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CEMENT DEVELOPMENT AND RESEARCH CENTRE,
DP/TUR/72/034,
TURKEY.

Technical report: Study on the equipment and organisation of the Concrete Technology Laboratory (part II)

Prepared for the Government of Turkey
by the United Nations Industrial Development Organization,
executing agency for the United Nations Development Programme

Based on the work of U.P. Zimmer, expert in building materials testing

United Nations Industrial Development Organization
Vienna

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ABSTRACT

As part of the ongoing project of the United Nations Development Programme (UNDP) "Cement Development and Research Centre" (DP/TUR/72/034) that the United Nations Industrial Development Organization (UNIDO) is carrying out as executing agency for UNDP, an expert in building materials testing was sent on a two-month mission to Ankara to advise the Centre on equipment for its concrete technology laboratory and on its organization. The expert carried out his mission from 2 June to 27 July 1978. During the mission he was attached to the Centre and worked in close co-operation with Turkish engineers.

While the objective of the expert's first mission in October 1977 was to advise on the outlay for construction of the building materials test rooms, to define the needed equipment to carry out such tests, and to advise on the training of Turkish engineers,[1] it was the purpose of his present mission to inspect the progress of the construction works and to follow up on the recommendations made in his previous report. The expert gave further technical advice with regard to the new building for the laboratory, prepared a list with additional equipment and testing apparatus required for a smooth operation of the laboratory, extracted from the equipment list contained in his previous report such items which can be bought or manufactured locally and prepared drawings with the exact measurements for some of them.

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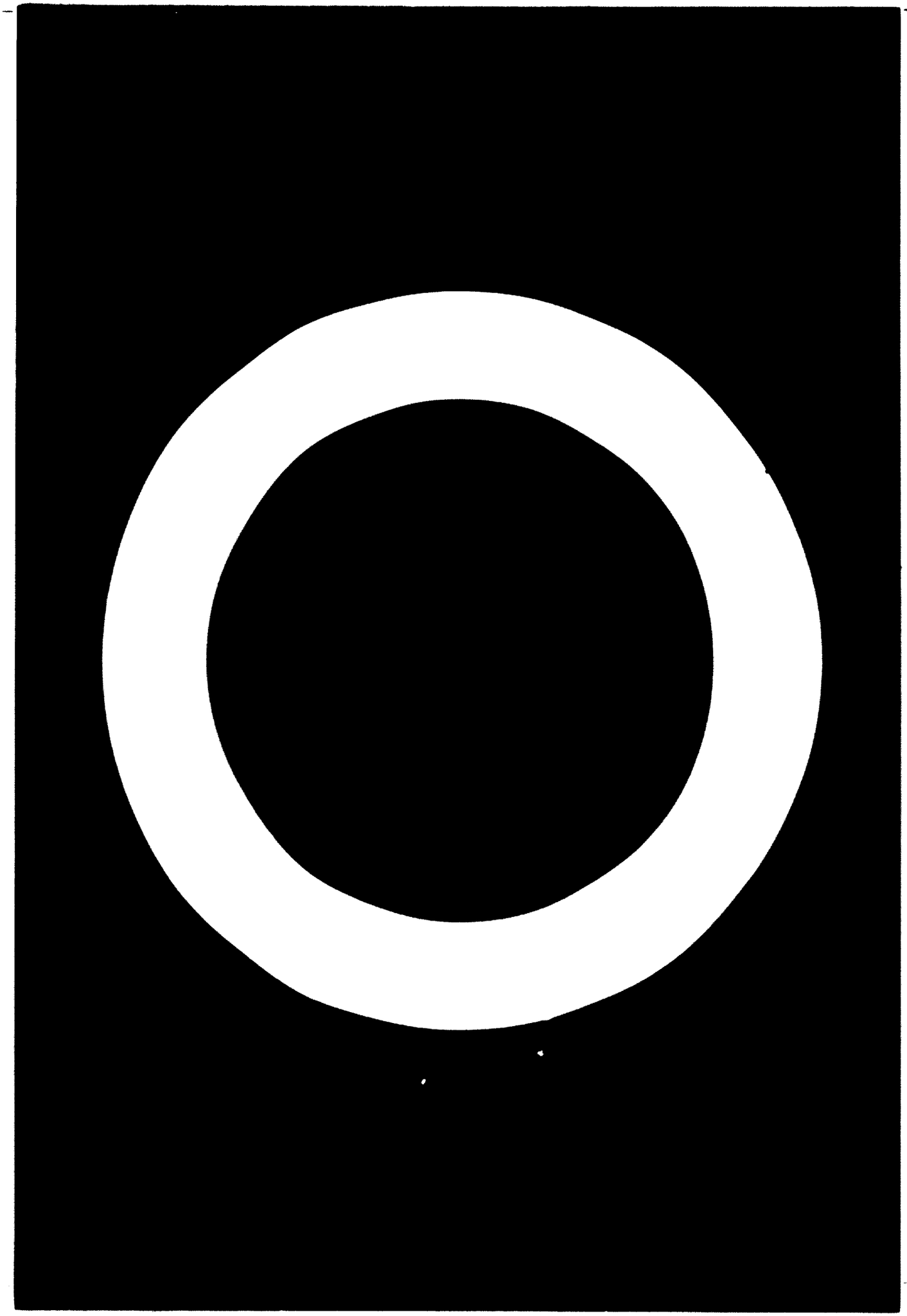
[1] See technical report DP/ID/SER.A/147.



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INTRODUCTION

As part of the ongoing project of the United Nations Development Programme (UNDP) "Cement Development and Researoh Centre" (DP/TUR/72/034) that the United Nations Industrial Development Organization (UNIDO) is oarrying out as executing agency for UNDP, an expert in building materials testing was sent on a two-month mission to Ankara to advise the Centre on equipment for its ooncrete technology laboratory and on its organization. The expert oarried out his mission from 2 June to 27 July 1978. During the mission he was attached to the Centre and worked in olose oo-operation with Turkish engineers.

I. CONCRETE TECHNOLOGY LABORATORY (ROUGH BRICKWORK)

Immediately upon his arrival at Ankara the expert visited the building site of the Turkish Cement Development and Research Centre. In the concrete technology laboratory, for which the expert is responsible, he checked that the measurements recommended in his first report for the rough brickwork were kept.

The expert made further technical recommendations which should guarantee an undisturbed and troublefree work in the laboratory. These recommendations were disoussed with a team of responsible engineers of the Centre and they were agreed upon with mutual consent. These technical amendments are not further described in this report.

II. TESTING APPARATUS AND EQUIPMENT

After repeated cheoking of the tests expected in future, under qualitative as well as quantitative aspects, a list with additional testing apparatus was prepared whioh should be taken into consideration when equipping the laboratory. This list is a result of discussions with the Turkish experts and especially with Mr. S. Kurihara, who's task was also to give his judgement on the testing equipment for the building materials laboratory on behalf of the Japan International Corporation Agenoy.

This equipment analysis with the exception of the above-mentioned jointly prepared list, is in all points identioal with the equipment proposed by the UNIDO expert (see DP/ID/SER.A/147).

Additional equipment

Item	Quantity	Specifioation
		Fresh oonorete testing room (room no. 1)
148	1 set	Proctor penetrometer (hydraulio gauge type) ASTM
149	1 set	Electrio steam ouring oven, 98°C, 200 l
150	1 set	MV (millivolt) recorder (for measuring ooncrete temperature) 10 MV, 12 points
151	3	Concrete blending test oontainer, ø 25 x 28.5 om, ASTM
		Curing room (room no. 2)
152	2	Water storage tanks (for oonorete mixing), 200 l
		Climate room (room no. 3)
153	1 set	German type oompaotor, DIN
154	1 set	Cement oompactor; ASTM
	1 set	Whittemore strain gauge, ASTM
155	3 sets	Spring-type oreep test apparatus (for compressive loading)
		Testing hall for hardened oonorete (room no. 4)
156	1 set	Automatio freezing and thawing test machine, ASTM
157	1 set	Dynamio modulus test apparatus

Item	Quantity	Specification
158	1 set	Ultrasonic concrete tester
		Strain determination apparatus
159	1 set	- Static strain indicator and switching and balancing box
160	1 set	- Compressometer and extensometer (for ϕ 15 x 30 cm specimen)
		Aggregates testing room (room no. 5)
161	1 set	Infra-red moisture balance
162	1 set	Aggregate crushing and impact testing apparatus, BS
163	1 set	Conical mould and tamper (JIS)
164	1 set	Sand and organic impurities test set (JIS)
165	1 set	Aggregate soundness test set, ASTM
166	1 set	Sand salt content test set (JIS)
167	3	Alkali-aggregate reaction container, ASTM
		Others
168	1 set	Electric autoclave, 300°C, 20 atm., 300 l
169	1 set	Sieving machine (for concrete testing aggregates)

At the request of the Turkish counterpart staff the expert extracted from the original list such apparatus and equipment which can be bought in Turkey or manufactured locally with simple means. This list includes the following 46 items of equipment described in detail in report DP/ID/SER.A/147: 1, 2, 3, 20, 23-26, 40, 61-79, 86-99, 110, 113, 119, 124 and 130. For most of these items the expert indicated the exact measurements and prepared the system drawings.

III. PLAN OF FUTURE ACTIVITIES

The rough brickwork of the concrete technology laboratory can be considered completed by the end of July 1978 and the inside building works should be completed at the latest 5 months afterwards.

The tender invitation for the equipment and apparatus should therefore be prepared without further delay. It has to be taken into consideration that the delivery time of the heavy equipment will be approximately 6 to 10 months. Transportation and erection will require further 4 to 6 weeks.

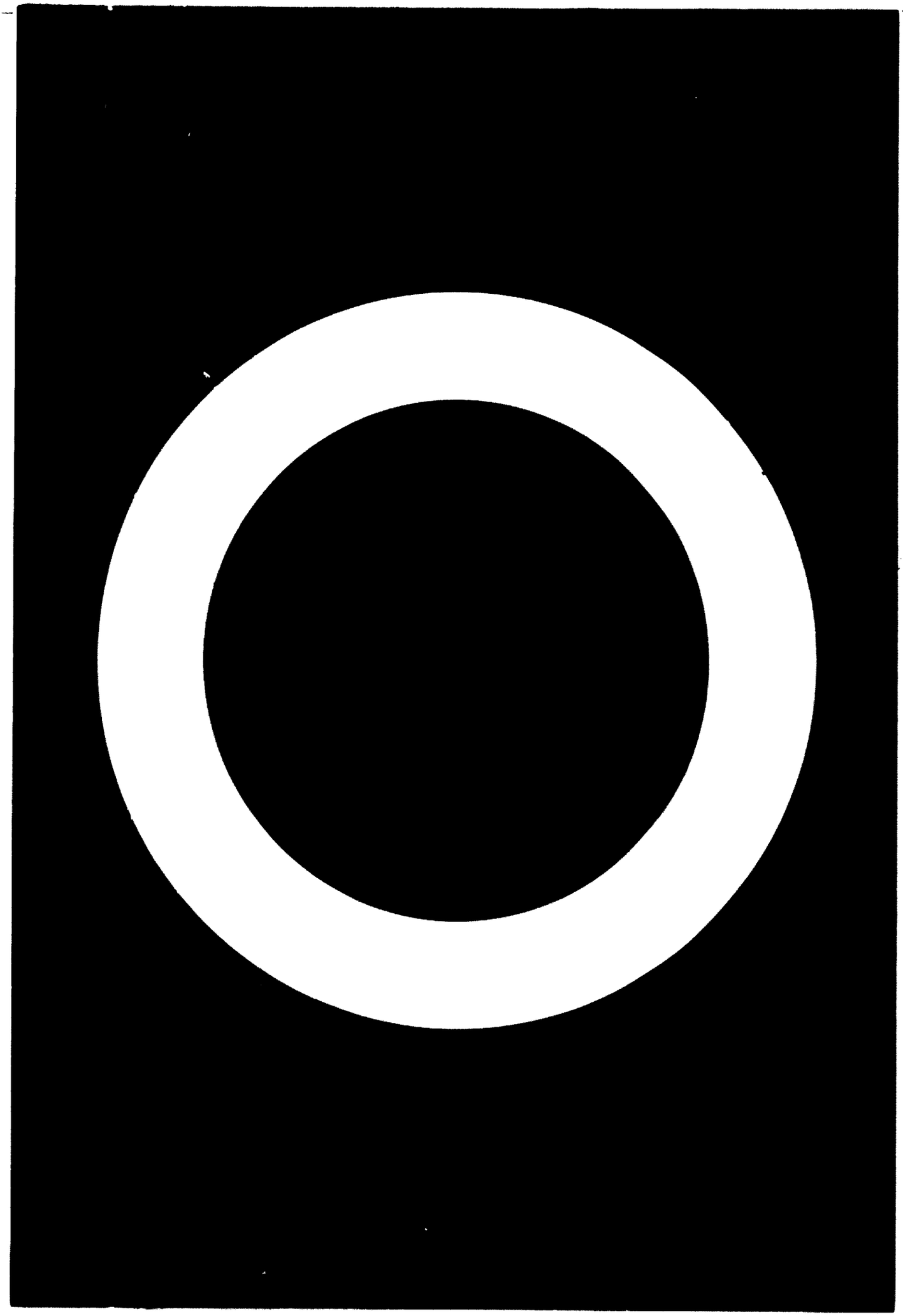
The training of the personnel will take 4 weeks. This means that the leading personnel (chief engineer and engineer) must be recruited some time before arrival of the equipment. They are, according to the training plan intended for this project, then to be trained at suitable institutes in Western Europe.

The following timetable should therefore be kept:

Activity	Starting	Time required
Prepare tender for the concrete and aggregates laboratory and for equipment for building materials testing hall	1st week 1979	4 weeks
Check offers nad order equipment	5th week 1979	4 weeks
Receipt of order confirmation of supplier	6th week 1979	6-10 weeks
Recruit leading personnel (chief engineer and engineer)	6th week 1979	4 weeks
Send personnel to training in Western Europe	30th week 1979	4 weeks
Delivery of testing equipment (assuming a maximun delivery time of 10 months)	46th week 1979	
Transport, erection and putting into operation (commissioning)	47th week 1979	6 weeks
Taking over of laboratory by own personnel	1st week 1980	

The expert considers the conorete technology laboratory in the Researoh Center an extremely important instrument in order to control, supervise and improve the Turkish building materials teohnology and building materials production.

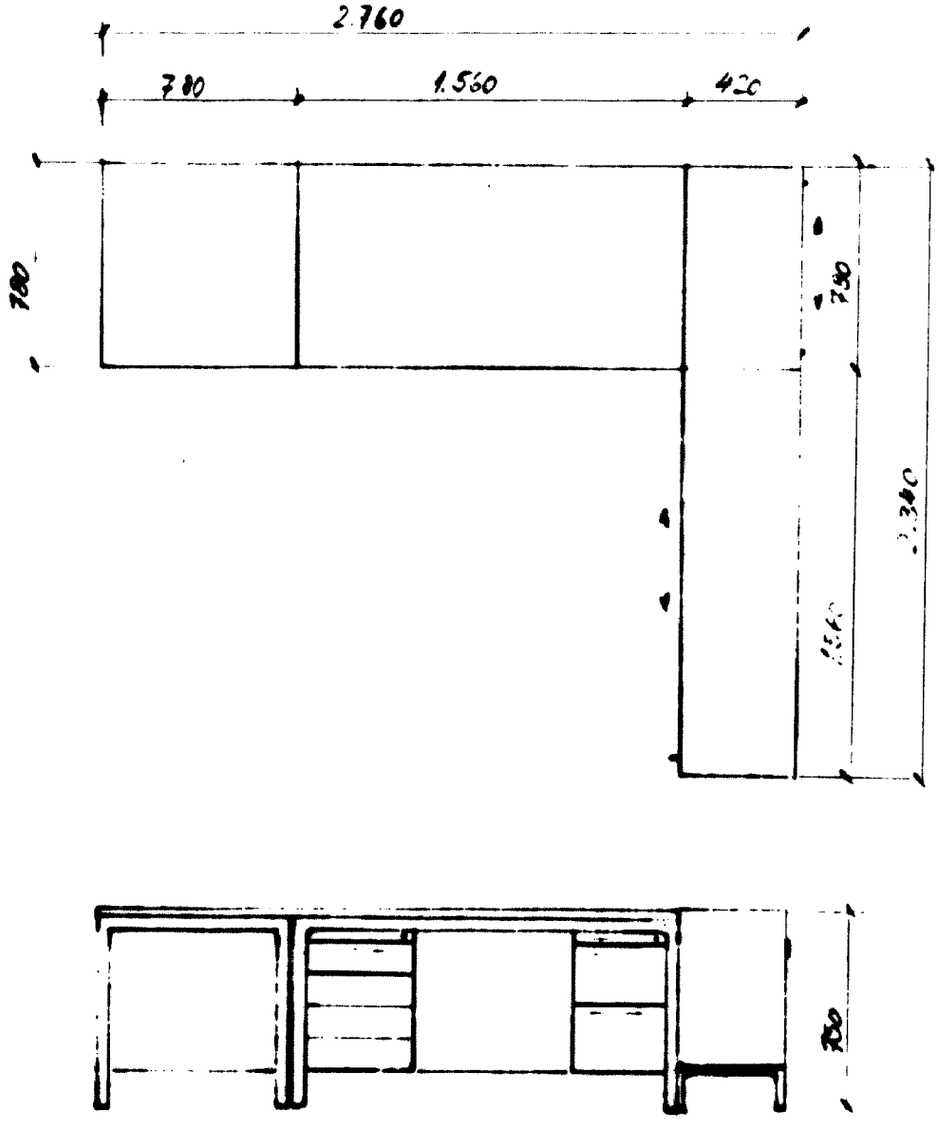
As such a central institute does not exist at present in Turkey, its operation must not be unneoessarily delayed. The above timetable shall prevent that, due to late dispositions, the laboratory may start to operate later than January 1980.



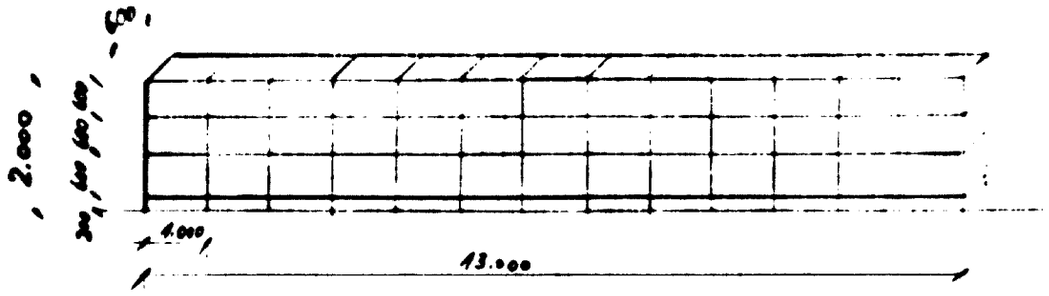
Annex

MEASUREMENTS AND PLANS FOR SOME ITEMS OF THE LABORATORY EQUIPMENT SUITABLE FOR LOCAL MANUFACTURE

Reoeption desk for incoming samples from customer (item 110)
(measurements in mm)

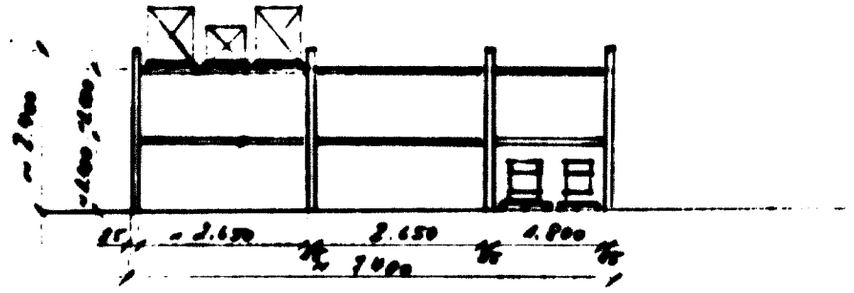


Shelf (item 24) for room no. 6



For room nos. 1 and 3, the shelf should be made only 2,000 mm long

Shelf for euro-special palettes (item 113) for room no. 4



Room 6 (store)

Item 24 1 ea. Steel shelving unit for the storage of samples

Length: approximately 13,000 mm

Depth: 600 mm

Height: 2,000 mm

with 13 compartments side by side and four steel shelves, one above the other, bolted in place

Load: 150 kp/shelf, with load distributed

Construction design: patent slotted angle iron (2-post) with steel footplates

Room 1 (fresh concrete testing)

Item 24 1 ea. Steel shelving unit

Length: approximately 2,000 mm

Depth: 600 mm

Height: 2,000 mm

Otherwise as above

Item 25 1 ea. Steel cupboard

Length: approximately 930 mm

Depth: 500 mm

Height: 1,950 mm

Steel cupboard with leaf doors. Three-bolt safety lock.

Four adjustable loose shelves

Item 26 1 ea. Steel cupboard

As above, item 25

Room 3 (climate room)

Item 24 3 ea. Steel shelving units

Length: 2,000 mm

Depth: 600 mm

Height: 2,000 mm

Otherwise as item 24, room 6

Room 4 (testing hall for hardened concrete)

Item 26 2 ea. Steel cupboards

As described under item 25, room 1

Item 25 3 ea. Steel cupboards

As described under item 25, room 1

Item 110 Reception desk

Consisting of:

1 table with modesty panel, tubular steel frame, 780 x 780 mm, 750 mm high

One desk with modesty panel on tubular steel frame 780 x 1,560 mm, 750 mm high

With two pedestals of eight vertical units each Left-hand pedestal with telescopic drawer, four tray drawers, mounted on roller bearings, normal extension

Right-hand pedestal with glass plate and two tray drawers mounted on roller bearings, normal extension

One cupboard with sliding doors 780 x 420 mm, 750 mm high, one loose shelf, veneered rear panel

One cupboard with sliding doors 1,560 x 420 mm, 750 mm high, one loose shelf, veneered rear panel

Tables and cupboard on tubular steel frames, height adjustable by means of levelling screws

Construction according to the latest regulations of the furniture industry and the vocational co-operative

Desk top and carcase finished according to colour table, either stained oak or walnut

Layout: see sketch to item 110

Item 113 1 ea. Pallet storage unit

Length: approximately 7,400 mm

Depth: approximately 1,050 mm

Height: approximately 2,400 mm

With two pairs of beams each, one on top of the other, for a total of 24 Euro pallets (1,200 x 800 mm)

Load: maximum 1,000 kp/pallet

Design: welded pallet store unit with patented slotting

Beam fixed by suspension fastening, with retention device

Continuous angle irons on base for better load distribution on floor, with holes for fixture by dowelling

Item 113a
50 ea. Euro pallets
1,200 x 800 mm, according to DIN 15146/1

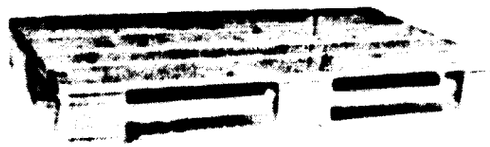
Item 119 1 ea. Refuse container
800 x 1,200 mm x approximately 525 mm high

On feet for lifting by forklift truck

Stackable. Capacity 1,000 kp

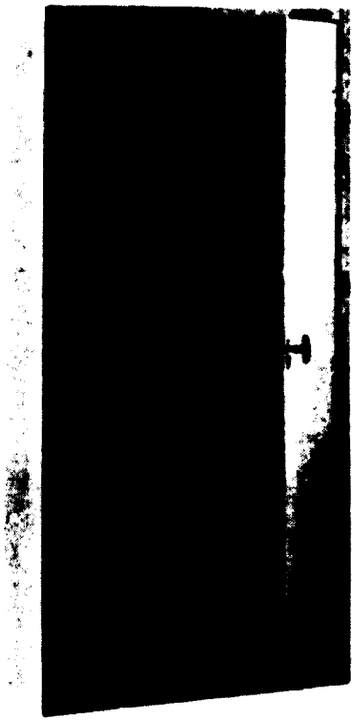
Laboratory equipment, Ankara, Turkey

Item 24

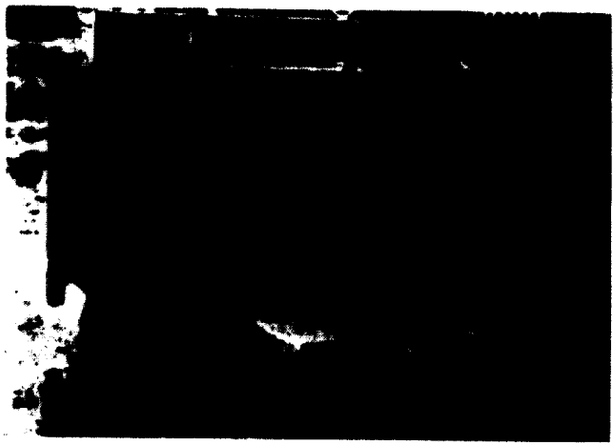


Item 113a

Europa flat pallet
Dimensions 800 x 1,200 mm, DIN 15146/1
(four-way pallet) entry from all four sides by forklift truck or hand lift truck



Items 25 and 26

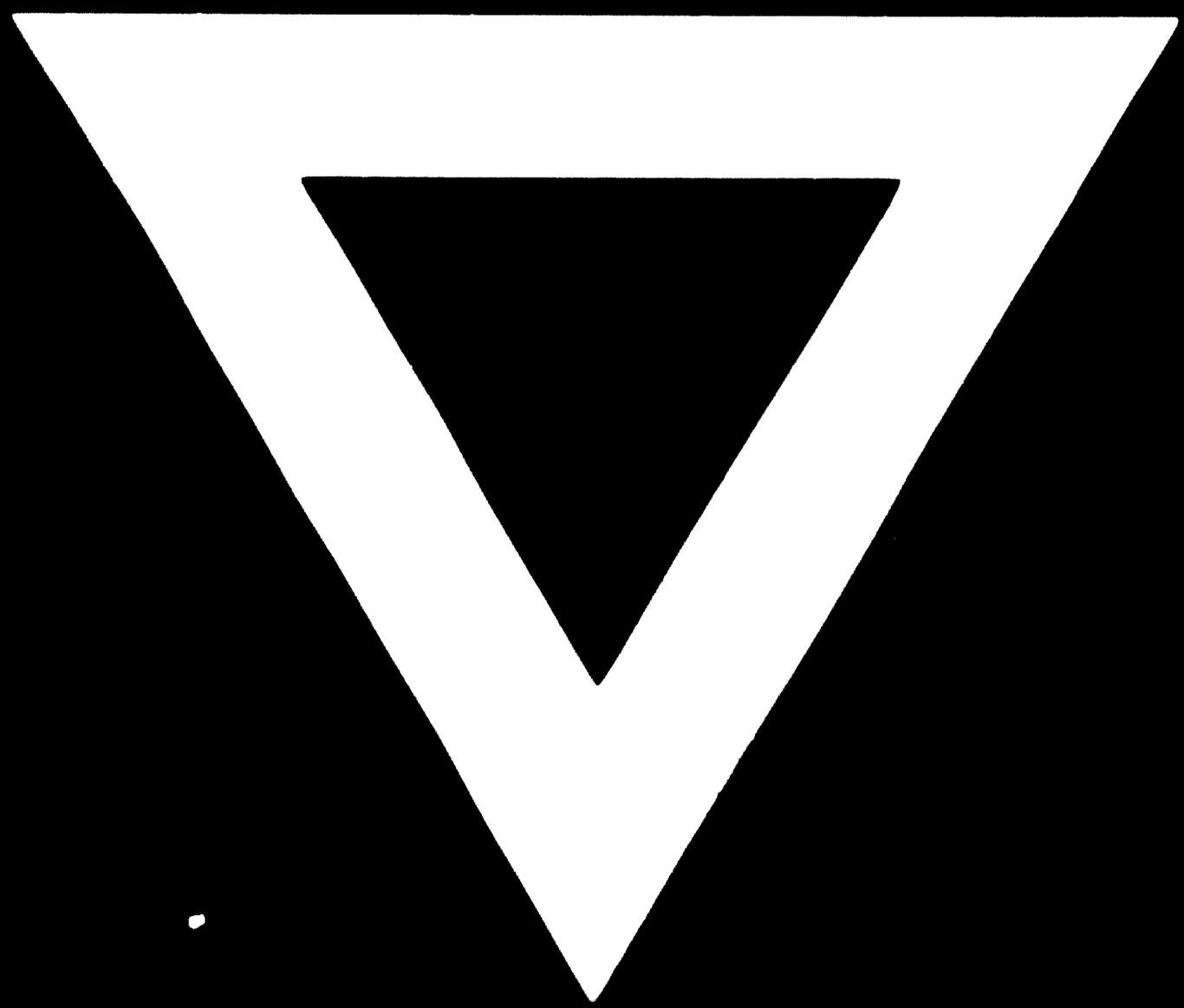


Item 119

Steel section construction, bottom frame and corner upright of steel sections, upper edge twice folded over. Bottom and walls of sheet steel. Bottom strengthened with braces. Large stacking corners. Capacity 1,000 kg. Stackable four ways. Colour: blue

Width		length		height	Entry height for forklift
		mm			mm
600	x	800	x	525	plus 100
800	x	1000	x	525	plus 100
800	x	1200	x	525	plus 100
1000	x	1200	x	525	plus 100

B-6



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