Rail Asset Management

Mark Newman

Talk Outline

- Definitions:
  - Asset Lifecycle Stages
  - Components, Attributes, Data dictionary
    - Motorised isolator
    - Colour Light Signal
- Outcome:
  - Smart forms (attributes, asset lifecycle stages)
  - Asset Passport
  - GIS for Railways

MOTZKY
Mark Newman

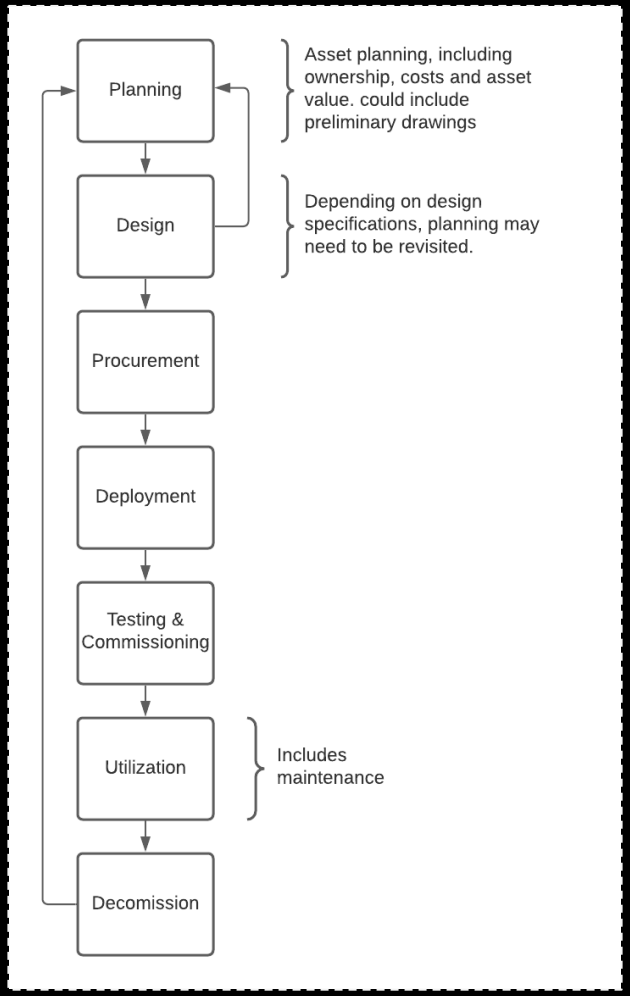
About me

- Experience in Asset Management and Information Management in Australia and Overseas
- Experience in rail industry working on QR, Aurizon and ARTC Projects
- Experience in variety of asset information programs
- Detail understanding of asset quantities
- Passionate about big data

MOTZKY
Mark Newman

Asset Lifecycle Stages

1. Planning
2. Design
3. Procurement
4. Deployment
5. Testing & Commissioning
6. Utilisation
7. Decommissioning



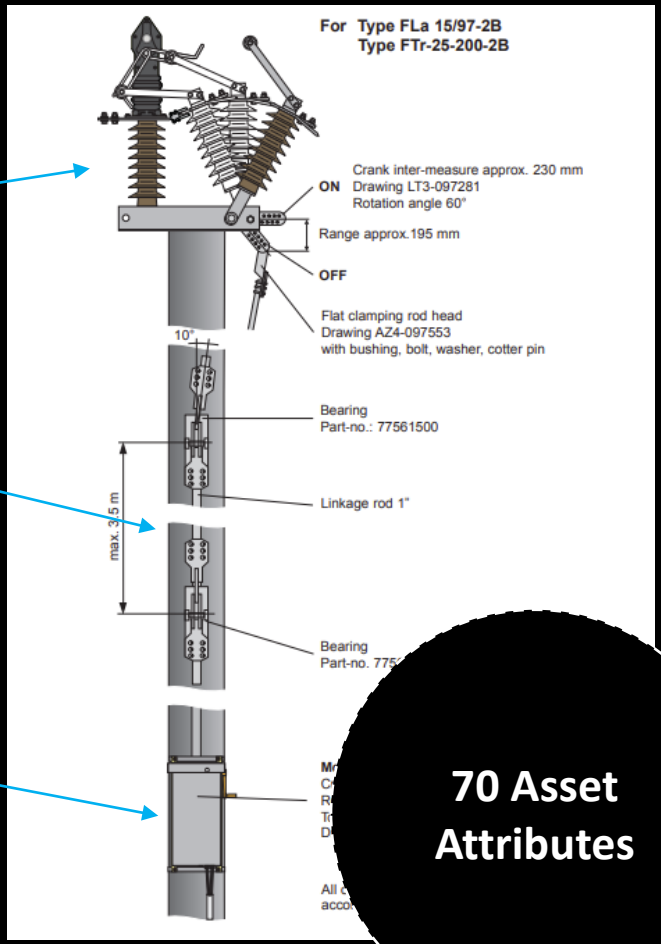
MOTZKY

Mark Newman

Motorised Isolator

Components:

1. Mechanical isolator
2. Motor actuator / drive train
3. Motor and control / detection assembly



Motor and control/ detection assembly

MOTZKY
Mark Newman

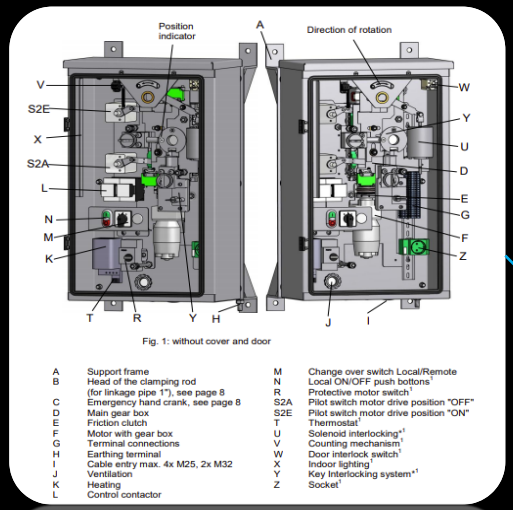
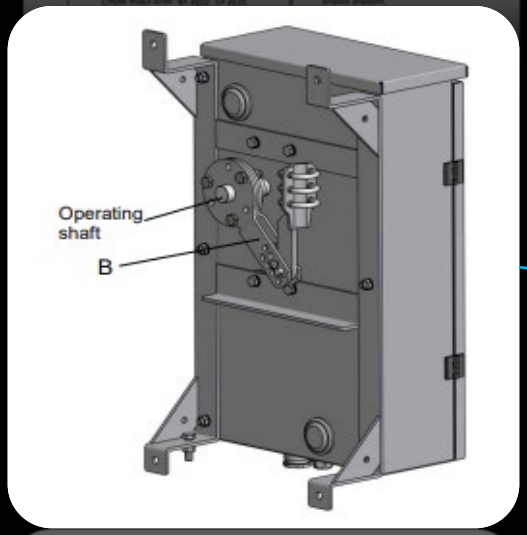
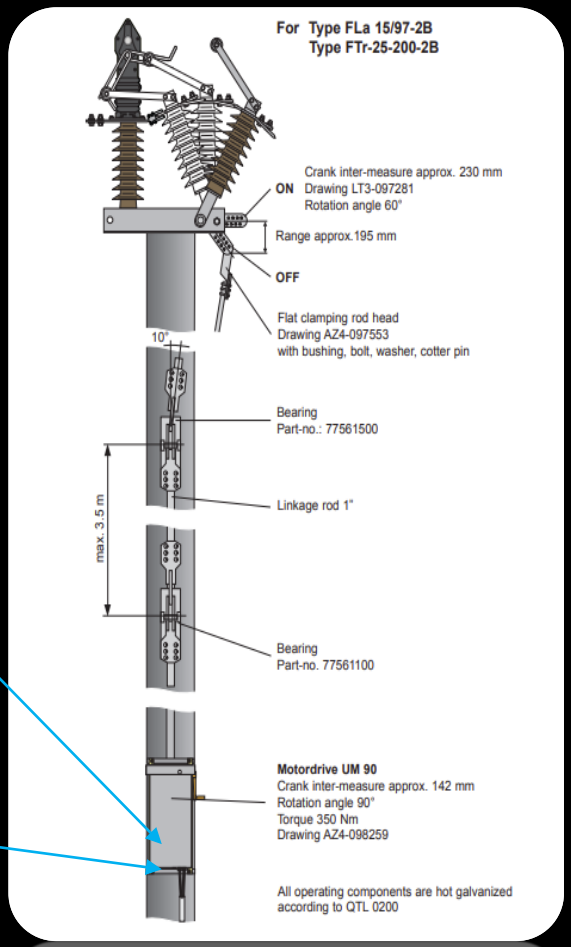


Fig. 1: without cover and door

A	Support frame	M	Change over switch Local/Remote
B	Head of the clamping rod (for linkage pipe 1"), see page 8	N	Local ON/OFF push bottons[1]
C	Emergency hand crank, see page 8	R	Protective motor switch[1]
D	Main gear box	S2A	Pilot switch motor drive position "OFF"
E	Friction clutch	S2E	Pilot switch motor drive position "ON"
F	Motor with gear box	T	Thermostat[1]
G	Terminal connections	U	Solenoid interlocking*[1]
H	Earthing terminal	V	Counting mechanism[1]
I	Cable entry max. 4x M25, 2x M32	W	Door interlock switch[1]
J	Ventilation	X	Indoor lighting[1]
K	Heating	Y	Key Interlocking system*[1]
L	Control contactor	Z	Socket[1]





MOTZKY
Mark Newman

Motorised Isolator Asset Attributes

Typical Isolator involves 70 attributes

Comprising of:

Generic Asset Attributes = 34

Isolator Specific Attributes = 36

Motorised Isolator Asset Attributes

MOTZKY
Mark Newman

Generic Asset Attributes

- Asset Description
- Class
- Object Type
- Corridor Name
- Start Line KM
- End Line KM
- Length
- Unit of Measure
- Description KM
- Parent Asset

Isolator Specific Attributes

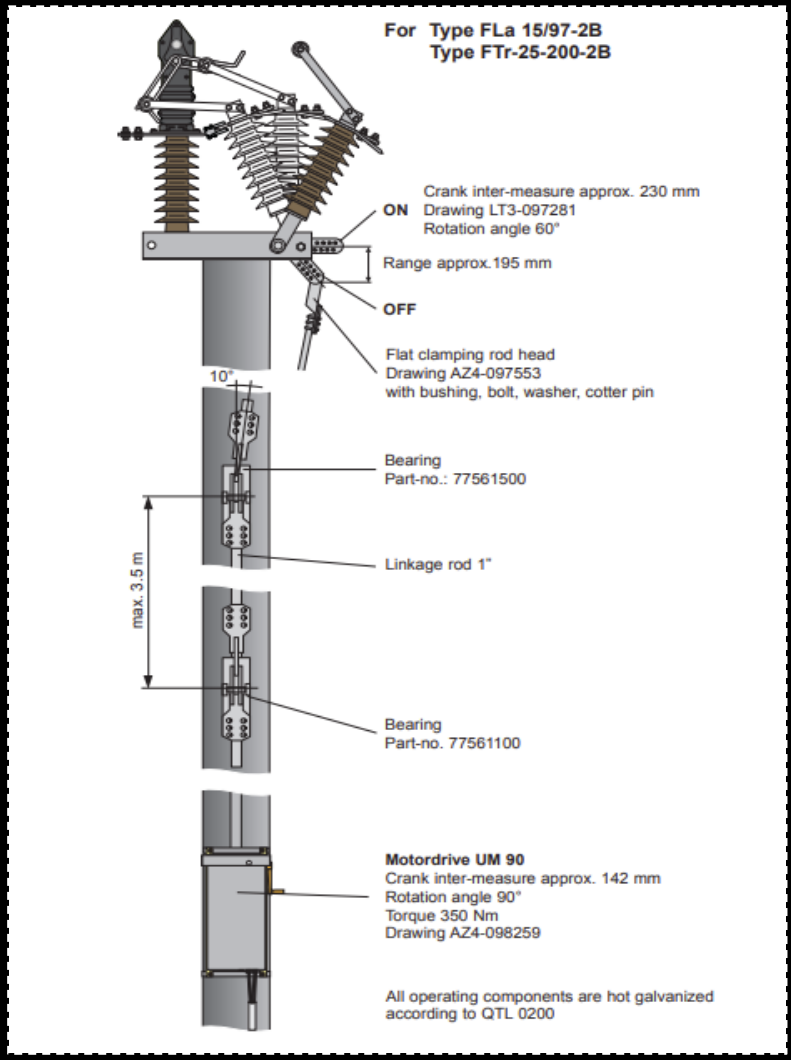
- CURRENT RATING
- EARTH POSITION Y/N?
- ELECTRICAL SECTION
- TYPE OF HANDLE
- HORIZONTAL OR VERTICAL
- ISOLATOR TYPE IN/OUT
- LOAD BREAK CAPABILITY Y/N
- MOTOR OPERATION Y/N?
- RATED NOMINAL V OF EQUIPMENT
- NO OF POLES
- NO OF POSITIONS

MOTZKY

Mark Newman

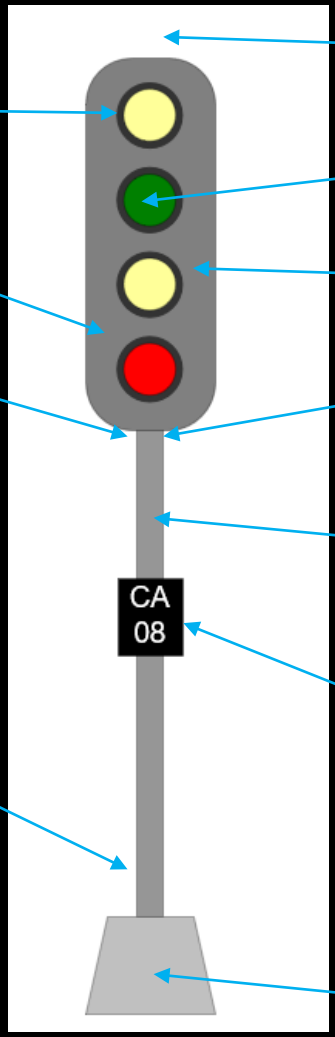
Data Dictionary

Attribute	Description	Where information is collected from	Options
Current Rating	Motor Current Rating	Drawing	Manual Input
Earth Rating		Manual	Manual Input
Electrical Section	Electrical Section Isolator is located in	Drawing	Manual Input
Type of Handle	Handle Type	Manual	Type 1 Type 2 Type 3
Horizontal or Vertical	How does isolator operate	Manual	HORIZONTAL VERTICAL
Isolator Type	Type of Isolator Present	Manual	INCOMING OUTGOING
Load Break Capability		Manual	
Motor Operation	How is the motor operated	Manual	NOT MOTORISED MOTORISED
Rated Nominal voltage of equipment	Voltage of Equipment	Manual	Manual Input
Number of Poles	How Many Poles	Drawing	Manual Input
Number of Positions	How many positions are there	Drawing	Manual Input



MOTZKY
Mark Newman

Colour Light Signal



2. Type of Signal Head

8. Signal Back Plane

3. Mounting Style

11. Local Cabling

4. Overhead Clearance

7. Light Colour

1. Signal Aspect

5. Disconnection Box

9. Post Type

6 Name Plate

10. Foundation Type

65 Asset Attributes

MOTZKY
Mark Newman

Signal
Asset Attributes

Typical Signal involves 65 attributes

Comprising of:

Generic Asset Attributes = 34

Signal Specific Attributes = 31

MOTZKY
Mark Newman

Signal Asset Attributes

Example of generic asset attributes

- Asset Description
- Class
- Object Type
- LRP
- Start Position
- End Position
- Length
- UOM
- Description KM
- Superior FLOC / Equipment

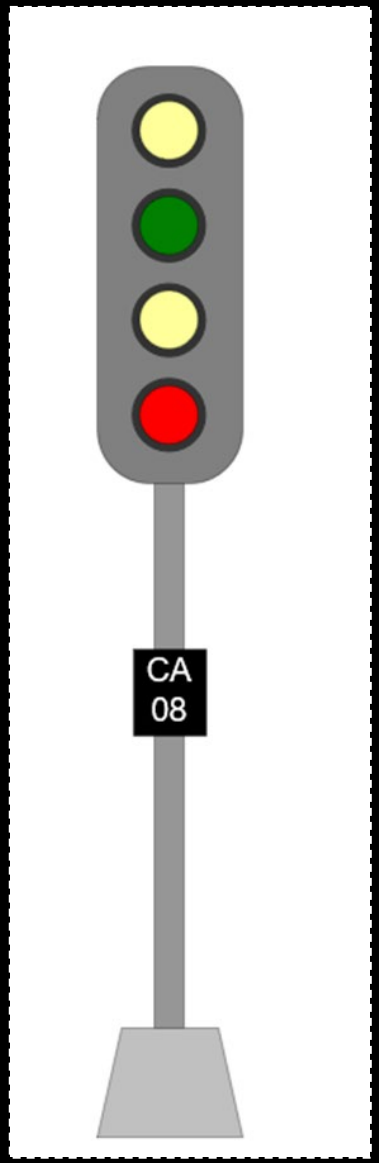
- TYPE OF ELECTRIC SIGNAL
- TYPE OF INCANDESCENT LAMP
- TYPE OF LED UNIT
- MOUNTING STYLE
- OVERHEAD_CLEARANCE
- TYPE OF SIGNAL LAMP

Example of signal specific asset attributes

Data Dictionary

MOTZKY
Mark Newman

Attribute	Description	Source of Information	Options
1 Type Of Electric Signal	The type of signal	Drawing	Type 1 Type 2 Type 3
2 Signal Head Type	The Type of Signal Head used	Drawing	Type 1 Type 2 Type 3
3 Mounting Style	The Type of Mounting Style used	Drawing	Style 1 Style 2 Style 3
4 Overhead Clearance	The overhead clearance the signal has.	Drawing	Text Input
5 Voltage	The voltage the signal operates at	Manual	Text Input
6 Current	The Current the signal operates at	Manual	Text Input
7 Light Colour	The colour of lights	Drawing	Red Yellow Green
8 Signal Head Type	The Type of Signal Head used	Drawing	Type 1 Type 2 Type 3
9 Post Type	The Type of Post used	Drawing	Type 1 Type 2 Type 3
10 Foundation Type	The Type of foundation used	Drawing	Type 1 Type 2 Type 3
11 Local Cabling		Drawing	



MOTZKY
Mark Newman

Smart Forms - Asset Attributes

data_capture1 - Feature Attributes

Asset data collection | Stages

Attribute form

MOTZKY details

Asset ID: 1

Asset Type: Isolator

Asset type

Parent Asset: ☐

Child Asset: ☑

Lifecycle

Design: ☑ Procurement: ☑ Deployment: ☑

Commissioning: ☑ Utilization: ☑ Decommissioning: ☑

Location

Start km: 0

End km: 0.2

Describtion km: Roma St Station

Corridor name: Qld Rail

Closest station: Roma St

Distance from nearest station: 200m

Direction from nearest station: West

Is this location 3km from a salt water body? yes

Planning

Specifications

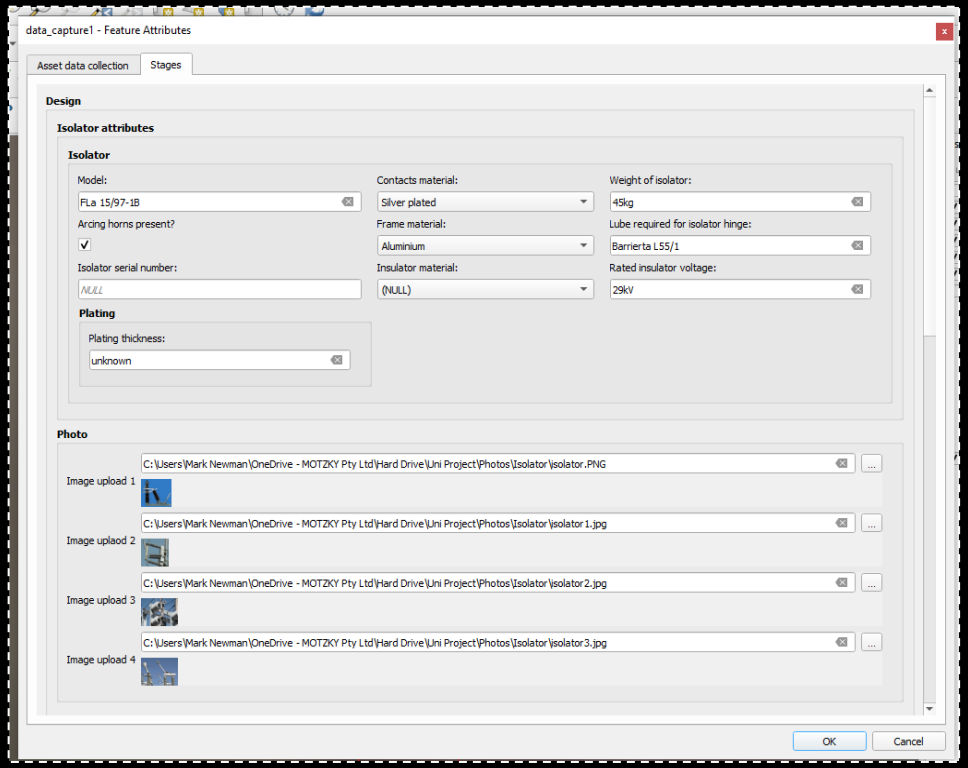
Input Voltage:

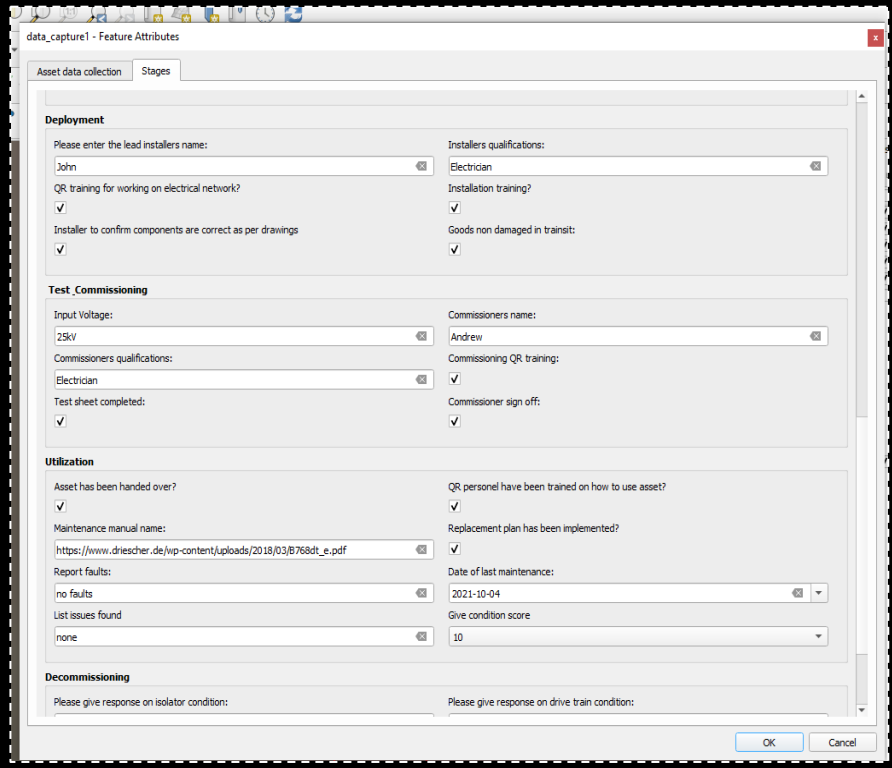
Switching Speed:

OK | Cancel

Smart Forms
Asset Lifecycle Stages

MOTZKY
Mark Newman



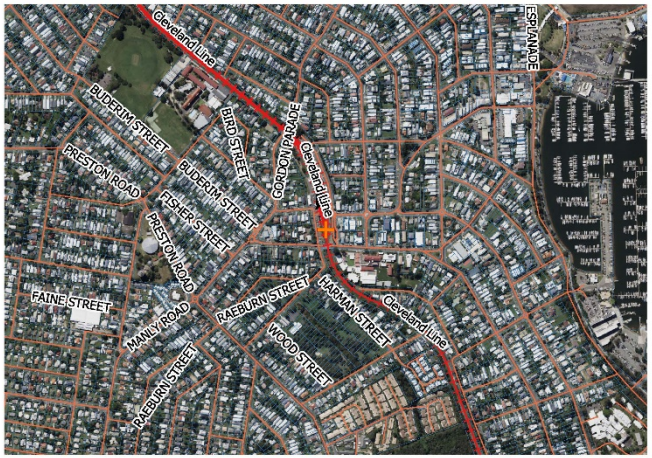


Asset Passport

MOTZKY Asset Passport

Railway Name: Cleveland Line

Asset: Motorised Isolator



MOTZKY

TITLE: MOTZKY Asset Passport Report
Railway Name: Cleveland Line
Asset: Motorised Isolator

Asset Passport Report

Location:

Railway Name: Cleveland Line	Chainage Start: 15.2	Chainage Finish : 15.8
Section: Manly Station	Road: New Rd	Suburb: Manly
Closesets Station: Manly Station	Dist to Station Varies	Near Salt Water: Yes

Planning

Specifications:	Additional Detail:
Input Voltage: 25kV	On QR Network : yes
Switching Speed: 10s	Approved :
	SCADA Funct.

Item Details

Manufacturer: DRIESCHER	Manuals
Model FLa 15/97-1B	Isolator: https://www.driescher.de/wp-content/uploads/
	Enclosure:
	Drive:
	Drive:

Design

Model:	Lube Type:
Drive Material :	Bolt Material :

Procurement

Datasheet Lube: Yes	Certificate Drive: Yes
Drawing Isolator: Yes	Certificate Enclosure: Yes
Drawing Enclosure Yes	Certificate Pole: Yes
Certificate Isolator :Yes	

Deployment

Installer Name: John	Installation Training Completed :Yes
Installers Quals: Electrician	Drawings Checked?: Yes
QR Electrical Training Completed Yes	Goods Damaged in Transit : Yes

Commissioning

Input Voltage:25kV	QR Commissioning Training Completed: Yes
Commissoners Name: Andrew	Test Sheet Completed: Yes
Commissoners Quals: Electrician	Sign Off: Yes

Utilization

Asset Handed Over: Yes	Reported Faults: No
QR Personel Trained: Yes	Date of Last Maintenance: 2021-10-04
Maintenance Manual Name:	List of issues found: none
Replacment Plan Implemented: Yes	Condition Score: 10

Decommissioning

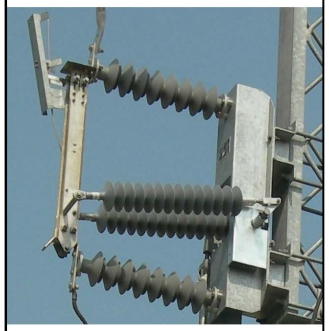
Isolator Condtion: 10/10	Reported Faults
Drive Train Condtion: n/a	Date of Last Maintenance: 2021-10-04
Motor Condtion: n/a	List of issues found: none
Motor Condition: n/a	Condition Score: 10

MOTZKY

TITLE: MOTZKY Asset Passport Report
Railway Name: Cleveland Line
Asset: Motorised Isolator

Asset Passport

Pictures:

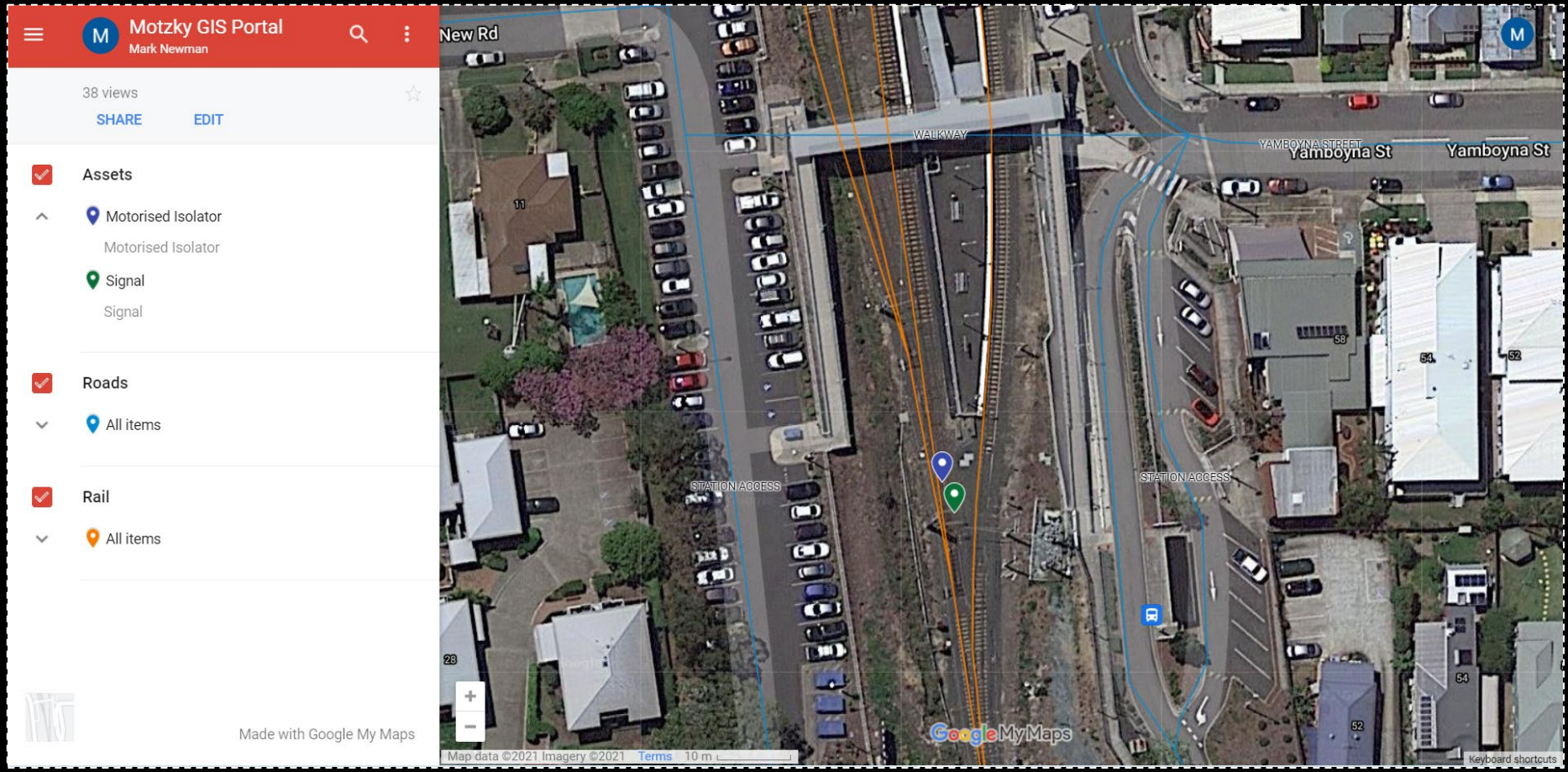


MOTZKY

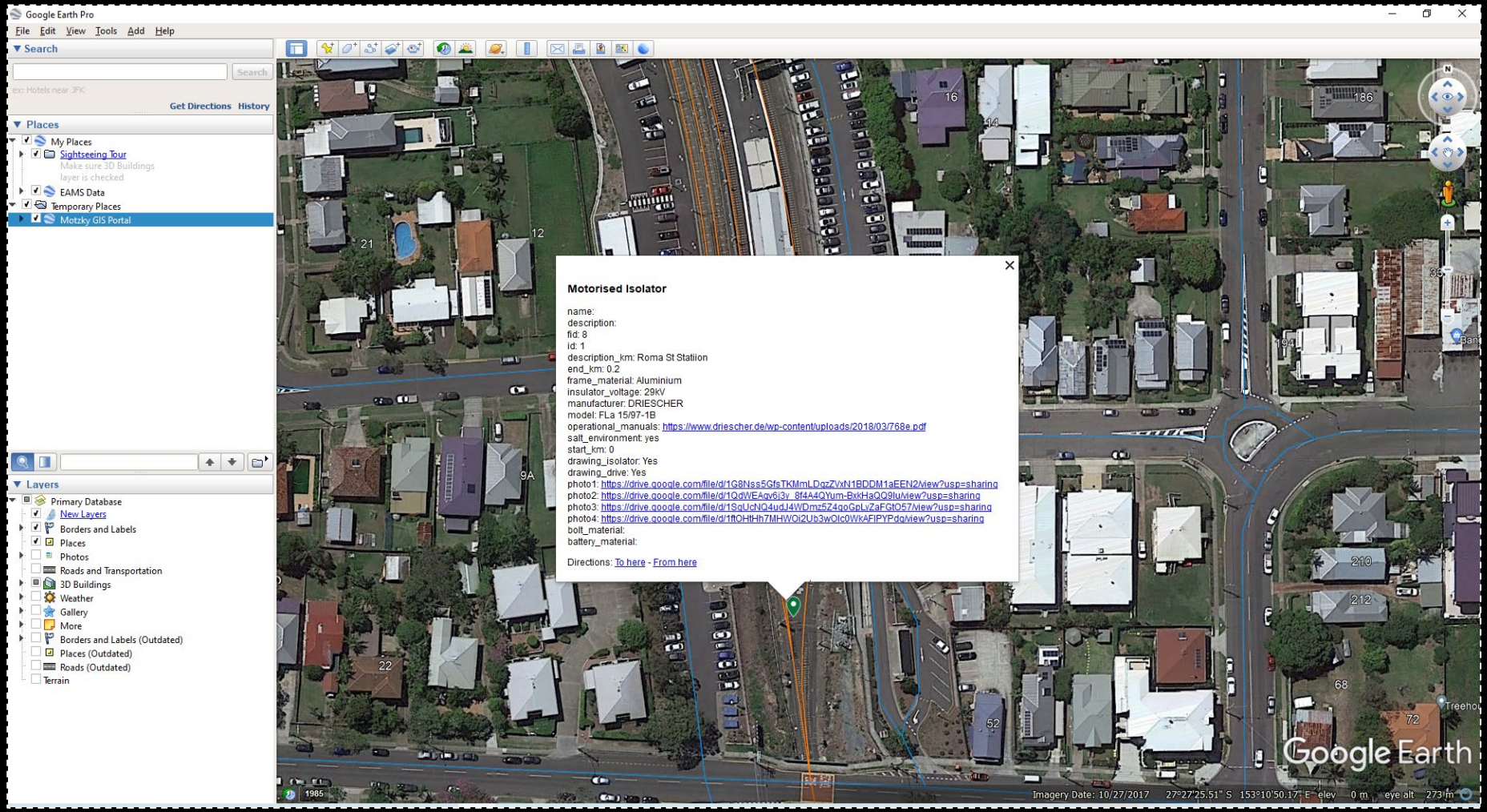
TITLE: MOTZKY Asset Passport Report
Railway Name: Cleveland Line
Asset: Motorised Isolator

MOTZKY
Mark Newman

GIS for Railways – Web



GIS for Railways – Google Earth



Conclusions

- Attributes of each linear asset can be divided to Generic and Asset Specific
- Data dictionary enables consistency in data entry
- Smart forms segregate data by lifecycle and make the content relevant
- Asset Passport identifies essential attributes of an asset
- GIS enhances localisation of assets and integrates attributes to the user interface