Irrigation Manual

Planning, Development, Monitoring and Evaluation of Irrigated Agriculture with Farmer Participation

Module 6

Guidelines for the Preparation of Technical Drawings

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Contents

List of figures iv
List of tables iv
Foreword v
Acknowledgements vii
Unit conversion table viii

1. INTRODUCTION 1

2. DRAWING EQUIPMENT 3

3. SIZES AND SCALES OF DRAWING 5

4. DRAWING LINES AND CHARACTERS 7
   4.1. Lines and line work 7
   4.2. Lettering and numerals 7

5. LAYOUT OF DRAWINGS 9
   5.1. Outline 10
   5.2. Plan, cross-section, scheme layout, longitudinal profile and contour map 10
      5.2.1. Plans and cross-sections of structures 10
      5.2.2. Layout of a sprinkler irrigation scheme 10
      5.2.3. Layout of a surface irrigation scheme 14
      5.2.4. Longitudinal profiles 15
      5.2.5. Contour map 17
   5.3. Heading 17
   5.4. Legend 17
   5.5. Notes and amendments 17

6. REGISTERING AND FILING OF DRAWINGS 21

List of figures

1. Relationship between the different normal A-size papers 5
2. An example of different stencils and letter heights used in lettering 8
3. Schematic layout of a technical drawing 9
4. Outline of a drawing 10
5. Example of lines, lettering and numerals used in the drawing of the plan of a diversion structure 11
6. Example of lines, lettering and numerals used in the drawing of a cross-section (A-A in Figure 5) of a diversion structure 12
7. Example of lines, lettering and numerals used in the drawing of the layout of a sprinkler irrigation scheme 13
8. Example of lines, lettering and numerals used in the drawing of the layout of a surface irrigation scheme 14
9. Drawing showing the longitudinal profile of a canal 15
10. An example of a drawing of a contour map 16
11. An example of a heading or a title block used for drawings of A1 and A0 paper sizes 18
12. Some of the commonly-used legend symbols in irrigation and drainage layout drawings 19
13. Folding of different A-size papers in order to fit in a A4 document 22

List of tables

1. Minimum equipment requirements for a reasonable drawing office 3
2. Nominal sizes and areas of normal A-size papers 5
3. Nominal sizes and areas of alternative A-size papers 6
4. Example of a register for a drawing office 21

Foreword

The first edition of the Irrigation Manual was published in 1990 in two volumes by the "Smallholder Irrigation" Project (UNDP/FAO/AGRITEX/ZIM/85/004). The authors of this first edition were FAO Staff on the project[1]. This edition of one hundred copies ran out within two years from publishing.

Although the manual was written with Zimbabwe in mind, it soon became popular in several countries of the sub-region. In view of the high demand, it was decided to proceed with a second edition. The experience gained from using the first edition of the manual as the basic reference for the AGRITEX[2] training programme of irrigation practitioners and the University of Zimbabwe, was incorporated in the second edition which was published in 1994, in one volume by the "Technical Assistance to AGRITEX" project (UNDP/FAO/AGRITEX/ZIM/91/005). This second edition was published under the same authors as the first edition, with the assistance of a review committee from AGRITEX[3]. The two hundred copies of this edition also ran out within two years of publishing.

In 1995, the FAO Sub-regional Office for East and Southern Africa (SAFR) was established in Harare, Zimbabwe, in order to provide easy access to technical assistance and know-how for the countries of the sub-region[4]. In view of the high demand for support in the field of smallholder irrigation by the countries of the sub-region, this office was strengthened with four water resources management officers and a number of on-going programmes have been developed to provide this support. One of these programmes is the publishing of a new regional edition of the irrigation manual in support of the on-going national training programmes within several countries in the sub-region and to provide the basic reference for another important programme, which is the sub-regional training on planning and design of smallholder irrigation schemes.

This third edition aspires to further strengthen the engineering, agronomic and economic aspects of the manual and to introduce new modules related to social, health and environmental aspects of irrigation development. The emphasis is directed towards the engineering, agronomic and economic aspects of smallholder irrigation, in view of the limited practical references in this area. This manual, being directed to the irrigation practitioner, does not provide an in-depth analysis of the social, health and environmental aspects in irrigation development. It only attempts to introduce the irrigation practitioner to these areas, providing a bridge between the various disciplines involved in irrigation development.

The initiatives and efforts of the Water Resources Management Team of SAFR in publishing this Manual are considered as a valuable contribution to the dissemination of knowledge and training of irrigation practitioners in the sub-region. The material covered by this manual is expected to support both national and sub-regional training programmes in the planning, design, construction, operation and maintenance and on-farm water management of irrigation schemes. This will support the implementation of FAO's mandate to increase food production through water control, intensification and diversification, which are the basic components of the Special Programme for Food Security (SPFS).

The manual is the result of several years of field work and training irrigation engineers in the sub-region. The approaches have been field tested and withstood the test of time.

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[2] *Agritex: Department of Agricultural Technical and Extension Services, Ministry of Lands and Agriculture, Zimbabwe.*

[3] *Review committee: E. Chidenga, Acting Chief Irrigation Officer; P. Chipadza, Senior Irrigation Specialist; A. Dube, Senior Irrigation Specialist; L. Forichi, Irrigation Specialist; L. Madhiri, Acting Principal Irrigation Officer; S. Madyiwa, Irrigation Specialist; P. Malusalila, Chief Crop Production; R. Mariga, Assistant Secretary, Economic and Markets Branch; D. Tawonezvi, Agricultural Economist.*

[4] *The following 21 countries are part of the FAO-SAFR region: Angola, Botswana, Burundi, Comoros, Eritrea, Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Rwanda, Seychelles, South Africa, Swaziland, Tanzania, Uganda, Zambia, Zimbabwe.*

For ease of reference to the various topics covered by this Manual, the material has been divided into 14 modules, covering the following:

Module 1:	Irrigation development: a multifaceted process
Module 2:	Natural resources assessment
Module 3:	Agronomic aspects of irrigated crop production
Module 4:	Crop water requirements and irrigation scheduling
Module 5:	Irrigation pumping plant
Module 6:	Guidelines for the preparation of technical drawings
Module 7:	Surface irrigation systems: planning, design, operation and maintenance
Module 8:	Sprinkler irrigation systems: planning, design, operation and maintenance
Module 9:	Localized irrigation systems: planning, design, operation and maintenance
Module 10:	Irrigation equipment for pressurized systems
Module 11:	Financial and economic appraisal of irrigation projects
Module 12:	Guidelines for the preparation of tender documents
Module 13:	Construction of irrigation schemes
Module 14:	Monitoring the technical and financial performance of an irrigation scheme

To those who have been waiting for so long for a practical irrigation engineering manual: here it is. I am sure that it will have a lot to offer to both new and experienced irrigation engineers.

Victoria Sekitoleko
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The preparation of the third edition of the Irrigation Manual is an initiative of FAO's Sub-Regional Office for East and Southern Africa (SAFR).

The whole project was managed and coordinated by Andreas P. Savva and Karen Frenken, Water Resources Development and Management Officers at FAO-SAFR, who are the main authors. Karen Frenken also is the main technical editor.

The following persons provided valuable inputs into this Volume I: Fabeon Chigumira (Module 3), Mawira Chitima (Module 4), Owen Hughes (Module 3), Tove Lilja (Module 1 and 5), Simon Madyiwa (Module 1 and 5), Victor Mthamo (Module 5), Kennedy Mudima (Module 1, 4 and 5), Samuel Sunguro (Module 2), Lee Tirivamwe (Module 2, 3, 4 and 6).

The preparation of several drawings by Solomon Maina is acknowledged.

Special appreciation is extended to Chris Pappas for his substantial contribution to the layout of the Irrigation Manual.

Unit conversion table

Length

1 inch (in)	0.0254 m
1 foot (ft)	0.3048 m
1 yard (yd)	0.9144 m
1 mile	1609.344 m
1 metre (m)	39.37 inches (in)
1 metre (m)	3.28 feet (ft)
1 metre (m)	1.094 yards (yd)
1 kilometre (km)	0.62 miles

Area

1 square inch (in^2)	6.4516×10^{-2} m^2
1 square foot (ft^2)	0.0929 m^2
1 square yard (yd^2)	0.8361 m^2
1 acre	4046.86 m^2
1 acre	0.4046 ha
1 square centimetre (cm^2)	0.155 square inches (in^2)
1 square metre (m^2)	10.76 square feet (ft^2)
1 square metre (m^2)	1.196 square yard (yd^2)
1 square metre (m^2)	0.00024 acres
1 hectare (ha)	2.47 acres

Volume

1 cubic inch (in^3)	1.6387×10^{-5} m^3
1 cubic foot (ft^3)	0.0283 m^3
1 cubic yard (yd^3)	0.7646 m^3
1 cubic centimetre (cm^3)	0.061 cubic inches (in^3)
1 cubic metre (m^3)	35.315 cubic feet (ft^3)
1 cubic metre (m^3)	1.308 cubic yards (yd^3)

Capacity

1. imperial gallon	0.0045 m^3
1. US gallon	0.0037 m^3
1. imperial barrel	0.1639 m^3
1. US. barrel	0.1190 m^3
1 pint	0.5681 l
1 US gallon (dry)	0.0044 m^3
1 litre (l)	0.22 imp. gallon
1 litre (l)	0.264 U.S. gallon
1 litre (l)	0.0061 imperial barrel
1 hectolitre (hl)	100 litres = 0.61 imperial barrel = 0.84 US barrel
1 litre (l)	1.760 pints
1 cubic metre of water (m^3)	1000 l = 227 U.S. gallon (dry)
1 imperial barrel	164 litres

Mass

1 ounce	28.3286 g
1 pound	0.4535 kg
1 long ton	1016.05 kg
1 short ton	907.185 kg
1 gram (g)	0.0353 ounces (oz)
1 kilogram (kg)	1000 g = 2.20462 pounds
1 ton	1000 kg = 0.984 long ton = 1.102 short ton

Pressure

1 pound force/in^2	6894.76 N/m^2
1 pound force/in^2	51.7 mm Hg
1 Pascal (PA)	1 N/m^2 = 0.000145 pound force /in^2
1 atmosphere	760 mm Hg = 14.7 pound force/in^2 (lbf/in^2)
1 atmosphere	1 bar
1 bar	10 metres
1 bar	100 kpa

Energy

1 B.t.u.	1055.966 J
1 foot pound-force	1.3559 J
1 B.t.u.	0.25188 Kcalorie
1 B.t.u.	0.0002930 KWh
1 Joule (J)	0.000947 B.t.u.
1 Joule (J)	0.7375 foot pound-force (ft.lbf)
1 kilocalorie (Kcal)	4185.5 J = 3.97 B.t.u.
1 kilowatte-hour (kWh)	3600000 J = 3412 B.t.u.

Power

1 Joule/sec	0.7376 foot pound/sec
1 foot pound/sec	1.3557 watt
1 cheval-vapor	0.9861 hp
1 Kcal/h	0.001162 kW
1 watt (W)	1 Joule/sec = 0.7376 foot pound/sec (ft lbf/s)
1 horsepower (hp)	745.7 watt 550 ft lbf/s
1 horsepower (hp)	1.014 cheval-vapor (ch)
1 kilowatt (kW)	860 Kcal/h = 1.34 horsepower

Temperature

^{0}C (Celsius or centigrade-degree)	$^0C = 5/9 \times (^0F - 32)$
^{0}F (Fahrenheit degree)	$^0F = 1.8 \times {}^0C + {}^0F$
K (Kelvin)	$K = {}^0C + 273.15$

Chapter 1
Introduction

Technical drawings should be prepared for every design, whether it refers to a scheme layout, a structure or a longitudinal profile of a canal. They are essential for completing the engineering design, for estimating the quantities of materials and relative costs and for implementing the project.

Technical drawings also communicate to the contractor all the information that the designer or client has developed. Contractors, on their part, are always required to provide the client with so-called Working drawings and As built or Record drawings (see Module 12). These drawings should incorporate any modifications made to the originals provided by the client during construction.

Technical drawings also serve as future reference for anyone who wants to obtain information about the scheme, for example for operation, maintenance, repairs and rehabilitation purposes.

Simple freehand sketches are convenient forerunners to the final working, and are frequently used for preliminary studies or to illustrate an explanation during a discussion. They are also a logical way for the designer to convey their ideas to the draftsperson. Freehand sketches may be used for developing plans by testing a number of alternative designs, or for evolving detail drawings of complex project elements. They are particularly useful in recording details and dimensions from existing structures or prefabricated units.

Once the final drawing has been chosen from the sketches, it is re-drawn with instruments on tracing paper so that prints may be readily made. Relatively light paper, 70-75 g/m^2 paper, can generally be used. However, if many prints have to be made heavier paper should be used. Plastic tracing film is a more durable material than tracing paper, especially for handling and storage, and it has the advantage that ink can be removed with a moist eraser. It is however more expensive than tracing paper and requires the use of special lead and drawing pens, since its surface is much harder.

Technical drawings should be easily understood, and comprehensive and detailed enough for the purpose. They should be a good record of the designer's intentions. In this module standardization of drawings and guidelines to be adhered to by designers and to be used in the drawing office will be discussed.

Chapter 2
Drawing equipment

It is important to have a permanent workplace, a drawing office, for the preparation of drawings. The layout of the drawing office should provide an efficient and comfortable environment for the draftsperson. This includes a good chair (stool) of convenient height, a good tiltable drawing board, sufficient light and sufficient space for the drawing equipment (Table 1).

A good drawing board should be large enough to hold the size of the paper selected (see Chapter 3). While a sheet of hardboard or blockboard may be used as a drawing board, it is advisable to install a hardwood edge such as ebony. It may be necessary to saw longitudinal grooves 75-100 mm apart in the back of the board to prevent warping. The board may be placed on a table or on trestles and should be covered with thick white paper or special plastic to give a smooth surface. Drafting tape should be used to affix the tracing paper or film to the table, as the low adhesion allows for easy removal without damage.

Table 1
Minimum equipment requirements for a reasonable drawing office

Furniture	:	Table Chair Light Drawing board Cutting board
Curves	:	Circles template Ellipse template Lettering template or stencil French curve Flexible curve Compass plus bar
Fixing	:	Drawing tape Masking tape Drawing pins Weights
Erasing	:	Rubber (vinyl) Ink rubber Razor blade Erasing shield
Lines	:	T-square Set squares Adjustable set square Scale rule Protractor Hangers Metal ruler
Filing	:	Files Fling cabinet or drawer
Pens/pencils	:	Cedarwood pencil Clutch pencil 2mm Clutch pencil 0.3-0.9mm Leads (2H, HB, 2B) Ink-pen 0.25, 0.35, 0.50, 0.70 Fibre-tip pens
Sharpeners	:	Pen knife Mechanical sharpeners Sand paper
Cutting	:	Scissors Knife Scalpel
Paper	:	Sketching A4 transparent Tracing A1 transparent Scratch pad A4 Card board Sketch book Grid paper
Handling	:	Storage shelf Tubes Case for instruments
Other	:	Cleaning cloth

Chapter 3
Sizes and scales of drawings

For technical drawings normal A-size papers are usually used, for which there is a fixed relation of √2:1 between the length and width of the paper (Figure 1 and Table 2). In simple terms, this relation means that the length is 1.41 times the width. The width of one paper size is equal to the length of the next smaller size and the length of one size is equal to two times the width of the next smaller size (Table 2). This means that the area of the next smaller size is half the area of the preceding size. The fixed relation between length and width allows reductions and enlargements of drawings to be made.

Figure 1
Relationship between the different normal A-size papers

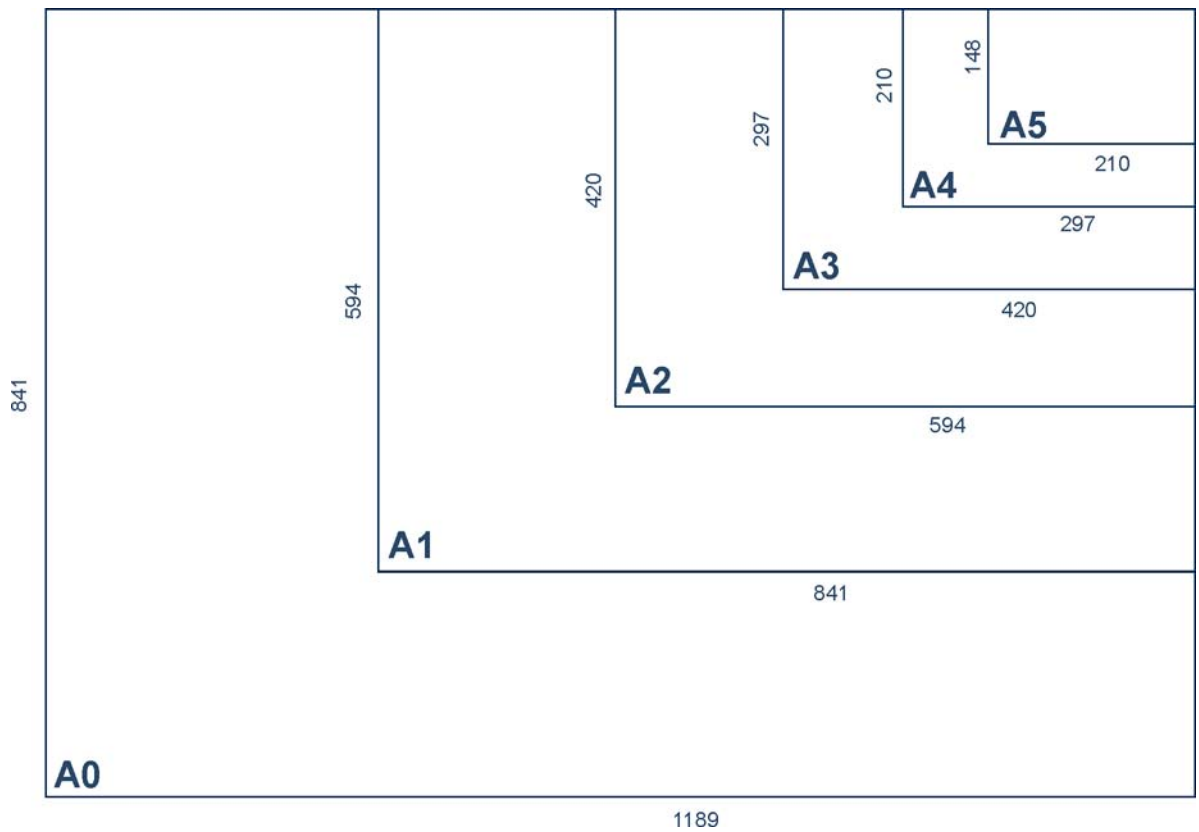


Table 2
Nominal sizes and areas of normal A-size papers

Format	Nominal size: width (mm) x length (mm)	Area (m^2)
A0	841 x 1189	1.00
A1	594 x 841	0.50
A2	420 x 594	0.25
A3	297 x 420	0.125
A4	210 x 297	0.0625
A5	148 x 210	0.0312

Table 3
Nominal sizes and areas of alternative A-size papers

Format	Nominal size: width (mm) x length (mm)	Area (m^2)
A10	594 x 1189	0.70
A20	420 x 1189	0.50
A21	420 x 841	0.35
A31	297 x 841	0.25
A32	297 x 594	0.18

If the project plans tend to be very long, as can be the case when drawing a longitudinal profile of a canal for example, alternative A-sizes may be useful (Table 3).

The formats A0, A10 and A20 are difficult to handle and should be avoided, if possible. Instead, try to use a smaller scale or divide the figure into more drawings. If possible, only one format should be used for all drawings in a project or alternatively all drawings should have the same height.

A number of sheets of each size of paper should be sourced in advance and kept in the drawing office. Then, whenever a drawing is brought into the drawing office for tracing, the best paper size can be chosen. The designer should select the scale of the drawings such that they fit onto the selected paper size and enough detail can be seen.

For contour maps prepared for irrigation purposes and for irrigation layouts, common scales vary from 1:500 to 1:2 000 depending on the size of area. It is not recommended to use scales larger than 1:2 000. If the scheme area cannot fit within one drawing, it is recommended to divide the area into appropriate blocks and make more drawings. For structures, the scales normally vary from 1:5 to 1:100. Sufficient cross-sections and details should be included.

Before starting to draw, one should estimate how large the figure will be and centre it on the page. A worthwhile aid to include is a small figure, identifying the location of a detail drawing in relation to the master plan.

The scale of a drawing should be shown on a line scale form, so that it remains valid when reducing or enlarging the drawing through photocopying.

Chapter 4
Drawing lines and characters

4.1. Lines and line work

Principal lines are first sketched by pencil using a number of short strokes. Once the joining points have been established and lines are satisfactorily straight, they may be traced by ink-pen and darkened as needed to give emphasis and easy reading. All lines should be uniformly black.

Thick continuous lines define visible edges and outlines, while thin continuous lines are for dimensioning and leader lines.

Dashed lines indicate hidden outlines and edges while thin, mixed broken and dotted lines are mostly used for centre lines. Dashed lines should start and end with dashes in contact with the hidden or visible lines from which they originate. If a dashed line meets a curved line tangentially, it should be so marked using a solid portion of dashed line. All chain lines should start and finish with a long dash.

Centre lines show the centre of a structure, such as a road or part of it, or they indicate at what place in the structure a designed cross-section is taken. When centre lines define centre points, they should cross one another at long dash portions of the line. Centre lines should extend only a short distance beyond the feature or view to which they apply, and they should not touch a line off the drawing (for example the lines indicating the dimensions).

The drawings presented in this module provide illustrations of all these lines.

4.2. Lettering and numerals

Ideally, in technical drawings letters and numbers of a straight upright type (sans serif) are used, as shown in the example in the box below.

Clarity, style, spacing and size are very important in a technical drawing. Using the correct techniques, clear lettering can be produced as easily and as swiftly as scratchy letters. Suggested heights for letters are:

- 3 mm or 0.3 cm for the text in figures, measurements and descriptive techniques
- 5 mm or 0.5 cm and 7 mm or 0.7 cm for headings and for drawings that will be reduced

Lettering should normally run from left to right and be parallel to the edge of the sheet. When it becomes necessary for lettering to run vertically it should always run from the bottom upwards.

Notes and captions should be placed in such a way that they can be read in the same direction as the title block. The underlining of notes and captions is not recommended. Instead, larger characters should be used to draw attention to a note or a caption.

For an unskilled draftsperson, guiding lines may be essential. They may be drawn lightly in pencil for subsequent erasure when lettering is done in ink; or they may take the form of a closely-gridded sheet laid underneath the transparent tracing paper.

Letters and words are spaced by eye rather than by measuring. If the proportion, form and spacing of the letters are done properly, the result will be pleasing to the eye.

Figure 2 shows the different stencils, ink-pen sizes and letter heights that can be used in lettering.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	– bold
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	– regular
a b c d e f g h I j k l m n o p q r s t u v w x y z	– bold
a b c d e f g h I j k l m n o p q r s t u v w x y z	– regular
1 2 3 4 5 6 7 8 9 0	– bold
1 2 3 4 5 6 7 8 9 0	– regular

Figure 2
An example of the different stencils and letter heights used in lettering

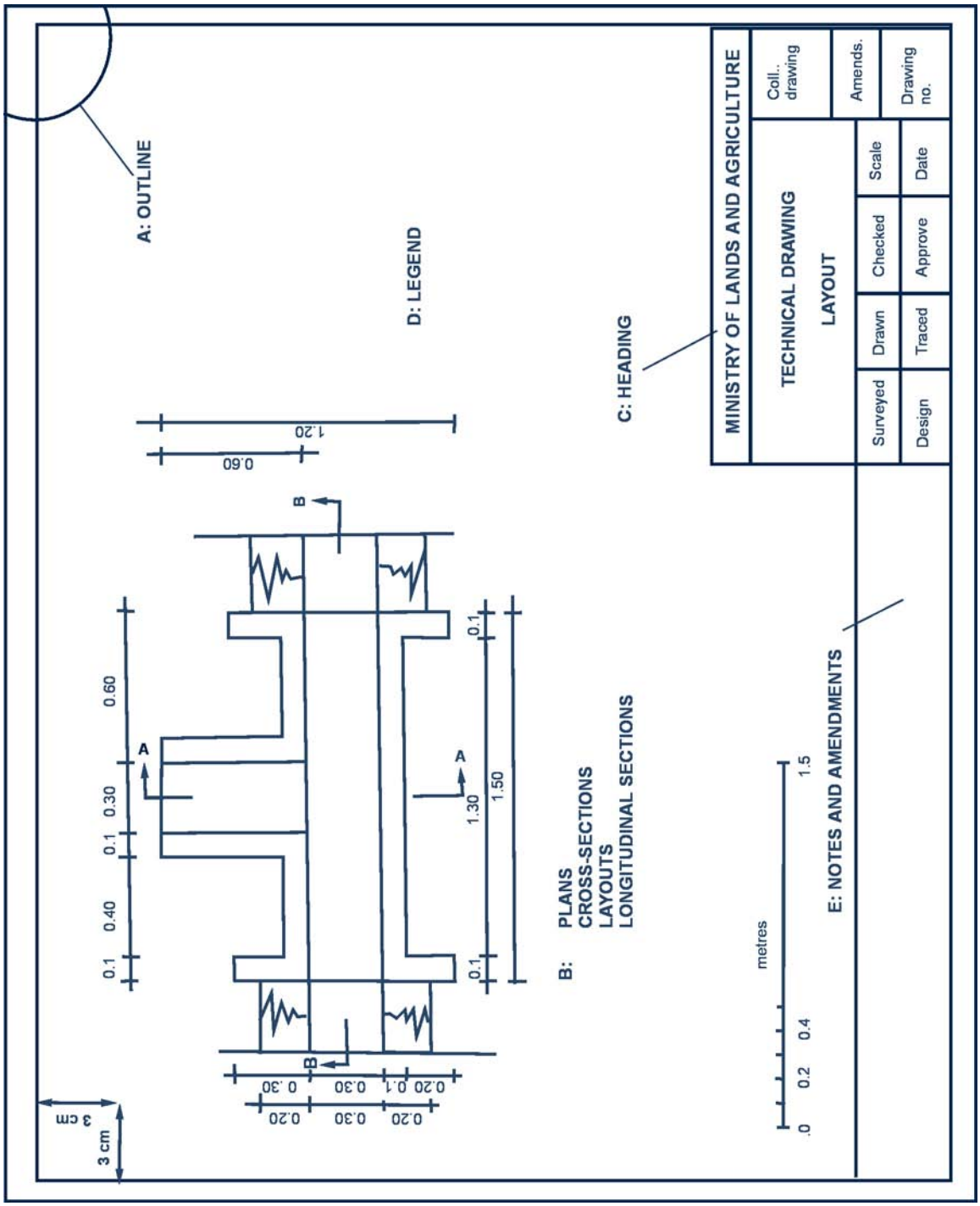
STENCIL SIZE		Letter height mm
40		1
50		1.2
60	A A B C	1.5
80	A A B C D	2
100	A B C D E	2.5
120	A B C D E	3
140	A B C D E F	3.5
175	A B C D E F G	4.5
200	A B C D E F G H	5
240	A B C D E F G H	6
290	B C D E F G H K	7.5
350	B C D E F G H K	9
425	B C D E F G H K	10.5
500	B C D E F G H K L	12

Stencil means template

Chapter 5
Layout of drawings

Figure 3 gives a schematic layout of a technical drawing. The details (A, B, C and D) will be explained in the next sections, and the most commonly used ink-pen size or thickness of 0.50, 0.35 and 0.25 mm will be indicated in italics.

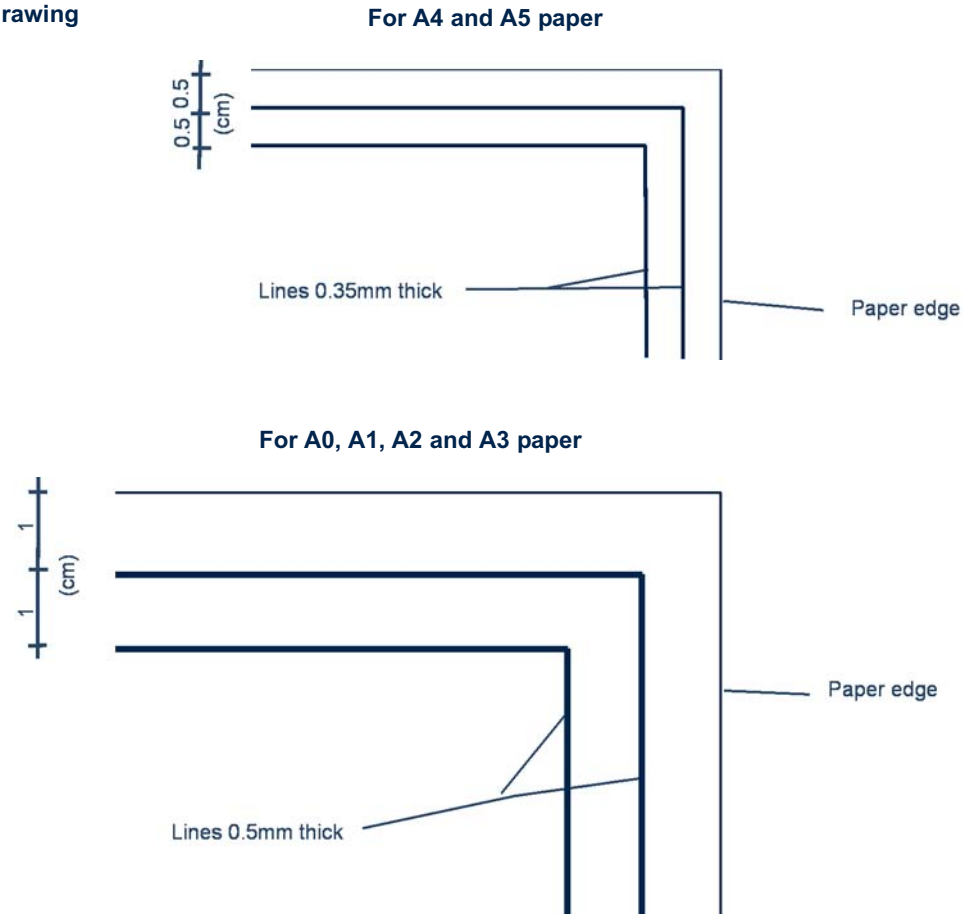
Figure 3
Schematic layout of a technical drawing



5.1. Outline

For A0, A1, A2 and A3 size paper, an outline is made by tracing two lines at the edge of the paper at 1 cm spacing (Figure 4). The line thickness to be used is 0.50 mm. For A4 and A5 size paper, it is 0.5 cm spacing and 0.35 mm line thickness.

Figure 4
Outline of a drawing



5.2. Plan, cross-section, scheme layout, longitudinal profile and contour map

5.2.1. Plans and cross-sections of structures

For every structure, a clear plan (top view) and a sufficient number of cross-sections should be made so that the drawing is clear. The drawing should be clear enough that the structure can be constructed on site by reading the drawing. Figures 5 and 6 give an example of a top view and a cross-section respectively.

There should always be at least 3 cm spacing between the outline and the drawing, depending on the size of the paper. By doing so, one avoids squeezing in the dimensions of the structure. It is recommended to trace the structure itself with the 0.5 mm ink-pen size. Less important aspects of the drawing, such as the canal in Figure 5, should be traced with the 0.35 mm pen. All dimension and centre lines should be traced with the 0.25 mm pen. The cutoff lines are also broken and dotted using a thickness of 0.25 mm.

The recommended ink-pen sizes for the different lines, letters and numbers are indicated in the Figures 5-11.

The parts of the structure through which one should cut in order to get a view of its section could be shaded, as with the concrete floor in Figure 6. This is usually done by drawing lines across the section at an angle of 45° to the edges of the structure, as is done at the middle of the concrete floor in Figure 6. Alternatively, dots could be used, as shown at the edges of the concrete floor of Figure 6.

5.2.2. Layout of a sprinkler irrigation scheme

Figure 7 shows an example of lines, lettering and numerals used in the drawing of a layout of a sprinkler irrigation system.

Figure 5

Example of lines, lettering and numerals used in the drawing of the plan of a diversion structure

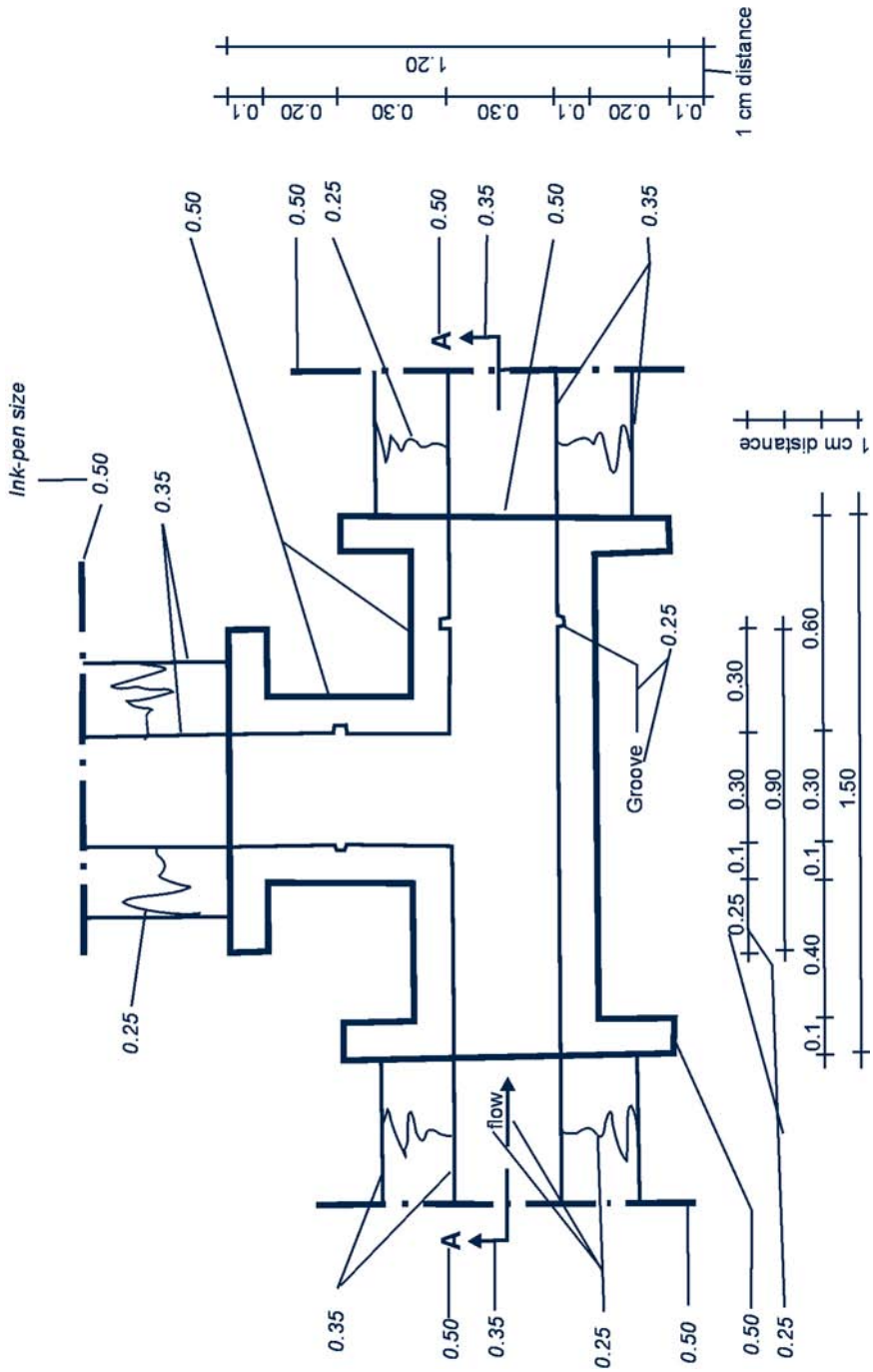


Figure 6

Example of lines and numerals used in the drawing of a cross-section (A-A in Figure 5) of a diversion structure

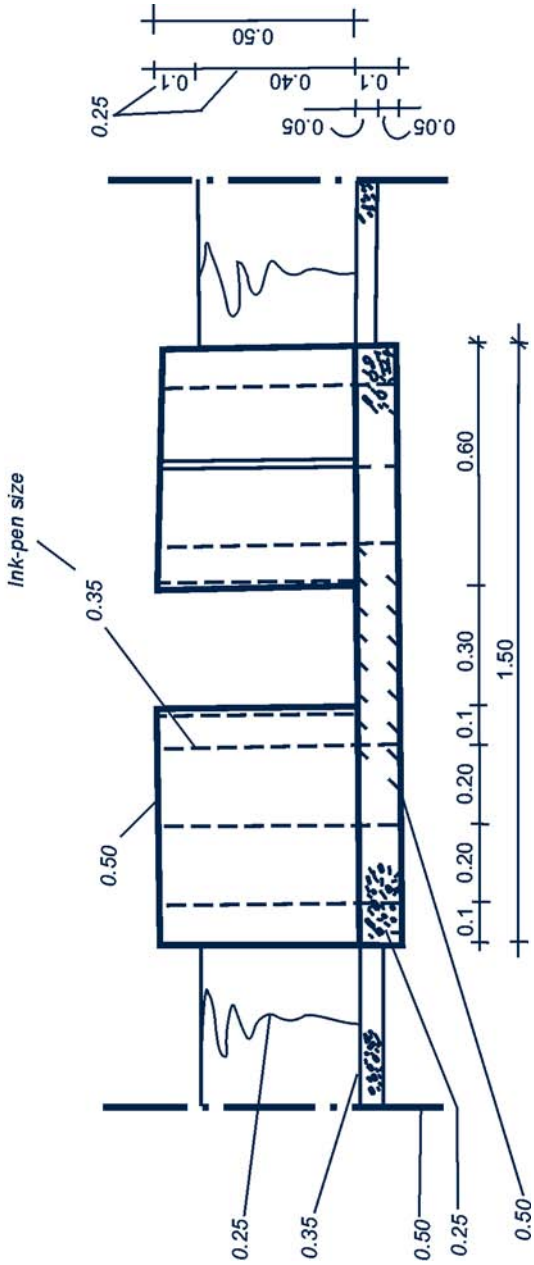
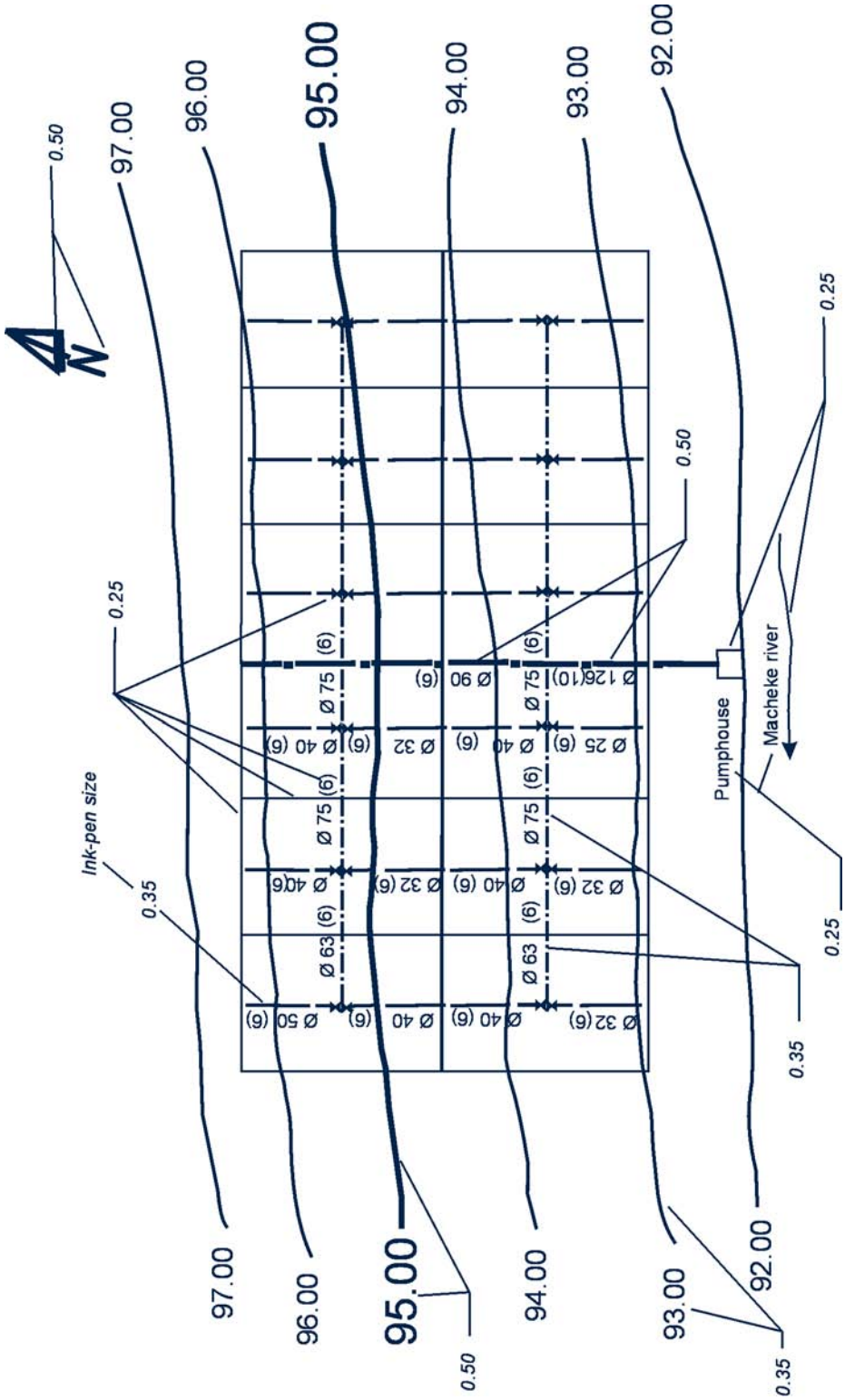


Figure 7

Example of lines, lettering and numerals used in the drawing of the layout of a sprinkler irrigation scheme

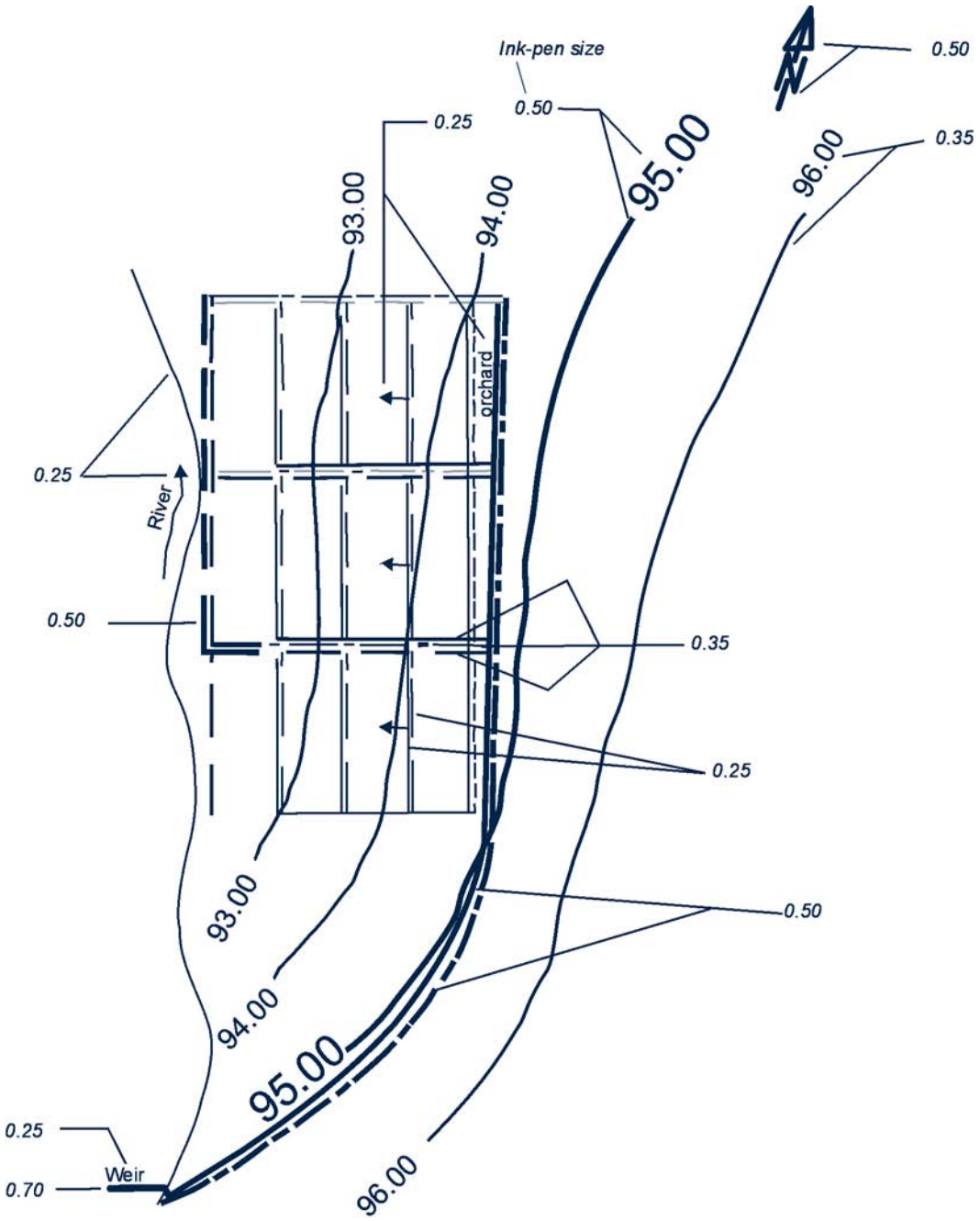


The tracing should be done such that the biggest size pipe is indicated with a 0.50 mm pen. For smaller size pipes subsequently smaller size ink-pens are used. As there are usually more pipe sizes than there are available ink-pen sizes, it is important to clearly indicate the diameter and the class of the pipe, as is done in Figure 7. For example, Ø 63 refers to the pipe diameter and the number 6 between brackets refers to the pipe class. All pipelines should be indicated with a broken line (see the 25, 32, 40 and 50 mm pipes) or a mixed broken and dotted line (see the 63, 75, 90 and 126 mm pipes). All segments of a same pipe size should have the same ink-pen thickness and also the same segment length.

5.2.3. Layout of a surface irrigation scheme

The layout of a surface scheme should be traced in the same way as a sprinkler scheme. Figure 8 shows an example of lines, lettering and numerals used in the drawing of a layout of a surface irrigation system.

Figure 8
Example of lines, lettering and numerals used in the drawing of the layout of a surface irrigation scheme

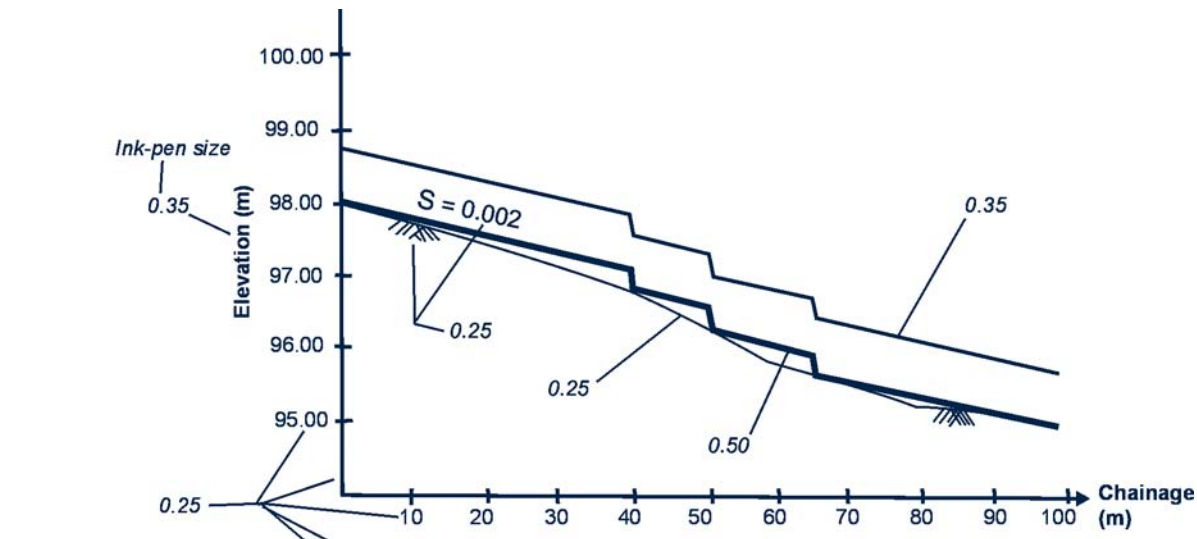


The larger canal sizes should be traced with the largest size ink-pen (0.50 mm). Irrigation canals should be indicated with continuous lines, drainage channels should be indicated with broken lines. In Figure 8, some drainage channels are perpendicular to the direction of the irrigation water flow over the field (and at the bottom of the field). The arrows starting from field canals indicate the direction of the irrigation water flow. Other drains, which are parallel to the infield roads (shown by dashed lines with long and short segments), are parallel to the arrows showing flow direction. Surface irrigation schemes usually have many different kinds of structures, for example diversion and drop structures, bridges and culverts. These should all be explained in the legend (see Section 5.4 and Figure 12).

5.2.4. Longitudinal profiles

Drawings showing longitudinal profiles of canals are not only prepared to calculate required earthworks but also to facilitate their setting out during construction. One should select an appropriate vertical and horizontal scale, such that the figure fits on the paper size and enough detail can be read. Figure 9 shows an example of a longitudinal profile. The recommended ink-pen sizes to be used are again indicated.

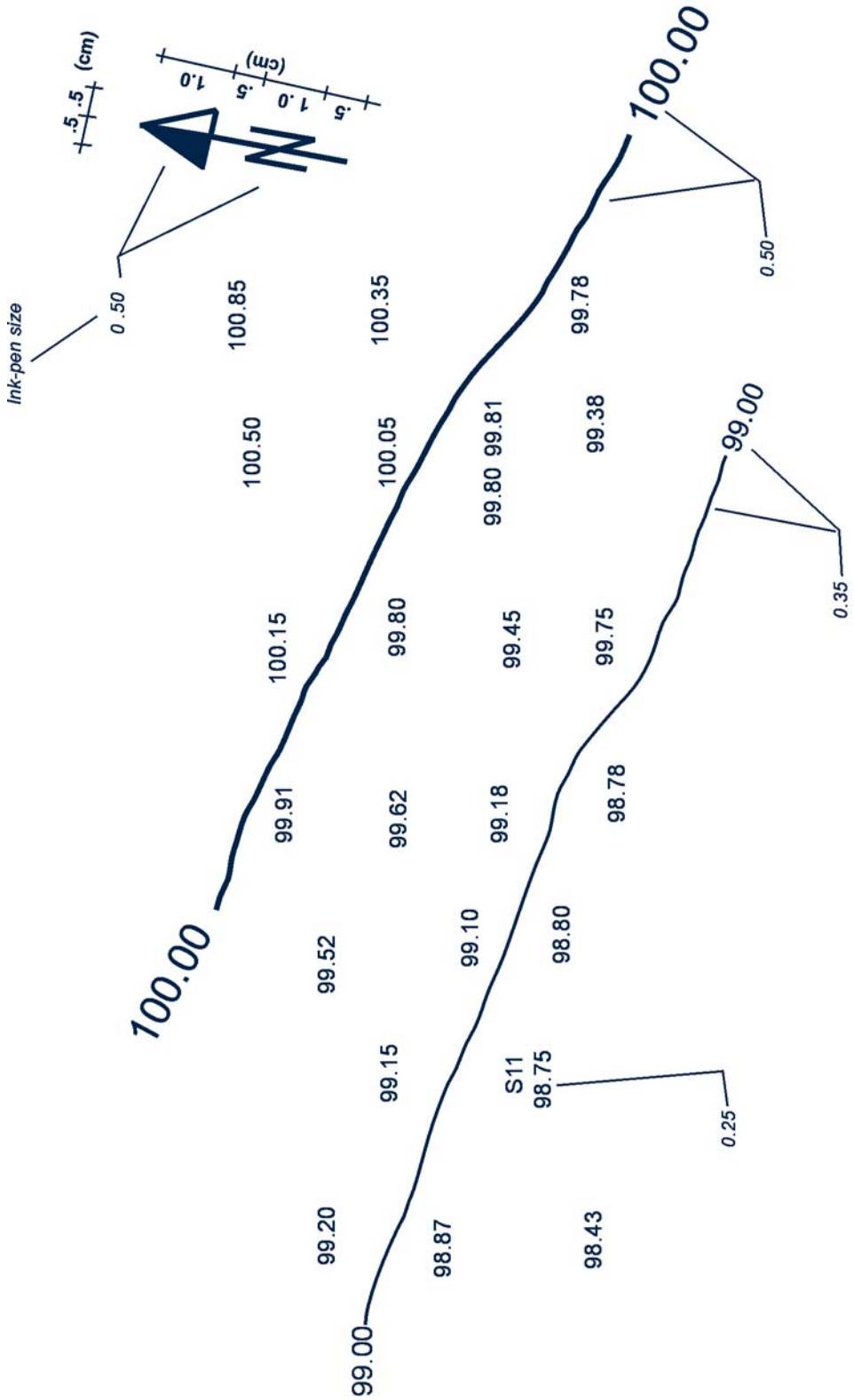
Figure 9
Drawing showing the longitudinal profile of a canal



0.35

Chainage (m)	0	20	40	52	60	65	80	100
Original groundlevel (m)	98.00	97.50	96.80	96.25	95.75	95.65	95.20	94.95
Bedlevel (m)	98.00	97.60	97.20	96.50	96.70	96.25	96.05	95.95	95.65	95.35	94.95
Banklevel (m)	98.75	98.35	97.95	97.65	97.45	97.00	96.80	96.70	96.40	96.10	95.70

Figure 10
An example of the drawing of a contour map



5.2.5. Contour map

An example of part of a contour map is shown in Figure 10. The recommended ink-pen sizes are again indicated. All contour lines were traced with a 0.35 mm ink-pen size, except those at 5 m intervals, like 100.00 and 95.00, for which a 0.50 mm ink-pen was used.

5.3. Heading

Figure 11 shows the heading that could be used for all drawings on A1 and A0 paper sizes. For smaller paper sizes, a reduced heading size should be used, otherwise too much space will be taken from the paper. The heading should clearly indicate the title of the drawing, the persons responsible for survey, design, checking and approval, as well as the scale and the date. Each drawing should be numbered. Drawings related to each other, for example a layout drawing and longitudinal canal sections, should be indicated as collateral drawings. Dates of any amendments should be indicated and explained in the box containing notes and amendments.

5.4. Legend

In general, many symbols are used in irrigation and drainage layouts. The most important symbols are given in Figure 12. All explanations in the legend, such as main drain or drop structure, should be written in small letters using a 0.35 mm ink-pen.

5.5. Notes and amendments

At the bottom of each drawing, a space of 4 cm in height is left for notes and amendments (see E in Figure 3).

Examples of notes are:

- Concrete mix is 1:2:3
- All brick walls to be plastered on both sides
- Soil refill to be well compacted in layers of 15 cm at the correct soil moisture

Any amendments made after the original design should also be explained in this section. As an example, when an extra tertiary canal is added in the field it should be indicated and explained on the drawing.

Figure 11
An example of a heading or title block used for drawings of A1 and A0 sizes

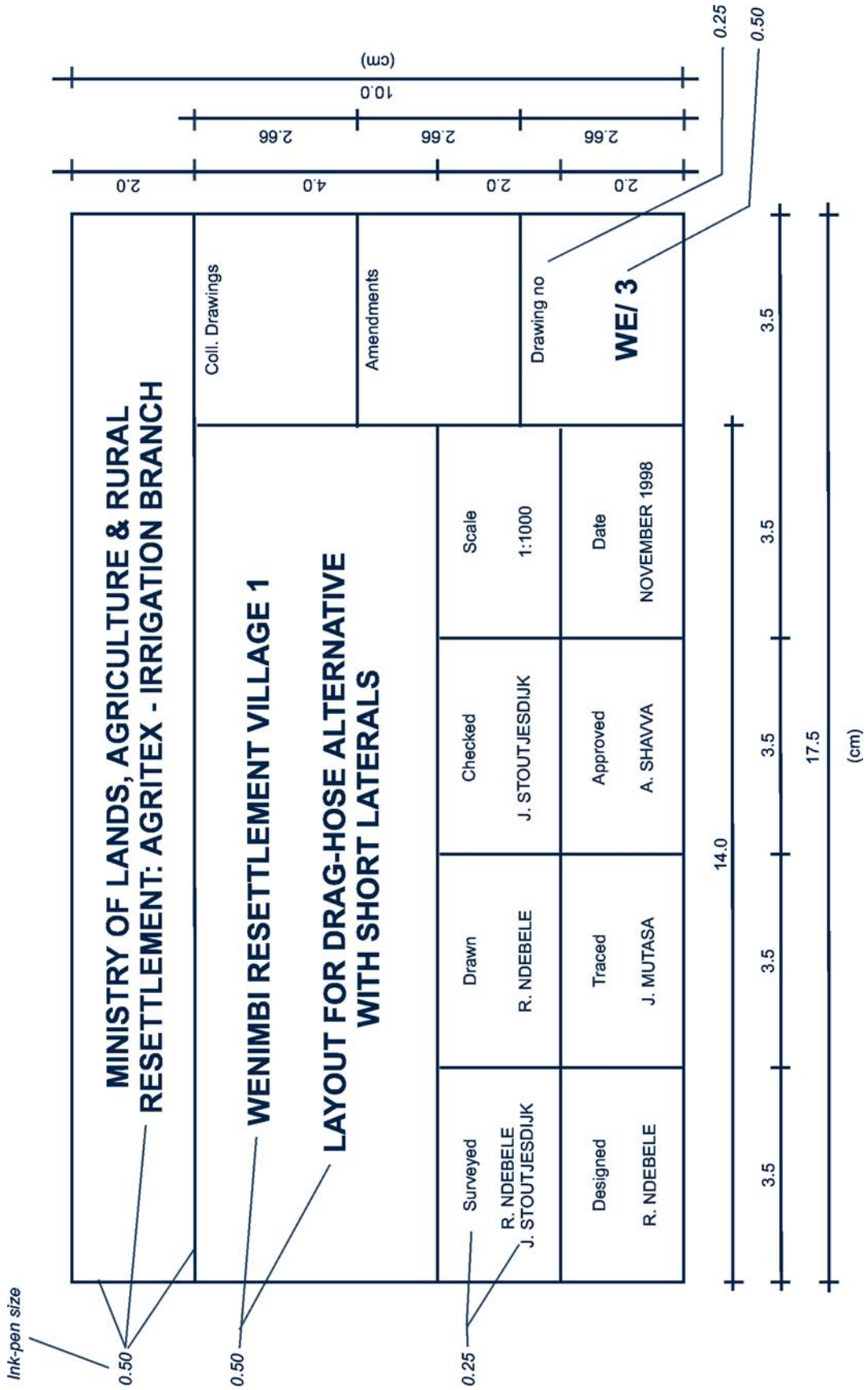
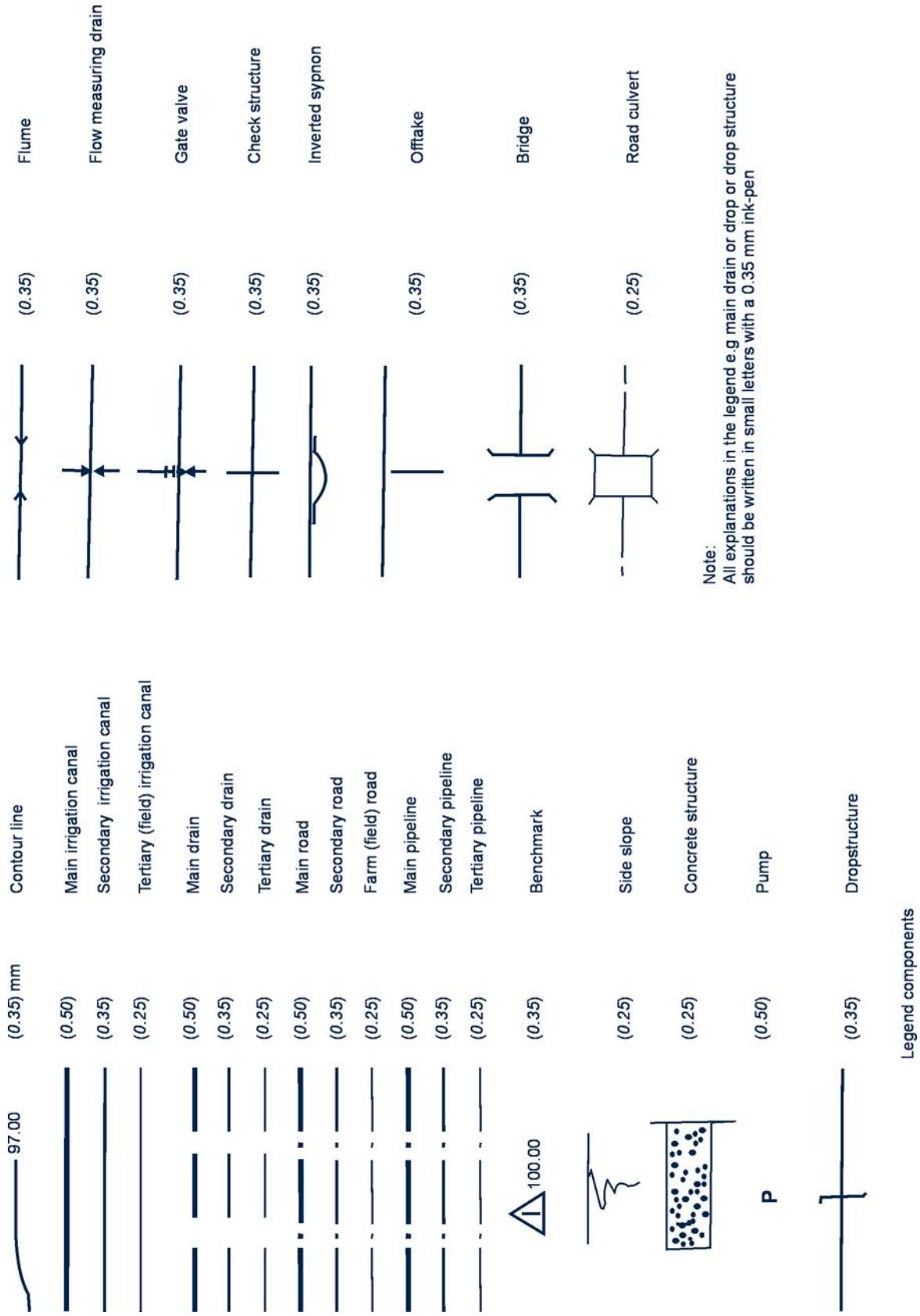


Figure 12

Some of the commonly-used legend symbols in irrigation and drainage layout drawings



Chapter 6
Registering and filing of drawings

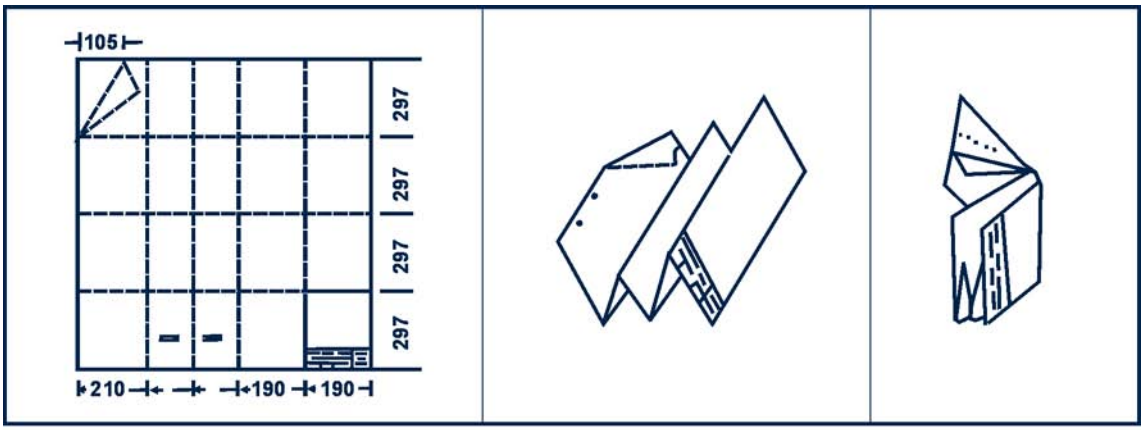
As a rule, the engineers prepare their drawings with pencil on bond paper. These drawings or sketches are brought to the drawing office for tracing. Once the drawing is brought to the drawing office, the entry date, name of designer and title of drawing should be entered in a register. The supervisor of the drawing office should allocate one of the technical officers or draftspersons to do the tracing. Their name should also be entered in the register, as shown in Table 4. Once the tracing of the drawing is completed, the date should be indicated in the register. Drawings that are completed and returned for filing should be kept in filing cabinets. Drawings that are pending should be kept flat, either in a drawer or on top of a large table.

Usually, prints are made of the traced original drawing. For storage of the originals, the drawings should be rolled with the printed side facing outwards and kept in a dark place. For storage of copies in a binder or for inclusion in documents, the copies (not originals) should be folded in such a way that the title block is visible and that it can be unfolded without being taken out of the binder (Figure 13).

Table 4
Example of a register for drawing office

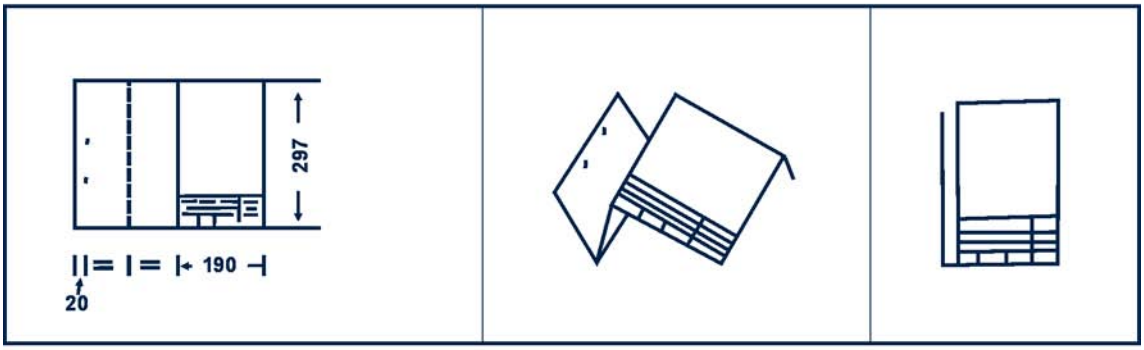
Date in	Designer	Drawing title	Draftsperson	Date completed
17.01.87	Stoutjesdijk	Nabusenga layout	Mabwe	23.01.87
21.02.97	Madyiwa	Tikwiri land levelling map	Mutasa	10.03.97
22.02.97	Chirwa	Nyatate main canal	Maina	28.02.97

Figure 13
Examples of folding of different A-size papers in order to fit in an A4 document



FOLDING OF A0

FOLDING OF A1 & A2



FOLDING OF A3