4－3　レポート

THE REPORT OF THE MEETING BETWEEN THE JAPANESE EXPERTS SURVEY TEAM AND THE MALAYSIAN TEAM ON THE JAPANESE TECHNICAL COOPERATION FOR THE PROJECT ON FOUNDRY TECHNOLOGY UNIT IN THE STANDARDS AND INDUSTRIAL RESEARCH INSTITUTE OF MALAYSIA

The Japanese Experts Survey Team (hereinafter referred to as "The Japanese Team") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") visited Malaysia from March 29 to April 6, 1989 for the purpose of working out the details of the technical cooperation programme concerning the Project on Foundry Technology Unit in the Standards and Industrial Research Institute of Malaysia (hereinafter referred to as "the Project").

During its stay in Malaysia, the Japanese Team conducted surveys and had a series of discussions with the authorities of the Malaysian Team (hereinafter referred to as "the Malaysian Team") on the matter of the building (including extension, utility and layout) and the operation of the Unit to be clarified for the implementation of the Project.

Both Teams have worked out the documents attached hereto and agreed to report to their respective Governments.

Shah Alam, April 5, 1989

THE ATTACHED DOCUMENT

I. SITE OF THE UNIT

1. Extension of the Building

As a result of the surveys, the Japanese Team proposed the appropriate layout and foundation of the foundryshop shown in Annex 1.

The Malaysian Team agreed with the proposal subjected to continuous review and promised the following action :

(1) To provide the necessary extension of the building to meet the proposed layout and foundation by the end of November 1989.

(2) To inform JICA Malaysia Office of the construction progress at least once a month.

2. Utility Plan

The Japanese Team explained the Utility Plan for the building including electricity, water, gas and lighting shown in Annex 2.

The Malaysian side understood the plan and agreed to follow it.

II. NUMBER AND QUALIFICATION OF MALAYSIAN COUNTERPART PERSONNEL

Both the Japanese and the Malaysian sides confirmed the numbers, status and qualification of Malaysian counterpart personnel at the time of signing the Record of Discussions (hereinafter referred to as "R/D"), October 12, 1988.

However, the Malaysian Team proposed the alternative organization structure of the counterpart personnel shown in Annex 3. This is due to the decision of the Malaysian side not to enroll Assistant Research Officer in the Project.

The Japanese Team accepted it on the condition that the Malaysian side will allocate the above-mentioned counterpart personnel as scheduled.

III. TECHNICAL COOPERATION PROGRAMME

The Japanese side has considered the following measures and to some extent, some actions had been implemented:

1. Dispatch of the Japanese Experts

Long term expert

- Chief Advisor (under recruitment)
- Coordinator (dispatched on March 16, 1989)
- Expert in the field of
  Pattern Making (under recruitment)
  Melting (dispatched on March 16, 1989)
  Moulding (under recruitment)

With reference to the R/D, that is, "Short-term experts may be dispatched, if necessity arises, for the installation or operation of the machinery and equipment provided by the Government of Japan and for any other objectives", both Teams examined the necessities of dispatching short-term experts for the Japanese fiscal year (hereinafter referred to as "JFY") 1989 and tentatively scheduled as shown in Annex 4.

The Malaysian Team promised to prepare A1 forms for the said short-term experts by the end of July 1989.

2. Training of Malaysian Counterpart Personnel in Japan

As for the counterpart personnel training in Japan, both the Japanese and the Malaysian sides have agreed on the following training arrangement as confirmed last October:

a. The Japanese side will receive three (3) counterpart personnel a year and continue for four (4) years, that is a total of twelve (12) personnel will be trained during the technical cooperation period.

b. The term of the training will accordingly be in the field in which each counterpart personnel is engaged. The range of the term is from six (6) months to one (1) year.

c. There is no possible allocation for this project to undertake counterpart training in Japan within JFY 1988.

d. The Malaysian side requested the Japanese side to receive two (2) more counterpart personnel; One is for the Project Head and the other is for a draughtman. The Japanese side explained the procedure and the limitation of the number of the acceptance of counterpart personnel. The Japanese side understood the importance of these two (2) personnel and promised to make efforts to secure their training opportunities.

By now, the Japanese side has secured one (1) extra training opportunity for the Project Head as follows:

- Mr. Helme Hashim :Project Management, February 20 -March 7 1989.

Through the experience of the training of the Project Head and following a series of discussions, both Teams have agreed to shorten the term of the training to three (3) months in JFY 1989 because of the reason underneath:

a. Nature of Training

It is understood that a long practical experience is essential for counterpart personnel to be a capable foundry technician. As such, training period is not a crucial factor in the Project. Due to time limitation, basic practical foundry training is considered sufficient which requires a short period of two (2) months. Technicians are therefore expected to acquire their practical experience in Foundry Technology Unit (hereinafter referred to as "FTU") after returning to Malaysia. Long industrial exposure in Japan may be ineffective in educating counterpart personnel as most of the equipment are automatic. What is needed for counterpart personnel is manual practices.

Based on this understanding, it is therefore mutually agreed that counterpart personnel training in Japan should be more in basic practical foundry operation and techniques with a brief industrial exposure through factory visits, for a period of about three (3) months.

b. Equipment Arrival and Installation

As scheduled, most of the Equipment will be arriving at FTU and to be installed towards the end of 1989 and early 1990. This requires the presence of all the technicians to assist and to learn the installation procedures. As such, time is limited for counterpart personnel to undertake long training in Japan as they are needed in FTU.

Above-mentioned term, three (3) months, is tentatively fixed for JFY 1989. The adequate term for the training in and after next year will be finalized by the next-coming Survey Team.

The content and the schedule of the counterpart personnel training in Japan in JFY 1989 is shown in Annex 5.

3. The Target of the Technical Cooperation

It is understood by both Japanese side and the Malaysian side that operational target of FTU should be geared towards identification of foundry products and then make in FTU. This is to ensure that the transfer of various foundry technology namely; pattern making, moulding and melting, to be coordinated in parallel so that knowledge acquired by counterpart personnel will enable them to make products.

The technology transfer programme will consists of the following:

(i) Theory of foundry practices
(ii) Practical operation
(iii) Application - i.e. practice by the trained counterpart personnel in giving advisory services to local industries upon supervision of the experts.

On the role of Advisory services to the local industries during the term of the cooperation, it is understood that the experts will assist FTU in providing on site advisory services on technical problems faced by the local industries. Trainings and seminars are to be organized by the counterpart personnel with the assitance from the Japanese side so as to transfer technology and information to the local industries.

IV. PROVISION OF MACHINERY AND EQUIPMENT

The necessary equipment to be provided by the Government of Japan (hereinafter referred to as "the Equipment") has been listed up by both Teams as shown in Annex 6.

Up to now, almost all the Equipment have been already contracted beyond expectations by dint of the Japanese side's efforts.

The schedule of procurement and shipping of the Equipment is shown in Annex 7.

In relation to the above-mentioned schedule, the Japanese Team explained the necessary measures to be taken by the Malaysian side as listed in Annex 8.

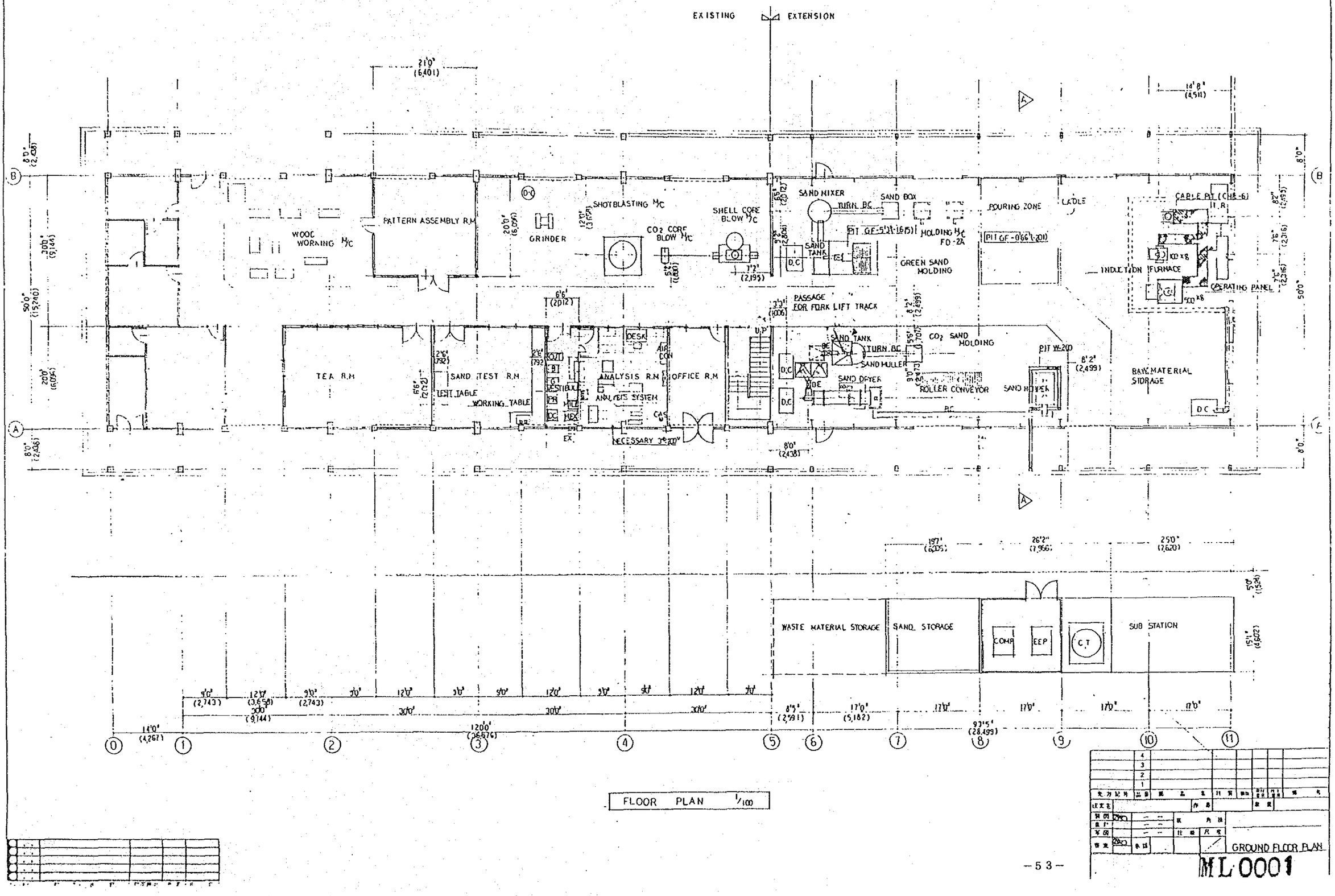
The Malaysian side appreciated the Japanese side's efforts and agreed to observe the measures.

Moreover, the Malaysian Team explained the schedule of the preparation of the equipment to be provided by the Malaysian side as shown in Annex 9. In addition, the Japanese side requested the Malaysian side to prepare woekshop facilities as shown in Annex 10.

V. ATTENDANCE OF THE MEETING

The attendance of the meeting is shown in Annex 11.

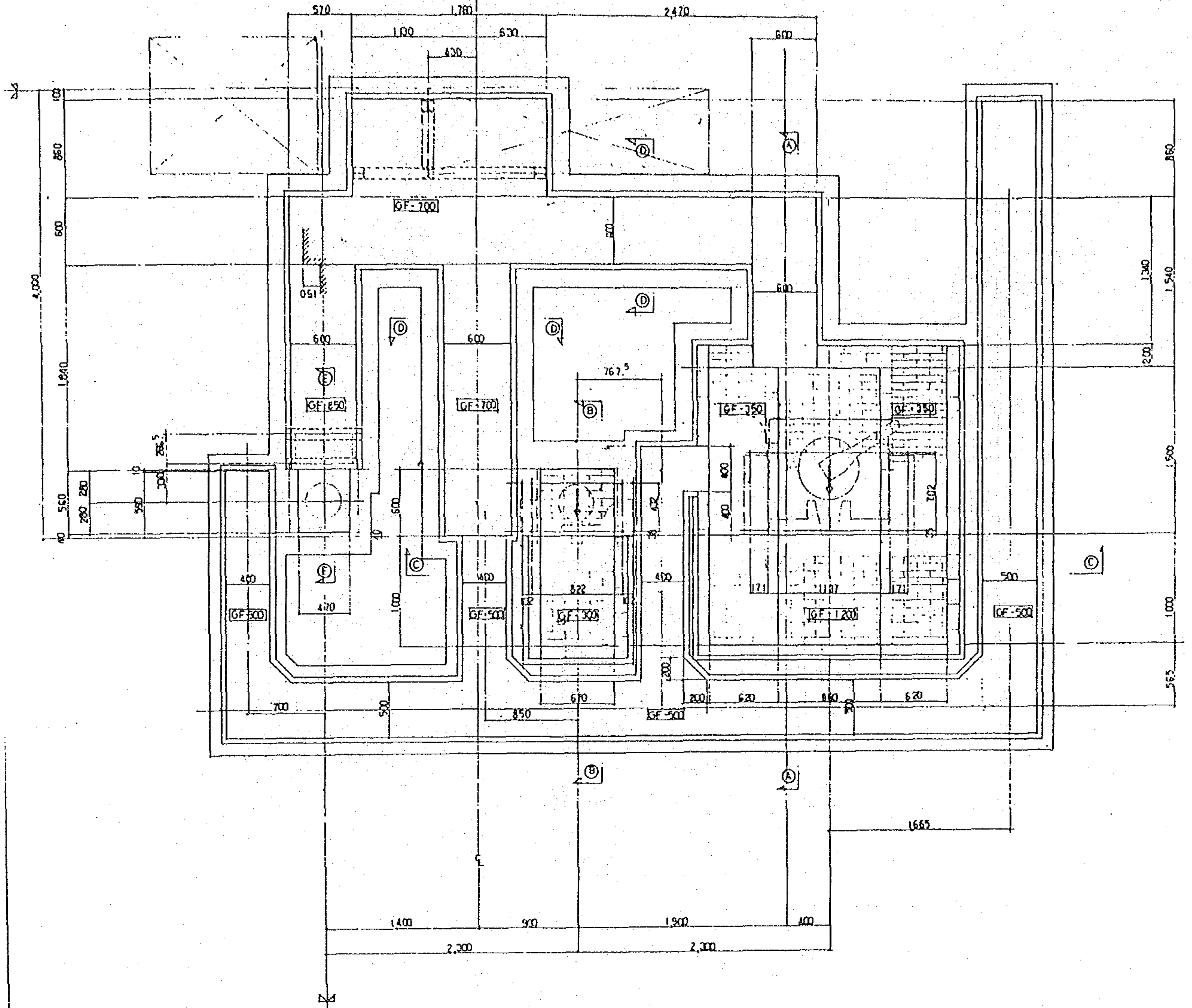
ANNEX 1 THE LAYOUT AND THE FOUNDATION OF THE FOUNDRYSHOP



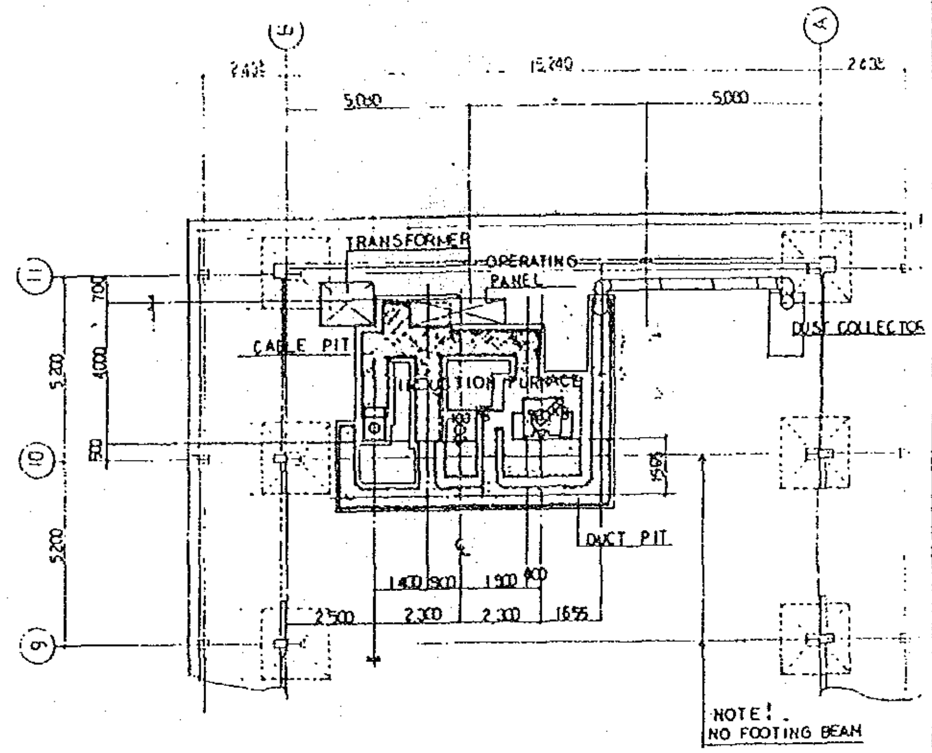
FLOOR PLAN 1/100

GROUND FLOOR PLAN

ML-0001



GROUND FLOOR DETAIL 1/20

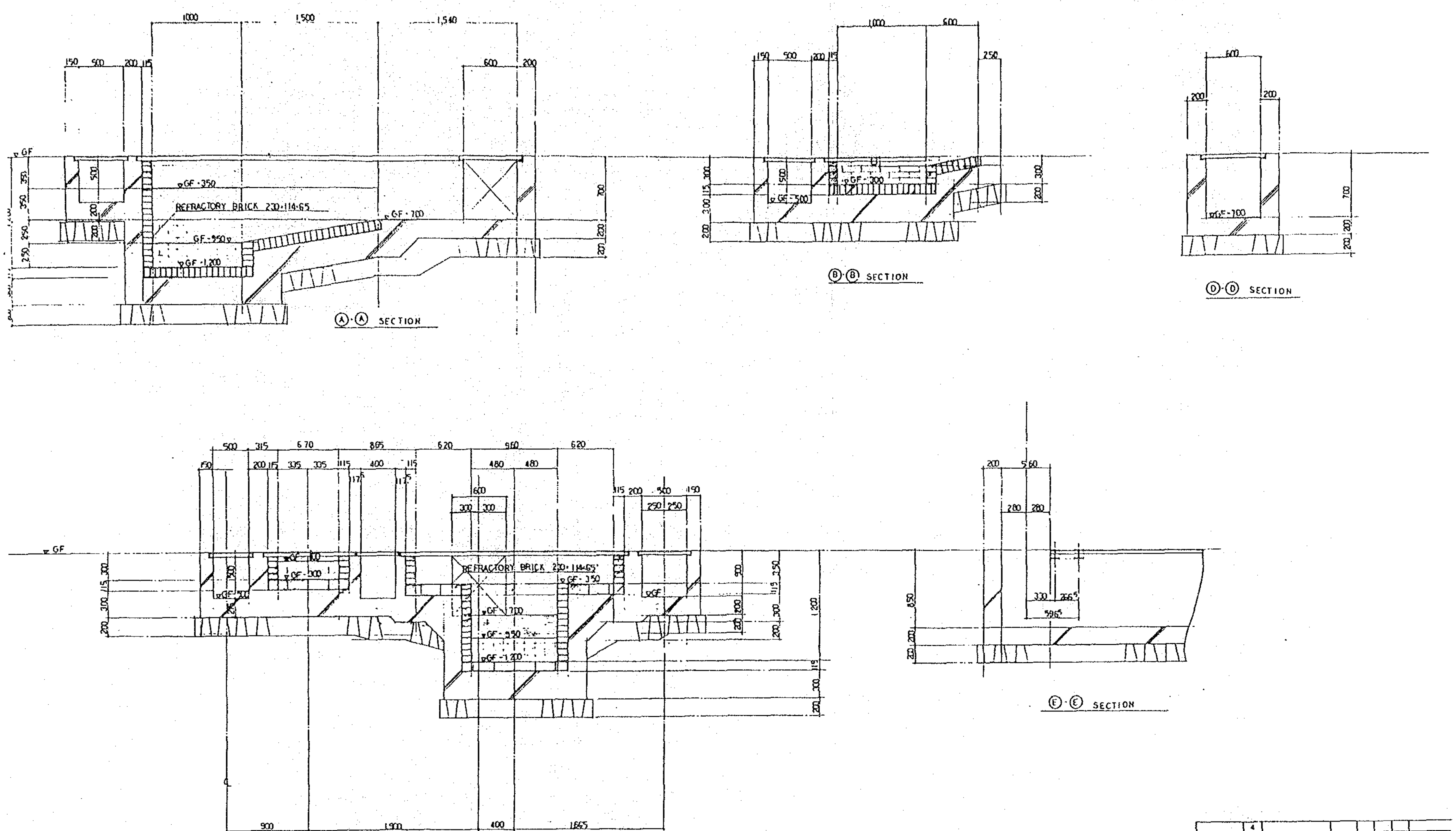


GROUND FLOOR KEY PLAN 1/100

2-12-83

INDUCTION FURNACE PLA

[redacted] MLH001



SECTION DETAIL 1/20

INDUCTION FURNACE
SECTION DETAIL

[redacted] MLH002

PIT COVER DETAIL 1/20

COVER DETAIL 1/5

Ⓐ DETAIL 1/10

Ⓑ DETAIL 1/10

ANCHOR PLATE 1/20

ANCHOR DETAIL 1/2

SITE WORK SURROUNDINGS FURNACE

CHR-6 OP

L-50·50·5

L-40·40·5

H-100·100·6·8

ANCHOR 1-9φ L-120 @ 900

BR-9 HTB 2-M16

BR-9 120-120
ANCHOR BOLT 2-13° L-250

BASE MORTAR

BOLT SECURE INTO FLOOR

LOCK WASHER
FLAT WASHER
ISOLATION WASHER

STANCHION BASE

GROUT

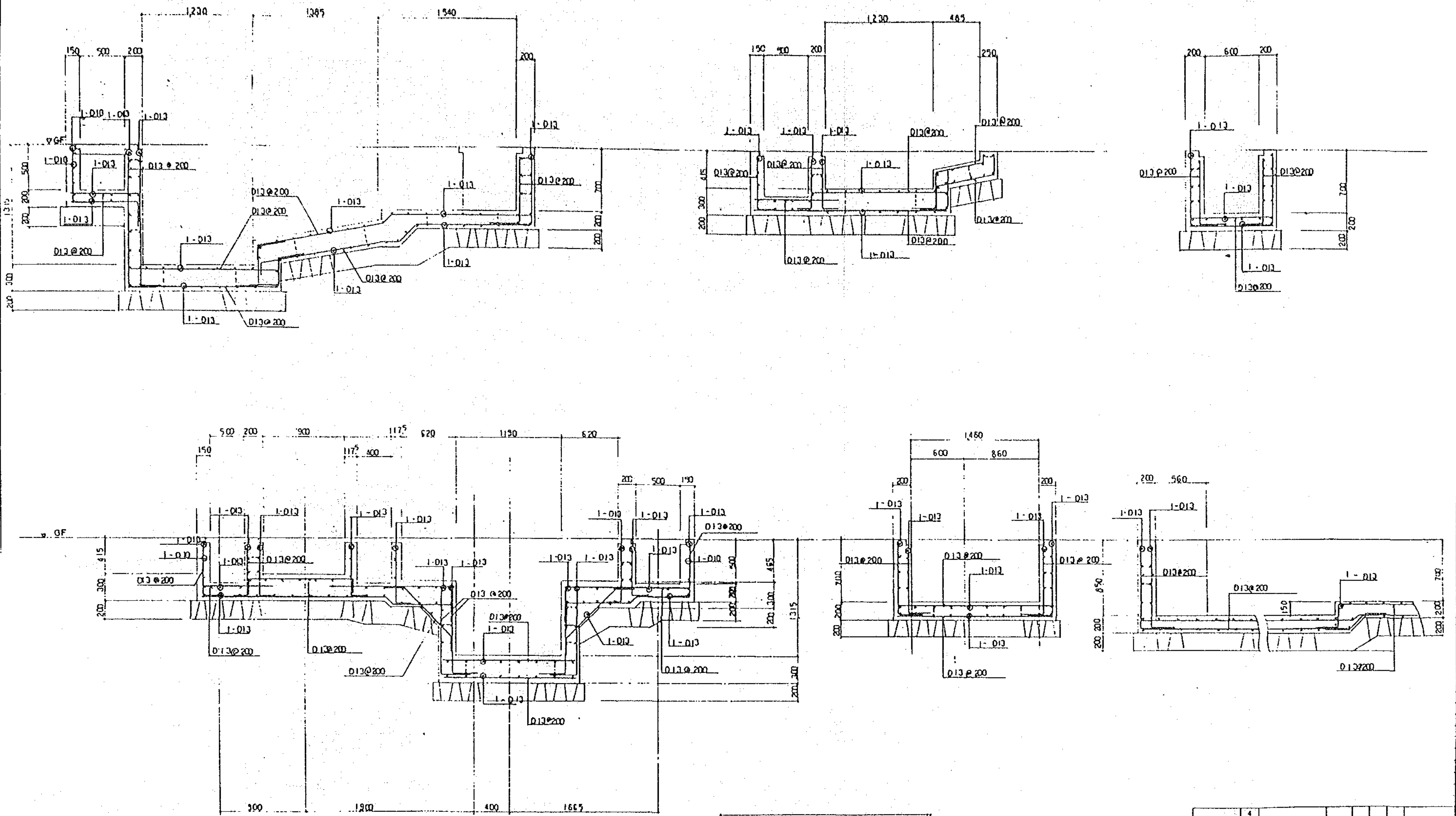
ISOLATION SLEEVE

5/8 SUS ANCHOR BOLT 16-SET

12T PUNCHING

INDUCTION FURNACE
PIT COVER DETAIL

MLH003



BAR ARRANGEMENT DETAIL 1/20

NOTE 1

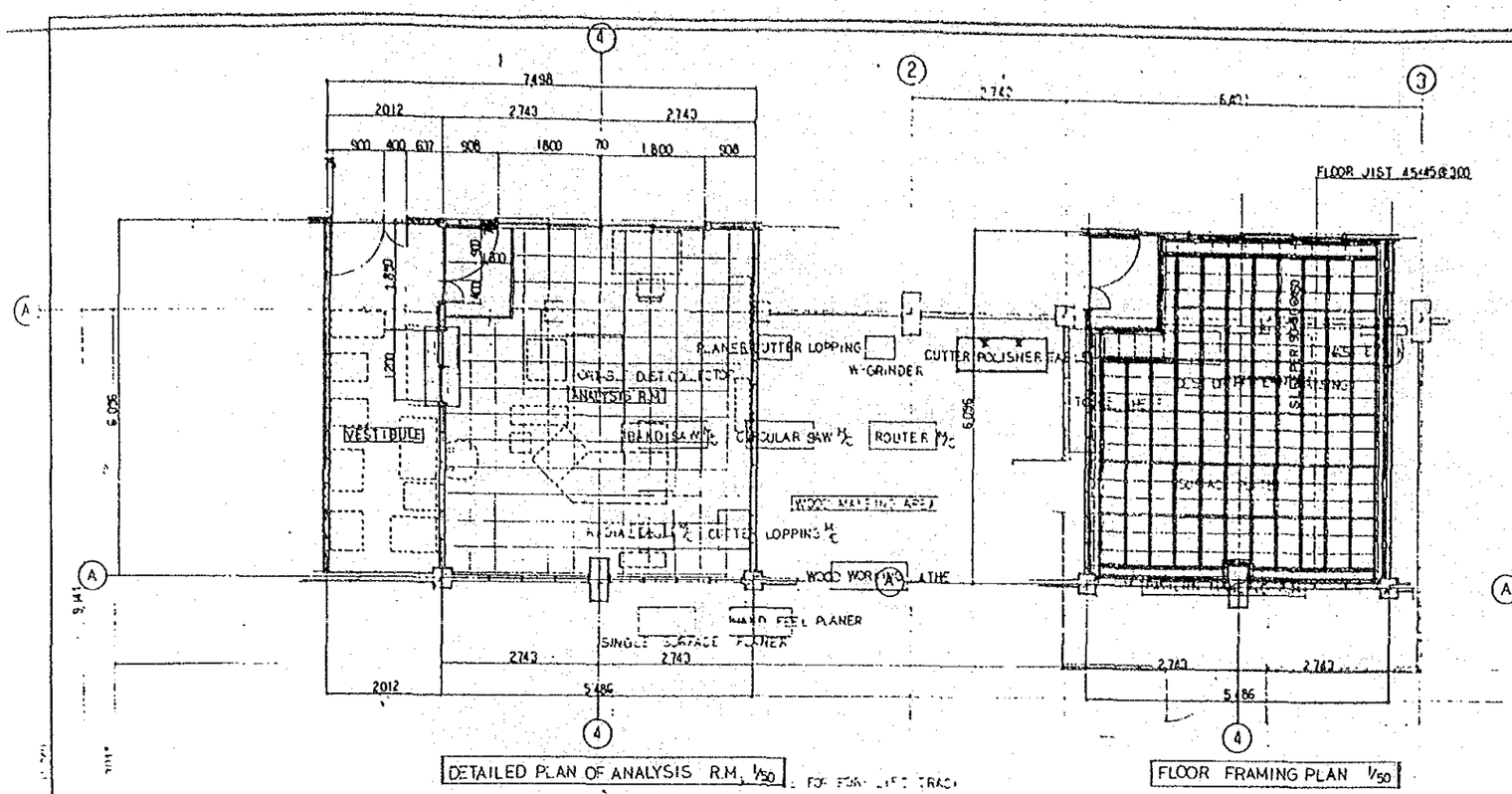
REINFORCEMENT	SD30
CONCRETE	FC - 180 $^{kg}/_{cm^2}$

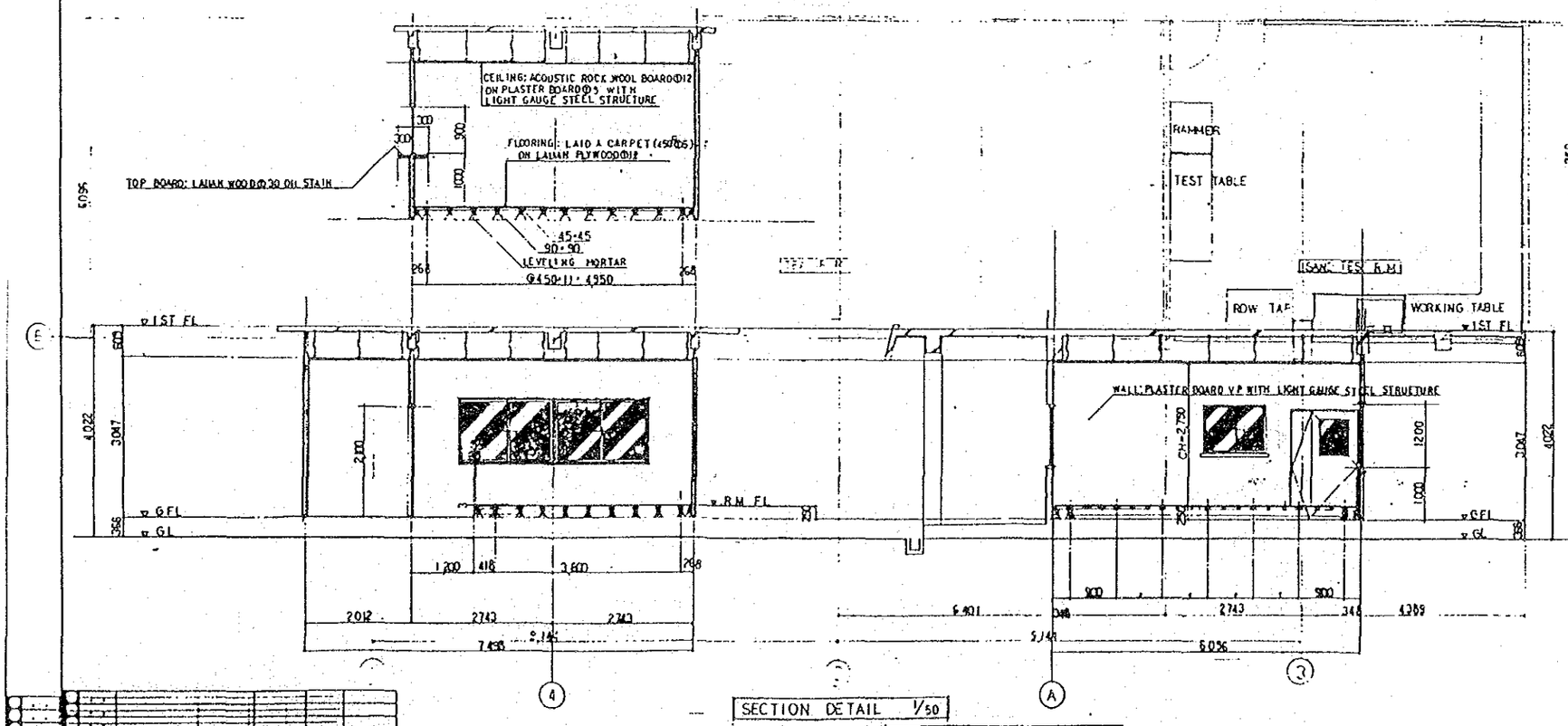
	4
	3
	2
	1

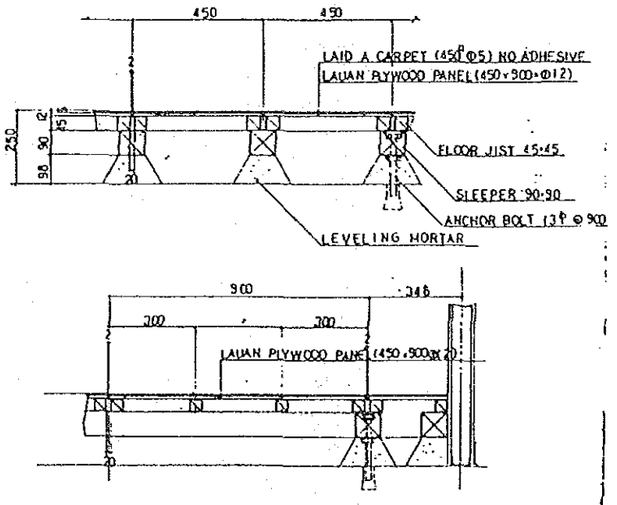
2-12-89

INDUCTION FURNACE
BAR ARRANGMENT DETAIL

[redacted] MLH004



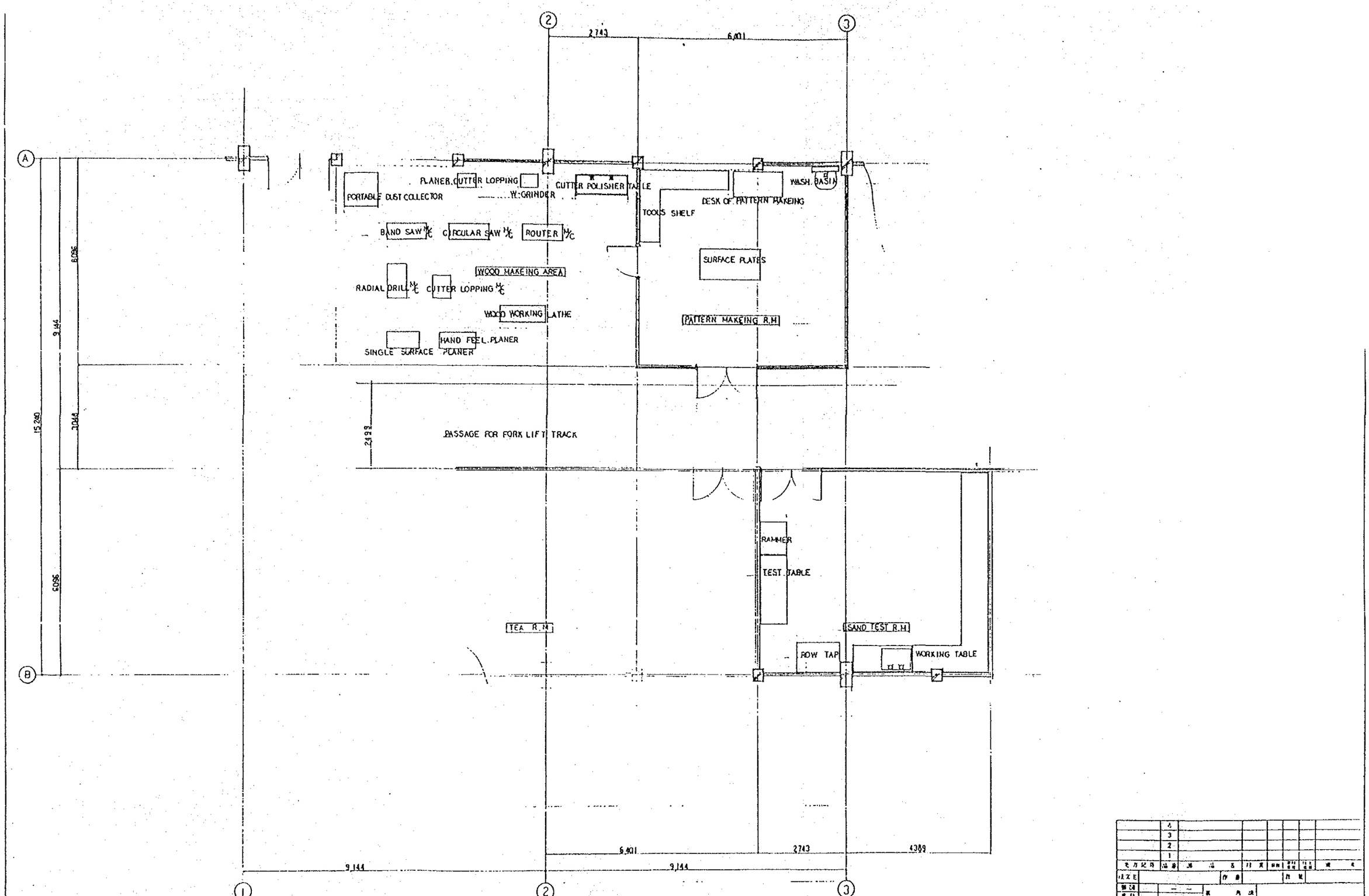




DETAIL OF FLOOR FRAMING 1/10

ANALSIS R.M

MLH005

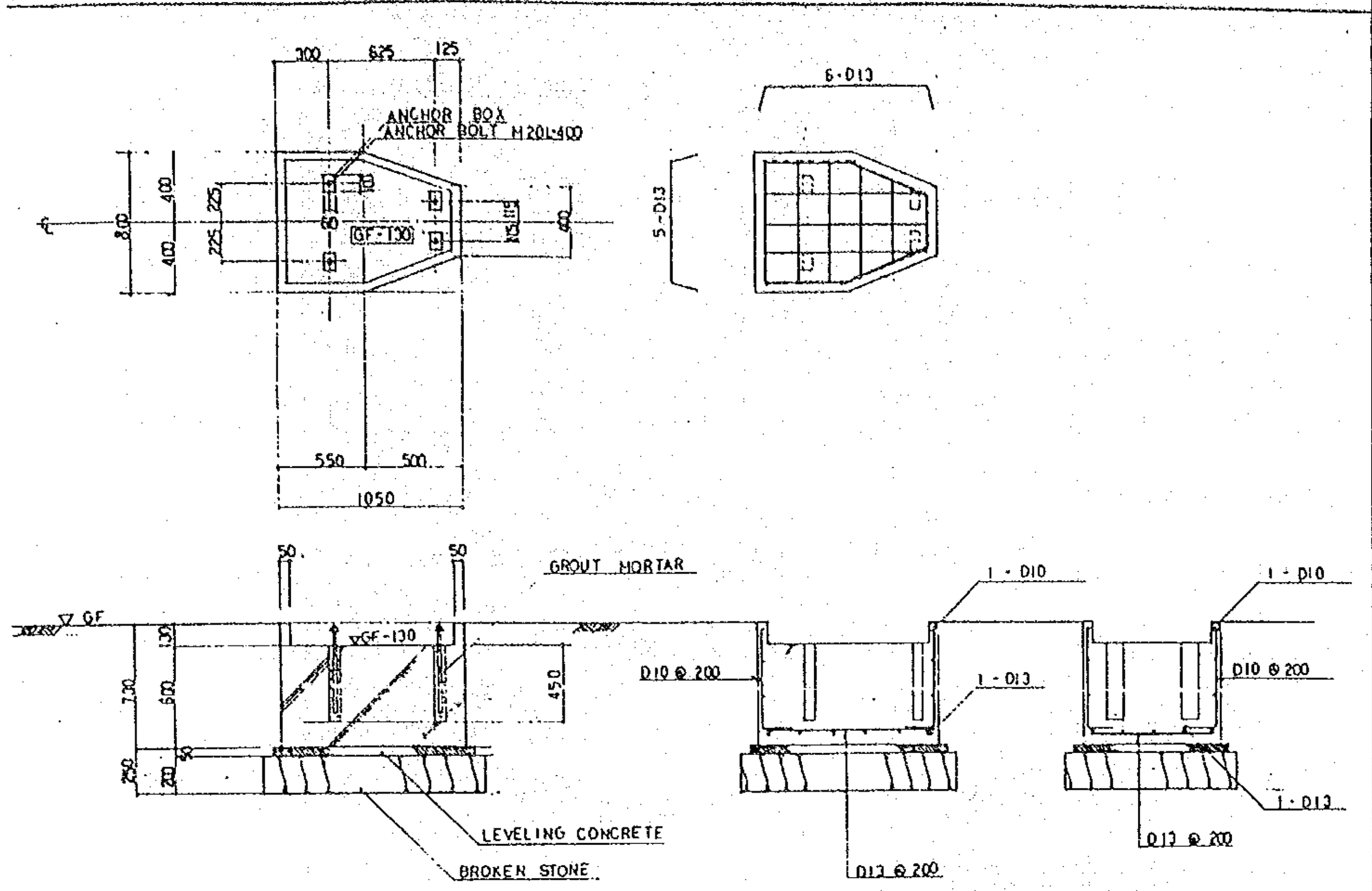


M/C LAYOUT PLAN 1/50

M/C LAYOUT PLAN

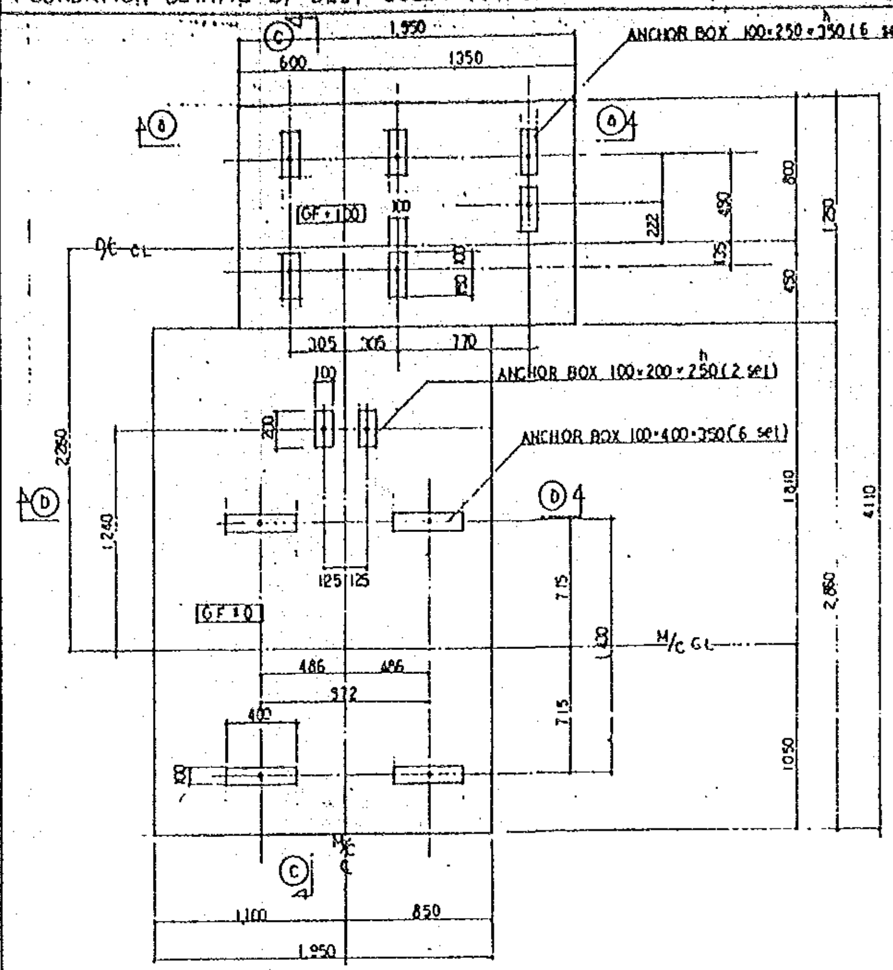
MLH006

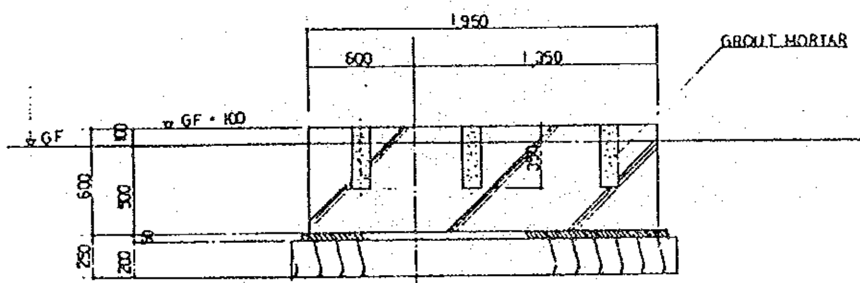
FOUNDATION DETAIL OF MOLDING M/C (TYPE FD-2A) 1/20 REFERENCE PLAN



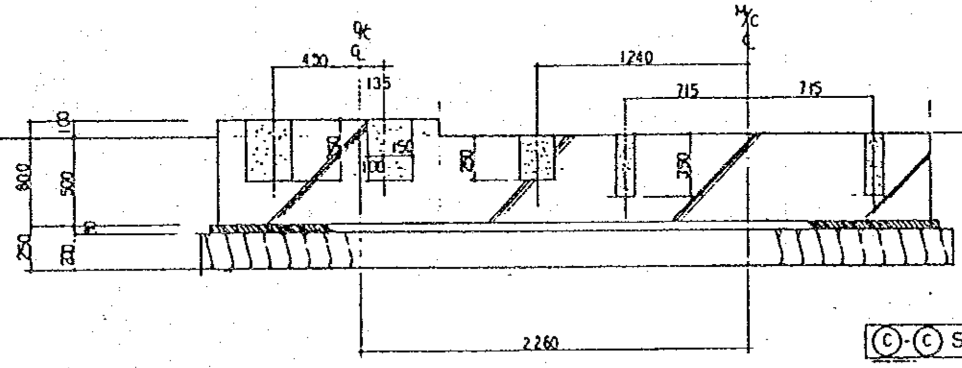
BAR ARRANGEMENT 1/20

FOUNDATION DETATIL OF DUST COLLECTOR (INDUCTION FURNACE, GREEN SAND LINE, & CO_2 SAND LINE) 1/20 REFERENCE PLAN





ⓐ-ⓐ SECTION



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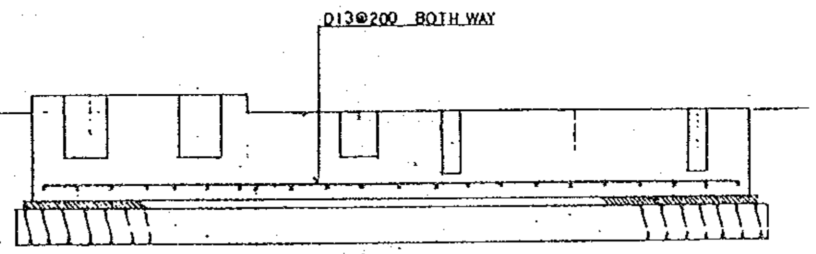

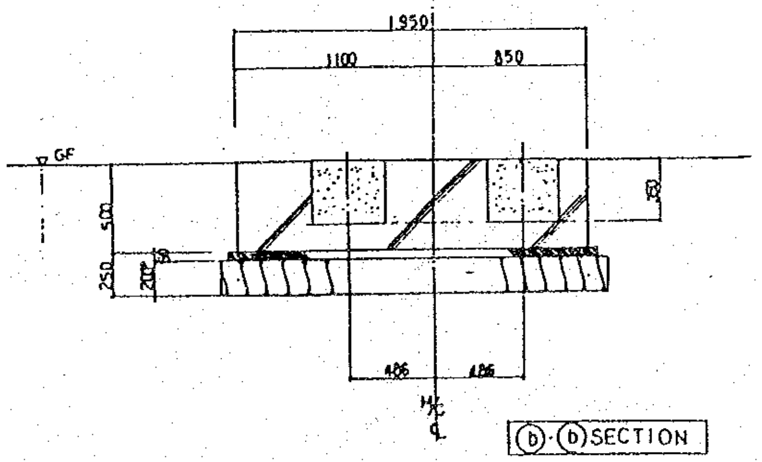

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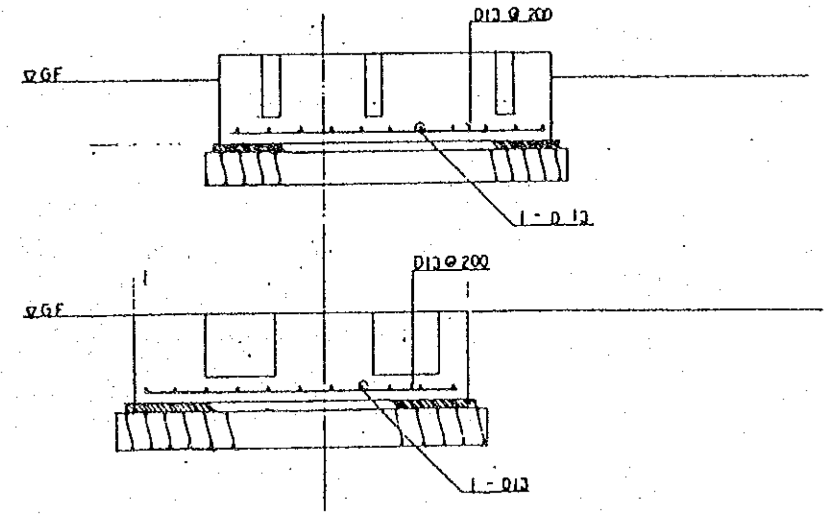
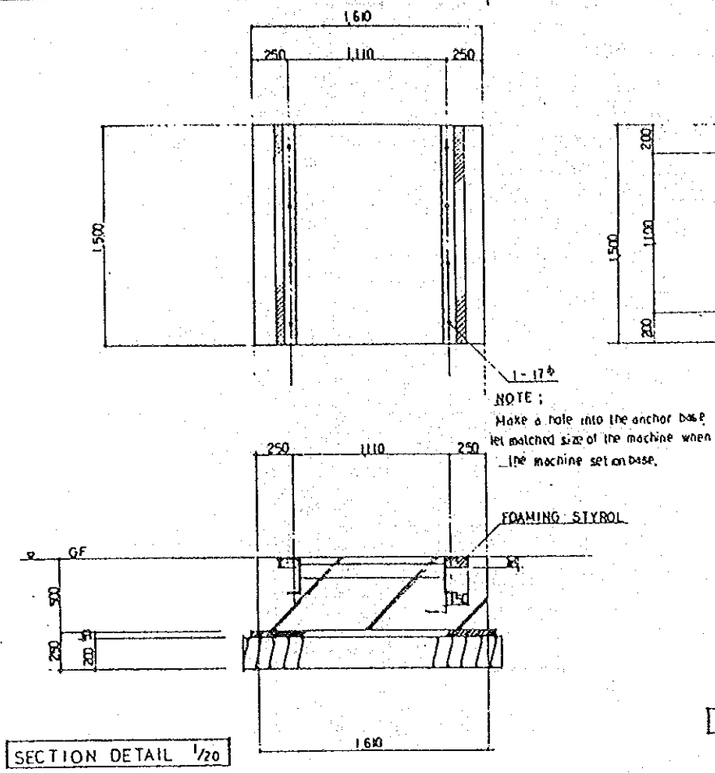


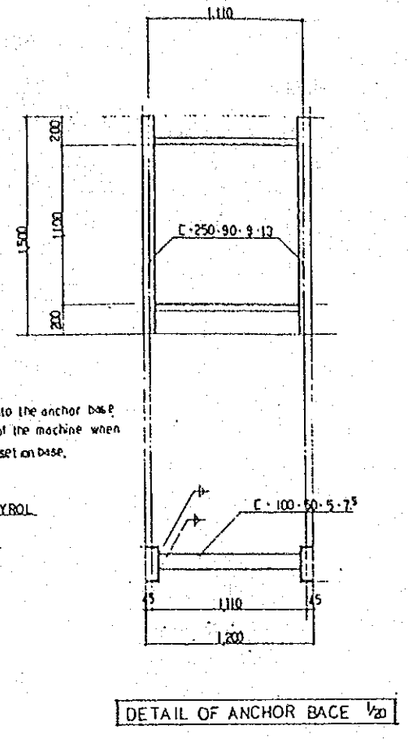
DETAIL OF FOUNDATION(1)

MLH007

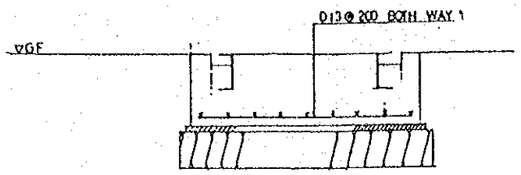
FOUNDATION DETAIL OF SHAKE OUT M/C (TYPE SHO-3T) 1/20 REFERENCE PLAN

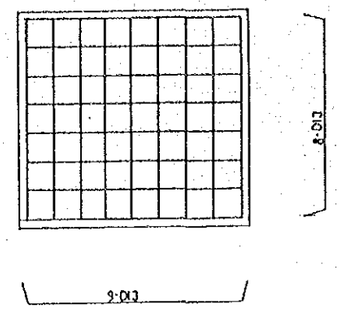


SECTION DETAIL 1/20



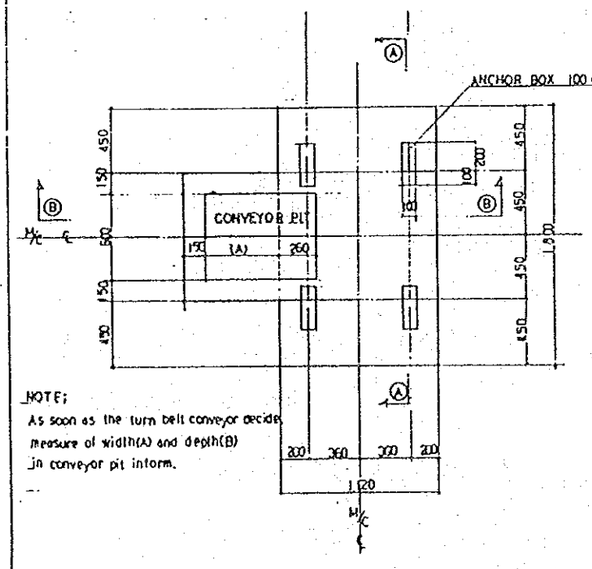
DETAIL OF ANCHOR BACE 1/20

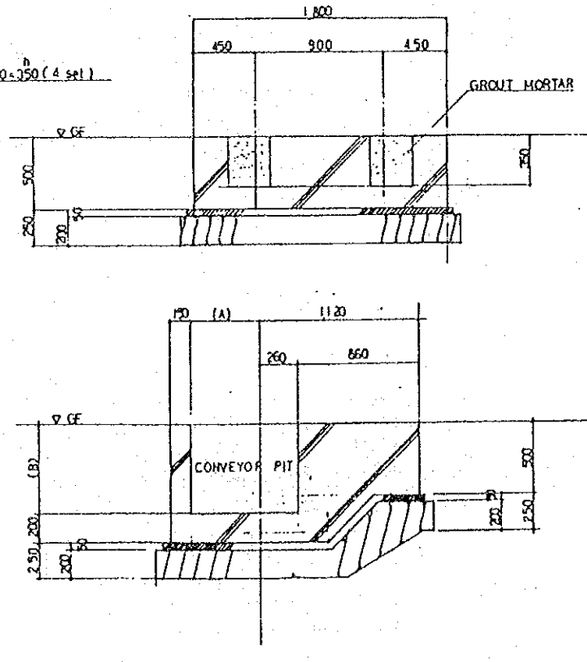


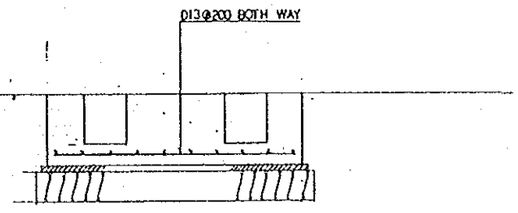


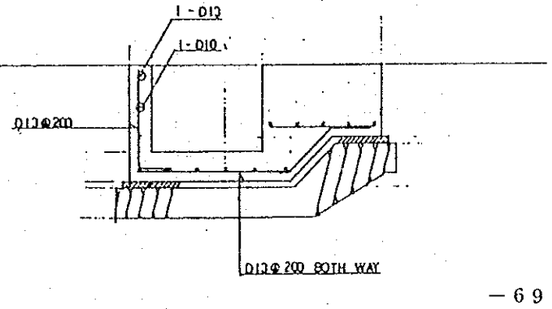
BAR ARRANGMENT 1/20

FOUNDATION DETAIL OF MIX MULLER M/C (TYPE MSF-10A) 1/20 REFERENCE PLAN





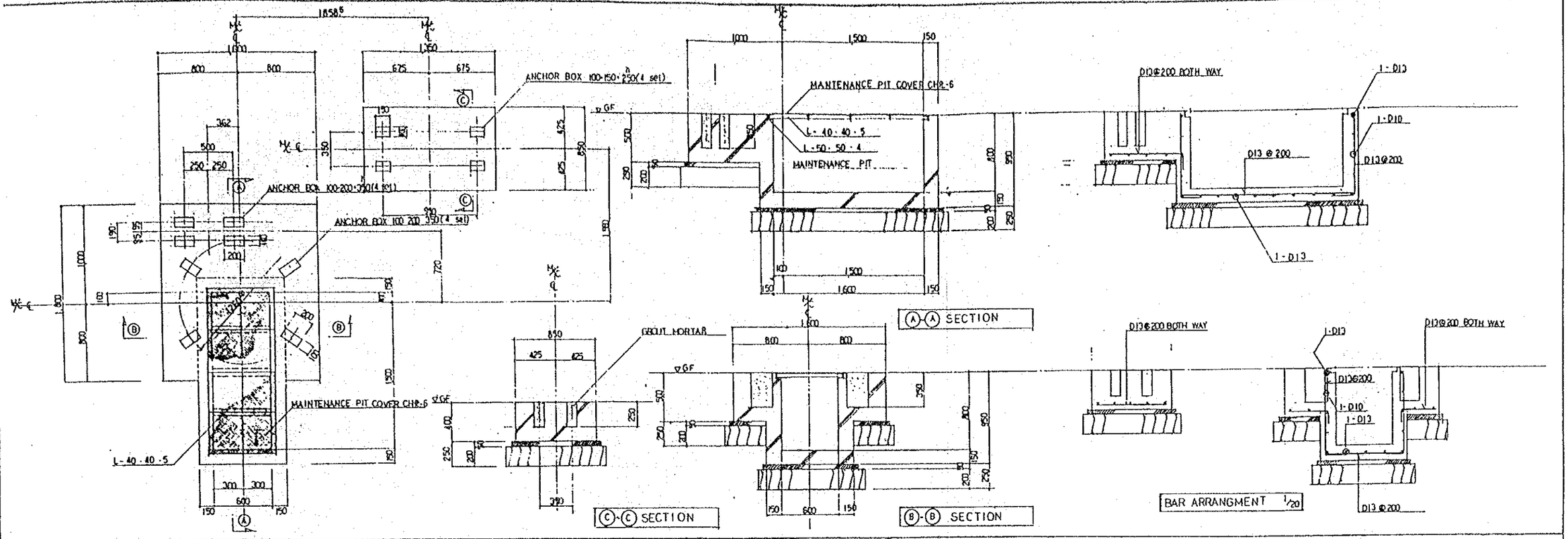




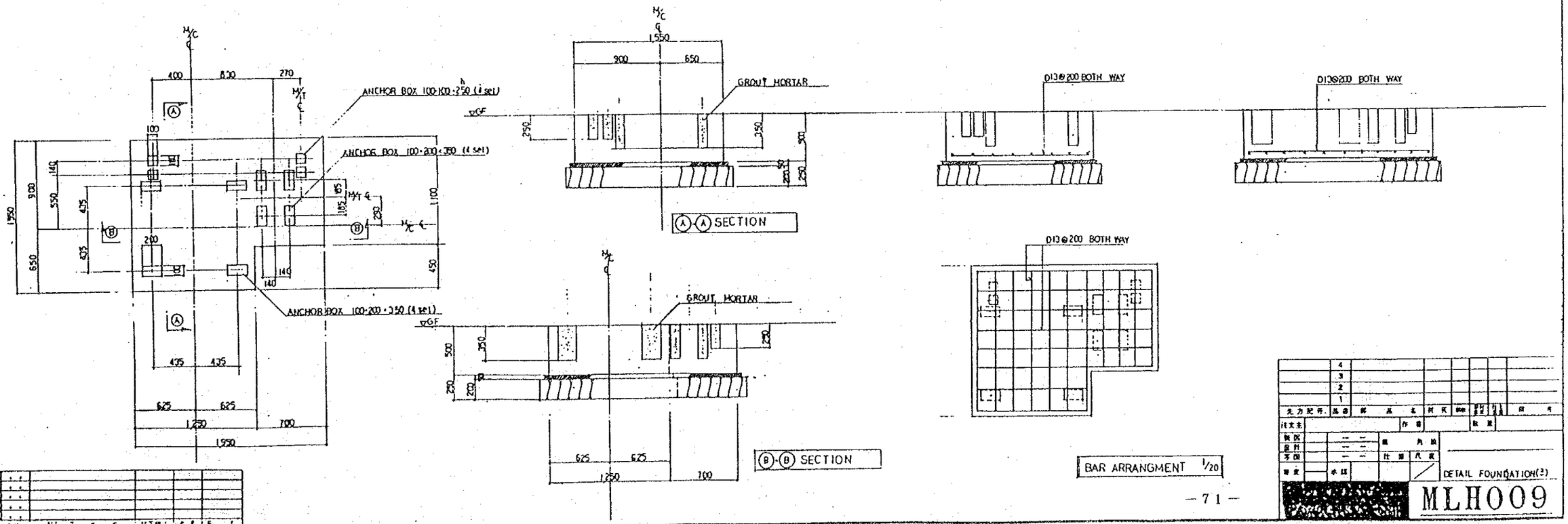
DETAIL OF FOUNDATION(2)

MLH008

FOUNDATION DETAIL OF SHOT BLAST M/C (TYPE SNT-OPA) 1/20 REFERENCE PLAN



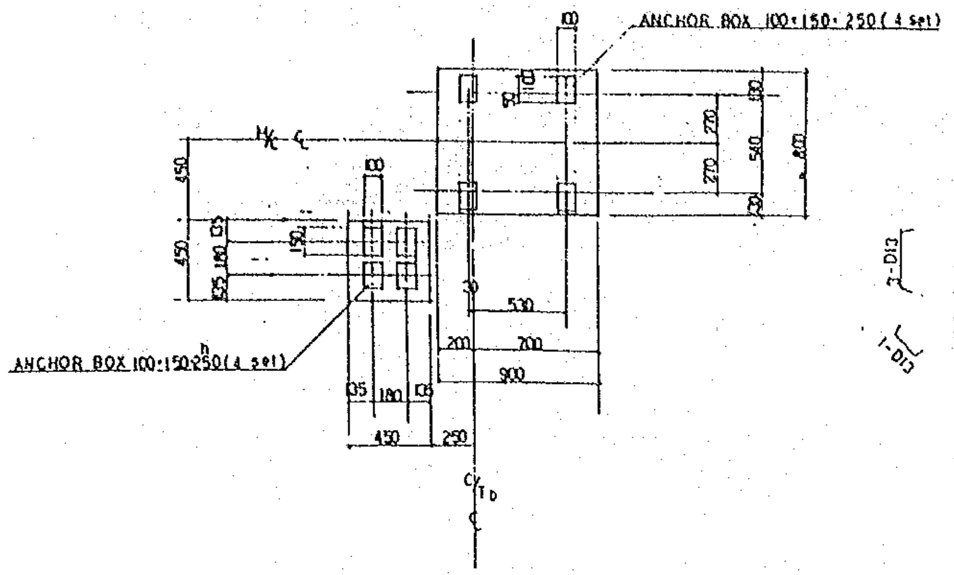
FOUNDATION DETAIL OF MIXER M/C (TYPE MSU-20) 1/20 REFERENCE PLAN

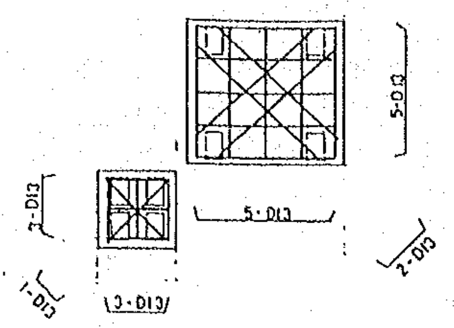


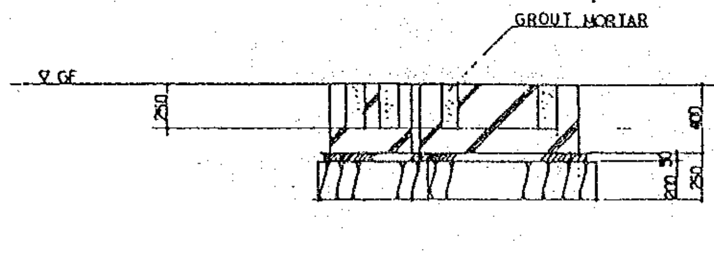
DETAIL FOUNDATION(3)

MLH009

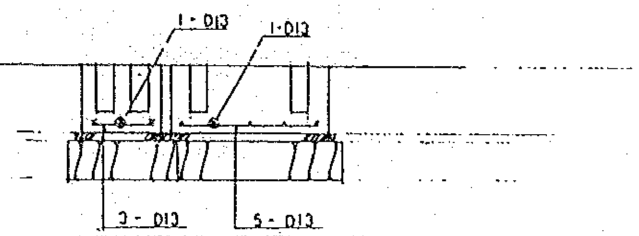
DETAIL OF CO_2 CORE CHUTER (TYPE - SBO 3) 1/20 REFERENCE PLAN







SECTION DETAIL 1/20

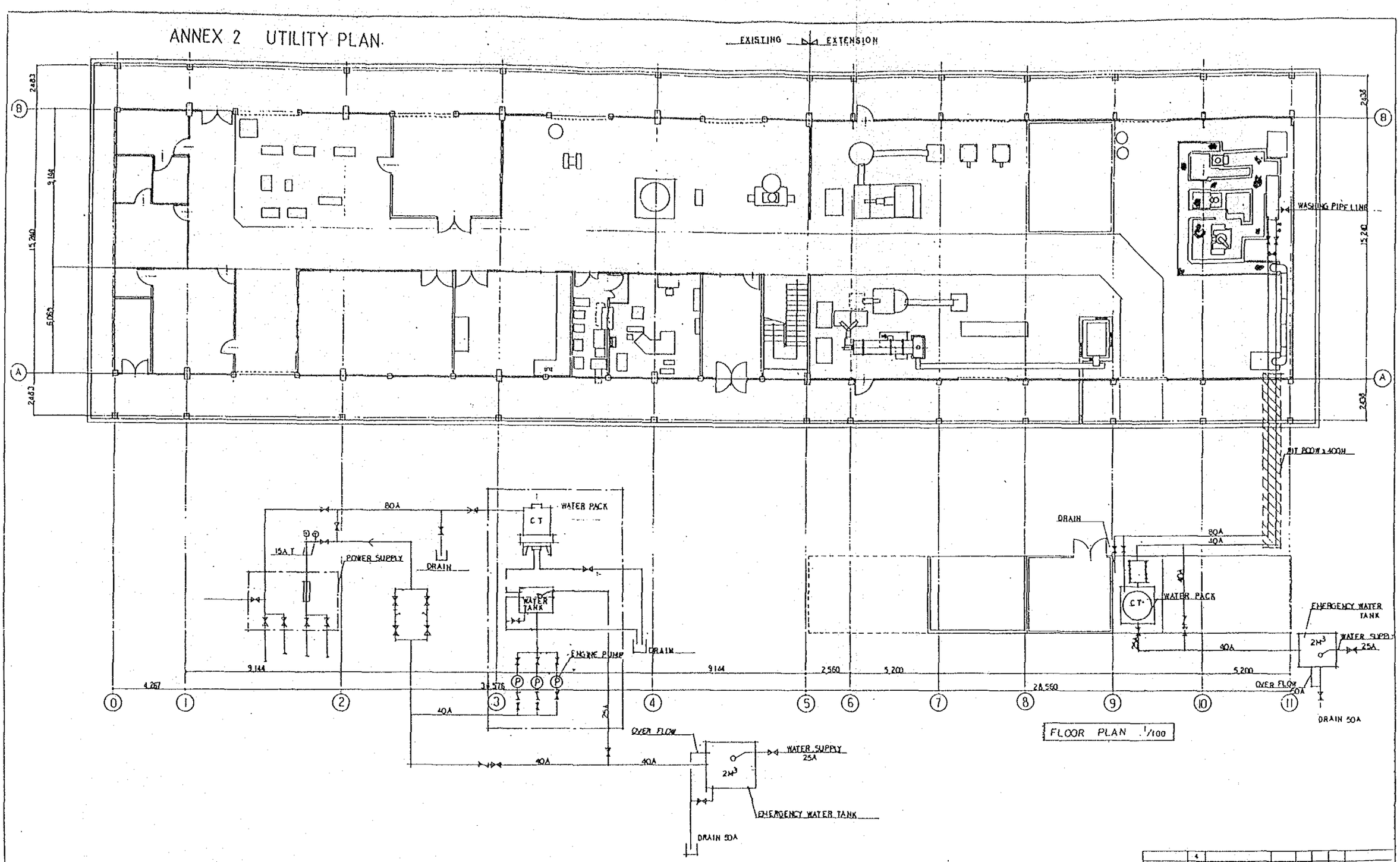


BAR ARRANGMENT 1/20

DETAIL OF FOUNDATION

MLH010

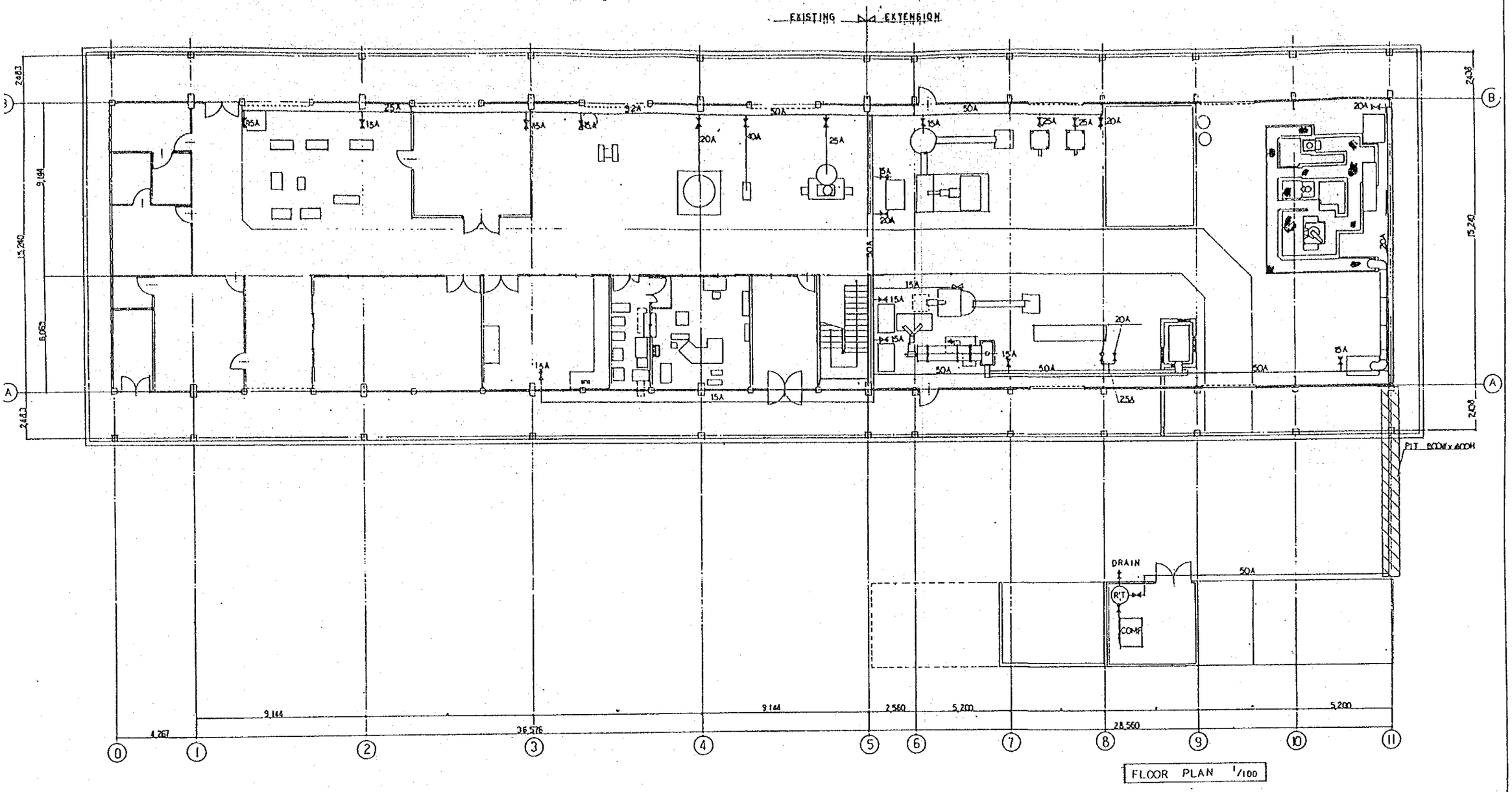
ANNEX 2 UTILITY PLAN.



FLOOR PLAN 1/100

PIPING PLAN
OF
COOLING WATER

MLH013

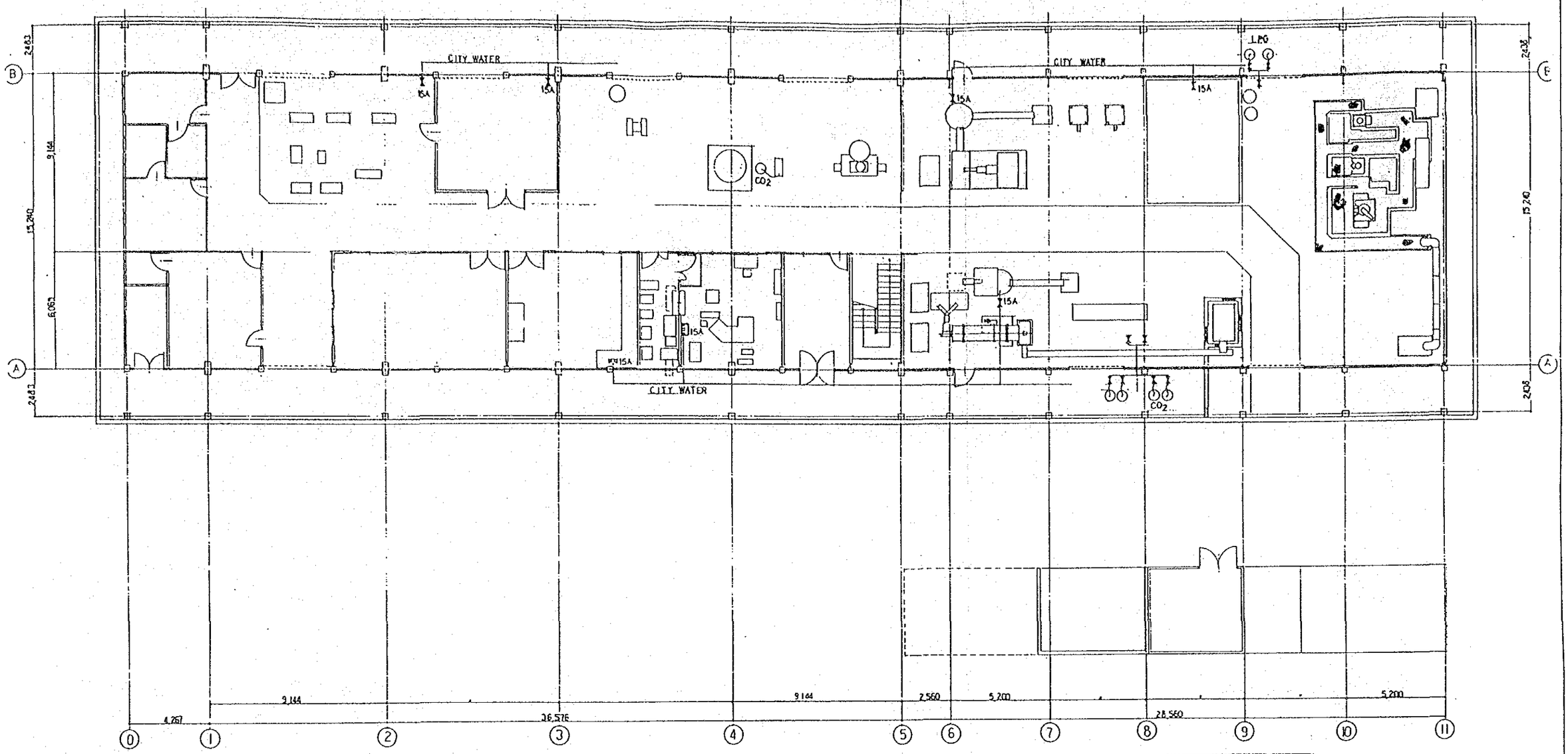


PIPING PLAN

AIR

MLH01.4

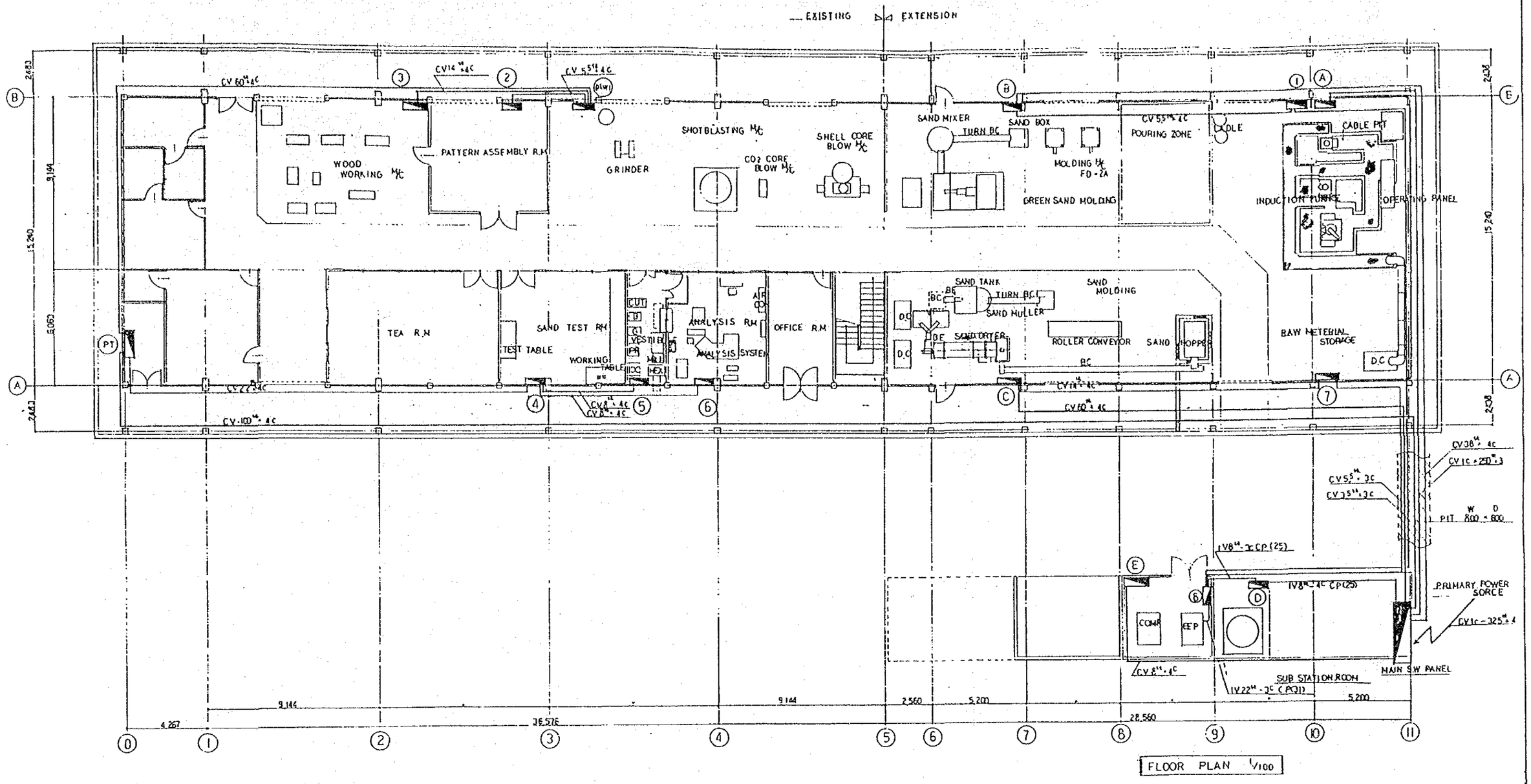
EXISTING EXTENSION



FLOOR PLAN 1/100

PIPING PLAN
LPG, CO_2
CITY WATER

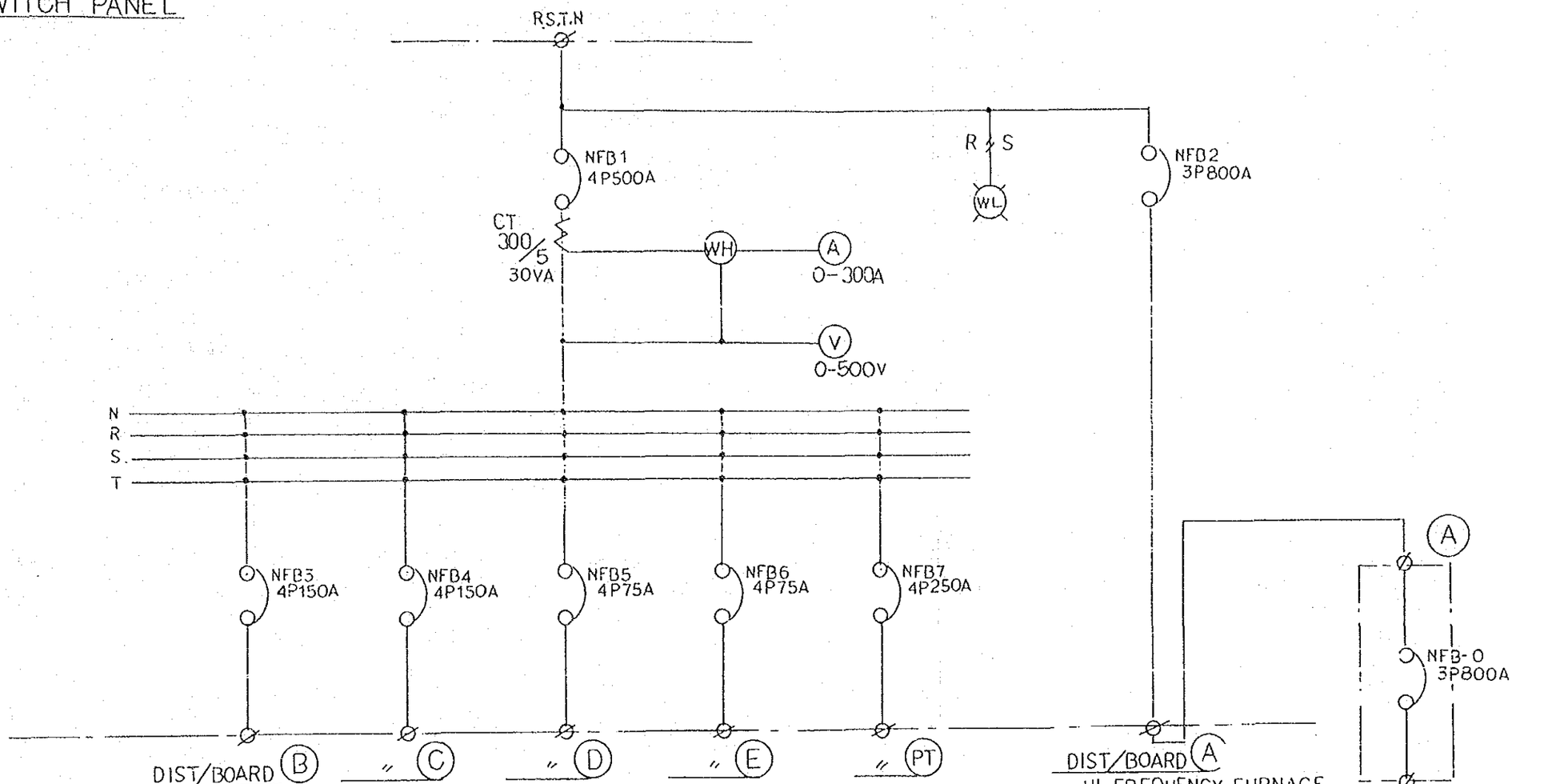
MLH015



ELECTRIC WIRING PLAN

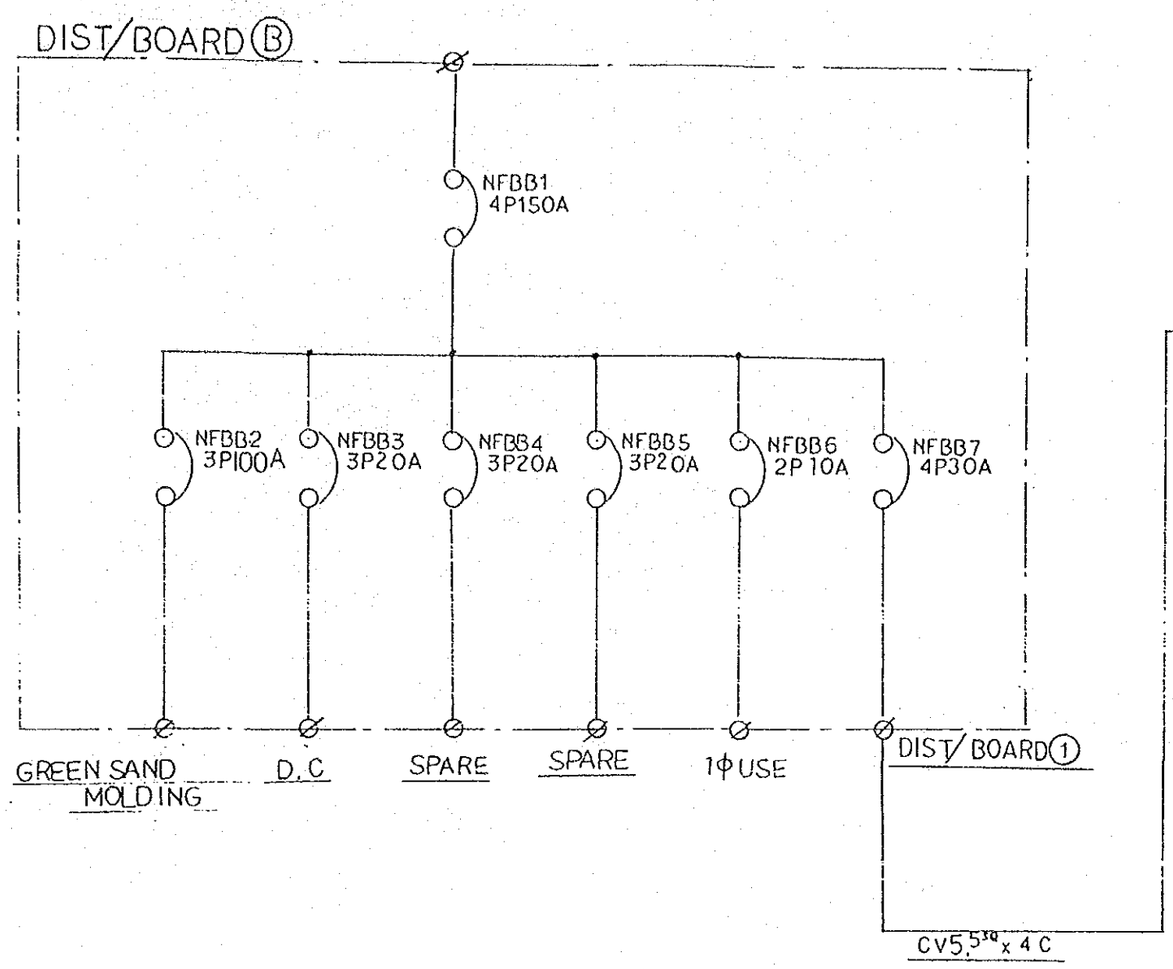
M1 H016

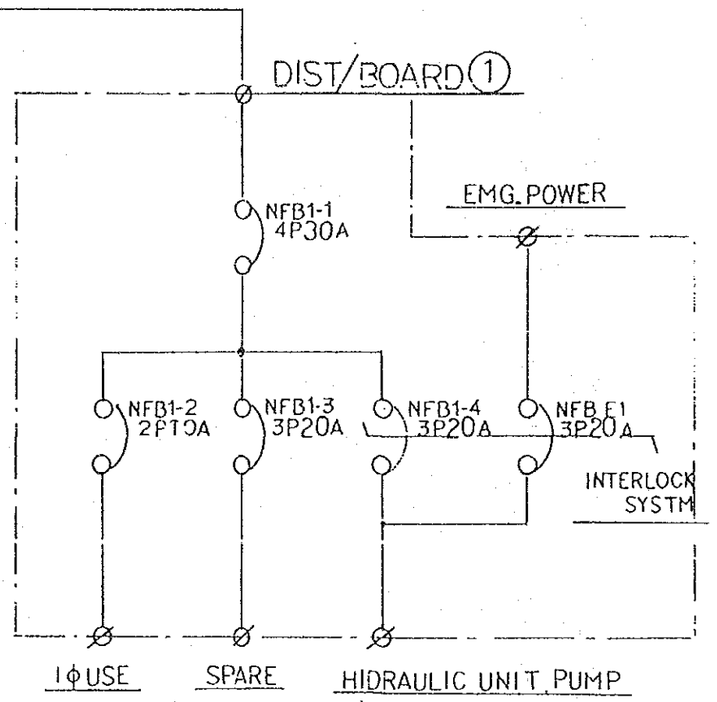
MAIN SWITCH PANEL



MLH017

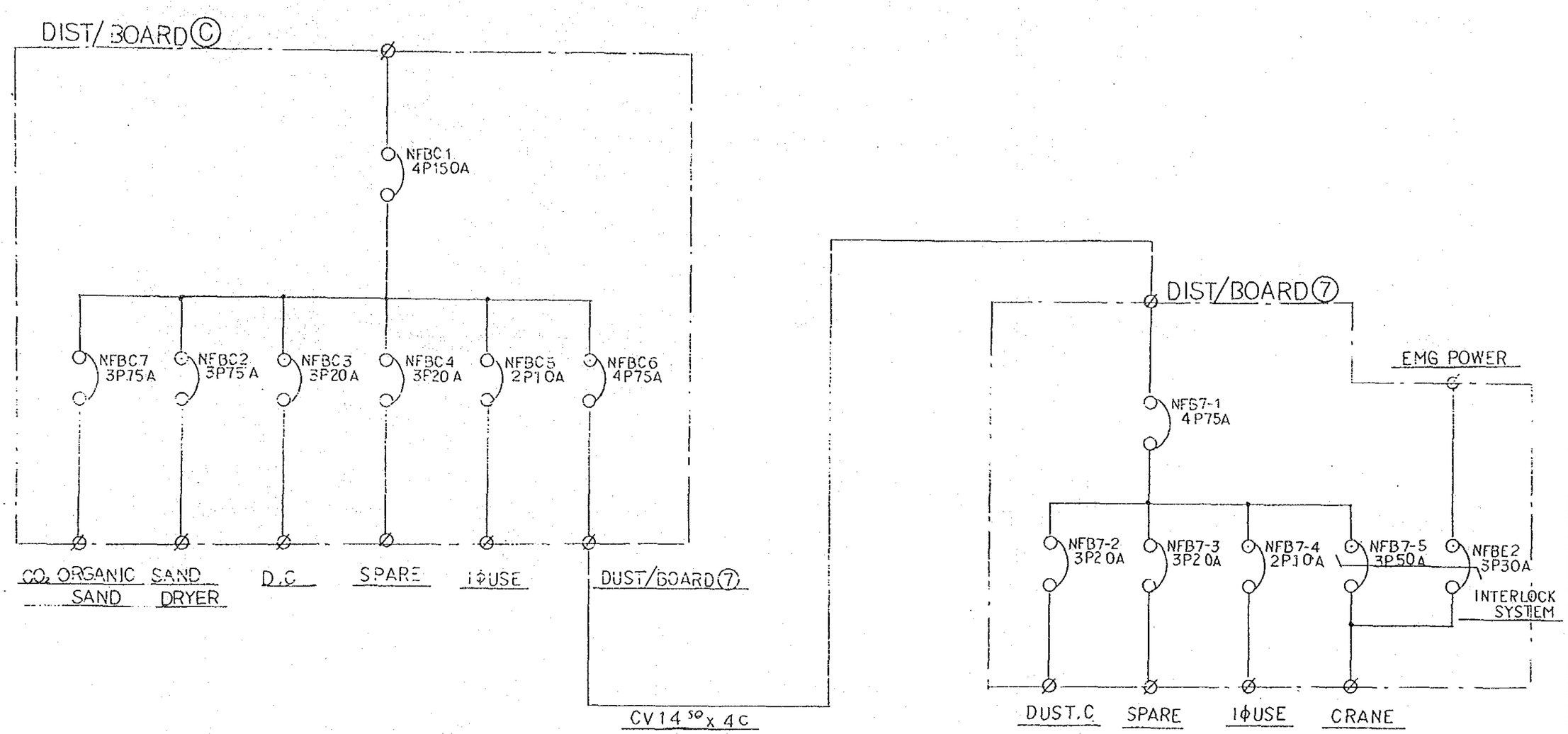
製図			審査			名称	MAIN SWITCH PANEL
写図			承認				





MLH018

製図		審査		名称	DIST/BOARD (1)
写図		承認			



MLH019

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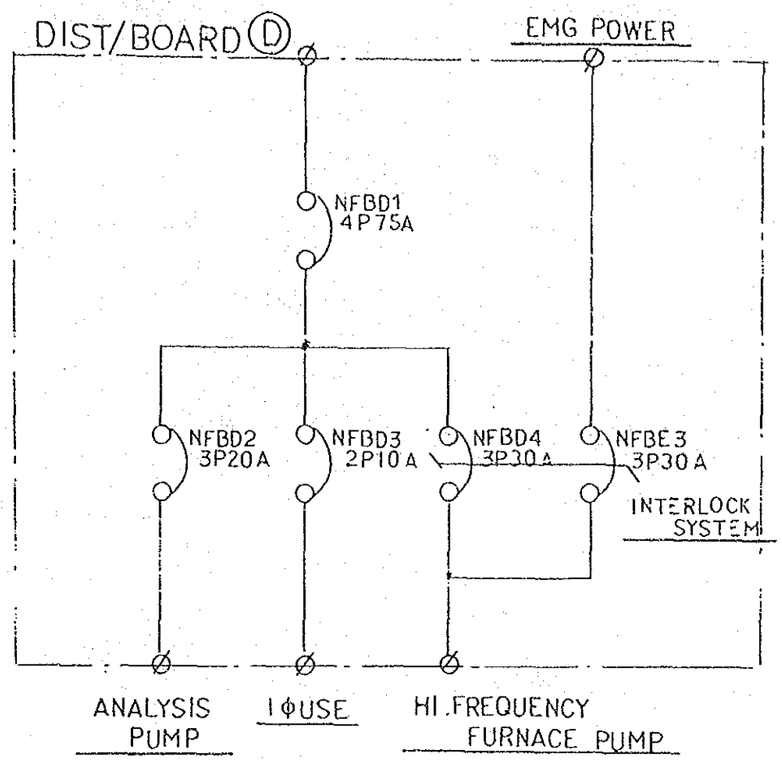
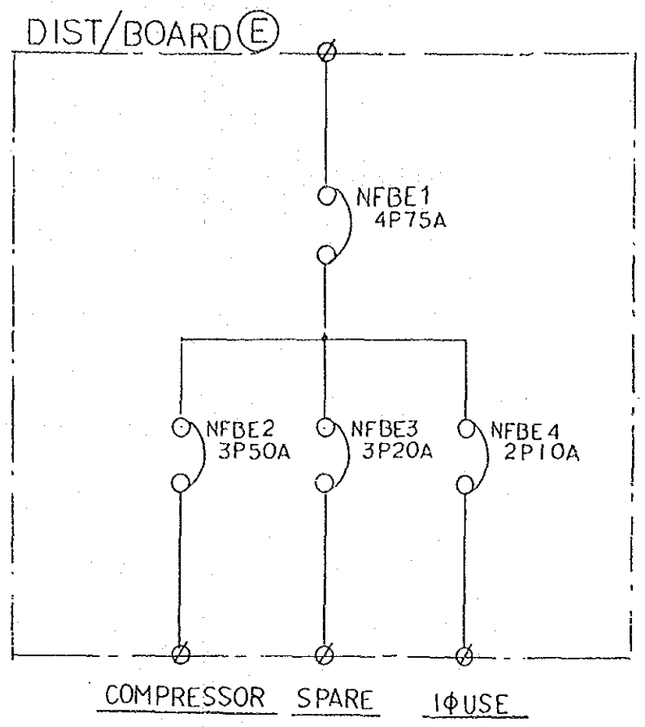
写図		承認			





MLH020

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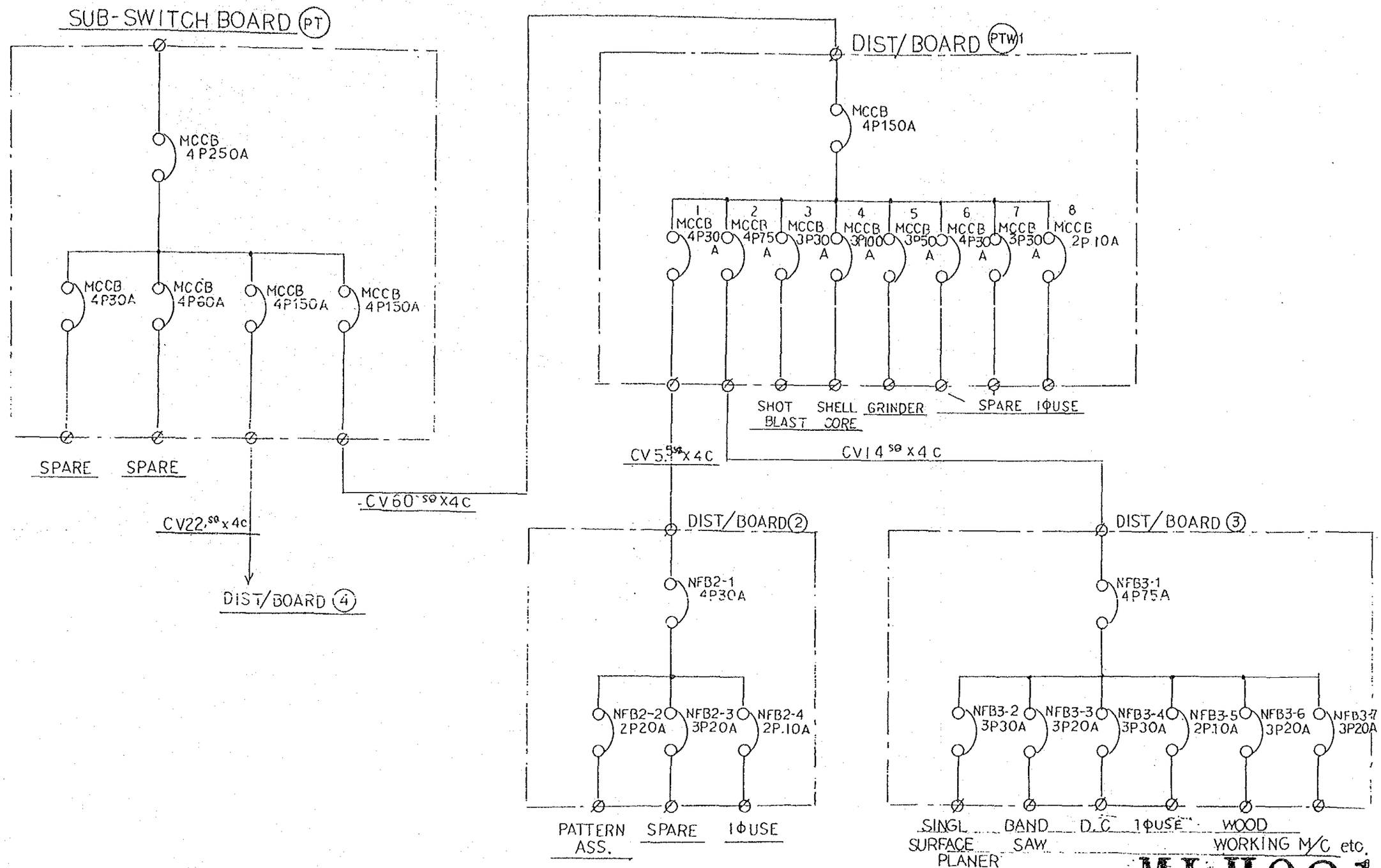
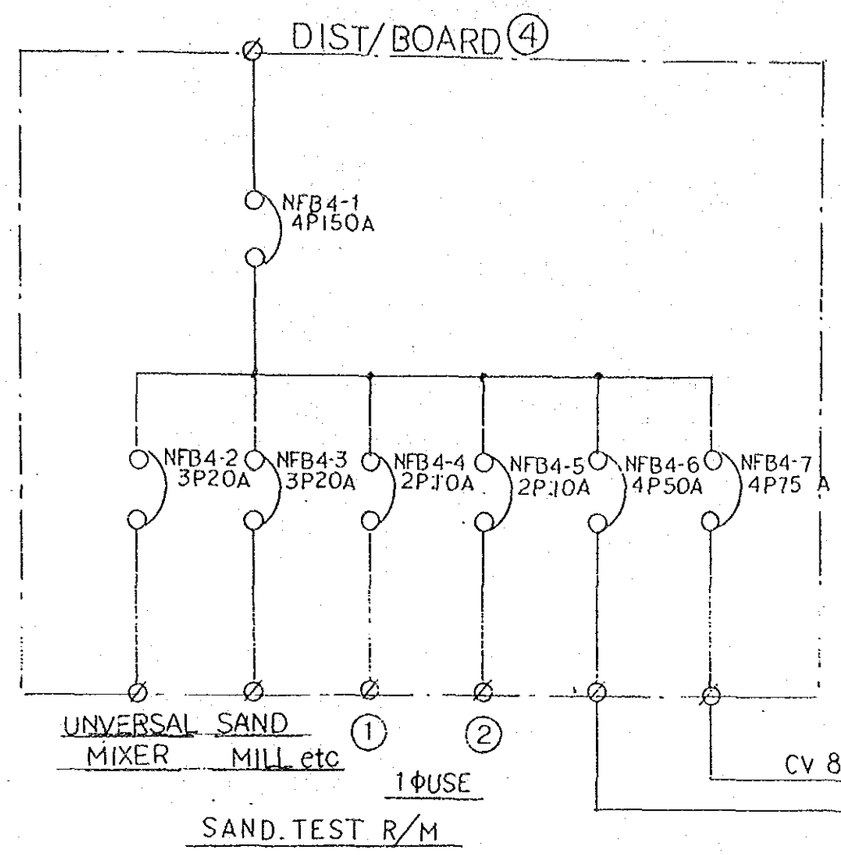
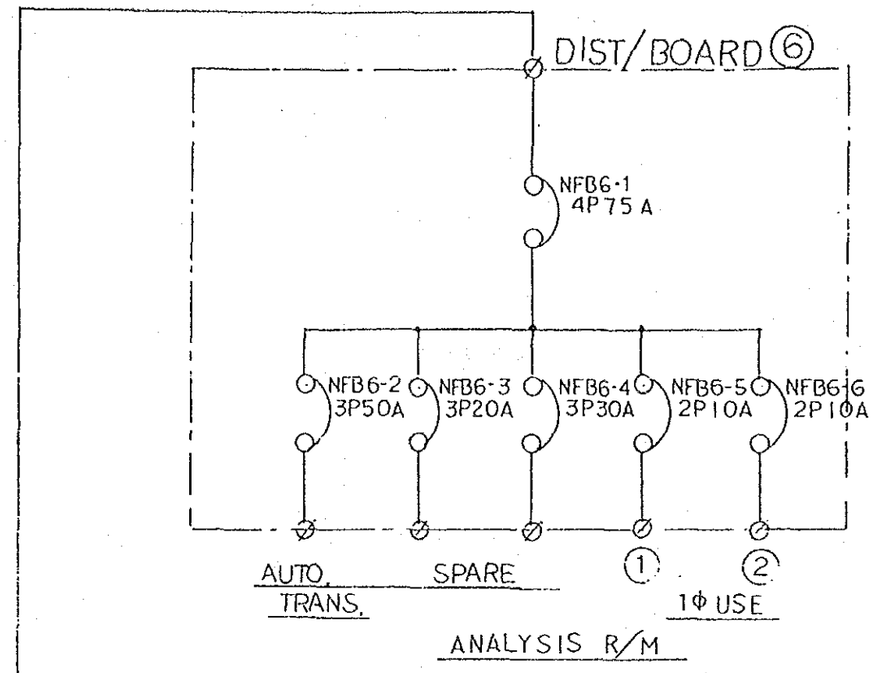
写図		承認			



MLH021

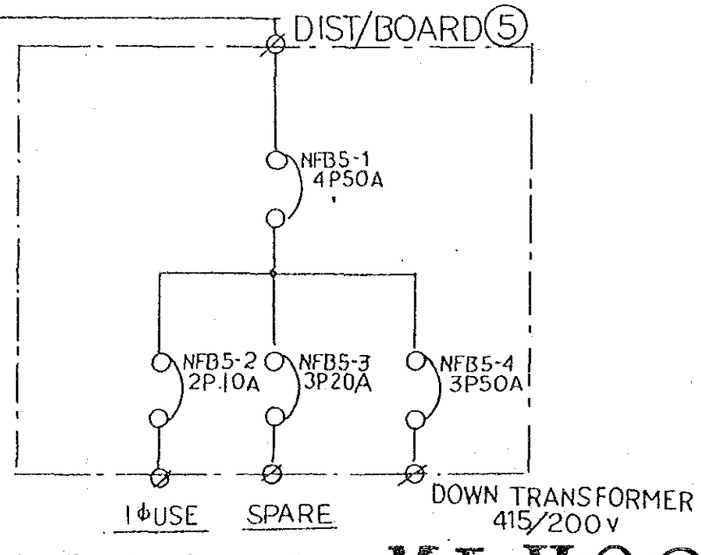
DIST/BOARD (4)





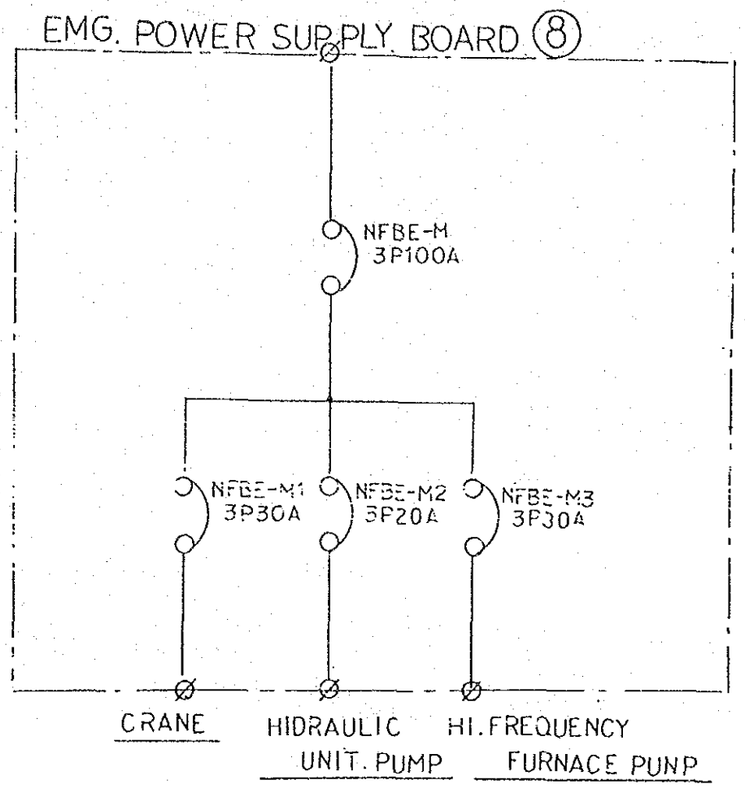
CV 8 sq x 4c

CV 8 sq x 4c



製図		審査		名称	DIST/BOARD (5)
写図		承認			

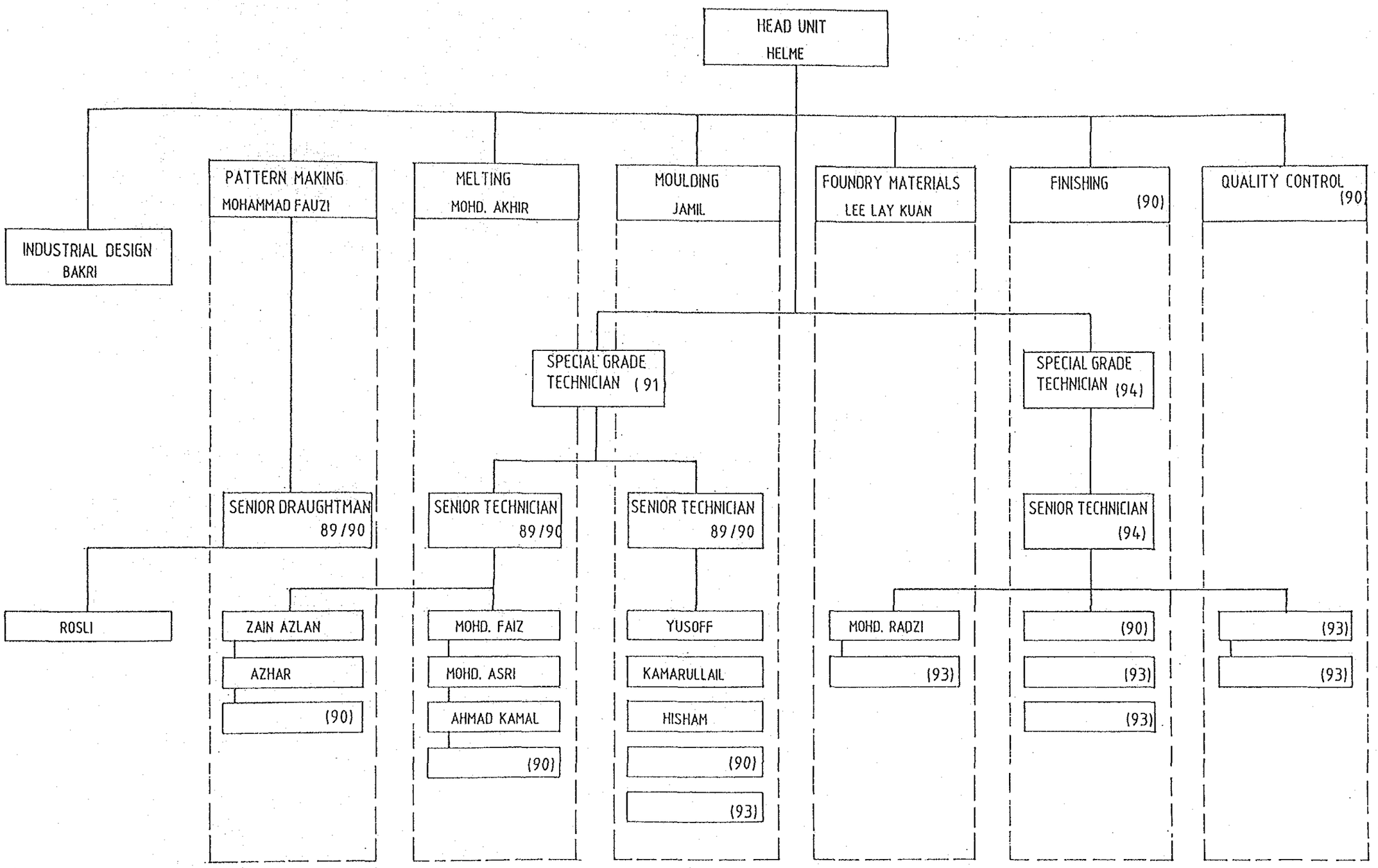
MLH022



MLH023

製図		審査		名称	EMG. POWER SUPPLY BRD
写図		承認			

ANNEX 3 ORGANIZATION STRUCTURE OF FOUNDRY TECHNOLOGY UNIT



ANNEX 4. DISPATCH OF THE SHORT-TERM EXPERTS

The Japanese side will dispatch the short-term experts in the field of:

- Installation and Operation

  a. High Frequency Furnace (3 weeks).
  b. X-Ray Flourescent Analyzer (3 weeks).
  c. Sand Preparation: CO_2 and organic sand (3 weeks).
  d. Sand Preparation: green sand (3 weeks).

- Melting (3 - 5 months).

- Moulding (3 - 5 months).

In addition to the above-mentioned short-term experts, the Malaysian side requested the Japanese side to dispatch short-term expert in the field of building supervision.

ANNEX 5. THE COUNTERPART PERSONNEL TRAINING IN JAPAN

Training of counterpart personnel in Japan in FY 1989 consists of two (2) courses; one is foundry in general and the other is the specified field.

1. General Course

This course aims at introducing basic knowledge and technique of foundry operaton. All four (4) counterpart personnel will be trained in one group.

The tentative time-schedule is as follows:

Field	Lecture (hour)	Practical Training (hour)
Pattern Making	15	6
Melting	15	6
Sand Preparation	6	3
Core Making	3	3
Moulding	6	3
Finishing	6	3
Inspection	9	6
Total	60	30

Note : A draughtman will undertake only the Pattern, Core Making and Moulding lectures.

2. Specified Course

This course aims at introducing production theory and technique in the specified field which each counterpart personnel engages in.

The tentative time-schedule is as follows;

(*1: L=Lecture(hour), *2: PT=Practical Training(Hour))

Field	Site	Transfer Items	L *1	P T *2
Pattern	Mo ka Works	1. Pattern Making 2. Gating System 3. Use of the Equipment 4. Maintenance of the Equipment	30	228
Moulding	Mo ka Works Material Laboratory	1. Moulding (Co_2 Process, Green Sand) 2. Sand Control 3. Core Making 4. Sand Testing 5. Maintenance of the Equipment	30	228
Melting	Mo ka Works Material Laboratory	1. Furnace Operation 2. Component Analyzing, Foundry Test 3. Furnace Making 4. Maintenance of the Equipment	30	228

Field	Site	Transfer Items	I. *1	P T *2
Drawing	Mo ka Works	1. Casting Design 2. Pattern Design 3. Gating System 4. Exposure to the operation & taking care of the drawing board & simulation computer	24	300

3. Others

In addition to the above-courses, the Japanese side will prepare a field trip.

ANNEX 6 LIST OF THE EQUIPMENT

PLAN				POWER	MANUFACTURER	MODEL	REMARKS
NO.	EQUIPMENT AND APPARATUS	SPECIFICATION	QUANTITY	(KW)			
1.	Melting						
	1) High frequency electric furnace (with power unit)	500kg/325kw	1	325	INDUCTOTHERM		(With ring hood/ Without duct & piping)
	2) High frequency electric furnace	100kg/230kw	1	230	INDUCTOTHERM		(ditto)
	3) Crucible furnace	80kg (for Cu) 25kg (for Al)	1	75	INDUCTOTHERM		(Without canopy hood, duct & piping)
	4) Cooling tower	for electric furnace	1	7.5			
	(Hydraulic pump)			2.2			
	5) Dust collector	50m³/min	1	3.7	SINTO	CDR-64PR	
	6) Scale	50kg/max	1		YAMATO	SD-50	
		500kg/max	1		YAMATO	DI-2	
	7) Ladle	50kg/max	1		NIPPON LADLES	NLG-50	
		100kg/max	2		NIPPON LADLES	NLG-100	
		600kg/max	2		NIPPON LADLES	NLG-600	
	8) Burner (gas fired)		1	0.4	CHUGAIRO	TMG-6B-L-D	
	9) Over head hoist crane	5 ton.14m×28m	2 set				
	10) Fork lift car	1.5 ton. (with shovel)	1		BOBCAT	SKID-STEER LOADER MODEL 743	

PLAN				POWER	MANUFACTURER	MODEL	REMARKS
NO.	EQUIPMENT AND APPARATUS	SPECIFICATION	QUANTITY	(KW)			
2.	Moulding						
	1) Jolt squeeze stripper moulding machine	650×575 (mm) (with pattern 2 sets)	2		SINTO	FD-2A	
	2) Roller conveyor	300 mm (width) Double	1		NAGAOYA KIKOH		
	3) Flask	300×240 × (200/200) mm	10 set		HISAGOYA		
		580×460 × (250/250) mm	5 set		HISAGOYA		
		1,000×800 × (300/250) mm	3 set		HISAGOYA		
	4) Pneumatic rammer		2		NSK	FR-00, FR-00L	
3.	Core making						
	1) Core blowing machine	310(W) × 400(L) × 340(H) (with pattern 1 set)	1		SINTO HISAGOYA	SBO-3C	
	2) Shell core machine	300(W) × (70/70) × 300(H) (with pattern 1 set)	1		SINTO HISAGOYA		

PLAN				POWER	MANUFACTURER	MODEL	REMARKS
NO.	EQUIPMENT AND APPARATUS	SPECIFICATION	QUANTITY	(KW)			
4.	Sand preparation						
	[CO_2 & organic sand]						
	1) Bucket elavator	10 t/h	1	2.2	SINTO		
	2) Sand storage with belt feeder	3 cu.m	1	1.5	SINTO		
	3) Whirle mixer	150 kg/Batch	1	15	SINTO		
	4) Dust collector	50 cu.m/min.	1	3.7	SINTO		(Except duct & piping)
	[Green sand]						
	5) Shakeout machine	1,000×1,000(mm)	1	3.7	SINTO		
	6) Belt conveyor	10 t/h with magnet pully & magnet separator	1	2.2	SINTO		
	7) Bucket elavator	10 t/h	1	2.2	SINTO		
	8) Sand storage with belt feeder	3 cu.m	1	1.5	SINTO		
	9) Sand mixer	120 kg/Batch, 7.5kw	1	7.5	SINTO		
	10) Dust collector	50 cu.m/min.	1	3.7	SINTO		(Except duct & piping)
	[Sand dryer]						
	11) Sand dryer (with sand supplying equipment and dust collector)	0.5 t/h	1 set	(20)	To be informed later		(Except duct & piping)

PLAN				POWER	MANUFACTURER	MODEL	REMARKS
NO.	EQUIPMENT AND APPARATUS	SPECIFICATION	QUANTITY	(KW)			
5.	Finishing						
	1) Shot blasting machine with dust collector	Table type 1m(dia.)/5.5kw	1	10	SINTO	SNT-OPT	(Except duct & piping)
	2) Grinder with dust collector	Wheel 510mm(dia.)/11kw	1	14.7	MATSUZAKI	MMG-20	(Except duct & piping)
6.	Air compressor etc.						
	1) Air compressor with dehydrator	15kw (2 cu.m/min.)	1 set	15	KOHBE STEEL	KST-15-C	
	2) Emergency electric power	Diesel engine, 37KVA	1 set		DENYO	DCA-45SP1	
7.	Instrumental analysis						
	1) X-ray fluorescent analyzer	80mA, 60kV	1	20	RIGAKU	3070E	
	2) C,S analyzer	C: 0 ~ 3.5% S: 0 ~ 0.35%	1	4	LECO	CS-244	
8.	Physical test						
	1) CE meter	2000 ~ 2500 ° F	1	0.1	NISABU	EH100-001	
	2) Immersion pyrometer	Digital type	1		NISABU	NSP-203(R)	
	3) Gas analyzer	Graduation 0.01ccH_2/100g	1	0.5	AL FAITH	DP-MKII	

PLAN				POWER	MANUFACTURER	MODEL	REMARKS
NO.	EQUIPMENT AND APPARATUS	SPECIFICATION	QUANTITY	(KW)			
9.	Sand test						
	1) Sand mill	20kg/Batch	1	0.75	SINTO	MSF-0L	
	2) Universal mixer	30kg/Batch	1	3.7	SINTO	OTM-101	
	3) Sand rammer	for test piece (ϕ50×50mm)	1		SINTO	SR	
	4) Sieving apparatus	240 r.p.m.	1	0.2	SINTO	RO-TAP SS	
	5) Sand washer	Timer:60min.	1		SINTO	SW	
	6) Permeablity tester	for green sand	1		SINTO	PT	
	7) Sand strength tester	Compressive strength	1	0.03	SINTO	US-M	
	8) Moisture tester	Infrared lamp drying	1	0.5	SINTO	F-2B	
	9) Hardness tester (green sand)	Load range:105 ~ 237g	1		SINTO	GHT	
	10) Hardness tester (dry sand)	Load range:1.1 ~ 2.0kg	1		SINTO	DHT	
	11) Active clay tester	with PH meter	1	0.2	SINTO	DT-535A	
	12) Mouldability tester	controlled by a timer	1	0.1	GF	PMT	
	13) Specific surface tester	820×236 ×207mm	1		GF	POF	
	14) Compactability tester	Comp.10kg/cm^2	1		NAKAYAMA	NS-CBT-2	
	15) Transverse strength tester	430×613 ×180mm	1		GF	PFG	
	16) Balance	Digital type	1	0.01	A & D	FR-300	
	17) Electric oven	40 ~300 ℃	1	1.4	YAMATO	DX-41	
		250~1200℃	1	1.0	SINTO	NMR 12SK	
	18) Wooden pattern for test piece	for Transverse strength	1		GF	PBC	

NO.	EQUIPMENT AND APPARATUS	SPECIFICATION	QUANTITY	POWER (KW)	MANUFACTURER	MODEL	REMARKS
10.	Pattern making						
	1) Single surface planer	Max.600(W) × 300(T)mm	1	4.85	IIDA KOHGYO	SX-633	
	2) Hand feed planer	Max.295(W)mm	1	1.5	IIDA KOHGYO	EJ-302	
	3) Band saw machine	Max.390mm	1	4.1	JONAN SEISAKUSYO	JBS-650	
	4) Radical drill machine	Drill dia.13 mm	1	0.25	YAMAMOTO KOHKI	EF-24	
	5) Wood working lathe	Length of bed : 2500 mm	1	1.5	FUJIKYU KIKAI	FT-24	
	6) Cutter lapping machine	Length 300 mm	1	0.2	FUJIKYU KIKAI	TF	
	7) Electric hand planer	Capacity 136(W)mm	1	1.14	HITACHI KOHKI	P40	
	Electric hand drill	Drill dia.13mm (steel)	1	0.62	HITACHI KOHKI	BUL-SH-3	(for steel)
	Electric hand jig saw	Capacity 60(W)mm	1	0.38	HITACHI KOHKI	JH-60A	(for wood)
	Electric hand sander	Capacity 114 × 280mm	1	0.35	HITACHI KOHKI	SV 12Y1	
	8) Measuring tools						
	Height gauge	300, 600 mm	each 1		MITSUTOYO	H-730N, H-760H	
	Box parallels	203.2×203.2 ×203.2 mm	1		NABEYA	BP-19M	
	Vernier caliper	200, 300 mm	each 1		MITSUTOYO	NE-20, NE-30	
	Scale	300, 600 mm	each 1				
	9) Surface plates	600×600, 900×1800 mm	each 1		OSS	OS-6060, OS-90180	
	10) Router machine	Table size 810×510 mm	1	1.5	SHODA IRON	RO-116	
	11) Circular saw machine	Table size 1000×900 mm	1	2.2	ISHIZU SEISAKUSHO	ISB-16	
	12) Grinder	Wheel size 255 mm	1	0.97	HITACHI KOHKI	ABT-4	
	13) Planer cutter lapping machine	Capacity 600×90 mm	1	0.75	TAKEGAWA IRON	JG-T60	
	14) Manual cutting tools		1		To be informed		
	15) Dust collector	80 cu.m./min.	1	5.5	NIHON SHUJIN		(Except duct & piping)

PLAN				POWER	MANUFACTURER	MODEL	REMARKS
NO.	EQUIPMENT AND APPARATUS	SPECIFICATION	QUANTITY	(KW)			
11.	Information Instrument						
	1) Copy machine		1		MINOLTA	EP-870Z	(Purchased in Malaysia)
	2) Personal computer		1				
			1		COMPAQ	DESK PRO 286	(Purchased in Malaysia)
			1		COMPAQ	LAPTOP SLT/286	(Purchased in Malaysia)
	3) Video Set						
	Video camera		1		SONY	CCD-V200	(Purchased in Malaysia)
	Color corrector	Multi system	1		SONY	XV-C700	(Purchased in Malaysia)
	Color monitor	Multi system	1		SONY	KX-21HG1	(Purchased in Malaysia)
	Video cassette recorder	Multi system	1		HITACHI	VT-498EM	(Purchased in Malaysia)
12.	Vehicle						
	1) Minibus	16 passengers with office room	1		MERCEDES	03090/35	(Purchased in Malaysia)

ANNEX 7 The Schedule of the Delivery of the Equipment

MMM : Making SSS : Shipping III : Installation OOO : Operation

Name of the Equipment	1989												1990			
	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7
Melting																
1. High Frequency E. F.	MMM	MMM	MMM	MMM	MMM	MMM	MMM	MMM	SSS	III	OOO	OOO	OOO	OOO	OOO	OOO
2. Scale	MMM	MMM	MMM	SSS	SSS					III	OOO	OOO	OOO	OOO	OOO	OOO
3. Ladle, Burner	MMM	MMM	MMM	SSS	SSS					III	OOO	OOO	OOO	OOO	OOO	OOO
Moulding																
1. Moulding Machine	MMM	MMM	MMM	MMM	MMM	MMM	MMM	MMM	SSS	III	OOO	OOO	OOO	OOO	OOO	OOO
2. Flask	MMM	MMM	MMM	MMM	MSS	SSS					OOO	OOO	OOO	OOO	OOO	OOO
Core Making																
1. Core Blowing Machine	MMM	MMM	MMM	MMM	MMM	MMM	MMM	MMM	SSS	III	OOO	OOO	OOO	OOO	OOO	OOO
2. Shell Core Machine	MMM	MMM	MMM	MMM	MMM	MMM	MMM	MMM	SSS	III	OOO	OOO	OOO	OOO	OOO	OOO
Sand Preparation																
1. CO_2 & Organic Sand	MMM	MMM	MMM	MMM	MMM	MMM	MMM	MMM	SSS	III	OOO	OOO	OOO	OOO	OOO	OOO
2. Green Sand	MMM	MMM	MMM	MMM	MMM	MMM	MMM	MMM	SSS	III	OOO	OOO	OOO	OOO	OOO	OOO
3. Sand Dryer				MMM	MMM	MMM	MMM	MMM	MMM	SSS	III	OOO	OOO	OOO	OOO	OOO
Finishing																
1. Shot Blasting Machine	MMM	MMM	MMM	MMM	MMM	MMM	MMM	MMM	SSS	III	OOO	OOO	OOO	OOO	OOO	OOO
2. Grinder	MMM	MMM	MMM	SSS	SSS					III	OOO	OOO	OOO	OOO	OOO	OOO
Air Compressor etc.																
1. Air Compressor	MMM	MMM	MMM	SSS	III						OOO	OOO	OOO	OOO	OOO	OOO
2. Emergency E. P.	SSS	III									OOO	OOO	OOO	OOO	OOO	OOO
Analysis & Test																
1. X-ray F. Analyzer	MMM	MMM	MMM	MMM	MMM	MMM	SSS			III	OOO	OOO	OOO	OOO	OOO	OOO
2. C. S Analyzer	MMM	MMM	MMM	MMM	SSS					III	OOO	OOO	OOO	OOO	OOO	OOO
3. CE Immersion Pyrometer	SSS												OOO	OOO	OOO	OOO
4. Gas Analyzer	SSS												OOO	OOO	OOO	OOO
Sand Test																
1. Compactability, Balance	SSS										III	OOO	OOO	OOO	OOO	OOO
2. Transverse S. Tester	MMM	MMM	MMM	SSS							III	OOO	OOO	OOO	OOO	OOO
3. Sand Mill	MMM	MMM	MMM	MMM	SSS						III	OOO	OOO	OOO	OOO	OOO
Pattern Making																
1. Measuring Tools	SSS						OOO	OOO	OOO	OOO	OOO	OOO	OOO	OOO	OOO	OOO
2. Electrical Hand Planer etc.	MMM	MMM	MMM	SSS			OOO	OOO	OOO	OOO	OOO	OOO	OOO	OOO	OOO	OOO
3. Single Surface, Circular Saw Machine	MMM	MMM	MMM	MMM	SSS	III	OOO	OOO	OOO	OOO	OOO	OOO	OOO	OOO	OOO	OOO

ANNEX 8. Measures to be taken by the Malaysian side before and after the arrival of the Equipment

The Malaysian side agrees to take the following actions:

1. To provide internal transportation from the port of disembarkation to the Project site.

2. To engage local contractors for the installation of the Equipment

3 To provide sufficient manpower assisting in the field of piping, wiring, ducting and installation.

4. To provide necessary facilities and material needed for the installation & operation.

Note: The duration for the installation is subjected to the circumstance during the installation

ANNEX 9: EQUIPMENT TO BE PROVIDED BY MALAYSIAN SIDE

NO.	EQUIPMENT	ESTIMATED COST	1990												1991			
			1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
1.	Casting Simulation Software	180,000	SSS	SSS	TTT	TTT	BBB	DDD	DDD	DDD	CCC	CCC						
2.	Heat Expansion Tester	150,000					SSS	SSS	TTT	TTT	TTT	BBB	DDD	DDD	DDD	DDD	CCC	
3.	Heat Conductivity Tester	270,000				SSS	SSS	TTT	TTT	TTT	BBB	DDD	DDD	DDD	DDD	CCC		
4.	Heat Treatment Furnace (gas fired)	250,000		SSS	SSS	SSS	TTT	TTT	TTT	BBB	DDD	DDD	DDD	DDD	CCC	CCC		
5.	Quenching Bath	50,000						SSS	SSS	TTT	TTT	BBB	DDD	DDD	DDD	CCC		
6.	Thermal Video System	280,000	SSS	TTT	TTT	BBB	DDD	DDD	DDD	DDD	CCC							
	Total	1,180,000																

S : Tender Specification T : Tender Process
B : Tender Board D : Delivery
C : Installation & Commissioning

ANNEX 10 WORKSHOP FACILITY

CART OF CORE (2 SET) 1/20

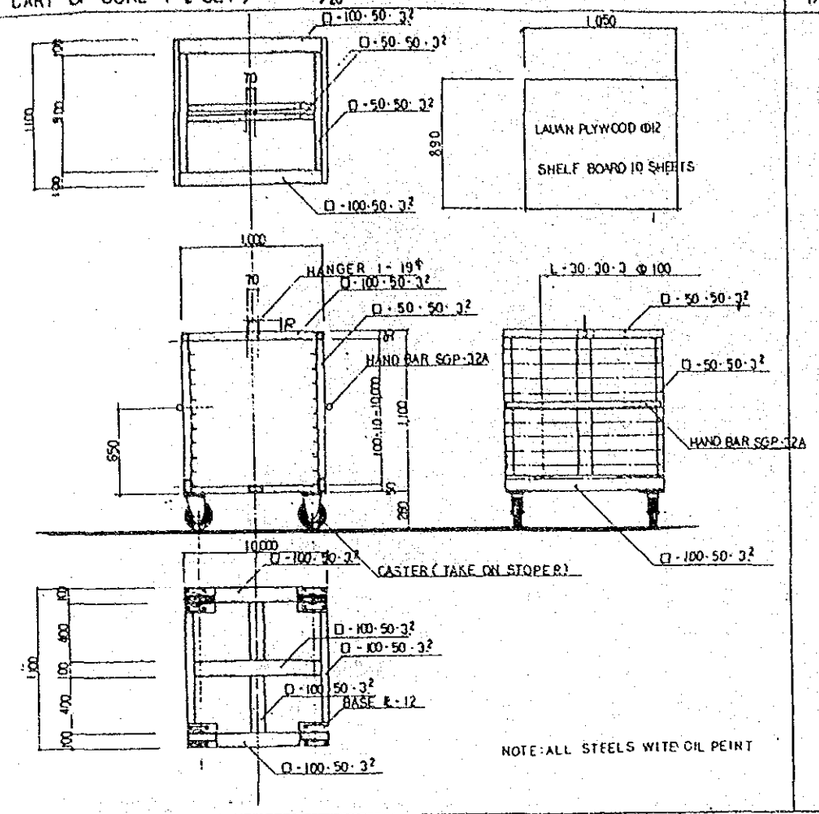
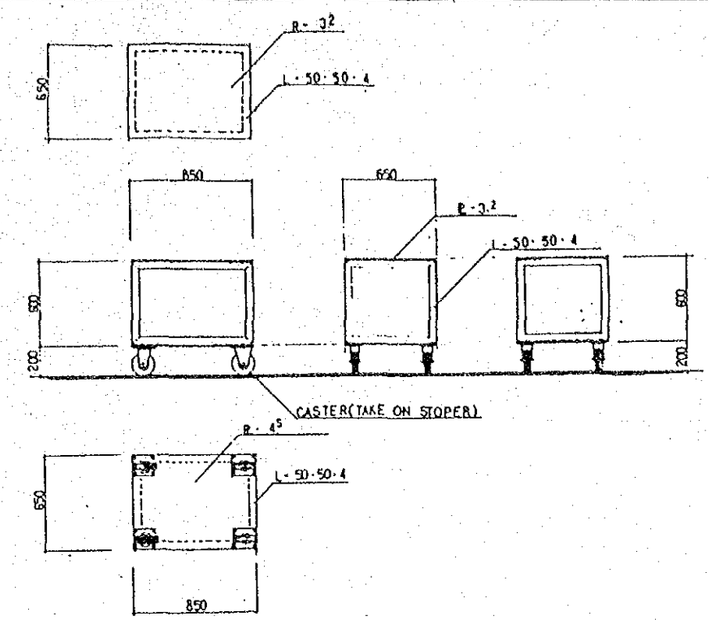
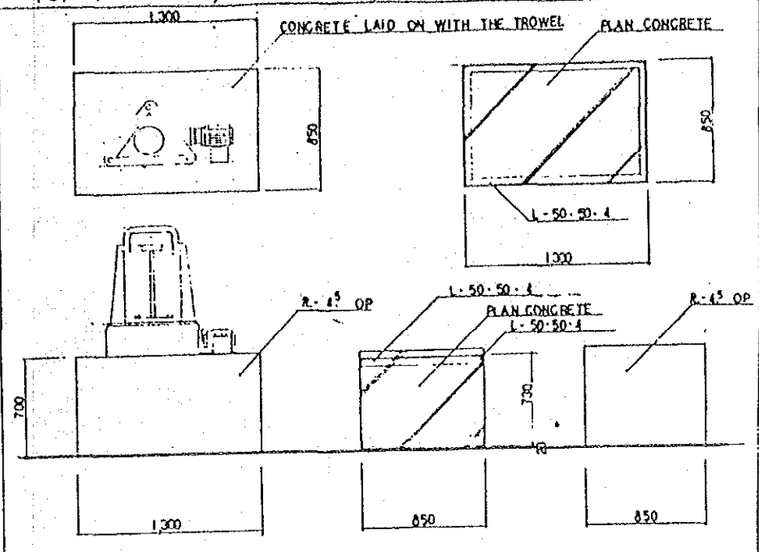


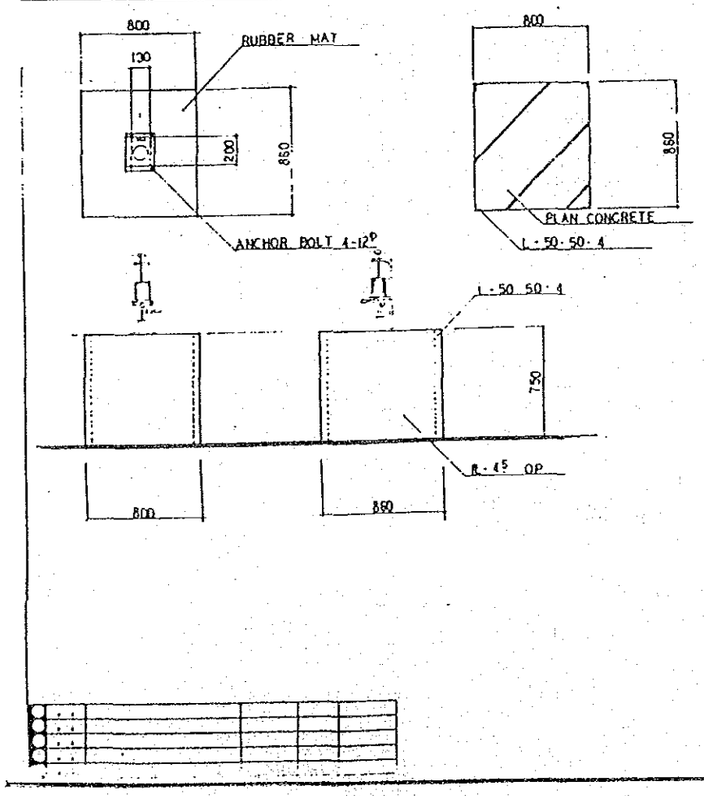
TABLE OF CORE MAKEING : (2 SET) 1/20



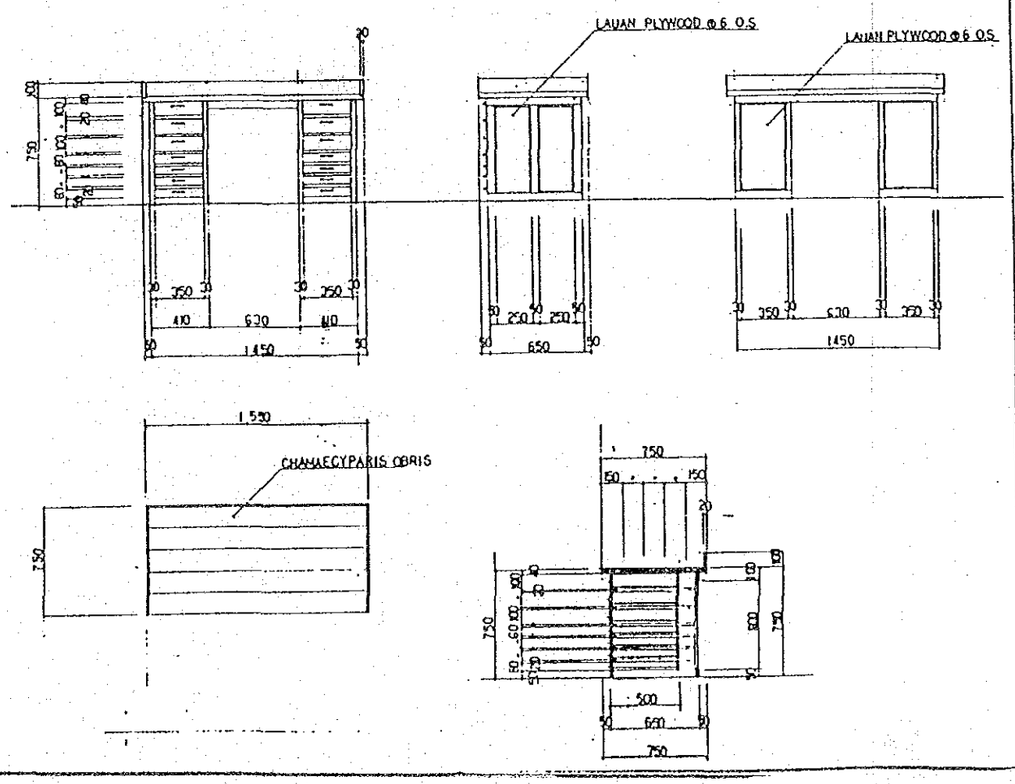
ROW TAP 1/20



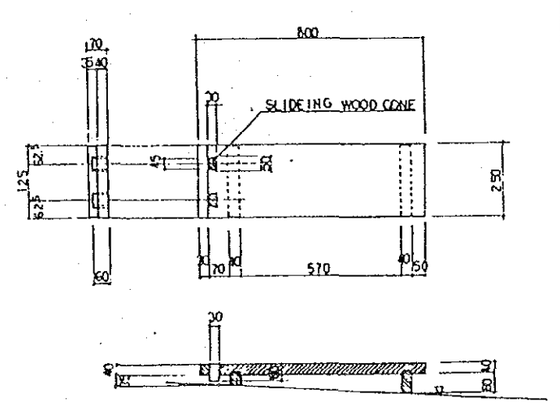
RAMMER 1/20



DESK 'OF PATTERN MAKEING 1/20



PLANER TABLE 1/10

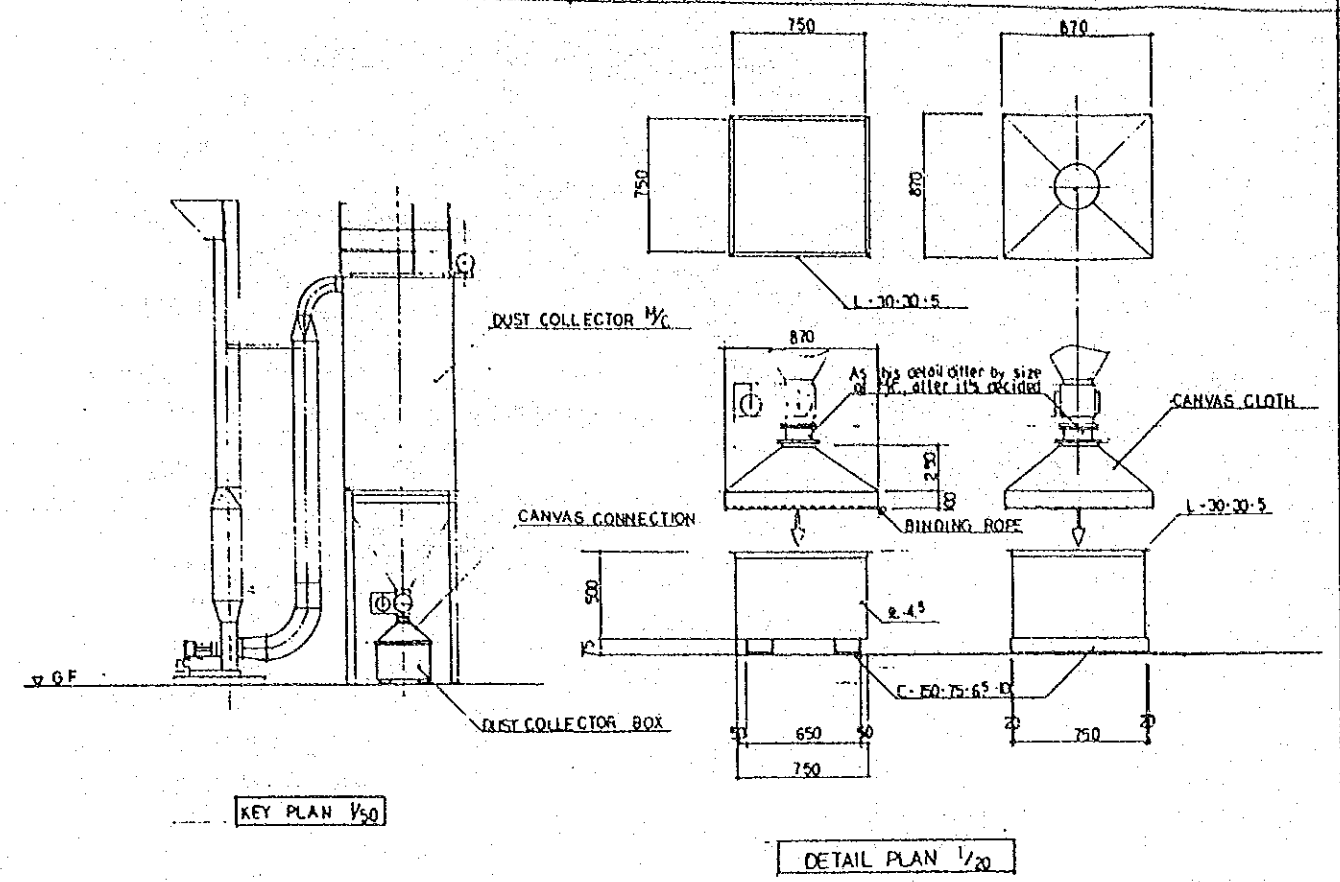


NOTE: MAKE OF CHAMAECYPARIS OBRIS

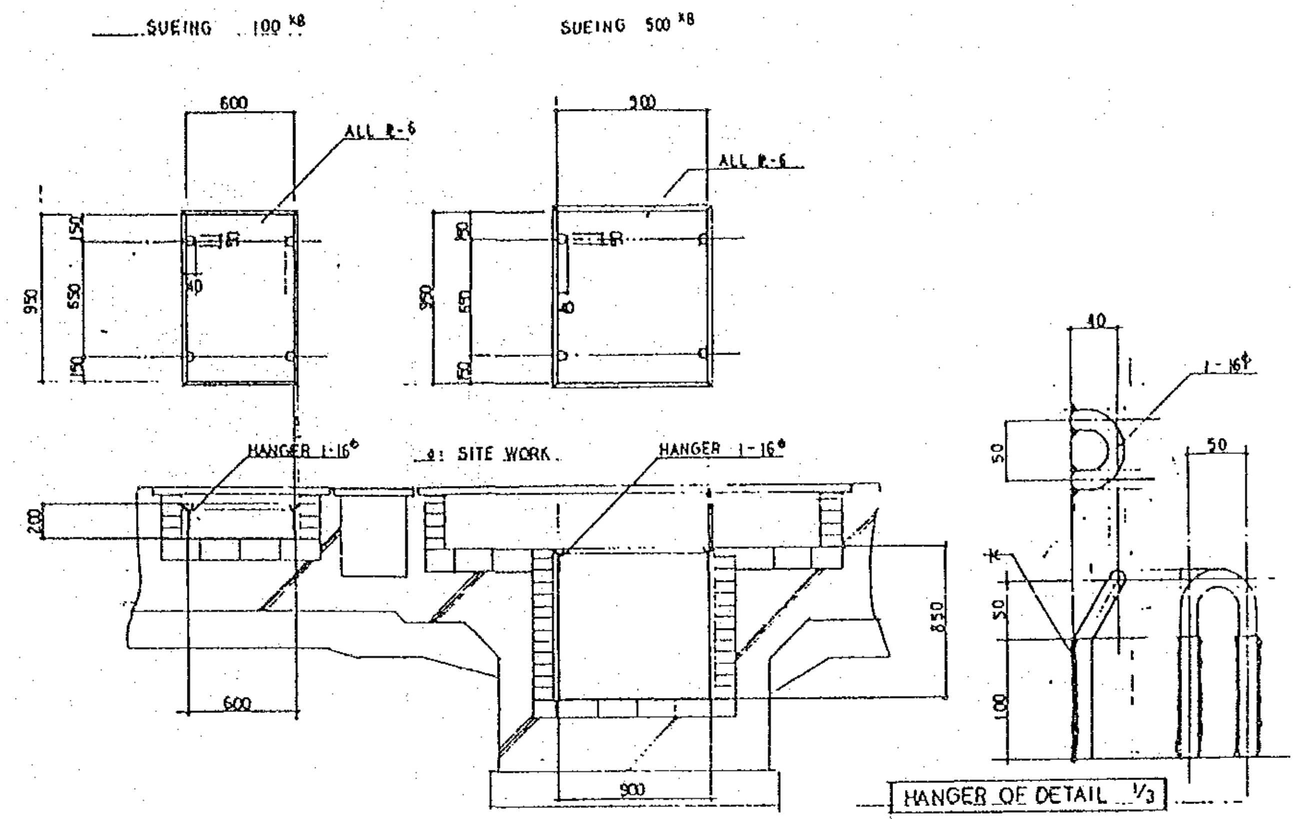
DETAIL PLAN (1)

MLH011

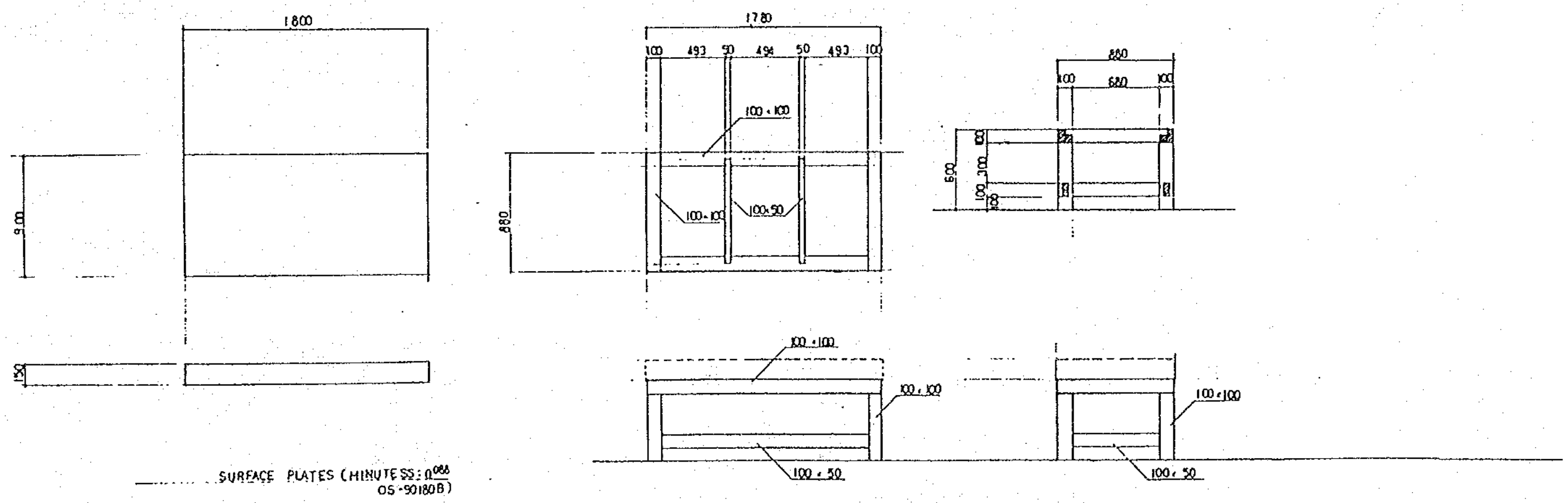
DETAIL OF DUST COLLECTOR BOX 1/50 1/20



DETAIL OF SLAG BUCKET 1/20



SURFACE PLATES & STAND 1/20



STAND OF SURFACE PLATES (MAKE UP CONIFER etc PINE)

符号	年月日	訂 正 内 容	訂正理由	作 業	氏 名

	4						
	3						
	2						
	1						
先方記号	品番	部 品 名	材 質	数量			備 考
注文主		作 番		数 量			
製図	— —	第 角 法					
資料	— —						
承認	— —	仕 様	尺 度				
事業	参照		／	DETAIL PLAN (2)			
[redacted]				MLH012			

ANNEX 11. ATTENDANCE OF MEETING

A. JAPANESE SIDE

1. The Expert Survey Team

- Naomichi Hara
  (Technology Transfer)
- Makoto Yamashita
  (Technical Cooperation Programme)
- Noriyasu Oe
  (Equipment)
- Takeo Ono
  (Building Extension)
- Kohiro Oshita
  (Utility Plan)
- Nobuyuki Fukai
  (Training Programme)

2. Long Term Expert

- Hiroshi Kanamori
  (Coordinator)
- Shinjiro Masamoto
  (Melting)

B. MALAYSIAN SIDE

1. SIRIM

- Helme Hashim
  Head of Foundry Technology Unit
- Asmadi Md. Said
  Head of Planning, Development & Evaluation Unit
- Muhammad Fauzi Ismail
  Research Officer

- Ahmad Zainal Abidin
  Research Officer
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