



MEF Standard
MEF 79.0.2

Amendment to MEF 79: Address Validation

July 2021

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1 List of Contributing Members

The following members of the MEF participated in the development of this document and have requested to be included in this list.

Member Company
Amartus
AT&T
Colt
Orange
Proximus
Spirent
Verizon

Table A2-1 – Contributing Member Companies

2 Abstract

There are several areas within Address Validation that are incorrect or unclear in MEF 79 [3]. The purpose of this amendment is to correct areas that are incorrect and clarify the areas that are unclear. MEF 79 [3] does not currently define address validation for Geographic Point. This amendment adds requirements to support Address Validation for Geographic Point and Geographic Address Label. To provide needed clarification, an appendix containing examples of different situations and how Address Validation is performed in those situations will be added. In addition, a more complete explanation of the Address Validation and Site Retrieval processes is added to the document.

3 Terminology and Abbreviations

This section defines the terms used in this document. In many cases, the normative definitions to terms are found in other documents. In these cases, the third column is used to provide the reference that is controlling, in other MEF or external documents.

Term	Definition	Reference
Geographic Address Label	An identifier that is unique within the Administrative Authority that controls assignment of the label and that specifies a fixed location on earth.	This document

Table A2-2 – Terminology and Abbreviations

4 Compliance Levels

The key words "**MUST**", "**MUST NOT**", "**REQUIRED**", "**SHALL**", "**SHALL NOT**", "**SHOULD**", "**SHOULD NOT**", "**RECOMMENDED**", "**NOT RECOMMENDED**", "**MAY**", and "**OPTIONAL**" in this document are to be interpreted as described in BCP 14 (RFC 2119 [1], RFC 8174 [2]) when, and only when, they appear in all capitals, as shown here. All key words must be in bold text.

Items that are **REQUIRED** (contain the words **MUST** or **MUST NOT**) are labeled as [**Rx**] for required. Items that are **RECOMMENDED** (contain the words **SHOULD** or **SHOULD NOT**) are labeled as [**Dx**] for desirable. Items that are **OPTIONAL** (contain the words **MAY** or **OPTIONAL**) are labeled as [**Ox**] for optional.

Editor Note 2: The following paragraph will be deleted if no conditional requirements are used in the document.

A paragraph preceded by [**CRa**]< specifies a conditional mandatory requirement that **MUST** be followed if the condition(s) following the "<" have been met. For example, "[**CR1**]<[D38]" indicates that Conditional Mandatory Requirement 1 must be followed if Desirable Requirement 38 has been met. A paragraph preceded by [**CDb**]< specifies a Conditional Desirable Requirement that **SHOULD** be followed if the condition(s) following the "<" have been met. A paragraph preceded by [**COc**]< specifies a Conditional Optional Requirement that **MAY** be followed if the condition(s) following the "<" have been met.

5 Introduction

This amendment corrects and clarifies Address Validation to include validation of addresses reflected as Geographic Point and Geographic Address Labels. The updates are detailed below.

- Update Use Case #1 to include Geographic Point and Geographic Address Label
- Table 2 – Update to replace Global Address Reference with Geographic Address Labels
- Section 6.2 - Update to replace Global Address Reference with Geographic Address Labels
- Table 3 - Update Use Case Description
- Table 4 - Update Description to include Geographic Point and Geographic Address Label
- Add Sonata Interactions high level figures to section 7
 - These provide information on the portions of the Sonata Interface described in the document
- Update Section 8.1 to include Geographic Point and Geographic Address Label
 - Update Table 13 Address Type and Buyer Specified Address attributes
 - Add requirements covering Geographic Point and Geographic Address Label Location Types
 - Update Table 14 Seller Verified Addresses attribute Type description to include Geographic Point and Geographic Address Label
- Update Section 8.2 to include Geographic Point and Geographic Address Label
 - Delete and replace R24 to include Geographic Point and Geographic Address Label
- Table 21 - Update to replace Global Address Reference with Geographic Address Labels
- Section 8.9.2.1 – Add requirement that Known ID Method must not include any attributes other than Fielded Address Identifier.
- Section 8.9.4 - Update to replace Address Reference with Geographic Address Labels.
- Update section 8.10 to clarify that Geographic Point and Geographic Address Label are both valid ways to describe a Service Site for both the Buyer and Seller.
- Describe Geographic Point format is agreed to as a part of the on-boarding process between Buyer and Seller.

- Update section 8.9.5 with text that states "Note: the format for Geographic Point is agreed to by the Buyer and Seller during the on-boarding process."
- Define that Geographic Address Label is formatted as defined by the administrative authority that assigns the Geographic Reference Identifier
- Clarify that address can be referred to by Fielded Address Identifier, Formatted Address Identifier, Geographic Address Label Identifier, or Geographic Point Identifier
- Update Table 35 to include Geographic Point Identifier
- Add requirement to section 8.9.4 that allows the Buyer to specify the Geographic Address Label by ID using Known Address ID
- Update section 8.9.4 with a description of the use of Telecodes, CLLI codes, etc.
- Add requirement to section 8.9.5 that allows the Buyer to specify the Geographic Point Identifier using Known Address ID
- Make editorial updates to correct an error with O9. This should be a mandatory requirement.
- Add Appendix A that provides examples of the use of Address Validation in different scenarios.
 - Provide high level explanation of Address Validation, Site Retrieval, and POQ

In this amendment, changes are shown as follows:

- Instructions for how to apply the amendment are shown in *blue italics*
- In content modified by the amendment, text to be removed is shown with ~~red strikethrough~~
- In content modified by the amendment, text to be added is shown in red

6 Changes to Section 3

Replace Table 2 with Table 2 below.

Term	Definition	Reference
Address	A way of specifying an absolute fixed location on earth using pre-established boundary and identifier information such as country, city, postal code and street information.	This document
Address Operation	An Operation involving validating or querying an Address.	This document
Carrier Ethernet Network (CEN)	A network from a Service Provider or network operator supporting the MEF service and architecture models.	MEF 12.1
Deferred Response	A Seller's response to a Buyer's request whereby the Seller immediately acknowledges that the request was received, and, over time, sends notifications to update the Buyer on the status and results of the request (assuming the Buyer has subscribed to receive the notifications). The Buyer can also poll the Seller for the results and status associated with the request.	This document
Fielded Address	A type of Address that has a discrete field and value for each type of boundary or identifier down to the lowest level of detail. For example, "street number" is one field, "street name" is another field, etc.	This document
Formatted Address	A type of Address that has discrete fields for each type of boundary or identifier with the exception of street and more specific location details, which are combined into a maximum of two strings based on local postal addressing conventions.	This document
Geocode	A set of coordinates (typically including latitude and longitude) that describes a particular location on earth.	This document
Global Address Reference Geographic Address Label	An identifier that is globally unique within the Administrative Authority that controls assignment of the label and that specifies a fixed location on earth.	This document

Term	Definition	Reference
Immediate Response	A Seller's response to the Buyer whereby the Seller responds immediately with the results of the request or indicates that the request cannot be processed. The maximum time to provide an Immediate Response is for further study, but is expected to be less than 30 seconds.	This document
Operation	An interaction between the Buyer and Seller, potentially involving multiple back and forth transactions.	This document
Product	One or more goods or services that is or may be sold to a Buyer by a Seller.	This document (Note this is a refinement to the definition of this term in MEF 50.1 [6])
Product Offering	The commercial and technical details of a Product sold by a Seller. A Product Offering defines all of the commercial terms and, through association with a particular Product Specification, defines all the technical attributes and behaviors of the Product. A Product Offering may constrain the allowable set of configurable technical attributes and/or behaviors specified in the associated Product Specification.	This document (Note this is a refinement to the definition of this term in MEF 50.1 [6])
Product Specification	A structured set of well-defined technical attributes and/or behaviors that are used to construct a Product Offering for sale to a market.	This document
POQ	Product Offering Qualification	This document
POQ Item	Product Offering Qualification Item	This document
Product Offering Qualification	One or more POQ Items formulated into a request made by a Buyer to a Seller.	This document
Product Offering Qualification Item	An individual article included in a POQ that describes a Product of a particular type (Product Offering). The objective is to determine if it is feasible for the Seller to deliver this item as described and for the Seller to inform the Buyer of the estimated time interval to complete this delivery.	This document
Requesting Entity	The business organization that is acting on behalf of one or more Buyers. In the most common case, the Requesting Entity represents only one Buyer and these terms are then synonymous.	This document

Term	Definition	Reference
Responding Entity	The business organization that is acting on behalf of one or more Sellers. In the most common case, the Responding Entity represents only one Seller and these terms are then synonymous.	This document
Service Site	A fixed physical location at which a Product can be installed. Its location can be described either with geocodes (Lat/Long information) or by association with an Address or Global Address Reference Geographic Address Label. This association may include a Sub-address describing where within that Address or Global Address Reference Geographic Address Label this particular Service Site is located.	This document
Service Site Operation	An Operation involving validating or querying Service Site information.	This document
Sub-address	A description of where a particular Service Site is located (or where a Service Site may be located in the future) within a location defined by an Address or Global Address Reference Geographic Address Label.	This document
Use Case	A Use Case is a means to capture the requirements of a system(s). A system may have several Use Cases that define different aspects of its behavior	OMG UML v2.5

Table 2 - Terminology and Abbreviations

7 Changes to Section 6.2

Replace the sixth bullet in this section describing the Global Address Reference with the following text.

- Providing a ~~Global Address Reference~~ Geographic Address Label. An identifier that is unique within the Administrative Authority that controls the assignment of the identifier and that specifies a fixed location on earth.

8 Changes to Section 7

Insert Figure and the associated text into section 7.

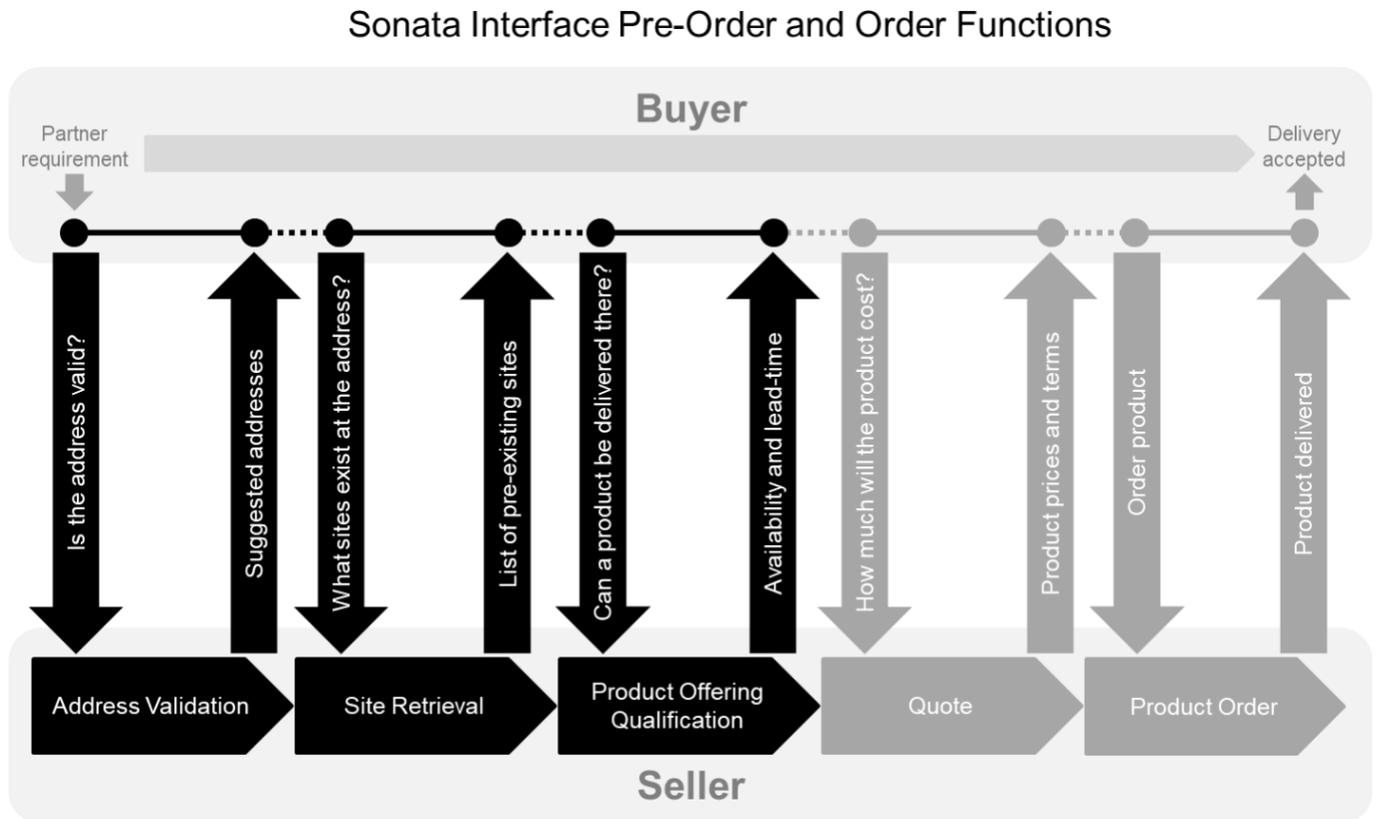


Figure A2-1 – Sonata Interface Focus

Figure A2-1 shows the Sonata Pre-Order and Order functions:

- Address Validation
- Site Retrieval
- Product Offering Qualification
- Quote
- Product Order

The functions shown in this figure are not mandatory. Sellers may require a Buyer to perform functions in a particular order. If the Seller does not mandate that certain functions are to be performed before others, the Buyer may choose to skip these functions. As an example, a Buyer

might submit a Quote request without performing Address Validation or Product Offering Qualification.

The use cases within this document support Address Validation, Site Retrieval, and Product Offering Qualification. Address Validation allows the Buyer to identify how a Seller represents a given address within the Seller's systems. Site Retrieval allows the Buyer to retrieve information on a site once an address has been validated. Product Offering Qualification allows the Buyer to determine whether the Seller can feasibly deliver a Product Offering, to a specific set of geographic locations (if applicable). The Seller also provides estimated time intervals to complete these deliveries.

9 Changes to Section 7.2

Replace Table 3 with Table 3 shown below.

Use Case #	Use Case Name	Use Case Description
1	Validate Address	The Buyer sends Fielded Address, Formatted Address, Geographic Point, or Geographic Address Label Address information known to the Buyer to the Seller. The Seller responds with a list of Addresses known to the Seller that likely match the Address information sent by the Buyer. For each Address returned, the Seller should also provide an Address Identifier, which uniquely identifies this Address within the Seller. When the Buyer sends a Geographic Point or Geographic Address Label, the Seller may also return an associated address.
2	Retrieve Address by Identifier	The Buyer requests the full details of a single Address based on an Address identifier that was previously provided by the Seller.
3	Retrieve Service Site List	The Buyer requests that the Seller provides a list of Service Sites known to the Seller based on a set of Service Site/Address filter criteria. For each Service Site returned, the Seller also provides a Service Site Identifier, which uniquely identifies this Service Site within the Seller.
4	Retrieve Service Site by Identifier	The Buyer requests the full details for a single Service Site based on a Service Site identifier that was previously provided by the Seller.
5	Register for POQ Notifications	A request initiated by the Buyer to instruct the Seller to send notifications of POQ state changes (see section 9) in the event the Seller uses the Deferred Response pattern to respond to a Create Product Offering Qualification request.
6	Create Product Offering Qualification	A request initiated by the Buyer to determine whether the Seller can feasibly deliver a particular Product (or Products), to a specific set of geographic locations (if applicable). The Seller also provides estimated time intervals to complete these deliveries.

7	Retrieve POQ List	The Buyer requests a summarized list of POQs (in any state; see section 9.1) from the Seller based on a set of POQ filter criteria. For each POQ returned, the Seller also provides a POQ Identifier that uniquely identifies this POQ within the Seller.
8	Retrieve POQ by Identifier	The Buyer requests the full details of a single Product Offering Qualification based on a POQ identifier.
9	Notify of POQ State Change	The Seller sends the following types of notifications to the Buyer who has subscribed to these notifications <ul style="list-style-type: none"> • POQ creation • POQ state change

Table 3 – Use Case Table

Replace Table 4 with Table 4 as shown below.

Field	Description
Use Case Number	1
Use Case Name	Validate Address
Description	Validate a Fielded or Formatted Address Fielded Address, Formatted Address, Geographic Point, or Geographic Address Label of a given location.
Actors	Buyer/Seller
Pre-Conditions	None
Process Steps	<ol style="list-style-type: none"> 1. The Buyer sends a Validate Address request to the Seller specifying Address filter criteria (as understood by the Buyer) on the location the Buyer wishes to reach. 2. The Seller receives the request and attempts to match the Buyer's filter criteria with Address information known to the Seller. The determination of what is considered a match is at the Seller's discretion. 3. If the filter criteria match one or more Addresses known to the Seller, a positive response is returned with the Seller's Address information optionally including an Address Identifier (that is unique within this Seller) for each Address returned.
Post-Conditions	The Buyer has received the list of Addresses in the exact form known to the Seller for each Address.

Alternative Paths	<ol style="list-style-type: none"> 1. The Seller returns an error message if an error is encountered while processing that prevents the Seller from completing the request. 2. If the Seller cannot find a match to the given location, a negative response is returned to the Buyer. 3. If the Seller finds too many matches (the definition of “too many” is at the Seller’s discretion), the response indicates this condition and no results are returned. In this case, the Buyer would likely elect to reinitiate the Address Validation request using more specific criteria to obtain a match. 4. If the Address Type in the Buyer’s Validate Address request is GEOGRAPHIC_POINT or GEOGRAPHIC_ADDRESS_LABEL, the Seller may return an Associated Address such as a Fielded Address in addition to the Geographic Point or Geographic Address Label information.
Business Process	MEF 50.1 Lead-Response-to-Contract

Table 4 – Validate Address

10 Changes to Section 8.1

Replace Table 13 with Table 13 below.

Attribute	Description	Type
Buyer ID	The unique name identifier of the organization that is acting as the Customer in this transaction. See Section 8.8 for requirements around the use of this attribute.	String
Seller ID	The unique identifier of the organization that is acting as the supplier in this transaction. See Section 8.8 for requirements around the use of this attribute.	String
Address Type	The type of Address used in this request.	A string that is one of: <ul style="list-style-type: none"> • FIELDDED_ADDRESS • FORMATTED_ADDRESS • GEOGRAPHIC_POINT • GEOGRAPHIC_ADDRESS_LABEL
Buyer Specified Address	The Address to be validated.	A Fielded Address as defined in section 8.9.2.1, or a Formatted Address as defined in section 8.9.3.1, a Geographic Point as defined in section 8.9.5, or a Geographic Address Label as defined in section 8.9.4.

Table 13 – Geographic Address Buyer Request Attributes

Add the following requirements after R8.

- [A2-R1]** If the Address Type is GEOGRAPHIC_POINT, then for Use Case 1 (Validate Address) in Table 3, the Buyer **MUST** specify the Buyer Specified Address attribute using the “Unknown Address ID” method of a Geographic Point as described in section 8.9.5.
- [A2-R2]** If the Address Type is GEOGRAPHIC_POINT, then for Use Case 2 (Retrieve Address by Identifier) in Table 3, the Buyer **MUST** specify the Buyer Specified Address attribute using the “Known Address ID” method of a Geographic Point as described in section 8.9.5.
- [A2-R3]** If the Address Type is GEOGRAPHIC_ADDRESS_LABEL, then for Use Case 1 (Validate Address) in Table 3, the Buyer **MUST** specify the Buyer Specified Address attribute using the “Unknown Address ID” method of a Geographic Address Label as described in section 8.9.4.
- [A2-R4]** If the Address Type is GEOGRAPHIC_ADDRESS_LABEL, then for Use Case 2 (Retrieve Address by Identifier) in Table 3, the Buyer **MUST** specify the Buyer Specified Address attribute using the “Known Address ID” method of a Geographic Address Label as described in section 8.9.4.

Replace Table 14 with Table 14 below.

Attribute	Description	Type
Seller Response Code	A response identifier, indicating if the Seller was able to successfully fulfill the request. The detailed response options are for further study but include: Success, No Matching Addresses, and Too Many Records.	String
Buyer Specified Address	The address specified by the Buyer in the Buyer's request.	A Fielded Address as defined in section 8.9.2.1, or a Formatted Address as defined in section 8.9.3.1, Geographic Point as defined in section 8.9.5.1, or a Global Address Reference Geographic Address Label as defined in section 8.9.4.1.
Seller Verified Addresses	An array of zero or more Addresses known to the Seller that are considered by the Seller to match the Buyer Specified Address.	A list of either Fielded Addresses as defined in section 8.9.2.2, or Formatted Addresses as defined in section 8.9.3.2, Geographic Point as defined in section 8.9.5.2, or a Global Address Reference Geographic Address Label as defined in section 8.9.4.2.
The following attributes are returned per Seller Verified Address		
Address Has Public Sites	For each Address returned, this attribute specifies if that Address contains Service Sites that are public such as Meet-Me-Rooms at an interconnect location or a shared telecom room in the basement of a multi-tenant building.	Boolean
Address Allows New Sites	For each Address returned, this attribute specifies if a Buyer must use one of the known existing Service Sites at this location for any Products delivered to this Address. For example, if a particular building owner mandated that all interconnects be done in a shared Public Meet-Me-Room, this attribute would be set to False for that Address.	Boolean
Best Match	For each Address returned, this attribute specifies if the Seller believes this is the best match to the Buyer specified Address. Setting this to TRUE also represents that the Seller is confident this is likely a direct match to the Buyer Specified Address.	Boolean
If the Address Type is GEOGRAPHIC_ADDRESS_LABEL or GEOGRAPHIC_POINT, the Seller may return an Associated Address		
Associated Address	A Fielded Address that is associated with the Geographic Address Label or Geographic Point.	A Fielded Address as defined in section 8.9.2.2

Table 14 – Geographic Address Seller Response Attributes

Add the following requirements after R11.

[A2-R5] If the Address Type in the request was GEOGRAPHIC_ADDRESS_LABEL, any and all Seller Verified Addresses returned **MUST** be GEOGRAPHIC_ADDRESS_LABEL as specified in section 8.9.4.2.

[A2-R6] If the Address Type in the request was GEOGRAPHIC_POINT, any and all Seller Verified Addresses returned **MUST** be GEOGRAPHIC_POINT as specified in section 8.9.5.2.

- [A2-O1] If the Address Type in the request was GEOGRAPHIC_POINT or GEOGRAPHIC_ADDRESS_LABEL, the Seller **MAY** return an Associated address as specified in Table 14.

Note: when a Geographic Point is specified by the Buyer, the Seller will return either one Geographic Point and it will be the Best Match or an empty list. An empty list is returned when there is some error in the Latitude or Longitude submitted by the Buyer.

Note: when a Geographic Address Label is specified by the Buyer, the Seller will return one Geographic Address Label and it will always be the Best Match or an empty list. An empty list is returned when there is an error in the Geographic Address Label.

Add the following requirements after R12.

- [A2-R7] For Use Case 1 (Validate Address), the Seller Response Code indicating success **MUST** be returned when the Buyer's request passed all validations even if no matching addresses are found.
- [A2-R8] For Use Case 1 (Validate Address), if the Seller Response Code indicates success and no matching addresses are found, the Seller **MUST** return an empty Seller Verified Addresses list.
- [A2-R9] For Use Case 1 (Validate Address), the Seller Response Code indicating failure **MUST** be returned when a validation step fails.

Note: Validation of the Buyer's request is performed in the Seller's systems. The initial validation verifies that the structure of the request matches the API definition, and the business validation verifies that all necessary attributes are included in the request.

Add the following requirements after R16.

- [A2-R10] The Seller **MUST** include the Buyer Specified Address in their response.
- [A2-R11] The Buyer Specified Address **MUST** be identical to the address specified in the Buyer's request.

11 Changes to Section 8.2

Delete R24 and replace with the requirement below.

[A2-R12] For each Service Site returned, the Seller **MUST** specify at least one Service Site Location using either a Fielded Addresses, ~~or~~ a Formatted Address, a Geographic Point, or Geographic Address Label (Based on the default agreed upon by this Buyer/Seller pair).

12 Update to Section 8.4.1.1

Replace Table 21 with Table 21 below.

Attribute	Description	Type
Buyer POQ Item Attributes		
Product Offering Qualification Item Identifier	An identifier for this POQ item, which is unique within this POQ.	String
POQ Activity	The activity associated with this POQ item. INSTALL means that this POQ Item being evaluated is a completely new deployment. CHANGE means that this is a change to an existing Product (e.g. to increase the bandwidth). DISCONNECT means this is an evaluation of feasibility of disconnecting an existing Product (e.g. may not be feasible to disconnect a UNI without first disconnecting attached Access E-Lines)	String that is one of: <ul style="list-style-type: none"> • INSTALL • CHANGE • DISCONNECT
Product Identifier	The identifier of an in-service Product that an activity is being performed on. This field is only populated if an activity is being performed on (e.g. CHANGE or DISCONNECT in POQ Activity attribute) an existing Product.	String
Product Offering Identifier	The identifier for a particular Product Offering associated with this POQ Item. This identifier is unique to the Seller and is established between the Buyer and Seller prior to issuing any POQ requests.	String
Product Specific Attributes	The technical attributes for the Product that would be delivered to fulfill this POQ Item. This essentially specifies the values for attributes defined in the Product Specification. The detail of the Product Specification is for further study.	For further study.
Product Relationships	A list of other POQ Items in this POQ or existing Products that are related to the Product that would be delivered to fulfill this POQ Item.	A list of Product Relationships as defined in section 8.4.1.2.
POQ Item Location Type	The method used to describe the location at which this POQ Item is installed or is to be installed if this POQ Item is to be installed at a particular location.	String that is one of: <ul style="list-style-type: none"> • SERVICE_SITE_IDENTIFIER • FIELDDED_ADDRESS • FORMATTED_ADDRESS • GEOGRAPHIC_POINT • ADDRESS_REFERENCE • GEOGRAPHIC_ADDRESS_LABEL

POQ Item Location	The detailed location at which this POQ Item is installed or is to be installed if this POQ Item is to be installed at a particular location.	A Service Site Identifier, a Fielded Address as defined in section 8.9.2, a Formatted Address as defined in 8.9.3, a Global Address Reference Geographic Address Label as described in 8.9.4 or a Geographic Point as defined in 8.9.5.
POQ Item Location Contact	The person to call to get access to this Service Site in case such access is required to complete the evaluation of this POQ Item.	Contact information as described in 8.11.

Table 21 - Buyer POQ Item Attributes

13 Changes to Section 8.7

Delete requirement O9.

~~[O9] If the State Attribute is IN_PROGRESS or ABANDONED, the Seller **MUST NOT** specify the following attributes in Table 25: POQ Confidence Level, Installation Interval Unit, Installation Interval Value, Guaranteed Until, Termination Error and Alternate Product Proposals.~~

Add the following requirement.

[A2-R13] If the State Attribute is IN_PROGRESS or ABANDONED, the Seller **MUST NOT** specify the following attributes in Table 25: POQ Confidence Level, Installation Interval Unit, Installation Interval Value, Guaranteed Until, Termination Error, and Alternate Product Proposals.

14 Changes to Section 8.9.2.1

Add the following requirement after R91.

[A2-R14] The Known Address ID Method **MUST NOT** include any attributes other than Fielded Address Identifier.

15 Changes to Section 8.9.4

Change section 8.9.4 title to Specifying Geographic Address Label

Replace Table 34 with Table 34 below.

Attribute	Description	Type
Administrative Authority Address Label	The unique reference to an Address.	String
Administrative Authority	The organization or standard from that organization that administers this Global Address Reference Geographic Address Label ensuring it is globally unique within the Administrative Authority.	String
Global Address Reference Geographic Address Seller Identifier	The Seller's Identifier for this Geographic Address Label	String

Table 34 - ~~Global Address Reference~~ Geographic Address Label Attributes

Add text after Table 34.

Note: the Geographic Address Label Administrative Authority is agreed to by the Buyer and Seller during on-boarding. The Geographic Address Label may use Telecodes, Common Language Location Identifier (CLLI) codes, or other methods as Administrative Authority Address Label.

Add section 8.9.4.1 after Table 34.

8.9.4.1 Specification of Geographic Address Label by Buyer

There are two ways in which a Buyer can specify a Geographic Address Label.

- Initially, a Buyer will not know the Seller's unique Geographic Address Seller Identifier for the Address. In this case, they use the "Unknown Address ID" method.
- After a successful Address Operation using the "Unknown Address ID" method, the Buyer may become aware of the Seller's unique Geographic Address Seller Identifier for the Address. In this case, they can use the "Known Address ID" method.

Delete R99.

~~[[R99] — When specifying a Geographic Address Identifier, the Buyer or Seller MUST specify all of the attributes in Table 34.~~

Add the following requirements after R99.

[A2-R15] When a Buyer specifies a Geographic Address Label, the Buyer **MUST** either use the Unknown Address ID Method or the Known Address ID method.

[A2-R16] If the Buyer is using the Unknown Address ID method to specify a Geographic Address Label, the Buyer **MUST** specify the Administrative

Authority Address Label and Administrative Authority attributes in Table 34.

[A2-R17] If the Buyer is using the Unknown Address ID method to specify a Geographic Address Label, the Buyer **MUST NOT** specify the Geographic Address Seller Identifier in Table 34.

[A2-R18] If the Buyer is using the Known Address ID method to specify a Geographic Address Label, the Buyer **MUST** specify the Geographic Address Seller Identifier attribute in Table 34.

[A2-R19] If the Buyer is using the Known Address ID method to specify a Geographic Address Label, the Buyer **MUST NOT** specify any of the other attributes in Table 34.

Add section 8.9.4.2.

8.9.4.2 Specification of Geographic Address Label by Seller

[A2-D1] When specifying a Geographic Address Label, the Seller **SHOULD** specify the Geographic Address Seller Identifier in Table 34.

[A2-R20] When specifying a Geographic Address Label, the Seller **MUST** specify the Geographic Address Label and Administrative Authority attributes in Table 34.

[A2-O2] When specifying a Geographic Address Label, the Seller **MAY** specify a Fielded Address associated with the Geographic Address Label.

16 Changes to Section 8.9.5

Replace Table 35 with Table 35 below.

Attribute	Description	Type
Geographic Point Identifier	Identifier of the Geographic Point that is unique within this Seller	String
Spatial Reference	A standardized coordinate-based local, regional, or global system used to locate geographical entities.	String
Latitude	The latitude of the location using the format required by the Spatial Reference system.	String
Longitude	The longitude of the location using the format required by the Spatial Reference system.	String
Elevation	The elevation of the location using the format required by the Spatial Reference system.	String

Table 35 – Geographic Point Attributes

Add Section 8.9.5.1.

8.9.5.1 Specification of Geographic Point by Buyer

There are two ways in which a Buyer can specify a Geographic Point.

- Initially, a Buyer will not know the Seller’s unique Geographic Point Identifier for the Address. In this case, they use the “Unknown Address ID” method.
- After a successful Address Validation using the “Unknown Address ID” method, the Buyer may become aware of the Seller’s unique Geographic Point Identifier for the Address. In this case, they can use the “Known Address ID” method.

Delete R100.

~~[R100] — When specifying a Geographic Point, the Buyer or Seller **MUST** specify all the attributes in Table 35.~~

Add the following requirements after R100.

[A2-R21] The Buyer and Seller **MUST** agree to the level of accuracy of the Latitude, Longitude, and Elevation.

[A2-R22] When a Buyer specifies a Geographic Point, the Buyer **MUST** either use the Unknown Address ID Method or the Known Address ID method.

[A2-R23] If the Buyer is using the Unknown Address ID method to specify Geographic Point, the Buyer **MUST NOT** specify the Geographic Point Identifier in Table 35.

[A2-R24] If the Buyer is using the Unknown Address ID method to specify a Geographic Point, the Buyer **MUST** specify the following attributes in Table 35, Spatial Reference, Latitude, Longitude.

- [A2-O4] If the Buyer is using the Unknown Address ID method to specify a Geographic Point, the Buyer **MAY** specify the Elevation as shown in Table 35.
- [A2-R25] If the Buyer is using the Known Address ID method to specify a Geographic Point, the Buyer **MUST** specify the Geographic Point Identifier in Table 35.
- [A2-R26] If the Buyer is using the Known Address ID method to specify a Geographic Point, the Buyer **MUST NOT** specify any of the other attributes in Table 35.

Add section 8.9.5.2.

8.9.5.2 Specification of Geographic Point by Seller

- [A2-D2] When specifying a Geographic Point, the Seller **SHOULD** specify the Geographic Point Identifier in Table 35.
- [A2-R27] When specifying a Geographic Point, the Seller **MUST** specify the following attributes in Table 35: Spatial Reference, Latitude, Longitude.
- [A2-O5] When specifying a Geographic Point, the Seller **MAY** specify the Elevation as shown in Table 35.
- [A2-O6] When specifying a Geographic Point, the Seller **MAY** specify a Fielded Address associated with the Geographic Point.

17 Changes to Section 8.10

Replace Table 36 with Table 36 below.

Attribute	Description	Type
Service Site Location Type	The method used to describe the location of this Service Site.	String that is one of: <ul style="list-style-type: none">• FIELDDED_ADDRESS• FORMATTED_ADDRESS• GEOGRAPHIC_POINT• GEOGRAPHIC_ADDRESS_LABEL
Service Site Location	The detailed location of this Service Site	A Fielded Address as defined in section 8.9.2, a Formatted Address as defined in 8.9.3, a Global Address Reference Geographic Address Label as described in 8.9.4 or a Geographic Point as defined in 8.9.5.

Table 36 – Service Site Location

Delete text and R101, R102, and R103.

~~The following requirements apply to both a Buyer and a Seller when specifying a Service Site Location.~~

~~[R101] The Buyer or Seller **MUST** specify the Service Site Location Type attribute in Table 36.~~

~~[R102] If the Service Site Location type is ADDRESS_REFERENCE, then the Buyer or Seller **MUST** specify the Service Site Location attribute in Table 36 using a Global Address Reference as defined in section 8.9.4.~~

~~[R103] If the Service Site Location type is GEOGRAPHIC_POINT, then the Buyer or Seller **MUST** specify the Service Site Location attribute in Table 36 using a Geographic Point as defined in section 8.9.5.~~

18 Changes to Section 8.10.1.1

Add the following requirements after R105.

- [A2-R28] If the Service Site Location type is GEOGRAPHIC_ADDRESS_LABEL, then the Buyer **MUST** specify the Service Site Location attribute in Table 36 using a Geographic Address Label as defined in section 8.9.4.1.
- [A2-R29] If the Service Site Location type is GEOGRAPHIC_POINT, then the Buyer **MUST** specify the Service Site Location attribute in Table 36 using a Geographic Point as defined in section 8.9.5.1.

19 Changes to Section 8.10.1.2

Add the following requirements after R107.

- [A2-R30] If the Service Site Location type is GEOGRAPHIC_ADDRESS_LABEL , then the Seller **MUST** specify the Service Site Location attribute in Table 36 using a Geographic Address Label as defined in section 8.9.4.2.

- [A2-R31] If the Service Site Location type is GEOGRAPHIC_POINT, then the Seller **MUST** specify the Service Site Location attribute in Table 36 using a Geographic Point as defined in section 8.9.5.2.

20 Add Appendix A

Add Appendix A to the document after the References.

Appendix A Explanation of Address Validation, Site Retrieval, and Product Offering Qualification

The purpose of this appendix is to provide an explanation of how Address Validation, Site Retrieval, and Product Offering Qualification are used by a Buyer to determine if a Seller can support one or more products at a specific address. The appendix is broken down into three sections, Address Validation, Site Retrieval, and Product Offering Qualification.

Address Validation is used by the Buyer to ensure that the Buyer and Seller are referring to the same location using the same terms. As an example, 123 Main St, Anytown, Anycountry might be reflected as 123 Main Street, Anytown, Anycountry in the Seller's systems and as 123 Main, Anytown, Anycountry in the Buyer's systems (and is what the end-customer provided to the Buyer). To successfully obtain a POQ, Quote, or place an Order for a Product, the Buyer needs to specify the address as reflected in the Seller's systems. The Seller may assign an identifier to the address within their systems and the Buyer can use this identifier to refer to the address going forward.

Site Retrieval allows the Buyer to determine if there is already a site, as defined by the Seller, at the address. The Buyer requests a list of sites at an address or if the Site identifier is known, may ask for details on that site.

Product Offering Qualification is used by the Buyer to determine if the Seller supports the desired Product at the address specified by the end-customer.

It is important to understand that none of the above steps are mandated. A Buyer may skip any or all of Address Validation, Site Retrieval, and Product Offering Qualification. The Buyer may submit a Quote or Product Order request to the Seller using the end-customer provided address and for a Product Offering that they believe the Seller offers. Errors in the information contained in these requests might result in the Seller rejecting the request.

Each of the steps described in this appendix are discussed in the following sections.

A.1 Address Validation

This section provides details on why and when a Buyer performs Address Validation. Figure A2-2 provides a high-level view of Address Validation.

Sonata Interface Address Validation



Figure A2-2 – Sonata Interface Address Validation

When a Buyer receives a request from their customer for a particular product or set of products to a location that the Buyer cannot service directly, they need to determine if a partner can provide a product or set of products at that location that will allow the Buyer to meet their customer's needs.

The first step in this process may be to validate the address provided to the Buyer by their end-customer. This address validation does not determine if the Seller offers the products the Buyer wants to order at the location, it only validates that the Seller understands and knows the location as specified by the Buyer. Since there are often different representations of the same address, as an example the address 123 Main Street might be known as 123 Main Street, 123 Main St, or 123 Main. The Buyer sends a request with the address as they know it to the Seller and the Seller returns possible matches that the Buyer can select from, including the Formatted or Fielded Address Identifier for each.

There are cases where a location is not identifiable by a street address. To resolve this, the Buyer may need to use a Geographic Point to identify the location of interest. The Buyer requests Address Validation based on the Geographic Point and the Seller returns the Geographic Point Identifier for that location.

The Buyer may use a standard Geographic Address Label that identifies a location. The Buyer requests Address Validation based on the Geographic Address Label and the Seller returns the Geographic Address Seller Identifier for that location.

Each Address Type (Formatted, Fielded, Geographic Point, or Geographic Address Label) may have an Identifier for the address within the Seller’s systems. The Address Type returned by the Seller matches the Address Type in the Buyer’s request.

Regardless of the address format used by the Buyer, Fielded Address, Formatted Address, Geographic Point, or Geographic Address Label, when the Address Validation process is completed, the Buyer knows how the address appears in the Seller’s systems and may have an identifier of the address for the location as it is known by the Seller.

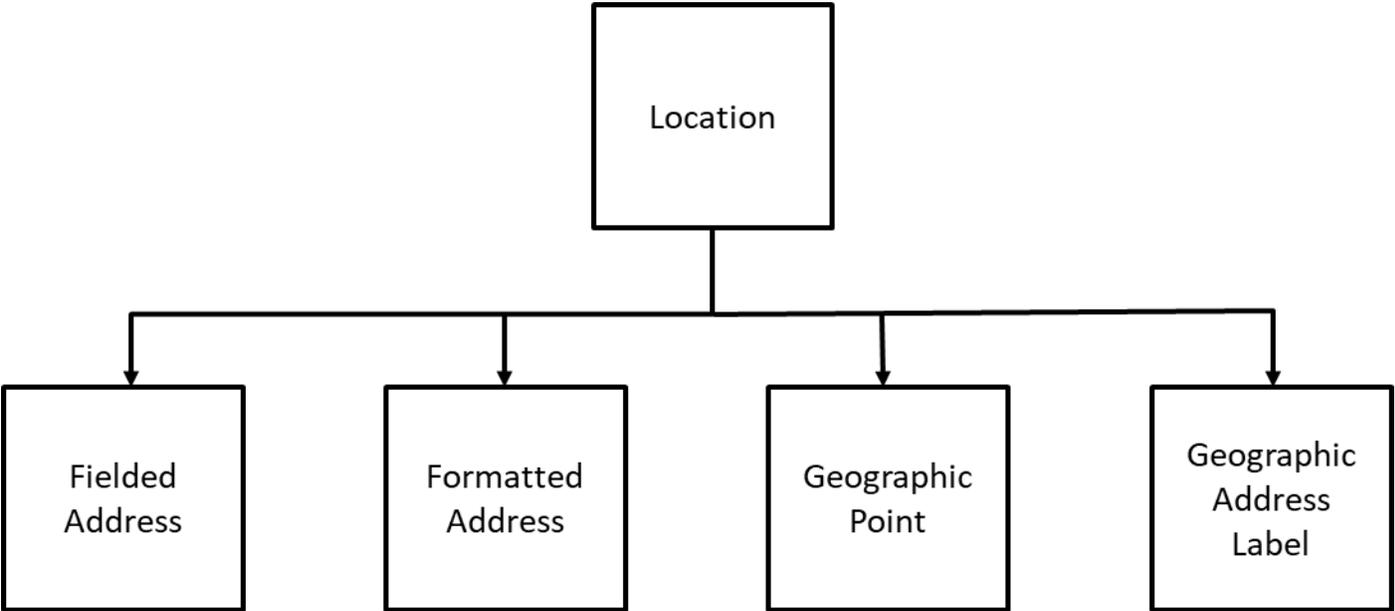


Figure A2-3 – Location and Address Relationship

The relationship between Location and Address is shown above. A Location has one or more Addresses. A Location can be identified by any combination of the Address Types.

If the Buyer is familiar with the location and the Seller’s ID for the location or does not desire to validate the address, they may omit this step in the process.

A.2 Site Retrieval

A Site within a Seller’s network normally represents a location where the Seller has already delivered one or more products. A Site Identifier is assigned at some point by the Seller to reference the location. A Site may be reflected by one or more types of addresses.

Once the Seller’s Address for a location is known, the Buyer is able to retrieve details about the location by retrieving the site(s) for the location. Figure A2-4 shows a high-level view of the Site Retrieval process.

Sonata Interface Site Retrieval

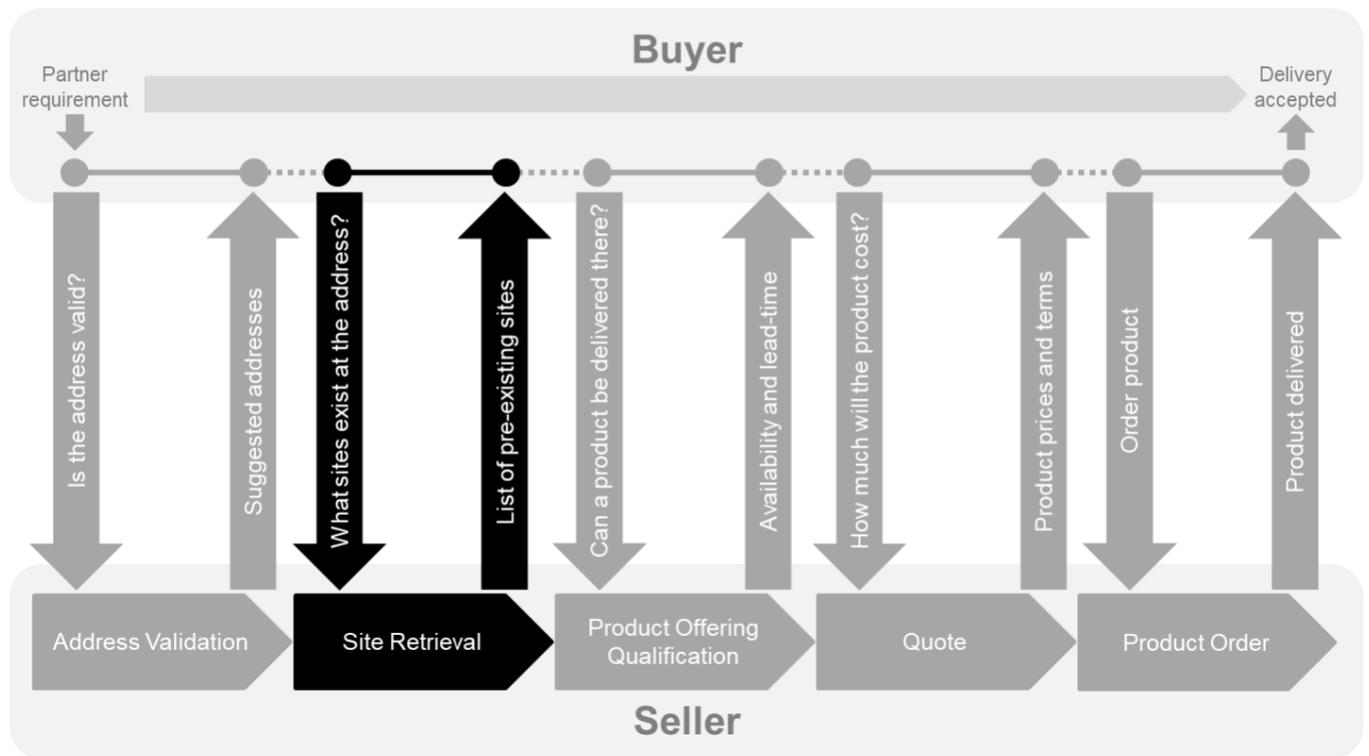


Figure A2-4 – Sonata Interface Site Retrieval

Before the Buyer can request that the Seller performs a Product Offering Qualification, they may need to obtain details on the site. These details can include whether the site is public or private, room and floor information, contacts for the site, a description of the site, and additional details. Section 8.2 of MEF 79 [3] provides more information on the Service Site details.

One example of why a Buyer may need to perform a Site Retrieval prior to submitting a Product Offering Qualification Request is to determine if that site is Public, meaning that the Seller is willing to provide service to any end-customer at the site, or Private, meaning that the end-customers that the Seller will provide service to at that site are limited.

Public sites are often located in a common area at a Location, such as a basement, where all end-customers at that Location can be accessed. Normally, all Public sites at a Location will be included in the list of sites returned by the Seller in response to the Buyers Retrieve Site request.

Private sites are dedicated to a single end-customer and cannot be shared with other end-customers at that Location. The Seller cannot connect a Buyer to the Private site without the permission of the end-customer. Normally, a Private site will not be included in the list of sites at a Location returned by the Seller in response to the Buyers Retrieve Site request unless the Buyer is authorized to view the Private sites at that Location.

The relationship between Sites, Locations, and Addresses is shown in Figure A2-5.

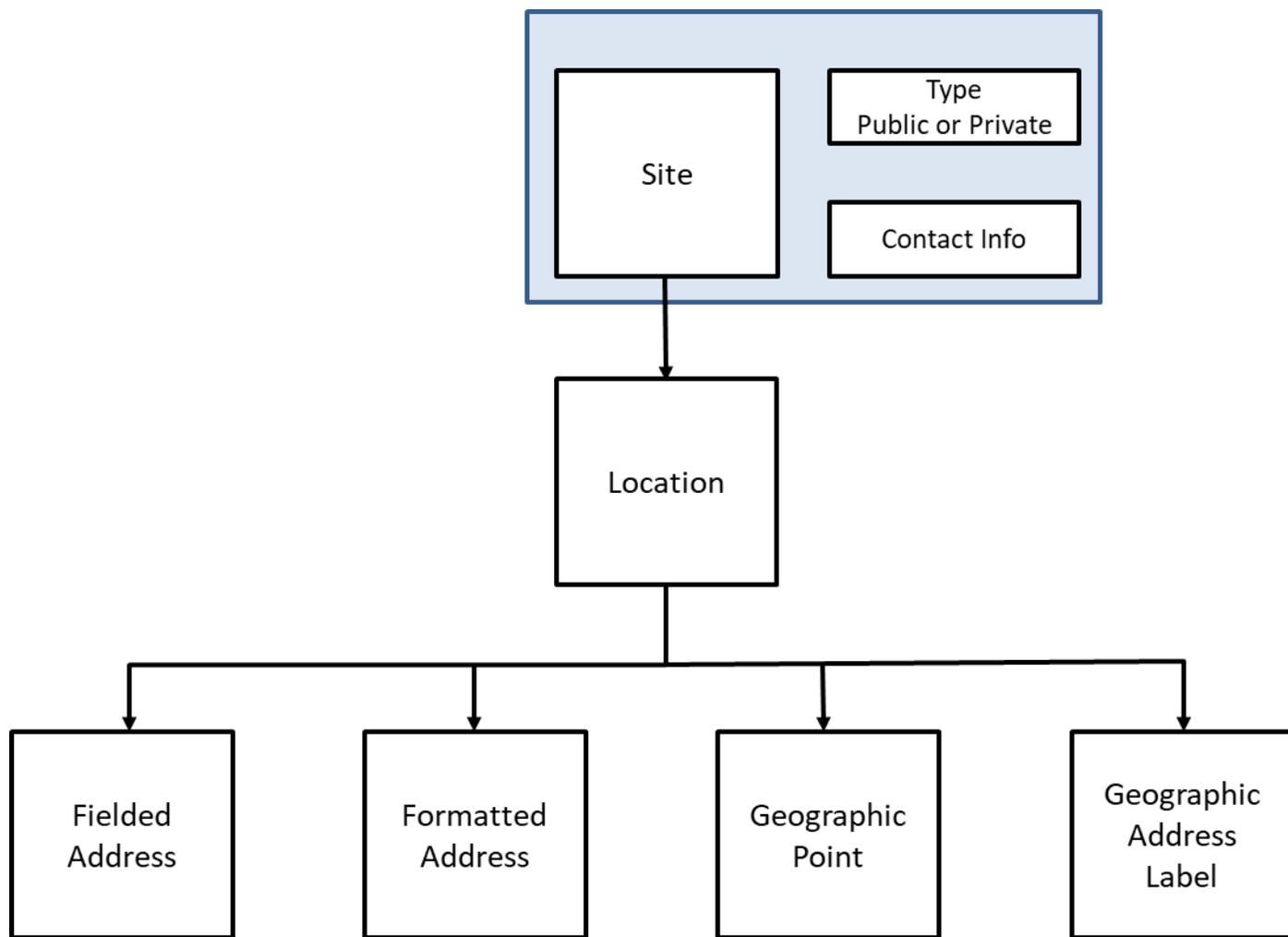


Figure A2-5 – Site, Location, and Address Relationship

Figure A2-5 shows how the Site, Location, and Address are related. The description of the Site includes the Type (Public or Private), the Contact for the Site, and the Location of the Site. One or more Sites may exist at a Location. The Location is identified by the Address of the Location.

If the Buyer is familiar with this site and the Seller’s representation of it or do not desire to verify the site, they may omit this step in the process.

A.3 Product Offering Qualification

A Buyer may need to determine if the Seller can provide the desired product or products at a location. Figure A2-6 shows a high-level view of the Product Offering Qualification process.

Sonata Interface Product Offering Qualification

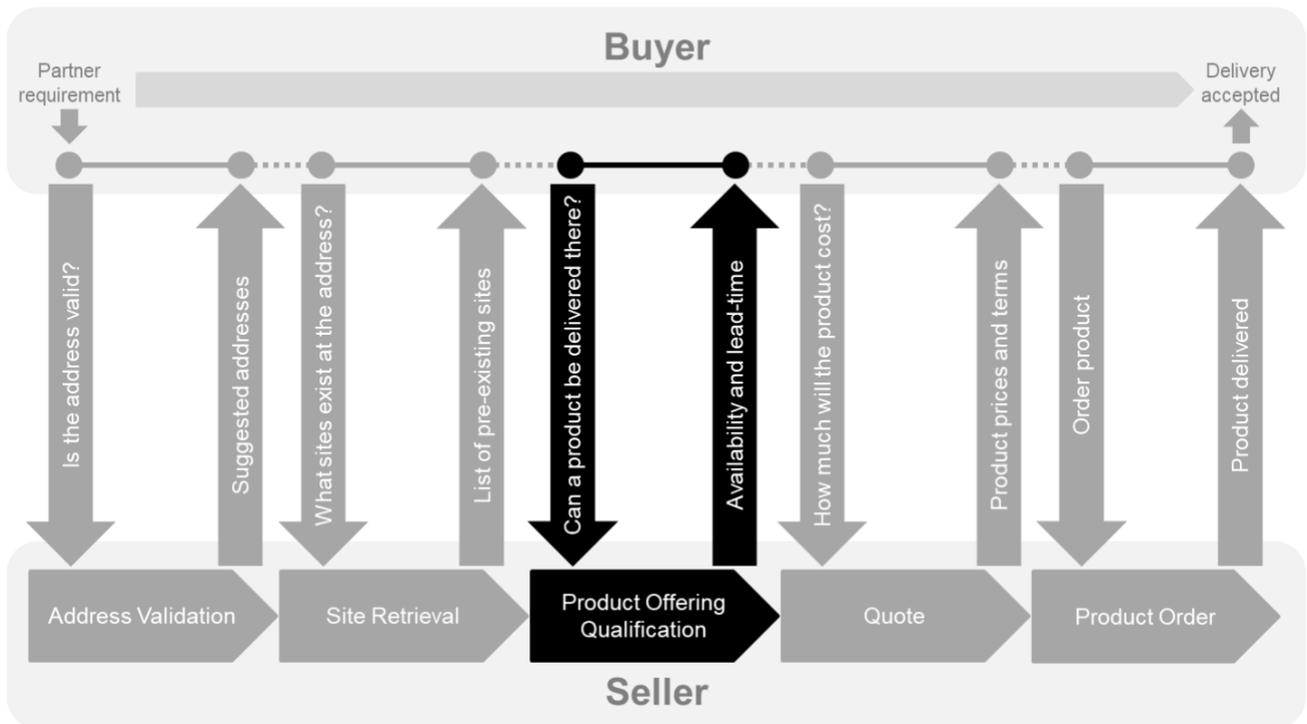


Figure A2-6 – Sonata Interface Product Offering Qualification

The Product Offering Qualification verifies that the specific Product Offering can be supported at the customer address. The Buyer submits a POQ Request that includes the desired Product or Product Offering, product specific attributes, and the location(s) for the Product or Product Offering. The Seller's response indicates to the Buyer if they can deliver the specified Product Offering at the specified location(s) and provides a best-case interval for delivering the Product Offering. If the Seller cannot deliver the specified Product Offering, they may offer alternative Product Offerings to the Buyer in their response.

21 References

- [1] Internet Engineering Task Force RFC 2119, *Key words for use in RFCs to Indicate Requirement Levels*, March 1997
- [2] Internet Engineering Task Force RFC 8174, *Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words*, May 2017
- [3] MEF 79, *Address, Service Site, and Product Offering Qualification Management Requirements and Use Cases*, November 2019