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INVEST-IMPORT, Beograd, Yugoslavia
SOUR LIVNICA ŽELJEZA i TEMPERA "KIKINDA"
RO "PROGRES" - Kikinda, Yugoslavia

17968

FINAL REPORT

UNIDO CONTRACT No. 88/60
Project No. DP/URT/80/022 (PHASE II)
Activity Code: J 13209

START - UP OF THE NEFCO FOUNDRY WITH THE MECHANICAL WORKSHOP AT MWANZA IN THE UNITED REPUBLIC OF TANZANIA

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December, 1989

CONTENTS

This Final Report covers a stage of implementation of the Project as per Terms of Reference dated 01.10.1987. (Item 3.) i.e. a supervising the revision of all equipment and installations, the start-up and operating in the Project Area, of a Foundry with an Integrated Mechanical Workshop of an annual capacity of 1000-3000 tons of ferrous and non-ferrous castings.

The aim of the Final Report is to show implemented results, indicate the problems which accompanied implementation and to give recommendations for future operation.

The establishment of a plant was based on a contribution from Yugoslav Government related to equipment, engineering design, training, supervision etc., as declared during the Solidarity Meeting in Arusha in July 1979. As proposed and accepted at the Solidarity Meeting, the Project was implemented jointly by The United Republic of Tanzania, UNIDO and Yugoslavia with the coverage of local, Yugoslav and convertible currency requirements from the three sources respectively. The plant was located in Mwanza, as it was agreed particularly to assist further industrialization and agriculture development of this region.

The Small Industries Development Organization (SIDO) from Tanzania and Invest-Import from Yugoslavia were nominated as Governments Agencies responsible for the implementation of the Project.

The Foundry Project is earmarked to produce a wide range of basic items such as spares for ginneries, trailers, tractors, sugar mills, textile mills, imputs for construction industry, brake shoes for the railways, etc.

The Contract between UNIDO and Invest-Import for the design and provision of machinery and equipment was signed on 16th of June, 1982.

The 14 Tanzanian trainees were trained in the production plants of LŽT "Kikinda" in Kikinda - Yugoslavia in the period of six months (from 02.06.1984. till 26.11.1984.)

The installation works started on 14th August, 1985. and were successfully completed on 21/22nd of July 1986.

That was the FIRST PHASE of project implementation and all implemented results, problems and details are given in our Final Report of Septembar 1987.

The Integrated Mechanical Workshop was put into operation in 1986, and continued to operate.

However, more than two years have been necessary for the provision of basic conditions for the start-up of the Foundry.

The Foundry, which is a major part of the company, carried out successfully its first melting on 28th of November, 1988.

From the date of the first melting, up to the end of the six-months trial operation, quantity of about 7o,ooo kilos of good ferrous and non-ferrous castings has been produced against average reject value of 13,68% for ferrous and 9,4% for non-ferrous castings.

Conclusions:

1. The six months trial operation confirmed a technological concept of the plant as properly chosen.

2. The equipment is functioning in accordance with projected requirements.

3. The produced castings are, despite insufficient quantity, of good quality with acceptable reject percentage. Insufficient quantity of produced castings is the result of the lack of manpower, discontinued production, insufficient marketing and patterns and core boxes, missing laboratory items etc.

4. Local manpower is well trained, and present on site except for the casting and pattern designer who left the company in February of 1989.

Recommendations:

1. Without proper marketing, foundry has no serial production.

   The immediate objective could be achieved by a higher technological discipline, market research, continuous production, provision of raw material in due time, thus bringing the plant to full operational capacity level.

2. To maintain the equipment regularly as to provide full operation capacity level.

3. To keep on site already trained manpower and to employ a new designer for castings and patterns.

4. To equip the existing laboratory with the "green sand" strength tester and laboratory furnace. Analytical balance up to looo g would facilitate laboratory analyses, but it is not really necessary.

5. To install and put into operation the additional Yugoslav supply of pattern-shop machinery. A higher quality and larger quantity of patterns and core boxes have to be manufactured within a shorter time, more pattern-makers have to be employed and trained, and thus quantity and quality of castings will be improved.

   The pattern shop machinery (5 pcs.) delivered from Yugoslavia on o3/o7/89, reached Mwanza only on 3o/11/89. Installation and testing of the same will be done during December 1989(Encl. No. 6/3: telex from Nefco dated ol/12/89.)

INTRODUCTION

The aim of the Project was to establish and start operating in the Project area a foundry with an integrated mechanical workshop of an annual capacity of looo to l.3oo tons of ferrous and non-ferrous castings.

Machinery installation of the plant has been carried out since 1985, and by July 1986, the installation was ready allowing the mechanical shop to operate.

The foundry plant was delayed to start operations due to delays in providing the funds and local items of raw materials.

In accordance with the Contract, signed on 23rd of September 1988 between UNIDO and Invest-Import, the supervising of the revision of all equipment and installations started on o4th of October 1988, and was successfully completed on 27th of November 1988.

The first melting of the foundry was successfully carried out on 28th of November 1988.

The six months trial operation confirmed the technological concept of the plant as properly chosen.

The complete Tanzanian personnel present on site was trained to the level enabling continuation of casting production.

(Encls 6/1 and 6/2 Production Reports dated 16/06/89 and 12/12/89).

The trial operation was successfully completed on 28th May 1989.

BASIC PROJECT PARAMETERS

BASIC PROJECT PARAMETERS

1. Grey iron foundry capacity	1350 to/year
2. Aluminium dpt. capacity	100 "
3. Time parameters:	
- number of working days per year	245
- number of shifts per day	2
- number of working hours per shift	8
- number of efficient working hours per shift	6
4. Scrap value:	
- casting production	17,5 %
- core production	5,0 %
- machining process	1,5 %
5. Capacity of two mechanical moulding lines (with about 136.000 moulds per year)	1200 to/year
6. Capacity of hand moulding line (for grey iron and aluminium production)	250 to/year
7. Casting average weight (grey iron)	6,11 kgs.

BASIC PARAMETERS FOR START-UP PRODUCTION

1. Start-up period	6 months
2. Number of shifts per day	1
3. Total monthly projected capacity (for one shift work)	56.25o kos/Month
4. Month I (capacity 1o%)	5.625 kos/Month
Month II (capacity 3o%)	16.875 kos/Month
Month III (capacity 5o%)	28.125 kos/Month
Month IV (capacity 8o%)	45.ooo kos/Month
Month V (capacity 9o%)	5o.625 kos/Month
Month VI (capacity 1oo%)	56.25o kos/Month
5. Six-months total production	2o2.5oo kos

PROPOSED PRODUCTION PROGRAMME AND PROCESSES

No.	Item	Drw.No.	Material	Est.annual demand (pcs)	Weight (kgs/cast.)	Moulding process	No.of cores per cast.	Machining process
1.	Charcoal iron	01.01.0013		68.500				
	- body*	01.01.0001	cast iron	68.500	2,80	mechanical	1	drilling,milling,polishing
	- top cover*	01.01.0002	cast iron	68.500	0,50	mechanical	-	drilling
	- handle	01.01.0003	wood	68.500	-	-	-	turning
	- handle plate	01.01.0004	steel	68.500	-	-	-	cutting, drilling
	- lock pin	01.01.0005	steel	68.500	-	-	-	turning
	- lock handle	01.01.0006	wood	68.500	-	-	-	turning
	- lock handle plate	01.01.0007	steel	68.500	-	-	-	cutting, drilling
	- ash tray	01.01.0008	steel	68.500	-	-	-	cutting, drilling
	- rivet Ø 4	01.01.0009	steel	137.000	-	-	-	-
	- screw M4x10	01.01.00010	steel	274.000	-	-	-	-
	- nut, M4	01.01.00011	steel	274.000	-	-	-	-
	- C'SK screw, M4	01.01.0012	steel	137.000	-	-	-	-
2.	High level lavatory cistern:	01.04.00011	cast iron	5.900				
	- cistern tank	01.04.0001	cast iron	5.900	12,00	hand	-	drilling, milling
	- cistern cover*	01.04.0002	cast iron	5.900	4,90	mechanical	-	drilling
	- siphon pipe cover*	01.04.0003	cast iron	5.900	2,50	hand	0,5	drilling
	- siphon pipe	01.04.0004	cast iron	5.900	1,30	mechanical	1	turning
	- lever arm*	01.04.0005	cast iron	5.900	1,50	mechanical	-	drilling
	- cistern float ASS	01.04.0006	steel	5.900	-	-	-	-
	- round head bolt	01.04.0007	steel	11.800	-	-	-	-
	- nut M 8	01.04.0008	steel	11.800	-	-	-	-
	- nut M 15	01.04.0009	steel	5.900	-	-	-	cutting,milling,turning
	- nut M 45	01.04.00010	steel	5.900	-	-	-	cutting,milling,turning
3.	Soil pipe*	01.02.0001	cast iron	4.500	7,00	hand	1	-

PROPOSED PRODUCTION PROGRAMME AND PROCESSES

No.	I t e m	Drw.No.	Material	Est.annual demand (pcs)	Weight (kgs/cast.)	Moulding process	No.of cores per cast.	Machining process
4.	Sewage pipes:							
	- cross joint with door	01.03.0001	cast iron	4.500	8,50	mechanical	1	milling, drilling
	- S trap*	01.03.0002	cast iron	4.500	7,00	mechanical	1	-
	- T joint with door*	01.03.0003	cast iron	4.500	5,30	mechanical	1	milling, drilling
	- Y joint*	01.03.0004	cast iron	4.500	5,40	mechanical	1	-
	- P trap*	01.03.0005	cast iron	4.500	4.50	mechanical	1	-
	- socket*	01.03.0006	cast iron	4.500	1,40	mechanical	0,25	-
	- nahani trap	01.03.0007	cast iron	4.500	2,50	mechanical	1	drilling
	- ventilation cover*	01.03.0008	cast iron	4.500	2,50	mechanical	1	drilling
5.	Manhole cover 16x16"	01.05.0001	cast iron	16.700	15,00	hand	2	-
	- manhole frame 16 x 16"	01.05.0002	cast iron	16.700	7,00	hand	-	-
6.	Bench vice	M 100						
	- vice body*	M100-1	cast iron		8,50	mechanical	2	drilling, milling
	- vice slipper	M100-2	cast iron		4,50	mechanical	1	drilling, milling
	- vice jaw	M100-3	steel		-	-	-	cutting, drilling, milling
	- screw M8 x 25	M100-4	steel		-	-	-	-
	- plate 4 mm	M100-5	steel		-	-	-	turning
	- screw M6	M100-6	steel		-	-	-	-
	- handle	M100-7	steel		-	-	-	turning
	- handle cup	M100-8	steel		-	-	-	turning
	- nut	M100-9	steel		-	-	-	turning
	- pin	M100-10	steel		-	-	-	turning
	- spindle	M100-11	steel		-	-	-	turning, drilling
	- lath	M100-12	steel		-	-	-	cutting, milling

PROPOSED PRODUCTION PROGRAMME AND PROCESSES

No.	I t e m	Drw.No.	Material	Est.annual demand (pcs)	Weight (kgs/ cast.)	Moulding process	No.of cores per cast.	Machining process
1.	Ginnery parts							
	- arm lever	01.07.0001	brass		8,00	hand	2	drilling, milling
	- arm bracket	01.07.0002	brass		0,60	mechanical	-	drilling, milling
	- Coupling:							
	- upper part	01.07.0003	cast iron		0,65	mechanical	1	drilling, milling
	- lower part	01.07.0004	cast iron		0,60	mechanical	1	drilling, milling
	- sliding bracket	01.07.0006	cast iron		4,10	mechanical	1	drilling, milling
	- sliding plate 1.	01.07.0007	cast iron		3,00	mechanical	-	drilling, milling
	- sliding plate 2.	01.07.0008	cast iron		3,15	mechanical	-	drilling, milling

Note: Brass castings can not be produced with the existing equipment
= Prepared patterns and core boxes (16.12.1987.)

MONTHLY PLAN FOR START-UP PRODUCTION: M O N T H I

A = mechanical moulding line I
B = mechanical moulding line II
C = hand moulding line

Total production: 5.625 kos

Moulding line	I t e m	Drw.No.	Kos/ cast	No.of cast. (pcs)	No. of cores (pcs)	No. of moulds (pcs.	kos/ item	remarks
A	Charcoal iron	o1-o1-ooo1/2	3,3o	16o	16o	8o	528,oo	
A	Cross joint	o1-o3-ooo1	8,5o	12o	12o	12o	1o2o,oo	
A	S - trap	o1-o3-oco2	7,oo	1oo	1oo	1oo	7oo,oo	
A	T - joint	o1-o3-ooo3	5,3o	12o	12o	12o	636,oo	
B	Y - joint	o1-o3-oco4	5,4o	12o	12o	12o	648,oo	
B	P - trap	o1-o3-ooo5	4,5o	118	118	118	531,oo	
B	Socket	o1-o3-ooo6	1,4o	28o	7o	35	392,oo	
B	Vent. cover	o1-o3-ooo8	2,5o	5oo	12o	6o	3oo,oo	
C	Manhole cover	o1-o5-ooo1	15,oo	3o	6o	3o	45o,oo	
C	Manhole frame	o1-o5-ooo2	7,oo	3o	-	3o	21o,oo	
C	Soil pipe	o1-o2-ooo1	7,oo	3o	3o	3o	21o,oo	
	T O T A L			1228	1o18	843	5625,oo	

MONTHLY PLAN FOR START-UP PRODUCTION: MONTH II

Total production: 16.875 kos.

Moulding line	I t e m	Drw.No.	Kos/ cast	No.of cast. (pcs)	No.of cores (pcs)	No.of moulds (pcs)	kos/ item	remarks
A.	Charcoal iron	01-01-0001/2	3,30	162	162	81	535,00	
A	Cross joint	01-03-0001	8,50	400	400	400	3400,00	
A	S - trap	01-03-0002	7,00	400	400	400	2800,00	
A	T - joint	01-03-0003	5,30	400	400	400	2120,00	
B	Y - joint	01-03-0004	5,40	400	400	400	2260,00	
B	P - trap	01-03-0005	4,50	400	400	400	1800,00	
B	Socket	01-03-0006	1,40	1000	250	125	1400,00	
B	Vent. cover	01-03-0008	2,50	600	600	300	1500,00	
C	Manhole cover	01-05-0001	15,00	40	80	40	600,00	
C	Manhole frame	01-05-0002	7,00	40	-	40	280,00	
C	Soil pipe	01-02-0001	7,00	40	40	40	280,00	
	T O T A L			3882	3132	2626	16875,00	

MONTHLY PLAN FOR START-UP PRODUCTION: MONTH III

Total production: 28.125 kgs.

Moulding line	I t e m	Drw.No.	Kgs/ cast	No.of cast. (pcs)	No.of cores (pcs)	No.of moulds (pcs)	kgs/ item	remarks
A	Charcoal iron	01-01-0001/2	3,30	520	520	260	1715,00	
A	Cross joint	01-03-0001	8,50	600	600	600	5100,00	
A	S - trap	01-03-0002	7,00	600	600	600	1200,00	
A	T - joint	01-03-0003	5,30	600	600	600	3180,00	
B	Y - joint	01-03-0004	5,40	600	600	600	3240,00	
B	P - trap	01-03-0005	4,50	600	600	600	2700,00	
B	Socket	01-03-0006	1,40	1600	400	200	2240,00	
B	Vent. cover	01-03-0008	2,50	800	800	400	2000,00	
C	Manhole cover	01-05-0001	15,00	50	100	50	750,00	
C	Manhole frame	01-05-0002	7,00	50	-	50	350,00	
C	Soil pipe	01-02-0001	7,00	50	50	50	350,00	
B	Bench vice	1100-1/2	13,00	100	300	100	1300,00	
B	Nahani trap	01-03-0007	2,50	400	400	200	1000,00	
	T O T A L			6570	5570	4310	28125,00	

MONTHLY PLAN FOR START-UP PRODUCTION: MONTH IV

Total production: 45.000 kgs.

Moulding line	I t e m	Drw.No.	Kgs/ cast	No.of cast. (pcs)	No.of cores (pcs)	No.of moulds (pcs)	kgs/ item	remarks
A	Charcoal iron	01-01-0001/2	3,30	1500	1500	750	4950,00	
C	Cistern tank	01-04-0001	12,00	50	-	50	600,00	
A	Cistern cover	01-04-0002	4,90	50	-	50	245,00	
C	Siphon pipe cover	01-04-0003	2,50	50	25	50	125,00	
B	Siphon pipe	01-04-0004	1,30	50	50	13	65,00	
B	Level arm	01-04-0005	1,50	50	-	25	75,00	
C	Soil pipe	01-02-0001	7,00	40	40	40	280,00	
A	Cross joint	01-03-0001	8,50	800	800	800	6800,00	
A	S - trap	01-03-0002	7,00	1100	1100	1100	7700,00	
A	T - joint	01-03-0003	5,30	1100	1100	1100	5830,00	
B	Y - joint	01-03-0004	5,40	900	900	900	4860,00	
B	P - trap	01-03-0005	4,50	900	900	900	4050,00	
B	Socket	01-03-0006	1,40	1800	450	225	2520,00	
B	Vent. cover	01-03-0008	2,50	900	900	450	2250,00	
C	Manhole cover	01-05-0001	15,00	70	140	70	1050,00	
C	Manhole frame	01-05-0002	7,00	70	-	70	490,00	
B	Bench vice	H100-1/2	13,00	200	600	200	2600,00	
B	Nahan trap	01-03-0007	2,50	204	204	102	510,00	
	T O T A L			9834	8709	7895	45.000,00	

MONTHLY PLAN FOR START-UP PRODUCTION: MONTH V

Total production: 50.625 kog.

Moulding line	I t e m	Drw.No.	Kog/ cast	No.of cast. (pcs)	No.of cores (pcs)	No.of moulds (pcs)	kog/ item	remarks
A	Charcoal iron	01-01-0001/2	3,30	1600	1600	800	5280,00	
C	Cistern tank	01-04-0001	12,00	50	-	50	600,00	
B	Cistern cover	01-04-0002	4,90	50	-	50	245,00	
C	Siphon pipe cover	01-04-0003	2,50	50	25	50	125,00	
B	Siphon pipe	01-04-0004	1,30	50	50	13	65,00	
B	Lever arm	01-04-0005	1,50	50	-	25	75,00	
C	Soil pipe	01-02-0001	7,00	40	40	40	280,00	
A	Cross joint	01-03-0001	8,50	900	900	900	7650,00	
A	S - trap	01-03-0002	7,00	1100	1100	1100	7700,00	
A	T - joint	01-03-0003	5,30	1100	1100	1100	5830,00	
B	Y - joint	01-03-0004	5,40	900	900	900	4860,00	
B	P - trap	01-03-0005	4,50	900	900	900	4050,00	
B	Socket	01-03-0006	1,40	2000	500	250	2800,00	
B	Nahany trap	01-03-0007	2,50	862	862	431	2155,00	
B	Vent. cover	01-03-0008	2,50	900	900	450	2250,00	
C	Manhole cover	01-05-0001	15,00	80	160	80	1200,00	
C	Manhole frame	01-05-0002	7,00	80	-	80	560,00	
B	Bench vice	M100-1/2	13,00	200	600	200	2600,00	
B	Coupling upper	01-07-0003	0,65	200	200	67	130,00	
B	Coupling lower	01-07-0004	0,60	200	200	67	120,00	
B	Sliding bracket	01-07-0006	4,10	200	200	67	820,00	
B	Sliding plate 1	01-07-0007	3,00	200	-	67	600,00	
B	Sliding plate 2	01-07-0008	3,15	200	-	67	630,00	
	T O T A L			11912	10 237	7754	50625,00	

MONTHLY PLAN FOR START-UP PRODUCTION: MONTH VI

Total production: 56,250 kgs.

Moulding line	Item	Drw.No.	Kgs/ cast.	No.of cast. (pcs)	No.of coren (pcs)	No.of moulds (pcs)	kgs/ item	remark
A	Charcoal iron	01-01-0001/2	3,30	2000	2000	1000	6600,00	
C	Cistern tank	01-04-0001	12,00	60	-	60	720,00	
B	Cistern cover	01-04-0002	4,90	60	-	60	294,00	
C	Siphon pipe cover	01-04-0003	2,50	60	30	60	150,00	
B	Siphon pipe	01-04-0004	1,30	60	60	15	78,00	
B	Lever arm	01-04-0005	1,50	60	-	30	90,00	
C	Soil pipe	01-02-0001	7,00	40	40	40	280,00	
A	Cross joint	01-03-0001	8,50	1000	1000	1000	8500,00	
A	S - trap	01-03-0002	7,00	1200	1200	1200	8400,00	
A	T - joint	01-03-0003	5,30	1200	1200	1200	6360,00	
B	Y - joint	01-03-0004	5,40	1000	1000	1000	5400,00	
B	P - trap	01-03-0005	4,50	1000	1000	1000	4500,00	
B	Socket	01-03-0006	1,40	2000	500	250	2800,00	
B	Nahany trap	01-03-0007	2,50	1000	1000	1000	2500,00	
B	Vent. cover	01-03-0008	2,50	1000	1000	500	2500,00	
C	Manhole cover	01-05-0001	15,00	99	198	99	1485,00	
C	Manhole frame	01-05-0002	7,00	99	-	99	693,00	
B	Bench vice	M100-1/2	13,00	200	600	200	2600,00	
B	Coupling upper	01-07-0003	0,65	200	200	67	130,00	
B	Coupling lower	01-07-0004	0,60	200	200	67	120,00	
B	Sliding bracket	01-07-0006	4,10	200	200	67	820,00	
B	Sliding plate 1	01-07-0007	3,00	200	-	67	600,00	
B	Sliding plate 2	01-07-0008	3,15	200	-	67	630,00	
	T O T A L			13138	11428	9148	56250,00	

R E S U L T S

SUPERVISING OF THE REVISION OF ALL EQUIPMENT AND INSTALLATIONS

In the period from o4th of October 1988 till 26th of November 1988, a total of 1o,5 man-months was spent for supervising the revision of all equipment and installations.

The following activities have been implemented:

Melting shop

- Cleaning of A and B cupola furnaces and refractory lining there-of,
- Dismantling of receiver and removing of it's cover for the refractory lining preparation,
- Manufacture of metal gauges for refractory ramming of two cupola furnaces, receiver, aluminium furnace and cupola syphons,
- Refractory lining of the receiver,
- Dismantling, cleaning and checking of oil burners and their connecting,

Sintering of the receiver refractory lining,

- Manufacture of the auxiliary foundry tools (slag cleaner, shake-out hook, etc.)
- Refractory lining of pouring ladles,
- Draying of the pouring ladles refractory lining,
- Refractory lining of aluminium furnace,
- Repair of aluminium furnace fan bearings,
- Adjustment of pouring ladles conveying height,

- Refractory ramming of the melting zones in the cupola furnaces,
- Sintering of the melting zones refractory lining,
- Refractory ramming of cupola syphons,
- Sintering of the cupola syphons refractory lining,
- Refractory lining of the pouring sprues,
- Draying of the pouring sprues refractory lining,
- Two-hours melting test (cupola furnace A),
- Training of Tanzanian personnel for handling and maintenance of the melting plant,
- Mould pouring test (machine moulding line A, 15 moulds).

Moulding shop

- Preparation of foundation for two pairs of moulding machines (cleaning of anchor - bolt holes),
- Dismantling of the moulding machine tables and changing of pattern plates fixing system (tables supplied by UNIDO, with slots on improper places),
- Preparation of tehnical documentation for fixing pins and guiding of pattern plate and moulding box,
- Preparation of technical documentation for wooden press plates of moulding machines,
- Repair of broken parts of moulding machines (lifting pins console knobs, jolting and form separation knobs, etc.),
- Fixing of moulding machines onto the foundations, levelling and connecting thereof to the compressed air line,
- Refixing of the moulding machines tables,

- Adjustment of the moulding machines,
- Testing of four moulding machines,
- Repair of damaged moulding machine (moulding line A, drag moulding),
- Connecting of the pneumatic rammer to the compressed air line (hand moulding area),
- Connecting of the pneumatic cleaners to the compressed air line (moulding machines),
- Training of Tanzanian personnel for handling and maintenance of the moulding machines,
- Moulding test (moulding line, 15 moulds).

Sand preparation and Core shop

- Adjustment of rubber belt conveyer (conveyer adjusted for a tinner rubber belt replacing the original belt stolen, previously, cleaning, electrical installation control, replacement of missing fuses and lubricating,
- Completing of core making department: working tables, CO_2 distribution line, etc. ,
- Checking and adjustment of water supplying system (sand mixer),
- Sieving and dust cleaning of new quartz sand,
- Filling of the sand preparation plant with quartz sand,
- Testing of complete preparation plant-automatic operation,
- Training of Tanzanian personnel for handling and maintenace of the sand preparation plant,
- Preparation of moulding sand for test moulding .

Cleaning shop

- Preparation of shot blast machine: cleaning, electrical installation checking, lubricating, filling with steel shot and

testing (cleaning of old iron parts-castings),

- Testing of entire dust collecting system,
- Training of Tanzanian personnel for handling and maintenance of the cleaning machinery and equipment.

Compressed air unit

- Testing of the complete compressed air system.

Machining shop

- Marking of pattern plates for pattern assembling for five items of castings (ginnery parts) in accordance with drawings for gating system,
- Training of Tanzanian personnel for machining of pattern plates,
- Defecting and repair of milling and drilling machines,
- Completing of the foundry tools (patterns and core boxes)

Technology and Production Preparation DPT

- Training for designing and calculation of ingate system for three items of ginnery parts,
- Preparaton of production programme for trial operation,
- Training of Tanzanian personnel for preparation of chill-test and dies for collecting of rejected (waste) liquid iron,
- Training of Tanzanian personnel for testing of new patterns and core boxes: test moulding, pouring, shake-out, casting removal, cleaning and fetlling, inspection, scrap determination, marking, etc.

SUPERVISING OF THE START - UP

From the date of the first melting, up to the completion of the six-months trial operation, quantity of about 7o,ooo kos of good ferrous and non-ferrous castings has been produced against average reject value of 13,68% for ferrous and 9,47% for non-ferrous castings.

Implemented results

The following ferrous castings have been produced during the trial operation:

1.	Plough wheel	2,5 kos/pc
2.	Muff coupling lower	1,1 "
3.	Beater distance plate R/L	1,o "
4.	T - joint pipe	11,o "
5.	Cistern tank	18,o "
6.	Ventilation cover	4,o "
7.	P - trap	12,o "
8.	S - sleeve	1,5 "
9.	Textile arm	o,4 "
1o.	Latch stand	1,o "
11.	Latch dressor	o,6 "
12.	T - Bracket No.3	1,1 "
13.	Man-hole cover 16 x 16"	16,o "
14.	Man-hole frame	7,o "
15.	Nahany trap	2,5 "
16.	Socket pipe	2,5 "
17.	Motor cover for tanesco	1,5 "
18.	Cross joint pipe	14,6 "
19.	Soil pipe	11,o "
2o.	Muff coupling upper	1,o "
21.	Y - joint pipe	1,1 "

22. Filler Feeder..... o,5 kos/pc
23. Slide guide..... 1,1 "
24. Spherical sleeve..... 1,5 "
25. Cast iron round bar 2" Ø x 27"..... 15,o "
26. " 3" Ø x 27" ..... 22,o "
27. " 4" Ø x 13" ..... 25,o "
28. " 4 1/2" Ø x 14 1/2"..... 27,o "
29. Beater bracket - flat..... 4,o "
3o. Beater bracket - cranked..... 3,o "
31. V - pulley blanks, 8 1/2" x 3 B..... 16,o "
32. Pin lift bracket..... 2,o "
33. Trailor hub..... 6,o "
34. Mill bad plate..... 72,o "
35. Siphon pipe..... 1,5 "
36. Gear wheel..... 18,o "
37. Loose weight..... 1,7 "
38. Siphon pipe cover..... 5,o "
39. Textile part..... 3,o "
4o. Charcoal iron..... 2,o "
41. Bench vice M 1oo ..... 21,o "
42. Flange - Tanesco..... 16,o "
43. Cross wood clamps ..... 1,3 "
44. Rod clamping bracket ..... 2,o "
45. V - pulley blanks, 1o 1/2" x 2 B..... 22,o "
46. Flexible flange coupling..... 6,8 "
47. Filling cam follower hub..... 15,o "
48. Box front - textile ..... 2,6 "
49. Pulley Ø 5 1/2"..... 8,o "
5o. Seed guard rail..... 1,4 "
51. Whip roll cam ..... 5,8 "
52. Bearing housing gear end ..... 2,4 "
53. " open end ..... 2,4 "
54. " cap ..... 1,5 "

55.	Gear end cover	1,5 kos/pc.
56.	B - 24679	1,0 "
57.	Hand clutch	0,4 "
58.	Back table	66,0 "
59.	Taper lock bush (med)	3,0 "
60.	" " " (small)	1,5 "
61.	Bevel pinion	7,6 "
62.	Worn gear wheel - support	
63.	Solder spoon	0,5 "
64.	Machine frame	
65.	Hand moulding box	142,0 "
66.	Weight for moulds	45,0 "
67.	Rice mill coupling	0,8 "
68.	Lathe slide bracket	2,0 "
69.	Front table	66,0 "
70.	Suction pipe Ø 12 x 8"	44,0 "
72.	Round plate	158,0 "
73.	Anchlor bolt	4,5 "
74.	Shaft with two nuts	64,0 "
75.	Maize mill shaft	130,0 "
76.	I - joint	13,0 "
77.	Slay guard	1,0 "
78.	Square block weight	9,2 "
79.	Textile shuttle	3,0 "
71.	Angle plate	4,7 "

The following non - ferrous castings have been produced during the trial operttion:

1. V- pulley Ø 7 1/2" ..... 1,5 kos/pc
2. Paralel link ..... 0,8 "
3. C. Soda flange ..... 1,0 "

Implemented parameters

Melting capacity (cupola furnace) ..... 1,46 - 1,90 tons/hour

Machine moulding capacity
(one pair of machines) ..... 30 - 33 moulds/hour

Sand plant capacity ..... 10 tons/hour

Shot blast machine capacity ..... 600 kos/hour

Scrap value:

- grey iron production 13,68%
- non-ferrous production 9,47%

Casting average weight:

- grey iron production ..... 4,1 kos/cast
- non-ferrous production ..... ,142 "

Monthly production:	Non-ferrous	grey iron
- month I	-	7.250.10 kos
- month II	-	11.178.10 "
- month III	-	20.216.65 "
- month IV	465.00	9,225.10 "
- month V	712.00	12,094.70 "
- month VI	208.50 -"-	9.610.35 "
Six months total production	1,385.50 -"-	69.575.00 "

Spent man-montns (Yugoslav experts)..... 40

Implemented parameters and results confirmed a technological concept of the plant as properly chosen. The equipment is functioning in accordance with projected requirements. The produced castings are, despite insufficient quantity, of good quality with acceptable reject percentage. Insufficient quantity of produced castings is the result of the lack of manpower, discontinued production, insufficient marketing and patterns and core boxes, missing laboratory items etc.

During the first six months of trial run, the Tanzanian patternmaker made about 60 complete patterns and core boxes and about 70.000 kg. of high-quality castings were produced. It is a fact that the foundry in Mwanza is of service type and that it does not have mass production, and therefore many patterns are necessary for small orders of various castings. In that sence, the problem will be solved, or at least, brought to a minimum, by erecting a patternmaking shop which we supplied free of charge. In this patternmaking shop, a well trained patternmaker can successfully train new patternmakers.

The pattern-making problem occurred in the third month of trial run when the well skilled pattern designer left the company. As we then insisted on an urgent replacement, NEFCO announced an open competition for a new engineer. However, by the end of the trial run, nobody had applied, and within the available labour, there were not any adequate workers to be trained for this type of work. Our expert, the mechanical engineer, trained two Tanzanian engineers for three months, but only periodically, as they were engaged with their regular responsibilities (chief of technology and foundry and chief of inspection).

The project was implemented in time, with the engagement of 18 experts from LŽT "Kikinda", who, apart from their modest knowledge of English, confirmed their skillfulness and reputation at well-known world companies. However, mutual communication could not have been a problem, since a course of Serbocroation was organized for the 14 tanzanian trainees during their six-month training in Yugoslavia.

After the six-months trial operation, the casting production has been continued by Tanzanian experts and workers and, as shown in the enclosed telex dtd 14/06/1989, the implamented results are quite satisfactory (Enclosure No. 6).

ANNEX 1

TERMS OF REFERENCE

1.10.87

TERMS OF REFERENCE

DP/URT/80/022

ESTABLISHMENT OF THE NEFCO FOUNDRY WITH THE MECHANICAL WORKSHOP
PHASE II
START-UP AND INITIAL OPERATION

1. General Background

It is proposed that the Contractor which has handled the project to date, will assume the responsibilities of the present Contract. The project has overrun several years with no price increase to the benefit of the Contractor. The Contractor was unable to start up the foundry under the past Contract due to lack of funds, and it was agreed by UNDP to provide additional cash for the start-up; that the Government of Yugoslavia would contribute, and that the counterpart would supply funds in local currency.

2. Aim of the Project

To set up an operating NEFCO foundry in Mwanza.

3. Scope of the Contracting Services

The Contractor is required to

(a) Supervise the revision of all equipment and installations and perform such work as may be required to ensure that all is in proper working order.

(b) Supervise the operation of the plant during a period of six months, continuously. The production will follow a schedule to be agreed between NEFCO and UNIDO and INVEST-IMPORT.

(c) During the six months' period the Contractor will train the local personnel to a level which will permit them to continue the operation of the plant following the completion of this contract.

(d) The Contractor will ensure that the acquisition/production and maintenance of the foundry patterns by the counterpart is properly organized upon termination of the contract.

4. General Time Schedule

Following the award of the Contract:

(a)	Briefing in Vienna of the Team Leader (Foundry Engineer)	September 1988
(b)	Arrival of Maintenance Team in Project Area	October 1988
(c)	Arrival of Production Team in Project Area	December 1988
(d)	Termination of Programme	May 1989
(e)	Presentation of Final Report	June 1989

UNIDO will have 4 weeks to comment on the Draft Final Report.

5. Language Requirement

English.

6. Reports

An Interim Report and a Draft Final Report, in English, in five (5) copies and a Final Report, in English, in ten (10) copies.

ANEX 2.

REPORT ON THE TRIPARTITE MEETING

MINUTES OF THE PROJECT REVIEW MEETING ON THE ESTABLISHMENT OF A SIDO FOUNDRY WITH INTEGRATED MECHANICAL WORKSHOP - DP/URT/80/022

The meeting was chaired by Mrs. Mary Chinery-Hesse, Resident Representative of the United Nations Development Programme (UNDP) with the following participants at the Nyanza Engineering and Foundry Company (NEFCO) (1000 - 1200 hours) and at the New Mwanza Hotel (1400 - 1700 hours) on 11 November 1987.

PARTICIPANTS

UNDP	Mrs. Mary Chinery-Hesse Resident Representative
UNIDO	Mr. Isuyoshi Mikuchi Senior Industrial Development Field Adviser
YUGOSLAVIA	Mr. M. Brscic Counsellor of the Embassy of the Socialist Federal Republic of Yugoslavia
	Mrs. Boba Stojanovic Invest-Import
	Mr. Sava Matejic Invest-Import
	Mr. Bubalo Predrag Invest-Import
SIDO	Mr. E.B. Toroka Director General, SIDO Headquarters
	Mr. F.E. Sauwa, SIDO Headquarters
	Mr. M. Mfalimbega Regional Manager, SIDO Mwanza
	Mr. S. Samson, SIDO Mwanza
	Mr. N.M.Lukanya General Manager, NEFCO Mwanza
	Mr. W. Wansakya, NEFCO Mwanza
	Mr. Evarist T. Mihigo NEFCO Mwanza

The meeting was briefed by Small Industries Development Organization (SIDO) and the Mwanza foundry staff on the importance of the project to the Economic Recovery Programme. The most important end-user would be the cotton-ginning industry which has been facing frequent shut-downs as a result of lack of spare parts. The area to be served by the foundry is the most important cotton growing region. Currently there are large stocks of cotton awaiting ginning before export. The sugar industry would also benefit from the foundry as will agriculture generally, especially for rehabilitation of a large number of tractors which are incapacitated for lack of spare parts. Other end-users of sheet metal products will also benefit.

Equity for the foundry has been provided by SIDO - 40%, the Municipality of Mwanza - 30% and the Nyanza Cooperative Movement - 30%. The necessary overdraft from the Commercial Bank (NBC) for supplementing working capital is in the final stages of arrangement and imported raw material for 6-8 months production is nearly all already in the country. Local inputs present no problem. Both water and electricity have been installed and a constant supply is assured. Fourteen staff members have been trained in Yugoslavia and all of them are still employees of the foundry except for the Pattern Shop technician who is working in the Dar es Salaam foundry but who will be available for Mwanza once there is a pattern shop. The Plant expects to break even within two years at 70% capacity.

The Yugoslavs explained the inputs of the various partners to date. On the whole, over $1 million has been contributed by all parties including United Nations Development Programme (UNDP). The Yugoslav Government has tried to keep costs at the original quotations in spite of inflation and has supplied and replaced items not previously anticipated. The only action outstanding is to have a trial run. There is need to thoroughly clean and service all the parts in view of the fact that the equipment

has been installed but idle for some time, carry out refraction, hot test and start up production moving to full production. In the process, modifications to the machines might need to be effected, and cracks and other problems which might surface rectified. All replacements would be made under guarantee by the Yugoslav side and at no additional cost. The process would take eight months in all - two months for cleaning and refraction and six months for the actual trial run. Eleven multi-disciplinary experts would need to be fielded for this operation. The total number of man-months involved is 37 man-months, one man-month less than was originally foreseen in the document agreed with UNIDO. The cost of this technical assistance would be $203,000 or $5,486 per man-month all inclusive. After lengthy negotiations, the meeting agreed that the amount should be cost-shared as follows:

UNDP	-	$156,000
SIDO	-	6,250
Yugoslavia	-	41,750
		$203,000

The Yugoslav contribution amounts to 21% of the total cost. The UNDP contribution includes $36,000 for international travel.

Another subject matter for protracted discussion related to the need for a pattern shop on site in Mwanza. The UNDP Representative explained that the impact of the project would suffer from an inability to carry out specific tasks rather than assembly line type production. The Government side agreed to investigate the possibilities in this regard and the Yugoslav side indicated that there is a very strong possibility Yugoslavia would donate the pattern shop within the framework of their bilateral negotiations with Tanzania. The Government submitted a definitive list of items to be cast in the first year of operation. They confirmed that many of these already have the patterns made and the requirements of the Mwanza foundry would be given priority treatment

in both the Dar es Salaam and Shinyanga pattern shops. In other words, immediately, the foundry would have enough critical work to perform even in the absence of a pattern shop on site, based on an actual market survey.

On the continued and sustained availability of imported inputs, the meeting agreed that it was necessary to receive from the Ministry of Industries confirmation that the requirements of the Mwanza foundry would be put on the priority list in the same way as other export-oriented industries since it was so strongly supportive of the export sector. In addition, it should be possible to latch it on to the beneficiary industries' export retention scheme procurements. SIDO undertook to explore this possibility.

Manpower for the foundry would conintinue to be trained at the Moshi Foundry Training School. The meeting recognised the need for those trained in Yugoslavia to be used as trainers. Also it was agreed that there is need to associate the trained manpower with the Yugoslavé experts for the start-up operations when they arrive. The maintenance technician should receive special attention. The Yugoslav side, for planning purposes informed the meeting that most of their experts would be concentrated in the first two months pre-start up activities period, i.e. five experts consuming 28 man-months. The counterparts could work with them on the job for experience until they have proved the production capacity, quality and suitability and issued a certificate. Work force for the first year which would operate a single shift would be 57 and there would be no difficulty recruiting. SIDO confirmed that the rated capacity of the plant is 1,300 tons per year of grey castings and 100 tons per year of non-ferrous castings.

In order to facilitate planning, the meeting agreed that Invest-Import should develop for the guidance of SIDO a checklist required to synchronize activities during the start-up and trial operation period. SIDO undertook to ensure assembly of local imported inputs in accordance with the check-list and time chart.

The organisational structure of the foundry was discussed. All emphasized the need for an efficient and profitable venture in the interest of the shareholders and to ensure continued operation. The organisational chart is attached.

The UNIDO SIDFA referred to the preference of UNIDO Headquarters for the use of one Associate expert and one UNVexpert to start up the foundry. The meeting agreed that this proposal would not prove feasible since it is important for the suppliers of the machinery and the consultants for installation to start-up the machines and have a trial run before hand-over. It was impossible for the personnel mentioned above to possess the multiplicity of skills needed to clean, test and repair the equipment. If even they could, it would take an inordinately long time in face of the urgent need for the output of the foundry in the Economic Recovery Programme. There would later be arguments as to where responsibility rests should problems surface during this period and the suppliers would dispute claims for replacement. It is intended that this final phase of the project should commence in February 1988 and all parties - UNDP, UNIDO, the Yugoslav authorities and ILO should bear it in time-frame in mind and work towards it. A monitoring machinery should be installed to ensure all parties play their part.

The meeting requested Invest-Import to submit regular reports using the UNDP format. UNIDO SIDFA was requested to send the format to the Yugoslavian side.

ANNEXE 3

LIST OF INSTALLED EQUIPMENT

UNIT : MELTING SHOP

ITEM	D E S I G N A T I O N	QTY	TECHNICAL DATA
1.	Cupola furnace	2 pcs	600 mm DIA
2.	Receiver	1 pc	LD 5-1,o t.
3.	Pouring monorail	1 set	63 m length
4.	Pouring ladle	2 pcs	70 kg.
5.	Pouring ladle	4 pcs	250 kg.
6.	Tools and accessories	set	-
7.	FAN	1 pc	4000 Mn^3/hour
8.	Platform	set	
9.	Fire-clay brick	975 pcs	KÜ - 1
10.	Fire-clay brick	2055 pcs	Normal
11.	Fire-clay mixture	5000 kgs	M.P.-6
12.	Fire-clay mixture	3000 kgs	V-K.A.
13.	Cast iron brick	80 pcs	Vertical lining
14.	Cast iron brick	15 pcs	Edge lining
15.	Set of pattern tools for iron brick production		
16.	Industrial scale,measuring	1 pc	Range 1000 kgs
17.	Skip	1 pc	1 T, 7m
18.	Aluminium melting furnace	1 pc	150 kg
19.	Pouring ladle lift device	3 pcs	300 kgs, 1600 mm
20.	Oil burner	2 pcs	-
21.	Bricklayer`s trowel	1 pc	-
22.	Bricklayer`s scoop	1 pc	-
23.	Bricklayer`s hammer	1 pc	700 gr.
24.	Plumb - bob	1 pc	300 gr.
25.	Wheelbarrow	3 pcs	-
26.	Asbestos glove	2 pairs	-
27.	Compasses	1 pc	DIA 500 mm
28.	Compasses for holes	1 pc	DIA 250 mm
29.	Pneumatic gun	1 pc	-
30.	Pouring ladle	1 pc	750 kgs
31.	Set of refractory lining forms	1 set	

UNIT : MOULDING SHOP

ITEM	DESIGNATION	Q T Y	TECHNICAL DATA
1.	Moulding flask	108 pairs	562x440x200(mm)
2.	Roller conveyers		84 m
3.	Shake - out grid	1 pc	IR - 05
4.	Overhead travelling crane	1 pc	2 t x 9 m
5.	Tools and accessories	1 set	-
6.	Pneumatic rammers for sand	2 pcs	Type NP -18
7.	Flask pallette	60 pcs	1000x620 (mm)
8.	Moulding machines	4 pcs	FKT - 65 B

UNIT : SAND PREPARATION AND CORE SHOP

ITEM	D E S I G N A T I O N	Q T Y	TECHNICAL DATA
1.	Moulding sand mixer with dozing equipment	1 set	M 25, 500 lit
2.	Core sand mixer with dozing equipment	1 set	MJ-50, 50 lit
3.	Moulding sand transportation equipment: two belt conveyers	2 sets	37 m each
4.	Return sand belt conveyer	3 sets	49 m each
5.	Polygonal sieve	1 pc	15 t/h,12x12 (mm)
6.	Cyclone	1 pc	16000 m^3 / h
7.	Magnetic separator	1 pc	500 mm
8.	Hopper assembly with platform carrying construction for storing of sand,additives and moulding sand	1 set	-
9.	Additive and new-sand hoist with separator	1 set	1 Mp
10.	Tools and accessories	set	-
11.	Working bench	2 pcs	1400x800x800 (mm)
12.	Water tank with pipe line	1 set	400 l.

UNIT : CLEANING SHOP

ITEM	D E S I G N A T I O N	Q T Y	TECHNICAL DATA
1.	Wheelabrator unit with cyclone	1 set	K2-1600
2.	Pedestal two-side grinder	2 pcs	4 kW,450 mmDIA
3.	Swing type grinder	1 pc	4 kW,400 mm DIA
4.	Working bench	5 pcs	1000x800x800 (mm)
5.	Balance,measuring	1 pc	range up to 1000kgs
6.	Tools and accessories	1 set	-
7.	Pneumatic grinding machine	5 pcs	Type VB 485/BV4-12
8.	Pneumatic grinding machine	5 pcs	TYpe V 3180/BV3-6E
9.	Self-closing valve	5 pcs	Type VC 10-0,8
10.	Connection	5 pcs	Type PR 1/4V-0,8
11.	Pneumatic gun	9 pcs	-
12.	Grinder stand	1 pc	-
13.	Stable grinder	1 pc	Type BT - 250
14.	Self-closing valve	5 pcs	Type VC 13-1,7
15.	Connection-Connector	5 pcs	Type PR 1/2V-1,7

UNIT : ALUMINIUM FOUNDRY

ITEM	D E S I G N A T I O N	Q T Y	TECHNICAL DATA
1.	Aluminium melting furnace	1 pc	
2.	Tools and accessories	set	

UNIT : LABORATORY

ITEM	D E S I G N A T I O N	Q T Y	TECHNICAL DATA
1.	Gas and volumetric determinating of C and S content	1 set	Type KU - 47
2.	Automatic analytical balance	1 set	Range up to loo gr.
3.	Vessels for weighing AL	10 pcs	70 mm
4.	Brushes for scale cleaning	5 pcs	-
5.	Plugs	1 kg	No.6
6.	Stand for filtration with 3 funnels	4 pcs	-
7.	Spraying PVC bottles	4 pcs	500 ml
8.	PVC spoon double	10 pcs	180 mm
9.	Pincers for small pot	5 pcs	450 mm
10.	Brushes for glass washing	10 pcs	-
11.	Laboratory thermometer	3 pcs	H8,0-100°C
12.	Bottle for gas washing	5 pcs	250 Ml, Vega
13.	U-pipe with ground seal	8 pcs	16X160 tlos
14.	Laboratory glass	50 pcs	250 ml pula
15.	Laboratory glass	50 pcs	600 ml pula
16.	Laboratory glass	10 pcs	1000 ml pula
17.	Round bottle	20 pcs	300 ml pula
18.	Clock glass	20 pcs	DIA 100 mm pula
19.	Funnel for quick filtration	10 pcs	dia 80 mm pula
20.	Pipette	10 pcs	10 ml 1/10 tlos
21.	"	10 "	5 ml 1/20 tlos
22.	Spraying bottle with rubber seal	4 "	1000 ml pula
23.	Distilled water bottle with tube and tap at bottom	2 pcs	10.000 ml pula
24.	Dripping bottle	5 "	50 ml KP 3174
25.	Funnel	5 "	DIA 100 mm pula

ITEM	D E S I G N A T I O N	Q T Y	TECHNICAL DATA
26.	Round bottle for weighing	5 pcs	500 ml pula
27.	Porcelain vessels for annealling	4000 pcs	90x15x9 (mm)
28.	Small pot Pt with lid	1 pc	No 7
29.	Marsh `s furnace for quick estimation of C content with combustion pipe,transformer-set and apparatus for estimation of C and S contents in steel	1 set	
30.	Ceramic tube	50 pcs	17x22x600 (mm)
31.	Laboratory glass	5 pcs	3000 ml
32.	Exiccator with tube and tap	3 pcs	DIA 200 mm
33.	Cylinder	5 pcs	50 ml
34.	Graduated vessel	5 pcs	500-2000 ml
35.	Graduated vessel	2 pcs	25 ml
36.	Burette automatic, dark	2 sets	50 ml
37.	Burette automatic	2 sets	25 ml
38.	Porcelain annealling pot	50 pcs	40x32 mm
39.	Round measuring bottle	3 pcs	1000 ml
40.	Tube for Ca Cl 2 with ball	5 pcs	
41.	Metalographic microscope	1 pc	
42.	Infra-ray dryer	1 pc	
43.	Permeability tester	1 pc	
44.	Ramming	1 pc	
45.	Sieves	1 set	
46.	Mould hardness tester	2 pcs	
47.	Apparatus for clay content testing	1 set	
48.	Set of equipment and apparatus for chemical analysis	1 set	

UNIT : MACHINING SHOP

ITEM	DESIGNATION	Q T Y	TECHNICAL DATA
1.	Universal lathe	2 pcs	Type US-400A/1000
2.	Standard accessory	2 sets	2 x 3 items
3.	Special accessory	2 sets	2 x 16 "
4.	Universal milling machine	1 pc	Type FA 3 AU
5.	Standard accessory	1 set	30 items
6.	Special accessory	1 "	30 "
7.	Radial drilling machine	1 pc	Type RB-40 SPA
8.	Standard accessory	1 set	3 items
9.	Necessary accessory	1 set	11 items
10.	Rectifier for electric welding	1 set	Type LCH-575 A
11.	Welding equipment,with 2x10 m cable and clamps	1 set	-
12.	Smith `s working bench with hard wood top	6 sets	Type DM-1
13.	Joiner `s bench	2 pcs	-
14.	Joiner `s tools	1 set	-
15.	Pair of compasses	1 pc	-
16.	Vertical ruler	1 pc	1000 mm
17.	Feeler gauges	1 set	0,05-1,00
18.	Screw pitch gauge	1 set	-
19.	Hand mask	1 pc	-
20.	Hacksaw blades	12 pcs	HSS 2/2 300
21.	Metaldrills	10 pcs	DIA 8 mm
22.	Masonry drills for stone	10 pcs	DIA 8 mm
23.	Steel vice	8 pcs	120 mm
24.	Glass for mask	5 pcs	10 x 10 mm
25.	Welding set	1 set	GZV - 4
26.	Vertical ruler	1 pc	750 mm
27.	Caliper	2 pcs	300 mm
28.	Depthmeter	3 pcs	300 mm

ITEM	D E S I G N A T I O N	Q T Y	TECHNICAL DATA
32.	Planes	1 pc	140x250 mm
33.	Oxygen reducing valve	1 pc	-
34.	Acetylene reducing valve	1 pc	-
35.	Brush	4 pcs	60/MT
36.	Bumping hammer	1 pc	500 gr
37.	Hollow screw wrench	4 pcs	14 mm
38.	Hollow screw wrench	4 pcs	19 mm
39.	Vernier caliper	5 pcs	150 mm
40.	Vernier caliper	4 pcs	300 mm
41.	Vernier caliper	2 pcs	400 mm
42.	Vernier caliper	1 pc	1000 mm
43.	Dial gauge	4 pcs	DIA 60-1/100
44.	Dial test indicator	1 pc	DIA 38-1/100
45.	Ruler	1 pc	500 mm
46.	Ruler	1 pc	1000 mm
47.	Tools in a tool box	4 sets	art.525
48.	Electrician `s tools	2 sets	-
49.	"MINIREK"shelves with 5 sections:		
	- column	8 pcs	2 m
	- foundation plate	8 pcs	-
	- connecting support	30 pcs	VNM 190
	- assembly beam	16 pcs	PM-100
50.	Comb.insulated pliers	1 pc	200 mm
51.	Monksy wrench	1 pc	250 mm
52.	Screw drivers	1 set	5 pcs
53.	Saw frame	2 pcs	-
54.	Smith`s hammer	1 pc	400 gr.
55.	Open-end spanner	1 set	6-22 (mm)
56.	Electric saw	1 pc	DIA 250 mm
57.	Hand operated el.driller	1 set	max DIA 13 mm
58.	Smith`s metal desk with 3 drawers	1 set	
59.	Smith`s working desk with 6 drawers	1 set	-
60.	Single metal tools cabinet	4 sets	-
61.	Smoothing plate	1 pc	1600x1000 mm
62.	Tools in tool box	3 sets	art.530

ITEM	D E S I G N A T I O N	Q T Y	TECHNICAL DATA
63.	V - blocks	2 pcs	200x170x80 mm
64.	Smith `s steel square	1 pc	400x265 mm

UNIT : TRANSPORT FACILITIES

ITEM	D E S I G N A T I O N	Q T Y	TECHNICAL DATA
1.	Transport storage case	20 pcs	1000x800x800 mm
2.	Tilting cart	6 pcs	
3.	Hand operated cart	2 pcs	Type"Turtle", 500 kgs.
4.	Hand operated cart for flasks	1 pc	RB 02 B
5.	Fork lift	2 pcs	Type"Turbomatic" I-20
6.	Pallettes	3 pcs	1,5 t
7.	Core rack	4 pcs	total 30 m²
8.	Transporting containers metallic	20 pcs	1200x800x700 mm

UNIT : DUST COLLECTING

UNIT	D E S I G N A T I O N	Q T Y	TECHNICAL DATA
1.	Exhaust hood	4 pcs	700 x 700 mm
2.	Table with lattice as a working surface for cleaning	4 pcs	-
3.	Cyclone cone	2 pcs	ASH 100/80
4.	Cyclone cap	1 pc	ASH 100/82
5.	Construction column with plates	8 pcs	2N PUlox6loo mm
6.	Diagonal NPL	72 pcs(8m)	50x50x5 (mm)
7.	Diagonal NPL	16 pcs(1,2m)	70x70x7 (mm)
8.	Profile NPL	70 pcs(o,7m)	45x45x4 (mm)
9.	Cyclone separator housing	2 pcs	ASH 100/80
lo.	Frame 2 NPU	8 pcs	lox182o (mm)
11.	Cyclone separator Cap	1 pc	ASH 100/80
12.	Deflector	1 pc	DIA 200. 30°
13.	Plastomatic	15 pcs	DIA 6 mm
14.	Nut screw	850 pcs	M10x30(mm)
15.	Nut screw	300 pcs	M6x25 (mm)
16.	Nut screw	130 pcs	M8x40 (mm)
17.	Centifugal fan with el. motor	2 pcs	Type SMK
18.	Antivibrational washers	8 pcs	-
19.	Anchor screw	32 pcs	M 16 mm
20.	Nut screw	32 pcs	M 16 mm
21.	Tube	6,40m	DIA 120mm
22.	Tube	1,50m	DIA 160mm
23.	"	26,60m	DIA 200mm
24.	"	20,00m	DIA 250mm
25.	"	2,10m	DIA 280mm
26.	"	11,30m	DIA 300mm
27.	"	1,60m	DIA 320mm
28.	"	17,90m	DIA 350mm
29.	"	3,30m	DIA 380mm
3o.	"	5,85m	DIA 400mm
31.	"	22,95m	DIA 500mm

ITEM	D E S I G N A T I O N	Q T Y		TECHNICAL DATA
32.	Conus tube	0,80	m	350/500 mm
33.	Bifurcation tube element	11,	pcs	various
34.	Elbow	52	pcs	"
35.	Flange	6	pcs	"

UNIT : COMPRESSED - AIR STATION

ITEM	D E S I G N A T I O N	Q T Y	TECHNICAL DATA
1.	Compressor generating set	1 set	Type E 1MK-206o
2.	Tank R 10/10	1 pc	10 M^3
3.	Control and feeding assembly	1 pc	Type US-55
4.	Outlet cooler	1 pc	Type HEZ-6
5.	Water separator	2 pcs	Type OUG-6
6.	Collector	1 pc	Type K-1
7.	Flexible pipe	1,2 m	No.65
8.	Pipe line fittings	set	various

ANNEX 4

LABORATORY REPORTS

CERTIFICATE

LIVNICA ŽELJEZA I TEMPERA -KIKINDA-
KIKINDA, YUGOSLAVIA

LABORATORY

Material grade: Grav Iron

Product: BEATER BRACKET FLAT

Date

Delivery for

CHEMICAL COMPOSITION

C	Si	Mn	P	S	Cu	Cr			
%	%	%	%	%	%	%	%	%	%
3.33	1.74	0.80	0.08	0.068	0.08	0.073			

MECHANICAL PROPERTIES

Tensile strength	Yield strength	Elongation	Impact resistance	Brinell hardness
MPa	MPa	%	J/cm²	HB
-	-	-	-	167

Microstructure

Type A size 3-7 and type D size 5, graphite flakes in a matrix of pearlite.

Laboratory chief

Inspection department chief

CERTIFICATE

LIVNICA ŽELJEZA I TEMPERA »KIKINDA«
KIKINDA, YUGOSLAVIA

LABORATORY

Material grade: Gray Iron

Product: PLOUGH WHEEL

Date

Delivery for

CHEMICAL COMPOSITION

C	Si	Mn	P	S	Cu	Cr			
%	%	%	%	%	%	%	%	%	%
3.23	1.99	0.62	0.18	0.063	0.06	0.069			

MECHANICAL PROPERTIES

Tensile strength	Yield strength	Elongation	Impact resistance	Brinell hardness
MPa	MPa	%	J/cm²	HB
-	-	-	-	217

Microstructure

Type A, size 4-7 and type D size 5, graphite flakes in a matrix of pearlite.

Laboratory chief

Inspection department chief

NYANZA ENGINEERING AND FOUNDRY COMPANY LIMITED

LABORATORY

ANALYSIS OF MOULDING SAND

				NORMAL VALUE
DATE 08/04/1989				
PLACE AND TIME OF SAMPLING	10.00	10.40	11.30	
MOISTURE (%)	3.8%	3.5%	3.5%	3.0% – 5.0% (max)
BULK DENSITY (g/cm^3)				
COMPACTABILITY (%)	47%	44%	40%	35% – 45% (max)
SPECIFIC MASS (g/cm^3)				
PERMEABILITY				
COMPRESSION STRENGTH (KPa)				
SHEARING STRENGTH (KPa)				
TEMPERATURE (°C)				

ANALYST .....

/ms

NYANZA ENGINEERING AND FOUNDRY COMPANY LIMITED

LABORATORY

PYROMETRIC TEMPRATURE MEASUREMENTS

MELTING SHOP

DATE: 8/4/1989

TIME	CUPOLA FURNACE C°	HOLDING FURNACE °C	POURING LADLE °C
01·30	1450°C	1430°C	1370°C
02·5	1420°C	1400°C	1310°C
03·35	1480°C	1390°C	1340°C
MEAN			

ANALYST [signature]

[signature]

LIVNICA ŽELJEZA I TEMPERA „KIKINDA"
LABORATORIJA

LABORATORY REPORT No. 8

Subject of testing: Analysis of grey iron casted in NEFCO Foundry, Tanzania

Received to be tested: on 5th December 1988

Subject of testing in detail: Chemical and metallographic testing of grey iron sample. Sample was casted in Tanzania.(Mwanza,28th Nov.1988

RESULTS OF TESTING

1. Chemical composition

chemical elements %						
C	Si	Mn	S	Cr	P	Cu
3.16	2.76	1.00	0.067	0.104	0.115	0.20

2. Metallographic properties and hardness

base structure (%)	graphite shape	graphite size (mm)	No.of eutectic cells (No/cm²)	hardness HB	
				core	surface
perlite 90 +	D	D8(1.5)			
phosphide	E	E 7-5(2-10)	200	219	219-252
eutectucum +	A	A 7-3(3-25)			
Fe_3C in traces	C	C 7-4(3-18)			

Laboratory chief

Mirjana Vlašić

ENCLOSURE No.1.

IMPLEMENTATION BAR-CHART

No.	A C T I VI T Y	DEADLINE Conctracted 16/o6/82	Revised 28/o2/83.	Implemented
1.	Awarding the Contract			Jan 81.
2.	Concluding the contract between SIDO and Invest-Import	Apr.81.	-	Nov.81.
3.	Planning and scheduling of process documentation	Jan.82.	-	Feb.82.
4.	Specification of raw material and labour standards	Jan.82.	-	Feb.82.
5.	Tender documentation for equipment procurement	Jan.82.	-	Jan.82.
6.	Documentation of work methods	Jan.82.	-	Jan.82.
7.	Detailed technological and engineering design	Feb.82.	-	Feb.82.
8.	Procurement and contracting of equipment and machinery	Feb.82.	-	Jan.Mar.82.
9.	Building/erection	Sept.82.	Apr.83.	Apr.85.
lo.	Technical documentation for assembly and installation of the eguipment	Sept.82.	-	July82.
11.	Completion of training of Tanzanian personnel in Yugoslavia			
12.	Shipment of equipment			
	- first lot	Aug.82.	-	-
	- final lot	Dec.82.	-	Dec.82.
13.	Supervision of erection and installation works (completion)			
	- energy,water and other infrastructure elements	Aug.83.	Feb.84.	July86.
	- mechanical workshop	Aug.83.	Feb.84.	July 86.
	- foundry	Dec.83.	Feb.84.	July86.
14.	Running and performance tests (completion)	Jan.84.	Sept.88.	May 89.

ENCLOSURE No. 2

NEWSPAPER REPORT

Foundation (CUT-KAF) project to enhance co-operative activities.

In an interview with the *Daily News* yesterday, the Programme Officer of the Swedish Co-operative Centre (SCC), Ndugu Reijo Lehto, said the expansion programme would involve Coast, Dodoma, Singida and Kigoma regions.

Under the programme, Swedish farmers will help their counterparts in Tanzania through the Swedish Co-operative Centre and the Cooperative Union of

The SCC Programme Officer said the Support Programme had been started in Morogoro Region by involving the Morogoro Region Co-operative Union (MORECU) and primary co-operative societies in Kilosa, Morogoro rural, Kilombero and Ulanga districts.

The regional support programme involves foreign exchange for import-support under the Swedish International Development Agency (SIDA). Also consultancy services, training and education, special primary co-operative society development scheme, studies and surveys.

Another CUT-KAF project which started rural savings schemes in Iringa Region early September this year will extend services to Kilimanjaro Region as soon as other donors NORAD leave.

According to KFI Resident Representative to Tanzania, D. Wolfgang Maier, the aim of the project is to strengthen and promote savings and credit cooperatives in Tanzania.

Between 1988 to 1990 the project will run seminars for committees, secretaries, managers and desk officers.

The project would also finance travel expenses for field officers, pay salaries for field officers in the rural savings schemes, finance running costs of saving and credit department, provide transport

would be extended in 1990 to another region to be named later.

said it all failed. "We shall see the Pr... nt"

Veterinarians end meeting

From Correspondent Roland Ntondolo

THE Sixth Conference of the Tanzania Veterinary Association has recommended that more effort be given to traditional veterinary medicines to reduce dependence on imported drugs and vaccines.

This is one of the 15 recommendations adopted after a three-day conference, whose theme was "...the Veterinary Profession ...as had in the Developing Countries."

It has been recommended that control of African swine fever be taken seriously as the disease had been reported in three regions of Mainland Tanzania. Veterinary class drugs should be sold by prescription only.

Mwanza foundry starts operations

THE 300m/- Nyanza Engineering and Foundry Company (NEPCO) which was formed in 1984 has started trial operations, manufacturing different spare parts.

The General Manager of the company, Ndugu N. Lukanya, told the Mwanza Regional Commissioner, Ndugu Timothy Shindika, who visited the plant on Thursday that trial runs were carried out successfully on November 28, this year, *Shihata* reported.

He said the plant was capable of producing 33 different types of spares for ginneries, sanitary sewarage fittings of various sizes and shapes, spares for the sugar and textile industries and other assorted machine parts.

Ndugu Tukanya told the Regional Commissioner that the plant was also capable of producing grey iron castings from which industrial spares are made.

He said the foundry was able to produce non-ferrous castings of aluminium and brass or bronze materials from its non-ferrous furnance.

He informed Ndugu Shindika that a machining shop is attached to the plant to carry out machining of spares from the foundry which required such ... machining.

... a joint venture between Tanzania Government and the Government of the Socialist Federal Republic of Yugoslavia and the United Nations Industrial Development Organization (UNIDO).

Machinery Installation of the plant was carried out since 1985 and by July 1986, the installation was ready allowing the mechanical shop to operate.

The General Manager has said the foundry plant was delayed to start operations due to delays in receiving some materials.

The Mwanza Foundry is said to be the biggest in the country with the capacity to produce 1,350 tons of ferrous and 100 tons of non-ferrous castings compared to other foundries which together produce 2,400 tons of ferrous.

Leaders urged to fight racketeering

PARTY and Government leadership in mining areas where gold and other minerals are sold in black markets should stop the illegal business using existing laws.

This was said on Thursday by a member of the Party National Executive Committee (NEC), Ndugu Daudi Mwakawago when reacting to a Party member's blame on the Government for not taking action against the racketeers.

Ndugu Mwakawago said although there had been complaints about gold racketeering and other black market businesses, Party branches and Government authorities of the respective areas had not taken any action to stop the acts, *Shihata* reported.

Arusha Municipal probes thefts

THE Arusha Municipal Council has formed a committee to investigate allegations of corruption, theft, embezzlement of funds and abuse of power by some officials of the municipal.

An official of the municipal told *Daily News* in Arusha yesterday that the committee had been formed following recent reports of misallocation of plots and lack of co-operation between municipal officials, *Shihata* reported.

Last month, the Government ordered stoppage of construction activities of four houses along Naura River which were being constructed contrary to land regulations.

The Municipal director J. Lipangile has admitted that the plots, located in the centre of Arusha municipality and allocated to individuals, were wrongly allocated.

Ndugu Lipangile said, however, that no action had been taken against officials who were involved in the allocation of the plots in dispute.

Meanwhile it has been found that petrol and diesel worth 2m/- including spare parts have disappeared during the past ten months.

Shihata has found ... of the stolen spare ... 13 tyres and five ...

Investigations ... that loss of the ... cluding ... due to ... ten ... It is alleged ... diesel from ... Station ... and ... cal Purchase ... TPC ...

Lawyers exchange notes in Arusha

From Moses hiturura in Arusha

CORPORATION counsels and legal officers in public service are convening here for their second annual refresher course to update knowledge and compare notes on the expanding body of law on public enterprises.

The course, together ... participants ... to provide a forum ... between academic ... faculty of law ...

Ukerewe coconu

UKEREWE — About a third of coconut seedlings sent to Ukerewe under President Mwinyi's order to encourage the crop in the Lake Victoria island have withered for lack of care.

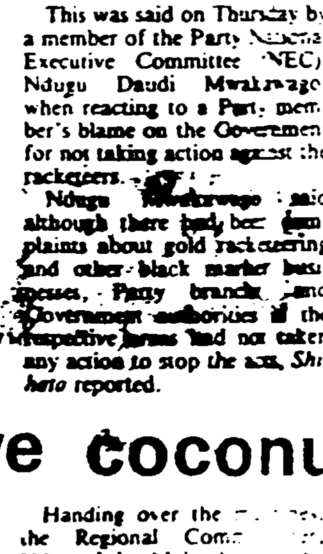
Quoting the District Agricultural Officer's report, *Shihata* said upto September 8 this year 340 seedlings out of 1,100 had dried up due to lack of water or weeding ... had been destroyed by animals.

The report said all the 36 seedlings given to Kagunguli Girls School had been destroyed, including the 26 at the Party College and 22 at the teachers College and Mrutunguru village.

IRINGA — The Denmark-Tanzania Friendship Association has donated 10 sewing machines worth more than ... to ... three ... Region.

Handing over the machines, the Regional Commissioner, Ndugu John Malecela ... the sewing machines would ... way to strengthen women ... economic activities.

DAR ES SALAAM — ...



District M... Masudi A. Masudi ... to ...

ENCLOSURE No.3.

LIST OF ADDITIONAL ITEMS NEEDED

LIST OF ADDITIONAL ITEMS NEEDED

1. Laboratory muffle furnace
2. Hardness tester with accessory

ENCLOSURE No. 4

LIST OF LOCALLY AVAILABLE MATERIAL.

LIST OF LOCALLY AVAILABLE MATERIAL

1. Quartz sand
2. Steel scrap
3. Lime stone
4. Old grey iron parts
5. Old non-ferrous castings
6. Coal dust
7. Liquid CO_2
8. Liquid O_2
9. Fuel oil
10. Petroleum
11. Water glass
12. Machine oil
13. Lubricants
14. Fireclay mass for cupola furnace

ENCLOSURE No. 5

SPARE PARTS

SPARE PARTS FOR MWANZA FOUNDRY - TANZANIA

		Qty
A/	**RUBER CONVEYERS**	
1.	Drum - Gear TR 32o, Ø 324, L-6oo mm	1 pc
2.	Electric Engine 5AZ 112 M4-B 3.4 kW, 143o rpm, tropical design	1 pc
3.	V-Belt 13x8 - trapezoid	6 pcs
4.	Support Roll G2 0433 - Ø 89x6oo	7o pcs
5.	Support Roll G2 0420 - Ø 89x315	3o pcs
6.	Rubber Strap 3 EP 160 3/2, B-5oo mm	2oo met.
7.	Sealing Ring BA 45x65x10 - DIN 3760	5 pcs
8.	Sealing Ring BA 6ox8ox1o - DIN 3760	5 pcs
9.	Sealing Ring BA 4ox6ox1o - DIN 3760	1o pcs
1o.	Sealing Ring BA 35x52x7 - DIN 3760	5 pcs
11.	Ball Bearing 6208 - JUS M.C3.500	5 pcs
12.	Ball Bearing 6305 - JUS M.C3.500	5 pcs
13.	Ball Bearing 6010Z - JUS M.C3.500	5 pcs
14.	Ball Bearing 6307 - JUS M.C3.500	5 pcs
B/	**RECEIVER**	
1.	Bearing Box SN 506	1 pc
2.	Bearing Box SN 509	1 pc
3.	Bearing 25 KB 735 (conical)	1 pc
4.	Bearing 4o SE 13 (double-row cylindrical)	1 pc
C/	**OVERHEAD TRAVELLING CRANE**	
1.	Engine	1 pc

./..

D/ CORE SAND MIXER	Qty
1. V-Belt 17x11x1100	2 pcs
2. Cone-Roll Bearing 30207	2 pcs
3. Ball Bearing 6003	1 pc

E/ TWO - SIDED GRINDER	
1. Electric Engine 4 AZ 112 M-2 B3	1 pc
2. V-Belt 17x11x1750 (also for sand mixer)	10 pcs
3. Ball Bearing 6210	6 pcs

F/ POLYGONAL SIEVE	
1. Bearing Box with Bearing	2 pcs

G/ MOULDING SAND MIXER

- Cogged Gear -

1. Sealing OG-36 "P" - 70x90x10	2 pcs
2. Sealing OG-36 "P" - 45x65x8	1 pc
3. Sealing OG-36 "P" -150x180x15	2 pcs
4. ConeBearing 32306 A	1 pc
5. Cone Bearing 30310 A	1 pc
6. Cone Bearing 32219 A	3 pcs
7. Cone Bearing 32032 SKF	1 pc
8. V-Belt 17x11x1700 (Included under "Two-Sided Grinder")	6 pcs

Fixing of Rotor Head

1. Cone Bearing Ø 170-230 SKF (1+1)	2 pcs
2. Sealing Ring 190x220x15	2 pcs

Squize Wheel

1. Ball Bearing Ø 60/110	1 pc
2. Ball Bearing Ø 60/130	1 pc
3. Sealing Ring Ø 75/100x10	2 pcs

./..

Pneumatic System	Qty
1. Pneumatic Non-return valve PDK-10	2 pcs

H/ SHAKE - OUT GRID

1. V-Belt 13x8x1400	3 pcs
2. Roller Bearing 21310	2 pcs

I/ SHOT -BLAST MACHINE

1. Blade
2. Divider
3. Star

J/ RADIAL PILLAR DRILLING MACHINE

Necessary Spare Parts as per Manufacturers`List

K/ LATHE

Necessary Spare Parts as per Manufacturers`List

L/ MILLING MACHINE

Necessary Spare Parts as per Manufacturers`List

M/ FORK LIFT TU-20

1. Outer Tyre 560x105x11 (8+4)	12 pcs
2. Inner Tyre 560x105x11	8 pcs
3. Rear Wheel 18x7	4 pcs
4. Storage Battery	2 pcs

N/ COMPRESSOR E1 MK 2060

1. Set of Suction and Pressure Valves	1 set
2. Cooler Air Pressure Gauge	1 pc
3. Oil Pressure Gauge	1 pc
4. Tank Air Pressure Gauge	1 pc

	Qty
5.Electromagnet, Valve 3/2 Type 880	1 pc
6. V-Belt 13x1100	2 pcs
7. Safety Valve	1 pc
8. Sealings	1 set

O/ ALUMINIUM MELTING FURNACE

1.Jet 65° S for Burner	2 pcs

Miscellaneous

- Electric Coupling	1 pc
- Fuse 100 A	6 pcs
- Fuse 160 A	10 pcs
- Fuse 250 A	10 pcs
- Fuse 300 A	10 pcs

Carbon Brushes for Manual Grinder		
Ø 4 and Ø 6	(2+2)	4 pcs

P/ MOULDING MACHINE FKT-65 B

As per Manufacturers`List

ENCLOSURE No. 6

PRODUCTION REPORT

POST - TRIAL PRODUCTION

Enclosure No.6/1

•
12413 INVEST YU
46168 ATPLMZ TZ
TO MRS STOJANOVIC.
24/6/1989.

RE:- FOUNDRY PRODUCTION SUMMARY

DATE	TYPE OF MELT	METAL CHARGES	METAL POURED	SCRAP %	REMARKS
31/5/89	BRASS	50 KG	36.5 KG	-	TRIAL MELT
1/6/89	ALUMINIUM	330 KG	262 KG	22%	BAD SCRAP BAD PATTERNS
2/6/89	G. CAST IRON	1560 KG	988 KG	40%	CCOLD METAL DUE TO LOW VOLTAGE AND MELTING STOPPED.
7/6/89	G. CAST IRON	4092 KG	3597 KG	7%	GOOD
10/63:53777	CAST IRON	4030 KR	3642 J6	8%	GOOD

1•
12413 INVEST YU ALU TRANSPORT PROBLEMS TO MWANZA

REGARDS,

LUKANYA GM - NEFCO
READ: 10/6/89--G.CAST IRON.
DELAY WAS DUE TO TRANSPORT PROBLEMS TO MWANZA.•
12413 INVEST YU
46168 ATPLMZ TZ
Telex:- 2400-•• primljen na 16/06/89 u 08 č 35 trajanje: 06 mn 17

*
12638 INVEST YU
46369 NEFCO TZ

Enclosure No.6/2

ATTN: MRS B. STOJANOVIC/MR. S. MATEJIC

RE: FOUNDRY PRODUCTION PROGRESS

SORRY FOR DELAY TO GIVE YOU FOUNDRY WORK PROGRESS. BELOW IS SUMMARY DATA.

A. GREY IRON CASTING

	SEPTEMBER 1989	OCTOBER 1989	NOVEMBER 1989	DECEMBER UP TO 11/12/89
NO OF MELTS	3	3	5	0
METAL CHARGE (KG)	9230	6890	13260	0
METAL POURER (KG)	6980	4500	9379	0
INGOTS/COLD METAL KG	2832	1668	3792	0
GOOD CASTING (KG)	3068	1450	2685	0
REJECTION (KG)	859	825	1956	0

B. ALUMINIUM CASTING

NO OF MELTS	4	0	1	0
METAL CHARGE (KG)	567	0	116	0
METAL POURER (KG)	455	0	95	0
INGOTS/METAL (KG)	18	0	18	0
GOOD CASTING (KG)	270	0	61	0
REJECTIONS (KG)	73	0	0	0

PROBLEMS

1. SHORTAGE OF FIRE CLAY
2. PATTERN MAKING PROBLEMS
3. NO HEAVY CASTING ON MACHINE MOULD FOR REASONABLE METAL CHARGE
4. REJECTION IS HIGH FOR THIN SECTION CASTINGS E.G. CHARCOAL IRON AND PIPES WHICH DO NOT FILL THE MOULD
5. FINANCIAL PROBLEMS

N.B:

PATTERN SHOP MACHINERY RECEIVED WITHOUT WORKING TOOLS AND ABRASIVES FOR DISC SANDER. IT IS DIFFICULT TO OPERATE WITHOUT THESE THINGS.

RGDS,
L.P. MPANGALALA - PRODUCTION MANAGER

46369 NEFCO TZ*
12638 INVEST YU
Teleks:- 1640-** primljen na 12/12/89 u 06 č 51 trajanje: 06 mn 13
Povod kraja veze: 13

10.44 *
15508 AUTO K YU
46369 NEFCO TZ

ATT: SAVA MATEJIC
--- -----------

RE: PATTERN SHOP MACHINERY
-- ------------------

1. WE ARE HAPPY TO INFORM YOU THAT FIVE MACHINES FOR PATTERN SHOP HAVE BEEN RECEIVED AT NEFCO ON 30/11/1989 INTACT.

   WE INTEND TOHAVE INSTALLATION AND TESTING OF THE SAME WITHIN THREE WEEKS TIME. PLS INFORM US IF THERE IS ANY ADVISE ON THIS.

2. FOUNDRY PRODUCTION IS GOING ON ALRIGHT. MELTING IS NOT SO FREQUENT DUE TO SHORT OF FIRE CLAY AND PATTERNS. WE ARE NOW PRODUCING SANITARY PIPES AND CHARCOAL IRON. SCRAP RATE IS 30% DUE TO MISRUNS FOR THIN SECTIONS.

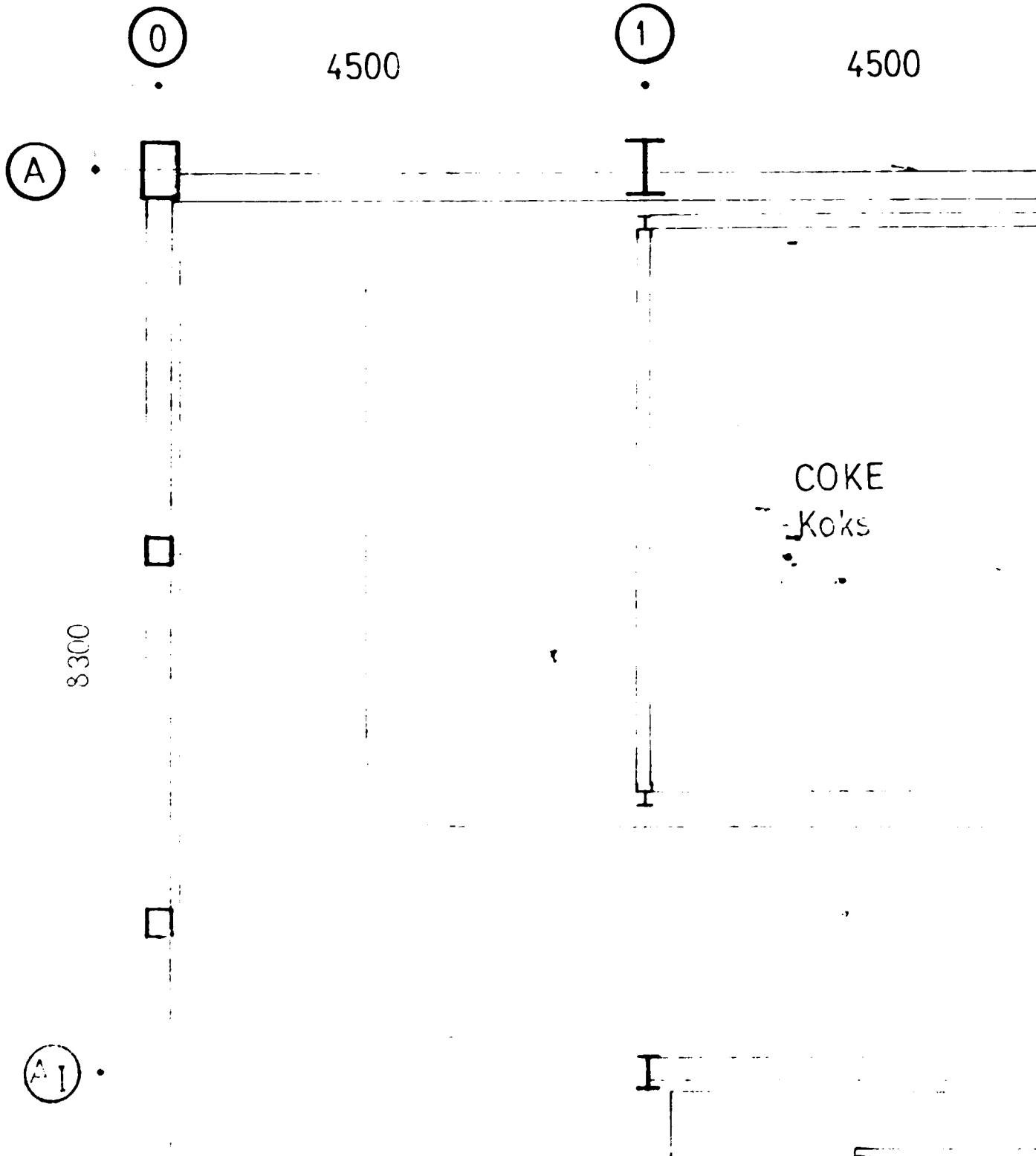
REGDS AND HAPPY X - MAS.
L. P. MPANGALALA
FOR GENERAL MANAGER

46369 NEFCO TZ*
15508 AUTO K YU
Teleks:- 426 -** primljen na 01/12/89 u 10 c 45 trajanje: 02 mn 33
Po/od kraja veze: 13

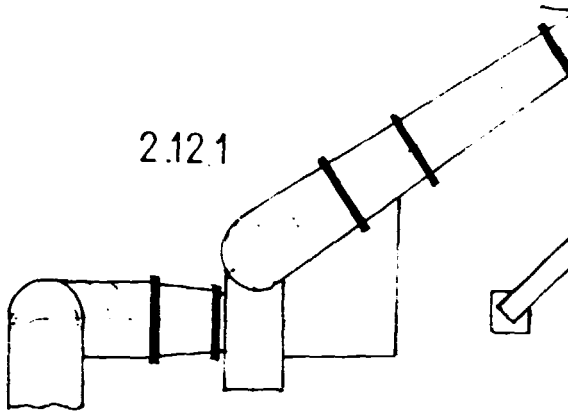
ENCLOSURE No. 7

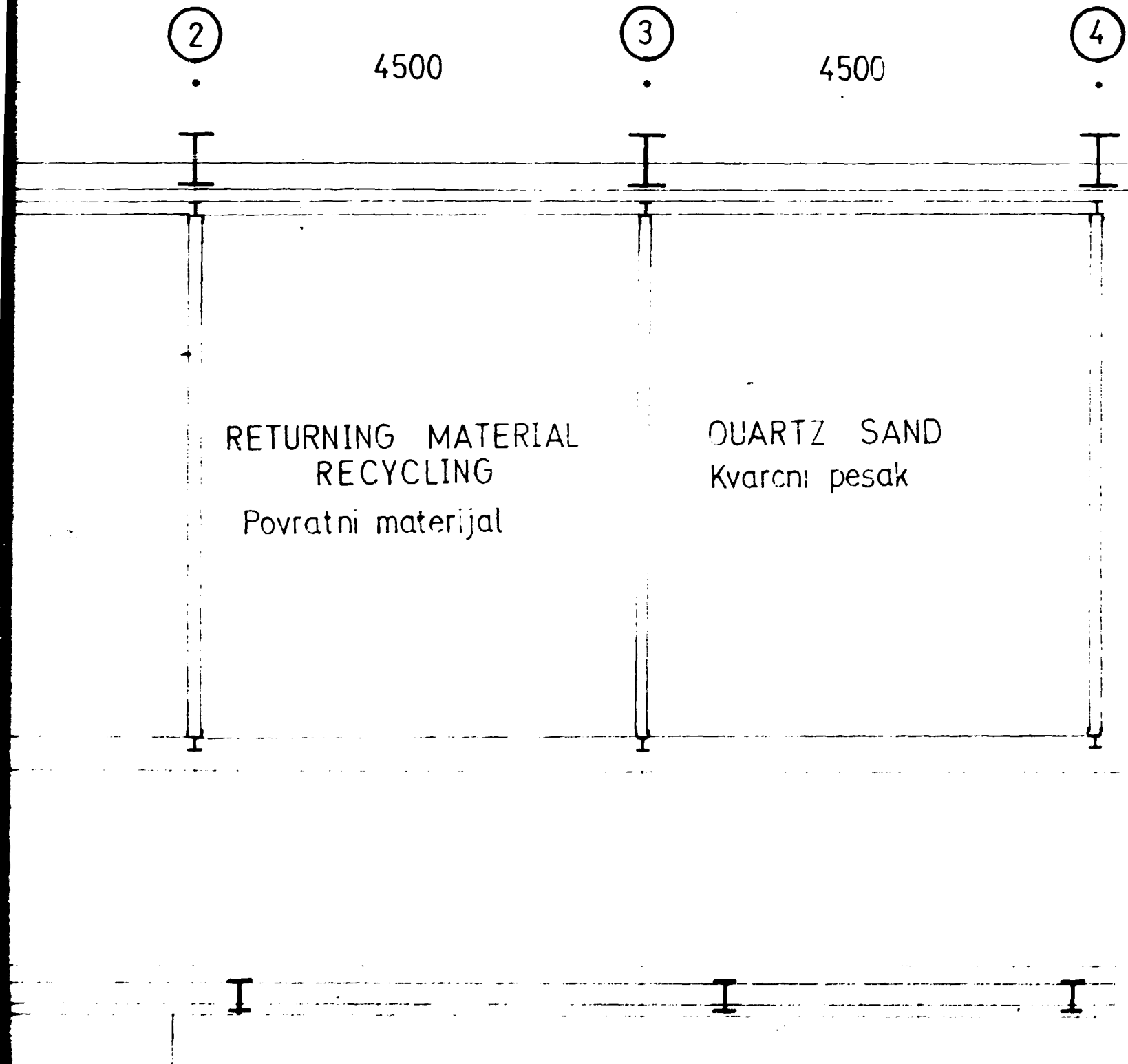
LAY - OUT "AS BUILT"

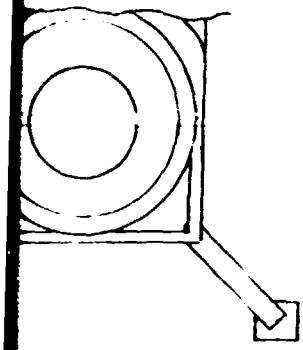
SECTION 1



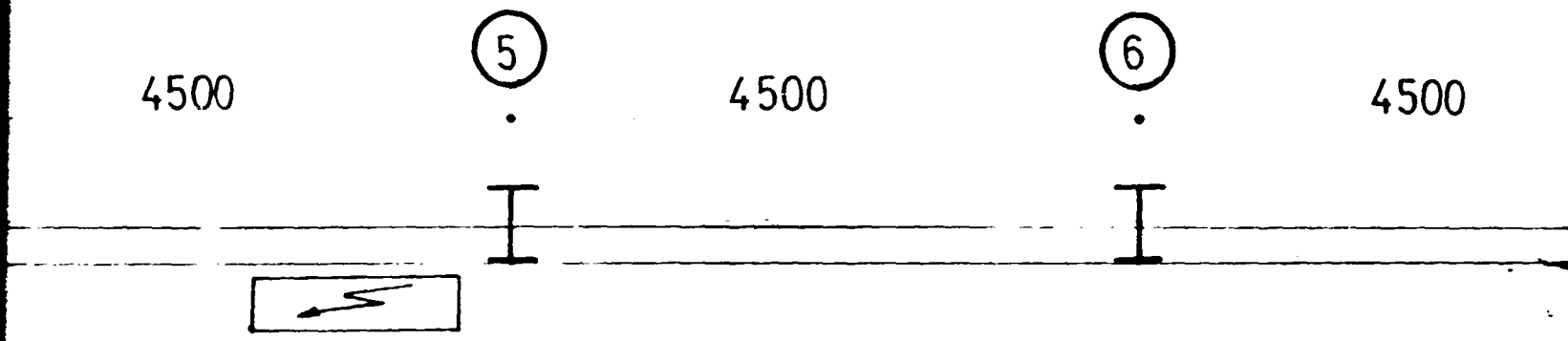
SECTION .2


2.12.1


2
3
4
4500
4500
RETURNING MATERIAL
RECYCLING
Povratni materijal
QUARTZ SAND
Kvarcni pesak

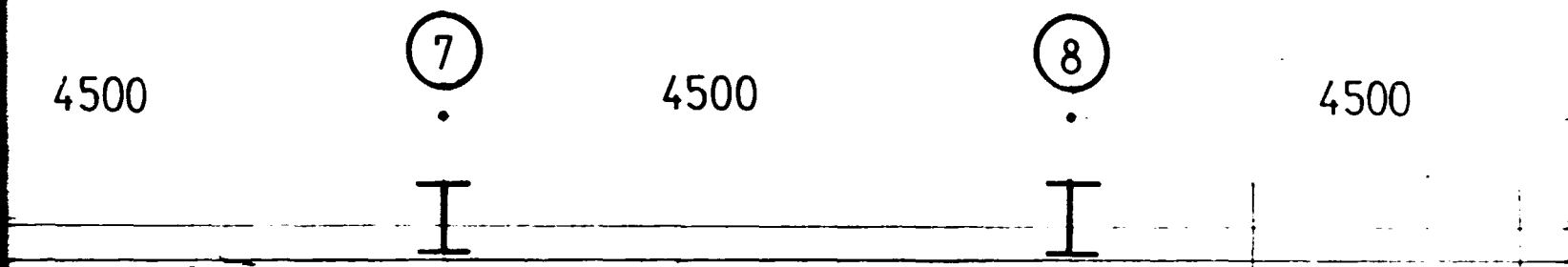


SECTION 3

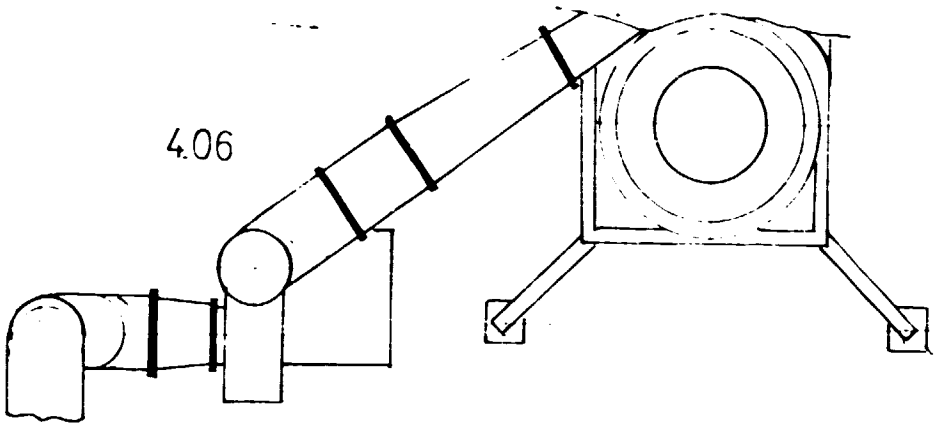


COOLING AND MOULD SEPAR
Prostor za hlađenje i odlupav

SECTION 4

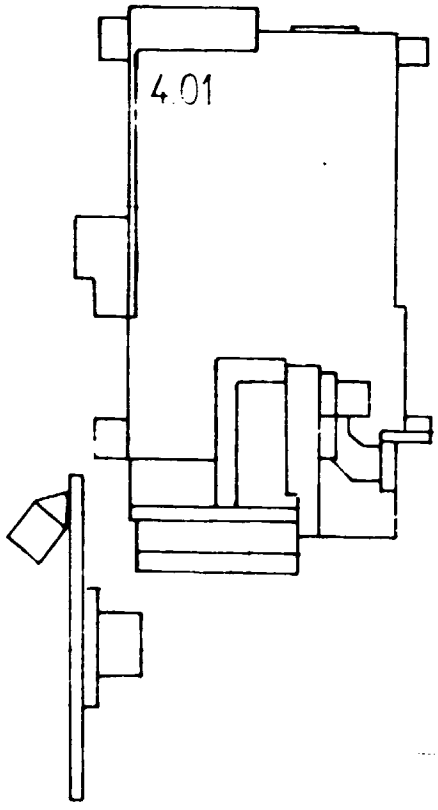


ULD SEPARATING AREA
e i odlupavanje robe -



SECTION 5

500 (9) 4500 (10) 4500



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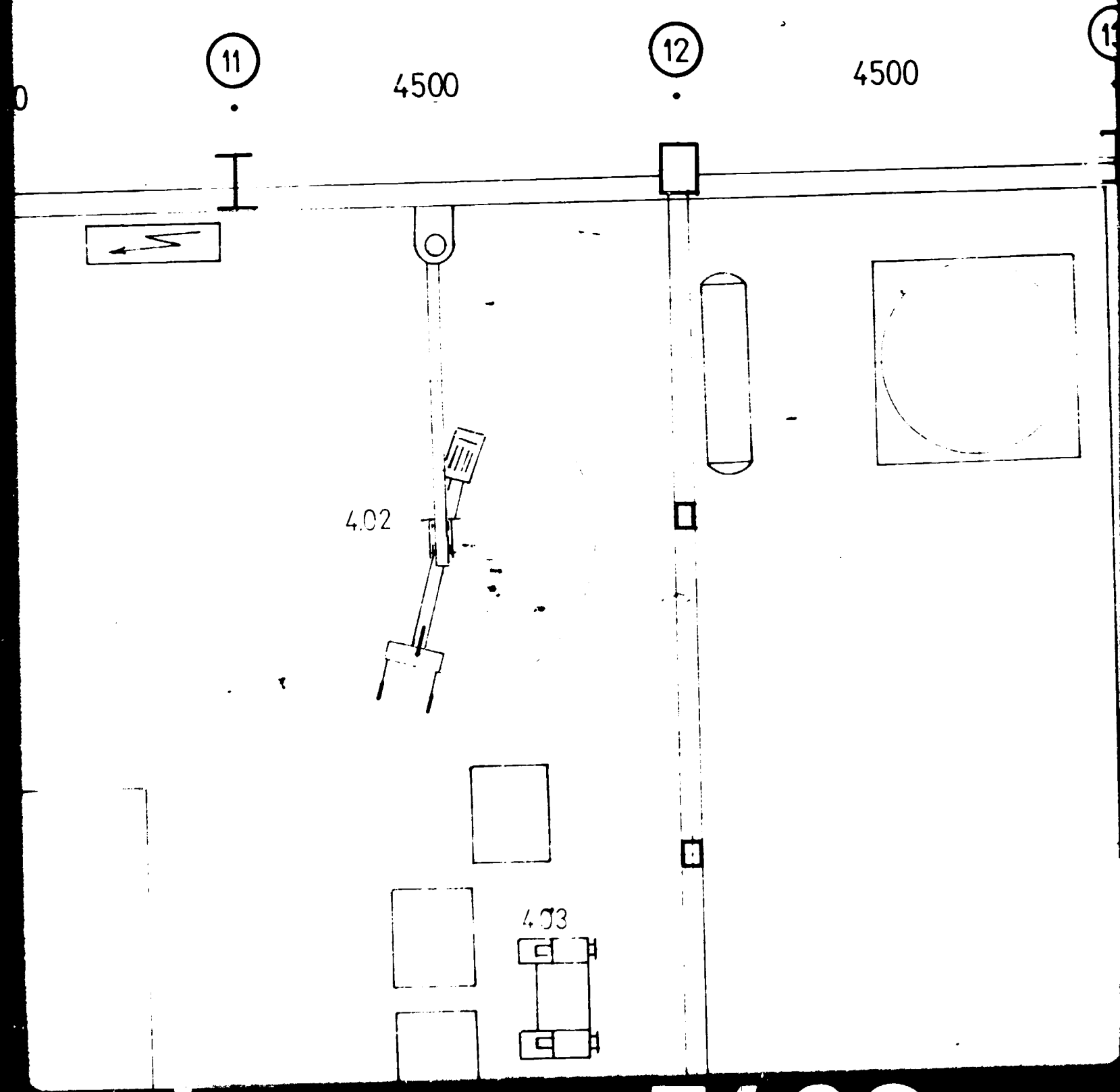

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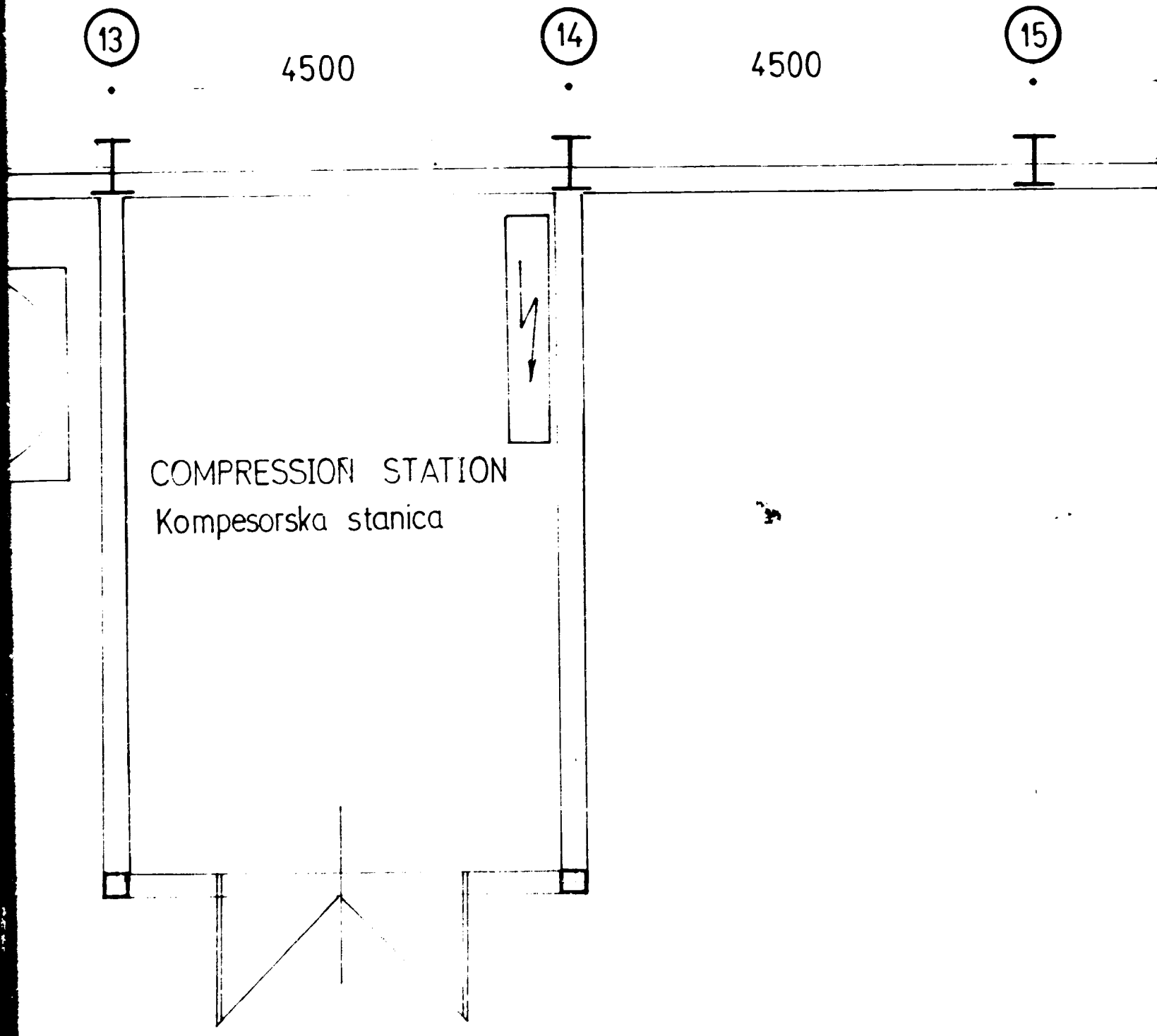
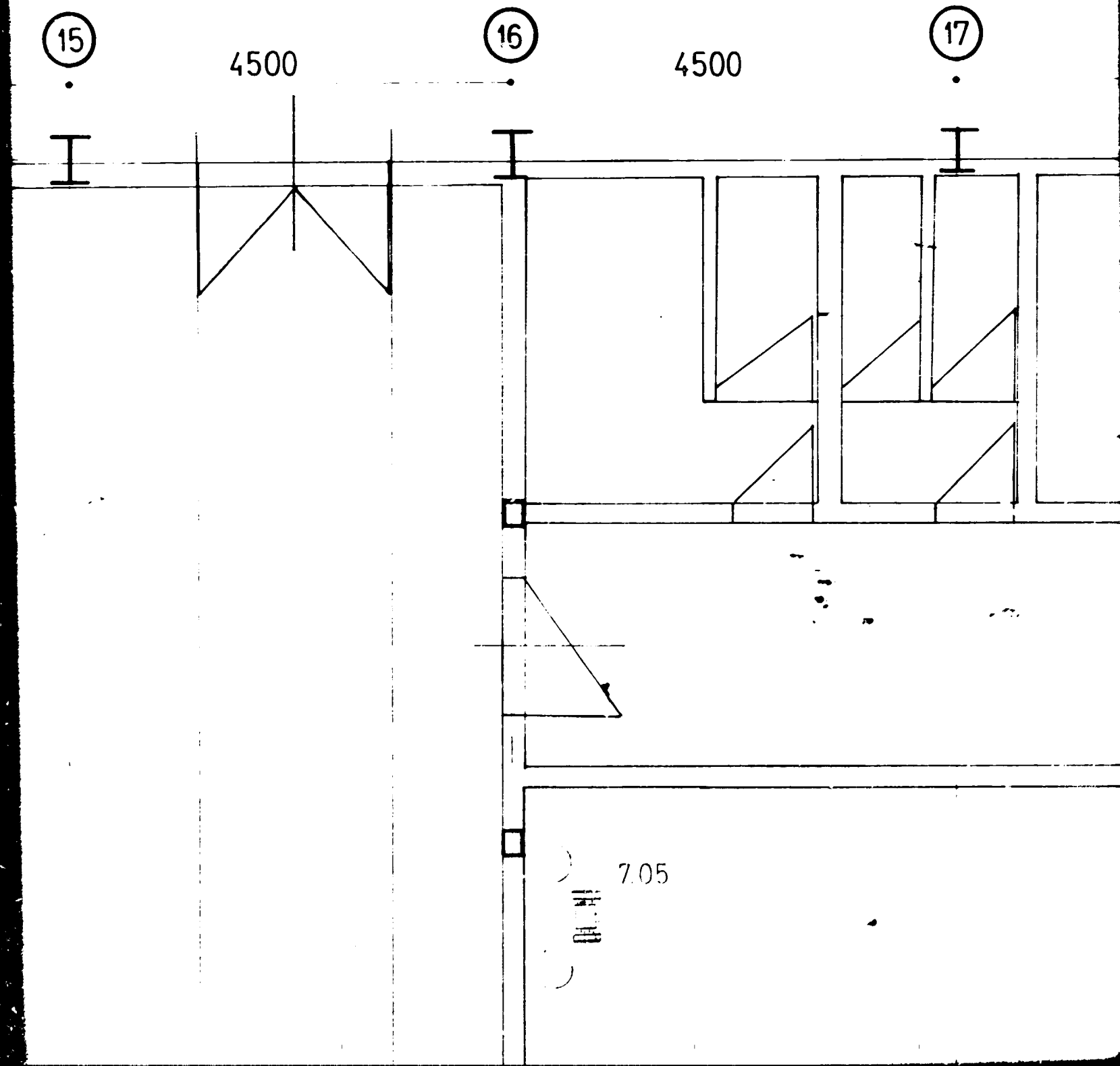

13
14
15
4500
4500
COMPRESSION STATION
Kompesorska stanica

SECTION 8



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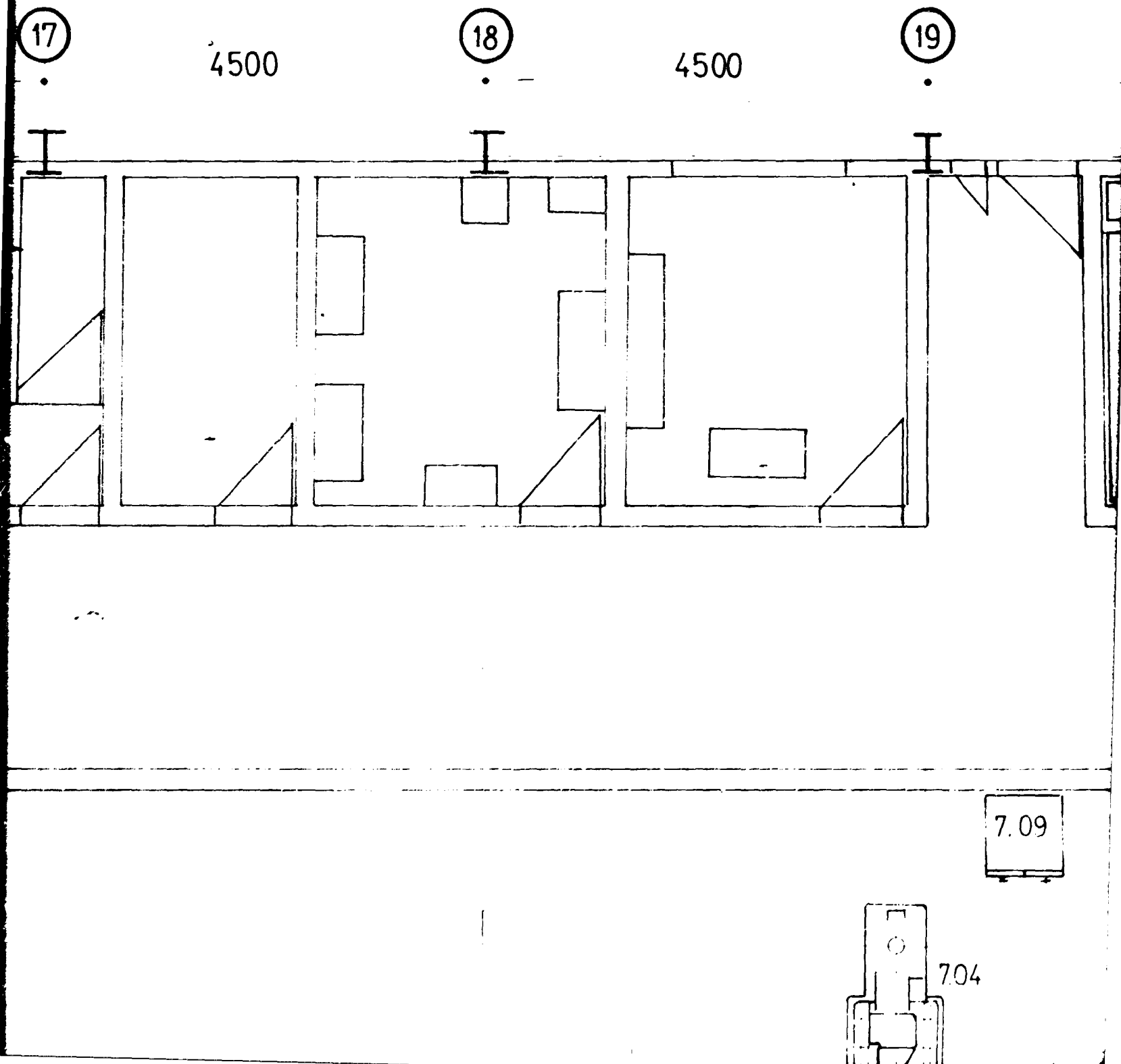
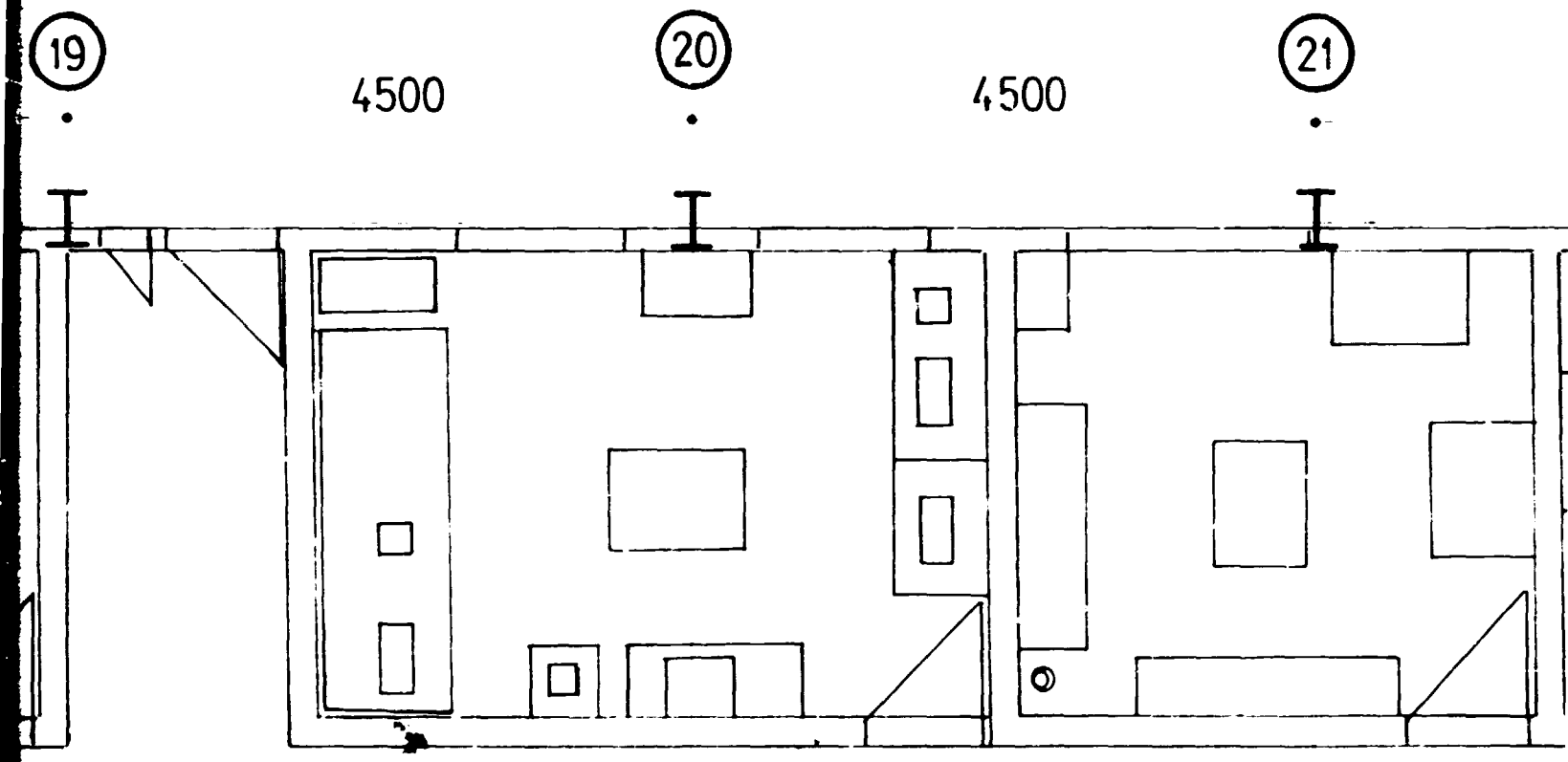
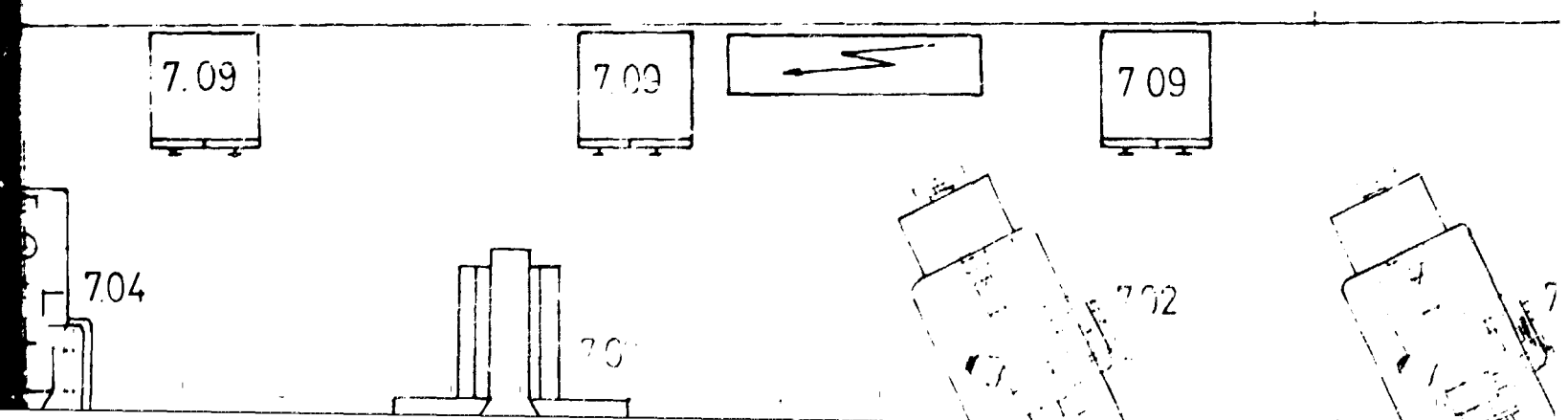
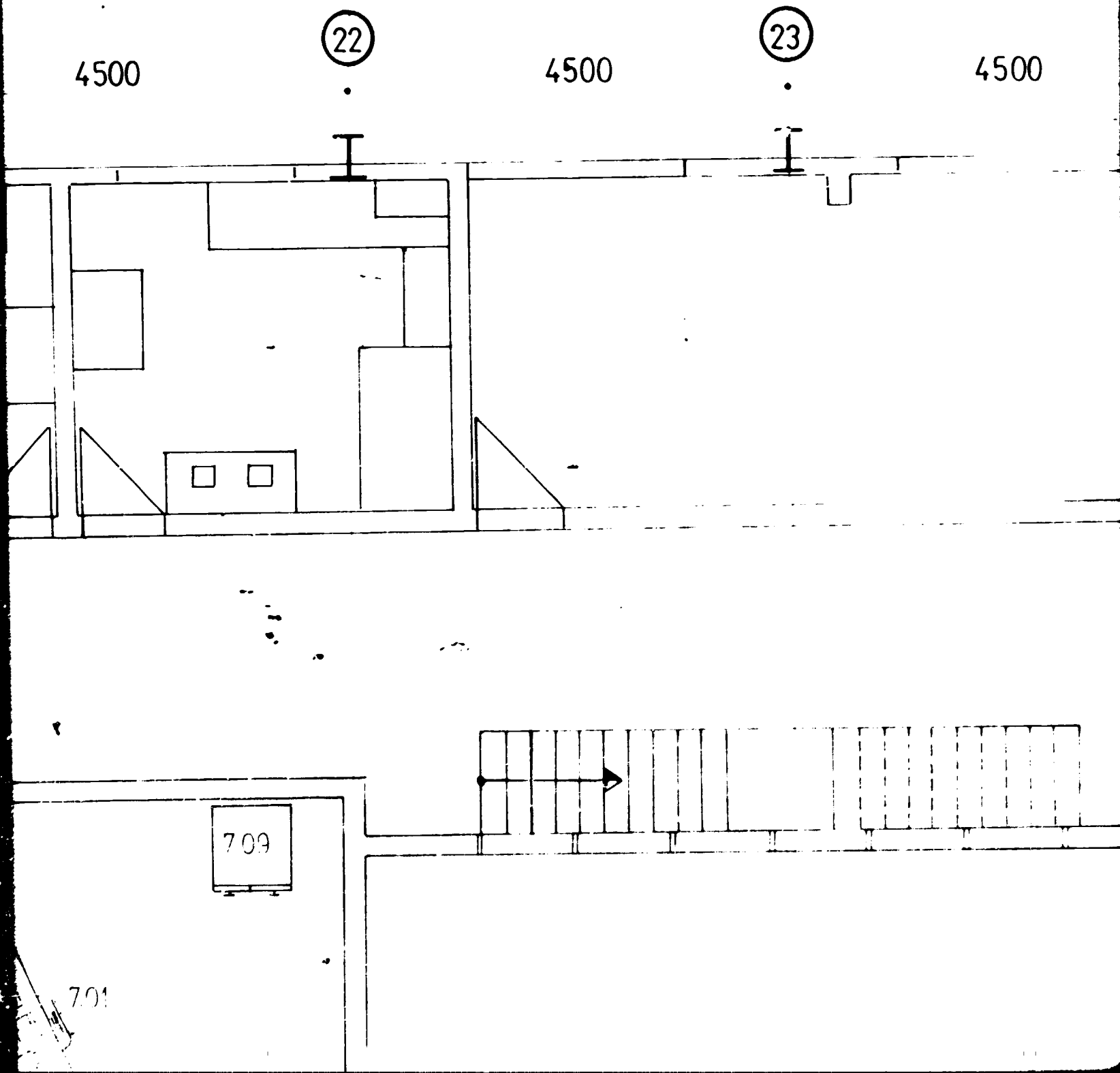


SECTION 10





SECTION 11



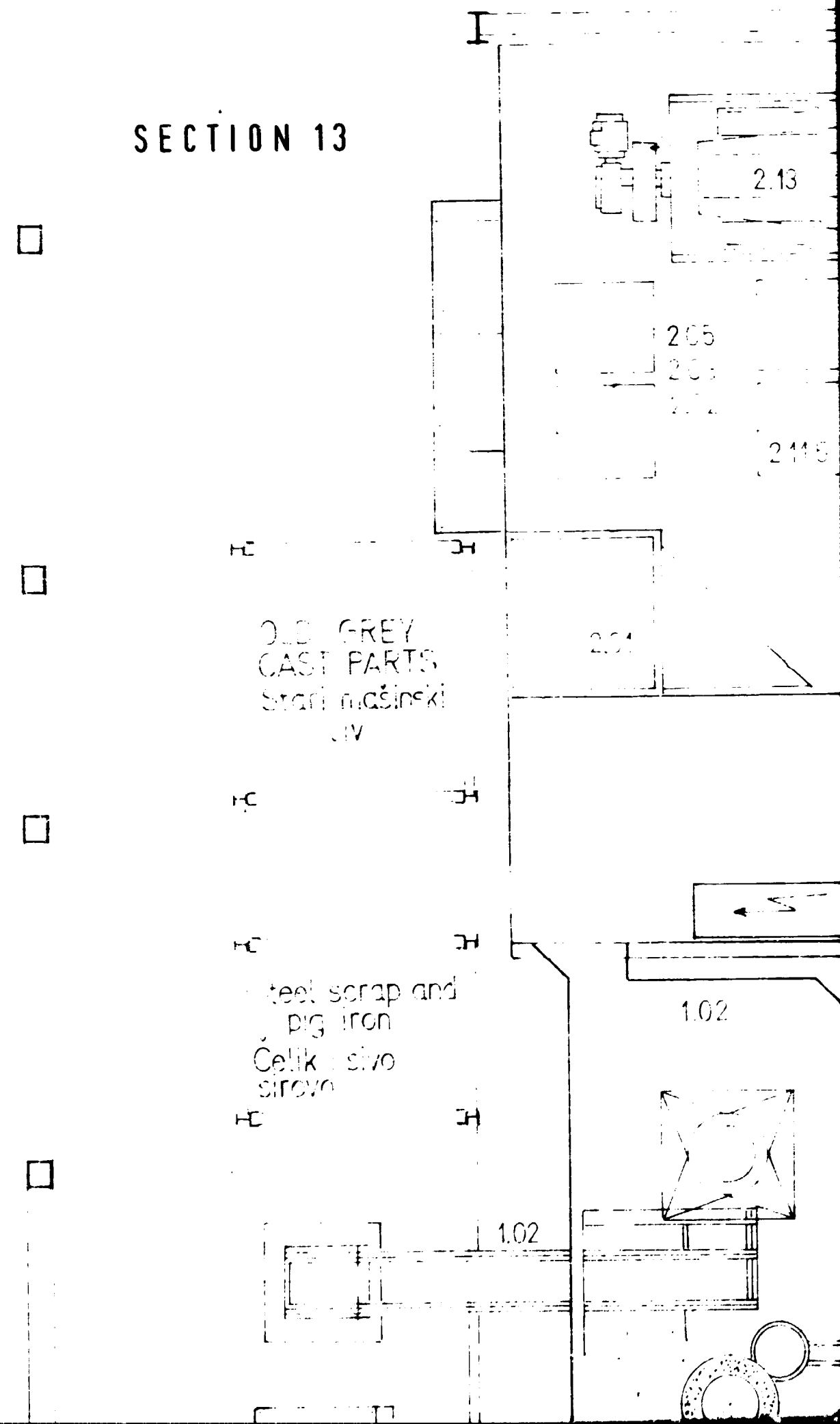
SECTION 12

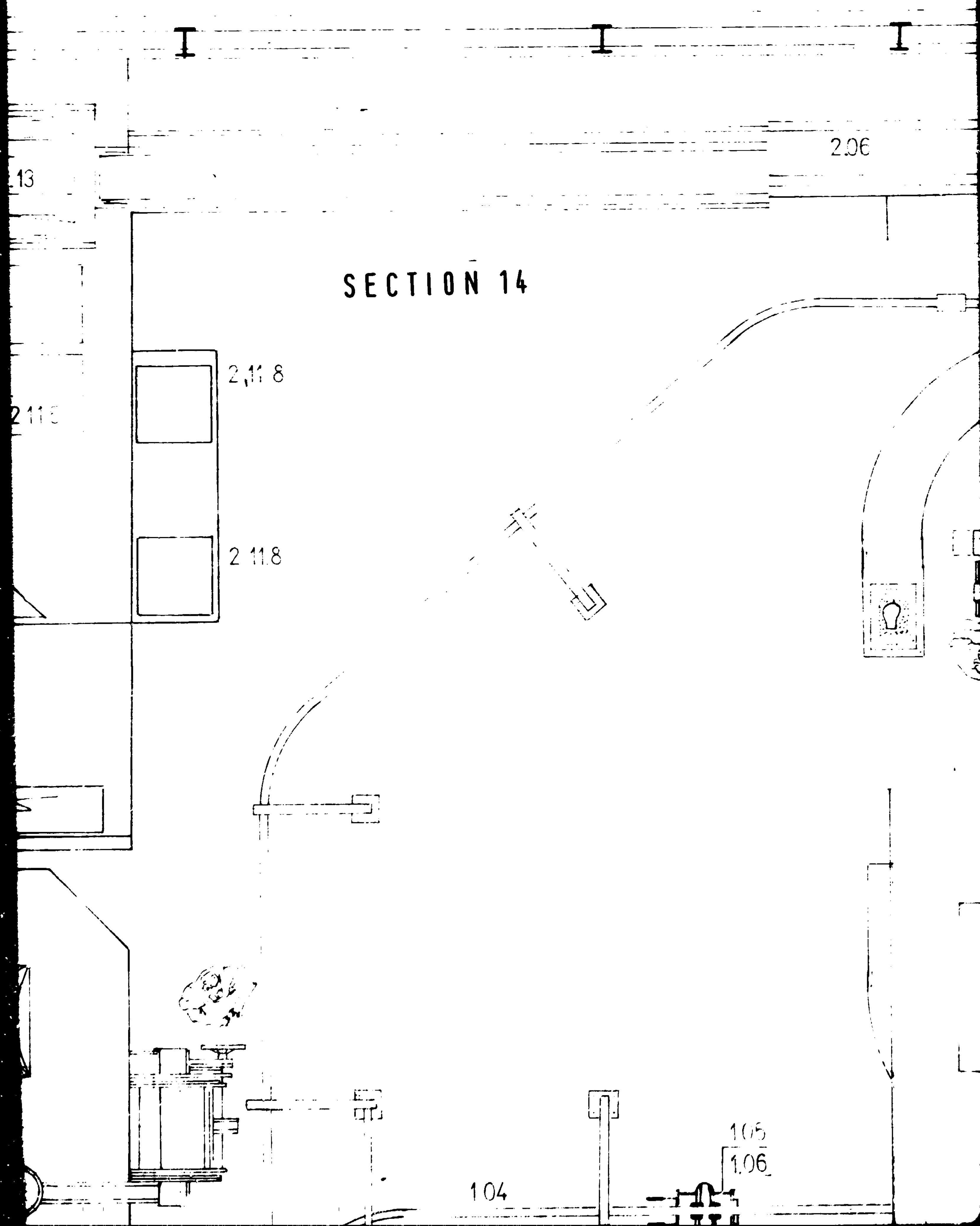
(24)

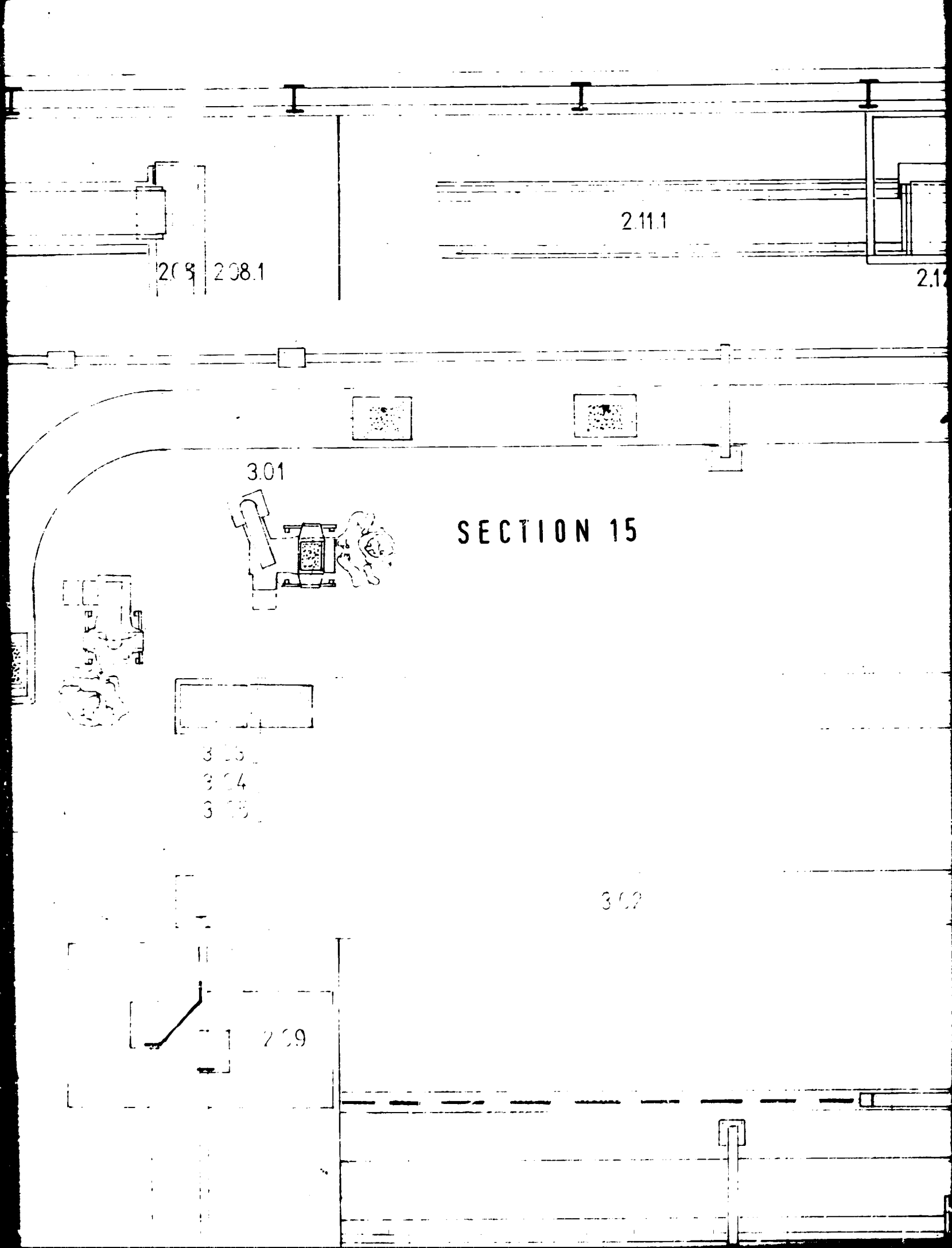
718	Band saw AS-435 Tračna testera	1		
717	Precise circular saw PCT-AS Precizna cirkular testera	1		
716	Bobbin and disc sanding machine Tanjirasto-valjkasta brusilica	1		
715	Copy lathe A 140 Kopirni strug	1		
714	Combined machine for joinery KSM-500 Kombinovana stolarska mašina	1		
713	Inspection table Ploča za kontrolu	1		
709	Tool cabinet Alatni orman	4		
708	Locksmith working table Bravarska tezga	6.		
706	Carpenter working table Stolarska tezga	2		
705	Sharpener Oštrilica	1		
704	Radial drill Radijalna bušilica	1		
703	Universal milling machine Univerzalna glodalica	1		
702	Universal lathe machine Univerzalni strug	1		
701	Universal lathe machine Univerzalni strug	1		
707	Planing working table Sto za krajcovanje	4		
708	Dust collector for cleaning shop Ciklon za čistionicu	1		
702	Grinder double wheel Brusilica - dvostrana	2		
712	Overarm grinder Konzolna brusilica	1		
	Blasting machine	1		

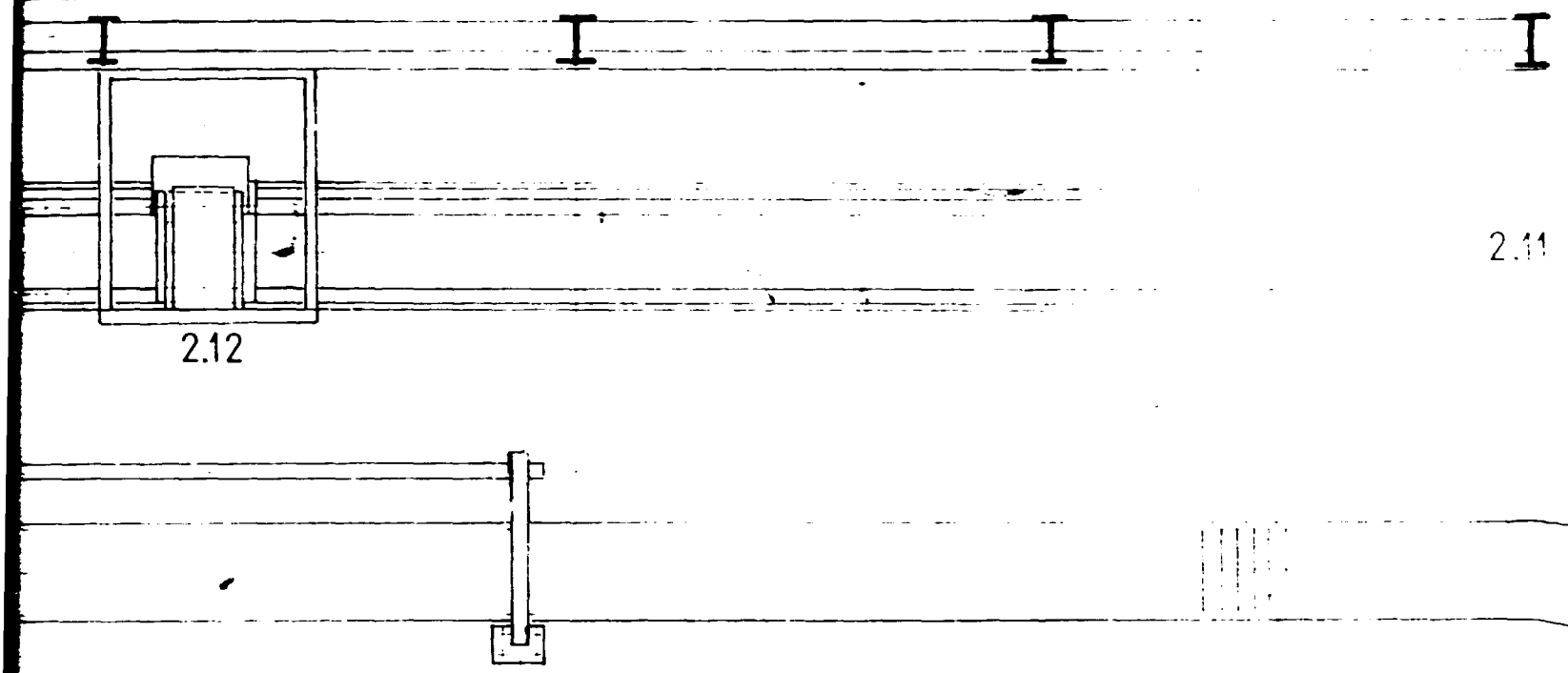
(1)

SECTION 13

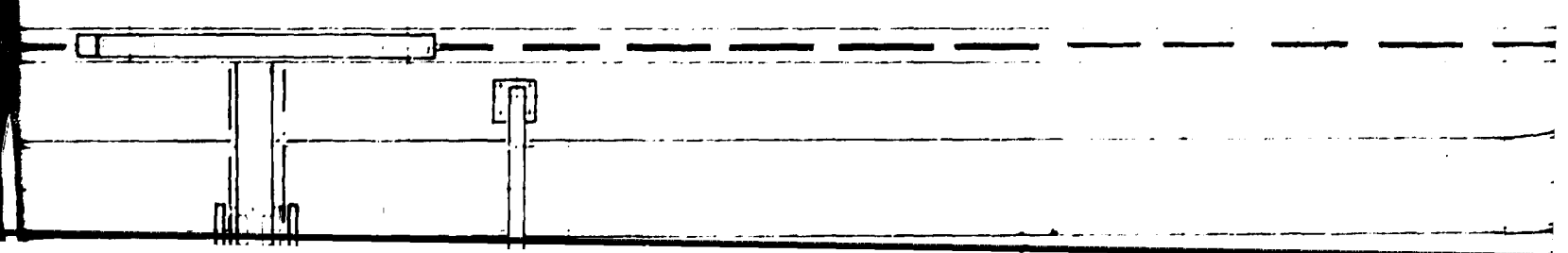

2.13
2.05
2.11
2.01
OLD GREY
CAST PARTS
Stari nagšinski
liv
steel scrap and
pig iron
Čelik i sivo
sirovo
1.02
1.02


SECTION 14
2.06
13
2,11.8
2 11.8
1.05
1.06
1.04

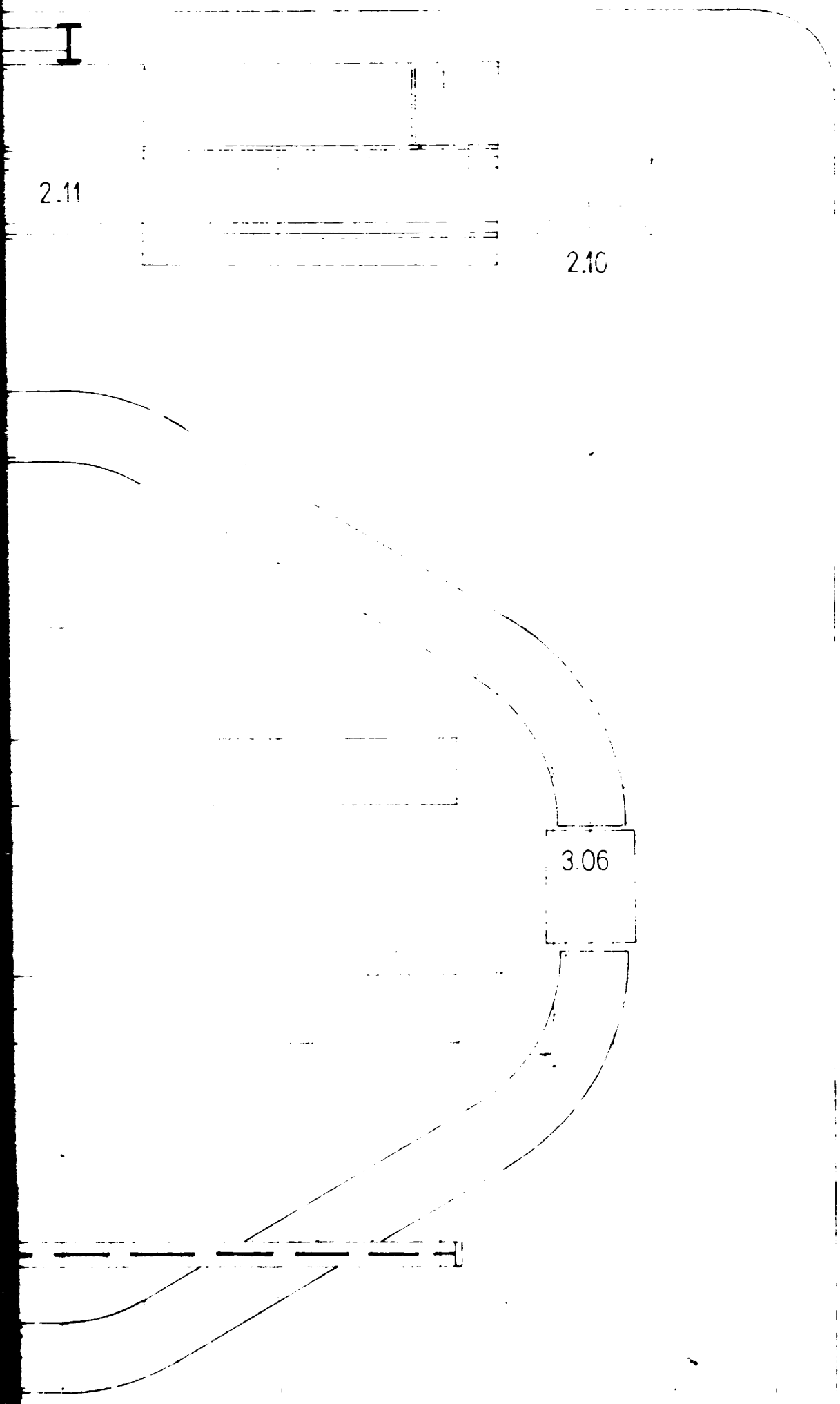

2.11.1
3.01
SECTION 15

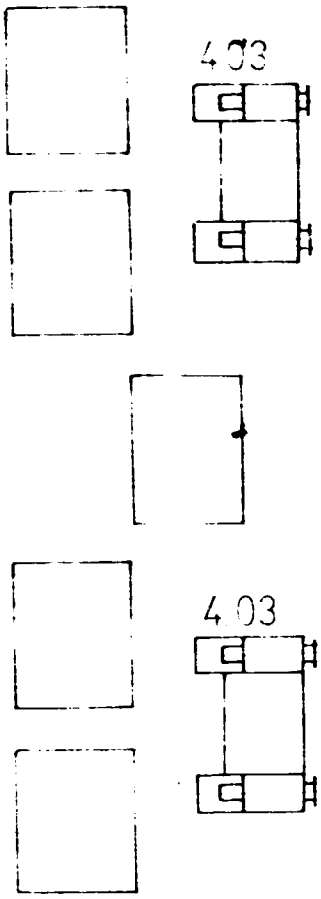


SECTION 16

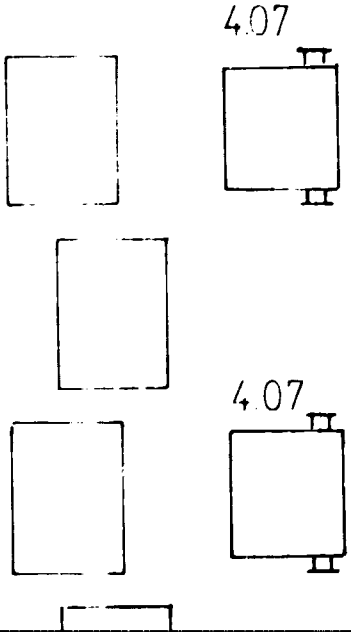


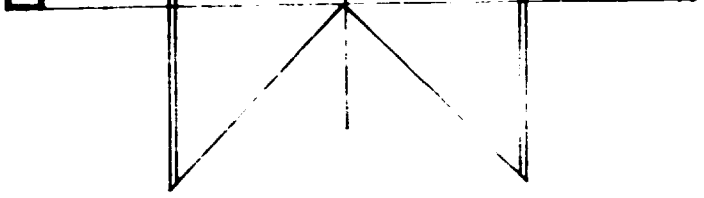
SECTION 17





SECTION 18





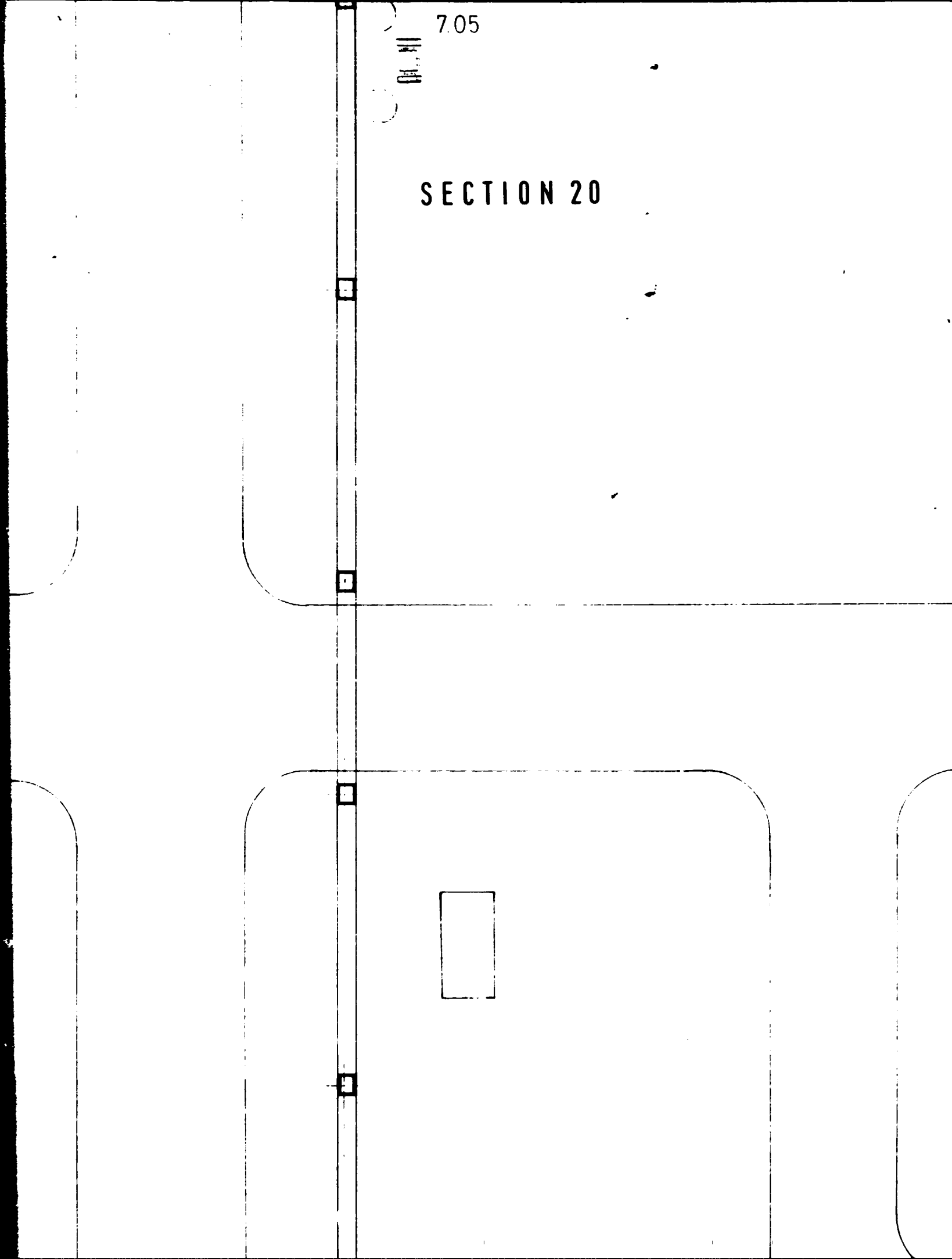
SECTION 19

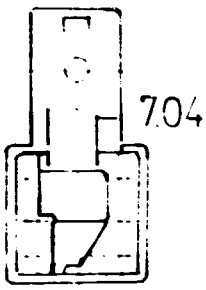
INSPECTION AREA

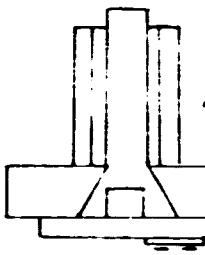
Kontrola

7.05

SECTION 20

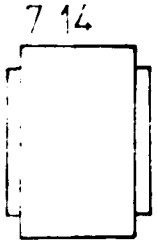


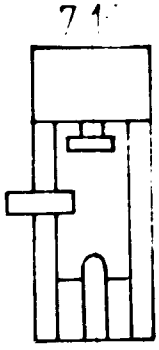


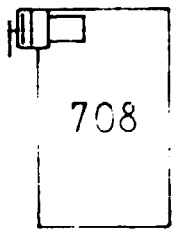


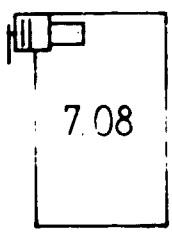
SECTION 21

MECHANICAL W
Mašinska ob
strug



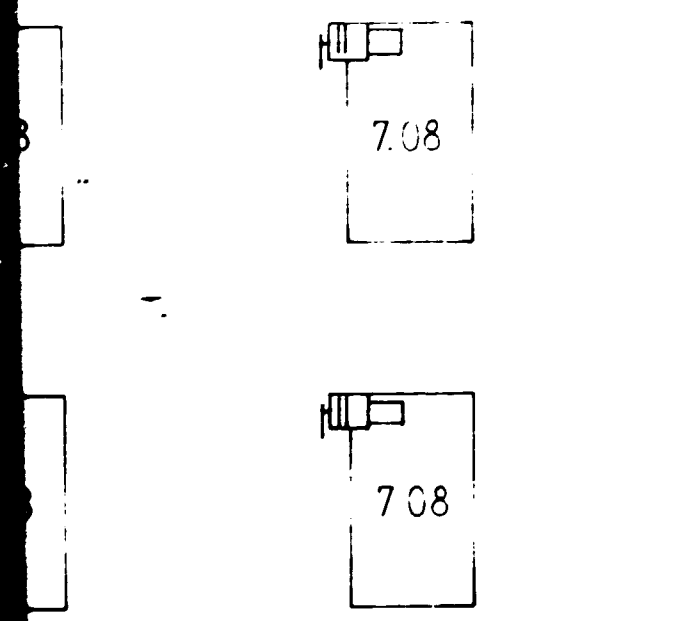






SECTION 22

AL WORKSHOP - MACHINING
a obrada skidanjem
strugotine



STORAGE PATTERNS AND FINAL PRODUCTS

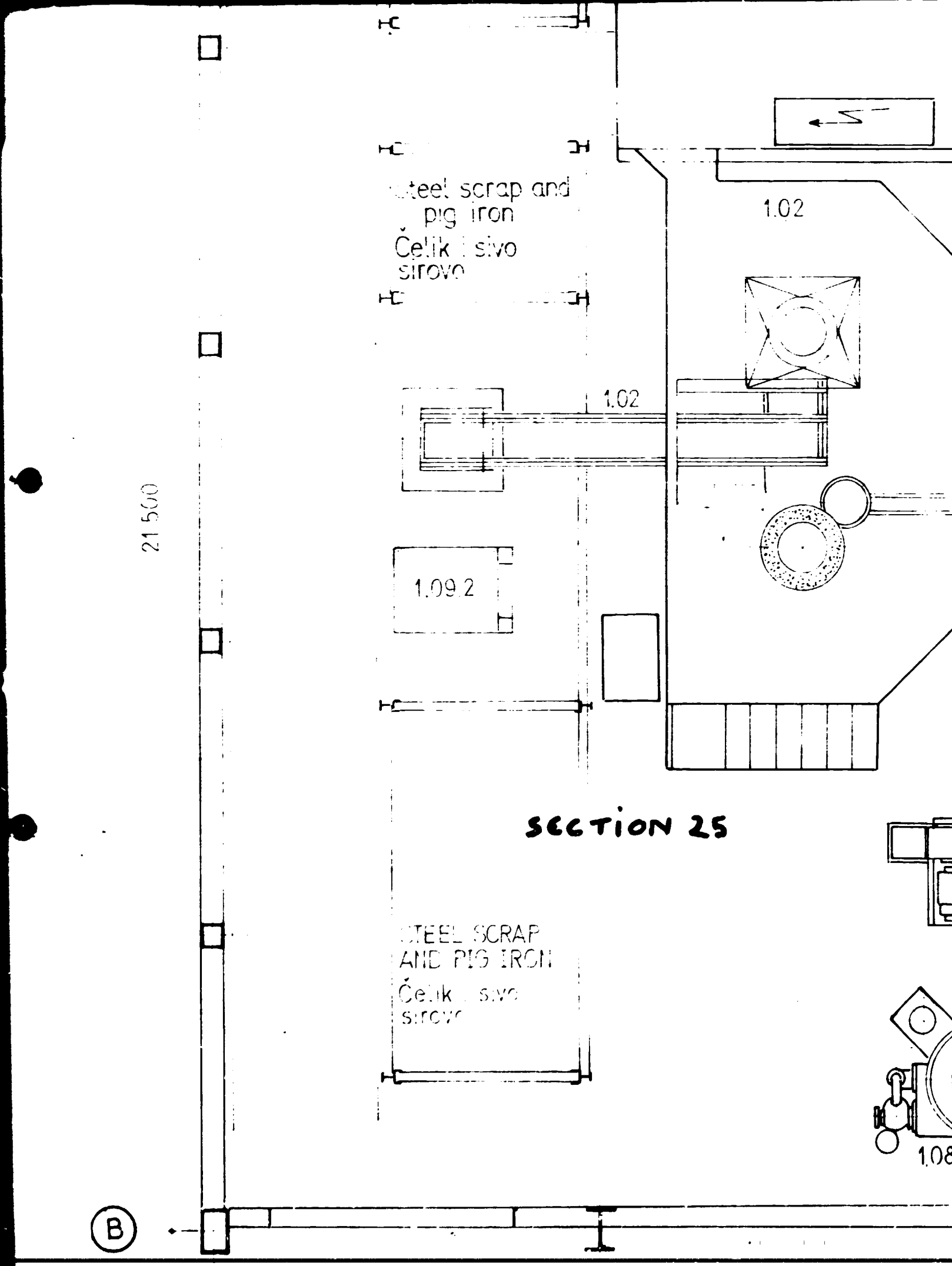
Magazin modela i gotove robe

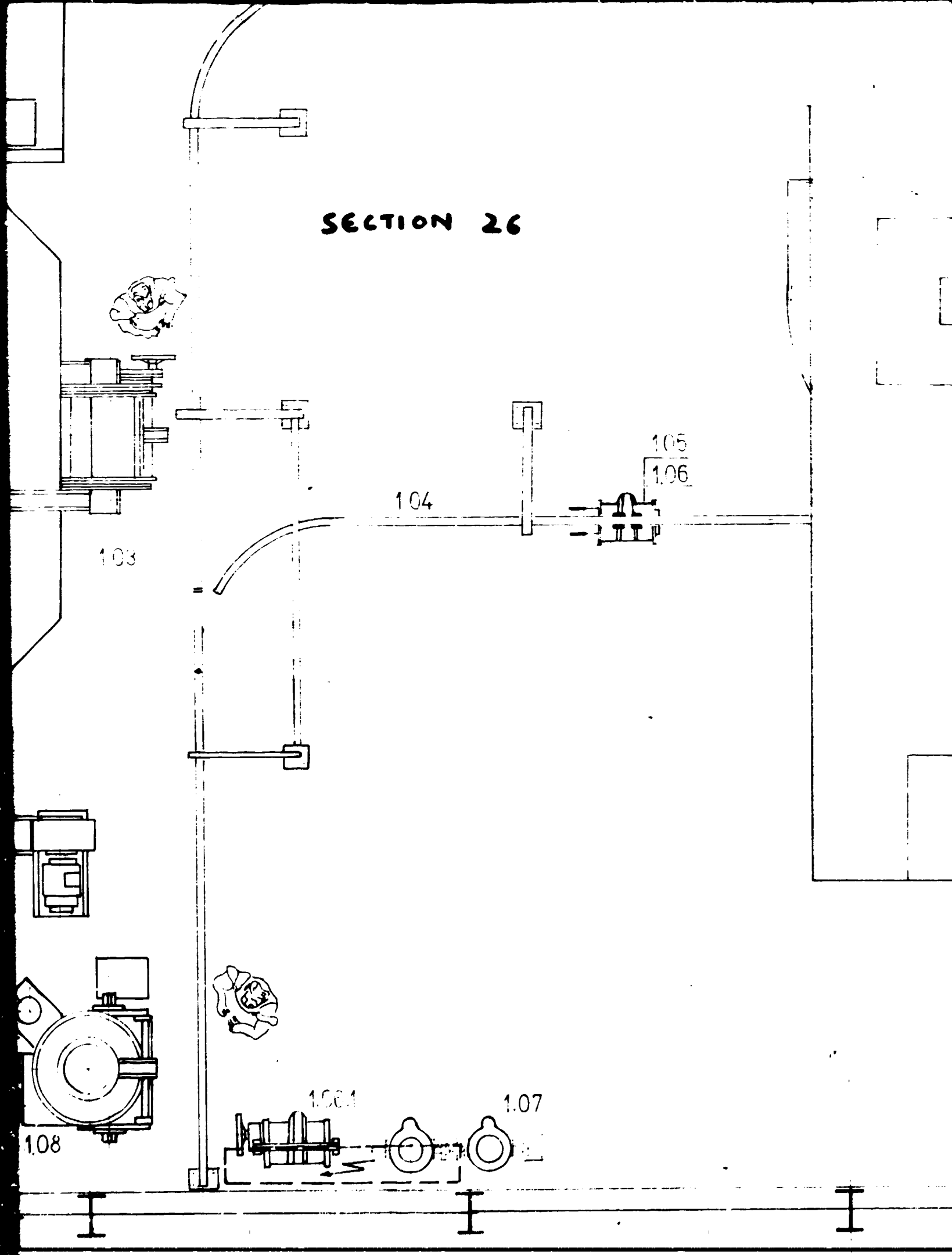
SECTION 23

STORAGE OF TOOLS SPARE PARTS

Magazin alata re: delova i standardnog pribora

	[illegible] zatr [illegible]		
[illegible]	Finishing working table Sto za krajcovanje	4	
-06	Dust collector for cleaning shop Ciklon za čistionicu	1	
-03	Grinder-double wheel Brusilica-dvostrana	2	
[illegible]	Overarm grinder Konzolna brusilica	1	
[illegible]	Blasting machine Čistionički stroj	1	
[illegible]06	Shake-out grid Stresna rešetka	1	SECTION 24
[illegible]	Moulding-box [illegible] 562x440x180	2	
[illegible]	Moulding-box [illegible] 562x440x140	2	
[illegible]	Moulding box frame Paleta za kalupnik	2	
[illegible]	Roller conveyer Valjčana staza	1	
[illegible]	Moulding machine Kaluparska mašina	4	
[illegible]	Polygonal sieve Poligonalno sito	1	
[illegible]	Sand preparation dust collector Ciklon za pripremu peska	1	
[illegible]	Magnetic separator Magnetni separator	1	
[illegible]	Core making table Radni sto jezgrovničara	2	
[illegible]	Core sand mixer Mešalica jezgrarskog peska	1	
[illegible]	Rubber belt conveyer Gumeni transporter	1	
2[illegible]	Rubber belt conveyer Gumeni transporter	1	
[illegible]	Rubber belt conveyer Gumeni transporter	1	
[illegible]	[illegible] hopper Dozirni bunker	5	
[illegible]	Supporting steel construction Noseća konstrukcija	1	
[illegible]	Rubber belt conveyer Gumeni transporter	1	
[illegible]	Rubber belt conveyer Gumeni transporter	1	
[illegible]	Moulding sand mixer Mešalica kaluparskog peska	1	
[illegible]	Volumetric dosing device Volumski dozator	1	
[illegible]	Set of hoppers Set of bunkera	1	
[illegible]	Dry synthetic sand sieve Pokretno separ sito	1	
[illegible]	Lift for additives Dizalica za aditive	1	
1092	Scale Vaga	1	
1091	Travelling crane [illegible]	1	


Steel scrap and pig iron
Čelik i sivo sirovo
1.02
1.02
1.09.2
21 500
SECTION 25
STEEL SCRAP AND PIG IRON
Čelik i sivo sirovo
B

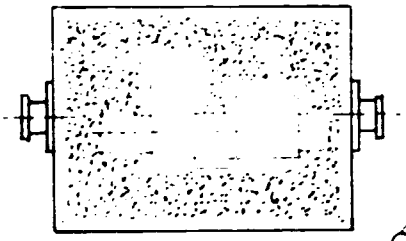

SECTION 26
105
1.06
104
103
1.08
1.07

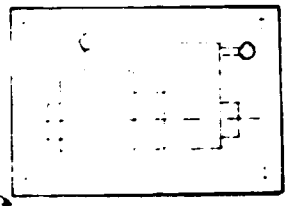
3 03
3 04
3 05

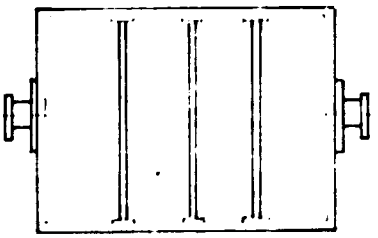
3 02

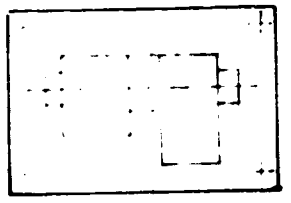
SECTION 27

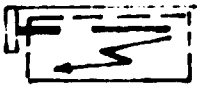
209



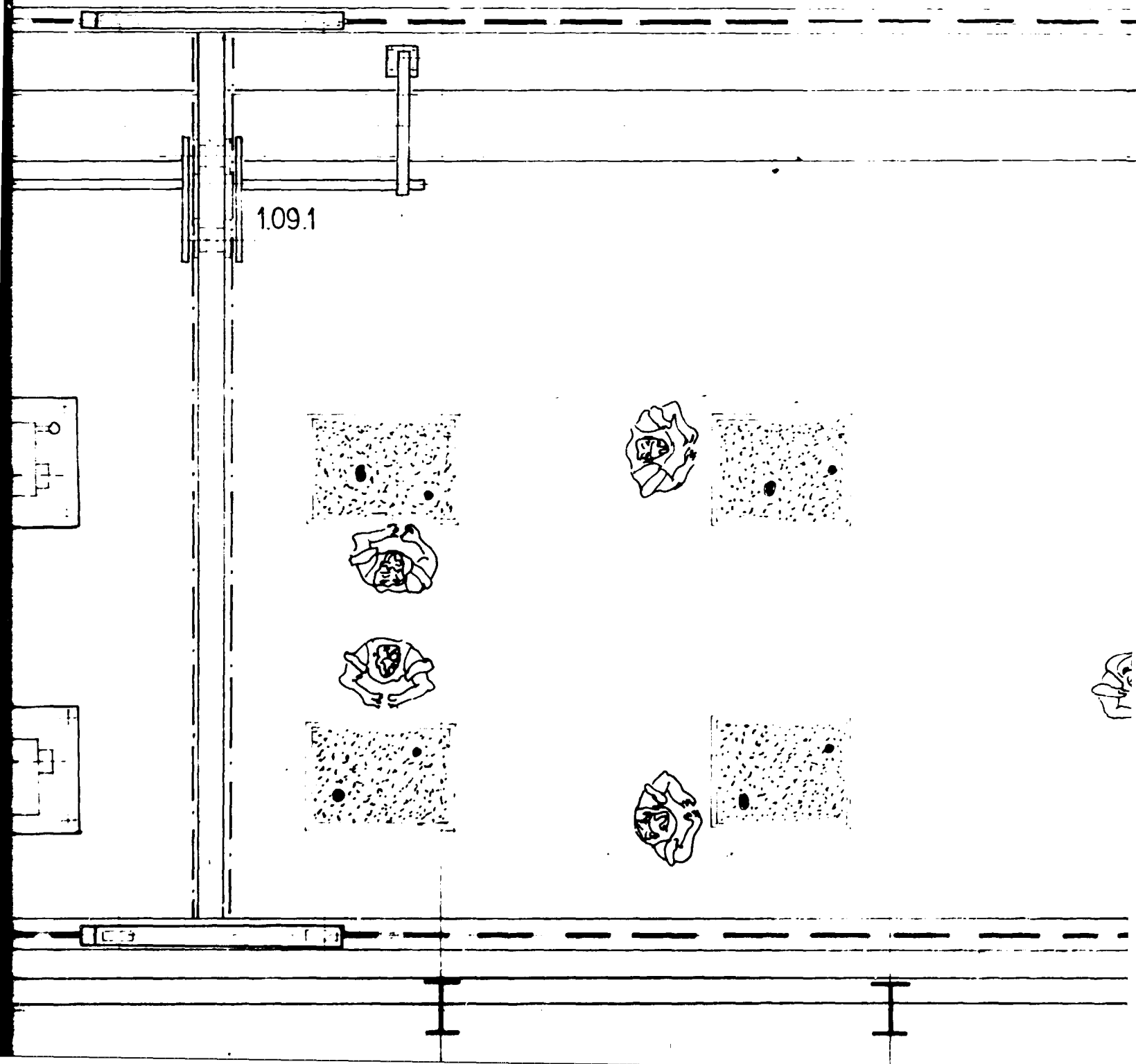




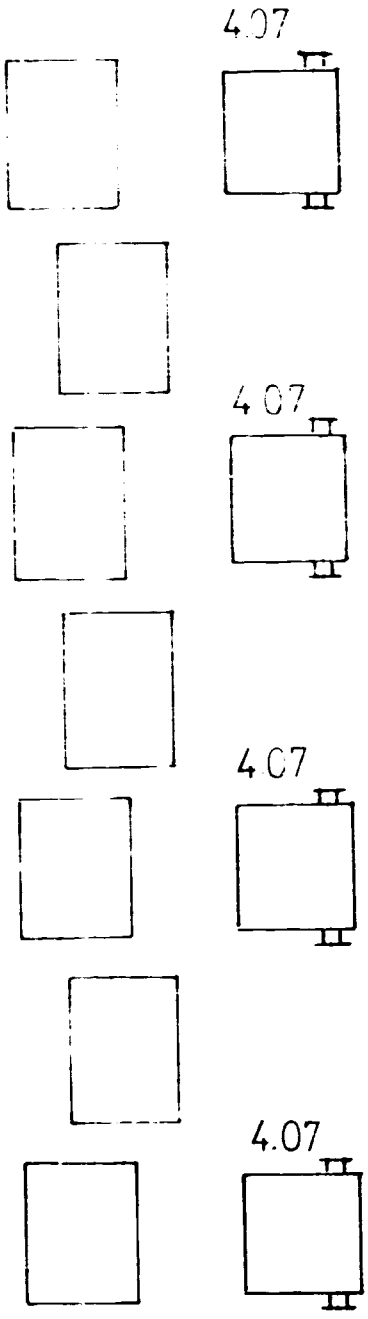




SECTION 28



SECTION 29

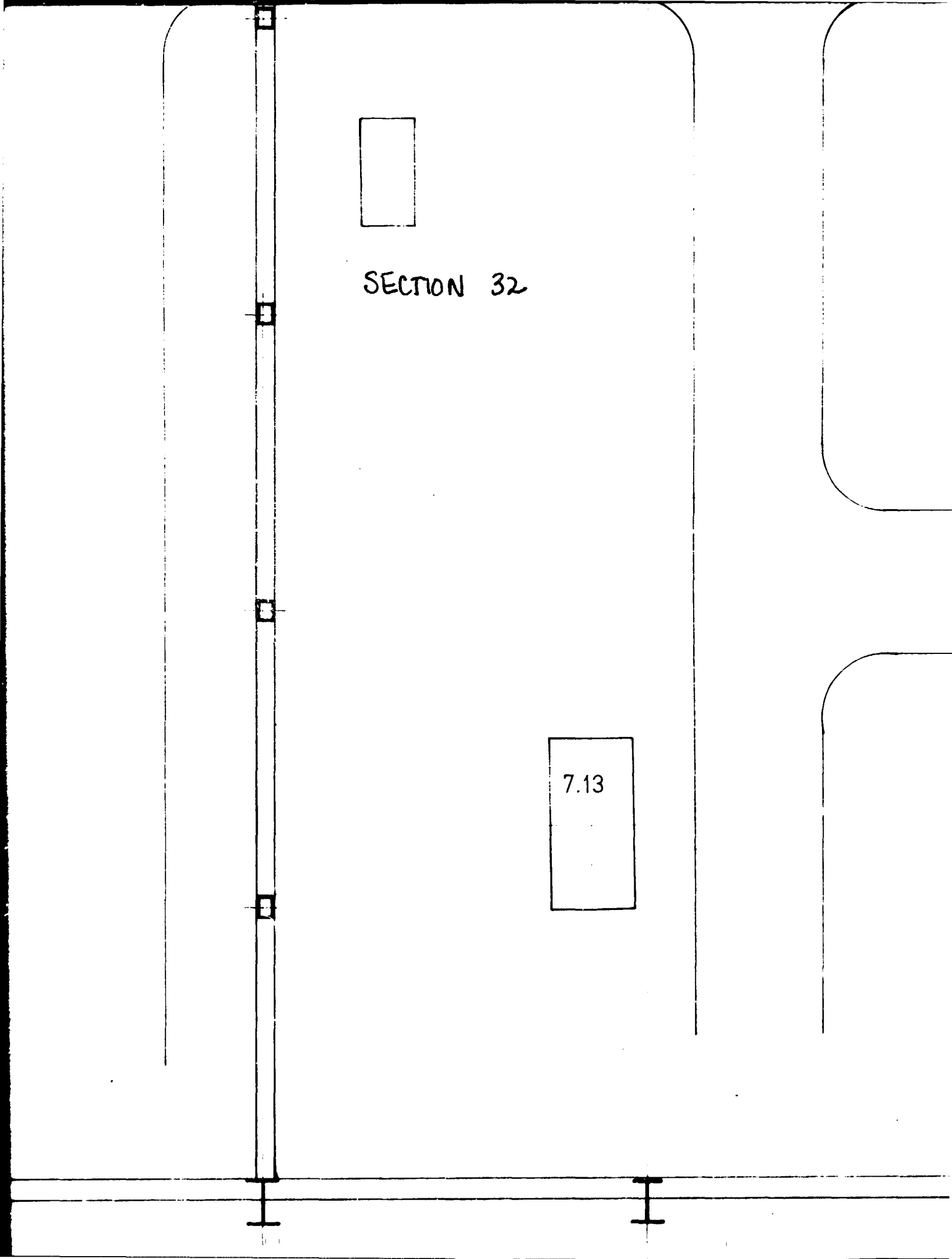


SECTION 30

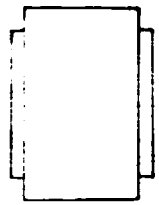
IN

SECTION 31

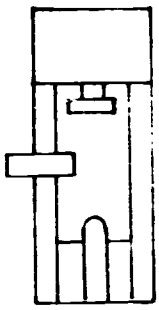
INSPECTION AREA
Kontrola

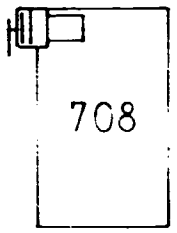

SECTION 32
7.13

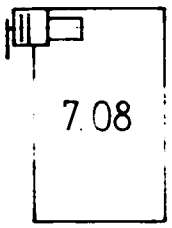
7.14



7.1

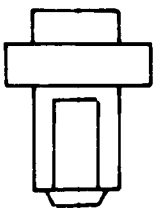




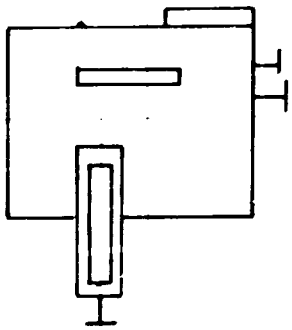


SECTION 33

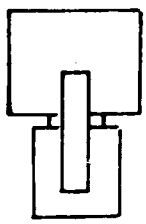
7.16

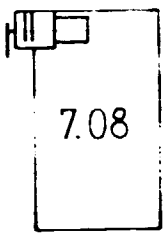


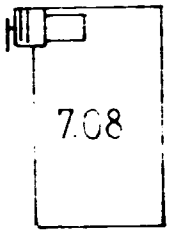
7.17

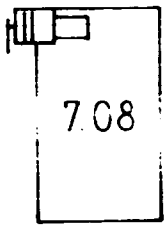


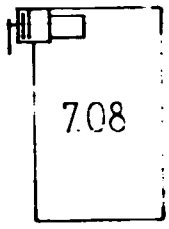
7.18





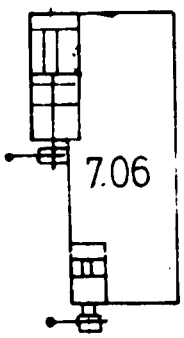


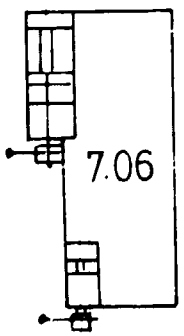




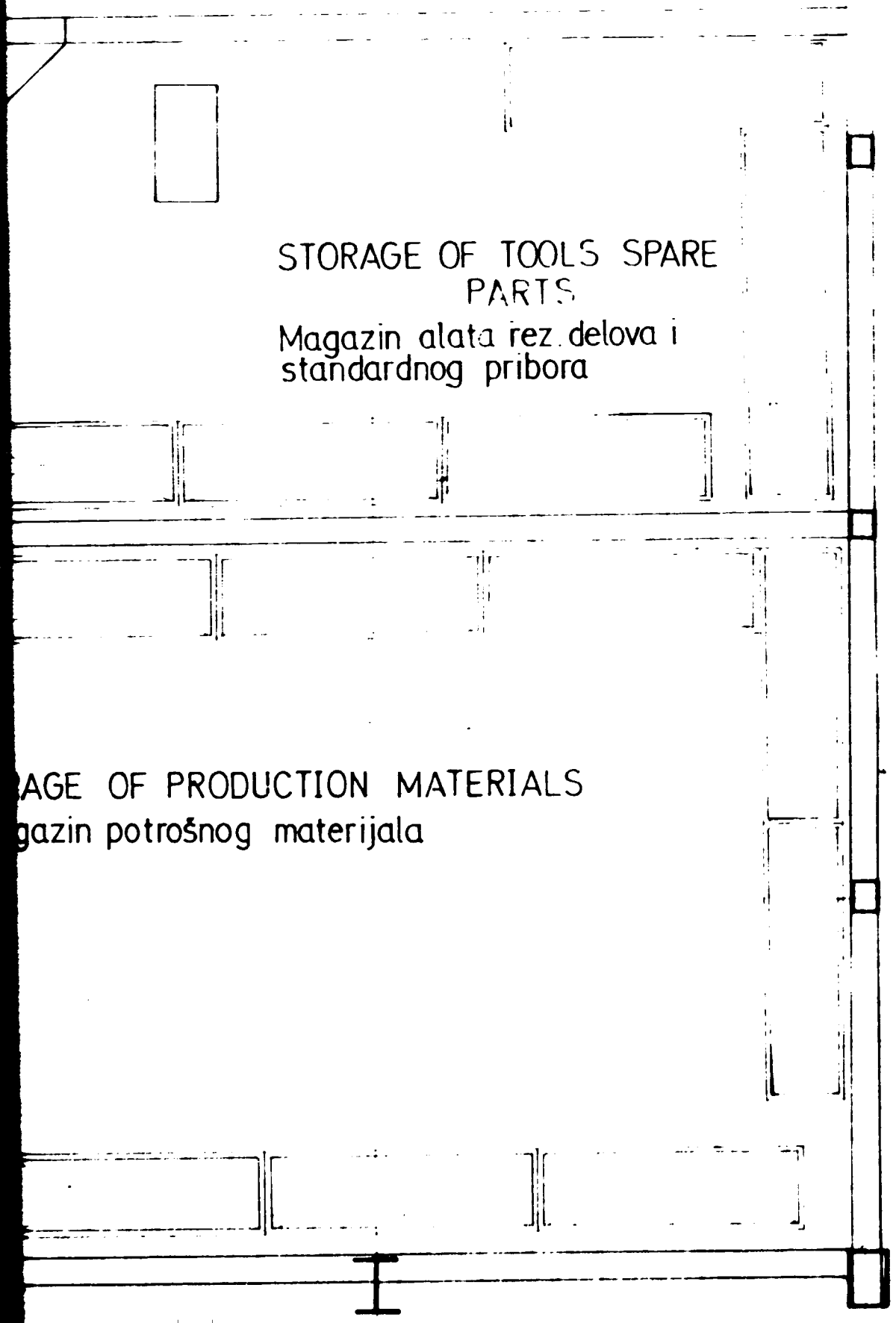
SECTION 34

STORAGE
Magazin





SECTION 35



ITEM NO Br. poz	ITEM Naziv po
2.10	Gumeni trans
1.09.2	Kaga
1.09.1	Mostna dizal
1.08	Al- Melting
1.07	Pouring ladl
1.06.1	Pouring ladl
1.06	Pouring ladl
1.05	Lifting devi
1.04	Pouring mon
1.03	Receiver
1.02	Cupola furn

Odgovorni projektant
Knežević M

Datum

Saradnici
Samardžija M

Kontrola
Cisar A

185/89

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ITEM NO Br. poz	ITEM DESCRIPTION Naziv pozicije	PCS Kom.	TECH PARAMETRES Parametri pozicije	NOTE Primedba
110	Gumeni transporter	5		
	[illegible]	1		
	[illegible]	1		
	[illegible] steel construction	1		
	Kosnica konstrukcija	1		
	Rubber belt conveyer	1		
	Gumeni transporter	1		
	Rubber belt conveyer	1		
	Gumeni transporter	1		
	Mixing sand mixer	1		
	Mješalica za miješanje pijeska	1		
	Volumetric dosing device	1		
	Mješalica dozator	1		
	Set of hoppers	1		
	Set bunkera	1		
	Dry synthetic sand sieve	1		
	Pokretno separ sito	1		
	Lift for additives	1		
	Dizalica za aditive	1		
1092	Scale	1		
	Vaga	1		
1091	Travelling crane	1		
	Mostna dizalica	1		
108	Al- Melting furnace	1		
	Peć za topljenje Al	2		
107	Pouring ladle 70kg	1		
	Livački lonac	4		
1061	Pouring ladle 750 kg	3		
	Livački lonac	1		
106	Pouring ladle 200 kg	1		
	Livački lonac	1		
105	Lifting device	2		
	Podizna naprava			
104	Pouring monorail			
	Livački monorej			
103	Receiver			
	Predpečnjak			
102	Cupola furnace			
	Kupolna peć			

SECTION 36

Odgovorni projektant: Knežević M

Datum: 15.5.1989 Paraf:

Investitor: „SIDO" Tanzanija

Šifra: T-81/101/NK

Objekat: FOUNDRY

Naziv crteža: LAY OUT

Mesto gradnje: MWANZA

SOUR
LIVNICA ŽELJEZA
I TEMPERA
„KIKINDA"
RO „PROGRES"

Izmena: dopuna

broj datum paraf

Saradnici: Samardžija M

Kontrola: Cisar A

185/89

Ek. jed: 17

Razmera: 1:50