



# Laurel Hill GIS

Geodatabase Integrity Solutions <sup>SM</sup>



## GeoData Sentry Technical Specification

Laurel Hill GIS' GeoData Sentry is an automated Quality Control/Quality Assurance application for ESRI's© ArcGIS™ geodatabase. GeoData Sentry assists technical and managerial users in detecting and reporting errors related to attribute validity, referential integrity, and spatial relationships.

Below is the list of test that are available, along with a description and purpose.

### GeoData SENTRY Test Descriptions and Purposes

Test Categories and Tests	Test description and purpose
<b>Attribute Tests</b>	
Coded Domain	The Coded Domain test detects values in a single column that are not part of the domain of legal values. GeoData Sentry detects non-legal values by comparing values in the column with a pre-established geodatabase coded domain, existing geodatabase tables, or a custom list that you define for the test. The Coded Domain test is useful for identifying data entry mistakes or unexpected values that are introduced during data conversion. This test is most effective for testing columns that have a discrete listing of values. Analysis and symbolization of the data are affected when there are values outside of a domain.
Range Domain	The Range Domain test detects values that lie outside of a specified range. This test is best used on columns that are composed of continuous values, such as elevation data or pressure values. An example of elevation range testing in the Continental US would be from approximately 300 to 15000 feet. GeoData Sentry can compare values in a column against valid ranges specified in a geodatabase coded range or a minimum and maximum range that you enter manually.
Non-Standard	The Non Standard Values test detects attribute values within a column that are not standard letters, such as ?*&%\$. These characters may have been input into an uncontrolled database column where there can be little or no input validation, such as an address or property own name. This test detects data entry training errors where a user believes that # is an acceptable substitute for NUMBER. Run this test against all uncontrolled character columns where these values are not allowed.



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NULL Values	The Null Test detects attribute values within a column that are null, blank or zero. NULL errors detected for an attribute may signal an uncontrolled data processing procedure where new features may have been added without being fully coded. This test may be the only way to verify that non-discrete attributes are populated. For example, if the attribute STREET_NAME does not have a known set of values, the only invalid value would be a blank or null value.
Unique Values	The Unique Single Column test detects attribute values within a column that are duplicated. Unique values for an attribute are critical for referential integrity, especially for primary key attributes. Uncontrolled data processing can easily duplicate keys by simply copying a feature, or by splitting an edge. All primary keys should be tested with the Unique Single Column test, along with attributes that are expected to be unique especially those used for doing zoom to locating for example, pole numbers, hydrant numbers and bridge identification numbers.
Single Values	The Single Value Test detects attribute values within a column that are not set to the default value. This test is useful for data that is being converted into future use attributes. The data may not exist on the current source, so it will be populated at a later date. In the meantime, a default value is set for the values in a single column that do not equal a required value. You specify the required value when you create the test, and GeoData Sentry compares the values in the column against the required value.
Column Length	The Column Length test detects attribute values within a column that are shorter or longer than a specified length. This test runs against columns where a static length is required. An example would be a 5 digit zip code or a 9 digit social security number.
Subtype Values	The Subtype test detects invalid values based on the subtype for the feature class or table. Invalid subtype values can affect ArcGIS validation of features and how ArcGIS symbolizes features. The subtype is probably the most important attribute for a feature and no errors should be tolerated.
Custom Query	The Custom Query test returns a record set based on a custom SQL query. The SQL statement must be read only and must have correct syntax. All records that fit the SQL criteria are returned. Multiple columns can be tested looking for row inconsistency errors, where one attribute's values are contingent on another's values with a row of the database. For example, a database might require that for certain pipe sizes, certain pipe materials are used (very large pipe might be made out of concrete while very small pipe is made out of copper or PVC). A custom SQL query can test whether the pipe size and pipe material values correspond.
Table Relationship	The Relationship test detects mismatches between two tables based on the primary key/ foreign key relationship. All rows in one table are related to all rows in a second table based on a common key item.



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	<p>This test may be run in both directions to ensure that orphan records do not exist in either table.</p>
Subtype Dependent Domain	<p>The Subtype Dependent Domain test detects invalid values based on the subtype and domain assigned. For example subtype 1 may have domain A assigned to COL1, and subtype 2 may have domain B assigned to COL1. This is a very common method to insure integrity between subtypes.</p>
<b>Spatial Relationship Tests</b>	
Intersect	<p>The Intersect Test detects features from one feature class that do not intersect with features from a second feature class. This test is critical to detecting spatial problems between feature classes. The quality of the geometric network may be compromised if features that are supposed to participate in the network are not coincident with the network. These errors can be detected prior to building the network. Data that has been loaded into the geodatabase from another GIS system may not be snapped to the required level of the geodatabase, in order to build a correct geometric network.</p>
Overshoot/Undershoot	<p>The Overshoot/Undershoot Test detects features from one feature class that do not connect with feature of the same feature class or an optional second feature class. This test is critical to detecting spatial problems within and between feature classes. Small gaps or undershoot or small extensions of edges or overshoots may result in poor tracing within a feature class or between feature classes. An example of this is a service later line feature class that does not fully connect to the main feature class. This may result in poor spatial analysis when tracing to custom meters. These errors may be detected using standard tracing methods, but the process is a visual inspection that can be labor intensive. Additionally, these undershoot/overshoot feature may not be visible with tracing, if there is a back-fed situation.</p>
Duplicates	<p>The Duplicates Test detects where geometries for features are duplicated with the feature class. This test may be generated for all feature classes in the geodatabase.</p>
Invalid Geometry	<p>The Invalid Geometry Test detects a host of invalid geometries that may exist in a feature class.</p>
<b>Logical Connectivity Tests</b>	
Edge To Edge	<p>The Edge to Edge Test detects where two edges are connected that should not be, based on either the connectivity rules from the geometric network, or user defined rules.</p>
Junction To Edge	<p>The Junction to Edge Test detects where a junction is connected to an edge where it should not be, based on either the connectivity rules from the geometric network, or user defined rules. Below is an example of the geometric network rules and the associated test that is generated.</p>



Edge To Edge with Junction Filter	The Edge to Edge with Junction Filter Test detects where two edges are connected at a junction where they should not be, based on either the connectivity rules from the geometric network, or user defined rules. Below is an example of the geometric network rules and the associated test that is generated.
Junction Valence	The Junction with Valent Filter Test detects junctions where the connected number of edges is in conflict with the Equality Type and the valence noted in the parameters. Below is an example of ElectricDistribution_Junctions should only occur where there are less than 3 edges at any of the Primary or Secondary conductors. Below are the Equality Types available: <ul style="list-style-type: none"> <li>•equal to</li> <li>•equal to or greater than</li> <li>•equal to or less than</li> <li>•greater than</li> <li>•less than</li> <li>•not equal to</li> </ul>

## GeoData SENTRY License Editions

GeoData Sentry version 3.4.4 support ArcGIS version 10.2.1. GeoData Sentry has three different editions available at version 3.4.4. Below are the tests that are available for each edition and the geodatabase connection support for each edition.

Test Categories and Tests	Personal	Professional	Enterprise
<b>Attribute Tests</b>	•	•	•
Coded Domain Test	•	•	•
Range Domain Test	•	•	•
Non-Standard Test	•	•	•
NULL Values Test	•	•	•
Unique Values Test	•	•	•
Single Values Test	•	•	•
Column Length Test	•	•	•
Subtype Values Test	•	•	•
Custom Query Test	•	•	•
Table Relationship Test	•	•	•
Subtype Dependent Domain Test	•	•	•
<b>Spatial Relationship Tests</b>		•	•
Intersect Test		•	•
Overshoot/Undershoot		•	•
Duplicates		•	•
Invalid Geometry		•	•
<b>Logical Connectivity Tests</b>			•



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Edge To Edge Test			•
Junction To Edge Test			•
Edge To Edge with Junction Filter Test			•
Junction Valence			•

<b>Geodatabase Connection Support</b>	<b>Personal</b>	<b>Professional</b>	<b>Enterprise</b>
Personal geodatabase	•	•	•
File geodatabase		•	•
Oracle Enterprise SDE geodatabase		•	•
SQL Server Enterprise SDE geodatabase		•	•

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