

TANZANIA BANKERS' CLEARING HOUSE



PAPER INSTRUMENT STANDARDS.

**Directorate of National Payment Systems
BANK OF TANZANIA
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FOREWORD

These standards specify the requirements for the design of paper instruments used for inter-bank payment in local currency between banks in Tanzania.

They have been developed to facilitate the automation of the clearing process of paper instruments. It is for this reason that banks shall ensure full compliance with the specifications. In this regard, bank customers wishing to introduce their own cheques shall refer their proposed designs to their bank for approval.

These standards shall be read and applied in conjunction with the Tanzania Bankers Clearing-House Regulations and Rules. Where these standards are in conflict with these regulations and rules the latter shall prevail.

Amendments of these standards shall be addressed to the National Payment Systems Directorate at the Bank of Tanzania for consideration.

1. PAPER INSTRUMENT DESIGN AND LAYOUT

This part specifies the layout and design features for paper instruments used in Bankers' Clearing Houses in Tanzania, viz. Dar Es Salaam, Mwanza, Arusha, Mbeya and Zanzibar Clearing Houses. These includes:

- a) Cheque Book Standard 1 Specification (CBS1)
- b) Physical Characteristics
- c) Paper Instruments Handling
- d) Paper Instruments Design and Layout
- e) Magnetic Ink Character Recognition (MICR) Specifications
- f) Other issues in support of standardisation
- g) Security Features

2. PAPER INSTRUMENTS SPECIFICATION

a) Introduction

The paper on which instruments are printed shall conform to the CBS1 specification described below. The paper shall be free from an excessive tendency to curl and from any magnetic inclusions.

CBS1 is designed to provide a paper that has a satisfactory performance irrespective of grain direction. However, where an alternative is available to an individual bank, a preference shall be given for long grain, aimed at enhancing the handling qualities of the paper.

b) Physical Characteristics

- i) Grammage
ISO 536 {BS 3432:1980}
95.0 g/m² ($\pm 5\%$)
- ii) Thickness
ISO 534 {BS 3983:1989}
Minimum 105 micrometres
Maximum 130 micrometres
- iii) Bendsten Roughness
ISO 8791-2 {BS 4420:1990}
Both surfaces: -Maximum 150 ml/min
- iv) Stiffness
ISO 2493 {BS 3748:1992}
MD : Min. 7.9 m/N
CD : Min. 3.1 m/N

NOTE:- *The following stiffness values, obtained using alternative test methods, may be considered to be equivalent to the above.*

TABER method using 10 mm test length

MD : min 3.3 Taber units

CD : min 1.3 Taber units

CLARK method TAPPI T451 pm 74

MD : min 124 Clark flexing resistance units

CD : min 50 Clark flexing resistance units

v) Air Resistance or Permeance

Air Resistance (Gurley)

ISO 5636/5 {BS 6538-3 (1987)}

Min: 27 s/100 ml

Or

Air Permeance (Bendtsen)

ISO 5636/3 {BS 6538-2: (1992)}

Max: 450 ml/min

vi) Internal Tearing Resistance

ISO 1974 {BS 4468:1990}

Both directions

Min: 705 m/N

vii) Folding Endurance

Not applicable.

viii) Imaging Surface

Printing shall be on the side of the paper which is most appropriate for the technology being used as recommended by the equipment supplier. Any form of printing on the reverse of the cheque, as part of the cheque design, will require the approval of the customer's clearing bank.

ix) Reflectance

Ideally the reflectance of the paper should be consistently high, around 78-80%.

3. HANDLING OF PAPER INSTRUMENT

a) Perforations and Trimming

Perforations shall give a clean tear and provide adequate retention of the document. This is most easily achieved by using slit or knife perforations with 2.4 - 3.5 ties per cm and with a retaining web of approximately 0.76 mm. Micro perforations are also permitted.

b) Continuous Stationery

Incorrect cutting can result in the code line being moved either too far left or right of the voucher or positioned too low or high; this causes the code line information to be misread and rejected.

Perforations are permissible on any edge. However, if they are on a reference edge the need for a clean tear is paramount. Before presentation to a bank all forms of sprocket holes, and pinwheel feed perforations shall be removed and all cheques separated.

i) Separation by Guillotine

Where a horizontal perforation occurs a double cut shall be used giving a clean edge to both vouchers. Sufficient space will need to be allowed in the design to ensure that this does not result in the code line being positioned too low after guillotining, i.e. less than 5 mm.

ii) Separation by Burster

Horizontal perforations shall be of a long slit type designed to minimise residual webs after bursting. Cutting devices used for the removal of pin wheel feed perforations, sprocket holes and for document separation, shall allow for the correct positioning of any encoding in relation to the new reference edges of the document.

c) Cut Sheet

When the paper is in a stack there shall be no increase in stack height at the area of the perforation. Printing shall not infringe any perforation. A clear area of 1.6 mm shall be left each side of any perforation.

Gauge marks shall not encroach into the clear band area.

d) Tear-off Vouchers

It is essential to preserve the reference edges as these are used to align the document in automatic paper feed mechanisms. Thus counterfoils shall be to the left of, or above, the voucher.

e) Perforations

The body of all vouchers shall not contain perforations, holes or any other incisions.

4. CHEQUE DESIGN AND LAYOUT

All information listed below shall be present, unless specifically indicated otherwise. No Information other than that described below shall be permitted on the face of the cheque.

Only white and pastel shades shall be permitted on either side of the cheques as the security background, with an average background reflectance (ABR) greater than 60% (see ANSI X9.7 1988 - Section 4.3).

a) Physical Characteristics Of The Cheque

The British Association for Payment Clearing Services (APACS) paper specification was used as reference when developing the cheque paper standards for Tanzania.

All financial transaction instruments shall be printed on accepted paper with low reflectivity.

i) Paper Sizes

Paper sizes shall be in the following ranges, if not specifically stated otherwise

	MIN.	MAX.
Length	178mm	204mm
Height	77 mm	102mm

ii) Cheque Sizes

There will be three types of cheques with following sizes:

- 178mm X 77 mm - Fig. 1 when used as cheque, will be known as Personal (pocket) Cheques.
- 203mm X 90 mm - Fig. 2 when used as cheque, will be known as Standard Corporate (company) Cheques.
- 203mm X 102 mm - Fig. 3 when used as cheque will be referred to as Auto printed Corporate Cheques. Cheques of this sizes are primarily for use with "Automatic writing machines and systems"

- iii) Reference Edges as Basis for Measurements
Horizontal dimensions shall be measured from the right-hand edge of the trimmed document, which shall be known as the vertical reference edge. Vertical dimensions shall be measured from the bottom edge of the trimmed document, which shall be known as the bottom or horizontal reference edge.
- iv) Paper Specification
The paper shall be flat, without curl, at a moisture content normal for this use. It shall also be free from any magnetic inclusions. Other properties including security features shall be normal for this grade of paper.
- v) Grain Direction
Grain direction shall have little effect on the paper's performance. However, long grain enhances the handling qualities of paper and shall be given preference, where available.
- vi) Sensitivity of Paper
CBS1 paper shall have chemical sensitivity to acids, alkali bleaches, solvents, and proprietary ink eradicators that will give visible evidence of fraudulent alteration.
- vii) Exception: Chemically Coated Paper
The relevant Clearing Bank may approve the use of chemically coated papers either on the back or on the front e.g. carbon less copy papers, as an exception. The clear band shall be free from coating on the face of the cheque.

Printing and chemically generated images on the face of the cheque shall be permanent and allow for microfilming and image-based processing.

The paper used shall meet requirements specified for grammage and minimum thickness as specified in CBS1 specification, shall be met after coating. Chemical coating on the front shall normally be restricted to the area for completion and shall always be well clear of the clear band. The printing quality shall be suitable for Image Processing.

viii) Printing Of The Face Of The Cheque

Any fraudulent attempt to erase payment details, by chemical, or mechanical means, should result in damage to the background of the cheque, or visible discoloration of the paper, which should give clear evidence of alteration.

ix) Inks For Background Printing

Protection is required against fraudulent attack on vulnerable parts of the cheque (i.e. payee line, amount in word's line(s), and the amount box). Attention should also be paid to the signatures to ensure that they are completed in indelible inks. Any fraudulent attempt to erase payment details should give clear evidence of alteration and should result in damage to the background of the cheque or visual discoloration of the paper. To achieve this, the background design of a cheque shall be printed in ink(s) that are sensitive to solvents and water based reagents so as to provide a visible result after attack.

Inks used for printing the face of the cheque should, as far as possible, be non-fading and the background should be dark enough to reveal attempts at falsification or erasure, yet not so dark as to interfere with microfilming and image-based processing.

The inks to be used for background printing on cheques can be divided into three categories:

- Water Soluble Inks.
Water soluble inks are erasable and will smear or wash out if any water-based chemical is applied to the paper / image. Ink erasers will also disturb the background pattern.
- Chemical Soluble Inks.
Chemical soluble inks are erasable and will smear or wash out if certain alcohol-based chemicals are applied to the image. Ink erasers will also disturb the background pattern.
- Combination Printing

Either of the following methods of applying the security background may be used:

- Separate workings of solvent sensitive and water fugitive inks.
- A combinative ink comprising solvent sensitive and water fugitive properties.

Whichever method is used for printing the security background, the “wet finger” test shall result in a clearly visible removal of the water fugitive component.

x) Security Background

The background printed on cheques shall extend over the entire front surface area of the cheque, though not including the clear band described below.

xi) Tolerances

It is accepted that it is not possible to cut paper precisely and to maintain position accurate during printing, therefore the following tolerances are acceptable:

- The height shall be between the nominal vertical measurement less 1.6mm, and the nominal vertical measurement plus 4.8mm.
- The length shall be the nominal horizontal measurement plus /minus 1.6mm.
- The nominal location of each design feature and field shall be within 1.3mm horizontally & within 1.6mm vertically, relative to the nominal location of each field.

b) Clear Band

All documents shall contain a clear band located:

- i) Horizontally, the complete lengths of the document – from the right-hand (vertical reference) edge to the left-hand edge of the document.
- ii) Vertically for a height of 16mm measured from the bottom (horizontal reference edge).

Nothing shall be printed, or written, at any time on the face or reverse of the document in the clear band area, other than an approved MICR code line on the face only.

Gauge marks for cutting shall appear only above the clear band or on the counterfoil. The clear band may be indicated by a

horizontal line (the clear band divider) with a width of 0.5mm to 1mm, across the face of the document, at least 16mm from the horizontal reference edge. This divider shall not be joined to any other line or text. Any wording such as “please do not write below this line or fold this document” shall be added above the clear band.

If there is any wording on the reverse of the document, then a clear band divider may be printed on the reverse. Where non-impact printing using “magnetic ink” toner is used then no clear band divider line shall be printed in “magnetic ink” because of the potential for displaced toner particles affecting the subsequent code line reading process.

c) Restraint Area

The restraint area shall be an unmarked rectangular space on the right hand side of the instrument where only specified items are printed. Only the background design may extend into this space.

Collecting banks and customers accepting cheques shall not cause marks, stamps, or inscriptions in this space, other than what is necessary to complete the instrument.

The left-hand boundary of the restraint area shall measure 54mm for Personal Cheques and 60mm for Corporate Cheques from the vertical reference edge of the document. The right-hand edge shall be the vertical reference edge. The height of the restraint area shall extend from the horizontal reference edge to the top of the document.

Any pre-printed characters in this area shall be printed in an ink, preferably black, giving a Print Contrast Signal (PCS) greater than 0.6 (60%). The bank code and the optional Print-run Serial Number shall be printed in characters meeting OCR-B1 British Standard BS 6616:1986 specifications. The character pitch shall be nominally 2.54mm.

i) Convenience Amount

- Scan Area

This is where the convenience / courtesy amount box rectangle will be located. The Convenience Amount Scan Area is an imaginary rectangle of fixed size and location

with its long axis parallel to the horizontal reference edge of the document.

The scan area shall be 16mm high and extends across the width of the restraint area. The lower edge of the scan area shall be 32mm for Personal Cheques, 40mm for Corporate Cheques and 48mm for Auto-printed Corporate Cheques.

The right-hand edge of the scan area shall be the right-hand vertical reference edge of the document.

- Amount Box

For image processing the amount box area shall be printed to provide an Average Background Reflectance (ABR) of value greater than 60% (See ANSI X9.7 1988 – Section 4.3). The amount box area shall be 41mm wide for Personal Cheques and 46mm wide for corporate cheques. Both will have a height of 9.5mm.

In order to make the amount box visible either a low contrast border may be printed outside the amount box area or the amount box itself, the PCS of the background print immediately outside the amount box shall be less than 0.3 (30%).

Any border to the low contrast amount box area shall be printed in a drop-out ink (as defined in ANSI X9.7 1988 American Standard: Bank Check background and convenience amount field – appendix A3). The minimum thickness of this border shall be 1.3mm. The PCS value of the border shall be less than 0.3 (30%) using white or pastel shades. Black ink shall not be used. The low contrast border shall immediately surround the amount box area, i.e. the internal dimensions of the low contrast border, if any, shall be 41mm wide for Personal Cheques and 46mm for Corporate Cheques and 9.5mm high.

The amount box shall be positioned within the restraint area with the lower edge of the box 35mm from the horizontal reference edge of the voucher for Personal Cheques and 43mm for Corporate Cheques. For Autoprinted Corporate Cheques the lower edge of the box is to be 51mm from the horizontal reference edge of the document. The right hand edge of the amount box shall be 5mm from the vertical reference edge.

- The Currency Symbol

The letters “TZS” shall be printed in black outside the amount box area to the left and centred vertically on the box.

It shall conform to the OCR-B character style with a height of 4mm and shall appear within the restraint area. The space between the right hand edge of the “TZS” symbol and the left - hand edge of the amount box area shall be no greater than 1mm. The “TZS” symbol will thus be partially within the left – hand vertical border, if present, or no more than 1mm to the left of the left – hand edge of the amount box area, i.e. the measurement shall be taken from the inside of the left – hand vertical border, if present, or the left – hand edge of the amount box area.

ii) Date Line

The date line consists of a horizontal black line, with a width of 0.5mm to 1mm, 41mm long preceded by the word “Date”. The base of the horizontal line shall be positioned at 55mm for Personal Cheques and 69mm for Corporate Cheques, from the horizontal reference edge of the document. Auto-printed Corporate Cheques shall have the Date Line positioned 74mm from the horizontal reference edge of the document. The right hand edge of the date line shall be positioned at 5mm from the vertical reference edge.

iii) Bank Code and Serial Number

The Bank Sorting Code shall be printed within the restraint area, in OCR-B font, with the base of the characters positioned 64mm for Personal Cheques, 78mm for Corporate Cheques and 90mm for Auto-printed Corporate Cheques, from the horizontal reference edge of the document with the right – hand edge of the rightmost digit of the sorting code number at 5mm from the vertical reference edge.

iv) Print-Run Serial Number

The optional Print-run serial number is to enable a sequence number to be included during a cheque writing run on continuous stationery. The Print-run Serial Number is not applicable to Personal Cheques and is optional for Auto-printed Corporate Cheques.

The Print-run Serial Number shall be printed on the same line as the Bank Code. The senior digit shall be positioned

not closer than 5mm to the right of the left-hand edge of the restraint area.

v) Identification of Printer

The name of the printer of the base stock and, if possible, the date e.g. month and year, of production of the stock shall appear on the face of the cheque. It shall be clear of the "clear band". It shall be printed vertically on the furthest left part of the document using a small but legible font.

The date of personalisation and the name of the personalisation printer, if different from the base stock printer, shall be printed at the bottom left hand side of the cheque above the "clear band".

vi) Account Name

The account name shall be printed within the restraint area above the signature(s) position and below the Convenience Amount Scan Area in a single line. There shall be a minimum clear area of 3mm between the top of the characters forming the personalisation printing and the lower edge of the amount box area, i.e. the inside of the lower edge of the low contrast border, if present. The height of the characters shall not exceed 2mm. If the Account Name is not printed in this position the words "Authorised Signatory (below)" shall be printed instead.

vii) Crossing

Any Crossing shall consist of two parallel lines, printed bolder than any adjacent lines on the document, placed vertically or diagonally across the centre of the cheque and may incorporate a band of distinctive colour or shade. It shall not extend into the Clear Band.

Any wording associated with the crossing should be placed between the parallel lines.

viii) Payee Name

- Personal Cheques

The Payee Name line shall be 42mm above the horizontal reference edge. The payee line shall be as shown below:

Pay_____ or Order

Or

Pay_____ or Bearer

The letter “r” of the word “Order” / “Bearer” shall be no closer than 2.5mm to the Restraint Area.

- Corporate Cheques

The position for the Payee Name Line for Corporate Cheques is 52mm above the horizontal reference edge.

Auto- printed Corporate Cheques shall have the Payee Name Line 60mm above the horizontal reference edge.

The legend “Pay” shall not be above the space for the payee name. It shall be on the same line and immediately to the left of the space where the payee name will be inserted.

ix) Amount in Words

- Personal Cheques

The Amount in Words position shall be two lines at 34mm and 26mm above the horizontal reference edge. The Amount in Words line shall be shown as below:

Shillings_____ |

_____ |

The right hand limit is the restraint line. The Restraint Line shall be no closer than 2.5mm to the Restraint Area. The height of the restraint line shall be between 3mm and 6mm.

- Corporate Cheques

The position for the Amount in Words lines for Corporate Cheques is 41mm and 30mm from the horizontal reference edge.

- Auto-printed Corporate Cheques

The position for the Amount in Words lines for Auto-printed Corporate Cheques is 51mm and 42mm from the horizontal reference edge.

d) The Drawee Bank information Printing

i) Name of the Drawee Bank

The name of the drawee bank shall be printed clearly along the upper edge of the cheque, extending from the left and clearly outside the Restraint Area.

The format, font, size and colour of the bank's name are entirely at the discretion of the drawee bank.

Printing elsewhere on the cheque, including the customer's name shall not be visually larger than the drawee bank's name.

Where the drawee bank is a division of a holding company, this shall be stated, immediately below the drawee bank name, in characters 25% of the size of the latter.

ii) Name Of The Drawee Bank Branch

The correct name of the drawee branch is to be obtained from the bank or branch concerned.

The name of the drawee branch shall be shown, in visually clear print, immediately below or to the right of the name of the drawee bank.

The letters shall be smaller than the letters in which the name of the drawee bank is printed.

iii) Payee Identification

The payee's name shall form the basis for identifying the beneficiary of a cheque. The identity number of the payee, or any other means of identification shall not, therefore, be included in the completion of a cheque, in any form.

It follows that no provision for the payee's identity number, or any other means of identification shall be included in the design of a cheque.

iv) The Reverse Side Of Cheques

Spot Carbonising on the reverse side of the cheque is allowed only if a superior quality hot printed carbon is used, and provided that it does not extend over the 16-mm clear band, nor appear within a mechanical endorsement area. Reference should be made to the drawee bank as to their specific requirements.

Any printing on the back of a cheque must have the drawee bank's prior approval.

Any such printing must be of a shade that will allow legible mechanical endorsement, microfilming or optical reading by the banks' processing equipment.

v) Pictorial Backgrounds

Pictorial backgrounds are acceptable provided all other rules pertaining to the printing of the security background are strictly observed.

The background shall be printed using inks that exhibit both solvent and chemical or water fugitive reactions when subjected to organic and inorganic reagents.

In combination, the cheque paper and background inks shall provide easily observable fugitive reaction (bleed) to all known solvents, acids, alkalis, bleaches and patent ink eradicators.

Backgrounds must be printed in two or more colours using design and colour combinations, which are difficult to separate by filtration. At least one colour should be a shade which resists accurate reproduction by colour-photocopier.

vi) Perforations

Slit or slotted type perforations may be allowed along any edge of the instrument. Pinhole perforations shall not be permitted.

vii) Duties

An area shall be kept clear of all pre-printed information except the mark "Duty Paid," required to indicate that duty has been paid. This area:

- a) Has the right-hand side abutting the restraint area; and
- b) Has the left-hand edge 25mm from the edge of the restraint area into the unrestrained area.

The "Duty Paid" mark shall be centred in the above-indicated space.

If Revenue Stamp Duty is payable and is required to be attached to the instrument, a composition revenue rubber stamp shall be endorsed on the rear of the instrument.

Note: attachment of PHYSICAL STAMPS IS NOT PERMITTED.

5. MAGNETIC INK CHARACTER RECOGNITION (MICR) SPECIFICATIONS

a) Font to be used

The approved font is E-13B which shall be printed in accordance with BS 4810:1980. Tolerances shall be as specified in that standard. All customers originated paper instruments for passing between banks shall bear the standard MICR code line.

b) Ink Used

All E-13B characters shall be printed in magnetic ink (i.e. ink capable of being magnetised and sensed).

c) Magnetic Printing

i) The E-13B Character Set

The E-13B MICR font consists of:

- Ten numerals (i.e. 0 1 2 3 4 5 6 7 8 9) used to represent numbers; and,
- Four symbols (i.e. A, B, X, and Δ), which are used as described below:
 - SORTING CODE SYMBOL 10 (A), which indicates to the reader-sorter where to commence reading the Sorting Code.
 - AMOUNT SYMBOL 11 (B), which indicates to the reader-sorter the boundaries of the Amount field.
 - ON US SYMBOL 12 (X), which indicates to the reader-sorter where to start reading the account number and where to start and finish reading the reference (or serial) number.
 - DASH SYMBOL 13 (Δ), which is a divider or hyphen to the reader-sorter.

ii) Code Line Printing

The drawee bank shall verify information at time of approval and specifically the 6-digit bank/branch sort code and the account number.

MICR Encoded cheques processed by the Clearing Centre shall not exceed a "field" reject rate of more than 1%.

iii) Specification Of The Printed MICR Image

The printed MICR image shall comply with the requirements of the E-13B MICR font as defined in the latest issue of the International Standard document ISO 1004.

iv) Code-Line Content And Format

The code-line shall be printed such that the bottom edge of its characters is 6 mm (plus or minus 1.6 mm) from the horizontal reference edge. This implies that fields of information can be printed with a horizontal tolerance of ± 1.6 mm and it is assumed that the distance of any characters' bottom edge from the horizontal edge of the instrument shall lie between 5 mm and 8mm.

The code-line shall be printed between the specified margins and shall contain the six data fields listed below (in order from the left edge):

	FIELD	MAXIMUM SIZE
1	Serial Reference Number	6 digits
2	Sort code Country-Centre Code Bank code Branch code	2 digits 2 digits 2 digits
3	Check digits	2 digits
4	Account Number	10 digits
5	Transaction code	2 digits
6	Amount	12 digits.

- Field Separators

Every field shall be closed by the appropriate closing symbol or by the opening symbol to another field as follows:

- The Serial Reference Number shall be encoded with the On-Us symbol (X) as its field opening and closing symbol (i.e. on its left and right side).
- The sort code field (i.e. Country-Centre, Bank and Branch codes put together in that order) shall be encoded with the Sort Code Symbol 10 (A) as its field opening symbol and the On Us Symbol 11 (X) which an opening symbol for reference number, as its closing symbol. However, the Country-Centre Code shall be separated from the Bank code on its right by a dash symbol (Δ).
- Account Number shall use the On-Us symbols (X) the and sort code (A)as its field opening and the On-Us Symbol (X) as the closing symbols.
- Transaction code shall use the Amount symbols (B) for its field opening and closing respectively.
- Amount shall have the Amount symbol (B) as its field opening and closing symbol.

v) An example of the Tanzania MICR code-line

4	9	4	8	4	7	4	6	4	5	4	4	4	3	4	2	4	1	4	0	3	9	3	8	3	7	3	6	3	5	3	4	3	3	2	3	1	3	0	2	9	2	8	2	7	2	6	2	5	2	4	2	3	2	2	2	1	2	0	1	9	1	8	1	7	1	6	1	5	1	4	1	3	1	2	1	1	1	0	9	8	7	6	5	4	3	2	1
X	1	2	3	4	5	6	X	1	2	Δ	1	2	1	2	1	2	1	2	A	1	2	3	4	5	6	7	8	9	0	X	1	2	E	1	2	3	4	5	6	7	8	9	0	1	2	B																																									

Serial Number
6 digits

Sorting Code / C-D
8 digits

Account Number
10 digits

Tran Code
2 digits

Amount
12 digits

- **Right Margin.** 7.937mm measured from the right reference edge of the document to the right edge of the opening symbol for the amount.
- **Amount Field.** Fixed in length and position and consisting of twelve digits plus symbols to open and close the field. A digit to appear in every position provided i.e. a zero to be printed in each position that has no significant digit.
- **Transaction Code:** Fixed in length, providing for the adjacent digits and no symbols. A single digit code must be preceded by a zero. The transaction code may be moved one space to the left or the right if required to ensure correct alignment. When this is done, it is essential that the transaction code be printed at the same time as the immediately adjacent field.

- **Account Number:** Fixed in length and position. It consists of ten digits plus a symbol to open and close the field. A digit shall appear in every position provided, a zero shall be printed in each position where there is no significant digit.
- **Check Digit:** This is a field for modulus 11 check digit that shall be filled by the coding machine on personalising the cheque. It is a two-digit field that shall be applied for purposes of sort code verification.
- **Sorting Code.** This field shall contain the first four digits of the bank/branch separated by a Dash Symbol (13) followed by a two-digit country / centre code. The field is fixed in length and zero filled where necessary.
- **Cheque number:** This field normally contains the serial number, the right end of which is in a fixed position. The field will be of a maximum of 6 characters plus a symbol 12 in the left and right position.
- The sorting code and the serial number shall be repeated in the restraint area, in OCR-B1 font in black with a PCS of greater than 0.6 (60%) in characters 3mm high.
- **Left Margin.** There shall be provided a left margin of at least 7.937mm.

d) Toner Based Non-Impact Printers

Toner based non-impact printers shall not be used for completion of instruments, due to the superficial nature of the imprint. However, when non-impact printer applies a magnetic toner, this may be acceptable, provided that rigorous control measures are applied in the operation to ensure continuing quality. In order to minimise fraud it is not allowed to use reverse printing style.

e) Clients' Information And Emblems

The cheque is an instrument of payment; nothing on it may be allowed to interfere with this fundamental purpose. However, in order to cater for clients' needs, the bottom left part of the cheque above the clear band may be used for any additional information which must be within the rectangular area.

f) Control Vouchers Usage

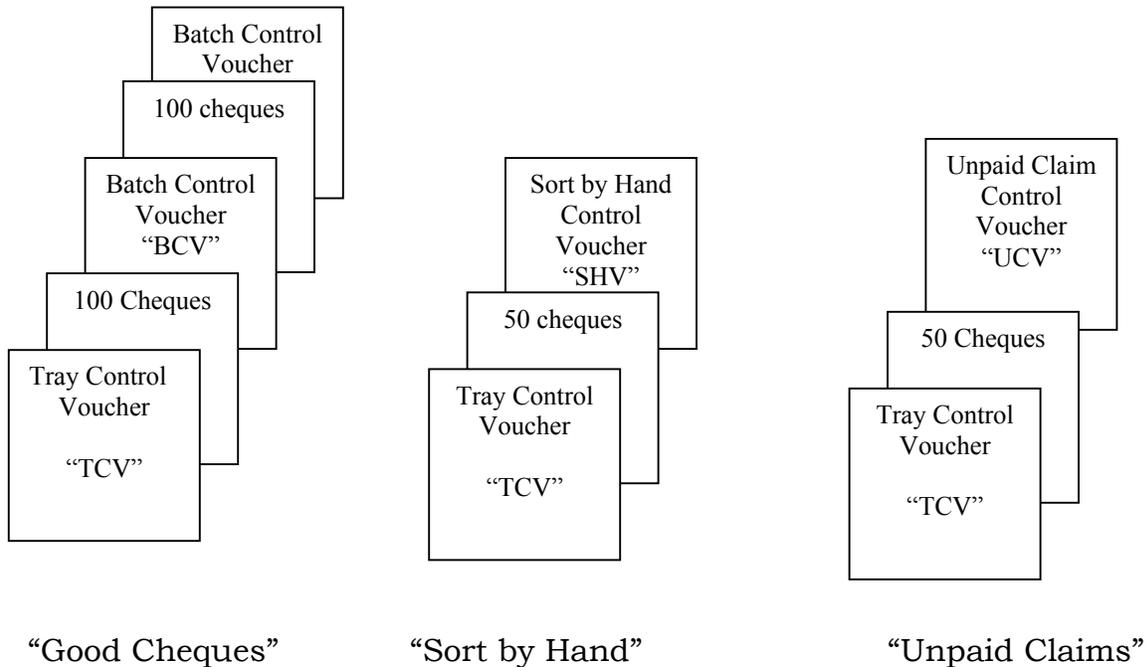
Control Vouchers will be inserted by the bank presenting cheques to the Clearing House. Four types of control vouchers have been identified to accompany cheques being presented to the Clearing House.

When cheques are presented there will be:

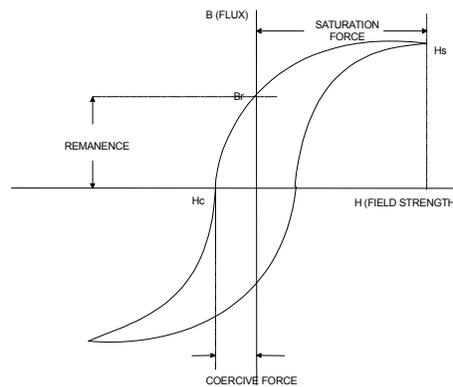
- i) A Tray Control Voucher (TCV), Transaction Type 70, in front of up to a maximum of 1,000 cheques.
- ii) A Batch Control Voucher (BCV), Transaction Type 71, separating up to every 100 cheques. The BCV will contain within a code-line the total value of the cheques between it and the preceding control voucher in the amount box.
- iii) An Unpaid Claim Control Voucher" (UCV), Transaction Type 72 separating up to a maximum of not more than 50 vouchers for unpaid instruments.
- iv) A Sort-by-Hand Control Voucher (SHV), Transaction Type 73 separating up to the maximum of not more than 50 vouchers for instruments sorted by hand.

It is the responsibility of individual banks to meet the requirements of the Control Vouchers.

A diagram is provided below, as an illustration of how a typical tray of work should be presented to the Clearing House.



g) Magnetic Ink Properties



Under optimum printing conditions, judged on an optical base, the magnetic properties of a magnetic E-13B code line should be such that signal level measurements should give a reading near 100% when compared with a standard printing sample.

Where a process uses ink, a range of inks may be required in order to meet this requirement. It is important that a type of ink, once selected by a printer, shall be consistent in its magnetic properties and have a tolerance of $\pm 10\%$ for each property.

Inks, which have been found to be satisfactory, have properties within the following ranges when tested in bulk on a suitable instrument:-

Saturation Force (H): 1000 - 1500 Oersted (80 - 120 kA/m)
 Coercive Force (H): 250 - 350 Oersted (20 - 28 kA/m)
 Remanence (B)
 Letterpress Inks: 500 - 650 Gauss (50 - 65 mT)
 Lithographic Inks: 600 - 900 Gauss (60 - 90 mT)

It is emphasised that the data quoted are not to be interpreted as expressing ink-manufacturing tolerances.

h) MICR (E-13B) Code Line Character Positions

The MICR Code line characters shall be placed as per distances shown below from the right hand edge of each character square measured from the vertical reference edge.

Position	Inches		mm
	Fraction	Decimal	
P1	5/16	0.3125	8
P2	7/16	0.4375	11
P3	9/16	0.5625	14
P4	11/16	0.6875	17
P5	13/16	0.8125	21
P6	15/16	0.9375	24
P7	1 ¹ /16	1.0625	27
P8	1 ³ /16	1.1875	30
P9	1 ⁵ /16	1.3125	33
P10	1 ⁷ /16	1.4375	37
P11	1 ⁹ /16	1.5625	40
P12	1 ¹¹ /16	1.6875	43
P13	1 ¹³ /16	1.8125	46
P14	1 ¹⁵ /16	1.9375	49
P15	2 ¹ /16	2.0625	52
P16	2 ³ /16	2.1875	56
P17	2 ⁵ /16	2.3125	59
P18	2 ⁷ /16	2.4375	62
P19	2 ⁹ /16	2.5625	65
P20	2 ¹¹ /16	2.6875	68
P21	2 ¹³ /16	2.8125	71
P22	2 ¹⁵ /16	2.9375	75
P23	3 ¹ /16	3.0625	78
P24	3 ³ /16	3.1875	81
P25	3 ⁵ /16	3.3125	84

Position	Inches		mm
	Fraction	Decimal	
P26	3 ⁷ /16	3.4375	87
P27	3 ⁹ /16	3.5625	90
P28	3 ¹¹ /16	3.6875	94
P29	3 ¹³ /16	3.8125	97
P30	3 ¹⁵ /16	3.9375	100
P31	4 ¹ /16	4.0625	103
P32	4 ³ /16	4.1875	106
P33	4 ⁵ /16	4.3125	110
P34	4 ⁷ /16	4.4375	113
P35	4 ⁹ /16	4.5625	116
P36	4 ¹¹ /16	4.6875	119
P37	4 ¹³ /16	4.8125	122
P38	4 ¹⁵ /16	4.9375	125
P39	5 ¹ /16	5.0625	129
P40	5 ³ /16	5.1875	132
P41	5 ⁵ /16	5.3125	135
P42	5 ⁷ /16	5.4375	138
P43	5 ⁹ /16	5.5625	141
P44	5 ¹¹ /16	5.6875	144
P45	5 ¹³ /16	5.8125	148
P46	6 ³ /16	5.9375	151
P47	6 ⁷ /16	6.0625	154
P48	6 ¹¹ /16	6.1875	157
P49	6 ¹⁵ /16	6.3125	160

- Narrative Of MICR Code Line

Position 1

“Q” Symbol 11

Amount Field Open

Position 2 – 13	Amount Field
Position 14	“Q” Symbol 11 Amount Field Closed
Position 15	Space
Position 16 – 17	Transaction Codes
Position 18	Space
Position 19	“Q” symbol 12 On Us
Position 20 – 29	Account Number
Position 30	Space
Position 31	“Q” symbol 10 Sort Code Symbol
Position 32 – 37	Sort Code & Check Digit - Modulus 11 = 2 Characters)
Position 38	“Q” Symbol 13 Dash
Position 39 –40	Country / Clearing Centre
Position 41	Space
Position 42	“Q” Symbol 12 On Us
Position 43 – 48	Serial Number
Position 49	“Q” Symbol 12 On Us

6. OTHER ISSUES IN SUPPORT OF STANDARDISATION

a) Parties

All members of the Bankers Clearing House and their sponsored banks shall be committed to cheque standardisation.

b) Approval Of Instruments

All newly designed instruments or reprints shall conform to the standards. Commercial banks' clients who decide to print their own instruments shall submit “proofs” to their bankers for approval. Sponsored banks are responsible for ensuring client adherence to standards.

Members who present instruments that do not meet the specified standards shall be penalised by a fine, possible suspension from the clearing house and any other penalties as shall be decided by the Clearing House.

c) Format Errors and Code-Line and/or Non-adherence to Standard.

- i) Instruments printed with an incorrect MICR code-line and/or format shall be withdrawn and destroyed immediately.
- ii) Banks shall undertake to keep a reference sample of instruments they had approved for printing.

- iii) Any order from a customer to a printing company to print MICR code-line shall be accompanied by drawee bank approval.

7. CALCULATING THE MODULUS 11 CHECK DIGIT

The individual banks to their instrument printers shall supply the Check Digit.

Modulus 11 is used with individual digits of the Sorting Code field, weighted from the right by factors 2,3,4,5,6,7,8,9. Commencing with the least significant, each digit of the Sort Code, is multiplied separately by the appropriate weight factor. The individual multiplication products are summed and the total divided by 11.

If the remainder is 0, this is the check digit. If the remainder is 1, the check digit is 10, and is represented by 0. All other remainders (2 to 10), are subtracted from 11 and the difference is the check digit. The check digit is placed in the rightmost position of the field being checked.

Example:

To calculate a check digit for bank branch with code 38653899

Field code	3	8	6	5	3	8	9	9
Weighting:	9	8	7	6	5	4	3	2
Product	27	64	42	30	15	32	27	18
Sum	255							

255 divided by 11 yields a remainder of 2

Therefore the check digit = 09 (i.e. 11-2)

Note; for a field containing more than eight characters the weighting series is repeated, commencing with the factor 2 for the eleventh character from the right.

8. Security Features

a) Collecting Bank Responsibilities

The collecting bank's responsibilities for the detection of fraudulent instruments will include the following: -

- i) Satisfying itself that the account to which the funds are credited is that intended by the drawer of the cheque.
- ii) The date is valid
- iii) A signature is present
- iv) The amount in words and figures are the same

- v) The instrument is not an obvious counterfeit;
- vi) The instrument is properly completed and nothing encroaches into the clear band.

b) Paying Bank Responsibilities

The paying bank is responsible for the detection of fraudulent instruments. The paying bank will need to identify attempts to: -

- i) Alter the intention of the drawer of the cheque
- ii) Present stolen cheques
- iii) Present counterfeit cheques

To achieve this, a number of security features shall be built into the instrument. These features will depend upon the clearing system used by the paying bank. Processing banks shall therefore, determine the features and procedures for detecting criminal activity.

Customer's wishing to print their own instruments shall agree with their bank on features and procedures to be undertaken to detect criminal activity.

The following minimum security features are mandatory:

- i) Security Printed Background
- ii) Reference number composed of Bank code and Cheque Number
- iii) Water Marked Paper

Banks may include additional security features but shall not encroach upon standard specifications.

c) Attachments and Adhesions

Attachments and adhesions other than holograms shall not be permitted on any instrument presented to the Clearing House.

d) Holograms on Instruments

Customers wishing to use instruments with holograms shall require prior approval with their bank which shall ensure that:

- i) The hologram attachment meets the required characteristics

- ii) The hologram has been applied by an approved hologram applier and by an approved attaching device.

The assessment of the value of the hologram as a security device is a matter for the judgement of the issuing bank and its customer.

e) Characteristics of a Hologram Protected Cheque

- i) Location

The hologram shall be located at the top left hand corner of the instrument, positioned no nearer than 16mm from the adjacent top and left-hand edges of the instrument and no further than 38mm from those edges.

Hologram Size and Shape

The hologram shall have dimensions of no greater than 22mm X 22mm. It shall be circular, rectangular or square in shape.

- ii) Thickness

Holograms shall be applied by hot stamping or similar process. There shall be no evidence of embossment, and never greater than 5 microns for the transferred layer. The process of application shall leave no evidence of distortion of the paper.

- iii) Design

Combinations of printed and holographic designs shall be permitted, if in the perception of the customer and their bankers, the combination shall enhance the security of the cheque. For the same reason, the hologram image itself may be of the form of a registered security design.

The level of precision, clarity and recognisable optically visible shifts within the hologram, are a matter of agreement between the customer, its bank and the applier.

f) Watermarked Paper

Watermarked paper is mandatory for instrument printing. Banks shall ensure that watermarking, background printing and/or tinting do not affect the quality of subsequent MICR E-13B printing. Where a background tint or pastel shade is used, the ABR shall be greater than 60%.

9. COMPLETION OF INSTRUMENTS

a) **Computer Printers**

Where instruments are completed using computer printers it is recommended that impact printers be used and those ribbons be permanent ink ribbons, changed regularly so as to maintain good print quality. One time or total transfer ribbons shall not be used. Ink-jet printers may be used.

If instruments are completed using computers, it is recommended that continuous stationery be used.

b) **Typewriters**

Where cheques are completed using typewriters total transfer correctable ribbons must not be used. Ribbons shall be changed regularly so as to maintain good print quality.

c) **Hand-written Cheques**

Where cheques are completed by hand, indelible pen or permanent ink shall be used. Pencil, fugitive or non-permanent inks shall not be used.

d) **Point of Sale Printing**

Cheque writing machines may be used if they comply with the standards in printing details of amount, payee and date on instruments. The machines should enable instruments of different sizes and designs to position these details correctly.

e) **Characteristics of Print on the Front of Cheques**

i) **Legibility of Print**

The character set used to complete the front of cheques shall be as follows.

- Capital alpha characters A to Z, (NO lower case alpha characters);
- Numeric characters 0 to 9;
- Parentheses, including brackets, viz.: (), [], { },
- Symbols, “greater than” (>), and “less than” (<);
- Hyphen (-), apostrophe (‘), full stop (.), comma (,), solidus (/);
- Ampersand, (&);

- Asterisk, (*);
- Block character (1 character width of solid print)

The minimum height of any printed alpha or numeric character shall be 2.5mm, and the number of characters shall not exceed 15 per inch. Compliance with the requirement for minimum height may be achieved by using a font conforming to the requirements of BS 5464: Part 2: 1977 or, in the case of matrix printing, the character set specified in ECMA-42: 1973

The PCS of the amount in figures shall exceed 0.5 (50%). This level will normally be obtained where black ink is used, provided that the printer ribbon is changed regularly.

ii) Security of Print

All forms of print shall produce an indelible image using non-fugitive ink.

iii) Format of Text on the Front of Cheques

A minimum of two and a maximum of three lines shall be available for printing the details on the cheque. The first line shall give the payee details. The other lines shall show the amount in words. The amount in figures shall be shown in the amount box. The date shall appear at the top right hand corner as specified.

- Payee Details

The payee details shall comprise the payee name and any optional reference. A payee reference shall be contained within parentheses immediately after the payee's name.

- Date

The date shall have the format 'DDMMYYYY', where the first two characters (day) are numeric, the next two characters (month) are numeric and the last four characters (year) are numeric.

- Amount in Words

The 'amount in words' shall be capital alpha characters ending with the word "only".

iv) Amount in Figures

The amount in figures shall comprise only numeric, hyphen and asterisk characters. The amount shall commence with one or more asterisks. No currency symbols shall be printed in the amount in figures. The value shall be expressed in figures, with two digits of cents, the latter separated from the

Shilling by means of a hyphen. When there are no Shillings the decimal shall appear but shall be preceded by a single zero. One or more asterisks shall complete the field.

APPENDICES

CLEARING AND COUNTRY CODES

Tanzania has a range of 33 Clearing and Country Codes that commence with number 67 and ending with number 99. The distribution of these codes is as under:

Dar es Salaam	Numbers	67 to 72
Arusha	Numbers	73 to 78
Mwanza	Numbers	79 to 84
Mbeya	Numbers	85 to 90
Zanzibar	Numbers	91 to 92
Reserved code	Numbers	93 to 99

BANK CODES

The Bank codes are here below shown: -

01	Bank of Tanzania
02	National Bank of Commerce
03	CRDB(1996)Ltd.
04	People's Bank of Zanzibar
05	Standard Chartered Bank Tanzania Limited
06	Stanbic Bank Tanzania Limited
07	Trust Bank
08	CitiBank
09	Eurafrica Bank
10	Greenland Bank (Tanzania) Limited
11	Diamond Trust Bank TZ Ltd.
12	Akiba Commercial Bank TZ Ltd.
13	Exim Bank
14	Kilimanjaro Co-operative Bank
15	NBC (1997) LTD
16	NMB LTD
17	Kenya Commercial Bank Tz. Ltd.
18	Habib Bank Ltd
19	International Bank of Malaysia

CHEQUE AND VOUCHER PRINTING: PROCEDURES FOR APPROVAL

It is expected that commercial bank's shall ensure that their printers have the capacity, equipment and security to satisfy their requirements.

It is recommended that cheque- printing companies should be in possession of suitable testing equipment and be able to demonstrate proficiency in its use.

Cheques and vouchers designed to be processed through the clearings must satisfy:

- (i) The technical requirements of these standards, which have been drawn up to enable the document to be processed through the automated cheque clearing;
- (ii) The specific requirements of the issuing bank (i.e. the financial institution on which the cheque is drawn) to provide the protection (for itself and its customers) which the bank requires in respect of cheques drawn on itself; and
- (iii) To satisfy any specific procedural requirements associated with the internal processes operated by the bank.

REQUIREMENTS OF INDIVIDUAL CLEARING BANKS

Printed cheques and vouchers (including MICR encoding prior to completion) must be approved by a clearing bank, which will be the issuing bank (or its agent clearing bank, if it is not itself a clearing bank). Before giving its approval, the clearing bank must satisfy itself with respect to the general acceptability of the product, including minimum design features and security features specified in these standards.

PROCEDURES FOR PRINTERS AND OTHER SUPPLIERS

The printer must first provide an assurance to relevant clearing bank (via the issuing bank, if different) that all technical standards are, and will continue to be, complied with fully.

Non-impact printing of MICR code lines is known to present particular difficulties to high-speed reader sorting equipment. Such printing is only permitted when carried out on printing machines, which have been approved following submission for testing.

Printers are required to demonstrate that their product satisfies all the relevant requirements of these standards, and at the same time has been well tested. In the event of any unresolved conflict connected with quality and design, the matter can be taken for further advice to the National Payment Systems Directorate who may refer to the Tanzania Bureau of Standards.

SECURITY FEATURES ON CHEQUES – PROCEDURES FOR APPROVAL

A printer whose cheques contain security features, must demonstrate that the supplied product conforms in all respects with the requirements of the issuing bank (i.e. the financial institution on which the cheque is drawn), and of all relevant standards.

Any security feature, which is not generally permitted by these standards, including attachment or adhesions, requires approval of the commercial bank involved so as to ensure compliance with these standards.

CHECK LIST FOR THE APPROVAL OF PRIVATELY PRINTED CHEQUE AND VOUCHER FORMS

A. Cheque or Voucher Design & Layout

1. Size

Does the cheque conform to the one of the approved sizes?

2. Clear Band

Is there a clear white band 16mm deep along the full length of the bottom of the cheque?

3. MICR Code-Line

Is the MICR Code-Line information printed correctly in the right place in the clear band?

4. Name of Drawee Bank

- i) Is the name of the bank shown prominently and clearly in the top part of the cheque?
- ii) Is the name of the Bank visually larger than the printing elsewhere on the cheque?

5. Name of Drawee Bank Branch

- i) Is the branch name immediately below that of the Bank?
- ii) Is the branch name correct?
- iii) Is the type smaller than that of the Bank's name?

6. Sorting Code Number

- i) Is the 6 digit Sorting Code Number printed in the right place in the top right hand corner of the cheque?
- ii) Is it correct and punctuated by hyphens (e.g. 68-06-23)?
- iii) Is the serial number printed along side the Sort Code.

7. Date Line

Has provision been made for the date on the right hand side of the cheque below the Sorting Code Number with a line of the correct size and in the correct position?

8. Amount Box

- i) Is the box for the Amount in Figures in the right place and in the right format?
- ii) Is the low contrast border (if present) in accordance with the specifications in terms of size and colour?

9. Currency Symbol

Are the letters TZS denoting Tanzania Shillings printed in black, of the right size and in the correct position, (i.e. central and less than 1mm to the left of the amount box)?

10. Payee Name

Is the line for the Payee Name correctly printed in the right place.

11. Amount in Words

- i) Is provision for the amount in words made below the payee name consisting of two lines of the specified size and in the correct position?
- ii) Do both lines end with a vertical line called the Amount in Words Line Restraint?

12. Drawer of Cheque

- i) Is the name of the drawer (and optionally the second line for the address) printed in the correct place above the signature area and 3mm below the Amount Box leaving sufficient space for the signature?
- ii) Is the drawer's name printed in type visually smaller than the Bank's name, i.e. not exceeding 2mm in height?

13. Crossing

- i) Is the crossing in the form of two parallel lines, printed bolder than any adjacent lines on the cheque, placed vertically or diagonally across the centre of the cheque.
- ii) The crossing must not extend into the Clear Band.
- iii) Is the wording in the crossing, if any printed between the parallel lines?

14. Receipts

Is the printing on the cheque free of receipts or any reference thereto?

15. Customer's Business Name and/or Logo on Corporate Cheques only

- i) Is the customer's business name and/or Logo – if present – printed at the bottom of the document just above the Clear Band and outside the restraint area?
- ii) Is the space used within a rectangular shaped area, not exceeding one third of the length of the cheque or one fifth of the depth of the cheque?
- iii) Is the lettering or text within this area visually smaller than the name of the Drawee Bank?

- iv) Is the whole of this area clearly separated by a space or by a line from the working areas of the cheque?

B. PHYSICAL CHARACTERISTICS

1. Paper

Does the paper conform to CBS1 specification?

2. Watermark

Is the 16mm Clear Band clear of any watermark?

3. Perforations

- i) Are any perforations only of the slit or slotted type?
(If not discernible, check with the printer)
N.B. Pin - Hole perforations are not permitted.
- ii) Is the body of the document clear of all perforations, holes or other incisions?

4. Holograms

Is the Hologram, if present, fully in accordance with these standards?

5. Attachments and / or Adhesions

Are there no other attachments or adhesions except Holograms in accordance with these standards?

C. REVERSE OF THE DOCUMENT

1. Is the reverse of the document clear of all printing except as allowed in these standards?
2. Is there no printing at all behind the 16mm Clear Band area?
3. Is the endorsement area on the reverse of the document clear of all print or dark colours?
4. Are the endorsement area on the reverse of the document and the area behind the 16mm Clear Band free of any spot carbonising, if used on the reverse of the document?

D. SECURITY FEATURES

1. Paper

Does the paper conform to the CBS1 specification?

2. Sensitivity of Print

Is the background design of the cheque printed in ink(s) sensitive to solvents and water based reagents as specified in these standards?

3. Watermark

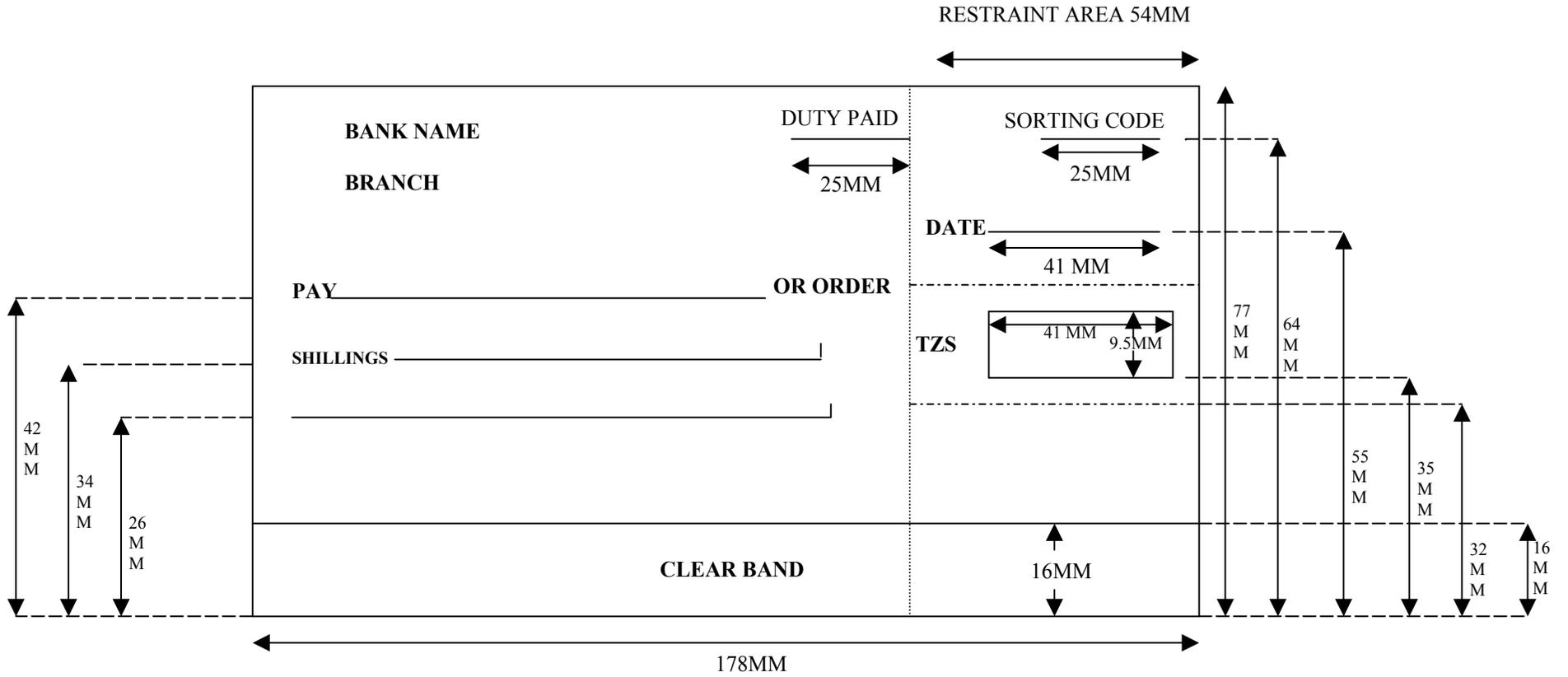
Is the watermark present in the body of the document but not intruding on the “Clear Band”

4. Microprint Signature

Is the microprint printer identification line present on the document together with the printer of the personalisation details?

FIGURES

**Figure I
Personal Cheque Size**



**Figure II
Corporate Cheque Size**

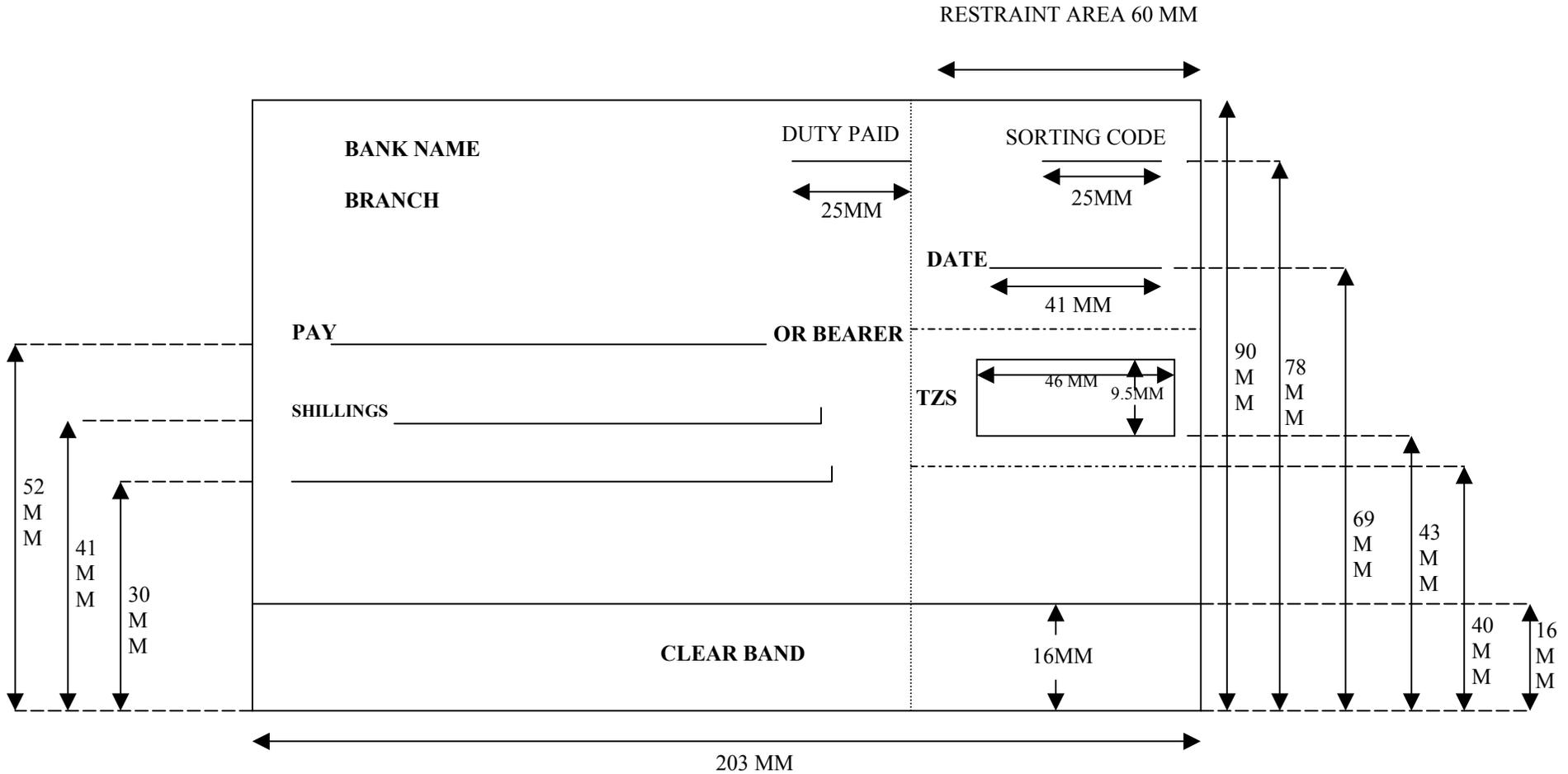


Figure III
Auto-printed Corporate Cheque Size

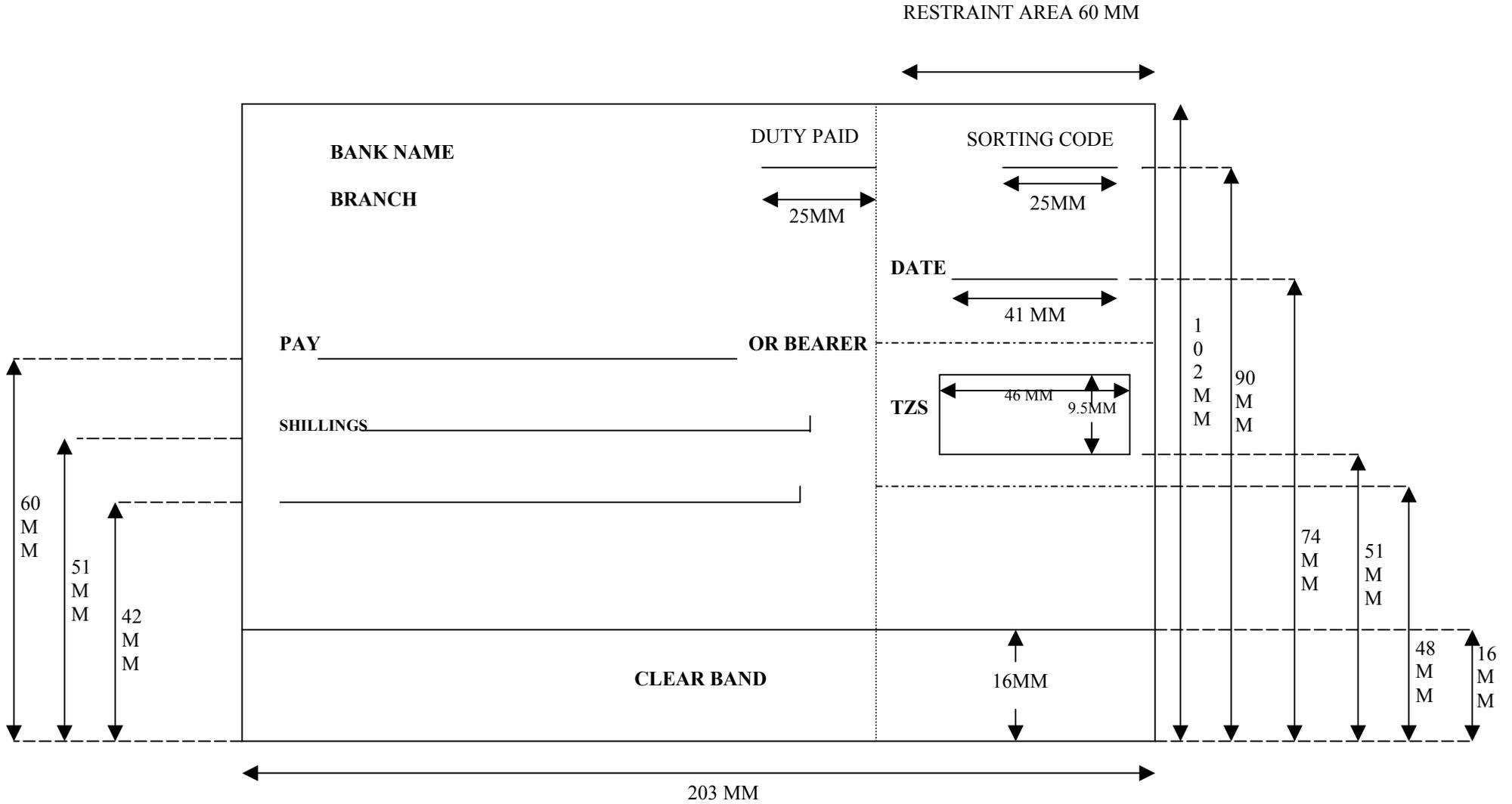
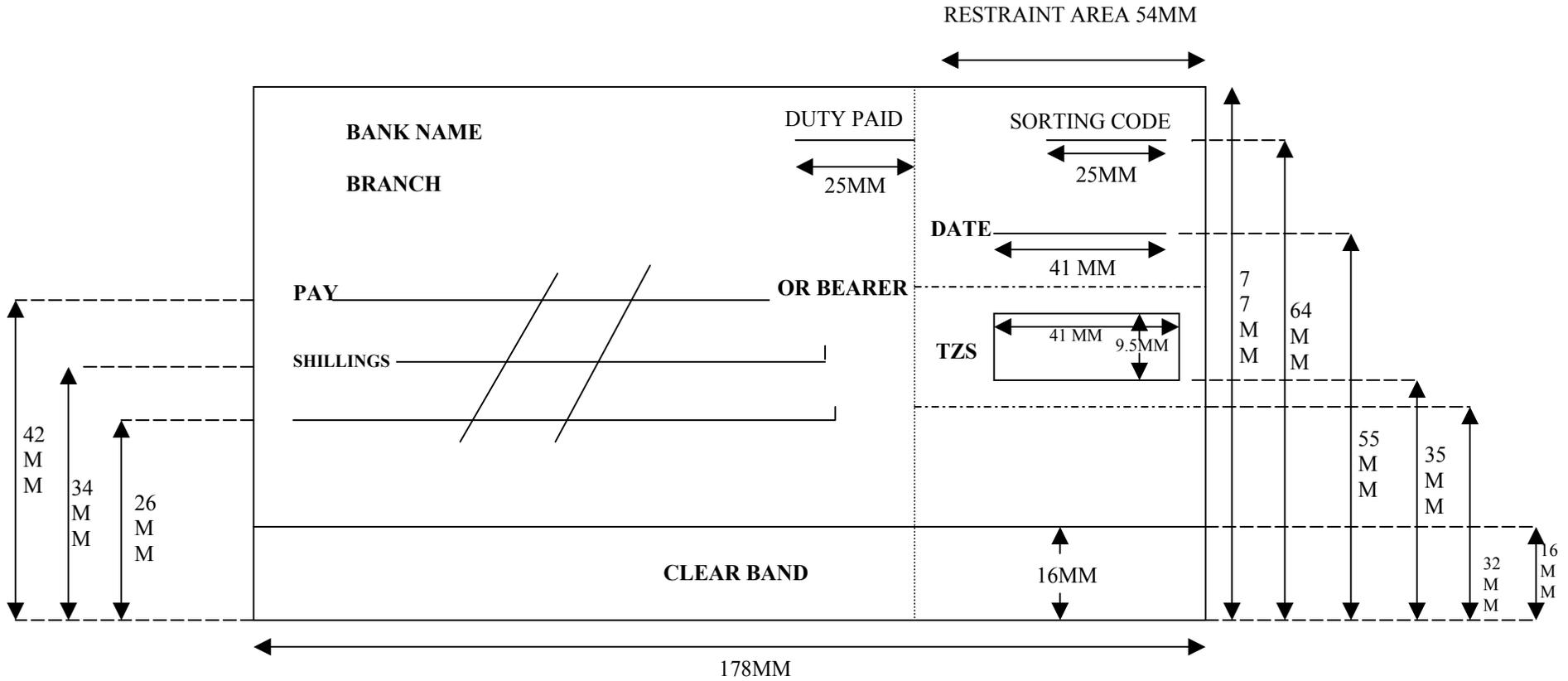


Figure IV
Personal Cheque with Crossing



GROSSARY OF TERMS:-

ABR	Average Background Reflectance.
Amount Field	Field within MICR code-line for encoding amount.
Amount Box	Area within “restraint area” for numeric entry of cheque amount.
ANSI	American National Standards Institute.
APACS	British Association for Payment Clearing Services
BS	British Standards.
CBS 1	Cheque Book Standard 1 specification.
Check Digit	Algorithm to check data is correct.
Cheque	An unconditional written order from one party to another.
Cheque Number	Sequence number printed on a cheque.
Clearing House	A central location or central processing mechanism through which financial institutions agree to exchange payment instructions or obligations.
Clearing Bank	A bank that participates in the clearing of payment instructions between banks.
Clear Band	A “clear” area at the bottom of a cheque 16mm deep for the application of MICR data.
Collecting Bank	A bank that collects value for cheques or other debit instruments on behalf of its customers.
Code Line	The printed MICR characters present in the “clear band”.
Control Vouchers	Documents used for identification of batches of instruments.
Curl	The “turning up” or “rolling” of a cheque.
Double Cut	The individual cutting of the top and bottom of each cheque.
Drawee	Entity issuing the cheque
Encoding	The act of applying MICR to the “clear band”.
E13-B	Approved code-line printing font having magnetic qualities
Field	A specified element of the code-line.
Gauge Marks	Small marks to guide cutting and printing.
Grammage	weight
Hologram	Three-dimensional photographic image used as additional security measure.
Imaging	The act of capturing all or part of a document for data entry or storage.
ISO	International Standards Organisation
Long Grain	The direction of fibres in body of CBS 1 paper.
MICR	Magnetic Ink Character Recognition.
Non-Impact Print	Printing that is not impacted onto the paper i.e. Laser, Ink-Jet.
OCR-B1	Approved printing font.
Paying Bank	The bank that has to meet a payment instruction directed to it from the collecting bank.

PCS	Print Contrast Signal
“Q” Symbol	Field Separator
Reference Edges	The right-hand vertical side is the “vertical” reference edge with the bottom edge being the “horizontal” reference edge. All dimensions are referenced from these edges.
Reflectance	Reflective qualities of CBS 1 paper.
Restraint Area	Area of cheque having specified data printed only.
TBS	Tanzania Bureau of Standards.
Transaction Code	Numeric identifier of document type.
Watermark	A design in the body of the paper that is visible under certain conditions and acts as a security measure.

REFERENCES

FURTHER INFORMATION SOURCES

a) MICR-13B

Full information regarding specifications and use of type font E-13B is given in BS 4810:1980. This contains details of:

Character configuration dimensions

Character spacing, alignment, skew and tolerances

Ink voids, film uniformity and extraneous ink limitations

Embossment (impression)

Signal level

b) Titles of Publications Referenced

ANSI X9.7: 1988	Bank Check Background and Convenience Amount Field
BS 3430: 1986	Method for sampling to determine the average quality of paper and board (ISO 186)
BS 3431: 1973	Method for the conditioning of paper and board for testing
BS 3432: 1980	Method for determination of grammage of paper and board (ISO 536)
BS 3748: 1992	Method for the determination of resistance to bending of paper and board (ISO 2493: 1992)
BS 3983: 1989	Method for determination of thickness and apparent bulk density or apparent sheet density of paper and board (ISO 34)
BS 3319: 1980	Method for determination of folding endurance of paper (ISO 5626)
BS 4420: 1990	Method for the determination of the Bendtsen roughness of paper and board (ISO 8791-2)

BS 4468: 1990	Method for the determination of the internal tearing resistance of paper (ISO 1974)
BS 4810: 1980	Specification for print for magnetic ink character recognition (ISO 1004)
BS 5477: 1977	Method for visual assessment, by grid assay, of dirt in paper for character recognition
BS 6538	Air Permeance of paper and board Part 2: 1992 - Method for determination of air permeance using the Bendtsen apparatus (ISO 5636-3) Part 3: 1987 - Method for determination of air permeance using the Gurley apparatus (ISO)
CBS1	Cheque Book Standard 1 - (USA Standards for Cheque Book)
APACS	Association for Payment Clearing Services Standard Manual 3
Kenya Bankers Association	Clearing House Agreement for Automated Clearing.