NCOALink®

IMPROVING DELIVERABILITY THROUGH SECURE TECHNOLOGY

USER'S TECHNICAL REFERENCE

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Version 12

NATIONAL CUSTOMER SUPPORT CENTER
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INTRODUCTION

NCOA[Link®] is a data only product that introduces secure technology into the world of National Change-of-Address (NCOA) processing. The secure technology of this DATA ONLY PRODUCT eliminates the clear text representation of the change-of-address data and the complexity of name and address matching routines. Once the software used to access this data is completed and a successful inquiry is achieved, the new address and/or return flags can be derived from the results.

This product and technology is patented and licensed by the United States Postal Service® (USPS®). By virtue of reading this documentation, the company and or business entity, which includes employees, entered into a Non-Disclosure Agreement.

ADMINISTRATION

The USPS provides support for this system through the National Customer Support Center (NCSC) in Memphis TN. For all administration and technical information regarding this product please contact the NCOA department at 800-589-5766 or email at ncoalink@usps.gov.

DISCLAIMER

The USPS makes no warranty or representation either expressed or implied, with respect to the NCOA[Link®] technology and/or the computer system in which it is contained, including its correctness, quality, performance, merchantability, or fitness for any particular purpose.

The USPS will not be liable for direct, indirect, special, incidental, consequential, or other similar damages arising out of use of, or inability to use, the NCOA[Link®] technology and/or computer system, even if advised of the possibility of such damages.

DEVELOPER SPECIFICATIONS AND REQUIREMENTS

For the purpose of clarity, developer is synonymous with vendor, or any other term that implies a creator of a software system developed for the purpose of communicating and interfacing with the USPS NCOA[Link®] system. The term licensee is defined as one who has been certified and licensed by the USPS to perform NCOA[Link®] processing.

The sole intent of the NCOA[Link®] system is to provide data back to the customer for the purpose of updating an address list that will be used for mailing purposes. A one hundred unique record file minimum is required. Development of an interface system must incorporate USPS guidelines and specifications contained in this document as well as any requirements contained in the USPS NCOA[Link®] License Agreement and Performance Requirements.

Any advertising or marketing promotions that mention and/or imply a relationship with the USPS NCOA[Link®] technology must be approved in writing prior to its use, by the USPS National Customer Support Center (NCSC). The approval of this material is a requirement and is inclusive to all developers, vendors, licensees, sub-contractors and users that directly or indirectly utilize the USPS NCOA[Link®] system.

Due to the sensitive nature of USPS provided COA data, the system employs a secure technology approach, designed and created by the USPS. The sensitivity of the COA data and customer data requires a high level of security and accuracy with respect to the use of the data in any electronic process. Any interface system that provides for, or allows data transfer between the interface and any other location or device, must enable the user/licensee to ensure that no COA information obtained from the NCOA[Link®] system is intercepted, copied, rerouted, stored, retained, archived, or used for any purpose other than explicitly authorized in the license agreement.
All addresses prior to submission to the NCOA[Link®] interface system must be processed by the users/licensee's Coding Accuracy Support System (CASS) certified software. **The ZIP+4 and City State databases utilized by the CASS certified software must be updated monthly.**

The purpose of this document is to communicate the NCOA[Link®] technical specifications to prospective developers of interface systems. This includes sequences of processing records, data exchange, record layouts and field definitions. However, as with any system, future testing, and experiences may warrant modifications to the NCOA[Link®] requirements and/or details. This xl contained herein, is provided for your exclusive use, to guide your NCOA[Link®] interface development efforts, and must not be provided to anyone outside of your organization, including customers, licensees, or potential licensees.

It is **required and necessary** to incorporate the reading of the **NCOA[Link®] License Agreement** to obtain the requirements of a potential licensee and to ensure that the developed interface and or licensee can meet these requirements. The completed NCOA[Link®] system will require specific specifications with regard to processing in addition to statistical and other reporting requirements that will be contained in the above document.

Computer Hardware Specifications

The NCOA[Link®] data product will be fulfilled by Electronic Product Fulfillment (EPF). It is suggested that the minimum system requirements required for this system is 2GB RAM and 60GB of disk space.

Software Developer Kit Contents

The contents included will provide enough information to develop an interface to the NCOA[Link®] data only product. The sample code and data files are provided for educational purposes in the development of a NCOA[Link®] interface. It is not intended, recommended or implied that the utilization of the actual code included will produce a certifiable and/or production ready NCOA[Link®] interface. All code included, unless otherwise stated, will be written in COBOL.

The NCOA[Link®] COA data included in this package only contains positive results for the example data provided in this documentation.

For clarity, square brackets enclosed with letters or numbers and a dash will be used to identify sequential like named files. The following example identifies a series of files, samp[a-z].hs[0-9], refers to files sampa.hs0, sampb.hs0 etc.

The Secure Hash Algorithm (SHA) is an integral part of this development. The specific SHA variant used is SHA-256. Additional information on SHA-256 can be found on the internet using "SHA-256" or "SHA-2" for the search criteria or visit http://csrc.nist.gov/groups/ST/toolkit/secure_hashing.html. In this document, the terms SHA and SHA-256 may be used interchangeably.

The contents of this interface development package utilize "big-endian" examples. Additional information on "big-endian" can be found on the internet using "endian" for the search criteria. Even though "big-endian" examples are used it is possible to incorporate this into a "little-endian" environment.

Software Developer Kit (SDK) – contents:

DATA	Contains tables and/or data files required for the NCOA[Link] system. The NCOA[Link] COA data included in this package only contains test data that is associated with the STAGE test files. Data is distributed electronically via the USPS electronic product fulfillment (EPF) site.
NCOALink*.doc	This document, programs and source code will be provided via email. Please contact us for updated versions via email.
Source	Contains sample source code needed to guide in the development of a NCOA[Link] interface system. The sample code is provided for educational purposes in the development of a NCOA[Link] interface. It is not intended, recommended or implied that the utilization of the actual code included will produce a certifiable and/or production ready NCOA[Link] interface.

Getting Started

1. Read this document thoroughly.

2. Obtain the appropriate NCOA$^{Link®}$ License Agreement for this development. This will contain the necessary additional requirements that will be required for an interface to be certified. A developer can provide an NCOA$^{Link®}$ interface for a Full Service Provider - 48 month data product, Limited Service Provider – 18 month data product, End-User – 18 month data product or all three. The NCOA$^{Link®}$ data product 48 month and 18 month can be fulfilled in a HASH file format or a Flat file format. The NCOA$^{Link®}$ Limited Service Provider and End-User have an additional fulfillment option called NCOA$^{Link®}$ with ANK$^{Link®}$ which can be fulfilled in a HASH file format or a Flat file format. In addition to the data provided in months 1 – 18, additional data will be provided for months 19 – 48. The data in months 19 – 48 will not provide any new address information but will provide return codes indicating the result.

3. Please note that there is a 100 unique record minimum requirement for processing files. It is recommended that the method of implementation of this requirement be developed in a manner which can be turned on or off so the interface can process one record at a time. This method should be implemented in a secure manner where the end user cannot switch/turn on/off without interaction by the software developer. This option will allow for single record processing when necessary such as for testing or for other future application interface processing. Special permission must be obtained in writing from the USPS to operate using this option.

4. For name matching, standard matching logic requires inquiries in the following order:
   Business: Match on business name.
   Individual: Match on first name, middle name, surname and title required. Gender is checked and nickname possibilities are considered.
   Family: Match on surname only.

5. Within the interface, the system must be designed to have the following options:

Name	Description	Code
Business only	Interface system will provide only new address information for Business moves.	B
Individual only	Interface system will provide only new address information for Individual moves	I
Individual with Business	Interface system will provide only new address information for Individual and Business moves.	C
Individual with Family	Interface system will provide only new address information for Individual and Family moves. (Residential)	R
Standard	Interface system will not restrict any matches or prohibit the return of information based on move types (Family, Individual or Business). (Standard)	S

6. Pure Family only matching is prohibited. The interface system must utilize only the above options. The interface cannot remove, ignore or drop any other name information except as prescribed in this document and the associated License Performance requirements. This document does not supersede the License Performance requirements.

7. The interface system must provide for return code only options.

8. Allow user to select time frame shorter than the NCOA$^{Link®}$ Product but no less than six months. (Time period covered and total matches rejected must be reported in the Customer Service Log.)

9. Middle name matching must be performed by the interface software. The NCOA$^{Link®}$ system will return only two characters of the middle name.

10. The interface system must utilize all NCOA$^{Link®}$ data files as received with regard to content. Additions or subtractions from data files/tables with regards to data content is prohibited unless otherwise stated. The following files may be modified or replaced: pl.txt, sl.dat and sl.txt.

11. While the NCOA$^{Link®}$ system requires the utilization of a CASS certified ZIP+4 system it is not mandated that the ZIP+4 system be imbedded or inline within the NCOA$^{Link®}$ system.

12. While the NCOA$^{Link®}$ system may require the utilization of a certified DPV system it is not mandated that the DPV system be imbedded or inline within the NCOA$^{Link®}$ system.

13. Mailing lists may contain multiple named individuals, especially in the financial and insurance environment, and may be printed on the actual mailpiece. The multiple named individuals within a base record may or may not contain the same last name. Regardless, it is the responsibility of the mail list owner to identify the primary target name for submission to the NCOA$^{Link®}$ process or develop processes to handle these records. Any pre or post proprietary process will come under USPS scrutiny when used in this manner and any information used to enhance matching must be explained to the client. The specific name used in the query to obtain the match must be returned to the client. All NCOA$^{Link®}$ tests must be taken in the FULL PRODUCTION environment and any and all pre- and/or post-processing MUST be included.

    The presentation of name order is established using a pre-process before querying the NCOA$^{Link®}$ database. However, there are no restrictions on using a process to interchange the name order to yield the best possible results using the NCOA$^{Link®}$ database. It is ultimately the responsibility of the Mailer Owner working with the Licensee to determine the name order presentation correctly.

14. Develop the interface system to utilize appropriate hardware that will meet the business needs of your clients with regards to processing speeds, connectivity to other platforms or data streams and operational controls.

15. Determine the impact, if any, this system may have with existing COA processes such as direct customer contact, Address Change Service and mailpiece endorsements.

16. The data will contain a header file, which will contain a data date, all file names and their associated SHA value including the compressed and uncompressed files. The SHA value should be used to confirm that the files have been copied and uncompressed to the necessary media correctly. The record that contains the release date also contains a SHA value of the release date which can be utilized to prevent tampering with the release date. If the SHA value of the release date is not correct compared to the computed SHA from the software then the software could decide not to load the release and/or not allow the software to operate if the date stored on the system has been tampered with. PLEASE NOTE: UNDER NO CIRCUMSTANCES MAY A FILE BE SWAPPED OR REPLACED FROM ANOTHER RELEASE. DOING SO WILL CAUSE UNKNOWN RESULTS AND CAN CORRUPT ADDRESS LISTS.

17. In processing any COA data, regardless of origin, it is a good idea that the base files contain flags/fields that provide the necessary information on origin of the COA and when the record was updated. In conjunction with other COA processes circumstances may occur in which automated updating of certain base records may need to be prohibited and/or diverted to a different process. The utilization of these flags/fields or other fields will facilitate in the systemic decision making.

18. It is suggested and recommended that the interface process utilize an additional flag. In keeping with the philosophy as stated in 17 above, a file submitted for NCOA$^{Link®}$ processing may contain a flag that indicates that the customer may not want this address automatically updated. The intent of this flag is just to be passed back to the customer. This field/flag could be a date or some other character or string. At this time it will not override the NCOA$^{Link®}$ process and the normal interface processing will occur and the field will be passed back to the customer.

19. Understand all of the components of the COA data, including the different styles of addresses to insure the base file is being updated properly. The publications below are recommended for reference material:

"Postal Addressing Standards" (Publication 28)
"Address Information System Products Technical Guide"

The above material may be ordered from the USPS National Customer Support Center at 800-238-3150.

20. Provide adequate security that will prohibit unauthorized access or use to the interface and NCOA$^{Link®}$ product. Security specifically for the data tables as a standalone entity is not required. The tables as they are have no value unless an interface system is used. NCOA$^{Link®}$ cannot be reversed engineered. The utilization of logon ID's and access logs should be sufficient depending on the implementation environment.

21. Process specialized USPS certification, audit or test files.

22. Provide 45 day expiration date logic based on the date of the NCOA$^{Link®}$ product. This logic should prevent utilization even if the system date is set back.

23. The move type must be returned when a match is made. This is determined by the interface based on the specific name inquiry utilized to obtain the match.

24. For those who are developing for Full Service interface capabilities, the software must populate the field RESULT ZIP+4 RETURN CODE with a value of 'AA' or 'A1'(ZIP+4 matched, ZIP+4 not matched, respectively). The Result DPV Return Code field will only be populated with one DPV return code when appropriate. If the DPV processes results in multiple return codes, excluding AA and A1, for the purpose of NCOA$^{Link®}$ testing select only one return code. In production processing we understand that all applicable codes will be returned to the customer per the license agreement.

25. For those who are developing for the Limited Service Provider or End-User (which do not require DPV) the field RESULT ZIP+4 RETURN CODE must be populated with a value of 'AA' or 'A1' and the Result DPV Return Code field will be space filled. If one of these licensees exercises a DPV option then the Result DPV Return Code field will be populated in the same manner as the Full Service Provider.

Return Code description file

The intent of this file is to provide the ability to dynamically add and/or modify existing return codes between product builds. If the USPS adds a new return code to a product build (data derived return code) then the processing software will be able to process this return code without changing or recompiling the software. Any modifications or additions of "software defined" return codes will still be a coordinated event.

In order to reduce the time and effort in adding, modifying, deleting, implementation and the coordination of NCOA^Link return codes, we will add a Return Code description table. The software must be able to handle all numeric return codes from 00 to 99 and the alphabetic "A " and not rely on hard coded concepts. The table will consist of a two character numeric field for the return code followed by text field description of the return code. The file will consist of all 100 records (00-99) with a description. If the return code is not utilized, it will have a description of "RESERVED". The software must be able to print or display this table.

Rules Table

The use of the Secure Hash Algorithm (SHA-256) in many of the data products created by the USPS requires the data used to probe the tables be an exact match to the data used to create the tables. To accomplish the synchronization of data a set of rules has been created. This process is referred to as the "Rules Table". The Rules Table will facilitate matches that otherwise would not be possible, i.e. JOHNY and JOHNNY, without the risks associated with soundex. The Rules Table will be fulfilled as part of the NCOA^Link data fulfillment and will allow the USPS to dynamically modify matching rules between product builds without requiring the software vendor to recompile programs.

The implementation of the Rules Table allows the rules to be used by the build process, the lookup process and to be altered without action from the software vendor (after initial implementation) or their customers. Each NCOA^Link fulfillment will contain a file/table that will contain "rules" as well as directives for applying those rules. The rules will contain a string of characters to search for, a second string of characters to use as a replacement and the directives will indicate what part of the name to apply the rule. Below is an example of how the table will look.

Rules Table example:

Example 1	Y	N	N	3	2	MAC	MC
Example 2	Y	Y	Y	2	2	UO	OU
Example 3	Y	Y	Y	2	1	LL	L
Example 4	Y	Y	Y	2	1	NN	N

The first three one character fields are the directives on how to apply the changes, and will consist of the literals 'Y' for yes or 'N' for no. The first one character field indicates if the rule applies to the beginning of the name, the second one character field indicates if it applies to the middle of the name, and the third one character field indicates if it applies to the end of the name. The next two fields are one character each and contain a numeric value. The first field indicates how large the string to be replaced is and the second field indicates how many characters will be used to replace the original string. The next field of eight characters contains the string to be replaced and the last column of eight characters will be used to replace the original string. For example, the first rule indicates that "MAC" will be replaced with "MC" and the directions would indicate that this change should only be applied to the left or beginning of the name, numbers indicate that the original string "MAC" is three characters and will be replaced with the two character string "MC". After using a rule, the software will replace the original string with the modified version of the string and continue through the rule table. This process will be repeated each time a rule is used and continue until there are no more rules to try for that word/name.

Pass	Name string	Rule Applied	Name string after rule applied
1	MacConville	Example 1	McConville
1	McConville	Example 3	McConvile
2	McConvile	None	

Note: **The rules must be tested in the order in which they are received in the rule file.** If a rule is used the software must continue through the table to check the remaining rules. If a rule was used then the software must go back to the beginning of the rule table and reprocess the string as if it were the initial string. This process continues until a complete pass through the file is made and there were no rules used. The final pass through the table must have no matches. The field "Apply to beginning of name" is defined as when the Source Literal matches the first and subsequent characters at the beginning of the word/name and no other characters are to the left of the Source Literal identified in the name. The field "Apply to the middle of name" is defined as when the Source Literal matches characters in the word/name and there is at least one character to the left and one character to the right of the Source Literal identified in the name. The field "Apply to end of name" is defined as when the Source Literal matches the last characters at the end of the word/name and no other characters are to the right of the Source Literal identified in the name. The rules table must only be utilized on the First and Last name. Remove all punctuation from the string before going to the rules table. Remove all pre and imbedded spaces from the string. Hyphenated names – remove hyphen.
Search rule table (from top-down; must be tested in the order in which they are received).

The benefits of this approach include the ability to quickly add and remove rules and a finer level of control as to how the rules should be applied. Once implemented, the software will be able to apply the new or modified rules dynamically, allowing the data to drive the matching logic.

Business Names

If the old address is present attempt to match the input business name. The software will attempt to perform a match on the business name. The determining factor to make a match to the business name is determined by the software. Each developer has their own proprietary matching process for matching names. The results from software to software can vary.

Non-Business Names

Developers must create their own name parser and the quality of the responses from the NCOA^{Link} data will be directly dependent on the quality of the name parser. Because the developers are using different parsers a slight difference in results may be possible. But for the most part you should receive the same response from each vendor providing all the data is the same. For each attempted lookup on an individual name, first the name will be used as it appears, then attempt the normalized version of the last name, then known nicknames and normalized version of the first name.

Please Note: The only valid generational name suffixes that can be used as input to NCOA/Link are II, III, IV, JR, and SR.

Appropriate use of the Drop Flag

drop flag – This logic is only applicable when there is a street level ZIP+4 Match and an individual name match. If this flag is set to 'Y' then this means the USPS dropped the Secondary Number to create this record and if the interface processing has dropped the Secondary Number a match cannot be made (return code 16). This covers the rule requiring that the secondary number may be missing from either the input or the COA but not both.

drop-n flag – This logic is only applicable when there is a complete Middle Name and individual name match. If this flag is set to 'Y' this means the USPS created a record with the first initial and middle name and if you have also truncated the first name you may not make this match (return code 15 or 17). This covers the rule requiring that the first name may be shortened to one letter on either the input or the COA but not both.

Appropriate use of the Hint Byte

The hint byte is managed in clks16c0. Clks16c0 takes an eleven digit ZIP code and a hint byte as parameters and returns an address. Clks16c0 calls rv9s12c0 and llks03c0 to create a list of all possible delivery points for the given 11-digit ZIP code. The hint byte, if present, will be used to break ties in the list OR augment the address.

First, try to use the hint byte to break ties if more than one potential delivery point is returned. Compare the hint byte to the right side of the secondary number if present. If there is no secondary number present then compare the hint byte to the right side of the primary number. Do this for every potential delivery point in the list. If the hint byte matches only one delivery point in the list then this is the address to be returned, now disregard the hint byte because it has been used and do not use it in the address reconstruction. If this process results in zero or more than one address then keep the hint byte to augment the address.

Note: The hint byte will never be used to augment 'H' records. After the hint byte is used in the tie breaking portion of reconstruction and there is a single delivery point and that record has a delivery type of 'H', always discard the hint byte.

Next, attempt to DPV confirm the delivery point without using the hint byte. If only one address DPV confirms, then use the hint byte to augment the address (if a hint byte is present). If none DPV confirms attempt to DPV confirm all of the candidate delivery points using the hint byte to augment each address. If you get one match then this is the address to return. Note: The dph.hsa table provided with NCOALink must be used for this process. This table is specific to change of address data.

When you augment an address using the hint byte, do the following:

a) First, if the hint is '1/2' then augment the primary number with the hint byte if the PNO does not end in 1/2.
b) If it is a single letter consult the left right table and augment the address accordingly.
c) If it is a single letter and the 9-digit is not in the leftrite table, put the hint in the sno.
d) If it is an exceptional unit designator then put it in the descriptor.
e) Else, put '#' in the descriptor, and the hint byte in the secondary number field.

Appropriate use of the Daily Delete file

The daily delete table will contain the first 8-bytes of the SHA of the EMDP and the 4-byte release number. Before loading this file it is permissible to remove records that have release number that is older than the release number of the NCOA^{Link} data that is currently loaded. Just before checking the clk.hsb table developers should take the first 8-bytes of the SHA and perform a lookup in the daily delete table using the same SHA'd EMDP. If the SHA is present and they have not applied the release associated with that SHA then they should NOT perform a lookup on this record and return the return code of '66'. If the SHA is not present or is present but the release has been applied they should continue the NCOALink process as normal.

Test versions of this file will be available with the STAGE1 and STAGE2 test data.

The production versions of this file (dailydel.dat or dailydel.ebc) will be available via download from https://epf.usps.gov.

The daily delete header file names are dhdr.txt and dhdr.ebc. One is ASCII the other is EBCDIC. It is strongly suggested that you use this file to verify the integrity of the specific daily delete file that was downloaded.

The daily delete file contains about 45 days of data.

NCOA^{Link} with ANK^{Link}

An optional fulfillment enhancement for the NCOA^{Link} Limited Service Provider and End-User has been developed. The additional optional fulfillment format is called NCOA^{Link} with ANK^{Link}. In addition to the data provided in months 1 – 18, additional data will be provided for months 19 – 48. The data in months 19 – 48 will not provide any new address information but will provide return codes indicating the results.

Any ANK^{Link} record that has a final NCOA^{Link} defined return code as A, 91, 92 will not have a new address.

NCOA^Link Return Code Descriptions

Code = Return Code
Address = "Y" = New Address provided
= "N" = New Address not provided

Description = Explanation of Return code
How = "D" = Derived by data – returned in lieu of 11digit
"S" = Derived by software

Code	Description	Address	How
A	**COA Match** - The input record matched to a COA record. A new address could be furnished.* Please Note: If this return code is achieved, no other matching attempts are permitted regardless of the PROCESSING mode.	Y	s
00	**NO Match** - The input record COULD NOT BE matched to a COA record. A new address could not be furnished. This return code may be returned regardless of the processing mode, matching logic, or COA type. Please Note: When processing in any mode and this return code is received, it is required to attempt the match again using the next level of matching logic allowed by the processing mode.	N	s
01	**Found COA: Foreign Move** – The input record matched to a COA record but the new address was outside the USPS delivery area. This return code may be returned regardless of the processing mode, matching logic, or COA type. Please Note: If this return code is achieved, no other matching attempts are permitted regardless of the PROCESSING mode.	N	D
02	**Found COA: Moved Left No Address(MLNA)** - The input record matched to a COA record but the new address was not provided to the USPS. This return code may be returned regardless of the processing mode, matching logic, or COA type. Please Note: If this return code is achieved, no other matching attempts are permitted regardless of the PROCESSING mode.	N	D
03	**Found COA: Box Closed No Order(BCNO)** – The Input record matched to a COA record containing an old address of PO BOX, which has been closed without a forwarding address provided. This return code may be returned regardless of the processing mode, matching logic, or COA type. Please Note: If this return code is achieved, no other matching attempts are permitted regardless of the PROCESSING mode.	N	D
04	**Cannot match COA: Street Address with Secondary** – In the STANDARD mode utilizing Family matching logic the input record was a potential match to a family type COA record with an old address that contained secondary information. The input record does not contain secondary information. The record is a ZIP+4 street level match. This address match situation requires individual name matching logic to obtain a match and individual names do not match. Please Note: This return code is only obtained when processing in the STANDARD mode using Family matching logic.	N	D
05	**Found COA: New 11-digit DPBC is Ambiguous** – The input record matched to a COA record. The new address on the COA record could not be converted to a deliverable address because the DPBC represents more than one delivery point. This return code may be returned regardless of the processing mode, matching logic, or COA type. Please Note: If this return code is achieved, no other matching attempts are permitted regardless of the PROCESSING mode.	N	D
06	**Cannot Match COA: Conflicting Directions: Middle Name Related** –There is more than one COA record for the match algorithm and the middle names or initials on the COAs are different. Therefore, a single match result could not be determined. This return code is only obtained when using individual matching logic. Please Note: If this return code is achieved, no other matching attempts are permitted regardless of the PROCESSING mode.	N	D
07	**Cannot Match COA: Conflicting Directions: Gender Related** –There is more than one COA record for the match algorithm and the genders of the names on the COAs are different. Therefore, a single match result could not be determined. This return code is only obtained when using individual matching logic. Please Note: If this return code is achieved, no other matching attempts are permitted regardless of the PROCESSING mode.	N	D

NCOA[Link] Return Code Descriptions – continued

08	**Cannot Match COA: Other Conflicting Instructions** – The input record was a potential match to two COA records. The two records were compared and due to differences in the new addresses, a match could not be made. This return code may be returned regardless of the processing mode, matching logic, or COA type. Please Note: If this return code is achieved, no other matching attempts are permitted regardless of the PROCESSING mode.	N	D
09	**Cannot Match COA: High-rise Default** – The input record was a potential match to a family COA record from a High-rise address ZIP+4 coded to the building default. This address match situation requires individual name matching logic to obtain a match and individual names do not match. Please Note: This return code is only obtained when processing in the STANDARD mode using Family matching logic.	N	D
10	**Cannot Match COA: Rural Default** - The input record was a potential match to a family COA record from a Rural Route or Highway Contract Route address ZIP+4 coded to the route default. This address situation requires individual name matching logic to obtain a match and individual names do not match. Please Note: This return code is only obtained when processing in the STANDARD mode using Family matching logic.	N	D
11	**Cannot Match COA: Individual Match: Insufficient COA Name for Match** – There is a COA record with the same surname and address but there is insufficient first/middle name information on the COA record to produce a match using individual matching logic. This return code is only obtained when using individual matching logic. Please Note: When processing in the STANDARD mode and this return code is received utilizing Individual Logic, discontinue the Individual logic sequence and go straight to FAMILY matching logic.	N	D
12	**Cannot Match COA: Middle Name Test Failed** - The input record was a potential match to a COA record. A match cannot be made because the input name contains a conflict with the middle name or initials on the COA record. This return code is only obtained when using individual matching logic. Please Note: If this return code is achieved, no other matching attempts are permitted regardless of the PROCESSING mode.	N	S
13	**Cannot Match COA: Gender Test Failed** – The input record was a potential match to a COA record. A match cannot be made because the gender of the name on the input record conflicts with the gender of the name on the COA record. This return code is only obtained when using individual matching logic. Please Note: When processing in the STANDARD mode and this return code is received utilizing Individual Logic, discontinue the Individual logic sequence and go straight to FAMILY matching logic.	N	S
14	**Found COA: New Address Would Not Convert at Run Time** - The input record matched to a COA record. The new address could not be converted to a deliverable address. This return code may be returned regardless of the processing mode, matching logic, or COA type. Please Note: If this return code is achieved, no other matching attempts are permitted regardless of the PROCESSING mode.	N	S
15	**Cannot Match COA: Individual Name Insufficient** – The input record was a potential match to a COA record that contains a first initial and middle initial/name [ex. C M Smith or C Mary Smith]. A match cannot be made because the input middle initial/name is missing or does not equal the middle initial/name on the COA. This return code is only obtained when using individual matching logic. Please Note: When processing in the STANDARD mode and this return code is received utilizing Individual Logic, discontinue the Individual logic sequence and go straight to FAMILY matching logic.	N	S
16	**Cannot Match COA: Secondary Number Discrepancy** – The input record was a potential match to a street level COA record. However, a match is prohibited because there is conflicting secondary information on the input and COA record. This return code is only obtained when using individual matching logic. Please Note: If this return code is achieved, no other matching attempts are permitted regardless of the PROCESSING mode.	N	S

NCOA[Link] Return Code Descriptions – continued

17	**Cannot Match COA: Other Insufficient Name** – The input record was a potential match to a COA record that contains a full first name and full middle name. The input middle initial/name is missing or different from the middle name on the COA. A match cannot be made because the first name on the COA was truncated (drop-n flag) and the middle names must be equal in order to make this match. This return code is only obtained when using individual matching logic. Please Note: When processing in the STANDARD mode and this return code is received utilizing Individual Logic, discontinue the Individual logic sequence and go straight to FAMILY matching logic.	N	S
18	**Cannot Match COA: General Delivery** – The input record was a potential match to a COA record from a General Delivery address. This address situation requires individual name matching logic to obtain a match and individual names do not match. Please Note: This return code is only obtained when processing in the STANDARD mode using Family matching logic.	N	D
19	**Found COA: New Address not ZIP + 4 coded, New address primary number not DPV confirmable or Temporary Change Of Address**** – There is a change of address on file but the new address cannot be ZIP + 4 coded and therefore there is no 11-digit DPBC to store or return, the new address primary number cannot be confirmed on DPV or the new address is temporary. This return code may be returned regardless of the processing mode, matching logic, or COA type. Please Note: If this return code is achieved, no other matching attempts are permitted regardless of the PROCESSING mode.	N	D
20	**Cannot Match COA: Conflicting Directions after re-chaining** – Multiple COA records were potential matches to the input record. The COA records contained different new addresses and a single match result could not be determined. This return code may be returned regardless of the processing mode, matching logic, or COA type. Please Note: If this return code is achieved, no other matching attempts are permitted regardless of the PROCESSING mode.	N	D
66	**Daily Delete** – The input record matched to a business, individual or family type COA record with an old address that is present in the daily delete file. The presence of an address in the daily delete file means that a COA record with this address is pending deletion from the COA master file and that no mail may be forwarded from this address. This return code may be returned regardless of the processing mode, matching logic or COA type. Please Note: If this return code is achieved, no other matching attempts are permitted regardless of the PROCESSING mode.	N	S
91	**COA Match: Secondary Number dropped from COA** – The input record matched to a COA record. The COA record had a secondary number and the input address did not. Please Note: This return code is derived from Individual and business matching logic only. If this return code is achieved, no other matching attempts are permitted regardless of the PROCESSING mode.	Y	S
92	**COA Match: Secondary Number or Single Trailing Alpha Dropped from input address – The input record matched to a COA record and either:** **a. The input address had a secondary number and the COA record did not. A second attempt is made by dropping the secondary number and trailing alpha or fractions from the original input address (is present). (OR)** **b. The record is a ZIP+4 street level match and the single trailing alpha was dropped to make a ZIP + 4 match (address matching returns a TA footnote).** Please Note: This return code is derived from individual and business matching logic only. If this return code is achieved, no other matching attempts are permitted regardless of the PROCESSING mode.	Y	S

Please Note: When processing in STANDARD mode and return codes 00, 11, 13, 15 and 17 are received utilizing Individual Logic, it is required to attempt the match again using FAMILY matching logic.
*** A new address is not returned with ANK[Link] data (months 19-48).**
**** Temporary COAs are only available in the 48-month product.**

= return codes classified as "match"

NCOA[Link] Return Code Matrix

Code	Received during Business matching logic	Received during Individual matching logic	Received during Family matching Logic	Retry matching attempts
A	YES	YES	YES	NO
00	YES	YES	YES	attempt the match again using the next level of matching logic allowed by the processing mode
01	YES	YES	YES	NO
02	YES	YES	YES	NO
03	YES	YES	YES	NO
04	NO	NO	YES	NO
05	YES	YES	YES	NO
06	NO	YES	NO	NO
07	NO	YES	NO	NO
08	YES	YES	YES	NO
09	NO	NO	YES	NO
10	NO	NO	YES	NO
11	NO	YES	NO	When processing in the STANDARD mode and this return code is received utilizing Individual Logic it is required to attempt the match again using FAMILY matching logic.
12	NO	YES	NO	NO
13	NO	YES	NO	When processing in the STANDARD mode and this return code is received utilizing Individual Logic it is required to attempt the match again using FAMILY matching logic.
14	YES	YES	YES	NO
15	NO	YES	NO	When processing in the STANDARD mode and this return code is received utilizing Individual Logic it is required to attempt the match again using FAMILY matching logic.
16	NO	YES	NO	NO
17	NO	YES	NO	When processing in the STANDARD mode and this return code is received utilizing Individual Logic it is required to attempt the match again using FAMILY matching logic.

NCOA^{Link} Return Code Matrix - continued

Code	Received during Business matching logic	Received during Individual matching logic	Received during Family matching logic	Retry matching attempts
18	NO	NO	YES	NO
19	YES	YES	YES	NO
20	YES	YES	YES	NO
66	YES	YES	YES	NO
91	NO	YES	NO	NO
92	NO	YES	NO	NO

New address information is returned only on the following return codes: A, 91, 92

Return Codes that indicate a COA was found but was unable to provide a new address: 01, 02, 03, 05, 14, 19

Return Codes that return a move effective date (MATCH Return Codes): A, 91, 92, 01, 02, 03, 05, 14, 19

Return Codes in which the move effective date must be discarded by licensee: 04, 06, 07, 08, 09, 10, 11, 12, 13, 15, 16, 17, 18, 20

Return Codes that indicate potential matches but could not make the match due to rules: 04, 06, 07, 08, 09, 10, 11, 12, 13, 15, 16, 17, 18, 20

Return Codes returned during Individual logic only: 06, 07, 11, 12, 13, 15, 16, 17, 91, 92

Return Codes returned during Family logic only: 04, 09, 10, 18

Return Codes that require discontinuing the Individual logic sequence and go straight to the FAMILY matching logic. 11, 13, 15, 17

Return Codes that do not allow retry of matching logic: A, 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 12, 14, 16, 18, 19, 20, 91, 92

Return Code 00 indicates neither a match nor potential match achieved.
.

Other Return Code Descriptions

Code	Description	Process
AA	Input Address ZIP+4 match	ZIP+4
A1	Input Address ZIP+4 not matched	ZIP+4
BB	Input Address DPV matched (all components)	DPV
CC	Input Address DPV Primary Number match, Secondary Number not Matched (secondary number present but is not DPV confirmed)	DPV
F1	Matched ZIP+4 Military Record	DPV
G1	Matched ZIP+4 General Delivery Record	DPV
M1	Input Address Primary Number Missing	DPV
M3	Input Address Primary Number Invalid	DPV
N1	Input Address DPV Primary Number match, High-rise Address Missing Secondary Number	DPV
NL	Used when your customer wants DPV on a new address that is the result of NCOA^{Link} and the new address can not be DPV confirmed. All new addresses from NCOALink are Primary number DPV confirmable. This issue occurs when a different version of the DPV file is used by the licensee. (timing issue) The Secondary number may or may not be confirmable.	DPV
P1	Input Address Missing PO, RR, or HC Box number	DPV
P3	Input Address PO, RR, or HC Box number invalid	DPV
R1	Input Address DPV matched to CMRA but PMB Number not Present	DPV
RR	Input Address DPV matched to CMRA	DPV
U1	Matched ZIP+4 Unique ZIP Record	DPV

NCOA^Link Return Code Examples

RC = Return Code
How – Derived from D (data) or S (software)
Address – Y (new address provided) or N (new address not provided)

RC	How	Description	Input Record	COA Record old side ↓ new side	Address
A	D	COA Match	Mary Jackson 123 Main ST	Mary Jackson 123 Main ST	Y
66	S	Daily Delete	Mary Jones 123 Main ST	Mary Jones **123 Main ST** (in daily delete file)	N
00	D	NO Match	Mary Smith 123 Main ST	No COA on file	N
01	D	Found COA: Foreign Move	John Baker 123 Main ST	John M. Baker Foreign 123 Main ST address	N
02	D	Found COA: Moved Left No Address (MLNA)	Mary Baker 456 Elm ST	Mary Baker MLNA 456 Elm ST	N
03	D	Found COA: Box Closed No Order (BCNO)	Moore Printing PO BOX 123	Moore Printing BCNO PO BOX 123	N
04	D	Cannot Match COA: Street Address with Secondary	Smith 789 Oak ST	Pam Smith (family) 789 Oak ST APT 3 (S)	N
05	D	Found COA: New 11-digit DPBC is Ambiguous	Mary Smith 1 1st ST STE 211	Mary Smith new 11-digit 1 1st ST STE 211 ambiguous	N
06	D	Cannot Match COA: Conflicting Directions: Middle Name Related	Ann (or) Ann S (or) Ann M Adams 123 Main ST	Ann M Adams 123 Main ST 456 Elm ST Ann S Adams 123 Main ST 789 Oak ST	N
07	D	Cannot Match COA: Conflicting Directions: Gender Related	Patrick 123 Main ST	Patrick Adams 123 Main ST 456 Main ST Mrs Patrick Adams 123 Main ST 789 Oak ST	N
08	D	Cannot Match COA: Other Conflicting Directions	Cindy Williams 123 Main ST	Cindy Williams 123 Main ST 456 Elm ST med: 200110 (2 COAs on file with different new) 789 Oak ST med: 200110	N
09	D	Cannot Match COA: High-rise Default	Smith 50 First ST	John Smith (family) 50 First ST (L)	N
10	D	Cannot Match COA: Rural Default	Smith RR 1	Martha Smith (family) RR 1 (D)	N
11	D	Cannot Match COA: Individual Match: Insufficient COA Name for Match	M Smith 123 Main ST	M Smith 123 Main ST {COA w/first initial only}	N
12	S	Cannot Match COA: Middle Name Test Failed	Mary P Jones 456 Elm ST	Mary R Jones 456 Elm ST	N
13	S	Cannot Match COA: Gender Test Failed	Mrs Randy 789 Oak ST	Randy Jones 789 Oak ST	N
14	S	Found COA: New Address Would Not Convert at Run Time	Paul Walters 1 Second ST	Paul Walters new 11-digit 1 Second ST ambiguous	N

NCOA^{Link} Return Code Examples - continued

RC = Return Code
How – Derived from D (data) or S (software)
Address – Y (new address provided) or N (new address not provided)

RC	How	Description	Input Record	COA Record old side ↓ new side	Address
15	S	Cannot Match COA: Individual Name Insufficient	J Michael Smith (or) J M Smith (or) J Smith 1 Main ST	J Mark Smith 1 Main ST {COA w/first initial and complete middle}	N
16	S	Cannot Match COA: Secondary Number Discrepancy	1) Mary Jackson Original input: **21 Front ST** APT 7 Drop secondary and try again: **21 Front ST** (w/drop flag)	1) Mary Jackson **21 Front ST** APT 2 ← **Primary COA** 21 Front ST ← **Baby COA** (w/drop flag)	N
17	S	Cannot Match COA: Other Insufficient Name	M Kathleen Johnson (or) M C Johnson (or) M CJ Johnson (or) M Johnson 456 Elm ST	Mary Cindy Johnson (I) 456 Elm ST {COA w/complete first and middle; name drop flag is set}	N
18	D	Cannot Match COA: General Delivery	Smith General Delivery	Mary Smith (family) General Delivery	N
19	D	Found COA: New Address not ZIP+4 Coded	John Smith 99 First ST	John Smith 123 Main ST → 99 First ST Anytown, ST 11111-0000	N
20	D	Cannot Match COA: Conflicting Directions after re-chaining	Cindy Smith-Jones	Cindy Smith-Jones 123 Main ST 789 Oak ST Cindy Smith med: 200210 789 Oak ST PO BOX 100 Cindy Jones med: 200210 789 Oak ST 1011 Fig DR	N
91	S	COA Match: Secondary Number dropped from COA	Richard Smith 123 Main ST	Richard Smith 123 Main ST (S) (w/drop flag)	Y
92	S	COA Match: Secondary Number dropped from Input	Gary Jones 123 Main ST (dropped sec#)	Gary Jones 123 Main ST (S)	Y

NCOALink Name Sequence Presentation

1. **Original Input:** Attempt a match utilizing the First Name, Middle Name and Last Name as presented from the input file (Individual logic). Using individual match logic:
    a. if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA^{Link} match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address.
    b. if a ZIP+4 address match is made to a street level record and a trailing alpha was dropped to DPV confirm for address matching and if no NCOA^{Link} match is obtained then a second attempt is made by dropping the trailing alpha on primary numbers from the original input address.

   Optional: If the last name ends with an 'S', you may drop the 'S' and try this again.

2. **Normalize First Name:** If a match is not obtained utilizing rule 1, then query the NORMALF.LST with the input first name, and substitute the normalized version(s) of the first name (Individual logic)**.** Using individual match logic, if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA^{Link} match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address. Optional: If the last name ends with an 'S', you may drop the 'S' and try this again. These steps will be repeated for all normalized occurrences until a match is obtained or there are no more normalized occurrences to try.

3. **Nickname:** If a match is not obtained utilizing rule 2, then query the NICK.LST utilizing the original input or normalized version(s) of the first name if one was obtained, and substitute the nickname for the first name for all nickname occurrences (Individual logic). Using individual match logic, if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA^{Link} match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address. Optional: If the last name ends with an 'S', you may drop the 'S' and try this again. These steps will be repeated for all nicknames until a match is obtained or there are no more nicknames to try.

   NOTE: Once you have normalized a first name, use the nickname(s) of the normalized first name. **Do not attempt normalization of nick names.**

4. **Normalize Last Name:** If a match is not obtained utilizing rule 3, then query the NORMALL.LST with the input last name and substitute the normalized version of the last name. (Individual logic). Using individual match logic, if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA^{Link} match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address. **(The FIRST NAME must REFLECT the ORIGINAL first name when performing this lookup) Attempting variations of the first name and last name simultaneously is prohibited**. Repeat the above processes for all normalized occurrences until a match is obtained or there are no more normalized occurrences to try.

   Note: **Do not attempt the "optional** drop 'S'" on the original input last name or the normalized name.

5. **First Name Initial:** If a match is not obtained utilizing rule 4, if there is a Middle Name (more than 1 character), you may attempt a lookup on only the first initial, full middle name, and last name **utilizing the original input as presented** (Individual logic). Using individual match logic, if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA^Link match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address. Optional: If the last name ends with an 'S', you may drop the 'S' and try this again. **Attempting variations of the first name and last name simultaneously is prohibited**. **Do not** truncate first names while testing normalized spellings of last names.

   Note: If the first name is truncated to the first initial only, the software should set the INPUT DROP NAME FLAG (or any other variable name utilized by the software to track if the input truncated to the first initial) must be set to positive. If the returned NCOA^Link DROP N FLAG is positive and the INPUT DROP NAME FLAG is positive then this lookup should be treated as a no match (Return Code: 00). Continue with the lookup process. Please refer to section labeled *Appropriate use of the Drop Flag***.**

6. **Swap First/Middle Name:** If a match is not obtained utilizing rule 5, you may reverse the order of the first name and full middle name, providing, of course, that the middle name is more than 1 character **utilizing the original input as presented** (Individual logic). Using individual match logic, if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA^Link match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address. Optional: If the last name ends with an 'S', you may drop the 'S' and try this again. If an NCOA^Link match is obtained and does not contain a middle name/initials this will be treated as a no match. If an NCOA^Link match is obtained and contains middle name/initials but they do not agree then it will be treated as a no match. The only way to match in this scenario is if the input and NCOA^Link result both have middle initials and they equate. **Do not attempt name variations when using this option. Use the name as presented.**

7. **Last Name:** If a match is not obtained utilizing rule 6, then you may attempt the lookup **utilizing only the original input LAST NAME as presented** (family logic). Optional: If the last name ends with an 'S', you may drop the 'S' and try this again. **If you got to this step by return code 11, 13, 15, and 17 then this would be your last lookup.**

8. **First Name – Hyphenated Middle/Last:** If a match is not obtained utilizing rule 7, then you may attempt the First Name, and Hyphenated Middle Name / Last Name combination **utilizing the original input as presented** (Individual logic). Using individual match logic, if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA^Link match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address. Optional: If the last name ends with an 'S', you may drop the 'S' and try this again. **Do not attempt name variations when using this option.**

9. **Hyphenated Middle/Last:** If there is not a match utilizing Example 8 then you may attempt the Hyphenated Middle Name / Last Name combination (family logic). Optional: If the last name ends with an 'S', you may drop the 'S' and try this again. **Do not attempt name variations when using this option**.

NCOA[Link] Name Sequence Presentation – Example A

Each of the numbered examples below correspond to the numerical example listed under the title NCOA[Link] Name Sequence Presentation. The following is an order of precedence for presenting names to NCOA[Link]. The middle names or initials are presented in this presentation for clarity and it is understood that middle names or initials are not presented for matching, but are used for comparison and validation of the information returned from NCOA[Link].

For this example sequence, assume the following information in the NCOALink Data:

NORMALF: ANDREJ ANDREW **NICK :** ANDREW ANDY
: ANDREJ ANDRE **:** ANDREW DREW

NORMALL: ALDABBAS DABBAS

1. **Original Input:** First Name, Middle Name, and Last Name as presented (Individual logic).

Rule 1 – Original Input Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**
Attempted input name:

Step	First	Middle	Last	Address	Description
A	ANDREJ	DEAN	ALDABBAS	123 MAIN ST APT 35	original Input

Using individual match logic, if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA[Link] match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address.

Rule 1 – Original Input Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**
Attempted input name:

Step	First	Middle	Last	Address	Description
B	ANDREJ	DEAN	ALDABBAS	123 MAIN ST	drop pno trailing alpha or fraction/2ndary

Option to drop the 'S' from the last name. (Individual logic)

Rule 1 – Original Input Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**
Attempted input name:

Step	First	Middle	Last	Address	Description
C	ANDREJ	DEAN	ALDABBA	123 MAIN ST APT 35	original input/drop "S" (optional)

Using individual match logic, if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA[Link] match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address.

Rule 1 – Original Input Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**
Attempted input name:

Step	First	Middle	Last	Address	Description
D	ANDREJ	DEAN	ALDABBA	123 MAIN ST	drop "S"/drop pno trailing alpha or fraction/2ndary (optional)

2. **Normalize First Name:** Query the NORMALF.LST with the input first name, and substitute the normalized version(s) of the first name (Individual logic).

Rule 2 – Normalize First Name Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**
Attempted input name:

Step	First	Middle	Last	Address	Description
A	ANDRE	DEAN	ALDABBAS	123 MAIN ST APT 35	normalize first name

Using individual match logic, if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA[Link] match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address.

Rule 2 – Normalize First Name Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**
Attempted input name:

Step	First	Middle	Last	Address	Description
B	ANDRE	DEAN	ALDABBAS	123 MAIN ST	normalize 1st/drop pno trailing alpha or fraction/2ndary

Option to drop the 'S' from the last name. (Individual logic)

Rule 2 – Normalize First Name Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**
Attempted input name:

Step	First	Middle	Last	Address	Description
C	ANDRE	DEAN	ALDABBA	123 MAIN ST APT 35	normalize 1st/drop "S" (optional)

Using individual match logic, if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA[Link] match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address.

Rule 2 – Normalize First Name Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**
Attempted input name:

Step	First	Middle	Last	Address	Description
D	ANDRE	DEAN	ALDABBA	123 MAIN ST	drop "S"/drop pno trailing alpha or fraction/2ndary (optional)

Repeat the above processes for all normalized occurrences until a match is obtained or there are no more normalized occurrences to try.

Rule 2 – Normalize First Name Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**
Attempted input name:

Step	First	Middle	Last	Address	Description
E	ANDREW	DEAN	ALDABBAS	123 MAIN ST APT 35	normalize first name
F	ANDREW	DEAN	ALDABBAS	123 MAIN ST	normalize 1st/drop pno trailing alpha or fraction/2ndary
G	ANDREW	DEAN	ALDABBA	123 MAIN ST APT 35	normalize 1st/drop "S" (optional)
H	ANDREW	DEAN	ALDABBA	123 MAIN ST	drop "S"/drop pno trailing alpha or fraction/2ndary(optional)

3. **Nickname:** Query NICK.LST utilizing the original input or normalized version(s) of the first name if one was obtained, and substitute the nickname for the first name for all nickname occurrences (Individual logic).
   NOTE: Once you have normalized a first name, use the nickname(s) of the normalized first name.

RULE 3 – NICKNAME Name as presented: ANDRE DEAN ALDABBAS **Logic: Individual**
Attempted input name:

Step	First	Middle	Last	Address	Description
A	*** NO MATCHING RECORD IN THE NICKNAME TABLE ***				

First, ANDRE is presented to the nickname table. There is no matching record for ANDRE. Next, ANDREW is presented. ANDREW corresponds with ANDY in the nickname table and is used as input:

RULE 3 – NICKNAME Name as presented: ANDREW DEAN ALDABBAS **Logic: Individual**
Attempted input name:

Step	First	Middle	Last	Address	Description
B	ANDY	DEAN	ALDABBAS	123 MAIN ST APT 35	nickname(1)

Using individual match logic, if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA^Link match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address.

RULE 3 – NICKNAME Name as presented: ANDREW DEAN ALDABBAS **Logic: Individual**
Attempted input name:

Step	First	Middle	Last	Address	Description
C	ANDY	DEAN	ALDABBAS	123 MAIN ST	nick(1)/drop pno trailing alpha or fraction/2ndary

Option to drop the 'S' from the last name. (Individual logic)

RULE 3 – NICKNAME Name as presented: ANDREW DEAN ALDABBAS **Logic: Individual**
Attempted input name:

Step	First	Middle	Last	Address	Description
D	ANDY	DEAN	ALDABBA	123 MAIN ST APT 35	nick(1)/drop "S" (optional)

Using individual match logic, if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA^{Link} match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address.

RULE 3 – NICKNAME Name as presented: ANDREW DEAN ALDABBAS **Logic: Individual**
Attempted input name:

Step	First	Middle	Last	Address	Description
E	ANDY	DEAN	ALDABBA	123 MAIN ST	nick(1)/drop "S"/drop pno trailing alpha or fraction/2ndary (optional)

Repeat the above processes for all nicknames until a match is obtained or there are no more nicknames to try. The next nickname for ANDREW is DREW. DREW is now used as input into NCOALink. Note: Do not attempt normalization of nicknames.

RULE 3 – NICKNAME Name as presented: ANDREW DEAN ALDABBAS **Logic: Individual**
Attempted input name :

Step	First	Middle	Last	Address	Description
F	DREW	DEAN	ALDABBAS	123 MAIN ST APT 35	nickname(2)
G	DREW	DEAN	ALDABBAS	123 MAIN ST	nick(2)/drop pno trailing alpha or fraction/2ndary
H	DREW	DEAN	ALDABBA	123 MAIN ST APT 35	nick(2)/drop "S" (optional)
I	DREW	DEAN	ALDABBA	123 MAIN ST	nick(2)/drop "S"/drop pno trailing alpha or fraction/2ndary(optional)

Repeat for all nicknames until a match is obtained or there are no more nicknames to try

Note: Had normalized first names not been obtained from the normalization table (no corresponding record), the original input name would have been used to query the nickname table:

RULE 3 – NICKNAME Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**
Attempted input name: The Original Input Name ANDREJ has no nickname associated with it.

Step	First	Middle	Last	Address	Description
A					

4. **Normalize Last Name:** Query the NORMALL.LST with the input last name and substitute the normalized version of the last name**. (The FIRST NAME must REFLECT the ORIGINAL first name when performing this lookup)**. (Individual logic) Attempting variations of the first name and last name simultaneously is prohibited.

RULE 4 – Normalize Last Name Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**
Attempted input name : Original input - hyphenated middle name and last name

Step	First	Middle	Last	Address	Description
A	ANDREJ	DEAN	DABBAS	123 MAIN ST APT 35	normalized last name

Using individual match logic, if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA[Link] match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address.

RULE 4 – Normalize Last Name Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**
Attempted input name : Original input - hyphenated middle name and last name

Step	First	Middle	Last	Address	Description
B	ANDREJ	DEAN	DABBAS	123 MAIN ST	normalize last/drop pno trailing alpha or fraction/2ndary

Note: **DO not attempt the "optional** drop 'S'" on the original input last name or the normalized name.

Repeat the above processes for all normalized occurrences until a match is obtained or there are no more normalized occurrences to try.

Note: The last name of ALDABBAS only has one normalized name associated with it "Dabbas". The following example depicts an additional normalized name using a fictitious name.

RULE 4 – Normalize Last Name Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**
Attempted input name : Original input - hyphenated middle name and last name

Step	First	Middle	Last	Address	Description
C	ANDREJ	DEAN	DAB	123 MAIN ST APT 35	normalized last name
D	ANDREJ	DEAN	DAB	123 MAIN ST	normalize last/drop pno trail alpha or fraction/2ndary

5. **First Name Initial:** Middle Name (more than 1 character), attempt a lookup on only the first initial, full middle name, and last name **utilizing the original input as presented** (Individual logic).

Rule 5 – First Name Initial Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**

Attempted input name :

Step	First	Middle	Last	Address	Description
A	A	DEAN	ALDABBAS	123 MAIN ST APT 35	First initial

Using individual match logic, if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA[Link] match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address.

Rule 5 – First Name Initial Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**

Attempted input name :

Step	First	Middle	Last	Address	Description
B	A	DEAN	ALDABBAS	123 MAIN ST	1st initial/drop pno trailing alpha or fraction/2ndary

Option to drop the 'S' from the last name. (Individual logic)

Rule 5 – First Name Initial Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**

Attempted input name :

Step	First	Middle	Last	Address	Description
C	A	DEAN	ALDABBA	123 MAIN ST APT 35	1st initial/drop "S" (optional)

Using individual match logic, if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA[Link] match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address.

Rule 5 – First Name Initial Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**

Attempted input name :

Step	First	Middle	Last	Address	Description
D	A	DEAN	ALDABBA	123 MAIN ST	drop "S"/drop pno trailing alpha or fraction/2ndary (optional)

Note: If the first name is truncated to the first initial only, the software must set the INPUT DROP NAME FLAG (or any other variable name utilized by the software to track if the input truncated to the first initial) must be set to positive. If the returned NCOA[Link] DROP N FLAG is positive and the INPUT DROP NAME FLAG is positive then this lookup should be treated as a no match (Return Code: 00). Continue with the lookup process. Please refer to section labeled *Appropriate use of the Drop Flag*.

6. **Swap First/Middle Name:** Reverse the order of the first name and full middle name, providing, of course, that the middle name is more than 1 character **utilizing the original input as presented** (Individual logic). **Do not attempt name variations when using this option.** If an NCOA^{Link} match is obtained and does not contain a middle name/initials this will be treated as a no match. If an NCOA^{Link} match is obtained and contains middle name/initials but they do not agree then it will be treated as a no match. The only way to match in this scenario is if the input and NCOA^{Link} result both have middle initials and they equate.

Rule 6 – Swap First/Middle Name Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**
Attempted input name :

Step	First	Middle	Last	Address	Description
A	DEAN	ANDREJ	ALDABBAS	123 MAIN ST APT 35	Reverse First/Middle name

Using individual match logic, if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA^{Link} match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address.

Rule 6 – Swap First/Middle Name Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**
Attempted input name :

Step	First	Middle	Last	Address	Description
B	DEAN	ANDREJ	ALDABBAS	123 MAIN ST	Reverse 1st-mid/drop pno trailing alpha or fraction/2ndary

Option to drop the 'S' from the last name. (Individual logic)

Rule 6 – Swap First/Middle Name Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**
Attempted input name :

Step	First	Middle	Last	Address	Description
C	DEAN	ANDREJ	ALDABBA	123 MAIN ST APT 35	Reverse 1st-mid/drop "S" (optional)

Using individual match logic, if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA^{Link} match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address.

Rule 6 – Swap First/Middle Name Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**
Attempted input name :

Step	First	Middle	Last	Address	Description
D	DEAN	ANDREJ	ALDABBA	123 MAIN ST	drop "S"/drop pno trailing alpha or fraction/2ndary (optional)

7. **Last Name:** Attempt the lookup **utilizing only the original input LAST NAME as presented** (family logic). **If you got to this step by return code 11,13,15, and 17 then this would be your last lookup.**

Rule 7 – Last Name Name as presented: ANDREJ DEAN ALDABBAS **Logic: Family**

Attempted input name :

Step	First	Middle	Last	Address	Description
A			ALDABBAS	123 MAIN ST APT 35	last name only

Option to drop the 'S' from the last name. (family logic)

Rule 7 – Last Name Name as presented: ANDREJ DEAN ALDABBAS **Logic: Family**

Attempted input name :

Step	First	Middle	Last	Address	Description
B			ALDABBA	123 MAIN ST APT 35	last name/drop "S" (optional)

8. **First Name – Hyphenated Middle/Last:** Attempt the original input First Name, and Hyphenated Middle Name / Last Name combination **utilizing the original input as presented** (Individual logic). **Do not attempt name variations when using this option.**

Rule 8 – First Name – Hyphenated Middle/Last Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**

Attempted input name :

Step	First	Middle	Last	Address	Description
A	ANDREJ		DEAN-ALDABBAS	123 MAIN ST APT 35	hyphenated middle/last

Using individual match logic, if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA^{Link} match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address.

Rule 8 – First Name – Hyphenated Middle/Last Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**

Attempted input name :

Step	First	Middle	Last	Address	Description
B	ANDREJ		DEAN-ALDABBAS	123 MAIN ST	drop pno trailing alpha or fraction/2ndary

Option to drop the 'S' from the last name. (Individual logic)

Rule 8 – First Name – Hyphenated Middle/Last Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**

Attempted input name :

Step	First	Middle	Last	Address	Description
C	ANDREJ		DEAN-ALDABBA	123 MAIN ST APT 35	drop "S" (optional)

Using individual match logic, if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA^{Link} match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address.

Rule 8 – First Name – Hyphenated Middle/Last Name as presented: ANDREJ DEAN ALDABBAS
Logic: Individual

Attempted input name :

Step	First	Middle	Last	Address	Description
D	ANDREJ		DEAN-ALDABBA	123 MAIN ST	drop "S"/drop pno trailing alpha or fraction/2ndary optional)

9. **Hyphenated Middle/Last:** Attempt the Hyphenated Middle Name / Last Name combination (family logic). **Do not attempt name variations when using this option.**

Rule 9 – Hyphenated Middle/Last Name as presented: ANDREJ DEAN ALDABBAS **Logic: Family**

Attempted input name :

Step	First	Middle	Last	Address	Description
A			DEAN-ALDABBAS	123 MAIN ST APT 35	hyphenated middle/last

Option to drop the 'S' from the last name. (Family logic)

Rule 9 – Hyphenated Middle/Last Name as presented: ANDREJ DEAN ALDABBAS **Logic: Family**

Attempted input name :

Step	First	Middle	Last	Address	Description
B			DEAN-ALDABBA	123 MAIN ST APT 35	drop 'S' (optional)

NCOA[Link] Name Sequence Presentation – Example B

Each of the numbered examples below corresponds to the numerical example listed under the title NCOA[Link] Name Sequence Presentation. The following examples are exactly the same as in the NCOA[Link] Name Sequence Presentation – Example A, but reflect a consolidated format. The middle names or initials are presented in this presentation for clarity and it is understood that middle names or initials are not presented for matching, but are used for comparison and validation of the information returned from NCOA[Link].

For this example sequence, assume the following information in the NCOALink Data:

NORMALF: ANDREJ ANDREW **NICK:** ANDREW ANDY
: ANDREJ ANDRE ANDREW DREW

NORMALL: ALDABBAS DABBAS

1. **Original Input:** Attempt a match utilizing the First Name, Middle Name and Last Name as presented from the input file (Individual logic). Using individual match logic, if a ZIP+4 address match is made to a street level record and there is address information in the input address and if no NCOA[Link] match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address. Optional: If the last name ends with an 'S', you may drop the 'S' and try this again.

Rule 1 – Original Input Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**
Attempted input name :

Step	First	Middle	Last	Address	Description
A	ANDREJ	DEAN	ALDABBAS	123 MAIN ST APT 35	original Input
B	ANDREJ	DEAN	ALDABBAS	123 MAIN ST	drop pno trailing alpha or fraction/2ndary
C	ANDREJ	DEAN	ALDABBA	123 MAIN ST APT 35	original input/drop "S" (optional)
D	ANDREJ	DEAN	ALDABBA	123 MAIN ST APT	drop "S"/drop pno trailing alpha or fraction/2ndary (optional)

2. **Normalize First Name:** If a match is not obtained utilizing rule 1, then query the NORMALF.LST with the input first name, and substitute the normalized version(s) of the first name (Individual logic). Using individual match logic, if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA[Link] match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address. Optional: If the last name ends with an 'S', you may drop the 'S' and try this again.

Rule 2 – Normalize First Name Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**
Attempted input name :

Step	First	Middle	Last	Address	Description
A	ANDRE	DEAN	ALDABBAS	123 MAIN ST APT 35	normalize first name
B	ANDRE	DEAN	ALDABBAS	123 MAIN ST	normalize 1st/drop pno trailing alpha or fraction/2ndary
C	ANDRE	DEAN	ALDABBA	123 MAIN ST APT 35	normalize 1st/drop "S" (optional)
D	ANDRE	DEAN	ALDABBA	123 MAIN ST	drop "S"/drop pno trail alpha or fraction/2ndary (optional)
E	ANDREW	DEAN	ALDABBAS	123 MAIN ST APT 35	normalize first name
F	ANDREW	DEAN	ALDABBAS	123 MAIN ST	normalize 1st/drop pno trailing alpha or fraction/2ndary
G	ANDREW	DEAN	ALDABBA	123 MAIN ST APT 35	normalize 1st/drop "S" (optional

H ANDREW DEAN ALDABBA 123 MAIN ST drop "S"/drop pno trailing alpha or fraction/2ndary (optional)

Repeat for all normalized occurrences until a match is obtained or there are no more normalized occurrences to try

3. **Nickname:** If a match is not obtained utilizing rule 2, then query the NICK.LST utilizing the original input or normalized version(s) of the first name if one was obtained, and substitute the nickname for the first name for all nickname occurrences. (Individual logic). Using individual match logic, if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA[Link] match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address. Optional: If the last name ends with an 'S', you may drop the 'S' and try this again. These steps will be repeated for all nicknames until a match is obtained or there are no more nicknames to try. NOTE: Once you have normalized a first name, use the nickname(s) of the normalized first name. **Do not attempt normalization of nick names.**

Rule 3 – NICKNAME Name as presented: ANDRE DEAN ALDABBAS **Logic: Individual**
Attempted input name :

Step	First	Middle	Last	Address	Description
A	*** NO Matching Record in the NICKNAME table for ANDRE ***				

RULE 3 – NICKNAME Name as presented: ANDREW DEAN ALDABBAS **Logic: Individual**
Attempted input name :

Step	First	Middle	Last	Address	Description
B	ANDY	DEAN	ALDABBAS	123 MAIN ST APT 35	nickname(1)
C	ANDY	DEAN	ALDABBAS	123 MAIN ST	nick(1)/drop pno trailing alpha or fraction/2ndary
D	ANDY	DEAN	ALDABBA	123 MAIN ST APT 35	nick(1)/drop "S" (optional)
E	ANDY	DEAN	ALDABBA	123 MAIN ST	nick(1)/drop "S"/drop pno trailing alpha or fraction/2ndary (optional)
F	DREW	DEAN	ALDABBAS	123 MAIN ST APT 35	nickname(2)
G	DREW	DEAN	ALDABBAS	123 MAIN ST	nick(2)/drop pno trailing alpha or fraction/2ndary
H	DREW	DEAN	ALDABBA	123 MAIN ST APT 35	nick(2)/drop "S" (optional)
I	DREW	DEAN	ALDABBA	123 MAIN ST	nick(2)/drop "S"/drop pno trailing alpha or fraction/2ndary(optional)

Repeat for all nicknames until a match is obtained or there are no more nicknames to try

Note: Had normalized first names not been obtained from the normalization table (no corresponding record), the original input name would have been used to query the nickname table:

RULE 3 – NICKNAME Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**
Attempted input name: The Original Input Name ANDREJ has no nickname associated with it.

Step	First	Middle	Last	Address	Description
A					

4. **Normalize Last Name:** If a match is not obtained utilizing rule 3, then query the NORMALL.LST with the input last name and substitute the normalized version of the last name. (Individual logic). Using individual match logic, if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA^Link match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address. **(The FIRST NAME must REFLECT the ORIGINAL first name when performing this lookup) Attempting variations of the first name and last name simultaneously is prohibited**. Repeat the above processes for all normalized occurrences until a match is obtained or there are no more normalized occurrences to try.

Note: **DO not attempt the "optional** drop 'S'" on the original input last name or the normalized name.

RULE 4 – Normalize Last Name Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**
Attempted input name : Original input - hyphenated middle name and last name

Step	First	Middle	Last	Address	Description
A	ANDREJ	DEAN	DABBAS	123 MAIN ST APT 35	normalized last name
B	ANDREJ	DEAN	DABBAS	123 MAIN ST	normalize last/drop pno trailing alpha or fraction/2ndary

Repeat the above processes for all normalized occurrences until a match is obtained or there are no more normalized occurrences to try. Note: The last name of ALDABBAS only has one normalized name associated with it "Dabbas". The following example depicts an additional normalized name using a fictitious name.

RULE 4 – Normalize Last Name Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**
Attempted input name : Original input - hyphenated middle name and last name

Step	First	Middle	Last	Address	Description
C	ANDREJ	DEAN	DAB	123 MAIN ST APT 35	normalized last name
D	ANDREJ	DEAN	DAB	123 MAIN ST	normalize last/drop pno trailing alpha or fraction/2ndary

5. **First Name Initial:** If a match is not obtained utilizing rule 4, if there is a Middle Name (more than 1 character), you may attempt a lookup on only the first initial, full middle name, and last name **utilizing the original input as presented** (Individual logic). Using individual match logic, if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA^Link match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address. Optional: If the last name ends with an 'S', you may drop the 'S' and try this again. **Attempting variations of the first name and last name simultaneously is prohibited**. **Do not** truncate first names while testing normalized spellings of last names.

Note: If the first name is truncated to the first initial only, the software should set the INPUT DROP NAME FLAG (or any other variable name utilized by the software to track if the input truncated to the first initial) must be set to positive. If the returned NCOA^Link DROP N FLAG is positive and the INPUT DROP NAME FLAG is positive then this lookup should be treated as a no match (Return Code: 00). Continue with the lookup process. Please refer to section labeled *Appropriate use of the Drop Flag*.

Rule 5 – First Name Initial Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**

Attempted input name :

Step	First	Middle	Last	Address	Description
A	A	DEAN	ALDABBAS	123 MAIN ST APT 35	First initial
B	A	DEAN	ALDABBAS	123 MAIN ST	1st initial/drop pno trailing alpha or fraction/2ndary
C	A	DEAN	ALDABBA	123 MAIN ST APT 35	1st initial/drop "S" (optional)
D	A	DEAN	ALDABBA	123 MAIN ST	drop "S"/drop pno trailing alpha or fraction/2ndary (optional)

6. **Swap First/Middle Name:** If a match is not obtained utilizing rule 5, you may reverse the order of the first name and full middle name, providing, of course, that the middle name is more than 1 character **utilizing the original input as presented** (Individual logic). Using individual match logic, if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA^{Link} match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address. Optional: If the last name ends with an 'S', you may drop the 'S' and try this again. If an NCOA^{Link} match is obtained and does not contain a middle name/initials this will be treated as a no match. If an NCOA^{Link} match is obtained and contains middle name/initials but they do not agree then it will be treated as a no match. The only way to match in this scenario is if the input and NCOA^{Link} result both have middle initials and they equate. **Do not attempt name variations when using this option. Use the name as presented.**

Rule 6 – Swap First/Middle Name Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**

Attempted input name :

Step	First	Middle	Last	Address	Description
A	DEAN	ANDREJ	ALDABBAS	123 MAIN ST APT 35	reverse First/Middle name
B	DEAN	ANDREJ	ALDABBAS	123 MAIN ST	reverse 1st-mid/drop pno trailing alpha or fraction/2ndary
C	DEAN	ANDREJ	ALDABBA	123 MAIN ST APT 35	reverse 1st-mid/drop "S" (optional)
D	DEAN	ANDREJ	ALDABBA	123 MAIN ST	drop "S"/drop pno trailing alpha or fraction/2ndary (optional)

7. **Last Name:** If a match is not obtained utilizing rule 6, then you may attempt the lookup **utilizing only the original input LAST NAME as presented** (family logic). Optional: If the last name ends with an 'S', you may drop the 'S' and try this again. **If you got to this step by return code 11, 13, 15, and 17 then this would be your last lookup.**

Rule 7 – Last Name Name as presented: ANDREJ DEAN ALDABBAS **Logic: Family**

Attempted input name :

Step	First	Middle	Last	Address	Description
A			ALDABBAS	123 MAIN ST APT 35	last name only
B			ALDABBA	123 MAIN ST APT 35	last name/drop "S" (optional)

8. **First Name - Hyphenated Middle/Last:** If a match is not obtained utilizing rule 7, then you may attempt the First Name, and Hyphenated Middle Name / Last Name combination **utilizing the original input as presented** (Individual logic). Using individual match logic, if a ZIP+4 address match is made to a street level record and there is secondary address information in the input address and if no NCOA^{Link} match is obtained then a second attempt is made by simultaneously dropping the secondary number and trailing alpha or fractions on primary numbers (if present) from the original input address. Optional: If the last name ends with an 'S', you may drop the 'S' and try this again. **Do not attempt name variations when using this option.**

Rule 8 – First Name – Hyphenated Middle/Last Name as presented: ANDREJ DEAN ALDABBAS **Logic: Individual**

Attempted input name :

Step	First	Middle	Last	Address	Description
A	ANDREJ		DEAN-ALDABBAS	123 MAIN ST APT 35	hyphenated middle/last
B	ANDREJ		DEAN-ALDABBAS	123 MAIN ST	drop pno trailing alpha or fraction/2ndary
C	ANDREJ		DEAN-ALDABBA	123 MAIN ST APT 35	drop "S" (optional)
D	ANDREJ		DEAN-ALDABBA	123 MAIN ST	drop "S"/drop pno trailing alpha or fraction/2ndary (optional)

9. **Hyphenated Middle/Last:** Attempt the original input First Name, and Hyphenated Middle Name / Last Name combination (Individual logic). **Do not attempt name variations when using this option.**

Rule 9 – Hyphenated Middle/Last Name as presented: ANDREJ DEAN ALDABBAS **Logic: Family**

Attempted input name :

Step	First	Middle	Last	Address	Description
A			DEAN-ALDABBAS	123 MAIN ST APT 35	hyphenated middle/last
B			DEAN-ALDABBA	123 MAIN ST APT 35	drop 'S' (optional)

Cindy-Mary Table

	Cindy Mary	Cindy M	Cindy	C Mary	C M	C	Mary	Mary C	Mary Cindy
Cindy Mary	Match	Match	Match	Match	No match	No match	No Match	No Match	Match
Cindy M	Match	Match	Match	No match	No match	No match	No match	No match	No match
Cindy	Match	Match	Match	No match	No match	No match	No match	No match	No match
C Mary	Match	No match	No match	Match	No match	No match	No Match	Match	No match
C M	No match	No match	No match	No match	Match	No match	No match	No match	No match
C	No match	No match	No match	No match	No match	No match	No match	No match	No match
Mary	No Match	No match	No match	No match	No match	No match	Match	Match	Match
Mary C	No Match	No match	No match	Match	No match	No match	Match	Match	Match
Mary Cindy	Match	No match	No match	No match	No match	No match	Match	Match	Match

NCOA[Link] Build Records

COA Type and Name as provided by customer:		Record(s) Created during NCOALink Build:	Input Name:	Sequence Input Name (not all inclusive):	Return Code:
I	M Jones	M Jones (I)	M Jones		11
			C Jones		00
			M C Jones		11
			C M Jones		00
			M Cathleen Jones		11
			Cathleen M Jones		00
			Mary Jones		00
			Mary Cathleen Jones	M Cathleen Jones	11
			Cathleen Mary Jones		00
			Jones [family logic]		00
F	M Jones	M Jones (I) Jones (F)	Same as above except input of last name 'Jones' [family logic] would receive return code A.		
I	M C Jones	M C Jones (I)	M C Jones		A
			C M Jones		00
			B C Jones		00
			M P Jones		15
			M Jones		15
			C Jones		00
			M Cathleen Jones		15
			Cathleen M Jones		00
			Mary Jones		00
			Mary Cathleen Jones	M Cathleen Jones	15
			Cathleen Mary Jones		00
			Jones [family logic]		00
F	M C Jones	M C Jones(I) Jones (F)	Same as above except input of last name 'Jones' [family logic] would receive return code A.		
I	M Cindy Jones	M Cindy Jones (I)	M Cindy Jones		A
			M Cindy Jones [w/ndrop flag]		A
			Cindy M Jones		00
			B Cindy Jones		00
			Cindy B Jones		00
			Mary Cindy Jones	M Cindy Jones	A
			Cindy Mary Jones		00
			Cindy Jones		00
			Mary Jones		00
			M Jones		15
			C Jones		00
			M C Jones		15
			C M Jones		00
			M Cathy Jones		15
			Cathy M Jones		00
			Mary Cathleen Jones	M Cathleen Jones	15
			Cathleen Mary Jones		00
			Jones [family logic]		00

NCOA^Link Build Records - continued

COA Type and Name as provided by customer:		Record(s) Created during NCOALink Build:	Input Name:	Sequence Input Name (not all inclusive):	Return Code:
F	M Cindy Jones	M Cindy Jones (I) Jones (F)	*Same as above except input of last name 'Jones' [family logic] would receive return code A.*		
I	Mary Cindy Jones	Mary Cindy Jones (I) M Cindy Jones (I) *with n-drop flag*	Mary Cindy Jones Cindy Mary Jones M Cindy Jones Macy Cindy Jones Cindy M Jones Mary Jones Cindy Jones C Mary Jones Mary C Jones M Jones C Jones M C Jones C M Jones M Chris Jones Chris M Jones Mary Cathleen Jones Cathleen Mary Jones Melissa Cindy Jones Jones [family logic]	 Mary Cindy Jones M Cindy Jones [drop] Mary C Jones Mary Cathleen Jones 	A A A 00 00 A 00 00 A 17 00 17 00 17 00 12 00 00 00
F	Mary Cindy Jones	Mary Cindy Jones (I) M Cindy Jones (I) *with n-drop flag* Jones (F)	Same as above except input of last name 'Jones' [family logic] would receive return code A.		
I	Mary Jones	Mary Jones (I)	Mary Jones Cindy Jones Mary C Jones C Mary Jones M Jones C Jones M C Jones C M Jones Mary Cathleen Jones Cathleen Mary Jones Jones [family logic]	 Mary C Jones Mary Cathleen Jones 	A 00 A 00 00 00 00 A 00 00
F	Mary Jones	Mary Jones (I) Jones (F)	Same as above except input last name of 'Jones' [family logic]		

NCOA^Link Build Records - continued

COA Type and Name as provided by customer:		Record(s) Created during NCOALink Build:	Input Name:	Sequence Input Name (not all inclusive):	Return Code:
I	Mary C Jones	Mary C Jones (I)	Mary Jones		A
			Cathy Jones		00
			C Mary Jones	Mary C Jones	A
			Mary C Jones		A
			B Mary Jones	Mary B Jones	00
			Mary B Jones		12
			C Jones		00
			M Jones		00
			C M Jones		00
			M C Jones		00
			Mary Cathleen Jones		A
			Cathleen Mary Jones	Mary Cathleen Jones	00
			Jones [family logic]		00
F	Mary C Jones	Mary C Jones (I) Jones (F)	Same as above except input of last name 'Jones' [family logic] would receive return code A.		
I	Mary Smith-Jones	Mary Smith (I) Mary Jones (I) Mary Smith-Jones(I) Mary Jones-Smith(I)	Mary Smith		A
			Mary Jones		A
			Mary (Smith-Jones)		A
			Mary (Jones-Smith)		A
			Mary Cathy Smith		A
			Mary Cathy Jones		A
			Cathy Mary Smith	Mary Cathy Smith	00
			Cathy Mary Jones	Mary Cathy Jones	00
			M S Jones		00
			S M Jones		00
			M Smith Jones		00
			Smith M Jones		00
			Mary Cathy (Smith-Jones)		A
			Mary Cathy (Jones-Smith)		A
			Cathy Mary (Smith-Jones)	Mary Cathy (Smith-Jones)	00
			Cathy Mary (Jones-Smith)	Mary Cathy (Jones-Smith)	00
			M S (Jones-Smith)		00
			S M (Jones-Smith)		00
			M Smith (Jones-Smith)		00
			Smith M (Jones-Smith)		00
			(Jones-Smith) [family logic]		00
			(Smith-Jones) [family logic]		00
F	Mary Smith-Jones	Mary Smith (I) Mary Jones (I) Mary Smith-Jones (I) Mary Jones-Smith (I) Smith-Jones (F) Jones-Smith (F)	Same as above except input of last name 'Smith-Jones' [family logic] or 'Jones-Smith' [family logic] would receive return code A.		

NCOA[Link] Build Records - continued

COA Type and Name as provided by customer:		Record(s) Created during NCOALink Build:	Input Name:	Sequence Input Name (not all inclusive):	Return Code:
I	Mary Cindy Smith-Jones	Mary Cindy Smith-Jones(I) Mary Cindy Jones-Smith(I) Mary Cindy Smith (I) Mary Cindy Jones (I) M Cindy Smith-Jones (I) M Cindy Jones-Smith (I) M Cindy Smith (I) M Cindy Jones (I)	Mary Smith Cindy Smith Mary Jones Cindy Jones Mary C Jones C Mary Jones Mary C Smith C Mary Smith Cindy M Jones M Cindy Jones Cindy M Smith M Cindy Smith M Smith M Jones Mary Smith Jones Cindy Smith Jones Mary Jones Smith Cindy Jones Smith Smith Mary Jones Smith Cindy Jones Mary (Smith-Jones) Cindy (Smith-Jones) Mary (Jones-Smith) Cindy (Jones-Smith) Mary C (Jones-Smith) C Mary (Jones-Smith) Mary C (Smith-Jones) C Mary (Smith-Jones) Cindy M (Jones-Smith) M Cindy (Jones-Smith) Cindy M (Smith-Jones) M Cindy (Smith-Jones) M Cindy (Smith-Jones) [w/ndrop flag] Melissa Cindy (Smith-Jones) M (Smith-Jones) M (Jones-Smith) Mary Smith (Jones-Smith) Cindy Smith (Jones-Smith) Mary Jones (Smith-Jones) Cindy Jones (Smith-Jones) Smith Mary (Jones-Smith) Smith Cindy (Jones-Smith) (Smith-Jones) [family logic] (Jones-Smith) [family logic]	 Mary C Jones Mary C Smith Mary (Smith-Jones) Mary (Jones-Smith) Mary Smith Jones Mary C (Jones-Smith) Mary C (Smith-Jones) Mary Smith (Jones-Smith)	A 00 A 00 A 00 A 00 00 A 00 A 17 17 A 00 A 00 12 00 A 00 A 00 A 00 A 00 A 00 00 A 00 00 17 17 12 00 12 00 00 00
F	Mary Cindy Smith-Jones	All records in previous example and Smith-Jones (F) Jones-Smith (F)	Same as above except input of last name 'Smith-Jones' [family logic] or 'Jones-Smith' [family logic] would receive return code A.		

NCOA[Link] Build Records - continued

COA Type and Name as provided by customer:		Record(s) Created during NCOALink Build:	Input Name:	Sequence Input Name (not all inclusive):	Return Code:
I	John Mary Smith	John Smith Mary Smith	John Smith Mary Smith Mary A Smith John A Smith A John Smith A Mary Smith J Mary Smith Mary J Smith John Mary Smith Mary John Smith Smith [family logic]	 John A Smith Mary A Smith Mary J Smith	A A A A A A A A A A 00
F	John Mary Smith	John Smith Mary Smith Smith (F)	Same as above except input of last name 'Smith' [family logic] would receive return code A.		

Note: If the COA is a ZIP+4 street level record with secondary information, a drop-flag record is created in addition to the above specified record in the table. For example: If the COA is for 'M Cindy Jones' moving from 123 Main ST APT 2, street level record, the following records would be created:

M Cindy Jones, 123 Main ST APT 2

M Cindy Jones, 123 Main ST (w/drop flag)

Certification and Audit

Query Name Handling

When the input contains a middle initial/name:

If the COA returns a middle initial/name and a return code other than '00' was received, display the input middle initial/name in the query name field **if it was used during lookup**. The presence of the query middle initial/name indicates that the middle initial/name was influential in determining the output. If the COA does not contain a middle initial/name, do not return a query middle initial/name.

Input	COA	Middle return	Query name *(rules representation)*
Charles Al Arnette	Charles Allan Arnette	AL	AL
Charles Allan Arnette	Charles Allan Arnette	AL	ALEN
Charles Allan Arnette	Charles A Arnette	A	ALEN or A
Charles Doc Arnette	Charles Doc Arnette	DO	DOC
Charles DJ Arnette	Charles DD Arnette	DD	DJ
Charles J Arnette	Charles D Arnette	D	J
Charles DJ Arnette	Charles D Arnette	D	DJ or D
Charles D Arnette	Charles DJ Arnette	DJ	D
Charles A Arnette	Charles Arnette	(blank)	(blank)
Charles Allan Arnette	Charles Arnette	(blank)	(blank)
Charles Arnette	Charles A Arnette	A	(blank)

Query Name - middle name information

	NCOALink Middle Name Return: ***Blank***	**NCOALink Middle Name Return:** ***1 character***	**NCOALink Middle Name Return:** ***2 Characters***
Input Middle Name: ***Blank***	Blank	Blank	Blank
Input Middle Name: ***1 Character***	Blank	1 (first) character	1 (first) character
Input Middle Name: ***2 or more Characters***	Blank	1 (first) character OR the Full Input Middle Name	Full Input Middle Name

The following is a description of the file layouts used in the Audit and certification process. The following layouts describe how the Certification/Audit file, which is also called the Stage 2 file, will be constructed:

TEST CLIENT INPUT FILE HEADER RECORD
TEST CLIENT INPUT FILE DETAIL RECORD

The Certification/Audit file (better known as Stage 2) will only contain the questions.

The following is a description of the file layouts used in the developer process or by any Licensee to test the system. The following layouts describe how the test file, which is also called the Stage 1 file, will be constructed:

TEST CLIENT OUTPUT FILE HEADER RECORD
TEST CLIENT OUTPUT FILE DETAIL RECORD

The test file (better known as Stage 1) will contain the questions and the answers. Developers and Licensees can utilize this file to analyze if the system is functioning properly. This format will be utilized to provide back the answers to a Certification/Audit file (Stage 2).

Test file (Stage 1) grading is performed on the decrypted, readable name, address and other identified field results such as the move effective date, gender, return code, etc. The 48/49-byte object, data retrieved values, 17-digit result and other hex or sha values are not graded and you do not have to match those fields. We only use those fields to help diagnose issues the customer may have in retrieving the correct results.

All Alpha fields, defined as (pic x(#)) in the output file, will be left justified and space filled. When an Alpha field is empty it must contain all spaces. All Numeric fields, defined as (pic 9(#)) in the output file, will be right justified zero filled. When a Numeric field is empty it must contain all zeros. All records will be fixed length and contain a carriage-return line-feed (CRLF) at the end of each record.

TEST CLIENT INPUT FILE
HEADER RECORD

RECORD FROM	POSITION TO	FIELD NAME	LENGTH	COBOL
1	8	NCSC AUDIT FILE CREATED DATE(YYYYMMDD)	8	9(08)
9	14	NCSC AUDIT FILE CREATED TIME(HHMMSS)	6	9(06)
15	18	NCSC AUDIT FILE NUMBER	4	9(04)
19	26	NCSC NCOA^Link RELEASE DATE (Data Date)	8	9(08)
27	34	NCSC ZIP+4 RELEASE DATE (Data Date)	8	9(08)
35	42	NCSC DPV RELEASE DATE (Data Date)	8	9(08)
43	43	NCSC TYPE (Audit, Certification, Stage)	1	X(01)
44	297	FILLER	254	X(254)
298	298	RECORD TYPE (Header/Detail) (H,D)	1	X(01)
299	300	CARRIAGE RETURN LINE FEED	2	X(02)

TEST CLIENT INPUT FILE DETAIL RECORD				
RECORD FROM	POSITION TO	FIELD NAME	LENGTH	COBOL
1	28	INPUT CUSTOMER KEY	28	X(28)
29	29	INPUT NAME PARSED (Y,N)	1	X(01)
30	95	INPUT CUSTOMER NAME	66	X(66)
	NOTE:	The information found in the INPUT CUSTOMER NAME will be fixed length. The data contained within the field may be presented as a single field or it may be parsed. If the name is a business, then the name will start in the first position.		
30	35	INPUT PREFIX TITLES	6	X(06)
36	50	INPUT CUSTOMER FIRST NAME	15	X(15)
51	65	INPUT CUSTOMER MIDDLE NAME	15	X(15)
66	85	INPUT CUSTOMER LAST NAME	20	X(20)
86	91	INPUT SUFFIX TITLES	6	X(06)
92	95	FILLER	4	X(04)
96	96	INPUT ADDRESS PARSED (Y,N)	1	X(01)
97	124	INPUT CUSTOMER URBANIZATION NAME	28	X(28)
125	191	INPUT CUSTOMER ADDRESS	67	X(67)
	NOTE:	The information found in the INPUT CUSTOMER ADDRESS will be fixed length. The data contained within the field may be presented as a single field or it may be parsed.		
125	134	INPUT PARSED PRIMARY NUMBER	10	X(10)
135	136	INPUT PARSED PRE-DIRECTIONAL	2	X(02)
137	164	INPUT PARSED PRIMARY NAME	28	X(28)
165	168	INPUT PARSED SUFFIX	4	X(04)
169	170	INPUT PARSED POST-DIRECTIONAL	2	X(02)
171	174	INPUT PARSED UNIT DESIGNATOR	4	X(04)
175	182	INPUT PARSED SECONDARY NUMBER	8	X(08)
183	191	FILLER	9	X(09)
192	192	INPUT LAST LINE PARSED (Y,N)	1	X(01)
193	234	CUSTOMER LAST LINE	42	X(42)
	NOTE:	The information found in the INPUT CUSTOMER LAST LINE will be fixed length. The data contained within the field may be presented as a single field or it may be parsed.		
193	220	INPUT CITY NAME	28	X(28)
221	222	INPUT STATE	2	X(02)
223	227	INPUT FIVE DIGIT ZIP	5	X(05)
228	231	INPUT ZIP+4 ADDON	4	X(04)
232	234	FILLER	3	X(03)
235	297	FILLER	63	X(63)
298	298	RECORD TYPE (Header/Detail) (H,D)	1	X(01)
299	300	CARRIAGE RETURN LINE FEED	2	X(02)

TEST CLIENT OUTPUT FILE HEADER RECORD				
RECORD FROM	POSITION TO	FIELD NAME	LENGTH	COBOL
1	8	NCSC AUDIT FILE CREATED DATE(YYYYMMDD)	8	9(08)
9	14	NCSC AUDIT FILE CREATED TIME(HHMMSS)	6	9(06)
15	18	NCSC AUDIT FILE NUMBER	4	9(04)
19	26	NCSC NCOA^Link RELEASE DATE (DATA DATE)	8	9(08)
27	34	NCSC ZIP+4 RELEASE DATE (DATA DATE)	8	9(08)
35	42	NCSC DPV RELEASE DATE (DATA DATE)	8	9(08)
43	43	NCSC TYPE (Audit, Certification, Stage)	1	X(01)
44	298	FILLER	255	X(255)
299	306	OUTPUT AUDIT FILE CREATED DATE(YYYYMMDD)	8	9(08)
307	312	OUTPUT AUDIT FILE CREATED TIME(HHMMSS)	6	9(06)
313	320	PROCESSED AGAINST NCOA^Link RELEASE DATE (DATA DATE)	8	9(08)
321	328	PROCESSED AGAINST ZIP+4 RELEASE DATE (DATA DATE)	8	9(08)
329	336	PROCESSED AGAINST DPV RELEASE DATE (DATA DATE)	8	9(08)
337	340	PROCESSED ON PLATFORM ID (platform ID assigned by USPS)	4	X(04)
341	997	FILLER	657	X(657)
998	998	RECORD TYPE (Header/Detail) (H,D)	1	X(01)
999	1000	CARRIAGE RETURN LINE FEED	2	X(02)

TEST CLIENT OUTPUT FILE
Page 1 of 2

RECORD FROM	POSITION TO	FIELD NAME	LENGTH	COBOL
1	28	INPUT CUSTOMER KEY	28	X(28)
29	29	INPUT NAME PARSED (Y,N)	1	X(01)
30	95	INPUT CUSTOMER NAME	66	X(66)
	NOTE:	The information found in the INPUT CUSTOMER NAME will be fixed length. The data contained within the field may be presented as a single field or it may be parsed. If the name is a business, then the name will start in the first position.		
30	35	INPUT PREFIX TITLES	6	X(06)
36	50	INPUT CUSTOMER FIRST NAME	15	X(15)
51	65	INPUT CUSTOMER MIDDLE NAME	15	X(15)
66	85	INPUT CUSTOMER LAST NAME	20	X(20)
86	91	INPUT SUFFIX TITLES	6	X(06)
92	95	FILLER	4	X(04)
96	96	INPUT ADDRESS PARSED (Y,N)	1	X(01)
97	124	INPUT CUSTOMER URBANIZATION NAME	28	X(28)
125	191	INPUT CUSTOMER ADDRESS	67	X(67)
	NOTE:	The information found in the INPUT CUSTOMER ADDRESS will be fixed length. The data contained within the field may be presented as a single field or it may be parsed.		
125	134	INPUT PARSED PRIMARY NUMBER	10	X(10)
135	136	INPUT PARSED PRE-DIRECTIONAL	2	X(02)
137	164	INPUT PARSED PRIMARY NAME	28	X(28)
165	168	INPUT PARSED SUFFIX	4	X(04)
169	170	INPUT PARSED POST-DIRECTIONAL	2	X(02)
171	174	INPUT PARSED UNIT DESIGNATOR	4	X(04)
175	182	INPUT PARSED SECONDARY NUMBER	8	X(08)
183	191	FILLER	9	X(09)
192	192	INPUT LAST LINE PARSED (Y,N)	1	X(01)
193	234	CUSTOMER LAST LINE	42	X(42)
	NOTE:	The information found in the INPUT CUSTOMER LAST LINE will be fixed length. The data contained within the field may be presented as a single field or it may be parsed.		
193	220	INPUT CITY NAME	28	X(28)
221	222	INPUT STATE	2	X(02)
223	227	INPUT FIVE DIGIT ZIP	5	X(05)
228	231	INPUT ZIP+4 ADDON	4	X(04)
232	234	FILLER	3	X(03)
235	298	FILLER	64	X(64)
	NOTE:	The following (query name) fields reflect the results of input name after the utilization of a name parser. This is the final parsed name information utilized in the process which was responsible for the final result. If the name is a business, then the name will start in the first position. If no match (return code 00) or daily delete (return code 66) then these fields will be blank.		
299	304	QUERY PREFIX TITLE	6	X(06)
305	319	QUERY CUSTOMER FIRST NAME	15	X(15)
320	334	QUERY CUSTOMER MIDDLE NAME	15	X(15)
335	354	QUERY CUSTOMER LAST NAME	20	X(20)
355	360	QUERY SUFFIX TITLE	6	X(06)

TEST CLIENT OUTPUT FILE Page 2 of 2				
RECORD FROM	POSITION TO	FIELD NAME	LENGTH	COBOL
	NOTE:	The following (query address) fields reflect the results of the input address after the utilization of a certified CASS ZIP+4 system and the LCD table. This is the final address information that was utilized in the process which was responsible for the final result. If no match (return code 00) or daily delete (return code 66) then these fields will be blank.		
361	388	QUERY PARSED URBANIZATION NAME	28	X(28)
389	398	QUERY PARSED PRIMARY NUMBER	10	X(10)
399	400	QUERY PARSED PRE-DIRECTIONAL	2	X(02)
401	428	QUERY PARSED PRIMARY NAME	28	X(28)
429	432	QUERY PARSED SUFFIX	4	X(04)
433	434	QUERY PARSED POST-DIRECTIONAL	2	X(02)
435	438	QUERY PARSED UNIT DESIGNATOR	4	X(04)
439	446	QUERY PARSED SECONDARY NUMBER	08	X(08)
447	474	QUERY PARSED CITY NAME	28	X(28)
475	476	QUERY PARSED STATE	2	X(02)
477	481	QUERY FIVE DIGIT ZIP	5	X(05)
482	485	QUERY ZIP+4 ADDON	4	X(04)
	NOTE:	The following (result address) fields reflect the output (new) address obtained from NCOA^Link. These fields only apply for match return codes A, 91 and 92. For any other return codes these fields will be blank.		
486	513	RESULT PARSED URBANIZATION NAME	28	X(28)
514	523	RESULT PARSED PRIMARY NUMBER	10	X(10)
524	525	RESULT PARSED PRE-DIRECTIONAL	2	X(02)
526	553	RESULT PARSED PRIMARY NAME	28	X(28)
554	557	RESULT PARSED SUFFIX	4	X(04)
558	559	RESULT PARSED POST-DIRECTIONAL	2	X(02)
560	563	RESULT PARSED UNIT DESIGNATOR	4	X(04)
564	571	RESULT PARSED SECONDARY NUMBER	08	X(08)
572	599	RESULT PARSED CITY NAME	28	X(28)
600	601	RESULT PARSED STATE	2	X(02)
602	606	RESULT FIVE DIGIT ZIP	5	X(05)
607	610	RESULT ZIP+4 ADDON	4	X(04)
611	613	RESULT DPBC (including check digit)	3	X(03)
614	617	RESULT CARRIER RTE	4	X(04)
618	618	*RESULT DROP FLAG	1	X(01)
619	619	*RESULT DROP N FLAG	1	X(01)
620	625	RESULT MOVE EFFECTIVE DATE	6	X(06)
626	627	*RESULT MIDDLE NAME/Initials(returned from NCOA/Link)	2	X(02)
628	628	*RESULT GENDER (returned from NCOA/Link)	1	X(01)
629	636	*RESULT HINT BYTE (after expansion)	8	X(08)
637	638	RESULT NCOA LINK RETURN CODE	2	X(02)
639	640	RESULT ZIP+4 RETURN CODE	2	X(02)
641	642	RESULT DPV RETURN CODE	2	X(02)
643	658	HEX VALUE OF THE EMDP (from input address)	16	X(16)
659	698	HEX VALUE OF THE SHA OF EMPD (from input address)	40	X(40)
699	714	HEX VALUE OF THE FIRST 8 CHARACTERS OF 48 or 49 BYTE OBJECT	16	X(16)
715	729	FIRST NAME OF THE 48 or 49 BYTE OBJECT	15	X(15)
730	749	LAST NAME OF THE 48 or 49 BYTE OBJECT	20	X(20)
750	754	SUFFIX NAME OF THE 48 or 49 BYTE OBJECT	5	X(05)
755	794	HEX VALUE OF THE SHA OF 48 or 49 BYTE OBJECT	40	X(40)
795	810	HEX VALUE OF THE DATA RETRIEVED (before reorder)	16	X(16)
811	827	DECIMAL VALUE OF THE 17 DIGIT RESULT VALUE	17	X(17)
828	828	RESULT MOVE TYPE (Family, Individual, Business)/(F,I,B)	1	X(01)
829	836	OPTIONAL – INTERMEDIATE RETURN CODES	8	X(08)
837	838	ANK^Link RETURN CODE (77)	2	X(02)
839	840	FUTURE RETURN CODE	2	X(02)

TEST CLIENT OUTPUT FILE Page 3 of 3				
841	841	MATCH TO NCOA^Link 18 MONTH PRODUCT	1	X(01)
842	842	MATCH TO NCOA^Link WITH ANK^Link PRODUCT	1	X(01)
843	843	MATCH TO NCOA^Link 48 MONTH PRODUCT	1	X(01)
844	997	FILLER	154	X(154)
998	998	RECORD TYPE (Header/Detail) (H,D)	1	X(01)
999	1000	CARRIAGE RETURN LINE FEED	2	X(02)

***The following fields of returned data used for analysis must not be returned to the customer: result drop flag, result drop n flag, result middle name, result gender and result hint byte.**

Report/File calculation

The NCOA^Link system requires report and file generation of statistical data. The following is provided as a reference only to the Customer Service Log (CSL) as an example of data collected. For a full list of the most current requirements please consult the appropriate NCOA^Link Licensee Performance requirements.

Note: All field positions indicate the field start.

1. All information on the Processing Summary Report is from the CSL & PAF reports

2. Total of detail records for all Count fields should equal the Sum placed in the header record

3. Position 115 'Total Number of Records Matched to the ZIP+4 File' should equal the total of the following fields:

Start	FIELD NAME
287	Total Matched To PO Box
298	Total Matched To HCR Exact
309	Total Matched To RR Default
320	Total Matched To Firm
331	Total Matched To General Del
342	Total Matched To Highrise Default
353	Total Matched To Military
375	Total Matched To RR Exact
386	Total Matched To Street
397	Total Matched To HCR Default
408	Total Matched To Highrise Exact
419	Total Matched To Other

4. The following ZIP + 4 Coded fields should equal the corresponding CASS Fields.

NCOA^Link Field Name	CASS Field
Total Matched To PO Box	PO Box
Total Matched To HCR Exact	HCR Exact
Total Matched To RRoute Default	RR Default
Total Matched To Firm	Firm
Total Matched To General Del	General Del
Total Matched To Highrise Default	Highrise Default
Total Matched To Military	Military
Total Matched To Non-Deliverable	Non-Deliverable
Total Matched To RR Exact	RR Exact
Total Matched To Street	Street
Total Matched To HCR Default	HCR Default
Total Matched To Highrise Exact	Highrise Exact
Total Matched To Other	Other
Total Matched To Pos LACS	Pos LACS
Total Matched To EWS	EWS

5. The following ZIP + 4 Counts should be close to the corresponding 3553 Boxes

NCOA^{Link} Field Name	3553 Field
Total Matched To RR Default	Sum of RR Default and HCR Default
Total Matched To RRoute Exact	Sum of RR Exact and HCR Exact
Total Matched To Highrise Default	High Rise Default
Total Matched To Highrise Exact	High Rise Exact
Total Matched To Pos LACS	LACS
Total Matched to EWS	EWS
Total Number Of Records DPV Confirmed	DPV

6. The sum of the following fields should equal Position 93 "Total Number of Records Matched".

Start	FIELD NAME
452	A – Match
463	91 – Match With Secondary Number Dropped On COA (Old Side)
474	92 – Match With Secondary Number Dropped On Input
485	01 – Match – Foreign Move
496	02 – Match – Moved Left No Address
507	03 – Match – Po Box Closed
529	05 – Match – New 11 Digit DPBC Is Ambiguous
617	19 – Match – New Address Not ZIP+4 Codable
661	14 – Match – New Address Would Not Convert

7. The sum of the following fields should equal Position 93 (Total Number of Records Matched) + ANK[Link] match return codes (77- A,91,92,01,02,03,05,14,19) located between positions 1855 and 2118.

Start	FIELD NAME
837	Addresses Matched Month 0
848	Addresses Matched Month 1
859	Addresses Matched Month 2
870	Addresses Matched Month 3
881	Addresses Matched Month 4
892	Addresses Matched Month 5
903	Addresses Matched Month 6
914	Addresses Matched Month 7
925	Addresses Matched Month 8
936	Addresses Matched Month 9
947	Addresses Matched Month 10
958	Addresses Matched Month 11
969	Addresses Matched Month 12
980	Addresses Matched Month 13
991	Addresses Matched Month 14
1002	Addresses Matched Month 15
1013	Addresses Matched Month 16

Start	FIELD NAME
1024	Addresses Matched Month 17
1035	Addresses Matched Month 18
1046	Addresses Matched Month 19
1057	Addresses Matched Month 20
1068	Addresses Matched Month 21
1079	Addresses Matched Month 22
1090	Addresses Matched Month 22
1101	Addresses Matched Month 24
1112	Addresses Matched Month 25
1123	Addresses Matched Month 26
1134	Addresses Matched Month 27
1145	Addresses Matched Month 28
1156	Addresses Matched Month 29
1167	Addresses Matched Month 30
1178	Addresses Matched Month 31
1189	Addresses Matched Month 32

Start	FIELD NAME
1200	Addresses Matched Month 33
1211	Addresses Matched Month 34
1222	Addresses Matched Month 35
1233	Addresses Matched Month 36
1244	Addresses Matched Month 37
1255	Addresses Matched Month 38
1266	Addresses Matched Month 39
1277	Addresses Matched Month 40
1288	Addresses Matched Month 41
1299	Addresses Matched Month 42
1310	Addresses Matched Month 43
1321	Addresses Matched Month 44
1332	Addresses Matched Month 45
1343	Addresses Matched Month 46
1354	Addresses Matched Month 47
1365	Addresses Matched Month 48

8. The sum of the following fields should >= Position 126 "Total Number of Records DPV Confirmed" .

Start	FIELD NAME
1453	Street (S) Records Validated
1486	High Rise (H) Records Validated
1519	Po Box (P) Records Validated
1530	RR/HC (R) Records Validated
1563	Firm (F) Records Validated
1596	General Delivery (G) Records Validated

9. The sum of the following fields should >= Position 1673 "Total Secondary Number Error"

Start	FIELD NAME
1684	Street (S) Records With Secondary Number Error
1695	High Rise (H) Records With Secondary Number Error
1706	Firm (F) Records With Secondary Number Error

10. The sum of the following fields should equal position 2119 "77 – Total records matched using ANK^Link "

1855	77 – A – Match
1866	77 – 91 – Match with Secondary No. Dropped on COA (Old Side)
1877	77 – 92 – Match with Secondary Number Dropped on Input
1888	77 – 01 – Match – Foreign Move
1899	77 – 02 – Match – Moved Left No Address
1910	77 – 03 – Match – PO Box Closed
1921	77 – 04 – No Match – Family move - Street Address w/Secondary
1932	77 – 05 – Match – New 11 digit DPBC is ambiguous
1943	77 – 06 – No Match – Middle Name Related
1954	77 – 07 – No Match – Gender Related
1965	77 – 08 – No Match – Conflicting Instructions
1976	77 – 09 – No Match – Family move from Highrise default
1987	77 – 10 – No Match – Family move from Rural/HC Route default
1998	77 – 11 – No Match – Individual move – Insufficient name data
2009	77 – 18 – No Match – Family move from General Delivery
2020	77 – 19 – Match – New Address not ZIP+4 codeable
2031	77 – 20 – No Match – Multiple Response – Conflicting Directions
2042	77 – 12 – No Match – Middle Name test failed
2053	77 – 13 – No Match – Gender test failed
2064	77 – 14 – Match – New Address would not convert
2075	77 – 15 – No Match – Individual Name insufficient on input
2086	77 – 16 – No Match – Secondary Number discrepancy
2097	77 – 17 – No Match – Different First Name
2108	77 – 66 – No Match – Input Address appears in "Daily Delete" suppression file

The report file layouts are available on the USPS PostalPro Website at:
https://postalpro.usps.com/ncoalink_rpts_mstrfile_description.

The layout document will contain the current requirements and future requirements when applicable.

For all report files:

Customer Service Log Report Notes

- All numeric fields are right justified, zero filled.
- All alphanumeric fields are left justified, spaced filled.
- This file shall be submitted in standard ASCII text format and electronically transmitted to the NCSC. The file shall be named using "C," the 4-character code assigned by the NCSC, the 1-character code for the month and the year with an extension of DAT. (e.g. CNAAAC02.DAT)

Processing Acknowledgement Form Report Notes

- All numeric fields are right justified, zero filled. All alphanumeric fields are left justified, spaced filled.
- This file shall be submitted in standard ASCII text format and electronically transmitted to the NCSC. The file shall be named using "P," the 4-character code assigned by the NCSC, the 1-character code for the month and the year with an extension of DAT. (e.g. PNAAAC02.DAT)
- A single PAF may be completed to cover processing for all lists submitted by the list owner provided that the official signing the document has the authority to do so for each separate list. If multiple lists are covered by a single PAF, Licensee must record "MULTIPLE" in the space provided for the Customer ID on the pre-printed PAF. When "MULTIPLE" appears as the Customer ID, an itemization of the list names and corresponding Customer IDs assigned to each must be recorded on the back of the PAF.
- All PAF information may be maintained in a single dataset within the Licensee's system. At the time of reporting, the Licensee must provide a single record of the PAF information for each unique Customer ID which appears in the Customer Service Log for the corresponding time period. A second record for a Customer ID will be necessary only if the list is processed before and after PAF renewal during the month in which that PAF is renewed.

Broker-Agent/List Administrator Report Notes

- All numeric fields are right justified, zero filled.
- All alphanumeric fields are left justified, spaced filled.
- This file shall be submitted in standard ASCII text format and electronically transmitted to the NCSC. The file shall be named using "B," the 4-character code assigned by the NCSC, the 1-character code for the month and the year with an extension of DAT. (e.g. BNAAAC02.DAT)
- A Broker/Agent or List Administrator representative must sign the PAF of each of its customers. All information on these third parties may be maintained in a single dataset within the Licensee's system. At the time of reporting, the Licensee must provide a single record of the third party information for each unique ID which appears in the corresponding PAF Information Log.
- A Broker/Agent is defined as an external third party who generates business for a Licensee. The Broker/Agent may or may not actually handle the mailer's lists for processes other than NCOA^{Link}. The Broker/Agent does not perform any address updates for the mailer.
- A List Administrator is defined as a third party who maintains the database(s) of a mailing list owner. All address updates are performed by the List Administrator on behalf of the list owner. In instances where a list owner outsources maintenance of its data to the Licensee, the Licensee must be listed on the PAF and recorded in the Log files as the List Administrator.

**** For ANK^{Link} Licensees only***
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Version Changes

This Guide (version 12) has been updated with the following modifications:

- Removed FSP CSL File Layouts

This Guide (version 10) has been updated with the following modifications:

- Return code clarifications; formatting changes

This Guide (version 8) has been updated with the following modifications:

- Updated to incorporate SHA-256
- Under Getting Started #13, added the following statement regarding name presentation:

  The presentation of name order is established using a pre-process before querying the NCOA^{Link} database. However, there are no restrictions on using a process to interchange the name order to yield the best possible results using the NCOA^{Link} database. It is ultimately the responsibility of the Mailer Owner working with the Licensee to determine the name order presentation correctly.

This Guide (version 7) has been updated with the following modifications:

- References to DVDs have been removed.

This Guide (version 6) has been updated with the following modifications:

- The definition of return code 19 was updated. Temporary COAs are only in the 48-month product.

This Guide (version 5) has been updated with the following modifications:

- Updated the Customer Service Log.

This Guide (version 4) has been updated with the following modifications:

- Updated return codes to reflect move effective date (MED) changes.
- Updated to place hint byte in secondary number field if any entry is not found in the left-right table.

This Guide (version 3) was updated September 3, 2008 with the following modifications:

- Name Rules Presentation – Rules section
- Cindy-Mary table
- NCOA^{Link} Build Records table

This Guide (Version 2) has been updated to contain all known changes that are scheduled to be completed by developers on July 31, 2006. The following is a list of those required changes that will be included in the NCOA^{Link} Data Release Date 9/11/2006 with a Release number of 733:

Added new matching logic mode of "R"

- Added new matching logic mode of "R"
- DVD Header Changes
- High Match Rate description field
- Query Name Change
- Return Code Description file
- CSL Changes
  - Matching Logic Applied
  - LACS^{Link}™ return code 09
  - NCOA^{Link} DVD Product Version
  - High Match Rate Description
  - Suite^{Link} Reporting
  - Reserved NCOA^{Link} return code counter fields
  - Reserved ANK^{Link} return code counter fields

- Enlarged Filler field
- Removal of Soundex
- Incorporate Rules Table
- Name Sequence Presentation