

FORENSIC ANALYSIS REPORT

Children Tracking Groups Forensics — PDF Groups A1–F1

Minnesota Court Records Online (MCRO) — Fourth Judicial District, Hennepin County

Property	Value
Report Subject	Font Tracking Group Classification & Cross-Group Discontinuity Analysis
PDF Groups Analyzed	A1, A2, A3, A4, A5, A6, B1, C1, D1, D2, D3, E1, F1 (13 groups)
Total Documents in Scope	1,942 PDFs across 245+ cases
Font Families	6 letter-families: A (TTF-A), B (TTF-B/CFF), C (TTF-C), D (TTF-D), E (TTF-E), F (TTF-F)
Date Range of Filings	January 2017 – August 2025
Data Source	PostgreSQL forensic database (Supabase) — READ-ONLY analysis
Database Tables Used	children_tracking_groups, children, hashpack, children_objects, children_signatures_full_report
Report Date	March 2026
Reproducibility	All findings are query-reproducible. SQL in Appendix.

IMPORTANT DISCLAIMER: This report presents objective forensic data findings reproducible from the source database. It does not assert conclusions about guilt, fabrication, or criminal intent. Each finding documents measurable patterns that warrant independent expert examination. No motives are attributed. Significance sections describe what the numbers show, not why they exist.

1. EXECUTIVE SUMMARY

1,942 PDF court filings belong to 13 tracking font groups (A1–F1) spanning 6 letter-families, each defined by a unique combination of bespoke embedded font objects with identical SHA256 hashes across all member documents.

Family A (139 docs, 6 subgroups) consists entirely of charging instruments (complaints, amended complaints) produced by the Winnovative HTML-to-PDF engine. Its defining feature is a zero-byte ghost font (TTF-Font-1a, SHA256 = e3b0c44...) present in 66 of 139 documents. No judicial officer signatures appear; signers are limited to MCRO Watermark and Integration Service Account.

Family B (235 docs, 1 subgroup) is the only CFF-format tracking font family. It spans the broadest filing type range (27 types) and the longest active period (Feb 2017 – Aug 2025). 99% of B1 documents carry judicial officer signatures and 40% carry ESolutions CA digital signatures.

Family C (1,089 docs, 1 subgroup) is the dominant group, comprising 56% of all tracked documents. Defined by COLNXP+ArialMT + Arial font pair, it is concentrated in Rule 20 competency proceedings (28% of docs are Rule 20.01 Evaluation orders; 14% are Finding of Incompetency orders).

Family D (473 docs, 3 subgroups) uses standard Windows system fonts (Calibri, Symbol, Wingdings) in combinatorial subsets. D3 is forensically anomalous: it is the ONLY group with zero judicial officer signatures — every document carries only the MCRO Watermark (1.00 sigs/doc average).

The A → B boundary is the sharpest discontinuity in the corpus: font format changes (TTF → CFF), producer pipeline shifts (Winnovative → Word/PDFMaker), filing types shift from complaints to judicial orders, and signature architecture transforms completely.

Text content uniqueness ratio drops from 100% in Family A to 42–64% in Families B–D, indicating heavy template reuse in judicial order production. Family D1 has the lowest ratio (42.3%), meaning 58% of its documents share identical extracted text with at least one other D1 document.

Family E (2 docs) and Family F (4 docs) are micro-groups with unique font fingerprints (Times New Roman and TTF-Font-1f respectively). F1 has the highest signature density of any group (5.0 sigs/doc average).

KEY METRICS

- Zero judicial signatures in D3: 238 documents, 0% judicial officer signatures — only MCRO watermark
- Ghost font in A-family: SHA256 = e3b0c44... (zero-byte empty file) embedded in 66 charging instruments
- Template reuse in D1: only 44 distinct text hashes across 104 documents (42.3% uniqueness)
- C1 dominance: 1,089 docs = 56% of all tracked documents, concentrated in Rule 20 pipeline
- B1 longevity: single CFF font active 8.5 years (Feb 2017 – Aug 2025), 27 filing types
- A → B brick wall: 0% → 99% judicial signatures, TTF → CFF, Winnovative → Word, complaints → orders
- F1 signature density: 5.0 signatures per document (vs corpus average of ~1.5)
- Metadata wall at A → B: XMP creator_tool presence jumps from <5% (A-family) to 98%+ (B onwards)

2. METHODS

2.1 Cohort Definition

The analysis cohort consists of all rows in `children_tracking_groups` where `pdf_group` is one of: A1, A2, A3, A4, A5, A6, B1, C1, D1, D2, D3, E1, F1. This yields 1,942 document-rows, each uniquely identified by `evidence_uid`.

The `pdf_group` column assigns each document to exactly one group based on the combination of embedded tracking font objects (`font1` through `font4`) present in the PDF. The `font_group` column identifies the letter-family (TTF-A, TTF-B, TTF-C, TTF-D, TTF-E, TTF-F). Within each letter-family, the numeric suffix (e.g., A1 vs A2) distinguishes documents by which specific subset of fonts from that family they contain.

2.2 Tables and Join Keys

Primary table: `children_tracking_groups` (`pdf_group` classification, font SHA256 hashes, filing metadata). **Joined to:** `children` (`evidence_uid` → `evidence_uid`) for XMP metadata, MSIP flags, page counts, file sizes. **hashpack** (`evidence_uid` → `evidence_uid`, 1:1) for text hash fingerprints, EOF counts, stream counts. **children_objects** (`evidence_uid` → `evidence_uid`) for internal PDF object inventories. **children_signatures_full_report** (`evidence_uid` → `evidence_uid`) for digital signature structure analysis.

2.3 Feature Dimensions Analyzed

Group composition: document count, distinct cases, distinct clusters, filing type distribution, case type distribution, date range.

Font/object signatures: tracking font names and SHA256 hashes, font format (.ttf vs .cff), font count per document, top object hashes by group, group-defining object concentration.

Metadata signatures: XMP creator_tool, XMP producer, XMP create_date, metadata_date, document_id, instance_id presence rates; top values and concentration.

Signature structure: signature count per document, signer identity distribution, rev_count (PDF revision count), edits_after_sig_flag rates, presence of judicial officer signatures vs system signatures (MCRO Watermark, ESolutions CA, Integration Service Account).

Internal fingerprints: text hash uniqueness ratio ($\text{distinct fp_text_sha256} / \text{total docs}$), EOF count distribution, other stream count distribution.

2.4 Boundary Discontinuity Method

For each pair of adjacent groups (A6 → B1, B1 → C1, C1 → D1, D1 → D2, D2 → D3, D3 → E1, E1 → F1), the analysis computes the absolute difference in key proportions (e.g., % with judicial signature, % with XMP creator_tool, median font count) and identifies the top features with the largest shifts. Effect sizes are reported as raw proportion differences.

3. FINDINGS

Finding 1: Cohort Composition by PDF Group

Background: Each pdf_group represents a distinct combination of embedded tracking font objects. The table below provides the complete census of all 13 groups.

Grp	Doc s	Case s	Clust	Earliest	Latest	Font Family	Font Format	Tracking Fonts	#Font s
A1	7	7	5	2017-01-19	2018-11-01	TTF-A	.ttf	TTF-Font-1a	1
A2	65	62	34	2020-01-06	2023-12-15	TTF-A	.ttf	TTF-Font-2a, 3a	2
A3	51	51	38	2020-10-26	2023-11-14	TTF-A	.ttf	TTF-Font-1a, 2a, 3a	3
A4	9	8	5	2020-02-05	2025-05-29	TTF-A	.ttf	TTF-Font-2a, 3a, 4a	3
A5	6	6	6	2022-08-08	2023-07-05	TTF-A	.ttf	TTF-Font-1a–4a	4
A6	1	1	1	2023-04-12	2023-04-12	TTF-A	.ttf	TTF-Font-1a, 3a	2
B1	235	130	51	2017-02-21	2025-08-22	TTF-B	.cff	CFF-Font-1b	1
C1	1089	196	77	2020-01-07	2025-07-02	TTF-C	.ttf	COLNXP+ArialMT, Arial	2
D1	104	75	24	2023-08-14	2025-04-28	TTF-D	.ttf	Calibri, Symbol, Wingdings	3
D2	131	92	30	2021-12-06	2024-04-03	TTF-D	.ttf	Symbol, Wingdings	2
D3	238	124	61	2021-08-13	2025-04-28	TTF-D	.ttf	Symbol	1
E1	2	2	2	2024-01-17	2024-04-26	TTF-E	.ttf	Times New Roman	1
F1	4	3	3	2024-01-10	2025-04-28	TTF-F	.ttf	TTF-Font-1f	1

Significance: Group C1 alone accounts for 56.1% of all tracked documents (1,089 of 1,942). The A-family subgroups are combinatorial subsets of four TTF-A fonts, with A5 containing all four and A1 containing only the zero-byte ghost font. The D-family similarly uses combinatorial subsets of three standard Windows fonts. B1 is the only CFF-format group, and F1 uses a unique unidentified font seen nowhere else in the corpus.

Finding 2: Filing Type Concentration by Group

Background: Filing type determines the legal function of each document. The distribution across groups reveals whether specific font-tracking signatures correlate with specific document production pipelines.

Grp	Top Filing Type	Coun t	% Grp	2nd Filing Type
A1	E-filed Comp-Warrant	4	57%	E-filed Comp-Order for Detention (29%)
A2	E-filed Comp-Order for Detention	31	48%	E-filed Comp-Summons (29%)
A3	E-filed Comp-Order for Detention	34	67%	E-filed Comp-Summons (22%)

A4	E-filed Comp-Summons	4	44%	E-filed Comp-Order for Detention (22%)
A5	E-filed Comp-Order for Detention	4	67%	E-filed Comp-Warrant (17%)
A6	Amended Criminal Complaint	1	100%	—
B1	Findings and Order	69	29%	Order Revoking Interim Conditions (12%)
C1	Notice of Remote Hearing	309	28%	Rule 20.01 Evaluation Order (28%)
D1	Rule 20.01 Evaluation Order	85	82%	Other Document (16%)
D2	Rule 20.01 Evaluation Order	128	98%	Rule 20.02 Eval Order (2%)
D3	Notice of Remote Hearing	210	88%	Summons (6%)
E1	Finding of Incompetency and Order	2	100%	—
F1	Other Document	2	50%	Findings of Fact/Order (25%)

Significance: The A-family is exclusively charging instruments (complaints). B1 spans 27 distinct filing types — the broadest range in the corpus. D1 and D2 are overwhelmingly Rule 20.01 competency evaluation orders (82% and 98% respectively). D3 is predominantly hearing notices. This filing-type specialization aligns precisely with group boundaries, suggesting each group corresponds to a specific document generation template or pipeline.

Finding 3: Group-Defining Font and Object Signatures

Background: The `children_tracking_groups` table records up to four tracking font objects per document, each with a SHA256 hash. The `children_objects` table provides the complete internal object inventory. Font hash identity across documents proves common binary origin.

A-Family Font Architecture: Four distinct TTF tracking fonts define the A-family:

Font Name	Type	Size (bytes)	SHA256 Prefix	Significance
TTF-Font-1a	.ttf	0 (ZERO)	e3b0c44298fc1c14	Zero-byte ghost font — SHA256 of empty file. Present in A1, A3, A5, A6.
TTF-Font-2a	.ttf	40,068	3909d3a28c60f88a	Present in A2, A3, A4, A5. Standard tracking font.
TTF-Font-3a	.ttf	40,660	f627466c20a82cd2	Present in A2, A3, A4, A5, A6. Most common A-family font.
TTF-Font-4a	.ttf	60,816	10f3aaa3db59a93e	Present in A4, A5 only. Largest A-family font.

B-Family: Single CFF-format font (CFF-Font-1b, SHA256 prefix 427af119e8f70484, 86,093 bytes). This is the ONLY Compact Font Format tracking font in the entire corpus. Present in 211 of 235 B1 documents with confirmed hash. The remaining 24 have null hash values (font name confirmed but binary not extracted).

C-Family: Paired TTF fonts: COLNXP+ArialMT (SHA256 prefix 1fa67c75ff967237, 55,072 bytes) and Arial (SHA256 prefix b50a0345994f437f, 916,684 bytes). Both appear in 100% of C1 documents. The Arial font at 916 KB is anomalously large for a font subset — 9–23x larger than typical tracking fonts.

D-Family: Standard Windows system fonts used in combinatorial subsets: Calibri (SHA256 prefix varies by subgroup), Symbol (SHA256 prefix 086b4c456dbe6f09, 11,088 bytes), and Wingdings (SHA256 prefix 2585ea8d81cf3df4, 14,252 bytes). D1 contains all three; D2 contains Symbol + Wingdings; D3 contains only Symbol. Critically, the Symbol and Wingdings hashes are byte-for-byte identical across all D-family documents.

E-Family: Single TTF font: Times New Roman (SHA256 prefix 5c896c5fc6611826, 115,676 bytes). Only 2 documents.

F-Family: Single TTF font: TTF-Font-1f (SHA256 prefix ca5c750721902726, 68,808 bytes). Unidentified bespoke font appearing in only 4 documents. Not observed anywhere else in the corpus.

Finding 4: Metadata Presence Discontinuities

Background: XMP metadata fields (creator_tool, producer, create_date, document_id, instance_id) are embedded inside PDFs by the authoring application. Their presence/absence patterns reveal whether different groups were produced by fundamentally different software pipelines.

Gr p	Do cs	Creato r Tool	Produ cer	Creat e Date	Meta Date	Doc ID	Insta nce ID	MSIP	Has Sig	Last Mod
A1	7	0 (0%)	7 (100 %)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0	7 (100 %)	7 (100 %)
A2	65	3 (5%)	65 (100 %)	4 (6%)	4 (6%)	4 (6%)	4 (6%)	0	65 (100 %)	65 (100 %)
A3	51	0 (0%)	51 (100 %)	2 (4%)	2 (4%)	2 (4%)	2 (4%)	0	51 (100 %)	51 (100 %)
A4	9	2 (22%)	9 (100 %)	3 (33%)	3 (33%)	3 (33%)	3 (33%)	0	9 (100 %)	9 (100 %)
A5	6	0 (0%)	6 (100 %)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0	6 (100 %)	6 (100 %)
A6	1	0 (0%)	1 (100 %)	1 (100 %)	1 (100 %)	1 (100 %)	1 (100 %)	0	1 (100 %)	1 (100 %)
B1	235	231 (98%)	235 (100 %)	235 (100 %)	235 (100 %)	235 (100 %)	235 (100 %)	19 (8%)	235 (100 %)	235 (100 %)
C1	1089	1071 (98%)	1089 (100 %)	1089 (100 %)	1088 (100 %)	1088 (100 %)	1088 (100 %)	1 (<1%)	1088 (100 %)	1089 (100 %)
D1	104	104 (100%)	104 (100 %)	104 (100 %)	104 (100 %)	104 (100 %)	104 (100 %)	0	104 (100 %)	104 (100 %)
D2	131	131 (100%)	131 (100 %)	131 (100 %)	126 (96%)	131 (100 %)	131 (100 %)	0	131 (100 %)	131 (100 %)
D3	238	238 (100%)	238 (100 %)	238 (100 %)	211 (89%)	238 (100 %)	238 (100 %)	0	238 (100 %)	238 (100 %)
E1	2	2 (100%)	2 (100 %)	2 (100 %)	2 (100 %)	2 (100 %)	2 (100 %)	0	2 (100 %)	2 (100 %)
F1	4	4 (100%)	4 (100 %)	4 (100 %)	3 (75%)	4 (100 %)	4 (100 %)	0	4 (100 %)	4 (100 %)

Significance: The A-family is a metadata desert: 0–5% of documents have XMP creator_tool, and most lack create_date, document_id, and instance_id. This abruptly reverses at B1, where 98–100% of documents have all metadata fields populated. From B1 onward, metadata completeness remains at 96–100% across all groups. This is the single sharpest metadata discontinuity in the corpus.

Producer pipeline analysis: A-family documents are produced by Winnovative HTML to PDF Converter (versions 11.4 and 15.0), modified by iText 7.1.16 (Minnesota Judicial Branch licensed). B1

and later groups are predominantly produced by Microsoft Word for Microsoft 365 and Acrobat PDFMaker, also modified by iText 7.1.16. This confirms two fundamentally different document generation pipelines.

Finding 5: Signature Structure Differences by Group

Background: PDF digital signatures serve as cryptographic attestations. The corpus contains three categories of signers: system signatures (MCRO Watermark, Integration Service Account, ESolutions Development CA), and judicial officer signatures (named judges/referees).

Gr p	Do cs	Avg Sigs/D oc	Median Rev	Judicial Sig %	ESolutio ns %	Integ Svc %	Edits After	Distinc t Signer s	Top Signer
A1	7	1.86	5	0%	0%	86%	46%	2	Integratio n Svc Acct
A2	65	1.94	4	0%	0%	94%	48%	2	Integratio n Svc Acct
A3	51	1.96	5	0%	0%	94%	49%	2	Integratio n Svc Acct
A4	9	1.67	4	0%	0%	67%	40%	2	Integratio n Svc Acct
A5	6	2.00	5	0%	0%	100%	50%	2	Integratio n Svc Acct
A6	1	1.00	4	0%	0%	0%	0%	1	MCRO Watermar k
B1	235	2.71	5	99%	40%	0%	63%	37	Janzen, Lisa (30%)
C1	1089	1.40	5	29%	<1%	0%	29%	20	Browne, Michael (15%)
D1	104	1.82	6	80%	0%	0%	45%	6	Dayton Klein, Julia (50%)
D2	131	1.73	6	58%	5%	0%	42%	11	Dayton Klein, Julia (26%)
D3	238	1.00	5	0%	0%	0%	0%	1	MCRO Watermar k (100%)
E1	2	2.50	9	100%	0%	0%	60%	4	Multiple
F1	4	5.00	6	75%	75%	0%	80%	6	ESolution s Dev CA (75%)

Significance: Three groups have ZERO judicial officer signatures: all six A-family subgroups (A1–A6) and D3. In the A-family, the Integration Service Account replaces judicial signatures. In D3 (238 documents), the ONLY signer is the MCRO Watermark — these documents pass through the system

with no judicial, ESolutions, or Integration Service Account attestation beyond the download-time watermark.

The D2 → D3 boundary is particularly notable: D2 has 58% judicial signature presence; D3 drops to 0%. Yet both groups carry the same Symbol tracking font. This means documents with identical font infrastructure are being processed through two different signing pipelines.

F1 anomaly: At 5.0 signatures per document, F1 has the highest signature density in the corpus. Three of its four documents carry ESolutions CA signatures. With only 4 documents, F1 represents a distinct high-attestation production pathway.

Finding 6: Boundary "Brick Wall" Analysis

Background: This finding quantifies the most dramatic feature shifts at each group boundary, measuring how sharply the forensic profile changes between adjacent groups.

BOUNDARY: A6 → B1 (The Primary Brick Wall)

Feature	A6 (n=1)	B1 (n=235)	Δ (Difference)	Direction
Font format	TTF only	CFF only	—	Complete format change
Judicial officer signatures	0%	99%	+99 pp	Appear entirely
XMP creator_tool present	0%	98%	+98 pp	Metadata appears
XMP create_date present	100%	100%	0 pp	Both present
Integration Service Account	0%	0%	0 pp	Both absent
ESolutions CA present	0%	40%	+40 pp	Tyler sig appears
Producer pipeline	Winnovative HTML	Word/PDFMaker	—	Complete tool change
Filing types	Complaints only	27 distinct types	—	Radical expansion
Distinct signers	1	37	+36	Judicial universe opens
Avg sigs/doc	1.0	2.71	+1.71	Layered signing begins

This is the single sharpest boundary in the corpus. Every measurable dimension shifts simultaneously. The A-family's Winnovative HTML-to-PDF pipeline, with no judicial signatures and no XMP metadata, gives way to a Word/PDFMaker pipeline with rich metadata, judicial officer attestations, and ESolutions CA digital signatures.

BOUNDARY: B1 → C1

Feature	B1 (n=235)	C1 (n=1089)	Δ	Direction
Tracking font format	CFF (.cff)	TTF (.ttf)	—	Format reverts to TTF
Judicial officer sig %	99%	29%	−70 pp	Dramatic drop
ESolutions CA %	40%	<1%	−40 pp	Nearly disappears
Avg sigs/doc	2.71	1.40	−1.31	Simpler signing
Doc count	235	1,089	4.6x	Massive volume increase
Dominant filing type	Findings and Order	Notice Remote Hearing	—	Shifts to notices/R20
Text uniqueness ratio	63.8%	52.4%	−11.4 pp	More template reuse

BOUNDARY: D2 → D3 (The Signature Vanishing Point)

Feature	D2 (n=131)	D3 (n=238)	Δ	Direction
Judicial officer sig %	58%	0%	−58 pp	Complete disappearance
Avg sigs/doc	1.73	1.00	−0.73	MCRO-only

Distinct signers	11	1	–10	Only MCRO remains
Edits after sig %	42%	0%	–42 pp	Zero post-sig edits
Tracking fonts present	Symbol + Wingdings	Symbol only	–1 font	Wingdings drops
Dominant filing type	R20.01 Eval Order (98%)	Remote Hearing Notice (88%)	—	Orders → Notices
Avg objects/doc	7.9	8.0	+0.1	Nearly identical

D2 and D3 share the Symbol tracking font and similar average object counts, yet their signature profiles are completely different. D2 documents receive judicial signatures 58% of the time; D3 documents receive none — ever. Combined with the filing type shift from Rule 20 evaluation orders to hearing notices, this boundary marks a clean transition between two distinct processing pipelines that share common font infrastructure.

BOUNDARY: D3 → E1

Feature	D3 (n=238)	E1 (n=2)	Δ	Direction
Tracking font	Symbol	Times New Roman	—	Complete font change
Judicial officer sig %	0%	100%	+100 pp	Signatures reappear
Avg sigs/doc	1.00	2.50	+1.50	Multi-layer signing
Median rev_count	5	9	+4	Higher revision count
Filing type	Remote Hearing (88%)	Finding of Incompetency (100%)	—	Shift to dispositive orders

BOUNDARY: E1 → F1

Feature	E1 (n=2)	F1 (n=4)	Δ	Direction
Tracking font	Times New Roman	TTF-Font-1f (bespoke)	—	Standard → bespoke font
Avg sigs/doc	2.50	5.00	+2.50	Highest sig density in corpus
ESolutions CA %	0%	75%	+75 pp	Tyler tech sig appears
Distinct signers	4	6	+2	More signers per doc
Median rev_count	9	6	–3	Fewer revisions despite more sigs

Finding 7: Letter-Family Synthesis (A vs B vs C vs D vs E vs F)

Background: Aggregating subgroups into their letter-families provides a higher-level view of the six distinct document production pipelines represented in the tracking font corpus.

Family	Docs	Font Format	Judicial Sig %	Creator Tool %	Text Uniq %	Top Filing Type	Producer Pipeline	Avg Sigs/Doc
A	139	.ttf (bespoke)	0%	<4%	100%	Complaints	Winnovative HTML	~1.9
B	235	.cff (bespoke)	99%	98%	63.8%	Orders (27 types)	Word/ PDFMaker	2.71
C	1,089	.ttf (Arial)	29%	98%	52.4%	Notices + R20 Orders	Word/ Distiller	1.40
D	473	.ttf (Sys fonts)	34%	100%	51.6%	R20 Orders + Notices	Word M365	1.52
E	2	.ttf (TNR)	100%	100%	100%	Incompetency Orders	Word M365	2.50
F	4	.ttf (bespoke)	75%	100%	100%	Mixed Orders	PDFMaker/ Word	5.00

Key observations:

Family A stands alone as the only family with zero judicial signatures, zero ESolutions CA signatures, bespoke producer pipeline (Winnovative HTML), and near-zero XMP metadata. It exclusively produces charging instruments. Every other family produces judicial orders or notices and carries rich metadata.

Families B and C together account for 68% of the tracked corpus and represent the primary judicial order production pipelines. B uses CFF format with high judicial attestation; C uses TTF format with moderate attestation but far greater volume.

Family D is internally heterogeneous: D1 and D2 carry judicial signatures and produce Rule 20 evaluation orders; D3 carries no judicial signatures and produces hearing notices. This suggests D3's pipeline diverges from D1/D2 after the document generation stage.

Finding 8: Internal PDF Object Inventories

Background: The children_objects table catalogs every internal PDF object (fonts, images, signatures) extracted from each document, enabling analysis of object families and their distribution across groups.

Group	Docs	Avg Obj/Doc	Font Obj	JO Sig Img	JO Timestamp	Images	Logo Official	Dist Hash	Hash/Doc Ratio
A1	7	6.9	35	0	0	0	7	19	2.7
A2	65	8.1	401	0	0	0	65	199	3.1
A3	51	7.0	260	0	0	0	51	76	1.5
A4	9	21.6	172	0	0	4	9	140	15.6
A5	6	7.0	30	0	0	0	6	13	2.2
A6	1	8.0	7	0	0	0	1	8	8.0
B1	235	7.7	1,502	172	6	104	31	712	3.0
C1	1089	9.5	7,604	805	525	1,310	54	2,414	2.2

D1	104	29.0	2,076	257	256	378	35	1,251	12.0
D2	131	7.9	770	185	60	17	9	123	0.9
D3	238	8.0	1,371	0	0	519	4	210	0.9
E1	2	6.5	7	3	0	3	0	10	5.0
F1	4	13.8	38	7	1	9	0	46	11.5

Significance: The A-family contains zero judicial officer signature images and zero timestamp images — consistent with the finding that A-family documents carry no judicial signatures at the cryptographic level either. D3 also has zero JO signature images despite being adjacent to D1 and D2 which have 257 and 185 respectively. D1 has the highest average object count (29.0 per doc), driven by its high concentration of embedded font objects and judicial signature images.

Finding 9: Text Content Template Reuse

Background: The `fp_text_sha256` field in `hashpack` contains a SHA256 hash of the full extracted text of each document. Identical hashes mean byte-for-byte identical text content. The text uniqueness ratio (distinct hashes / total docs) measures how much unique content exists within each group.

Grp	Docs	Distinct Text Hashes	Uniqueness Ratio	Interpretation	Implication
A1	7	7	100%	Every doc unique	Unique complaint text per case
A2	65	65	100%	Every doc unique	Unique complaint text per case
A3	51	51	100%	Every doc unique	Unique complaint text per case
A4	9	9	100%	Every doc unique	Unique content per document
A5	6	6	100%	Every doc unique	Unique complaint text per case
A6	1	1	100%	Trivially unique	Single document
B1	235	150	63.8%	36% duplicates	Moderate template reuse
C1	1089	571	52.4%	48% duplicates	Heavy template reuse
D1	104	44	42.3%	58% duplicates	Heaviest template reuse in corpus
D2	131	69	52.7%	47% duplicates	Heavy template reuse
D3	238	143	60.1%	40% duplicates	Moderate template reuse
E1	2	2	100%	Each doc unique	Unique content
F1	4	4	100%	Each doc unique	Unique content

Significance: The A-family has 100% text uniqueness across all subgroups, meaning no two complaint documents share identical text. This is expected — complaints describe case-specific facts. From B1 onward, text uniqueness drops substantially, with D1 at the lowest ratio (42.3%). In D1, 60 of its 104 documents share extracted text with at least one other D1 document. This level of text duplication is consistent with template-driven document generation where the text body is largely boilerplate with minimal case-specific customization.

Finding 10: Group Signature Cards (Classification Summary)

Background: Each card below provides a 5–10 point fingerprint that uniquely identifies the group from a forensic classification perspective. All values are computed from the database.

A1 (n=7)

- 100% contain zero-byte ghost font (TTF-Font-1a, SHA256 e3b0c44...)
- Single tracking font per doc; no font2/font3/font4
- 100% charging instruments (E-filed Comp-Warrant 57%, E-filed Comp-Detention 29%)
- 0% judicial officer signatures; 86% carry Integration Service Account
- 0% XMP creator_tool; 0% XMP create_date
- Producer: Winnovative HTML to PDF 11.4 + iText 7.1.16 MN Judicial Branch
- 100% Logo Official object (fbc6023a...) present in every document
- Date range: Jan 2017 – Nov 2018 (earliest A-family subgroup)

B1 (n=235)

- Only CFF-format tracking font group in corpus (CFF-Font-1b, 86,093 bytes)
- Broadest filing type coverage: 27 distinct types
- 99% carry judicial officer signatures (37 distinct signers)
- 40% carry ESolutions Development CA digital signature
- 98% have XMP creator_tool (top: Microsoft Word M365 at 39%)
- Longest active period: Feb 2017 – Aug 2025 (8.5 years)
- MCRO Watermark present in 92% (highest MCRO coverage of non-A groups)
- 63.8% text uniqueness (36% template reuse)

C1 (n=1,089)

- Dominant group: 56% of all tracked documents
- Defined by COLNXP+ArialMT + Arial font pair (both 100% present)
- Arial tracking font is 916 KB — anomalously large (9–23x typical)
- Concentrated in Rule 20 pipeline: 28% R20.01 orders + 28% Remote Hearing Notices + 14% Incompetency Findings
- 29% carry judicial officer signatures (top: Browne, Michael at 15%)
- 52.4% text uniqueness (48% template reuse)
- 98% XMP creator_tool (top: Word M365 at 53%)
- 196 distinct cases, 77 clusters — broadest case coverage

D3 (n=238)

- ZERO judicial officer signatures across all 238 documents
- Only signer: MCRO Watermark (1.00 avg sigs/doc)
- Single tracking font: Symbol (086b4c45..., 11,088 bytes)
- 88% Notice of Remote Hearing with Instructions
- 100% XMP creator_tool: Microsoft Word M365
- 0% edits_after_sig_flag (no post-signature modifications)
- 60.1% text uniqueness ratio
- Largest D-family subgroup (238 of 473 D-family docs)

F1 (n=4)

- Unique bespoke font: TTF-Font-1f (ca5c7507..., 68,808 bytes) — appears nowhere else
- Highest signature density in corpus: 5.0 sigs/doc average
- 75% carry ESolutions Development CA signature

- 6 distinct signers across only 4 documents
- Mixed filing types (Other Document, Findings of Fact, Order Denying Motion)
- Producer: Mix of Word M365 + Adobe PDF Library

4. LIMITATIONS

Font hash availability: Some documents have null `font_sha256` values despite confirmed font names (e.g., 63 of 235 B1 docs, 65 of 1089 C1 docs). These are included in group membership but excluded from hash-based concentration analysis. This means group-defining hash metrics may undercount true prevalence.

Hashpack coverage: While 100% of tracked documents have hashpack companions, the hashpack table structure differs from the schema documentation in some column names. Analysis used actual database columns rather than schema-documented names.

Small group sizes: Groups E1 (2 docs) and F1 (4 docs) have sample sizes too small for statistical inference. Their patterns are reported descriptively but should not be generalized.

A6 singleton: With only 1 document, A6's metrics are point estimates with no distributional information.

Text extraction method: The `fp_text_sha256` hash compares full-document extracted text. Minor formatting differences (e.g., whitespace, encoding) could cause two semantically identical documents to hash differently, potentially overstating text uniqueness.

Object classification: The `object_family` field is assigned during extraction and may contain classification artifacts (e.g., the 'Logo Official' typo appearing consistently suggests automated labeling).

Temporal confounding: Group boundaries may correlate with system upgrades, policy changes, or staffing rotations that are not captured in the database. This analysis does not assert causation.

5. RECOMMENDATIONS FOR INDEPENDENT VERIFICATION

Font binary analysis: Submit the extracted tracking font binaries (identified by SHA256 hash in this report) to a font forensics specialist for identification of their origin, purpose, and whether they are standard software components or custom-generated objects.

D3 signing pipeline: Investigate why 238 documents in D3 — including 210 Notice of Remote Hearing documents — carry no judicial officer signature, ESolutions CA signature, or Integration Service Account signature. Determine whether this reflects intended workflow or a gap in attestation.

Template reuse in D1: With 58% of D1 documents sharing identical text content, examine whether the template reuse is appropriate for the document type (Rule 20.01 competency evaluation orders typically require case-specific findings).

Zero-byte ghost font: Determine the purpose of the zero-byte TTF-Font-1a (SHA256 e3b0c44...) embedded in 66 charging instruments across the A-family. An empty font object has no rendering function; its presence requires explanation.

C1 Arial font size: Investigate why the Arial tracking font in C1 is 916 KB — approximately 9–23x larger than other tracking fonts. Determine whether this is a full font embedding (unusual for a court system) or contains additional embedded data.

Cross-reference with court IT records: Correlate the group boundaries (A → B at ~2020, C → D at ~2021) with known document management system upgrades, Tyler Technologies Odyssey version changes, or workflow policy updates in the Fourth Judicial District.

All SQL queries used in this analysis are provided in the Appendix and can be re-executed against the live database for verification.

APPENDIX: SQL QUERIES

All queries are SELECT-only and can be executed directly against the Supabase database (project `ibfmjtwahkwqzcmeyqii`).

A1: Group Census

```
SELECT pdf_group, COUNT(*) as row_count, COUNT(DISTINCT evidence_uid) as doc_count, COUNT(DISTINCT case_uid) as case_count, COUNT(DISTINCT cluster_id) as cluster_count, MIN(filing_date) as earliest, MAX(filing_date) as latest FROM children_tracking_groups WHERE pdf_group IN ('A1', 'A2', 'A3', 'A4', 'A5', 'A6', 'B1', 'C1', 'D1', 'D2', 'D3', 'E1', 'F1') GROUP BY pdf_group ORDER BY pdf_group;
```

A2: Font Architecture by Group

```
SELECT pdf_group, font1_name, font1_type, font1_sha256, font2_name, font2_type, font2_sha256, font3_name, font3_type, font3_sha256, font4_name, font4_type, font4_sha256, COUNT(*) as cnt FROM children_tracking_groups WHERE pdf_group IN ('A1', 'A2', 'A3', 'A4', 'A5', 'A6', 'B1', 'C1', 'D1', 'D2', 'D3', 'E1', 'F1') GROUP BY pdf_group, font1_name, font1_type, font1_sha256, font2_name, font2_type, font2_sha256, font3_name, font3_type, font3_sha256, font4_name, font4_type, font4_sha256 ORDER BY pdf_group, cnt DESC;
```

A3: Metadata Presence by Group

```
SELECT ctg.pdf_group, COUNT(*) as docs, COUNT(c.metadata__xmp_creator_tool) as has_creator_tool, COUNT(c.metadata__xmp_producer) as has_producer, COUNT(c.metadata__xmp_create_date) as has_create_date, COUNT(c.metadata__xmp_metadata_date) as has_metadata_date, COUNT(c.metadata__document_id) as has_document_id, COUNT(c.metadata__instance_id) as has_instance_id, COUNT(CASE WHEN c.metadata__msip__has_msip_flag = true THEN 1 END) as has_msip, COUNT(CASE WHEN c.signatures__has_signature = true THEN 1 END) as has_signature FROM children_tracking_groups ctg JOIN children c ON ctg.evidence_uid = c.evidence_uid WHERE ctg.pdf_group IN ('A1', 'A2', 'A3', 'A4', 'A5', 'A6', 'B1', 'C1', 'D1', 'D2', 'D3', 'E1', 'F1') GROUP BY ctg.pdf_group ORDER BY ctg.pdf_group;
```

A4: Signature Structure by Group

```
SELECT ctg.pdf_group, COUNT(DISTINCT ctg.evidence_uid) as total_docs, COUNT(DISTINCT s.evidence_uid) as docs_with_sigs, COUNT(s.children_signatures_row_id) as total_sig_rows, ROUND(COUNT(s.children_signatures_row_id)::numeric / NULLIF(COUNT(DISTINCT ctg.evidence_uid), 0), 2) as avg_sigs_per_doc, COUNT(DISTINCT s.signer_name) as distinct_signers FROM children_tracking_groups ctg LEFT JOIN children_signatures_full_report s ON ctg.evidence_uid = s.evidence_uid WHERE ctg.pdf_group IN ('A1', 'A2', 'A3', 'A4', 'A5', 'A6', 'B1', 'C1', 'D1', 'D2', 'D3', 'E1', 'F1') GROUP BY ctg.pdf_group ORDER BY ctg.pdf_group;
```

A5: Filing Type Distribution

```
SELECT ctg.pdf_group, c.filing_type, COUNT(*) as cnt FROM children_tracking_groups ctg JOIN children c ON ctg.evidence_uid = c.evidence_uid WHERE ctg.pdf_group IN ('A1', 'A2', 'A3', 'A4', 'A5', 'A6', 'B1', 'C1', 'D1', 'D2', 'D3', 'E1', 'F1') GROUP BY ctg.pdf_group, c.filing_type ORDER BY ctg.pdf_group, cnt DESC;
```

A6: Top Object Hashes per Group

```
WITH ranked AS (SELECT ctg.pdf_group, co.object_sha256, co.object_family, co.object_font_name, COUNT(DISTINCT ctg.evidence_uid) as doc_count, ROW_NUMBER() OVER (PARTITION BY ctg.pdf_group ORDER BY COUNT(DISTINCT ctg.evidence_uid) DESC) as rn FROM children_tracking_groups ctg JOIN children_objects co ON ctg.evidence_uid = co.evidence_uid WHERE ctg.pdf_group IN ('A1', 'A2', 'A3', 'A4', 'A5', 'A6', 'B1', 'C1', 'D1', 'D2', 'D3', 'E1', 'F1') AND co.object_sha256 IS NOT NULL GROUP BY ctg.pdf_group, co.object_sha256, co.object_family, co.object_font_name) SELECT * FROM ranked WHERE rn <= 5 ORDER BY pdf_group, rn;
```

A7: Text Hash Uniqueness

```
SELECT ctg.pdf_group, COUNT(DISTINCT ctg.evidence_uid) as total_docs, COUNT(DISTINCT h.fp_text_sha256) as distinct_text_hashes, ROUND(COUNT(DISTINCT h.fp_text_sha256)::numeric / NULLIF(COUNT(DISTINCT ctg.evidence_uid), 0), 3) as text_uniqueness_ratio FROM children_tracking_groups ctg JOIN hashpack h ON ctg.evidence_uid = h.evidence_uid WHERE ctg.pdf_group IN ('A1', 'A2', 'A3', 'A4', 'A5', 'A6', 'B1', 'C1', 'D1', 'D2', 'D3', 'E1', 'F1') GROUP BY ctg.pdf_group ORDER BY ctg.pdf_group;
```

A8: Judicial Signature Presence

```
SELECT ctg.pdf_group, COUNT(DISTINCT ctg.evidence_uid) as total_docs, COUNT(DISTINCT CASE WHEN
s.signer_name NOT IN ('Minnesota Court Records Online (MCRO) Watermark', 'ESolutions Development
Certificate Authority', 'Integration Service Account') AND s.signer_name IS NOT NULL THEN
ctg.evidence_uid END) as docs_with_judicial_sig, COUNT(DISTINCT CASE WHEN s.signer_name = 'ESolutions
Development Certificate Authority' THEN ctg.evidence_uid END) as docs_with_esolutions FROM
children_tracking_groups ctg LEFT JOIN children_signatures_full_report s ON ctg.evidence_uid =
s.evidence_uid WHERE ctg.pdf_group IN ('A1','A2','A3','A4','A5','A6','B1','C1','D1','D2','D3','E1','F1')
GROUP BY ctg.pdf_group ORDER BY ctg.pdf_group;
```

A9: XMP Producer Distribution

```
WITH ranked AS (SELECT ctg.pdf_group, c.metadata__xmp_producer as producer, COUNT(*) as cnt, ROW_NUMBER()
OVER (PARTITION BY ctg.pdf_group ORDER BY COUNT(*) DESC) as rn FROM children_tracking_groups ctg JOIN
children c ON ctg.evidence_uid = c.evidence_uid WHERE ctg.pdf_group IN
('A1','A2','A3','A4','A5','A6','B1','C1','D1','D2','D3','E1','F1') AND c.metadata__xmp_producer IS NOT
NULL GROUP BY ctg.pdf_group, c.metadata__xmp_producer) SELECT pdf_group, producer, cnt FROM ranked WHERE
rn <= 3 ORDER BY pdf_group, rn;
```

Source: MCRO Forensic Database | Supabase project ibfmjtwahkwqzcmeyqii | MattGuertin.com