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**Standard for the Examination of Documents for
Alterations**

DRAFT



Standard for the Examination of Documents for Alterations

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Forward

Forensic Document Examiners are often asked to determine if documents are authentic or have been changed or altered since originally created. This determination is incumbent upon the examiner employing several types of examinations.

An alteration is a revision, modification, or anomaly within a document that changes the stated obligation or use as evidence. An alteration can be made to a document by physical, chemical, electronic, or mechanical means (or a combination of the aforementioned means). Alterations can generally be categorized as an addition, deletion, obliteration, or substitution of information and can be revealed by a variety of techniques. Examination of alterations require a broad range of knowledge, skills, and abilities to effectively apply appropriate scientific and technical methods, and properly evaluate the findings in order to reach appropriate conclusions. This standard summarizes commonly accepted techniques, technologies, and procedures.

All hyperlinks and web addresses shown in this document are current as the publication date of this standard.

Keywords: *forensic document examiner, alterations, obliterations, insertions, deletions, interlineations.*

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DRAFT

Standard for the Examination of Documents for Alterations

1 Scope

This document establishes the base minimum requirements for the procedure(s) to be used by Forensic Document Examiners for the examination of documents for alterations.

2 Normative References

There are no normative reference documents, Annex A, Bibliography, contains informative references.

3 Terms and Definitions

For purposes of this document, the following definitions apply.

3.1

alteration

A modification made to a document by physical, chemical or mechanical means including, but not limited to, obliterations, additions, overwritings, or erasures.

3.2

digital image

An image that is stored in numerical form.

3.3

document

Any evidentiary material that conveys a message or contains information on which a set of observations can be made. May be used interchangeably with "item".

3.4

digital image processing

Any activity that transforms a digital image.

3.5

electrostatic detection device

EDD

An instrument that uses electrostatic charge as the mechanism to visualize paper fiber disturbances (for example, indentations, erasures, typewritten material/lift off).

3.6

erasure

The area where material has been removed from a document by chemical, abrasive, or other means.

3.7

fluorescence

A process by which radiant flux of certain wavelengths is absorbed and reradiated nonthermally at other, usually longer, wavelengths.

**3.8
infrared
IR**

Referring to radiant flux having wavelengths longer than the wavelengths of light, usually wavelengths from about 760 nm to about 3 mm.

**3.9
infrared luminescence
IRL**

The emission of radiant energy during a transition from an excited electronic state of an atom, molecule, or ion to a lower electronic state (fluorescence or phosphorescence, or both), where the spectrum of the excitation source is in the ultraviolet (UV) or visible region of the electromagnetic spectrum, or both, and the spectrum of the emitted energy is in the far red or infrared (IR) region of the electromagnetic spectrum.

**3.10
indentations**

Latent or visible impressions in paper or other media.

**3.11
side lighting**

Illumination from a light source that is at a low angle of incidence, or even parallel, to the surface of the item. Syn., oblique lighting.

**3.12
transmitted light**

Illumination that passes through a document.

**3.13
ultraviolet
UV**

Referring to radiant flux having wavelengths shorter than the wavelengths of light, usually wavelengths from about 10 nm to 380 nm.

4 Requirements

4.1 Competence

4.1.1 General

Competency in the examination of altered documents is based upon a combination of the requisite knowledge, skills, and abilities acquired through appropriate education, training, and experience specific to forensic document examination.

4.1.2 Requisite Knowledge, Skills, and Abilities

It is critical that the Forensic Document Examiner (FDE) has a knowledge base that includes the manufacturing processes of materials used in the production and preservation of documents as well as the skills and abilities to analyze, compare, and evaluate case-related items. The examiner's

training shall conform to the requirements of SWGDOC *Standard for Minimum Training Requirements for Forensic Document Examiners*.

4.2 Equipment

4.2.1 General

The FDE shall ensure that all equipment and apparatus shall be properly maintained and calibrated, as required by manufacturer's specifications, and documented as required by the practices and quality assurance procedures.

4.2.2 Standard Equipment

4.2.2.1 Appropriate light source(s) to distinguish fine detail shall be available. Natural, incandescent, fluorescent, light emitting diode (LED), or fiber optic lighting sources are generally used. These may include transmitted, side, and vertical incident lighting.

4.2.2.2 Optical or digital magnification necessary to resolve fine detail shall be available. The magnification level and the equipment used to observe the feature(s) should be recorded.

4.2.2.3 Image capture device(s) capable of sufficient resolution to record accurate detail shall be available. The equipment used and the resolution needed to observe the feature(s) should be recorded.

4.2.2.4 Infrared (IR) image conversion device or system with appropriate light sources and filters for use in infrared reflectance (IRR) and infrared luminescence (IRL) examinations shall be available.

4.2.2.5 Long-wave, mid-wave, and short-wave ultraviolet (UV) sources shall be available.

4.2.2.6 Measuring devices shall be available, these may include paper micrometer, typewriter grids, rulers, and magnifiers with reticle patterns.

4.2.2.7 An electrostatic detection device (EDD) shall be available.

4.2.2.8 The examiner shall have the time and facilities necessary to complete all applicable procedures and prevent deleterious effects.

4.2.2.9 Other equipment or devices generally accepted in the forensic document examination discipline that should be available for the examination of documents for alterations, as deemed appropriate by the examiner, may include:

- hand tools (e.g., scalpel, spatula, tweezers);
- magnetic properties detector;
- software for digital image processing.

4.3 Considerations and Limitations

4.3.1 Items submitted for examination can have limitations that interfere with the procedures in this standard. Limitations can be due to the submission of non-original documents; the condition, quantity, or comparability of the material submitted; or from limited discriminating characteristics. The examiner shall ensure that limitations are noted and recorded.

4.3.2 Document examinations should be conducted prior to any destructive processing (e.g., latent print, DNA, ink chemistry). Items shall be handled as required to avoid compromising subsequent examinations. The results of prior storage conditions, handling, testing, or destructive processing can interfere with the examination.

4.3.3 The examiner shall consider that characteristics associated with alteration may have occurred during normal preparation, handling, and storage of the document. Some alterations might not have observable physical characteristics or be detectable based on the type of examination(s) in this standard. The absence of observable physical characteristics does not ensure the absence of an alteration.

4.3.4 The procedures in this standard can require destructive changes to an item in order to facilitate the examination process. Prior to making such changes, the examiner shall obtain and record permission from the responsible party requesting the examination and advise them as to the potential benefits and subsequent limitations of these examinations and the extent of possible physical changes to the document.

4.3.5 The examiner shall ensure that material(s) removed from the item under examination shall be documented and may be imaged prior to and after removal, and preserved separately for subsequent examination(s). These materials can be of evidentiary value and can include staples, other binding devices, other attached documents, and trace materials.

4.3.6 The examiner shall ensure that images are captured and documented before and after making destructive changes to the evidence or to the images of the evidence. Destructive examinations as defined in section 4.6.

4.3.7 The examination of the original item(s) is always preferable, as images and copying processes can mask physical characteristics of a document. The examiner should request the original item(s) if not previously submitted.

4.3.8 If the original item(s) is not made available for examination, the examiner should use the best available evidence to assess the quality of the significant details present in the item(s). If the details have been reproduced with sufficient clarity for examination purposes, continue with the applicable procedures to the extent possible.

4.4 Procedures

4.4.1 The examiner shall conduct an initial assessment of the document to determine the appropriate examinations, the sequence of examinations, and the potential limiting factors.

4.4.2 Subsequent to the completion of the initial assessment the examiner shall proceed to the applicable examinations. The examiner may discontinue the procedure at any point during the examination. The examiner shall record the reason(s) for such a decision.

Note: The remaining procedures in this section need not be performed in the order listed below. All procedures may not be applicable to the item(s) being examined.

4.4.3 The examiner shall perform applicable procedures and contemporaneously record the examinations performed and relevant observations. The results and accompanying notes should have sufficient detail to allow for an independent review and assessment of the conclusions by a forensic document examiner. The examiner shall include any relevant information, observations, equipment used, methods, evaluations, and conclusions, opinions, or interpretations.

4.4.4 The examination of a document for alterations can include the following:

- a) handwriting;
- b) overwriting or obliteration of entries;
- c) crowded or awkward spacing of writing;
- d) inconsistent handwriting features;
- e) characteristics of the writing media, such as variation in color and intensity or class of writing instrument;
- f) printing processes and defects;
- g) variation in features used to characterize printing processes;
- h) type of printing process, such as conventional or digital;
- i) color or intensity of printing media;
- j) physical characteristics of the print media, such as the morphology, magnetic, infrared, and ultraviolet properties;
- k) use of different fonts, sizes, styles, spacing, and margins;
- l) crowded or awkward placement of printed text, such as irregular vertical and/or horizontal alignment;
- m) different class characteristics, such as artifacts and misspellings;
- n) paper characteristics;
- o) area(s) of discoloration or other physical changes to the optical properties of the substrate;
- p) paper fiber disturbance;
- q) variation in paper characteristics, such as, thickness, length, width, opacity, guillotine marks, watermarks, and UV fluorescence;
- r) paper cuts, tears, perforations, and folds;

- s) indentations;
- t) fastening or binding characteristics;
- u) inconsistent or multiple binding methods;
- v) presence, absence, or removal of adhesives;
- w) alignment and number of staples and staple holes;
- x) the makeup, condition, placement, and effect of paper clips on a document;
- y) presence and alignment of multiple hole punches and perforation patterns;
- z) presence or absence of expected markings;
- aa) miscellaneous characteristics;
- bb) presence of an obscuring substance;
- cc) smearing of printing/writing media;
- dd) sequence of line intersections, such as those involving writing media, mechanical impressions, folds, printed text, and other anomalies;
- ee) cutting and pasting or substitution;
- ff) insertion(s) or omission(s) of pages or entries; and
- gg) presence of visible indented impressions.

4.5 Non-destructive Examinations

4.5.1 The examiner shall ensure that non-destructive procedures be performed when applicable as required by the evidence. All findings shall be recorded in the case notes.

4.5.2 The examiner shall visually examine all sides of the item macroscopically and microscopically.

4.5.3 The examiner shall record observations, measurements, or both as required by the evidence including the following:

- a) paper;
- b) letter, word, line, and margin spacing;
- c) color;
- d) fastening and binding marks;
- e) facsimile transmitted terminal identifiers (TTI); and

f) trash, roller, and picker bar marks.

4.5.4 The FDE shall examine the document using various optical techniques and light sources, such as side lighting, transmitted lighting, UV, IRR, and IRL.

4.5.5 The FDE shall examine the document with imaging techniques, such as photography or digital image processing.

4.5.6 A measurement scale shall be included in the image area when photographing an evidence item.

4.5.7 Capture conditions, including resolution, color, and bit depth, shall be permanently recorded, within the metadata or otherwise, when an evidence item is scanned.

4.5.8 If the documents require examination for latent indentations, the examiner shall process the physical documents using oblique lighting and/or EDD.

4.5.9 The examiner shall examine the print media with a magnetic properties detector, if available.

4.5.10 The examiner shall record visualized entries.

4.5.11 The examiner may attempt to decipher and transcribe visualized entries.

4.5.12 The examiner shall analyze and compare the observed features and characteristics of the document to known items (if available), and evaluate the findings.

4.5.13 The examiner shall form a conclusion based on the results of the above examinations, comparisons, and evaluations and report accordingly.

4.5.14 Proceed to destructive examinations, if deemed necessary by the examiner and with the approval of the requesting party.

4.6 Destructive Examinations

4.6.1 Destructive examinations are those that damage or otherwise change the item. They should be performed after non-destructive methods have been exhausted. All findings shall be recorded in the case notes. Consideration should be given to the order in which destructive examinations are performed.

4.6.2 The responsible party requesting the examination should be informed as to potential benefits of these examinations and the extent of possible physical changes to the document. The responsible party should inform attorneys or other interested parties.

4.6.3 Prior to destructive testing, obtain and record permission from the responsible party requesting the examination.

4.6.4 The use of destructive examinations can interfere with other types of forensic examinations (for example, chemical analysis of ink or latent print examinations).

4.6.5 All sides of the items shall be imaged before and after using destructive techniques.

4.6.6 When an obscuring substance is present (e.g., correction fluid, correction tape), the obscured entry can be visualized by several destructive methods.

4.6.7 When using solvents, the examiner shall ensure that testing be performed prior to general application to each item in order to determine the best course of action.

Caution: Exposure to solvents, in an attempt to counteract the obscuring substance, can have a deleterious effect on inks, toner, or the substrate. Refer to the Safety Data Sheet (SDS) for proper application and any health and safety effects.

4.6.7.1 Prior to application of a liquid to the item submitted for examination, initial testing should be performed on non-casework items, that are made of similar materials.

4.6.7.2 Apply a solvent or other visualization substance to make paper translucent for visualization of the obscured entry.

4.6.7.3 Apply a solvent capable of counteracting the obscuring substance.

4.6.8 If applicable, physically remove (for example, abrade, scrape, lift, or peel) the obscuring substance from the entry.

4.6.9 Entries physically obscured by synthetic or biological substances (such as blood, grease, tape, or gum) may be recovered by removal of the substance after freezing.

4.6.10 This standard does not apply to chemical ink examinations. For additional information, refer to *SWGDOC Standard for Test Methods for Forensic Writing Ink Comparison*.

4.6.11 The examiner shall analyze and compare the observed features and characteristics of the document to known items (if available), and evaluate the findings.

4.6.12 The examiner shall conduct other forensic document examinations as appropriate (e.g., handwriting comparison, typewriter comparison).

4.6.13 The examiner shall form a conclusion based on the results of the above examinations, comparisons, and evaluations and report accordingly.

4.6.14 The conclusions or opinions resulting from the procedures in this standard can be reached after the examination(s) have been conducted. The number and nature of examination(s) are dependent on the material being evaluated.

4.7 Reporting

4.7.1 Reports generated as the result of the procedures used in this standard shall be complete and thorough. The report shall contain the stated purpose of the examination(s), the examination(s) conducted, observations, conclusions and/or opinions, limitations and sources of uncertainty (as applicable), and can include the method(s) used.

4.7.2 The conclusions and/or opinions in the report shall address the following, as appropriate:

a) whether or not characteristics indicative of alterations were observed;

- b) whether or not any of the altered entries were decipherable;
- c) the text or description of altered and original entries;
- d) the method or sequence of alterations;
- e) images of alterations and original entries; and
- f) apparent alterations in documents that can actually be the result of software, hardware, or user affected variations, and can occur during normal or legitimate document production.

5 Conformance Requirements

5.1 Conformance

Conformance to this standard will be achieved if an implementation and its associated data records conform to normative (“shall”) Sections 4.1. through 5.1. Documentation to verify conformance with the above requirements shall be maintained by the laboratory or individual forensic document examiner and shall be made available upon request.

5.2 Conformance to Equipment

Conformance to 4.2 Equipment, requires demonstration of ongoing access to the standard equipment and availability of access to the special equipment needed for examinations.

5.3 Conformance to Competence

Conformance to 4.1 Competence, requires the laboratory or individual forensic document examiner to maintain and supply evidence of technical competence in the examination of altered documents (e.g., by maintaining appropriate training records, individual competency and proficiency testing, quality assurance system, and by demonstrating laboratory accreditation or individual certification by a recognized accreditation or certification body).

Annex A (informative)

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