

EZ24x7★Enhance

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CASS™, Coding Accuracy Support System, certification is the process of normalizing addresses to USPS® Publication 28 standards and validating them against current USPS data. All address elements are verified while adding ZIP Code™, ZIP+4™, carrier route and delivery point details.

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Enhance – Users Guide

Introduction

EZ24x7 address service results are enhanced using interactive address investigation helping you make informed decisions going beyond what CASS/DPV automatic address validation is permitted in batch. Enhance allows you to work addresses that have not been assigned a ZIP+4.

Addresses are grouped by error code making it easier to work groups sharing a similar problem. Many multiple-match and deferred addresses can be solved by simply accepting CASS suggestions. When there are no suggestions because of Publication 28 formatting or typographical errors, the “painter” helps you find the solution.

The “painter” reduces valid addresses to one CASS standardized address through a process of elimination using address elements parsed from the original address data. Publication 28 standardization permits reliable parsing of input addresses. A “Pub-28 Edit” screen is provided from the “painter” allowing you to tweak address data as necessary to perfect parsed address elements later used as clues in the “painter” using the “CTRL+Q” context sensitive paste command.

Limitations

This interactive address enhancement tool is available two weeks from the time the list was processed assuring that the address list remains at the same USPS data revision level. NCOA^{Link} is not included with Enhance because of USPS license restrictions.

- NCOA^{Link} batch processing requires a minimum of 100 unique names and addresses.
- AES systems is required to report all EZ24x7 batch job statistics on job completion.

Due Diligence

“Do no harm” is the primary reason why CASS/DPV software is not allowed to make decisions that Enhance is designed to help you make. Good practice tips...

- Consider the importance of the correspondence. When in doubt, say “I do not know”.
- Avoid data entry using context sensitive paste, “CTRL+Q”, especially with door and BOX numbers.
- Accuracy and speed improve with experience, take your time and apply due diligence.

Objective

The greatest good is achieved by resolving as many reparable addresses as possible. A few groups, such as “DPV Invalid”, offer limited opportunity to solve without talking to the recipient. These addresses were matched, but the primary number is not delivery point valid. In most cases, the only way to solve them is to find out the correct door or BOX number. Consider skipping these groups.

Most Enhance “Error Code” groups require human judgment to break ties or accept solutions after comparing the input address to the suggestion. Once satisfied, click the “certify” icon to save the solution improving list quality. You can mark addresses as “lost cause”. Set addresses you consider unresolvable or too risky aside using the “bypass” icon.

Bypass doesn’t change the response, but moves the address to the “SKIPPED” group. It is useful to set “lost cause” addresses aside while working your way through groups.

Course Outline

We start with a description of the Enhance tab followed by a quick tour of the “painter” and its “Pub-28 Edit” screen. We then go through advanced “painter” topics in detail.

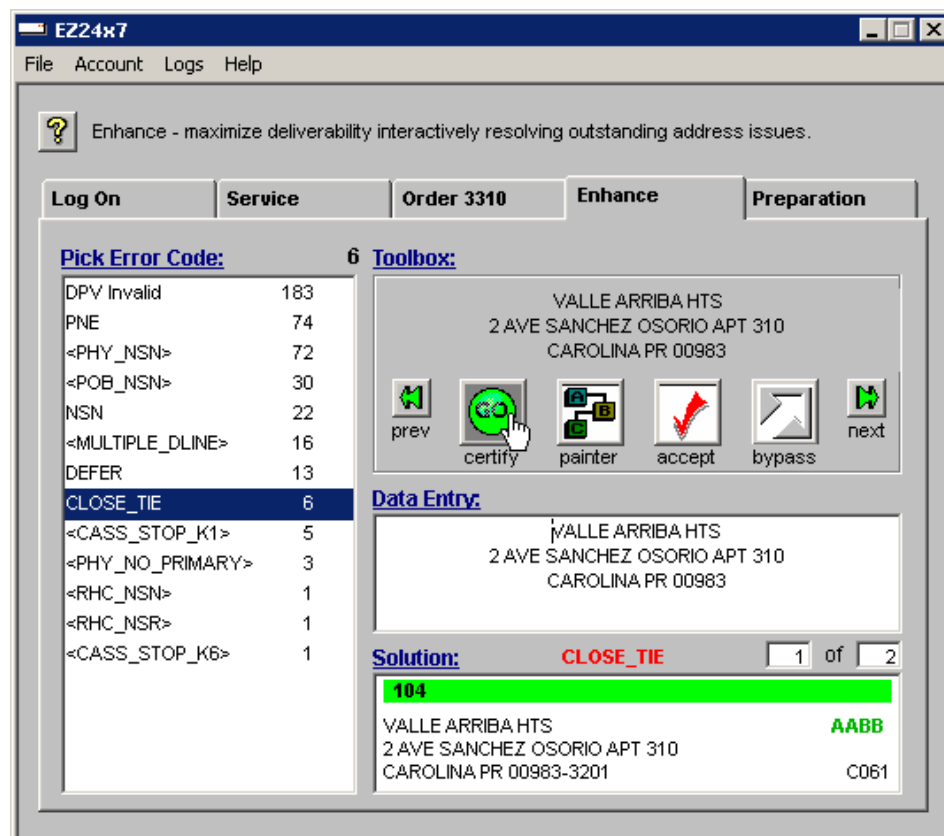
Every solution you find and accept depends on your wits, good judgment and experience with USPS addressing standards and issues resulting from faulty data entry.

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Enhance Tab

The tab features a “Pick Error Code:” list box where you select an address group to work, a “Toolbox:” showing the original current address and six icons for investigation and navigation through the address group, a free form “Data Entry:” block and a read only “Solution:” block.

HINT: The tab is available for all lists serviced in the last two weeks.



Pick Error Code

Non-automated addresses are grouped by error code and sorted by the number of addresses in the group. Once a group has been selected, you can click on the “?” icon to see a description of the “Error Code”.

Toolbox Address

The current address being worked is shown in its original form.

HINT: Click on the address to see the record number, address key and name(s).

Toolbox Icons

- “prev” — Previous address in the group
- “certify” — CASS/DPV validates the address data shown in the “Data Entry” block
- “painter” — Opens the “painter”
- “accept” — Saves the selected “Solution” and shows to the next address
- “bypass” — Moves address to the “SKIPPED” group and shows the next address
- “next” — Next address in the group

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“Data Entry:” Block

Multiple-line editable field is validated when clicking the “certify” icon.

HINT: Echoes addressees created by the “painter”.

“Solution:” Block

This read only block displays CASS solutions resulting from the “certify” icon.

Address State

Just above the "Solution:" block, you will find text indicating the state of the address. Address state messages are listed and explained in appendix A. In this example, the state, “**CLOSE_TIE**”, indicates that multiple solutions are available.

Counter Fields

Immediately to the right of “Address State”, you will see two counters showing which address candidate is visible of the number of candidates. The candidates are sorted in reliability order.

HINT: Use “DOWN-ARROW” and “UP-ARROW” keys to view multiple candidate addresses.

Reliability Bar

The reliability bar is color coded, {green, yellow, red}, with a reliability value reported to the left. Address reliability is determined by the edits required on the input address to certify it.

In batch, Enhance only certifies green unambiguous addresses that do not violate a specific CASS rule prohibiting validation in batch.¹ Any address with a reliability value of less than 85 is not considered a green address.

Green: Reliability \geq 85.

Yellow: Reliability between 70 and 84

Red: Reliability less than 70

CASS Address

The complete CASS certified address appears below the reliability bar. The carrier route is displayed to the far right of the last address line.

HINT: Click in the “Solution:” block to open a window explaining how the address was created and right-click to see the DPV, Delivery Point Validation, status.

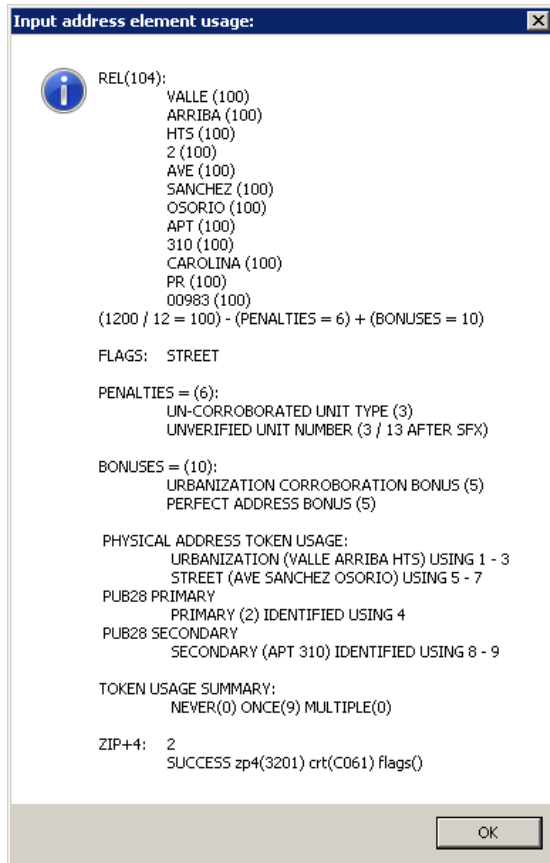
¹ CASS BLOCKS – There are several USPS CASS blocks where the USPS Coding Accuracy Support System, CASS, require the address to be no-match in batch. USPS CASS does not impose such limitations to what you can do with your addresses considered as post processing.

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Enhance diagnostics

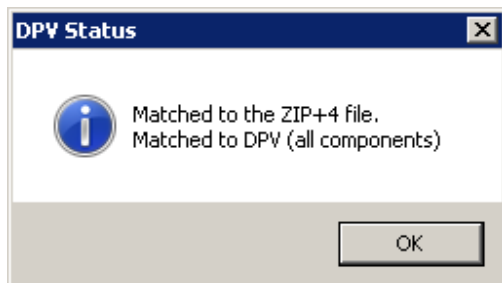
Click on the current candidate in the “Solution:” block to see the analysis explaining how reliability was set and how input tokens were matched to certified address elements. Example diagnostic for:

VALLE ARRIBA HTS
2 AVE SANCHEZ OSORIO APT 310
CAROLINA PR 00983



- REL – The first section reports address and token reliability. The sample shows street name and city/state name token reliability 100%. Overall, token reliability is 100% while address reliability is 104% adjusted by penalties and bonuses.
- FLAGS – Address Qualify Flags indicate address type and edits necessary to match the address. This example is a perfect address requiring no edits and only shows the address type, “STREET”.
- PENALTIES – Reports penalties for unverified unit type, “APT”, and number, “310”.
- BONUSES – Reports bonuses for Puerto Rico urbanization corroboration and perfect address for five points each.
- TOKEN USAGE – The next sections describe how input tokens were matched and include a match summary.
- The analysis ends showing ZIP+4 search results. If the USPS ZIP+4 lookup required consideration of either primary or secondary number variants, all alternate numbers are listed.

Right-click to see the DPV status including “Vacant” and “No-Stat”. No-Stat is used by the USPS to indicate mail is being returned for reasons including, no mailbox, etc. Example “DPV Status” report:



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The "painter" – Quick Tour

Let us begin by taking a quick tour demonstrating "painter" address investigation designed to minimize keystrokes. We are using the "Error Code" "PNE" where clues such as street name were not matched.

Avoid keying address clues by using "CTRL+Q" context sensitive paste. It is preferable to paste input address elements to avoid introducing typographical errors and wasting time and effort.

In the example below, notice the message "**Street – Pub-28 Standard**". This tells us that the input address was successfully parsed making City, State, Zip, primary number, street, etc. available for context sensitive paste with the command, "CTRL+Q".

The "painter" starts with blank address context. Always begin by setting the city/state context.

The screenshot shows the "Enhance Address Painter" window. At the top, there is a header bar with a question mark icon, a "Pub-28 - Edit" button, and the text "Street - Pub-28 Standard". Below this, the "Door: 1808" is displayed. The main address information is listed as "URB LAS LOMAS", "1808 CALEL 12 SW", and "SAN JUAN PR 00921". The central area is divided into three main sections: a "State" dropdown menu on the left, a "City" text input field in the middle, and a "Zip-code" field on the right. The "Zip-code" field has sub-fields for "G", "P", "S", "H", "R", "U", "lmin", and "lmax". The "State" dropdown is currently set to "AA". The "City" field is empty. The "Zip-code" field is also empty. At the bottom, there is a progress indicator showing "0 of 62".

From the state clue field, "CTRL+Q" pastes input state, "PR". If matched, the cursor moves to the city clue automatically where input city, "SAN JUAN", is pasted using "CTRL+Q". Once city and state are established, address type tabs appear. It is recommended that you avoid specifying ZIP code too early because it limits address candidates. If the ZIP were wrong, the correct street would not appear.

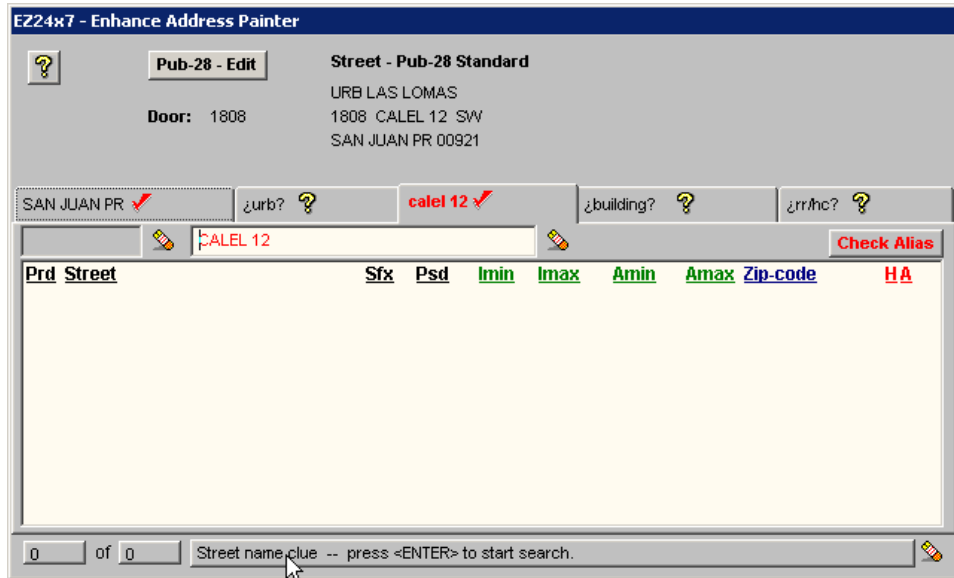
The screenshot shows the "Enhance Address Painter" window after the state and city have been entered. The "State" dropdown is now set to "PR" and the "City" field contains "SAN JUAN". Above the main input fields, there are several tabs: "SAN JUAN PR" (selected), "urb?", "street?", "building?", and "inc?". Below the "SAN JUAN PR" tab, there is a list of zip codes and their corresponding address details. The list is as follows:

Zip-code	G	P	S	H	R	U	lmin	lmax
00901		X	X					
00902		X					15011	9027515
00906		X					9065001	9067517
00907		X	X	X				
00908		X					9000	16894
00909		X	X	X				
00910		X					8000	20996
00911		X	X					
00912		X	X					
00913		X	X					
00914		X					6001	12386

At the bottom, there is a progress indicator showing "0 of 36".

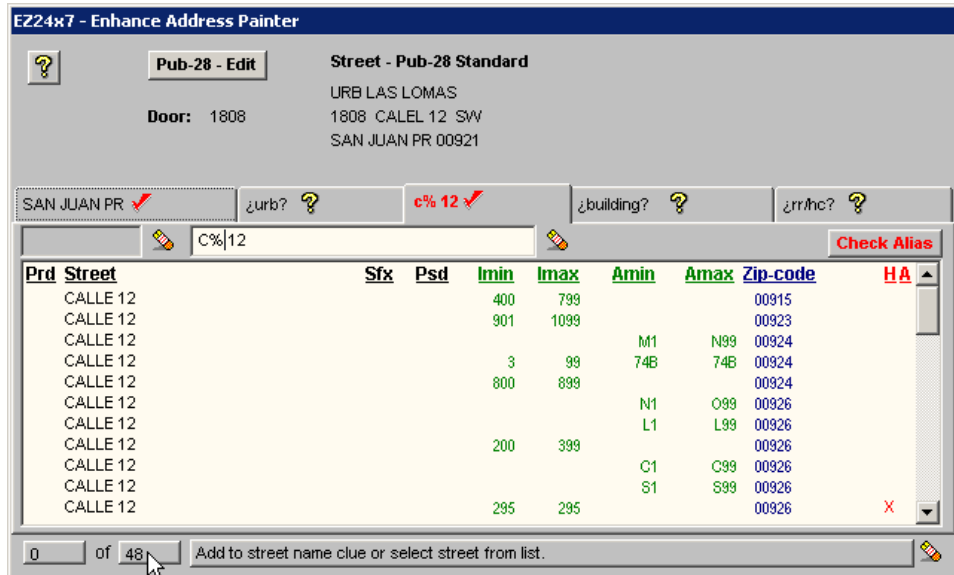
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Notice that the Publication 28 parse suggests that this is a street address type, suggesting a click on the street tab followed by “CTRL+Q” in the street clue field.



The street search comes up empty. “CALEL” could be changed to “CALLE”, but we could also use a wildcard, “%”, making the clue “C% 12” and hit the “ENTER” key.

HINT: The Enhance wildcard is the percent sign, “%”.



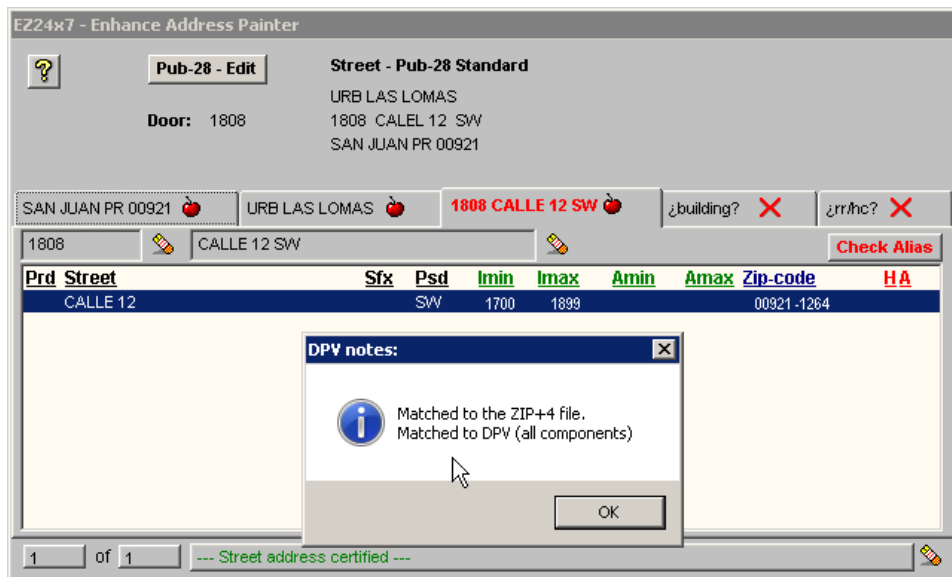
This resulting list has 48 streets within the context “SAN JUAN PR”. A door number will reduce the list further. Since queries are performed against our servers in California, the number of candidate rows is limited to 50 for primary number verification and filtering for performance reasons.

HINT: If the list is too long (more likely in Puerto Rico), you might resort to specifying a ZIP or if you have an urbanization clue, use that tab to reduce the number of candidates in the list.

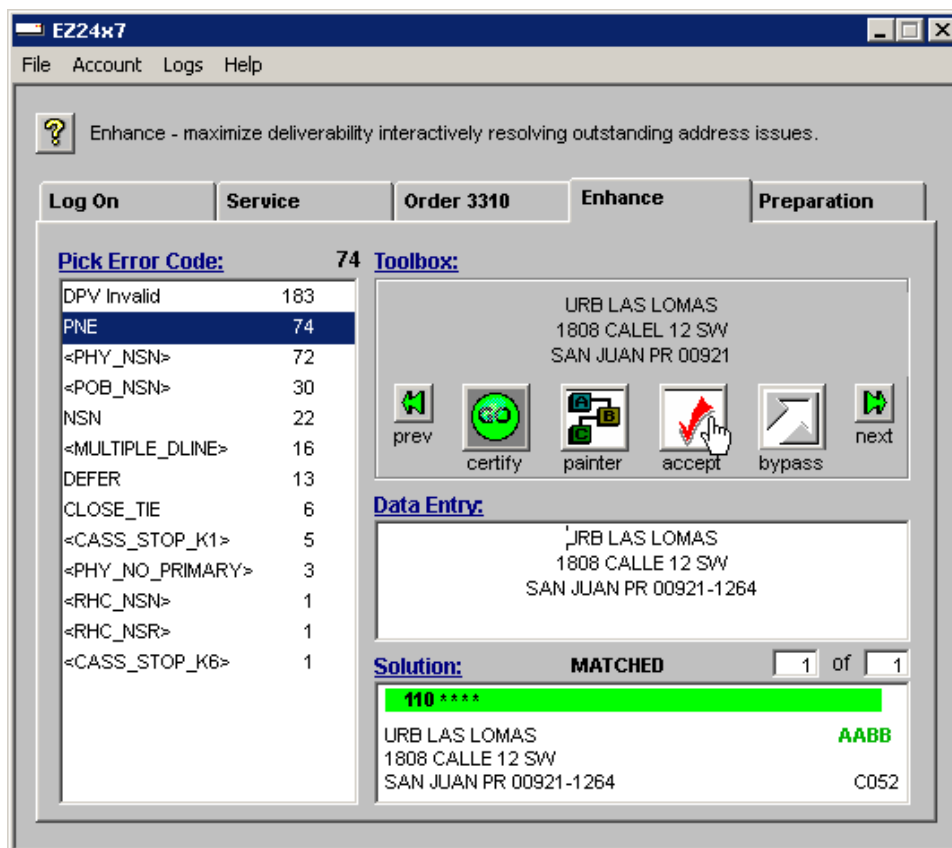
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A “CTRL+Q” on the door number clue pastes the clue followed by an “ENTER” key. The list is reduced to one candidate in the same urbanization and same ZIP.

HINT: Right-Click on the street row performs DPV validation reporting the candidate is DPV valid.



All the while the “painter” address is being echoed into the “Data Entry:” block of the Enhance screen. Click the “certify” icon and then click “accept” will add this solution to the EZ24x7 address list.



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Pub-28 Edit – Quick Tour

Much depends on the ability to paste input address elements. Correct parsing of input address elements relies on Pub-28 standards. If the input address is not in Pub-28 standard form, the task gets harder.

If the input address cannot be parsed because of Pub-28 problems, the “Pub-28 Edit” screen opens before the “painter” screen allowing you the chance to tweak the address.

Publication-28 Standardization

Original Address
URB LAS LOMAS
CALEL 12 SW 1808
SAN JUAN PR 00921

ADDRESS: Must begin with primary number.

Auxiliary Line JRB LAS LOMAS
PR Urbanization

Delivery Line CALEL 12 SW 1808
Primary No. ?
Pre Directional
Street Name
Street Suffix
Post Directional

Last Line SAN JUAN PR 00921
City SAN JUAN
State PR
Zip Code 00921

Secondary
Unit Designator
Secondary No.

Publication-28 Standardization

Original Address
URB LAS LOMAS
CALEL 12 SW 1808
SAN JUAN PR 00921

Street

Auxiliary Line URB LAS LOMAS
PR Urbanization URB LAS LOMAS

Delivery Line 1808 CALEL 12 SW
Primary No. 1808 ?
Pre Directional
Street Name CALEL 12
Street Suffix
Post Directional SW

Last Line SAN JUAN PR 00921
City SAN JUAN
State PR
Zip Code 00921

Secondary
Unit Designator
Secondary No.

The arrow is pointing to the problem described in red letters. In Puerto Rico it is common to see the door number on the right. Pub-28 standard form requires that the door number be on the left.

Easy enough to correct except you want to avoid typing – especially door numbers.

- Placing the cursor before the “1801” and select the door number.
- Then cut the door number using Windows standard “CTRL+X”.
- You then move to the beginning of the field with the “HOME” key.
- Paste the door number at the beginning with Windows standard “CTRL+V”.
- You will need to hit the space bar to leave a space after the door number.
- Then hit the “ENTER” key.

The problem clears itself and you exit the screen with the “X” icon in the upper right corner.

Pub-28 Objects

- The original address is always preserved for reference.
- If there is a Pub-28 issue, it will appear below original address in red letters.
- If there are no Pub-28 standard issues, the address type will appear. Address types:
 - General Delivery
 - PO BOX
 - Rural Route
 - Military
 - Street
- Three single line edit fields are provided for tweaking the address.
- Text below the edit fields shows the parsed address elements.
- Pub-28 supports two secondary clauses with street address (e.g. APT 1), one of which can be a CMRA private mailbox (e.g. PMB 1).

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Painter Objects

Painter objects organize all USPS address data into a hierarchy that allows the user to interactively build address context. The user provides clues and the “painter” shows what address elements remain conforming to those clues until there is only one CASS certified address.

Tabs

Address elements are organized by tabs and ordered hierarchically. The tabs include city/state/ZIP, urbanization (Puerto Rico only), street, building/firm and rural route. Address context is developed in tab and criterion field order. Each additional criterion further limits the address candidates available.

Tab Page

Each tab owns one or more criterion fields that limit address element candidates displayed as rows in address element data windows. Criterion fields and data windows make up the tab page.

Tab Focus

Although there are several address element tabs, only one tab has focus. The tab page of the tab that has the focus is the only tab page that is visible. The tab’s text appears in red when the tab has the focus; otherwise, the tab text is black.

Tab Text

Until tab criteria have been established, the text displays the tab’s purpose in lower case within question marks “¿?”. Once criterion has been established, the tab’s name is replaced by the criterion.

Criterion is inexact when the criterion field clue(s) results in multiple candidate rows and no row has been selected. Once the clue results in only one candidate or a row is selected, criterion is exact. Exact criterion is displayed uppercase text while inexact criterion is shown in lowercase.

Tab Picture Clues and Their Meaning

- Yellow question mark No criterion has been established for the tab
- Red question check Inexact criterion has been established for the tab
- Red cherry Exact criterion has been established for the tab
- Red “X” Tab is not applicable due to address context²

² If the city/state context includes ZIP code and the ZIP indicated does not have Rural Routes, the rural route tab will be visible but unavailable.

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Criterion Fields

The user controls address context by entering clues into criterion fields. Criterion fields control which address element candidate rows appear in their respective data windows. Once there is one and only one possible address element candidate, the criterion field is no longer available for data entry.

HINT: Command sanative paste “CTRL+Q” is preferable to keying clue data into fields.

Criterion Field Focus

Only one criterion field can have the focus. The field that has the focus will have a cream background color and will contain the cursor while all other fields will have a gray background.

Criterion Field Cursor

There is only one cursor that indicates where typed characters will go. An actual flashing cursor bar will appear in the criterion field that has focus showing where new characters will be entered or from which point characters will be deleted.

Criterion Field Erase Icon

Every criterion field has an erase icon. There is also a master erase icon in the lower right after the message line. The master erase icon resets all fields. Erase icons allow:

- Double-Click resets the single field – If the criterion field was established implicitly, the erase icon command will be ignored and a user message will be provided in red explaining why the command was ignored and how to override.
- Right-Click deselects the selected candidate row and scrolls to the first candidate row – If there is only one candidate based on the criterion set by the user, the single candidate will appear in the field and the right-click command will be ignored.

Data Windows

A data window is provided for address elements, state, city, ZIP code, urbanization, street, building and rural route. Data windows display rows of candidates available based on the established context and the criterion fields that control the data window.

Data Window Rows

Address elements meeting the address context and field criterion appear as candidate rows.

Data Window Columns

Address element candidates have attributes that appear as columns in the candidate row.

Data Window Row Selection

Any candidate in the row can be selected. The selected candidate row is highlighted in blue and becomes an exact criterion regardless of the inexact clue used to find it. The selected candidate will override the clue in the criterion field and the tab text will be shown uppercase.

Current Row of Candidate Rows Counters

There are two counters that indicate which row of how many candidate rows is selected. The counters refer to the data window that has the focus. With the exception of the city/state/ZIP code tab, all tabs have only one data window. The first tab, which establishes state, city and ZIP code, has three data windows.

Message Line

The message line provides the user with suggestions on how to proceed or error messages and resolution tips. If the message appears in black text, it contains a suggestion as to how to proceed. If the message appears in green text, address element identification is being confirmed along with a suggestion how the user might proceed. Red messages report error conditions and any resolution.

Intelligent Clues – Tutorial

Effective use of minimum key data entry of “painter” depends largely on the use of intelligent clues. This topic serves as a discussion on selecting the most significant clue.

Picking the Best Token Clue

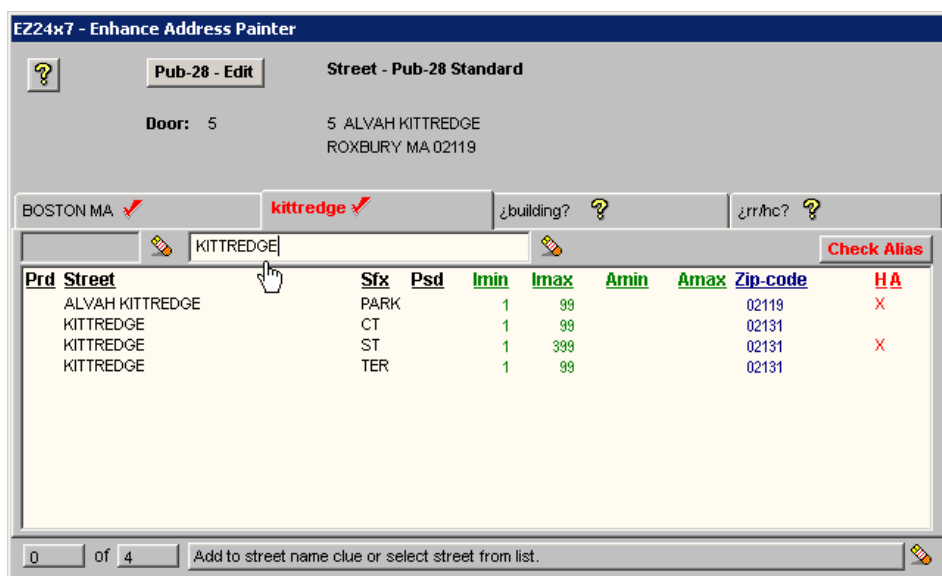
Token is used in this document to mean a single word without spaces. Streets usually have multiple tokens and elements. If chosen well, a good search can usually be performed on one simple token.

All street elements are permissible clues. Street directionals, suffixes and common words such as “STATE”, “COUNTY”, etc. are not the most significant clues and can result in too many candidates.

Multiple token names such as MARTIN LUTHER KING can have several variations based on the use of abbreviations. The last name is usually the best single token choice.

Token Search vs. Name Search

Most names have only one token. Finding multiple token names can be simplified by considering that Enhance and the “painter” perform both name and token searches. For example, there is a street in “BOSTON MA” named “ALVAH KITTREDGE PARK”. The token “PARK” is the street suffix and the actual street name is “ALVAH KITTREDGE”. If there are no spaces in the clue, the search is a token search and the clue “KITTREDGE” results in the candidates seen below. As will be seen when discussing phonetic searches, the clue “KTRDG” would have produced the same result.



Literal and Phonetic Search

Literal searches will only produce candidates where a token matches exactly. Phonetic search is based on sounds and has the feature of producing inexact match candidates that sound like the clue.

Literal Precedence

Enhance and the “painter” only resort to phonetic searches when no literal match exists.

Understanding Phonetic Searches

Phonetic searches convert graphemes, letters, into phonemes, letter representations of sounds. Having a basic understanding of how phonetic searches work can help the experienced user when entering long clue names and solving difficult address problems. For example:

Grapheme Consonant → Phoneme Conversion

This is a partial list of consonant phonics considerations.

- The letter “C” before the vowels “E”, “I” and “Y” sound like an “S” while the same letter “C” sounds like the English letter “K” in most other instances.
- The letter “K” before and “N” such as “KNOXVILLE” is silent.
- The letter “X” can sound the same as “KS”
- The letters “H” and “W” within a word is often silent.

Several consonants receive similar grapheme to phonemic conversions based on their context. Since non-standard abbreviations, foreign names, uncertain syllable breaks and typographical errors make a single phonetic system fallible, the “painter” and Enhance use two phonetic systems. Other phonetic search considerations are:

All But First Vowel Dropped

The phonemic representation of the name “ELTON” retains the “E” while dropping the “O”.

WARNING: Double Consonants Reduced to One

Users wanting to take advantage of phonetic searches to reduce keystrokes have to be careful about this rule. For example, the name “LILLIAN” keeps the first and second “L” while dropping the third “L” since it occurs in the “LL” pair.

LILLIAN → LLN

If the user chose a clue “LLN”, “LILLIAN” would not be a candidate because ...

LLN → LN does not equal LLN ← LILLIAN

The rule should be that the user relying on phonics should avoid double consonants in the clue. Instead, the clue “LILN” does match the name “LILLIAN”.

LILN → LLN does equal LLN ← LILLIAN

Words ending in “S” drop the final “S”

It is a common error to add or drop a final “S”.

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Using Wildcards

The percent sign, “%”, is the Enhance “wildcard” which permits inexact searches without using phonics. When using the wildcard character the search will be against the entire name and not individual tokens. Returning the phonetic example used in “BOSTON” to discuss token searches, consider the following search result noting that “ALVAH KITTREDGE PARK” does not appear when using the clue “KIT%”. The clue “A% KIT%” would have included “ALVAH KITTREDGE PARK” just as the clue “M% KING” would match:

- MARTIN LUTHER KING
- MARTIN L KING
- M L KING
- ML KING
- MR KING

The screenshot shows the 'EZ24x7 - Enhance Address Painter' window. At the top, it displays 'Pub-28 - Edit' and 'Street - Pub-28 Standard'. Below this, the address is shown as 'Door: 5' and '5 ALVAH KITTREDGE ROXBURY MA 02119'. The search criteria are 'BOSTON MA' (checked), 'KIT%' (checked), and 'building?' (unchecked). A 'Check Alias' button is visible. The search results are displayed in a table with columns: Prd, Street, Sfx, Psd, lmin, lmax, Amin, Amax, Zip-code, and HA. The results show three entries for 'KITTREDGE' with different suffixes (CT, ST, TER) and zip codes (02131). The 'HA' column shows 'X' for the first two entries and is empty for the third.

Prd	Street	Sfx	Psd	lmin	lmax	Amin	Amax	Zip-code	HA
	KITTREDGE	CT		1	99			02131	
	KITTREDGE	ST		1	399			02131	X
	KITTREDGE	TER		1	99			02131	

0 of 3 Add to street name clue or select street from list.

Concepts Effective Users Need To Know

Effective use of the “painter” requires an understanding the following.

ADDRESS HIERARCHY

The order of importance of address elements is referred to as address hierarchy. Address hierarchy of last line address elements begins with state, followed by city and finally ZIP code. Address element hierarchy continues as described for each address type as follows.

GENERAL DELIVERY

No other hierarchical elements to consider

PO BOX

Continues with PO BOX number

Street

Continues with urbanization (Puerto Rico only), followed by street and then door number

High-rise

Continues with street, door number, unit designator and secondary number

Rural Route

Continues with route type and number followed by box number

Context

Address context is the entire set of criterion established in hierarchical order. Once the state “WY” is established, only cities in “WYOMING” remain candidates within the address context.

Context is cumulative. For example, the street candidate list that contains ten rows without a street door number might be reduced to only one or two after supplying the door number.

Implicit Criterion

Data that is established automatically because of an address element lower in the hierarchy results in implicit criterion. For example, if address creation begins by setting the ZIP code to “90210” without having established the city/state, “BEVERLY HILLS CA” is set as the implicit city/state criteria.

Explicit Criterion

Criterion established by data entry or a click selecting a row

USPS Default Range

CASS certified addresses rely on ZIP+4 records where the primary or secondary number is within the ZIP+4 range.

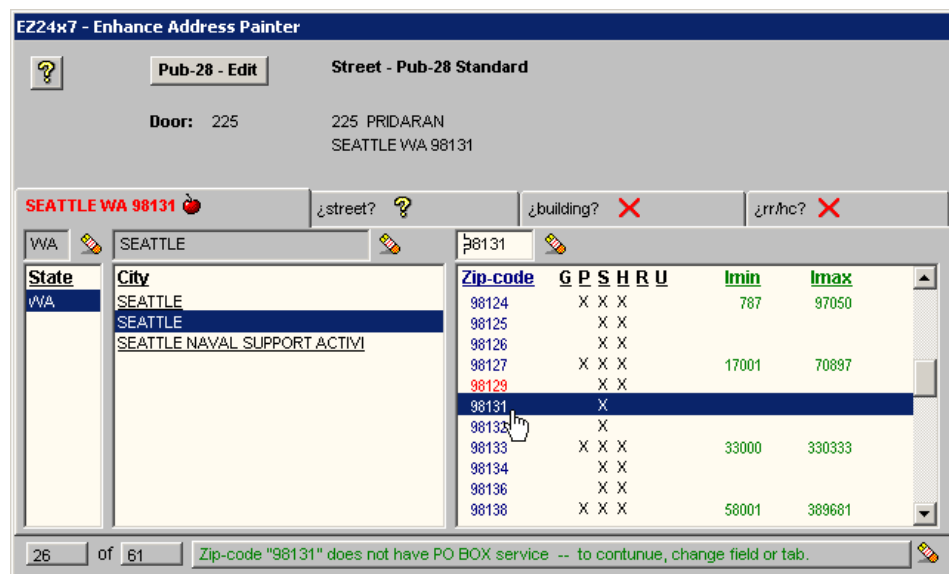
Two address types, rural route and high-rise addresses, have ZIP+4 records which have null or empty ranges that serve as a catch all for all rural route box numbers or building unit numbers where there is not a non-default ZIP+4 that can be used to certify the address.

A third special instance of default records exists for unique ZIP codes regardless of address type.

Default matches are usually not ideal. USPS form 3553 has an address quality statistics section providing fields reporting default address matches for both high-rise and rural route addresses.

City, State ZIP code Address Element Tab

The city/state tab is the only address element tab that has multiple data windows. Only after the city has been established do other tabs become accessible. The “current row” of “number of rows” counters refers to the data window that has the focus that is determined by the criterion field that has the focus.



HINT: ZIP code in red is a unique ZIP belonging to a company, organization or government entity. Unique ZIP codes are special CASS matching rules are discussed in detail on the next page.

State Code Criterion Field

The first criterion field allows for a two-digit state code.

City Criterion Field

Once the state has been established, the city criterion field is available. There is an implied trailing wildcard, '%'. The implied wildcard can be eliminated by terminating the clue with a period, ".".

Non-postal Cities

The city data window includes underlined non-postal cities. A non-postal city name represents an alias or alternate name that references one or more ZIP codes in one or more postal-cities. A city name may appear as both postal and non-postal city. Selecting a non-postal city will cause the ZIP code list to contain all the ZIP codes implied by the selected non-postal city. In this case, selection of any ZIP code in the list of non-postal ZIP codes will set the implied city context to the default ZIP city.

Finance Numbers

The USPS has internal administrative districts identified by finance number. These districts can serve multiple cities and can be thought of as metropolitan areas. Finance numbers are important because CASS requires street searches to include the finance number area.

ZIP code

The user can begin with the ZIP code if it is known to establish an implied city/state context.

HINT: Double-click of the ZIP row will report all USPS AMS-II city names for that ZIP preceded by a "(USE = {Y, N})" note. If the use value is 'Y', the city name is accepted by the USPS for the ZIP; otherwise the name is known, but cannot be used on mail for the ZIP code.

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PO BOX

There is a fourth criterion field for PO BOX number that is visible only when the selected city or the selected ZIP code has PO BOX delivery.

ZIP code Data Window Columns

- The first column contains ZIP codes and if a PO BOX number is present and certified will include the ZIP+4. Regular non-unique ZIP codes are blue and unique ZIP codes are red and underlined.

HINT: A unique ZIP code has special treatment because the ZIP code has been assigned to a single government agency, company, organization, university, etc. and usually serves as a single USPS drop where the organization receiving the mail is responsible for delivery. CASS matching rules within unique ZIP codes are different from non-unique ZIP codes.

- The second group of six columns, marked with either an “X” or blank, reports the delivery services available for the ZIP code. Urbanization is not actually a delivery type and only refers to Puerto Rican ZIP codes that have urbanizations in the ZIP code.

G: “GENERAL DELIVERY”	H: “High-Rise”
P: “PO BOX”	R: “RR/HC”
S: “STREET”	U: Urbanization

- The third group of green columns reports absolute integer PO BOX ranges. Right-Click on the ZIP code opens the ZIP+4 range window described later in this guide.
- The last group of columns appears in red when applicable. When the first column contains an “X”, there are alphanumeric PO BOX ranges for the ZIP code. The last column contains any address quality flags that need to be reported for the certified PO BOX address.

Once the city has been established, PO BOX and rural route candidates will be considered only within the set city. In the case of streets, CASS requires that searches be expanded to include all cities with the same finance number of the matched city. If no ZIP code has been set, both the “painter” and Enhance will search for streets in all cities with the same finance number. The “painter” will restrict searches to the ZIP code if one has been set.

HINT: Be careful starting with a ZIP – if wrong, it would prevent you from finding the actual address.

Exercise

Set the address context to a city with several ZIP codes. Navigate to the ZIP code criteria field noting the total number of ZIP codes for the city.

Open the ZIP+4 range window with a right-click on a ZIP that has PO BOX ranges. It may be necessary to use the ZIP code data window scrollbar to find a ZIP code that has PO BOX ranges. Right-click again to return to the city/state/ZIP code tab. ZIP+4 ranges are discussed in detail at the end of this document just before Appendix A.

Enter a valid PO BOX number in the fourth field. If a valid PO BOX number is not known for the city, pick any number listed in green in the PO BOX data window.

After entering a valid PO BOX number, note that the ZIP code list has been reduced to only ZIP codes that have the valid PO BOX.

Urbanization Address Element Tab

There is only one criterion field and one data window associated with the tab. There is an implied leading and trailing wildcard. The trailing wildcard can be eliminated by ending the clue with a period, “.”.

The city or ZIP code selected and the field criterion entered affect the address context. This example shows ten urbanizations in “BAYAMON PR” that have an “HO” in the name.

Urbanization	Zip5	City	Streets
SECT EL RELINCHO	00917	SAN JUAN	X
SECT HOYO	00926	SAN JUAN	X
URB DOS PINOS TOWNHOUSE	00923	SAN JUAN	X
URB HOLLYWOOD EST	00926	SAN JUAN	X
URB HORIZONS	00926	SAN JUAN	X
URB PARK GDNS TOWNHOUSES	00926	SAN JUAN	X
URB RIO HONDO 1	00961	BAYAMON	X
URB RIO HONDO 2	00961	BAYAMON	X
URB RIO HONDO 3	00961	BAYAMON	X
URB RIO HONDO 4	00961	BAYAMON	X

- The first column reports the candidate urbanization name.
- The second and third columns report the ZIP code and city. The state is always Puerto Rico.
- The last column is a flag indicating that the urbanization actually has street references. The USPS does publish urbanizations that have no streets.

Side effects

If the tab picture clue is yellow because no urbanization criterion has been set, this tab will have no effect on the address context.

If the urbanization criterion is exact, only one urbanization candidate, the street tab will only consider streets in that urbanization. If the urbanization criterion is inexact, more than one candidate row, only streets referencing urbanizations in the list will be considered candidates. Remember that selecting a row causes the criterion to be exact and only streets in the selected urbanization will be candidates.

HINT

Puerto Rican urbanizations usually begin with an urbanization prefix. Since the prefix clue may be incorrect, it is usually best if the urbanization clue starts with the name and not the prefix, which will avoid missing the target urbanization.

The urbanization might be wrong or the street might not be listed in any urbanization. If the street being investigated is not in the urbanization indicated, clear the urbanization field and try again.

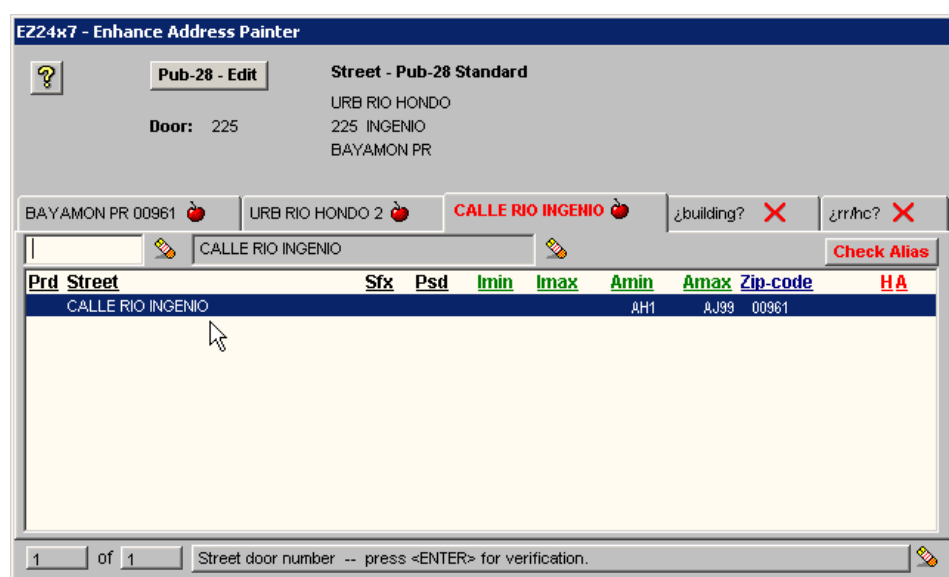
If the target street has a name, it is usually quicker to skip the urbanization and go directly to the street clue. If there are too many streets that match, the criterion can be refined by returning to the urbanization tab. If the street is a number or single letter and an input urbanization clue exists, it is usually preferable to begin with the urbanization tab.

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Street Address Element Tab

The street tab has two criterion fields, one data window and three command buttons. The city or ZIP code selected and the field criterion entered affect the address context. In Puerto Rico, the urbanization criterion will be included in the address context if any urbanization criterion is set.

This example is a continuation of the previous screen to illustrate inclusion of urbanization context with an inexact urbanization clue. The street token “INGENIO” was pasted with “CTRL+Q” followed by the “ENTER” key. The search excluded any urbanization not having the letters “HO” somewhere in the name. Since ZIP code was not part of the address context, the search included all cities having the same USPS finance number as BAYAMON which includes SAN JUAN.



- The first four columns in order are pre-directional, street name, suffix and post directional.
- Columns in green report integer and alphanumeric ranges of the street door numbers for the street.
- The section in blue reports the ZIP code and if the address is certified, the ZIP+4.
- The last group in red includes three columns:
 1. If the address is certified any address quality flags.
 2. The column titled “**H**” indicates that the candidate street has buildings and or firms on the street.
 3. The column titled “**A**” indicates that the candidate street has high-rise alternates.

Side effects

If a street is selected, the high-rise tab will only show building and firms on that street. If a list of streets appears, the high-rise tab will only show building and firms on this list of streets.

HINT

Intelligent clues, token searches and the mechanism used for phonetic searches dramatically simplify investigation. An understanding of finance numbers will avoid confusion when looking for a street in a specific city and seeing candidates in other cities that share the same finance number.

Exercise

Set a city/state with multiple ZIP codes that you know. Do not set a ZIP code. From the street tab’s street criteria field practice various street clues using intelligent clues, token, name, phonetic, literal and wildcard searches. Complete some address by supplying a door number.

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Street Components and Hints

A good understanding of the anatomy of street names and possible erroneous street component splits and splices can help resolve some of the most perplexing addressing problems.

Pre-directional and Post-directional – maximum 2 characters {N, NE, NW, S, SE, S, W, E, W}

Directionals may not be present. Rarely does an address have both pre-directional and a post-directional.

Sometimes street directionals are seen where the directional is actually part of the street name:

“WEST LAKE” → “WESTLAKE”

Directionals might be misplaced such as “W 45TH” when in fact it is “45TH W”.

The directional value might be wrong. The USPS has reported that, “... changing a directional from one cardinal point to another (e.g., south to north or east to west) produces erroneous assignments more than 50 percent of the time. However, in cases where a non-cardinal point change occurred (e.g., north to northeast) or where the directional value was added to or deleted from the input address, the delivery point was confirmed at least 80 percent of the time.” Below is a street directional conversion table recommended by the USPS.

	N	NE	NW	S	SE	SW	E	W	Blank
N	Y	Y	Y						Y
NE	Y	Y					Y		Y
NW	Y		Y					Y	Y
S				Y	Y	Y			Y
SE				Y	Y		Y		Y
SW				Y		Y		Y	Y
E		Y			Y		Y		Y
W			Y			Y		Y	Y
Blank	Y	Y	Y	Y	Y	Y	Y	Y	Y

Name – maximum 28 characters

The reverse of the sample above might also be true where the address clue is “WESTLAKE” → “W LAKE”. In this case, the street name would become “LAKE” with a pre-directional of “W”. Another example might be an address clue that appears “N SIDE DR” where “N” appears to be a pre-directional but the actual address turns out to be “NORTHSIDE DR”.

Suffix – maximum 4 characters

There are 188 street suffixes most of which require abbreviation. Many of them have a singular and plural form (i.e. “COURT” → “CT” and “COURTS” → “CTS” or “HILL” → “HL” and “HILLS” → “HLS”).

Keep in mind the following possibility considering that “WAY” and “WALK” are standardized USPS suffix that does not require abbreviations. In New York “BROAD WAY” is probably “BROADWAY” where in some other city “BROADWAY” could be “BROAD WAY”.

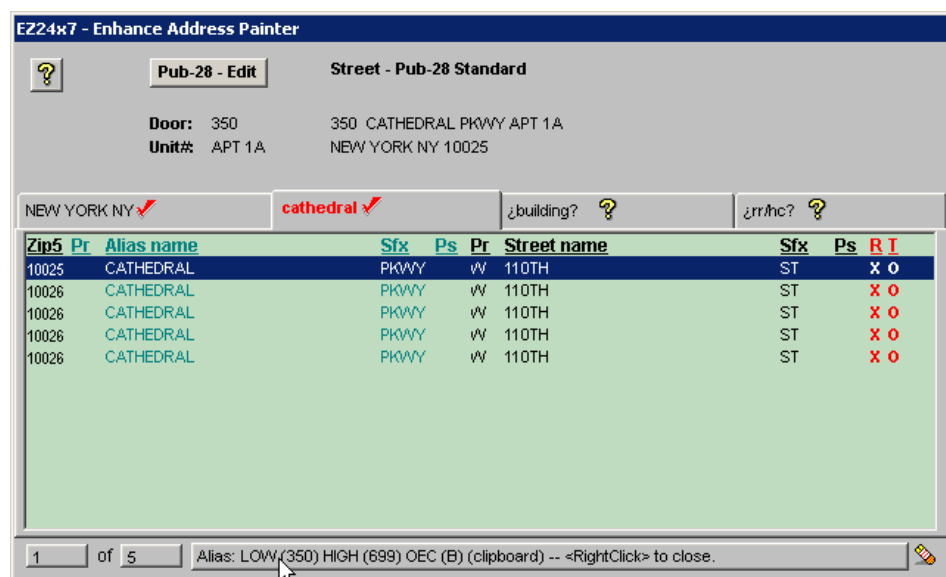
Element Shifts Examples

- “VALLEY VW” ↔ “VALLEYVIEW ST”
- “SOUTHPARK AVE” → “S PARK AVE”
- “E LAKE CIR” ↔ “EASTLAKE CIR”
- “SW DRIVE” ↔ “SOUTHWEST DR”
- “W SIDE CIR” ↔ “WESTSIDE CIR”

Check Alias Button

The USPS publishes common street aliases by ZIP code. There is a command button available from the street address element tab that will open the street alias window. The address context includes the city and if set, the ZIP code as well as any street field criterion.

This example has the address context “NEW YORK NY” without a ZIP code. The street name clue, “CATH%”, selects all streets that begin with “CATH”. Click on the “Check Alias” command button opens a window of all “NEW YORK” street aliases that begin with “C”. Right-Click on the alias data window will close it returning to the street tab. The first candidate row was clicked before taking this snapshot.



- The first column in black is the ZIP code.
- Four columns in green after the ZIP code report the four street alias components.
- Four columns in black report the four USPS recommended street components.
- If the column in red contains an “X”, the alias is a ranged alias and should only be considered a substitute within the alias range specified. Once selected, ranged alias records report the effective range in the user message in the message field as seen above. “OEC” means odd/even code and has values of {O=odd, E=even, B=both}.

The selected row along with the user message is suggesting that addresses reported on “CATHEDRAL PKWY, NEW YORK NY 10025” with odd/even numbers between 350 and 699 are known by the USPS as “W 110th ST, NEW YORK NY 10025”.

HINT

For convenience, the “painter” provides for easy cut and paste of the target street. After a mouse click of the alias row, the Windows clipboard is loaded with the alternate street that can in turn be pasted directly into the street name criterion field.

Exercise

Set a large city/state with multiple ZIP codes that you know. Do not set a ZIP code. Click the “Check Alias” command button and look for streets that you know. Also, look at street alias records that are ranged and note the effective ranges. Verify that click on an alias row loads the Windows “clipboard” with the USPS standard address that can be pasted into the street criterion field.

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Delivery Point Alternate

The USPS publishes PO BOX, street, building and rural route ZIP+4 ranges that are called alternate delivery point records. Unlike high-rise alternate records where a street ZIP+4 is redirecting the address to a high-rise, the alternate delivery point is redirecting the primary or secondary number to another range of the same address type.

Unlike high-rise alternate records where CASS requires CASS certified products to make the conversion automatically, delivery point alternates cannot be changed automatically by CASS software.

The Enhance address quality flag '@' marks addresses where alternate delivery points were detected and provides the "Check ALT" command button when this occurs.

This is an example of an alpha PO BOX being changed to a PO BOX number.

State	City	Zip-code	G	P	S	H	R	U	lmin	lmax
GA	ATLANTA	30315-0160	X	X	X	X	X	X	6501	150836 X @

The arrow is pointed to the address quality flag, "@", for this certified address and the "Check ALT" command button is visible. Click the command button to show the alternate range.

PO BOX alternate range(s):

150160-150160

OK

The range 150160-150160 leaves no doubt which box number represents "PO BOX PMB". Change the BOX number, "PMB" to the alternate BOX number "150160" shown above.

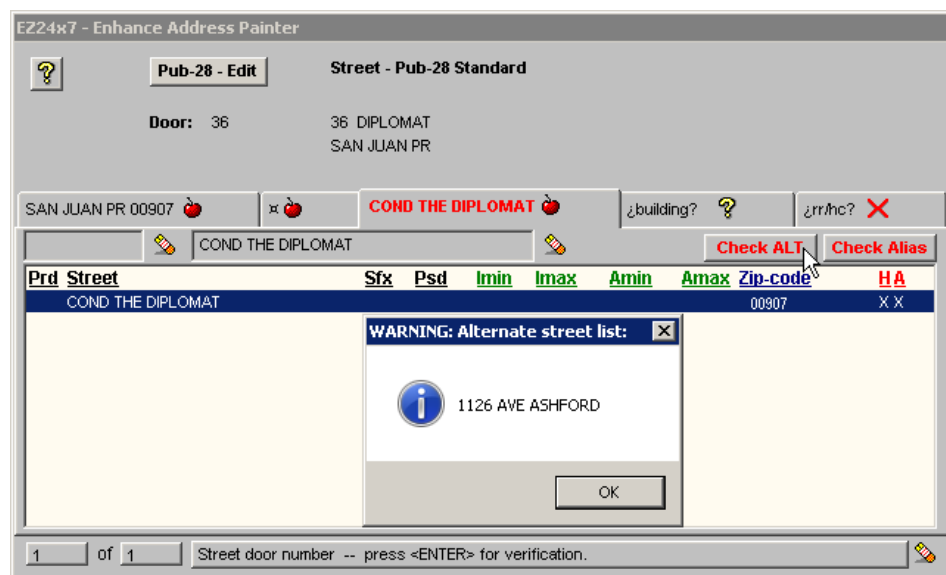
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High-rise Alternate – redirection to a single address

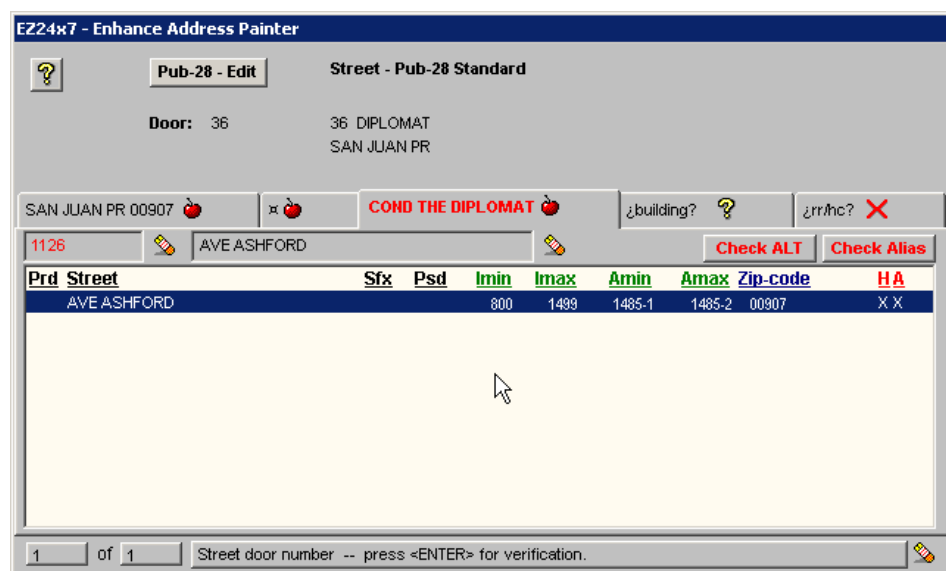
The USPS provides special records that redirect building addresses. Frequently buildings on street corners or accessible from two parallel streets create doubt which street is the building's address. Input addresses in Puerto Rico frequently use the building name instead of the street address – see example.

Note the “X” under the heading “A” in the last column of “COND THE DIPLOMAT”. That is the high-rise alternate flag. The “Check ALT” button will appear when the highlighted candidate has an alternate.

“Check ALT” reports “COND THE DIPLOMAT, SAN JUAN PR 00907” is “1126 AVE ASHFORD”.



After closing the message box, the “Take ALT” command button appears allowing you to accept the redirection automatically avoiding having to type “1126 AVE ASHFORD”.

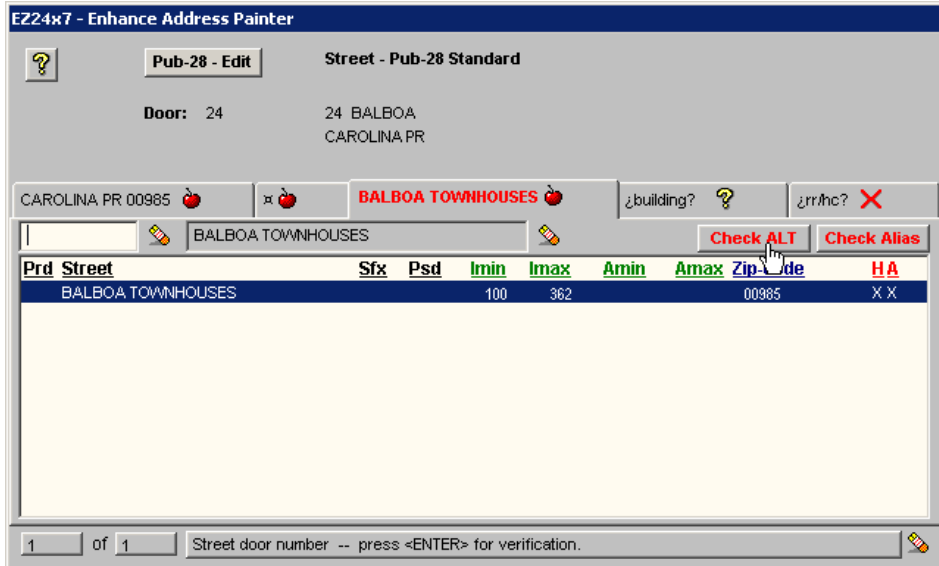


Exercise

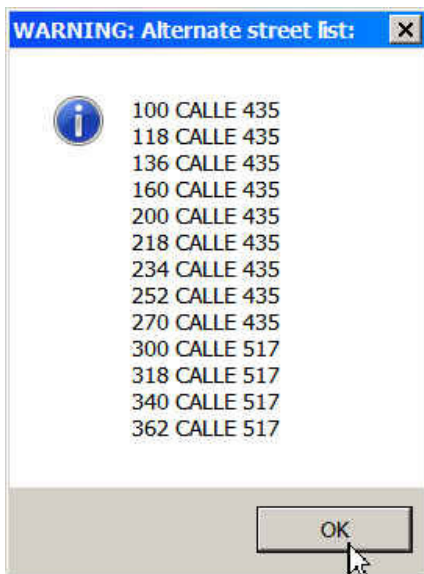
Repeat this exercise and follow through with the “Take ALT” command button.

High-rise Alternate – redirection to multiple addresses

Clusters of buildings can be redirected to multiple street addresses. For this example, the context is “CAROLINA PR 00985” and the street criterion clue is the token “BALBOA” which results in one match.

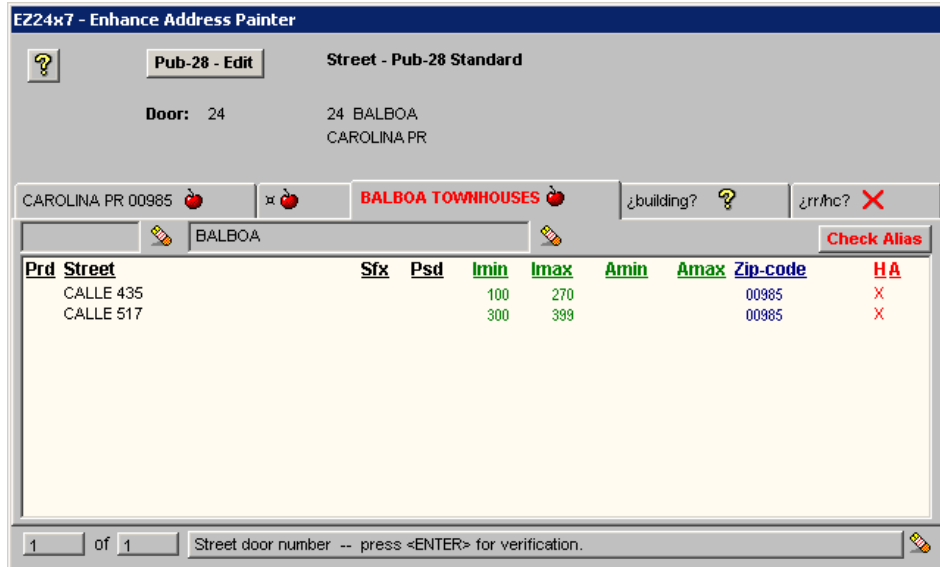


Remember that when only one candidate appears, it is selected automatically. When the “painter” recognizes that a high-rise alternate exists, the “Check ALT” button is made available. Click on “Check ALT” results in the following screen.



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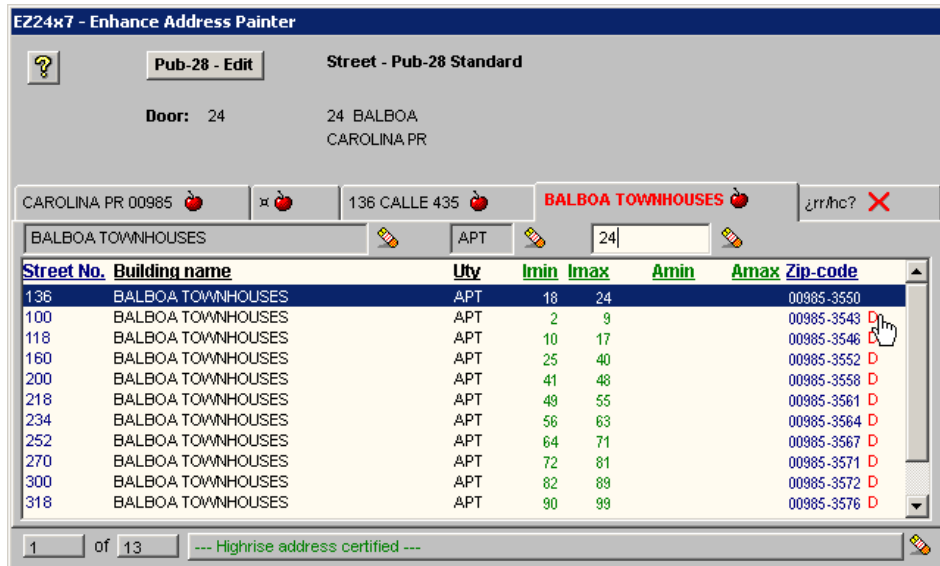
After closing the “Alternate street list” screen, a “Take ALT” button appears. Click “Take ALT” to establish this “Alternate street list” context. The address context is now defined as all addresses in the list of thirteen addresses in “CAROLINA PR 00985” on streets “CALLE 435” and “CALLE 517”.



This example will be continued with the high-rise address element tab, scenario 1 on the very next page.

To complete the solution, (1) click on the “building” tab, (2) [F3] will select all the building on this list of alternate street/door numbers and (3) enter the door number, 24.

HINT: It was necessary to key “24” into the building unit number field. Context sensitive paste, “CTRL+Q”, parsed the “24” as the Pub-28 street door number. “CTRL+Q” pastes the Pub-28 element into the appropriate field. Street door number and building unit number are not the same Pub-28 element.



The red ‘D’ at the end of the row indicates the solution is a default range. The correct solution bubbled to the top of the list being the only solution where the unit number was not a default high-rise ZIP+4.

High-rise Address Element Tab

There are a number of address context scenarios that need to be considered for the high-rise tab. The high-rise tab is being introduced demonstrating three common high-rise address problems.

1. Complete the previous exercise, “High-rise Alternate – redirection to multiple addresses”
2. Solve a high-rise address having a street address and building unit number
3. Demonstrate a common problem of resolving buildings in “PR” where no street information exists

Data window columns are documented in scenario 3.

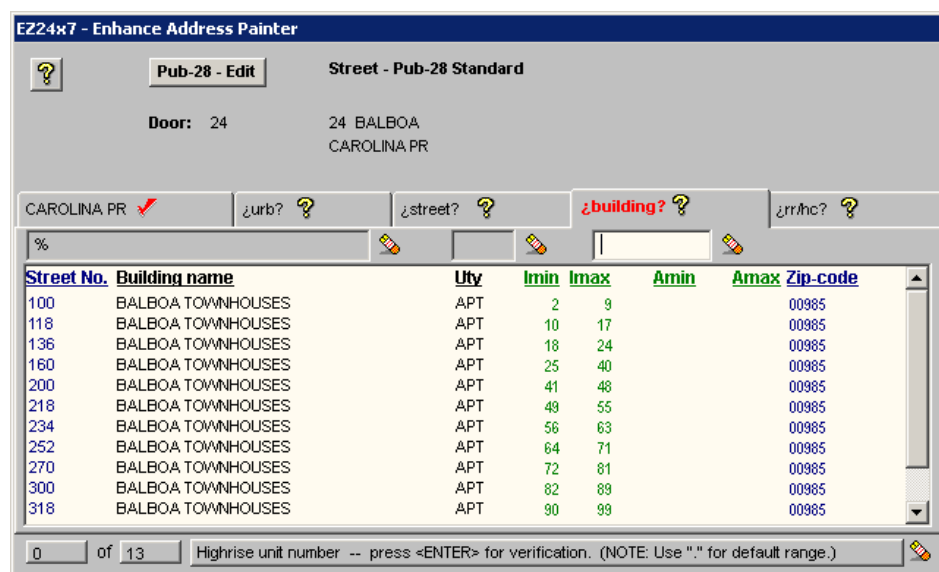
The city or ZIP code and street criteria affect the address context. In the order of specificity:

- If inexact street criterion has been established resulting in a list of streets in the street tab’s data window, only buildings and firms found in the street data window’s list of streets would be candidates.
- If a specific street has been selected, only buildings and firms on that street will be listed.
- If the street number is included and a USPS registered high-rise exists at that specific street address, only one building and any USPS registered firms will appear in the high-rise tab.

A single building will have a building row for every unit designator type. If the building has apartments, unit designator “APT”, and business suites, unit designator “STE”, there will be two rows showing the unit number ranges for each unit designator. A building might have any number of firms. Firm records have a red ‘F’ flag before the firm’s name.

Scenario 1: “High-rise Alternate – redirection to multiple addresses” – cont. from previous page

The street city criterion was “CAROLINA PR 00985” and there was an inexact street criterion including a list of two streets. Click on the high-rise address element tab followed by [F3] wildcard search.



The data window shows 13 high-rise records all having the unit designator “APT”. Scrolling through the candidates will show that all these buildings are on the two streets established by the street criterion field clue “BALBOA”, “CALLE 435” and “CALLE 517”. Selecting any building row changes the inexact street criteria, setting the implied street address criteria of the building.

HINT

Most buildings in Puerto Rico have USPS registered names. Most USPS registered buildings outside of Puerto Rico are not named. Firms are almost always named except within unique ZIP codes.

Not all firms are listed because USPS firm records only list organizations that have been given one or more private ZIP+4’s. Firms that have not requested ZIP+4 records will not appear in this data window.

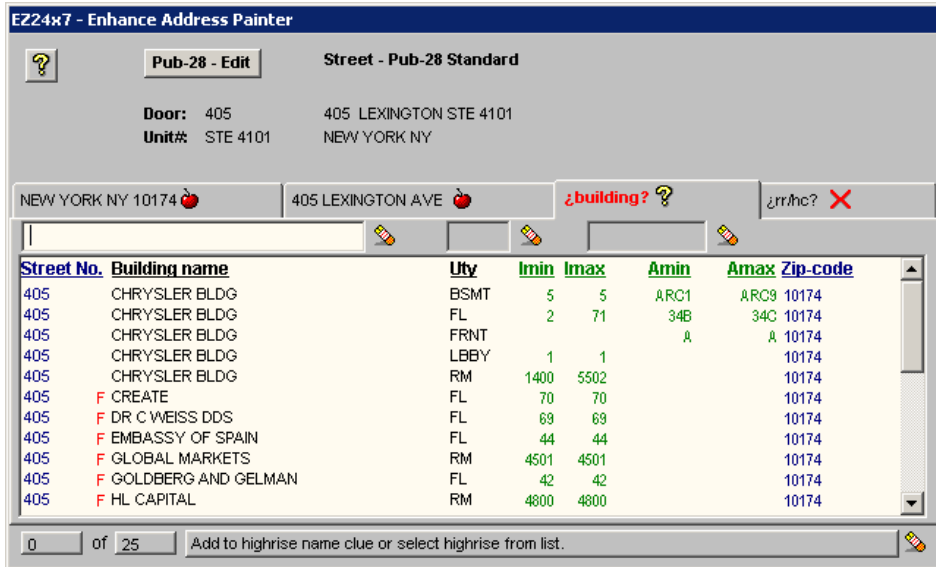
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Scenario 2: Finding High-rise Using Street Information

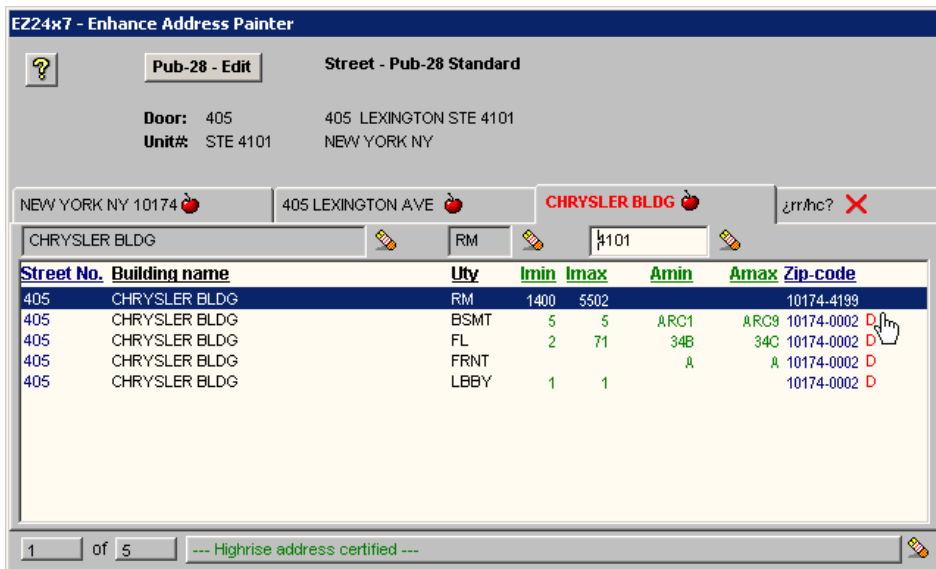
United States high-rise address information rarely includes a building name, but should always have a street door number and street name and usually includes a unit designator and/or unit number similar to:

405 LEXINGTON STE 4101, NEW YORK NY

From the city tab, set “NEW YORK NY” without a Zip code. From the street tab, enter “LEX%” resulting in 19 occurrences of “LEXINGTON AVE” in 19 different Zip codes in NEW YORK. The high-rise door number, “405”, reduces the list to one candidate, “405 LEXINGTON AVE, NEW YORK NY 10174”. Click the high-rise tab.



The building “405 LEXINGTON AVE” has 25 rows, five unit types, “BSMT”, “FL”, “FRNT”, “LBBY” and “BSMT”, followed by firms having USPS vanity ZIP+4’s assigned to them. The red ‘F’ followed by firm name distinguishes firms from buildings. Use “CTRL+Q” to paste the number “4101” in the third column.



The first record is the preferred non-default ZIP+4 match. The first record with ZIP+4 “4199” is the right choice if there is no firm name clue. The remaining four records are for unit types using the default ZIP+4 record where ZIP+4 = “0002”.

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Scenario 3: (Puerto Rico) Finding High-rise without Street Data Using the Building Name

In Puerto Rico, high-rise address data frequently does not have street information reporting only the building name, unit designator and/or unit number similar to: DIPLOMAT APT 36, SAN JUAN PR. Since there is a unit designator, the clue 'DIPLOMAT' is a likely building name clue. Skipping over the street tab, we use the clue 'DIPLOMAT' in the building tab followed by "ENTER".

Street No.	Building name	Uty	Imin	Imax	Amin	Amax	Zip-code
1126	COND THE DIPLOMAT	APT	21	88	C-01	SPH-8	00907
1126	COND THE DIPLOMAT	OFC			C-06	ADM	00907
1126	COND THE DIPLOMAT	PH	1	8			00907
1126	COND THE DIPLOMAT	STE	1	5	C-02	C11	00907

There are four high-rise records. Selecting any of the four rows will set the implied street. "CTRL+Q" in the third clue field pastes unit number "36" and select the first row causing the implied street to appear.

Street No.	Building name	Uty	Imin	Imax	Amin	Amax	Zip-code
1126	COND THE DIPLOMAT	APT	21	88	C-01	SPH-8	00907-1221
1126	COND THE DIPLOMAT	OFC			C-06	ADM	00907-1237 D
1126	COND THE DIPLOMAT	PH	1	8			00907-1237 D
1126	COND THE DIPLOMAT	STE	1	5	C-02	C11	00907-1237 D

- The first column reports the street door number.
- The second column will contain a red "F" if the record is a firm record.
- The columns in black report the building or firm name if present and the unit designator.
- The green columns report absolute integer and alphanumeric ranges.
- The blue columns report the ZIP code and if the address is certified the ZIP+4.
- The last column reports any address quality flags in red.

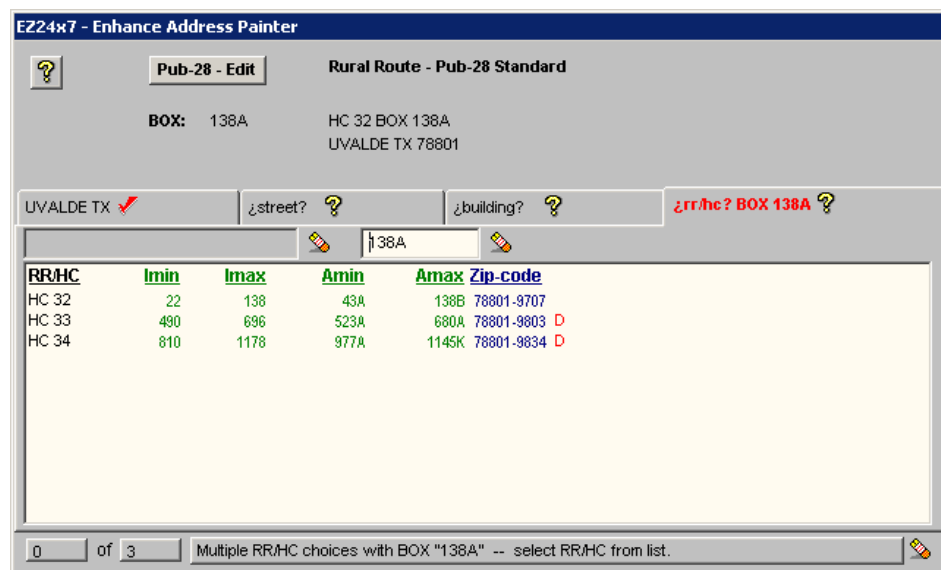
Rural Route Address Element Tab

The data window has two criterion fields and a single data window.

There is an implied leading and trailing wildcard. The trailing wildcard can be eliminated ending the clue with a period, ".".

The example shows 3 rural routes in "UVALDE TX" using only the criterion field for rural route box number pasted using "CTRL+Q". The candidate list is sorted by address flags then by name.

The red 'D' at the end of candidate rows indicates that the solution is based on a default range. Default range records were discussed earlier in the general concepts section of this guide.



- The first column reports the rural route type and number.
- Columns in green report integer and alphanumeric absolute ranges of the boxes for the rural route.
- The section in blue reports the ZIP code and if the address is certified, the ZIP+4.
- The last column shows address quality flags in red.

Side effects

If urbanization, street and or high-rise criterion had been established, navigation to this tab resets it.

HINT

Most rural routes provide a default ZIP+4 record. Many rural routes only have a single ZIP+4 default record for certification of all boxes on the route. Rural route box numbers are usually unique within the ZIP code.

Rural route adjustments are not uncommon where boxes are removed from one route and added to another. Rural route adjustment is seen as a rise in rural route default range matches.

Default range rural route matches can be caught using Mail*LIST criteria and repaired by changing the route number. Care should be taken by either contacting the delivery post office or the recipient before any route change.

Deprecating for Emergency Services (Slowly but Surely)

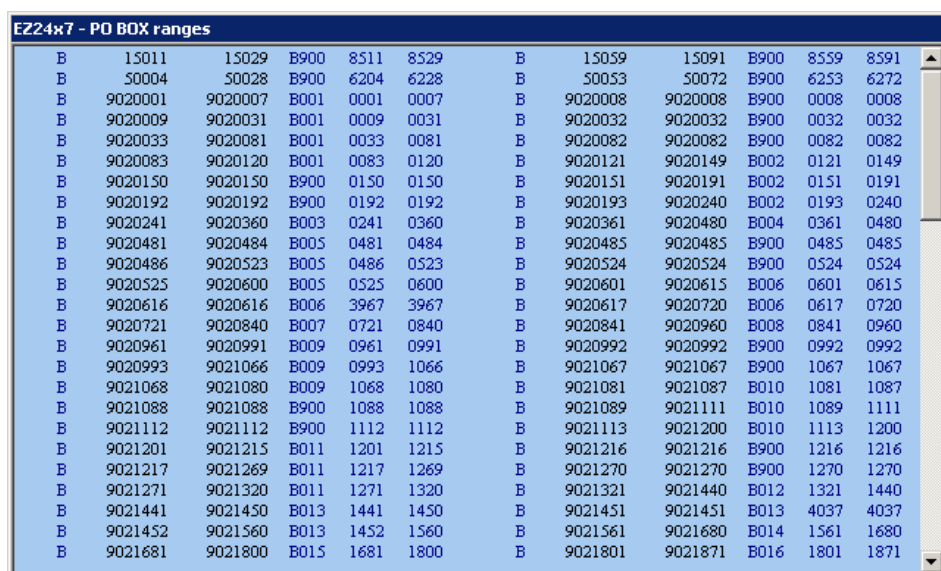
Rural Routes are postal, not physical addresses. Physical addresses are replacing rural route address for effective dispatch of emergency services. Every month there are fewer rural route records requiring the licensed LACS^{Link} product to successfully translate rural route addresses with street style addresses.

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ZIP+4 Range Data Window

ZIP+4 range data windows are opened and closed with a “CTRL+right-click” on a candidate ZIP code, street, high-rise and rural route rows. The data window does not have the standard “current row” of “number of rows” counters and does not respond to <up-arrow> and <down-arrow> keys.

Rows can be selected with a click of the row. If the candidate ZIP code, street, high-rise or rural route had been CASS certified, the ZIP+4 range used to certify the address will have been highlighted. A double-click of the window will return to that highlighted row at any time.



E224x7 - PO BOX ranges											
B	15011	15029	B900	8511	8529	B	15059	15091	B900	8559	8591
B	50004	50028	B900	6204	6228	B	50053	50072	B900	6253	6272
B	9020001	9020007	B001	0001	0007	B	9020008	9020008	B900	0008	0008
B	9020009	9020031	B001	0009	0031	B	9020032	9020032	B900	0032	0032
B	9020033	9020081	B001	0033	0081	B	9020082	9020082	B900	0082	0082
B	9020083	9020120	B001	0083	0120	B	9020121	9020149	B002	0121	0149
B	9020150	9020150	B900	0150	0150	B	9020151	9020191	B002	0151	0191
B	9020192	9020192	B900	0192	0192	B	9020193	9020240	B002	0193	0240
B	9020241	9020360	B003	0241	0360	B	9020361	9020480	B004	0361	0480
B	9020481	9020484	B005	0481	0484	B	9020485	9020485	B900	0485	0485
B	9020486	9020523	B005	0486	0523	B	9020524	9020524	B900	0524	0524
B	9020525	9020600	B005	0525	0600	B	9020601	9020615	B006	0601	0615
B	9020616	9020616	B006	3967	3967	B	9020617	9020720	B006	0617	0720
B	9020721	9020840	B007	0721	0840	B	9020841	9020960	B008	0841	0960
B	9020961	9020991	B009	0961	0991	B	9020992	9020992	B900	0992	0992
B	9020993	9021066	B009	0993	1066	B	9021067	9021067	B900	1067	1067
B	9021068	9021080	B009	1068	1080	B	9021081	9021087	B010	1081	1087
B	9021088	9021088	B900	1088	1088	B	9021089	9021111	B010	1089	1111
B	9021112	9021112	B900	1112	1112	B	9021113	9021200	B010	1113	1200
B	9021201	9021215	B011	1201	1215	B	9021216	9021216	B900	1216	1216
B	9021217	9021269	B011	1217	1269	B	9021270	9021270	B900	1270	1270
B	9021271	9021320	B011	1271	1320	B	9021321	9021440	B012	1321	1440
B	9021441	9021450	B013	1441	1450	B	9021451	9021451	B013	4037	4037
B	9021452	9021560	B013	1452	1560	B	9021561	9021680	B014	1561	1680
B	9021681	9021800	B015	1681	1800	B	9021801	9021871	B016	1801	1871

This window is the result of “CTRL+right-click” on the ZIP code “00902”. The other ZIP+4 range windows for street, high-rise and rural route use the same data window. The only differences are the window’s title and that streets, high-rises and rural routes only have a single ZIP+4 instead of a ZIP+4 low and high range. Firm records, which share the high-rise data window, do have low and high ZIP+4 ranges.

- The first column contains the odd/even code having the domain {O=odd, E=even, B=both}. Delivery for a ZIP+4 can include all odd, even or both odd and even numbers within the range.
- The second and third columns report the effective minimum and maximum delivery point range.
- The fourth column reports the carrier route assigned to the range.
- The last column(s) after the carrier route report the ZIP+4 range for PO BOX and firm records and a single ZIP+4 for street, high-rise and rural route delivery.

Enhance – Users Guide

Appendix A – Error Codes

CITY: Could not resolve the city.

CITY_NOISE: City not resolved due to extraneous clues in or around city name.

CLOSE_TIE: There are multiple candidates whose reliabilities vary but the difference is too close to call.

DEFER: There is at least one candidate, but the reliability is not high enough to recommend a solution.

NSN: (No Such Number) Candidate(s) were found, but the primary/secondary number is not supported by any of the ZIP+4 ranges.

PNE: (Primary Not Encountered): Primary token clues, excluding street directions and suffixes, unit designators, etc., were not found with sufficient reliability within city/state context.

STATE: Could not resolve the state.

SCOPE: (Installations with limited USPS service area) State is outside scope of geographic configuration.

STC_ZIP_CONFLICT: Conflict exists between input ZIP code and state.

TIED: There are multiple candidates with the same reliability that no tiebreaker was able to resolve.

USX: The address resolves to more than once carrier route and DPV validation was either not used or could not break the tie.

K5_CLOSE_TIE: Close tie between multiple candidates w/ name match and inexact directional match.

K5_DEFER: Multiple candidates w/ name match and inexact directional match having poor reliability.

K5_TIED: Tie between multiple candidates w/ name match and inexact directional match.

<GEN_DEL_DEFER>: General delivery address with unreliable last line changes

<MULTIPLE_HRISE>: Same as “TIED” where candidates are in the same high-rise.

<MULTIPLE_DLINE>: Same as “TIED” where candidates have the same delivery line.

<MULTIPLE_ALIAS>: Multiple exact street match alias records resulted in an ambiguity.

<POB_MLC>, <RHC_MLC>, <MIL_MLC> or <PHY_MLC>: Same as “USX” except that the address type has been identified as PO BOX, Rural Route, Military or Street/High-Rise.

<NO_ADDRESS>: The input address is empty.

<NO_DEL_LINE>: The input address does not have a delivery line.

<POB_NSN>, <RHC_NSN>, <MIL_NSN> or <PHY_NSN>: Same as “NSN” except that the address type has been identified as PO BOX, Rural Route, Military or Street/High-Rise.

<POB_NO_PRIMARY>, <RHC_NO_PRIMARY>, <MIL_NO_PRIMARY> or <PHY_NO_PRIMARY>: There was no primary number available for PO BOX, Rural Route, Military or Street/High-Rise.

<RHC_NSR>: The rural route address has no corresponding route number within the city/state context.

<CASS_STOP_Kn>: When CASS address quality flags indicate a condition where CASS forbids automatic address certification, the address status is reported as <CASS_STOP_Kn> where Kn is one of:

K0 - Standalone word ‘BUZON’ in a Puerto Rican address

K1 - Both address quality flags ‘A’ and ‘M’ prevent the address from being accepted

K2 - Matched to unique ZIP code that is not supported by the input data

K3 - PO BOX with a unique ZIP code can never be changed to a non-unique ZIP code

K4 - Inexact match is not allowed when an exact match exists for a ranged street alias

K5 - Multiple candidates with exact name match and inexact directional match

K6 - Both the ZIP code and city name changed

K7 - Stop overlapping range containing a non-del record

K8 - Exact match to an Early Warning System record

K9 - Both the address suffix and the directional were changed

Appendix B – Shadow Data

Since 1996, CASS has required maintaining un-validated urbanization noise data for Puerto Rico in the urbanization address line if there was no valid urbanization occupying the urbanization line. This CASS requirement was later extended to include leading and trailing segments of the delivery line. AES refers to this retained un-validated data as shadow data.