Collaborative Testing Services, Inc
FORENSIC TESTING PROGRAM

P.O. Box 650820
Sterling, VA 20165-0820
e-mail: forensics@cts-interlab.com
Telephone: +1-571-434-1925
Web site: www.cts-forensics.com

Questioned Documents Examination
Test No. 23-5211 Summary Report

Each sample set contained one questioned employee contract, consisting of three pages (Item 1). Participants were asked to review the pages of the contract to determine if there were any signs of alteration that would support the employee's claim. Data were returned from 165 participants and are compiled into the following tables:

This report contains the data received from the participants in this test. Since these participants are located in many countries around the world, and it is their option how the samples are to be used (e.g., training exercise, known or blind proficiency testing, research and development of new techniques, etc.), the results compiled in the Summary Report are not intended to be an overview of the quality of work performed in the profession and cannot be interpreted as such. The Summary Comments are included for the benefit of participants to assist with maintaining or enhancing the quality of their results. These comments are not intended to reflect the general state of the art within the profession.

Participant results are reported using a randomly assigned "WebCode". This code maintains participant's anonymity, provides linking of the various report sections, and will change with every report.

Manufacturer's Information

Each sample set contained one questioned employee contract, consisting of three pages (Item 1). Participants were asked to review the contract to determine if there were any signs of alteration that would support the employee's claim.

SAMPLE PREPARATION -

All pages of the document were printed on a HP LaserJet printer. The employee, Julie Andie, completed the employee signature and date on page 3. The company official, Rachel Smith, completed all other entries in the contract. Each individual signed their own names on page 3. All sections were completed with a Bic Round Stic pen with black ink.

SAMPLE SET ASSEMBLY -

After visual quality reviews of the questioned items were complete, each item was packed into a pre-labeled envelope with protective chipboard. Following predistribution testing, all envelopes were sealed and initialed with "CTS."

VERIFICATION -

Two predistribution examiners determined that the questioned employee contract had not been altered or probably had not been altered. The other predistribution examiner could not make a determination and cited the possibility of undetectable alternations. The participants who determined that the document was not altered supported their conclusions noting a single set of staple holes and similarities in the following: ink characteristics, indentions/impressions, alignment, corner folds.

Summary Comments

Each sample set contained one questioned employee contract, consisting of three pages (Item 1). Participants are asked to review the pages of the contract to determine if there were any signs of alteration that would support the employee's claim. The document was not altered (Refer to the Manufacturer's Information for preparation details).

Of the 165 responding participants, 155 (94%) reported that the contract had not been altered ("E", 114 participants) or probably not altered ("D", 41 participants).

Across the 165 responding participants, the most common method reported was Video Spectral Comparator (VSC), which was reported 134 times. Other commonly used methods were: ESDA, Microscopic Examination and Visual Exam.

To support their conclusions, a majority of the participants noted that indented writing was present on all pages submitted, the presence of one set of staple holes in the corner of the paper, and that the ink reacted similarly under different wavelengths of light.

Examination Results

Based on the findings of your examination, to what degree can it be confirmed or refuted that the questioned document has been altered?

TABLE 1

WebCode	Q1	WebCode	Q1	WebCode	Q1
2FL3W2	E	4XRA2F	D	9JGZNF	D
2JUJV4	E	67Y9AG	E	9XAR6W	C
2LARD6	E	6DNTEV	E	A7LBQT	E
3AM4KP	E	6DV99V	E	AANA7R	E
3EHXHQ	E	6EEYT2	E	ANJTFN	D
3GCEF8	D	6RMVW4	E	AUA4R8	D
3J3KUC	E	6TC7MW	E	B6MLYW	D
3PPD6C	E	722977	E	BC6TN2	D
3UW2JD	E	7293AY	E	BCCXH6	E
3UXXP3	D	77YN48	B	BE27NZ	E
3VN449	E	7DHVJQ	D	BFC9AY	E
3VU87Y	E	7HWGNQ	E	BNXE2X	A
3VWYXF	E	7WTMH9	E	C8T8NU	D
4CUKU8	E	8CLV27	E	C8ZAKU	D
4HGFQ6	D	8DVRKN	E	CAJNNU	D
4RBGBN	E	9AMZUV	A	CK3ZY8	E
4UR7XK	E	9FTQYL	D	CLUZWH	C

TABLE 1

WebCode	Q1	WebCode	Q1	WebCode	Q1
D37DML	D	HEMQRJ	E	KBZMBP	E
EAQK76	E	HJUNZ4	E	KPWYHV	E
F4UHA6	E	HKH8RH	E	L4JACQ	E
F6QXHV	E	HU6F7D	D	LB2XQT	D
FEABNR	E	HUEHNT	E	LJDZNE	E
FFWE3K	E	HVLA7M	E	LJQNTM	E
FQFXFQ	D	HVYYAZ	D	LM9TNB	E
FW2V3R	D	JFYGUM	E	LRH6GH	D
FZV4KU	E	JH48Z3	E	LT2M8W	E
G3FGQN	E	JJK9ZW	E	LVQWCQ	D
GBT7L3	E	JJYQTG	E	M3JRAM	D
GF4FHQ	E	JQ2VZT	E	M6966C	E
GHP2K2	A	JQN4AW	E	MBPRHG	E
GQK87Z	D	K46HNF	C	MWPUKW	D
H3VY8E	E	K47HGN	D	MWXT2R	C
H9ACPF	E	K88LBW	E	N3LTUD	D
H9LD6M	E	K9WRPN	E	NJRXHQ	E
HAKEBE	E	KAVXA2	E	NKJ3UA	E
HBMCF2	D	KBYRQK	E	NQM6WP	D

TABLE 1

WebCode	Q1	WebCode	Q1	WebCode	Q1
NTD9MB	E	RUUMNG	D	VWRBCU	E
NTDB9A	E	RY8C8Q	E	W2ZWX7	E
NXH43R	E	RZ8ALT	E	WB64FQ	E
NYFCEV	E	T4BZKQ	C	WT6UWU	E
P384MQ	D	TPRCHU	E	XJACJ6	E
P6BXJA	E	U4B3KF	E	Y6QADQ	E
PDRBLF	E	UBDZEE	D	Y9CRTQ	D
PNGWBC	E	UGJXJC	E	YLY2HG	E
PQ69BG	D	UMMRU8	E	YTFH86	E
PR8CGK	D	UPC4J6	E	YVL3RY	E
PW489K	E	UPD3DD	E	Z49JNE	D
Q9RMHD	E	UVGWM9	E	Z4LBEA	E
QEAEDE	B	V7CLMG	E	Z88WGK	D
QZLLCK	E	VFWRL7	E	ZAYVY3	E
R444BG	D	VGT8UW	D	ZERRNT	E
R82HZR	E	VQVP6Y	E	ZGLEJ7	E
RFCYEJ	E	VT4Y8J	E	ZGTYRD	E
RH28JE	D	VTNK29	E	ZJMJYC	E
RRUG9B	E	VUML8Z	D	ZY4H2R	E

Response Summary - Q1

Total Participants: **165**

Based on the findings of your examination, to what degree can it be confirmed or refuted that the questioned document has been altered?

Response	Q1
A	3
B	2
C	5
D	41
E	114

Response Key:

A. The questioned document HAS BEEN ALTERED.
B. The questioned document HAS PROBABLY BEEN ALTERED.
C. CANNOT DETERMINE whether or not the questioned document has been altered.
D. The questioned document HAS PROBABLY NOT BEEN ALTERED.
E. The questioned document HAS NOT BEEN ALTERED.

Methods and Observations

What methods/techniques did you utilize? What observations were made from each method/technique?

TABLE 2

WebCode	Methods/Techniques	Observations
2FL3W2	Visual Examination	Staple holes - one impression present. No evidence of removal and re-stapling. Correspondence in text, size and font when aligned.
	Microscopic Examination	Printing speckling toner. Similar appearance all 3 pages.
	Video Spectral Comparator (VSC)	Paper -same fluorescence UV. Inks - no difference IR/visible spot.
	ESDA	Indentations show all pages in close proximity when all were written.
2JUJV4	Visual Examination	With the 10x optical instrument, it was observed that on pages one to three there was no evidence of addition or subtraction of the lines.
	Video Spectral Comparator (VSC)	Video comparator VCS Subsequently, the documents are subjected to different wavelengths, specifically of the infrared spectra, in order to identify possible alterations in the scripts (digits and letters) in the substrate, through physical absorption and luminescence phenomena, which allow observing the physical behavior of the ink where no change of the writer element was observed in the substrate
2LARD6	ESDA	The second page of the questioned document was placed on top of the third page. The pressure marks of the handwritten numbers 12 and 5 in ink on the second page were found when viewed with a bottom light source on the third page. It can be inferred that the second page was placed on top of the third page when it was written. The first page of the questioned document was placed on top of the second page. The pressure marks of the handwritten numbers 9 and 22 May and Julie Andie number 3 and symbol O in ink on the first page were found when viewed with a bottom light source on the second page. It can be inferred that the first page was placed on top of the second page when it was written.
	Infrared Light	Examination of optical properties (IR luminescence and IR absorption) indicate that all the handwritten were used the same pen(ink) , there's no difference founded.
	Microscopic Examination	There are three sheets of paper in the questioned document sample. Only one staple was found on the top of the left side of the document. After removing the staple, each paper has one pair of holes. The questioned document has not been altered.
3AM4KP	ESDA	indentations from the writing of 1st page appear on 2nd. 2nd page appear on 3rd. 3rd page (including signature & handwriting of employee) appear on page 1. This proves that all pages were completed one on top of the other.
	Microscopy examination	did not reveal any difference between the printing technique amongst the 3 pages.
	Video Spectral Comparator (VSC)	examination did not differentiate any part of the ink of the amount on page one. There is no evidence of substitution or alteration.
	Macroscopic Examination	
	Magnification	

TABLE 2

WebCode	Methods/Techniques	Observations
3EHXHQ	ESDA	Item 001, front of page 1, revealed impressions of the number 12 and number 5 from page 2 and the signatures and dates from page 3. It appears that pages 2 and 3 were written on while on top of page 1. Item 001, back of page 1, revealed impressions of the reverse original writing of the front of page 1 and the reverse original writing of page 3. Item 001, front of page 2, revealed impressions of the original writing found on the front of page 1 and the original writing from page 3. It appears that pages 1 and 3 were written while on top of page 2. Item 001, back of page 2, revealed impressions of the reverse original writing of the front of page 1 and the reverse original writing from page 2. Item 001, front of page 3, revealed impressions of the original writing from page 1 and the original writing from page 2. It appears that pages 1 and 2 were written while on top of page 3. Item 001, back of page 3, revealed impressions of the reverse original writing of the front of page 3. The amount of money found on the front of page 1 in the original writing was found on page 2 and 3 in the form of an indentation. It appears that the three pages were stapled together, written on one at a time, and flipped backwards underneath the post documents until complete. The indentation examination revealed the handwritten entries on all three pages of the document.
	Video Spectral Comparator (VSC)	The various light sources of the VSC were used (i.e. IR, UV, and transmitted) to examine the black ball point ink used to create all three pages of the document. It was determined that the ink that was used to prepare all three pages of the document contained the same optical properties. The three pages of the document did not contain a watermark.
	Microscopic Examination	A microscopic examination was conducted on the staple that bound the three pages of the document in the upper left corner. The left corner of pages 1 and 2 were folded forward and page 3 was folded backward. Other impressions and indentations noted appear to come from the original staple. There were no other staple holes identified other than the original staple holes. The large staple holes appear to come from the wear and tear of the document.
3GCEF8	Macroscopic Examination	No prominent trash marks observed on any of the documents. Observing a trash mark on one document, but not others, may be an indication of page substitution. One staple hole was observed for all 3 documents. When each document is observed separately, the text appears similar in alignment.
	Micrometer	All 3 documents had paper thickness of 0.004 to 0.0045 inches.
	Microscopic Examination	Toner printing process observed for all 3 documents. Font appears the same for all 3 documents (Calibri font), no significant differences in font observed. Black ink, possible ballpoint, was used for all handwritten entries (numerals, signatures, and dates).
	Transmitted Light	No watermarks were observed for any of the documents. When documents were examined together (overlayed), text appeared to be similar in alignment.
	Video Spectral Comparator (VSC)	All 3 documents have similar UV characteristics. Examination of ink entries shows spectral similarities, no ink discrimination detected to indicate alterations to handwritten text.

TABLE 2

WebCode	Methods/Techniques	Observations
	ESDA	Examination revealed the following results: page 1 ESDA - impressions of page 3 discovered. This indicates that page 3 was overlayed onto page 1 when page 3 signatures and dates were written. page 2 ESDA - impressions of page 1 and 3 discovered. This indicates that pages 1 and 3 were overlayed onto page 2 when the page 1 handwriting was executed and the page 3 signatures and dates were executed. page 3 ESDA - no impressions were discovered. This finding suggests that neither pages 1 or 2 were overlayed onto page 3 when pages 1 and 2 inked entries were executed. None of these ESDA findings indicate that a page substitution or ink or other alteration occurred.
	Handwriting Examination	Not performed. Information provided relates that Rachel Smith wrote all inked entries except for the employee signature and date. It was related that Julie Andie wrote the employee signature and date. No questioned handwriting or signatures were offered in this case.
3J3KUC	Visual Examination	The document was visually examined - no obvious alterations to the document were found.
	Microscopic Examination	The document was examined using low power microscopy. No differences were noted in the printing techniques and no alterations to the handwritten entries were found. The stapled area was examined - no obvious additional set of staple holes were noted on any of the three pages.
	Oblique Light	Indented impressions were found on all three pages of the document when examined using oblique light.
	ESDA	Impressions from pages 2 and 3 were found on page 1 Impressions from pages 1 and 3 were found on page 2 Impressions from pages 1 and 2 were found on page 3 No impressions from an unknown source were found. These results indicate that the handwritten entries on each page were produced whilst resting on top of the other two pages.
	Video Spectral Comparator (VSC)	The document was examined using various light sources: -IR Absorbance - no differences were noted between the inks present -IR-Fluorescence - no differences were noted between the inks present. -UV - the three pieces of paper all reacted the same to UV light.
3PPD6C	ESDA	1. ESDA examination on front page of the first page of the questioned document revealed indented writing reading as "12, 5, Signature 1 (Company Official Signature), May 9, 2022, Signature 2 (Employee Signature), May 9, 2022". 2. ESDA examination on reverse page of the first page of the questioned document revealed indented writing reading as "9th May 22, Julie Andie, 12, 5, Signature 1 (Company Official Signature), May 9, 2022, Signature 2 (Employee Signature), May 9, 2022, 43,894, [circle symbol] and 3". 3. Therefore, ESDA examination on first page of the questioned document revealed indented writing consistent to the handwritten entries on the third page of the questioned document.
	Video Spectral Comparator (VSC)	All handwritten entries on first, second and third pages of the questioned documents showed similar ink characteristics under UV light, infrared luminescence and infrared reflectance.
	Visual Examination	All handwritten entries showed similarities in being written using black ballpoint inks.
3UW2JD	Macroscopic/Microscopic Examination	On Pages 1 - 3: (i). All handwriting and signatures consisted of original ink strokes as evident by observed striations. (ii). All printed matter were of similar font size and font style.

TABLE 2

WebCode	Methods/Techniques	Observations
	Visual Examination	On Pages 1 - 3: (i). All handwriting and signatures are written in black ink only. (ii). No visible damage, additions or deletions to the printed matter on the surface of the document. (iii). No visible trash marks on the document.
	Infrared Absorption	On Pages 1 - 3: (i). All handwriting and signatures disappeared at 695nm. (ii). All printed matter did not disappear throughout wavelength range.
	Infrared Fluorescence	On Pages 1 - 3: (i). All handwriting and signatures fluoresce at 695nm (400 - 640nm) filters. (ii). All printed matter did not fluoresce.
	Ultraviolet Fluorescence	On Pages 1 - 3: (i). All handwriting, signatures and printed matter did not fluoresce.
	Oblique Light	On Page 1 - no indentations detected. On Page 2 - Visible indentations of page 1 handwritten items: (i) date "9th", "May", "22" (ii). name "Julie Andie" (iii). amount "43,894"(iv). months "3". On Page 3 - Visible indentations of page 2 handwritten items: (i). "12" (ii). "5".
	ESDA	On Page 1 - no indentations detected. On Page 2 - Visible indentations of page 1 handwritten items: (i) date "9th", "May", "22" (ii). name "Julie Andie" (iii). amount "43,894"(iv). months "3". On Page 3 - Visible indentations of page 2 handwritten items: (i). "12" (ii). "5".
3UXXP3	Macroscopic/Microscopic Examination	no visible evidence of alterations observed removed staple and found no additional staple holes or upper left hand corner folds
	Oblique Light	possible indented observed on pages 1 and 2, none observed on page 3
	Video Spectral Comparator (VSC)	various light source used: IR, spot, UV, transmitted, and side-lighting could not differentiate the paper or inks on the 3 pages of the contract Observed indented writing on all 3 pages of the contract
	ESDA	processed the front of each page of the contract -page one contained indented writing from page 3 of the contract -page 2 contained indented writing from pages 1 and 3 of the contract -page 3 contained indented writing from pages 1 and 2 of the contract
3VN449	Video Spectral Comparator (VSC)	
	Macroscopic/Microscopic Examination	
	Infrared Light	
3VU87Y	Visual Examination	A visual overview was conducted on each page and observations were recorded. All three pages had the same overall paper colour (white) and opaque opacity. The three pages felt smooth and were evenly coloured. On the top left corner of each page was a metal staple securing the pages. Page 1 had the crown (top portion) of the staple on the top of the page and the back of page 3 had the legs of the staple, securing the pages together. There were two puncture holes observed in each page and were from the staple legs penetrating the paper. All three pages had the same characteristic fold mark/line and was located diagonally in the top left corner of each page, just below the staple. The three pages consisted of handwriting in black ink and black machine generated text using a sans serif font with margins/alignment appearing consistent.
	Oblique Light	Oblique light was used with NIL watermarks observed. The back of page 3 had two small indentations, diagonally located just under the legs of the staple and fold line. These marks appear to align with the staple legs when the page is folded back along the fold line. No additional puncture holes observed.

TABLE 2

WebCode	Methods/Techniques	Observations
	ESDA	A ESDA examination was conducted on the front and back of all three pages. Sourced (known) indentations were developed on both sides of the pages and linked to Item 1 (Q1). Sourced indentations from page 3 were developed on the ESDA foil from page 1. Sourced indentations from pages 1 and 3 were developed on the ESDA foil from page 2. Sourced indentations from pages 1 and 2 were developed on the ESDA foil from page 3. This indicates that page 3 was on top of pages 1 and 2 during the act of signing and was below pages 1 and 2 during the act of writing on pages 1 and 2. No unsourced indentations were developed.
	Video Spectral Comparator (VSC)	The VSC was used to examine the documents for any variance under different light sources such as Ultraviolet (UV), Infrared (IR) and filters. UV was used to look at the paper and how it reacts, with all three pages fluorescing and reacting the same. Bitmap data was also checked, with a NIL finding. The ink from the writing implement/s absorbed under UV and fluoresced under IR. Using a range of different light sources from UV to IR (254nm - 1000nm) there was no variance within the ink (which may indicate another writing implement or being written at a different time). The machine generated text - absorbed under both UV and IR. Transmitted light was also used to examine the puncture holes from the staple and examine for any additional holes in each page. Only the two holes from the current staple legs were observed and did not appear bigger (which may indicate a previous hole) than what would be expected from movement of the page. No watermarks were present on the pages.
	Microscopic Examination	Using the Leica M80 microscope, an examination of the machine-generated print was conducted. The three pages were printed with black toner and all pages had overspray from its use. A black -paste ball point pen was used as the writing instrument. Further examination of the staple holes on all pages and indents (on the back of page 3) was conducted with results the same as previously discussed.
	Ruler	Measurements were recorded of the page sizes and all three pages were consistent (approximately 21.7cm x 28cm), as well as margins. The staple and fold lines were also measured and recorded on each copy page (of the images).
	Magnification	Macroscopic examination as well as magnification was used throughout the examination before using further specialised equipment such as the VSC and microscope.
3VWYXF	Macroscopic/Microscopic Examination	The staple and staple holes were examined for consistency and the possibility of multiple staples being used. As per the staple holes, one staple was used to attach all three pages and all three sets of holes match in alignment. Images are attached to this report.
	Video Spectral Comparator (VSC)	The inks on Submission 001 (all three pages) were examined with the Video Spectral Comparator (VSC) for consistency. The ink on all three pages reacted similarly under Infrared Reflectance and Infrared Luminescence.
	Adobe Photoshop, Lab Color	All of the inks also reacted similarly when examined with Adobe Photoshop (Lab Color, Channel b) Demonstrative images are attached to this report.
	ESDA	All three pages of submission 001 were examined visually, with sidelighting, and with the electrostatic detection apparatus (ESDA) for the presence of indentations from indented writings. Indentations of this sort are often caused on one document when writing is done on another document that is physically on top of it. No unexplainable indented writings were revealed.

TABLE 2

WebCode	Methods/Techniques	Observations
	Font	The font used to prepare Submission 001 is a 10 point, sans serif font. The same font is used on all three pages of Submission 001. The only text not printed in 10 point size is the title "Employment Contract" which was printed in 13 point size.
	UV / Paper	All three sheets of paper in Submission 001 are the same size, slightly less than 8.5" x 11". Each page reacted similarly under UV lighting with the VSC.
4CUKU8	Video Spectral Comparator (VSC)	VIDEO SPECTRAL COMPARATOR (VSC-6000HS): Applications were made with different types of light, for example: Infrared, Ultraviolet, Transmitted, Oblique. Magnification and superimposition work was carried out, the absence of alterative aspects is verified, there is no contrast in the substrates, nor differences in the ink of the handwritten and printed texts in the document.
	Macroscopic/Microscopic Examination	ESTEREOMICROSCOPE: During the evaluation, the absence of alterative maneuvers regarding erasures, thinning of the paper, avulsion or bristling of fibers, physical or chemical eradication, transfers is ratified on paper.
4HGFQ6	Visual Examination	Position of folds and staple, absence of other staple holes. Size of paper leaves. Condition of the edges of the paper leaves.
	Microscopic Examination	Appearance of inks of handwritten entries. Appearance of image substance of typed text.
	Oblique Light	Search for indentations; grain of paper surface.
	ESDA	Visualisation of indentations.
	Ultraviolet Light	Reactions of paper leaves.
	Transmitted Light	"Mottle" of paper leaves.
	Dichroic Filters	Appearance through the filters of the inks of the handwritten entries.
	Magnetic viewer	Whether or not the toner of the typing on each page was magnetic.
	Comparison of typestyles	Whether or not the typing on each page of the contract was in the same typeface.
4RBGBN	ESDA	2.2) Items Q1.1, Q1.2, and Q1.3 were examined with oblique light (side lighting) and the use of the ESDA (Electrostatic Detection Apparatus) for the possible presence of indented impressions with the following results: 2.2.1) Indented impressions consistent with the existing handwritten entries on items Q1.1, Q1.2, and Q1.3 were developed on each of the Q1.1, Q1.2, and Q1.3 items. 2.2.2) Impressions consistent with originating from within the Q1.1, Q1.2, and Q1.3 items were noted (example: Impressions from the handwriting on item Q1.3 were found as indented impressions on item Q1.1), however no impressions of investigative value (including numeral additions/alterations) were found. 2.2.3) No indented impressions from other than the visible handwriting found on items Q1.1, Q1.2, and Q1.3 were found.
	Infrared Light	2.1) Visual and macroscopic examination, infrared luminescence, Black and White infrared reflectance, ultraviolet examination, and type font comparison resulted in the following: 2.1.1) No visual differences in the handwritten inked entries, in both the visible and the near-infrared regions of light were noted between and within each of items Q1.1, Q1.2 and Q1.3.

TABLE 2

WebCode	Methods/Techniques	Observations
	Ultraviolet Light	2.1.2) No visual differences in paper reflectivity were noted in the ultraviolet region at each of 365nm, 312nm, and 254nm between each of items Q1.1, Q1.2 and Q1.3.
	Font	2.1.3) No differences in type font between and within each of items Q1.1, Q1.2 and Q1.3 were noted.
4UR7XK	Video Spectral Comparator (VSC)	1. After careful examination and comparison of original questioned three page Employee Contract (item no. 1) using Video Spectral Comparator (VSC-8000, Software Version 7.2), following observations are noted: 1 . All the handwritten entries and signatures on item no. 1 have been written using similar kind of writing instrument(pen)/ink. 2. Font style and font size of printed text on all three pages of item no. 1 are consistent. 3. Interlinear spacing between consecutive lines on item no. 1 is similar. 4. UV response of all three pages of contract is similar. 5. No perforation or mark other than the mark due to pressing of paper on stapler pin was observed along with creases of paper for folding the contract.
	ESDA	After careful processing of original questioned three page Employee Contract (item no. 1) using Electrostatic Detection Apparatus (ESDA Lite), following observations are noted: 1. Indentations revealed on first page of employment contract correspond to entries "12 & 5" present on 2nd page and to signatures of employee, employer and date "May, 9,2022" (in front of each signature) on third page of item no. 1. 2. Indentations revealed on second page of employment contract correspond to entries present on first page i.e "9th" , "May", "22" "Julie Andie" , "43,894" , " encircled " & digit "3" and entries present on third page of item no. 1 i.e., Signature of employer & employee and date "May 9, 2022" (present in front of both signatures). 3.Indentations revealed on third page correspond to handwritten entries present on first page i.e "9th" , "May", "22" "Julie Andie" , "43,894" , " encircled" and digit "3" and "12 & 5" present on 2nd page of item no. 1. 4. Indentations corresponds to handwritten entries on page no. 01, 02, & 03 of Questioned Contract were developed (as inverted text indentations) on back side of each page. 5. No indentation other than indentations of handwritten entries on contract agreement were deciphered.
4XRA2F	Microscopic Examination	All three pages printed with toner, no visual differences between the three pages observed. All handwritten parts written with what seems to be a blueish black ballpoint pen, no optical differences in normal white light observed.
	Infrared Light	No optical differences between the three pages observed (toner). No optical differences between the three pages observed (ballpoint ink).
	Ultraviolet Light	No optical differences between the three pages observed (toner). No optical differences between the three pages observed (ballpoint ink).
	ESDA	On the second page indented writing exactly corresponding with the handwritten parts on the first page has been found. On the third page indented writing exactly corresponding with the handwritten parts on the second page has been found. Weak indented writing corresponding with handwritten text on the first page has also been found on the third page.
67Y9AG	Video Spectral Comparator (VSC)	Microscopic and macroscopic examination don´t show differences between inks.
	Video Spectral Comparator (VSC)	IR light examination doesn´t show any changes.
	Video Spectral Comparator (VSC)	UV light examination doesn´t show any changes.

TABLE 2

WebCode	Methods/Techniques	Observations
6DNTEV	Macroscopic/Microscopic Examination	The body of the document is printed using black toner granules, with no text addition or deletion features. The completion of the different blank spaces of the document, are made in black ink, without differences in the tonality of the ink or trace of the writing element.
	Video Spectral Comparator (VSC)	The spectral scan carried out on the document did not show differences that allow us to infer the use of more than one kind of ink in its production.
6DV99V	Indented writing (ESDA2 and Oblique Light)	- Indented writing of the handwriting of the first page of the questioned document "Q1" was revealed both on the second and the third page of the questioned document "Q1". - Indented writing of the handwriting of the second page of the questioned document "Q1" was revealed both on the third and the first page of the questioned document "Q1". - Indented writing of the handwriting of the third page of the questioned document "Q1" was revealed both on the first and the second page of the questioned document "Q1". This demonstrates that all three pages of the questioned document "Q1" were together during the execution of the handwritten inked entries.
	Visual examination Macroscopic /microscopic examination	- Visual/Macroscopic/Microscopic examination of the questioned document "Q1" did not reveal any differences in the edges, the dimensions (length, width), the color between the three pages of the questioned document "Q1". - The text printed on the three pages of the questioned document "Q1" was produced by the same printing process (laser printing), with the same line spacing and margins. - There is one staple hole in each page of the questioned document "Q1". There is also a fold or crease in all three page of the questioned document "Q1" that match up very well in size and location. Nothing unusual noticed.
	ALS examination (UV examination/ Transmitted light)	- Under UV light, no differences were found between the three pages of the questioned document "Q1". - Under transmitted light, no differences were found between the three pages of the questioned document "Q1".
	Handwriting examination	- The handwriting "May 9, 2022" on the last line of the third page of the questioned document "Q1" was written by a different person than the one who wrote the rest of the handwriting appearing in the questioned document "Q1".
	Ink Examination: Video spectral comparator / Infrared light	- Infrared absorption and fluorescence examinations did not reveal any differences in the ink entries on the questioned document "Q1".
6EEYT2	Ultraviolet Light	no chemical alteration visible
	Infrared Light	Ink throughout is similar no alteration detected
	Transmitted Light	No eraser was detected and No alteration.
6RMVW4	Video Spectral Comparator (VSC)	In the infrared oblique light(about 800 nm), indentation was observed on the first page of the contract. This indentation was identical to the signature and date written by the employee on the third page. In addition, we can find the indented mark '5' on the third page, which was originated handwritten '5' on the second page.
	Oblique Light	In the visible lay oblique light, we can observe the indented marks on the whole page, and the marks appearances are very similar to the handwritings on the previous page of the contract.
	Macroscopic Examination	Pressed mark by the staple was found on the third page.

TABLE 2

WebCode	Methods/Techniques	Observations
6TC7MW	Video Spectral Comparator (VSC)	It is verified wether the handwritten writings have been printed or have been made with a writing instrument. Once it has been verified that they been carried out using a writing toll with black inck, the inks of the writing tool are studied, subjecting them to luminiscence excitation and spectroscopy tosee if they show the same reaction.
722977	Indented Writing	Utilizing oblique lighting and the VSC side light function, indented impressions were observed on Q1b that corresponded to the handwritten "9th", "May", "22" "Julie Andie", an oblong circle and "3" on Q1a.
	Video Spectral Comparator (VSC)	Used to visualize consistent ink used for Q1a, Q1b and Q1c. Paper also reacted consistently.
	MICROREF Smart Rule	Used to measure font size on Q1a, Q1b, and Q1c
	IdentiFont	Used to identify or narrow down the font used to prepare the Q1a-c documents
7293AY	Transmitted Light	No Mechanical erasure Detected
	Ultraviolet Light	No chemical erasure Detected
	Infrared Light	sam ink used for hanwriting
77YN48	Oblique Light	No impressions visible, page 3 folded in opposite direction of pages 1 and 2
	Video Spectral Comparator (VSC)	All original ink entries reacted the same way under various light sources. No watermarks or other features of paper observed under transmitted light.
	Visual Examination	Indentation or margin of signatures lines and preceding statement differs from margin setting from the rest of document.
7DHVJQ	ESDA	Complete examinations for indented writings (oblique light and ESDA): observations consistent with what is visible on the document: no indication of alteration.
	Handwriting Examination	Spontaneous-looking handwritten writing, with no hint of additions nor problems with caliber or alignment
	Macroscopic Examination	Paper color the same for all pages, font type, font size, alignement all coherent. No sign of alteration
	Overlays	Header, footer and paragraphs all overlays from page to page, as do the intended writtings and the visible writtings, no signs of alteration
	Microscopic Examination	Printing process the same for the entire contract, printing quality, printing defects fusion pattern show no indication of alteration
	Ruler	No misalignment
	Video Spectral Comparator (VSC)	Complete examinations in UV, IR reflection and IR luminescence for the entire document, paper and ink. Results consistent with what would be expected, no sign of alteration
	Transmitted Light	Paper formation consistent trought all pages
	Thickness	Same thickness for all pages of the contract
7HWGNQ	Ultraviolet Light	no chemical eraser is visible
	Infrared Light	Ink used in hand writing is the same
	Transmitted Light	No eraser is visible

TABLE 2

WebCode	Methods/Techniques	Observations
7WTMH9	ESDA	Impressions were found on each page from handwritten entries on the previous page. Impressions of the signatures and dates from page 3 were found on page 1. All pages of the contract were therefore present when the handwritten entries were completed.
	Video Spectral Comparator (VSC)	No differences were observed between the ink used to apply the handwritten entries on each page. No differences were found in the appearance of each sheet of paper when viewed using ultraviolet light.
	Visual Examination	All pages have been produced using black toner typical of a laser printer. The document was fastened in the top left-corner with a staple. No vacant staple holes were found that would indicate any pages have been substituted.
8CLV27	Visual Examination	4-10-2023 Examined Item 1 visually - one staple at the top. Fold at the staple. Handwritten entries black ball point ink.
	Microscopic Examination	4-10-2023 Item 1 examined microscopically. Printed text consists of toner technology. Handwritten entries are black ball point ink. Staple removed and revealed no other staple holes.
	Indented Writing	4-10-2023 Item 1 was examined for indented writing impressions. Test strip positive and will be uploaded to the evidence images drop box. Indentations were observed on all 3 pages. The following indented writing was observed: Page 1 contained indentations of the handwritten signatures and date appearing on page 3. Page 2 contained indentations of the handwritten entries from pages 1 and 3. Page 3 contained indentations of the handwritten entries from page 2 and the handwritten entries from sections 3 and 5 from page 1.
	Transmitted Light	4-10-2023 Item 1 examined with transmitted light. No water mark observed.
	Video Spectral Comparator (VSC)	4-10-2023 Item 1 was examined under infrared light sources. No ink differentiation was observed.
	Ultraviolet Light	4-10-2023 Item 1 was examined under ultraviolet light. No differentiation was observed.
8DVRKN	Ultraviolet Light	No chemical alterations detected
	Infrared Light	The ink is uniform throughout the document
	Transmitted Light	No eraser was detected on document
9AMZUV		
	No Methods or Observations were reported by this participant.	
9FTQYL	Visual Examination	Three-page stapled contract with handwritten entries on each page. The body of the document is computer printed on white non-ruled paper. No obvious alterations or inconsistencies.
	Microscopic Examination	Printing appears to have been produced using toner technology.
	Oblique Light	Some illegible indentations were noted.
	Video Spectral Comparator (VSC)	The inked entries on each page reacted consistently to the different light sources.
	Ultraviolet Light	All three pieces of paper reacted consistently to 254, 313, and 365nm of ultraviolet light.
	Transmitted Light	no obvious alterations or inconsistencies were noted.

TABLE 2

WebCode	Methods/Techniques	Observations
	Comparison of folds and staple holes	Using oblique light and transmitted light, the folds in the top left corner and the staples hole number and location were compared and no inconsistencies were noted.
	ESDA	An indentation examination was performed and no unsourced indentations were recovered.
9JGZNF	VSC8000/HS	Using the video spectral comparator the writing done by hand printing in the document identified Q-1 was verified and it was observed that it was done using the same writing instrument. When applying ultraviolet light (UV) in the analysis of the papers, it is observed that they react in the same way. The document identified Q-1 was made using the same printer. The toner of the three (3) sheets of the contract has the same physical characteristics. Using the optical process, no change is observed in the identified document Q-1
	Stereomicroscopic	Using the stereomicroscope, no change in the paper grain was observed in the three (3) sheets. The staple is aligned with the holes in the three (3) pages of the document identified as Q-1, including the folds in the upper left corner.
9XAR6W	ESDA	There is no any additional unusual handwriting Impression on all three pages.
	Video Spectral Comparator (VSC)	There is no discriminations of inks that have been used to write the filled data when they exposed to UV, IR, SPOT IR .
	Infrared Light	There is no discriminations of inks that have been used to write the filled data when they exposed to IR.
	Handwriting Examination	The numbers have been written in the form was written by the same person which is MS.Smith
	Oblique Light	There is no any additional unusual handwriting Impression on all three pages.
A7LBQT	Visual Examination	Size of paper sheets. Letter fonts, right and left margins, line spacing, distance between paragraphs. Union of the three sheets of paper. Staple holes and marks. Possible clip joint marks (2) at the top of the three sheets.
	Microscopic Examination	Characteristics of printed texts. No differences have been detected between sheet 1, 2 and 3. Characteristics of handwritten texts. Used viscose ink pen, black color.
	Video Spectral Comparator (VSC)	No differences have been found in the reponse of the inks to light sources.
	ESDA	The handwritten texts of page 1 have been marked on page 2. The handwritten numbers (12 and 5) on page 2 have left indented writing on page 3. All this in the position of the stapled sheets. Also the signatures and dates on page 3 have left indentation on page 1, indicative that the contract has been completed with the three sheets stapled.
AANA7R	Video Spectral Comparator (VSC)	Equipment that allows through the different illuminations and wavelengths to observe alterations and differential physical behaviors of the inks used in the completion of the questioned document: it also allows to obtain images of what was observed
	Microscopic Examination	Nikon SMZ1500 stereo microscope with digital camera. It allows the detailed observation of the physical characteristics of the document, for the present case the identifying aspects that indicate whether or not an alteration was presented
	Portable magnifiers	Allows to evidence details of the documents

TABLE 2

WebCode	Methods/Techniques	Observations
ANJTFN	Microscopic Examination	A comparative study of printed text and handwritten text on all pages of the document in inclined rays.
	Video Spectral Comparator (VSC)	Comparative study of handwritten text and printed text on all three pages of the document in Infrared, UV and Co-Axial rays.
	Infrared Light	
	Ultraviolet Light	
AUA4R8	Macroscopic/Microscopic Examination	Same printing process on all pages, no watermarks on any of pages, no evidence of erasures or additions, impressions from fold & staple consistent with state of document as received (no extraneous staple holes), although limited in comparability - consistency in handprinted entries throughout document as alleged
	Indented Writing	Indented writing was observed on each page of Item 1, using oblique lighting and electrostatic processing. This indented writing was attributed to writing from the preceding and/or following pages within Item 1 (e.g., indented writing observed on page 1 was attributed to writing present on pages 2 and 3).
	Video Spectral Comparator (VSC)	No optical differences observed for pages or entries using UV, IR & IRL
B6MLYW	ESDA	Indented writing positive on all three pages: page 1 contains indented writing from pages 2 and 3, page 2 contains indented writing from pages 1 and 3, page 3 contains indented writing from pages 1 and 2.
	Video Spectral Comparator (VSC)	handwriting ink/paper reacts consistently under alternate light sources (UV, spot) across all 3 pages.
	Macroscopic/Microscopic Examination	Toner machine printing (melted, mounded beads), original handwriting (impressed into paper).
	Visual Examination	Staple did not appear to have been removed (1 set of staple holes); creased along top top corner. No apparent anomalies observed.
BC6TN2	ESDA	Indented writing on pages consistent with writing from other pages of the item.
	Macroscopic/Microscopic Examination	Printing, binding, and other physical characteristics consistent.
	Video Spectral Comparator (VSC)	no paper or ink optical differentiation
	Oblique Light	Indentations noted
BCCXH6	Macroscopic Examination	Paper color and size were similar on all pages of the contract. Margins, indentations, and other formatting on pages appear similar. No inconsistencies or alterations observed in the handwriting. No differences in font were observed between the pages. They have a similar fold in the same location at the top left of each page.

TABLE 2

WebCode	Methods/Techniques	Observations
	Microscopic Examination	Only one pair of staple holes was observed on all pages, and the location, size, and spacing of the holes are consistent. A pair of indentation marks above the staple holes was observed on the first page of the contract but not on the others. No inconsistencies in formatting of the machine printing on the document, such as indentations and margins, were observed between the three pages. The machine printing on all three pages is consistent with a toner process. Epi-illumination (reflected lighting) from above shows the handwritten ink on all three pages reflects where it crosses the toner printing, supporting the writing ink is on top of the machine printing. No paper fiber disturbances were observed around the handwritten entries, and there were no indications that any of the handwriting was altered. Paper weave pattern and shape of corners were similar on all pages. Fonts show slight variation in some areas on the same page, but no clear differences between pages were observed.
	ESDA	Examination for indented writing revealed that writing impressions from page 1 were found on pages 2 and 3. Likewise, writing impressions from page 2 were found on pages 1 and 3, and impressions from page 3 were found on pages 1 and 2. Using transparencies of the original documents, the location of the impressions superimposes over the handwriting on the original documents. This means that each page was written while all three pages were stapled together or lined up manually.
	Video Spectral Comparator (VSC)	Alternate light source examination revealed no unexpected features or inconsistencies between the pages. Ultraviolet examination of the paper showed no difference in fluorescence among the pages. No differences in writing inks were detected using infrared reflectance or luminescence. No watermarks were observed on any of the pages using transmitted light.
	Micrometer	Paper thickness was similar for all pages of the contract.
BE27NZ	ESDA	- Indented impressionsd developed on each page - Impressions on page 1 sourced to writing on page 2 & 3 - Impressions on page 2 sourced to writing on page 1 & 3 - Impressions on page 3 sourced to writing on page 1 & 2 - No unsourced indentations were observed
	Macroscopic/Microscopic Examination	- Used to identify printing process and writing instrument - Toner printing (glossy appearance, raised, stray particles) - Ballpoint pen (gooping, streaking, shiny in co-axial light, viscous ink)
	Video Spectral Comparator (VSC)	- No inconsistencies in ink/toner/substrate response to various lighting conditions
	MagMouse	- No inconsistencies
	Photo Editing Software	- Used to assist in sourcing ESDA impressions - No misalignments in printed text observed on any page of the 3 page document
BFC9AY	ESDA	Indentation analysis was conducted. No anomalies regarding placement of indentations with respect to ink already present on the document were observed. Additionally, no unaccounted-for latent indentations were observed.
	Macroscopic Examination	A stereomicroscope was used to conduct a visual examination, of machine generated text, handwriting, staple holes, and folds, using incident and raking light. No abnormalities were observed.
	Video Spectral Comparator (VSC)	Handwriting was examined using various wavelength of incident light and various camera filters. No differences in spectral responses by ink were observed.

TABLE 2

WebCode	Methods/Techniques	Observations
	X-ray	Iron-bearing toner was observed throughout all three pages with no non-iron-bearing toner present.
	MagMouse	Magnetic (monocomponent) toner was observed throughout all three pages with no non-magnetic toner present.
	Overlays	Overlays of the pages were made in imaging software. No abnormalities in font type, font size, line spacing, or margin alignment were observed.
BNXE2X	Macroscopic/Microscopic Examination	The document was analyzed microscopically and macroscopically, taking close-ups in the upper left corners of the sheets that make up the document, as well as various parts of the document.
	Video Spectral Comparator (VSC)	Various light filters were applied to the document using the VSC workstation, applying infrared light and fluorescence spot, as well as oblique and compound grazing light.
	Visual Examination	Through direct and careful observation of the document, analyzing the characteristics of the substrate and the filling of the format, elements are obtained to reach a conclusion.
C8T8NU	ESDA	Text on page 3 was indented on pages 1 and 2. Text on page 1 was indented on pages 2 and 3, to include portions of the salary. Text on page 2 was indented on page 3.
	Macroscopic Examination	Same font and print process
	Ultraviolet Light	Same or similar paper
	Video Spectral Comparator (VSC)	Could not differentiate ink at this level of testing using visible filters and fluorescence.
C8ZAKU	Microscopic Examination	Microscopic examination of the staple holes after removal of the staple did not reveal any evidence that any of the pages had been stapled more than once.
	ESDA	ESDA exam of Page 2 disclosed indentations of the dollar amount from Page 1.
	Video Spectral Comparator (VSC)	No optical differences concerning the inked entries on any of the three pages.
CAJNNU	Visual Examination	There was one set of staple holes observed on all three pages. There was also one fold located below the set of the staple holes. The direction of the fold was consistent with the pages being stapled prior to being folded.
	Indented Writing	Page 1 – contained handwriting impressions that sourced from pages 2 and 3 Page 2 – contained handwriting impressions that sourced from pages 1 and 3 Page 3 – contained handwriting impressions that sourced from pages 1 and 2
	Microscopic Examination	The writing instrument was a black ballpoint ink on all three pages Printing Process was toner on all three pages
	Video Spectral Comparator (VSC)	The three-page questioned document was examined for optical ink properties. All documents were examined under different wavelengths and recorded at: visible, 665nm, 695nm, spotlight 515-640nm; spotlight 485 – 610nm; and 365nm UV. No optical ink differences were observed. No paper differences were observed.
	Transmitted Light	No watermarks observed on all three pages.
CK3ZY8	Macroscopic Examination	The questioned documents, Q1.1, Q1.2, and Q1.3, were viewed macroscopically with ambient lighting. They all appear to be a white sheet of copy paper that are the same in size.

TABLE 2

WebCode	Methods/Techniques	Observations
	Microscopic Examination	The questioned documents, Q1.1, Q1.2, and Q1.3, were examined microscopically using a stereo microscope Stemi 2000-C. The printed text on Q1.1, Q1.2, and Q1.3 appears to be produced using toner technology, and the handwritten portions appear to be written in black ball point ink.
	Video Spectral Comparator (VSC)	The ink in the handwritten filled-in portions on the questioned documents, Q1.1, Q1.2, and Q1.3, react similarly to one another when viewed with spot fluorescence and infrared absorption light sources. Also, the paper reacts similarly when viewed with ultraviolet lighting.
	Oblique Light	Fiber-optic oblique lighting was used to determine if apparent latent writing impressions were present on Q1.1, Q1.2, and Q1.3. Latent writing impressions appear to be present on Q1.1, Q1.2, and Q1.3.
	ESDA	Latent writing impression restoration was performed using the ESDA on the front and back of the questioned documents, Q1.1, Q1.2, and Q1.3 at 0 minutes humidity. Latent writing impressions were developed on the front and back side of Q1.1, Q1.2, and Q1.3. Latent writing impressions (LWI) developed on the front side of Q1.1 appear to be the handwritten portions from the front side of Q1.2 and Q1.3. The LWI developed on the back side of Q1.1 appear to be the handwritten portions from the front side of Q1.1 and Q1.3. The LWI developed on the front side of Q1.2 appear to be the handwritten portions from the front side of Q1.1 and Q1.3. The LWI developed on the back side of Q1.2 appear to be the handwritten portions from the front sides of Q1.1 and Q1.2. Faint LWI from Q1.3 appear as well. The LWI developed on the front side of Q1.3 appear to be the handwritten portions from the front side of Q1.1 and Q1.2. The LWI developed on the back side of Q1.3 appear to be the handwritten portions from the front sides of Q1.2 and Q1.3. Faint LWI from Q1.1 appear as well.
CLUZWH	ESDA	- Each of the questioned documents bear writing impressions sourced to the other 2 questioned documents.
	Video Spectral Comparator (VSC)	- Various transmitted, infrared, and ultraviolet light examinations were performed on the pages: - The intersections of toner and ink were examined by overexposing the image. A color change was observed where the ink crossed the toner, and therefore, it appears the writing was executed after the black text was printed on the document. - No watermark observed on the questioned documents. - At this level of examination, the three sheets of paper exhibit similar class characteristics, such as size, color, and response to ultraviolet and infrared light sources. - At this level of examination, the ink(s) could not be differentiated on each of the questioned documents and reacted similarly throughout the spectrum.
	Macroscopic/Microscopic Examination	- The machine printing on the questioned documents was produced with an office machine system utilizing black toner. - The font used in the body of each of the questioned documents is a sans-serif font and is internally consistent throughout the document. - A black ballpoint pen was used for the original writing on the questioned documents.
	Overlays	- Similar arraignment, margin usage and baseline usage of the printed text was observed between the three questioned pages. - A similar sans-serif font was used for the printed text on the three questioned pages. - The questioned documents were fastened together by a staple and the staple marks overlaid precisely.

TABLE 2

WebCode	Methods/Techniques	Observations
	Visual Examination	- Upon receiving the evidence, the contract was affixed via one staple in the upper left-hand corner, along with a fold line observed running diagonally in the left-hand corner on all three pages. - Each of the questioned documents bear machine printing and original manuscript printing in black ink. - The paper of each of the questioned documents was white in color and non-coated (thick, rough texture).
	Oblique Light	- The fold lines just below the staples on Item 1A (page 1) and Item 1B (page 2) appear to be in the same direction, whereas the fold line on Item 1C (3 page) appears to be in the opposite direction.
D37DML	Handwriting Examination	All of the handprinted entries did not look modified. The downstroke of the '1' in '12' has hesitation about in the top third of the stroke.
	Visual Examination	The three pages had only been stapled once. The left-hand margin was consistent with each other. The overall formatting was consistent except for bullet points used under the 6. The Paid Time Off section. Alphabetical ordering was used in the other sections. The word Employer is written with the capital letter 'E' everywhere except Section 6. in the sentence 'The employer reserves..."
	Ultraviolet Light	The ink fluoresced the same.
	Transmitted Light	Toner droplets consistent
	Overlays	Formatting Consistent
	Microscopic Examination	The ink was consistent in UV/IR lighting techniques.
EAQK76	Microscopic Examination	The writing was freely and naturally prepared. There were no suspicious pen lifts or stops. Similar striations and gooping were noted throughout the writing.
	ESDA	ESDA test strip run with positive results. ESDA lift-Item 1.1.1 contained indented impressions from Items 1.2 and 1.3. ESDA lift-Item 1.2.1 contained indented impressions from Items 1.1 and 1.3. ESDA lift-Item 1.3.1 contained indented impressions from Items 1.1 and 1.2. No additional unidentified indented impressions were found.
	Video Spectral Comparator (VSC)	No differences were detected in the various inked entries.
	Visual Examination	The writing was freely and naturally prepared.
F4UHA6	Visual Examination	I used the method of analysis for documentary alterations, in the three stages of the referred method, I applied the simple and instrumented observation. The observation techniques are from top to bottom, from left to right on the front and back of the Q1 document. The first stage is without application of the equipment, through the sense of sight resulting that Q1 is in good condition, without the presence of stains, without breaks. The document is bond paper, white, letter size, opaque, smooth; It does not present a traced writing sign, the printing system is laser; in all the autograph writing it presents similar tonality. The upper and lower margins are regular, there is no evidence of page insertion, the questionable document is printed harmoniously, with no apparent signs of alteration.

TABLE 2

WebCode	Methods/Techniques	Observations
	Microscopic Examination	In the second stage of the method is with equipment application. I used both stereoscopic and digital microscopes and a 10x and 20x forensic magnifying kit, using direct and transmitted light; I carried out the search for signs of alteration resulting in no latent stains, ruffled paper fibers, no text deletion or addition marks, it is confirmed that the text of the document is by means of the monochrome laser printing system, the handwriting was observed in a similar tone throughout the questioned document. Likewise, the fastener holes (staple) are the same between the three sheets, the color of the support is similar between them.
	Video Spectral Comparator (VSC)	In the third stage, I examined the Q1, using direct light, UV light, transmitted light, infrared filter, oblique white light and with IR filter, Color inversion with infrared filter, white light with reticle and oblique; the spectrometer tool. Result: with ultraviolet light it does not reveal signs of any chemical solvent used in the support and text; with white light and infrared filter the autograph writing disappears uniformly, with transmitted light it does not reflect signs of thinning of the support; with white light and grid, harmony is observed in its spaces between the lines; with color inversion and infrared filter you can see the text without signs of alteration; with oblique light and an infrared filter, the ink from the pen is removed and the grooves of the autograph writing are observed; With oblique light and an infrared filter, the grooves of some sectors of the autograph writing can be observed on sheet 2. reflected on sheet 1, corresponding to the location of the writing on sheet 1, likewise it happens in the autograph writing on sheet 2 it is marked on sheet 3, the spectrometer takes various samples between the autograph writing resulting in their similar values. The document shows no signs of alteration. Regarding the amount of $43,894, I used, in addition to what was described, a great approach, inversion of color and oblique light, white light with various filters, the values were compared through the spectrometer between different traces of the referred digits, a similar result between due to the above, the Q1 document is not altere
	Method for the analysis of documentary alterations	Method comprising three stages; the first stage without the application of equipment; second stage with application of general equipment and third stage with application of specialized equipment.
F6QXHV	Macroscopic Examination	First, a preliminary visual analysis was made. The observations made were simply that the employment contract is printed on three pages and filled out by hand. At first sight the handwriting of both employer and employee appears to be made with the same black ink pen, and it appears unaltered.

TABLE 2

WebCode	Methods/Techniques	Observations
	ESDA	An Electrostatic Detection Apparatus (ESDA) was used to look for indented impressions on each of the three sheets in the contract. The ESDA analysis showed that there were indentations from all of the visible handwriting. However, the results showed no indented text on the sheets besides from the handwriting which was seen during the preliminary visual (macroscopic) analysis. Interpretation of the results: An interpretation of the indentations gives an insight into the order in which the pages were completed by hand: Page one was filled out on top of page two and three; page two was filled out on top of page three; and page three was filled out on top of page one and two. Finally, they were clipped together. The fact that all of the visible text match the indented impressions shows that the three pages were all present at the time of both completing and signing. It can also be concluded that no text was added/altered after the time of completing and signing. Furthermore, it can be concluded from the indented impression analysis that none of the pages have been replaced later on, as this would, as well, have created a mismatch between the visual examination and the ESDA sheets.
	Video Spectral Comparator (VSC)	The document was examined in VSC8000 with main focus on the handwritten parts, to look for potential alterations in the handwriting. All colored filters were used in combinations with the whole range of wavelengths from UV to IR. - All of the black pen ink reacted in the same way to the different filter/light combinations, indicating that the same pen was used in all of the handwriting. - Similar UVPL's were observed on the three pages under UV light, indicating that the paper comes from the same batch. This indicates that the three pages were printed at the same place (although it does not ultimately prove it). - The toner printing quality and the amount of toner pollution is similar on the three pages, which indicates that they were printed using the same printer.
FEABNR	Visual Examination	The physical characteristics of the substrate and completion of the three-page contract identified as item Q1 were analyzed, a document that when observed directly , where no sign of change was observed with the naked eye.
	Magnification	The physical characteristics of the substrate and completion of the three-page contract identified as item Q1 were analyzed, a document that when observed directly and through optical instruments such as magnifying glasses, where no sign of change was observed.
	Microscopic Examination	The physical characteristics of the substrate and completion of the three-page contract identified as item Q1 were analyzed, a document that when observed through microscope , where no sign of change was observed with the naked eye.
	Transmitted Light	Subsequently, the filling areas were analyzed in detail through the use a trasmitted light a an exercise of which no vestiges or evidence of any type of change in the substratum or completion of the contract were found.
	Video Spectral Comparator (VSC)	the filling areas were analyzed in detail through the use of a VSC and exposure under different wavelengths such as UV, IR in absorption and fluorescence, as well as different directions of white light such as diagonal, incident and transmitted, an exercise of which no vestiges or evidence of any type of change in the substratum or completion of the contract were found.

TABLE 2

WebCode	Methods/Techniques	Observations
FFWE3K	Indentation Examination-ESDA	1 Indentations were detected on page 1 of the document, item 1, which were caused by the handwritten entries appearing on pages 2 and 3 of the document, item 1. Note : An indentation of an oval was observed over the handwritten oval appearing around the printed entry 'per annum' on page 1 of document, item 1. This indentation was possibly caused by the ball point housing of the writing implement. The significance of this could not be determined. 2 Indentations were detected on page 2 of the document, item 1, which were caused by the handwritten entries appearing on pages 1 and 3 of the document, item 1. 3 Indentations were detected on page 3 of the document, item 1, which were caused by the handwritten entries appearing on pages 1 and 2 of the document, item 1.
	Image Enhancement-Video Spectral Comparator (VSC)	Image Enhancement Infra-Red luminescence All the handwritten entries appearing on the document, item 1, reacted in a similar way when observed under IRL. (645nm to 1000nm) Infra-Red reflectance All the handwritten entries appearing on the document, item 1, reacted in a similar way when observed under IRR @ 645 nm. The same or a similar ink was used to create all the handwritten entries appearing on the document, item 1.
	Microscopic Examination	The printed entries appearing on all 3 pages of the document, item 1, were created using a mono chrome electrophotographic -EPG(laser) printing process. EPG spray was detected on all 3 pages of the document, item 1.
FQFXFQ	Macroscopic/Microscopic Examination	- One set of staple holes on all three pages, fold consistent in upper left corner. A staple was present upon receipt of evidence and was removed previously. - Paper for pages 1, 2 and 3 shows consistencies in color, size, reaction to 365nm UV light source, and transparency appearance - Printing process on the pages 1, 2, and 3 shows consistencies as black, toner printing throughout - Printing placement on pages 1, 2, and 3 are mostly consistent in margins, spacing, formatting. Some margin measurements vary but measurements are approximate. Besides the variation in indentation along right side, no portions seem misaligned, abnormally spaced, or unnaturally crowded. - Font and size consistencies present on the three pages, although no font classification or font size measurements were attempted at this level of analysis. The word 'Employee' did overlay with transmitted light to printing on the other pages. - Dimples at bottom of the page. There is an indented "dimple" mark at the bottom of each page, but they do not align in horizontal placement. What caused this mark on each page is unsourced.
	ESDA	- There are indentations from the writing on page 2 and page 3 in Item 1 on the lifts from page 1, uniquely identified as 1-1 FR and 1-1 REV. - There are indentations from the writing on page 1 and page 3 in Item 1 on the lifts from page 2, uniquely identified as 1-2 FR and 1-2 REV. - There are indentations from the writing on page 1 and page 2 in Item 1 on the lifts from page 3, uniquely identified as 1-3 FR and 1-3 REV. - No unsourced indented impressions developed on the six lifts from the EDD examination of Item 1. - Indented impressions: each page has indentations from writing on the other two pages which means that they were in contact when that writing was conducted.
	Video Spectral Comparator (VSC)	- The ink for the writing on pages 1, 2, and 3 is grey/black ballpoint ink that reacts similarly under alternative light sources, although the limitations of being on different pages applies.
FW2V3R	Video Spectral Comparator (VSC)	Neither the ink or the paper in pages #1-#3 could be differentiated from one another.

TABLE 2

WebCode	Methods/Techniques	Observations
	ESDA	Page #1 has indented writing from pages #2 and #3. Page #2 has indented writing from pages #1 and #3. Page #3 has indented writing from pages #1 and #2.
	Visual Examination	Each page only has one set of staple holes. There are consistent fold marks near the staple holes on each page.
FZV4KU	Visual Examination	-No extra staple marks were observed indicating that the document was still intact. -Uniform font size, style, spacing and alignment of the printed material was observed on all the 3 pages of the document.
	Video Spectral Comparator (VSC)	Using the flood and UV light sources of the VSC8000 and varying the filters from 530nm to 925nm, all the handwritten inks reacted similarly disappearing at 695nm implying that similar pen ink was used. The toner on all the 3 pages also reacted similarly implying that a similar type of printer was used.
	Oblique Light	Using the oblique light source of the VSC8000 in the infrared mode, indentations were observed for all the handwritten entries implying that a ballpoint pen was used.
	Transmitted Light	Using the transmitted light source of the VSC8000, similar appearance of the paper was observed for all the 3 pages implying that the same type of paper was used for the entire document.
	Microscopic Examination	-Glossy appearance of all the handwritten entries was observed. Striations were also observed in the ink-lines which proved that a ballpoint pen was used in the handwriting throughout the entire document. -Similar appearance of the paper was observed in all the 3 pages of the document. -Shiny toner particles on top of the paper were observed which indicated that a LaserJet printer was used.
	Handwriting Examination	The handwriting of the date corresponding to the company official on the last page was consistent with the handwriting of the date on the first page and this was different from the one corresponding to the employee. This ruled out the possibility of Smith forging the handwriting of Andie on the last page.
G3FGQN	Video Spectral Comparator (VSC)	The manuscripts were verified with the different ranges of lights, without evidencing any type of alteration.
	Visual Examination	The document was visually verified without observing any type of alteration.
	[No Method Reported.]	It was verified with a magnifying glass in the scriptural bodies without finding alteration.
GBT7L3	Visual Examination	Applying the method of alterations, the analysis of the document under study (QD) begins, ruling out interferences.
	Macroscopic/Microscopic Examination	Continuing with the method identify design features, size, color. Discarding mutilations, cuts or detachments. No probable alteration is apparent.
	Video Spectral Comparator (VSC)	The QD document (constant of 3 pages) is subjected to analysis with spectral equipment, applying different light sources, such as lateral light (left and right), ultraviolet and transmitted light, infrared filter and fluorescence point, without detecting relevant reaction.
GF4FHQ	Macroscopic Examination	no element was found that indicates the possible alteration of the document in the data of completion and signatures
	Video Spectral Comparator (VSC)	no element was found that indicates the possible alteration of the document in the data of completion and signatures

TABLE 2

WebCode	Methods/Techniques	Observations
	Infrared Light	no element was found that indicates the possible alteration of the document in the data of completion and signatures
GHP2K2	Macroscopic Examination	At this stage of the analysis, the senses were used to examine the three pages of the employee contract, observing that it is a single type of printing and that the ink characteristics of the handwritten text present similar qualities.
	Microscopic Examination	At this stage, a stereomicroscope was used to observe the three pages of the employee contract, which confirmed that it is the same printed typeface and the ink characteristics of the handwritten text are similar, although handwritten strokes are visible underneath the printed text.
	Video Spectral Comparator (VSC)	At this stage, the VSC was used to apply infrared luminescence (IR LUMI) and observe the first two pages of the work contract, which confirmed that the handwritten text shows traces below the printed text.
	ESDA	When applying the ESDA analysis, it did not provide any relevant information to determine any alteration in the questioned document.
GQK87Z	ESDA	Indented writing from other pages of same document observed
	Macroscopic Examination	Pages appeared consistent in printing font style and size; no alignment issues observed
	Microscopic Examination	Examined printing process; original writing observed; staple holes from one staple observed on each page
	Video Spectral Comparator (VSC)	Paper comparison of all pages; examination for differences in inked entries
	Transmitted Light	No watermarks observed
H3VY8E	Visual Examination	Document of three pages/sheets.
	Macroscopic/Microscopic Examination	No tonality changes were observed on sheet surface. No stains observed on the sheet surface. The strokes are uniform both in handwriting and signatures. Margins are not aligned.
	Microscopic Examination	Printed text does not present discoloration; changes of texture on the paper was not observed.
	Transmitted Light	Paper does not show thinned areas on its mass.
	Oblique Light	No brittle fibers were observed.
	Video Spectral Comparator (VSC)	No variations were spotted on the paper surface nor the handwriting using UV light. Handwriting shows variations with infrared light.
H9ACPF	ESDA	Observation: Indented impressions observed on the three pages from Item 1. Comparison: Handwritten entries written on one page were lifted as indented impressions on the following page, indicating that the handwritten entries were written on top of the subsequent page.
	Macroscopic/Microscopic Examination	Observations: - No signs of roughened paper surfaces on the three pages from Item 1. - Consistent printing process, alignment, font types and sizes of printed text within each page. Comparison: No exclusionary differences observed between the three pages from Item 1 in terms of their: - printing process - alignment of printed text - font types and sizes of printed text - paper substrate
	Video Spectral Comparator (VSC)	Observations: - No additions of ink strokes under VSC on the three pages from Item 1. - Consistent optical properties of printing and pen ink observed within each page.

TABLE 2

WebCode	Methods/Techniques	Observations
H9LD6M	Infrared Light	This method was used to check if the document has any signs of added text or use of different pen to alter the information in the document. There was no signs of added text or alteration using a different pen.
	Ultraviolet Light	This method was used to check if the document has any signs of chemical erasures, which was not present in the questioned document.
	Transmitted Light	This method was used to check if the document has any signs of mechanical erasures, which the document did not contain such erasures.
HAKEBE	ESDA	Latend indeted impressions of the hand printing from page 1 (9th / May / 22 / Julie Andie / 43,894 / "round frame" around "per annum" / 3) can be detected on page 2 and page 3. The hand printing from page 2 (12 / 5) can be detected on page 3. Also the hand printing from page 3 (both signatures and both dates) can be detected on page 1 and page 2.
	Video Spectral Comparator (VSC)	IR Absorbtion All handwritten entries correspond in its optical property to each other.
	Video Spectral Comparator (VSC)	IR Fluorescence All handwritten entries correspond in its optical property to each other.
	Transmitted Light	Each page shows the same paper structure (wire, mesh, transparency).
	Ultraviolet Light	Each page shows the same degree of fluorescence.
	Microscopic Examination	The text of all pages of the contract (except the hand printing) is printed with black toner with corresponding properties. No manipulations can be detected in the area of the staple.
HBMCF2	ESDA	Impressions on page 1 from pages 2 and 3. Impressions on page 2 from pages 1 and 3. Impressions on page 3 from pages 1 and 2.
	Visual Examination	Examination of area around staple for evidence that it has been tampered with. Inspection of font style, paper and inks etc
	Video Spectral Comparator (VSC)	Comparison of ballpoint inks found to be same. UV examination of paper similar.
HEMQRJ	Macroscopic/Microscopic Examination	Scientific method taking into account the phases of: observation, indication or signaling of the distinctive characters (individualizing characteristics), confrontation and identity judgments.
	Infrared Light	
	Overlays	
HJUNZ4	Oblique Light	No signs of alteration observed in Q1. Used the oblique lighting (right and left, along with composite, max, min, and difference) options on the Video Spectral Comparator. No significant indentations observed on Q1-1, Q1-2, or Q1-3. The indentations observed on Q1-2 are from the original writing on Q1-1. I was able to observe what appeared to be "9th", "May", "22" and some letters from Julie Andie's name. Some text was indecipherable and was noted as such. The indentations observed on Q1-3 are from the numerals/original writing on Q1-2. I was able to observe what appeared to be a "1" and a "5".

TABLE 2

WebCode	Methods/Techniques	Observations
	Infrared Light	No signs of alteration observed in Q1. Used the infrared reflectance and infrared luminescence settings on the Video Spectral Comparator to examine and compare the writing inks and the three pieces of paper. Writing Ink: No optical differences were observed between the writing inks on Q1-1, Q1-2, and Q1-3. Each page was also examined independently to determine if there were any alterations within the text based on the writing inks. The writing inks on Q1-1 behaved similarly through the different wavelengths under IR reflectance and also under IR luminescence. No significant optical differences between the written entries on Q1-1 were observed. The writing inks on Q1-2 behaved similarly through the different wavelengths under IR reflectance and also under IR luminescence. No significant optical differences between the written entries on Q1-2 were observed. The writing inks on Q1-3 behaved similarly through the different wavelengths under IR reflectance and also under IR luminescence. No significant optical differences between the written entries on Q1-3 were observed. Paper: No optical differences observed in the paper characteristics when comparing the three pages of Q1 (Q1-1, Q1-2, and Q1-3). All three pages exhibited similar characteristics under IR reflectance (925nm) and IR luminescence (400nm-640nm). Toner: No optical differences under IR reflectance and IR luminescence was observed in the toner on Q1-1, Q1-2, and Q1-3.
	Macroscopic/Microscopic Examination	No signs of alteration observed in Q1. Used a microscope, a loupe, and visual observations. No stains or discoloration observed on Q1 (Q1-1, Q1-2, and Q1-3). Staple: The staple was observed intact, image captured, and then was removed from Q1. Single staple mark observed which suggests the document was only stapled the one time. No observed appearance of additional staple marks. Paper: No areas of disturbance in the paper. I did not observe any thinner than normal areas on the pages of Q1 that would suggest potential alterations. The paper was consistent throughout. Color of the paper is white for all three pages of Q1. Size of paper is consistent in Q1 (Q1-1, Q1-2, and Q1-3). No watermark observed on Q1-1, Q1-2, and Q1-3. Toner: The toner printed text appears consistent across Q1-1, Q1-2, and Q1-3. No physical/visual differences noted in rastering pattern, color, font size and shape. Writing Ink: Original writing was present on Q1-1, Q1-2, and Q1-3. The original writing was produced using a black ballpoint pen ink. No physical/visual differences observed (macroscopic or microscopic) between the inks present on Q1-1, Q1-2, or Q1-3.
	Ruler	Paper: Measured the size of the pages (Q1-1, Q1-2, and Q1-3). All three pages were consistent in size with one another (8.5" x 11"). No differences in size were observed. Printing: Spacing between the lines of printed text was consistent on all three pages of Q1. The margins were consistent in the printed text of Q1-1 Q1-2, and Q1-3 when compared to one another.
	Transmitted Light	No signs of alteration observed in Q1. Used the transmitted light settings on the Video Spectral Comparator to examine and compare the three pieces of paper. Paper: No watermark present on Q1-1, Q1-2, and Q1-3. No thin/disturbed areas observed on the three pages. No stains or discoloration observed on the three pages. No differences observed in the paper characteristics when comparing the three pages of Q1 (Q1-1, Q1-2, and Q1-3) under transmitted light.

TABLE 2

WebCode	Methods/Techniques	Observations
	Ultraviolet Light	No signs of alteration observed in Q1. Used the Ultraviolet settings on the Video Spectral Comparator to examine and compare the three pieces of paper, writing inks, and toner. Writing Ink: No optical differences were observed between the writing inks on Q1-1, Q1-2, and Q1-3. Each page was also examined independently to determine if there were any alterations within the text based on the writing inks. The writing inks on Q1-1 behaved similarly under UV 365nm. No significant optical differences between the written entries on Q1-1 were observed. The writing inks on Q1-2 behaved similarly under UV 365nm. No significant optical differences between the written entries on Q1-2 were observed. The writing inks on Q1-3 behaved similarly under UV 365nm. No significant optical differences between the written entries on Q1-3 were observed. Paper: No optical differences observed in the paper characteristics when comparing the three pages of Q1 (Q1-1, Q1-2, and Q1-3). All three pages exhibited similar characteristics under UV 365nm. No stains or discoloration to the paper observed in Q1-1, Q1-2, and Q1-3. Toner: No optical differences under UV 365nm was observed in the toner on Q1-1, Q1-2, and Q1-3.

TABLE 2

WebCode	Methods/Techniques	Observations
	Video Spectral Comparator (VSC)	No signs of alteration observed in Q1. Used the various settings on the Video Spectral Comparator to examine and compare the three pieces of paper, writing inks, and toner. Oblique Lighting: No significant indentations observed on Q1-1, Q1-2, or Q1-3. The indentations observed on Q1-2 are from the original writing on Q1-1. I was able to observe what appeared to be "9th", "May", "22" and some letters from Julie Andie's name. Some text was indecipherable and was noted as such. The indentations observed on Q1-3 are from the numerals/original writing on Q1-2. I was able to observe what appeared to be a "1" and a "5". Infrared Reflectance and Infrared Luminescence: Writing Ink: No optical differences were observed between the writing inks on Q1-1, Q1-2, and Q1-3. Each page was also examined independently to determine if there were any alterations within the text based on the writing inks. The writing inks on Q1-1 behaved similarly through the different wavelengths under IR reflectance and also under IR luminescence. No significant optical differences between the written entries on Q1-1 were observed. The writing inks on Q1-2 behaved similarly through the different wavelengths under IR reflectance and also under IR luminescence. No significant optical differences between the written entries on Q1-2 were observed. The writing inks on Q1-3 behaved similarly through the different wavelengths under IR reflectance and also under IR luminescence. No significant optical differences between the written entries on Q1-3 were observed. Paper: No optical differences observed in the paper characteristics when comparing the three pages of Q1 (Q1-1, Q1-2, and Q1-3). All three pages exhibited similar characteristics under IR reflectance (925nm) and IR luminescence (400nm-640nm). Toner: No optical differences under IR reflectance and IR luminescence was observed in the toner on Q1-1, Q1-2, and Q1-3. Transmitted Light: No watermark present on the paper of Q1-1, Q1-2, and Q1-3. No thin/disturbed areas observed on the three pages. No stains or discoloration observed on the three pages. No differences observed in the paper characteristics when comparing the three pages of Q1 (Q1-1, Q1-2, and Q1-3) under transmitted light. Ultraviolet Light: Writing Ink: No optical differences were observed between the writing inks on Q1-1, Q1-2, and Q1-3. Each page was also examined independently to determine if there were any alterations within the text based on the writing inks. The writing inks on Q1-1 behaved similarly under UV 365nm. No significant optical differences between the written entries on Q1-1 were observed. The writing inks on Q1-2 behaved similarly under UV 365nm. No significant optical differences between the written entries on Q1-2 were observed. The writing inks on Q1-3 behaved similarly under UV 365nm. No significant optical differences between the written entries on Q1-3 were observed. Paper: No optical differences observed in the paper characteristics when comparing the three pages of Q1 (Q1-1, Q1-2, and Q1-3). All three pages exhibited similar characteristics under UV 365nm. No stains or discoloration to the paper observed in Q1-1, Q1-2, and Q1-3. Toner: No optical differences under UV 365nm was observed in the toner on Q1-1, Q1-2, and Q1-3. Visual Exam: No stains or discoloration observed on Q1 (Q1-1, Q1-2, and Q1-3). Staple: The staple was observed intact, image captured, and then was removed from Q1. Single staple mark observed which suggests the document was only stapled the one time. No observed appearance of additional staple marks. Paper: No areas of disturbance in the paper. I did not observe any thinner than normal areas on the pages of Q1 that would suggest potential alterations. The paper was consistent throughout. Color of the paper is white for all three pages of Q1. Size of paper is consistent in Q1 (Q1-1, Q1-2, and Q1-3). No watermark

TABLE 2

WebCode	Methods/Techniques	Observations
		observed on Q1-1, Q1-2, and Q1-3. Toner: The toner printed text appears consistent across Q1-1, Q1-2, and Q1-3. No differences noted in rastering pattern, color, font size and shape. Writing Ink: Original writing was present on Q1-1, Q1-2, and Q1-3. The original writing was produced using a black ballpoint pen ink. No physical differences observed (macroscopic or microscopic) between the inks present on Q1-1, Q1-2, or Q1-3.
	Visual Examination	No signs of alteration observed in Q1. Used a microscope, a loupe, Video Spectral Comparator, and visual observations. No stains or discoloration observed on Q1 (Q1-1, Q1-2, and Q1-3). Staple: The staple was observed intact, image captured, and then was removed from Q1. Single staple mark observed which suggests the document was only stapled the one time. No observed appearance of additional staple marks. Paper: No areas of disturbance in the paper. I did not observe any thinner than normal areas on the pages of Q1 that would suggest potential alterations. The paper was consistent throughout. Color of the paper is white for all three pages of Q1. Size of paper is consistent in Q1 (Q1-1, Q1-2, and Q1-3). No watermark observed on Q1-1, Q1-2, and Q1-3. Toner: The toner printed text appears consistent across Q1-1, Q1-2, and Q1-3. No physical/visual differences noted in rastering pattern, color, font size and shape. Writing Ink: Original writing was present on Q1-1, Q1-2, and Q1-3. The original writing was produced using a black ballpoint pen ink. No physical/visual differences observed (macroscopic or microscopic) between the inks present on Q1-1, Q1-2, or Q1-3.
	Thin-Layer Chromatography	Used Thin-Layer Chromatography (TLC) to look at the components within the paper and the toner to determine if there were any chemical differences in either the toner or paper of Q1-1, Q1-2, and Q1-3. Paper: Q1-1, Q1-2, and Q1-3 exhibited similar characteristics under TLC. The paper used for Q1-1, Q1-2, and Q1-3 were chemically indistinguishable at this level of analysis. Toner: Q1-1, Q1-2, and Q1-3 exhibited similar characteristics under TLC. The toner used for Q1-1, Q1-2, and Q1-3 were chemically indistinguishable at this level of analysis.
HKH8RH	Visual Examination	The indented mark of the stapler is visible on pages 1, 2 and 3 due to the folding of the paper while the 3 pages were stapled together.
	ESDA	The latent image of all the handwritten entries of page 1 were found on pages 2 and 3. The latent image of all the handwritten entries of page 2 were found on page 3. The latent image of all the handwritten entries (both signatures and both dates) of page 3 were found on pages 1 and 2.
	Microscopic Examination	The morphology of the black inked handwritten entries on pages 1, 2 and 3 is similar, suggesting the use of a same ballpoint pen. The morphology of the black toner printed entries on pages 1, 2 and 3 is similar, suggesting the use of a same printing device.
	Visualizer of magnetic properties	All the three pages of the Q1 agreement use a dry magnetic toner.
	Video Spectral Comparator (VSC)	The black ink used on pages 1, 2 and 3 is similar. The handwritten ink entries show a similar behavior using Infrared Reflection (IRR) and Infrared Luminescence (IRL). The paper of the three pages shows a similar behavior using Infrared Reflection (IRR), Infrared Luminescence (IRL) and UV light illumination.
	Metrical examinations	The paper surface morphology is similar between the three pages, as well as the metrical and physical properties such length, width, thickness and grammage.

TABLE 2

WebCode	Methods/Techniques	Observations
HU6F7D	ESDA	Revealed on page 1 : - Indentation of handwriting from Pages 2 and 3 - Marks from roller printer Revealed on page 2, indentation of handwriting from pages 1 and 3 Revealed on page 3, indentation of handwriting from pages 1 and 2
	Macroscopic Examination	Contract printed by electrophotography except handwriting printed by ballpoint pen Electrophotography text : Font and margin (no difference betwwen the 3 pages). Same defect of printing in the left margin for the 3 pages.
	VSC, infrared, Raman, XRD	No difference between toner on pages 1, 2 and 3.
	VSC, Raman	No difference between ballpoint ink on pages 1, 2 and 3.
	paper (color, opacity, thickness, pattern of paper surface, sizes	No significant difference between the 3 pages. 2 staple holes and one crease per page are noticed (no difference of position)
HUEHNT	Visual Examination	Visual examination reveals no evidence of manipulation or alteration. Paper size and opacity appear similar in all respects visually. Printed matter was produced by a machine using toner technology. Inks for written entries and signatures on the document all appear to be similar. A single set of staple holes is observed on each page, with consistent appearance on the document from the stapling process. The three pages are reveal slight folding creases in the upper left corner of the document. Otherwise, the pages are unremarkable.
	Microscopic Examination	Microscopic examinations confirmed visual examinations.
	ESDA	Examinations of the document were performed first on the fronts of there pages, following staple removal and separation. The documents were humidified for two minutes each prior to being placed onto the ESDA platten with the following impressions being recovered: Front of Pg. 1 = Impressions from the signatures and dates from pg. 3 = Impressions from the vacation days 12 and sick days 5 Front of Pg. 2 = All written entries from Pg. 1 Front of Pg. 3 = All written entries from Pg. 2
	Video Spectral Comparator (VSC)	The documents are unremarkable under Video Spectral Comparator. No differences were noted, nor was there any evidence of alteration
	Digital overlays of the impressions recovered by ESDA were examined carefully with layered images of the individual pages.	Layered digital files were created to examine and compare the indentations recovered from the three pages of the document. The indentations recovered were consistent with the entries contained on the three pages.
HVLA7M	Visual Examination	No inconsistencies with respect to font, spacing and margins within the 3 page document were disclosed. No cut and paste characteristics noted. No crowding of printing noted. Internal consistency and no alterations observed in the written entries. No discoloration of paper noted. One set of staple holes was revealed. The similar fold lines consistent in shape and location were detected.

TABLE 2

WebCode	Methods/Techniques	Observations
	Video Spectral Comparator (VSC)	The same optical properties of paper of all three pages was noted. No evidence was detected to suggest that the staple in the upper left corner had been removed or replaced prior to examination. All text was printed using a laserjet technology (black toner). Characteristic printer's features (vertical printed thin line) within the left margin on all pages were observed. No alterations, additions, obliterations, or erasures were disclosed. Optical properties (absorption and luminescence) of ballpoint pen entries on all pages are compatible.
	Magnetic Properties	Similar magnetic properties of toner on all pages were detected.
	Macroscopic/Microscopic Examination	No differences in morphology of toner were noted. No paper fibre disturbances noted.
	ESDA	On page 1 - indented writing from page 3 and page 2 was revealed. On page 2 - indented writing from page 1 and partially from page 3 was revealed. On page 3 - indented writing from page 2 and partially from page 1 was revealed. All the indented writing was consistent in content and location with the written entries from which it has its origin.
HVYYAZ	ESDA	Indented impressions was observed on the first page. The impressions are most likely from the signatures at the last page of the contract. The folding of the paper indicates that the contract was folded so the last page were over the first page when the signatures were signed
	Video Spectral Comparator (VSC)	The ink of the handwriting on all pages was compared under different wave lights in near infrared and illumination, and no differences in the reaction was observed. The paper in all pages was compared and no differences were observed in transmitted light, illumination and UV-light.
	Microscopic Examination	Printing technique on all pages was identified as toner (toner based print). The handwritten text and numbers was examined with microscope and no signs of alteration was observed.
	Oblique Light	Oblique light was used to examine indented impressions
JFYGUM	Visual Examination	Observation of the document and photographic documentation
	Video Spectral Comparator (VSC)	Ink color and shade UV light IR Grazing light
JH48Z3	Visual Examination	White substrates, with printed text, text and signatures in black ink.
	Macroscopic/Microscopic Examination	Good quality texts and type of laser printing.
	Video Spectral Comparator (VSC)	SHEET ONE: Paragraph numbered 1, latent text furrow can be seen under the word "employee" apparently "May". Paragraph numeral like 2, a latent text groove can be seen under the words "responsibilities communicated" located in paragraph "1. Employment", apparently a signature. SHEET TWO: In the upper right part, a groove of latent text can be seen, apparently "Julie Andie". A figure of a latent text groove can be seen enclosing the word "assisting" located in the last line of the second paragraph of point number 8. Latent text groove can be seen, apparently the number "3" located at the height of point number 10. SHEET THREE: Latent text groove can be seen, apparently the number "12" in the upper left part.

TABLE 2

WebCode	Methods/Techniques	Observations
	ESDA	SHEET ONE: The word "may" is confirmed with the appearance of latent text and the appearance of latent text of a signature. SHEET TWO: Latent texts “9 th May 2022”, “Julie Andie”, “43 894”, an oval figure located in the last line of the second paragraph of point number 8 and a number “3” are revealed. SHEET THREE: Latent texts are revealed: number "12", number "5" located at the bottom of the paragraph of point number 11, the amount of 43,894, oval figure located at the bottom of where the signature is located.
JJK9ZW	Visual Examination	Pages 1, 2 and 3 have similar paper size, color, font type and size, spacing and margin.
	Ultraviolet Light	Pages 1, 2 and 3 have similar reactions to Ultraviolet light.
	Infrared Light	All the ink of the handwritten entries on pages 1, 2 and 3 have similar reactions and inks disappear at 695nm.
	Oblique Light	Indentations of a staple were observed around the area of the paper folds on all pages.
	Microscopic Examination	All printed texts on pages 1, 2 and 3 were made up of tiny black dots, while the handwritten entries were black and uniform with no striation.
	ESDA	The indentations of the handwritten entries on pages 2 and 3 were observed on page 1. The indentations of the handwritten entries on pages 1 and 3 were observed on page 2. The indentations of the handwritten entries on pages 1 and 2 were observed on page 3.
	Overlays	An overlay of the indentations on page 1 aligns with handwritten entries on pages 2 and 3. An overlay of the indentations on page 2 aligns with the handwritten entries on pages 1 and 3. An overlay of the indentations on page 3 aligns with the handwritten entries on pages 1 and 2.
JJYQTG	Ultraviolet Light	When the three pages that make up the Q1 doc-ument are examined under ultraviolet light of 312 and 365 nanometers, the mass of the paper appears stable and homogeneous, it does not present different tones that indicate that they have been subject to physical alterations such as erasures, scrapes, cuts. , grafts or chemical bleaching. When the three pages of the Q1 document are examined with the fluorescence dot technique, it is observed that the manuscripts on pages 1 and 2 show the same reaction as the ink of the Com-pany Official Signature handwritten signature on page 3, and different reaction with the ink of the Employee Signature handwritten signature and with the ink of the two handwritten dates that appear on page 3. When the ink of the Employee Signature hand-writing and the ink of the two dates on page 3 is examined with the fluorescence dot technique, it is observed that they present the same reaction. Therefore according to the Case scenario, the Q1 document has not been altered.
	Visual Examination	When the three pages of the Q1 document are examined with visible light, no indications of having been subjected to physical or mechanical alterations to the paper, inks or printing were found.
	Infrared Light	When the three pages of the Q1 document are examined in infrared light of 645 and 665 na-nometers, it is observed that the Company Offi-cial Signature ink has a different absorbance than the Employee Signature ink and the two dates.

TABLE 2

WebCode	Methods/Techniques	Observations
JQ2VZT	Video Spectral Comparator (VSC)	Ink is spectrally similar. The ink Fluoresces and drops out on the Q-1 (1), Q-1(2) and Q-1(3) in a similar and consistent manner. No differences regarding ink characteristics detected amongst the three exhibits, based upon on VSC testing.
	ESDA	Indented/impressed writing from Q-1 (1) was observed on Q-1 (2) and Q-1 (3) to include the compensation amount found under employment contract point number 3. This indicates Q-1(1) was overlayed over Q-1(2) and Q-1 (3) when the handwriting was produced on Q-1(1). Additionally, impressed writing appeared on the Q-1(1) and Q-1(2) exhibit that originated from the Q-1(3) exhibit, indicating Q-1(3) was on top of Q-1(1) and Q-1(2) when the handwriting/signatures were produced on the Q-1 (3).
	Macroscopic/Microscopic Examination	Inks visually appear similar. Text type appears consistent amongst all three documents. All three exhibits contain text derived through a toner-based method. Only one staple hole was observed in each of the three documents. No trash marks or other random marks appear on any of the exhibits, which can suggest a page substitution.
	Ruler	Q-1 (1), Q-1 (2) and Q-1 (3) documents all measure the same dimensions. All three documents measured 8.5 inches by 11 inches.
	Thickness	Q-1(1), Q-1 (2) and Q-1(3) documents all measure the same thickness. Thickness measurement for all three exhibits was .0004 ".
	Transmitted Light	The paper appears visually similar. No watermarks noted on any of the exhibits.
JQN4AW	ESDA	Sourced indented impressions were observed on Exhibit Q1-1. These impressions were sourced to Exhibits Q1-2 and Q1-3. Sourced indented impressions were observed on Exhibit Q1-2. These impressions were sourced to Exhibits Q1-1 and Q1-3. Sourced indented impressions were observed on Exhibit Q1-3. These impressions were sourced to Exhibits Q1-1 and Q1-2.
	Indented Writing	Sourced indented impressions were observed on Exhibit Q1-1. These impressions were sourced to Exhibits Q1-2 and Q1-3. Sourced indented impressions were observed on Exhibit Q1-2. These impressions were sourced to Exhibits Q1-1 and Q1-3. Sourced indented impressions were observed on Exhibit Q1-3. These impressions were sourced to Exhibits Q1-1 and Q1-2.
	Macroscopic/Microscopic Examination	Exhibits Q1-1, Q1-2, and Q1-3 were examined both macroscopically and microscopically. Microscopic examination revealed that all exhibits were produced using a combination of black toner and black ballpoint pen. No differences were observed with visible light.
	Micrometer	Exhibits Q1-1, Q1-2, and Q1-3 were examined utilizing the micrometer. Each exhibit measured approximately 0.003". No differences in paper thickness were noted.
	Video Spectral Comparator (VSC)	Exhibits Q1-1, Q1-2, and Q1-3 were analyzed utilizing the VSC8000 and a variety of light sources and filters. No differences were observed in the paper, printing ink, and writing ink in each exhibit.
	Oblique Light	Exhibits Q1-1, Q1-2, and Q1-3 were analyzed with oblique light. Indented impressions were observed on Exhibits Q1-1, Q1-2, and Q1-3.
	Overlays	Overlay examinations of Exhibits Q1-1, Q1-2, and Q1-3 were conducted. No dissimilarities in formatting, spacing, or font were observed.

TABLE 2

WebCode	Methods/Techniques	Observations
	Ruler	Exhibits Q1-1, Q1-2, and Q1-3 were measured with a ruler, and each exhibit measured approximately 8.5"x11".
K46HNF	Indented Writing	Indentations were detected on the questioned document originating from entries on other pages of the document. This indicates that the pages of the questioned document were in contact with each other at the time the handwritten entries were produced. No other indentations were detected.
	Macroscopic/Microscopic Examination	All printed entries have been produced using black toner. Printer defects and trash marks were observed. The presence of trash marks indicates that the printed entries may be a copy, rather than an original printed document. All handwritten entries have been produced using black ballpoint ink. The contract contained one staple and what appeared to be one set of staple holes. No evidence of alteration to the entries, or pages (i.e. page substitution) was observed.
	Video Spectral Comparator (VSC)	The black ballpoint ink entries were examined using infrared luminescence and infrared reflectance and were shown to have consistent optical properties, indicating that the same ink, or inks with similar optical properties, was used to produced the handwritten entries on the contract. No evidence of alteration of the handwritten entries was observed.
K47HGN	ESDA	e. ESDA- indented impressions positive of no value
	Video Spectral Comparator (VSC)	d. Video Spectral Comparator- No differences in optical properties observe with all light source
	Microscopic Examination	c. Microscopic (stereo)- dry toner particles for printed material
	Ultraviolet Light	f. UV light box- no optical difference in paper
	Transmitted Light	ii. No visual watermarks
	Visual Examination	a. Visual/oblique side lighting i. Staple marking (holes) and folds line up
K88LBW	Video Spectral Comparator (VSC)	1. On page 1: Similar ink was used on the entries “9th”, “May”, “22”, “Julie Andie”, “43,894”, a circle on the word “per annum” and “3” compared to the other later entries. 2. On page 2: Similar ink was used on the entries “12” and “5” compared to the other earlier and later entries. 3. On page 3: Similar ink was used on the company official signature, the employee signature, the entries “May 9, 2022” and “May 9, 2022” compared to the other earlier entries.

TABLE 2

WebCode	Methods/Techniques	Observations
	ESDA	1. Indented impressions were found on the page 1. The indented writing deciphered on page 1 reading as the company official signature, the employee signature, "May 9, 2022" and "May 9, 2022". 2. Indented impressions were found on the page 2. The indented writing deciphered on page 2 reading as "9th", "May", "22", "Julie Andie", "43,894", a circle on the word "per annum", "3", the company official signature, the employee signature, "May 9, 2022" and "May 9, 2022". 3. Indented impressions were found on the page 3. The indented writing deciphered on page 3 reading as "9th", "May", "22", "Julie Andie", "43,894", a circle on the word "per annum", "3", "12" and "5". 4. Indented writing revealed on page 1 (the company official signature, the employee signature, "May 9, 2022" and "May 9, 2022") were identical to the writings (the company official signature, the employee signature, "May 9, 2022" and "May 9, 2022") on page 3. 5. Indented writing revealed on page 2 ("9th", "May", "22", "Julie Andie", "43,894", a circle on the word "per annum" and "3") were identical to the writings ("9th", "May", "22", "Julie Andie", "43,894", a circle on the word "per annum" and "3") on page 1. 6. Indented writing revealed on page 2 (the company official signature, the employee signature, "May 9, 2022" and "May 9, 2022") were identical to the writings (the company official signature, the employee signature, "May 9, 2022" and "May 9, 2022") on page 3. 7. Indented writing revealed on page 3 ("9th", "May", "22", "Julie Andie", "43,894", a circle on the word "per annum" and "3") were identical to the writings ("9th", "May", "22", "Julie Andie", "43,894", a circle on the word "per annum" and "3") on page 1. 8. Indented writing revealed on page 3 ("12" and "5") were identical to the writings ("12" and "5") on page 2.
K9WRPN	Microscopic Examination	
	Video Spectral Comparator (VSC)	
	Visual Examination	
KAVXA2	Visual Examination	Visual inspection conducted to note any obvious issues such as obliterations, misalignments, etc. Staple hole sets were consistent among the pages.
	Microscopic Examination	An examination of the inks was made for a determination of the writing instrument used and the ink coloration.
	Ultraviolet Light	UV examination to check for correction fluid or erasures. It was also used to confirm consistency of optic brightness of the paper stock.
	Indented Writing	The pages were processed for indented writing with no indentations of value recovered.
	Infrared Light	IR light filters used to determine if different inks were used on the document.
	Magnification	Magnifiers used to determine if the font was consistent throughout the document.
KBYRQK	Video Spectral Comparator (VSC)	Examinations/ comparisons failed to reveal differences between the pieces of paper using all the light source and filter combinations available using the VSC. There are no flourenscent fibers present within any of the three sheets of paper.
	Video Spectral Comparator (VSC)	Examinations/ comparisons failed to reveal differences between the black ball point inks using all the light source and filter combinations available using the VSC.

TABLE 2

WebCode	Methods/Techniques	Observations
	ESDA	Page 1 of 3: Oblique light examinations and ESDA examinations of the front and backsides revealed two indented signature impressions and two handwritten dates of "May 9, 2022" that are a physical match / layover to the two signatures and two handwritten dates that are physically present in the middle section of Page 3 of 3. Control +
	ESDA	Page 2 of 3: Oblique light examinations and ESDA examinations of the front and backsides revealed indented handwritten impressions at the top of the page that reads, "9th", "May", "22", and "Julie Andie", in the middle of the page that reads, "43, 894" and a flattened, oval circle, and a handwritten number "3" in the lower left quadrant of the page, that are all a physical match / layover to the same exact writings that are physically present on the top, middle and lower left quadrant of Page 1 of 3. Control +
	ESDA	Page 3 of 3: Oblique light examinations and ESDA examinations of the front and backsides revealed indented handwritten impressions at the top left quadrant of the page that reads, "12" and "5" that are a physical match/ layover to the same exact writings that are physically present at the top left quadrant of Page 2 of 3. Control +
	Oblique Light	Backsides of pages 1, 2, and 3 revealed embossing from the handwriting on the front sides of each page. However, the embossing caused by the handwritten numbers "43, 894" and a flattened, oval circle on the backside of Page 2 of 3 is very light and hard to see.
	Visual Examination	All three pieces of paper have the same fold marks in the upper left corner. All three pieces of paper also bear the same single set of staple holes. All three pages are left justified and have the same left margin. All three pages are right non-justified All three pages have the same "Green Gardens Employee Hire Contract 2022" title placement All three pages have the same Page # of # placement
	Visual Examination	All three pages are printed in black, shiny toner. There are no watermarks present or any flourenscent fibers present within any of the three sheets of paper.
	Transmitted Light	There is no white out present, tape or white out liquid on any of the pages. There are no watermarks present within any of the three sheets of paper.
KBZMBP	Macroscopic/Microscopic Examination	We use of the macroscope to verify whether the printing systems used to prepare the questioned employee contract, specifically whether the introduction to it, its twelve clauses and the sections that delimit the signatures of the parties, were or not the same. The application of this technique allows us to notice that the device used in its preparation was an electrostatic monochrome toner printer, not detecting any inconsistency that allows us to affirm that any of the three pages of the contract were printed at a different time from the rest.
	Overlays	We use of a transparent millimeter template and its digital counterpart in a video spectra comparator, specifically a VSC8000, to verify if the lines and paragraphs contained in the contract on each and every one of the three pages are consistent with its preparation as a unit of action. The application of this simple but effective technique makes possible to see that the entire text on each and every one of the three pages, in its vertical and horizontal axis, is consistent, that is, that the three pages were printed as a unit of action, not noticing any subsequent additions.

TABLE 2

WebCode	Methods/Techniques	Observations
	Handwriting Examination	We use of a magnifying glasses to examine the handwriten inscriptions and signatures, to verify the writing tool used and its graphonomic characteristics, in order to see whether they are original or not, and if they contain any evidence in their grapho-features that makes us suspect of a manipulation or an addition. The application of this technique makes it possible to notice, first of all, that the handwritten inscriptions -graphics, digits, drawings and signatures- are indeed original, in fact, made with a ballpoint pen of black oil based ink. Secondly, all the experts have the opinion of reproaching to the first digit "4" of the number "43,894" for a strange location with respect to the rest, which leads them to suspect that, perhaps, it was introduced at a later time. To verify this hypothesis, these digits, as well as the rest of the handwritten inscriptions, are subjected to the following techniques...
	Video Spectral Comparator (VSC)	We use of the VSC8000 video spectrum comparator to expose the handwritten inscriptions that contain the three pages of the contract to the infrared luminescence technique, with the aim of verifying if there are inconsistencies that allow affirming the existence of a manipulation or addition. The application of the IR luminescence technique allows us to notice that the response of the inks of the first digit 4 is identical to that of the rest, within the number 43,894, which does not support the existence of manipulation. Likewise, the response of the rest of the registrations is consistent, not appreciating modifications or additions.
	ESDA	We use the ESDA2 Indented Print Revealing Device, to view the indentations contained in the different pages of the contract, in order to verify if there is any inconsistency that supports the presence of some type of manipulation. The application of this technique allows us to reveal the presence on pages 2 and 3 of the contract of all the inscriptions made, in turn, on pages 1 and 2, there being no other, on the other hand, that allows us to affirm the existence of some kind of manipulation.
KPWYHV	ESDA	Developing is applied to look for possible areas of alteration and to identify if there are any marks that do not match the document in question, by applying electrostatic discharges and toner powder on the developing film and then fixing it.
	Infrared Light	The oblique light filter is applied to verify that there are no grooves or any other signs of marks, using the light filter on the right and left side.
	Magnification	It is applied for ink discrimination, where it is appreciated that the writing on the document does not have different behavior in its content, i.e. it is printed with the same type of ink.
	Oblique Light	It is applied for ink discrimination, where it is appreciated that the writing on the document does not have different behavior in its content, i.e. it is printed with the same type of ink.
	Transmitted Light	It is used to verify possible areas of alteration where magnification is applied in the stapling area, to rule out possible alteration by substitution.
L4JACQ	Video Spectral Comparator (VSC)	After examination using relevant light sources, no signs of alteration were found in the Compensation portion of the employment contract.
	Video Spectral Comparator (VSC)	Upon examination of the staple binding at the upper left corner of the document, no evidence of re-binding or duplicate binding was found.
	Video Spectral Comparator (VSC)	There were no apparent differences in paper texture between the first and third pages.
	Indented Writing	Indentations found on the first page were significant similar with handwriting of the signature and date written by Andie on the third page.

TABLE 2

WebCode	Methods/Techniques	Observations
LB2XQT	ESDA	on page 1 - indented writing from page 3 on page 2 - indented writing from page 1+3 on page 3 - indented writing from page 1+2
	Microscopic Examination	same printing technique, no differences noted throughout the document
	Video Spectral Comparator (VSC)	no indication of deletions, additions or changes, no difference in paper size, color or texture. the staple left an indent on all 3 pages and there is no indication that it was extracted and a new one placed.
	Micrometer	same paper thickness
LJDZNE	Visual Examination	Questioned document has 3 sheets, stapled together with paper clip. Traces of paper folding visible in the upper left corner. Also indented impression of paper clip in upper left corner. None of the three sheets show any traces of previous stapling and unstapling.
	Microscopic Examination	Text is printed one-sided with black toner on white paper. Each sheet also contains individual handwritten notes written with black ballpoint pen. The signatures on the last sheet are also written with black ballpoint pen.
	Video Spectral Comparator (VSC)	Transmitted light: Print: the text, footnote and edges (left and right) of all sheets match; uniform shape and size of letters on all sheets. Paper: no differences between all sheets. Ultraviolet light: Paper: no differences between all sheets. IR luminescence: *Handwriting:no different reaction of ink of the written text on all sheets. *Paper:no differences between all sheets. IR absorption: *Handwriting:no different reaction of ink of the written text on all sheets. *Paper:no differences between all sheets. Oblique light: Indented impression on all sheets. By overlaying handwriting and signatures from previous sheet to the indented impression on next sheet, there is matching by position of the text and shape of the letters and numbers.
	ESDA	Indented impressions on sheet 1 matches with handwriting / signatures from sheet 3 by position of the text / signatures and shape of the letters and numbers. Indented impressions on sheet 2 matches with handwriting /signatures from sheets 1 and 3 by position of the text and shape of the letters and numbers. Indented impressions on sheet 3 matches with handwriting from sheets 1 and 2 by position of the text and shape of the letters and numbers.
	Magnetic properties visualization	Toner on all sheets shows magnetic properties.
LJQNTM	Video Spectral Comparator (VSC)	Subsequently, the video spectral comparator was used; which allowed the exposure of the substrate of the doubtful document, as well as its handwriting with visible light in a transmitted (from bottom to top), incidental (from top to bottom) and grazing (with angle of incidence) position; as well as different wavelengths, specifically of the infrared and ultraviolet spectra, in order to identify, through physical absorption and luminescence phenomena, characteristics or elements that evidence the alteration of the substrate, where elements such as loss of opacity, thinning were not found. of the paper, detachment of fibers that are characteristic of the affectation of the support by abrasion or scraping. In the same way, continuing with the requested inspection, a physical study of inks is carried out where, when the doubtful document is exposed in a general way before the different lighting filters that the laboratory equipment displays, it was not evidenced that the manuscripts used different elements. writers.

TABLE 2

WebCode	Methods/Techniques	Observations
	Magnification	A detailed inspection is carried out on the elements that make up the employee contract (Q1 three-page contract between Julie Andie and Rachel Smith) substrate, inks, prints and manuscripts, carrying out macroscopic and microscopic inspection, especially in those areas most susceptible to alteration, to determine whether or not there is an alteration and if it occurs, verify which modality was used in the document.
LM9TNB	Macroscopic Examination	The texte on the three pages of the questioned document is from a xerographic printing (laser)
	lateral light	Examination of the questioned document under lateral light, revealed no scrap marks (No scraping)
	Ultraviolet Light	Examination of the questioned document under ultraviolet light, (No trace of solvent)
	Spot Light (545-675) nm	Examination of the questioned document under Spot Light (454-675) nm, (Homogeneity in the color of the variable mentions)
LRH6GH	Visual Examination	Type of font,Type and ink colors, The physical characteristics of the paper, Line spacing, Page spacing are similar.
	Microscopic Examination	All three of them were printed with solid toner and were written with a ballpoint pen.
	Video Spectral Comparator (VSC)	- Ink Type: All pen inks glow the same way. - Indented: Light indents were found on all three sheets of paper but were not clear enough to read the text from the indents. - Transmitted/Overlays: All three documents have the same line spacing and page spacing.
	Indented Writing	- There are indentations from the writing of the 2nd and 3rd pages of the document on the 1st page. - There are indentations from the writing of the 1st and 3rd pages of the document on the 2nd page. - There are indentations from the writing of the 1st and 2nd pages of the document on the 3rd page.
LT2M8W	Visual Examination	No extra holes on pages. No significant differences in the general appearance or the positioning of the printing between pages.
	ESDA	Page 1: Indented impressions of the markings made with pen to page 3 (signatures and dates). Page 2: Indented impressions of the markings made with pen to pages 1 and 3. Page 3: Indented impressions of the markings made with pen to pages 1 and 2.
	Microscopic Examination	All pages made with monochrome toner expect certain markings made with pen. No significant differences in the appearance or details of the printing. No signs of tampering on the staple.
	Ruler	No significant differences in positioning of the texts between pages.
	Oblique Light	No signs of scraping, erasure or other alterations of texts.
	Video Spectral Comparator (VSC)	No signs of alterations in texts. No significant differences in the ink's optical properties in the markings made with pen. Coaxial light: Where the marking made with a pen intersects with toner (most notably the employee's signature), it was observed that the pen is likely to be on top of toner (glossy appearance was observed).
	Transmitted Light	No signs of scraping, erasure or other alterations of texts.

TABLE 2

WebCode	Methods/Techniques	Observations
LVQWCQ	Visual Examination	The visual examination disclosed that the three page document was prepared on letter size paper 8 ½ inches by 11 inches in dimension with machine printed entries, along with handwritten entries on all pages as well as signatures on page 3. A staple was observed to be used as a fastening device for the document. The staple holes present were observed to correspond to the staple that was present. Fold lines indicative of folding the pages back as a stapled unit were observed.
	Macroscopic/Microscopic Examination	The three pages of the document have been printed with an electrophotographic (EP) printer and the toner appearance is homogeneous throughout the document. On both sides of each page there is the presence of a trash (defect) mark that extends along the long edge of the page and is at the same location from the edge of the page. Additional trash (defect) marks were observed at different locations on the page but were not observed to be periodic in occurrence or at the same location. The hand printing and signatures have been written onto the document with black ballpoint pen ink. The ink morphology, color and overall appearance is consistent throughout the document. The font design is also consistent throughout the document. At the cross-over between ink writing and toner, there is the fluorescent behavior that is an indication that the writing ink is above the toner.
	Photoshop	Photoshop was used with the guides to verify the presence or absence of misalignments between the pages. None was detected.
	Video Spectral Comparator (VSC)	The three pages of the document have a similar response under ultraviolet (UV). Similarly, the ink on the three pages have a similar response under UV, infrared (IR) and luminescence .
	ESDA	Q1-1: indentations from the signatures and dates on page Q1-3 which suggest that Q1-1 was under Q1-3 when the signatures and dates were written onto Q1-3. Q1-2: indentations from the hand printing on Q1-1 and the signatures and dates on Q1-3, which suggest that Q1-2 was under page Q1-1 and Q1-3 when the document was prepared. Q1-3: indentation from some hand printing from Q1-1, from clauses 3 and 5 and indentation from the hand printing on Q1-2 which suggest that Q1-3 was under Q1-1 (when some hand printing has been written onto Q1-1) and Q1-2 when the hand printing was written onto Q1-2.
	Soft X-Ray	The Soft X-Ray analysis does not show any differences between the pages both in term of paper density and toner properties.
M3JRAM	ESDA	IW from previous pages that could be accounted for was present
	Microscopic Examination	Printing process examined on each page; printing process was consistent.
	Video Spectral Comparator (VSC)	Alternate light sources to examine optical ink characteristics and paper properties; no inconsistencies observed
M6966C	Ultraviolet Light	No chemical erasure observed quality of the three papers are same
	Transmitted Light	No mechanical erasure observed
	Infrared Light	No different Ink observed for hand printing
MBPRHG	ESDA	No indentations of value were noted.

TABLE 2

WebCode	Methods/Techniques	Observations
	Oblique Light	Indentations were observed on page 2 and page 3 with oblique light. These indentations came from the page above. All three pages contained feeder/gripper marks that demonstrate the paper went through either a laser printer or electrophotographic type machine.
	Video Spectral Comparator (VSC)	Examination of the ink on all three pages and the ink was consistent between the pages. Examined paper with UV and the pages reacted consistently.
	Micrometer	The papers measured .005" thick.
	Microscopic Examination	Examined the area containing the staple and all indentations on the first and third page coincided with the staple in the paper. The paper contained a fold directly to the right of the staple, the fold was consistent between all three pages. Exhibits Q1A-C were produced via an electrophotographic process.
	Magnetic Viewer	The toner was not magnetic.
	Ruler	Used E-ruler to examine the fonts and they were consistent on all 3 pages. The font measured 9 points on most of the document and 12 points where the documented contained larger letters on page one under Employment Contract.
	[No Method Reported.]	Typography grids - did not find any inserted text.
MWPUKW	ESDA	The only indented writing observed corresponded to the original writing from other pages.
	Video Spectral Comparator (VSC)	UV and IR light used to look for indications of page substitution and ink differences and signs of alterations.
	Macroscopic/Microscopic Examination	Staple holes and handwriting characteristics noted.
MWXT2R	Examination visually, microscopically, digitally and with infrared, ultraviolet and transmitted light.	The font and alignment of the machine printing on the Items 1A-1C questioned documents were examined visually, microscopically, and digitally with no overt discrepancies observed. The machine printing on Items 1A-1C was produced with an office machine system utilizing black toner. Toner is utilized in some office machines such as laser printers, photocopiers, and facsimile devices. The Items 1A-1C questioned sheets of paper were examined with no visible watermarks observed. The three sheets of paper exhibit similar class characteristics, such as size, color, and response to ultraviolet and infrared light sources indicating they may share a common source. However, it should be noted that paper of this type is produced in mass quantity and is available to the average consumer and should not be construed as a definitive identification. The questioned documents, Items 1A-1C, were submitted stapled together. Each document exhibited a single set of staple holes (4) with a corresponding diagonal fold pattern at the top of the pages. These holes and folds were noted to be in the same location on each page. No other staple holes were located on the documents.

TABLE 2

WebCode	Methods/Techniques	Observations
	ESDA	The questioned documents, Items 1A-1C, were examined for the presence of any indented writing, typing or other identifying impressions. These are impressions sometimes left on paper from writing, typing, or other markings done on another page while it was superimposed over the questioned material. The following impressions were recovered: Item 1A Front - Impressions sourced to the original writing on 1B (vacation days and sick days) and 1C (signatures and dates). Item 1B Front - Impressions sourced to the original writing on 1A (date, employee name, compensation amount, circle surrounding per annum and the number of months of probationary period) and 1C (signatures and dates). Indented Writing Examination: (continued) Item 1C Front - Impressions sourced to the original writing on 1A (compensation amount, circle surrounding per annum and the number of months of probationary period) and 1B (vacation days and sick days). Mechanical transport device impressions (roller marks) were recovered in the front and back of the questioned documents. There were no other meaningful impressions located.
	Video Spectral Comparator (VSC)	Various microscopic, infrared, and ultraviolet examinations were performed on the ink used to produce the original written entries on Items 1A-1C. This level of examination revealed that the ink used could not be differentiated and reacted similarly throughout the spectrum when comparing them with the other ink entries located on the same document.
N3LTUD	ESDA	All 3 pages of item 1 examined with ESDA back and front. The ESDA of page 1 contained latent indentations from handwriting and signatures from pages 2 and 3. The ESDA of Page 2 contained latent indentations from handwriting and signatures from pages 1 and 3. The ESDA of page 3 contained latent indentations from handwriting from pages 1 and 2. No further unsourced latent writing impressions were developed.
	Paper - spectral, visual, macro & microscopic exam	All 3 pages of item 1 display similar UV spectral properties under 365, 312 and 254nm, and transmitted 365nm. No evidence of chemical application to paper or other spectral differences of paper of the 3 pages observed using flood/spot and filters. All 3 pages apparent similar size, colour, opacity and fibre arrangement. No evidence of additional fastening/staple holes/impressions, or paper disturbances for alterations. No security features (overt or covert) observed.
	Printing - visual, macro & microscopic exam and overlay	All 3 pages similar laser printing process and toner. Similar margins and placement of header and pagination, line spacing and font over all 3 pages. Small repeated printing defect (light small vertical lines of toner) close to left margin (approx. 9mm from edge) observed on all 3 pages, repeating at similar intervals.
	Writing Ink - spectral, visual, macro & microscopic exam	Similar spectral reactions observed between ink entries on all 3 pages for IR absorption/reflectance/luminescence, with no notable differences. All ink entries in similar writing ink of black paste with no differences in morphology observed.
NJRXHQ	Examination Information	The items listed in this Certificate of Analysis were assessed and examined based on the methodology described in the Forensic Document Unit (FDU) Test Methods (unless otherwise noted). The methodology used included macroscopic, microscopic, paper, print process, ink, and indented impressions examinations, as well as a handwriting assessment. The laboratory request called for an examination of the three-page employee contract to determine if the document in Item 001 had been altered.

TABLE 2

WebCode	Methods/Techniques	Observations
	Macroscopic/Microscopic Examination	Paper Pages 1-3 in Item 001 reacted similarly to transmitted and ultra-violet lighting when assessed for paper fiber distribution and optical brightness. Pages 1-3 in Item 001 did not contain watermarks, fluorescent security fibers, or other distinguishing markings which could have been created during the manufacturing process. Pages 1-3 in Item 001 were bound with one (1) staple on the top left corner of the three-page document. One (1) diagonal fold along the top left corner near the staple was present on all three (3) pages. Print Process Pages 1-3 in Item 001 were printed with black toner technology. Ink The writing in Pages 1-3 in Item 001 was executed with black ballpoint ink. The inks reacted similarly to infrared luminescence and infrared reflectance.
	Indented Writing	Indented Impressions Pages 1-3 in Item 001 were processed for indented impressions. Indented impressions are generally impressions left on a document due to having been in contact with another document during the writing process. When deciphered, indented impressions may be subject to more than one interpretation. The initial indented impressions examination was conducted with the use of an oblique light source (side-lighting). Indented impressions were visible with side-lighting on Page 2 but were indecipherable. Pages 1-3 in Item 001 were suitable for an additional indented impressions examination with the Electrostatic Detection Apparatus (ESDA). Six (6) electrostatic detection device (EDD) lifts, individually marked as 001A1-001A6, were created from the front and reverse of Pages 1-3 in Item 001, respectively. The EDD lifts can be viewed in Item 001A. Sourced indented impressions were located on lifts 001A1-001A6, from the front and reverse of Pages 1-3 in Item 001. When the EDD lifts in Item 001A were placed on top of Pages 1-3 in Item 001, the sourced indented impressions overlayed. The findings suggested that: Page 1 was in contact with Pages 2 and 3 during the writing process of Pages 2 and 3. Page 2 was in contact with Pages 1 and 3 during the writing process of Pages 1 and 3. Page 3 was in contact with Pages 1 and 2 during the writing process of Pages 1 and 2. Unsourced indented impressions were observed on lift 001A6 in Item 001A, from the reverse of Page 3 in Item 001. The unsourced indented impression was deciphered as the number “2” on the lower left quadrant.
	Font Classification	Using reference materials available within the FDU, a font search was conducted on the sans serif font on Pages 1-3 in Item 001. The font was found to have class characteristics which most closely correlated to “Calibri” and other similar fonts. The classification was limited due to the lack of a complete character set of the font on Pages 1-3 in Item 001. The uppercase “G” in the word “Green”, located near the top edge of the paper in Pages 1-3 in Item 001 measured approximately 3/32”. The uppercase ”E” in the word “Employment” on the top left quadrant of Page 1 in Item 001 measured approximately ¼”. Based on the measurements of these characters, the sans serif font on Pages 1-3 in Item 001 had a size range of approximately 10 to 12 points.

TABLE 2

WebCode	Methods/Techniques	Observations
	Handwriting Examination	Pages 1-3 in Item 001 contained hand printing and numbers, excluding the two (2) stylized signatures on Page 3. The hand printing and numbers on Pages 1-3 appeared naturally written with good line quality, even pressure, and average skill. The two (2) "May 9, 2022" entries on Page 3 in Item 001 had differing features in number and letterforms. The writing features of the first "May 9, 2022" on Page 3 in Item 001 shared similarities with the number and letterforms of the writing observed on Pages 1 and 2 in Item 001. The two (2) signatures (Rachel Smith and Julie Andie) on Page 3 in Item 001 were stylized and mostly indecipherable. The signatures appeared naturally written with good line quality, with average speed and tapering on upward and downward strokes. The hand printing, numbers, and signatures on Pages 1-3 in Item 001 are suitable for a handwriting comparison.
	Remarks	The writing in Pages 1-3 in Item 001 were suitable for a handwriting examination. Please contact the FDU for information about the collection and submission of known standards if a handwriting examination should be needed in the future. Images of Pages 1-3 in Item 001 and EDD lifts 001A1-001A6 in Item 001A will be retained by the FDU.
NKJ3UA	Video Spectral Comparator (VSC)	There are no differences between optical properties of black ballpoint pen ink on three pages of the questioned document. There are no differences between optical properties of the paper of the questioned document.
	magnetic flux measurement by the Regula Magmouse	Magnetic properties of toner on every page of the questioned document are indistinguishable.
	ESDA	The indented writings visualized on every page of the questioned document corresponding with handwriting lines from other pages. Any other indented writings have not been found.
	Macroscopic/Microscopic Examination	No differences between fonts and the structure of printed letters on every page of the questioned document. Lines of printed text are parallel. Handwritings on the questioned document were made after text was printed.
NQM6WP	Magnification	Inks appear to be visually consistent. The inks appear to be ballpoint.
	Indented Writing	The writing that appears visually on page 1 is indented on page 2 The writing that appears on page 2 is indented on page 3.
	Video Spectral Comparator (VSC)	The optical characteristics of the ink formulations are consistent on pages 1 to 3 including the signatures.
	Ultraviolet Light	A UV examination was conducted on all three pages of the Contract. The three pages of the Contract share consistent UV properties.
NTD9MB	Visual Examination	Staple in upper left hand corner, with fold mark across all three pages. First two pages folded forward, last page folded backward. "Green Gardens Employee Hire Contract 2022" at the top of the page appears to correspond on all three pages, as does the "Page _ of 3" at the bottom of the page. No additional markings present observed.

TABLE 2

WebCode	Methods/Techniques	Observations
	Oblique Light	Page 1: Impressions noted in section 2 on page 1 - unable to read what is present. Impressions noted under section 1 on page 1 - "May (unreadable)" Page 2: Impressions in section 6 read "9th May 22" and "Julie Andie", which correspond to entries made on page 1, first paragraph. Impressions in section 8 are unreadable, but line up with the handwritten salary present on page 1. Cannot determine what the impression reads in this area. Impression in section 10 reads "3", which corresponds to the entry made on page 1, section 5. Page 3: Impressions in section 11 read "(unreadable) 5", which correspond to entries made on page 2, section 6. No additional markings observed under or around the original staple.
	Video Spectral Comparator (VSC)	See images in case file. UV light - all three pages appear similar under UV light, both directly above and transmitted underneath, at all 3 wavelengths. Transmitted light - words on top and bottom lines correspond for all three pages when staple holes are aligned. No watermark or other distinguishing features noted. Inks - Ink on all three pages reacts similarly. No dissimilarities noted across all ink entries. Oblique Lighting - Nothing further noted on all three pages.
	ESDA	Positive control with positive results. Positive control retained with one (1) ESDA lift from front of page 1, two (2) ESDA lifts from front of page 2, and one (1) ESDA lift from the front of page 3. Page 1 - Impressions recovered corresponding to the handwritten entries on page 3. Impressions revealed and deciphered to read: "(unknown signature) May 9, 2022 (unknown signature) May 9, 2022" Page 2 - Impressions recovered corresponding to the handwritten entries on page 1. Impressions revealed and deciphered to read: "9th May 22 Julie Andie 43,894 3" Impression of circle present on line with "43,894". When ESDA lift is overlaid on document Q-1 page 1, it corresponds to the positioning of "per annum". Page 3 - Impressions recovered corresponding to the handwritten entries on page 2. Impressions revealed and deciphered to read: "12 5" No impressions noted on backs of pages 1, 2, or 3.
NTDB9A	Ultraviolet Light	No chemical erasure Detected
	Transmitted Light	No Mechanical erasure Detected
	Infrared Light	same Ink used for hand printing
NXH43R	ESDA	No indentations were found which could not be associated with the visible handwriting.
	Video Spectral Comparator (VSC)	A similar ink was used to complete the handwriting. There is no evidence that any of the writing was altered using a second, different pen ink.
	Handwriting Examination	All hand writing appeared to have been completed fluently, with no signs of hesitation, tremor or additional strokes.
	Ruler	Margins were equal across all pages.
	Macroscopic/Microscopic Examination	Close observation did not reveal any damage to fibres, in the are of the writing which would indicate an attempt to alter the details.
	Examination of fonts, layout etc	The margins are consistent across the three pages. The same spacing, paragraph layout (justification) and font (Calibri) has been used across all three pages. There is nothing to indicate that there has been a page substitution.

TABLE 2

WebCode	Methods/Techniques	Observations
NYFCEV	Macroscopic Examination	I found that there is a fold in the top left corner of the contract and there are indented marks from the staple over the fold, which I would expect to find if the pages of the stapled contract had been flipped over and tucked underneath the others. Examination of staple for any evidence of removal of previous staple and no evidence found. Examination of general layout of the printed text for any inconsistencies and none were found. Similar toner marks noted in left margin of each page. I found no evidence of 'duplicate' toner marks.
	Microscopic Examination	Examination of printed text which was found to be black dry toner. I noted a similar 'speckled' appearance on each page.
	Indented Writing	Examination of each page of contract using oblique light and indented impressions found on each page, which appeared to be produced by entries on other page(s).
	ESDA	Indented impressions from all entries on page 1 found on pages 2 and 3. Indented impressions from all entries on page 2 found on pages 3 and 1. Indented impressions from all entries on page 3 found on pages 1 and 2. The positioning of these indented impressions is what I would expect to find if the handwritten details on the contract were filled in when the three pages were stapled with each page written resting on the other two pages; for example, page 1 is filled in and flipped back, so that page 2 is at the 'top' with page 3 underneath and with page 1 underneath page 3 and so on, throughout the 'pile'. Similar roller marks found on each sheet. I did not find any indented impressions of any writings other than those currently on the contract.
	Visual Examination	I found similarities in the general appearance of the paper of the three sheets. I found similarities in the general appearance of the black ballpoint pen ink entries on the three sheets. I did not find any evidence of alterations to the handwritten entries such as additional lines making the appearance of characters appear 'awkward' or 'squashed in'.
	Video Spectral Comparator (VSC)	Examination under specialised lighting; IR, UV and transmitted light. I found similarities in the physical properties of the three sheets of paper. I found the black ink entries on the three sheets to be indistinguishable.
P384MQ	Macroscopic/Microscopic Examination	3 page document, stapled. Removed staple for exam. Document was prepared using black toner (mounded beads sitting on top of surface, extraneous toner). Contains original HP and signatures; HP style is consistent throughout, though limited. Writing instrument - black ballpoint pen (striations, gooping) characteristics and color appear to be consistent throughout. Microscopic examination of Item 1 pg 1 near dollar amount - no evidence of staining, paper fiber disturbance, difference in ink color, no apparent alterations to handwriting. Staple holes, font, alignment, print processes all consistent across 3 pages
	Indented Writing	Page 1-3 all positive for indented writing via side lighting. ESDA positive, results show indentations consistent with handwriting on previous and later pages. No indication of alteration.
	Video Spectral Comparator (VSC)	Examination of handwritten compensation amount examined using alternate light sources and photography do not show any evidence of alteration. No difference in paper response to UV light or general print process (checking for page substitution).
P6BXJA	Ultraviolet Light	The document substrate was exposed to the ranges of 365nm, 312nm, not evidencing elements such as detachment of fibers or loss of opacity of the paper.

TABLE 2

WebCode	Methods/Techniques	Observations
	Infrared Light	the manuscript completion by Rachel Smith and Julie Andie show the same light absorption behavior in the infrared range of 665nm.
	Visual Examination	Aspects such as type of font, alignment, interlinear and interverbal spaces were verified, not finding elements that would allow the identification of any alteration.
	Video Spectral Comparator (VSC)	infrared fluorescence tool, exhibiting homogeneous behavior in the handwritten completion of the contract.
PDRBLF	Macroscopic/Microscopic Examination	Se realiza una inspección macroscópica de las características generales y particulares de los documentos y su estado de conservación. [Requested translation was not provided by time of publication.]
	Video Spectral Comparator (VSC)	Se utiliza el equipo para inspección microscópica de los ítem de inspección, teniendo en cuenta el tipo de sustrato, tintas, sistema de impresión, y elementos adicionales de seguridad, para identificar posibles alteraciones en los documentos inspeccionados. [Requested translation was not provided by time of publication.]
	Overlays	Se realiza superposición de las hojas para verificar si el tamaño de letra, espacios, márgenes, perforaciones del gancho de la cosedora, coinciden o tienen alguna diferencia. [Requested translation was not provided by time of publication.]
	Ultraviolet Light	Se utiliza la luz U.V en los documentos para buscar una posible alteración - toda vez que al ser expuesto el documento a la luz UV se pueden apreciar cambios en la tonalidad de las tintas y/o las posibles alteraciones se tornan visibles. [Requested translation was not provided by time of publication.]
	Infrared Light	Así mismo se utiliza luz de mayor longitud de onda que la luz visible para revisar alguna anomalía en cuanto a las tintas de los escritos. [Requested translation was not provided by time of publication.]
PNGWBC	Microscopic Examination	Similarities in print technology, font style and size, alignment, ink colour and morphology were observed on all pages of the questioned item. A single staple hole and fold was observed on each of the three pages. No fibre disturbance or signs of erasure or physical alteration were observed in the compensation amount on page 1.
	ESDA	Indentations were observed on each page that align with the writing from the other pages of item 1. No unattributed indentations were observed.
	Video Spectral Comparator (VSC)	No difference in optical response was observed within the ink in the compensation amount on page 1.
PQ69BG	Visual Examination	Each of the three pages were comprised of a pre-printed form with toner images on white paper. There was a single staple binding the pages together, and they had been folded back upon each other with the fold line in the staple region.
	Oblique Light	There is embossing of the handwriting, but fewer signs of impressions onto the faces of the pages.

TABLE 2

WebCode	Methods/Techniques	Observations
	Macroscopic/Microscopic Examination	There is black ball-point pen ink in the handwritten fields. This ink appears alike microscopically throughout the three pages. The signatures were freely and naturally formed. -The pre-printed contract was toner on white paper, with no observable differences in the toner printing or paper throughout the three pages. -There was no evidence of tracing found at the signature line for Julie Andie. -There were no surface abrasions which would have resulted if material had been removed anywhere in the contract. -There was no microscopic evidence of misaligned pen strokes in the written dollar amount at point 3.
	ESDA	The face and back of each of the three sheets were imaged and lifts were created.
	Video Spectral Comparator (VSC)	The video spectral comparator showed consistent responses of the pen ink on all three pages. The three sheets of paper showed consistent responses.
	Overlays	-The handwritten information on page 1 was impressed into pages 2 and 3. The handwritten information from page 2 was impressed into pages 3 and 1. The handwritten information from page 3 was impressed into pages 1 and 2. There was no misalignment of the 43,894 impressions on pages 2 and 3. -Electronic grid overlays showed that all three pages were consistent in line spacing, margins, indents, and layout. Overlays without grids also showed consistency in font throughout all three pages.
PR8CGK	Macroscopic/Microscopic Examination	Examined the document for consistency in alignment, spacing, printing process, staple holes, and other characteristics.
	Video Spectral Comparator (VSC)	Examined the document for consistency in the reaction of the paper and inks under various light sources and filters.
	ESDA	Examined the document for indented writing and was able to attribute indentations on one page to the other two pages, for each page of the document.
PW489K	Video Spectral Comparator (VSC)	a. The three pages of the Employment contract show no distinct UV fluorescence from each other. b. There is no difference in the response of the pen inks of the Employment Contract to infrared reflection and luminescence.
	ESDA	Indentations of handwriting on the first and second pages of the Employment contract are visible on the second and third pages respectively. The impression of the indentation perfectly overlaps the handwriting on the first and second pages not only in position but also in shape.
	Macroscopic Examination	There is no additional binding hole in the upper left corner of the first and the second page of the Employment contract. The three-page Employment contract shows no sign of rebinding.
Q9RMHD	Video Spectral Comparator (VSC)	Initially, a direct observation of the questioned document is carried out and later through the use of optical instruments and equipment with a wide field of vision, magnifying glasses and document comparator and through the use of different types of lights and wavelengths, no indications were found that allow establishing alteration of some kind to the document under inspection.
QEAEDE	Macroscopic/Microscopic Examination	The documents were examined with the stereomicroscope. The documents were produced by toner. The written entries were produced with a viscous ink. No erasures were observed. There are dissimilarities between the two 4s in the compensation entry. The first numeral 4, is dissimilar in size, proportions, pressure, and strokes related to the second 4. The staple holes were examined and there was consistent alignment.

TABLE 2

WebCode	Methods/Techniques	Observations
	Indented Writing	The documents were examined for indentations with oblique light and with the ESDA. The written entries were detected on the pages below. The third page entry was detected on the first page.
	Video Spectral Comparator (VSC)	The documents were examined with the VSC5000 for alterations. No discernable differences were detected in the documents or the compensation entry.
QZLLCK	Macroscopic/Microscopic Examination	
	Macroscopic Examination	
	Infrared Light	
R444BG	Visual Examination	No indented impressions observed. Additional blank line observed above the first line of text on Q3 (page 3) which is not observed on the previous two pages. Staple holes and crease/fold lines next to staple are consistent on all pages. No watermarks observed.
	Microscopic Examination	Dry toner print process on all pages. Ballpoint pen on all pages.
	Oblique Light	No indented impressions observed on all pages.
	Ultraviolet Light	All pages displayed the same optical properties.
	Video Spectral Comparator (VSC)	All pages displayed the same optical properties.
	ESDA	Indented impressions were observed on the ESDA lifts on Q1, Q2, Q3. However, those indented impressions are of the writings observed on the original evidence. Positive, no value.
R82HZR	Visual Examination	1. All 3 pages of questioned document (Item 1 – Employee Contract) showed similar paper characteristic in size and colour.
	Video Spectral Comparator (VSC)	1. No additional stroke or entries observed on all 3 pages of questioned document (Item 1 – Employee Contract) due to similar appearances observed on the all entries when exposed to different type of light. 2. All the handwritten entries on all 3 pages of the questioned document shows similar type of ink when observed under different type of light.
	ESDA	1. Indented handwriting was deciphered on three pages of the questioned document (Item 1 – Employee Contract) read as follows: Handwriting entries on page 1 9th May 22 Julie Andie Signature May 9, 2022 Signature May 9, 2022 43,894 3 Handwriting entries on page 2 9th May 22 Julie Andie Signature May 9, 2022 Signature May 9, 2022 43,894 3 Handwriting entries on page 3 12 9th May 22 5 Julie Andie Signature May 9, 2022 Signature May 9, 2022 43,894 3 2. Indented handwriting also deciphered on the reverse side of each page of the questioned document (Item 1 – Employee Contract). 3. The indented impression on all three pages of questioned document (Item 1 - Employee Contract) indicate the documents were attached together.
RFCYEJ	Visual Examination	One set of staple holes was noted in each sheet once the staple that was in it when submitted was removed.
	Macroscopic/Microscopic Examination	The printed material appearing on pages 1 – 3 were prepared with an office machine system that utilizes dry black toner.
	Typewriter Grids/E-Ruler	No inconsistencies were noted to indicate inserted/altered typewritten material.

TABLE 2

WebCode	Methods/Techniques	Observations
	Transmitted Light	There are no watermarks.
	Ultraviolet Light	The paper for each page fluoresced consistent with one another.
	Infrared Light	The inks absorbed consistently. The inks luminesced consistently.
	Indented Writing	Indented writing found on page 1 was consistent with the writing found on page 3. Indented writing found on page 2 was consistent with the writing found on pages 1 and 3. Indented writing found on page 3 was consistent with the writing found on pages 1 and 2.
	Thickness	Each sheet of paper was app. 0.004" in thickness.
RH28JE	Visual Examination	Examination of perforation from binding staple and crease pattern – the document was examined upon receipt for the staple binding the three pages together. There appeared to be only one set of staple holes corresponding for the pages. The staple was removed and the perforations were examined again. There is no evidence of the pages having been previously bound together other than the staple that was binding the documents upon receipt. There was a crease in the upper left corner at the staple that was consistent across all three pages with indentations on the back of the last page. This was consistent with the three bound pages (by the aforementioned staple) being folded over and the staple being pressed into the page it was making contact with – observed on the front of page 1 and rear of page 3.
	Crime-lite	- a screening of the documents was conducted to see if indentations were present utilizing the bright, oblique light – none were immediately observed.
	ESDA	- an examination for indentations was conducted by testing the front and back for all three pages submitted. Indentations were developed. Though the indentations developed had void areas on the face of some pages due to the printing repelling collection of toner in those areas, the analysis of the rear of the page (which was in contact with the page below it) yielded observable results. The original inked entries that were present on the three pages were observed as indentations on the other pages therein. This included the signature page leaving indentations on the first page of the three page set that was bound by the staple. This indicates that the signature page was placed on top of the first page and written directly above it to leave those recovered indentations.
	Video Spectral Comparator (VSC)	IRL response – Excitation Filter @ 485-590nm, Barrier Filter @ 715nm – Ink on all three pages had a similar response with strong luminescence noted for all inked entries. IRR response – Barrier Filter @ 665 – Ink on all three pages had a similar response where the inked entries were nearly invisible (and completely disappeared at longer wavelength filters). UV response – The three pages all exhibited a similar response to UV light. No differences in the response to UV light was observed at both 365nm and 254nm (no discernable difference in optical brighteners that could have been indicative of different paper used / or potential substitution).
	MagMouse	The three pages were examined for toner magnetism. All three pages were produced with a magnetic toner. Tests were conducted at two points on each page with consistent results throughout.

TABLE 2

WebCode	Methods/Techniques	Observations
RRUG9B	Macroscopic/Microscopic Examination	The questioned document consists of 3 pages of white copy paper of US letter size. A single staple in the top left corner holds the 3 pages together. A single set of staple holes is present in each page. A single diagonal fold is adjacent to the staple holes on each page. Under microscopic examination, toner spatter and other features of a fused toner print process were observed for the printed text on each page. The handwritten entries are in black ballpoint pen ink. Both the toner and the pen ink have similar appearance across all 3 pages. No discrepancies in the printed font were observed. The printed lines (for handwritten entries) have a similar notched appearance.
	ESDA	Indented impressions of handwritten entries of each page were detected on the other two pages of the contract. i.e. page 1 has impressions of the handwritten entries appearing on pages 2 and 3, and so on. These impressions are oriented indicating the three pages were neatly stacked together when the entries were made. The examination visualised the diagonal fold in the top left corner or each page. These align across the 3 pages. Impressions of printer roller marks were detected on each of the three pages, most prominent on pages 1 and 2, less so on page 3. This band runs vertically down the centre of the page. The position, width and nature is similar on all three pages. In addition, two aligned horizontal marks are present on page 1, approximately 1/4 of the way down the page.
	Spectral examination	All 3 pages show similar responses to UV-A, B and C light. The pen ink on each of the three pages shows similar spectral properties (within and between pages) throughout the spectral range from 400 - 1100nm.
	Overlays	Adobe Photoshop CS6 was used to create overlays of scans of the 3 pages. Staple holes, contract title (header), page numbering, line spacing within paragraphs and left margin align across all 3 pages (note that the contract header and page numbering are very slightly higher on page 1 than on pages 2 and 3).
	Transmitted Light	The paper of each of the 3 pages appears similar under transmitted light - no watermarks or other marks are evident.
RUUMNG	Visual Examination	All three pages in Item 1 were stapled together. Only one set of staple holes are present. All of the typed text within Item 1 appears to be the same font (Calibri.)
	Video Spectral Comparator (VSC)	None of the writing inks could be differentiated using non-destructive testing techniques. Appears to be same ink throughout document.
	Indented Writing	Both side lighting and ESDA was utilized for indented writing exam. Handwritten entries on pages 2 and 3 are indented onto page 1. Handwritten entries from pages 1 and 3 are indented onto page 2. Handwritten entries on pages 1 and 2 are indented onto page 3.
RY8C8Q	ESDA	There are indentations of handwritings on each page, which correspond to the handwritings on the other two pages. Especially the indentations of "43,894" and neibouring circle, corresponding to the exact handwritings on page 1, were left on page 2 and page 3, and the indentations of the employee's signature and date were left on page 1.
	Video Spectral Comparator (VSC)	There is no significant difference in the color and spectral properties of the paper and the ink entries on the three pages.

TABLE 2

WebCode	Methods/Techniques	Observations
	Macroscopic/Microscopic Examination	The handwritings on the three pages were written by ballpoint pen. The ink color and ink distribution of the handwritings show no significant difference. Additionally, no sign of modification or forgery was detected on the payment number "43,894" on page 1. The printed text was produced by electrostatic technique. The morphological features of the printed text on each page show no significant difference.
	Raman spectroscopy	The Raman spectra of the printed text on the three pages are identical.
RZ8ALT	ESDA	ESDA examination revealed indentations on pages 1 and 2 of both the employer and employees signatures (from page 3). Significant, as it strongly indicates that the employee signed page 3 of the contract with pages 1 & 2 of the contract below.
	Video Spectral Comparator (VSC)	VSC exam revealed no significant differences between the 3 pages of the contract and only similarities in the paper: Infrared absorption and fluorescence examination showed no differences between the ink used on each page. UV reaction pages 1- 3 observed to be the same. Print substrate (toner) was observed to be the same on each page.
	Visual Examination	Print font was observed to be the same on each page. Print alignment was observed to be the same on each page.
	Microscopic Examination	Single pair of staple holes observed. Would expect multiple (at least 2 pairs) of holes in an altered document.
	Micrometer	No significant differences in the thickness of the pages 1, 2 or 3 were detected.
T4BZKQ	Video Spectral Comparator (VSC)	Non-destructive visual and spectral examinations of the handwriting entry inks revealed no differences within each of pages 1, 2 and 3; it is possible a more definitive destructive chemical examination might define differences among the writing inks, if they exist. Relative paper UV reflectance quality, and vertical carrier lines on the back of each page, were consistent between pages 1, 2 and 3.
	Micrometer	The paper dimensions of 8.5" x 11" and thickness of .004", were consistent among pages 1-2-3. Relative UV reflectance quality, and vertical carrier lines on the back of each page, were consistent between pages 1, 2 and 3.
	Macroscopic Examination	Staple holes were consistent in size and relative positioning at the top left corner all three pages; folds were also consistent at the top left corner: a sample of three pages stapled and folded at the top lift, similar to the test material, was created: folds on pages 1-2-3 were consistent with test pages having been folded to allow entries to be written while pages were in one vertical stack.
	ESDA	Page 2 has indentations present were consistent with handwriting visible on pages 1 and page 3, with the exception of indentations corresponding to the dollar amount entry on the lower left of page 1, which was not decipherable. Several side-lighting exams and ESDA processing sequences on the front and back of page 2 failed to create readable indentations consistent with the amount entry on page 1.
TPRCHU	Video Spectral Comparator (VSC)	Any kind of alteration was not found under infrared light (VSC) either by the method of suppressive or additive.
	Video Spectral Comparator (VSC)	Under infrared light (VSC), from 640nm range to 960nm, finding that in all these ranges the inks (machine-print and handprint) from all 3 pages behave similarly i.e appear and disappear at the same ranges. Further examination also found no signs of alteration by chemical wash to the document.

TABLE 2

WebCode	Methods/Techniques	Observations
	Video Spectral Comparator (VSC)	Under UV light (VSC), at 254nm, 312nm and 365nm, all 3 pages show similar illumination. Also, any kind of alteration was not found under UV light either by the method of suppressive or additive.
	Macroscopic/Microscopic Examination	Examination to the staple holes indicates no extra holes found on pg.3.
U4B3KF	Macroscopic/Microscopic Examination	It is necessary to study if there is any type of alteration or modification in the document, for which a study is carried out on the support of the contract (substrate), the digital texts, the handwritten texts and the inks used to fill in the blank spaces. For this, direct observation and observation through the stereoscopic microscope of the three pages and their data are carried out, whose findings are evidenced in illustration No.2. Subsequently, the inks of the handwritten writings are analyzed by means of a physical study through the VSC6000HS Video comparator to know the spectral reaction of its components using for this purpose the exposure of the inks to different light radiation according to their absorption .
	Video Spectral Comparator (VSC)	Macroscopy: Used to observe in detail the morphology, size, alignment, spaces of digital and handwritten texts, as well as the physical characteristics of the document suhstrate and inks. Comparison by juxtaposition and superposition: observation techniques used to simultaneously compare alignment, spaces, text sizes. Micro spectrophotometry is used to analyze the spectral reaction by absorption and by fluorescence of the inks used in the handwritten and digital proccessing of the document.
UBDZEE	Visual Examination	Q1a, Q1b, and Q1c are stapled together with one (1) staple in the upper lefthand corner. Each page bears a single set of staple holes. The holes on Q1b are slightly wider than the holes on Q1a. The holes on Q1c are slightly wider than the holes on Q1a and Q1b. This is most likely due to friction and/or movement as the pages were turned and folded. The holes line up on each of the pages. The pages also each bear a single fold near the staple where the pages were folded over. The fold lines up on each of the pages. No evidence of a second set of staple holes was observed on any of the pages
	Video Spectral Comparator (VSC)	Q1 (including the front and back sides of Q1a, Q1b, and Q1c) were examined with various light sources and wavelengths of radiation and with magnification. No differentiation of the ink writing was observed with the longpass filters between 530nm-925nm. No ink differentiation was observed with ultra-violet (UV) light between 254nm-365nm or with spot integration. No evidence of erasures or broken paper fibers was observed with side lighting or magnification.
	ESDA	Indentations from the writing on Q1a were developed on the back side of Q1a, the front and back sides of Q1b, and the front side of Q1c. This means that Q1a was on top of Q1b and Q1c when the handwriting was added to Q1a. Indentations from the writing on Q1b were developed on the back side of Q1b, the front side of Q1a, and the front and back sides of Q1c. This means that Q1b was on top of Q1c and Q1a when the handwriting was written on Q1b. Indentations of the writing on Q1c were developed on the back side of Q1c, the front and back sides of Q1a, and the front side of Q1b. This means that Q1c was on top of Q1a and Q1b when the handwriting was written on Q1c.
UGJXJC	Macroscopic Examination	Mark by the staple can be found on the last page of the contract, and black lines by the printer was similar to each page.

TABLE 2

WebCode	Methods/Techniques	Observations
	Oblique Light	Impression marks were detected on the each page. Figure of the impression marks are identical to the handwritings on the previous page(i.e. second page handwriting --> last page impression mark)
	Video Spectral Comparator (VSC)	Impression by the handwritten characters can be observed in the near-infrared light mode of the VSC. Impression marks of the employee can be found on the first page, especially employee`s signature. When imposing the impression marks on the first page and employee`s signature and date(written by empolyee) on the last page, they are posed on the very similar position on the paper.
UMMRU8	Handwriting Examination	Compare writing of Ms. Smith on Employment Contract, and it was consistent. Handwriting of Ms. Andie was different than the writing of Ms. Smith.
	Oblique Light	Observed indentations made by handwriting on each page.
	Magnification	Did not see signs of alteration or erasures on the Employment Contract.
	Ultraviolet Light	All three pages fluoresce at a similar manner.
	Visual Examination	Marginalia and indentions of paragraphs appear to be consistent amongst the three pages.
	Folds/Staple holes	There was a similar fold near the staple mark in the upper left corner of each page. There were no additional staple holes on the upper left corner of the documents, besides the two holes that were made by the one staple that exists on the document.
UPC4J6	Visual Examination	All the 3 sheets of the employee contract were similar in their size. No holes (except the staple holes at the top left corner), tear, folds, creases, and/or defects were found on these pages. The font style and line spacing of the printed text were similar. The position of the header and footer as well as the left margin of the paragraphs on the 3 pages of the contract were agreeable with each other. No signs of alteration or tampering to the handwriting and signatures were observed. However, faint indented impressions were observed by oblique light.
	Video Spectral Comparator (VSC)	No watermarks were observed by transmitted light. Ultraviolet fluorescent properties of the 3 sheets of paper were similar. The optical properties of the writing ink of the handwriting and signatures on the 3 pages were similar.
	ESDA	Indentation marks revealed on each page of the employee contract by ESDA were summarized as follows: (i) Indentation marks corresponding to handwriting "12" and "5" on page 2 and signatures of company official and employee and the respective dates "May 9, 2022" on page 3 were found on page 1. The indentation marks and the handwriting entries were found to be superimposable with each other. (ii) Indentation marks corresponding to handwriting "9th" "May", "22", "Julie Andie", "43,894", a circle mark and "3" on page 1 and signatures of company official and employee and the respective dates "May 9, 2022" on page 3 were found on page 2. The indentation marks and the handwriting entries were found to be superimposable with each other. (iii) Indentation marks corresponding to handwriting "9th" "May", "22", "Julie Andie", "43,894", a circle mark and "3" on page 1 and "12" and "5" on page 2 were found on page 3. The indentation marks and the handwriting entries were found to be superimposable with each other.

TABLE 2

WebCode	Methods/Techniques	Observations
UPD3DD	Video Spectral Comparator (VSC)	The VSC 8000 was utilized to view the Item 1 (pages 1-3) contract under different light sources before and after the staple was removed.
	Oblique Light	Using oblique light, the staple area was viewed on the front of page 1 and the back of page 3. The holes did not appear enlarged or show any unexpected indentations around the staple. All three pages have creases on the bottom right corner and at the top center. These creases occurred before arriving at the laboratory. The indentations and holes are consistent with the staple not having been removed and replaced.
	Flood Light	There is a misalignment of stapled pages 1 and 2 but the forensic significance of this could not be determined.
	Ultraviolet, Spot Fluorescence, Transmitted & Oblique Light	These light sources did not reveal any additional information such as a watermark or UV fluorescent security features on the contract. The handwritten numbers on pages 1, 2, and 3 do not show any evidence of alteration.
	ESDA	The indentations found on the front of page 1 originated from pages 2 and 3; indicating that page 1 was under pages 2 and 3 when the contract was signed and dated by the two parties in this case. The reversed indentations found on the back of page 1 originated from the fronts of pages 1 and 3. The indentations found on the front of page 2 originated from pages 1 and 3; indicating that page 2 was under pages 1 and 3. The reversed indentations found on the back of page 2 originated from the fronts of pages 1 and 2. The indentations found on the front of page 3 originated from pages 1 and 2; indicating that page 3 was underneath pages 1 and 2 when the handwriting occurred. The reversed indentations found on the back of page 3 originated from the fronts of page 2 and 3.
	ESDA	The order of the indentations supports the statement from the company official, Rachel Smith, that they did not make any changes to the document after the employee, Julie Andie, signed the contract.
UVGWM9	Oblique Light	OBLIQUE LIGHTING DID NOT REVEAL ANY SUSPICIOUS DETAILS
	Microscopic Examination	ALL INK WAS EXAMINED UNDER MICROSCOPE. THE EXAM REVEALED WET INK ORIGINAL HANDWRITING ON ALL PAGES.
	Magnification	MAGNIFIED EACH PORTION OF THE THREE PAGES. UNDER MAGNIFICATION THE INK APPEARS TO BE ORIGINAL WET INK.
V7CLMG	Visual Examination	a) The document is prepared on three sheets of bond-type commercial paper, these sheets have staple holes in their upper left corner, they had matching holes on the three sheets. b) In addition to the above, the support does not present mutilations, additions or amendments that suggest a conversation on it.
	Macroscopic/Microscopic Examination	c) The document presents a black laser print in both the text and the fill lines, with the same type of print for the three pages. d) The filling of the document corresponds to handwritten writing embodied in black ballpoint ink.

TABLE 2

WebCode	Methods/Techniques	Observations
	Video Spectral Comparator (VSC)	e) When carrying out the spectral analysis on the content of the document, two spectral responses are obtained: one of Absorption for the text and digital printed format and one of luminescence for the filling of sheets 1 and 2, as well as the signatures and dates from sheet three. The use of more than one ink in filling out the document was not identified. f) When using transmitted light in the overlapping of the document sheets, the same alignment can be observed in the printing of the text, for which the same spacing can be established in the margin of the sheets that make up the document. g) The printed text, as well as the text embodied by hand, does not present additions, deletions, coatings, scratches or emendations that infer an alteration in the content of the document. h) With respect to the elements of sheet three, signature and dates, which present direct crosses with respect to the line, by zooming in on said crosses it is possible to establish that the pen ink print passes over the line print. i) No modifications were found that infer alterations both in the support and in the inks and prints that make up the document.
VFWRL7	Video Spectral Comparator (VSC)	Through the use of the VSC, different wavelengths of infrared light were used in order to verify the completion of the contract without evidencing any alteration in the substrate or in the inks present in the completion of this
VGT8UW	Microscopic Examination	Document has been produced using dry toner. Handwriting is in black ballpoint pen ink and appears visually similar throughout. no evidence of alterations/additions/erasures noted. One set of staple holes noted although some 'pulling'.
	ESDA	Examination showed impressions on page 1 from pages 2 and 3; impressions on page 2 from pages 1 and 3; impressions on page 3 from pages 1 and 2. All of the impressions of writing align and so the handwriting which caused these impressions must have been made whilst the three sheets were together with the edges aligned. For example, if the sheets were stapled together and folded back on each other after the handwriting on each sheet was completed. No impressions of writing from an unknown source were found.
	Oblique Light	
	Video Spectral Comparator (VSC)	The ink on each page was examined. It was not possible to compare the ink on different pages with each other. On each page, the black ballpoint pen ink behaves in a similar way. No detectable differences were noted in the ink on each page. Thus, the handwriting on each page has been completed in at least one ink. i.e. more than one ink could have been used on each page, but the inks cannot be discriminated using this technique.
VQVP6Y	Visual Examination	The questioned document is verified visually based on the description submitted by the Collaborative Testing Services; package observation, paper amount, tonality and general conditions.
	Macroscopic Examination	No tonality changes observed on sheet surface. No tonality changes observed on printed area. No retouches (overlapped printing) on the printed text nor the handwritten text. No added text on the printed text nor the handwritten text. No irregular spacing on the fill-in areas. No mismatched staple marks. No text alignment to the right on the three sheets. The first paragraph of the third sheet of the contract shows double spacing. There is a slight mismatch on the left margin located in third paragraph of the third sheet of the contract.

TABLE 2

WebCode	Methods/Techniques	Observations
	Microscopic Examination	Using the optical magnification equipment, there is no ink or toner residues observed on the fill-in areas; it was identified only one printing system on the whole document, with no overlapped nor added traces or items. While observing the staple marks, no additional holes are perceived.
	Transmitted Light	The mass of the paper does not present wearing nor thinner parts in the printed area nor the fill-in format.
	Oblique Light	No brittle fibers nor detached fibers were observed.
	Ultraviolet Light	Paper presents brilliance with no changes of tonality, nor stains that may suggest an ink washing.
	Infrared Light	Regarding the infrared analysis, it is observed uniformed absorbency in the fill-in areas with letters and numbers on the whole document; likewise, it shows uniformity by fluorescence. Regarding the infrared radiation for pigment removal (MEPRI in Spanish), it can be observed only one indentation on the traces.
	Video Spectral Comparator (VSC)	The signature and dates on the third sheet were analyzed using the 3D imaging module tool, observing firstly the format was printed and secondly signed and/or dated, accordingly.
VT4Y8J	Document Alteration Analysis Method	
VTNK29	Infrared Light	ink used in writing is all similar
	Transmitted Light	no eraser can be seen
	Ultraviolet Light	no chemical eraser can be seen
VUML8Z	Video Spectral Comparator (VSC)	Using IRL and IRR, no differences in ink response were noted between the Compensation entry (43,894) and the other handwritten entries.
	Microscopic Examination	No evidence of erasure or alteration was noted in the handwritten Compensation entry.
	ESDA	All the handwritten entries on page 1 have recorded on pages 2 and 3. All the handwritten entries on page 2 have recorded on pages 3 and 1. All the handwritten entries on page 3 have recorded on pages 1 and 2. No unsourced indentations were located. A consistent pattern of printer roller marks appear on all three pages.
	Oblique Light	A strong crease in the top left corner of the document and indentations from the staple mirrored across this crease are consistent with the pages of the contract having been folded back on themselves while stapled.
VWRBCU	Microscopic Examination	Microscopic examination showed: - handwritten entries were made by black ballpen or black ballpens; - titles, contents on all three pages and positions for entries were printed by use black laser jet technique. There were no diffrences in the structure of black toner between the pages
	Video Spectral Comparator (VSC)	Observation in VIS, UV and IR showed: - no differences in the optical properties of papers; - no differences in the optical properties of handwriting. Observation in oblique light showed indentations from handwriting on all pages of the document.
	ESDA	On every page were revealed indentations from handwriting which are identical to the handwriting on previous pages.
	ECCO	Paper analysis of both pages showed no differences in the ratios of the elements.

TABLE 2

WebCode	Methods/Techniques	Observations
W2ZWX7	Visual Examination	Visual examination of Exhibits 1(1)(a and b), 1(2)(a and b) and 1(3)(a and b) were conducted.
	Microscopic Examination	Microscopic examination of Exhibits 1(1)a, 1(2)a and 1(3)a was conducted. The questioned hand printed and signature inked entries on Exhibits 1(1)(a), 1(2)(a) and 1(3)(a) were prepared using black ballpoint ink. The questioned machine-generated entries on Exhibits 1(1)(a), 1(2)(a) and 1(3)(a) were prepared using toner printing technology. No font differences or alterations were observed within the questioned machine-generated entries on Exhibits 1(1)(a), 1(2)(a) and 1(3)(a).
	Video Spectral Comparator (VSC)	Alternate light source examinations of Exhibits 1(1)(a and b), 1(2)(a and b) and 1(3)(a and b) were conducted. The questioned paper and inked entries within Exhibits 1(1)(a and b) were compared with the questioned paper and inked entries within Exhibits 1(2)(a and b) and 1(3)(a and b). No ink differences or alterations were observed within the inks on Exhibits 1(1)(a), 1(2)(a) and 1(3)(a). The inks on Exhibits 1(1)(a), 1(2)(a) and 1(3)(a) were not distinguishable at this non-destructive level of analysis. If chemical analysis of the inks is requested, the evidence should be sent to a laboratory that conducts destructive ink examinations. The questioned paper within Exhibits 1(1)(a and b), 1(2)(a and b) and 1(3)(a and b) originated from or shares a common source.
	Indented Writing	Electrostatic Detection Apparatus (ESDA) examination of Exhibits 1(1)(a and b), 1(2)(a and b) and 1(3)(a and b) was conducted. Indented handwriting and machine-created impressions were observed on Exhibits 1(1)(a and b), 1(2)(a and b) and 1(3)(a and b); however, some of the handwriting impressions on Exhibits 1(1)b, 1(2)b and 1(3)b are not of evidentiary value. Indentation lifts were created to preserve the results of the ESDA examination.
	Digital preservation/processing	Exhibits 1(1)(a and b), 1(2)(a and b) and 1(3)(a and b) were digitally preserved. The ESDA indentation lifts were digitally processed.
WB64FQ	Video Spectral Comparator (VSC)	No detectable aggregates, grafts, trims, chemical washes or mechanical erasures.
	ESDA	It is found that the indented writing present on page 2 is consistent with the visible writing on page 1. On page 3 there is an indented writing product of the marks of the writing present on page 1 and page 2.
	Microscopic Examination	The printing system of the three pages of the questioned document is the same.
	Visual Examination	The characteristics of the supports (sheets of paper) in dimensions and materials are consistent.
WT6UWU	Macroscopic/Microscopic Examination	-no manipulation traces -first toner then writing ink -no indication of staple opening -no visible differences between writing ink
	Infrared Light	no visible differences between papers and writing ink
	Ultraviolet Light	no visible differences between papers
	Transmitted Light	no differentiable paper structure
	Micrometer	no differences in thickness
	ESDA	all traces can be recognized almost true to position
	Scales	no significant weight deviations

TABLE 2

WebCode	Methods/Techniques	Observations
	Magnetiziability of the toner	toner on all pages are magenitzable
XJACJ6	Video Spectral Comparator (VSC)	It was observed that the handwriting and signatures on the document were written with the same pen by using VSC 6000
	Macroscopic/Microscopic Examination	No post-corrections were observed in the handwritings on the pages of document by using microspe and eyes.
	Oblique Light	Pen pressure of handwriting on first page is observed on page 2 and 3 of the document and pen pressure of handwriting on second page is observed on page 3 of the document by using oblique light.
Y6QADQ	ESDA	Indented writing found on the back of each page (eg. entries of page 1 found on page 2, entries of page 1 and 2 found on page 3). All entries consistent with the entries of the previous page. No changes detectet.
	Infrared Light	No anomalies were found.
	Ultraviolet Light	No anomalies were found.
	Thickness	No difference in the paper thickness of page 1, 2 and 3 discernible.
	Microscopic Examination	No scratch marks or similar evidence of tampering. No obvious differences in the appearance of the print deposit.
	Tangenting t-crossing	Handwritten entries were added after the contract was printed. No blind entries.
	Magnetism	All pages were produced using magnetic toner material. No differences between the individual pages discernible.
	Screen structure	No differences between the respective pages discernible.
Y9CRTQ	[No Method Reported.]	The documents were examined visually under the stereo magnifying glass on the one hand and in the docucenter with various light sources (IR, UV, transmitted light, etc.) on the other.
YLY2HG	Visual Examination	(a). There was no physical changes observed in the questioned writing on pages 1 - 3 of Item 1 as well as the questioned signatures on page 3 of Item 1. (b). All questioned writing and signatures were written in black ink only. (c). Printed matter: No visible addition, deletion or damage to the surface of Item 1. (d). No trash marks were observed.
	Infrared Absorption	On pages 1 - 3 of Item 1: (a). All pen ink strokes disappeared at wavelength 965nm. (b). All printed matter disappeared throughout the wavelength range 645nm to 1000nm.
	Infrared Fluorescence	On pages 1 - 3 of Item 1: All pen ink strokes fluoresce at wavelength 695nm with filters (wavelength 400nm - 640nm).
	Ultraviolet Light	On pages 1 - 3 of Item 1: All pen ink strokes fluoresce at wavelength 365nm, 312nm and 254nm.
	Microscopic Examination	On pages 1 - 3 of Item 1: (a). All printed matter consisted of similar Font Size and Shape. (b). All questioned writing and the two (2) questioned signatures consisted of original ink strokes indicative of the striations observed.
	Oblique Light	On page 1 of Item 1: No indentations were observed. On page 2 of Item1: Indentations were observed i.e. the date '9th May 22', name 'Julie Andie', amount '43,849', circle around the word 'per annum' and number '3'. On page 3 of Item 1: Indentations were observed i.e. numbers '12' and '5'.

TABLE 2

WebCode	Methods/Techniques	Observations
	ESDA	On page 1 of Item 1: No indentations were observed. On page 2 of Item1: Indentations were observed i.e. the date '9th May 22', name 'Julie Andie', amount '43,849', circle around the word 'per annum' and number '3'. On page 3 of Item 1: Indentations were observed i.e. numbers '12' and '5'.
YTFH86	Visual Examination	Visual examinations of Exhibits 1(1)(a and b) through 1(3)(a and b) were conducted.
	Indented Writing	Side lighting and Electrostatic Detection Apparatus (ESDA) examinations of Exhibits 1(1)(a and b) through 1(3)(a and b) were conducted.
	Macroscopic/Microscopic Examination	The questioned machine-generated and inked entries on Exhibits 1(1)a through 1(3)a were examined microscopically.
	Video Spectral Comparator (VSC)	Alternate light source examination of Exhibits 1(1)(a and b) through 1(3)(a and b) were conducted.
	Digital preservation/processing	Exhibits 1(1)(a and b) through 1(3)(a and b) were digitally preserved. The ESDA indentation lifts were digitally preserved and processed.
YVL3RY	Transmitted Light	There was no eraser alteration detected
	Ultraviolet Light	No chemical eraser detected
	Infrared Light	same ink used in hand writing
Z49JNE	ESDA	Used ESDA to evaluate whether indented writing corresponded to patent writing on other pages.
	Indented Writing	Evaluated whether indented writing corresponded to patent writing on other pages or if there were indications of indented writing from other sources.
	Video Spectral Comparator (VSC)	Evaluated the document for optical consistency/evidence of insertions/deletions.
	Macroscopic/Microscopic Examination	Evaluated document for internal consistency/inconsistencies.
Z4LBEA	ESDA	Con el uso del equipo ESDA, analicé las marcas endentadas visibles en el contrato cuestionado en el cual se resaltó lo siguiente: En la zona superior de la primera página se logra observar las marcas endentadas correspondientes a las firmas y fecha de la página 3. Pag.2, zona superior se resaltan: El número 9 • La palabra “May” El número 22. • El nombre Julie Andie. Pág.2, zona inferior se resaltan: Se observa una figura con forma similar a un ovalo El número 3. En la Pág.3 zona superior se resaltan: • Los números 12 y 5. Pág.3, zona inferior se resaltan: El número 43,894. Se observa una figura con forma similar a un ovalo. [Requested translation was not provided by time of publication.]
	Indented Writing	se observaron escrituras latentes o pesadas en las tres páginas del contrato. [Requested translation was not provided by time of publication.]
	Oblique Light	La muestra cuestionada (contrato), al ser expuesto a la luz rasante y filtro al anverso del mismo se observa marcas de escrituras latentes, las cuales guardan relación entre ellas. [Requested translation was not provided by time of publication.]
	Infrared Light	Al someter las diferentes escrituras manuscritas que se ubican en el documento cuestionado a los distintos filtros se observa que las mismas reaccionan igual, lo que indica que fueron realizadas con el mismo elemento escritor. [Requested translation was not provided by time of publication.]

TABLE 2

WebCode	Methods/Techniques	Observations
	Magnification	En la zona superior izquierda, se aprecian orificios causado por el retiro de la grapa los cuales, al someter a luz directa y aumento se logra observar, que corresponden en tamaño tanto de la página 1 como de la página 2 y la página 3. [Requested translation was not provided by time of publication.]
	Video Spectral Comparator (VSC)	con este equipo critico del laboratorio se observaron los orificios, la reacción bajo la luz ultravioleta de las páginas, la pertenencia de una con la otra al visualizarse las marcas Indentadas de igual manera con los filtros se observaron la examinación visual de tintas. [Requested translation was not provided by time of publication.]
	Ultraviolet Light	La muestra dubitada (contrato), al ser sometido a la luz ultravioletas, se observa que el soporte del papel de las tres páginas reacciona de una misma tonalidad. [Requested translation was not provided by time of publication.]
	Transmitted Light	En la zona superior izquierda, se aprecian orificios causado por el retiro de la grapa los cuales, al ser sometidas a luz transmitida se logra observar, que corresponden en tamaño tanto de la página 1 como de la página 2 y la página 3. [Requested translation was not provided by time of publication.]
	Visual Examination	se observaron: * se observa que todo el documento mantenía una grapa en la zona superior izquierda. * La correspondencia de los orificios de la grapa mencionada. * El color de la tinta del elemento escritor, visible en la escritura manuscrita en distintos lados del documento. [Requested translation was not provided by time of publication.]
	Ruler	Al sobreponer las reglas (plantillas milimétricas) ante las escrituras impresas, observé que el diseño de la fuente es serif, tamaño N°10 en las tres páginas. [Requested translation was not provided by time of publication.]
	Macroscopic/Microscopic Examination	Se observo: * Que la escritura manuscrita y firmas visible en el documentos cuestionado (contrato), fueron realizadas en original. [Requested translation was not provided by time of publication.]
Z88WGK	Vaccum Box	Revelation of tracks of treading The traces revealed on all pages correspond to writings readable on the other pages. On the front of page 2, tool marks have been revealed
	Video Spectral Comparator (VSC)	Printing techniques: The three pages are printed in laser, mono component toner. Ink differentiation: (infrared, ultraviolet) No ink differentiation is detected
ZAYVY3	Macroscopic/Microscopic Examination	Black ballpoint ink, toner, toner trash marks, one set of staple holes
	Video Spectral Comparator (VSC)	Captured images, paper reacted similarly under Ultraviolet light, no watermark, writing ink reacted similarly, toner reacted similarly
	ESDA	Handwriting indented impressions on Exhibit 1 correspond with the original writing on the three-page document; machine-created indented impressions are similar in position and style
ZERRNT	Video Spectral Comparator (VSC)	The study of the questioned document under the stereoscopy microscope and video spectral comparator, suggests that the questionned document has not been altered
	Microscopic Examination	
ZGLEJ7	Infrared Light	The optical components of ink between characters are similar

TABLE 2

WebCode	Methods/Techniques	Observations
	Handwriting Examination	The handwriting of the employee is different from that of the employee
	Microscopic Examination	No additional entry or modification of handwriting observed
ZGTYRD	Video Spectral Comparator (VSC)	As a first measure, a preliminary inspection of the document was carried out where at first glance it was observed that said document does not show any type of manipulation. Subsequently, the doubtful element "contract" was subjected to the VCS8000 wide visual and light field instrument, in order to submit it to the different lighting sources and check if this format shows any type of manipulation or alteration in its format; finding that at the different passage of infrared light sources 640-720nm, no traces of deletions or additions were observed in its content in general.
ZJMJYC	ESDA	Indentations present on all three pages source and overlay/correspond to the inked entries on the document. Sequence is consistent with expected document production and handling practices.
	Macroscopic/Microscopic Examination	Consistency in print process (EP), general trash mark appearance, and document layout across all three pages. Staple holes, staple marks, and corner creases consistent with expected document production and handling practices. No observable physical erasures to inked entries.
	Video Spectral Comparator (VSC)	Similar response from paper substrate and inked entries across all three pages.
ZY4H2R	Visual Examination	Document Q-1 through Q-3 were examined for Impressions and Indented Writings. Positive for Impressions. Staple holes were aligned.
	Oblique Light	Document Q-1 through Q-3 were examined using Oblique Lighting for Impressions and Indented Writings. Positive for Impressions.
	Video Spectral Comparator (VSC)	Inks on Document Q-1 through Q-3 all reacted the same, fading out at 695nm (filter). No dissimilarities noted with all ink entries. Solid black font noted on all three Documents.
	ESDA	Positive control with positive results. Document Q-1: Impressions recovered from the handwritten entries from Document Q-3. Impressions reads: (unknown signature) May 9, 2022 (unknown signature) May 9, 2022 Document Q-2: Impressions recovered from the handwritten entries from Document Q-1. Impressions reads: "9th May 22" "Julie Andie" "43,894" An Impression of a "Circle" to the right of "43,984" entry. It corresponds to the positioning of "per annum" Document Q-1. Document Q-3: Impressions recovered from handwritten entries from Document Q-2. Impressions reads: "12" "5" An Impression of a "Circle" to the right of "43,984" entry. It corresponds to the positioning of "per annum" Document Q-1.

Response Summary

Participants: 165

Methods Utilized

ESDA	94	Magnification	10	Thickness	4
Handwriting Examination	11	Micrometer	8	Transmitted Light	32
Indented Writing	20	Microscopic Exam	56	UV Light	35
Infrared Light	31	Oblique Light	36	Visual Exam	64
Macroscopic Exam	20	Overlays	11	VSC	134
Macroscopic/Microscopic Exam	48	Ruler	9		

Note: Methods listed are the preloaded options for selection via the CTS Portal and do not reflect all answers provided by participants.

Conclusions

TABLE 3

WebCode	Conclusions
2FL3W2	In my opinion, there is no evidence the contract has been altered.
2JUJV4	The document Q1 object of inspection does NOT present alterations in its materiality.
2LARD6	Evidence shows the questioned document HAS NOT BEEN ALTERED. There's only one staple was found in the three sheets of paper , only one source of ink was used in handwritten of three pages , and every handwritten could be observed on the next page by esda.
3AM4KP	There is no evidence to support substitution of pages, completion after the fact or alteration of the amount on the 1st page.
3EHXHQ	Physical and instrumental examinations of the three-page document (Item 001) resulted in the following opinion: After a thorough examination of the Item 001 document, there are no characteristics observed to indicate that the document was altered.
3GCEF8	Upon completion of an examination of the Q-1 exhibit, it is the opinion of this examiner that the Q-1 exhibit has probably not been altered. All macroscopic, microscopic, spectral and instrumentation exams did not reveal any evidence that would indicate an alteration or page substitution to the questioned exhibit. This is not a conclusive opinion due to no genuine, similar-type document submitted for comparison. A more conclusive opinion may be possible with the submission of a genuine, contemporaneous employment contract (a known item, not in dispute) that will allow comparison of like features to the questioned exhibit.
3J3KUC	Based on our examinations, in our opinion, the questioned document has not been altered.
3PPD6C	On further examination, I found that there was no evidence of alteration detected on first, second and third pages of the questioned document. The ESDA examination on the first page of the questioned document revealed indented writing consistent to the handwritten entries on the third page of the questioned document. Hence, I am of the opinion that the questioned document has not been altered.
3UW2JD	No evidence of significance was found to indicate that Item 1, three-page employee contract between Julie Andie and Rachel Smith, was altered .
3UXXP3	Methods Item #1 was examined using various techniques: Magnification using a hand lens and a microscope Instrumental examination using various light sources Instrumental examination to develop indented writing Conclusions Examination of item #1 did not reveal evidence of alteration. Therefore, item #1 was probably not altered. The paper and inks on item #1 could not be differentiated using the available light sources. This does not preclude the possibility that more than one type of paper or ink was used to create item #1. The staple holes and folds are consistent within the pages of item #1. The developed indented writing is consistent with the documents being written on after they were stapled together. Indented writing was developed on page 1 from page 3. Indented writing was developed on page 2 from pages 1 and 3 indented writing was developed on page 3 from pages 1 and 2. Remarks: Images of this examination are being returned to your agency. Item #1 is available for return.
3VN449	The questioned document HAS NOT BEEN ALTERED.
3VU87Y	The examination of Item 1 (Q1) pages one to three, show the following findings. The three pages appear consistent in paper, opacity and surface. They all consist of machine generated text, using black toner and the same sans serif font type. Margins and alignment also appear to be consistent. The writing implement is a black ball point pen with paste and there is no indication of overwriting/alterations or multiple writing implements within the pages. The ESDA developed sourced (known) indentations and indicate that that Page 1 was written on top of pages 2 and 3, page 2 was written on top of page 3. The indentations developed also show that page 3 was signed and dated on top of pages 1 and 2. No unsourced indentations were developed on any of the pages. One fold line was observed on each page and is in the same location, which is diagonally under the staple in the top left corner. There are two

TABLE 3

WebCode	Conclusions
	staple holes on each page and are consistent with the current staple legs penetrating the paper to secure the page. Based on these findings, the evidence provides support that there were no signs of alteration to the question document Item 1 (Q1) pages 1 to 3.
3VWYXF	RESULTS & CONCLUSIONS After analyzing the evidence in this case, the following opinion has been formed: It has been determined that the three page Employee Contract in Submission 001 (001-A, 001-B, and 001-C) has not been altered. The staple and staple holes were examined for consistency and the possibility of multiple staples being used. As per the staple holes, one staple was used to attach all three pages and all three sets of holes match in alignment. Images are attached to this report. The inks on Submission 001 (all three pages) were examined with the Video Spectral Comparator (VSC) for consistency. The ink on all three pages reacted similarly under Infrared Reflectance and Infrared Luminescence. All of the inks also reacted similarly when examined with Adobe Photoshop (Lab Color, Channel b) Demonstrative images are attached to this report. All three sheets of paper in Submission 001 are the same size, slightly less than 8.5" x 11". Each page reacted similarly under UV lighting with the VSC. All three pages of submission 001 were examined visually, with sidelighting, and with the electrostatic detection apparatus (ESDA) for the presence of indentations from indented writings. Indentations of this sort are often caused on one document when writing is done on another document that is physically on top of it. No unexplainable indented writings were revealed. As per [LAB NAME] standard operating procedures the ESDA lifts were given a Submission number and have been returned with the evidence. The font used to prepare Submission 001 is a 10 point, sans serif font. The same font is used on all three pages of Submission 001. The only text not printed in 10 point size is the title "Employment Contract" which was printed in 13 point size. REMARKS "Explainable" indentations are those indentations wherein their source can be determined. For example, indentations found on the front of page 2 are easily recognized as coming from the writing on page 1. "Unexplainable" indentations are those indentations wherein their source cannot be determined. It should be noted that the Technical Review was conducted by [Analyst Name], sole proprietor of [Company Name].
4CUKU8	The Employment Contract investigated dated 9th May 2022, made up of three pages, subscribed and signed between RACHEL SMIT as Employer and JULIE ANDIE as Employee, IT HAS NOT BEEN MODIFIED OR ALTERED.
4HGFQ6	A detailed examination of the contract revealed no evidence that it had been altered in any way. I found nothing to suggest that the contract was anything other than what it purported to be.
4RBGBN	3) Wording of report: 3.1) It is concluded that Q1 item (Q1.1, Q1.2, and Q1.3) has not been altered. No differences were observed utilizing visual examination, macroscopic, infrared luminescence, Black and White infrared reflectance, ultraviolet examination, and type font comparison between and within each of items Q1.1, Q1.2 and Q1.3.
4UR7XK	After careful examination of three page Employee Contract (item no.1) using Video Spectral Comparator (VSC-8000, Software Version 7.2) and Electrostatic Detection Apparatus (ESDA) Lite, it is concluded that Employee Contract (item no. 1) has not been altered.
4XRA2F	The results support that the document has not been altered (Level -2)
67Y9AG	The employee´s contract has not been altered.
6DNTEV	The Employment Contract entered into between Green Gardens (Employer) and Mrs. "Julie Andie" (Employee), DOES NOT PRESENT CHARACTERISTICS OF ALTERATION by erasing, scraping, washing, lifting fibers, grafting or addition.
6DV99V	The questioned document (Q1) has not been altered.
6EEYT2	No alteration and No eraser was detected
6RMVW4	The contract has not altered because appearance of the indented marks on a page are very similar to the handwritings on the other page. Stapler marks also supports the this conclusion.

TABLE 3

WebCode	Conclusions
6TC7MW	All the texts are original handwriting using a writing toll with black ink.
722977	As a result of examination and comparison based solely on the material submitted the following conclusions and observations are opinions based upon my experience, education and training and are as follows: 1. The Q1a-c documents were scanned for preservation by Forensic Document Examiner XXX. 2. It is my opinion, based on the evidence submitted, that the contract has not been altered. 3. A VSC (Video Spectral Comparator) examination using various microscopic, infrared, ultraviolet, and alternate light source examination techniques was performed on the Q1a-c documents. The inks used for the handwritten information on Q1a, b, c reacted consistently using IRR, IRL/IRL-SPOT. The paper used for the Q1a-c documents reacted consistently using UV. The VSC sidelighting function was used to visualize and photograph indentations found on Q1b. Q1b - in the upper portion of the document were the images "9the" "May" "22" "Julie Andie" in the middle portion of the document was the image of an oblong circle in the lower portion of the document was the image of a "3" 4. An ESDA (ElectroStatic Detection Apparatus) examination for the detection and reading of indented writing, typing or other identifying impressions was performed on the Q1a-c documents. No impressions were recovered.
7293AY	[No Conclusions Reported.]
77YN48	Conclusions are not offered for alteration examinations.
7DHVJQ	No observation supports the alteration hypothesis. Based on the examinations performed and the document submitted, the Q-1 document was probably not altered.
7HWGNQ	the document showed no sign of being altered
7WTMH9	I have found no evidence that any pages of the Contract have been substituted or that any entries have been altered. In my opinion there is very strong support for the proposition that the Contract has not been altered.
8CLV27	Item 1 was examined under infrared and ultraviolet light sources. No ink differentiation was observed within the handwritten entries and no differentiation was observed in optical brightness. Item 1 was also examined for indented writing impressions. No indentations of evidentiary value were observed. Transmitted light examination of the pages of Item 1 revealed no watermarks present within the paper. The printed text appearing on Item 1 was produced with a toner technology. The pages of Item 1 were held together by one staple. No extraneous staple holes or impressions were observed. Based on these examinations and observations, Item 1 has not been altered.
8DVRKN	There document was not altered.
9AMZUV	[No Conclusions Reported.]
9FTQYL	No evidence was found to indicate Exhibit Q1 was altered.
9JGZNF	The document, identified Q-1 has probably not been altered. This doesn't support the allegation of the employee Julie Andie, pointing out that the established compensation is not the one that was negotiated on the day the contract was signed.
9XAR6W	we CAN NOT determine whether or not the questioned document has been altered even with all methods we have been used.
A7LBQT	The technical findings support the proposal that the contract is original. No alterations or modifications have been detected in the printed and handwritten texts. The sheets have not been unstapled.
AANA7R	Through the support of different equipment and special lighting such as infrared and fluorescence, the employment contract was verified which does not show any type of alteration; In addition, the differential analysis of inks was advanced, which presents similar behavior.

TABLE 3

WebCode	Conclusions
ANJTFN	No differences were found in the structure of the printed text during the comparative study. A comparative study of the ink content of the handwritten text and signatures on all three pages revealed no differences in structure and coloration in Infrared, Co-Axial and UV rays.
AUA4R8	A definite determination could not be reached due to limitations associated with non-destructive optical ink examinations. However, alterations were not detected on Item 1 using macroscopic, microscopic, optical, and electrostatic processing methods. Indented writing was observed on each page of Item 1, using oblique lighting and electrostatic processing. This indented writing was attributed to writing from the preceding and/or following pages within Item 1 (e.g., indented writing observed on page 1 was attributed to writing present on pages 2 and 3). The electrostatic lifts used to visualize and retain the indented writing are considered secondary evidence and have been designated Item 2. All pages of Item 1 were prepared using a toner printing technology. This technology is commonly found on numerous brands of printers/photocopiers/machines. The Item 1 writing is suitable for future hand printing and/or signature comparisons. If future examinations are desired, dictated and undictated known hand printing and signatures from ANDIE, SMITH, or any other logical suspect(s) should be submitted. The known writing should be comparable to the questioned writing in wording, style, and format. Dictated known writing should be prepared in the exact wording as the questioned writing and obtained on separate documents similar to the questioned item. Each repetition should be removed from the writer's view upon completion and numerous repetitions may be necessary in order to obtain naturally prepared writing. Undictated known writing consists of writing prepared during normal course of business activity. Possible sources of undictated known writing include business papers, letters, canceled checks, and/or applications. Additional observations and assessments have been made regarding the submitted item and recorded for possible future examinations.
B6MLYW	Alterations Were Not Detected. A definite determination could not be reached due to limitations associated with non-destructive optical ink examinations. However, nothing was observed to indicate Item 1 was altered due to the lack of observed additions or deletions. The machine printed text on Item 1 was prepared using a toner printing process, common on various brands of laser printers, photocopiers, and other office machines. Indented writing was observed on pages 1 through 3 of Item 1 using side lighting and electrostatic processing. The indented writing on page 1 originated from pages 2 and 3, the indented writing on page 2 originated from pages 1 and 3, and the indented writing on page 3 originated from pages 1 and 2. The electrostatic lifts are considered secondary evidence and have been designated Item 2. Images of the electrostatic lifts are enclosed for reference. Additional assessments and observations have been made regarding the submitted items and recorded for possible future comparisons.
BC6TN2	Results of Examinations: A definite determination could not be reached due to limitations associated with non-destructive optical ink examinations. However, nothing was observed to indicate Item 1 was altered. The following observations were made: 1. Indented writing entries from previous page(s) were observed on Item 1 pages 1 through 3 using oblique lighting and/or electrostatic processing. Three (3) indented writing lifts, which are used to capture and retain the indented writing, were designated Item 2 and are considered secondary evidence. Images of the lifts are enclosed for your investigative assistance. 2. No optical differentiation was observed between the paper or writing inks on Item 1 pages 1 through 3 using the Video Spectral Comparator 8000 (VSC). 3. The printed text on pages 1-3 of Item 1 was prepared using a toner printing process which may be found on numerous brand name printers.
BCCXH6	The findings very strongly support that the questioned contract was not altered as opposed to being altered as the employee claimed. The observed features, particularly the indented writing impressions from all pages on all other pages, are expected if the contract was completed and signed while stapled together or lined up manually.
BE27NZ	The following set of competing propositions were considered: H1: the 3 page employee contract was completed in a contiguous manner with no alterations to any information after its initial completion, and H2: the 3 page employee contract was not completed in a contiguous manner with alterations occurring to the document after its initial completion. The evidence described above (see observations section) provides extremely strong support for the proposition H1 over H2, that the document was completed in a

TABLE 3

WebCode	Conclusions
	contiguous manner with no alterations to any information after its completion.
BFC9AY	Based on the methods of examination conducted, Item 1 has not been altered.
BNXE2X	It was obtained as a result that the document does present alteration.
C8T8NU	There was no evidence developed that would support that the document was altered.
C8ZAKU	Thae questioned employee contract has probably not been altered.
CAJNNU	There were no indications that the three-page questioned document was altered. This is evidenced by: 1. Every page contained indented writing from the other two pages indicating that the other two pages were aligned and below each page at the time the handwriting was produced. 2. There were no visual nor optical ink differences. 3. There was only one set of staple holes for all three pages and the direction of the fold was consistent with the pages being stapled prior to being folded. No differences were observed in the examination of the paper. 4. Format and alignments were the same for all three pages. 5. All three pages were toner produced.
CK3ZY8	The questioned documents, Q1.1, Q1.2, and Q1.3, were viewed macroscopically, microscopically and with the aid of various light sources and filters. It has been determined that the three-page employee contract does not appear to have been altered. As is routine in some cases, the questioned items were processed for latent writing impressions. Latent writing impressions may be made when writing is performed on one sheet of paper and leaves indentations on the pages below. The ESDA sheet provides a restoration or partial restoration of the original writing which created the impressions. Latent writing impressions were developed on the front and back sides of Q1.1, Q1.2, and Q1.3.
CLUZWH	Request: To examine the questioned documents, Items 1A-1C, in an attempt to determine if any of the pages displayed characteristics of alterations. Results of Examination: Indentation Exam The questioned documents, Items 1A-1C, were examined for the presence of any indented writing, typing, or other identifying impressions. These are impressions sometimes left on paper from writing, typing, or other markings done on another page while it was superimposed over the questioned material. The following impressions were located: Item 1A Front = Impressions sourced to the original writing on the front of Item 1B and Item 1C. Item 1B Front = Impressions sourced to the original writing on the front of Item 1A and Item 1C. Item 1C Front = Impressions sourced to the original writing on the front of Item 1A and Item 1B. The resulting ESDA lifts (electrograph/imaging film) are being supplied to the submitting agency. Printing Process Exam The questioned documents, Item 1A-1C, were examined visually and microscopically. These examinations revealed that the machine printing on the questioned documents was produced with an office machine system utilizing black toner. Toner, is utilized in some office machines such as laser printers, photocopiers, and facsimile devices. Paper Exam The questioned documents, Items 1A-1C, were examined with no visible watermarks observed. Various microscopic, infrared, and ultraviolet examinations were performed on the pages. These examinations revealed that at this level of examination, the three sheets of paper exhibit similar class characteristics, such as size, color, and response to ultraviolet and infrared light sources. However, it should be noted that paper of this type is produced in mass quantity and is available to the average consumer and should not be construed as a definitive identification. Ink Exam The questioned documents, Items 1A-1C, were examined visually, microscopically, digitally, and with specialized equipment. These examinations revealed that the original writing on all three pages were executed with what appears to be a black ballpoint pen. Additional infrared and ultraviolet light examinations were performed on the ink(s) used to produce the writing. At this level of examination, the ink(s) could not be differentiated and reacted similarly throughout the spectrum. These examinations do not provide a definitive identification of the ink formulation, and further chemical testing may be deemed necessary to determine if the ink(s) are the same or different ink formulation. Alignment Exam The questioned documents, Items 1A-1C, were examined visually, microscopically, digitally, and with specialized equipment. These examinations revealed that the staple marks and fold lines in the upper left-hand corner, along with the machine printing on the three pages, are in expected alignment with each other. Typeface Exam The questioned documents, Items 1A-1C, were examined visually, microscopically, and digitally. These examinations

TABLE 3

WebCode	Conclusions
	revealed that a similar sans-serif font was used to produce the printed text on all three pages. Based on the above examinations, the questioned pages, Items 1A-1C, do not display any characteristics of alterations. However, at this level of examination, it cannot be determined whether or not the questioned Employment Contract has been altered (Indeterminable).
D37DML	My opinion is that questioned document, Green Garden Employee Hire Contract, pages 1-3, has probably not been altered.
EAQK76	Examination of Item 1 (1.1, 1.2 and 1.3) determined that the document has not been altered. Three (3) ESDA lift sheets were created from Item 1 (1.1, 1.2 and 1.3) and were made sub-items 1.1.1, 1.2.1 and 1.3.1. The transparent plastic-like lifts used to recover the indentations are being returned in evidence container #A. The lifts should be retained as evidence.
F4UHA6	Only. - The document called Employment Contract, in the name of employee Julie Andie, dated 9/May/2022, identified in its respective Chain of Custody Registry with QD indication; is not altered
F6QXHV	In this type of case, we would make an ESDA analysis looking for indented impressions. The conclusion would sound in translation: "the Questioned Document" is seen to contain impressions of overlying writing.
FEABNR	The questioned document does not present alterations
FFWE3K	It is my opinion that the evidence provides support for the proposition that the document, item 1, has not been altered.
FQFXFQ	The three pages in Item 1 contains black, toner printing, ballpoint ink writing, and a set of staple holes in the upper, left-hand corner. The staple was removed and will remain in the evidence container for Item 1. Indented Impression Examination Item 1 was examined for evidence of indented impressions. Indentations of this sort commonly occur when writing is done on one document producing indentations of that writing on a document underneath. The results of this examination are as follows: There are indentations from the writing on page 2 and page 3 in Item 1 on the lifts from page 1, uniquely identified as 1-1 FR and 1-1 REV. There are indentations from the writing on page 1 and page 3 in Item 1 on the lifts from page 2, uniquely identified as 1-2 FR and 1-2 REV. There are indentations from the writing on page 1 and page 2 in Item 1 on the lifts from page 3, uniquely identified as 1-3 FR and 1-3 REV. No unsourced indented impressions developed on the six lifts from the EDD examination of Item 1. Alterations Examination Item 1 was also examined visually, microscopically, and using various light sources. These examinations revealed the following: There are no indications that the three pages in item 1 was altered. Consistencies exist in the paper, printing, formatting, and font on the three pages in Item 1. Additionally, the writing on each page was indented on the other two pages, which indicates that the pages were in contact when the writing occurred.
FW2V3R	Methods A visual examination of the submitted item was completed. Instrumental analysis was also done. Instrumental Analysis Neither the ink or the paper in pages #1-#3 in the Green Gardens Employment Contract dated May 9th, 2022, in Item #1, could be differentiated from one another. However, this does not preclude that the ink or paper may have come from different sources. Instrumental examination of pages #1-#3 in Item #1 revealed the presence of indented writing. The developed indented writing on page #1 includes the written portions from page #2 and #3. The developed indented writing on page #2 includes the written portions from page #1 and #3. The developed indented writing on page #3 includes the written portions from page #1 and #2. Based on all the findings listed above, the contract in Item #1 was probably not altered. Remarks There was only one set of staple holes in each page of the contract. There were consistent fold marks near the staple holes on each page. Based on these facts and the developed indented writing listed above, the pages were most likely stapled together prior to the contract being filled out. VSC images are being retained with the case documentation in LIMS. The developed indented writing from #1 is being retained as Item #1.1. All items are available for return. If additional items are to be submitted, please re-submit the original items in their original [Lab Name] labeled packaging.

TABLE 3

WebCode	Conclusions
FZV4KU	Based on my findings, there is conclusive evidence to indicate that the questioned document has not been altered.
G3FGQN	The document identified with Q1 does not present alteration in its materiality.
GBT7L3	The sign marked as QD. 3-page contract between Julie Andie and Rachel Smith. It does not present alteration.
GF4FHQ	After the observation and analysis of the three pages that are part of the doubtful document, through direct observation, and the use of magnification instruments such as: stereomicroscope and thread counting magnifying glass, as well as a document comparator, no element was found that indicates the possible alteration of the document in the data of completion and signatures.
GHP2K2	The questioned document HAS BEEN ALTERED.
GQK87Z	A definite determination could not be reached whether the Item 1 document was altered due to the limitations associated with conducting only non-destructive document examinations. However, from the non-destructive document examinations conducted, nothing was observed to indicate Item 1 was altered based on the following observations: All inked entries on Item 1 pages 1 through 3 react in the same manner using various lights and filters The paper used to produce each page of Item 1 reacts in the same manner using various lights and filters Impressions observed on each page of Item 1 correspond with written entries on the other pages of Item 1 Consistent font used throughout the Item 1 document No interlineation issues observed in Item 1 No obliterated, erased, or altered entries observed in Item 1 Indented writing was observed on all pages of Item 1 using electrostatic processing and side lighting. The electrostatic lifts used to capture and retain the indented writing are considered secondary evidence and have been designated Item 2. Additional observations and assessments have been made regarding the submitted item and recorded for possible future examinations.
H3VY8E	The “Employment Contract” dated may 9, 2022, and which consists of three letter size front paged sheets does not shows signs of alterations. The aforementioned based upon technical reasons mentioned herein.
H9ACPF	There is no evidence of alteration in the questioned document "Item 1". Note: While no positive evidence of alteration exists, it is possible that an undetectable alteration has occurred.
H9LD6M	We conclude that the questioned document was not altered.
HAKEBE	No indications could be found for any page exchange or other manipulations to the contract. The toner as well as the optical properties of the paper pages correspond with each other. No proof for any alterations are detectable.
HBMCF2	I have found no evidence to support the proposition that the disputed document has been altered but cannot completely exclude such a possibility.
HEMQRJ	The document questioned as an employee contract between Julie Andie and Rachel Smith, does not present alterations of additive or suppressive type, in the three pages that make it up.
HJUNZ4	Physical, optical, and chemical examinations were conducted on Exhibit Q1. No alterations to Exhibit Q1 were observed.
HKH8RH	The findings provide extremely strong support for the proposition that the questioned document has not been altered.
HU6F7D	the contract has probably not been altered. However, given the informations available, we cannot completely rule out : - the substitution, - the complete reproduction as long as the signature of the employee has not been authenticated.
HUEHNT	Comprehensive examinations of the three-page document (after removing and preserving the staple) did

TABLE 3

WebCode	Conclusions
	not reveal any evidence that the document had been altered or manipulated. It is my opinion this document has not been altered or manipulated.
HVLA7M	According to the results of the examination, it can be confirmed that the questioned document has not been altered.
HVYYAZ	Resultatene taler til en viss grad for at kontrakten ikke er manipulert/endret. Transalted into "The results indicate to a certain degree that the contract is not altered."
JFYGUM	The doubtful document identified as item 1 shows no signs of alteration.
JH48Z3	IT IS ESTABLISHED THAT THE SHEETS INCLUDING JULIE ANDIE'S EMPLOYMENT CONTRACT WITH THE COMPANY OFFICER, RACHEL SMITH, HAVE NOT BEEN CHANGED.
JJK9ZW	A similar type of paper, printing process and page layout were used to print pages 1, 2 and 3. Pages 1, 2 and 3 were stapled together at once and the handwritten entries were made using the same pen ink on all three pages while they are stacked together. Based on these findings, in my professional opinion, the examination of Item 1 revealed no evidence of alteration to support the employee's claims. Therefore, the questioned document (Item 1) has not been altered.
JJYQTG	Therefore according to the Case scenario, the Q1 document has not been altered.
JQ2VZT	Upon completion of an examination and comparison of the questioned exhibits submitted in this case, it is the opinion of this examiner that the Q-1 (1), Q-1 (2) and Q-1 (3) exhibits are original genuine documents. There were no apparent alterations to the questioned exhibits that were observed during the examination.
JQN4AW	Based on visual and instrumental examinations of Exhibits Q1-1, Q1-2, and Q1-3, it was determined that Exhibits Q1-1, Q1-2, and Q1-3 were not altered. Based on visual and instrumental examinations of Exhibits Q1-1, Q1-2, and Q1-3 for indented impressions, the following was determined: Sourced indented impressions were observed on Exhibit Q1-1. These impressions were sourced to Exhibits Q1-2 and Q1-3. Sourced indented impressions were observed on Exhibit Q1-2. These impressions were sourced to Exhibits Q1-1 and Q1-3. Sourced indented impressions were observed on Exhibit Q1-3. These impressions were sourced to Exhibits Q1-1 and Q1-2.
K46HNF	I have not observed any signs to indicate that the document has been altered. I cannot rule out the possibility that any alterations have gone undetected. Additionally, I cannot comment on whether or not the original contract has been replaced in its entirety by the questioned document.
K47HGN	a. Laboratory item #1, Invoice #Q200660 was examined utilizing oblique/side lighting and ESDA for the possible presence of indented impression. Aside from the lab #, lab item #, envelope outline, paper outline, or extraneous markings- no impressions were found. b. Laboratory item #1 (pages 1, 2, and 3) has no observable microscopic, physical, or optical alterations detected based on the following examinations: i. Visual/ microscopic ii. UV light box iii. VSC iv. ESDA
K88LBW	On further examination, I found as follows: 1. Similar ink was used on the entirety entries. 2. Indented writing revealed on page 1 were identical to the writings on page 3. 3. Indented writing revealed on page 2 were identical to the writings on page 1 and 3. 4. Indented writing revealed on page 3 were identical to the writings on page 1 and 2. 5. There is no evidence of alteration observed. 6. Hence, I am of the opinion that the questioned contract titled “Employment Contract” has not been altered.
K9WRPN	No alterations are made on the submitted questioned document.
KAVXA2	The examination of the Employee Contract revealed no evidence of alteratons, obliterations, or erasures. The paper brightness and staple hole sets were consistent among all pages. The font was consistent among the three pages. The ink examination showed the writing on the contract was all written with a ballpoint pen having black ink.

TABLE 3

WebCode	Conclusions
KBYRQK	Examinations/ comparisons of the three pieces of paper used to create the questioned document (Q1), revealed the following: All three pages bear text created with a black toner printing process. All three pages are printed using the same page format. All three pages bear one single staple with no additional staple holes. All three pieces of paper used to create the questioned document, reacted similarly when compared to each other using all the light source and filter combinations availble on the VSC2000HR. (See Limitations) There are not any watermarks and/or fluorescent fibers visualized. All of the hand printing, signatures, and handwritten numbers present on the questioned document, reacted similarly when compared to each other using all the light source and filter combinations availble on the VSC2000HR. (See Limitations) Indented writing examinations, including oblique lighting examinations and Electorstatic Detection Apparatus (ESDA) examinations revealed indented writing impressions consistent with the following: Page 1 of 3 was laying on top of Page 2 of 3 when all the writing was produced on Page 1 of 3. Page 2 of 3 was laying on top of Page 3 of 3 when all the writing was produced on Page 2 of 3. Page 3 of 3 was laying on top of Page 1 of 3 when all the writing was produced on Page 3 of 3. Based on all the evidence revealed and stated above, there were not any alterations made to this document, IF the original compensation agreed upon was $43,894 per annum and if that was the amount that was written on Page 1 of 3 of the Q1 document when the Q1 document was signed by Julie Andie. *The "IF" included in the paragraph above is because there is never a clear statement by either of the parties as to what the "indicated compensation was" when Julie Andie was said to have signed the employeed contract.
KBZMBP	The employment contract signed by Julie Andie and Rachel Smith, this later on behalf of the employer the company Green Gardens of McLean, does not contain any evidence that allows us to affirm the existence of an addition or manipulation in its content.
KPWYHV	After a thorough and exhaustive analysis of the document CONTRACT OF EMPLOYMENT, it is found that it DOES NOT PRESENT ANY ALTERATION.
L4JACQ	The questioned document has not been altered.
LB2XQT	No alterations, additions or deletions were noted. The pages were probably placed on top of each other when the form was filled by hand writing.
LJDZNE	The results of the investigation show that the questioned document has not been altered. There were no limitations to the investigation. Our expert opinion is that the document has not been altered.
LJQNTM	The document subject to inspection does NOT present changes in its materiality
LM9TNB	The questioned document HAS NOT BEEN ALTERED
LRH6GH	Concludes that there is a probability that the questioned document has not been altered.
LT2M8W	It was observed that the printing on all of the document's pages has been made with a printer/photocopier based on electrophotography. No significant differences between the appearance or positioning of the printing on pages 1, 2 and 3 were observed. Certain markings made with a pen were observed on all pages. No observations were made that would indicate that the document would have been dismantled and/or that pages would have been replaced. No observations were made that would indicate that text alterations would have been made to the document. On page 1, indented impressions of the markings made with a pen to page 3 (signatures and dates) were observed. On page 2, indented impressions of the markings made with a pen to pages 1 and 3 were observed. On page 3, indented impressions of the markings made with a pen to pages 1 and 2 were observed. The above-mentioned observations of indented impressions link the pages 1, 2 and 3 together. Based on all the findings listed above it is concluded that the document has not been altered.
LVQWCQ	Within the limitations of the different examinations performed no indications of alteration to the questioned document were observed. Therefore there is strong support for the hypothesis that the questioned document Q1 has not been altered.

TABLE 3

WebCode	Conclusions
M3JRAM	A definite determination could not be reached due to the limitations associated with non-destructive optical ink examinations. However alterations were not detected in the Item 1 document. Indented writing entries from previous and/or following page(s) were observed on Item 1 pages 1 through 3 utilizing side-lighting and/or electrostatic processing. Two (2) electrostatic lifts, which are used to capture and retain indented writing, were designated Item 2 and are considered secondary evidence. Item 1 was prepared using a toner printing technology. This technology is commonly found on numerous brands of printers, photocopies, and other office machines. The majority of the Item 1 writing is suitable for future hand printing comparisons. If future examinations are desired, dictated and undictated known writing from any logical suspect(s) should be submitted. The known writing should be comparable to the questioned writing in wording, style, and format. Dictated known writing should be prepared in the exact wording as the questioned writing and obtained on separate blank forms similar to the questioned item. Each repetition should be removed from the writer's view upon completion and numerous repetitions may be necessary in order to obtain naturally prepared writing. Undictated known writing consists of writing prepared during normal course of business activity. Possible sources of undictated known writing include business papers, letters, canceled checks, and/or applications. Additional observations and assessments have been made regarding the submitted item and recorded for possible future examinations.
M6966C	[No Conclusions Reported.]
MBPRHG	Examination and comparison of exhibits Q1A-C were conducted, and the following conclusions and observations are based upon my education, training and experience and the results are as follows: Exhibits Q1A-C were scanned for preservation by Forensic Document Examiner XXX. An ESDA (ElectroStatic Detection Apparatus) examination for the detection and reading of indented writing, typing or other identifying impressions was performed on exhibits Q1A-C and the documents were negative for indentations of value. Exhibits Q1A-C were examined with oblique/side lighting and the results are as follow: indentations were observed in the corresponding areas that contained writing from above on page one and transferred indentations to page two and indentations were observed in the corresponding areas that contained writing from above on page two and transferred indentations to page three. A VSC (Video Spectral Comparator) examination was conducted on exhibits Q1A-C and the observations demonstrate that the ink on the three pages react consistently. Exhibits Q1A-C were examined with an ultra-violet light source and the three pages appear to react consistently. The papers were examined with a micrometer and the three pages measured .005" inches thick. None of the pages contained a watermark. The pages did appear to contain gripper and feeder marks that were consistent between the three pages demonstrating it went through a printer or photocopier. The three pages were stapled together and the staple left impression marks on the front of page one and the reverse of page three which corresponded to the staple in the paper. The three pages contained a diagonal fold slightly to the right of the staple that folded forward and is consistent with the three pages. Exhibits Q1A-C were examined, and it was determined that they were created via an electrophotographic process. The exhibits were examined for magnetic toner and results were negative. The main body of text on exhibits Q1A-C were produced with a 9-point Calibri font. Exhibit Q1A contains approximately 1.5" down the page the text "Employment Contract" which was produced with a 12-point Calibri font. The text on the exhibits were examined with typography grids to determine if a line of text had been inserted. Exhibits Q1A-C did not contain any line insertions. Based upon the evidence submitted, it was determined that the document in question has not been altered.
MWPUKW	Although a definite determination could not be reached due to the use of non-destructive techniques no alterations were detected to indicate that the Item 1 pages 1 through 3 documents were altered. Furthermore, indented writing corresponding to the original writing on Item 1 pages 1 through 3 was observed during the examination of Item 1 using side light and electrostatic processing. The electrostatic lifts, used to capture the indented writing, are considered secondary evidence and have been designated as Item 2. Images of the Item 2 indented writing are enclosed for your investigative assistance. No additional indented writing was observed on Item 1. The printed text on the Item 1 contract was produced utilizing a toner print process and may be found on numerous brand-name laser printers, photocopiers, and other machines.

TABLE 3

WebCode	Conclusions
MWXT2R	On the basis and level of the examinations listed above, it cannot be conclusively determined if the questioned documents, 1A-1C, have been altered. The method of production of the questioned document and the lack of a submitted comparison document, hindered the examination and precludes a more conclusive opinion.
N3LTUD	I have examined the 3 pages of item 1 for evidence of alteration. No significant differences in paper, printing, and ink were observed between and within the three pages of the document. The handwriting appearing on each page of the document was written while the page was on top of the other two pages. No other latent handwriting impressions were observed. Based on the absence of inconsistencies, and the indentations of handwriting observed on each page, no evidence of alteration to the document was observed.
NJRXHQ	Examination Information The items listed in this Certificate of Analysis were assessed and examined based on the methodology described in the Forensic Document Unit (FDU) Test Methods (unless otherwise noted). The methodology used included macroscopic, microscopic, paper, print process, ink, and indented impressions examinations, as well as a handwriting assessment. The laboratory request called for an examination of the three-page employee contract to determine if the document in Item 001 had been altered. Macroscopic and Microscopic Examination Paper Pages 1-3 in Item 001 reacted similarly to transmitted and ultra-violet lighting when assessed for paper fiber distribution and optical brightness. Pages 1-3 in Item 001 did not contain watermarks, fluorescent security fibers, or other distinguishing markings which could have been created during the manufacturing process. Pages 1-3 in Item 001 were bound with one (1) staple on the top left corner of the three-page document. One (1) diagonal fold along the top left corner near the staple was present on all three (3) pages. Print Process Pages 1-3 in Item 001 were printed with black toner technology. Ink The writing in Pages 1-3 in Item 001 was executed with black ballpoint ink. The inks reacted similarly to infrared luminescence and infrared reflectance. Indented Impressions Pages 1-3 in Item 001 were processed for indented impressions. Indented impressions are generally impressions left on a document due to having been in contact with another document during the writing process. When deciphered, indented impressions may be subject to more than one interpretation. The initial indented impressions examination was conducted with the use of an oblique light source. Indented impressions were visible with side-lighting on Page 2 but were indecipherable. Pages 1-3 in Item 001 were suitable for an additional indented impressions examination with the Electrostatic Detection Apparatus (ESDA). Six (6) electrostatic detection device (EDD) lifts, individually marked as 001A1-001A6, were created from the front and reverse of Pages 1-3 in Item 001, respectively. The EDD lifts can be viewed in Item 001A. Sourced indented impressions were located on lifts 001A1-001A6, from the front and reverse of Pages 1-3 in Item 001. When the EDD lifts in Item 001A were placed on top of Pages 1-3 in Item 001, the sourced indented impressions overlayed. The findings suggested that: Page 1 was in contact with Pages 2 and 3 during the writing process of Pages 2 and 3. Page 2 was in contact with Pages 1 and 3 during the writing process of Pages 1 and 3. Page 3 was in contact with Pages 1 and 2 during the writing process of Pages 1 and 2. Unsourced indented impressions were observed on lift 001A6 in Item 001A, from the reverse of Page 3 in Item 001. The unsourced indented impression was deciphered as the number "2" on the lower left quadrant. Font Classification Using reference materials available within the FDU, a font search was conducted on the sans serif font on Pages 1-3 in Item 001. The font was found to have class characteristics which most closely correlated to "Calibri" and other similar fonts. The classification was limited due to the lack of a complete character set of the font on Pages 1-3 in Item 001. The uppercase "G" in the word "Green", located near the top edge of the paper in Pages 1-3 in Item 001 measured approximately 3/32". The uppercase "E" in the word "Employment" on the top left quadrant of Page 1 in Item 001 measured approximately ¼". Based on the measurements of these characters, the sans serif font on Pages 1-3 in Item 001 had a size range of approximately 10 to 12 points. Handwriting Assessment Pages 1-3 in Item 001 contained hand printing and numbers, excluding the two (2) stylized signatures on Page 3. The hand printing and numbers on Pages 1-3 appeared naturally written with good line quality, even pressure, and average skill. The two (2) "May 9, 2022" entries on Page 3 in Item 001 had differing features in number and letterforms. The writing features of the first "May 9, 2022" on Page 3 in Item 001 shared similarities with the number and letterforms of the writing observed on Pages 1 and 2 in Item 001. The two (2) signatures (Rachel Smith and Julie Andie) on Page 3 in Item 001 were stylized and mostly indecipherable. The signatures appeared naturally written with good line quality, with average

TABLE 3

WebCode	Conclusions
	speed and tapering on upward and downward strokes. The hand printing, numbers, and signatures on Pages 1-3 in Item 001 are suitable for a handwriting comparison.
NKJ3UA	In course of examination found no evidences or no signs supporting alternation of the questioned contract.
NQM6WP	The optical characteristics of the handwritten entries on pages 1, 2 and 3 are optically consistent. The questioned document was probably not altered.
NTD9MB	1. Document Q-1 page 1 was examined for impressions with positive results, using the Foster and Freeman VSC 6000 H/S and the Foster and Freeman ESDA. One (1) ESDA lift was retained in the case file. Examination of the document using oblique lighting, the Foster and Freeman VSC 6000 H/S, and the Foster and Freeman ESDA assisted in deciphering the indentations present on document Q-1 page 1 to read: "(unknown signature) May 9, 2022 (unknown signature) May 9, 2022" Impressions appear to correspond with handwritten signatures and dates present on page 3 of document Q-1. 2. Document Q-1 page 2 was examined for impressions with positive results, using the Foster and Freeman VSC 6000 H/S and the Foster and Freeman ESDA. Two (2) ESDA lifts were retained in the case file. Examination of the document using oblique lighting, the Foster and Freeman VSC 6000 H/S, and the Foster and Freeman ESDA assisted in deciphering the indentations present on document Q-1 page 2 to read: "9th May 22 Julie Andie 43,894 3" Impression of a circle is present on line with "43,894". When ESDA lift is overlaid on document Q-1 page 1, it corresponds to the positioning of "per annum" printed on page 1 of document Q-1. Impressions appear to be consistent with the handwritten entries present on page 1 of document Q-1. 3. Document Q-1 page 3 was examined for impressions with positive results, using the Foster and Freeman VSC 6000 H/S and the Foster and Freeman ESDA. One (1) ESDA lift was retained in the case file. Examination of the document using oblique lighting, the Foster and Freeman VSC 6000 H/S, and the Foster and Freeman ESDA assisted in deciphering the indentations present on document Q-1 page 3 to read: "12 5" Impressions appear to be consistent with the handwritten entries present on page 2 of document Q-1. 4. NO ALTERATIONS REVEALED: Examination of document Q-1 pages 1 through 3 revealed no evidence of alteration.
NTDB9A	[No Conclusions Reported.]
NXH43R	In my opinion there is no evidence of any alteration to the either the 1 - handwritten entries on the Employment Contract 2 - nor the pages forming the Contract
NYFCEV	My findings are what I would expect if the 3 page questioned contract was completed as it is currently stapled with each page resting on the others as it was filled in. I found no evidence of alteration made to the handwritten compensation amount and no evidence of re-stapling of the contract or of additional text being added. In my opinion, my findings provide extremely strong support for the proposition that the questioned contract, in its current state, is what the employee signed rather than the questioned contract having been altered to change the compensatory amount.
P384MQ	Alterations Not Detected. A definite determination could not be made due to limitations associated with nondestructive testing. However, no alterations were detected on the Item 1 document using alternate light sources, photography, oblique lighting and/or electrostatic detection. A more definite determination may be possible with chemical analysis of the paper, toner and/or writing ink. Indented writing was observed on all three pages of the Item 1 document using side lighting and electrostatic detection. The indented writing observed on each page was consistent with the original writing on previous and/or later pages. The electrostatic lifts, used to capture and retain the indented writing, are considered secondary evidence and have been designated Item 2.
P6BXJA	The employment contract signed with the employee Julie Andie DOES NOT PRESENT CHANGES IN ITS MATERIALITY.
PDRBLF	El documento objeto de inspección NO presenta alteración(es) en su materialidad. [Requested translation was not provided by time of publication.]

TABLE 3

WebCode	Conclusions
PNGWBC	Item 1 has not been altered.
PQ69BG	The Item 1 three-page contract was examined to determine whether or not it had been altered. The document set was examined visually with various light sources, under a stereomicroscope, with grids, with a video spectral comparator to search for pen ink additions and deletions, and with the electrostatic detection apparatus – ESDA. The ESDA is typically used to visualize handwriting impressions, but also visualizes other paper fiber disturbances. The findings were as follows: 1. Each of the three pages were comprised of a pre-printed form with toner images on white paper. There was a single staple binding the pages together, and they had been folded back upon each other with the fold line in the staple region. 2. There is black ball-point pen ink in the handwritten fields. This ink appears alike microscopically throughout the three pages. The signatures were freely and naturally formed. 3. The handwritten information on page 1 was impressed into pages 2 and 3. The handwritten information from page 2 was impressed into pages 3 and 1. The handwritten information from page 3 was impressed into pages 1 and 2. There was no misalignment of the 43,894 impressions on pages 2 and 3. 4. Electronic grid overlays showed that all three pages were consistent in line spacing, margins, indents, and layout. Overlays without grids also showed consistency in font throughout all three pages. 5. The video spectral comparator showed consistent responses of the pen ink on all three pages. 6. There was present a single staple through all three pages and there were no additional staple holes. The staple was removed for examination of the holes, and to allow for the use of the ESDA. 7. The pre-printed contract was toner on white paper, with no observable differences in the toner printing or paper throughout the three pages. 8. There was no evidence of tracing found at the signature line for Julie Andie. 9. There were no surface abrasions which would have resulted if material had been removed anywhere in the contract. 10. There was no microscopic evidence of misaligned pen strokes in the written dollar amount at point 3. Based upon the evaluation of the above findings it is the conclusion of this examiner that there is no evidence of alteration to the submitted Item 1 three-page contract. It is acknowledged that simple handwritten strokes could be added with the same pen after the contract was signed, but no evidence of such can be determined from the submitted material. With no misalignments seen, it is concluded that the document set probably was not altered. It is noted that no known signatures were submitted for comparison, and no conclusion is reached regarding the signature genuineness.
PR8CGK	A definite determination could not be reached due to the inability to conduct ink chemistry analysis; however, no alterations were detected during the examination of the Item 1 document. It should be noted that all pages of the Item 1 document corresponded in optical characteristics when examined using alternate light sources and filters. Indented writing was observed on all three pages of the Item 1 document using oblique lighting and the Electrostatic Detection Apparatus (ESDA). The indented writing observed on the document can be attributed to other pages of the document. For example, the indented writing located on Item 1, Page 2 can be attributed to writing located on Item 1, Page 1 and Item 1, Page 3. The ESDA lifts used to capture and retain the indented writing are considered secondary evidence and have been designated Item 2. The three pages of the Item 1 document were prepared using a toner printing technology. This technology is commonly found on numerous brands of printers, photocopiers, and office machines. Additional observations and assessments were made regarding the submitted item and recorded for possible future examinations.
PW489K	In my opinion, the three-page Employment contract is authentic and has not been altered since the contract was completed.
Q9RMHD	The contract document does not present any indication that allows establishing that it has been altered in any of the fields of completion. has not been altered Q1-E
QEAEDE	There is evidence that indicates that the compensation amount on the questioned document was altered and may not be the original amount.
QZLLCK	The questioned document has Not been altered
R444BG	1. Laboratory item #1, Invoice #Q200659 was examined utilizing oblique/side lighting and ESDA (Electrostatic Detection Apparatus) for the possible presence of indented impressions. Aside from the

TABLE 3

WebCode	Conclusions
	laboratory number, lab item number, envelope outline, paper outline, or extraneous markings - no impressions were found. 2. Visual examination, oblique/side lighting examination, microscopic examination, UV (Ultraviolet) Lightbox examination, VSC (Video Spectral Comparator) examination and ESDA (Electrostatic Detection Apparatus) examination revealed that lab item #1 does not appear to be altered. 3. The following limitations preclude a more definitive opinion: - No known employee contract standard.
R82HZR	On further examination I found that, one type of ink were observed on all three pages of the Item 1 (Three-pages employee contract between Julie Andie and Rachel Smith) and ESDA examination indicates the documents were all attached to each other. Hence, I am of the opinion that, the questioned document (Item 1 – Employee Contract) has not been altered.
RFCYEJ	The Exhibit Q-1 item was examined with alternate light sources, microscopy, measuring devices and for indented writing. No evidence was noted to indicate that the Exhibit Q-1 item was subject to any form of alteration.
RH28JE	Based upon the examination of the three-page document submitted, it is this examiner's opinion that the contract as presented has probably not been altered. All examinations performed support the hypothesis that the document in question has not been altered from its original form.
RRUG9B	In my opinion, the evidence provides very strong support for the proposition that the questioned document has not been altered, over the proposition that the questioned document has been altered.
RUUMNG	There is no evidence to support the contention that item #1 has been altered. This conclusion is based on the following testing and observations: - Only one set of staple holes was found amongst the three pages of item #1. - The writing inks within item #1 could not be differentiated using non-destructive testing techniques. (VSC6000/HS) - All three pages of item #1 were processed for indented writing using an ESDA2. The handwritten entries on pages 2 and 3 were indented onto page 1. The handwritten entries on pages 1 and 3 were indented onto page 2. The handwritten entries on pages 1 and 2 were indented onto page 3.
RY8C8Q	The questioned document HAS NOT BEEN ALTERED.
RZ8ALT	In my opinion, the findings support Rachel Smith's claim that the questioned document is the original contact and has not been altered.
T4BZKQ	1. Non-destructive visual and spectral examinations of the handwriting inks revealed no differences within each of pages 1, 2 and 3. 2. The paper dimensions, relative UV reflectance quality, and vertical carrier lines on the back of each page, were consistent between pages 1, 2 and 3. 3. The computer printing text font, created by a dry toner printing process, was consistent between pages 1, 2, and 3. 4. Page 2 has indentations present that are consistent with handwriting visible on pages 1 and page 3, with the exception of indentations corresponding to the handwritten "43,894" compensation dollar amount entry on the lower left of page 1, which was not decipherable. Several side-lighting exams and ESDA processing sequences on the front and back of page 2 failed to create readable indentations consistent with the amount entry on page 1. 5. No determination was reached regarding whether or not the handwritten "43,894" compensation dollar amount entry on the lower left of page 1 was altered or not.
TPRCHU	Based on the analysis made, we found no signs of alteration on the questioned document.
U4B3KF	According to the analyzes carried out, the doubtful material used for this study and the technical reasoning set forth above, it is established that the document "GREEN GARDENS EMPLOYEE HIRE CONTRACT DOES NOT PRESENT ALTERATION according to what is stated in the item interpretation of result
UBDZEE	The presence of a single set of staple holes and a single fold on each page of Q1 supports that no page substitution(s) or page addition(s) occurred. No evidence of alterations, additions, obliterations, or erasures was found during VSC examination. The indentations developed on Q1a, Q1b, and Q1c further support that no alterations, additions, obliterations, erasures, page substitutions, or page

TABLE 3

WebCode	Conclusions
	additions were made to Q1.
UGJXJC	The contract has not been altered.
UMMRU8	It is my professional opinion that the Employment Contract is authentic (Identification of authenticity). There are no signs of alterations, erasures, page substitutions, or any other indications to reflect that the Employment Contract was tampered with.
UPC4J6	No signs of alteration to the handwriting entries (including signatures) on each page of the three-page contract were observed. In addition, the presence of indentation marks corresponding to the handwriting entries of page 2 and page 3 were observed on page 1. The indentation marks and the handwriting entries can be superimposable with each other. As writing impressions can be transmitted through paper to appear on lower sheets if the writings were made when the sheets are stacked together, this observation indicated that when handwriting entries on page 2 and page 3 were made, page 1 was placed under them. The presence of indentation marks corresponding to the handwriting entries of page 1 and page 3 on page 2 indicated that page 2 were placed underneath when handwriting entries on page 1 and page 3 were made. Similarly, the presence of indentation marks corresponding to the handwriting entries of page 1 and page 2 on page 3 indicated that page 3 was placed underneath when handwriting entries on page 1 and page 2 were made. Collectively, the above observations were consistent with all the writing entries (terms) in the contract were being made at the time the employee's signature was made. In view of the above findings, I am of the opinion that the questioned document has NOT been altered.
UPD3DD	Physical, microscopic, instrumental, and comparative examinations resulted in the following finding(s): The Item 1 (pages 1-3) contract shows no evidence of any data alteration or page substitution. This finding is supported by the fact that when viewing the handwriting under alternate light sources there are no visible changes to the handwriting. In addition, there is indented writing which links all three pages of the contract to one another. Evidence of indented writing and impressions were found on Item 1 (pages 1-3). As information, whenever two or more sheets of paper are stacked, traces of the writing on the top sheet usually become indented in the sheet(s) below. The indentations present were developed using the Electrostatic Detection Apparatus (ESDA) and intercompared. The indentations observed utilizing the ESDA support the statement from the company official, Rachel Smith, that no changes were made to the document after the employee, Julie Andie, signed the contract.
UVGWM9	IN CONCLUSION, UNDER MICROSCOPIC EXAMINATION, THE HAND WRITTEN INK PORTIONS DO NOT REVEAL ANY MANIPULATION. THE HANDWRITTEN INK IS ORIGINAL WET INK. THERE DO NOT APPEAR TO BE ANY CHANGES MADE TO THE THREE PAGE DOCUMENT IN QUESTION.
V7CLMG	FIRST. The questioned document identified as 283-2023-CLII-LDC-1 (Q1), previously described in its corresponding section, by virtue of the characteristics found in its constituent elements, said document IS DETERMINED AS AN UNALTERED DOCUMENT.
VFWRL7	The document being inspected (a three-page contract between Julie Andie and Rachel Smith) does NOT show changes in its materiality.
VGT8UW	Overall I found no evidence of alterations, additions or erasures on the document. The indented impressions of writing found align which shows that the handwriting on the document was made whilst the three sheets were aligned together. For example, if they were stacked together and each sheet placed back in the stack after writing or stapled together and the sheets folded back on themselves after writing. The black ballpoint pen ink of the handwritten entries appears visually similar and cannot be discriminated using specialised lighting techniques (VSC80i). The handwriting on each page has therefore been completed using at least one ink. That is, it is possible that more than one ink was used but that this cannot be discriminated using the techniques available. The possibility that the whole document is not genuine cannot be excluded. In my opinion the questioned document HAS PROBABLY NOT BEEN ALTERED.
VQVP6Y	The employment contract between Julie Andie and Rachel Smith, three pages/sheets identified as

TABLE 3

WebCode	Conclusions
	evidence number 2, was NOT altered, based upon the technical reasons mentioned throughout this expert's opinion report.
VT4Y8J	When analyzing the document, with the specialized UVSC and ESDA 2 team, no irregularities or traces of alteration and falsehood were detected, likewise following the steps of the method it was not possible to detect any type of alteration.
VTNK29	the document was not subject to any alteration nor eraser
VUML8Z	No evidence was located to suggest the compensation amount on the submitted contract has been altered.
VWRBCU	The questioned document has not been altered. Any alterations are no indicated.
W2ZWX7	Visual and alternate light source examinations of Exhibits 1(1)(a and b), 1(2)(a and b) and 1(3)(a and b) were conducted. Microscopic examination of Exhibits 1(1)a, 1(2)a and 1(3)a was conducted. The questioned paper and inked entries within Exhibits 1(1)(a and b) were compared with the questioned paper and inked entries within Exhibits 1(2)(a and b) and 1(3)(a and b). The questioned hand printed and signature inked entries on Exhibits 1(1)(a), 1(2)(a) and 1(3)(a) were prepared using black ballpoint ink. No ink differences or alterations were observed within the inks on Exhibits 1(1)(a), 1(2)(a) and 1(3)(a). The inks on Exhibits 1(1)(a), 1(2)(a) and 1(3)(a) were not distinguishable at this non-destructive level of analysis. If chemical analysis of the inks is requested, the evidence should be sent to a laboratory that conducts destructive ink examinations. The questioned paper within Exhibits 1(1)(a and b), 1(2)(a and b) and 1(3)(a and b) originated from or shares a common source. The questioned machine-generated entries on Exhibits 1(1)(a), 1(2)(a) and 1(3)(a) were prepared using toner printing technology. No font differences or alterations were observed within the questioned machine-generated entries on Exhibits 1(1)(a), 1(2)(a) and 1(3)(a). Electrostatic Detection Apparatus (ESDA) examination of Exhibits 1(1)(a and b), 1(2)(a and b) and 1(3)(a and b) was conducted. Indented handwriting and machine-created impressions were observed on Exhibits 1(1)(a and b), 1(2)(a and b) and 1(3)(a and b); however, some of the handwriting impressions on Exhibits 1(1)b, 1(2)b and 1(3)b are not of evidentiary value. Indentation lifts were created to preserve the results of the ESDA examination. Exhibits 1(1)(a and b), 1(2)(a and b) and 1(3)(a and b) were digitally preserved. The ESDA indentation lifts were digitally processed.
WB64FQ	Result: When performing the analysis of the questioned document, identified with the document called "Green Gardens Employee Hire Contract 2022" "Employment Contract" which consists of three pages of white paper printed in black ink and with manuscripts in black ink, it was determined that no alterations were detected. Interpretation: By virtue of what is indicated in the previous result, no signs of alteration are detected in the document in question.
WT6UWU	In summary, it is stated that no manipulations can be detected in the contract.
XJACJ6	In our opinion, scenario is not enough to examine the document
Y6QADQ	No objective forgery features or signs of a change in the entries could be identified. The contract appears unchanged.
Y9CRTQ	No objective counterfeiting features can be detected.
YLY2HG	No evidence of significance was found to indicate that the questioned three (3) page employee contract between Julie Andie and Rachel Smith (Item 1) was altered.
YTFH86	Visual, microscopic, and alternate light source examinations of Exhibits 1(1)a through 1(3)a were conducted. Visual and alternate light source examinations of Exhibits 1(1)b through 1(3)b were conducted. Side lighting and Electrostatic Detection Apparatus (ESDA) examinations of Exhibits 1(1)(a and b) through 1(3)(a and b) were conducted. The questioned machine-generated and inked entries on Exhibits 1(1)a through 1(3)a were intercompared. The indented impressions on Exhibits 1(1)(a and b) through 1(3)(a and b) were intercompared. Indented handwriting and machine-created impressions were

TABLE 3

WebCode	Conclusions
	observed on Exhibits 1(1)(a and b) through 1(3)(a and b). The results of the side-lighting examination were preserved digitally. Indentation lifts were created to preserve the results of the ESDA examination. The original questioned hand printed entries on Exhibit 1(1)a were observed as indented handwriting impressions on Exhibits 1(1)b, 1(2)(a and b) and 1(3)(a and b) The original questioned hand printed entries on Exhibit 1(2)a were observed as indented handwriting impressions on Exhibits 1(1)(a and b), 1(2)b, and 1(3)(a and b). The original questioned signatures and hand printed dates on Exhibit 1(3)a were observed as indented handwriting impressions on Exhibits 1(1)(a and b), 1(2)(a and b), and 1(3)b. The indented machine-created impressions observed on Exhibits 1(1)(a and b) are of the same type and design as the indented machine-created impressions observed on Exhibits 1(2)(a and b) and 1(3)(a and b). The questioned machine-generated entries on Exhibits 1(1)a, 1(2)a, and 1(3)a were prepared using toner printing technology. No alterations were observed on Exhibits 1(1)a through 1(3)a. No differences in printing technology or font were observed within the questioned machine-generated entries on Exhibits 1(1)a through 1(3)a. There are indications the questioned machine-generated entries on Exhibit 1(1)a may have been prepared by the same printer as the questioned machine-generated entries on Exhibits 1(2)a and 1(3)a; however, due to a limited amount of individualizing characteristics, the evidence falls short of that necessary to support a conclusive opinion. Additionally, the machine-generated entries on Exhibits 1(1)a through 1(3)a have limited suitability for comparison with submitted known printer standards or a suspected printer. The indented machine-created impressions on Exhibits 1(1)(a and b) through 1(3)(a and b) are suitable for comparison with submitted known printer standards or a suspected printer. No differences in the paper in Exhibits 1(1)(a and b) through 1(3)(a and b) were observed. No watermarks were observed on Exhibits 1(1)(a and b) through 1(3)(a and b). Therefore, the questioned paper in Exhibits 1(1)(a and b) originated from or share a common source with the questioned paper in Exhibits 1(2)(a and b) and 1(3)(a and b). The staple holes in Exhibits 1(1)(a and b) through 1(3)(a and b) aligned with one another and were consistent with being perforated by one staple. The creased folds in the upper stapled corners of Exhibits 1(1)(a and b) through 1(3)(a and b) aligned with one another. The questioned hand printed entries on Exhibits 1(1)a through 1(3)a and the questioned signatures on Exhibits 1(3)a were prepared using black ballpoint ink. The ink of the questioned hand printed entries and questioned signatures on Exhibits 1(1)a through 1(3)a were not distinguishable at this non-destructive level of analysis. If chemical analysis of the inks is requested, the evidence should be sent to a laboratory that conducts destructive ink examinations. Exhibit 1 was digitally preserved. The original ESDA indentation lifts were digitally preserved and processed.
YVL3RY	There was no alteration or eraser to the document.
Z49JNE	While a definite conclusion could not be reached due to limitations associated with non-destructive examinations, alterations were not detected on Item 1 based on the lack of observed additions or deletions and the consistency of the printed text and optical properties between pages. Indented writing was observed on each of the Item 1 pages that correspond to portions of the written text on the other pages, using oblique lighting and/or the Electrostatic Detection Apparatus (ESDA). The ESDA lifts, used to capture and retain the indented writing, are considered secondary evidence and have been designated Item 2. Additional assessments and observations have been made regarding the submitted items and recorded for possible future comparisons.
Z4LBEA	Se concluye que la muestra cuestionada no presenta alteración. [Requested translation was not provided by time of publication.]
Z88WGK	The employment contract has probably not been altered
ZAYVY3	Visual, microscopic and alternate light source examinations of Exhibits 1(1)a, 1(2)a, and 1(3)a were conducted. A visual examination of Exhibits 1(1)b, 1(2)b, and 1(3)b was conducted. Exhibits 1(1), 1(2), and 1(3) were inter-compared. Electrostatic Detection Apparatus (ESDA) examination of Exhibits 1(1)(a and b), 1(2)(a and b), and 1(3)(a and b) was conducted. The results are as follows: The original hand printed entries on Exhibit 1(2)a and the hand printed entries and signatures on Exhibit 1(3)a were observed as indented handwriting impressions on Exhibits 1(1)(a and b). The original hand printed entries on Exhibit 1(1)a and the hand printed entries and signatures on Exhibit 1(3)a were observed as indented handwriting impressions on Exhibits 1(2)(a and b). The original hand printed entries on Exhibits

TABLE 3

WebCode	Conclusions
	1(1)a and 1(2)a were observed as indented handwriting impressions on Exhibits 1(3)(a and b). The handwritten entries on Exhibits 1(1)a, 1(2)a, and 1(3)a were observed as embossing on Exhibits 1(1)b, 1(2)b, and 1(3)b, respectively; these impressions are not of evidentiary value. The machine-created indented impressions on Exhibits 1(1), 1(2), and 1(3) are similar in position and style. Indentation lifts were created to preserve the results of the ESDA examination. The questioned hand printed entries and signatures within Exhibits 1(1)a, 1(2)a, and 1(3)a were prepared using black ballpoint ink. The ink(s) on Exhibits 1(1)a, 1(2)a, and 1(3)a was not distinguishable at this non-destructive level of analysis. If chemical analysis of the ink(s) is requested, the evidence should be sent to a laboratory that conducts destructive ink examinations. The paper of Exhibits 1(1), 1(2), and 1(3) appears to have been stapled a single time, contains no watermark, and was not distinguishable at this non-destructive level of analysis. If chemical analysis of the paper is requested, the evidence should be sent to a laboratory that conducts destructive paper examinations. The questioned machine-generated entries on Exhibits 1(1)a, 1(2)a, and 1(3)a were prepared using toner printing technology. There are indications the questioned machine-generated entries on Exhibits 1(1)a, 1(2)a, and 1(3)a may have been prepared by the same printer; however, due to the absence of known exemplars, the evidence falls short of that necessary to support a conclusive opinion. Therefore, no characteristics of an alteration was observed. Exhibit 1 and the ESDA indentation lifts were digitally preserved.
ZERRNT	The questionned document has not been altered
ZGLEJ7	The questioned document has not been altered. No evidence was found to suggest that the document was altered.
ZGTYRD	Thus, once the document has been analyzed, the conclusion is reached that the "contract" document does not present an alteration in its materiality.
ZJMJYC	No alterations have occurred to the compensation terms of the questioned employee contract since the time of signing.
ZY4H2R	1. Document Q-1 through Q-3 were examined for Impressions and Indented Writings. Positive results noted, using Visual examination, Oblique Lighting source and Foster and Freeman VSC 600/HS ESDA. ESDA assisted in deciphering the impressions present on all three Documents. The Three (3) ESDA lifts were retained in the case file. 2. Document Q-1: Impressions recovered from the handwritten entries from Document Q-3. Impressions reads: (unknown signature) May 9, 2022 (unknown signature) May 9, 2022 3. Document Q-2: Impressions recovered from the handwritten entries from Document Q-1. Impressions reads: "9th May 22" "Julie Andie" "43,894" An Impression of a "Circle" to the right of "43,984" entry. It corresponds to the positioning of "per annum" Document Q-1. 4. Document Q-3: Impressions recovered from handwritten entries from Document Q-2. Impressions reads: "12" "5" An Impression of a "Circle" to the right of "43,984" entry. It corresponds to the positioning of "per annum" Document Q-1. 5. Examination of All Three Questioned Documents show No Evidence of Alteration.

Additional Comments

TABLE 4

WebCode	Additional Comments
3PPD6C	There was no difference in ink characteristics of handwritten entries observed on all pages of the questioned document.
4HGFQ6	Answer "D" was selected because examinations which do not find any evidence of alteration are not necessarily conclusive evidence that alteration has not occurred.
4RBGBN	4.1) The above findings are demonstrable through the use of enlarged illustrative charts. If testimony is anticipated, please return all items and allow at least three weeks for the necessary preparation. 4.2) The staple removed from item #01 is being returned as item #01.01 for your safekeeping. 4.3) The developed ESDA lifts are being returned as item #02 for your safekeeping. 4.4) All submitted items are being returned to the submitting Agency.
4XRA2F	Scale of conclusions including levels from -4 to +4.
67Y9AG	According to the results obtained in the aforementined test, there are no signs of alteration in the document.
6TC7MW	The second paragraph of point 12 is aligned differently with respect to the other paragraphs of the document.
722977	5. The images visualized under section 3 above, indicate that the first page of the contract, Q1a, was located above the Q1b document when the handwritten content was executed. 6. There was a single staple securing the three pages of the document. This staple was removed and the remaining holes were in alignment with the original staple with no additional holes. 7. The Q1a-c documents were produced by an electrophotographic process/laser printer on white copy paper. The documents were a preprinted format with printed lines for added handwritten information. 8. The font used for producing the Q1a-c was Calibri. The header on page Q1a was a size 13, bold, font. The paragraph headings were size 10, bold, with the content a size 10 font.
7WTMH9	I consider that a definite opinion regarding this case is not feasible because the remote possibility exists that the ink entries could have been added/amended using the same pen at a different time.
ANJTFN	It was not possible to answer categorically, since the document is not sealed in any way, only with the stapler pin, which allowed a document to be opened and any page changed without showing any traces of the page being changed.
BCCXH6	The report includes requested analysis, methods, and observation sections to explain the basis of the conclusions.
CLUZWH	Conclusions defined in accordance with ASTM E1658-08 Standard Terminology for Expressing Conclusions of Forensic Document Examiners. Indeterminable - This is the zero point of the confidence scale. It is used when there are significantly limiting factors, [...] and the examiner does not have even a leaning one way or another.
D37DML	I would like to see other contracts produced by this company during May 2022. To see if any formatting changes have occurred. Or if this is their standard Employee Hire Contract.
F6QXHV	In our lab, we do not interpret on ESDA findings in our reports. We merely state whether impressions were found or not, and mention that the impressions may originate from either: - already known/visible writing. Unknown writing (not visible). From case handling. Regarding the VSC examination it should be mentioned that we do not consider color comparison of ink based solely on optical investigation a valid method in our lab, and so we wouldn't base a conclusion on this examination alone.
FQFXFQ	Qualified opinions about the ink and evidence on alterations on the three pages in Item 1 were issued for the following reasons: - Because the inks have the same class characteristics and display similar optical properties but are on different substrates, they still may be different inks. If further chemical analysis of the inks is requested, please contact the laboratory to discuss further examinations. - Additionally, while evidence of an alteration may not exist, the possibility of an alteration cannot be eliminated. The evidence will be returned to the submitter.

TABLE 4

WebCode	Additional Comments
FZV4KU	From the findings, there were no signs of alteration in the handwritten entries or the printed material and no evidence of paper substitution was observed. This proved that no alteration was made to the questioned document.
GBT7L3	After subjecting the indication to different light sources, it is confirmed that it does not present alteration.
H3VY8E	The current TEST was carried out by the expert at the [LAB NAME]
JH48Z3	When submitting the questioned document to the different forensic lights (white light, transmitted light, fluorescent light, UV light and IR light) of the VSC team, no relevant data was observed.
KBYRQK	Limitations during non-destructive paper examinations/ comparisons: This non-destructive form of paper testing/ comparison is limited and additional chemical/ destructive testing of the paper will be needed if a more definitive conclusion is required involving these three sheets of paper. Limitations during non-destructive ink examinations/ comparisons: This non-destructive form of ink testing/ comparison is limited and additional chemical/ destructive testing of the inks will be needed if a more definitive conclusion is required involving these inked writing samples.
KBZMBP	The circumstance of being in the presence of a test in which there is no evidence of manipulation, having applied all the study techniques at our disposal, makes us doubt whether to select between conclusions C and E, that is, between the one that affirms that it cannot be determined if the questioned document has been altered or not, and that it has not been altered. In the end we opted for E, given the number of techniques applied and the unidirectionality of the results obtained.
LRH6GH	Handwriting and Signature should be examinationed to increase confidence in opinions. It also includes the possibility of further testing of pen inks by advanced methods such as HPLC, including Raman Spectroscopy.
MWXT2R	The resulting ESDA lift (electrograph/imaging film) and test strip are being supplied to the submitting agency.
N3LTUD	The examinations conducted are exhaustive of what is available in this lab. No evidence of alteration from these examinations does not negate all possibility the document has been altered in a means that has not been detected. Other examinations of paper and ink/toner not available in this lab may yield further results. Handwriting and signature examination has not been conducted. Further, it cannot be determined whether the handwritten entries appearing on pages 1 and 2 were written before or after the document was signed.
NJRXHQ	The writing in Pages 1-3 in Item 001 were suitable for a handwriting examination. Please contact the FDU for information about the collection and submission of known standards if a handwriting examination should be needed in the future. Images of Pages 1-3 in Item 001 and EDD lifts 001A1-001A6 in Item 001A will be retained by the FDU.
NYFCEV	In routine casework, it would be usual to ask specifically what both the employee and employer are alleging. It is stated that the employer has provided the alleged original contract. It is further stated that the employee alleges that she was not paid what was indicated as her compensation. As background information, we would ask what the employee alleges was the amount of her compensation (with and without deductions) and whether or not the contract was stapled when both parties signed it. However, it is accepted that this information may not be available in a real case.
PDRBLF	Los resultados de este informe pericial solo están relacionados con los EMP y EF analizados. [Requested translation was not provided by time of publication.]
PQ69BG	Known signatures of Julie Andie would have been requested by this examiner. Also, a request would be made for normal business practice at such times. If a copy of the contract was made, then that copy is requested for examination.
TPRCHU	1. Further chemical analysis of the ink may provide additional evidence, in which our organization does not provide. 2. It would also shed more lights if we can clarify with handling officer before the documents are handed over to the laboratory. 3. In terms of handwriting examination, we may need more exemplars from Ms. Smith because there is a small chance that she simulated Julie Andie's handwriting, precisely the letter 'M' on 'May'.

TABLE 4

WebCode	Additional Comments
U4B3KF	The printed texts are uniform in terms of size, morphology and spaces; they do not exhibit traces or signs of manipulation, insertion of letters or words: the substrate does not show signs of alteration by subtraction since there are no broken or curled fibers or thinning of the paper, which indicate the use of physical or chemical substances or abrasive media. As mentioned in the findings, in the upper right end of the support of the page "Page 1 of 3" and in the page Page 3 of 3" a small anomaly is observed at their ends, which is not present in the intermediate page. "page 2 of 3"; this may suggest a possible change to page 2 of the contract, but that, reviewed in context with the other constituent elements of the document, this finding does not affect its integrity. The manuscripts completed in the contract: "9th", "May. *'"22", "Julie Andie". "43.894", the oval enclosing the words "per annum", "3", "12", "5", the signatures that work in the space "Company Official Signature" and "Employee Signature", and the dates "May 9. 2022", are filled out with a writing instrument of similar physical characteristics.
UBDZEE	If further analysis and comparison of the inks is required, Q1 should be submitted to a lab that performs chemical/destructive testing. If examination and comparison of the handprinting and/or signatures on Q1 is required, a sufficient quantity of known specimen writing and signatures must be submitted.
UPC4J6	No additional comments.
VQVP6Y	The current TEST was performed by the expert at the [LAB NAME]
VT4Y8J	the groove marks of the three sheets of the contract coincide with each other and no mark other than those shown in the contract was found.
VUML8Z	No handwriting or signature specimens were received from Julie Andie. Accordingly, I cannot exclude the possibility that page 3 was not actually signed and dated by Julie Andie and that the whole document has been recreated.
YTFH86	If a printer is located, the entire machine, including power cords and/or known samples, should be submitted for examination and comparison. Exhibit 1 and the original ESDA indentation lifts will be returned.
Z4LBEA	[Lab Name] aplico los siguientes métodos: *Sistemas de Impresión. *Alteraciones. *Características de seguridad en papel. *Exámenes visuales de tintas. [Requested translation was not provided by time of publication.]

-End of Report-
(Appendix may follow)

Collaborative Testing Services ~ Forensic Testing Program

Test No. 23-5211: Questioned Documents Examination

DATA MUST BE SUBMITTED BY **April 24, 2023, 11:59 p.m. EDT** TO BE INCLUDED IN THE REPORT

Participant Code: U1234D WebCode: ZFQVH6

The Accreditation Release section can be accessed by using the "Continue to Final Submission" button above. This information can be entered at any time prior to submitting to CTS.

Scenario:
A new employee and company official are having a dispute regarding the terms of their employee contract. The employee, Julie Andie, states that she was not paid what was indicated as her compensation on the employee contract at the time of her signature. The company official, Rachel Smith has provided the alleged original, which she claims contains all terms to which her employee agreed. Ms. Smith is responsible for the hand printing in the document in its entirety, except the employee signature and date on page 3, which was completed by Andie. Investigators are asking you to review the three-page contract and determine if any alterations are indicated that may support the employees claims.

Items Submitted (Sample Pack QD):
Item 1: Three-page employee contract between Julie Andie and Rachel Smith

1.) Based on the findings of your examination, to what degree can it be confirmed or refuted that the questioned document has been altered?

(Select from the following list. If the wording below differs from the normal wording of your conclusions adapt these conclusions as best you can and use your preferred wording for question 3.)

A. The questioned document HAS BEEN ALTERED.
B. The questioned document HAS PROBABLY BEEN ALTERED.
C. CANNOT DETERMINE whether or not the questioned document has been altered.
D. The questioned document HAS PROBABLY NOT BEEN ALTERED.
E. The questioned document HAS NOT BEEN ALTERED.

Q1

2.) Methods and techniques utilized.

Please note: The list of methods/techniques provided in the dropdown list is not an all inclusive list and should not be used to determine what methods/techniques should be performed. Methods/techniques not on this list may be utilized.

Please briefly indicate the observations made from each method/technique utilized.

Please note: *Any additional formatting applied in the free form space below will not transfer to the Summary Report and may cause your information to be illegible. This includes additional spacing and returns that present your responses in lists and tabular formats.*

Please note: *Any additional formatting applied in the free form space below will not transfer to the Summary Report and may cause your information to be illegible. This includes additional spacing and returns that present your responses in lists and tabular formats.*

3.) What would be the wording of the Conclusions in your report?

4.) Additional Comments

RELEASE OF DATA TO ACCREDITATION BODIES

The Accreditation Release is accessed by pressing the "Continue to Final Submission" button online and can be completed at any time prior to submission to CTS.

CTS submits external proficiency test data directly to ASCLD/LAB, ANAB, and/or A2LA. Please select one of the following statements to ensure your data is handled appropriately.

○ This participant's data is intended for submission to ASCLD/LAB, ANAB, and/or A2LA. (Accreditation Release section below must be completed.)
○ This participant's data is **not** intended for submission to ASCLD/LAB, ANAB, and/or A2LA.

Have the laboratory's designated individual complete the following steps
only if your laboratory is accredited in this testing/calibration discipline
by one or more of the following Accreditation Bodies.

Step 1: Provide the applicable Accreditation Certificate Number(s) for your laboratory

ANAB Certificate No.
(Include ASCLD/LAB Certificate here)

A2LA Certificate No.

Step 2: Complete the Laboratory Identifying Information in its entirety

Authorized Contact Person and Title

Laboratory Name

Location (City/State)