ANNEX 4

FIGURES & TABLES

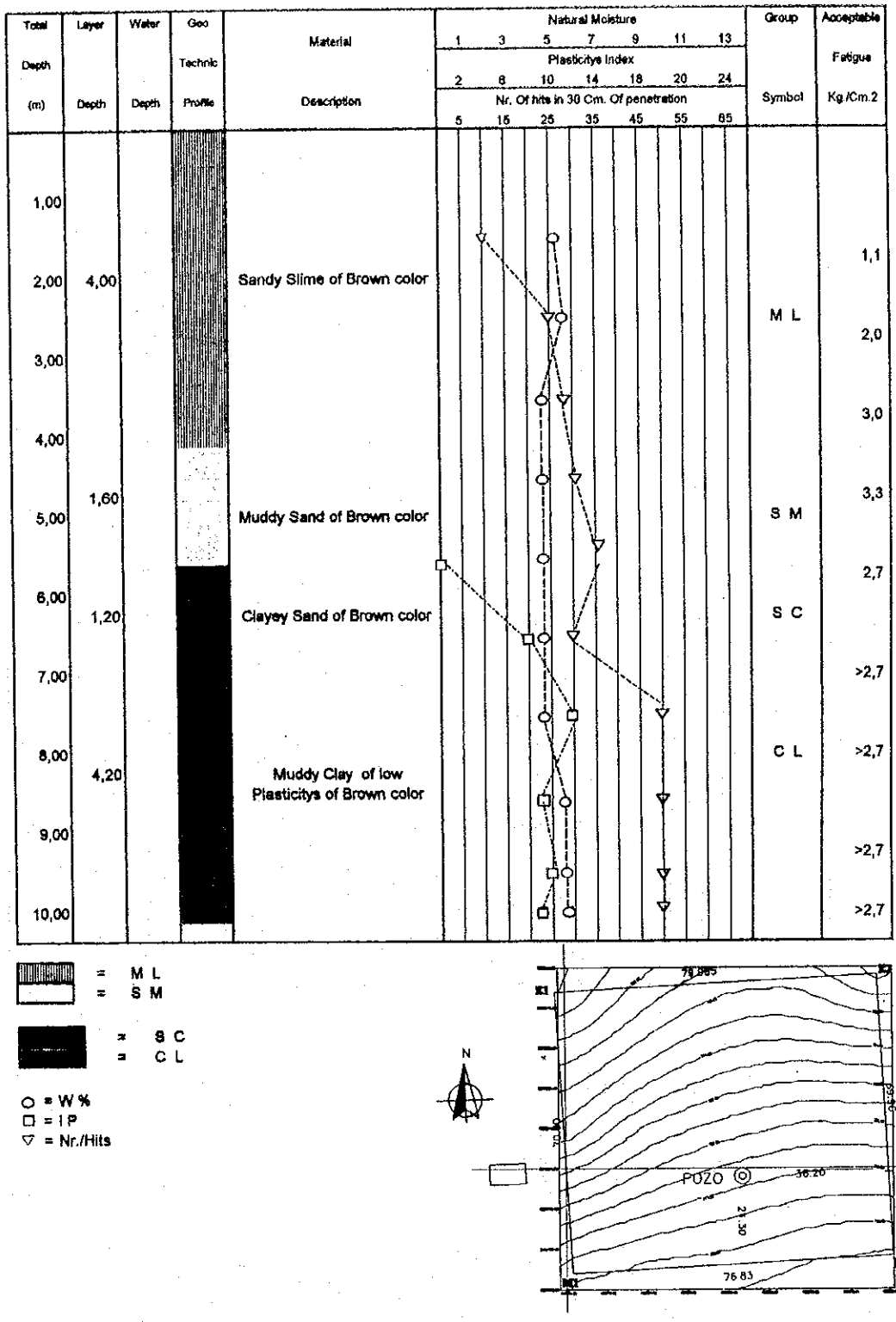

Fig. A.4.1-1 Boring Geotechnic Profile of Pampa Grande

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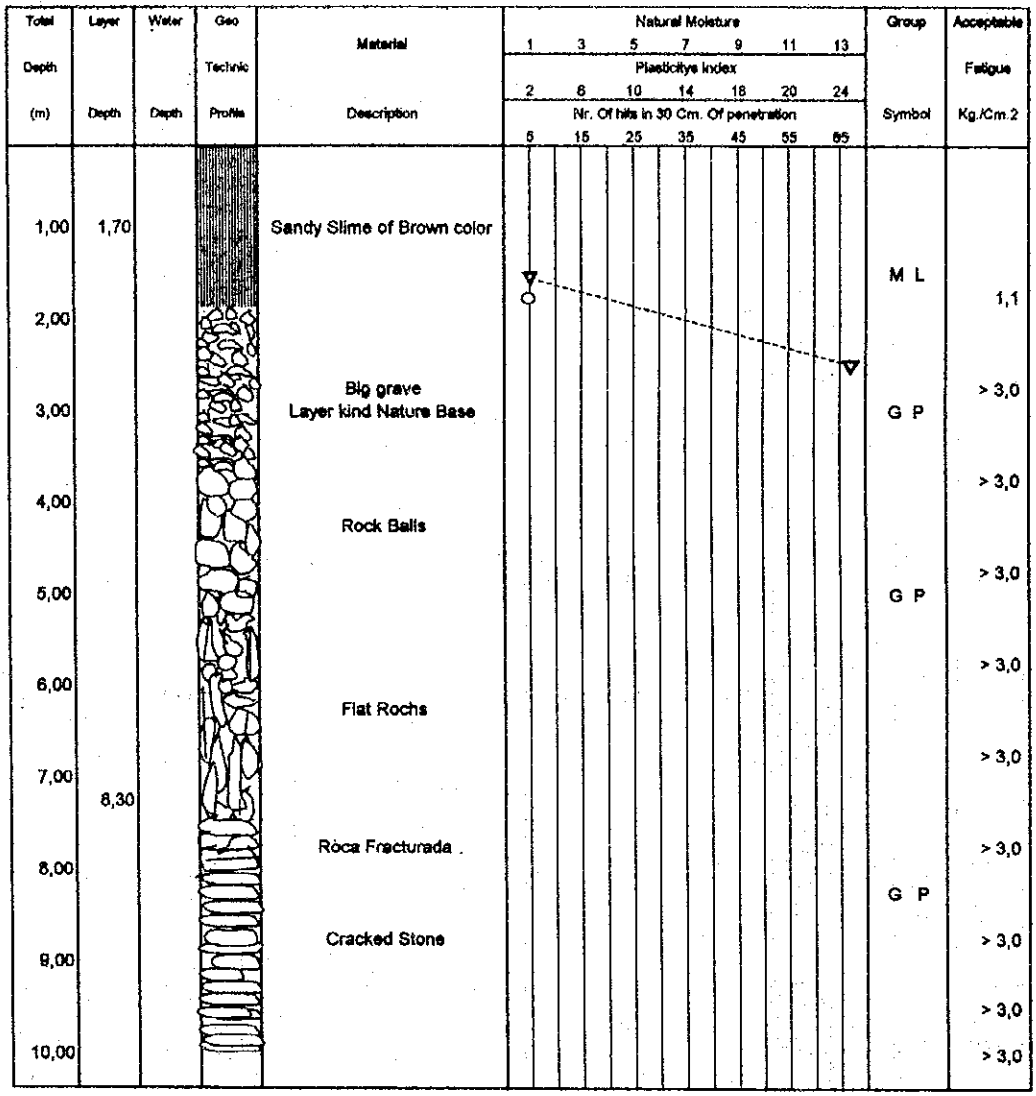

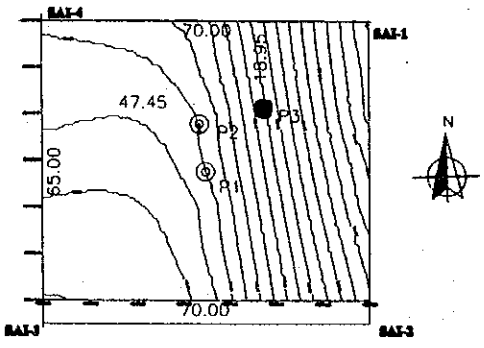

Fig. A.4.1-2 Boring Geotechnic Profile of Saipina

Feasibility Study for the Improvement of Agricultural Marketing System in Santa Cruz Republic of Bolivia
Japan International Cooperation Agency

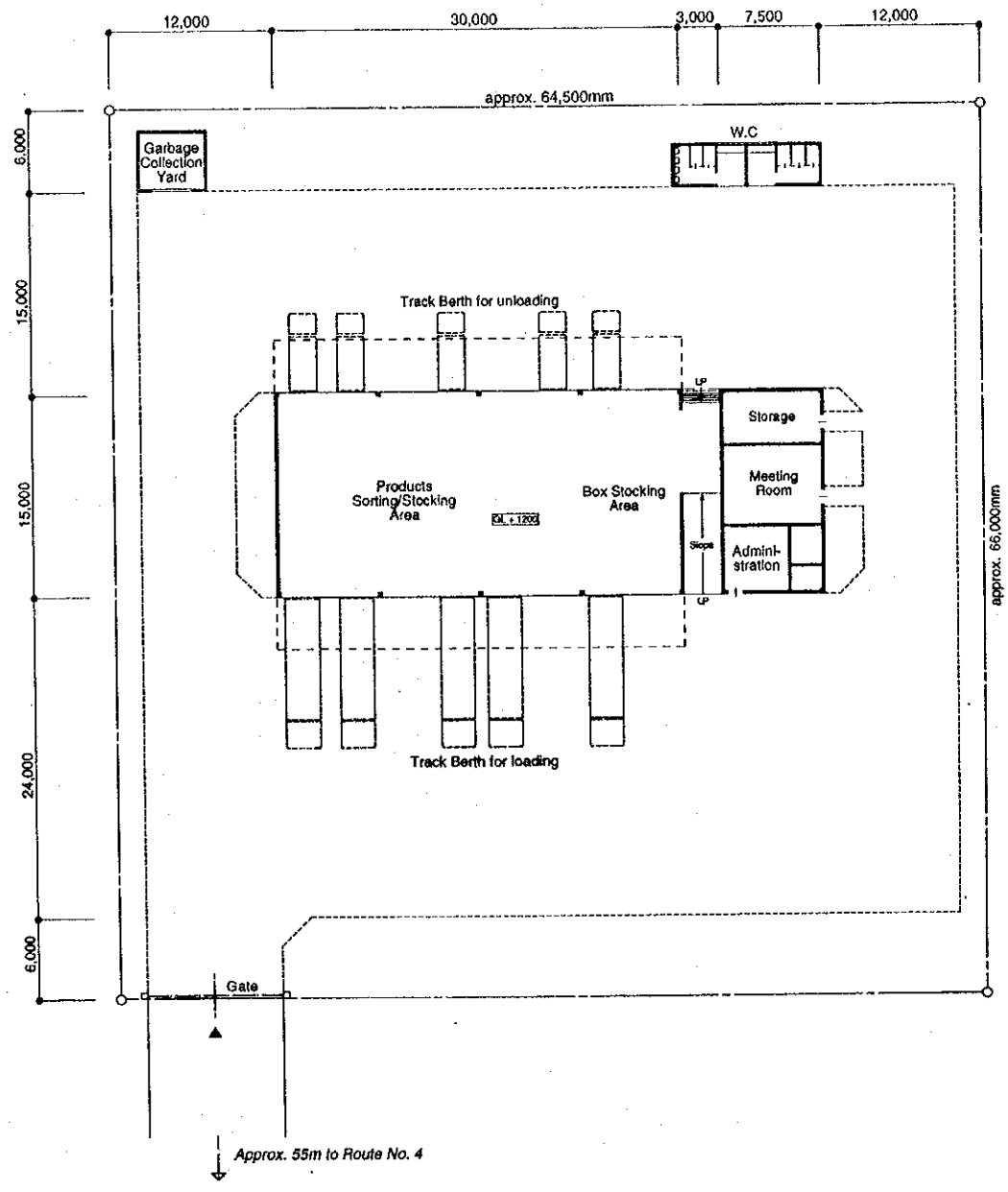

Fig. A.4.1-3 Products Collection and Distribution Center
— Mairana —
S = 1/500

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Republic of Bolivia
Japan International Cooperation Agency

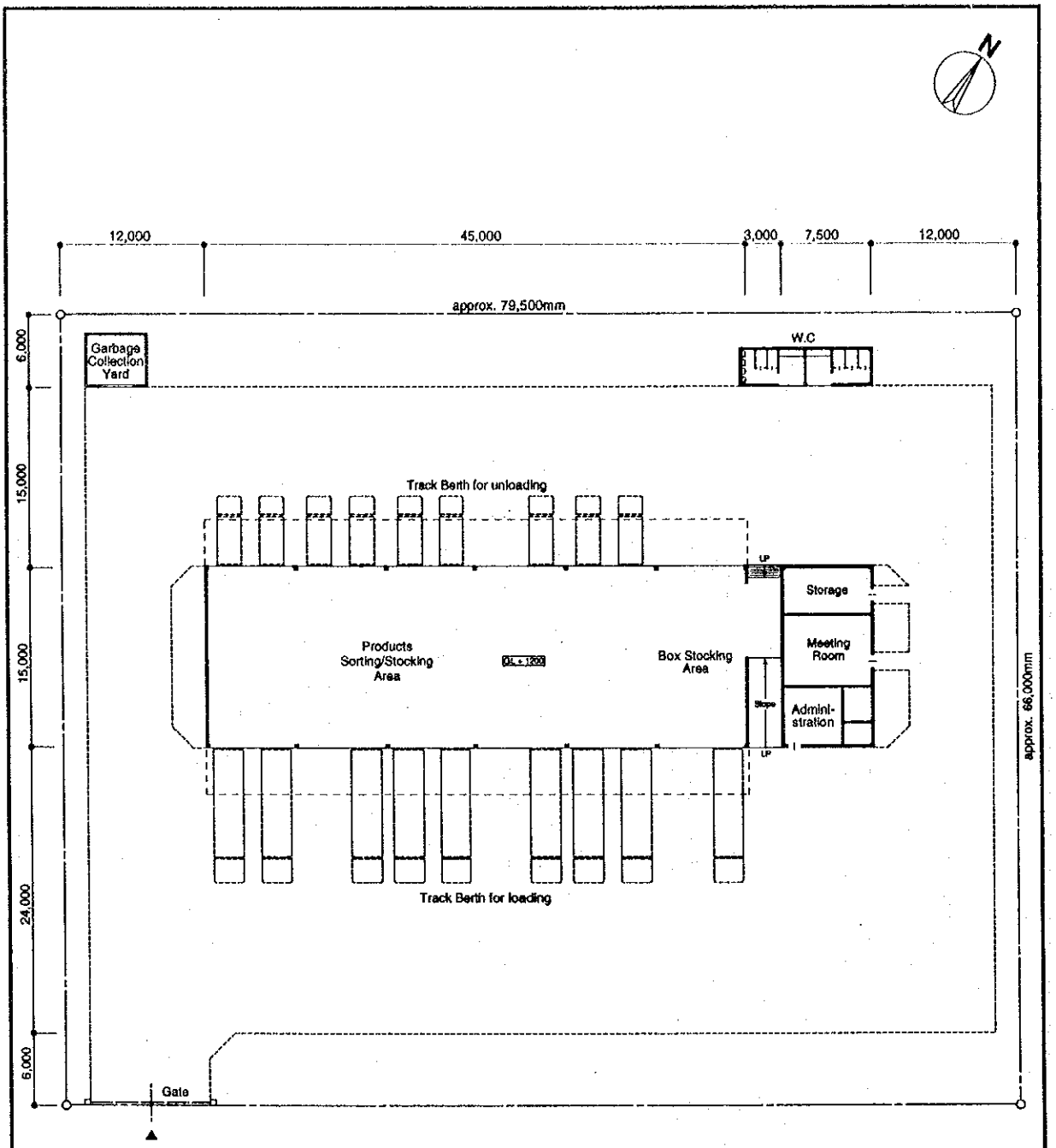

Fig. A.4.1-4 Products Collection and Distribution Center
— Pampa Grande —
S = 1/500

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Republic of Bolivia
Japan International Cooperation Agency

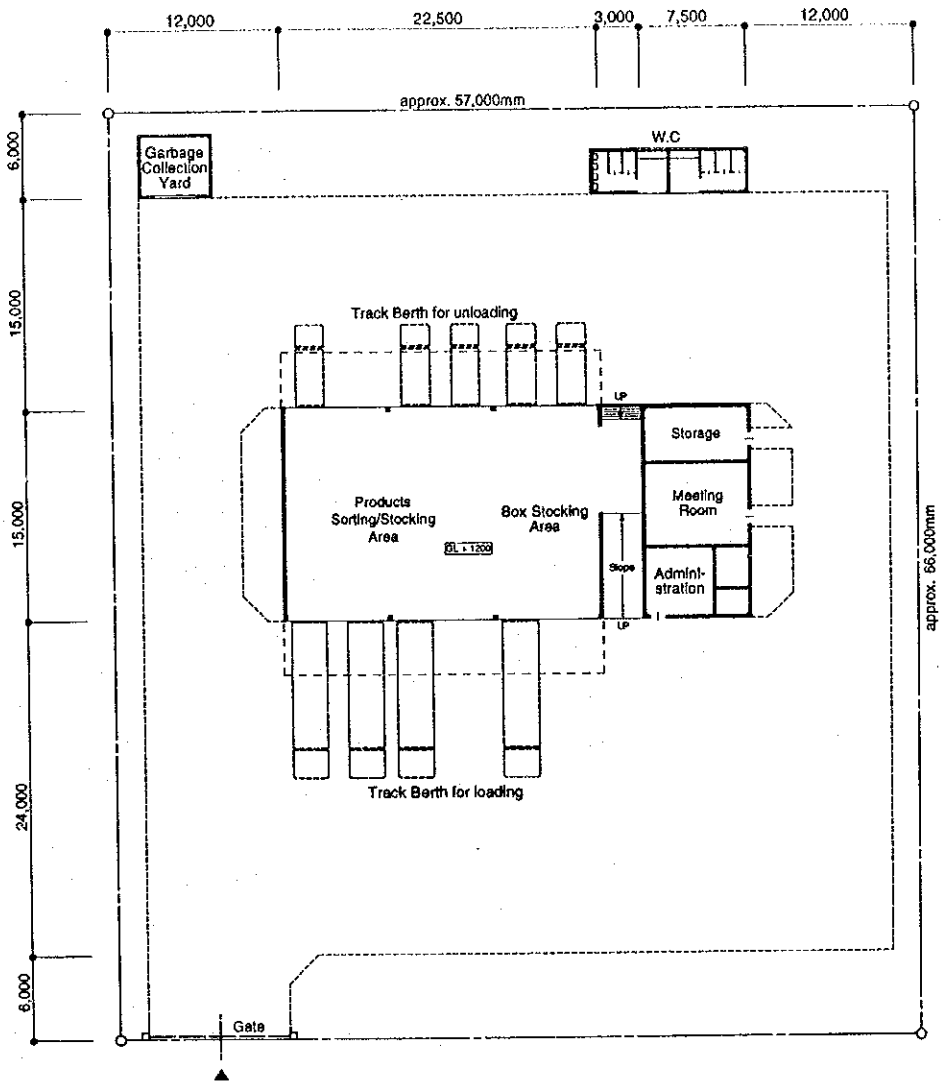

Fig. A.4.1-5 Products Collection and Distribution Center
— Comarapa —
S = 1/500

Feasibility Study for the Improvement of Agricultural Marketing System in Santa Cruz
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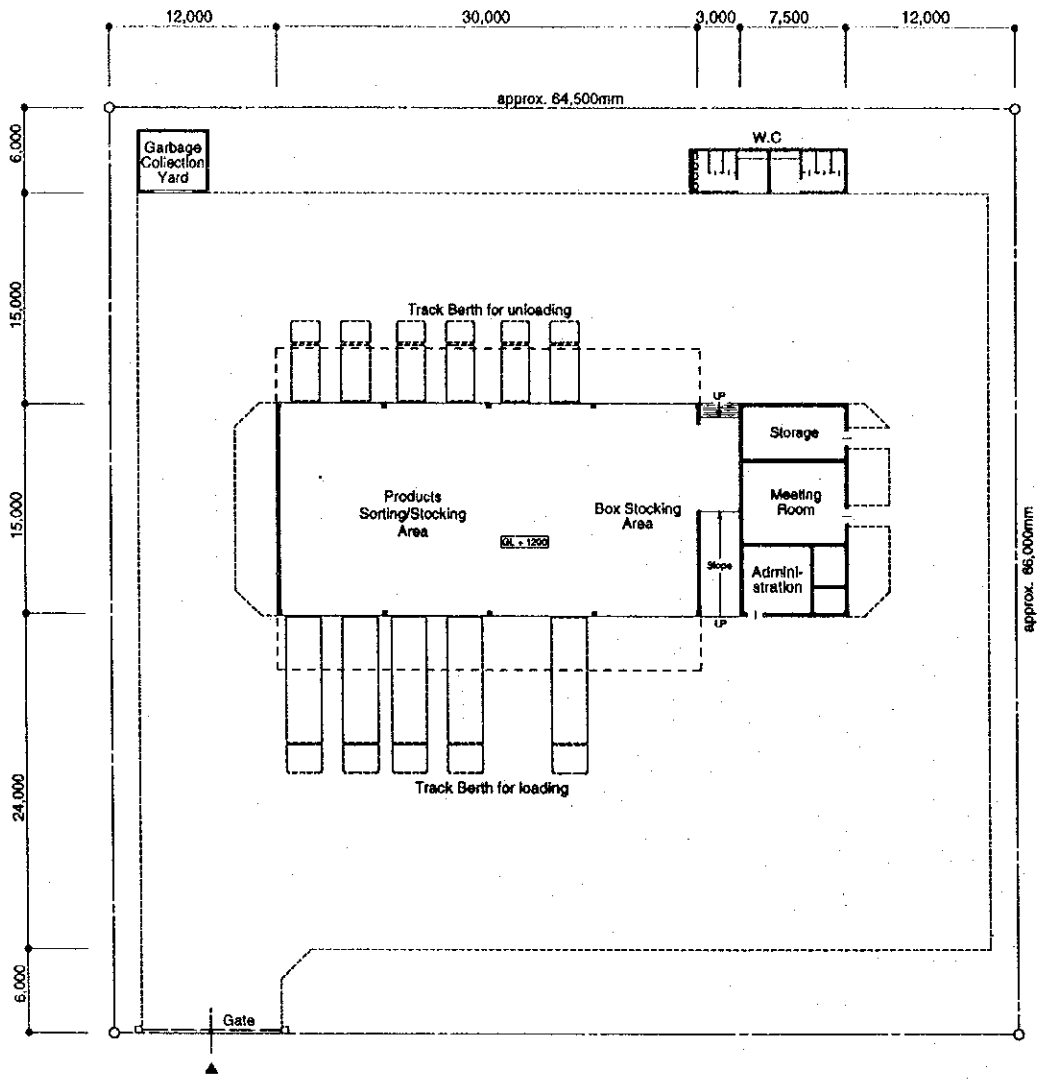

Fig. A.4.1-6 Products Collection and Distribution Center
— Saipina —
S = 1/500

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Republic of Bolivia
Japan International Cooperation Agency

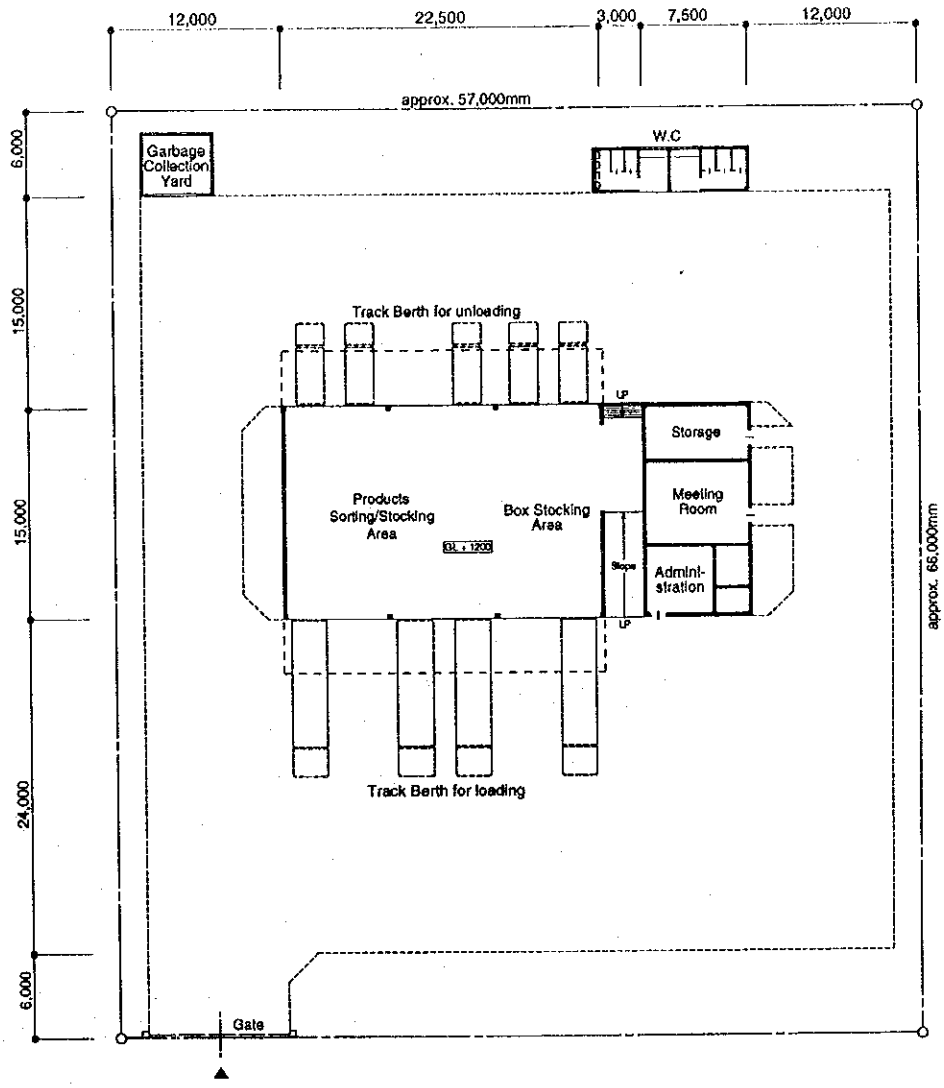

Fig. A.4.1-7 Products Collection and Distribution Center
— Valle Grande — S = 1/500

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Republic of Bolivia
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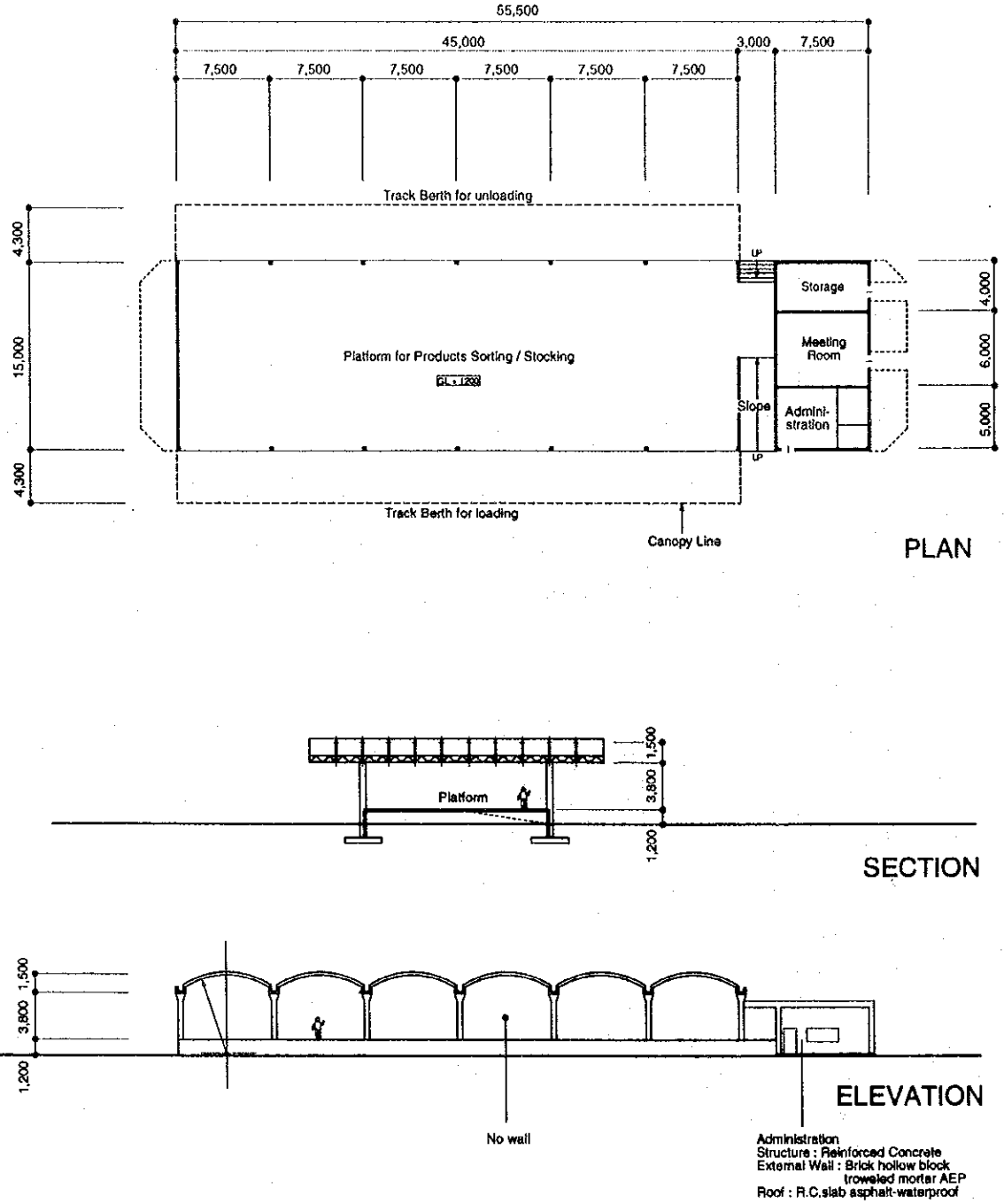

Fig. A.4.1-8 Products Collection and Distribution Center
— Pampa Grande — Plan / Elevation / Section
S = 1/500

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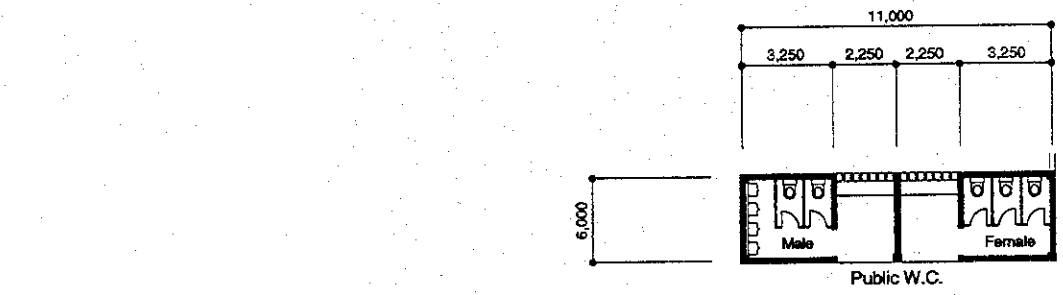

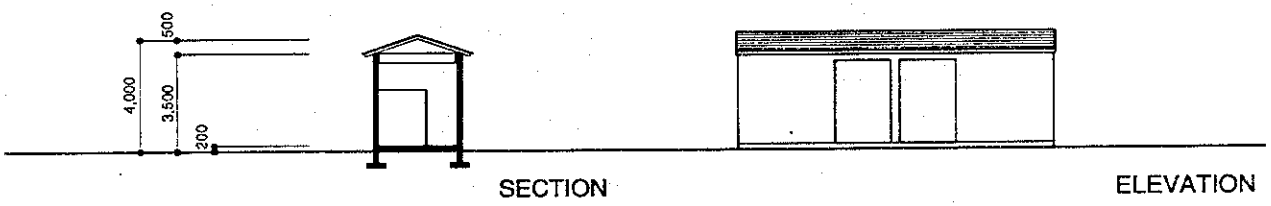

Fig. A.4.1-9 Public W.C. in C/D Center - Pampa Grande Plan / Elevation / Section

S = 1 / 250

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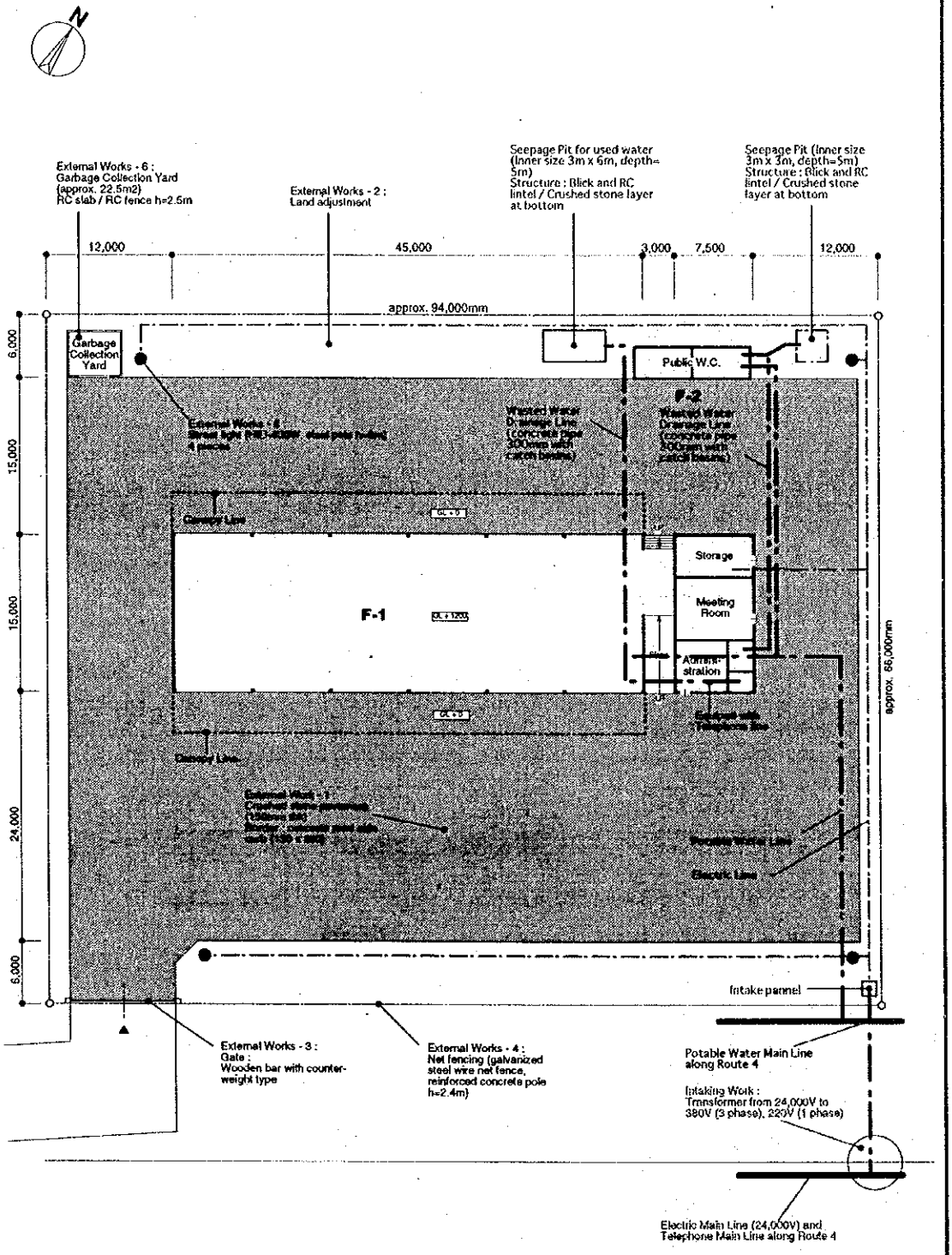

Fig. A.4.1-10 Products Collection and Distribution Center
— Pampa Grande — External Work Schedule /
Electricity, Potable Water, and Drainage Main Line in Site
S = 1/600

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Agricultural Marketing System in Santa Cruz
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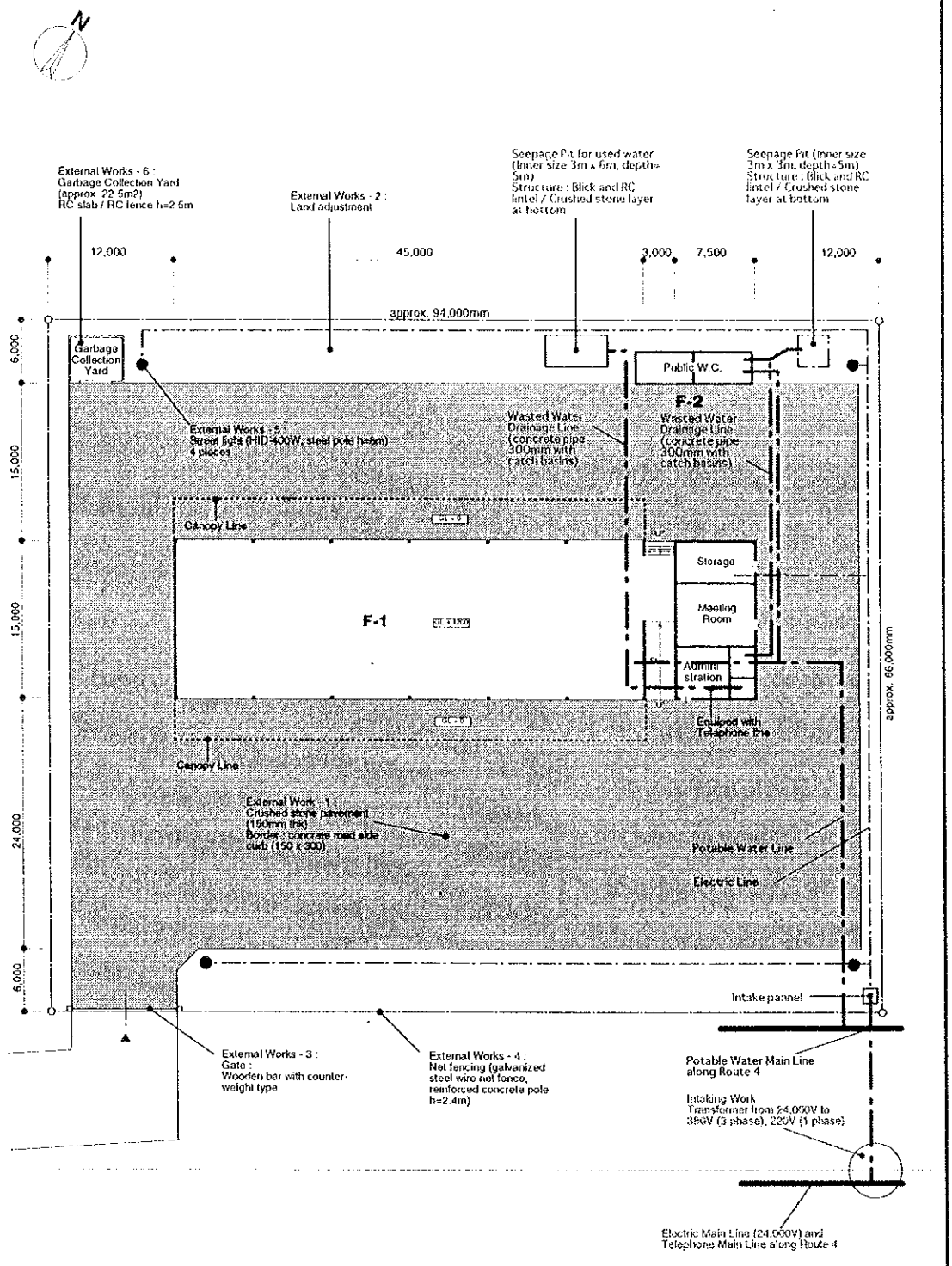

Fig. A.4.1-10 Products Collection and Distribution Center
— Pampa Grande — External Work Schedule /
Electricity, Potable Water, and Drainage Main Line in Site
S = 1/600

Feasibility Study for the Improvement of Agricultural Marketing System in Santa Cruz
Republic of Bolivia
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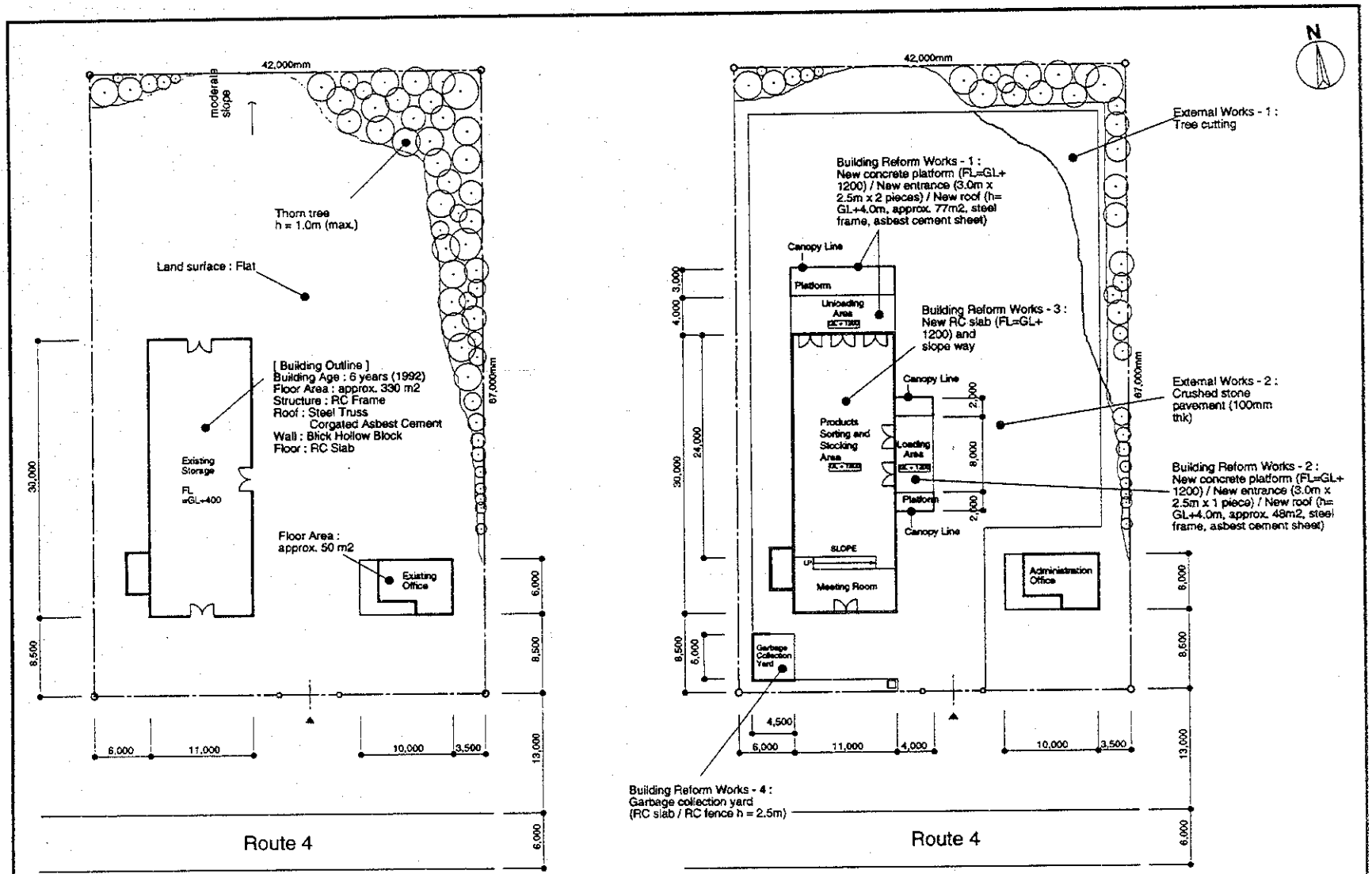

Fig. A.4.1-11 Products Collection and Distribution Center - Existing Site Condition / Layout Plan
— Samaipata — S = 1/1,000

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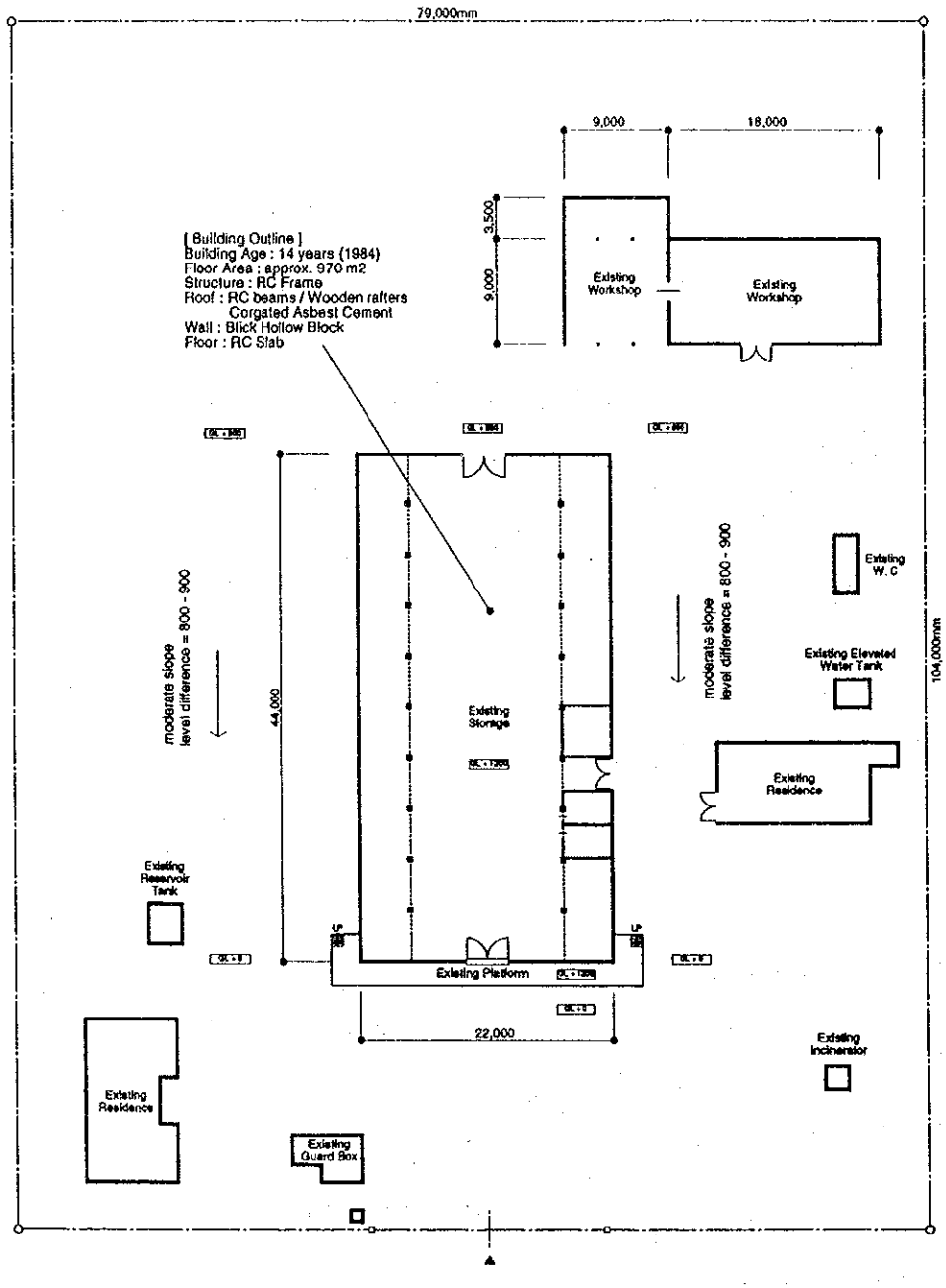
Republic of Bolivia
Japan International Cooperation Agency



Existing Site Condition

Fig. A.4.1-12 Products Collection and Distribution Center — San Isidro — Existing Site Condition S = 1/600

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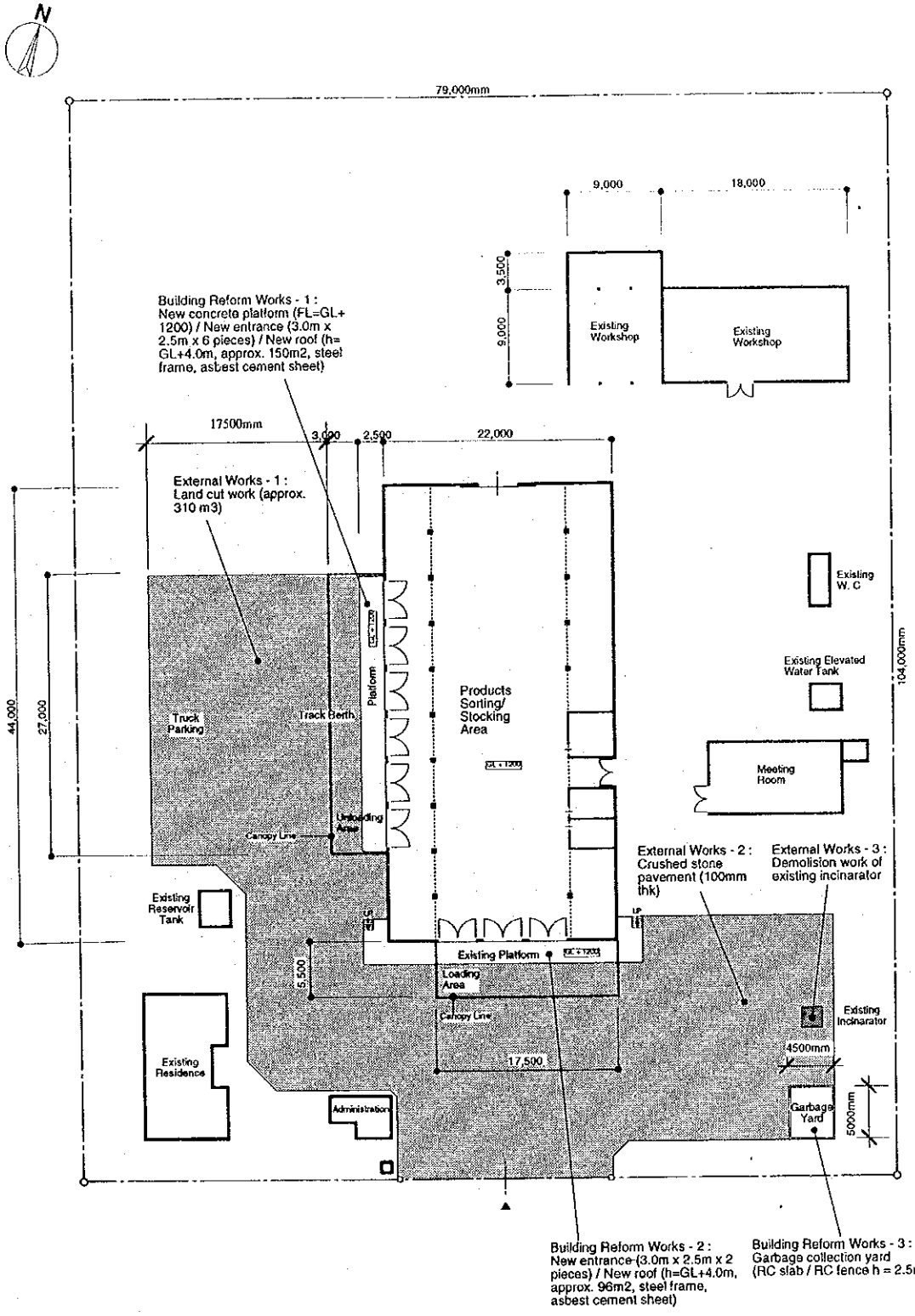

Layout Plan (Reform and new construction works)

Fig. A.4.1-13 Products Collection and Distribution Center — San Isidro — Layout Plan S = 1/600

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Republic of Bolivia
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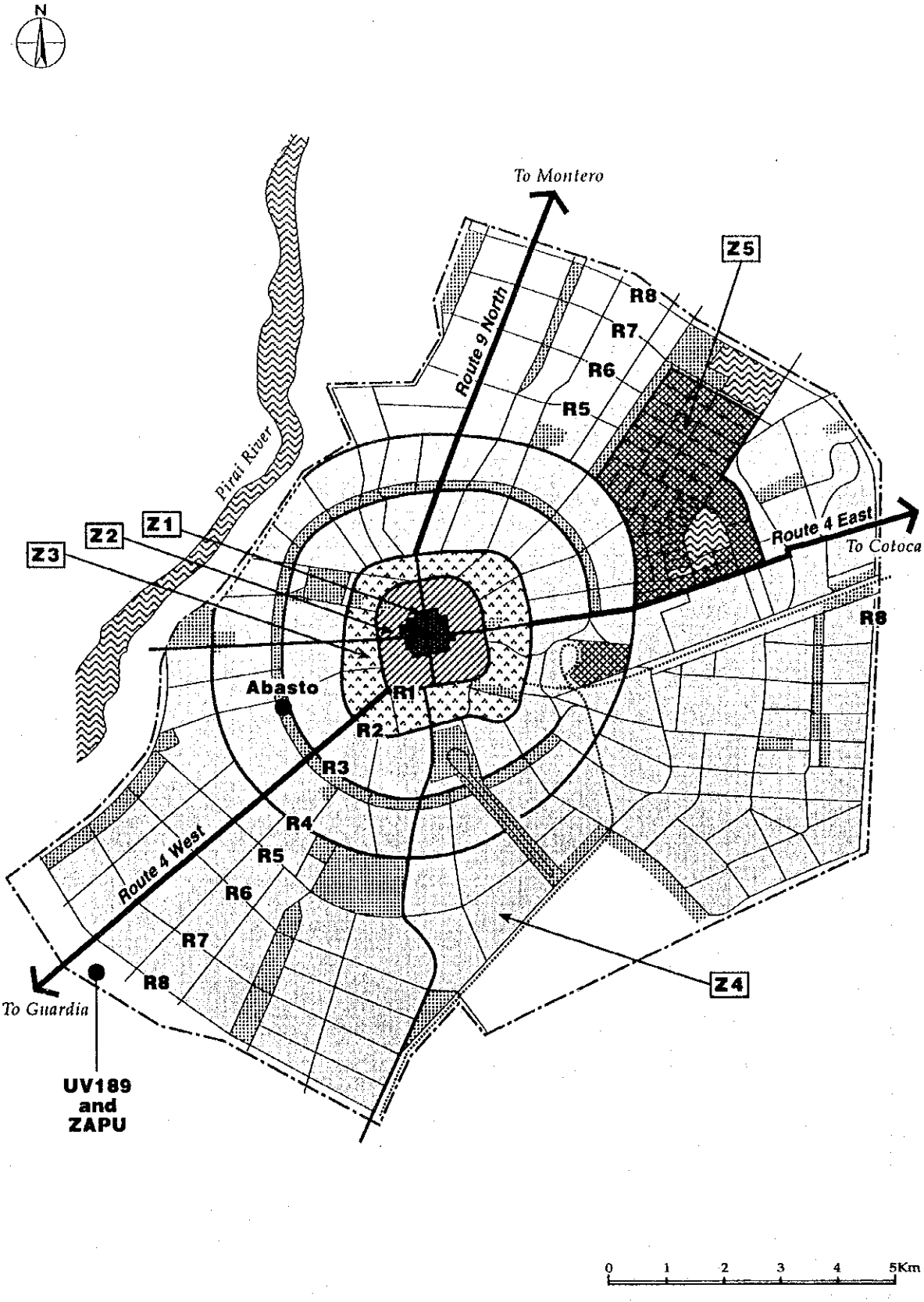

Fig. A.4.2-1 Outline of Santa Cruz City	Feasibility Study for the Improvement of Agricultural Marketing System in Santa Cruz Republic of Bolivia Japan International Cooperation Agency

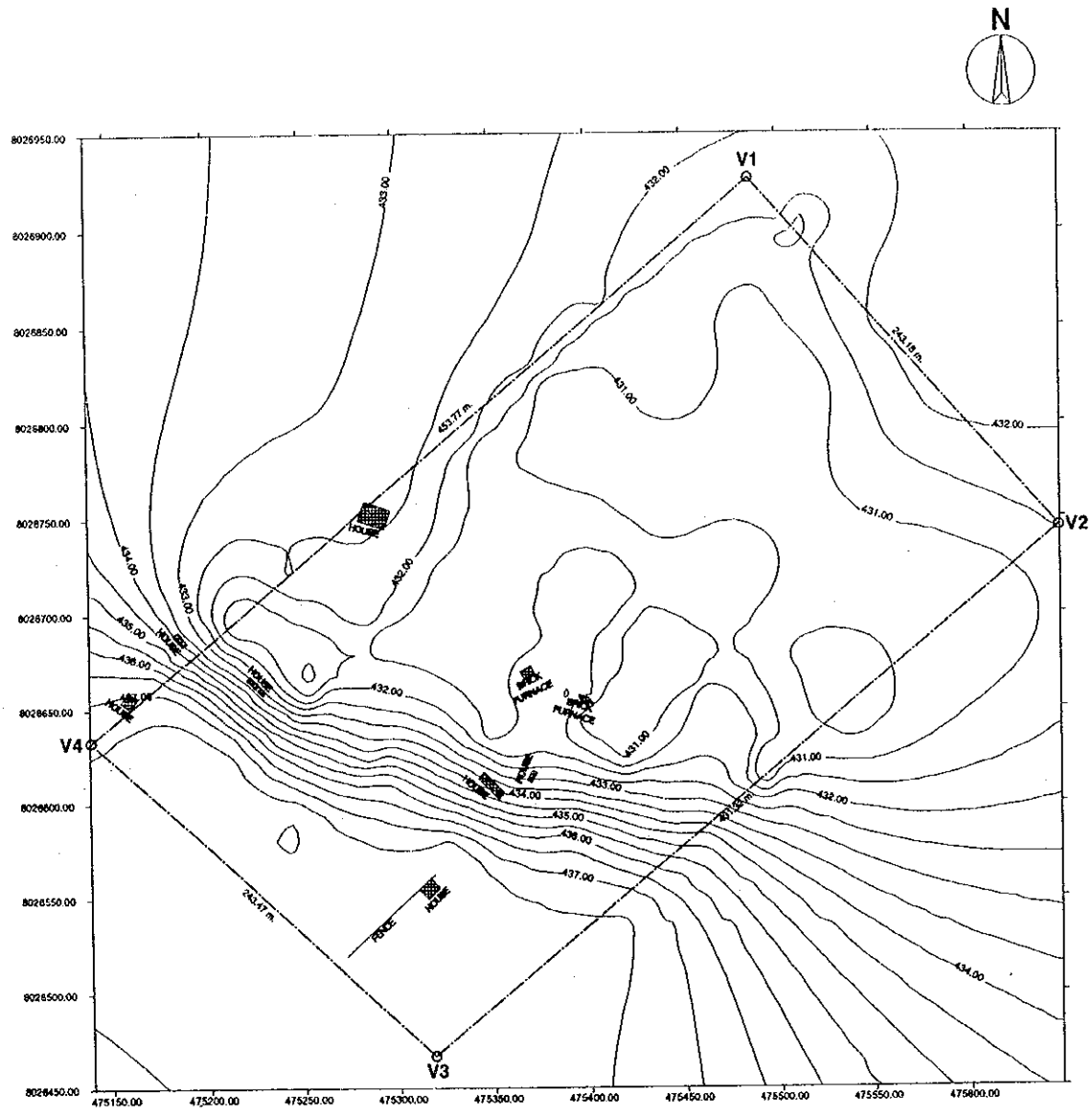

Fig. A.4.2-2 Survey Drawing of ZAPU, District 10, next to UV 189 in Santa Cruz City

S = 1/3,500

Feasibility Study for the Improvement of Agricultural Marketing System in Santa Cruz Republic of Bolivia
Japan International Cooperation Agency

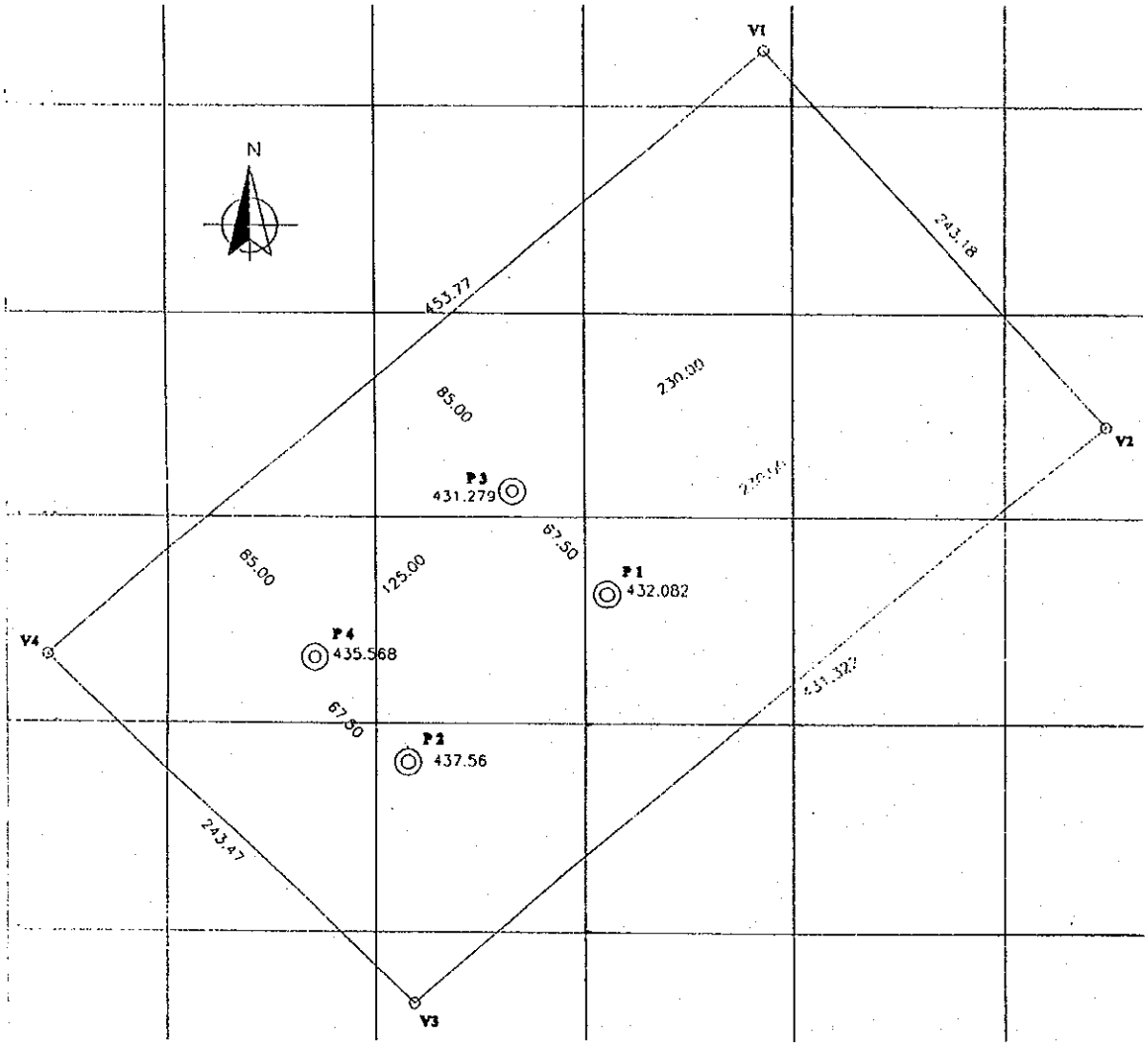

Fig. A.4.2-3 Boring Test Points of ZAPU, District 10, next to UV 189 in Santa Cruz City S = 1 / 3,300

Feasibility Study for the Improvement of Agricultural Marketing System in Santa Cruz
Republic of Bolivia
Japan International Cooperation Agency

Owner : Jica Study Team
Job : Soil Tests
Well Nr. : 1

Project : Improvement of Agricultural markt Systen S. Cru.
Location : Zona de Zapú Distrito Nr. 10 Santa Cruz
Date : 12/12/98

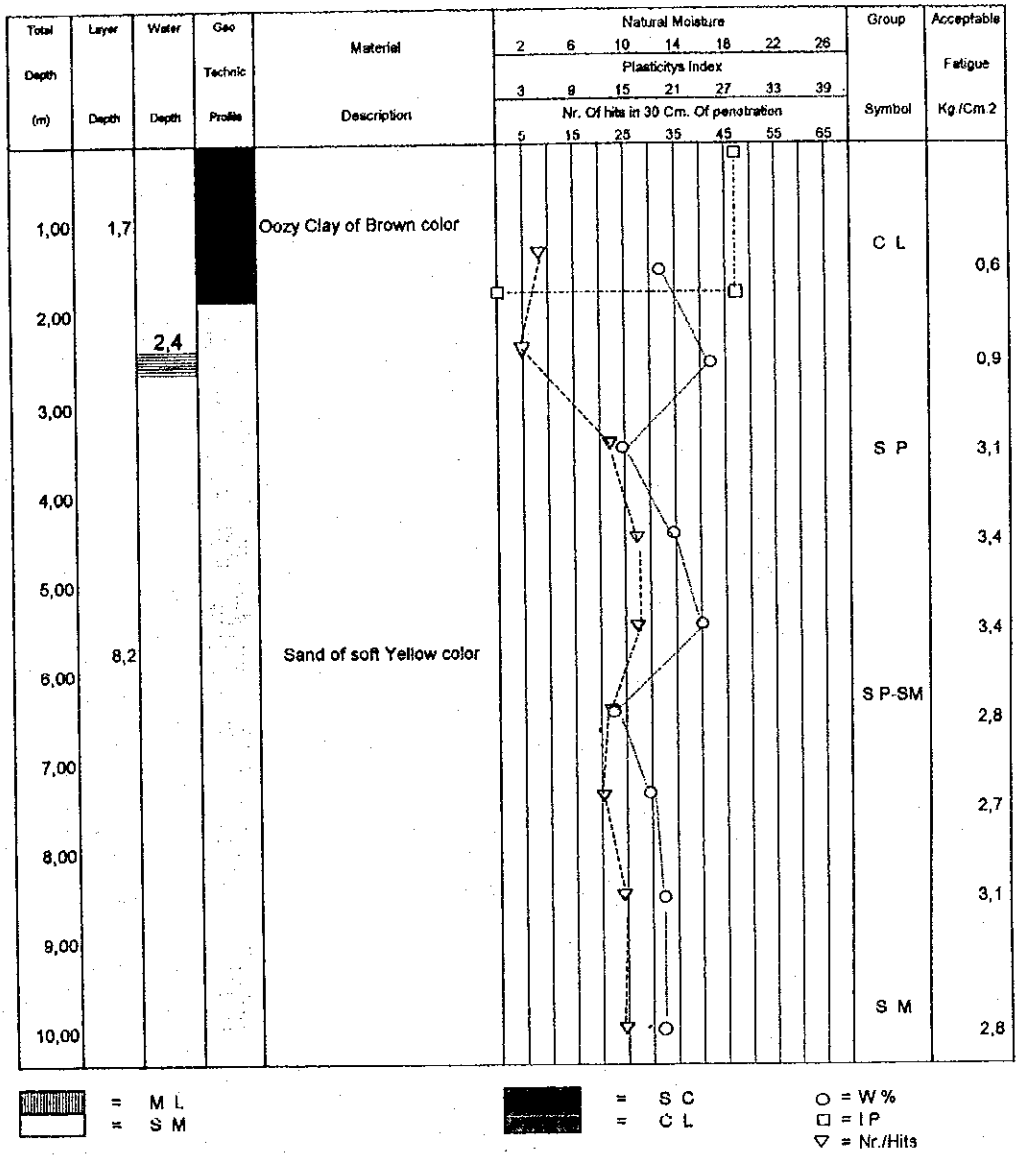

Fig. A.4.2-4 Boring Geotechnic Profile of ZAPU, District 10, next to UV 189 in Santa Cruz City - Borehole-1

Feasibility Study for the Improvement of Agricultural Marketing System in Santa Cruz
Republic of Bolivia
Japan International Cooperation Agency

Owner : Jica Study Team
Job : Soil Tests
Well Nr. : 2

Project : Improvement of Agricultural markt Systen S. Cru.
Location : Zona de Zapú Distrito Nr. 10 Santa Cruz
Date : 12/12/98

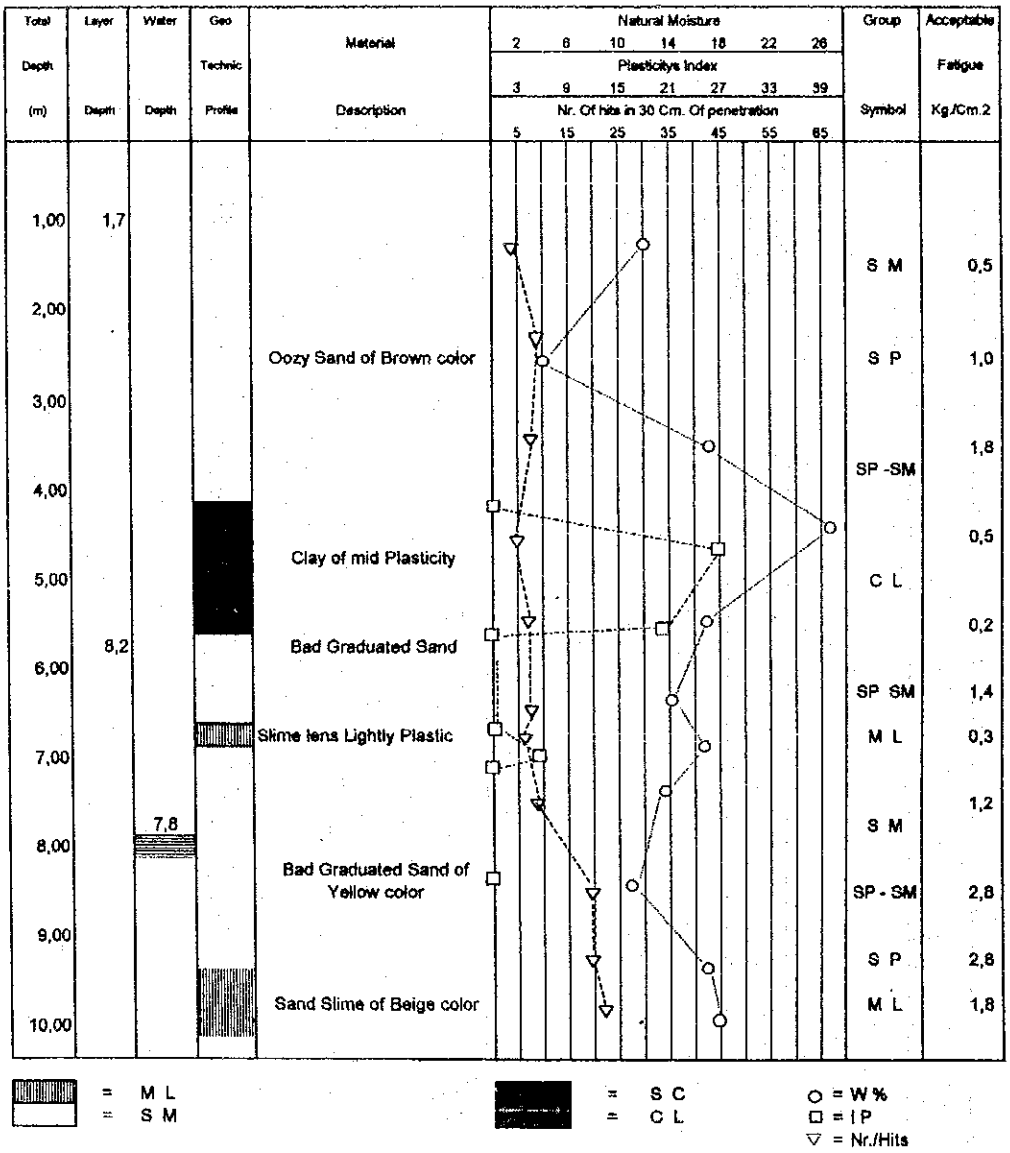

Fig. A.4.2-5 Boring Geotechnic Profile of ZAPU, District 10, next to UV 189 in Santa Cruz City - Borehole-2

Feasibility Study for the Improvement of Agricultural Marketing System in Santa Cruz
Republic of Bolivia
Japan International Cooperation Agency

Owner : Jica Study Team
Job : Soil Tests
Well Nr. : 3

Project : Improvement of Agricultural markt Systen S. Cru
Location : Zona de Zapú Distrito Nr. 10 Santa Cruz
Date : 12/12/98

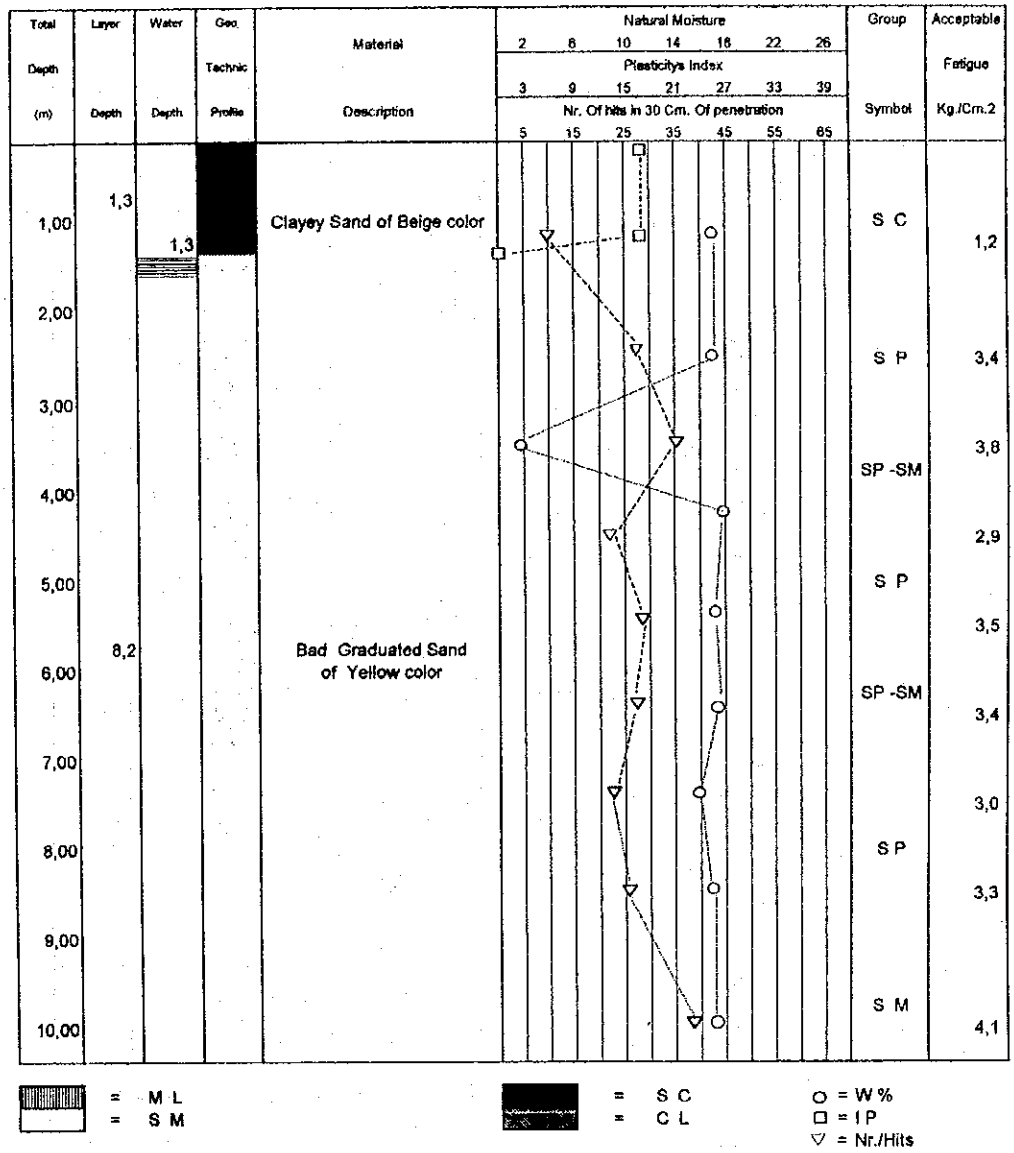

Fig. A.4.2-6 Boring Geotechnic Profile of ZAPU, District 10, next to UV 189 in Santa Cruz City - Borehole-3

Feasibility Study for the Improvement of Agricultural Marketing System in Santa Cruz
Republic of Bolivia
Japan International Cooperation Agency

Owner : Jica Study Team
Job : Soil Tests
Well Nr. : 4

Project : Improvement of Agricultural markt Systen S. Cru.
Location : Zona de Zapú Distrito Nr. 10 Santa Cruz
Date : 11/12/98

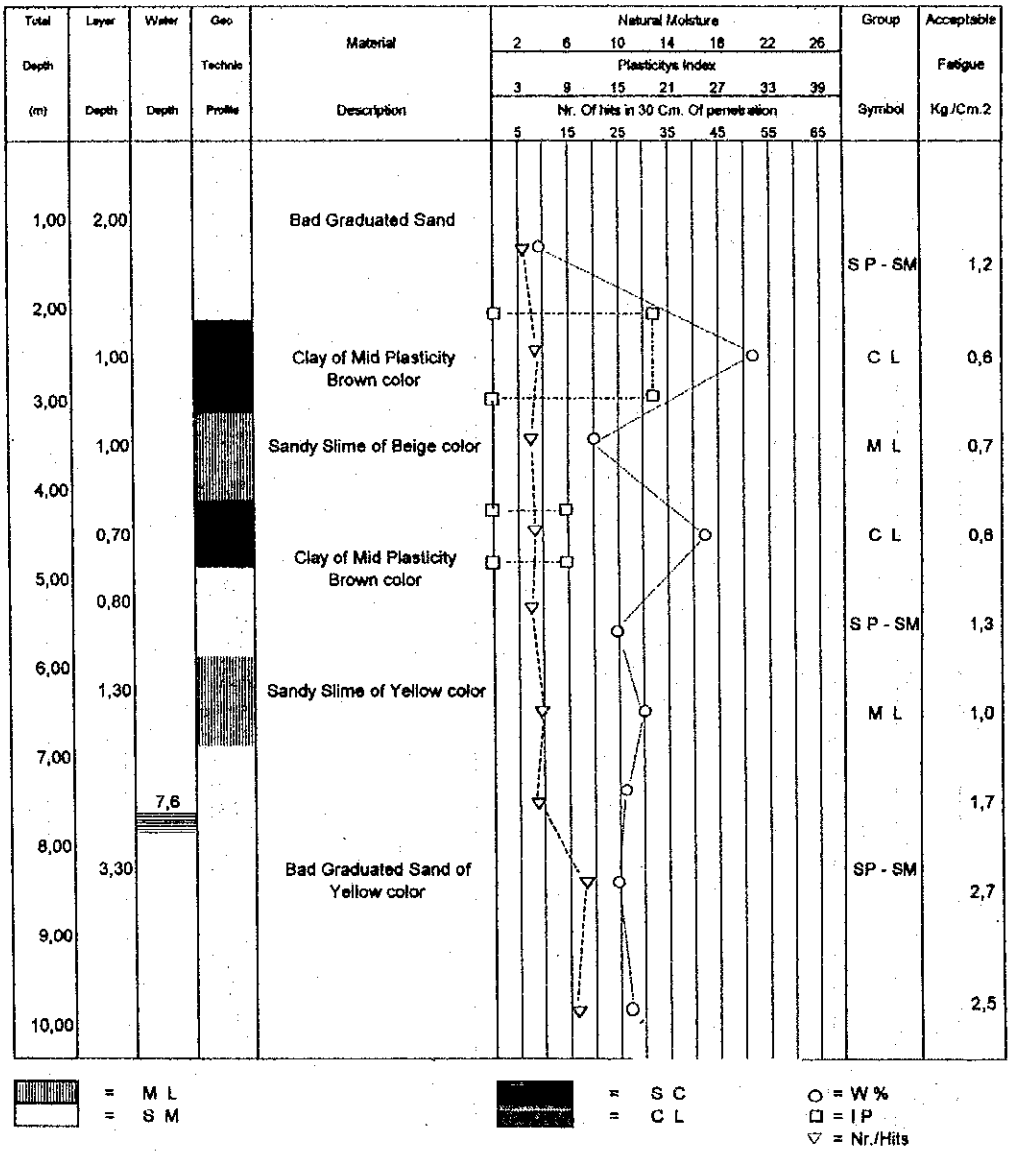

Fig. A.4.2-7 Boring Geotechnic Profile of ZAPU, District 10, next to UV 189 in Santa Cruz City - Borehole-4

Feasibility Study for the Improvement of Agricultural Marketing System in Santa Cruz
Republic of Bolivia
Japan International Cooperation Agency

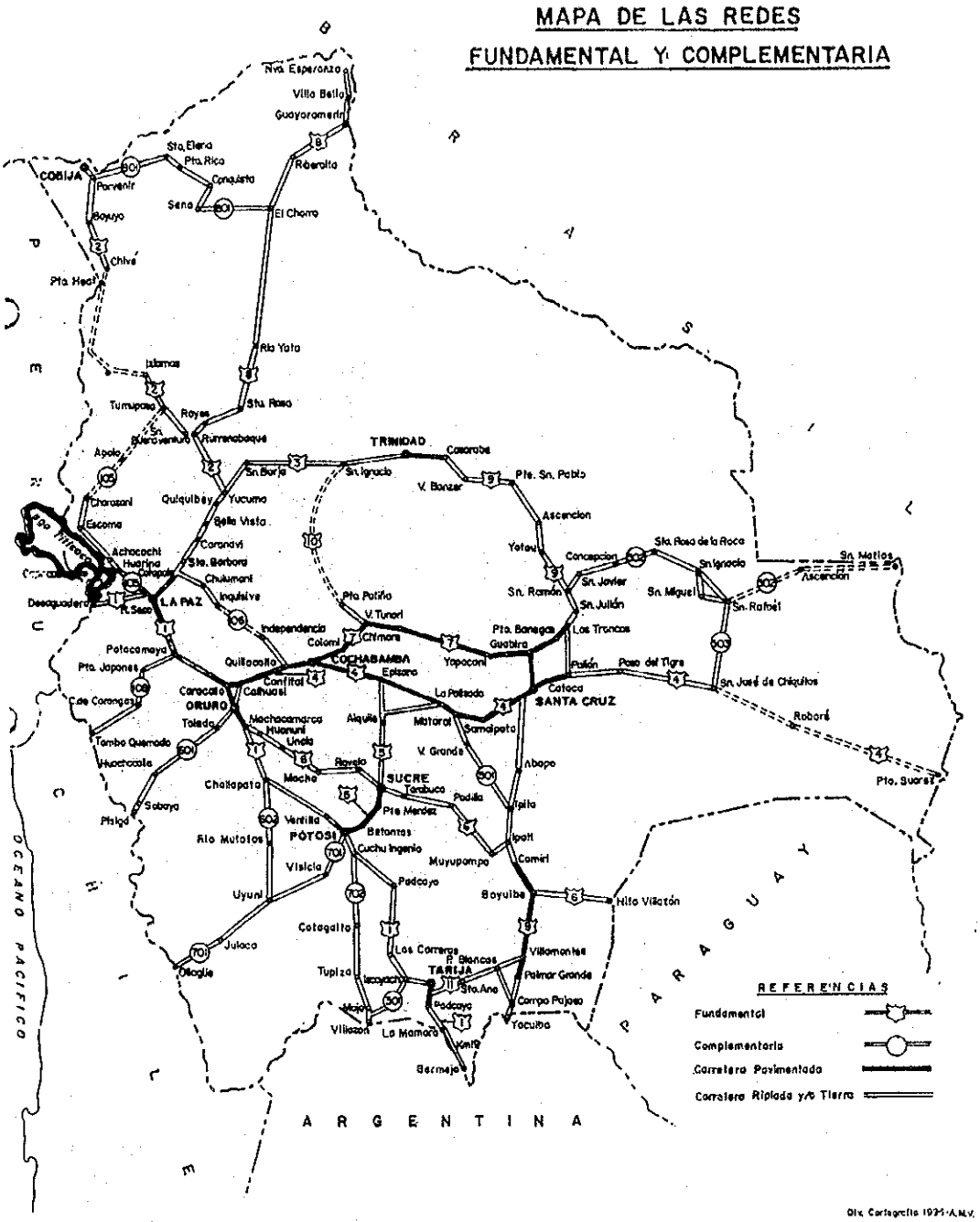

Fig. A.4.2-8 Existing Road Network and Road Network Development Plan in Santa Cruz Prefecture	Feasibility Study for the Improvement of Agricultural Marketing System in Santa Cruz Republic of Bolivia Japan International Cooperation Agency

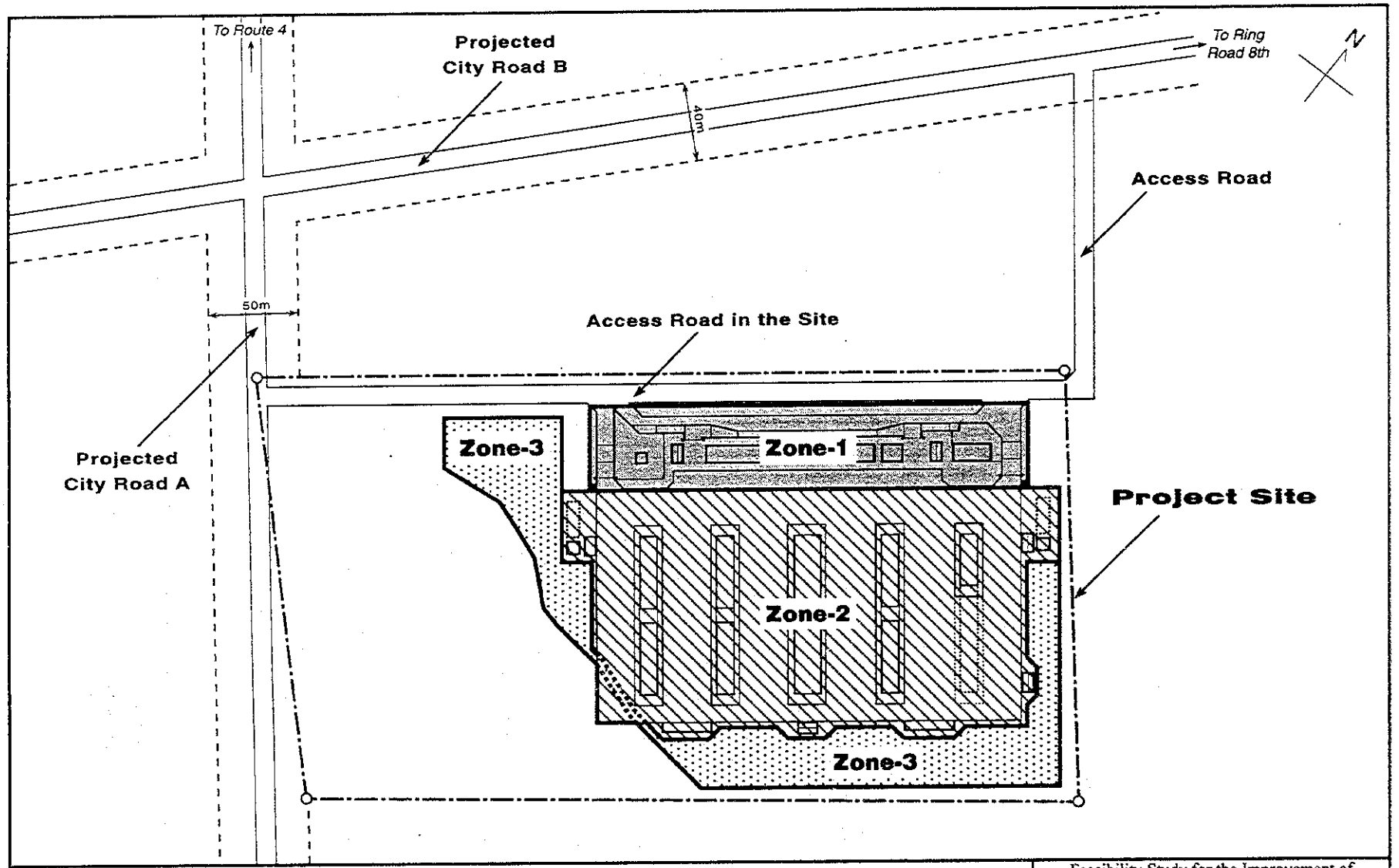

Fig. A.4.2-9 Zoning for New Wholesale Market Facilities

S = 1/3,000

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Agricultural Marketing System in Santa Cruz
Republic of Bolivia
Japan International Cooperation Agency

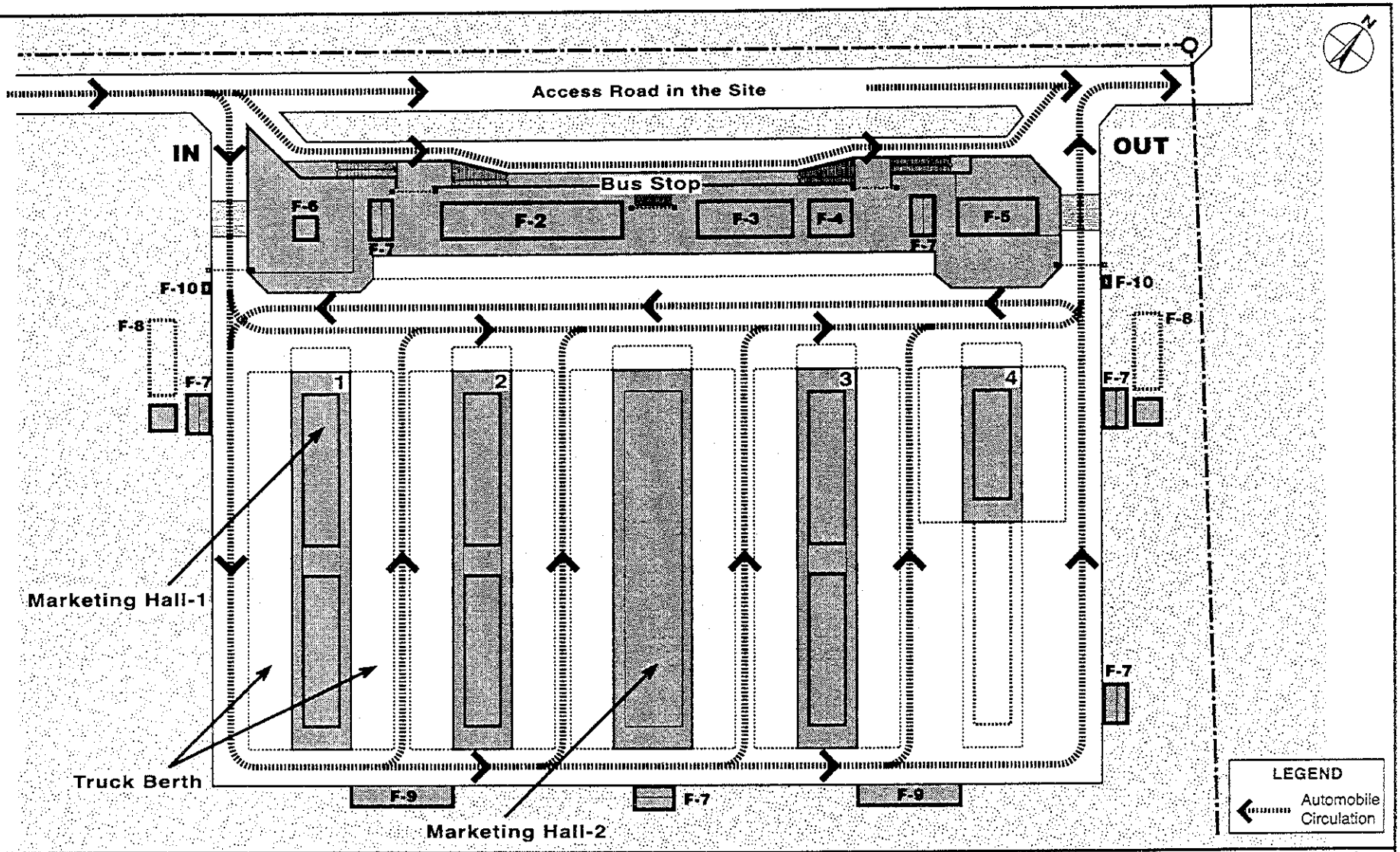

Fig. A.4.2-10 Circulation Plan for New Wholesale Market

S = 1/1,500

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Republic of Bolivia
Japan International Cooperation Agency

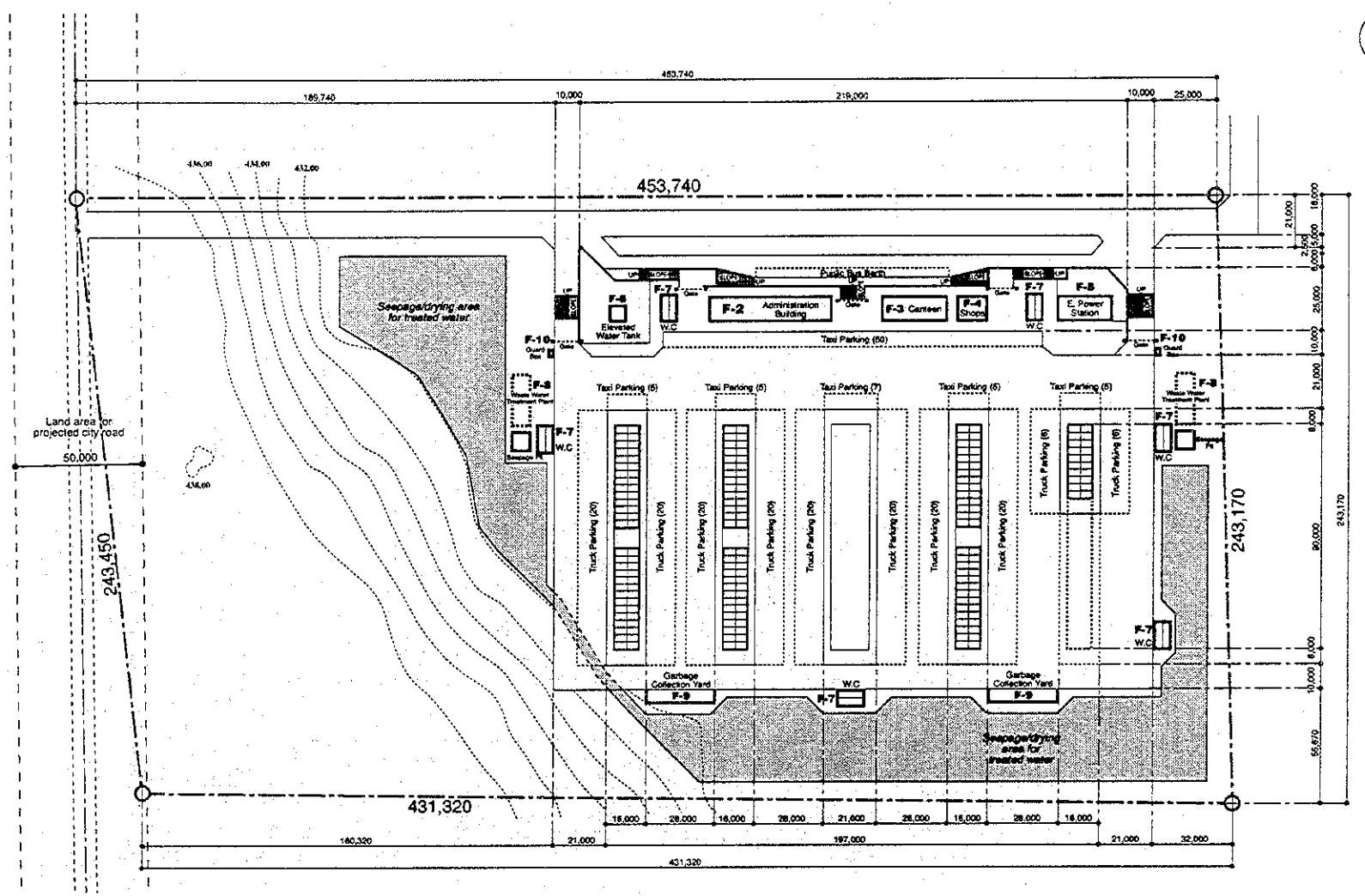

Fig. A.4.2-11 General Layout Plan for the New Wholesale Market

S = 1/2,500

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Republic of Bolivia
Japan International Cooperation Agency

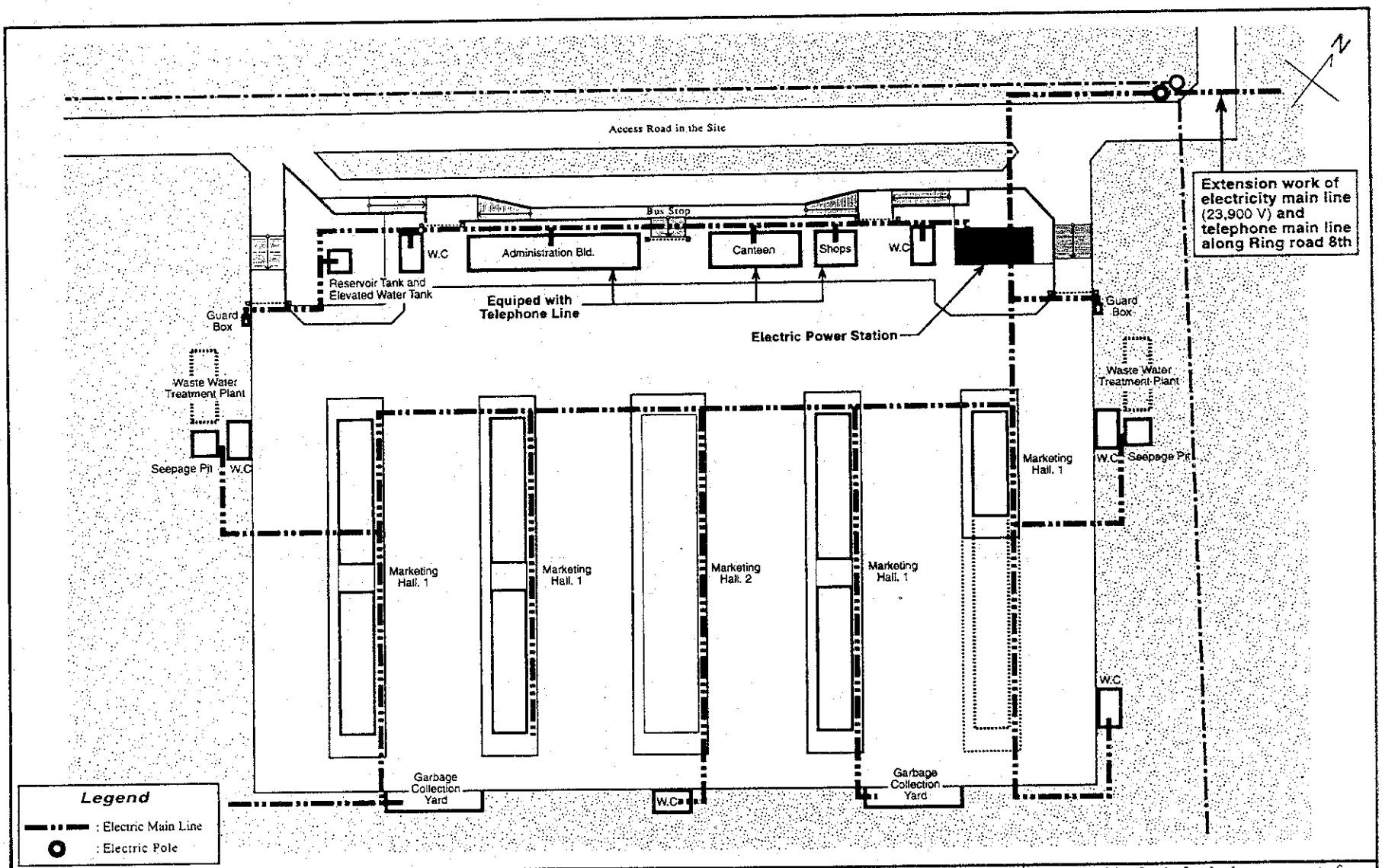

Fig. A.4.2-12 Main Line of Electricity in New Wholesale Market

S = 1/1,500

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Republic of Bolivia
Japan International Cooperation Agency

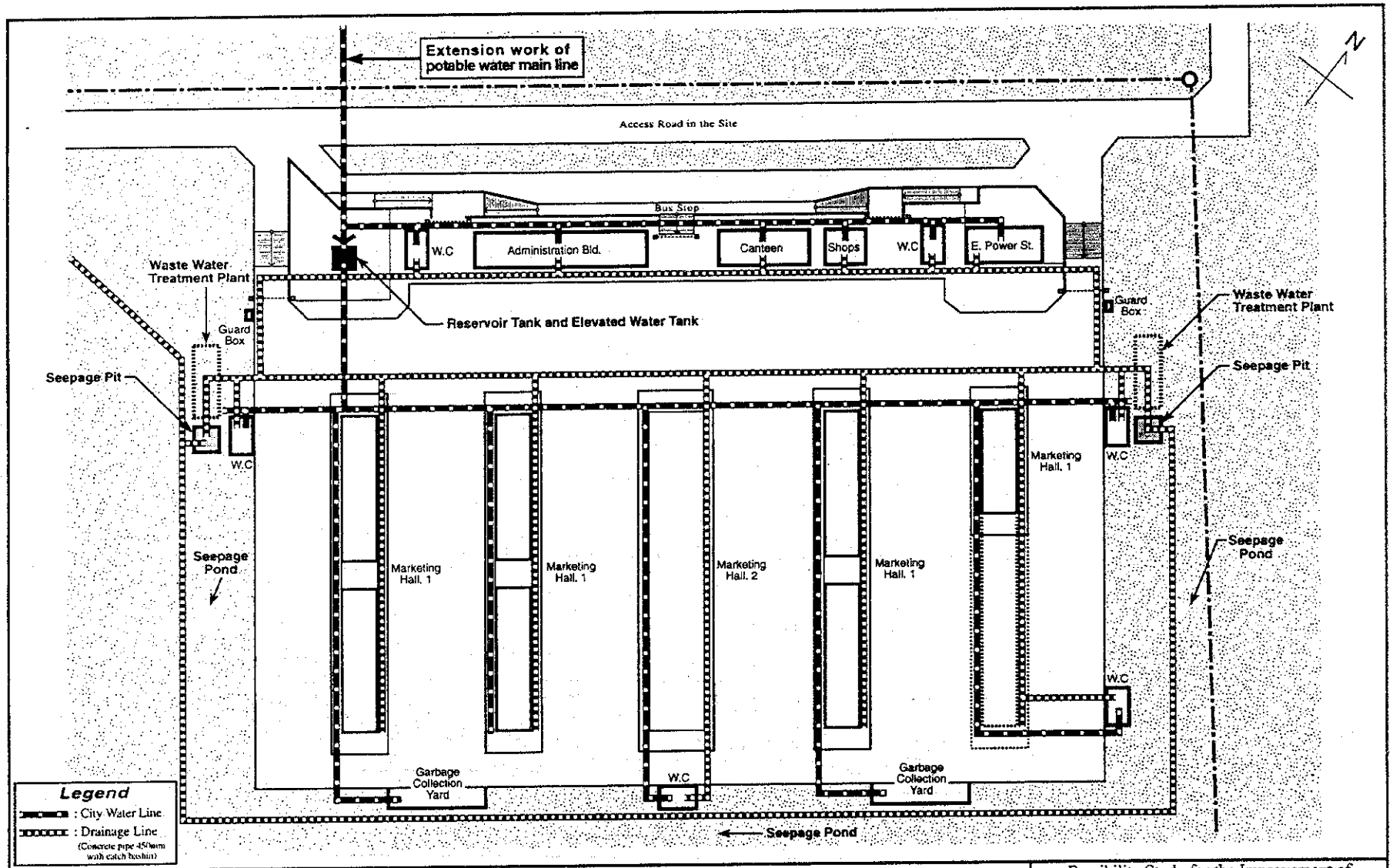

Fig. A.4.2-13 Main Line of Potable Water and Waste Water Drainage in New Wholesale Market
S = 1/1,500

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Republic of Bolivia
Japan International Cooperation Agency

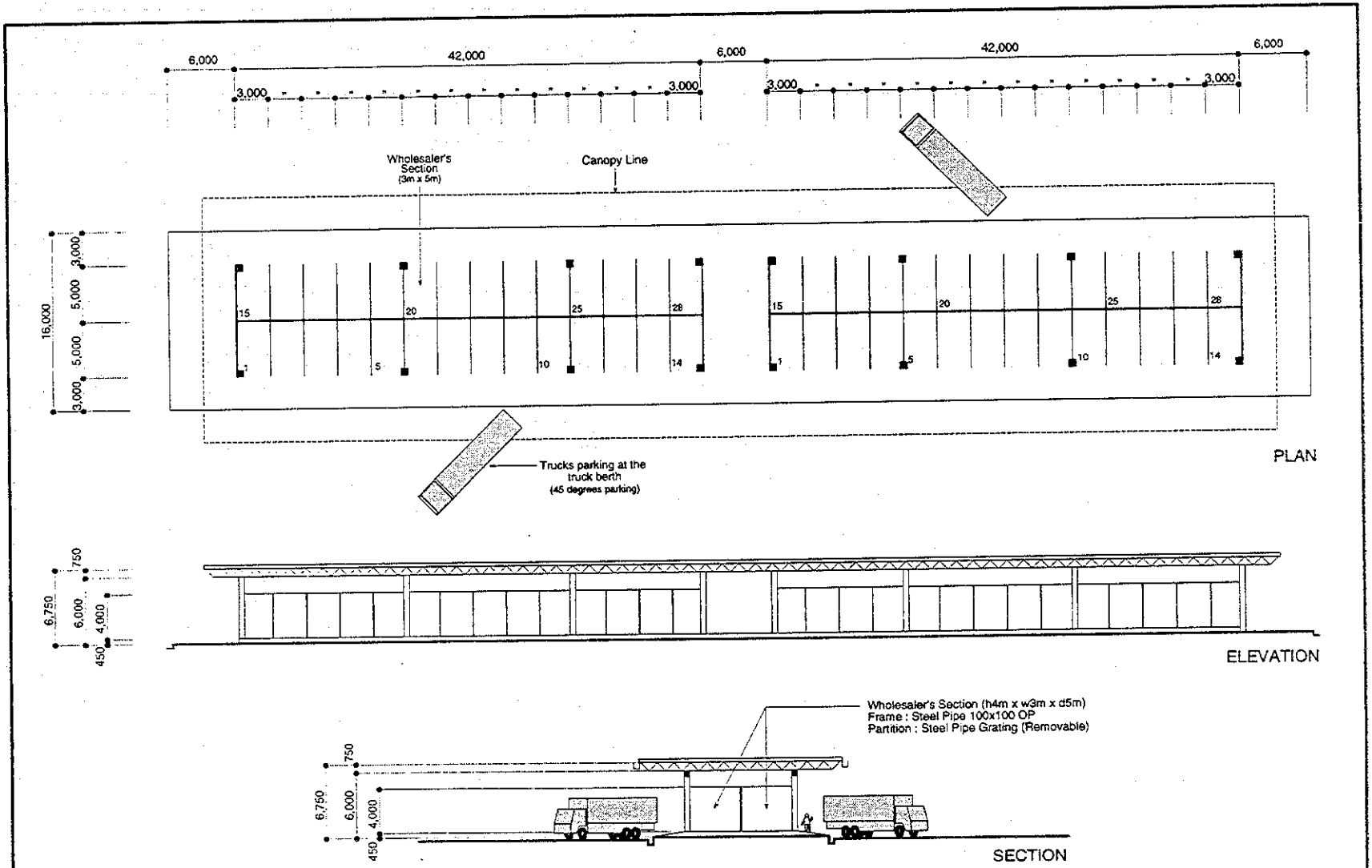

Fig. A.4.2-14 Marketing Hall - 1 Plan / Elevation / Section S = 1/500

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Republic of Bolivia
Japan International Cooperation Agency

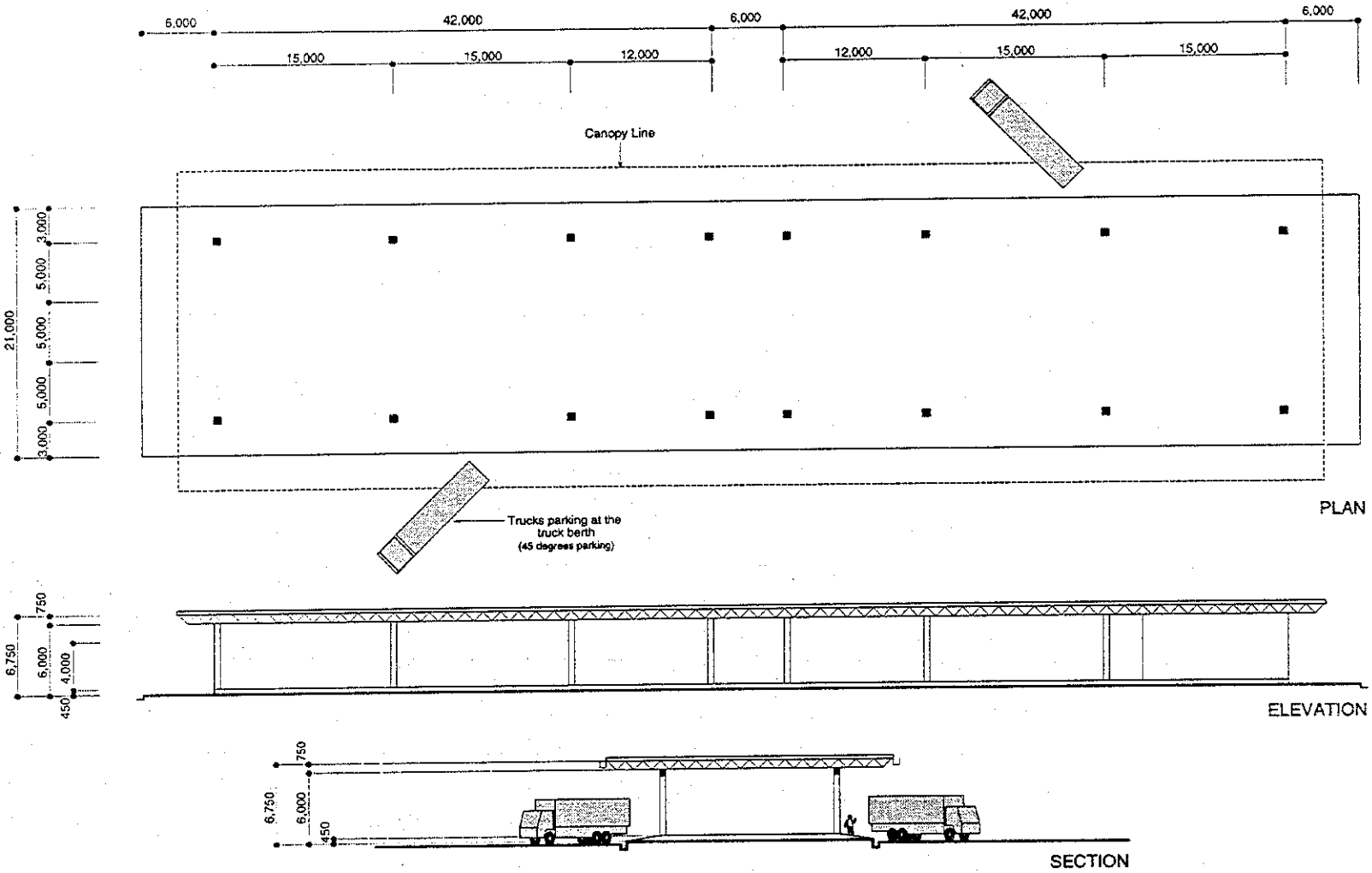

Fig. A.4.2-15 Marketing Hall - 2 Plan / Elevation / Section S = 1/500

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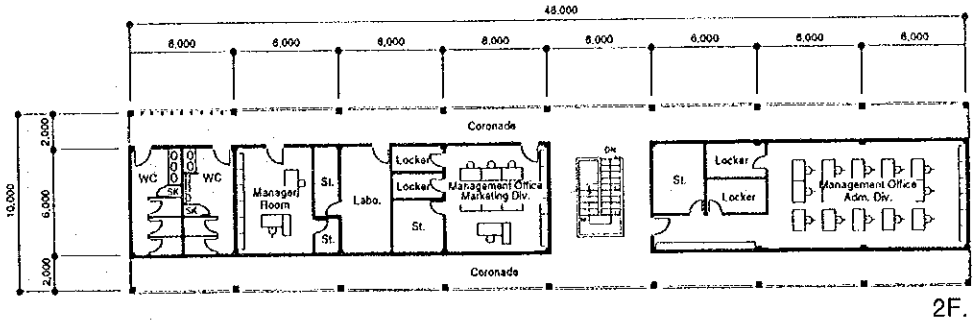
Republic of Bolivia
Japan International Cooperation Agency



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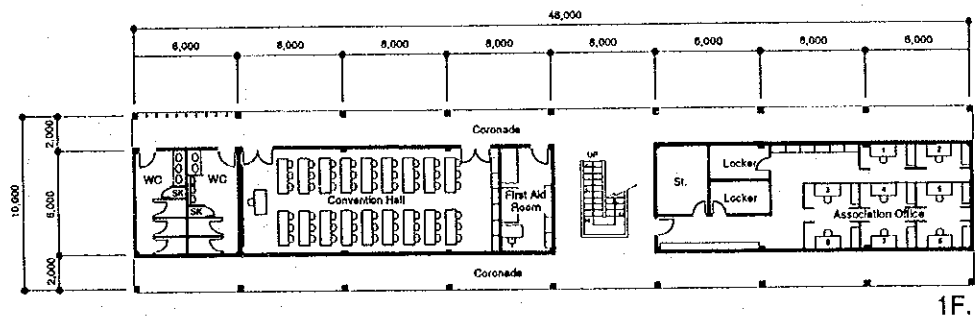

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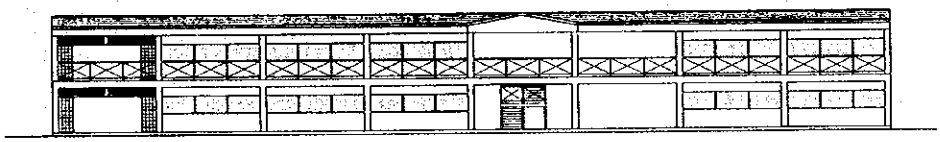
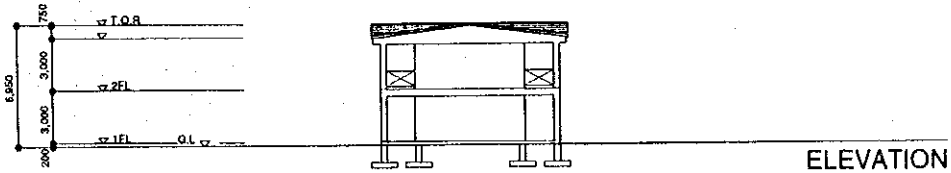


ELEVATION



ELEVATION

Fig. A.4.2-16 Administration Office in New Wholesale Market Plan / Elevation S = 1/400

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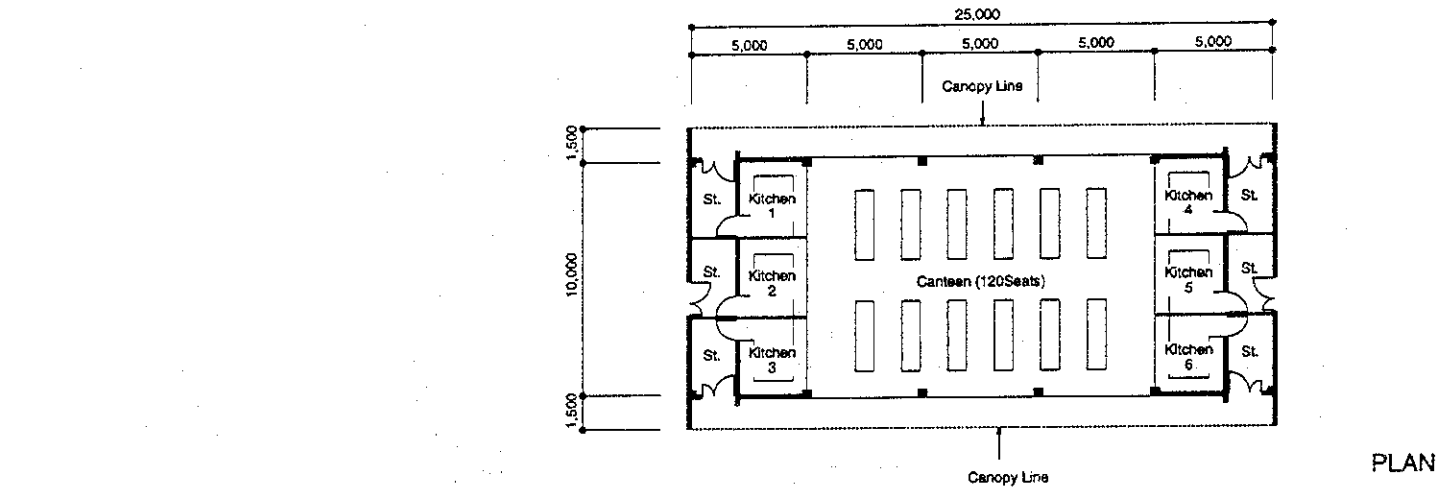
Japan International Cooperation Agency



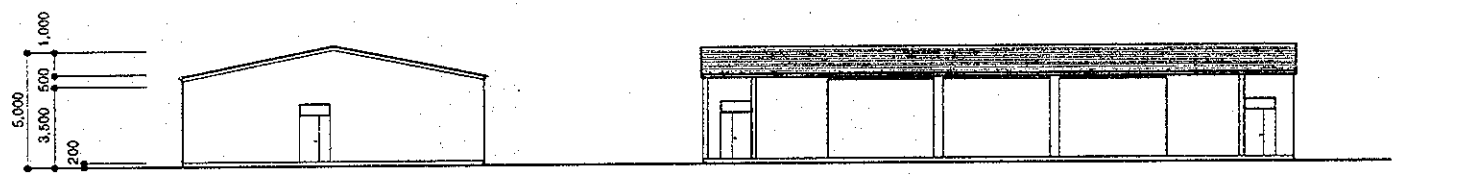


Fig. A.4.2-17 Canteen in New Wholesale Market Plan / Elevation / Section

S = 1 / 300

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Republic of Bolivia
Japan International Cooperation Agency

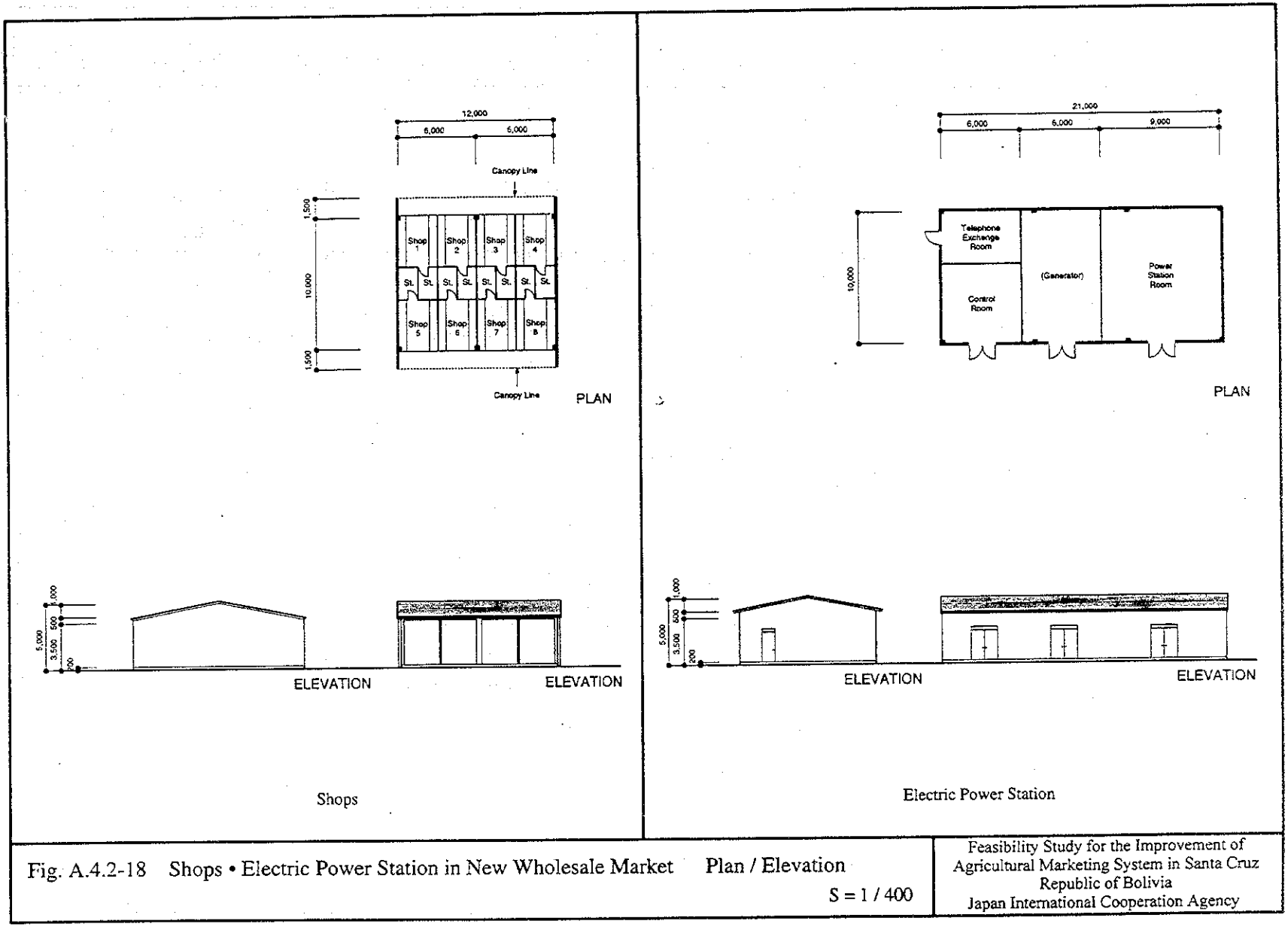

Fig. A.4.2-18 Shops • Electric Power Station in New Wholesale Market Plan / Elevation

S = 1 / 400

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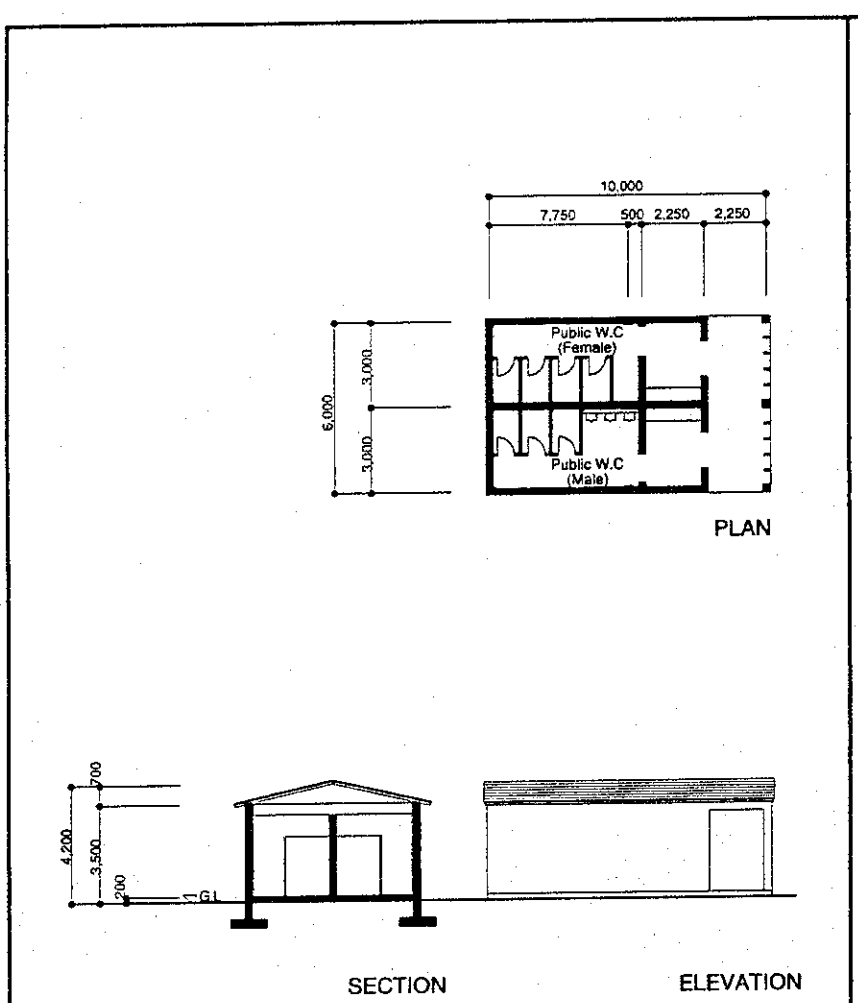
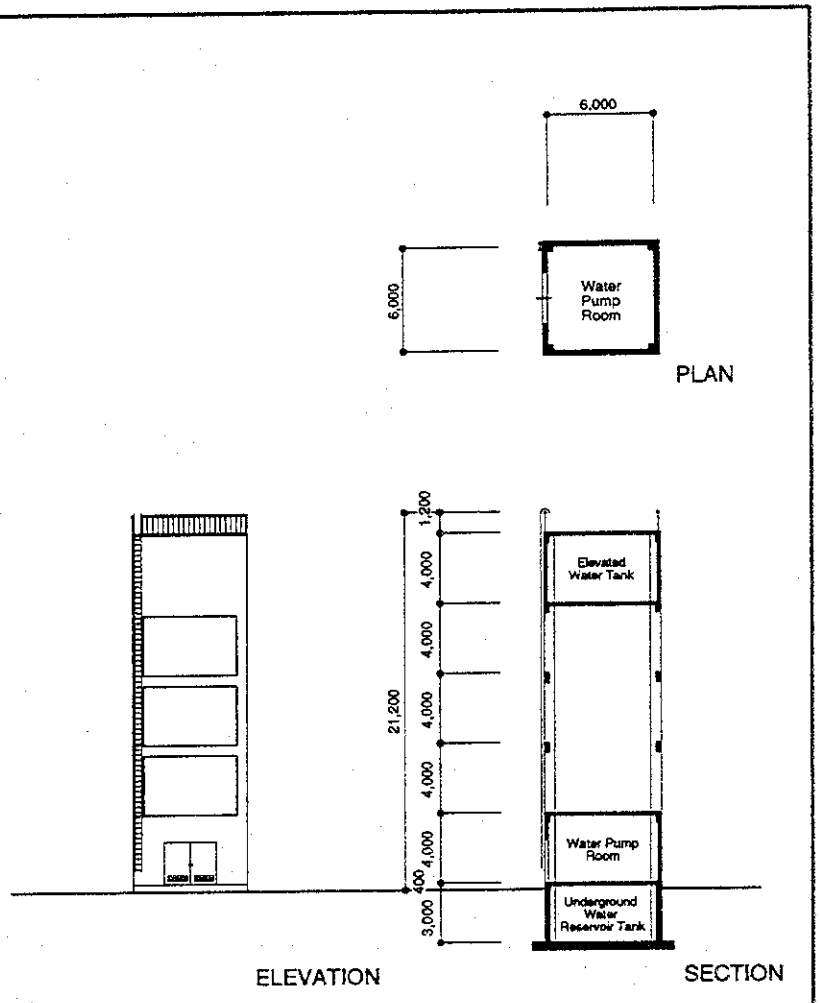
Republic of Bolivia
Japan International Cooperation Agency



Public Water Croset S = 1 / 250



Elevated Water Tank S = 1 / 400

Fig. 4.2-19 Public W.C • Elevated Water Tank in New Wholesale Market Plan / Elevation / Section

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Republic of Bolivia
Japan International Cooperation Agency

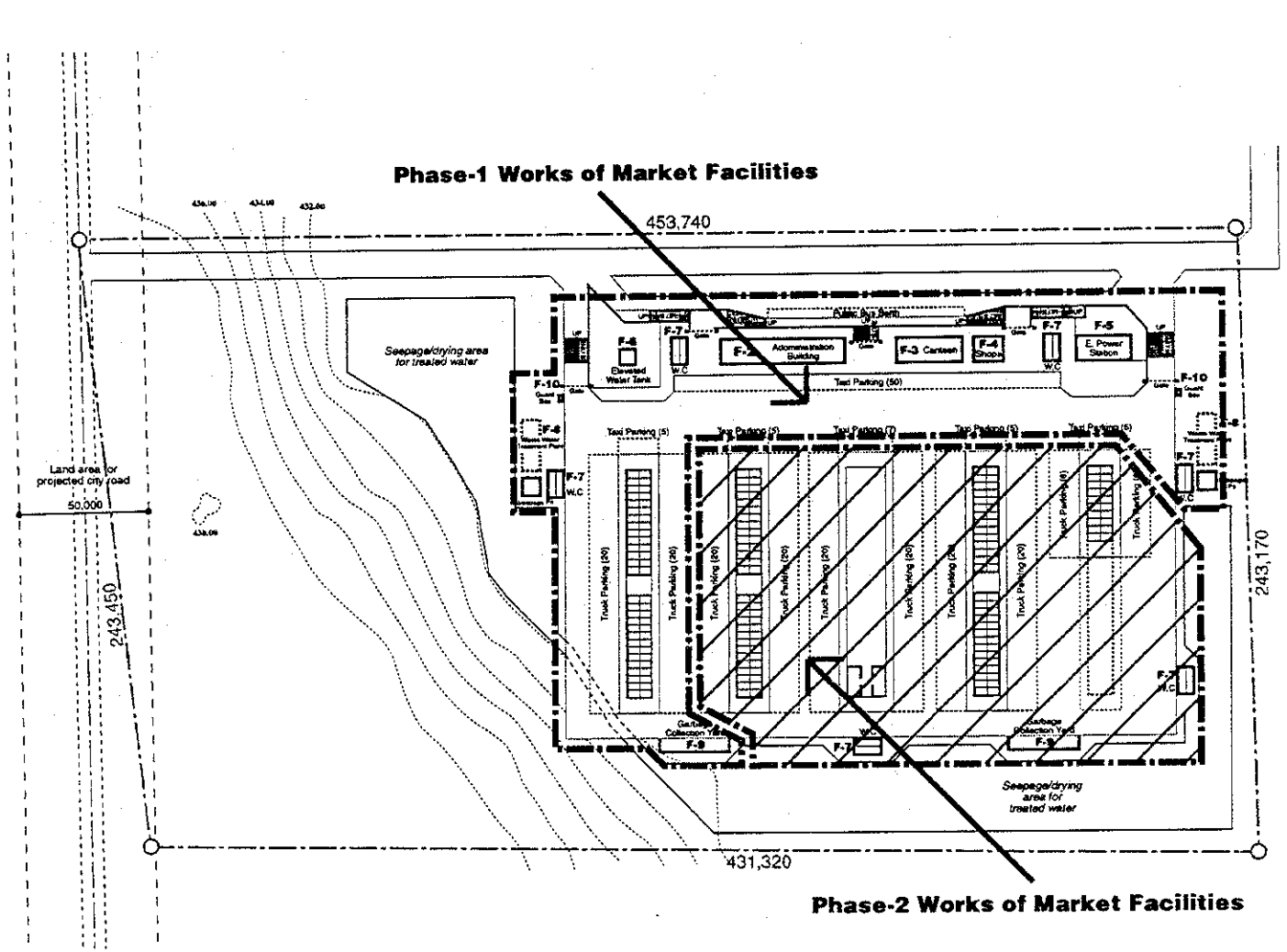

Fig. A.4.2-20 Phasing Schedule for Construction Works of New Wholesale Market Facilities S = 1/2,500

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Republic of Bolivia
Japan International Cooperation Agency

Table A.4.1-1 General Characteristics of Soil Condition (Result of Boring Test)

Locality	No. of Boreholes	Depth	Phreatic Level	Characteristics	Observations
Saipina	1	10.00	Not available	Up to 1.70 m, Sandy Slime. From 1.70 m to 10.00 m, Rock.	Apt to foundations, in any depth
Pampa Grande	1	10.00	Not available	Up to 5.50 m, Sandy Material. From 5.60 m to 10.00 m, Slime, Lighty Plastic.	Apt to foundations, in any depth
Santa Cruz	4	10.00	Available at Different Depth	Borehole #1 and #3. Up to 1.70 m, Clay. From 1.70 m to 10.00 m, Sand Materials. Phreatic Level, between 1.30 m and 2.40 m. Borehole #2 Up to 4.00 m, Slime Sand with Good Resistance. From 4.00 m to 5.00 m, Medium Plastic Clay with Low Resistance. From 5.00 m to 6.50 m, Lens Shape Clay Layer with Low Resistance. From 6.50 m to 10.00 m, Sand Materials with Good Resistance. Phreatic Level, at 7.8 m. Borehole #4 Up to 2.00 m, Poor Graded Sand. From 2.00 m to 5.00 m, Slime Clays and Clayly Slimes. From 5.00 m to 10.00 m, Sandy Materials, Phreatic Level at 7.60 m	Foundations restricted to a carefully researth

Table A.4.1-2 Foundation Recommendation (Result of Boring Test)

Locality	Foundation Level	Phreatic Level	Admissible Stress (kg/cm2)	Foundation Type	Observations
Saipina	-0.6	-	1.00	Spread	Seismic Zone
Pampa Grande	-0.6	-	1.00	Spread	Seismic Zone
Santa Cruz	To define by project engineer	429.6	Over Sandy Soil, 1.00 kg/cm2. Over Clay, 0.50 kg/cm2	Spread	Non Seismic Zone

Table A.4.1-3 Required Floor Area for Products Collection and Distribution Center

		Planned handling volume				No. of unloading trucks		Sorting				Producte stocking		Loading	Box/basket stocking area				Total platform area	
Production Area	Products Item	peak season collection volume (ton/month) A	planed operation days per month B	planned average handling volume (ton/day) C=A/B	peak handling volume (ton/day) D=C*1.5	unloading tonnage of dominant trucks (ton)	no. of unloading trucks (trucks/day)	sorter's working capacity (ton/day/man) E	required sorters (persons/day) F=D/E	required floor area for sorter (m2/person) G	required sorting area (m2) H=F*G	tonnage stockable in 1 m2 (ton/m2) I	required stocking area (m2) J=D/I*1.5	required unloading / loading area (approx. m2) K=J*0.27	required tomato-box stocking area (m2) M=D/1.34	required lettuce-basket stocking area (m2) N=D/0.45	required piment-basket stocking area (m2) O=D/0.36	total box/basket stocing area (m2) P=(M+N+O)*1.5	total floor area of platform and box/basket stocking area Q=H+J+K+P	Required no. of platform unit R=Q/112.5m2
Samaipata	Potato	Feb. 530	30	17.67	26.50	3.00	8.83	1.25	21.20	2.00	42.40	0.5	79.50							
	Tomato	120	30	4.00	6.00	3.00	2.00	1.25	4.80	2.00	9.60	0.6	15.00		4.48					
	Other Fruits	260	30	8.67	13.00	3.00	4.33	1.25	10.40	2.00	20.80	0.6	32.50		9.70					
	Total	910			45.50		15.17		36.40		72.80		127.00	34.29	14.18			21.27	255.36	-
Mairana	Potato	Nov. 130	30	4.33	6.50	3.00	2.17	1.25	5.20	2.00	10.40	0.5	19.50							
	Tomato	100	30	3.33	5.00	3.00	1.67	1.25	4.00	2.00	8.00	0.6	12.50		3.73					
	Lettuce	120	30	4.00	6.00	0.75	8.00	-	0.00	0.00	0.00	0.09	100.00			13.33				
	Other Vege	60	30	2.00	3.00	3.00	1.00	1.25	2.40	2.00	4.80	0.6	7.50							
	Other Fruits	430	30	14.33	21.50	3.00	7.17	1.25	17.20	2.00	34.40	0.6	53.75		16.04					
	Total	840			42.00		20.00		28.80		57.60		193.25	52.18	19.78	13.33		49.66	352.69	3.14
P. Grande	Potato	Oct. 850	30	28.33	42.50	3.00	14.17	1.25	34.00	2.00	68.00	0.5	127.50							
	Tomato	200	30	6.67	10.00	3.00	3.33	1.25	8.00	2.00	16.00	0.6	25.00		7.46					
	Lettuce	250	30	8.33	12.50	0.75	16.67	-	0.00	0.00	0.00	0.09	208.33			27.78				
	Other Vege	140	30	4.67	7.00	3.00	2.33	1.25	5.60	2.00	11.20	0.6	17.50							
	Citrus	0	30	0.00	0.00	3.00	0.00	1.25	0.00	2.00	0.00	0.6	0.00		0.00					
	Total	1,440			72.00		36.50		47.60		95.20		378.33	102.15	7.46	27.78		52.86	628.54	5.59
Comarapa	Potato	Nov. 580	30	19.33	29.00	3.00	9.67	1.25	23.20	2.00	46.40	0.5	87.00							
	Tomato	190	30	6.33	9.50	3.00	3.17	1.25	7.60	2.00	15.20	0.6	23.75		7.09					
	Piment	50	30	1.67	2.50	0.60	4.17	-	0.00	0.00	0.00	0.07	53.57				6.94			
	Other Vege	60	30	2.00	3.00	3.00	1.00	1.25	2.40	2.00	4.80	0.6	7.50							
	Other Fruits	0	30	0.00	0.00	3.00	0.00	1.25	0.00	2.00	0.00	0.6	0.00		0.00					
	Total	880			44.00		18.00		33.20		66.40		171.82	46.39	7.09		6.94	21.05	305.66	2.72
San Isidro	Potato	Nov. 680	30	22.67	34.00	3.00	11.33	1.25	27.20	2.00	54.40	0.5	102.00							
	Tomato	190	30	6.33	9.50	3.00	3.17	1.25	7.60	2.00	15.20	0.6	23.75		7.09					
	Corn	410	30	13.67	20.50	3.00	6.83	1.25	16.40	2.00	32.80	0.5	61.50							
	Other Vege	260	30	8.67	13.00	3.00	4.33	1.25	10.40	2.00	20.80	0.6	32.50							
	Other Fruits	0	30	0.00	0.00	3.00	0.00	1.25	0.00	2.00	0.00	0.6	0.00							
	Total	1,540			77.00		25.67		61.60		123.20		219.75	59.33	7.09			10.63	412.92	-
Saipina	Potato	Sept. 890	30	29.67	44.50	3.00	14.83	1.25	35.60	2.00	71.20	0.5	133.50							
	Tomato	470	30	15.67	23.50	3.00	7.83	1.25	18.80	2.00	37.60	0.6	58.75		17.54					
	Other Vege	120	30	4.00	6.00	3.00	2.00	1.25	4.80	2.00	9.60	0.6	15.00							
	Total	1,480			74.00		24.67		59.20		118.40		207.25	55.96	17.54			26.31	407.91	3.63
V. Grande	Potato	Mar. 500	30	16.67	25.00	3.00	8.33	1.25	20.00	2.00	40.00	0.5	75.00							
	Tomato	370	30	12.33	18.50	3.00	6.17	1.25	14.80	2.00	29.60	0.6	46.25		13.81					
	Other Vege	80	30	2.67	4.00	3.00	1.33	1.25	3.20	2.00	6.40	0.6	10.00							
	Other Fruits	330	30	11.00	16.50	3.00	5.50	1.25	13.20	2.00	26.40	0.6	41.25		12.31					
	Total	1,280			64.00		15.83		38.00		76.00		172.50	46.58	26.12			39.18	334.25	2.97

Table A.4.1-4 Building Outline of Products Collection and Distribution Center

	No. of Facilities	No. of Story	Total floor area (m2)	Type of Fundation	Main Structure			Roof Finishing
					Floor	Framing	Roof	
Samaipata								
F-1 Products Collection / Distribution Center Bldg. (Reform of existing facilities)	1	1	approx. 330	(Spread)	(RC slab)	(RC column / beam)	(Steel beam / rafter)	(Corrugated asbestos cement sheets)
F-2 Garbage Collection Yard	1	1	25	-	RC slab	RC fence h=2.5m	-	-
Mairana								
F-1 Products Collection / Distribution Center Bldg.	1	1	608	Spread	RC slab	RC column / RC	Steel beam/rafter / RC	Corrugated galvanized steel sheets / Asphalt waterproof
F-2 Public W.C. (incl. seepage pit)	1	1	33	Spread		RC column / beam	Steel beam/rafter / RC	Corrugated asbestos cement sheets
F-3 Garbage Collection Yard	1	1	25	-	RC slab	RC fence h=2.5m	-	-
Pampa Grande								
F-1 Products Collection / Distribution Center Bldg.	1	1	833	Spread		RC column / RC	Steel beam/rafter / RC	Corrugated galvanized steel sheets / Asphalt waterproof
F-2 Public W.C. (incl. seepage pit)	1	1	33	Spread		RC column / beam	Steel beam/rafter / RC	Corrugated asbestos cement sheets
F-3 Garbage Collection Yard	1	1	25	-	RC slab	RC fence h=2.5m	-	-
San Isidro								
F-1 Products Collection / Distribution Center Bldg. (Reform of existing facilities)	1	1	approx. 970	(Spread)	(RC slab)	(RC column / beam)	(Steel beam / rafter)	(Corrugated asbestos cement sheets)
F-2 Garbage Collection Yard	1	1	25	-	RC slab	RC fence h=2.5m	-	-
Comarapa								
F-1 Products Collection / Distribution Center Bldg.	1	1	495	Spread		RC column / RC	Steel beam/rafter / RC	Corrugated galvanized steel sheets / Asphalt waterproof
F-2 Public W.C. (incl. seepage pit)	1	1	33	Spread		RC column / beam	Steel beam/rafter / RC	Corrugated asbestos cement sheets
F-3 Garbage Collection Yard	1	1	25	-	RC slab	RC fence h=2.5m	-	-
Saipina								
F-1 Products Collection / Distribution Center Bldg.	1	1	608	Spread		RC column / RC	Steel beam/rafter / RC	Corrugated galvanized steel sheets / Asphalt waterproof
F-2 Public W.C. (incl. seepage pit)	1	1	33	Spread		RC column / beam	Steel beam/rafter / RC	Corrugated asbestos cement sheets
F-3 Garbage Collection Yard	1	1	25	-	RC slab	RC fence h=2.5m	-	-
Valle Grande								
F-1 Products Collection / Distribution Center Bldg.	1	1	495	Spread		RC column / RC	Steel beam/rafter / RC	Corrugated galvanized steel sheets / Asphalt waterproof
F-2 Public W.C. (incl. seepage pit)	1	1	33	Spread		RC column / beam	Steel beam/rafter / RC	Corrugated asbestos cement sheets
F-3 Garbage Collection Yard	1	1	25	-	RC slab	RC fence h=2.5m	-	-

Table A.4.2-1 REQUIRED FLOOR AREA FOR MARKETING HALL - 1

Target year	Planned handling Volume: Estimated consumption volume in Santa Cruz City (ton/year)	Planned handling volume not through Abasto Market and New Wholesale Market (ton/year)	Planned handling volume in Abasto Market and New Wholesale Market (ton/year): Abasto Market	New W. Market	Products items and their planned handling volume in New Wholesale Market A: Item	volume (ton/year)	planed operation days per year B	Planned average handling volume (ton/day) C=A/B	peak handling volume (ton/day) D=C*1.5	Productd stocking area: tonnage stockable in 1 m2 (ton/m2) I	required stocking area (m2) J=D/I	Units: required no. of wholesalers section K=J/11.25m2
2005	380,000	38,000	103,000	239,000	Potato / Onion	116,000	365	317.81	476.71 D=C*1.5	0.5	953.42	
					Banana	29,000	365	79.45	119.18 D=C*1.5	0.4	297.95	
					Fruits (Citrus)	38,000	365	104.11	156.16 D=C*1.5	0.6	260.27	
											86.76	— Fruit Box
					Tomato	56,000	365	153.42	230.14 D=C*1.5	0.6	383.56	
											127.85	— Fruit Box
					Total	239,000			982.19		2,109.82	187.54
2010	451,000	45,000	122,000	284,000	Potato / Onion	136,000	365	372.60	558.90 D=C*1.5	0.5	1,117.81	
					Banana	35,000	365	95.89	143.84 D=C*1.5	0.4	359.59	
					Fruits (Citrus)	48,000	365	131.51	197.26 D=C*1.5	0.6	328.77	
											109.59	— Fruit Box
					Tomato	65,000	365	178.08	267.12 D=C*1.5	0.6	445.21	
											148.40	— Fruit Box
					Total	284,000			1,167.12		2,509.36	223.05

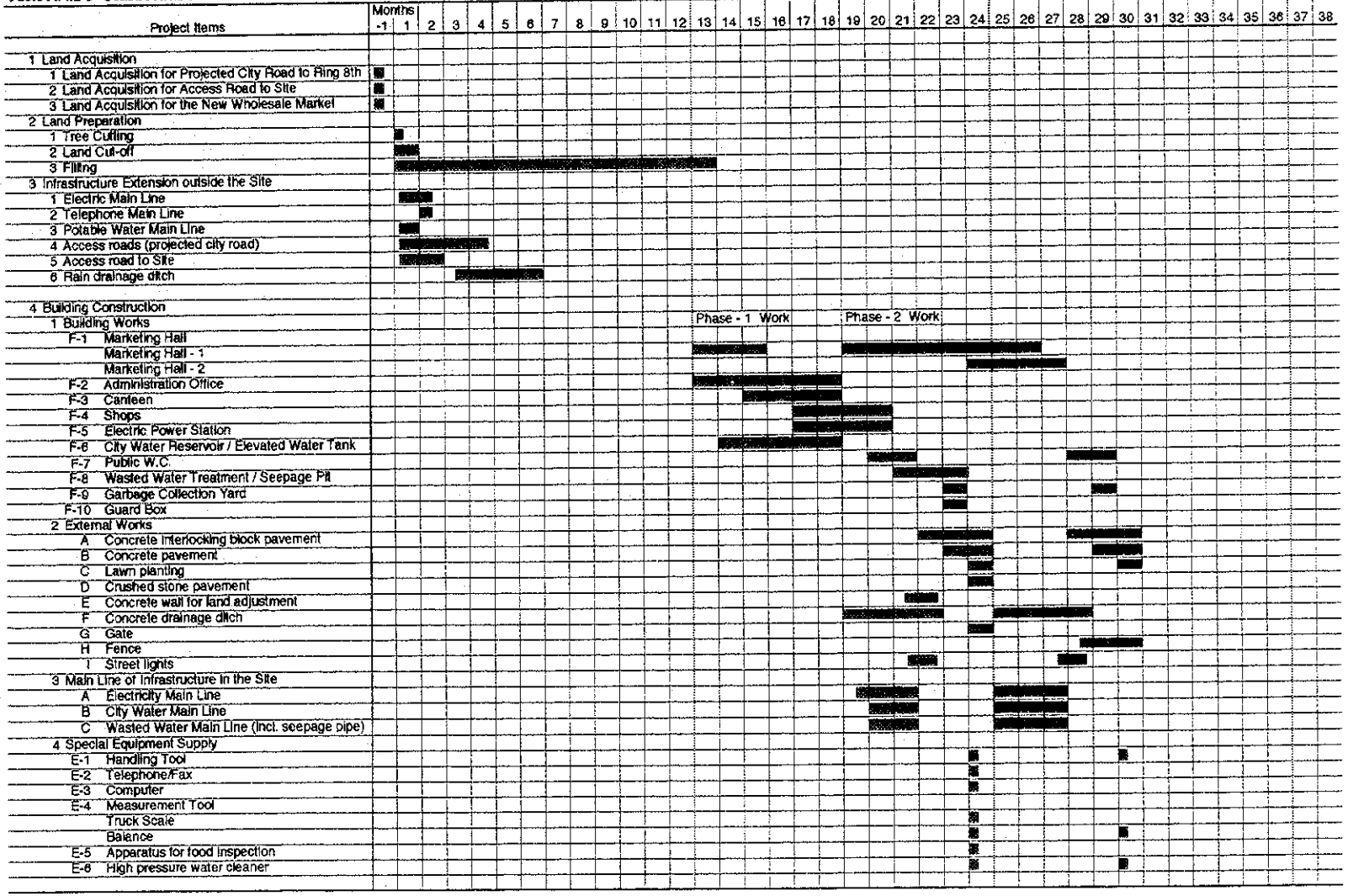
Remark : 1. Wholesalers unit 3 m x 5 m

2. 1 cluster of wholesalers unit : 56 units / 2005 : 56 units/cluster x 3 cluster + 20 units = 188 units, 2010 : 56 units/cluster x 4 cluster = 224 units

Table A.4.2-2 Building Outline of New Wholesale Market

		No. of Facilities	No. of Story	Total floor area (m2)	Type of Fundation	Main Structure: Floor	Framing	Roof	Roof Finishing
F-1	Marketing Hall								
	Marketing Hall - 1	1	1	4,800	Pile	RC slab	RC column / lintel	Steel space truss	Corrugated aluminum sheets
	Marketing Hall - 2	1	1	1,890	Pile	RC slab	RC column / lintel	Steel space truss	Corrugated aluminum sheets
F-2	Administration Office	1	2	960	Pile	RC slab	RC column / beam	Steel beam / rafter	Roof tile
F-3	Canteen	1	1	250	Spread	RC slab	RC column / beam	Steel beam / rafter	Roof tile
F-4	Shops	1	1	120	Spread	RC slab	RC column / beam	Steel beam / rafter	Corrugated asbestos cement sheets
F-5	Electric Power Station	1	1	210	Spread	RC slab	RC column / beam	RC slab	Asphalt waterproof finish
F-6	City Water Reservoir / Elevated Water Tank	1	1	-	Pile	RC slab	RC column / beam	RC slab	Asphalt waterproof finish
F-7	Public W.C.	6	1	360	Spread	RC slab	RC column / beam	Steel beam / rafter	Corrugated asbestos cement sheets
F-8	Wasted Water Treatment / Seepage Pit	1	1	-	Spread/Pile	RC slab	RC wall	-	-
F-9	Garbage Collection Yard	2	1	300	Spread	RC slab	RC column / lintel	-	-
F-10	Guard Box	2	1	13	Spread	RC slab	RC column / lintel	Steel beam / rafter	Corrugated asbestos cement sheets

Table A.4.2-3 Construction Schedule for New Wholesale Market



ANNEX 5

PROJECT COST ESTIMATION AND EVALUATIONS

ANNEX 5
PROJECT COST ESTIMATION AND EVALUATIONS

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ANNEX 5
PROJECT COST ESTIMATION AND EVALUATIONS

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1 COST ESTIMATION

1.1 Condition for cost estimation

Project cost estimation was carried out under the following conditions:

1) Project costs were calculated as of November, 1998.

2) Unit prices are constant prices as of November, 1998.

3) Cost was estimated in US Dollars. Exchange rate of Bs.5.62 to 1US$ was used to convert to local currency.

4) Tax exemption is applied to all imported material and equipment.

5) Project cost was calculated based on the current local unit cost in Bolivia except the construction cost of the NWM facilities.

6) The construction cost of NWM facilities was calculated based on the unit cost of overseas development assistance project that supplies high grade facilities

7) Construction period for each phase of construction was assumed to be one year from the time of contract signing.

2 BENEFIT CALCULATION

2.1 Gross benefit and benefit by target group

Items of gross benefit, system of basic unit setup for scale/ price/ cost have been identified. Also, benefit distribution system by target group has been examined. Difference in benefit by changes in activities and target group is described below.

Consumption Area

Item / Target Group	Without Project		With NWM Project
	Retail Function	Wholesale Function	
Congestion outside Abasto Market due to increase in truck traffic/ market handling volume			
• Producers / Intermediaries	- longer loading & unloading time due to congestion - increase use of porter to unload as trucks are increasingly parked outside		With the removal of the wholesale function from Abasto Market, traffic load and congestion will decrease. The NWM will have enough space and car park to accommodate the wholesale traffic for efficient unloading & loading and movement of products.
•Transporter	The truck traffic will increase with the increase in market volume handled by the Abasto Market affecting: - loss of time due to selling from truck - loss of time due to congestion and traffic jam - increase use of parking space outside market - increase congestion and traffic jam		- Benefit of space availability at any time for transporter - Benefit of immediate unloading for transporter / Producers / Intermediaries - Benefit of time saving from lack of traffic jam
Space congestion inside Abasto Market			
• Producers / Intermediaries	- loss of time trying to sell products due to lack of space inside Abasto Market - additional porter cost to transport products into Abasto Market from truck packed outside - loss of time selling products from truck		- Benefit of space inside market for unloading - Benefit of cheaper porter cost - Benefit of immediate unloading / sales
• Transporter	- long waiting time for trucks to enter Abasto Market - loss of time selling products from truck inside Abasto Market		
Wholesalers		Abasto Market cannot accommodate any increase in number of wholesalers. Inefficient and time consuming wholesale activities will get worse.	- The NWM will be able to accommodate increasing number of wholesalers interested to participate leading to increase wholesale volume and activities. - Efficient wholesaling function will be possible with the project.
Retailers	Abasto Market cannot accommodate any increase in number of retailers		- At Abasto Market, number of retailers may increase as wholesaler function is resulting in more space for retail activities there. - Additional cost for retailers to go to NWM to buy products for sale at Abasto

Porter	- Congestion in market creates bad working condition and restricts product movement. - number of porter in the market unlikely to increase due to congestion.	- loss of jobs in Abasto with wholesale function relocation to new market - improvement in work condition with less congestion - possibility of increase in number of porters in both NWM and Abasto.
Consumers	Consumers will find it increasingly difficult to access Abasto Market due to the congestion and traffic jam.	- Traffic and congestion will be reduced with the removal of wholesale function from Abasto Market.

Production Area

Item / Target Group	Without Project		With Collection / Distribution Centers Project
	Retail Function	Wholesale Function	
Production	Production volume will remain the same.		With technical assistance and guidance, production volume will increase.
Commercialization	Commercialization rate will remain the same.		With the operation of C/D centers enabling better marketing opportunities and timing, commercialization rate will increase.
Information system	Information system does not exist.		The project will introduce an information system to inform the farmers on the market prices of produce.
Marketing system	Marketing system will remain the same, i.e. using small trucks with inefficient transport volume.		With the collection centers, a more efficient transport system will be introduced with subsequent time and cost savings.
Producer / Intermediary	- Income will remain stable as production and commercialization increase potential not realized - Time lost following products to consumption area to sell products - lack of price information to decide market destination and timing to sell product		- increase in income due to increase in production and commercialization volume through training / technical assistance. - alternative use of free time - better business decision on when and where to sell product - additional time and cost incurred to use collection center
Transporter	- transport using small trucks to pick up products for sale at consumption area will remain largely unchanged due to stable production volume.		- more efficient transport with use of center

Especially for small-scale producers in the Valley areas, establishment of the organized collection/ distribution system plays a key role in the extent of benefit they may gain in use of the new wholesale market.

1) Without organized collection/ distribution: Accessibility to price information from the new wholesale market and alleviation of congestion within the market

will reduce market loss (degradation of commodity value and time loss). The actual income is expected to increase.

2) With organized collection/ distribution: In addition to the above 1), benefit from direct sales by gaining wholesaler's qualification is expected. In consequence, for producers in the Valley areas, the effect of comprehensive marketing improvement including the production area and consumption area is maximized with organized collection/ distribution.

Users of the new wholesale market apart from producers of the Valley areas will benefit from effects described in 1). It is also applied to the retailers and intermediaries of Abasto Market.

Analysis of the positive and negative impacts of the project on each of the target groups together with development policies to achieve the desired impacts are shown in Table A.5.2-1.

2.2 Benefit Items

With the implementation of the project, it is envisaged that there will be time / cost saving benefits in the following items (see Table A.5.2-2).

(1) City Entry Time Restriction

Trucks over 10t will be able to enter the NWM at any time without having to wait for nightime to enter the city limit to get to Abasto Market due to traffic restriction. The time restriction to enter means that trucks have to wait and / or time their departure to arrive at Abasto Market at night. Based on traffic survey data at Abasto Market, the annual benefit of entry at anytime to NWM will be US$91,772 in 2002 and US$121,140 in 2010.

(2) Space Restriction Inside Abasto Market

There are times when parking space inside Abasto Market is not available to trucks arriving at the market. As such, these trucks are forced to wait outside the market with their products until parking space is available inside Abasto Market. Based on survey data, 36 trucks per day wait an average of 9 hrs outside before finding space inside Abasto Market. 35% of these trucks parked outside will also engage in selling produce from the truck.

The present marketing system at Abasto Market allows some selling of products directly from the trucks. This type of selling method means that the trucks and the producers/ intermediaries are obliged to stay at market for the period of time it takes to sell all the products, generally not more than 3 days. The average time taken to sell produce from the truck is 19 hours.

The NWM will do away with this selling method resulting in benefits from time saving for transporters, reduce porters handling cost to bring produce into market from truck, and time saving for producers/ intermediaries. The annual benefit of immediate entry into the NWM to unload will be US$858,990 in 2002 and US$1,133,866 in 2010.

(3) Selling from truck outside Abasto Market

Some trucks that cannot get into Abasto Market are compelled to sell their produce from the truck while parked outside the market. Survey data shows 14 trucks per day are

selling from trucks and they take an average of 12 hours to finish selling. The NWM will do away with this selling method resulting in benefits from time saving for transporters, reduce handling cost of porters to bring produce into market from truck, and time saving for producers/ intermediaries. The annual benefit from this item will be US$628,570 in 2002 and US$829,713 in 2010.

(4) Reduction of Quality Loss (Value Loss) for Tomato

It is envisaged that with the Project's information network, over-supply conditions for tomatoes will be lessen. At present, over-supply condition leads to excess / unsold tomotoes being thrown away in the trash or experiencing a sharp price reduction. With better information on prices and supply condition with the Project implementation, it is assumed that the producers will be able to somewhat control / adjust the shipping of the tomatoes to the market until such time as the over-supply condition reduces and prices improves. Currently over-supply condition leading to products being thrown away is observed 2 times in a month. It is assumed that adjusted harvesting based upon marketing information will at least ensure the sale of tomato at Bs.1 / kg. This will result in benefits of US$19,790 in 2002 and US$25,745 in 2010.

(5) Consumer Time Saving

Due to the congestion at Abasto Market, consumers lose time when visiting the market to buy their daily necessities. From the household survey of the Master plan, 25% of households in Santa Cruz city go 1 to 3 times per week to Abasto Market. With the relief of congestion by transferring the wholesale function to the NWM, it is estimated that consumers will save 10 minutes each per visit resulting in benefits of US$145,144 in 2002 and US$240,383 in 2010.

(6) Production Increase

With the implementation of the technical and institutional guidance on cooperative marketing system, improvement in the production technology and crop production planning, the production volume is estimated to increase by about 10% per year in the project area after a time lag for the benefit to accrue. It is estimated that with operation of the Collection and Distribution centers at San Isidro in 2001, Samaipata, Vallegrande and Saipina in 2003, Mairana, Pampa Grande, and Comarapa in 2004, total benefits from the all centers' production increase will be US$1,623,559 in 2010 based on the assumption that the increase in production volume is multiplied by 70% of net producers' price. 30% of the net producers' price will be additional cost of increase production.

(7) Commercialization Rate Increase

Increase in commercialization rate is expected from better handling, packing, reduce losses, opportunity and the right time to market the products with the operation of the Collection and Distribution centers. Benefits from commercialization rate increase of all 7 Collection and Distribution centers will be US$469,290 in 2010 based on the assumption that the increase in commercialization volume is multiplied by 50% of net producers' price. The remaining 50% of the net producers' price will be additional cost associated with increased commercialization.

(8) Cost of Transport

With the Collection & Distribution Center, more efficient marketing and transport system

to bring products to the consumption area will be introduced to reduce the number of truck trips, empty ratio of trucks and the need for producers to follow the products to market. The benefits of this will be offset by additional cost of transport associated with bringing the products to the Collection and Distribution centers from the farms. It is assumed that the benefits will equal the additional cost.

(9) Indirect Benefits of Project

Indirect benefits of the projects are;

1) Effective land use of the existing Abasto Market

Wholesale function when transferred from Abasto Market to the NWM will create more space for other activities. These areas can now be more effectively used for retail activities and more streamline market operations. This will provide increased opportunities for direct retail activities by farmers and small traders in the informal sector.

The alleviation of the chaotic marketing activities and overcrowding at the existing Abasto Market will raise the efficiency of the marketing activities of small women traders who have traditionally conducted small transactions there.

2) Effective land use of the existing parking areas around Abasto Market

Reduction of wholesale traffic vehicles to Abasto will eliminate the need for parking area around Abasto Market. These areas could then be used for other activities more appropriate to the general characteristics of the area.

3) Social / Environment impact on existing market Abasto Market

Transfer of the wholesale activities from Abasto Market will have social impact on retailers or intermediaries that depend on these activities. These impact may be positive or negative depending on the affected party. Also, Abasto Market is expected to have a positive impact from the viewpoint of improved sanitary environment.

4) Spin-off economic activities around NWM

The introduction of the NWM will encourage other economic activities in the surrounding areas such as transport services, restaurants, ware-house, sundry stores, etc. These spin-off activities will create more job opportunities for the inhabitants.

Due to assistance from private firms, NGOs, and donor countries, farmers will not be limited to using the improved Abasto market, but will be able to participate in wholesale activities and to sell their products to wholesalers at the NWM, and thereby are given increased opportunities to raise their income.

5) Reduce traffic congestion around Abasto Market

The NWM will divert the wholesale traffic from the Abasto Market thus reducing traffic congestion and improving traffic flow in the area.

(10) Indirect Benefits to New Target Groups

In conjunction with the improvements to the traditional marketing system, new benefits will also be created for new target groups not utilizing the existing Abasto Market. The agricultural cooperatives of the lowlands (CAISY, CAICO) that wish to utilize the NWM, the Supermarket Association, and new farmer groups who wish to organize in order to participate in wholesale activities are just some of the new target groups pinpointed.

(11) Economic Benefit Distribution

1) Economic Benefits of the Collection and Distribution centers

The economic benefits of the Collection and Distribution centers are in terms of increase in production and commercialization, and producers time savings by eliminating the need to follow the products to the consumption markets. 100% of these benefits accrue to the producers.

2) Economic Benefits of the NWM

The economic benefits of the NWM are characterized by the opportunity cost in terms of transport time cost savings, producers / intermediaries time savings, wholesalers' porter charge savings, and consumer time savings.

Summary of Total Benefit Distribution by Target Group (2010)

	Producer / Intermediary	Transporter	Wholesaler	Consumer	Total Benefits
1 City Entry Time Restriction	+ $20,190	+ $100,950			$121,140
2 Space Restriction Inside Abasto Market	+ $84,984	+ $1,048,882			$1,133,866
3 Selling from truck outside Abasto Market	+ $320,927	+ $313,099	+ 195,687		$829,713
4 Reduction of Quality Loss for tomato	+ $25,745				
5 Consumer time savings				+ $240,383	$240,383
6 Production Increase	+ $1,623,559				$1,623,559
7 Commercialization Rate Increase	+ $469,290				$469,290
Total Benefits (US$)	$2,544,694	$1,462,931	$195,687	$240,383	$4,443,695
%	57%	33%	4%	5%	100%

Remark:
1. Wholesalers' additional benefit from NWM that is not reflected in the above table, will be time savings from more efficient marketing and movement of products. This time savings may be used by the wholesalers for other income generating activities thus increasing their income.
2. Benefit not reflected in the above table is that the NWM will also provide opportunity for new wholesalers to participate, not only those transferred from Abasto Market.
3. Indirect benefit to retailers not reflected in the above table, will be more retailing space/ activities at Abasto after wholesale function removed to NWM.