



# Kiewit Information Exchange (KIX) User Manual

Version 1.0

4/13/2020

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## What is Kiewit Information Exchange (KIX)?

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Modern enterprises generate large amounts of various types of data from a wide variety of sources and formats—on-premises, in the cloud, structured, unstructured—all arriving at distinct intervals and speeds.

Kiewit Information Exchange is a cloud-based, asset-centric enterprise data warehouse that extracts and refines enormous stores of raw data to offer a clean, unified source of truth that culminates in actionable business insight.

### Data Input

The KIX platform interfaces with an ever-expanding range of data sources, transactional systems, and relational databases, including:

- Excel
- InEight Control
- InEight Document (TeamBinder)
- InEight Plan
- Jovix
- SmartPlant

Project systems are often ‘siloes’ (that is, they do not communicate with each other), and the data collected can be structured, semi-structured, or unstructured. Kiewit Information Exchange aggregates this nonuniform data into a common data warehouse using a Schema on Read approach that imports data with minimal or no up-front schema mapping, increasing the speed at which data is added. (Schema mapping can be added later as required.)

As data is imported, Kiewit Information Exchange compares the metadata for each asset from all the different sources and flags inconsistencies. It also scans the metadata for related assets and stores the relationships it finds. (For example, if a pipe spool references an isometric drawing as part of its metadata, Kiewit Information Exchange generates a relationship between that pipe spool and the drawing.)

All data is added to a database that can be accessed via the front-end interface allowing users to search for assets in the system and enabling reporting functions generated by third-party software.

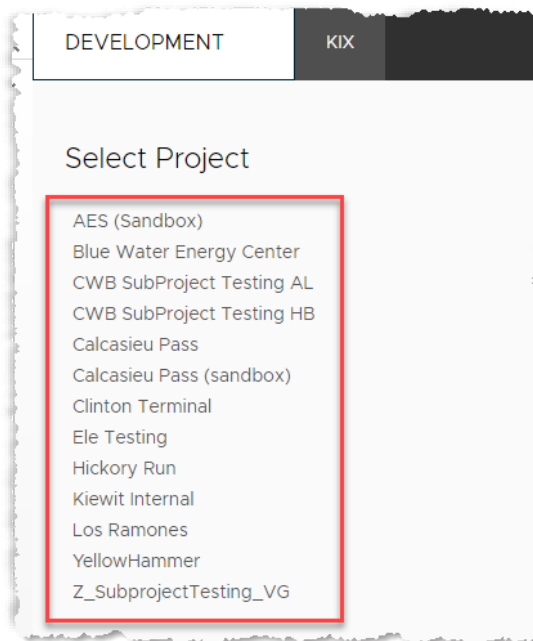
## Core Functions

The Kiewit Information Exchange (KIX) has the following core functions:

- **Relationships**—Kiewit Information Exchange acts as an asset identification and tracking system that establishes relationships to locate related assets quickly.
- **Search**—Kiewit Information Exchange Search function returns results based on all asset properties, and includes the ability to view an asset's [data card](#).

## KIX Project List

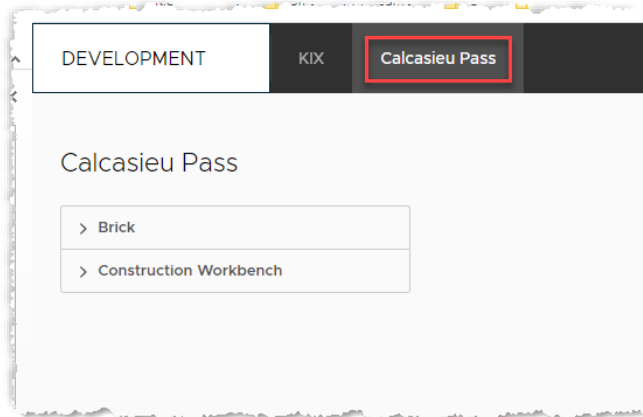
When you open the Kiewit Information Exchange app, existing projects are listed on the main KIX page, under Select Project:



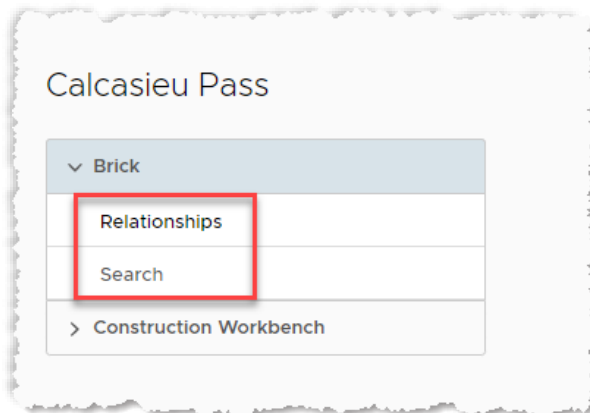
## Open a Project and Select a Function

To open a project in KIX:

1. Navigate to the KIX site, then select a project from the list. The project opens in a new tab.



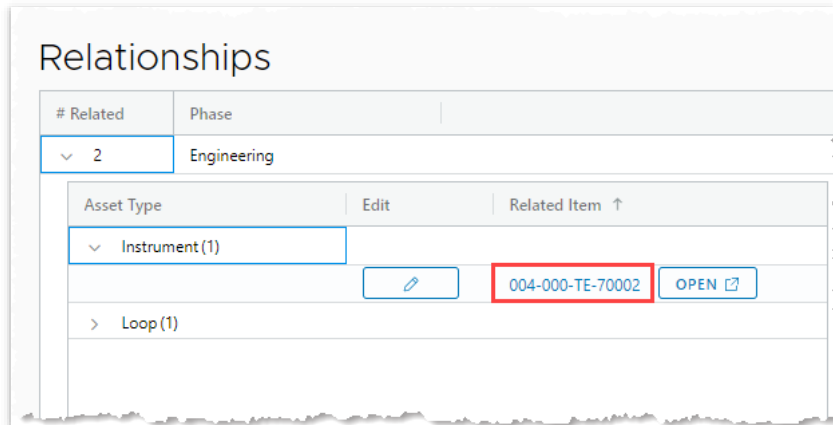
2. Click **Brick** to display the Brick functions.



3. Click one of the menu items to begin using the KIX app's functionality:
  - [Relationships](#)—opens the Relationships widget in a new tab.
  - [Search](#)—opens the Search function.

## Relationships

Kiewit Information Exchange acts as an asset identification and tracking system that establishes relationships to locate related assets quickly. Relationships are created automatically, and users can also create them manually in the online interface. Once the relationship is established, a link to the related asset appears on each asset's Data Card, allowing users to locate information about both assets quickly.



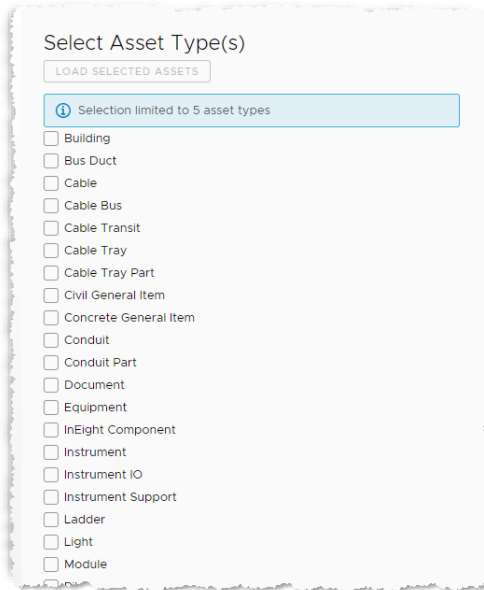
Relationships in Kiewit Information Exchange are created in the following ways:

- **Automatically**—when data is imported, Kiewit Information Exchange searches each asset's metadata for the names of other assets. If one is found, a relationship is created between the two assets.
- **Imported from Data Sources**—relationships are imported directly from some data sources, such as SmartPlant. (For example, if an isometric drawing in SmartPlant references a specific valve, Kiewit Information Exchange imports that relationship.)
- **Manually**—incoming data does not always match, even when two assets are, in fact, related. In this case, users can manually create relationships between assets using the Relationships widget.

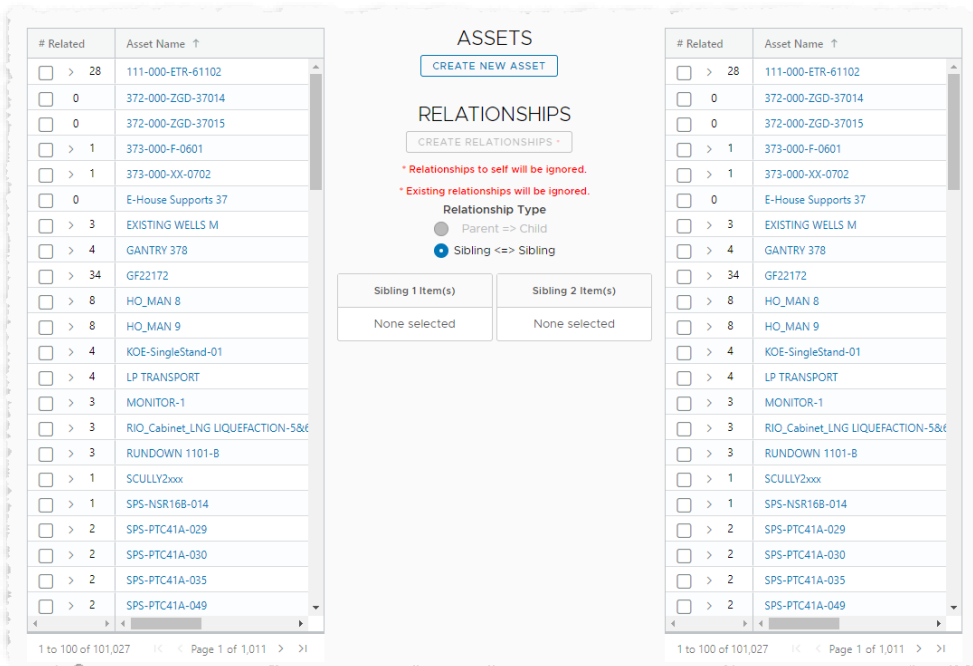
## Create an Asset Relationship

To create a relationship among multiple assets:

1. Open a project in KIX, then click **Brick > Relationships**. A list of asset types appears on the left.



2. Select up to five asset types, then click **Load Selected Assets**. The selected asset types are loaded into two lists: one in a pane on the left; one in a pane on the right.



**Note:** Clicking an asset name opens the asset's [data card](#) in a new browser tab.

3. Select at least one asset in each of the panes.

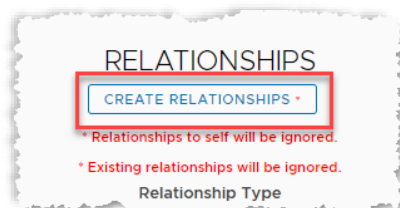
# Related	Asset Name ↑	Asset Type
<input checked="" type="checkbox"/> > 28	111-000-ETR-61102	Equipment
<input type="checkbox"/> 0	372-000-ZGD-37014	Equipment
<input type="checkbox"/> 0	372-000-ZGD-37015	Equipment
<input type="checkbox"/> > 1	373-000-F-0601	Equipment
<input type="checkbox"/> > 1	373-000-XX-0702	Equipment
<input checked="" type="checkbox"/> 0	E-House Supports 37	Equipment
<input type="checkbox"/> > 3	EXISTING WELLS M	Equipment
<input type="checkbox"/> > 4	GANTRY 378	Equipment
<input checked="" type="checkbox"/> > 34	GF22172	Equipment
<input checked="" type="checkbox"/> > 8	HO_MAN 8	Equipment
<input type="checkbox"/> > 8	HO_MAN 9	Equipment

The selected items appear in the Sibling lists.

Sibling 1 Item(s)	Sibling 2 Item(s)
E-House Supports 37	---3902
111-000-ETR-61102	---3603
HO_MAN 8	---3602
	---3801
	---3904
	--AE-39800
	---3601

4. Click **Create Relationships**. The relationships are created among all of the assets, and a message box appears.

**Note:** Existing relationships are not impacted. A relationship cannot be created between an asset and itself (e.g. by selecting the same asset in both columns).



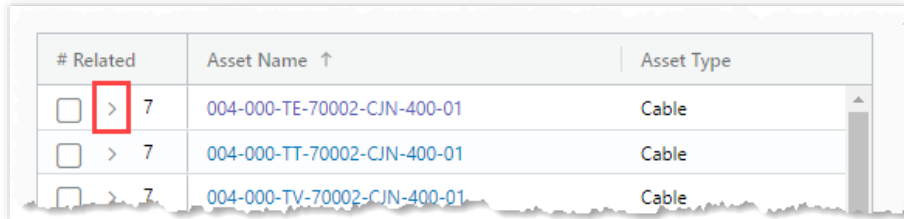
5. Click **OK** to close the message box.



### View Asset Relationships

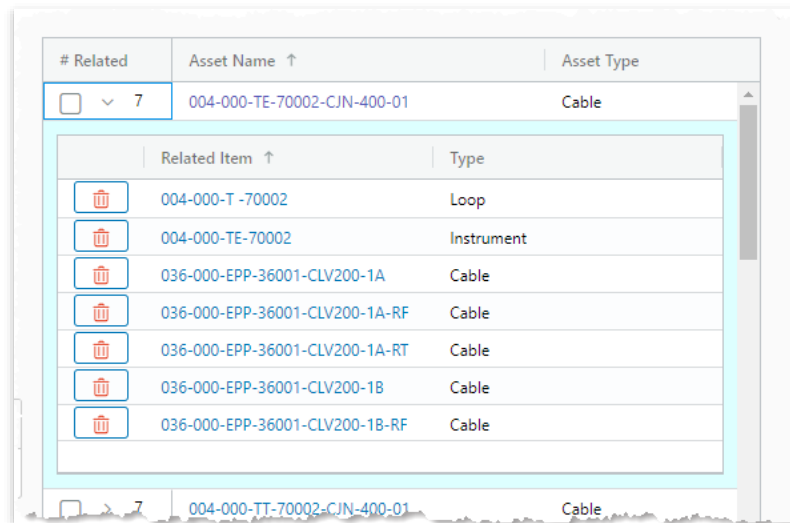
To view the assets with a relationship to a specific asset:

1. Load assets into the Relationship widget. A list of assets appears.



# Related	Asset Name ↑	Asset Type
<input type="checkbox"/> > 7	004-000-TE-70002-CJN-400-01	Cable
<input type="checkbox"/> > 7	004-000-TT-70002-CJN-400-01	Cable
<input type="checkbox"/> > 7	004-000-TV-70002-CJN-400-01	Cable

2. Locate the asset you want to view, then click the > icon to display the list of assets with a relationship to a selected asset.



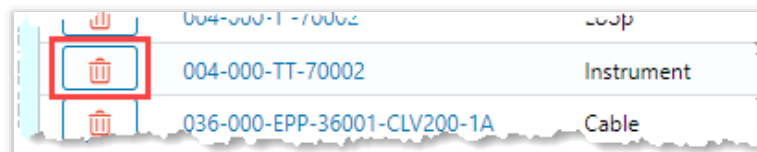
# Related	Asset Name ↑	Asset Type																
<input type="checkbox"/> v 7	004-000-TE-70002-CJN-400-01	Cable																
<table border="1"> <thead> <tr> <th>Related Item ↑</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> 004-000-T -70002</td> <td>Loop</td> </tr> <tr> <td><input type="checkbox"/> 004-000-TE-70002</td> <td>Instrument</td> </tr> <tr> <td><input type="checkbox"/> 036-000-EPP-36001-CLV200-1A</td> <td>Cable</td> </tr> <tr> <td><input type="checkbox"/> 036-000-EPP-36001-CLV200-1A-RF</td> <td>Cable</td> </tr> <tr> <td><input type="checkbox"/> 036-000-EPP-36001-CLV200-1A-RT</td> <td>Cable</td> </tr> <tr> <td><input type="checkbox"/> 036-000-EPP-36001-CLV200-1B</td> <td>Cable</td> </tr> <tr> <td><input type="checkbox"/> 036-000-EPP-36001-CLV200-1B-RF</td> <td>Cable</td> </tr> </tbody> </table>			Related Item ↑	Type	<input type="checkbox"/> 004-000-T -70002	Loop	<input type="checkbox"/> 004-000-TE-70002	Instrument	<input type="checkbox"/> 036-000-EPP-36001-CLV200-1A	Cable	<input type="checkbox"/> 036-000-EPP-36001-CLV200-1A-RF	Cable	<input type="checkbox"/> 036-000-EPP-36001-CLV200-1A-RT	Cable	<input type="checkbox"/> 036-000-EPP-36001-CLV200-1B	Cable	<input type="checkbox"/> 036-000-EPP-36001-CLV200-1B-RF	Cable
Related Item ↑	Type																	
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<input type="checkbox"/> 036-000-EPP-36001-CLV200-1A-RF	Cable																	
<input type="checkbox"/> 036-000-EPP-36001-CLV200-1A-RT	Cable																	
<input type="checkbox"/> 036-000-EPP-36001-CLV200-1B	Cable																	
<input type="checkbox"/> 036-000-EPP-36001-CLV200-1B-RF	Cable																	
<input type="checkbox"/> > 7	004-000-TT-70002-CJN-400-01	Cable																




3. Click the v icon to hide the related asset list.

### Delete an Asset Relationship

To delete a relationship to a specific asset:

1. Display the list of assets with a relationship to a selected asset.



<input type="checkbox"/> 	004-000-T -70002	Loop
<input type="checkbox"/> 	004-000-TT-70002	Instrument
<input type="checkbox"/> 	036-000-EPP-36001-CLV200-1A	Cable

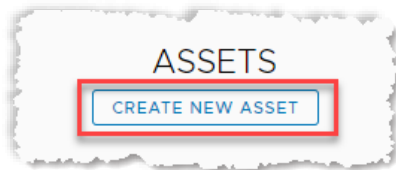
2. Click the **Trash Can** icon to the left of the asset whose relationship you want to remove. A confirmation box appears.
3. Click **OK**. The relationship is deleted.

## Create New Asset

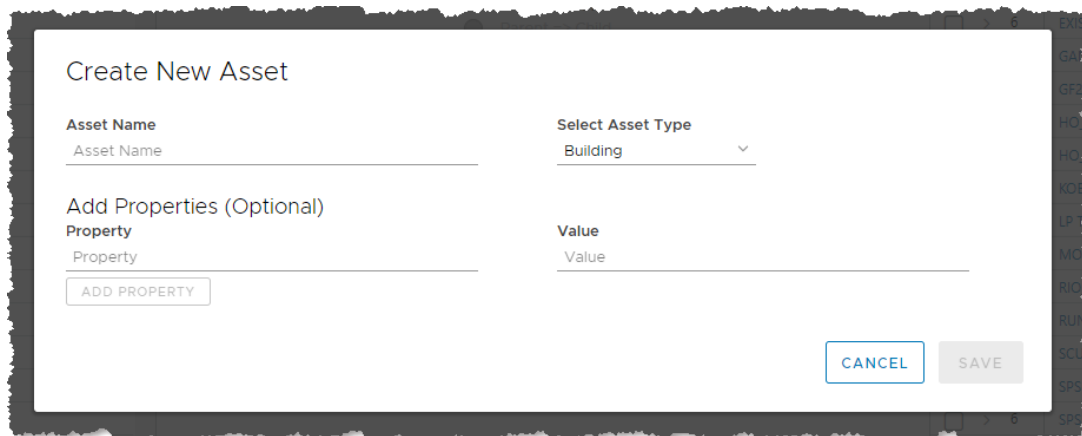
The Relationships widget offers functionality to create a new asset. (This might be, for example, a piece of equipment that is added to an existing project to resolve an engineering problem.)

To create a new asset:

1. Click **Create New Asset**.



The Create New Asset dialog opens:



2. Enter asset attributes:
  - **Asset Name**—unique ID of the asset.
  - **Select Asset Type**—select the category (Type) the asset belongs to from the drop-down.
  - **Property** (optional)—enter a property and a value. To add multiple properties, add a first property and value, then click **ADD PROPERTY**. A new field appears, allowing you to add another property and value. Repeat this step as many times as necessary.
  - **Value**—description of the asset's property; this field is required if the Property field is filled.
3. Click **SAVE**. The new asset is created and added to the project file.

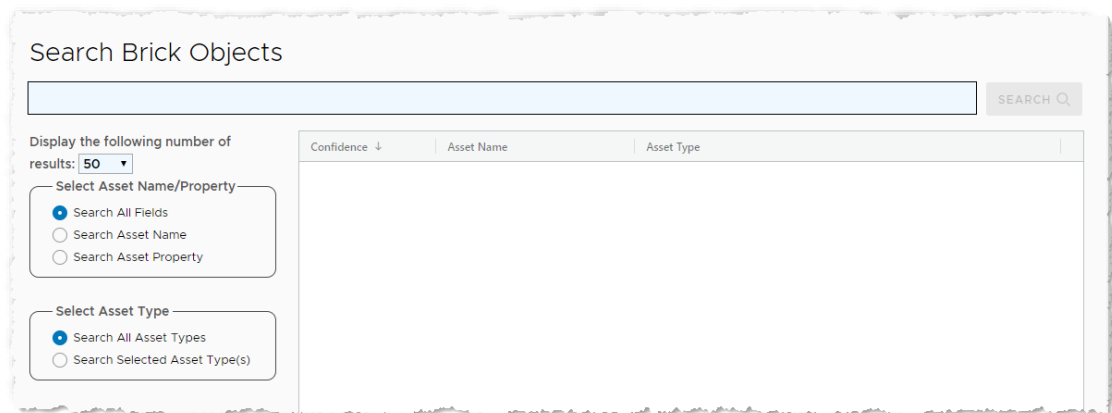
## Search

Kiewit Information Exchange offers a flexible search function, allowing you to search on *all* of an asset's properties. (For example, searching for an isometric drawing returns not only the isometric drawing itself, but all other assets that contain a reference to it in their properties.) Results are ordered by level of confidence, with the most relevant results at the top.

### Search for Assets

To search for an asset:

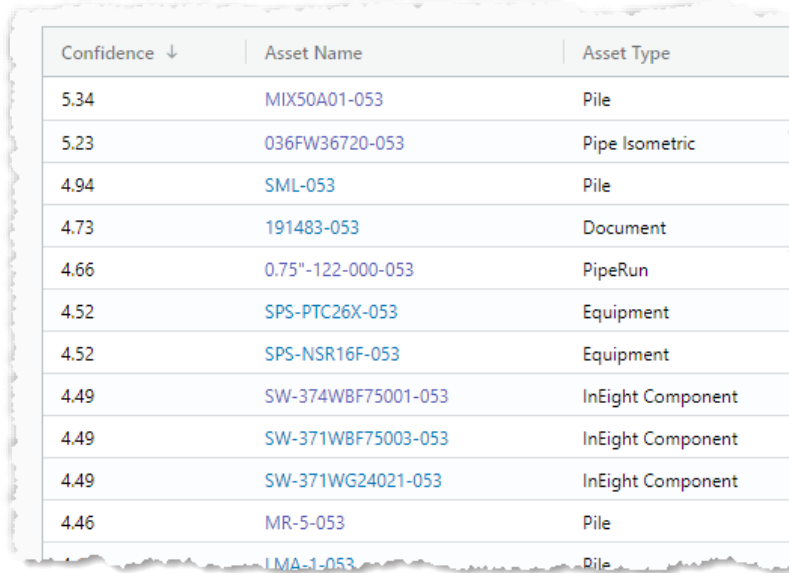
1. Open a project in KIX, then click **Brick > Search**. The Search Brick Objects screen opens.



The screenshot shows the 'Search Brick Objects' interface. At the top, there is a search input field with a 'SEARCH Q' button to its right. Below the input field, there are two sections for refining the search. The first section, 'Select Asset Name/Property', has three radio button options: 'Search All Fields' (selected), 'Search Asset Name', and 'Search Asset Property'. The second section, 'Select Asset Type', has two radio button options: 'Search All Asset Types' (selected) and 'Search Selected Asset Type(s)'. To the right of these options is a table with three columns: 'Confidence ↓', 'Asset Name', and 'Asset Type'. The table is currently empty.

2. Enter a search term. To refine your search, you can do the following:
  - Use quotation marks around search terms to restrict the returned values to those that match your search term(s) *exactly*. Use multiple search terms within quotation marks to return values that have even higher confidence.
  - [Sort columns](#)
  - [Filter table values](#)
3. Select a number of search results to display. You can select from the following options:
  - **50**
  - **100**
  - **1000**
4. Select a search option:
  - **Search All Fields**—(default) tries to match the search term to any field in an asset's metadata.
  - **Search Asset Name**—tries to match the search term only to an asset's name.
  - **Search Asset Property**— tries to match the search term to any property in an asset's metadata.

5. Select a search option:
  - **Search All Asset Types**—tries to match the search term to any asset type.
  - **Search Selected Asset Type(s)**—only tries to match the search term to the asset type (category) that you select from the drop-down that appears.
6. Click **SEARCH**. Matching assets appear in a table.



Confidence ↓	Asset Name	Asset Type
5.34	<a href="#">MIX50A01-053</a>	Pile
5.23	<a href="#">036FW36720-053</a>	Pipe Isometric
4.94	<a href="#">SML-053</a>	Pile
4.73	<a href="#">191483-053</a>	Document
4.66	<a href="#">0.75"-122-000-053</a>	PipeRun
4.52	<a href="#">SPS-PTC26X-053</a>	Equipment
4.52	<a href="#">SPS-NSR16F-053</a>	Equipment
4.49	<a href="#">SW-374WBF75001-053</a>	InEight Component
4.49	<a href="#">SW-371WBF75003-053</a>	InEight Component
4.49	<a href="#">SW-371WG24021-053</a>	InEight Component
4.46	<a href="#">MR-5-053</a>	Pile
	<a href="#">LMA-1-053</a>	Pile

Containing the following columns:

- **Confidence**—a number that represents the comparative relevance of a returned value. (The numbers do not have intrinsic significance; a higher or lower number is simply rated more or less relevant to your search term(s).)
- **Asset Name**—a unique tag that identifies an object.
- **Asset Type**—the category the asset belongs to.

Clicking on an asset name in the table opens the asset's [Data Card](#).

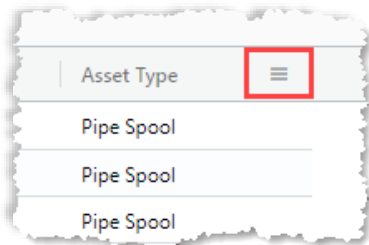
## Sort Columns

By default, search results are displayed in descending order of confidence. However, you can reorder the display by clicking a column header. As you click, the display cycles through the following order:

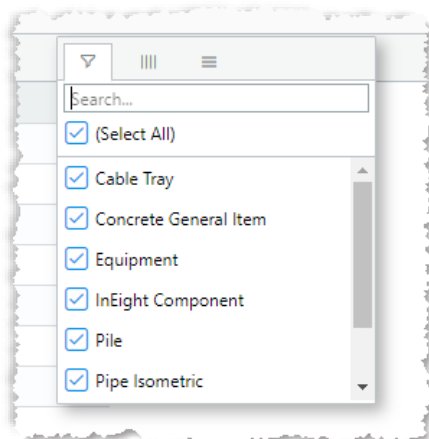
- **Ascending value** of the column you click
- **Descending value** of the column you click
- **Default value** (i.e., descending order of confidence)

## Column Options

Each column offers several sets of options that allow you to control the display of the table. Click a column header, then click the menu icon that appears to its right:

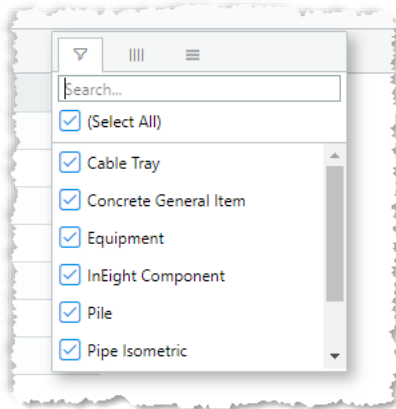


The column options drop-down appears:



## Filter Table Values

Clicking the left-hand icon opens the Filter options:



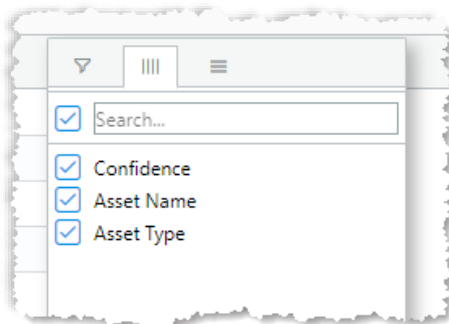
To filter out a value, uncheck the box to the left of its name. The unchecked item (or category and all items that belong to the category) are removed from the table display.

To add a value back, check the box to the left of its name. That item (or category and all items that belong to the category) are displayed in the table.

To search for a specific value, enter a search term in the Search field; results appear dynamically in a list as you type. You can then check/uncheck the item as above. Press **Enter** to display only the search results in the column.

## Show/Hide Columns

Clicking the middle icon opens the Show/Hide Columns options:



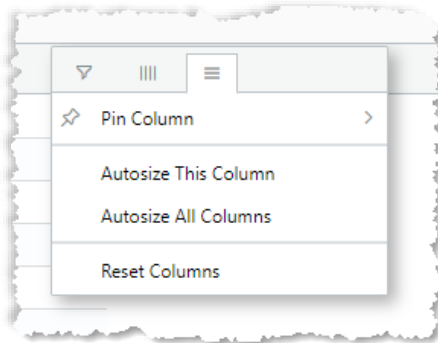
To hide a column, uncheck the box to the left of its name.

To show (*unhide*) a column, check the box to the left of its name.

To search for a specific value, enter a search term in the Search field; results appear dynamically in a list as you type. You can then check/uncheck the item as above.

## Column Display

Clicking the right-hand icon opens the Column Display options:



### Pin Column

Click this option to pin the current column to the left or right side of the screen; select No Pin to unpin the column.

### Autosize This Column

Click this option to autosize the selected column to fit its contents.

### Autosize All Columns

Click this option to autosize all columns to fit their contents.

### Reset Columns

Click this option to reset column display to the default.

## Data Card

Clicking on an asset hyperlink anywhere in Kiewit Information Exchange opens the asset's Data Card, displaying its attributes and relationships as reported by the data sources.

The data card displays the asset's name across the top, then its asset type below, and finally a table of its attributes on the left and a table of its relationships on the right.

MK-370AI23620-10
IT

Pipe Spool

### Attributes

Attribute	Compiled	Brick	S3D	Zenator
AliasTag_Zen				
AreaAux_Module	N/A			N/A
AreaConstruction	01I-U/G HR...			01I-U/G HRSG3
AreaUnit	370		370	
AssetType	Pipe Spool	Pipe Spool	Pipe Spool	Pipe Spool
BOB_BATCH	CONFLICT		BRK_VGCP_...	BRK_VGCP_ZEN_Pipe_S
BOB_BATCH_ID	CONFLICT		2224	310
BOB_BATCH_SOU...	CONFLICT		BRK_VGCP_...	BRK_VGCP_ZEN_Pipe_S
BOB_BATCH_TS	CONFLICT		2020-03-10...	2020-03-10T08:24:07.5
BOB_NAME	MK-370AI2...	MK-370AI...	MK-370AI23...	MK-370AI23620-10
BOB_NAME_ERROR				
BOB_SOURCE	CONFLICT		S3D	Zenator
BOB_TYPE	Pipe Spool		Pipe Spool	Pipe Spool
BOB_TYPE_Zenator	Pipe Spool			Pipe Spool

### Relationships

# Related	Phase
0	Engineering
0	Procurement
0	Construction
0	Commissioning
∨ 11	UNDEFINED

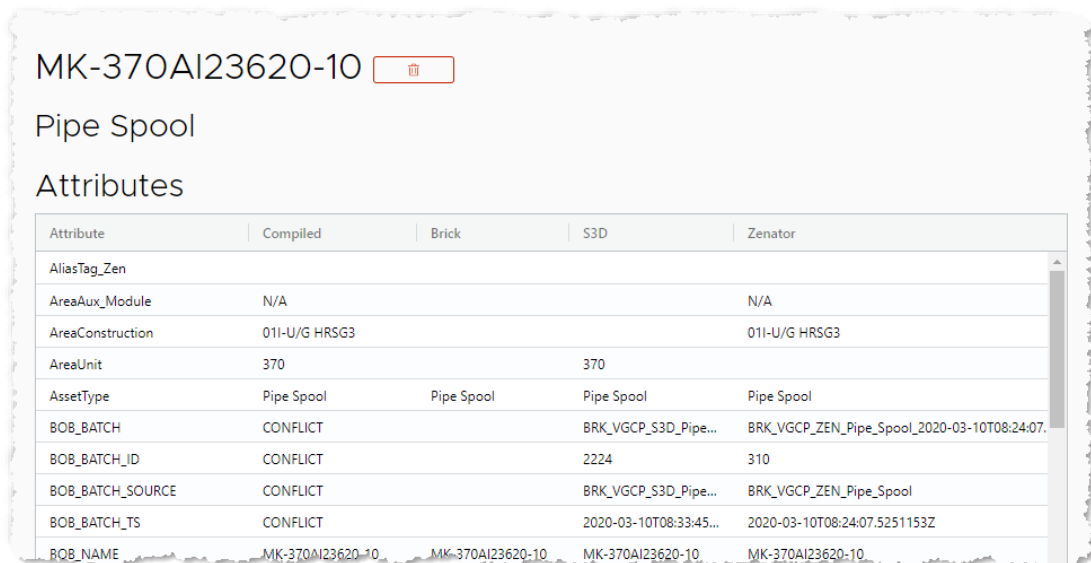
Asset Type	Edit	Related Item ↑
> Pipeline (1)		
> InEight Component (1)		
> Pipe Isometric (4)		
> Document (4)		
> PandID (1)		



## Attributes Table

The Attributes table on the Data Card displays the inputs from all the available data sources in individual columns as well as an aggregate of all the inputs from all the available data sources in a single 'Compiled' column. As it compiles the incoming data, Kiewit Information Exchange compares the values from the various data sources together and notes if any of the sources conflict. (For example, if the descriptions of a piece of equipment in SmartPlant 3D and Smart Plant P&ID do not match, Kiewit Information Exchange displays "CONFLICT" in the Compiled column.)

Certain asset types also contain hyperlinks to source apps such as UPV, TeamBinder, and InEight. Clicking on these links opens the asset in the linked system.



MK-370AI23620-10 ✖

Pipe Spool

Attributes

Attribute	Compiled	Brick	S3D	Zenator
AliasTag_Zen				
AreaAux_Module	N/A			N/A
AreaConstruction	011-U/G HRSG3			011-U/G HRSG3
AreaUnit	370		370	
AssetType	Pipe Spool	Pipe Spool	Pipe Spool	Pipe Spool
BOB_BATCH	CONFLICT		BRK_VGCP_S3D_Pipe...	BRK_VGCP_ZEN_Pipe_Spool_2020-03-10T08:24:07.
BOB_BATCH_ID	CONFLICT		2224	310
BOB_BATCH_SOURCE	CONFLICT		BRK_VGCP_S3D_Pipe...	BRK_VGCP_ZEN_Pipe_Spool
BOB_BATCH_TS	CONFLICT		2020-03-10T08:33:45...	2020-03-10T08:24:07.5251153Z
BOB_NAME	MK-370AI23620-10	MK-370AI23620-10	MK-370AI23620-10	MK-370AI23620-10

The Attributes table contains the following columns:

- **Attributes**—list of asset attributes.
- **Compiled**—compilation of attribute values from KIX and one or more other data sources when the values match. When they don't match, Kiewit Information Exchange displays "CONFLICT" in the Compiled column
- **Brick**—attribute values generated by KIX or input by the user via the front-end user interface.
- **[data source name]**—attribute values reported by a named data source.

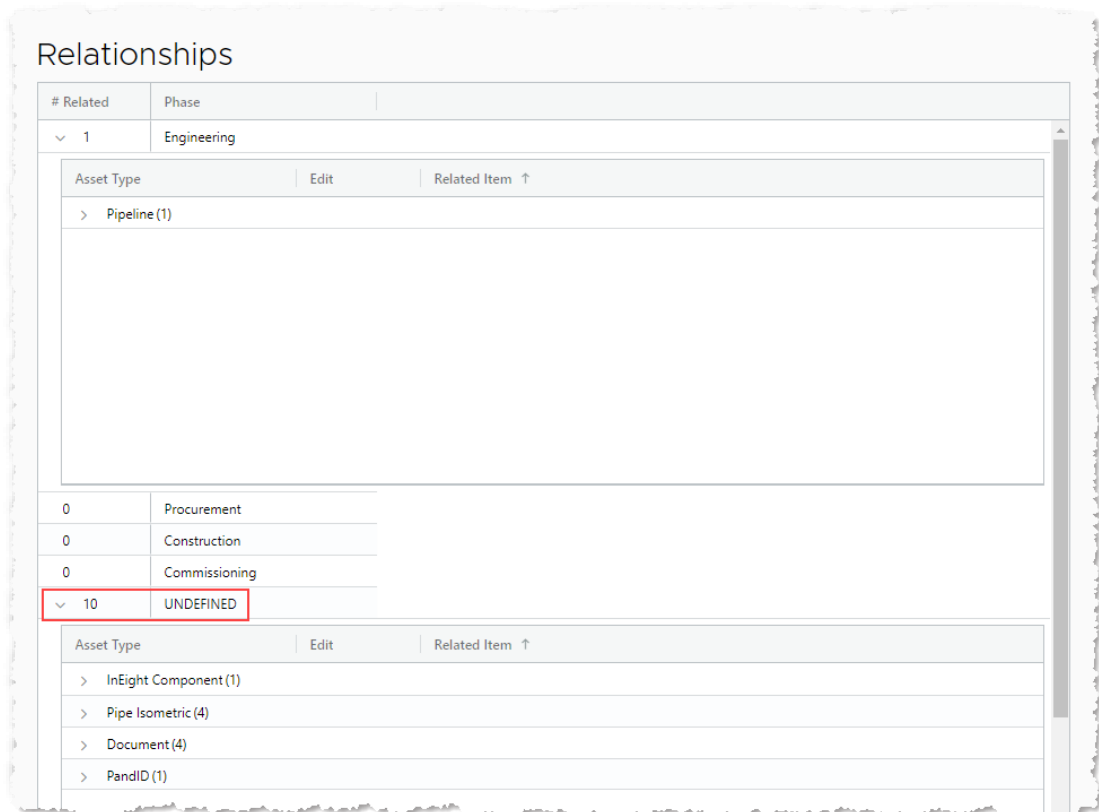
KIX compiles the data from all available data sources and displays it in the Compiled column.

- If data sources have different values, the Compiled column displays CONFLICT.
- If a data source does not supply a value for a specific attribute, then it does not influence the value for that attribute that is displayed in the Compiled column.

### Relationships Table

The Relationships table displays all the items in a project that have a relationship with the selected asset. This allows for quick access to information about all assets related to the specified asset.

By default, related items are listed under UNDEFINED until they are assigned to a specific project phase.



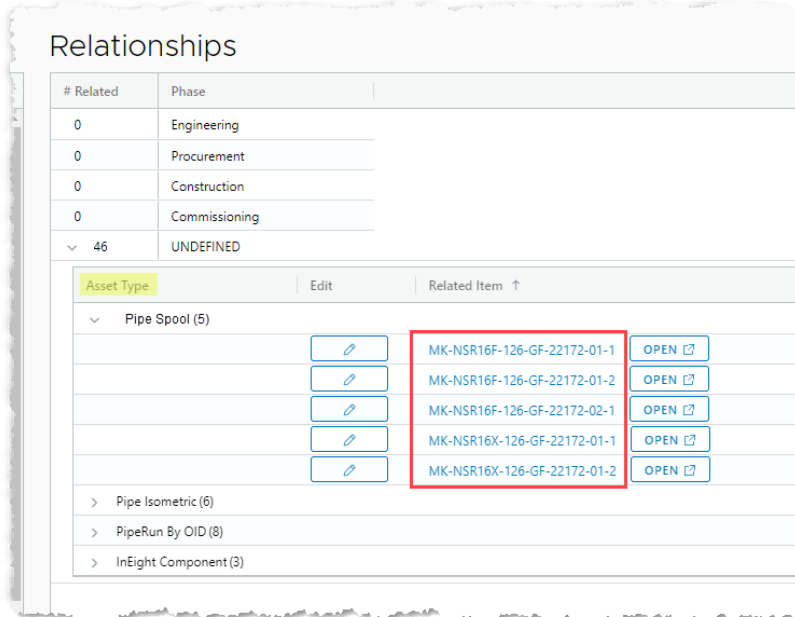
Assets in a project can be assigned to a specific project phase. Phases include:

- Engineering
- Procurement
- Construction
- Commissioning

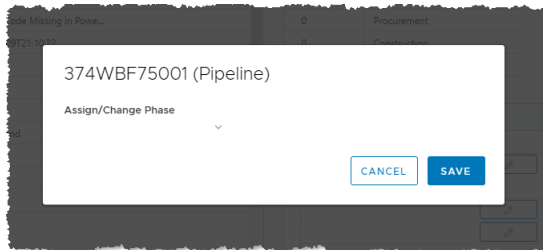
### Assign a Phase

To assign a phase:

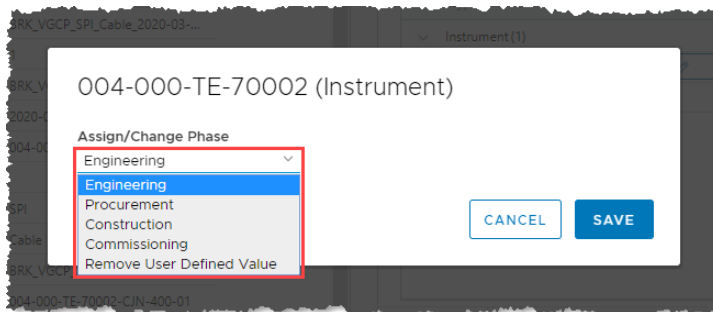
1. Click an asset type in the UNDEFINED category to display the items to be assigned.



2. Click the **Edit** icon to the left of the asset whose phase you want to assign. The Assign/Change Phase dialog opens.



3. Click the down arrow. The available phases appear in a menu.

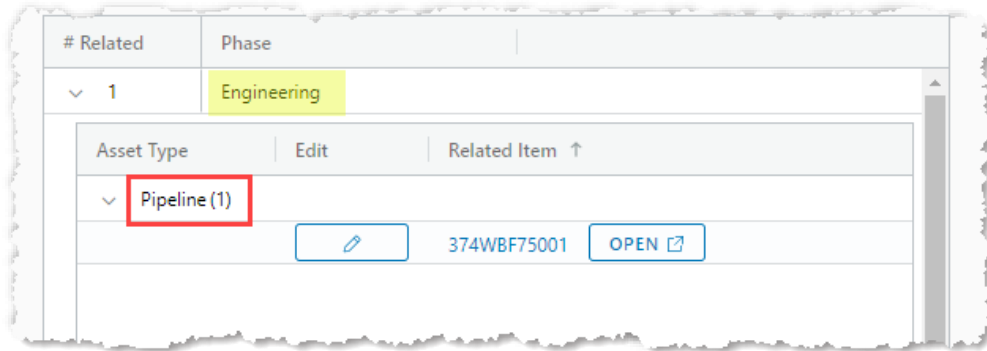


4. Select a phase, then click **Save**. The phase is assigned to the asset, and it appears under that phase in the table.

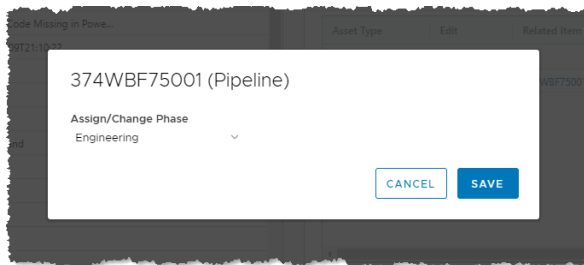
### Remove an Assigned Phase

To remove an assigned phase:

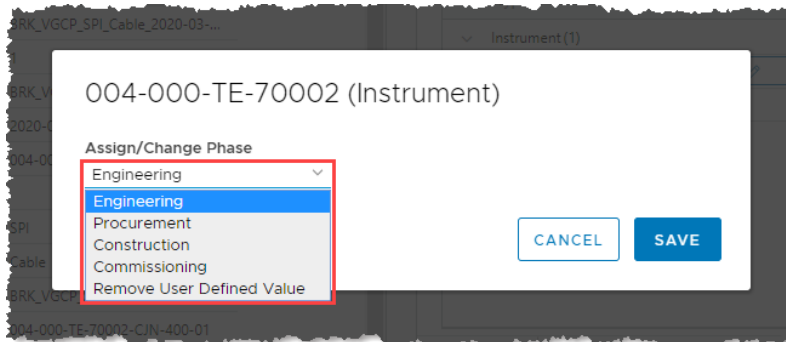
1. Click an asset type under the phase that contains the item whose phase you want to remove.



2. Click the **Edit** icon to the left of the item. The Assign/Change Phase dialog opens.

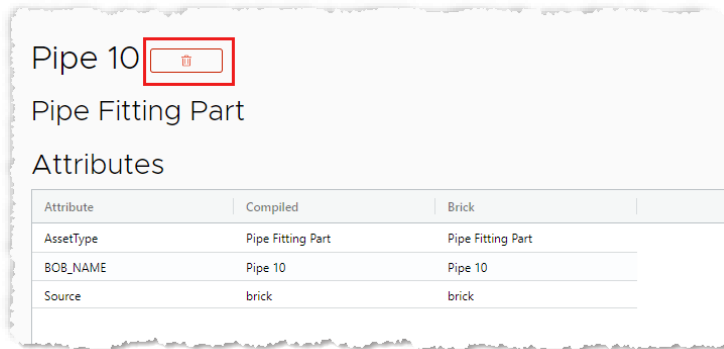


3. Click the down arrow. The available phases appear in a menu.



4. Select **Remove User-Defined Value**, then click **Save**. The phase is removed from the asset, and it appears under UNDEFINED in the table.

### Delete an Asset

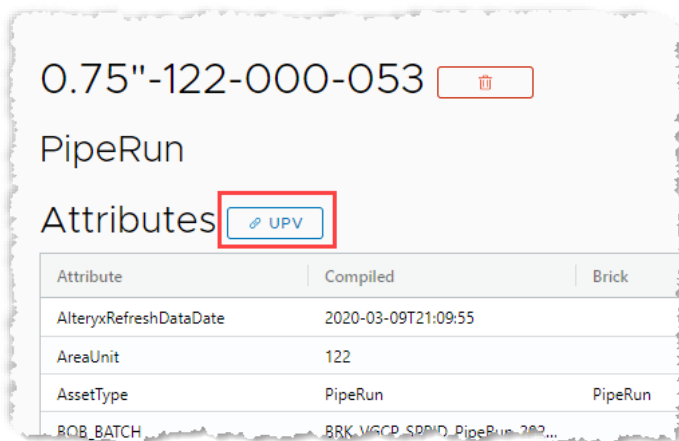


To delete an asset, click the **Trash** icon next to its name in the data card. The record is deleted.

**Note:** A deleted record is no longer available from the web interface; however, it is *not* removed from the database.

### Open an Asset in a Source App

The data card provides a button for viewing an asset in the original source or visualization application. Clicking the button opens the source app to a view of the asset.

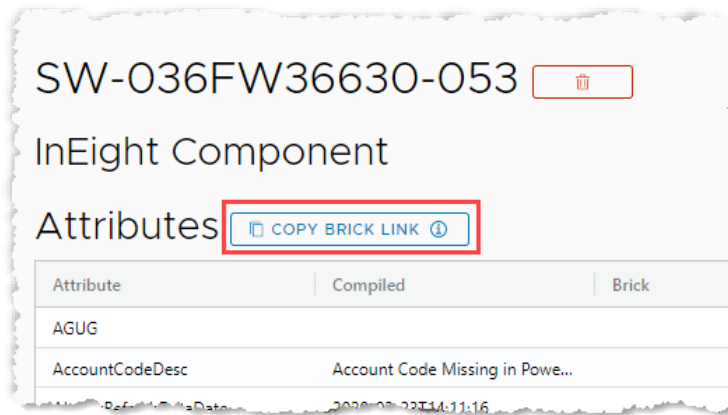


The following buttons are available:

- **InEight**—opens the asset in InEight.
- **TeamBinder**—opens the asset in TeamBinder.
- **UPV**—opens the asset in Universal Plant Viewer.

### Copy Brick Link

The Copy Brick Link button allows users to copy a link to a particular asset for use in third-party programs.




The button has the following functions:


- **Single-click**—copies a link to the asset in a human-readable format.
- **Double-click**—copies an Excel formula that links to the asset. You can use this formula as a template to generate links back to KIX. (If the asset does not exist, clicking the link opens it as a search result in KIX.)


## Orphaned Records

If an object is deleted in one of the data sources, it is *orphaned* by that data source. If there are multiple data sources, the table displays the value(s) from the remaining data source(s).

111-000-ETR-61102 

Equipment


 Orphaned – This object no longer exists in any data sources. [User Defined Orphan Status](#) v


Attributes 

Attribute	Compiled	Brick	S3D
AreaConstruction	31X - JTN North Jetty		31X - JTN North Jetty
AreaLevel1	Liquefaction/Jetty		Liquefaction/Jetty
AreaLevel2	JTN		JTN
AreaLevel3	31X		31X
AreaLogical	31X		31X
AssetType	Equipment	Equipment	Equipment
BOB_BATCH	BRK_VGCP_S3D_Equip_2020-02...		BRK_VGCP_S3D_Equip_2020-02...
BOB_BATCH_ID	1597		1597

Once an asset is orphaned, the following user-defined orphan status options become available on its data card:

- **Is Orphan**—allows user to confirm that the asset has indeed been orphaned.
- **Not Orphan**—overrides the data source to confirm that the asset is *not* orphaned.

 Orphaned – This object no longer exists in any data sources. [User Defined Orphan Status](#) v

Attributes 

Attribute	Compiled	Brick	S3D

is Orphan  
 Not Orphan