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Telecommunications
Engineers***

**ENGINEERING COMMITTEE
Interface Practices Subcommittee**

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Graphic Symbols for Cable Systems

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1. Introduction

1.1. Executive Summary

1.1.1. *Basic Considerations*

The symbols for devices do not indicate types or model numbers of any manufacturer. They represent the function of the device operated within a cable system. The symbols permit easy addition of model or type numbers within or near their outline. If such model or type designations are used, an explanation of these designations should be placed on a legend sheet for the drawing on which the symbols appear.

1.1.2. *Proposed Drafting Practices*

The orientation of a symbol on a drawing, including a mirror image presentation, does not alter the meaning of the symbol.

Line width does not affect the meaning of a symbol. In specific cases, a wider line may be used for emphasis. Generally, lines must be made sufficiently wide to avoid loss of resolution during photocopy reduction.

Symbols shown in this text are in the approximate correct size and proportion. This relationship should be maintained as nearly as possible on any particular drawing regardless of the symbol scale.

Symbols may be drawn to any proportional size that suits a particular drawing, depending upon reduction or enlargement anticipated. If essential for purposes of contrast, some symbols may be drawn relatively smaller than the other symbols on a drawing. The Standard recommends the use of no more than two sizes on a given drawing.

For simplification or clarification of a drawing, parts of a symbol for devices, such as amplifiers, may be separated. If this is done, suitable designations to show proper correlation of the parts must be provided.

1.2. Scope

The scope of this documentation is to illustrate the symbols recommended for Telecommunication drafting needs. It also provides recommendations for attributes both visible on the drafted map as well as embedded in the symbol when building a database mapping application. This will provide better data capturing and provide a better source of record for internal and external users.

It will provide much better benefit when moving to a mobile solutions to our boundary partners. With the need for a cleaner and more intuitive maps the data captured is needed in more granular detail of information with embedded attributes or extended symbol attributes which allows for more comprehensive data. Due to the necessary crowding of symbols onto telecommunication system mapping and grid diagrams, some symbols are structured differently than those used in electrical and electronic diagrams

1.3. Benefits

The need for this is to provide a much better view at the system drafted maps and provide the designers and drafters a consistent input. This will support when developing a Rulebook for their drafting application that would assist in developing drafting standards and rules.

The benefit using this will assistance to make better engineering decisions, help with reports and easier to make transitions into other tools that rely on consistence data integrity. It also provides the benefit to make the data more consistence across the industry.

The benefits for this are long term this is a living and growing document. It will constantly grow and change but the core symbols and fundamentals are mostly consistence, attribute could change more often which would help streamline data input and improve reporting and decision planning.

The benefit for this on the industry would help align all companies with more consistency, support job sharing with Design and Drafting within markets, aid the field technicians both locally and when traveling to another market and this will help with joining forces when companies need to come together and provide tie points for national backbone connections

1.4. Intended Audience

The intended audience initially for this would be for the Design & Drafting then all Field personnel with a mobile mapping viewer (or plotted maps when needed), Business Services, Dispatch, Network Operation Centers, as the data is captured and consistently placed the more need for other departments will rely on this data.

1.5. Areas for Further Investigation or to be Added in Future Versions

Areas that will need to be further investigated would be the attribute needed or required for each symbol. As newer technology is introduced we will need to update the type of symbols and attributes required.

2. Normative References

The following documents contain provisions, which, through reference in this text, constitute provisions of this document. At the time of Subcommittee approval, the editions indicated were valid. All documents are subject to revision; and while parties to any agreement based on this document are encouraged to investigate the possibility of applying the most recent editions of the documents listed below, they are reminded that newer editions of those documents might not be compatible with the referenced version.

2.1. SCTE References

- No informative references are applicable.

2.2. Standards from Other Organizations

- No normative references are applicable.

2.3. Published Materials

- No normative references are applicable.

3. Informative References

The following documents might provide valuable information to the reader but are not required when complying with this document.

- No normative references are applicable.

3.1. SCTE References

- No informative references are applicable.

3.2. Standards from Other Organizations

- No informative references are applicable.

3.3. Published Materials

- No informative references are applicable.

4. Compliance Notation

<i>shall</i>	This word or the adjective “ required ” means that the item is an absolute requirement of this document.
<i>shall not</i>	This phrase means that the item is an absolute prohibition of this document.
<i>forbidden</i>	This word means the value specified shall never be used.
<i>should</i>	This word or the adjective “ <i>recommended</i> ” means that there may exist valid reasons in particular circumstances to ignore this item, but the full implications should be understood and the case carefully weighted before choosing a different course.
<i>should not</i>	This phrase means that there may exist valid reasons in particular circumstances when the listed behavior is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behavior described with this label.
<i>may</i>	This word or the adjective “ <i>optional</i> ” means that this item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because it enhances the product, for example; another vendor may omit the same item.
<i>deprecated</i>	Use is permissible for legacy purposes only. Deprecated features may be removed from future versions of this document. Implementations should avoid use of deprecated features.

5. Abbreviations and Definitions

5.1. Abbreviations

Aer	Aerial
Amp	Amplifier
APC	Angled Physical Contact
BNC	Bayonet Neill–Concelman
Cab	Cabinet
CB	(Cox) Business Customer
CLLI	Common Language Location Identifier
CPE	Customer Premise Equipment
dB	Decibel
EDFA	Erbium-Doped Fiber Amplifier
EMT	Electric Metallic Tube
Ftg	Footage

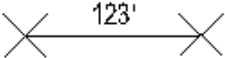
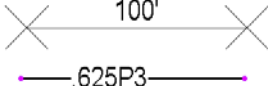
FTTX	Fiber To The X (Service Area)
GHz	Gigahertz
GIG	Gigabit
ITU	International Telecommunication Union
km	Kilometer
LCP	Local Convergence Point
m	Meter
MDU	Multiple Dwelling Unit
mi	Mile
MN	Micro Node
NAP	Network Access Point
NE	Network Element Name
NIU	Network Interface Unit
OCC	Optical Cross Connect
ODN	Optical Distribution Network
OLT	Optical Line Terminal
ONU	Optical Network Unit
OTE	Optical Terminal Enclosure
OTN	Optical Transition Node
PON	Passive Only Network
PS	Power Supply
RC	Reverse Conditioner
Regen	Regeneration
Resi	Residential Customer
RF	Radio Frequency
RFOG	RF Over Glass
RME	Rack Mounted Equipment
RX	Receive Transmitter
SC	Snap in Connector
SCTE	Society of Cable Telecommunications Engineers
TA	Terminal Access
TE	Terminal Enclosure
Telco	Telecommunication
TX	Transmitter
U/G	Underground
UPC	Ultra Physical Contact
WiFi	Wireless Device

5.2. Definitions

Poles	To support Aerial Route Network
Underground Route	Show where underground routing is located
Pedestals/Vaults	Underground structures to house equipment
Guys/Anchors	Helps support and guide the Aerial Route Network
Riser	Displays where Aerial to Underground transitions
Conduit	Tubing that is placed to housed and protect the network
Amplifier	Amplifies the RF signal in the network
Splitter/Coupler	A device to divide a single line network into two or three
Optical Node	A device to receive lightwaves and convert to RF

Channel Inserter	A device to remove a certain channel and insert local channel
Optical Splitter	A device to divide a single line network into two to many
Rack Mounted Equipment (RME)	Used to display the connects from the Inside network to the field network

6. Pole Types

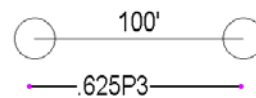
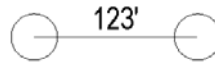
1. Power Pole	Object	Example	Drafted Example
			
Power Pole Attributes: • Construction Status • Type • Owner • Cox Pole Tag Number • Power Pole Tag • Telco Pole Tag • Attachments • Drop pole • Extension Arm • Ground Status • Ground Type • Material Type • Pole Config. Type • Latitude • Longitude • Mountable? Example - True/False - To place a WiFi or Small Cell Device • Location Number • Grid Number • Date Installed • Application Number			
Alternative Symbols:			

2. Telephone Pole

Object

Example

Drafted Example

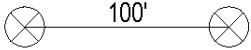
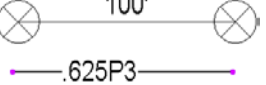


Telephone Pole Attributes:

- Construction Status
- Type
- Owner
- Cox Pole Tag Number
- Power Pole Tag
- Telco Pole Tag
- Attachments
- Drop pole
- Extension Arm
- Ground Status
- Ground Type
- Material Type
- Pole Config. Type
- Latitude
- Longitude
- Mountable?
- Location Number
- Grid Number
- Date Installed
- Application Number

Example - True/False - To place a WiFi or Small Cell Device

Alternative Symbols:

3. Joint Use Pole (Power and Telephone)	Object	Example	Drafted Example
			
Joint Pole Attributes:			
• Construction Status • Type • Owner • Cox Pole Tag Number • Power Pole Tag • Telco Pole Tag • Attachments • Drop pole • Extension Arm • Ground Status • Ground Type • Material Type • Pole Config. Type • Latitude • Longitude • Mountable? • Location Number • Grid Number • Date Installed • Application Number			
Alternative Symbols:			

Example - True/False - To place a WiFi or Small Cell Device

4. Cable System Pole

Object

Example

Drafted Example



123'



100'



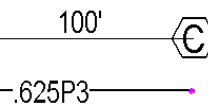
.625P3

Cable Pole Attributes:

- Construction Status
- Type
- Owner
- Cox Pole Tag Number
- Power Pole Tag
- Telco Pole Tag
- Attachments
- Drop pole
- Extension Arm
- Ground Status
- Ground Type
- Material Type
- Pole Config. Type
- Latitude
- Longitude
- Mountable?
- Location Number
- Grid Number
- Date Installed
- Application Number

Example - True/False - To place a WiFi or Small Cell Device

Alternative Symbols:

5. Concrete Pole	Object	Example	Drafted Example
Concrete Pole Attributes: • Construction Status • Type • Owner • Cox Pole Tag Number • Power Pole Tag • Telco Pole Tag • Attachments • Drop pole • Extension Arm • Ground Status • Ground Type • Material Type • Pole Config. Type • Latitude • Longitude • Mountable? Example - True/False - To place a WiFi or Small Cell Device • Location Number • Grid Number • Date Installed • Application Number		123'	
Alternative Symbols:			

6. Steel Pole

Object

Example

Drafted Example



123'



100'



.625P3

Steel Pole Attributes:

- Construction Status
- Type
- Owner
- Cox Pole Tag Number
- Power Pole Tag
- Telco Pole Tag
- Attachments
- Drop pole
- Extension Arm
- Ground Status
- Ground Type
- Material Type
- Pole Config. Type
- Latitude
- Longitude
- Mountable?
- Location Number
- Grid Number
- Date Installed
- Application Number

Example - True/False - To place a WiFi or Small Cell Device

Alternative Symbols:

7. Fiber Reinforced Pole	Object	Example	Drafted Example
Fiber Reinforced Pole Attributes: • Construction Status • Type • Owner • Cox Pole Tag Number • Power Pole Tag • Telco Pole Tag • Attachments • Drop pole • Extension Arm • Ground Status • Ground Type • Material Type • Pole Config. Type • Latitude • Longitude • Mountable? • Location Number • Grid Number • Date Installed • Application Number Alternative Symbols:		Example - True/False - To place a WiFi or Small Cell Device	

8. Power Transformer Pole	Object	Example	Drafted Example
Power Transformer Pole Attributes: • Construction Status • Type • Owner • Cox Pole Tag Number • Power Pole Tag • Telco Pole Tag • Attachments • Drop pole • Extension Arm • Ground Status • Ground Type • Material Type • Pole Config. Type • Latitude • Longitude • Mountable? Example - True/False - To place a WiFi or Small Cell Device • Location Number • Grid Number • Date Installed • Application Number			
Alternative Symbols:			

9. Joint Use With Power Transformer Pole

Object



Example



123'



Drafted Example



100'



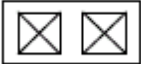
.625P3

Joint Use With Power Transformer Pole Attributes:

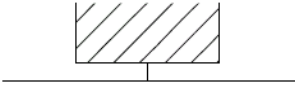
- Construction Status
- Type
- Owner
- Cox Pole Tag Number
- Power Pole Tag
- Telco Pole Tag
- Attachments
- Drop pole
- Extension Arm
- Ground Status
- Ground Type
- Material Type
- Pole Config. Type
- Latitude
- Longitude
- Mountable?
- Location Number
- Grid Number
- Date Installed
- Application Number

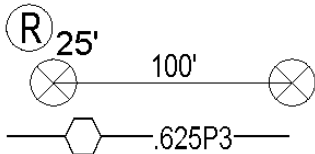
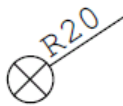
Example - True/False - To place a WiFi or Small Cell Device

Alternative Symbols:

10. Power Transformer Platform	Object	Example	Drafted Example
			
Power transformer Platform Attributes:			
• Construction Status • Type • Owner • Cox Pole Tag Number • Power Pole Tag • Telco Pole Tag • Attachments • Drop pole • Extension Arm • Ground Status • Ground Type • Material Type • Pole Config. Type • Latitude • Longitude • Mountable? • Location Number • Grid Number • Date Installed • Application Number			
Alternative Symbols:			
		Example - True/False - To place a WiFi or Small Cell Device	

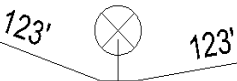
11. Transmission Line Contact	Object	Example	Drafted Example
			
Transmission Line Contact Attributes:			
• Construction Status • Type • Owner • Cox Pole Tag Number • Power Pole Tag • Telco Pole Tag • Attachments • Drop pole • Extension Arm • Ground Status • Ground Type • Material Type • Pole Config. Type • Latitude • Longitude • Mountable? • Location Number • Grid Number • Date Installed • Application Number			
Alternative Symbols:			
		Example - True/False - To place a WiFi or Small Cell Device	

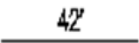
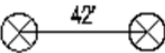
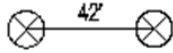
12. Other Support Type Structures	Object	Example	Drafted Example
			
Other Support Attributes:			
• Construction Status • Type • Owner • Cox Pole Tag Number • Power Pole Tag • Telco Pole Tag • Attachments • Drop pole • Extension Arm • Ground Status • Ground Type • Material Type • Pole Config. Type • Latitude • Longitude • Mountable? Example - True/False - To place a WiFi or Small Cell Device • Location Number • Grid Number • Date Installed • Application Number			
Alternative Symbols:			

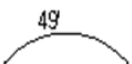
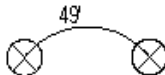
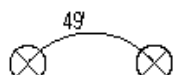
13. Riser Pole With Footage	Object	Example	Drafted Example
			
Riser Pole Attributes:			
• Construction Status • Height			
Alternative Symbols:			
			

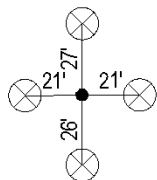
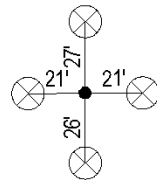
14. Drop Pole	Object	Example	Drafted Example
	DP 		
Drop Pole Attributes: • Construction Status • Type • Owner • Cox Pole Tag Number • Power Pole Tag • Telco Pole Tag • Attachments • Drop pole • Extension Arm • Ground Status • Ground Type • Material Type • Pole Config. Type • Latitude • Longitude • Mountable? Example - True/False - To place a WiFi or Small Cell Device • Location Number • Grid Number • Date Installed • Application Number			
Alternative Symbols: 			
NOTES: In this section, riser and drop poles are shown as joint use because this occurs most frequently. Unless otherwise specified, the standard considers wooden poles. The Standard states that unless otherwise specified on drawings or referenced documents, pole usage and ownership are the same. For modification, a designation may be shown adjacent to the pole symbol.			

7. Cable Support Elements

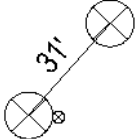
1. Extension Arm (Telecommunication Industry)	Object	Example	Drafted Example
			
Extension Arm Attributes: • Construction Status • Specification • Size • Type/Material • Model # • Manufacture (This could be tracked by Spec) Alternative Symbols:			

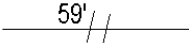
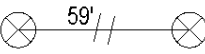
2. Tension Strand (Aerial Strand Route)	Object	Example	Drafted Example
			
Tension Strand Attributes: • Construction Status • Measure Length • Calculated Length • Drop Route? • Guy Type • Current Tension • Strand Size • Grounded Alternative Symbols:			

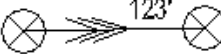
3. Slack Span	Object	Example	Drafted Example
			
Slack Span Attributes: • Construction Status • Measure Length • Calculated Length • Strand Size			
Alternative Symbols:			

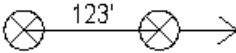
4. Mid Span Crossover	Object	Example	Drafted Example
			
Mid Span Crossover Attributes: • Construction Status • Type			
Alternative Symbols:			
Note: In this section, Poles are shown as Joint because this occurs most frequently			

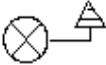
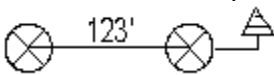
8. Anchoring and Guying

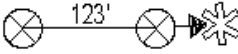
1. Push Brace	Object	Example	Drafted Example
			
Push Brace Attributes: • Construction Status • Type • Size • Material			
Alternative Symbols:			

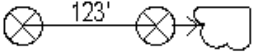
2. OverHead Guy	Object	Example	Drafted Example
			
OverHead Guy Attributes: • Construction Status • Type			
Alternative Symbols:			

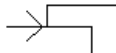
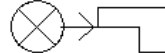
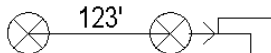
3. Pole to Pole Guy	Object	Example	Drafted Example
			
Pole to Pole Guy Attributes: • Construction Status • Type			
Alternative Symbols:			

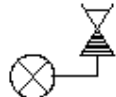
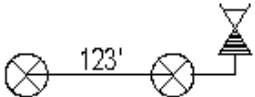
4. Down Guy With Anchor	Object	Example	Drafted Example
			
Down Guy With Anchor Attributes: • Construction Status • Type Alternative Symbols: 			

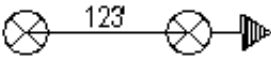
5. Side Walk Down Guy with Anchor - Existing	Object	Example	Drafted Example
			
Side Walk Down Guy with Anchor Attributes: • Construction Status • Type Alternative Symbols:			

6. Tree Guy	Object	Example	Drafted Example
			
Tree Guy Attributes: • Construction Status • Type Alternative Symbols:			

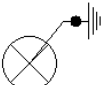
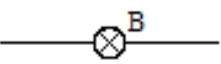
7. Rock Guy	Object	Example	Drafted Example
			
Rock Guy Attributes: • Construction Status • Type Alternative Symbols: 			

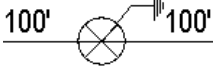
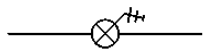
8. Building Guy	Object	Example	Drafted Example
			
Building Guy Attributes: • Construction Status • Type Alternative Symbols: 			

9. Set Cable Anchor	Object	Example	Drafted Example
			
- used for SideWalk CATV Set Cable Anchor Attributes: • Construction Status • Type Alternative Symbols: Existing  Set Cable Anchor 			

10. Existing Anchor	Object	Example	Drafted Example
			
Existing Anchor Attributes			
• Construction Status • Type			
Alternative Symbols:			

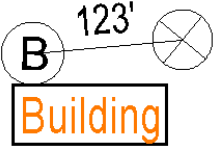
9. Miscellaneous Symbols

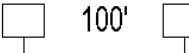
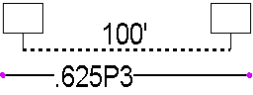
<i>Note: In this section, Poles are shown as Joint because this occurs most frequently</i>			
	4. MISCELLANEOUS SYMBOLS		
	<u>Attachments, Routing and Structures</u>		
1. BOND	Object	Example	Drafted Example
			
Bond Attributes			
• Construction Status • Type			
Alternative Symbols:			
			

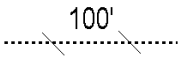
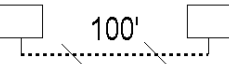
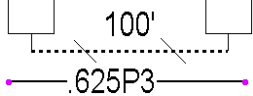
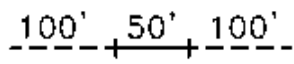
2. GROUND	Object	Example	Drafted Example
			
Ground Attributes:			
• Construction Status • Type			
Alternative Symbols:			
			

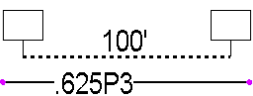
	Object	Example	Drafted Example
3. LockBox Surface Utility Mount			
LockBox Attributes:			
• Construction Status • Specification • Owner • Drop Terminal? • Ground Status • Ground Type • Label • Location Number			
Alternative Symbols:			

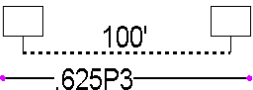
	Object	Example	Drafted Example
4. BackBoard Surface Utility Mount			
BackBoard Attributes:			
• Construction Status • Specification • Owner • Drop Terminal? • Ground Status • Ground Type • Label • Location Number			
Alternative Symbols:			

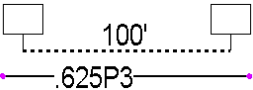
5. Building Bracket	Object	Example	Drafted Example
			
Building Bracket Attributes: • Construction Status • Specification • Owner • Location Number			
Alternative Symbols:			

1.A. Underground Routing Trench	Object	Example	Drafted Example
			
Trench - Underground Routing Attributes: • Construction Status • Measure Length • Calculated Length • Type = Example: Trench • Drop Route • Private • Telco-Only Conduits			
Alternative Symbols:			

1.B. Underground Routing	Object	Example	Drafted Example
Bore			
Bore - Underground Routing Attributes: • Construction Status • Measure Length • Calculated Length • Type = Example: Bore • Drop Route • Private • Telco-Only Conduits			
Alternative Symbols: 			

1.C. Underground Routing	Object	Example	Drafted Example
Building Riser			
Building Riser - Underground Routing Attributes: • Construction Status • Measure Length • Calculated Length • Type = Example: Building Riser • Drop Route • Private • Telco-Only Conduits			
Alternative Symbols: 			

1.D. Underground Routing	Object	Example	Drafted Example
Internal	100'		
Internal - Underground Routing Attributes: • Construction Status • Measure Length • Calculated Length • Type = Example: Internal • Drop Route • Private • Telco-Only Conduits Alternative Symbols:			

1.E. Underground Routing	Object	Example	Drafted Example
Plow	100'		
Plow - Underground Routing Attributes: • Construction Status • Measure Length • Calculated Length • Type = Example: Plow • Drop Route • Private • Telco-Only Conduits Alternative Symbols:			

2. Conduit Routing	Object	Example	Drafted Example
	-----	100' Conduit (1-1.")	
Conduit Route Attributes:			
• Construction Status • Measure Length • Calculated Length • Number Of Conduits • Size Of Conduits • Owner • Telco? • Status Example: Availability, Used, Vacant and Unknown • Type Example: Core Extraction, Conduit, Microduct, EMT....etc. • Contains Innerduct? • Innerduct Number and Size • Contains Microduct? • Microduct Number and Size • Date Installed • Notes			
Alternative Symbols:			

= Direct Buried Conduit Routing			

3. Pedestal

Object	Example	Drafted Example
	 100' 	 100'  ——.625P3——

Pedestal Attributes:

- Construction Status
- Specification
- Owner
- Drop Pedestal?
- Ground Status
- Ground Type
- Latitude
- Longitude
- Location Number
- Grid Number

Alternative Symbols:




4. Manhole

Underground Utility Box

Object	Example	Drafted Example
	 100' 	 100'  ——.625P3——

Manhole Attributes:

- Construction Status
- Specification
- Owner
- Drop Vault?
- Ground Status
- Ground Type
- Latitude
- Longitude
- Location Number
- Grid number

Alternative Symbols:




5. Vault

Underground Utility Box

Object



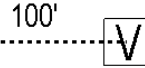
Example

100'



Drafted Example

100'



.625P3

Vault (UUB) Attributes:

- Construction Status
- Specification
- Owner
- Drop Vault?
- Ground Status
- Ground Type
- Latitude
- Longitude
- Location Number
- Grid number

Alternative Symbols:



* = Optional user Defined attribute

6. HandHole

Underground Utility Box

Object



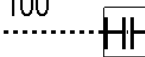
Example

100'



Drafted Example

100'



.625P3

HandHole Attributes:

- Construction Status
- Specification
- Owner
- Drop Vault?
- Ground Status
- Ground Type
- Latitude
- Longitude
- Location Number
- Grid number

Alternative Symbols:



* = Optional user Defined attribute

