



Appendix 16: PCS: MICR document design standards

version 3

Effective date: 13/08/2018

Document control**Title:** Appendix 16: MICR document design standards**Version:** 3**Effective date:** 13/08/2018**Circulation:** Payments NZ Limited participants, Buddle Findlay, Reserve Bank**Summary of amendments to standards:**

The following table summarises amendments to these standards.

Version number and description of amendment	Amendment method and date	Amendment notice date	Effective date of amendment	Authors
Version 2: Amendments to remove references to cheque duty, reformat and refresh diagrams	PCS management committee notice to chief executive: 21 September 2015	21 September 2015	23 November 2015	Frank Susko
Version 3: Amendments of a minor nature	CE amendment: 6 June 2018	6 June 2018	13 August 2018	Payments NZ Ltd

Table of contents

Clause 1: Introduction	5
1.1 Purpose	5
Clause 2: Design approval for special cheques and deposit forms	6
2.1 Approval	6
2.2 Certificate of acceptability and account number	6
2.3 Evaluations	6
Clause 3: Metric measurements	7
Clause 4: Document sizes	8
Clause 5: MICR code line and encoding	9
5.1 Requirements	9
5.2 MICR characters	9
5.3 Code line specifications	9
5.3.1 Positions 1 – 12: amount field	9
5.3.2 Position 13	9
5.3.3 Positions 14 – 15: transaction code field	9
5.3.4 Position 16	10
5.3.5 Position 17: domestic symbol 	10
5.3.6 Positions 18 – 20: account suffix	10
5.3.7 Position 21: dash symbol 	10
5.3.8 Positions 22 – 28: account number	10
5.3.9 Position 29	10
5.3.10 Position 30: transit symbol 	10
5.3.11 Positions 31 – 36: transit field	10
5.3.12 Position 37: domestic symbol 	11
5.3.13 Position 38	11
5.3.14 Positions 39 – 59	11
Clause 6: Document processing by image technology	13
Clause 7: Layout	14
7.1 Cheques	14
7.1.1 Bank name, logo and address	14
7.1.2 Special cheques: customer name	14
7.1.3 Payee and amount in words	17
7.1.4 Bearer or order	17
7.1.5 Account name (personalisation)	17
7.1.6 Signature area	17
7.1.7 Clear bands	18
7.1.8 MICR line	18
7.1.9 Date area	18
7.1.10 Amount	18
7.1.10.1 Amount in figures area	19
7.1.10.2 Completion of the amount in figures	20
7.1.10.3 Visual guides	21
7.1.11 Crossings	21
7.1.12 Distance between horizontal rulings	22
7.1.13 Background	22
7.1.14 Printing on the reverse of a cheque	22
7.1.15 Carbonising	22
7.1.16 Overprinting	22

7.2 Deposit forms.....	23
7.2.1 Title	23
7.2.2 Bank name and address.....	23
7.2.3 Special deposit forms: customer name	23
7.2.4 Teller's initials	23
7.2.5 Branch stamp.....	23
7.2.6 Item count.....	23
7.2.7 CREDIT: Bank Personalisation	25
7.2.8 Clear bands	25
7.2.9 MICR line.....	25
7.2.10 Date area.....	25
7.2.11 Optional detail area	25
7.2.12 Deposit details	25
7.2.13 Total amount area	26
7.2.14 Pre-printed \$-sign and use of asterisks.....	26
7.2.15 Protection zone.....	26
7.2.16 Background	27
7.2.17 Printing on the reverse of a deposit form	27
7.2.18 Small deposit forms	27
7.2.18.1 Total amount box.....	27
7.2.19 Large deposit forms	27
7.2.19.1 Total amount box.....	27
Clause 8: Paper.....	29
8.1 Paper specifications and properties	29
8.2 Sampling requirements.....	29
8.3 Standard for paper for MICR encoded documents	30
Clause 9: Security	31
9.1 Cheques	31
9.1.1 Scenic documents	31
9.2 Deposit forms	31
Clause 10: Perforations, edge notching and holes in documents	32
10.1 Perforations	32
10.2 Continuous stationery	32
10.3 Edge notching and holes in documents.....	32
10.4 Document writing / signing/ payee protection machines	32
10.5 Binding	32
Appendix A	33
Certificate of acceptability and account number	33
Appendix B	35
Inks for printing image-compatible documents.....	35
Appendix C.....	37
Measurement of print contrast signal.....	37
Appendix D	38
Examples of field guide design	38
Appendix E.....	39
\$-sign representation	39

Clause 1: Introduction

1.1 Purpose

This document sets out the mandatory standards for participants in the Payments NZ Limited paper clearing system and their customers who design and print cheques and deposit forms.

Although banks design and print most New Zealand cheques and deposit forms, some bank customers want to design cheques and deposit forms to meet their own special requirements (these are referred to as 'special cheques' and 'special deposit forms' in these standards).

All cheques and deposit forms, including those developed by customers, must comply with these standards to ensure that they can be processed accurately and efficiently by:

- banks' magnetic ink character recognition (MICR) readers (see below)
 - use of item image capture technology (clause 6)
-

MICR code line

In New Zealand, banks' processing is based on MICR which provides a speedy and economic means of reading and sorting cheques and deposit forms. Cheques and deposit forms carry a code line set in a special font designed to actuate an electronic sorting machine and which the human eye can easily read. This line is printed with a special ink containing iron oxide called magnetic ink (which while not magnetic itself is magnetised in the electronic sorter). This means the sorter is able to read the code line and sort cheques and deposit forms as appropriate. The characters used in the code line provide a common machine language recognised by all banks' sorting machines at their various offices around New Zealand. For information about the standards for the MICR code line and encoding, see clause 5.

Item image capture technology

Banks' processing may also include the use of item image capture technology which is a means of capturing, presenting and storing information on cheque and deposit forms. For printing and production standards, see clause 6. For information about the level of recognition of inks by scanners, see appendices B and C.

Clause 2: Design approval for special cheques and deposit forms

2.1 Approval

A customer who wishes to design special cheques or special deposit forms to meet their particular requirements should:

- first discuss their ideas with their bank, and
- carefully review drafts of these special documents to ensure they comply with these standards .

Before printing costs are incurred, the customer must refer the proofs of the proposed documents to their bank. The proofs must display the position of all required information. A bank will not approve any design/layout unless it complies with these standards.

The customer is responsible for all of the costs associated with the printing of special cheques and deposit forms. These include costs arising from non-compliance with these standards such as the costs of reprinting and any additional processing costs incurred by banks caused by this non-compliance.

2.2 Certificate of acceptability and account number

When a customer advises their bank that they plan to design and produce special cheques and/or deposit forms, the bank (on receipt of the proofs) must review the proposed document(s) and satisfy itself that they comply with the design standards.

Once the bank is satisfied that they comply with the design standards, it will complete the certificate of acceptability and account number (see appendix A) and forward this to the customer for the nominated printer for further action.

Printers must ensure all special cheques and deposit forms comply with these standards and must not commence printing before receiving the relevant certificate of acceptability and account number.

2.3 Evaluations

Prior to the delivery of the completed special cheques and/or deposit forms, evaluation samples of the document(s) may be required by the bank for MICR code line and paper testing. Please see sub-clauses 8.1 to 8.3.

Such testing does not release a customer from the responsibility for ensuring the customer's special cheques and/or deposit forms comply with the standards referred to in this document - particularly in relation to paper, ink quality and MICR encoding quality.

Clause 3: Metric measurements

Metric measurements

Most measurements given in these standards are derived from cheque printing equipment manufactured using imperial measurements. To ensure accurate measurements and to provide for a clear understanding of the measurement calculations (particularly in relation to tolerance specifications) these standards quote all measurements in the base in which they were originally established. These standards give metric alternatives to imperial measurements in brackets but do not generally give imperial alternatives to metric measurements. Accordingly, these standards give metric equivalents to the nearest millimeter (mm).

Clause 4: Document sizes

Maximum and minimum dimensions

The maximum and minimum dimensions (excluding butts and/or other attachments) for all cheques and deposit forms must comply with figure 2 and 4 respectively.

Equipment used for MICR and image processing systems can handle documents of any size within the limits of:

Length: 6 1/4" (159 mm) up to 8 1/4" (210 mm)

Height: 2 1/2" (64 mm) up to 3 2/3" (93 mm)

Measure all horizontal dimensions from the right edge and all vertical dimensions from the bottom edge. These edges must form a right angle and be true in every way. In the case of continuous forms (see sub-clause 10.2), take measurements from the perforations or the guide marks already provided to indicate the correct guillotining positions.

Do not crease or fold MICR documents as they may jam high speed electronic sorting equipment or be rejected by the equipment. For large size cheques and deposit forms, a length of 7 1/2" (190 mm) rather than 8 1/4" (210 mm) is preferable, as the lesser length will ensure that any centre fold does not pass through MICR characters in the code line.

Clause 5: MICR code line and encoding

5.1 Requirements All cheque and deposit forms must carry a MICR code line. All code line references are based on right to left reading.

5.2 MICR characters The type of font used for the MICR code line is called E-13B and is to be size 12.

MICR characters consist of ten numerals:

1 2 3 4 5 6 7 8 9 0

and four symbols:

-  bank/branch or transit symbol
-  amount symbol
-  domestic or account no. serial no. analysis code symbol
-  dash symbol

For technical specifications of E-13B characters and magnetic ink properties, printers are referred to the International Standardisation Organisation (ISO) Recommendation:

*Information Processing—Magnetic Ink,
Character Recognition—Print Specifications,
(ISO No. 1004)*

5.3 Code line specifications The following sub-clauses 5.3.1 to 5.3.14 (inclusive) refer to various positions in the MICR code line as shown in figure 1.

5.3.1 Positions 1 – 12: amount field The amount field at positions 1 - 12 consists of ten digits bracketed by two amount symbols , inserted by an accounting machine.

5.3.2 Position 13 Position 13 is currently blank.

5.3.3 Positions 14 – 15: transaction code field The transaction code field at positions 14 - 15 is used to differentiate between debits and credits and to identify a particular type of item.

5.3.4 Position 16	Position 16 is currently blank.
5.3.5 Position 17: domestic symbol 	The domestic symbol  at position 17 is mandatory if either the transaction code or suffix are present.
5.3.6 Positions 18 – 20: account suffix	Use of account suffixes at positions 18 - 20 is discretionary. Positions 18 - 20 cannot be used without the dash symbol  (position 21) being completed.
5.3.7 Position 21: dash symbol 	The dash symbol  at position 21 is mandatory if the account number and suffix are present.
5.3.8 Positions 22 – 28: account number	The seven digit account number at positions 22 – 28 must be present if the dash symbol  and suffix are present.
5.3.9 Position 29	Position 29 is currently blank. All of positions 18 – 29 may be blank.
5.3.10 Position 30: transit symbol 	The transit symbol  at position 30 must be present on all cheques and deposit forms.
5.3.11 Positions 31 – 36: transit field	<p>The six digit transit field at positions 31 - 36 is compulsory on all cheques and deposit forms and consists of the following:</p> <ul style="list-style-type: none">• positions 31 - 34: four digit destination branch number as listed in the bank branch register.• positions 35 - 36: two digit destination interchange number as listed in the interchange number register, which corresponds to the four digit branch number

5.3.12
Position 37:
domestic
symbol II[■]

The domestic symbol II[■] must be present on all cheques and deposit forms.

5.3.13
Position 38

Position 38 is currently blank.

5.3.14
Positions
39 – 59

Positions 39 - 59 may contain, in sequence, the serial number or reference field and the analysis field. The presence of these fields is optional and the size of each field is dependent upon the size of the form.

The serial number field on 6 1/4" (159 mm) long documents is limited to six digits, while on 8 1/4" (210 mm) long documents a maximum of twelve digits may be encoded. The field is completed by a domestic symbol II[■] in the next available position.

The analysis field is not available on 6 1/4" (159 mm) long documents whilst on 8 1/4" (210 mm) long documents its size depends upon the size of the serial number field but it can contain up to a maximum of twelve digits. The field is completed by a domestic symbol II[■].

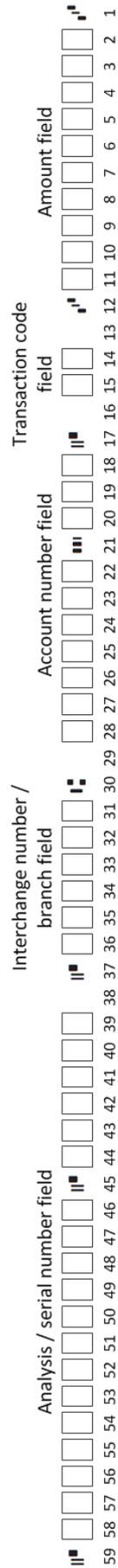


Figure 1: MICR code line specifications (see clause 5.3)

Clause 6: Document processing by image technology

Colour

All information that is to be retained, whether printed on the original document, hand written, stamped or machine printed, must be printed in a colour that will be seen by an image scanner.

Image scanning mechanisms cannot successfully reproduce all printed documents. This is largely due to the depth of shade or colour of the ink used in the printing process. Dark colours usually reproduce as black and pastel colours often do not reproduce at all. This is because the image scanner can see dark colours but not pastels.

Written or printed text on a dark background will be difficult to detect as the text blends into the background. Text will be clearly visible on a pastel background as the text will be seen, but the background will not.

Ink

The level of recognition of inks by scanners is dealt with in appendices B and C. Appendix B distinguishes between inks of scan readable and scan non-readable levels. To aid differentiation, inks whose properties fall in the mid-range between scan readable and scan non-readable should be avoided.

Boxes or lines around the area where amounts are entered on cheques or deposit forms should be printed in a scan non-readable ink to avoid recognition problems for optical character recognition (OCR) and intelligent character recognition (ICR).

OCR and MICR systems

OCR systems can be programmed to read particular fonts and type styles, in particular, the MICR line on cheques.

ICR software can be programmed to interpret handwritten or machine printed characters using a series of predefined algorithms. Some systems have a greater ability than others to distinguish between various representations of the same character.

Clause 7: Layout

7.1 Cheques

Introduction

A cheque is an operational document which should be readable by the human eye and also by a machine regardless of the manner in which it is completed. At law, the drawer of a cheque owes a duty to their bank to exercise reasonable care in the drawing of a cheque. This implies a need for care in the layout of all cheque forms.

Cheques are divided into a number of areas to enable insertion of information to assist with both manual and electronic processing by banks. The standard cheque layout showing these areas and their dimensions is represented in figures 2 and 3.

Details relating to the design and printing of these areas are outlined below, with cross references to the bullet points in figures 2 and 3 in square brackets. Except where specifically stated, area dimensions depend on the amount of information to be entered and the means of entry, i.e. by handwriting, typewriter or other means.

7.1.1 Bank name, logo and address

figure 2, [1a] [2]

Cheque layout must enable the bank issuing the cheque to be identified at a glance. The bank name logo and branch domicile/address take precedence over other information.

The main bank identifier:

- may be either the bank name or its logo and;
- must be:
 - prominent enough to be recognised against all other information on the cheque
 - located at the top left of the cheque or possibly in the top central position.

If the main bank identifier is:

- the bank logo, it should not be less than 1/8" (3 mm) high and the bank name should be positioned nearby, for example, sideways along the left edge of the cheque
- the bank name, the upper case letters should not be less than 1/8" (3 mm) high.

The correct branch/domicile of the bank must be below the main bank identifier.

7.1.2 Special cheques: customer name

figure 2, [1b] [2]

Customers' special cheque forms should be clear of extraneous printing so that while the customer's legal and/or trading name, and/or business logo, address, e-mail address, facsimile and phone number and/or nature of business may be shown and may appear in the upper portion of the special cheque, the name of the bank must be more prominent. No other information about the customer (including advertising) may be shown.

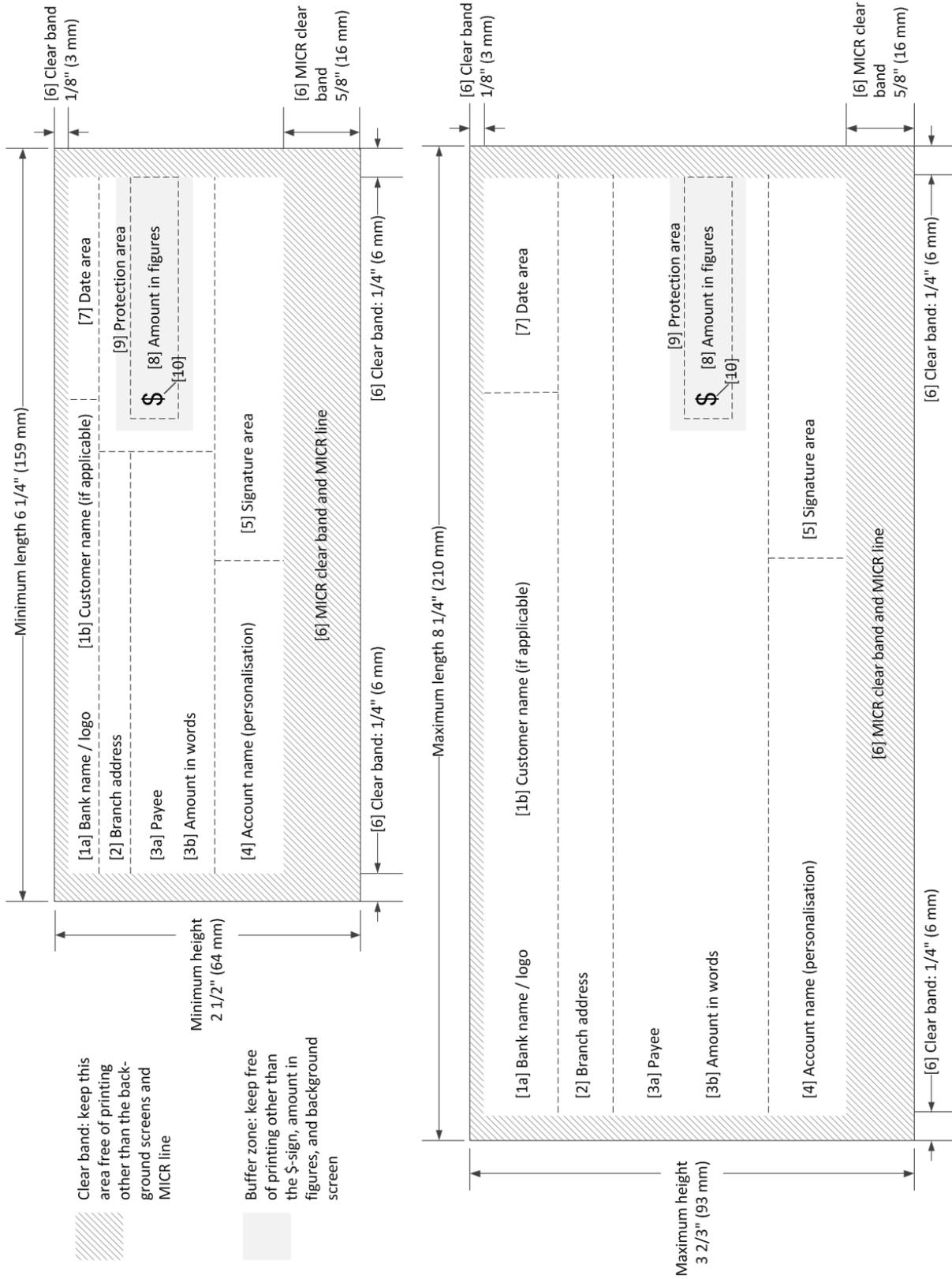


Figure 2: Standard cheque layout (see clauses 7.1.1 to 7.1.10)

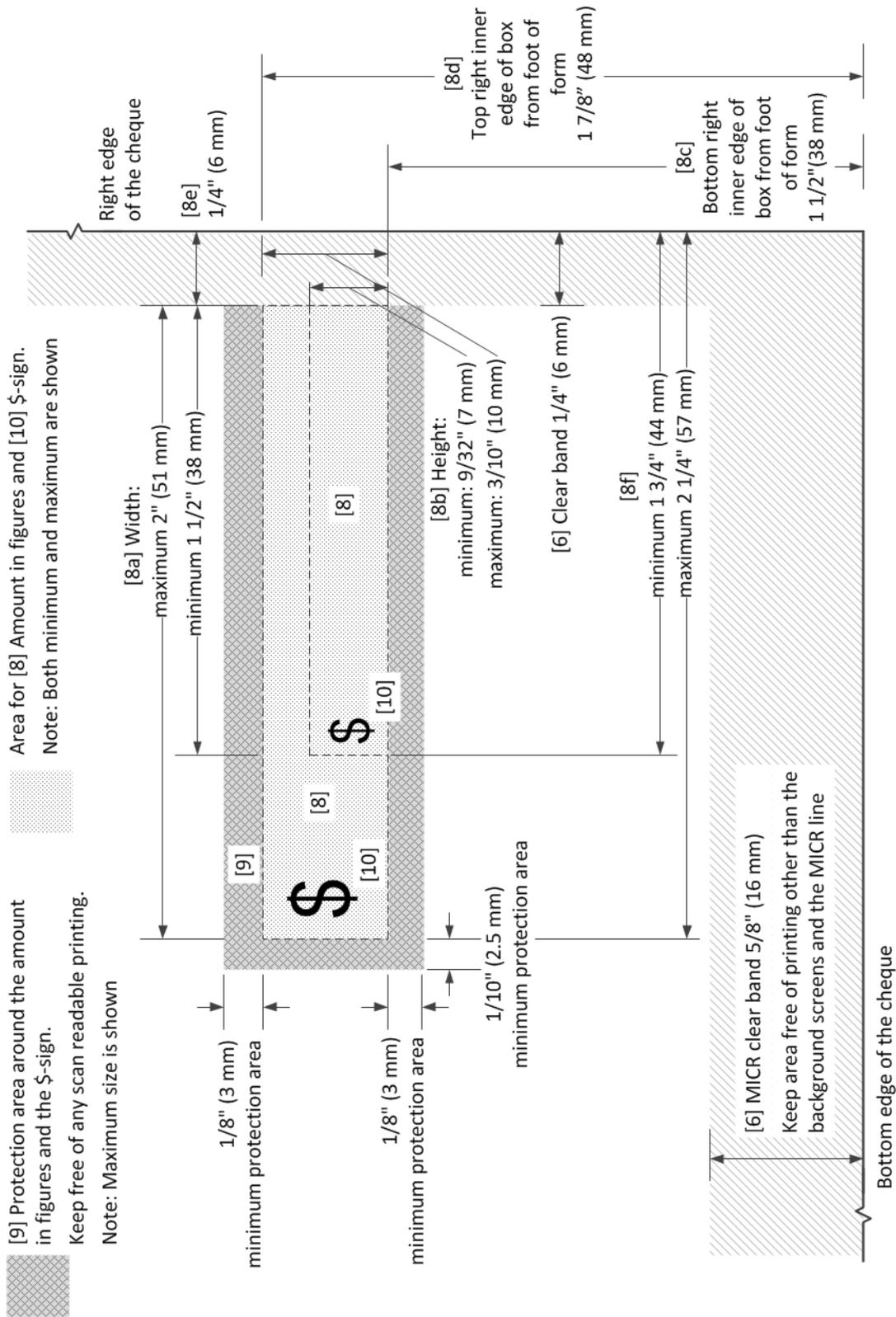


Figure 3: Standard cheque layout for the amount in figures area (see clauses 7.1.10)

**7.1.3
Payee and
amount in
words**

figure 2, [3a][3b]

If not completed by an accounting machine or a computer printer, the fields for payee and amount in words must have a vertical terminating bar printed at the end of each line in order to discourage the cheque writer from writing into the amount in figures box.

Provision for the payee's name, which should be positioned in such a way as to be easily recognisable, should start at the left end of the line and not extend beyond the terminating vertical bar. Examples are shown below:

Pay _____ | or bearer

or

Pay _____ | or order

The amount in words should start at the left end of the line and not extend beyond the vertical terminating bar. An example is shown below, the second line being optional:

The sum of _____ |
_____ |

When the amount normally in words is to be inserted by machine in figures with either the words 'dollars' and 'cents' or the \$-sign, asterisks must be inserted before and after the amount. The amount in figures should be printed within the area specified at sub-clause 7.1.10.1 with asterisks before and after the amount and the digits so aligned that no figure can be inserted between the dollars and cents columns.

**7.1.4
Bearer or
order**

The words 'or bearer' or 'or order' (if required) should be positioned in a way to allow easy recognition. If shown, these words should be at the end of the payee line at the right side of the cheque above the signature area.

**7.1.5
Account name
(personalisation)**
figure 2, [4]

Cheques should be designed so that the printed account name can be readily located. The account name should be adjacent to the signature area. Account name(s) must comply with the certificate of acceptability and account number (see clause 2) and, together with provision for the drawer's signature, should be the only information below the amount in words line and above the MICR clear band.

**7.1.6
Signature area**
figure 2, [5]

Cheques must be designed so that the signature of the drawer can be readily located. The recommended position for the signature of the drawer is the bottom half of the cheque below the amount in figures, above the MICR clear band and located so the signature does not encroach into the amount in figures area or the MICR clear band. The signature area must be free of other printing which could interfere with legibility. Printing of a signature line(s) is mandatory and it should be placed in accordance with the aforementioned requirements.

Where more than one signature is required, these may be placed on the same line or one above the other. If the signature(s) are pre-printed, the bank may require an indemnity.

7.1.7
Clear bands
figure 2, [6]

No words, writing or printing are permitted in the clear band areas except for both backgrounds and MICR encoding in the 5/8" clear band at the bottom of the cheque. Backgrounds in the clear bands must be printed in a scan non-readable ink (see appendix B). Keep the clear band reserved for the MICR line free of all printing other than the protective tints. As any printing could interfere with MICR print quality, it is strongly preferred that backgrounds do not intrude into the MICR clear band.

The following clear bands (see figure 2 [6]) must be maintained:

- 5/8" (16 mm) from the bottom of the cheque,
- 1/4" (6 mm) on each side of the cheque, and
- 1/8" (3 mm) from the top of the cheque.

7.1.8
MICR line
figure 1,
figure 2, [6]

For layout purposes, the MICR line must comply with the requirements of clause 5 above and the certificate of acceptability and account number (see clause 2 and appendix A).

7.1.9
Date area
figure 2, [7]

The date should be positioned in such a way as to allow easy recognition and should be placed in the top right corner of the cheque above the amount in figures area.

7.1.10
Amount
figures 2 and 3,
[8], [9], [10]

Cheques must be designed so that the correct amount of the cheque is readily recognisable – in particular so that anyone at a glance, rather than by close scrutiny, can easily recognise the correct dollar amount.

The amount in figures must be at the right side of the cheque and the amount in words must be at the left.

All other numbers and information must be kept well away from the amount in figures. Information must not appear to the right of the amount in figures.

7.1.10.1 Amount in figures area

Sub-clauses 7.1.10.1 (a), (b), (c), and (d) specify the requirements for the amount in figures, the \$-sign, and the protection area.

7.1.10.1 (a) Area for the amount in figures and \$-sign *figures 3, [8a] to [8f]*

The amount in figures and \$-sign are to be located in an imaginary rectangle. The size of which may vary according to need. The table below lists the specifications:

Dimension of the imaginary rectangle (for the amount in figures and \$-sign)	Specifications
[8a] Width	Min: 1 1/2" (38 mm) Max: 2" (51 mm)
[8b] Height	Min: 9/32" (7 mm) Max: 3/8" (10 mm)
[8c] Minimum distance of the bottom right corner from the bottom edge of the cheque	1 1/2" (38 mm)
[8d] Maximum distance of the top right corner from the bottom edge of the cheque	1 7/8" (48 mm)
[8e] Distance of the right edge of the imaginary rectangle from the right edge of the cheque	1/4" (6 mm)
[8f] Distance of left edge of the imaginary rectangle from the right edge of the cheque	Min: 1 3/4" (44 mm) Max: 2 1/4" (57 mm)

7.1.10.1 (b) \$-sign *figure 3, [10]*

The \$-sign must be present on all cheques and must not be handwritten as it provides a target for the image scanning equipment. The \$-sign should be formatted in accordance with appendix E.

The table below specifies the location for the \$-sign:

Location specifications for the \$-sign	Specifications
Distance from the left edge of the \$-sign to the right edge of the cheque.	Min: 1 3/4" (44 mm) Max: 2 1/4" (57 mm)
Minimum distance of the bottom of the vertical line through the \$-sign from the bottom edge of the cheque.	1 1/2" (38 mm)
Maximum distance of the top of the vertical line through the \$-sign from bottom edge of the cheque.	1 7/8" (48 mm)

If a field guide or rectangle is used, the \$-sign must be centred vertically on the guide.

**7.1.10.1 (c)
Amount in
figures**

The amount in figures must be printed or written to the right of the \$-sign. It must not touch the \$-sign to the left nor intrude into the 1/4" (6 mm) vertical clear band to the right. To avoid fraudulent alteration of the amount in figures, it should be written or printed as close as possible to the \$-sign.

Where the amount in figures is machine-printed, protecting asterisks may be used, (see sub-clause 7.1.10.2(b)), to fill the gap between the \$-sign and the amount in figures.

Nothing, other than protecting asterisks, is to be printed in scan readable ink to the right of the amount in figures.

**7.1.10.1 (d)
Protection
area**
figure 3, [9]

A protection area must be maintained around the \$-sign and amount in figures. No other printing or writing in scan readable ink is to approach closer than 1/10" (2.5 mm) to the left of the \$-sign, and 1/8" (3 mm) above and below the \$-sign and the amount in figures.

**7.1.10.2
Completion of
the amount in
figures**

Sub-clauses 7.1.10.2 (a) and (b) specify how the amount in figures should be completed.

**7.1.10.2 (a)
Handwritten
cheques**

Where the amount in figures is handwritten, a visual guide as described at sub-clause 7.1.10.3 is to be provided and must be positioned within the imaginary rectangle described at sub-clause 7.1.10.1(a) and can either be:

- a contrasting field guide as shown in appendix D, i.e. an open rectangle, see also sub-clause 7.1.10.3(a); or
- a contrasting dropout rectangle, see also sub-clause 7.1.10.3(b).

The \$-sign must be pre-printed and centered vertically in relation to the guide or rectangle and positioned within the area defined at sub-clause 7.10.1(b).

**7.1.10.2 (b)
Machine-
printed
cheques**

Where the amount in figures is machine or computer printed, a field guide or drop-out rectangle is not required provided the background is printed in scan non-readable ink. The \$-sign may be machine printed at the same time as the amount in figures. The sign must be positioned within the area defined at sub-clause 7.1.10.1(b), and the amount in figures positioned as defined at sub-clauses 7.1.10.1(a) and 7.1.10.1(c) on the same horizontal plane as the \$-sign.

If a field guide or dropout rectangle is used, conformance to the specification at sub-clause 7.1.10.2(a) is to be observed.

Asterisks may be printed to protect the beginning and/or the end of the amount in figures, i.e. between the \$-sign and the dollar amount and/or after the cents amount. No characters other than asterisks are permitted. The dollar amount must be separated from the cents amount by a decimal point only.

**7.1.10.3
Visual guides**

This sub-clause specifies the requirements for the imaginary rectangle (described in 7.1.10.1 (a)) if a contrasting field guide or a dropout rectangle are used as visual guides for the amount in figures.

**7.1.10.3 (a)
Field guide**

If a contrasting field guide is used the \$-sign must be printed immediately outside the guide and placed relative to the guide so as to minimise the risks of alteration of the amount in figures or the insertion of an additional figure(s). The guide must be either:

- printed in a screen or lines in a scan non-readable ink, or
- defined by a line formed by reversing out the background printing, i.e. the guide may be white.

For security purposes, it is recommended that a background security pattern or screen is always printed inside the field guide, and when present, must always be printed in scan non-readable ink.

**7.1.10.3 (b)
Dropout
rectangle**

If a contrasting dropout rectangle is used the \$-sign should be printed inside the rectangle. The background of the rectangle must be printed in colour contrasting to the background of the main body of the cheque and must be printed using a scan non-readable ink. For security purposes, it is recommended that a background security pattern or screen is always printed in the dropout rectangle.

**7.1.11
Crossings**

A crossing is two unbroken parallel transverse lines which direct that the cheque may only be paid through a bank and not cashed.

As a result of a change to the Cheques Act 1960, from 1 January 1996, crossing a cheque with the words:

- 'not transferable' or 'non-transferable', or
 - 'account payee' or 'a/c payee', either with or without the word 'only';
- means that the cheque cannot be transferred to someone else and can only be paid into a bank account in the same name of whoever the cheque is made out to.

Pre-printed non-transferable cheque forms are to:

- omit the words 'or bearer' or 'or order' from the payee line and
- insert the words 'not transferable' within the crossing.

Crossings should be conspicuous and placed as close as possible to the centre of the cheque. It is unwise to place the crossing near any edge of a cheque as it may be possible to cut or tear the cheque and so remove the crossing.

Printed crossings must not extend into the name of the bank or its branch name or into the 5/8" (16 mm) MICR clear band across the bottom of the cheque and must be at least 2 1/2" (64 mm) from the right edge of the cheque. The crossing must be printed in a scan readable ink.

**7.1.12
Distance
between
horizontal
rulings**

Horizontal rulings, if used on special cheques, should be spaced to meet the requirements of the individual customer.

**7.1.13
Background**

The background design of a cheque must be unobtrusive and preferably printed in scan non-readable inks.

The background, if it is printed in the clear bands and/or the amount in figures box or buffer zone, must be printed in a scan non-readable ink so as not to interfere with banks' machine reading process.

Some examples of appropriate inks are shown in appendix B.

**7.1.14
Printing on the
reverse of a
cheque**

No printing other than backgrounds is permitted on the reverse side of the clear band areas (see figure 2 and sub-clause 7.1.7).

Any printing on the reverse of the cheque must be in scan non-readable inks so as not to interfere with tracer numbers and stamps applied by the bank during processing.

**7.1.15
Carbonising**

The background image created by the use of carbon ink or wax is incompatible with image processing equipment and therefore its use is discouraged.

Carbonising is permissible only on the reverse side of forms and is to be restricted to the smallest possible area. Carbonising must not intrude into the clear bands (see figure 2).

Carbonless paper and interleaved one-time carbon is preferred for encoded documents.

**7.1.16
Overprinting**

Cheques may be overprinted using standard design forms overprinted with the name of the customer, title of account and crossing.

7.2 Deposit forms

Introduction

Adherence to the requirements in these standards will facilitate accurate and efficient manual and electronic processing of deposit forms.

Where a customer wishes to create a special deposit form to meet particular requirements, the wording and design of that special deposit form should conform with the standard deposit forms issued by the customer's bank, these standards and the certificate of acceptability and account number issued by the bank (see clause 2).

Unless otherwise specified, deposit forms must be printed in blue or black scan readable ink on white automation grade paper.

7.2.1

Title

figure 4

A deposit form must be easily identifiable as a deposit with either the word DEPOSIT or CREDIT placed above or to the right of the date and printed in a 3/16" (5 mm) minimum height bold-face type scan readable ink.

7.2.2

Bank name and address

figure 4, [1a]

The form and location of the bank name and address on the deposit form must comply with individual bank's requirements. Deposit form design should however enable the name of the bank to be determined at a glance with the bank name appearing in the upper portion of the form.

7.2.3

Special deposit forms: customer name

figure 4, (1b)

Customers' special deposit forms should be clear of extraneous printing so that while the customer's legal and/or trading name, and/or business logo, address and/or nature of business maybe shown and may appear in the upper portion of the document, the name of the bank must be more prominent.

No other information about the customer (including telephone, facsimile number or advertising) may be shown.

7.2.4

Teller's initials

figure 4, [2]

The teller's initials must be on the left side of the deposit form. This will ensure that the entry of initials will not intrude into the data areas.

7.2.5

Branch stamp

figure 4, [3]

The branch stamp should be placed adjacent to, directly below, or combined with the teller's initials area.

7.2.6

Item count

figure 4, [4]

The item count is an optional field.

7.2.7
CREDIT: Bank
Personalisation
figure 4, [5]

This area will contain the words 'For CREDIT of' and the title of the account being credited.

7.2.8
Clear bands
figure 4, [6]

No words, writing or printing are permitted in the areas except for backgrounds and protective tints, and MICR encoding in the 5/8" (16 mm) band at the bottom of the deposit form. Backgrounds in the clear bands must be printed in a scan non-readable ink (see appendix B).

Keep the clear band reserved for the MICR line free of all printing other than the protective tints. As any printing could interfere with MICR print quality, it is strongly preferred that backgrounds do not intrude into the MICR clear band.

The following clear bands must be maintained:

- 5/8" (16 mm) from the bottom edge of the deposit form
 - 1/4" (6 mm) on each side of the deposit form
 - 1/8" (3 mm) from the top edge of the deposit form
-

7.2.9
MICR line
figure 4, [6]

For design purposes the MICR line must comply with the requirements of clause 5 and the certificate of acceptability and account number at appendix A.

7.2.10
Date area
figure 4, [7]

The date must be placed on the top right of the deposit form in the date area so that it is easily recognisable.

7.2.11
Optional detail
area
figure 4, [8]

The optional detail area is not committed for specific use and could be used for the listing of cheques lodged, cash break-up, depositor's signature or fees.

7.2.12
Deposit details
figure 4, [9]

The deposit details area is between the date area at the top right of the form and the total amount box which is directly above the MICR clear band. This area is used for the deposit break-up (notes, coins, cheques etc.).

7.2.13
Total amount area
figure 4, [10]

Deposit forms must be designed so that the correct total amount of the deposit is readily recognisable - in particular so that anyone at a glance, rather than by close scrutiny, can easily recognise the correct total dollar amount. The total amount must be at the right side of the deposit form. All other numbers and information must be kept well away from the total amount. Information must not appear to the right of the total amount.

The total amount area must have a background of a scan non-readable ink or be outlined by either a scan non-readable screen or lines. For examples of appropriate ink shades, see appendix B.

The \$-sign must be pre-printed as shown in appendix E unless it is to be machine printed with the amount of the deposit.

The total amount area must be placed within a buffer zone as shown in figure 4. The buffer zone must be 3/5" (15 mm) high, and must be placed immediately above the MICR clear band and 1/4" (6 mm) in from the right edge of the form. See sub-clauses 7.2.18 and 7.2.19 for width specifications.

The total amount of the deposit must be written or printed in the total amount box which must be an area of between 9/32" (7 mm) and 3/8" (10 mm) high, and between 1 3/4" (45 mm) and 2 1/4" (58 mm) in length; the length dimension to include the \$-sign (see figure 4). It must be defined either by a printed rectangular background or a field guide outlining the rectangle within the buffer zone as shown in figure 4.

This guide must be printed using scan non-readable inks, see appendix B for examples. The field guide, examples of which are shown in appendix D, is intended only to provide visual guidance to writers of deposit forms.

The spacing allowed for characters on this form is 5 characters per inch (CPI).

7.2.14
Pre-printed \$-sign and use of asterisks
figure 4, [11]

The \$-sign must be pre-printed as shown in appendix E unless it is to be machine printed with the amount in figures. Forms that are machine printed may use asterisks as leading symbols to 'protect' the dollar amount against alteration (e.g. \$***123.60).

It is recommended that no more than three of these protective symbols should be used to permit rapid readability of the amount in figures.

7.2.15
Protection zone
figure 4, [12]

To the left of the deposit details and total amount areas a 1/2" (13 mm) vertical band must be reserved for pre-printed information only and may be combined with the optional detail area (see sub-clause 7.2.11) for printing of disclaimer clauses etc.

Those wishing to print special deposit forms should consult with the relevant bank on this matter.

**7.2.16
Background**

The use of dark colours in the background of deposit forms must be avoided to prevent interference with vital information. If a tinted background is used, it should be scan non-readable blue, although it is not necessary to use fugitive background and/or sensitised paper for these forms.

The background of a deposit form must be of an unobtrusive design and preferably printed in scan non-readable inks. The background, if it is printed in the clear bands and/or the total amount box, must be printed in scan non-readable inks so as not to interfere with the bank's machine reading process.

Some examples of appropriate inks are shown in appendix B.

**7.2.17
Printing on the
reverse of a
deposit form**

Any printing on the reverse of the deposit form must be in scan non-readable inks so as not to interfere with tracer numbers and stamps applied by the bank during processing.

**7.2.18
Small deposit
forms**
figure 5, [9]

Small deposit forms are generally supplied by a bank to its customers and provide for lodgement of a small number of items, (e.g. cheques) ; the details of which are recorded on the front or the reverse. The layout of the deposit detail section of these forms must comply with that shown in figure 5.

**7.2.18.1
Total amount
box**
figure 5, [10]

Because of the size of small deposit forms, allowance has been made for 8 characters of 5 CPI (characters per inch) in the total amount box (figure 5, [10]).

Data space required is 2 1/4" (57 mm) which includes:

- 1/4" (6 mm) on the right edge,
 - 3/16" (5 mm) for the \$-sign,
 - 1/4" (6 mm) for the space between the \$-sign and numerals, and
 - 1 9/16" (40 mm) space for 8 characters.
-

**7.2.19
Large deposit
forms**
figure 6, [9]

Large deposit forms are used for the lodgement of several cheques etc. The design of the deposit details section must comply with that shown in figure 6.

**7.2.19.1
Total amount
box**
figure 6, [10]

The total amount box has allowance for 10 character spaces of 5 CPI (characters per inch) in the total amount box (figure 6, [10]).

Data space required is 2 5/8" (67 mm) which includes:

- 1/4" (6 mm) on the right edge,
 - 3/16" (5 mm) for the \$-sign,
 - 1/4" (6 mm) for the space between the \$-sign and numerals, and
 - 1 15/16" (50 mm) space for 10 characters.
-

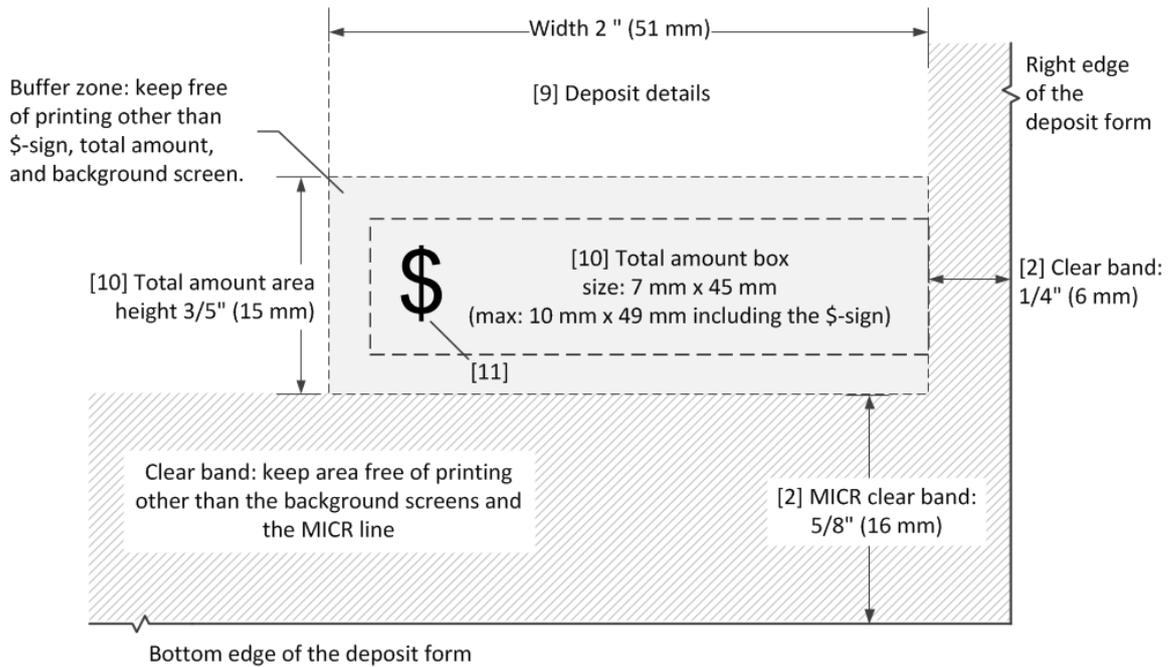


Figure 5: Layout of deposit details and total amount for small deposit forms (see clause 7.2.18)

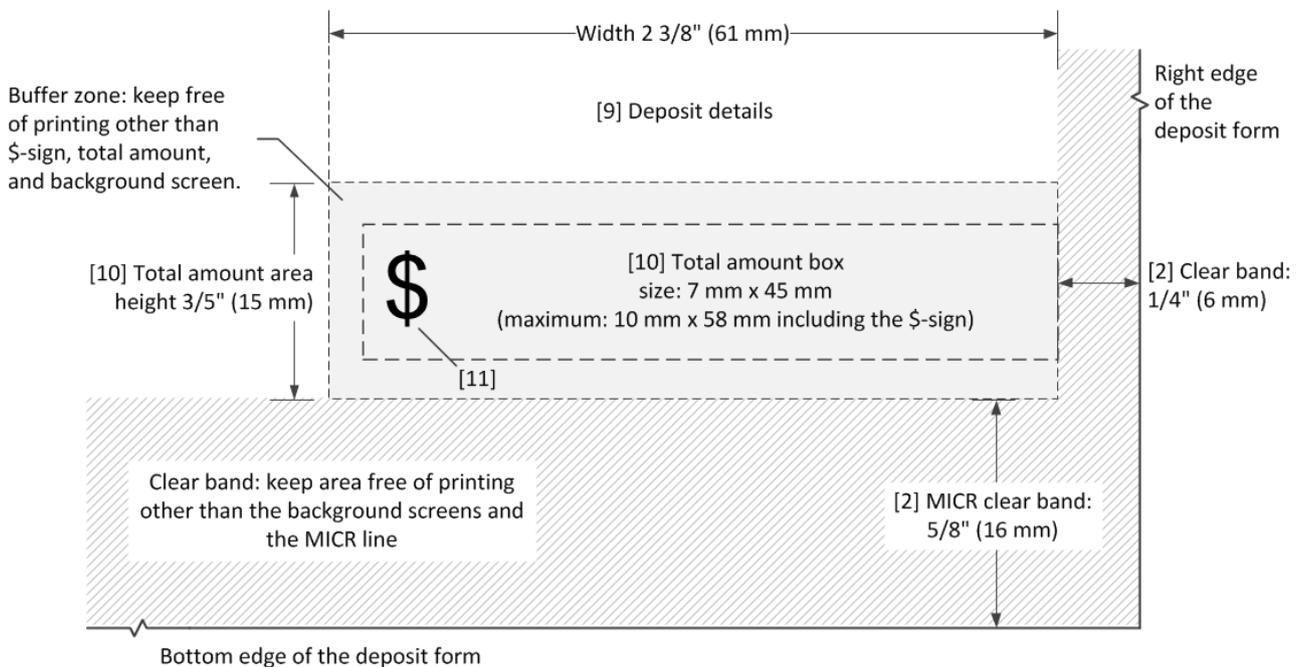


Figure 6: Layout of deposit details and total amount for large deposit forms (see clause 7.2.19)

Clause 8: Paper

8.1 Paper specifications and properties

All cheque and deposit forms must be printed on a paper that can withstand passing through high speed MICR reader/imaging equipment. The paper should conform to the standard in clause 8.3.

In the case of cheques, if they are to be printed totally with oil based inks and a fugitive ink is not used to improve the security of the document, sensitised paper must be used to provide that security, see clause 9.

In the case of special deposit forms, white paper must be used.

8.2 Sampling requirements

Where it is considered appropriate, the customer's bank may require 50 printed sample forms for testing prior to the production of the forms.

Bank branches are to forward samples to their head office who will arrange to test the paper.

8.3 Standard for paper for MICR encoded documents

The properties for MICR encoded paper are detailed in the table below:

Property	Limits	Test method(s)
Grammage	92 ± 4 g/m ²	AS 1301.405s
Thickness	108-120 µm	AS 1301.426s
Cross direction stiffness: Clark Taber Resonance Buchel	175 mm minimum critical flop length 0.15 mNm minimum 0.23 mNm minimum 54 mN minimum	TAPPI.T451cm AS 1301.431rp ISO 5629 ISO 2493
Surface strength (IGT Pick)	NOT LESS THAN 2.0 m/s on either surface (at 23 °C)	TAPPI.Um591 using medium viscosity test oil and spring B
Roughness: Bendtsen Sheffield	100-230 units on either surface 80-140 units on either surface	AS 1301.439s AS 1301.441s
Air permeability: Bendtsen Sheffield (using 19 mm orifice)	210-640 mL/min 60-140 mL/min	AS 1301.440s AS 1301.447s
Acidity (Hot extract pH)	5.0-9.5	AS 1301.422s
Cross direction tearing resistance	700 mN minimum	AS 1301.400s
Bursting strength	240 kPa minimum	AS 1301.403s
Machine direction tensile strength	80 N minimum for 15 mm strips	AS 1301.P404s
Opacity	83% minimum	TAPPI.T435om
Moisture content	5-6%	AS 1301.457s
Reflectance	60% minimum	See ANSI/ABA X9.7
Dirt content	Maximum 10 ppm	TAPPI.537om

Clause 9: Security

9.1 Cheques

Banks are concerned that changes in technology, through the use of colour photocopiers and the accessibility of sophisticated printing equipment, will increase the incidence of counterfeiting and the forging and/or altering of cheques. The security level desired for special cheques is that which offers reasonable protection against fraudulent alteration and counterfeiting, while still enabling clear recognition of all variable details.

The risk of counterfeiting can be reduced by the use of various design and production techniques. In addition, all cheques should be printed by recognised security printers under controlled conditions.

Background

The cheque background must be printed to protect against fraudulent chemical or physical alteration. When special cheques lack this protection the bank may require an indemnity from the customer. The background of a cheque must be of an unobtrusive design, using a proven fugitive ink and/or a sensitised/watermarked/safety paper complying with the paper requirements at clause 8 above and preferably printed in scan non-readable inks.

The background design of a cheque should be of a colour and pattern which will not interfere with the legibility of any information, either printed or written, on the original cheque, or any reproduction of it through use of microfilm, scanning or photocopying equipment. The use of VOID or COPY pantographs that reveal the word when photocopied are discouraged as when scanned for image capture the word may appear on the retained image.

Colour

The use of light pastel colours or standard safety tints with sufficient depth of colour to render alteration evident is recommended. Dark colours must not be used.

If customers have no particular preference regarding the colour of the fugitive ink background on their documents, it will assist all banks in the manual sorting of documents, if the relevant bank's standard colour background (or similar) is used.

9.1.1 Scenic documents

In the case of scenic special cheques, if a customer is uncertain about any aspect of the standards the customer should consult with their bank before proceeding with any design work or production, which may be unacceptable.

In order to obtain the desired colour registration for scenic documents, printers are often forced to use inks with doubtful or non-existent fugitive properties. In these cases, a sensitised or safety paper must be used. See appendix B for examples of ink colours.

9.2 Deposit forms

The use of fugitive background and or sensitised paper for deposit forms is not considered necessary.

Clause 10: Perforations, edge notching and holes in documents

10.1 Perforations

Slit type perforations are the only acceptable perforation. Other perforations such as pinhole lead to build up of paper fluff and can cause clogging in the reader/sorter equipment.

Printed perforation marks in magnetic ink or toner are not permitted within the MICR clear band. However, it is permitted to use ordinary (non-magnetic) ink, but not toner, at scan non-readable levels within this area.

10.2 Continuous stationery

Cheques and deposit forms produced in continuous form must have all sprocket hole selvages removed before distribution.

Cutting devices used for the removal of sprocket holes and for document separation must allow for the correct positioning of any encoding in relation to the reference edges of the document and give clean edges.

When the selvage on continuous deposit forms is not perforated, guide marks must be provided to indicate the correct guillotining position.

It is recommended that when these documents are folded for insertion into mailing envelopes, one fold be made on the perforation. Such folding weakens the perforation and facilitates the removal of the deposit form undamaged. Folds close to the perforation can result in damage to the deposit form which can cause processing difficulties.

10.3 Edge notching and holes in documents

Cheques and deposit forms must not be produced with notches or other types of indentation on any edge, or contain holes of any shape or size, as these cause the documents to interlock and jam the processing equipment.

10.4 Document writing / signing/ payee protection machines

Documents completed by document writing/ payee protection machines, which produce either a macerated or perforated surface, can cause processing problems. Customers should consult their bank prior to contemplating the use of this equipment. The details should be in a scan readable ink.

10.5 Binding

The application of glues, or other forms of binding, is not permitted on the right hand and bottom reference edges on any document.

Appendix A

Certificate of acceptability and account number

The certificate of acceptability and account number (to be used for both special cheques and deposit forms) must be printed with the following on the reverse of the certificate:

Responsibilities of customer:

- to ensure that special cheques and deposit forms and other MICR forms conform to the MICR Document Design Standards published by Payments NZ Limited
- to provide the bank with proofs for their approval of the design/layout
- when requested, to provide samples of MICR encoded forms to the bank for MICR code line and paper testing
- to incur all costs in connection with printing of special cheque or deposit forms and other MICR forms, this includes costs of non-compliance, e.g, reprints, and could also include any additional processing costs incurred by banks resulting from this non-compliance

Responsibilities of printer:

- to ensure all cheque or deposit forms and other MICR forms produced comply with the MICR Document Design Standards published by Payments NZ Limited

Responsibilities of bank:

- to complete a certificate of acceptability and account number if appropriate
 - to provide a copy of the Payments NZ Limited MICR Document Design Standards
 - to test sample cheque and deposit forms and other MICR forms where considered necessary
-

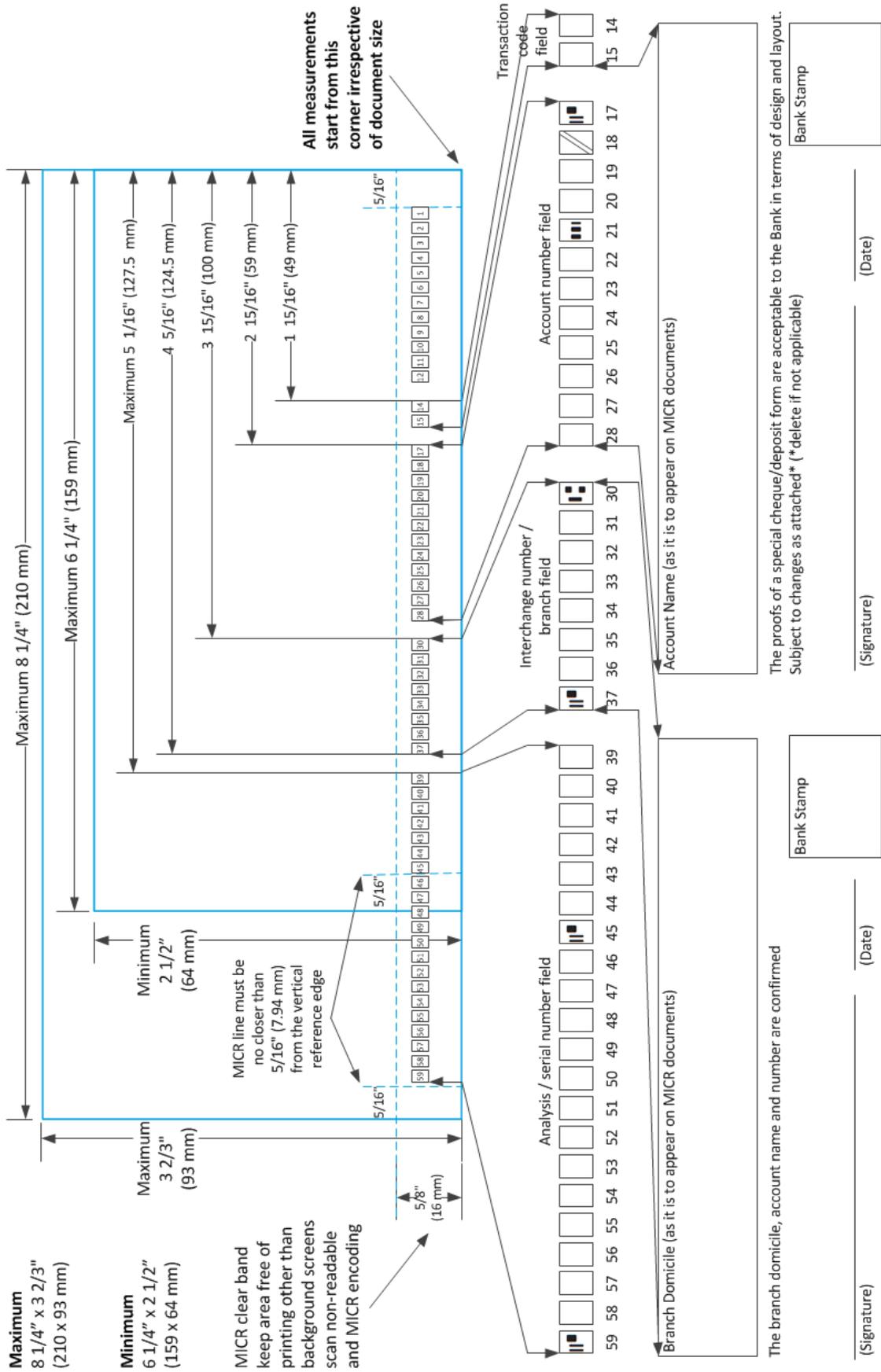


Figure 7: Certificate of acceptability and account number (see clause 2 and appendix A)

Appendix B

Inks for printing image-compatible documents

In all areas of cheques and deposit forms that are scanned to capture data, the data must be printed or written in a dark ink. Conversely the surrounding printed area must be in a light ink so that it does not interfere with the data. The requirements for these inks have been defined using a measure known as the Print Contrast Signal (PCS). A technical description of the method of measuring this PCS for any printed ink sample is provided in appendix C. For most designers this information can be obtained from an ink supplier or your printer. Some examples are provided here for guidance.

Colours of ink have been designated using the Pantone Matching System (PMS) number. While this is not a standard, it is a widely accepted method for specifying colours. For these cheques and deposit forms required to comply with these standards the uncoated PMS colours should be used, and these are designated by a U suffix.

1. Scan readable inks

The \$-sign and the amount in figures must be printed in a dark ink as they are the data the machine is reading. The \$-sign would normally be pre-printed on the form or be machine printed. A black or dark blue ink is preferable but in all cases it must have a PCS of more than 0.60. This will usually be printed as a solid (100% screen) of a dark colour

2. Scan non-readable inks

The areas surrounding the data, such as boxes to indicate where the data should be positioned, must have a PCS of 0.3 or less. This will create a high contrast with the data and facilitate accurate and fast data transcription.

3. Backgrounds

Where a background is required within the data area, such as a security pattern behind the amount in figures, it must have a PCS of 0.3 or less.

4. Examples

Examples of the PCS value of some commonly used colours are shown below:

Pantone colour designation	PCS for solid ink colour	Screen for PCS=0.60	Screen for PCS=0.25
Process Black U	0.91	53%	16%
Process Cyan	0.67	82%	32%
Process Magenta U	0.82	56%	15%
Process Yellow U	0.14	n/a	n/a
Reflex Blue U	0.88	55%	17%
Warm Red U	0.74	70%	23%
Cool Grey 3 U	0.43	n/a	51%
Red 032 U	0.77	67%	22%
Yellow 116 U	0.45	n/a	39%
Orange 156 U	0.40	n/a	54%
Red 1797 U	0.84	60%	19%
Pink 210 U	0.53	n/a	39%
Blue 290 U	0.33	n/a	80%
Blue 293 U	0.85	60%	17%
Blue 300 U	0.8	67%	21%
Green 3308	0.85	57%	18%
Green 347 U	0.68	73%	27%
Green 350 U	0.84	58%	19%
Green 356 U	0.78	69%	20%
Green 367 U	0.39	n/a	57%
Green 382 U	0.41	n/a	57%
Grey 420 U	0.37	n/a	62%
Grey 424 U	0.75	65%	22%
Grey 427 U	0.36	n/a	72%
Pink 487 U	0.54	n/a	42%

Note: n/a means the PCS value for solid ink is less than the required value.

These values are indicative only and should be checked with a printer or ink supplier before use as a number of factors will influence the actual value achieved, such as the paper used and dot gain on the printing press.

Appendix C

Measurement of print contrast signal The Print Contrast Signal (PCS) is a measure based on the reflectance of a specified area in relation to the background reflectance. In the case of a printed cheque, the PCS of an ink is the ratio of the reflectance of the printed area to the unprinted cheque paper.

1. Measurement The PCS can be measured directly with specialised instruments, such as the Macbeth (model no. PCM II) or RDM Image Qualifier (model no. IQ 1000). It can also be measured with normal reflectance meters as long as they are fitted with a filter which has a spectral response peak at 555 nanometres and a half peak response at 510 to 610 nanometres (e.g. Kodak Wratten No. 106)

2. Reflectance Reflectance as measured by a reflectance meter or print contrast meter is an absolute value calibrated by reference to a freshly pressed magnesium oxide (MgO) powder, or barium sulphate powder (BaSO₄) as the 100% value.

All reflectance measurements shall be made on equipment having a spectral response as specified above, and using an aperture of 0.008 of an inch in diameter. Reflectance as used in the standard refers to diffuse reflection; that is the reflected light used for measurement excludes specularly reflected light.

Measurement should be accomplished by using the blackbacking method; that is the sample being measured should be backed with a black material having no more than 0.5% reflectance.

3. Print contrast signal The Print contrast signal (PCS) of a point is defined by the following formula:

$$PCS_B = (R_B - R_P) / R_B$$

Where R_B is the average reflectance of the background within the area of interest and R_P is the reflectance of a small measurement area centred on point P.

The reflectance, and consequently the PCS, is measured with an aperture of 0.008 of an inch in diameter. This measurement is performed using the black-backing method as described above.

Appendix D

Examples of field guide design

The examples shown here are provided to demonstrate some simple ways in which the data fields may be designed to encourage correct positioning of data. This will make character identification simpler and more positive, thus improving the first time read rate and reducing operator intervention. In turn this will result in faster processing of documents. Format boxes must be printed in scan non-readable ink (see appendix B).

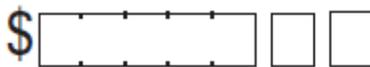
Recommended for cheques:

Open rectangle style

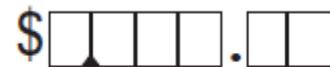


Recommended for deposits:

Rectangle with split cents/tic marks



Individual boxes plus decimal point, for separation of dollars and cents and tic mark for thousands (personal deposit)



Individual boxes plus decimal point, for separation of dollars and cents and tic mark every three digits (business deposit)



Appendix E

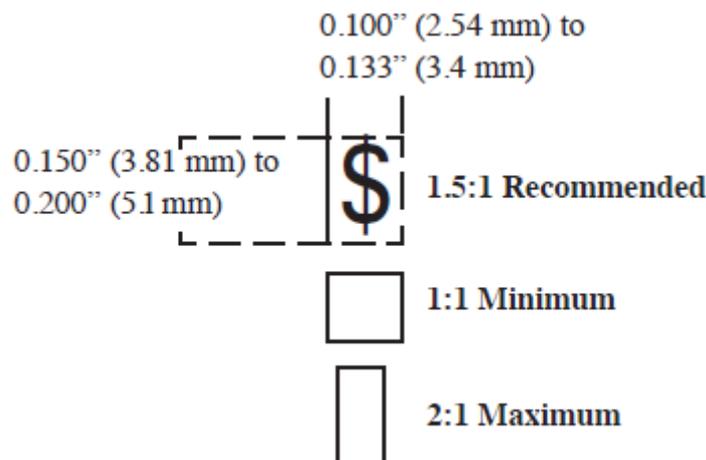
\$-sign representation

The \$-sign must be represented by a character that conforms to certain dimension and ratio rules, as shown below, to enable it to be recognised. The OCR B font \$-sign at point sizes 16 and 18 conforms to these requirements.

The pre-printed \$-sign is to have:

- a single vertical line through an upper case “S”,
- the vertical line is to be between 0.013” (0.33 mm) and 0.017” (0.43 mm) wide,
- the recommended height to width ratio is 1.5:1 (aspect ratio),
- the aspect ratio is to be between 1:1 and 2:1,
- the height is to be between 0.15” (3.5 mm) and 0.20” (5.1 mm), and
- the width is to be between 0.075 (1.9 mm) and 0.200” (5.08 mm).

1. Aspect ratio The aspect ratios for the pre-printed \$-sign are shown in the diagram below:



2. Location tolerances

The location tolerances for the pre-printed \$-sign are shown in the diagram below:

