Purpose:

To outline the methods utilized by the latent print examiner for the comparison of friction ridge skin impressions.

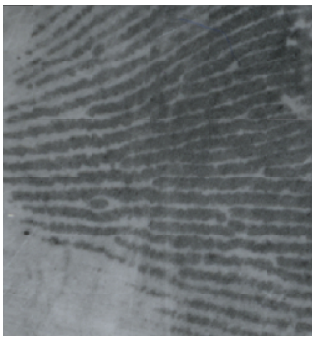
Responsibility:

Latent Print Examiners

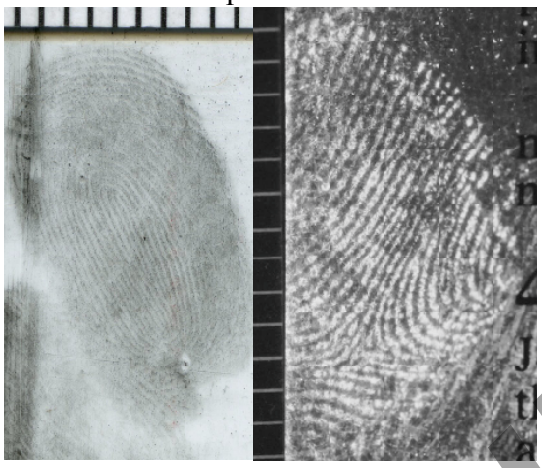
Definitions:

High Quality Friction Ridge Impression:
Level 1 detail is distinct
Level 2 details are distinct
Level 3 details are abundant and distinct

Medium-High Quality Friction Ridge Impression:
Level 1 detail is distinct
Level 2 details most are distinct
Level 3 details if present are minimal but distinct



Medium-Low Quality Friction Ridge Impression:
Level 1 detail is distinct
Level 2 details few are distinct
Level 3 details if present are minimal



Low Quality Friction Ridge Impression:
Level 1 detail may not be distinct
Level 2 details most are indistinct
Level 3 details are not distinct

Verifier: A competently trained analyst that will conduct an independent verification when requested by the primary examiner.

Procedure:

Indexing Friction Ridge Impressions of Value

1.1.
Friction ridge impressions selected for their potential comparison value will be documented and indexed on an appropriate worksheet (e.g. QR-LP1b, QR-LP1d, QR-LP-14 or other). These impressions will be clearly marked by the examiner. There should be no confusion as to the selected friction ridge impression and its associated index number, letter, or number letter combination. Examiners are not required to document or make comparisons to friction ridge impressions of no potential value.

2.
ACE-V Methodology Overview

2.1.
The comparison of friction ridge skin impressions are conducted utilizing the Analysis, Comparison, Evaluation, and Verification (ACE-V) methodology. This includes both qualitative and quantitative analysis of the following three levels of friction ridge detail:

Level 1 Detail
Overall ridge flow / pattern shape
Cannot be used alone to individualize.

Level 2 Detail
Individual ridge path and events (bifurcations, ending ridges, and dots) used in conjunction with level one detail to individualize as well as to exclude.

Level 3 Detail
Ridge dimensional attributes (width, edge shape, pores) used in conjunction with level one and level two detail to form a conclusion.

2.1.1
Other Features Associated with Friction Ridge Impressions

a. Creases
b. Injury related features both temporary and permanent (scars/cuts/blisters)
c. Skin ailments such as warts

Note: Other features may be used in conjunction with friction ridge detail to individualize or exclude.

3.
EXECUTING ACE-V

3.1.
Analysis

3.1.1.
Exemplars that have not been opened, examined or compared will be reported as such.

3.1.2.
Ridge events will include ridge endings, bifurcations, dots and other articulable ridge attributes that can be used to support a conclusion. Ridge events which were annotated as part of determining sufficiency for further review and comparison potential will be made part of the examiner's case file.

3.1.3.
Friction ridge impressions selected as being of value for comparison will be indexed.

3.1.4.
Based on the assessed quality of the friction ridge impression, at minimum, a latent print will be determined to be suitable to move forward for comparison if it contains at least eight (8) discernible level two detail.

3.1.5.
Due to the variability of friction ridge impressions and ridge events, those impressions that do not meet the above-listed criteria may be marked as comparison value at the discretion of the case analyst. In most instances, this will refer to friction ridge impressions that lack eight (8) discernible level two detail. The case examiner, in this circumstance, has discretion to move forward for review, impressions that lack eight (8) discernible level two detail.

3.1.6.
A printed copy of all analyzed friction ridge impressions will be included in the case file. Ridge events indicating sufficiency on medium low and low quality impressions in addition to impressions which contain less than eight (8) discernible level two detail will be documented by the primary examiner.

3.1.7.
Prints that have less than eight (8) discernible level two detail, shall be reviewed by a second analyst for sufficiency using QR-LP-14 (Sufficiency Worksheet). In reviewing the friction ridge impression for sufficiency, the second analyst will document all viable ridge events on the impression being reviewed and whether the impression is sufficient or insufficient to move forward to the comparison phase. The

annotated analysis including the sufficiency decision will be printed out and provided to the primary examiner for the case file.

3.1.8.
Ridge events marked for sufficiency will be traced or plotted and color coded based on the examiner's confidence level of the feature being marked. CSIpix, Adobe Photoshop or CorelDraw Graphics Suite software will be utilized for this analysis. Images should be calibrated to 1000ppi prior to analysis. The FreeHand or Dot tool will be the primary tools used to annotate the impression. The marking tool opacity should be set to an acceptable contrast level of 20% or higher. The following color codes will be used:

Green: High Confidence Level

Yellow: Medium Confidence Level

Red: Low Confidence Level (areas circled in red will indicate unsuitable for analysis)

Note: If another color code other than the above is used, the examiner will indicate the designations with a color code key on the printed copy in the case file.

3.1.9.
QR-LP-14 will be used to document the sufficiency of the latent print impression's quality. Additionally, the following information may also be noted on this form:

Anatomical Source (e.g., fingerprint, palm print)
Anatomical Orientation (e.g., distal, top, bottom, etc.)
Presence of level 1 detail
Presence of level 2 detail
Presence of level 3 detail
Matrix
Deposition Pressure
Directional Movement
Rotational Movement
Substrate
Preservation Method

3.2.
Comparison

3.2.1.

After a thorough analysis has been made of the unknown or questioned friction ridge impression(s) of value, it may be compared to the known impression(s) or exemplars.

3.2.2.
The comparison will be accomplished by comparing the friction ridge features documented during the analysis phase of the first friction ridge impression to the features of the 2nd friction ridge impression (which under most conditions will be obtained under controlled circumstances i.e. major case prints).

3.2.3.
Documented ridge events in the final comparison chart for identification should be marked in red, however the examiner may use an additional color to mark a place holder or to illustrate ridge counts or ridge flow.

3.2.4.
Types of Comparison

3.2.4.1.
The following types of comparison may be conducted:

a. Unknown vs Known

b. Known vs Known

c. Unknown vs Unknown

3.2.4.2.
Known Prints / Exemplar Impressions

3.2.4.2.1.
Known prints or exemplar impressions are those from a known source generally recorded under a controlled environment. Examples of known prints are:

a. Ten Print, Palm Print and Major Case Print Cards recorded by a law enforcement agency.

b. Elimination Print Submissions

c. John/Jane Doe Prints (serve as both known and unknown)

3.2.4.3.
Unknown Prints

3.2.4.3.1.
Unknown prints or impressions are of unknown or questionable origin. Examples of unknown prints are:

Prints obtained from crime scenes (unknown)

John/Jane Doe Prints (serve as both known and unknown)

3.3.
Evaluation

3.3.1.
The primary focus of the comparison and evaluation phase (preliminary review) is to first determine if an identification can be effected. If an identification cannot be effected, or a situation as listed in 3.3.3 below has not become apparent, then the next phase of the evaluation is to determine if any of the exemplars can be excluded as containing the source impression. If an exclusion is not possible then the reason for an inconclusive result will be reported. When conducting AFIS database searches only candidate identifications will be reported out.

3.3.2.
When a comparative analysis of a specific friction ridge impression to multiple exemplars results in an identification to a specific source, it is acceptable for the examiner to terminate any pending comparisons and evaluations. In this instance in addition to reporting the identification, it shall also be reported which other exemplars were compared and that a preliminary review resulted in no identification; it shall also be reported which exemplars were not compared.

3.3.3.
When a comparative analysis of multiple exemplars results in the focus of a particular region of friction ridge detail to a specific exemplar, in which the comparison results in a high level of agreement but falls short of an identification due to a lack of sufficient comparable areas in either the latent or exemplar; the examiner may terminate the comparison and evaluation of all other exemplars. In this instance in addition to reporting the inconclusive region of friction ridge detail, it shall also be reported which other exemplars were compared and that a preliminary review resulted in no identification; it shall also be reported which exemplars were not compared and that further comparisons or evaluations of any remaining exemplars will be conducted upon request. If a better quality exemplar can assist in providing a more definitive conclusion, this will also be reported out.

3.3.4
The following conclusions can be reported out as a result.

a. **That an identification was made**. When an identification is made to a friction ridge impression, the impression index number and source candidate are reported. If no identification is made, then the submitting agency's requested candidate exemplars which were examined will be reported out as excluded or inconclusive (see 3.3.5b and 3.3.5c).

b. **That the questioned source was excluded.** An exclusion will only be reported when one of the following conditions have been met and sufficient exemplars have been provided.

1. A known anchor point such as a loop, whorl or delta is available in both impressions which encompasses sufficient ridge events for a conclusion to be made. If an anchor point cannot be documented then the result will be reported as inconclusive.

2. Any ridge flow or formation which can be associated to its anatomical region (e.g. finger, palm, thenar) and sufficient ridge events for a conclusion to be made are present. If the anatomical region of the latent impression cannot be determined then the result will be reported as inconclusive.

c. **That the results of the examination were inconclusive.** The reason(s) for an inconclusive result will be documented and reported. Reasons for inconclusive results are as follows:

1. Inconclusive due to a lack of sufficient detail and or clarity in the latent impression.

2. Inconclusive due to insufficient exemplars with a notation indicating that exemplars of a specific anatomical region may provide a more definitive conclusion (e.g. major case prints or tips). This may be reported as the exemplar was unsuitable for analysis or that the exemplar was incomplete and a full examination could not be conducted.

3.3.5.
Documentation of Identification

3.3.5.1
Documentation of an identification shall be available in the case file and shall include:

a. The indexed friction ridge impression examined.
b. The known individual's name and/or identifying number.
c. The anatomical source of the friction ridge impression.
d. The annotated comparison chart of the analyst and all reviewers.
e. The initials, signature, or equivalent (e.g. unique identifier, electronic signature) of the examiner and the technical reviewer to be placed on all paperwork in the case file.

3.3.6.
Documentation of Exclusion or Inconclusive

3.3.6.1.
Documentation of an exclusion or inconclusive finding shall be available in the case file and shall include:

a. The indexed friction ridge impression examined.
b. The known individual's name and/or identifying number.
c. A notation of exclusion or inconclusive finding.
d. The initials, signature, or equivalent (e.g. unique identifier, electronic signature) of the examiner and the technical reviewer to be placed on all paperwork in the case file.

3.4.
Verification

3.4.1
All identifications shall be verified; the primary examiner will create a digital case folder titled "VR" for the verification review of all identifications made by the primary examiner. Digital images of the friction ridge impressions which were identified and the accompanying known impressions will be placed in this digital folder.

3.4.2
It shall be understood that the initial assessment of a friction ridge impression's quality rating will be subject to individual interpretation. The primary examiner's quality rating shall stand providing the verifying examiner(s) is not more than one quality step off in either direction. In order for the primary examiner or verifier to be asked to reassess their quality evaluation, the verifier must be more than one step off from the quality rating chosen by the primary examiner. The verifier's initials on the worksheet will indicate agreement that the primary's examiner's assessment is within one quality step of their review.

a. When a friction ridge impression is evaluated by the primary examiner to contain at least eight (8) discernible level two detail and its overall quality is assessed as "high" or "medium high", there will be one verification step before an identification can be released.

b. When a friction ridge impression is evaluated by the primary examiner to be of comparison value, or contains less than eight (8) discernible minutiae, or its overall quality is determined to be "medium low" or "low", there will be two verification steps before an identification can be released. One of the verifiers will be an independent examiner and the second will be the technical reviewer.

3.4.3
Examiners verifying identifications will independently analyze the indexed friction ridge impression in question as to its quality and observed ridge events prior to the comparison phase. The verifier will generate their own independent annotated charts for each identification verified. The annotated comparison charts will be placed in the case file and will be initialed and dated by the verifying examiner.

3.4.4
Aside from an identification which requires two verifiers, all other conclusions shall be verified by the assigned technical reviewer, unless the primary examiner requests additional verifications.

3.4.5
The results of all evaluations, verifications and conclusions made by the primary examiner and the verifier shall be reviewed by the technical reviewer. If the technical reviewer agrees with the primary examiner, he/she shall sign (by hand or electronically) the report prepared by the primary examiner. The technical review is the last step after the verification process.

3.4.6
Reports shall not be officially signed by the primary examiner until the administrative review process has been completed.

4.
SIMULTANEOUS IMPRESSIONS

4.1
Friction ridge impressions are simultaneous if they are deposited with one touch to an item or surface. The most obvious example of this would be impressions from adjoining fingers from one touch of the hand.

4.2
Individual segments of simultaneously placed impressions may or may not have sufficient value to arrive at a conclusion of identity.

4.3
It shall be the policy of the latent print unit, that at least one segment or area of detail, of what may appear to be simultaneously placed impressions, be able to stand alone in arriving at a conclusion of identity. An aggregate of detail from multiple impressions will not be used in concert to effect an identification.

4.4
Absent some unusual circumstance from which no other conclusion can be drawn, the latent print unit will not report a conclusion of multiple friction ridge impressions being deposited on an object simultaneously in one touch. In the rare instance such a conclusion is reported, proper documentation supporting the conclusion shall be made part of the case file.

5.
CONFLICT RESOLUTION

5.1
GL 18 will outline the technical and administrative review process.

5.2
When conducting a technical review, deference should always be given to the primary analyst's decision making discretion. It should be kept in mind that no two analysts will always technically approach the same problem in exactly the same manner.

If during the technical review, there appears to be deviation from standard operating procedures or substandard work, the Unit Lead/Supervisor shall be consulted.

5.3
If any reviewer has a difference of conclusion with a case that they are reviewing, the primary analyst will first be consulted on the matter. Additional work on evidence will not be performed without the approval of the primary analyst. If additional work is performed, the appropriate documentation will be placed in the case file. The reviewer and analyst will make every professional effort to resolve the issue. If the issue cannot be resolved, the matter at hand will be brought to the attention of the unit supervisor/lead. The unit supervisor/lead will determine the appropriate resolution. In the event the supervisor/lead is part of the conflict, then the Deputy Director of Identification Services will determine the appropriate resolution.

a. The lead or supervisor who handled the conflict will place a memo in the case file indicating that a conflict occurred and was resolved. The memo shall contain the following information:

1. Names of the examiners in disagreement.
2. A description of the issue at hand.
3. Final action taken.
4. The name of the lead or supervisor who resolved the conflict.

5.4

Erroneous Identifications and Exclusions

5.5.1
An erroneous identification or exclusion shall be defined as an incorrect conclusion of identity or exclusion which escapes the technical review process and is released in an official report. The laboratory has set strict standards for its examiners to follow in an effort to minimize erroneous findings. All examiners are expected to follow these standards. If it is found that an erroneous identification or exclusion has occurred, then this is a serious matter which will be referred to the Deputy Director of Identification Services and the Quality Section of the laboratory. A Quality Action Record will be opened and the following may be a remediation:

a. Retraining
b. Re-evaluation of prior casework.
c. Retraining and re-evaluation of prior case work
d. Retraining and removal from case work for a predetermined amount of time.
e. Self-initiated medical vision examination.
f. Any other appropriate action based on the results of a root cause analysis conducted Quality Section in conjunction with the Latent Print Unit Supervisor and the Deputy Director.

The customer will be notified by the release of an amended report and depending on the root cause, further communication may be needed.