

**Forensic Science Regulator**  
**Codes of Practice and Conduct – Draft guidance and standards on the**  
**analysis and comparison of fingerprints**

**HOS/12/028 FINGERPRINTS - INVITATION TO TENDER**

**Background**

The Forensic Science Regulator has published a standard entitled “Codes of Practice and Conduct” (the Codes). The Codes will be structured as a core document supplemented by guidance and appendices. The core shall deal with all general issues and build on the requirements of the International Standard ISO 17025.

The appendices may, in some cases, be sub-divided into separate documents to cover different specialist examinations with a specific area.

**Appendix**

This document seeks tenders for the production of:

- A draft appendix (guidance) for meeting specific requirements of ISO/EC17025 and the Codes pertaining to the analysis and comparison of fingerprints.
- A draft appendix (information) suitable for use as a primer for the judiciary that is short, but consistent with the content of the draft appendix.

**Approach**

Each appendix should contain the following material:

- Guidance that the Regulator could issue to the Home Office, law enforcement community, forensic science laboratories and others.
- Quality standards/requirements which apply in addition to the provisions of ISO 17025 and the Codes.
- The definition of what the requirements of ISO 17025 and the Codes mean in relation to each area of work.
- Guidance on how the requirements of ISO 17025 and the Codes should be met in each area of work.
- Guidance on the minimum requirements to meet the requirements of ISO 17025 and the Codes in each area of work.

Each appendix should be organised to match the structure of the ISO 17025 standard. In particular the numbering and section headings of the standard should be employed.

In areas of the ISO 17025 standard where there is no need to expand upon the general standard the appendix should have no content.

General requirements which go beyond, or clarify, the content of ISO 17025 are reflected in the Codes. It is, therefore, not necessary to set out the detail of that material in the appendices.

In areas of the ISO 17025 standard where there is a need to explain what the standard means in the context of that area, or to provide detail of the requirements in that area, (and this has not been dealt with, or sufficiently dealt with, in the Codes) the appendix should identify the relevant paragraph of ISO 17025 standard followed by the additional material that is required.

Where the author believes there needs to be further explanation of the requirement, beyond that in the Codes, it is appropriate to set out the text in the appendix

An example of the type of document that is required is provided at Annex 1 below. It is stressed that this is not provided as a completed appendix but a draft appendix to show the general structure, format and level of detail required.

In each case the draft appendix prepared by the contractor shall be subject to development and public consultation before being finalised. This process shall not be part of the contract.

### **Timetable**

The contract will start from 5 November 2012

The following timetable for selecting the successful contractor will be followed.

Milestone	Timescales
Receipt of tender	8 October 2012
Decision on award of contract	29 October 2012

Each draft appendix must be prepared within three months of the start of the contract.

### **Requirements**

Tenders are sought from persons or organisations that wish to produce the appendices specified above. Any person or organisation bidding for this work will be expected to meet the above timescale.

In addition the following requirements will apply.

- The bidder must be able to demonstrate a clear understanding of, and familiarity with, the operation of ISO standards particularly ISO 17025.

- The bidder must be able to demonstrate a clear understanding of the document UKAS<sup>®</sup> LAB 13: 2001: Guidance on the Application of ISO/IEC 17025 Dealing with Expressions of Opinions and Interpretations.
- The bidder must be able to demonstrate familiarity with the ILAC document G19.
- The bidder must be able to demonstrate a clear understanding of and familiarity with the provision of forensic science services to the Criminal Justice System in England and Wales including an appreciation of the legal requirements which attach to such work.
- The bidder must be able to demonstrate a clear understanding, and familiarity of the analysis and comparison of fingerprints.
- The bidder must be able to demonstrate a clear understanding of the use of IDENT1 database in the fingerprint analysis process.
- The bidder must be able to demonstrate a clear understanding of the impact of cognitive bias and mechanisms to reduce/minimise such biases across the fingerprint comparison processes.
- The bidder must be able to demonstrate a clear understanding of the issues in the Scottish fingerprint enquiry, R v Smith and the Madrid bombing case (Brandon Mayfield) that need to be considered within the appendix.
- The bidder must be able to demonstrate skills related to the production of high quality documents relating to the quality of forensic science. This may be quality management documents but books in the relevant area would be treated as an equivalent.
- The bidder must be able to identify the staff who will be allocated the work.
- The bidder must set out a proposed structure and content for each appendix.
- The bidder must provide an indicative costing for the generation of each appendix.
- The bidder must provide indicative times for preparation of each appendix.
- The bidder must be able to prepare the appendix in English.
- The bidder must be able to submit appendices electronically in MS-Word format or format that can be imported into MS-Word.
- A fully costed proposal including the number of days required to produce the guidance standards, and the relevant day rate

### **Submitting a Tender**

If you are interested in submitting a tender for this work it must be submitted by **no later than Noon on Monday 8th October 2012**. The tenders shall be evaluated against the ability to meet the requirements set out above. The tender should be submitted in word and no more than 6 sides of A4 (excluding appendices).

The contract will be awarded using standard Home Office Service Terms and Conditions.

Please e-mail tenders to [HOSProcurement@homeoffice.gsi.gov.uk](mailto:HOSProcurement@homeoffice.gsi.gov.uk) quoting reference **HOS/12/028 Fingerprints Appendix** in the subject line.

## **ANNEX 1**

### **EXAMPLE OF AN APPENDIX<sup>1</sup>**

#### **FINGERPRINT ANALYSIS AND COMPARISON**

##### **1. Introduction**

This Annex sets out guidance for fingerprint examination as practised in the investigation of crime and the administration of justice in the UK and forms part of the Forensic Science Regulator's Codes of Practice and Conduct. The guidance should be followed by all organisations who undertake fingerprint examination for the purpose outlined and will be the basis on which assessments and accreditation will be achieved to BS/EN ISO17025 for fingerprint examination.

- 1.1 The scope of fingerprint examination covered by this guidance includes;
- a) the comparison of fingerprints taken from an individual at different times (ten-print comparison) for the purpose of validating identity
  - b) the comparison of finger marks recovered in the course of a criminal investigation to establish the identity of the individual who made the finger mark, referred to as an Identification
  - c) the provision of information on the activity of the person who made the finger marks and the relevance of the disposition of finger marks to a criminal investigation or criminal proceedings.

##### **2. Basis for Fingerprint Examination**

2.1. Fingerprint examination is not a science in that it is derived from a theory or coherent set of principles and the result of a fingerprint examination is an opinion and not a fact. It is no less valuable than the results of scientific analysis but it does underscore the absolute need for any process of fingerprint examination to recognise and manage the risk of human error. This requires clear levels of individual competence to be set and complied with, within a system that is owned and operated by organisations that provide fingerprint examination to the criminal justice system. It also requires evidence that fingerprint methods are valid and that fingerprint evidence is objective and impartial.

2.2. With regard to the basis on for fingerprint examination the United States Scientific Working Group on Friction Ridge Analysis, Study and Technology (SWGFAST) identified the following premises for basing conclusions from a fingerprint examination;

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<sup>1</sup> This appendix provides a draft outline of the specific areas identified by the fingerprint Quality Specialist group and is not definite, but acts as a guide.

- Friction ridge skin bears an extremely complex, unique and persistent morphological structure.
- Notwithstanding the pliability of friction ridge skin, the contingencies of touching a surface and the nature of the matrix, an impression of friction ridge skin structure may be left following contact with a surface.
- This impression may display features of varying quality (clarity of ridge features) and specificity (weighted values and rarity).
- Notwithstanding variations in clarity and specificity, the unique aspects of friction ridge skin may be represented as highly discriminative features in impressions.
- An impression that contains sufficient quality and quantity of friction ridge features can be individualized to, or excluded from, a source.
- The use of a fixed number of friction ridge features as a threshold for the establishment of an individualization is not scientifically supported.

2.3. These are accepted as the working basis on which fingerprint identification can be made.

### **3. Validation of Fingerprint Examination**

3.1. Overall validation should be undertaken in line with Section 20 of the Forensic Science Regulator's Codes of Practice and Conduct.

3.2. Validation of methods and procedures used

### **4. Achievement of Competence as a Fingerprint Examiner**

4.1. Organisations who employ individuals who undertake fingerprint examination must have an effective process for developing an individual from initial assessment for suitability as a fingerprint examiner through to achievement of competence.

4.2. The process of achieving competence as a fingerprint examiner must form part of an accredited quality management system and include as mandatory elements the following key requirements;

4.2.1. Knowledge of .....

4.2.2. Understanding of.....

4.2.3. Ability to.....

4.3. Individual Assessments of Competence through written tests and practical exercises

4.4. A period of supervised casework with structured documented feedback and development by a designated supervisor who must have demonstrated competence as a fingerprint examiner

4.5. Completion of a Portfolio of Evidence that provides a record of all training, assessments and development projects undertaken on the journey to achieve

competence and this should be signed off by the Senior Accountable Person within an organisation that undertakes fingerprint examination

- 4.6. On achieving competence the name of the individual should be recorded on a publicly available internal register of competent fingerprint examiners by the organisation.

## **5. The Process of Fingerprint Examination**

### Overview

- 5.1. Fingerprint examination is best described as a cognitive process which relies on the ability of a competent individual to analyse and compare areas of friction ridge detail, and arrive at a decision as to whether they originate from the same person or not. In arriving at this decision fingerprint examiners will assess the pattern, ridge flow features and characteristic minutiae. It is the convention in fingerprint examination to consider in a strict hierarchical manner first, second and third level detail. These can be described as overall pattern (first level), characteristics such as ridge endings or bifurcations in ridges (second level) and detail within the ridge structure such as pores and ridge shape (third level). Each level of detail is considered in succession from first to third level detail, it follows that if a difference is found at first or second level detail then further levels of detail would not be considered and could not be used to make identification. To arrive at a definitive decision a fingerprint examiner should be able to demonstrate that the match or identification shows a coincident sequence of characteristics and that there are no unexplained differences.
- 5.2. A methodology referred to as ACE-V (Analysis, Comparison, Evaluation and Verification) has been widely adopted in many countries including the UK for fingerprint examination. This provides a broad structured approach to fingerprint examination, a basis for developing technical procedures. If the ACE-V methodology is followed, particularly in relation to analysis and verification, it provides some degree of safeguard against errors and incorrect results.
- 5.3. Organisations who undertake fingerprint examination should have documented technical procedures that meet the BS/EN ISO17025 international standard.
- 5.4. Assessment

While the ACE-V methodology provides a description of the process of fingerprint examination of a single finger mark it does not cover the initial phase of fingerprint examination that involves the assessment of all material, establishing the requirement of the investigator or lawyer and the fingerprint examiner's strategy for meeting the requirement. For example, faced with a case involving multiple persons (suspects, victims and witnesses) and finger marks the fingerprint examiner may legitimately adopt a screening or targeted approach to the material to meet the requirements identified and agreed.

Where initial assessment are made and a strategy adopted this should be documented and all results from this initial assessment should also be documented

5.5. Analysis

This involves.....

5.6. Comparison

This involves.....

5.7. Evaluation

This involves.....

5.8. Verification

This involves the independent examination of an identification made a fingerprint examiner or a trainee fingerprint examiner. All fingerprint examination that result in an identification or exclusion should be the subject of verification by a second competent fingerprint examiner

5.9. As a minimum the verification should be undertaken without any knowledge of how the first fingerprint examiner arrived at their conclusion, the verifier should start from the finger mark and known print and independently reach a conclusion

5.10. Organisations who undertake fingerprint examination should have within their accredited quality management system a procedure to deal with disagreement between fingerprint examiners at the verification stage of a fingerprint examination. This procedure should allow for resolution of differences and ensure that results can be relied on by the criminal justice system and that any differences of opinion are made available for consideration as to disclosure under the requirements of the criminal law. If an error is discovered then this should be dealt with as set out in 4.8.

5.11. Use of Automated Fingerprint Examination Systems(AFIS)

5.11.1. The use of AFIS to undertake searches of large databases of fingerprints and finger marks to tentatively identify persons is a major contributor to the effective use of fingerprint examination. Organisations who undertake fingerprint examination should have within their accredited quality management system a procedure that describes the use of the AFIS.

5.12. Image Quality and Processing

5.12.1. Fingerprint examination relies on the comparison of images whether recovered direct from a substrate or generated from an imaging

and processing device. As minimum the image quality of any processed image should be 1000 dpi.

5.13. Documentation

5.13.1. In addition to the requirement to document a case strategy the minimum requirement for documenting the process of fingerprint examination will be to;

5.14. Reporting Results / Terminology

5.15. Dealing with Errors

5.15.1. An error in fingerprint examination is defined as where an individual reports a conclusion of identification (false positive) or exclusion (false negative) that is provably and demonstrably wrong.

5.15.2. Organisations who undertake fingerprint examination should have within their accredited quality management system a procedure to deal with errors made by fingerprint examiners. This procedure should include a root cause analysis, assessment of reliability of other conclusions made by the fingerprint examiner and notification to appropriate authorities of the error.

5.15.3. A fingerprint examiner who makes an error should be the subject of a competence assessment and personal development plan to ensure that competence is demonstrated before resuming fingerprint examination and making conclusion on fingerprint examinations.

5.16. Audit and Review

5.16.1. Part of the accredited quality management system in organisations who undertake fingerprint examination should include an internal audit cycle in line with the requirements of BS/EN ISO17025. It is also a requirement of accreditation that organisations are subject to external assessment and this assessment should include technical audit of the work of fingerprint examiners in line with the requirements of BS/EN ISO17025.

5.17. Impartiality and Bias

5.17.1. It is critical that fingerprint examiners work within an environment and processes that minimise the risk of bias and ensure impartiality in the opinions expressed by fingerprint examiners.



5.18. The Code of Conduct for forensic science practitioners sets out the expectations of fingerprint examiners who undertake fingerprint examination within the scope of this Annex.

5.19. For a detailed description of the risks of bias Chapter 15 “Special Abilities and Vulnerabilities in Forensic Expertise” in the The Fingerprint Sourcebook produced by US National Institute of Justice provides a valuable source of information.

## **6. Quality Assurance**

6.1. Organisations who undertake fingerprint examination should have within their accredited quality management system a procedure that sets out the process that assures the quality of individual and organisation competence. These should include;

- Dip sampling
- Proficiency testing

6.2. Participation in inter-organisation trials

## **7. Glossary**

### Note:

The terminology and the glossary section to be used in the appendix will be agreed through a stakeholder exercise overseen by the Fingerprint Quality Standards Specialist Group.

## **8. Bibliography**