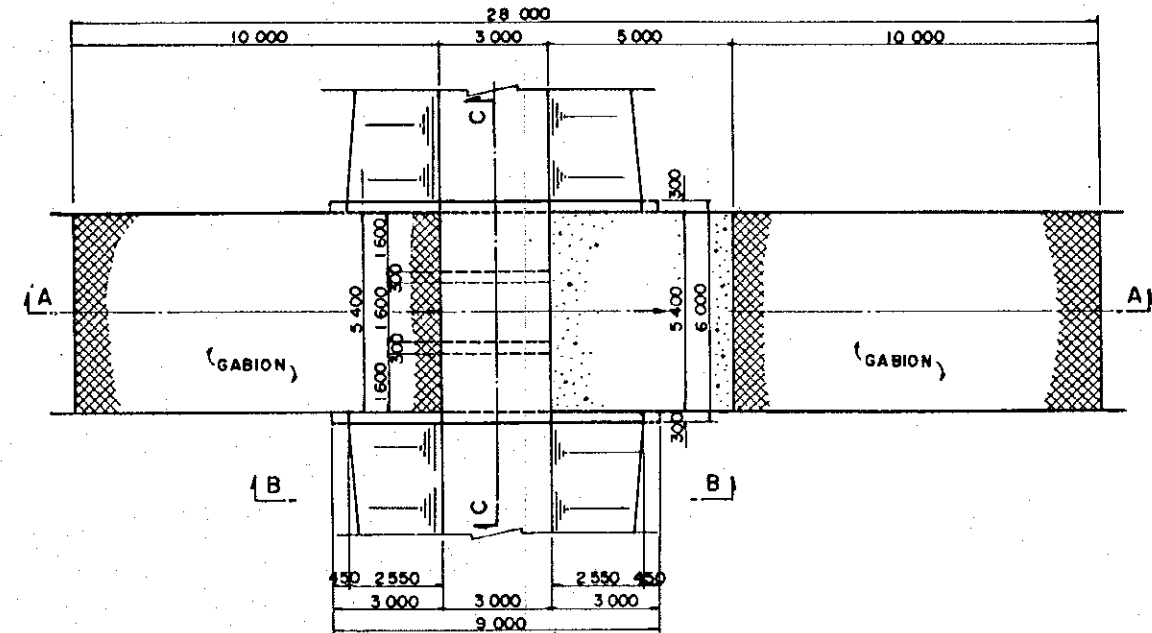


SECONDARY ROAD

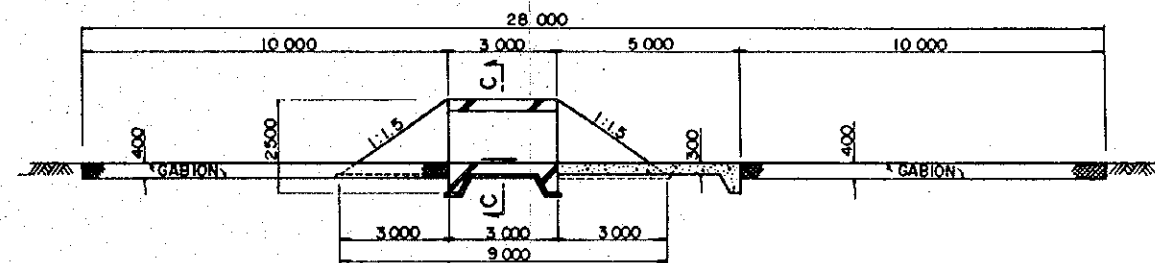


BOX CULVERT SCALE 1:100

PLAN

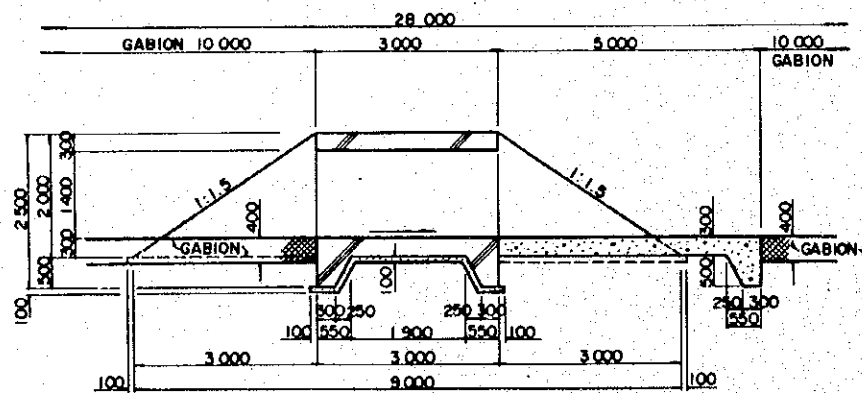


SECTION A-A

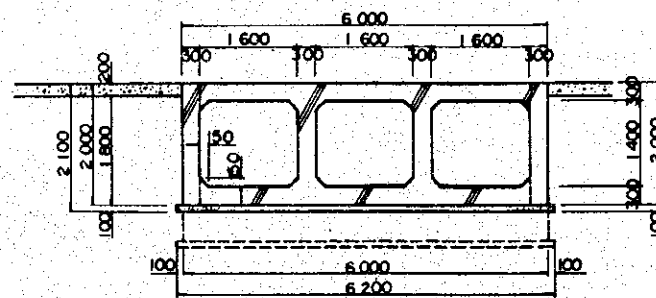


BOX CULVERT DETAIL SCALE 1:60

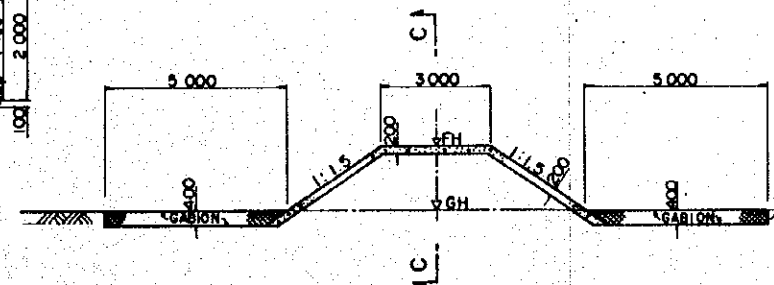
SECTION A-A



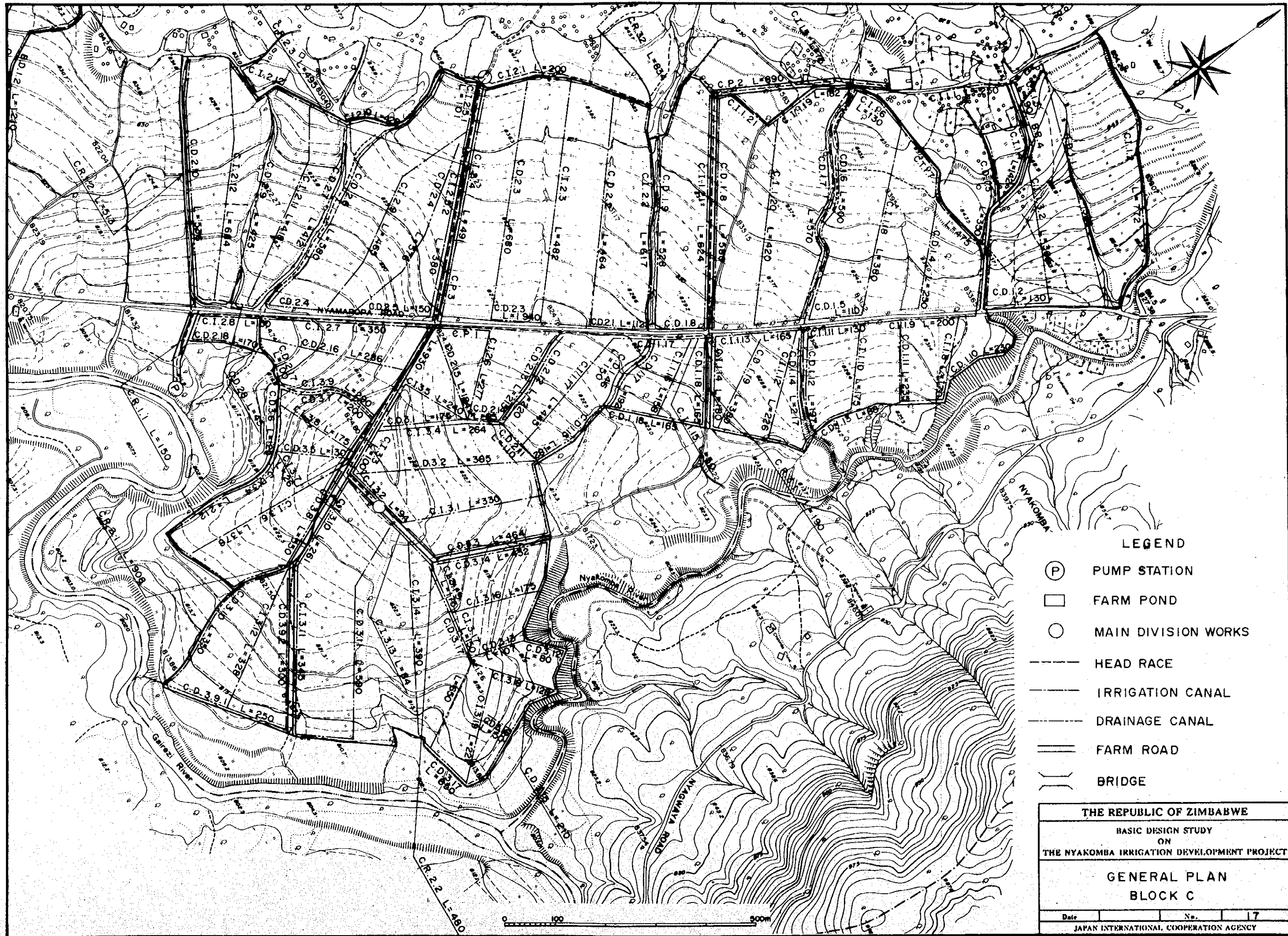
SECTION C-C



SECTION B-B
FARM ROAD PROTECTION



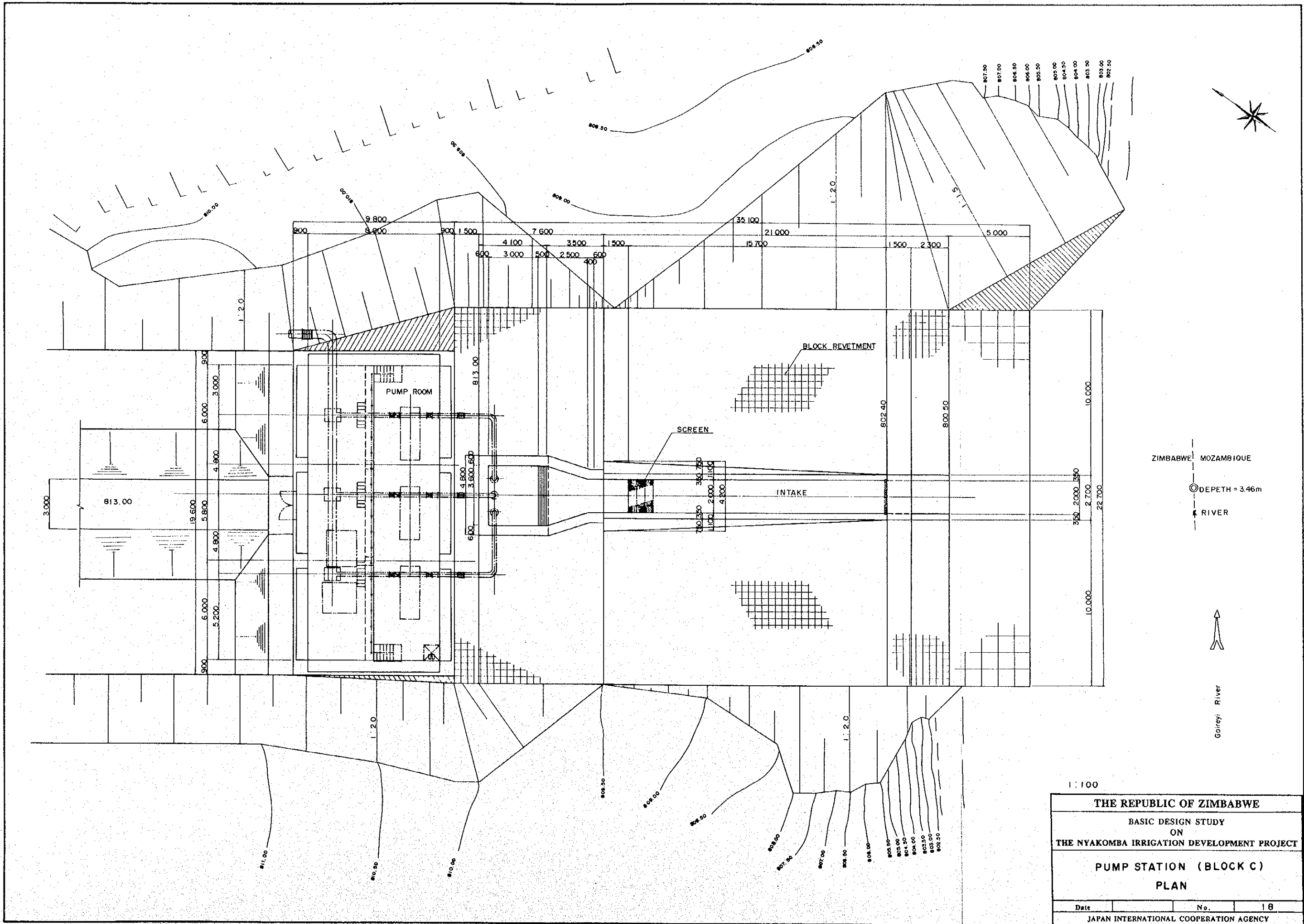
THE REPUBLIC OF ZIMBABWE		
BASIC DESIGN STUDY ON THE NYAKOMBA IRRIGATION DEVELOPMENT PROJECT		
FARM ROADS		
Date	No.	16
JAPAN INTERNATIONAL COOPERATION AGENCY		



LEGEND

- (P) PUMP STATION
- FARM POND
- MAIN DIVISION WORKS
- HEAD RACE
- IRRIGATION CANAL
- DRAINAGE CANAL
- == FARM ROAD
- || BRIDGE

THE REPUBLIC OF ZIMBABWE			
BASIC DESIGN STUDY ON			
THE NYAKOMBA IRRIGATION DEVELOPMENT PROJECT			
GENERAL PLAN BLOCK C			
Date		No.	17
JAPAN INTERNATIONAL COOPERATION AGENCY			



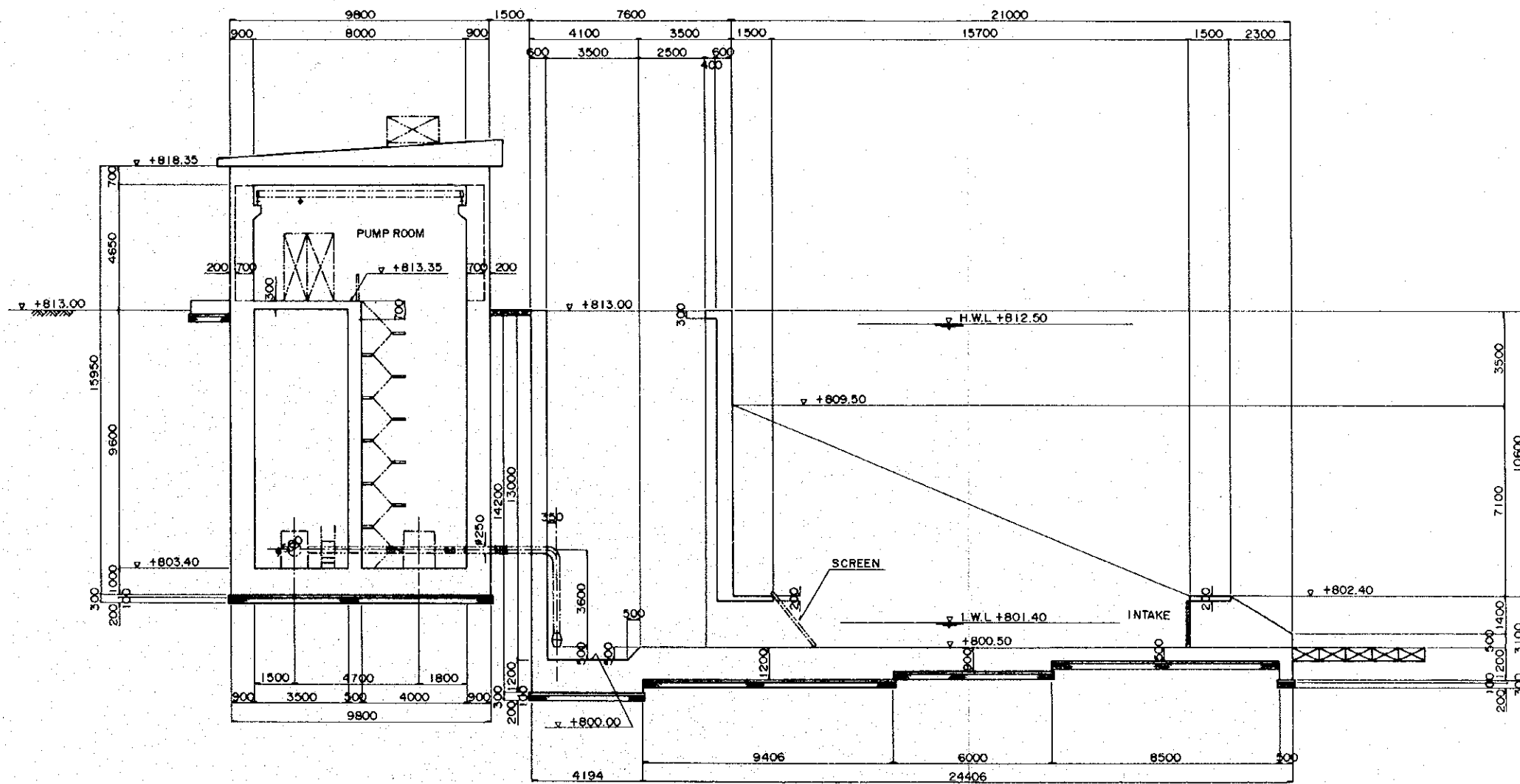
1:100

THE REPUBLIC OF ZIMBABWE

BASIC DESIGN STUDY
ON
THE NYAKOMBA IRRIGATION DEVELOPMENT PROJECT

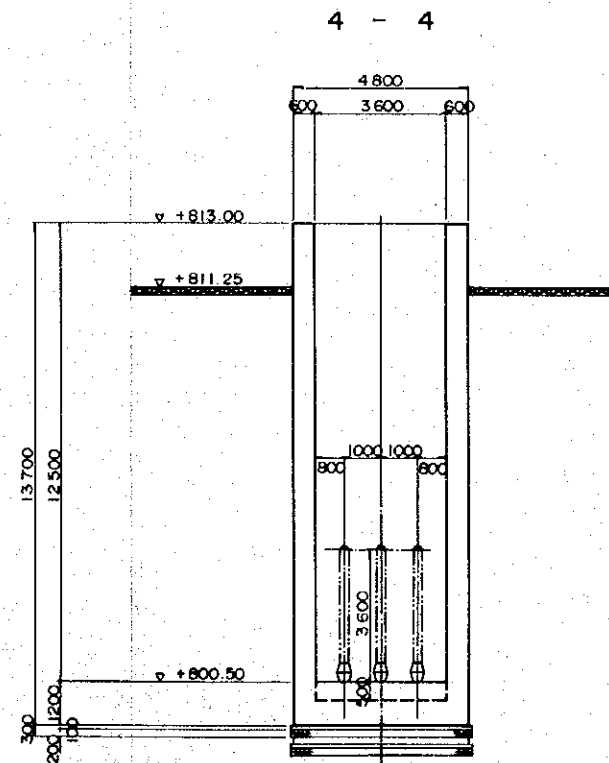
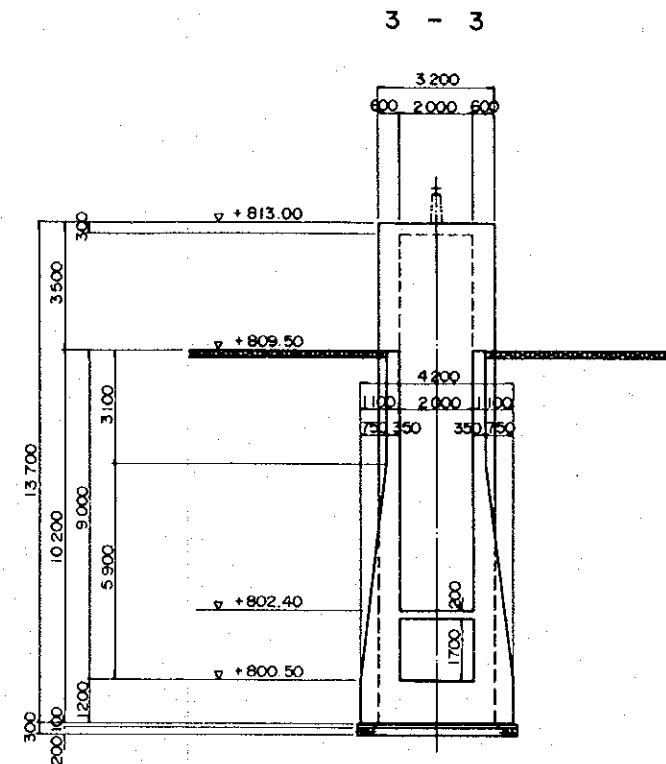
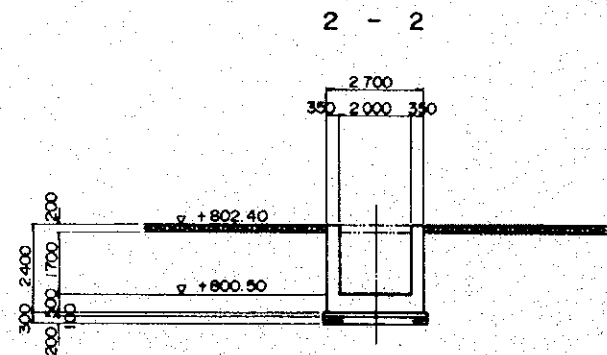
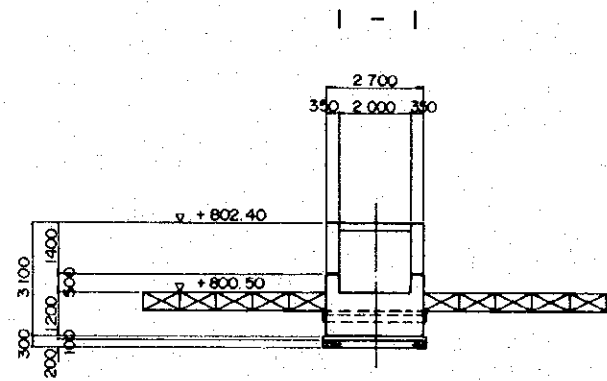
PUMP STATION (BLOCK C)
PLAN

Date	No.	18
JAPAN INTERNATIONAL COOPERATION AGENCY		



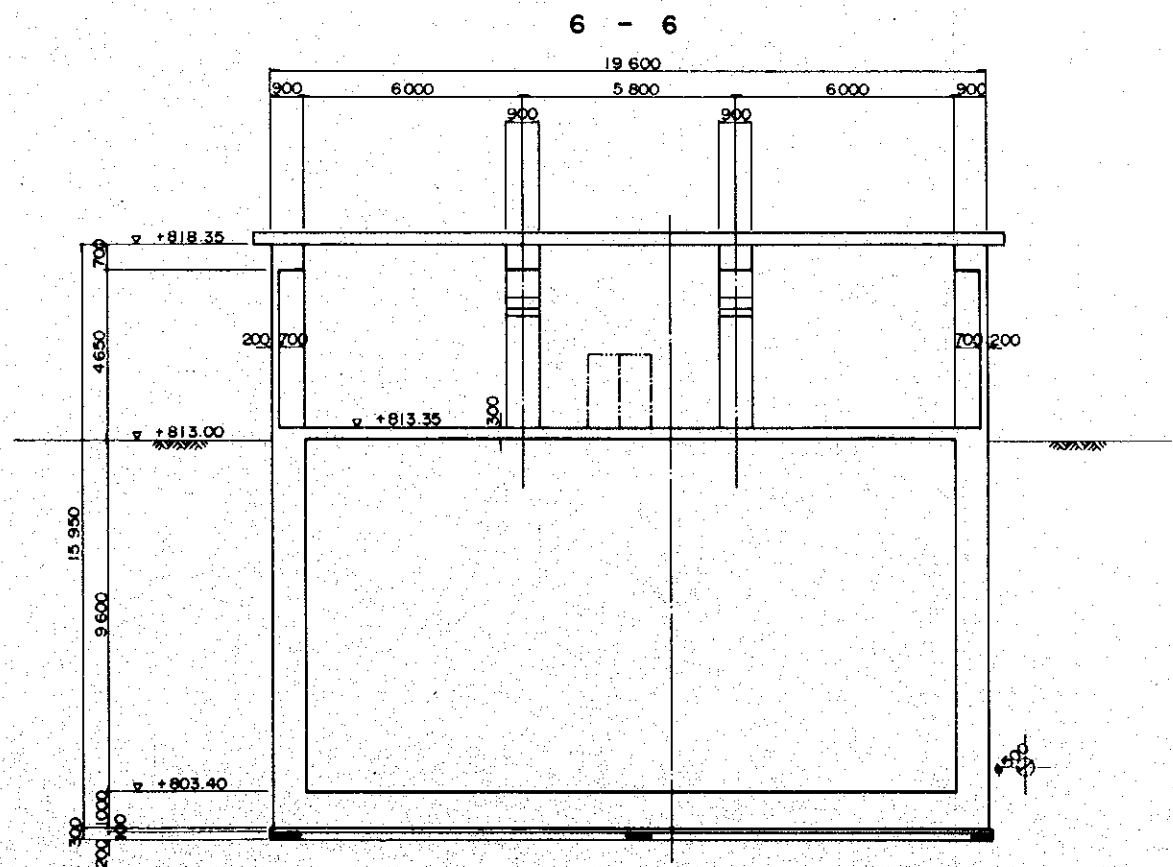
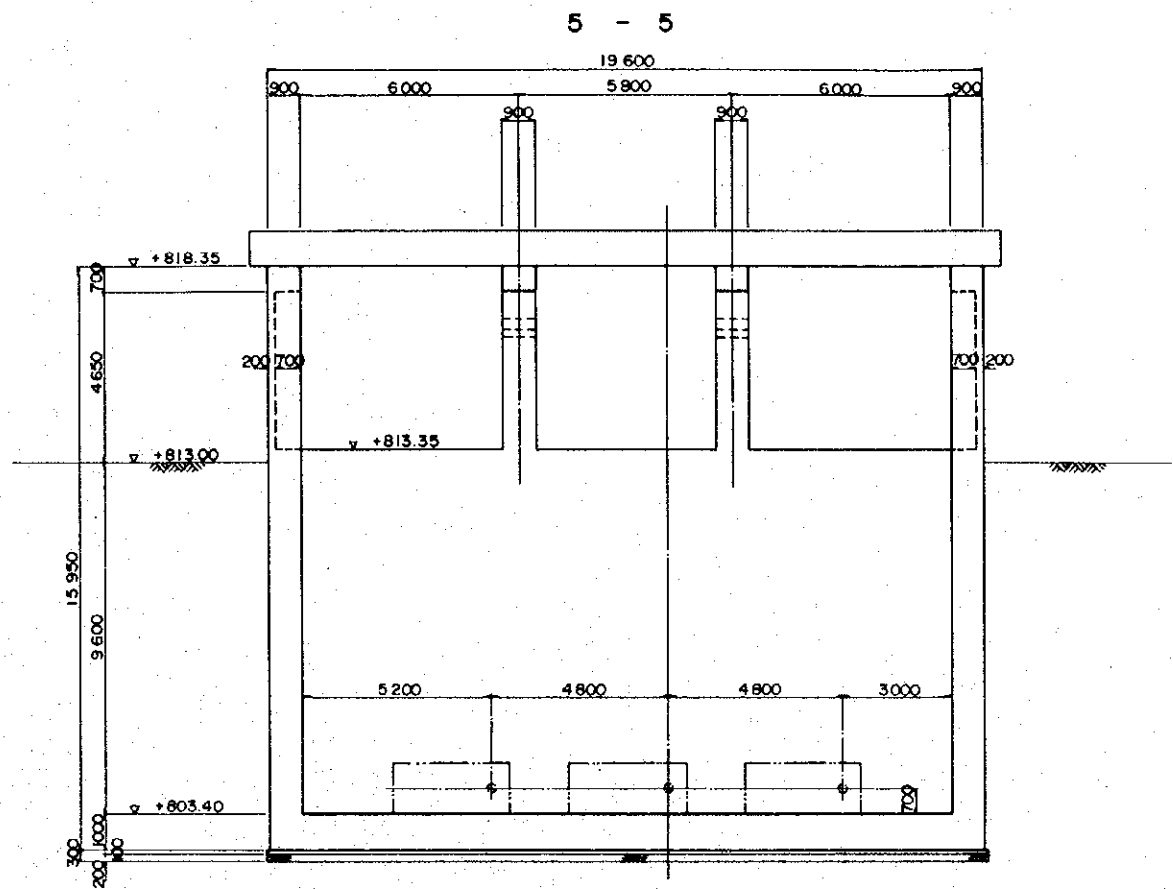
1:100

THE REPUBLIC OF ZIMBABWE			
BASIC DESIGN STUDY ON THE NYAKOMBA IRRIGATION DEVELOPMENT PROJECT			
PUMP STATION (BLOCK C) SECTION			
Date	No.	19	
JAPAN INTERNATIONAL COOPERATION AGENCY			



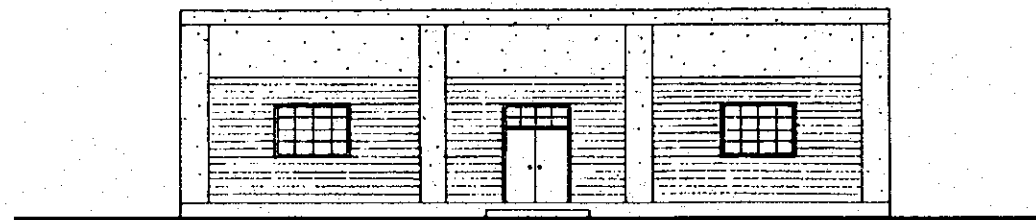
1:100

THE REPUBLIC OF ZIMBABWE			
BASIC DESIGN STUDY			
ON			
THE NYAKOMBA IRRIGATION DEVELOPMENT PROJECT			
PUMP STATION (BLOCK C)			
STRUCTURES (I)			
Date		No.	20
JAPAN INTERNATIONAL COOPERATION AGENCY			

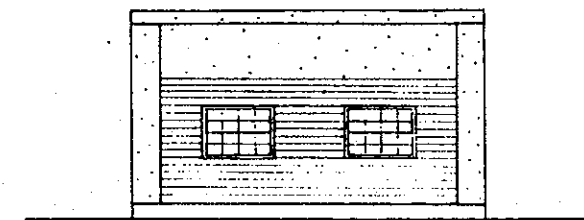


1:100

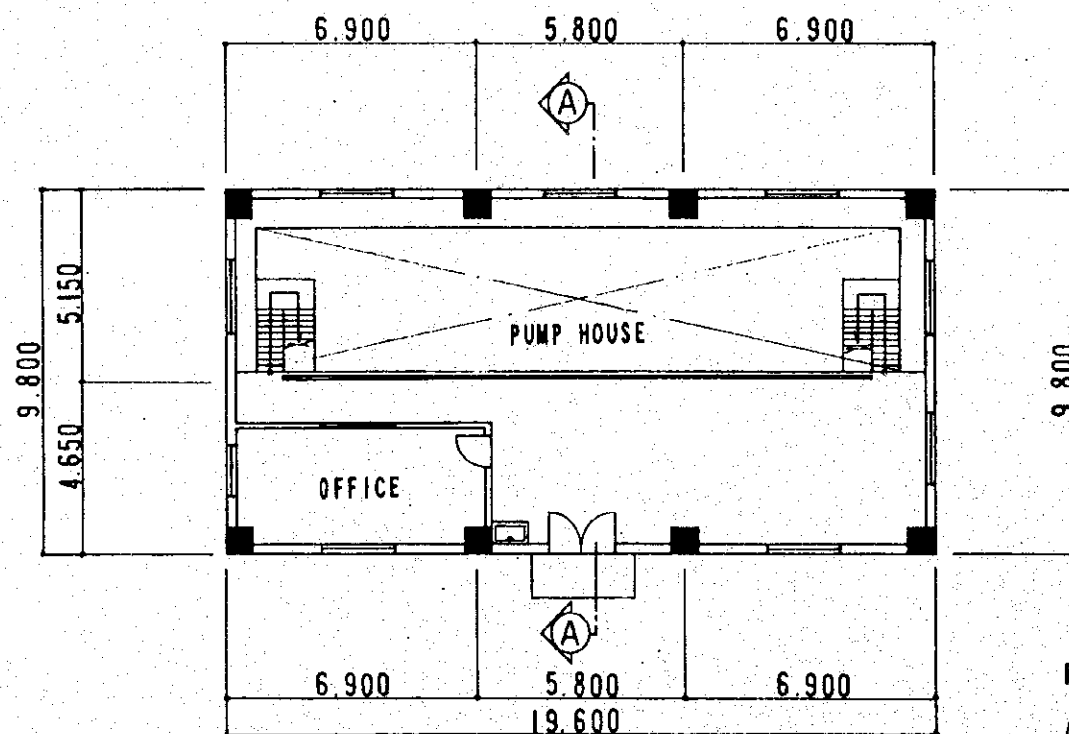
THE REPUBLIC OF ZIMBABWE			
BASIC DESIGN STUDY ON			
THE NYAKOMBA IRRIGATION DEVELOPMENT PROJECT			
PUMP STATION (BLOCK C)			
STRUCTURES (2)			
Date		No.	21
JAPAN INTERNATIONAL COOPERATION AGENCY			



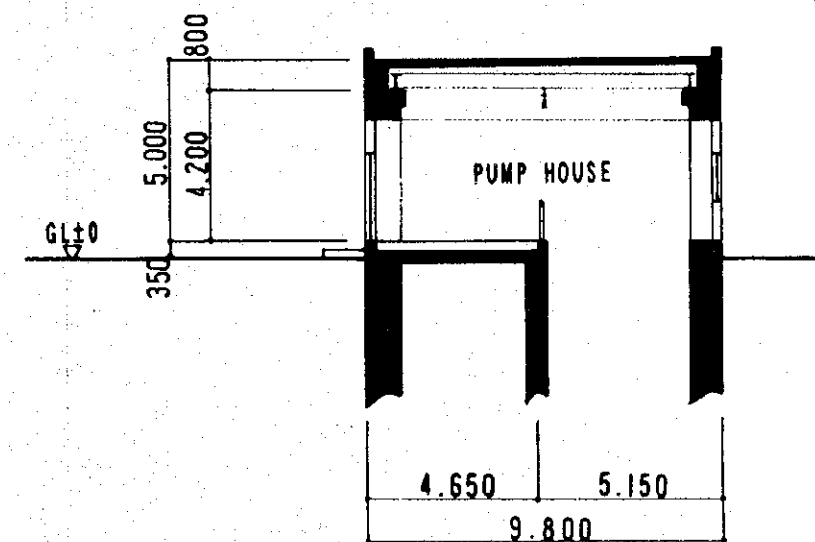
WEST ELEVATION



SOUTH ELEVATION



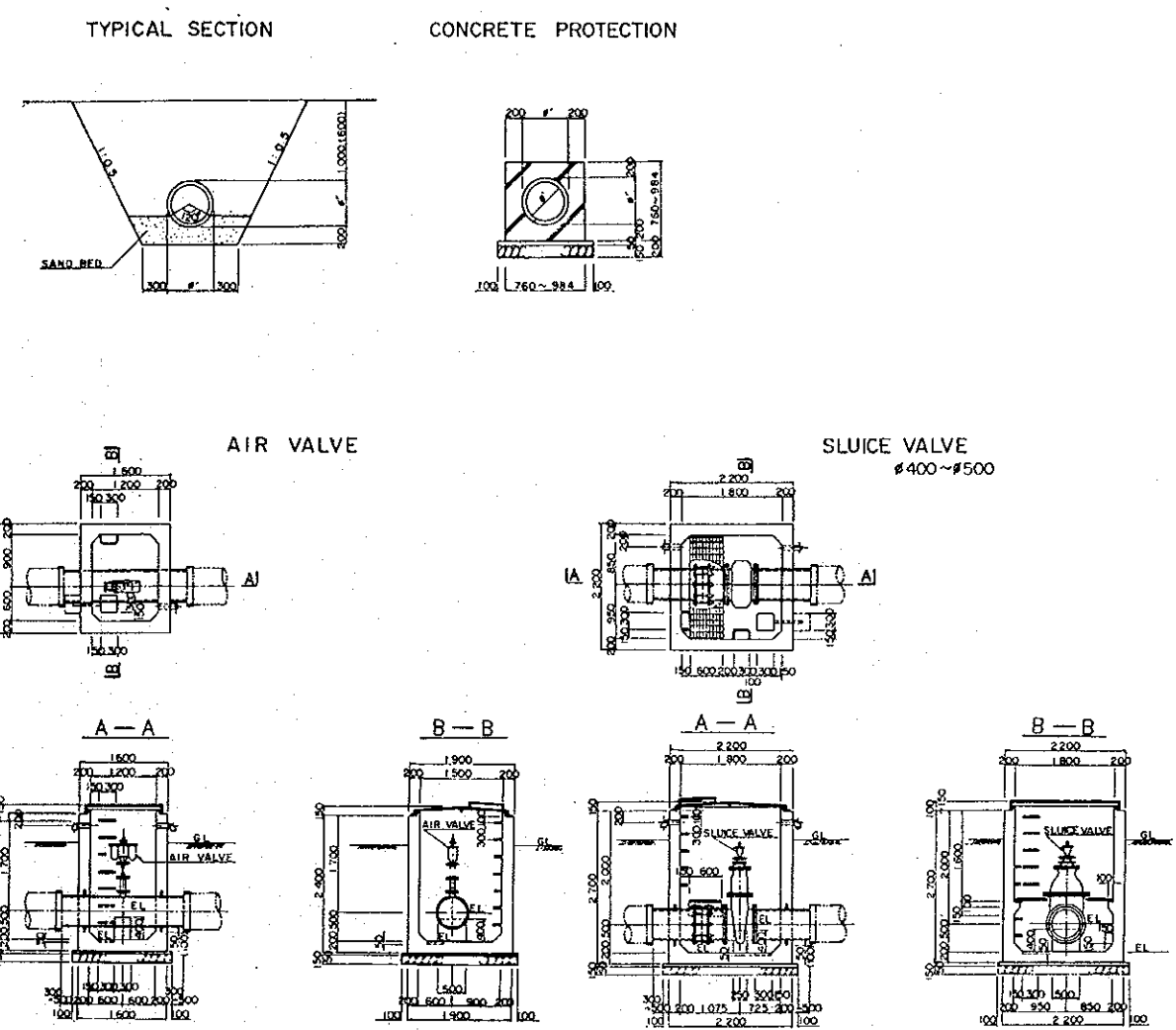
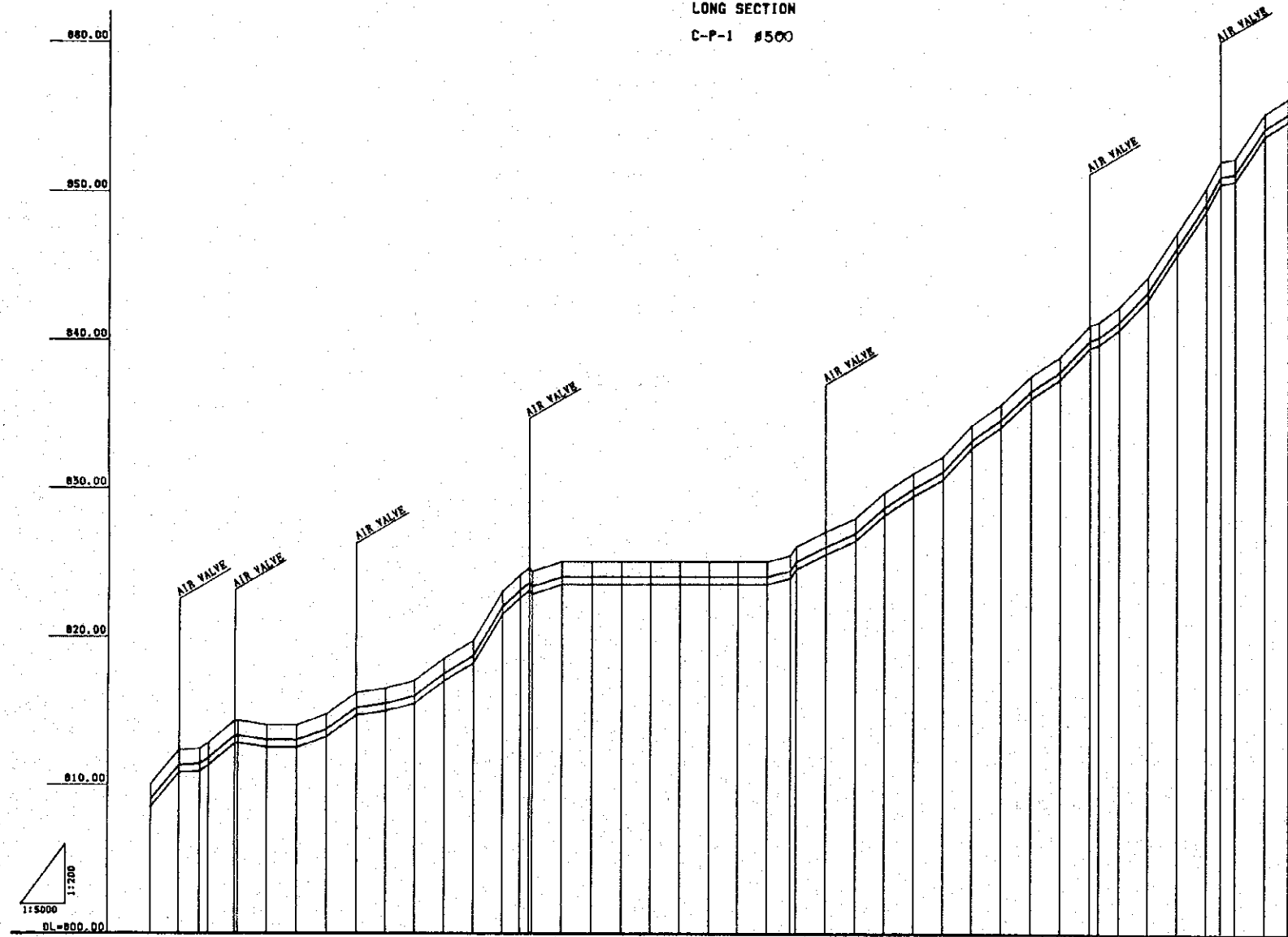
FLOOR PLAN
(B) (C) BLOCK



SECTION A-A

THE REPUBLIC OF ZIMBABWE			
BASIC DESIGN STUDY ON THE NYAKOMBA IRRIGATION DEVELOPMENT PROJECT			
PUMP STATION HOUSE			
Date	No.	22	
JAPAN INTERNATIONAL COOPERATION AGENCY			

LONG SECTION
C-P-1 #500

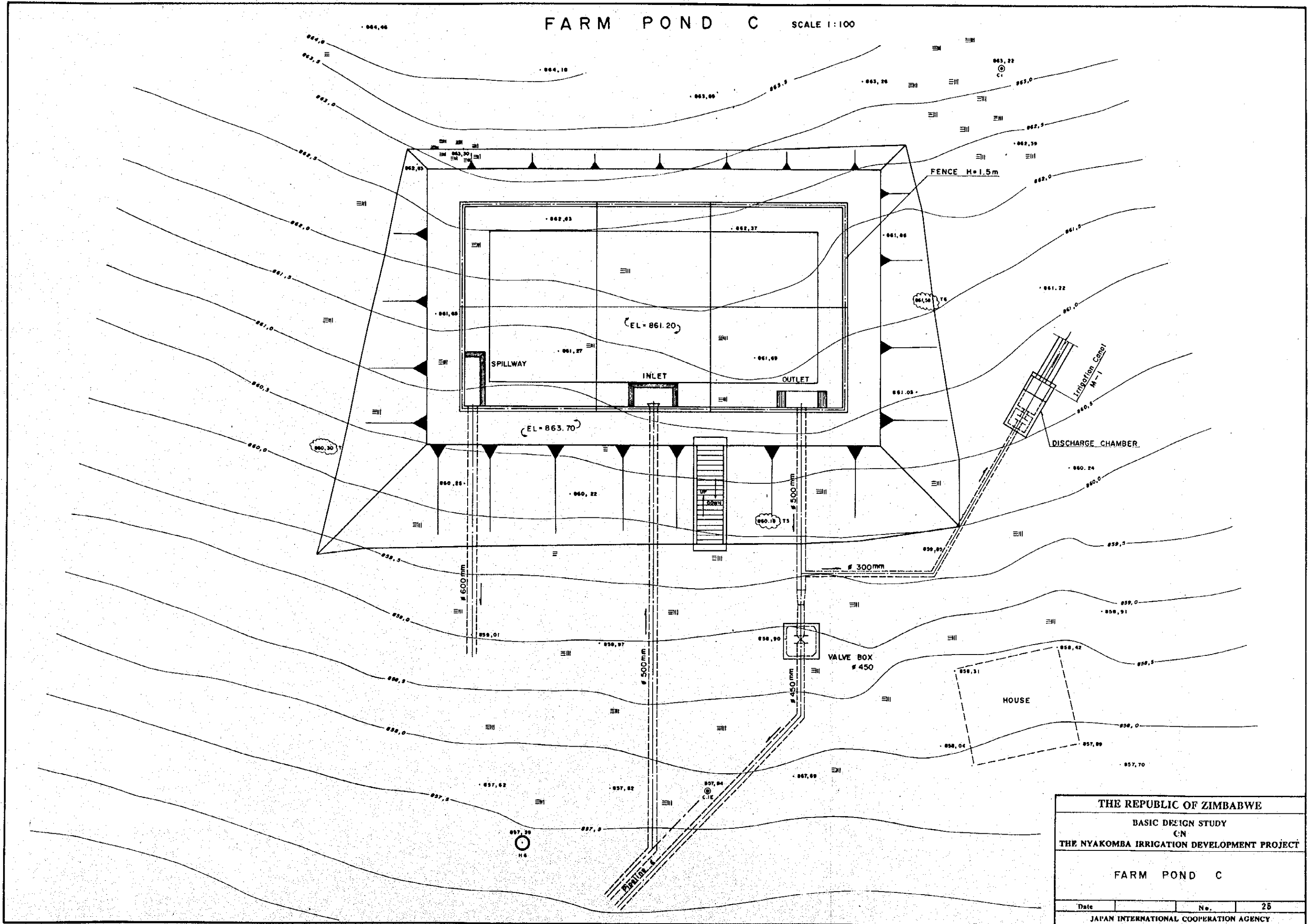


PIPE	DUCTILE CAST-IRON PIPE #500 L=1941m	
PIPE ELEVATION	810.750	840.750
GROUND LEVEL	810.00	840.00
ACCUMULATED DISTANCE	0.00	1941.00
DISTANCE	0.00	1941.00
STATION	0+00	1941+00
CURVE	$\Delta A=18^{\circ}30'$ $\Delta A=74^{\circ}00'$ $\Delta A=85^{\circ}30'$ $\Delta A=61^{\circ}30'$ $\Delta A=11^{\circ}30'$	

THE REPUBLIC OF ZIMBABWE
BASIC DESIGN STUDY
ON
THE NYAKOMBA IRRIGATION DEVELOPMENT PROJECT
HEAD RACE (1)
LONG SECTION C-P-1

Date: _____ No. 23
JAPAN INTERNATIONAL COOPERATION AGENCY

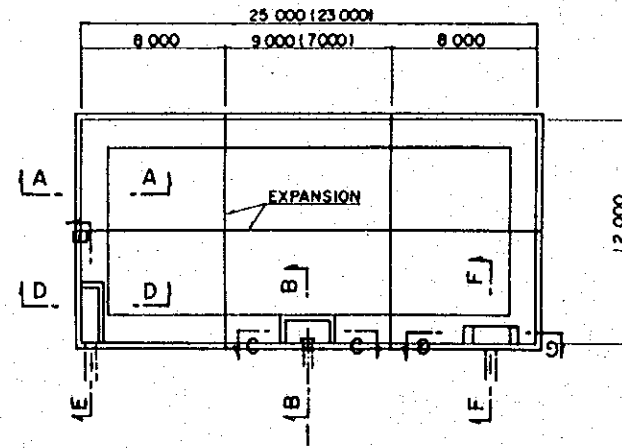
FARM POND C SCALE 1:100



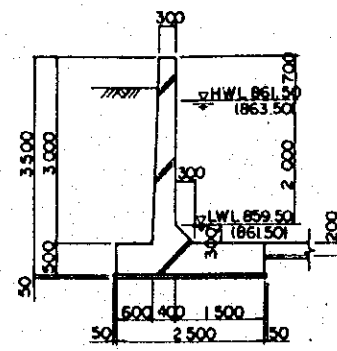
THE REPUBLIC OF ZIMBABWE			
BASIC DESIGN STUDY			
C/N			
THE NYAKOMBA IRRIGATION DEVELOPMENT PROJECT			
FARM POND C			
Date		No.	25
JAPAN INTERNATIONAL COOPERATION AGENCY			

FARM POND

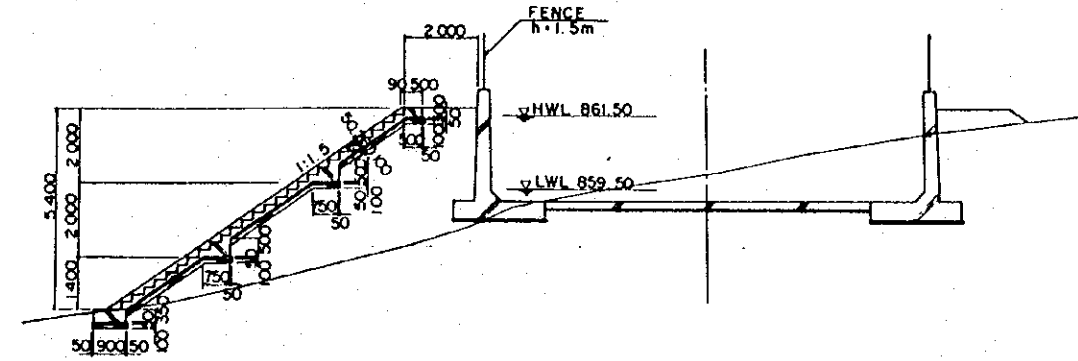
PLAN SCALE 1:200



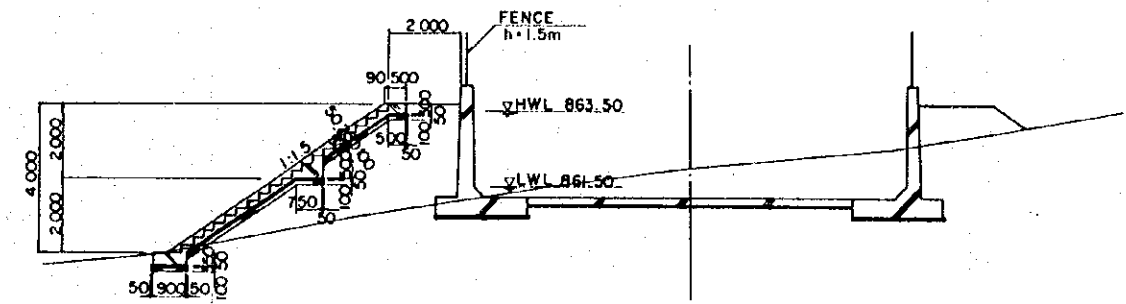
SECTION A-A SCALE 1:60



STAIR CASE SECTION (FARM POND B) SCALE 1:100



STAIR CASE SECTION (FARM POND C) SCALE 1:100

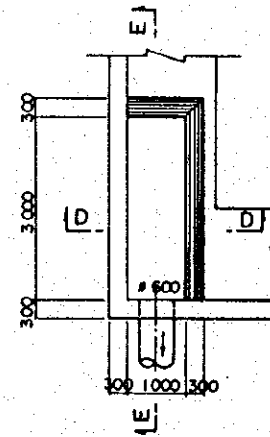
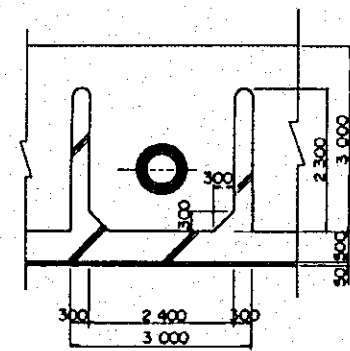
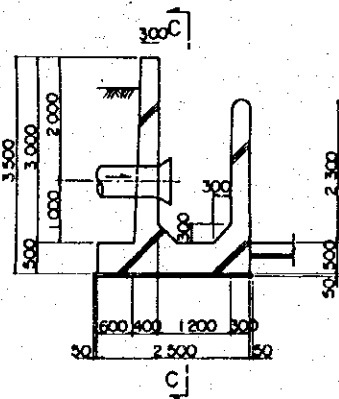


INLET SCALE 1:60

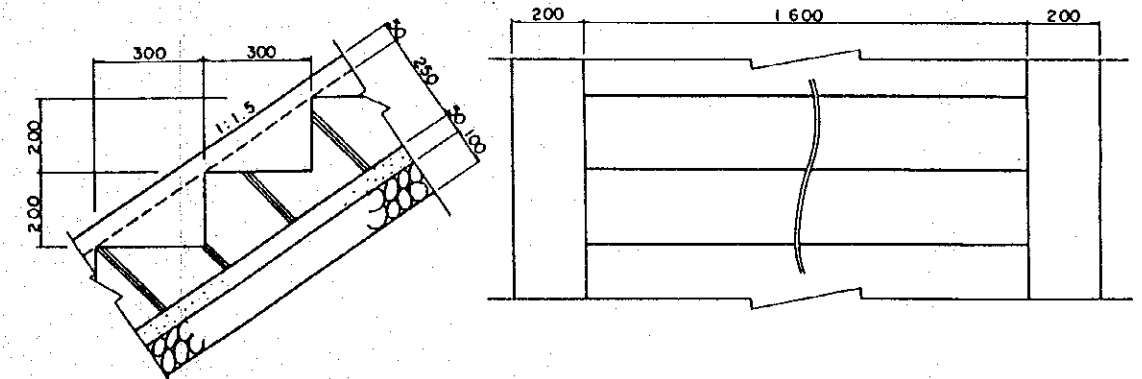
SPILL WAY SCALE 1:60

SECTION B-B

SECTION C-C



STAIR CASE DETAIL SCALE 1:10



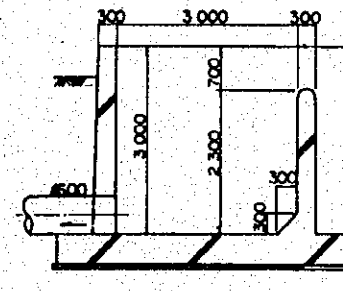
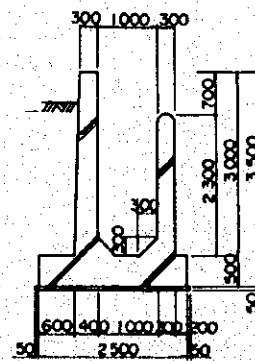
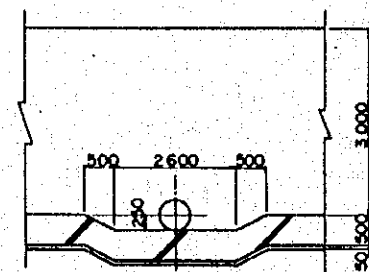
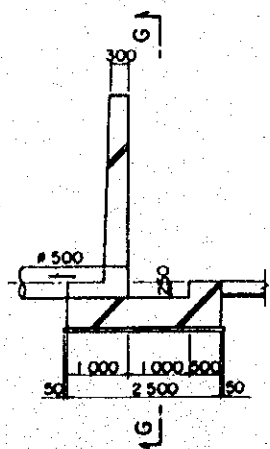
OUTLET SCALE 1:60

SECTION F-F

SECTION G-G

SECTION D-D

SECTION E-E

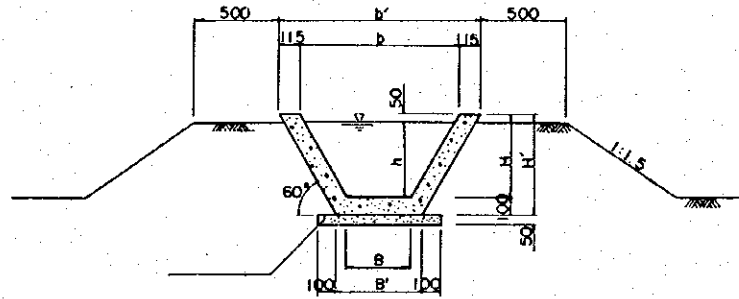


THE REPUBLIC OF ZIMBABWE		
BASIC DESIGN STUDY ON THE NYAKOMBA IRRIGATION DEVELOPMENT PROJECT		
DETAILS OF FARM POND		
Date	No.	26
JAPAN INTERNATIONAL COOPERATION AGENCY		

IRRIGATION FACILITIES (1/3)

IRRIGATION CANAL SCALE 1:20

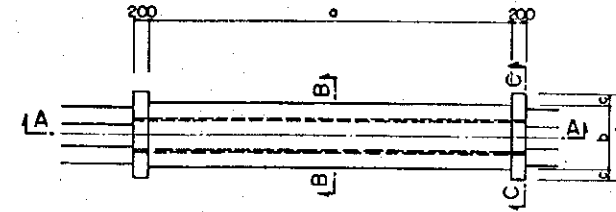
TYPICAL SECTION



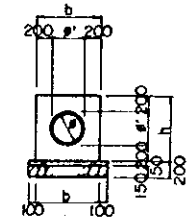
	B	B'	b	b'	H	H'	h
Type B	350	465	870	1100	450	550	400
Type C	300	415	762	992	400	500	350
Type D	250	364	654	884	350	450	300
Type E	200	314	546	776	300	400	250

CANAL CROSS CULVERT (ENTRANCE WORKS) SCALE 1:50

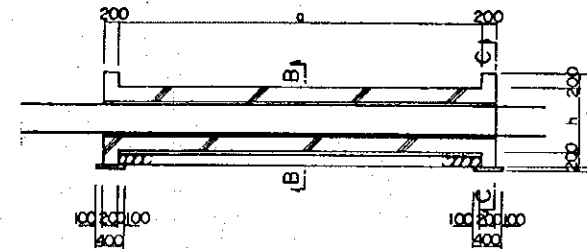
PLAN



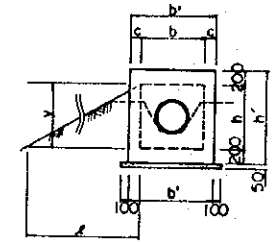
SECTION B - B



SECTION A - A

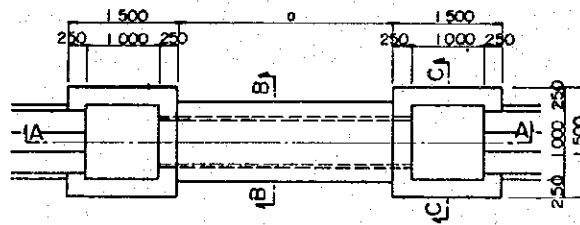


SECTION C - C

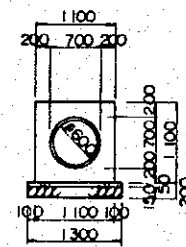


ROAD CROSS SIPHON SCALE 1:50

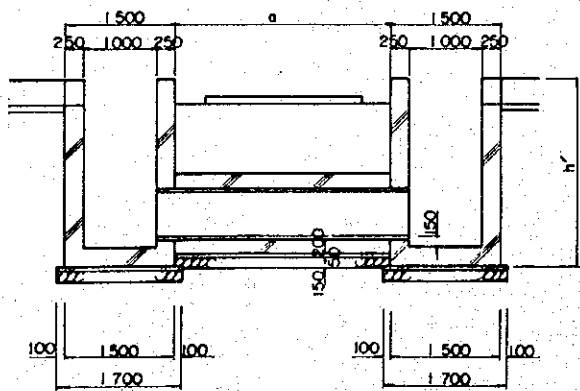
PLAN



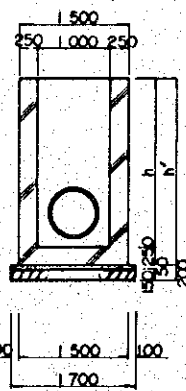
SECTION B - B



SECTION A - A



SECTION C - C

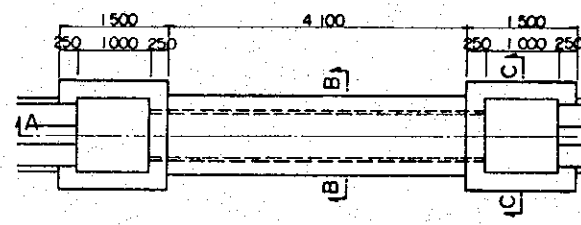


Road Cross Siphon (Irrigation)

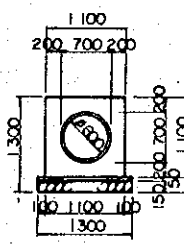
Type	a	β	h	h'	l (l)
Type 1	3,000	600	2400	2,650	50
Type 2	7,000	600	2400	2,650	50
Type 3	10,000	600	3150	3,400	50
Type 4	15,000	600	3150	3,400	50
Type 5	19,000	600	3150	3,400	50

CANAL CROSS SIPHON SCALE 1:50

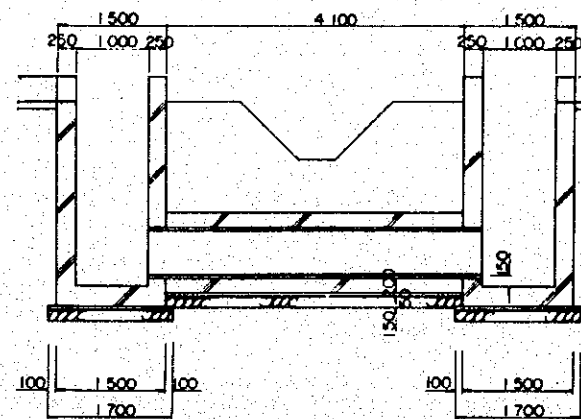
PLAN



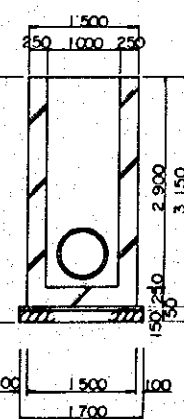
SECTION B - B



SECTION A - A



SECTION C - C



Canal Cross Culvert (Irrigation)
(Entrance Works)

Canal Type	a	β	b	c	b'	β	h	h'	γ	l	l (l)
Type 1-3 B(B=350)	3,000	450	926	172	1,270	526	926	1,326	938	7,817	38
Type 1-5 B(B=350)	5,000	450	926	172	1,270	526	926	1,326	938	7,817	38
Type 2-3 C(B=300)	3,000	400	870	146	1,162	470	870	1,270	885	7,375	35
Type 2-5 C(B=300)	5,000	400	870	146	1,162	470	870	1,270	885	7,375	35
Type 3-3 D(B=250)	3,000	350	814	120	1,054	414	814	1,214	832	6,933	32
Type 3-5 D(B=250)	5,000	350	814	120	1,054	414	814	1,214	832	6,933	32
Type 4-3 E(B=200)	3,000	300	760	93	945	360	760	1,160	780	6,500	30
Type 4-5 E(B=200)	5,000	300	760	93	945	360	760	1,160	780	6,500	30

THE REPUBLIC OF ZIMBABWE

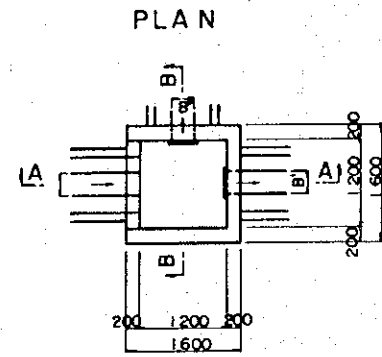
BASIC DESIGN STUDY
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THE NYAKOMBA IRRIGATION DEVELOPMENT PROJECT

IRRIGATION FACILITIES (1/3)

Date _____ No. _____ 27
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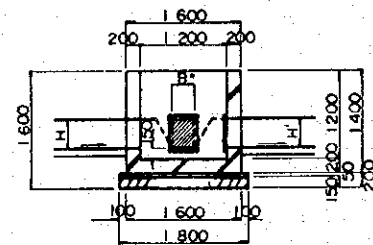
IRRIGATION FACILITIES (2/3)

DIVISION WORKS SCALE 1:50

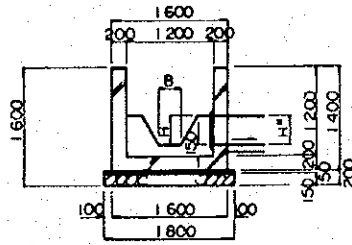


	B	H	B'	H'	GATE	B''	H''	GATE
TYPE 2	300	400	300	400	300x400 x1	300	400	300x400 x1
3	350	450	350	450	350x450 x1	350	450	350x450 x1
4	350	450	350	450	350x450 x1	200	300	200x300 x1
5	350	450	350	450	350x450 x1	300	400	300x400 x1
6	350	450	300	400	300x400 x1	250	350	250x350 x1
7	350	450	300	400	300x400 x1	300	400	300x400 x1
8	350	450	350	450	350x450 x1	250	350	250x350 x1
9	300	400	250	350	250x350 x1	250	350	250x350 x1

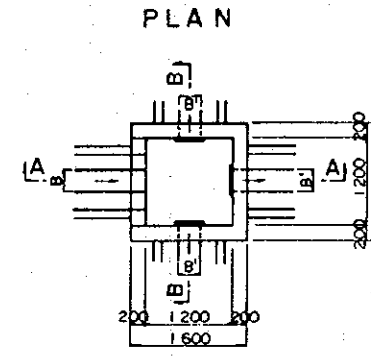
SECTION A-A



SECTION B-B

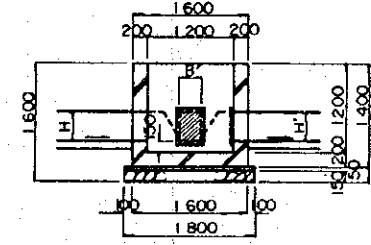


DIVISION WORKS SCALE 1:50

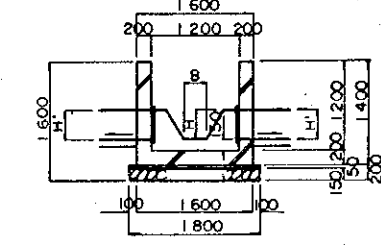


	B	H	B'	H'	GATE
TYPE 1	300	400	300	400	300x400 x 3
TYPE 10	300	400	250	350	250x350 x 3

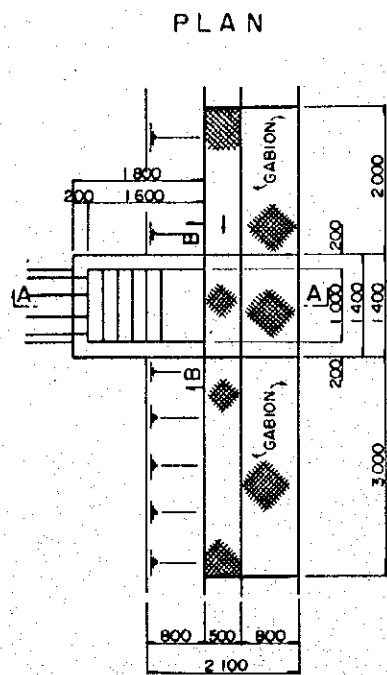
SECTION A-A



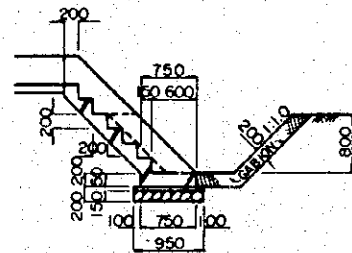
SECTION B-B



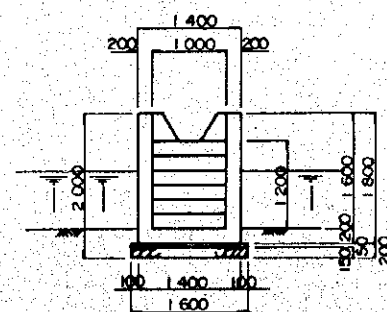
CHUTE SCALE 1:50



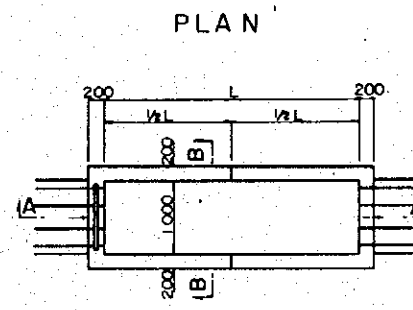
SECTION A-A



SECTION B-B

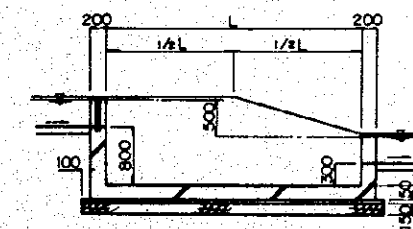


DROP SCALE 1:50

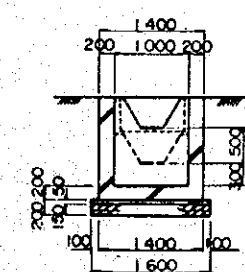


	L
Type B	3500
Type C	3500
Type D	3000
Type E	3000

SECTION A-A

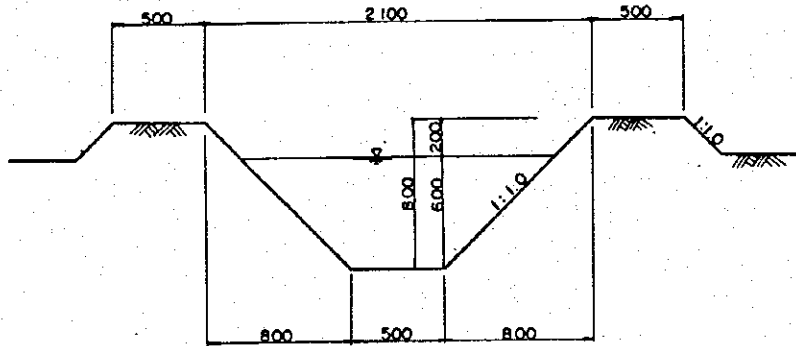


SECTION B-B



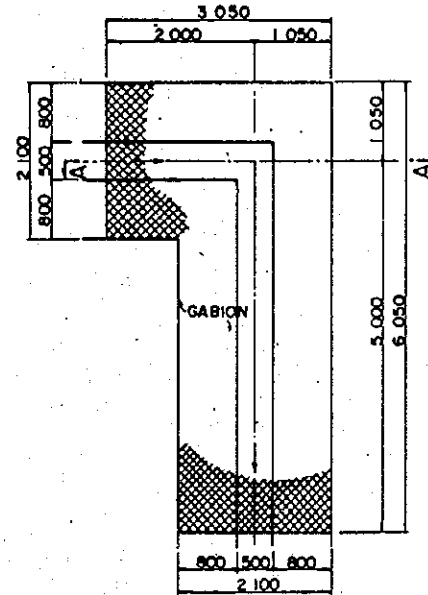
DRAINAGE FACILITIES (1/2)

DRAINAGE CANAL TYPICAL SECTION SCALE 1:20

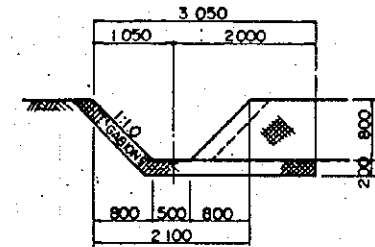


SLOPE PROTECTION SCALE 1:50

PLAN

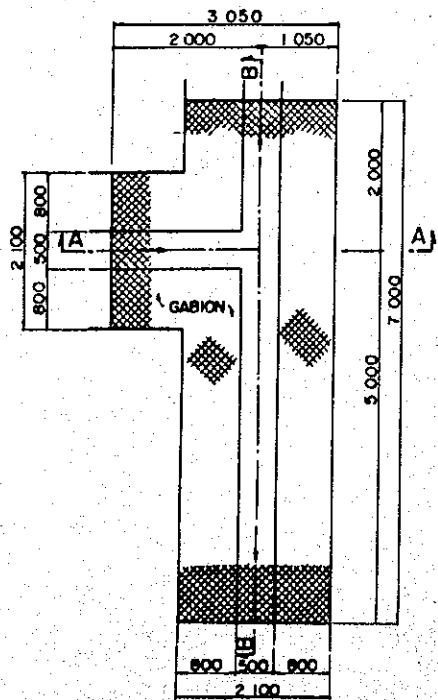


SECTION A-A

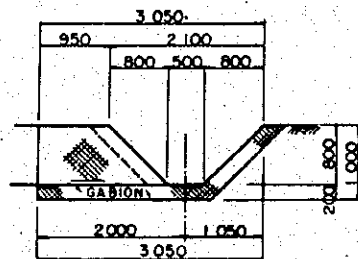


CONFLUENT FACILITIES SCALE 1:50

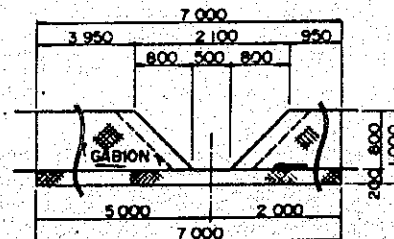
PLAN



SECTION A-A

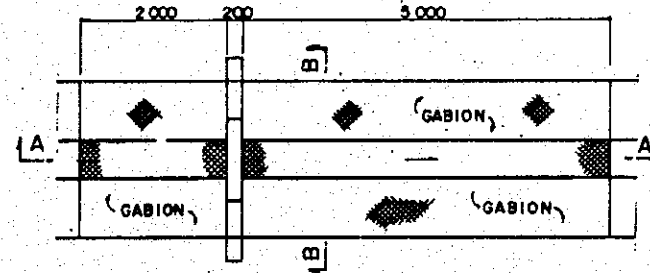


SECTION B-B

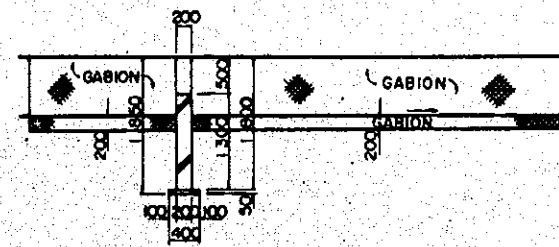


GROUND SILL SCALE 1:50

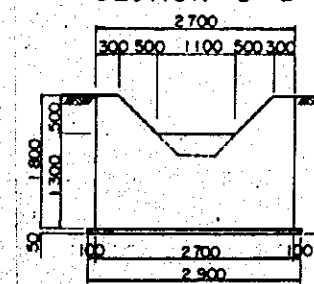
PLAN



SECTION A-A



SECTION B-B

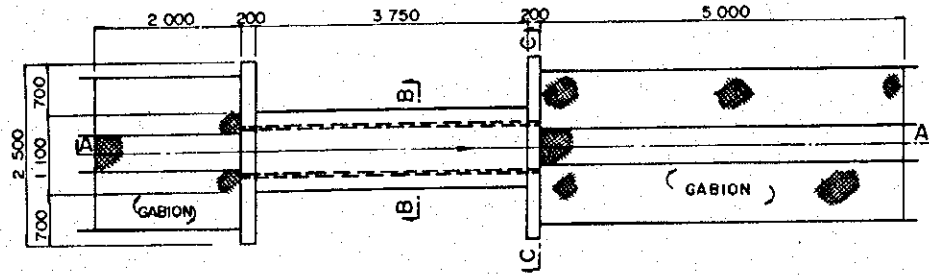


THE REPUBLIC OF ZIMBABWE		
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DRAINAGE FACILITIES (1/2)		
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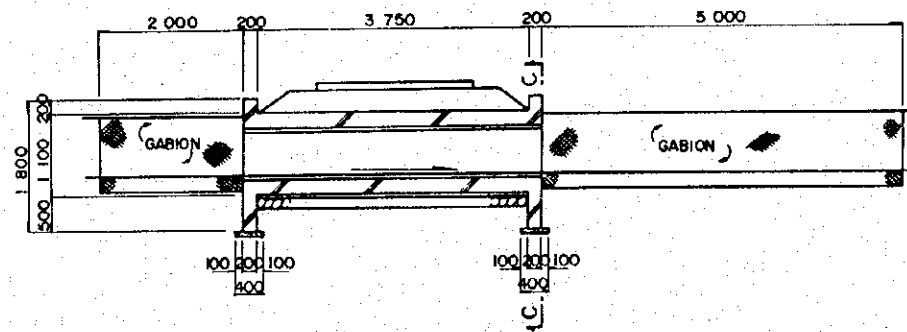
DRAINAGE FACILITIES (2/2)

ROAD CROSS CULVERT SCALE 1:50

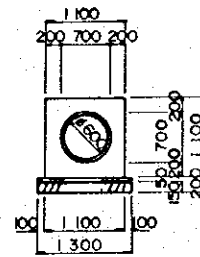
PLAN



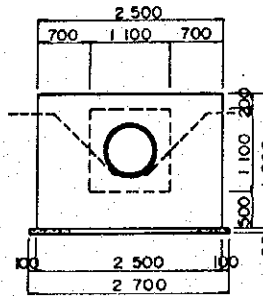
SECTION A-A



SECTION B-B

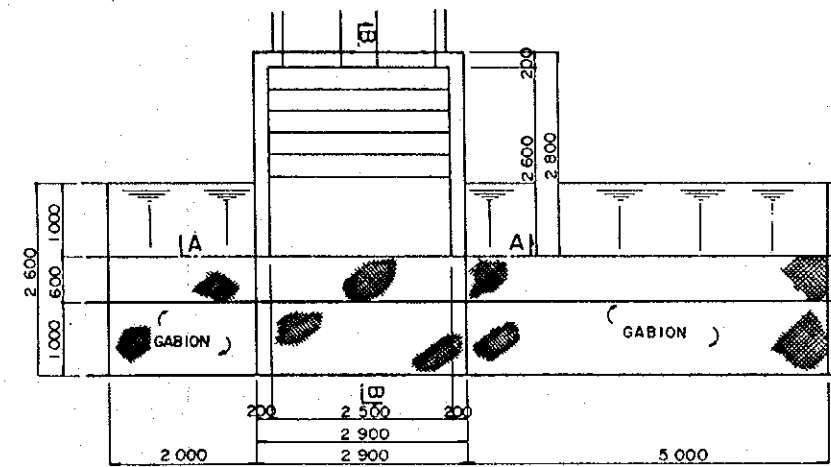


SECTION C-C

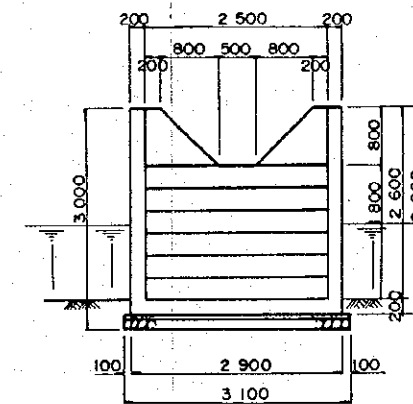


CHUTE SCALE 1:50

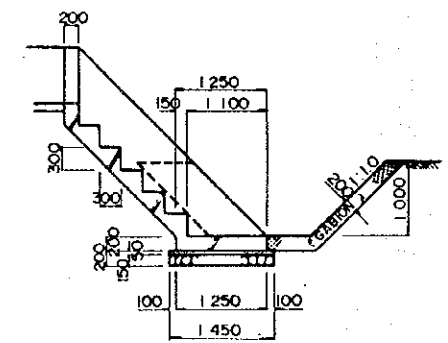
PLAN



SECTION A-A

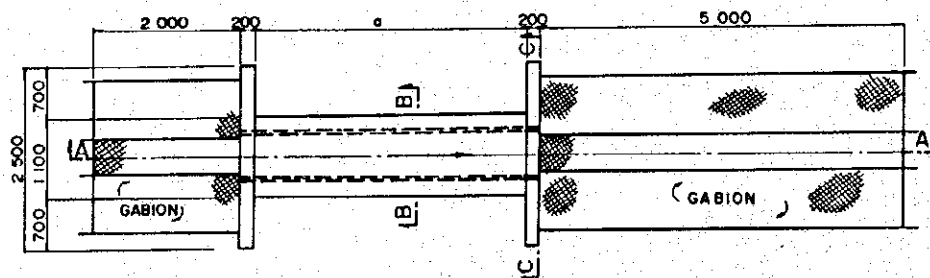


SECTION B-B

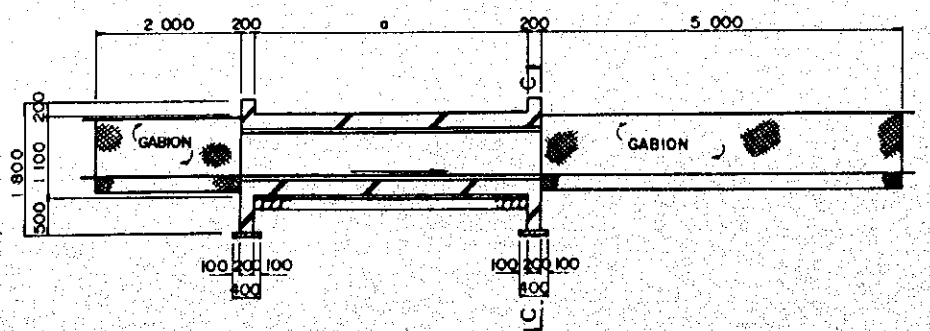


CANAL CROSS CULVERT (ENTRANCE WORKS) SCALE 1:50

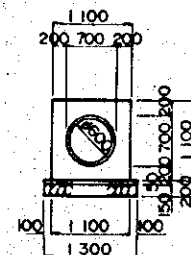
PLAN



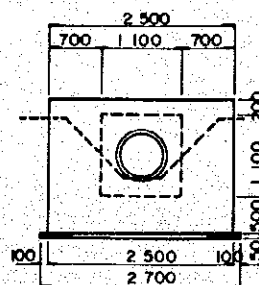
SECTION A-A



SECTION B-B



SECTION C-C

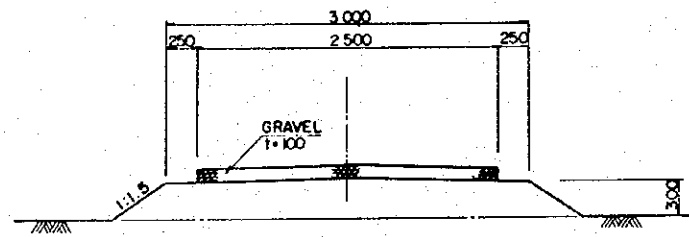


Canal Cross Culvert (Drainage)
(Entrance Works)

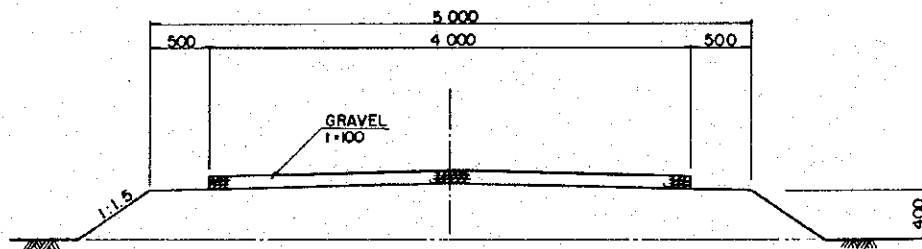
Road Type	a	#
Type 1	b = 3	3,000 - 600
Type 2	b = 5	5,000 - 600

FARM ROAD TYPICAL SECTION SCALE 1:30

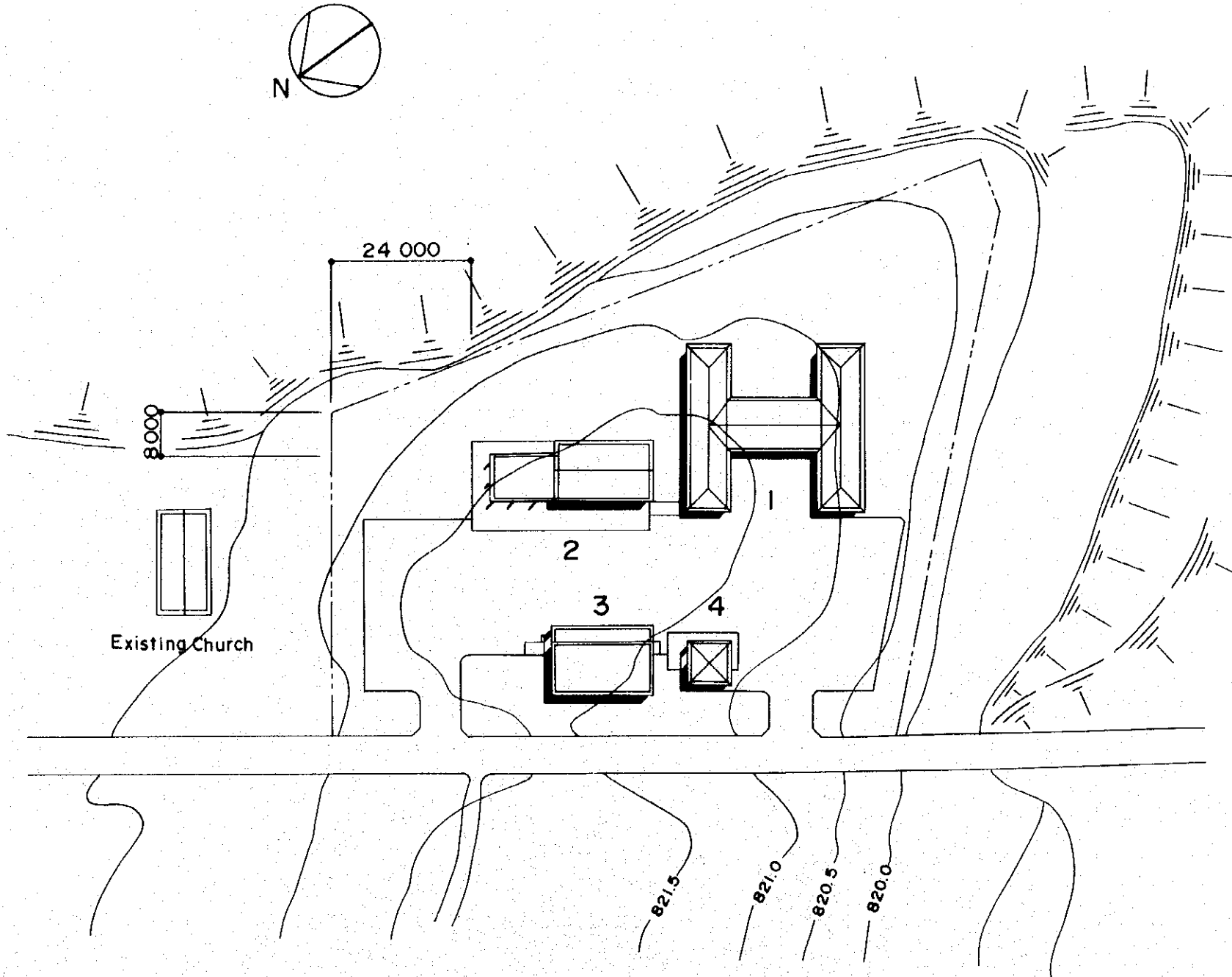
FARM ROAD



SECONDARY ROAD

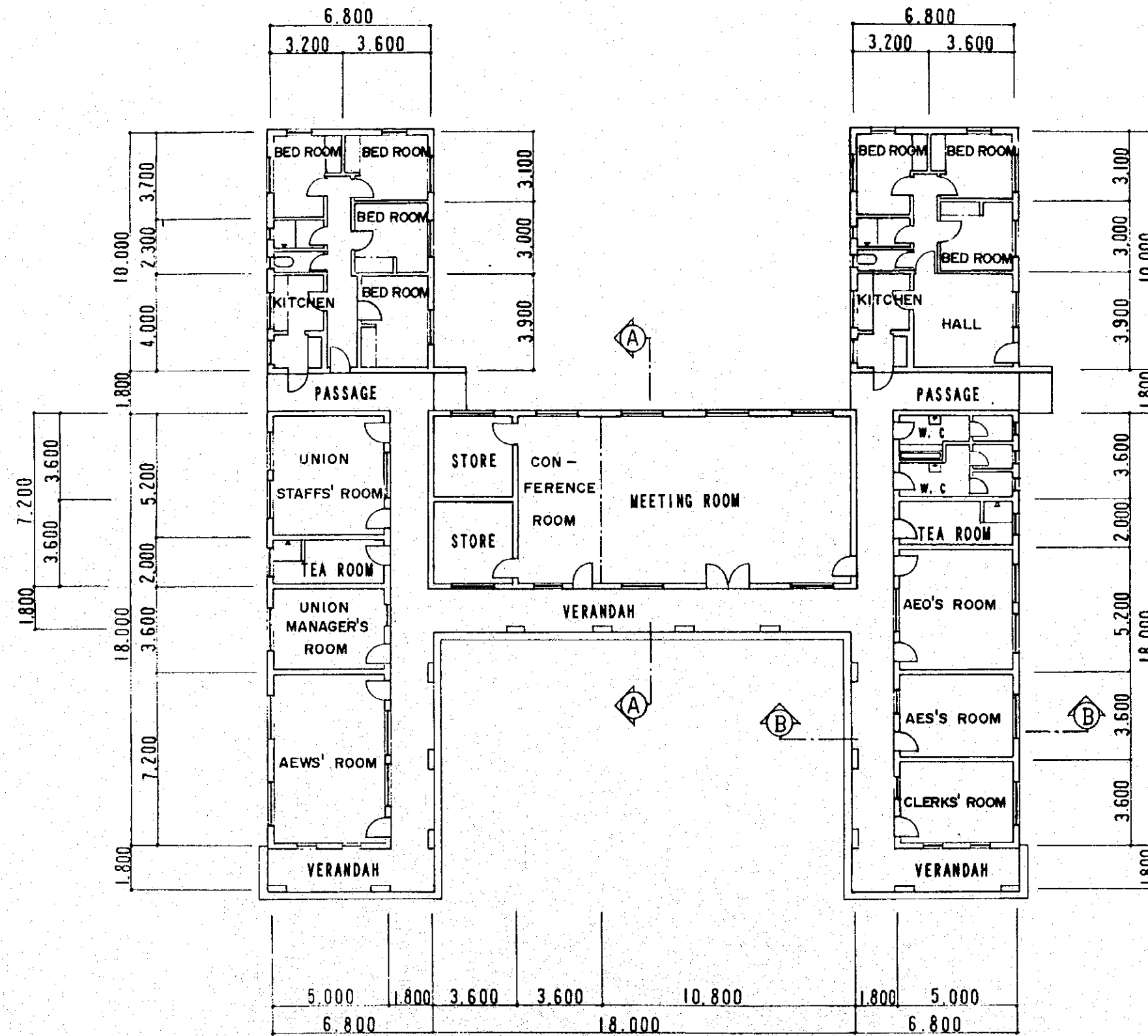


THE REPUBLIC OF ZIMBABWE			
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FARM ROADS			
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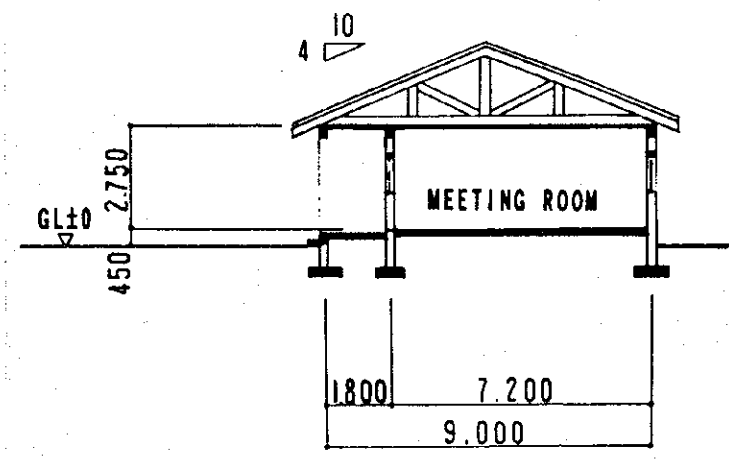


— Project Management Facilities —

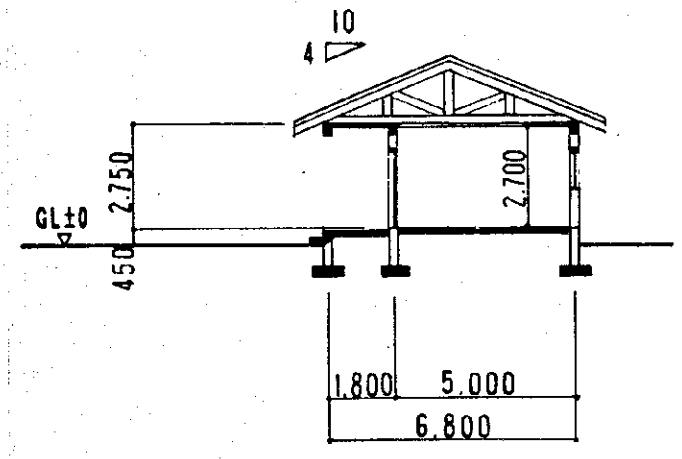
No.	Building	Planned Area (m ²)
1.	Project Management Building	6 0 3
2.	Workshop & Garage	2 7 2
3.	Warehouse	1 6 2
4.	Fuel Station	5 2
Total		1 0 8 9



FLOOR PLAN

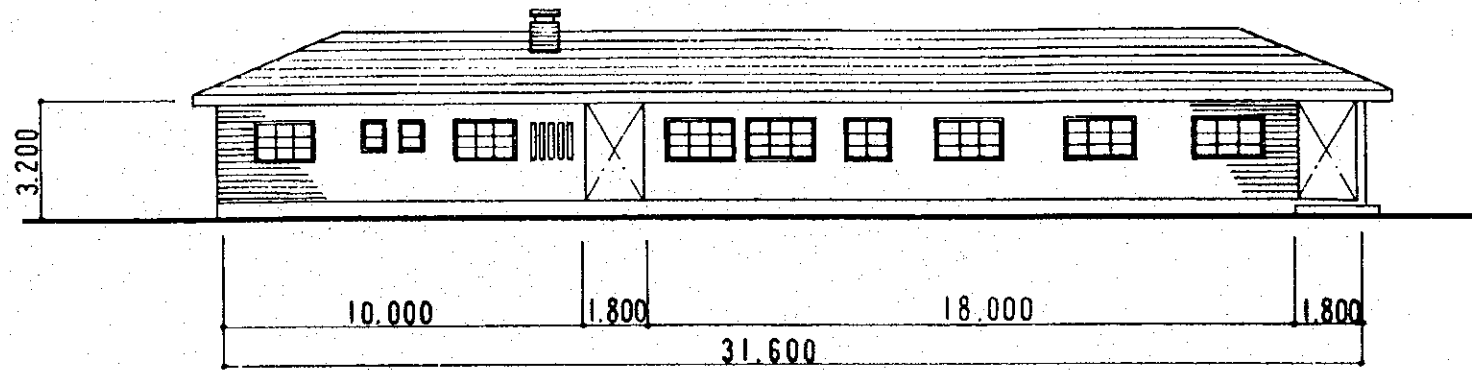


SECTION A-A

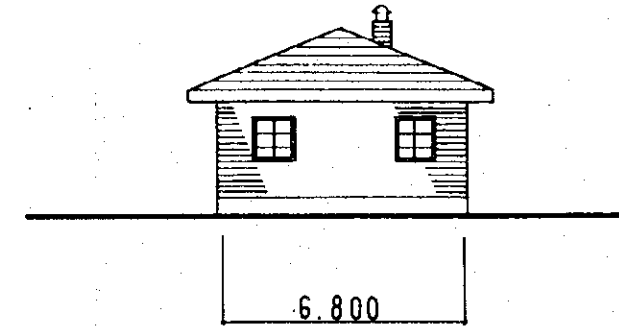


SECTION B-B

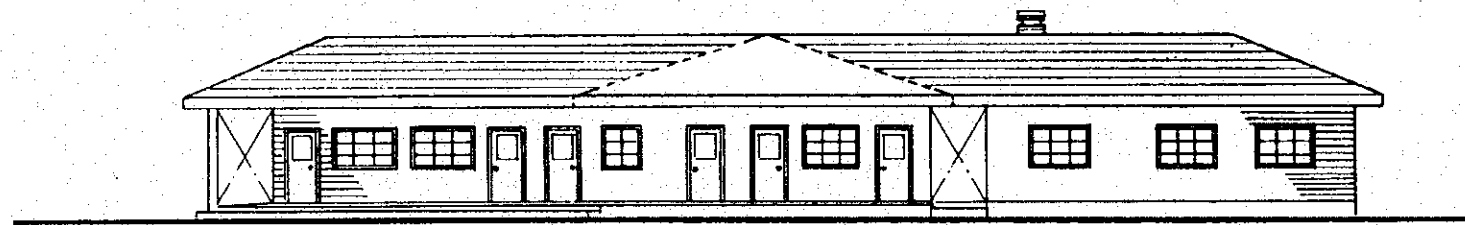
THE REPUBLIC OF ZIMBABWE			
BASIC DESIGN STUDY ON THE NYAKOMBA IRRIGATION DEVELOPMENT PROJECT			
PROJECT MANAGEMENT BUILDING PLAN & SECTION			
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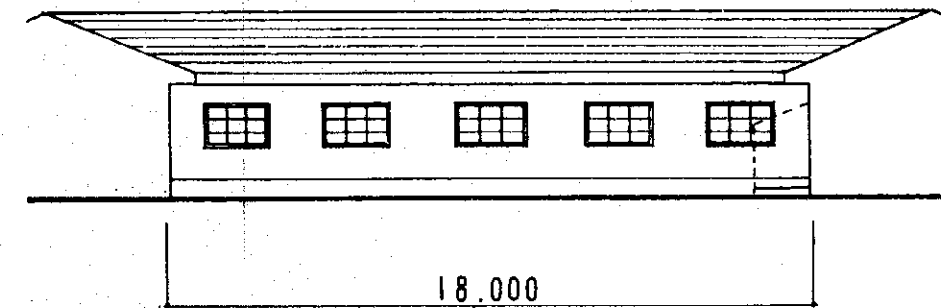
NORTH ELEVATION



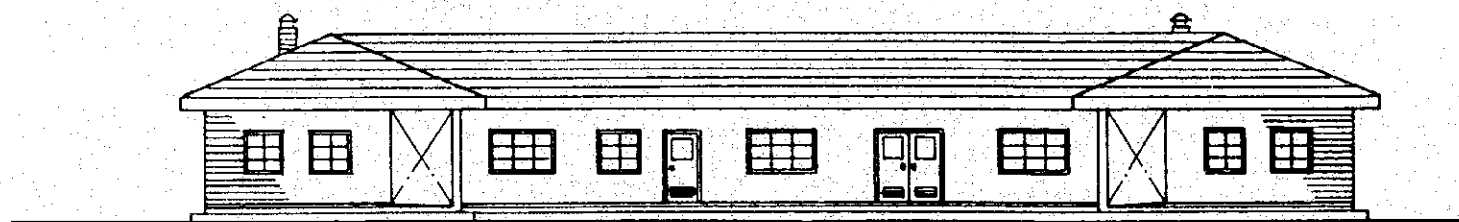
EAST ELEVATION



SOUTH ELEVATION

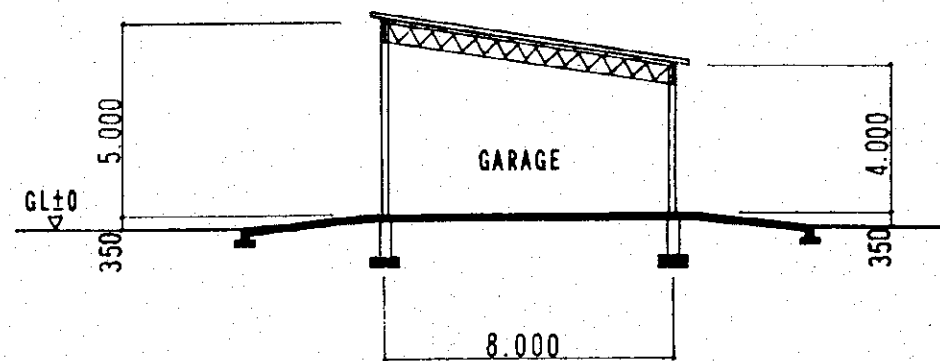


EAST ELEVATION

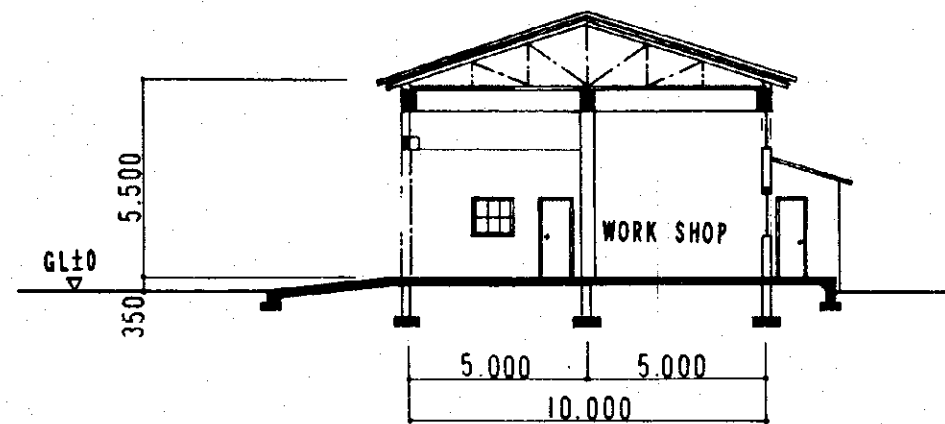


WEST ELEVATION

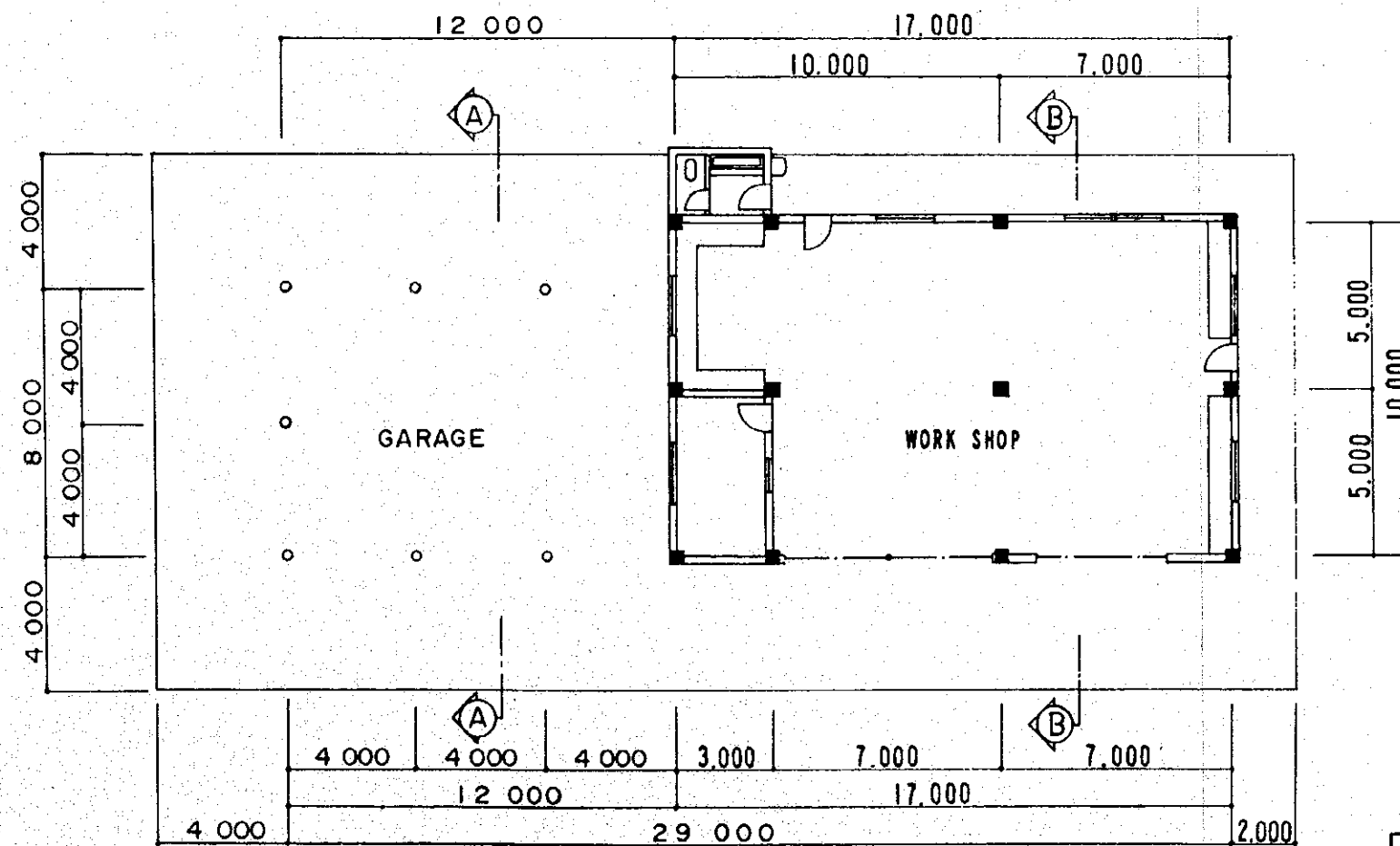
THE REPUBLIC OF ZIMBABWE			
BASIC DESIGN STUDY ON			
THE NYAKOMBA IRRIGATION DEVELOPMENT PROJECT			
PROJECT MANAGEMENT BUILDING ELEVATION			
Date		No.	35
JAPAN INTERNATIONAL COOPERATION AGENCY			



SECTION A-A

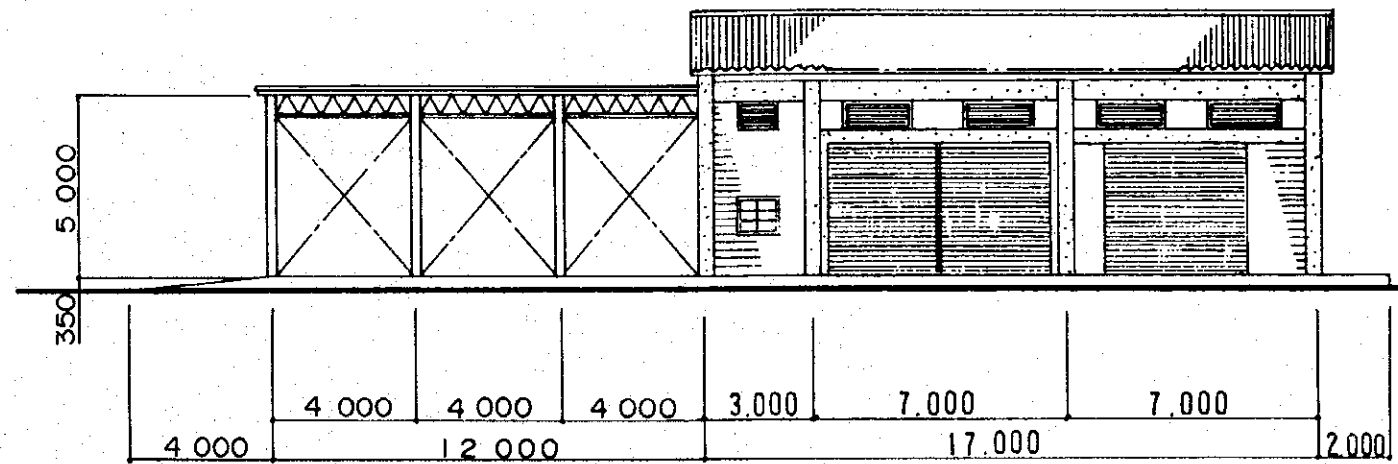


SECTION B-B

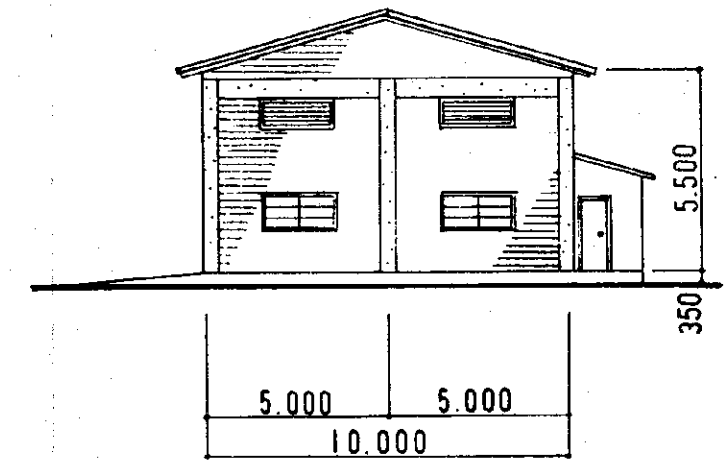


FLOOR PLAN

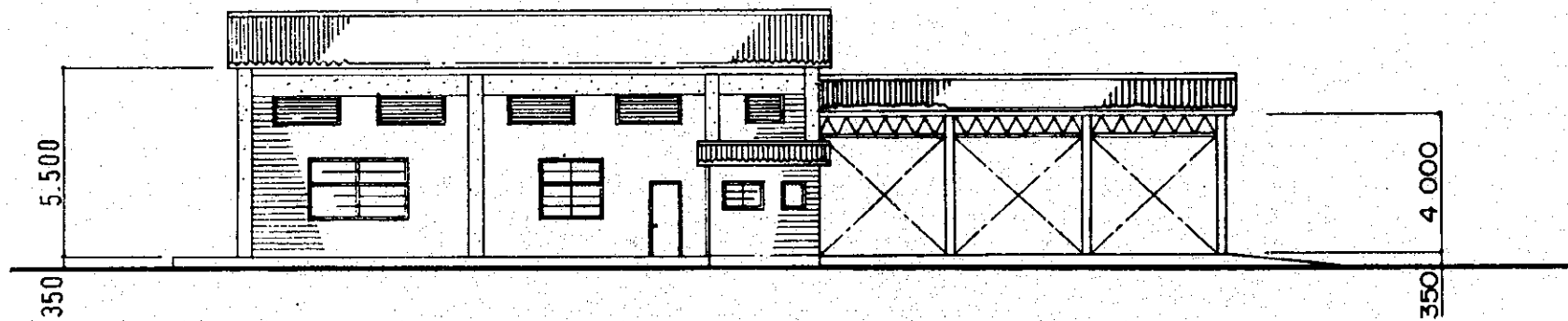
THE REPUBLIC OF ZIMBABWE			
BASIC DESIGN STUDY ON THE NYAKOMBA IRRIGATION DEVELOPMENT PROJECT			
WORKSHOP & GARAGE PLAN & SECTION			
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WEST ELEVATION

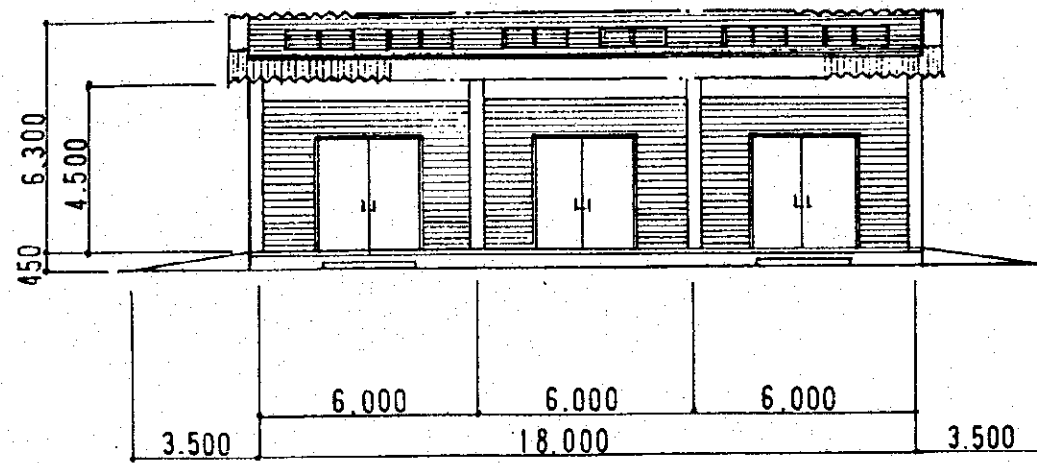


SOUTH ELEVATION

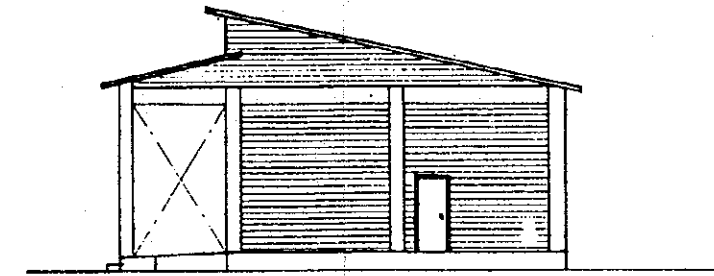


EAST ELEVATION

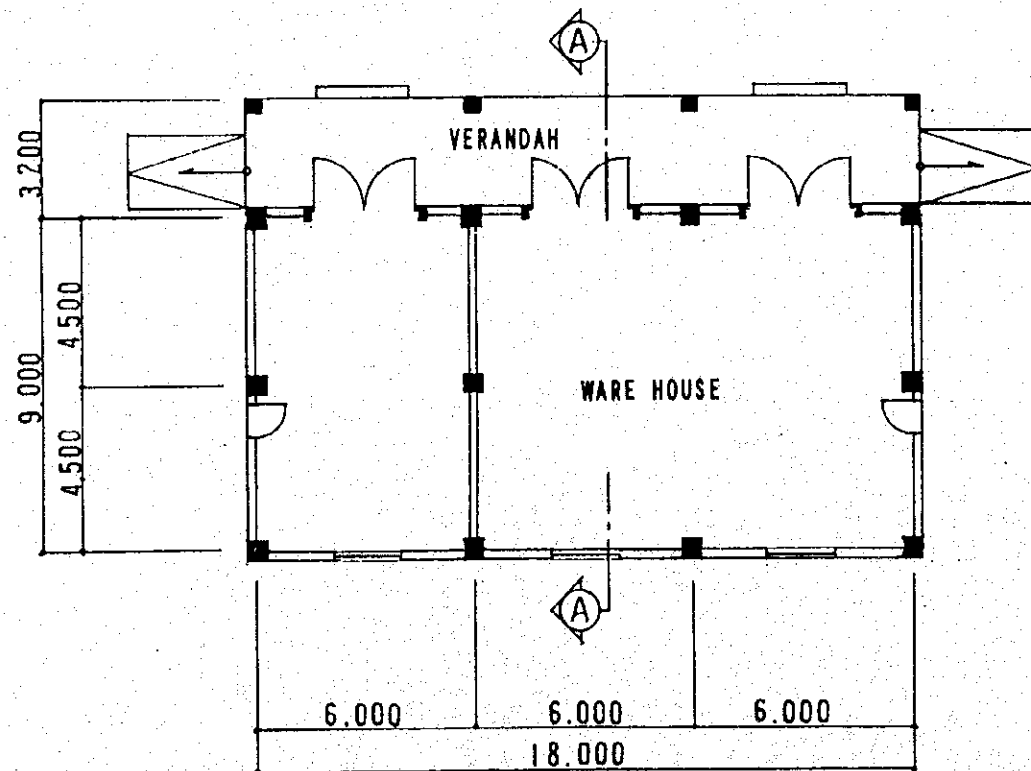
THE REPUBLIC OF ZIMBABWE			
BASIC DESIGN STUDY ON THE NYAKOMBA IRRIGATION DEVELOPMENT PROJECT			
WORKSHOP & GARAGE ELEVATION			
Date	No.	37	
JAPAN INTERNATIONAL COOPERATION AGENCY			



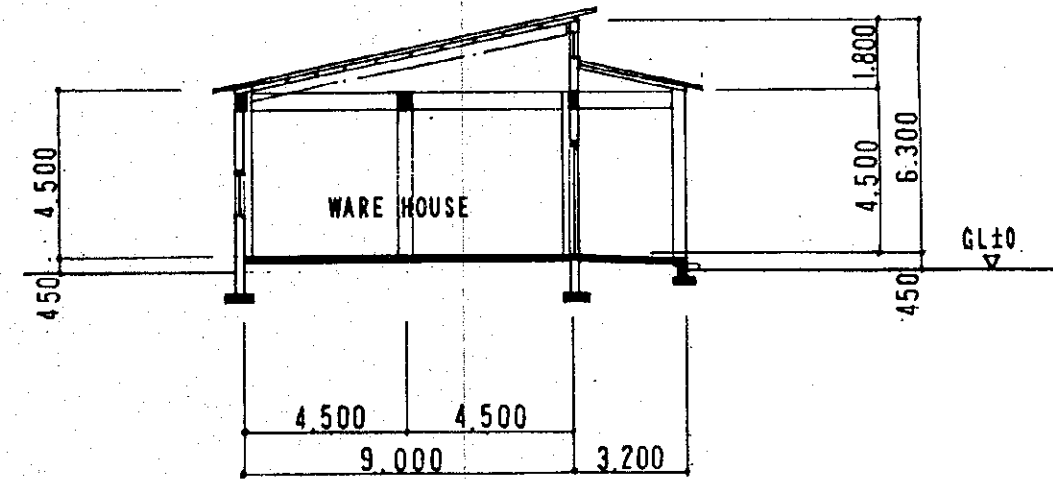
EAST ELEVATION



NORTH ELEVATION

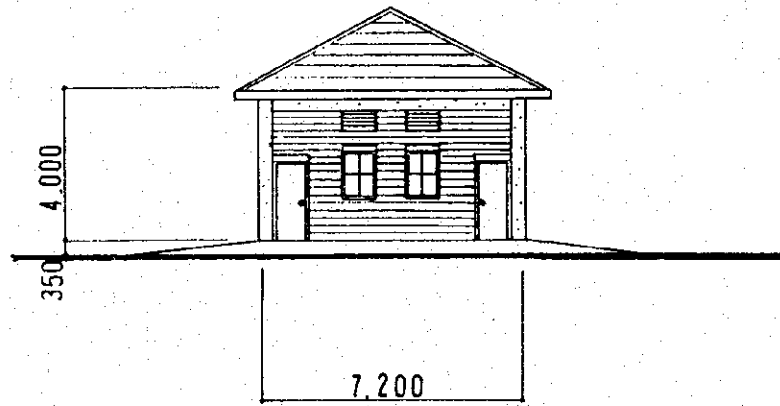


FLOOR PLAN

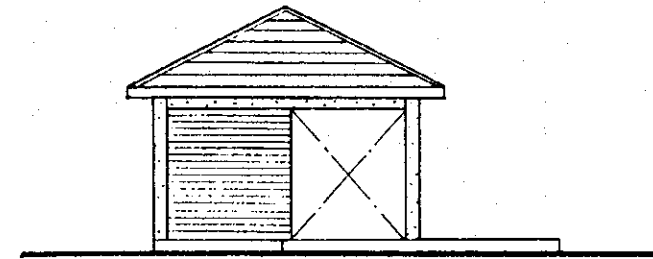


SECTION A-A

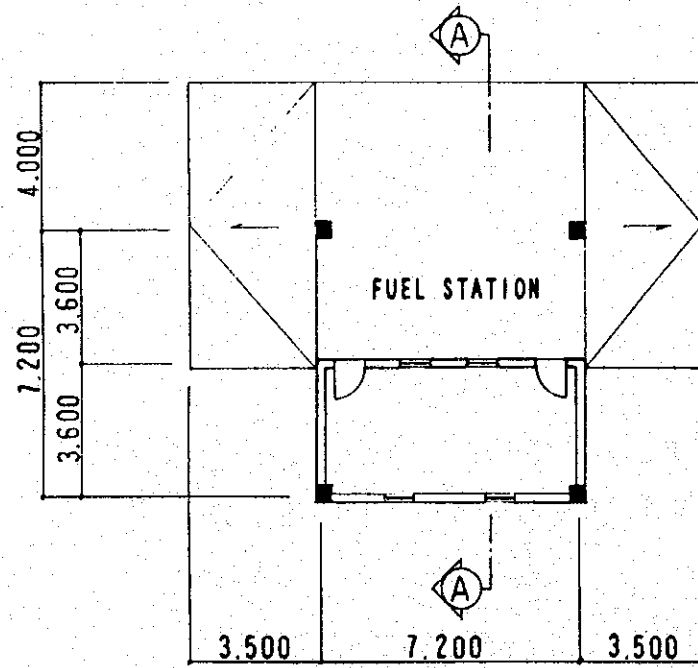
THE REPUBLIC OF ZIMBABWE			
BASIC DESIGN STUDY ON THE NYAKOMBA IRRIGATION DEVELOPMENT PROJECT			
WAREHOUSE			
Date	No.	38	
JAPAN INTERNATIONAL COOPERATION AGENCY			



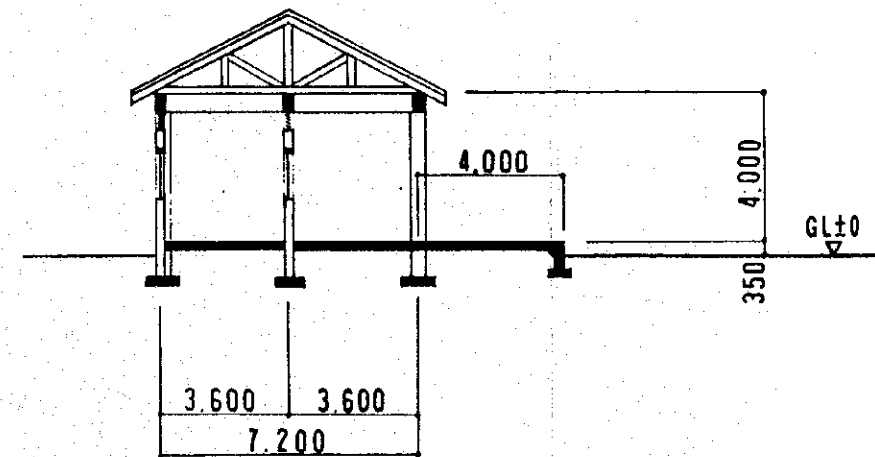
EAST ELEVATION



SOUTH ELEVATION



FLOOR PLAN



SECTION A-A

THE REPUBLIC OF ZIMBABWE			
BASIC DESIGN STUDY			
ON			
THE NYAKOMBA IRRIGATION DEVELOPMENT PROJECT			
FUEL STATION			
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