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CEMENT DEVELOPMENT AND RESEARCH CENTRE .

DP/TUR/72/034.

TURKEY.

Technical report: Study on the equipment and organization
of the Concrete Technology Laboratory .

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

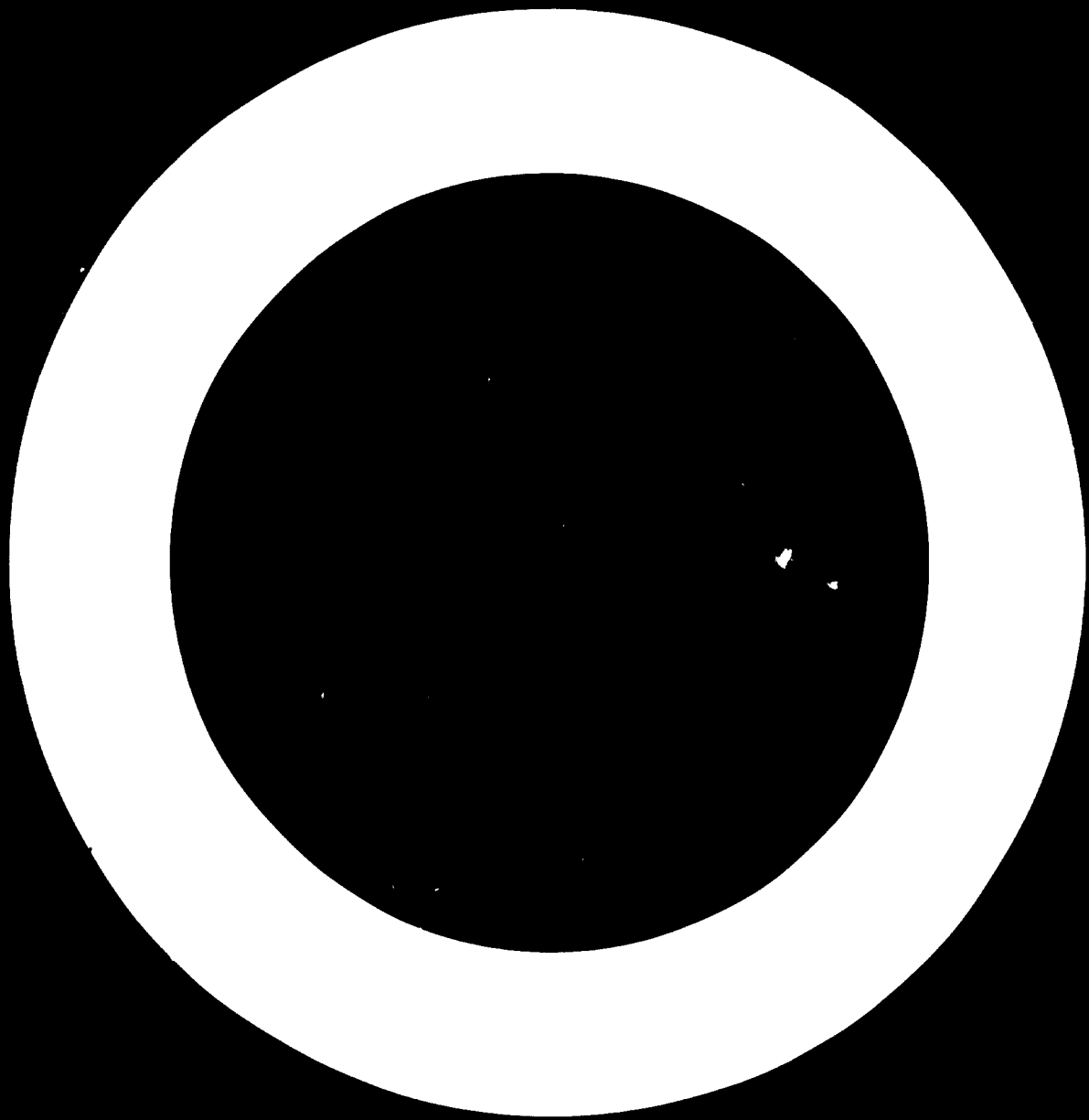
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ABSTRACT

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 one-month mission to Ankara at the request of the Government of Turkey to advise the Centre on equipment for its concrete technology laboratories and on their organization. The expert carried out his mission from 2 October to 15 November 1977 and from 2 December to 17 December 1977. During the mission he was attached to the Centre and worked in close co-operation with Turkish engineers.



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INTRODUCTION

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 one-month mission to Ankara at the request of the Government of Turkey to advise the Centre on equipment for its concrete technology laboratories and on their organization. The expert carried out his mission from 2 October to 15 November 1977 and from 2 December to 17 December 1977. During the mission he was attached to the Centre and worked in close co-operation with Turkish engineers.

Annex I gives the expert's job description.

I. FINDINGS

The bare brickwork of the institute (E-block)

The expert inspected the concrete laboratory, which was still bare brickwork at the time of his visit, thoroughly several times.

General impression

The rough brickwork of the E-block of the institute was already very far advanced, and the necessary alterations could only just be made.

The size and design of the rooms of the E-block are suitable for the activities of a concrete laboratory, but they are by no means too big.

In the concrete laboratories quality control, scientific research and development are to be executed according to Turkish and international standards (ISO, ASTM, DIN). Furthermore, it is intended to hold courses on concrete technology and on technological testing for experts at all educational levels.

The laboratory is, apart from some exceptions mentioned below in connection with proposals for improvement, very well planned.

After this laboratory has been completed and equipped it will be comparable with the concrete laboratories of concrete research institutes in Western Europe.

Proposals for improvement

The ceilings of the ground floor have been built with 350 kp/m^2 carrying capacity. For a laboratory, especially for the test hall of a laboratory with heavy testing machines, by far too little stability has been provided. Normally the ceilings of a concrete laboratory should be built with a ceiling load capacity of $1,000 \text{ kp/m}^2$. For heavy loads, it should be correspondingly higher. According to rough estimates, however, in the hardened-concrete test hall (room 4) even in the range of heavy test machines point-loads up to $15,000 \text{ kp/m}^2$ are likely.

Furthermore, it has to be taken into account that transport vehicles (e.g. fork-lifts) with loads up to $1,500 \text{ kp/m}^2$ will be moving on the premises.

The representatives of the building company and the building management have been informed of these facts and they will deal with this problem.

Special attention must be paid to the fact that no heavy vehicles, for example lorries, should be driven into the test hall (room 4), because of the low ceiling load capacity. For transport-technical reasons, a certain area at the entrance door of the hall should be reserved, which would have to be constructionally reinforced (for example by means of columns, which would have to be arranged accordingly in the basement).

Normally a test hall for the testing of freshly mixed concrete with heavy test machines is situated in the basement because individual machines need bigger concrete foundations, which then can be sunk into the ground. The test hall (room 4) unfortunately has a basement underneath it so that no foundations can be sunk into the ground. It is therefore recommended that for the heavy machines the normal concrete foundations be replaced by special steel foundations.

The drive to the main entrance of the test hall must have a ramp for vehicles. The ramp should have no more than a 10% slope, and it should have accordingly high stability.

The doors in the basement are too small for the transportation of the specimen. In rooms 5 and 6 the doors should be enlarged to a width of 150 cm.

In room 6, which serves as a storage room, a gate at least 2.5 m wide is required on the wall to the garage, since, it is necessary to drive into the room with a fork-lift or similar vehicle.

Individual laboratories

After intensive studies of the rooms of the concrete laboratory and after discussions on the future tasks of the laboratory, the expert allocated the rooms of the laboratory as described below. Technical drawings O1 and O2 in annex 2 show the layout.

Room 1 (aggregate and fresh concrete testing)

In room 1 the laboratory for aggregates and freshly mixed concrete will be installed; all tests on sand, aggregated and freshly mixed concrete will be carried out here.

These tests include:

- Sample splitting
- Drying
- Sifting
- Weighing
- General tests
- Grain size
- Moisture
- Bulk density
- Water absorption
- Materials of organic origin
- Abrasion
- Mixing
- Compacting
- Composition
- Air content
- Sampling
- Water permeability

Room 2 (curing room)

In room 2, the wet storage room, a relative humidity of 98% and a temperature of $20^{\circ}\text{C} \pm 2^{\circ}\text{C}$ will be maintained. Two basins for storing water will be placed here. In this room specimens will be stored wet, or damp, according to the standard.

Room 3 (climate room)

In room 3, the climate room, relative humidity of 65% and a temperature of $20^{\circ}\text{C} \pm 2^{\circ}\text{C}$ will be maintained. In this room specimens will be stored dry according to the standard.

Room 4 (testing hall for hardened concrete)

In room 4, the big test hall, all physical tests on hardened concrete will be carried out. The heavy testing equipment and machines, all machines for testing compression, bending, crushing and tensile strength, will be placed here.

The specimens will partly be transported on conveyor belts from the climate room to the compression testing machine. A fork-lift or crane will be used to transport heavy specimens. Among others, the following tests can be carried out in this laboratory:

- Compression tests
- Bending tests
- Tensile tests
- Crushing tests
- Abrasion
- Non-destructive tests

Room 5 (specimen preparation)

In room 5 specimens will be sawn or drilled out of stored pieces of material when needed. The surface (compression area) of the specimens can be ground here.

Room 6 (materials and specimen storage room)

In room 6 sand, aggregates and cement will be stored in boxes and containers. Specimens can be stored on shelves. Spare parts or non-used equipment can be stored here.

Water, electricity, drainage

The water and electricity supply is at present sufficient. An exact plan of the laboratory's required water, electricity and drainage connections is shown in technical drawing 03 in annex II.

Testing equipment

The proposals for equipping rooms 1-6 have been elaborated in accordance with the latest Western European technology and according to the standards.

Especially for the laboratory for testing aggregate and freshly mixed concrete so-called "performance units" are planned, that is, test apparatus that is built-in with the laboratory working tables for greater efficiency.

These performance units will be joined to form so-called "test streets", which means, the specimens can, partly on conveyor belts, be transported from one test unit to the other easily. This ensures a continual "test run".

The performance units have the following advantages:

- No erecting and dismantling of the testing apparatus
- Little physical effort required in transporting the specimens
- Quicker testing, good "test run"
- Clean working place
- Economic use of available space
- Accident-proof and decent working place
- Better survey of working place, convenient working heights
- All built-in apparatus secured as much as possible against damage and dirt

The expert proposed the test equipment and the best machines of the complete laboratory and described them in detail in accordance with the high level of the institute and its future field of activities (quality control and research). An exact description of the technical requirements is very important, since very high-quality technical apparatus is concerned, which, if not described in sufficient detail, can be supplied in a great variety of designs and of differing quality. The prices may sometimes differ by a factor of 10.

When inviting tenders or ordering the apparatus, utmost attention should be given to the correct observance of the technical requirements and descriptions.

Installation, erection and handing over of equipment

When the laboratory equipment is purchased, it is, for obvious reasons, urgently recommended that the equipment be ready for operation, which means that the price includes:

- Equipment
- Packing
- Insurance
- Transport to the laboratory
- Erection and connection of the power supply
- Handing over the equipment and instruction in its use

For the complicated machinery, an electrical engineer or a machinery engineer should have four weeks of training in the factory of the manufacturer in the technical and electrical functioning of the machinery. Additionally, a

concrete engineer of the manufacturer should be at the laboratory of the institute for 14 days to run in the apparatus, together with the personnel of the institute.

Spare parts

For all the important apparatus delivered, a supply of spare parts that will last for at least two years should be bought along with the laboratory equipment.

Recommendations and observations on the establishment of the testing facilities

Costs

The costs of the complete laboratory (equipment for rooms 1-6) will be, depending on the quality and the equipment, but according to the specification, DM 1.2-1.5 million (as of 1 November 1977).

The laboratory must be equipped with items 1-145 to guarantee its technically perfect operation. However, if for financial reasons, not all equipment can be purchased at once, items 114, 115, 117, 120 and 121 could be postponed until the next year. The costs would thereby decrease by DM 500,000 to DM 600,000. This equipment is, however, absolutely necessary.

Required personnel

The personnel requirements of the laboratory depend mainly on the size of the tests and the tasks to be executed.

Chief engineer

The chief of the concrete laboratory should be an academically educated engineer; and his professional training should have been either in chemistry, mineralogy or building construction. He should have worked at least seven years in the field of building materials or testing of building materials.

He will represent the laboratory professionally. He will be the discussion partner of customers and professional colleagues. He will be responsible for the management and the technical training of the personnel. He will have to work out research tasks and supervise their execution. Also he will have the full responsibility for all test certificates and test results.

Engineers

Two engineers will be required. They should have had an academic education as a chemistry or building engineer or the equivalent training, for example in concrete technology according to DIN 1045. They should have had at least two years' experience in the field of building construction or building materials testing. They will instruct the personnel, set up test instructions and test tasks and control the test results. They must be present and control difficult tests, represent the laboratory chief in his absence and prepare test certificates.

Laboratory assistants

Two laboratory assistants will be needed for carrying out the physical or chemical tests of aggregates, freshly mixed concrete and hardened concrete. They should have a basic knowledge of cement or concrete. One laboratory assistant should be responsible for the aggregate and fresh concrete laboratory and the other for the hardened concrete laboratory.

Both laboratory assistants should execute simple tests independently, difficult tests according to instructions. They should make test protocols and they should be able to operate all machines and apparatus without difficulty.

Assistants

Two assistants will be required for transporting specimens, aggregates and cement; servicing the machines and apparatus; helping with difficult tests; and cleaning the laboratories.

Training of personnel

Personnel must be trained in concrete technology and testing techniques. They should, if at all possible, be trained before the laboratory is equipped. For training, Western European laboratories are recommended.

In the Federal Republic of Germany, the following laboratories can be recommended:

All university laboratories for building materials testing (for example, Aachem, Stuttgart, Darmstadt)

National testing institutes (for example BAM West Berlin, MPA Dortmund)

Important association laboratories (for example, VDZ Düsseldorf, BVDB Dortmund)

Engineers

The training programme for engineers should last two months, and it should comprise the following main points:

Introduction to advanced concrete technology

Calculation of mixtures

Testing of freshly mixed concrete and recording the results

Testing of aggregates and recording the results

Testing of hardened concrete and recording the results

Special tests, non-destructive tests

Operation and service of testing machines

Laboratory assistants

The training programme for laboratory assistants should last one month and should comprise the following main points:

Brief introduction to concrete technology
Testing of freshly mixed concrete
Testing of aggregates
Testing of hardened concrete
Operation and service of testing machines

Organization

The procedure for handling and testing the specimens, which have been produced in the laboratory or have been brought in by customers or have been taken at building sites or factories, must be adhered to strictly.

The procedure to be followed from the time specimens are received until the test certificate is issued is shown in the organization chart (figure I).

Receiving of specimens

The specimens (from customers etc.) are delivered by the customer at the specimen reception in hall 4 and receive a number. The laboratory obtains this specimen number from the administration. All necessary data regarding the customer, or the specimen, is listed on a specimen way bill in triplicate. One copy of the specimen way bill is attached to the specimen; one goes to the administration, and one is kept in the reception section. A sample form is given in annex III. If a test application of the customer accompanies the specimen, it is sent to the administration department together with the specimen way bill.





Specimen testing

The testing procedure for specimens is shown in figure I. Numbers in parentheses refer to this figure. The specimen is first put into interim storage and later on stored and tested by the laboratory assistant according

to the instructions of the responsible engineer (8). The laboratory assistant draws up a record of the test results in duplicate. The original of the test results is handed to the engineer and the copy remains in the laboratory. A sample form is given in annex III. A rough outline of the tests and material flow in a concrete laboratory is given in figure II.

Administration

Upon receipt of the test application or the filling in of the specimen way bill, the order receives a handling number from the administration (4), for example:

| | | | |
|---|---|--|---|
| 21/ | 02219/ | 77 - | 09 |
|  |  |  |  |
| Department | Current number | Year | Month |

The application or the specimen way bill has to be acknowledged by the director (5); then it is given to the laboratory chief for acknowledgement and allocation of work (6). After that it is handed to the responsible engineer to be elaborated (7). He issues the testing- and working instructions to the laboratory assistant (8), and the confirmation of the order (14) to the customer. A sample form is shown in annex III.

The laboratory executes the test (8) and compiles the test results (9), which are turned into a test certificate by the responsible test engineer. At the same time the costs (17) are determined by the accounting department (20) and the administration (18) sends the invoice to the customer.

The written test certificate has to be signed by the laboratory chief and is sent to the customer by the mail department (12).

If required, the administration can certainly be wound up wholly or partially through electronic data processing. In this case the mail and accounting department would, for example, correspond with the data processing.

Transport and storage system

The specimen or the specimen material of the customer is normally delivered by truck to the entrance of hall 4 and then unloaded by crane (heavy specimen)

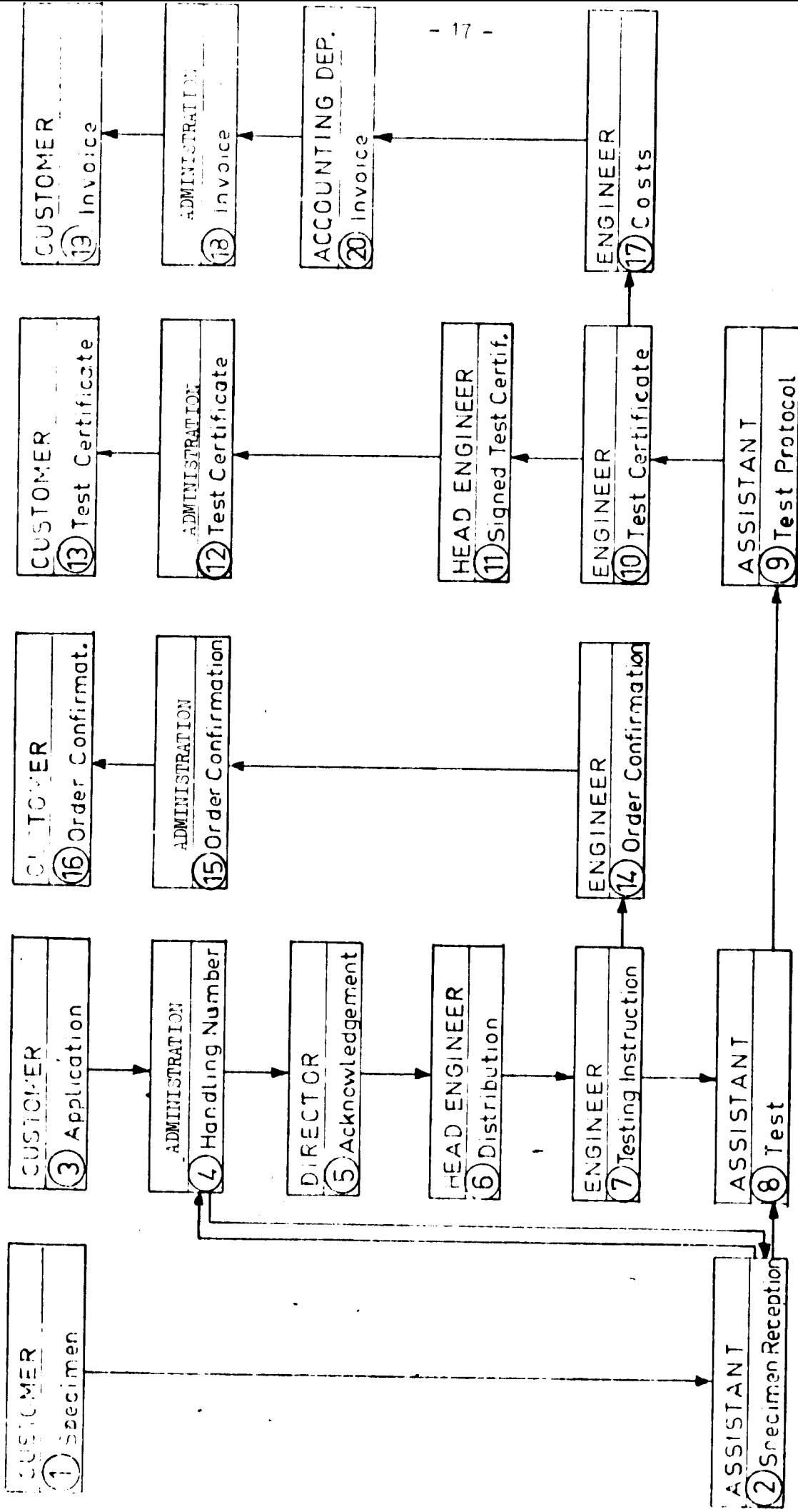


Figure I. Organization chart

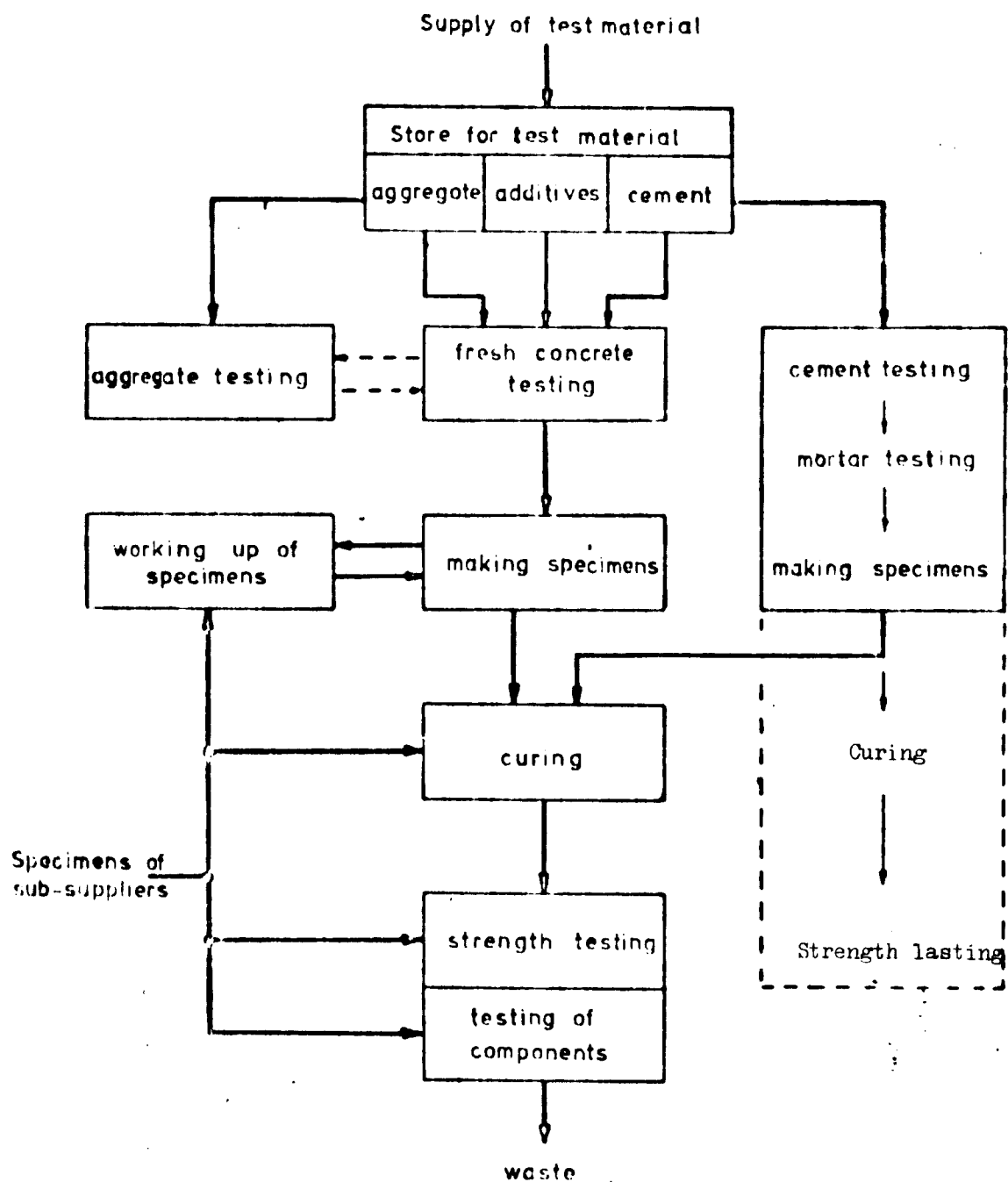


Figure II. General material flow in a cement and concrete laboratory

or by hand (light specimen). Then the specimens are loaded onto so-called "Euro-palletes" (120 cm x 80 cm) and marked with the handling number. These palletes can then be transported to suitable storage shelves either battery-driven or manually operated fork-lifts. The transport from testing machine to testing machine and general transport within the laboratory is also effected on these palletes. Garbage and waste matter is transported in containers.

In the fresh concrete laboratory the test subject is transported by so-called deposit carts, which are carts of the same heights as the system laboratory units. This has the advantage that the specimens do not have to be lifted anymore. Roller ways are applied for the transport of specimens.

The transport systems are described individually in the section on the specification of the equipment.

II. RECOMMENDATIONS^{1/}

Recommendations for equipment to be considered by the Centre

ITEM QTY. SPECIFICATION

| | | ROOM (1) |
|----|---|--|
| | | AGGREGATES AND FRESH CONCRETE LABORATORY |
| 01 | 9 | <u>Aggregate boxes</u> each 270 litres contents |
| 02 | 3 | <u>Cement storage container</u> each 100 litres contents |
| 03 | 1 | <u>Large balance</u> with indicator, capacity 100 kg, division of 50 g carried on 4 wheels table that can be fixed in place. |
| 04 | 1 | <u>Test screen vibrator with electromotive unbalance drive</u> Heavy duty sifting machine for sieves 400 mm Ø in heavy construction first class screening efficiency, even with the finest materials difficult to sieve. Both the screening and the vibrator sections must be provided with 0-60 min times and with controls for the magnitude of oscillation and vibration. Connection value: 0.5 K.V.A. 220/50 cycles The following accessories must included in the machine: 1 collection pan 1 disc of plexiglass, with spray head for wet screening 2 sieve pans with water discharge nozzle (material PVC) for wet screening 1 waterplug box, with clamping nozzle and two hose clips 1 extra strong PVC water hose 1/2" resistant to compression 1 set of sieves, 400 mm Ø, inside mesh aperture as follows: (in mm) 0.074 - 0.149 - 0.200 - 0.297 - 0.590 1.000 - 1.190 - 1.680 - 2.380 - 3.000 4.750 - 6.350 - 7.000 - 9.530 - 12.700 15.000 - 19.100 - 25.400 - 30.000 - 38.100 40.000 - 50.000 - 50.800 - 63.500 - 70.000 7.200 - 88.900 - 152.400 |

^{1/} This section has been reproduced without formal editing.

| ITEM | QUANTITY | SPECIFICATION |
|------|----------|--|
| 05 | 1 | <u>Performance unit,</u> <u>for time-saving sample splitting.</u> The test portion is quartered in a single operation. (double splitter) Flowing through capacity acc. to different standards. |
| 06 | 1 | <u>Performance unit</u> <u>for rapid weighing of sieve fractions.</u> Weighing range 15 kg. Quick taring device. |
| 07 | 1 | <u>Performance unit</u> <u>for drying up to 220^oC</u> with built-in warming cabinet, 115 ltr B x L x H, 800 x 750 x 850 mm |
| 08 | 1 | <u>Performance unit</u> <u>for fine weighing.</u> The lid covers-dustproof-a 3 kg precision balance. The cover closed, this unit presents an additional working surface. |
| 09 | 1 | <u>Performance unit</u> <u>for various tests:</u> - soda lye test - other chemical tests - setting test - grain shape - resieving, etc. Illuminated opal glass rear wall. Micro-chronometer and sockets in front plate |
| 10 | 1 | <u>Performance unit,</u> <u>for all operations connected with higher demand</u> <u>of water,</u> particularly the elutriation test. For preliminar sewage purification a silt trap must be fitted. |
| 11 | 1 | <u>Drying oven,</u> for drying UP TO 300 ^o C, Inner dimension appr. 700 LTR., connection value appr. 5,6 K.V.A. |
| 12 | 1 | <u>Abrasion testing machine,</u> for the determination of the abrasion value of aggregates. The machine is conform to ASTM C 131, connection value: 0.75 K.V.A. 220 V, 50 cycles 1 set of general equipment and tools must be belong to the machine: |

| ITEM | QUANTITY | SPECIFICATION |
|------|----------|---|
| | | Consisting of: 8 conical bowls 2 and 6 liter contents, 1 stirring pole, 2 scoops, 1 mixing spoon, 1 pouring pot, 1 straight edge, 1 wash bottle, 1 fine brush, 1 coarse brush, 1 folding rule, 1 trowel, 1 warm air drying unit, 2 measuring cylinders 1000 cm ³ , 2 sponges, 1 pck. of chalk, 1 hand brush. |
| 13 | 1 | <u>Mixer, 50 ltr. use contents</u> Mixer is driven by a four-paddle motor, 2,2 kW Connection value 2,2 K.V.A. 380 V, 50 cycles. Pan diameter approx. 80 cm carried on a pushcart on rubber wheels. The cart is designed to allow raising and lowering of the pan and positioning under the mixer, by a system of pulleys and steel wire, hand operated. The mixer, which represents the main separate part of the machine is provided with thick rubber footings to damp the noise and keep the machine in position. |
| 14 | 1 | <u>Mixer, 150 ltr. Use Contents,</u> Similar above mentioned, with transport carriage with lifting device for raising the mixing pan. Connection value 4 K.V.A. 380 V, 50 cycles. Pan diameter approx. 90 cm. The capacity per hour comes up to 6 M ³ |
| 15 | 1 | <u>Equalize table</u> For capping samples, approm. 24x 1.5 M., steel-plate |

| ITEM | QUANTITY | SPECIFICATION |
|------|----------|--|
| 16 | 1 | <u>Performance unit</u> <u>for a 24-hour interim storage of</u> <u>concrete specimen</u> Roller conveyors incorporated for easy transport of specimens |
| 17 | 1 | <u>Performance unit</u> <u>Filling station for the manufacture of concrete specimens,</u> as well as for air content testing and slump test Excess of fresh concrete and dirt falls through the working grate. |
| 18 | 1 | <u>Working table,</u> 1500 mm, with roller conveyer |
| 19 | 1 | <u>Performance unit for weighting samples</u> Up to 50 KG |
| 20 | 1 | <u>Performance unit</u> <u>for sample compacting with high-frequency</u> <u>vibrating slab.</u> Time switch. Rinsing tub for rapid cleaning. |
| 21 | 1 | <u>Performance unit</u> <u>for demoulding of specimens</u> and mould cleaning. Excess of concrete and dirt falls through the working grate |
| 22 | 1 | <u>Performance unit</u> <u>for testing the consistency</u> Particularary for slump test. Motorized lifting mechanism for automotical operation according to DIN standard |
| 23 | 1 | <u>Desk and chair</u> |
| 24 | 3 | <u>Shelf for small samples or tools</u> |
| 25 | 1 | <u>Cupboard for tools and equipment</u> |
| 26 | 1 | <u>Cupboard for tools and equipment</u> |

| ITEM | QUANTITY | SPECIFICATION |
|------|----------|--|
| 27 | 1 | <u>Water permeability tester</u> tor determination of the water permeability into concrete cubes. The tester shall allow the examination of up to 6 specimens simultaneously complete with air-compressor, valves manometers, hoses etc. Connection value 0.75 K.V.A. 220 V, 50 cycles. |
| 28 | 1 | <u>Vibro-consistometer,</u> for the determination of concrete consistency. consisting of: vibrating table, cylindrical container, conical-mould with filling funnel and swinging-out device, load-plate made of plexiglass. Electrical connection 220 V. 50 Hz, 0.25 kW. |
| 29 | 1 | <u>Performance station for filling and demoulding</u> |
| 30 | 1 | <u>Compacting factor apparatus for testing fresh concrete</u> It is with two steel conical hoppers, each with a hinged trap door. The trap door is operated by a quick release mechanism to give free flow to the released concrete sample. A cylindrical mould is fitted beneath the hoppers and all three items are mounted on a rigid steel stand. The apparatus is mounted one lab table |
| 31 | 1 | <u>Jolting apparatus</u> The apparatus is mounted one lab table |
| 32 | 1 | <u>Performance unit fine weighing</u> The lid covers-dust proof-a 10 Kg precision balance with 1 g reading. The cover closed, this unit presents an additional working surface. |

| ITEM | QUANTITY | SPECIFICATION |
|------|----------|--|
| 33 | 1 | <u>Performance unit for rapid drying and exsiccation test</u> On freshly-mixed concrete by strong propane burner |
| 34 | 1 | <u>Performance unit for all operations connected with higher demand of water</u> Particularly the elutriation test. For preliminary sewage purification, a silt trap must be fitted |
| 35 | 1 | <u>Hygromgter C-M apparatus</u> , including 100 capbid ampoules |
| 36 | 1 | <u>Bulk density measure</u> Apparatus, 28-79 :4-10-14-28 DM ³ |
| 37 | 1 | <u>Sand absorbtion crone</u> |
| 38 | 1 | <u>Penetration apparatus</u> From 10 LB. To 150 LB. The needle points supplied have cross sectial areas 1, 1/2, 1/4, 1/10, 1/20 and 1/40 square inch. Complete with pipette and tamping rod |
| 39 | 1 | <u>Slump test set</u> Containing galvanized steel slump cone, machined steel and cadmium plated tamping rod, galvanized steel metal cement pan, 600 mm x 450 mm x 80 mm stiff brass wire bristled brush. All steel trowel with wooden handle to comply with ASTM-C-143 and C-192 |
| 40 | 1 | <u>Laboratory screening machine with electromagnetic drive</u> in table design, for quick laboratory screening and working supervision. Special screening effect by infinitely variable amplitude with rotary resistance while quickly moving up and down, the material is also rotating on the perforated bottom. Height for screening rings, 7 a 50 mm, or 10 screening rings a 30 mm and one collecting pan. Machine with lengthened guide rods. Connection value 0.5 K.V.A. 220 V, 50 cycles |

| ITEM | QUANTITY | SPECIFICATION |
|------|----------|--|
| | | Including 1 set of sieves with the following Openings in mm |
| | | 0.074 - 0.149 - 0.200 - 0.297 - 0.590 - 1.000- |
| | | 1.190 - 1.680 - 2.380 - 3.000 - 4.760 - 6.350- |
| | | 7.000 - 9.530 - 12.700 - 15.000 - 19.100 - 25.400 |
| | | 30.000 - 38.100 |
| 41 | 1 | <u>Cube mould, 50.8 mm</u> Edge length in heavy cast design of aged steel material in according to ASTM C 109 weight; Approx. 1.4 kg |
| 42 | 1 | <u>Tension frame</u> Belonged To nr. 42 |
| 43 | 12 | <u>Cube mould, 100 mm edge length</u> Heavy cast design of aged material. A later deformation of the plates is therefore impossible. Maximum deviation of the inter- nal dimensions: \pm 0.2 p.c. From a length of 150 mm all side walls of the moulds are ground. The thus reached evenness comes up to 0.05 mm over a measured length of 100 mm (according to the standard 0.08 mm) . The individual plates are held together by revolving clamping bolts. The plates of one mould can be interchanged without that there will occur a deviation from the right angle of more than 0.30°. The given accuracy makes a later grinding of the surface unnecessary. Weight: Approx 7.5 Kg |
| 44 | 4 | <u>Mountable case</u> Belonged to nr. 43 |
| 45 | 12 | <u>Cube mould, 150 mm edge length</u> As described in nr. 43 Weight: Approx 15 Kg |
| 46 | 4 | <u>Mountable case</u> belonged To nr. 45 |
| 47 | 24 | <u>Cube mould, 200 mm edge length</u> As described in nr. 43 Weight: Approx 24 Kg |

| ITEM | QUANTITY | SPECIFICATION |
|------|----------|--|
| 48 | 8 | <u>Mountable case</u> belonged To nr. 47 |
| 49 | 24 | <u>Standart cylindrical mould</u> of 150 mm ϕ , 300 mm height, weight: approx: 16 Kg |
| 50 | 8 | <u>Mountable case</u> belonged to nr. 49 |
| 51 | 12 | <u>Beam-mould, 150 x 150 x 700 mm</u> Weight: approx 31 Kg |
| 52 | 3 | <u>Moutable case</u> belonged to Nr. 51 |
| 53 | 12 | <u>Beam-Mould, 100 x 100 x 500 mm</u> Weight: approx: 14 Kg |
| 54 | 3 | <u>Moutable cade</u> belonged to Nr. 53 |
| 55 | 3 | <u>Air content tester, 8 ltr.</u> Including assessories |
| 56 | 1 | <u>Mechanically operated apparatus for the graphical recording of temperature, airpressure and humidity.</u> With each apparatus the following is delivered: 1000 recording charts 3 extra pen heads 3 copies of operating instruction (English) 3 bottles of ink |
| 57 | 1 | <u>Pycnometer of 1 ltr.</u> Capacity for the determination of the specific gravity of fine aggregates |
| 58 | 2 | <u>Cylinder capping device</u> According to ASTM C 31 with capping frame and capping plate 155 mm cap diameter |

| ITEM | QUANTITY | SPECIFICATION |
|------|----------|--|
| 59 | 1 | <u>Handoperated small forklift</u> Lifting: Max 1250 Kg. Weight : 74 Kg |
| 60 | 1 | <u>Transport carriage</u> Transport of the specimens from the storage shelf by means of the transport carriage fitting in height of the performance units. No physical lifting of specimens Lifting: Max 300 kg Weight : 20 Kg. |
| 61 | 3 | <u>Standart spatula</u> |
| 62 | 3 | <u>Wire brush</u> |
| 63 | 3 | <u>Concrete supporting thermometer</u> |
| 64 | 3 | <u>Concrete slab thermometer</u> |
| 65 | 3 | <u>Max-Min-Thermometer</u> |
| 66 | 3 | <u>Stoh-Watch</u> |
| 67 | 3 | <u>Signal-chronometer</u> |
| 68 | 3 | <u>Cube tong for cubes 200 mm</u> |
| 69 | 3 | <u>Pair of rubber gloves</u> |
| 70 | 10 | <u>Set of measuring cylinders 100 ML.</u> 250 ML, 500 ML, 1000 ML |
| 71 | 5 | <u>Rubber hammer</u> |
| 72 | 5 | <u>Steel hammer</u> |
| 73 | 3 | <u>Set of chisel</u> |
| 74 | 3 | <u>Small water balance</u> |

| ITEM | QUANTITY | SPECIFICATION |
|------|----------|---|
| 75 | 1 | <u>Set of different brushes</u> |
| 76 | 20 | <u>Conical bowls,</u> Edel steel, 5 lit. |
| 77 | 3 | <u>Pycnometer</u> |
| 78 | 3 | <u>Warm air drying unit</u> |
| 79 | 3 | <u>Wash bottle</u> |
| 80 | 6 | <u>Special glas bottle</u> 250 cm ³ |
| 81 | 6 | <u>Special glas bottle</u> 350 cm ³ |
| 82 | 3 | <u>Colour standart</u> With 5 colour glasses |
| 83 | 3 | <u>Colour standart</u> With 3 colour sheets |
| 84 | 1 | <u>Bulk density measuring vessel</u> 5 and 10 lit. |
| 85 | 1 | <u>Grain size slide gauge</u> |
| 86 | 3 | <u>Slide gauge</u> 250 mm |
| 87 | 3 | <u>Hair lineal gauge</u> |
| 88 | 3 | <u>Right angle</u> 90 ⁰ |
| 89 | 3 | <u>Steel wire brush</u> |
| 90 | 3 | <u>Mixing pan,</u> 50 lit |
| 91 | 3 | <u>Mixing shovel</u> |
| 92 | 10 | <u>Hand shovel</u> |
| 93 | 10 | <u>Trowel</u> |

| ITEM | QUANTITY | SPECIFICATION |
|------|----------|---|
| 94 | 10 | <u>Mixing spoon</u> |
| 95 | 5 | <u>Drying casserole</u> |
| 96 | 20 | <u>Samples container</u> , capacity 10 Kg |
| 97 | 1 | <u>Measuring vessel</u> , set of 5, 10, 20 Lit. |
| 98 | 2 | <u>Thickness gauge</u> |
| 99 | 10 | <u>Folding rule</u> |
| 100 | 2 | <u>Schmidt-test-hammer</u> for the non-destructiv testing of the quality of concrete in buildings or at site Model N (impact energy = 0.225 MKP) |
| 101 | 1 | <u>Testing anvil</u> For schmidt-hammer serves for checking the correct operation. of the test-hammer |
| 102 | 1 | <u>High frequency internal vibrator</u> Driven by electrical motor and equipped with flexible shaft |

Technical data:

| | | |
|----------------------------|-------------------|---------------|
| Diameter of vibrating head | mm | 25 |
| Length of vibrating head | mm | 222 |
| Compression | m ³ /h | up to 5 |
| Vibrations per minute | | 11.00 - 12,00 |
| Length of flexible shaft | mm | 4000 |
| Power of motor | kW | 2,7 |
| Weight of motor | kg | 29.5 |

| ITEM | QUANTITY | SPECIFICATION |
|------|----------|---|
| | | ROOM (2) (CURING ROOM) |
| 108 | 2 | <u>Suspend thermostat for keeping the temperature in the water storage tank constant with contact thermometer 0-150°C, indicating thermometer 0-100°C, pump with capacity 20 litres/min and heating from 0 to 1000 Watt</u> |
| 109 | 2 | Water storage tanks of glass-fibre reinforced polyester resin for keeping concrete cubes and cylinders. Complete with over flow socket drain, feet and wear resistant special plastic grid Length : 2.000 mm Width : 1.000 mm Height : 600 mm CAPACITY : 1.200 LIT. |

| ITEM | QUANTITY | SPECIFICATION |
|------|----------|---------------|
|------|----------|---------------|

ROOM (3)
(CLIMA ROOM)

| | | |
|----|---|---------------------|
| 09 | 1 | Previously descript |
| 25 | 3 | " " |
| 26 | 1 | " " |
| 34 | 1 | " " |

| ITEM | QUANTITY | SPECIFICATION |
|------|----------|--|
| | | TESTING HALL (4) |
| | | TESTING OF HARDENED CONCRETE AND FULL-SIZE-COMPONENTS |
| 110 | 1 | <u>Reception Desk for incoming samples from customers</u> |
| 111 | | |
| 112 | 1 | <u>ABRASION TESTING MACHINE</u> for building materials, for determining the resistance to wear of concrete natural stones etc. Connection value 0.55 KVA, 220 V 60 Hz The motor of the machine could be set to rotate a selection of revolutions, together with a switch gear and all the necessary accessories. In addition: 200 kg of Carborundum sand 5 Deflectometer, total deflection 5 cm sensitivity 0.02 mm 5 Magnetic holders for deflectometers |
| 113 | | <u>Shelf for euro-special-palettes</u> High : 2.000 cm. Depth : 1.000 cm. Length : 6.000 cm. |

| ITEM | QUANTITY | SPECIFICATION |
|------|----------|---|
| 114 | 1 | BENDING AND CRUSHING TESTER MAXIMUM TEST LOAD 10 MP (100 KN) Class I DIN 51 227 Grade A (B.S.) |

Ma
Bending and crushing testers for testing beams, plates and tubes on their flexural and crushing resistance.

Equipment

Machine frame in rigid two-column design, both columns threaded for test height adjustment.

The bending supports as well as the crushing table are mobile and are set down for testing over an eccentric A bending support edge is tiltably seated. The upper bending edge, tiltable, too, is fixed to the piston and slewable by 90°, thus permitting to test tubes in longitudinal as well as in cross direction.

TECHNICAL DATA

| | | |
|--|----|----------|
| electr. connection: AC 380 V; 50 cycles, | kW | 2 |
| supporting distance adjustable L | mm | 250-3000 |
| edge length | mm | 1300 |
| edge radius | mm | 20 |
| distance: edge-support | mm | 0-1500 |
| compression tables | | |
| dimensions | mm | 1320x800 |
| maximum outer diameter of tubes | mm | 1600 |
| machine height | mm | 3500 |

INCLUDING:

Bending support

consisting of two mobile anvils with one stationary and one tiltable support with pivotable rollers (can be locked, if necessary).

Compression table

mobile for crushing tests; pulle with eccentric bearing for placing the table down in the test space.

THE FRAME IS CONNECTED TO MEASURING-AND CONTROL CABINET

with servo-hydraulic control and digital load indication
Accuracy: DIN 51 220 class I / BS 1610 Grade A

Application

Measuring-and Control Cabinet to be connected to test frames with hydraulic drive, for load-and deformation controlled tests with uninterrupted and cycling stress. Pre-selectable increase rate between 10 and 1000 seconds from 0 to maximal test load respectively maximal deformation.
Accuracy of load measuring: 1% of indicated value.

ITEM QUANTITY SPECIFICATION

INCORPORATED MUST BE A MAXIMUM VALUE STORAGE

Two measuring ranges from 1/1 and 1/5 of maximal test load, additionally 1/2. Alternativ one continous measu-
rine range from 1/1 to 1/50 of maximum load

Operation

From the pressure generation unit the oil is pumped into the hydraulic drive (constant delivery pump). Upon contact of the specimen with the upper compression plate regulation by servo-valve commences (closed loop system). Disconnecti-
on is effected automatically upon specimen breakage or upon reaching the maximal value.

The reached maximal test load is being recorded on the digital indication.

Peripherycal instruments can be connected to a digital output.

ADDITIONAL ASSESORY EQUIPMENT

1. Deformation measuring
2. Theoretical value fUnctions
3. Limit value pre-setting
4. Cyclic load
5. Commutation load-deformation
6. Measuring value out puts
7. Fault control
8. Lighting
9. Measuring range extention
10. x-y-Recording
11. Load maintenance
12. Tape printer for measured values
13. Small computer ana inter for test certificates

115

1

Universal tensile test frame 4OMP (400 KN) max. test load

Class I (DIN 51 227)

Grade A (BS 1 610)

Diameter of compression plates 180 mm

Distance between compression plates 0-300mm

Distance between supports 200-1000mm

Edge length 150mm

Radius of edges 25mm

Radius of clamps 15mm

Max. clamping height 130mm

Distance between gripping heads 0-600 mm

Piston stroke 300 mm

including:

Gripping tools for flat and round bars up to 30 mm

| ITEM | QUANTITY | SPECIFICATION |
|------|----------|---------------|
|------|----------|---------------|

The frame is connected to measuring-and control cabined with servo-hydraulic control and digital load indication accuracy: DIN 52 220 class I / BS 1 610 grade A

Universal tensile tester measuring ranges

1. measuring range 40 - 400 kN
2. measuring range 20 - 200 kN
3. measuring range 10 - 100 kN

ITEM QUANTITY SPECIFICATION

116 1 BENDING TEST FRAME MAX. TEST LOAD 100 kN (10 Mp)
Accuracy Class I, DIN 51 220
Grade A, BS 1610
Application
Versatile testing frame for bending tests on tubes, beams, large plates and components, as well as for crushing tests on tubes.

Design

Gap-frame type with particularly large span. Bending table electrically adjustable in height for an easy adaptation of the fitting dimensions to the actual testing purpose. Various exchangeable test devices. The hydr. aggregate is incorporated in the upper arm.

TECHNICAL DATA

| | | |
|---|--------|----------|
| Length of bending table | mm | 2000 |
| electrical height adjustment of bending table | mm | 350 |
| Distance between supports | mm | 200-2000 |
| Span of upper arm | mm | 500 |
| Working height (variation as per each fixture) | ca. mm | 700 |
| maximum clamping height (according to relative fixture) | mm | 600 |

Electrical connection 380 V/50 cycles, 1.5 kW

Including testing devices to be installed in the bending test machine:

- 1) Central bending edge for crushing strength tests on pipes up to 750 mm diameter and abt. 1500 mm length.
Edge length 1600 mm
- without wooden parts-only for bending tester 10 Mp
- 2) Bending device for the testing of plates and beams.
Length of the lateral supports and central edge 700 mm, edge radius 10 mm
- 3) Bending device for beams and plates with third-point load as per DIN 1048 lower distance between supports variable from 200 to 2000 mm, upper bending edges variable from 100 to 660 mm. When removing one of the upper bending edges, the device can also be used for center-point load.
Length of lateral supports and central bending edges 700 mm, bending edge radius 10 mm

ITEM QUANTITY SPECIFICATION

The frame is connected to measuring and control cabinet
With servo-hydraulic control and digital load indication
Accuracy: Class I (DIN 51 220)
Grade B (BS 1 610)
Details always described in position Nr.114

117 1

UNIVERSAL BEND-TESTING MACHINE MAX LOAD 2MP (20 KN)
Class I (DIN 51 220), Grade A (BS 1 610) for bending tests
of rods, prisms, plates, beams also compression test of
small test samples six dynamometric range

Application of force: mechanical.

The machine provides for tests with a specified rate of
deformation and -if an additional rate transmitter for
load application is installed-also with a constant rate
of load application. Adjustable backstroke absorption device.

Electrical connection 380 V/50 cycles 1.5 kW including
testing devices to be installed in the the universal bend-
testing machine

1) Bending device

- without roller blades- distance between supports
100-600 mm

2) Roller blade length 510, dia 6 mm

3) Roller blades length 510, dia 20 mm

| ITEM | QUANTITY | SPECIFICATION |
|------|----------|---------------|
|------|----------|---------------|

4) Roller blades length 32 mm

5) Combined bending device

for flat bars 21 x 15 x 255 mm

distance between supports 200 mm

for round bars up to 18 mm diameter

distance between support 100 mm

ADDITIONAL EQUIPMENT

Rate transmitter for load application,

for maintaining the load increase within the unit of time applicable to standard testing. A rotating disc with coloured fields serves as nominal value setter. Before testing, the rate of load application to be adhered to is - in accordance with the respective standard - adjusted via a sensitive controlling mechanism.

| ITEM | QUANTITY | SPECIFICATION |
|------|----------|--|
| 113 | 1 | <u>COMPRESSION TESTING MACHINE MAX TEST LOAD 300 MP (3000 KN)</u> Grade A (B.S.1 610) Building material testing machines with test height adjustable by middle spindle, particularly for compression tests on cubic and cylinder-type specimens, stones |

Design:

It is a rigid two-column design.

With electro-motrical drive and piston protection above and below the crosshead, as well as limit switches in the end positions.

Oil-hydraulic drive with ground-in piston and protected piston sliding face.

Compression plates hardened and polished

The lower compression plate must be slid out; a roller slideway must be arranged in front of the compression plate.

Protection outfit

consisting of two rigid plastic doors and side screens arranged in front of the test space.

TECHNICAL DATA

| | | |
|-------------------------------------|----|---------|
| maximum test load | Mp | 300 |
| size of compression plates | mm | 520-420 |
| distance between compression plates | mm | 50-550 |
| clearance between columns | mm | 500 |
| spindle adjustment | mm | 400 |
| elektrical connection, V, 50 | | 2.2 |

The frame is connected to measuring and control cabinet with servohydraulic control and digital load indication.

Accuracy : Class I (Din 51 227)

Grade B (BS 1 610)

Details always described in position N.R. 114

ITEM QUANTITY SPECIFICATION

119 1 Sample container
for tested samples size approx. 120 cm x 80 cm x 80 cm.
steel design.

121 1 FOUR-COLUMN COMPRESSION TESTING MACHINE, MAX. TEST
LOAD 600 IP (6000 KN)

Class I (DIN 51 227)

Grade A (BS 1 610)

Building material testing machines in particularly
torque-resistant design, with adjustable test height
by middle spindle, particularly suited for compressi-
on tests on cube-and cylindertype specimens, stones
and full-size components

Design:

Machine frame in torque resistant four-column design.
Height adjustment of upper compression plate by means
of spindle drive and electric motor. Spindle protecti-
on above and below the crosshead. Limit switches in the
end positions.

Compression plates particularly bending-resistant, with
screwed-on, hardened and polished wear plates of 20 mm
thickness.

Protection device

consisting of two rigid plexiglass doors and lateral
screens arranged in front of the test space.

Technical Data

| | | |
|--------------------------------------|----|---------|
| maximum load | kN | 6000 |
| size of compression plates | mm | 420-520 |
| distance between compression plates | mm | 0-650 |
| clearence between columns | mm | 615-415 |
| spindle adjustment | mm | 550 |
| electr. connection 380 V, 50 cycles, | kW | 9.0 |

The frame is connected to measuring and control cabinet

with servo-hydraulic control and digital load indication
accuracy: class I (DIN 51 227), grade A (B.S. 1610)
Details always described in position N.R. 114

| ITEM | QUANTITY | SPECIFICATION |
|------|----------|---|
| 120 | 1 | <u>COMPRESSION-TESTING MACHINE MAX TEST LOAD 60 MP (600 KN)</u> |

Class I (DIN 51227)

Grade A (B.S. 1610)

Building material testing machines with adjustable test height by middle spindle, particularly for compression tests on light concrete, refractory material, tubes, plaster and natural stone, tiles, slabs, small samples

DESIGN

Machine frame in two-column design

Test height setting by middle spindle with handwheel adjustment.

Oil-hydraulic drive with ground-in piston and protected piston sliding face.

Compression plates hardened and polished. The lower compression plate is lodged on the piston. It is equipped with a catch pan for the specimen remainders. The upper compression plate is adjustably seated in a spherical shell and is suspended to the middle spindle.

TECHNICAL DATA

| | | |
|-------------------------------------|-------|---------|
| maximum test force | kp | 60 |
| size of compression plates | mm | 230-230 |
| distance between compression plates | mm | 420 |
| clearance between columns | mm | 290 |
| maximum piston stroke | mm | 60 |
| pump delivery | l/min | 1.4 |
| spindle adjustment | mm | 420 |
| electr. connection, 380/V, 50 Hz | kl | 1.5 |

The frame is connected to measuring and control cabinet
with servo-hydraulic control and digital load indication.

Accuracy : Class I (Din 51 220)

Grade B (B.S. 1 610)

Details always described in position nr. 114

| ITEM | QUANTITY | SPECIFICATION |
|------|----------|--|
| 122 | 1 | <u>Conveyor belt</u> , approx 6 m long for sample transport and leading the specimen to the compression testing machine. |
| 123 | 1 | <u>Performance unit with built-in 50 kg balance</u> for the determination of the weight of the specimen |
| 124 | 50 | <u>Palettes, euro-size</u> , 800 cm x 1200 cm, load 1MP(10KN) each. |
| 125 | 1 | <u>Handoperated small forklift</u> Lifting : Max 1250 Kg Weight : 74 Kg |
| 126 | 1 | <u>Battery operated small forklift</u> Lifting : Max 1000 Kg Lifting Height : Max 2 meters Weight : 520 Kg |
| 127 | 1 | <u>Transport carriage</u> mentioned and described always in item 60 |
| 129 | 1 | <u>Ultrasonic concrete tester</u> , portable, for rapid non-destructiv quality control. Digital indicator, weight : 8 Kg. |
| 130 | 6 | <u>Movable writing plate</u> |

| ITEM | QUANTITY | SPECIFICATION |
|------|----------|---|
| 131 | 1 | Movable drilling machine with petrol engine, very heavy design, complete with strap wrench, water pump, 3set of diamond bits 58 mm-107 mm-131 mm-162 mm, 4 diamond bit adapter, core tongs, 50 shearing pins the machine must have a wankel motor, minimum 7 ps |
| 132 | 1 | <u>Special refrigerator for the frost-test of concrete up to 20°C minus, inside capacity approx.1500 liters</u> |

ITEM QUANTITY SPECIFICATION

ROOM (5) SPECIMEN PREPERATION

| | | |
|-----|---|--|
| 34 | 1 | <u>Peter sink</u> Identical and described always in item 34 |
| 141 | | <u>Non portable drilling machine</u> Complete with 1 set of diamond drilling cones |
| 142 | 1 | <u>Grinding machine</u> Including 1 diamond tool holder and 2 rot milling machines (300 mm ϕ) for grinding the top of the specimen. motor: 1 hp |
| 143 | 1 | <u>Diamond saw, wet-cutting</u> For cutting and preparation of specimen like concrete -cylinders, cubes, slabs, tiles, stones etc. The saw allows only wet cutting. Including 3 super cutting disc, 500 ϕ and 2 safety eye glasses. Technical data: 1. cutting disc ϕ not less 500 mm 2. electric motor 7.5 hp 3. cutting length not less than 780 mm, moveable 4. water tray and conveyor cart 5. water pressure not less than 100 mm water column connection cables: 1 K.V.A. 220 V, 50 cycles delta star connection |

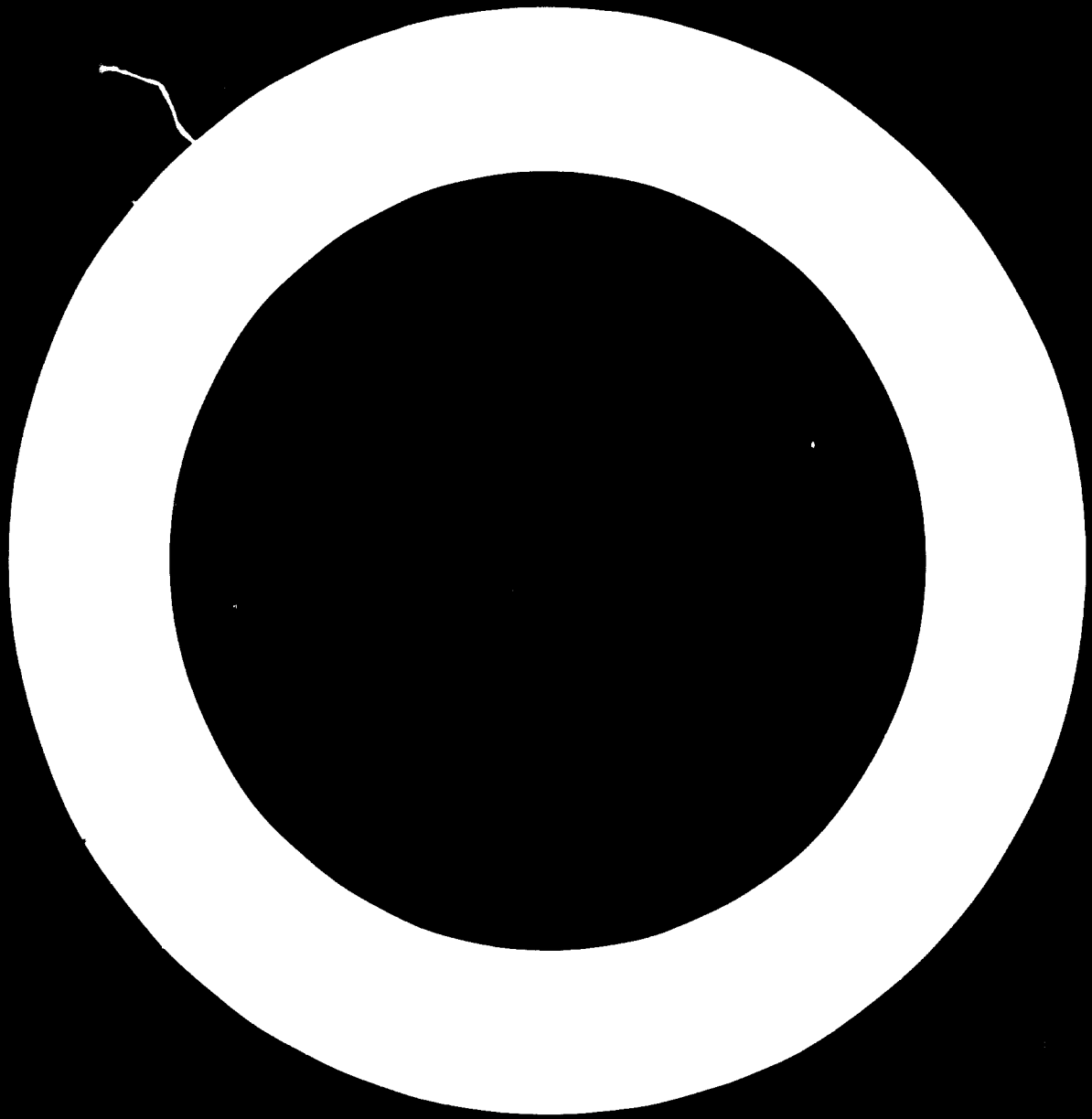
| ITEM | QUANTITY | SPECIFICATION |
|------|----------|--|
| 144 | 1 | <u>Diamond saw, dry-Cutting</u> Mentioned and described always in item 143 but only to use for dry-cutting |
| 145 | 1 | <u>Dust Container</u> With connecting exhauster in accordance to item Nr. 144 |

ITEM QUANTITY SPECIFICATION

ROOM NR. (6)

STORAGE ROOM

| | | |
|-----|---|---|
| 146 | 1 | Approx. 15 Meters shelf mentioned always in item nr. 24 |
| 147 | 2 | Steel container for aggregates, said to be mentioned always in item nr. 119 |



Annex I

JOB DESCRIPTION

Post title: Expert in Building Materials Testing

Duration: One month

Date required: October 1977

Duty station: Ankara

Duties: The expert will be attached to the Cement Research and Development Centre and will, in close co-operation with his counterpart and with the Project Co-ordinator, specifically be expected to:

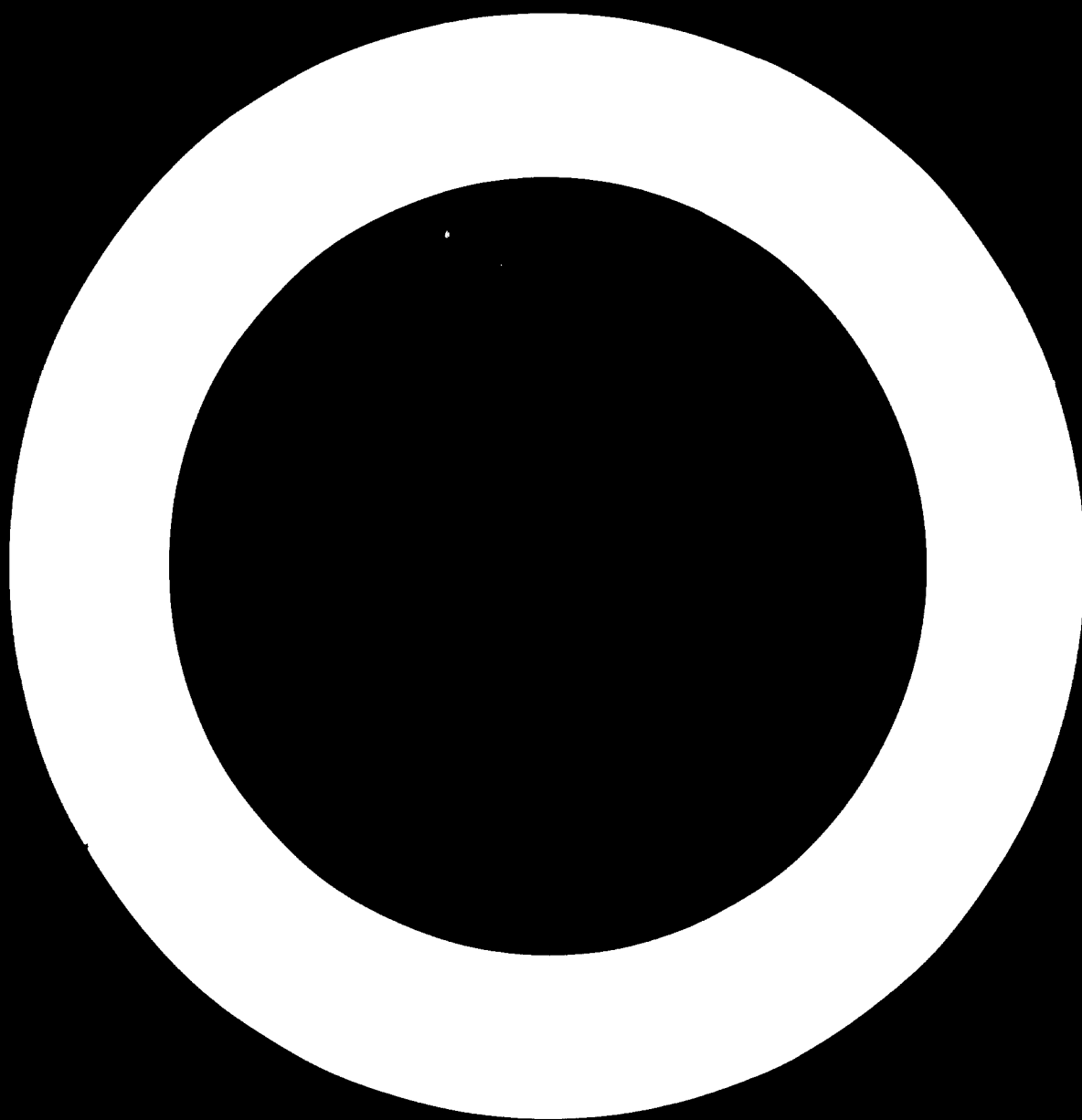
1. Advise on the outlay for construction of the building materials test rooms.
2. Define the needed equipment to carry out such tests.
3. Train Turkish engineers and advise on their training outside the country.

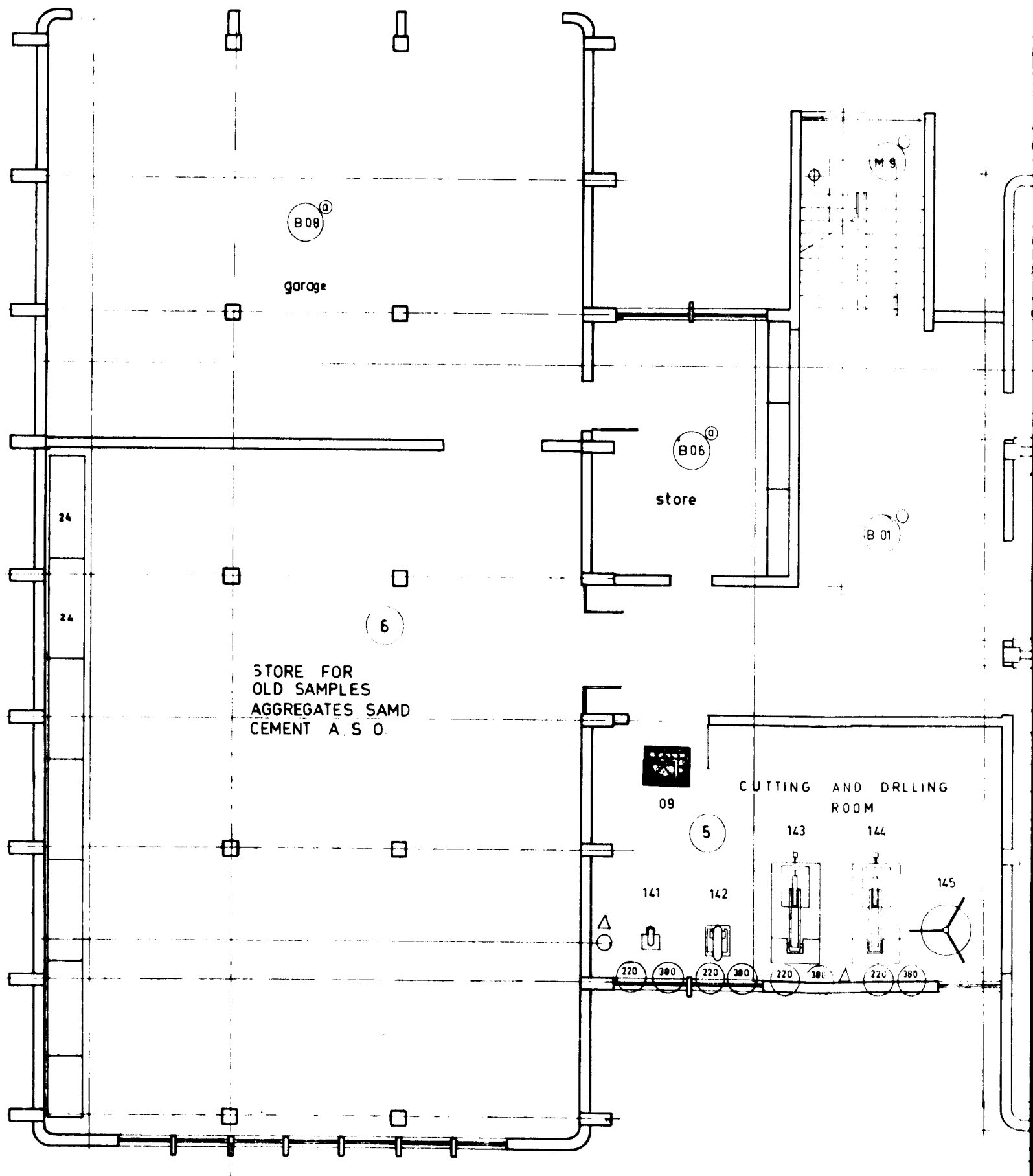
The expert will also be expected to prepare a final report, setting out the findings of his mission and his recommendations to the Government on further actions which might be taken.

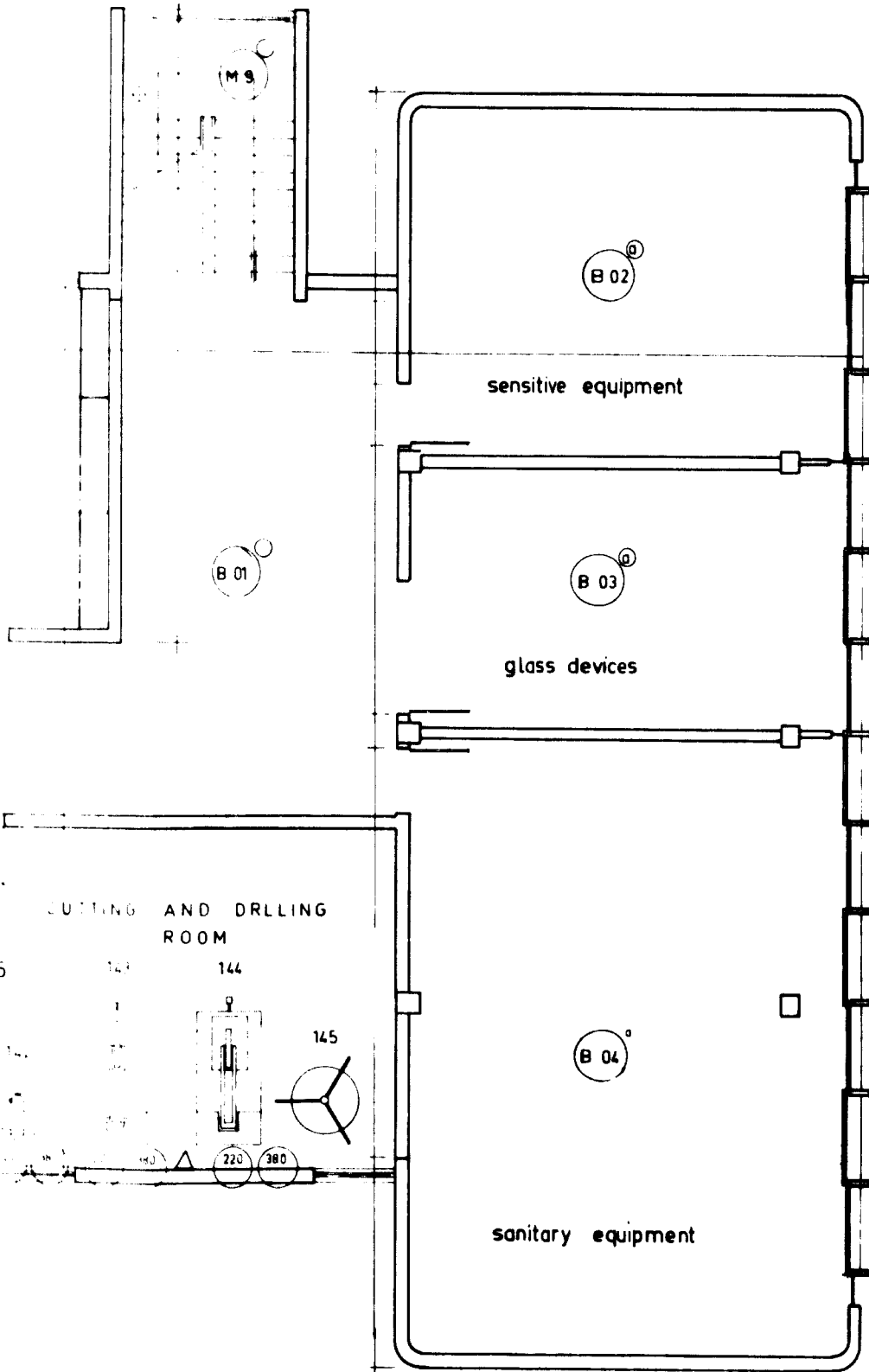
Language: English; knowledge of German an asset.

Qualifications: Industrial engineer with academic degree in building materials and concrete technology.

Background information: A Cement Research and Development Centre is being established in Ankara. UNIDO assistance is required for finalizing this very important institute. The Centre will have four main sections: process control, cement laboratory, raw material laboratory, and concrete laboratory. The construction work of the buildings will be completed in 1977.





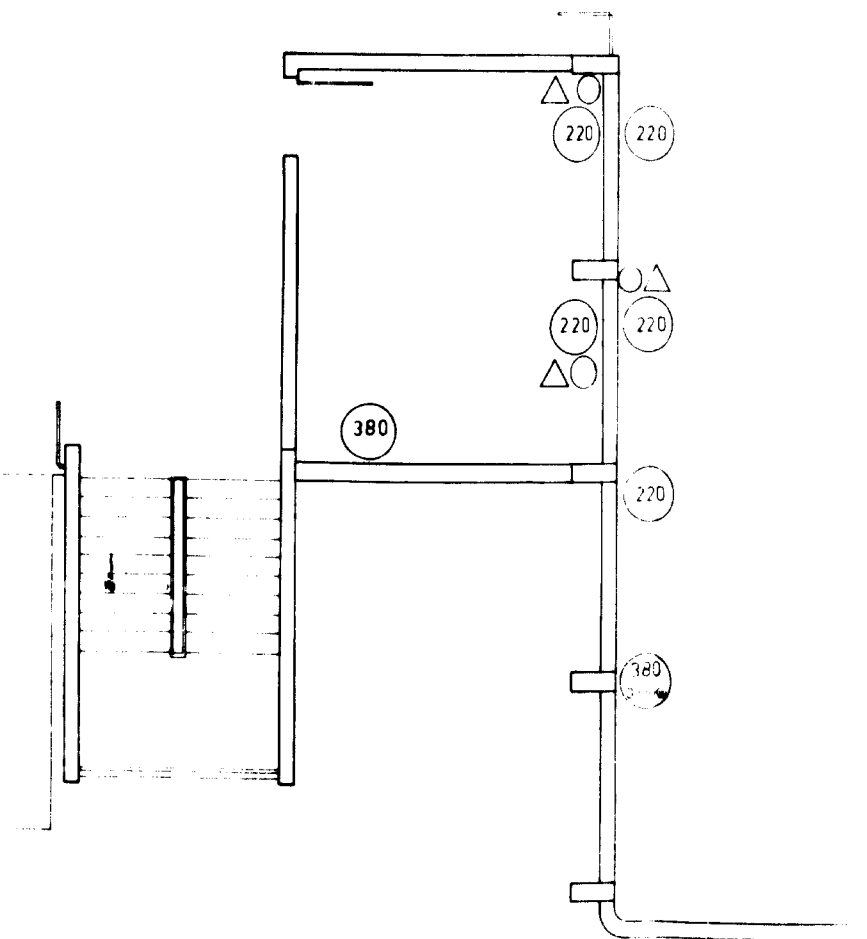
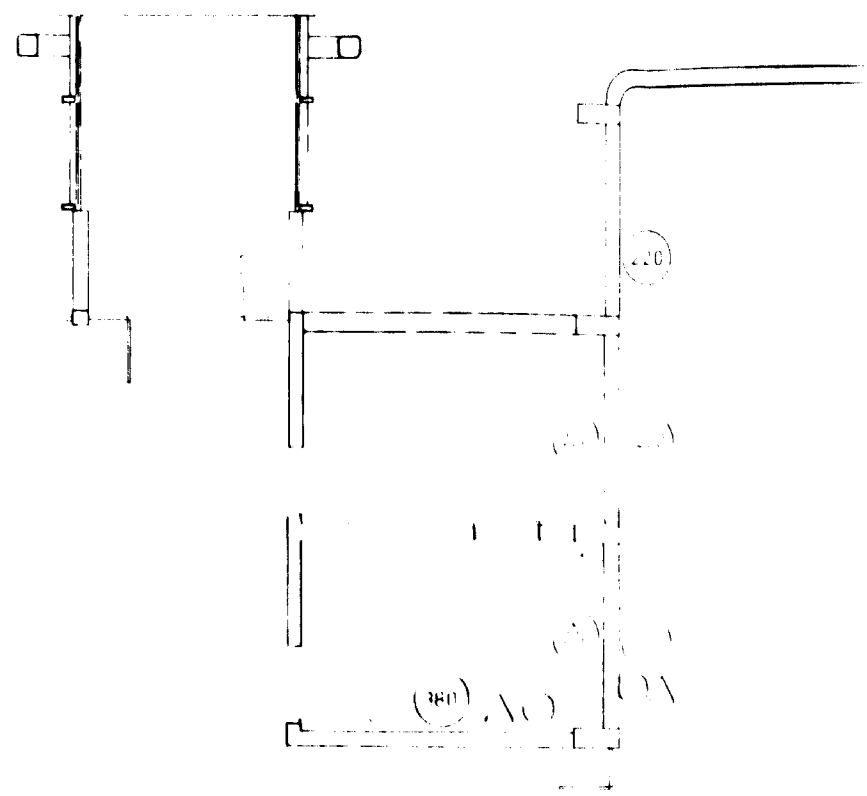
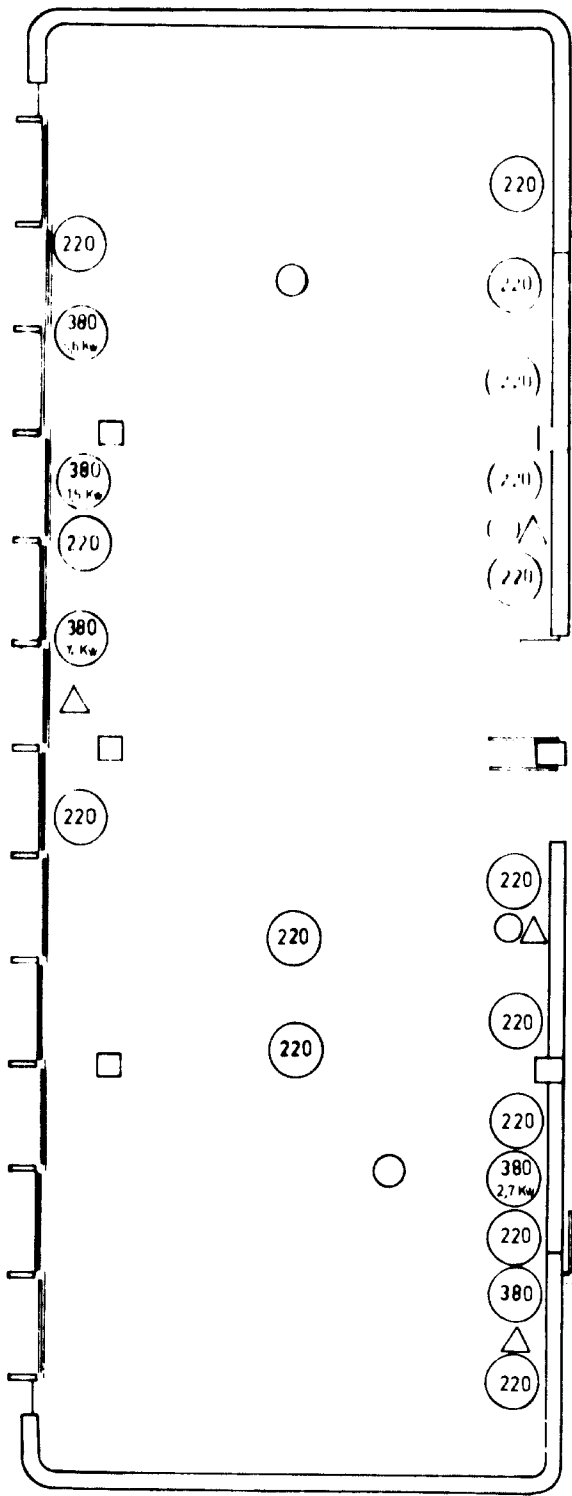


- 141 = DRILLING MACHINE
- 142 = GRINDING MACHINE
- 143 = DIAMOND SAW WET CUTTING
- 144 = DIAMOND SAW DRY CUTTING
- 145 = DUST CONTAINER

- (380) ELECTRICAL SUPPLY
380 VOLT, 50 HZ
- (220) ELECTRICAL SUPPLY
220 VOLT 50 HZ
- GULLY
- △ WATER SUPPLY

| | | | |
|---------------------------------|--|----|--|
| | | | |
| | | 02 | |
| LABORATORY EQUIPMENT - BASEMENT | | | |

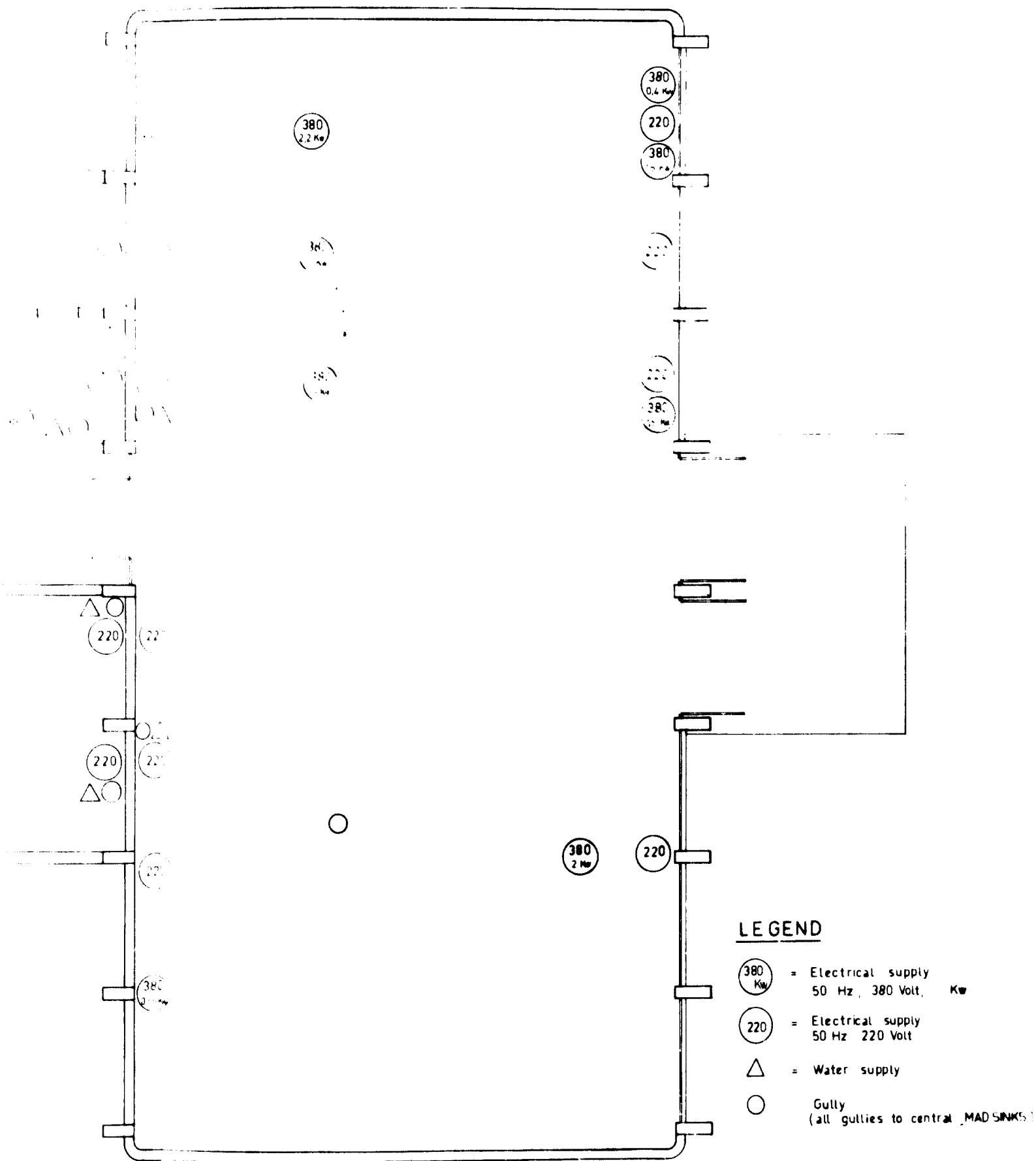
SECRET







03

ENERGY AND WATER SUPPLY CONNECTIONS

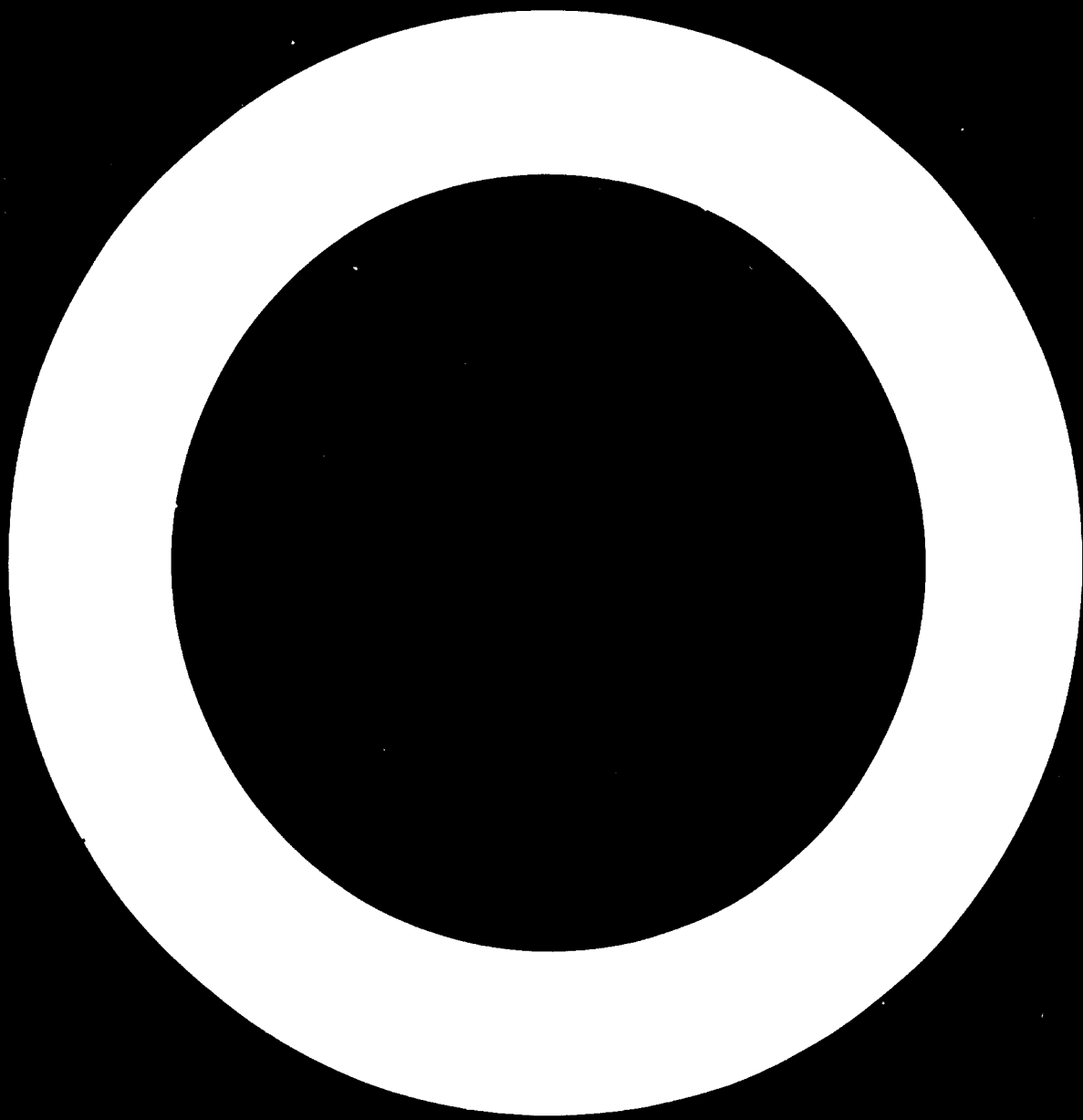




LEGEND

-  = Electrical supply
50 Hz, 380 Volt, Kw
-  = Electrical supply
50 Hz, 220 Volt
-  = Water supply
-  = Gully
(all gullies to central MAD SINKS)

SECRET



Annex III
SAMPLE FORMS
Specimen way bill

| | | |
|-------------------------------|----------------------------|-----------------------|
| PROBEN - BEGLEITZETTEL | Sachbearbeiter: | Annahme - Nr.: |
| | Bearbeitungs - Nr.: | |

Auftraggeber:

Eingangsdatum des Prüfmaterials: mit - ohne Antrag

| Lfd. Nr. | Menge und Verpackung | Art des Prüfmaterials | Bemerkungen |
|-----------------|-----------------------------|------------------------------|--------------------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Art der Anlieferung:

Annahme durch:

.....

Weitere Vermerke:

mpa1470

Prüfanweisung siehe Rückseite!

Bearbeitungs-Nr

Customer's order

A U F T R A G

für das Staatliche Materialprüfungsamt Dortmund - Abt. Dez.

auf Untersuchung, Prüfung nach den umseitig abgedruckten „Allgemeinen Bedingungen“ des Amtes

.....
.....
.....

Art des überbrachten Probematerials:

Voraussichtliche Kosten:

Voraussichtliche Prüfungsdauer:

Name und Anschrift

des Auftraggebers:

des Vertreters:

des Bevollmächtigten:

Dortmund, den

.....
(Unterschrift des Auftraggebers, Vertreters oder Bevollmächtigten)

| AUFTRAGS - ABRECHNUNG | | | | | BLATT: | VON: | | | | | |
|--|----------------------------|---|--------|----------|-------------------------|---------------|----------------|------------------|-------------|----|-----|
| | | | | | SATZ ART | Unteraufträge | | | | | |
| | | | | | | Vorauszahlung | | | | | |
| | | | | | | Reisekosten | | | | | |
| | | | | | | Jo | Nein | | | | |
| | | | | | | | | | | | |
| SATZART: 03 | | BEMERKUNGEN (3 × 50 ZEICHEN) ERSCHEINT AUF RECHNUNG | | | | | | | | | |
| 1 | | | | | | | | | | | |
| 2 | | | | | | | | | | | |
| 3 | | | | | | | | | | | |
| SATZART: 04 | | | | | ABGERECHNETE STUNDEN * | | | | | | |
| NR | BEZEICHNUNG DER PRUFUNG | - DM/h | | | - DM/h | | | RA- BATT % | | | |
| | | Anzahl K | ZE | Par | Anzahl L | ZE | Par | | Anzahl M | ZE | Par |
| 1 | | | | | | | | | | | |
| 2 | | | | | | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | | | | | | | | | | | |
| 5 | | | | | | | | | | | |
| SATZART: 05 | | | | | | | | | | | |
| NR | BEZEICHNUNG DER PRUFUNG | MASCHINEN NUTZUNG | | | AUFW.** | AUSLAC*** | Par | | | | |
| | | NR. | ANZAHL | KOSTEN | RA- BATT VOLLE DM | DM | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| *) auch Reise- und Wartezeiten (Ziff. 2+3 Vergütungsordnung MPA) **) außergewöhnliche Aufwendungen für Material, Energie, besondere Vorrichtungen und überdurchschnittliche Kosten (Ziff. 2.4 Vergütungsordnung MPA) ***) Ziff. 5 Vergütungsanordnung MPA | | | | | | | | | | | |
| SATZART: 06 | | FESTE SAETZE | | | | | | | | | |
| NR | BEZEICHNUNG DER PRUFUNG | AN- ZAHL | NUMMER | DM/EINH. | RA- BATT | Pp | NACH | | | | |
| | | | | | | | RECHN SCHREIB. | | | | |
| | | | | | | | RECHN - NUMMER | | | | |
| | | | | | | | RECHN - DATUM | | | | |
| | | | | | | | RECHN - BETRAG | | | | |
| | | | | | | | Datum: | | | | |
| | | | | | | | Bearbeiter: | | | | |
| SATZART: 99(ENDE - KARTE) | | | | | | | | | | | |

DATENERFASSUNG für Aufträge, Überwachungsverträge

Ersterfassung Änderung Löschung (zutreffendes ankreuzen)

| Auftragsnummer | | | | | | | | | | Folge-Nr. | | | | | | | | | | |
|----------------------------|---|--|--|--|---|--|---|--|--|--|----|-----------|---|---|--|--|----|---|----|-------|
| 10 | X | | | | X | | X | | | (Auftragsnr. = Vertragsnr. bei Überwachungsvertr.) | | 20 | X | X | | | 8 | Eingangsdatum Amt | | |
| Auftraggeber und Anschrift | | | | | | | | | | | | 21 | X | X | | | 8 | Datum d. Antragschreibens (Vertragsdatum bei Ubw. Vertr.) | | |
| 11 | | | | | | | | | | | 32 | | | | | | | | | |
| 12 | | | | | | | | | | | 32 | | | | | | | | | |
| 13 | | | | | | | | | | | 32 | | | | | | | | | |
| 14 | | | | | | | | | | | 32 | | | | | | | | | |
| 15 | X | | | | | | | | | | | 22 | | / | | | 14 | Telefon | | |
| | | | | | | | | | | | | 23 | | | | | | | 14 | Telex |
| | | | | | | | | | | | | Zuständig | | | | | | | | |
| | | | | | | | | | | | | 24 | | | | | | | 26 | |
| | | | | | | | | | | | | 25 | | | | | | | 30 | |

| | | | | | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|---|------------------|---|----------------|----|--------------------------|---|---|----|----|-------------------------------|
| 30 | | | | | | | | | | | MPA | 20 | Sachbearbeiter | 40 | <input type="checkbox"/> | 1 | Auftragsbestätig. drucken J = Ja N = Nein | | | |
| 31 | | | | | | | | | | 4 | MPA-Hausanschluß | Bezeichnung der Probe (BEMERKUNGEN in der Liste der U-Verträge) | | | | | | | | |
| Inhalt des Antrages (Gegenstand der Überwachung) | | | | | | | | | | | | 41 | | | | | | | 24 | |
| 32 | | | | | | | | | | | 24 | | | | | | | 24 | | |
| 33 | | | | | | | | | | | 24 | | | | | | | 24 | | |
| 34 | | | | | | | | | | | 24 | | | | | | | 24 | | |
| 35 | | | | | | | | | | | 24 | | | | | | | 24 | | |
| | | | | | | | | | | | | 45 | | | | | | | 8 | beteiligte Dezernate |
| | | | | | | | | | | | | 46 | X | X | | | | | 8 | Abschluß d. Prufg vorges. bis |
| | | | | | | | | | | | | 47 | X | X | | | | | 8 | wenn Probeneingang bis |
| | | | | | | | | | | | | 48 | | | | | | | 12 | voraussichtl. Prüfkosten DM |
| | | | | | | | | | | | | 49 | | | | | | | 12 | Vorauszahlung DM |

| | | | | | | | | | | | | |
|----|--|--|--|--|--|--|--|--|--|--|----|----------|
| 50 | | | | | | | | | | | 68 | Betrifft |
| 51 | | | | | | | | | | | 68 | Bezug |

| | | | | | | | | | | | | |
|----|--|--|--|--|--|--|--|--|--|--|----|---------------------|
| 60 | | | | | | | | | | | 36 | Besondere Vermerke |
| 61 | | | | | | | | | | | 36 | für die Karteikarte |

Inhalt des Antrages (ausführlich für die Auftragsbestätigung)

| | | | | | | | | | | | |
|----|---|--|--|--|--|--|--|--|--|--|----|
| 70 | | | | | | | | | | | 68 |
| 71 | | | | | | | | | | | 68 |
| 72 | | | | | | | | | | | 68 |
| 73 | | | | | | | | | | | 68 |
| 74 | | | | | | | | | | | 68 |
| 75 | | | | | | | | | | | 68 |
| 76 | | | | | | | | | | | 68 |
| 77 | | | | | | | | | | | 68 |
| 78 | | | | | | | | | | | 68 |
| 79 | | | | | | | | | | | 68 |
| 80 | | | | | | | | | | | 68 |
| 81 | | | | | | | | | | | 68 |
| 82 | | | | | | | | | | | 68 |
| 83 | | | | | | | | | | | 68 |
| 84 | | | | | | | | | | | 68 |
| 85 | | | | | | | | | | | 68 |
| 86 | | | | | | | | | | | 68 |
| 87 | | | | | | | | | | | 68 |
| 99 | Endesatz, 99 ist als Schlußzeichen abzulochen | | | | | | | | | | |

| Zust.- Datum | | | | | | | | | | Zustimmung durch | |
|--------------|---|---|--|--|--|--|--|--|--|------------------|--|
| 88 | X | X | | | | | | | | (Namenszeichen) | |
| | | | | | | | | | | 27 | |

mpa 1826

Bei Benutzung dieses Formulars zur Erfassung, Änderung oder Löschung von Vertragsdaten und -merkmalen ist stets die Vertrags-Nr. einzutragen. Bei Änderung ist nur der Änderungs- bzw. Ergänzungstext einzutragen.

Anstalt
Staatliche Materialprüfungsamt NW
Dortmund
Ruf 45021
46 Dortmund-Aplerbeck
Marsbruchstraße 186

den

| |
|------------------------|
| eingeliefert Abt. 2 am |
| Bearbeitungs-Nr 21 - |

.....
Forma
.....
(Postfz) Ort
.....
Straße

Betr.: Antrag auf Prüfung von ²⁾ Betonwürfeln von 20 cm,¹⁾ 10 cm,¹⁾ 15 cm,¹⁾ 30 cm¹⁾ Kantenlänge.
Hiermit wird gebeten, die eingelieferten Betonwürfel sofort¹⁾ im Alter von ²⁾ Tagen nach DIN 1048 Bl. 1
(Ausg. Januar 1972) Abs. 4.2. zu prüfen. Eignungsprüfung¹⁾ / Güteprüfung¹⁾ / Erhartungsprüfung¹⁾

Angaben des Antragstellers ²⁾

Hersteller: *Antragsteller bzw.*
Baustelle:
Bauteil:

| | | | | | |
|---|--|---|----|---|----|
| | ²⁾ Tag der Herstellung der Probekörper: | 1 | 2) | 4 | 2) |
| 1) Geforderte Betonfestigkeitsklasse B _n | | 2 | 2) | 5 | 2) |
| Weitere Angaben: | | 3 | 2) | 6 | 2) |

Die Probekörper wurden bis zur Einlieferung im Amt Tage naß und Tage trocken gelagert.
Die Probekörper sollen im Amt bis zur Prüfung Tage in bei °C
und Tage in bei °C
gemäß DIN 1048 Bl. 1 gelagert werden. 1) 2)

Die Prüfergebnisse erbitten wir in:
einem Prüfzeugnis (3-fach)
Die Rechnung in 2-facher Ausfertigung

.....
Unterschrift

Die umseitig abgedruckten Allgemeinen Bedingungen des Amtes werden anerkannt
1) Nichtzutreffendes streichen 2) bitte ausfüllen

| Nicht vom Antragsteller auszufüllen | | 1 | 2 | 3 | 4 | 5 | 6 |
|--------------------------------------|------------------------|-------------------------|------------|------------|------------------------------|--------------|--|
| Festgest. Kennzeichng. d. Probekorp. | | | | | | | |
| Augenscheinl. Beschaffenheit | | | | | | | |
| Alter d. Probekörper am Prüffag | | Tage | Tage | Tage | Tage | Tage | Tage |
| Würfel Nr. | Gewicht am Prüffage kg | Abmessungen Druckfläche | | | Rohdichte kg/dm ³ | Bruchlast kN | Druckfestigkeit in N/mm ² am Prüffage |
| | | Seite a mm | Seite b mm | Seite c mm | | | |
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| Bemerkungen zur Prüfung: | | | | | Mittelwerte: | | |

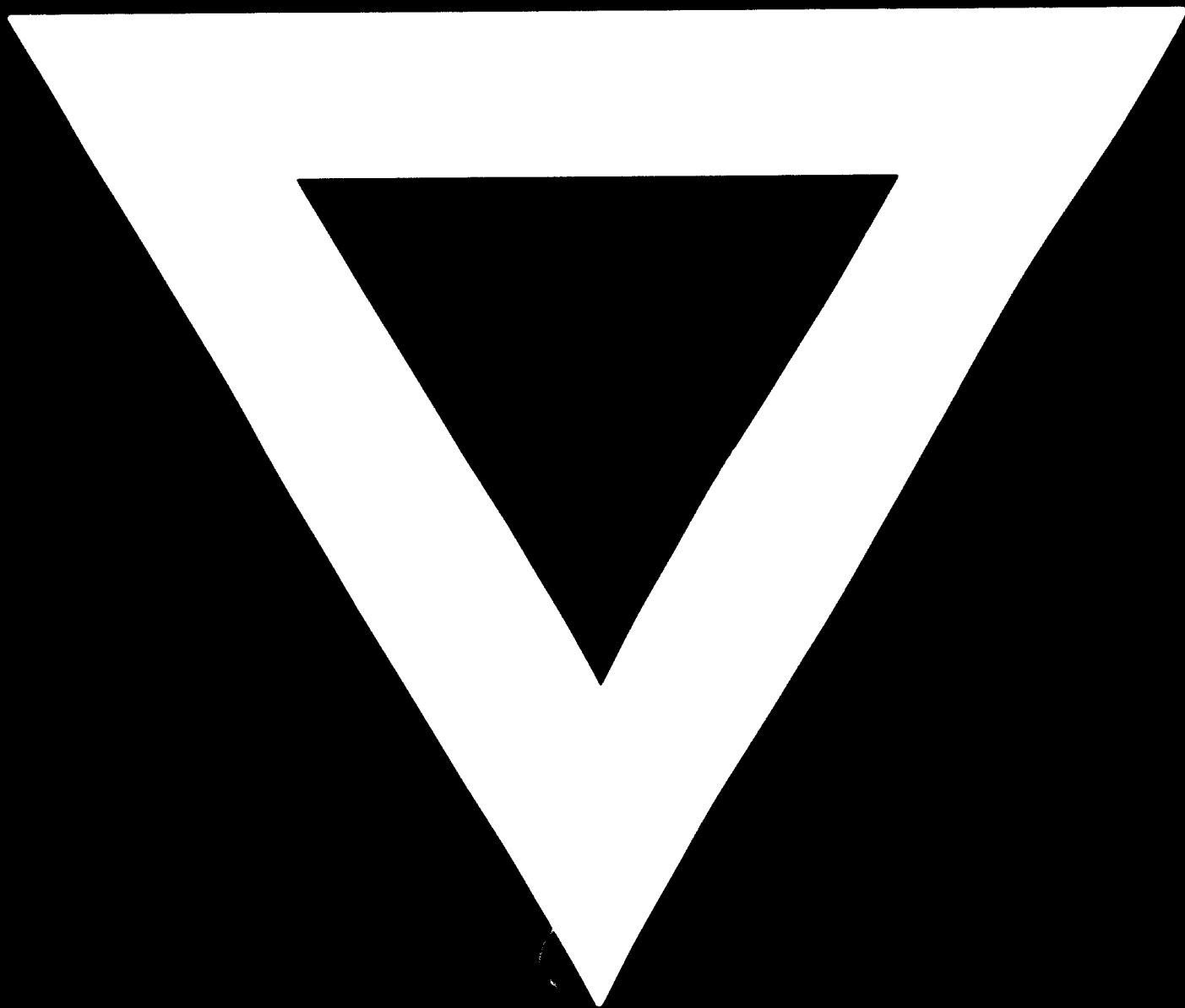
MPA 1492

Prüfung durchgeführt von

Rechnerisch geprüft



C-688



78.11.22