Oracle Cloud and National Mapping

- Éamonn Clinton, General Manager, Geospatial Services, Data Governance & Quality
- **Ordnance Survey Ireland**

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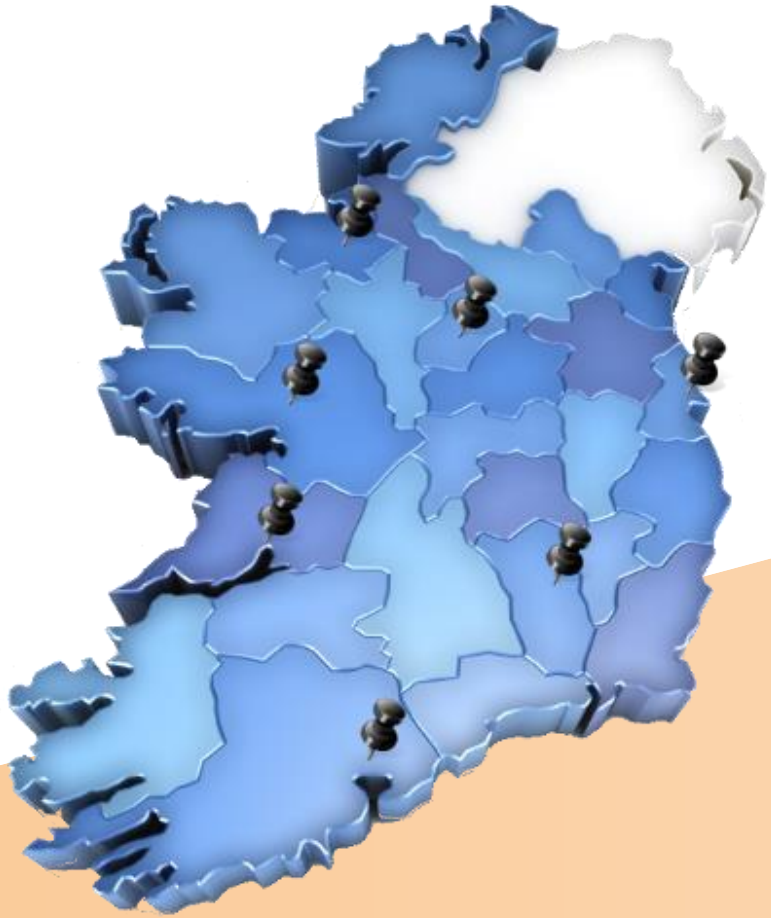
- Ireland's National Mapping Agency
- Established in 1824
- Operates under the Ordnance Survey Ireland Act, 2001

Mandate: "*To provide a national mapping service in the State… creating and maintaining the definitive national mapping and related geographic records*"



Ordnance Survey Ireland's use of OCI Proof of Value

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- Imagery Processing
- Point Cloud Generation
- Point Cloud Processing
- Positional Accuracy Improvement

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Imagery Processing

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Hardware and Software Configuration

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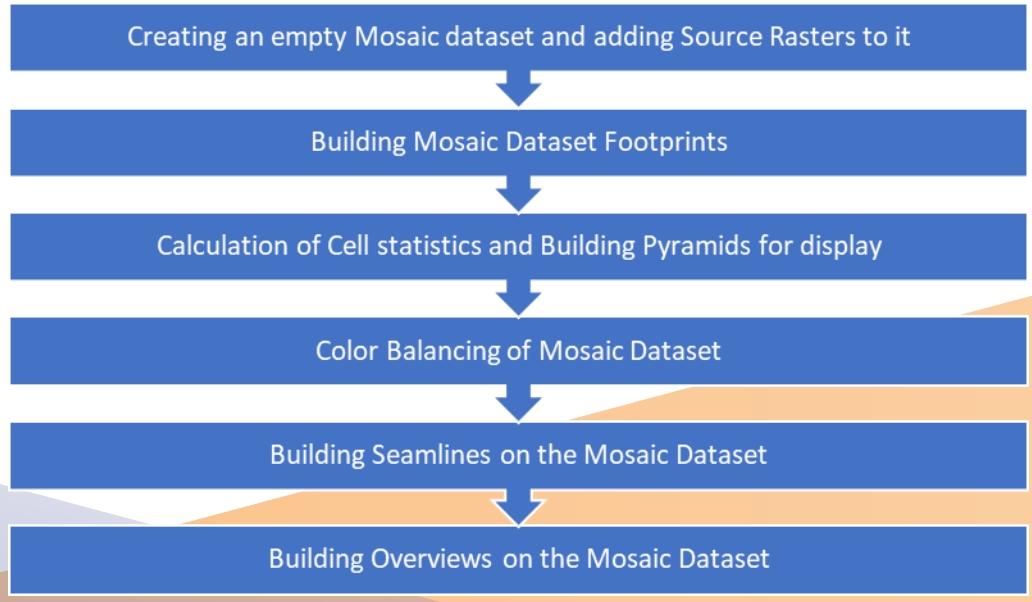
The following was the system configuration on the two machines:

RAM	**512 GB**
Processor	Intel Xenon 2.3 GHz (36 cores)
Storage	2.91 TB SSD
Operating System	Windows Server 2012 R2

The following ESRI software was installed on the machines:

S.No	Software
1	ArcGIS Desktop 10.6
2	ArcGIS Pro 2.1.0
3	ArcGIS Server 10.6
4	Python v2.7.14 (pre-configured with ArcGIS installation)



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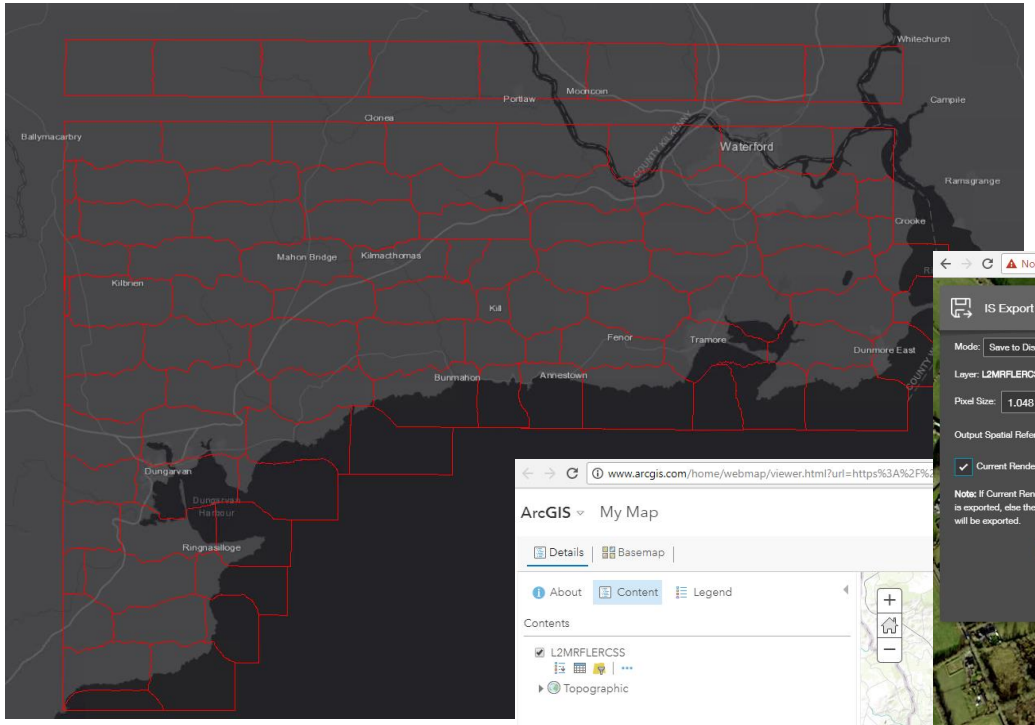

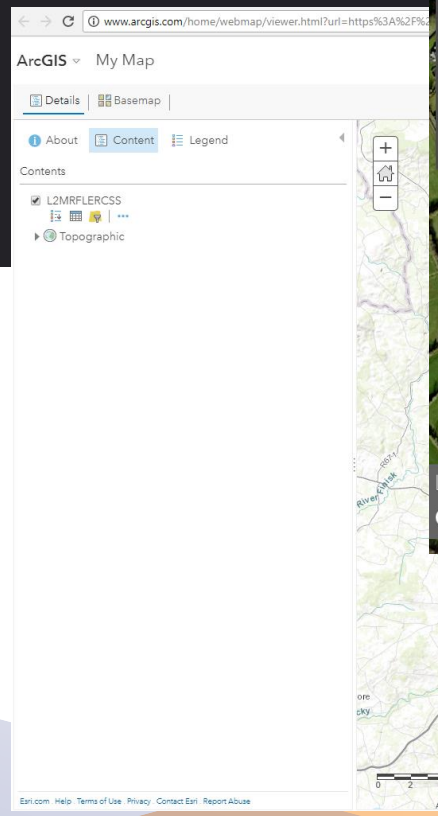

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Performance

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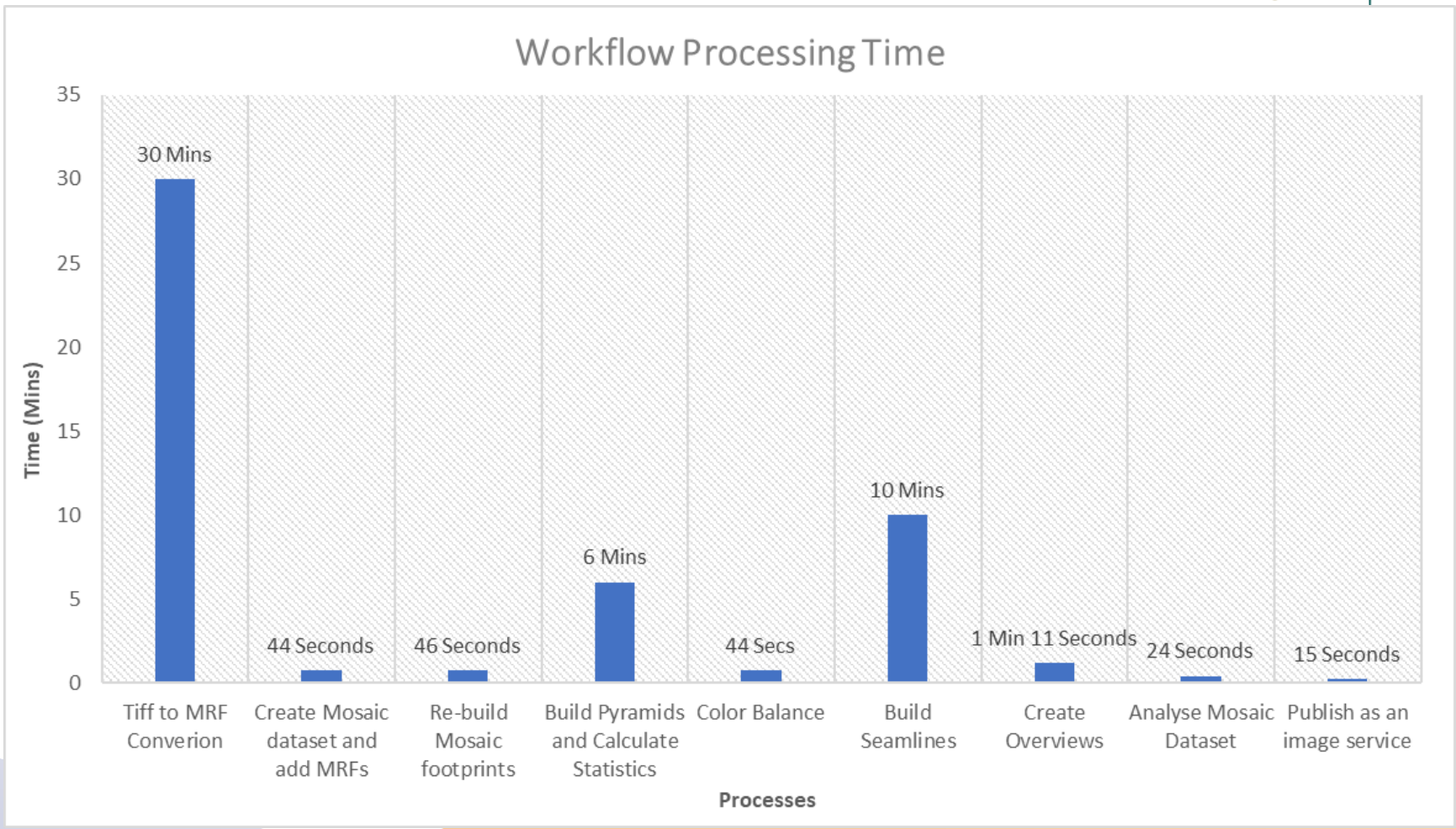

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Point Cloud Processing

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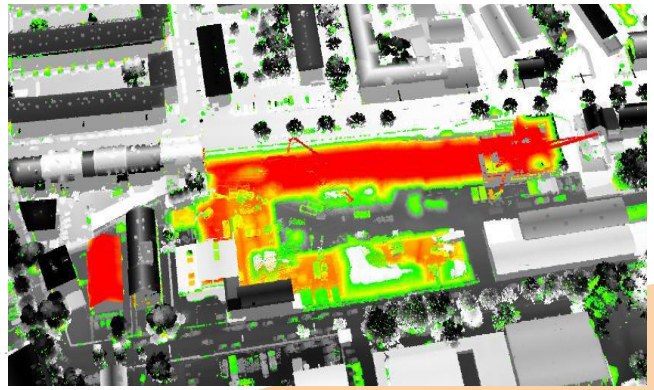
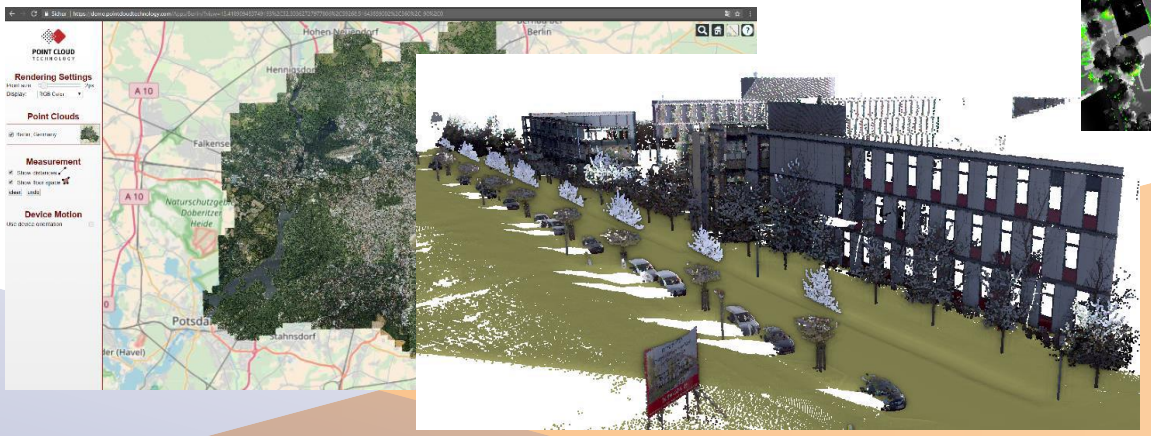
ORACLE
Cloud Infrastructure

POINT CLOUD TECHNOLOGY

Classification



Change Detection



Visualization

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Point Cloud Generation

HEXAGON GEOSPATIAL

SIS SURVEY INSTRUMENT SERVICES

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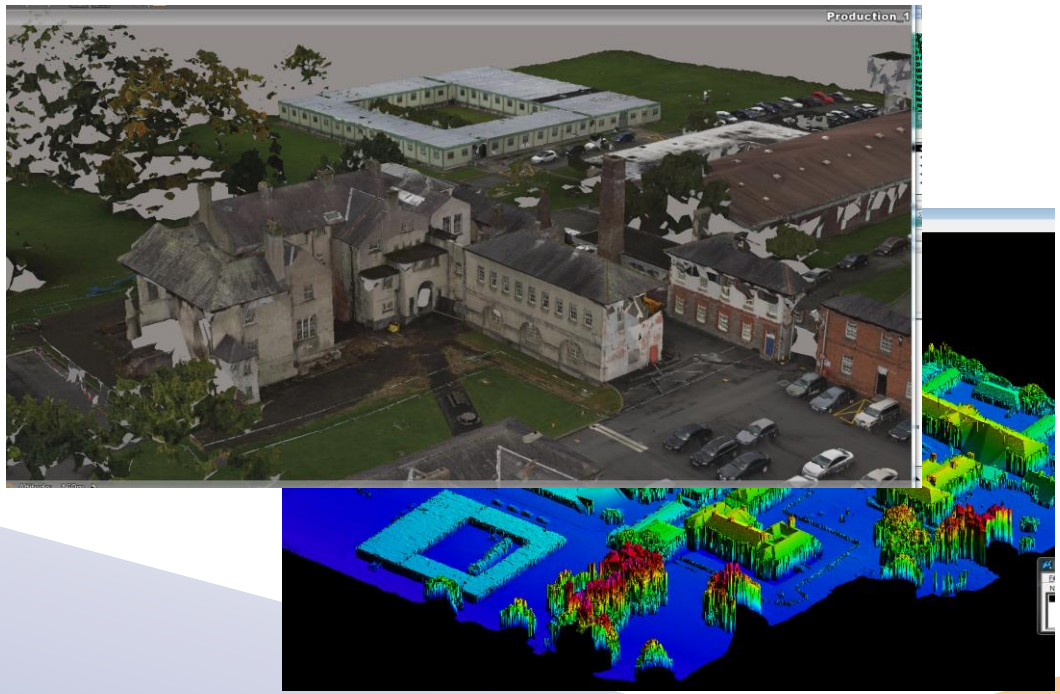

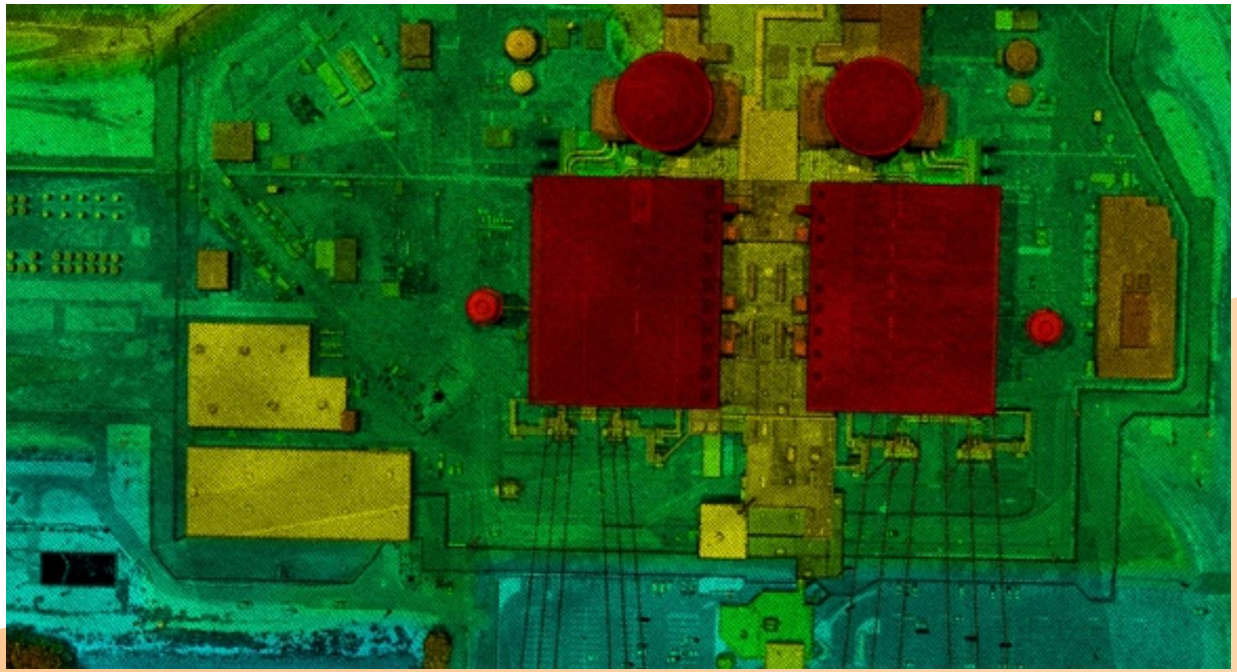

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Hardware and Software Configuration

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Oracle Server (BM.GPU 2.2):

- 2x NVIDIA Tesla P100
- 192 GB RAM
- 256 GB local HDD
- 8TB block volume attached
- Windows Server 2012 R2

Desktop:

- 1x NVIDIA GeForce GTX 1070
- 32 GB RAM
- 500 GB local SSD
- 3 TB local HDD
- Windows 10 Pro

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Test Data

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Block_9_Louth_Meath, combining two separate subsets:

Series 1, ADS 80
- 4 pts/m²
- 1.012 billion points
- 32.1 GB (las format)

Series 2, ADS 100
- 9 pts/m²
- 2.474 billion points
- 78.8 GB (las format)

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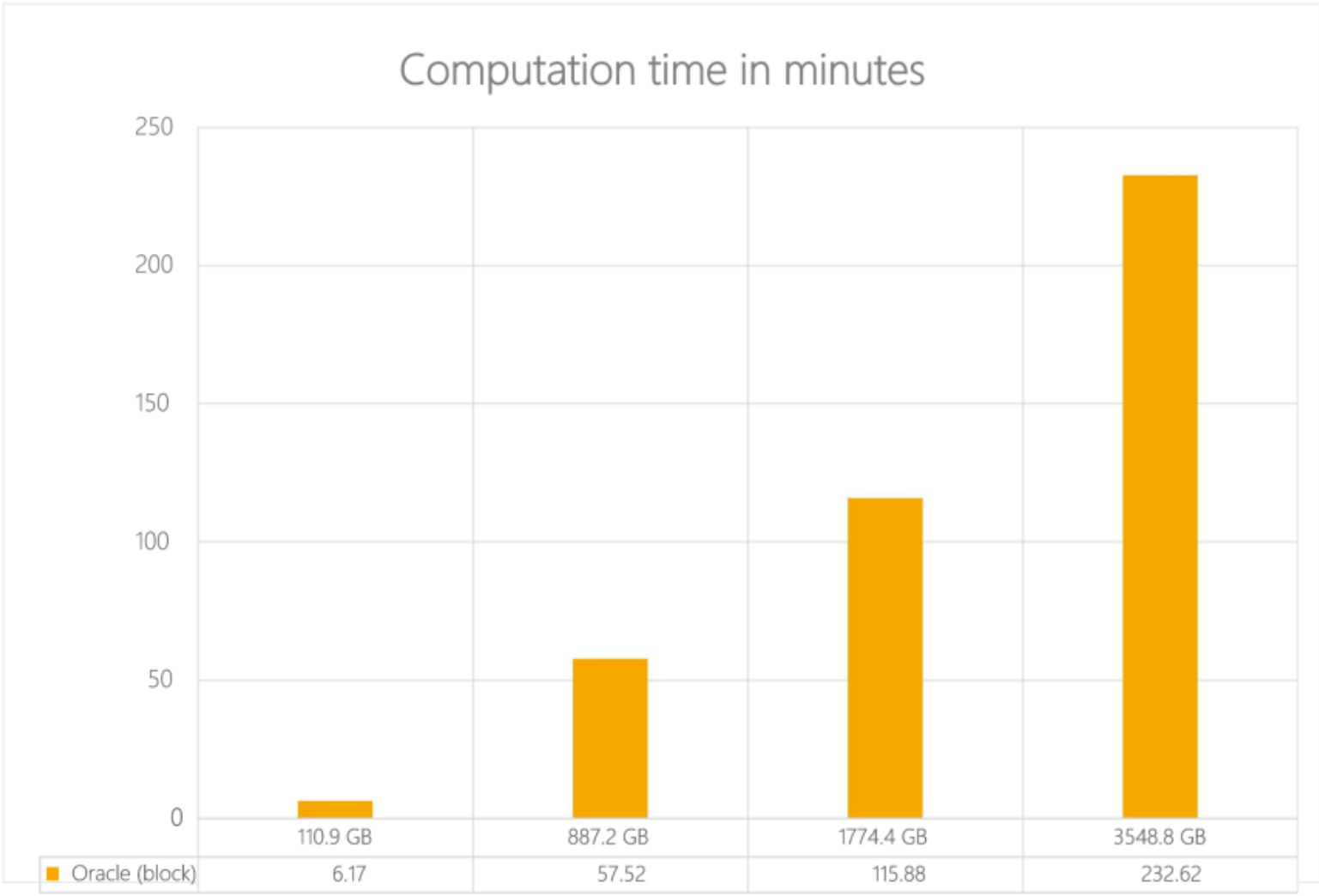

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Change Detection

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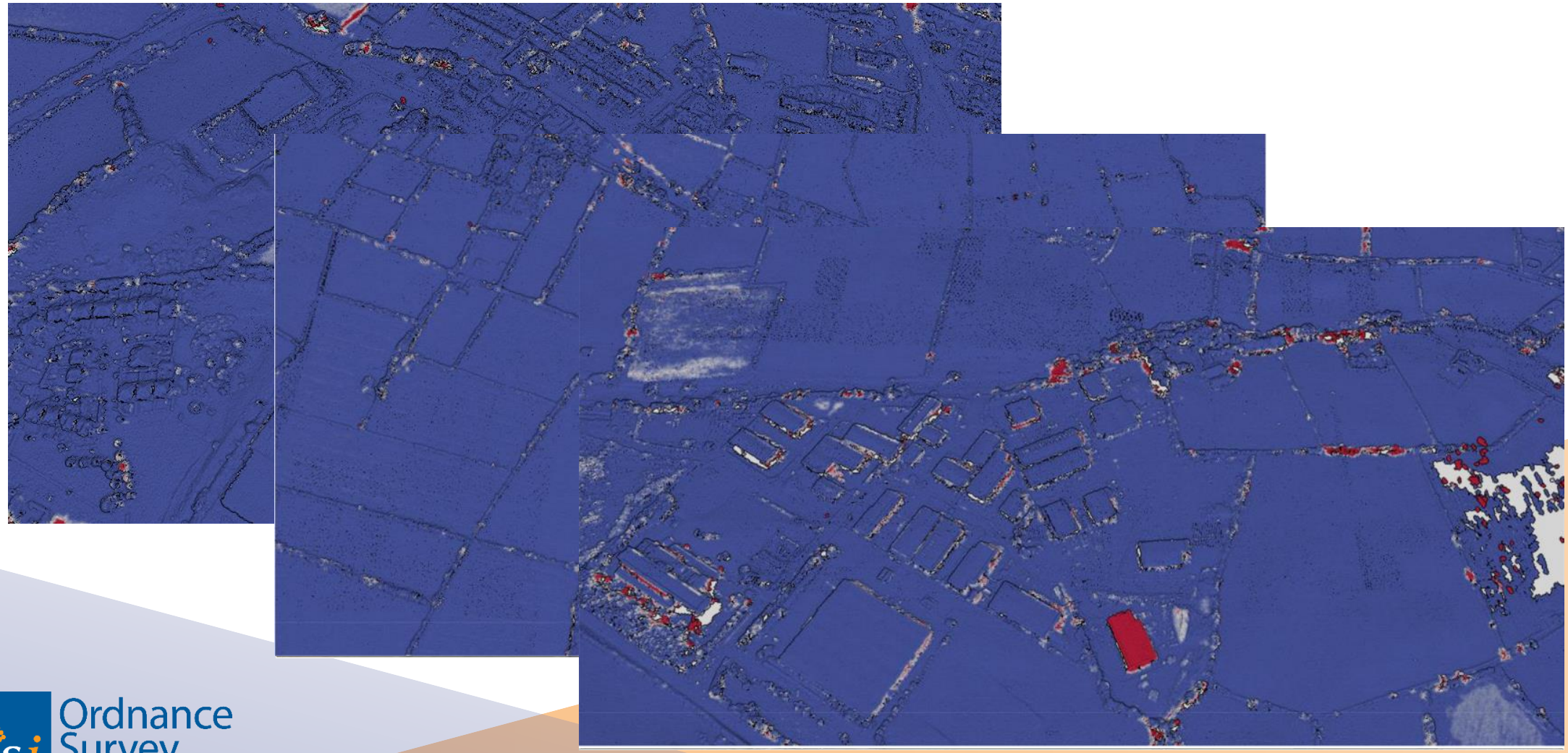

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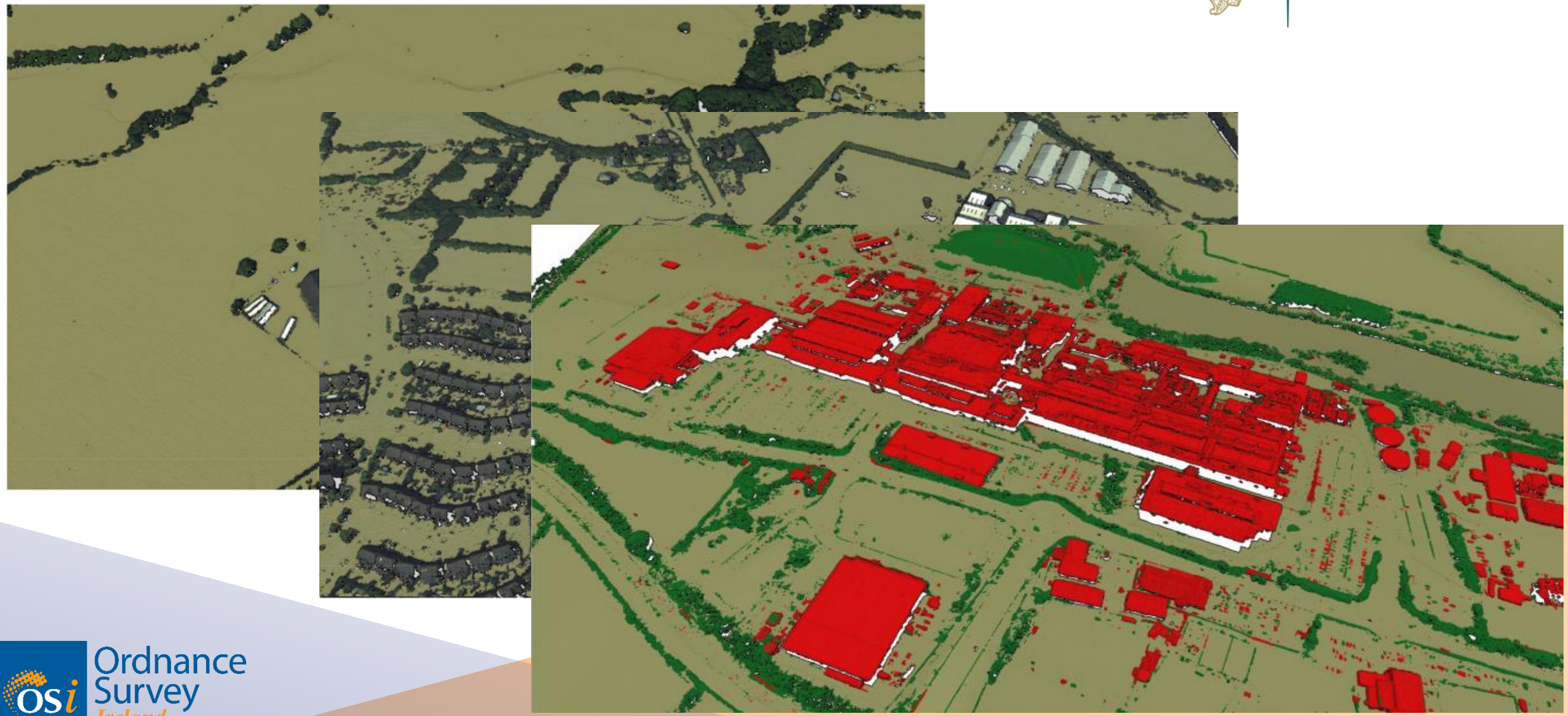
Classification



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Positional Accuracy Improvement

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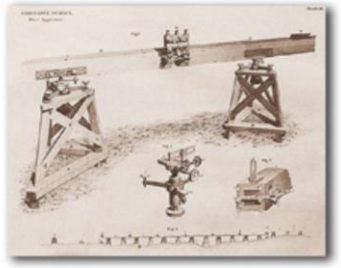
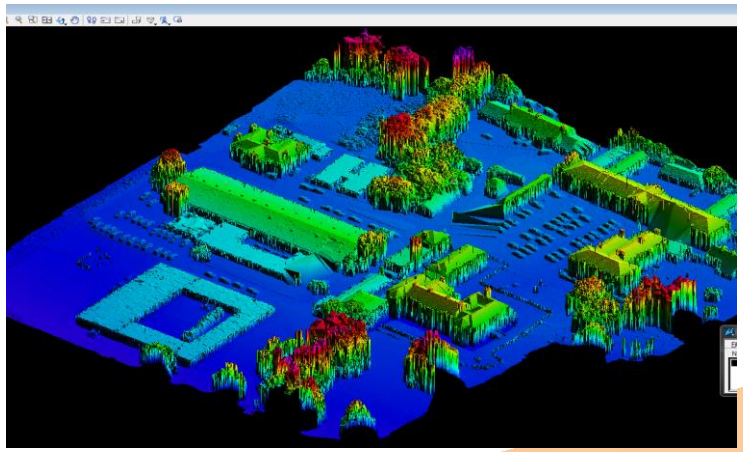
MAJOR THOMAS COLBY

1784-1852





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Positional Accuracy Improvement

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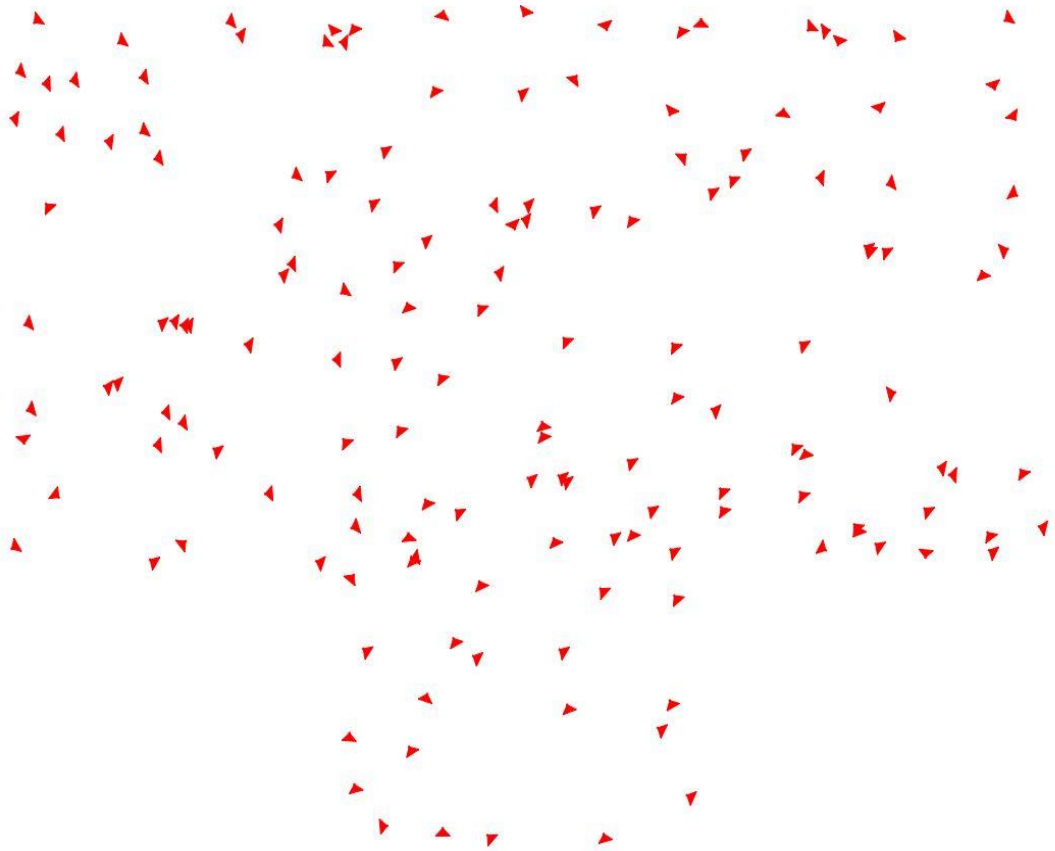
- Shift Vectors
  - Should identify systematic errors only
  - Remove random survey errors
  - Remove real world changes



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Identify Outliers

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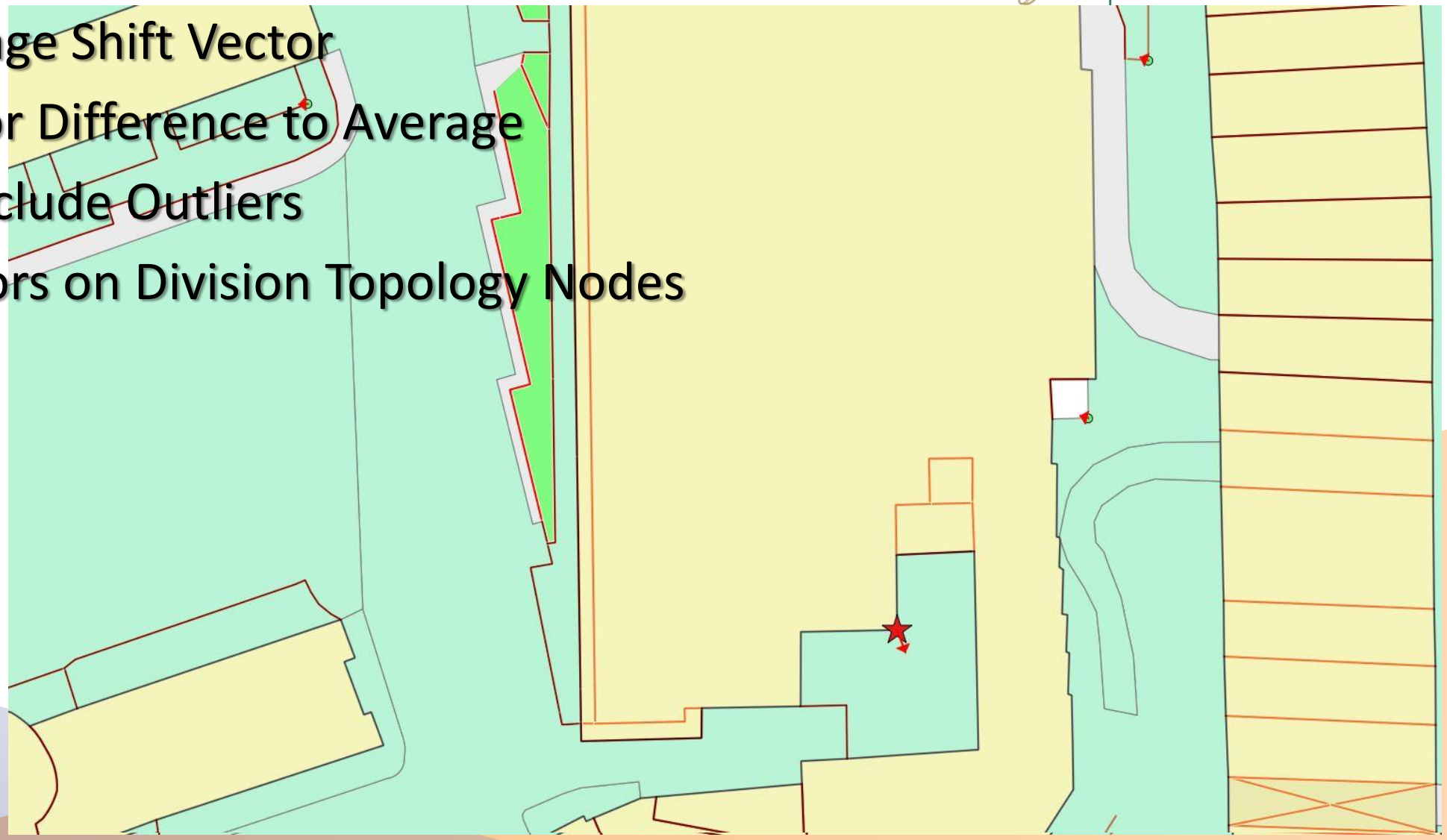
- Compute Average Shift Vector
- Compute Vector Difference to Average
- Identify and Exclude Outliers
- Best Shift Vectors on Division Topology Nodes



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Application of Shift Vectors

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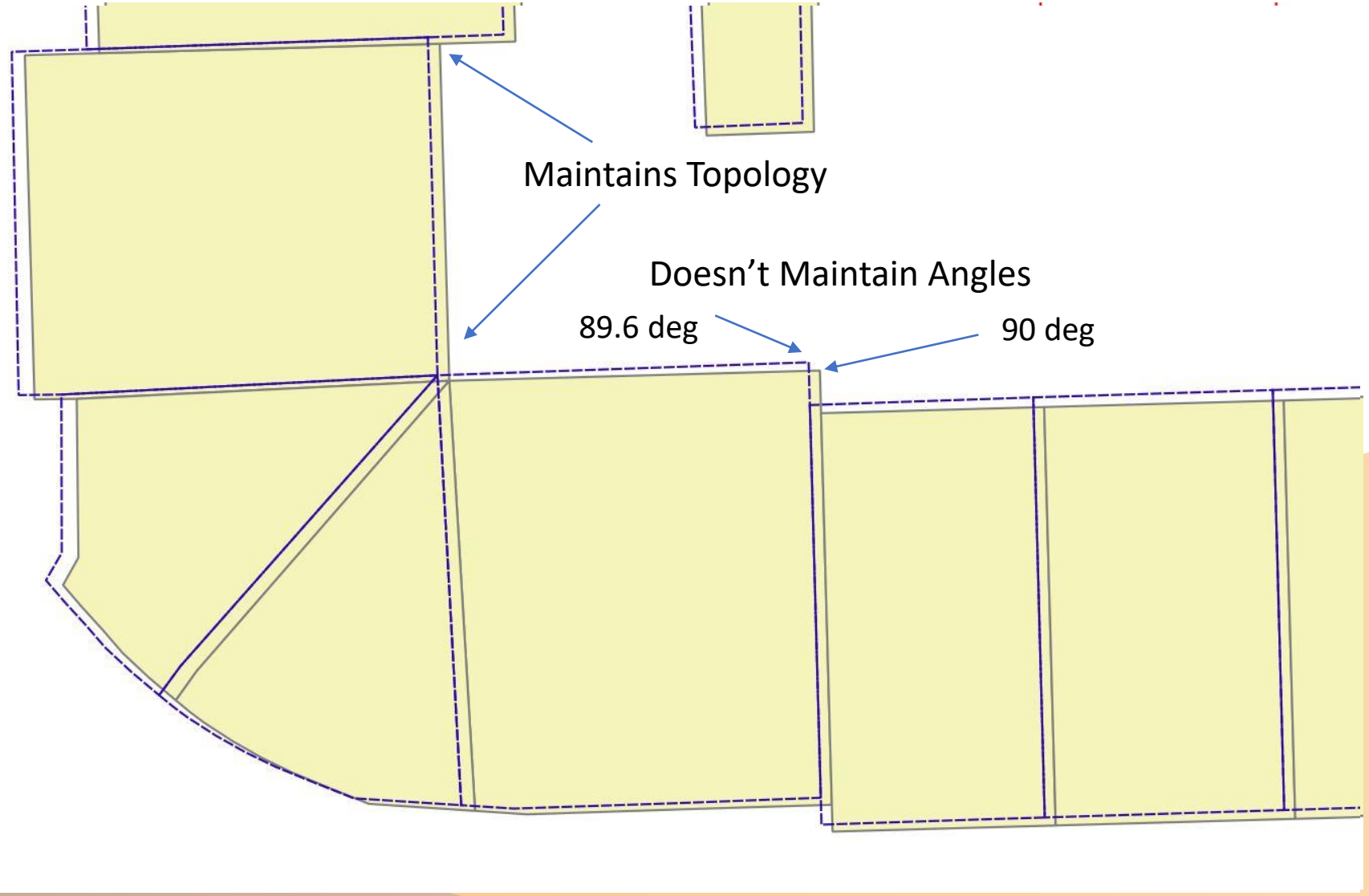

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Connected Blocks of data

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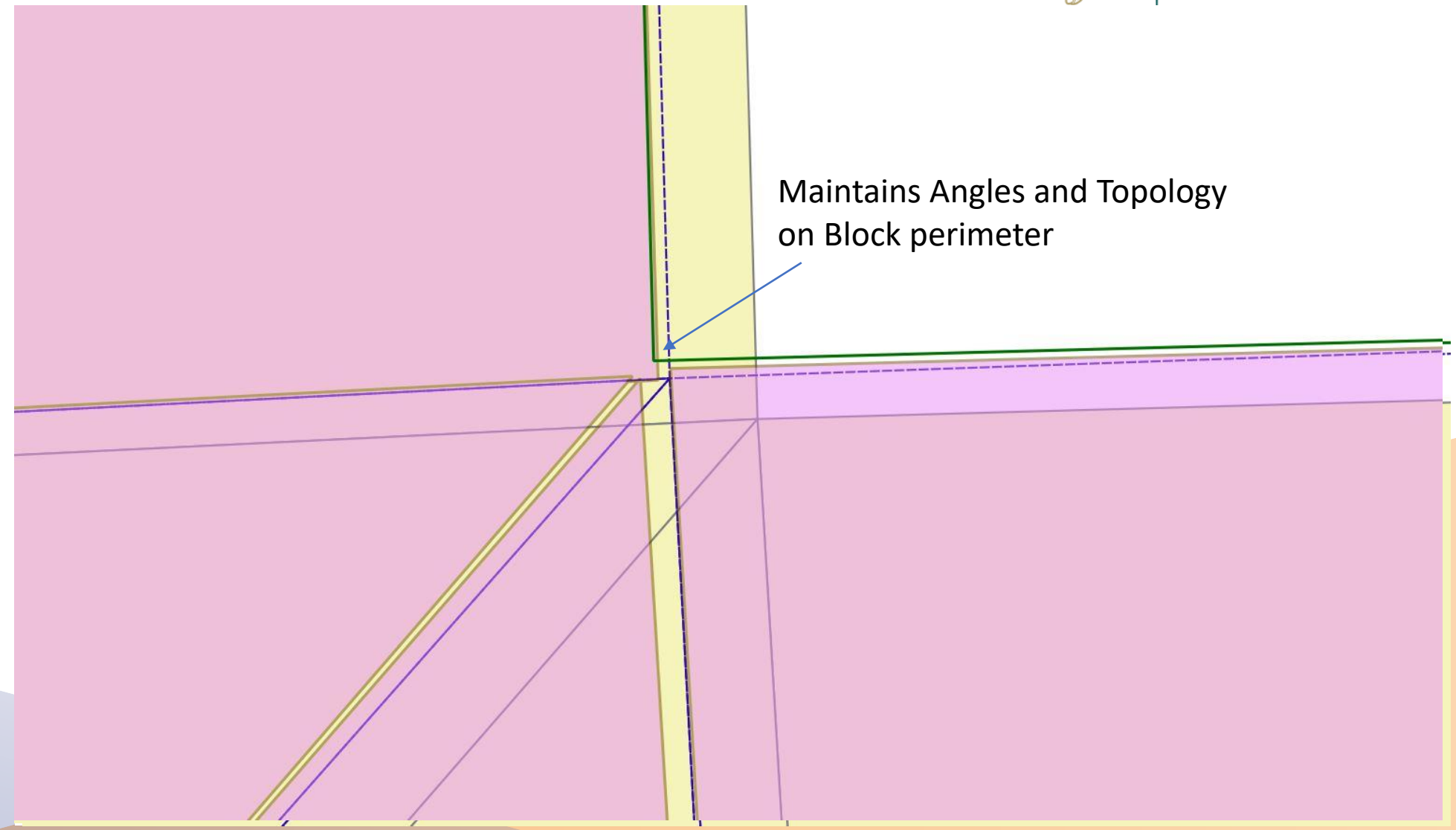

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Full Shift Vector Dataset

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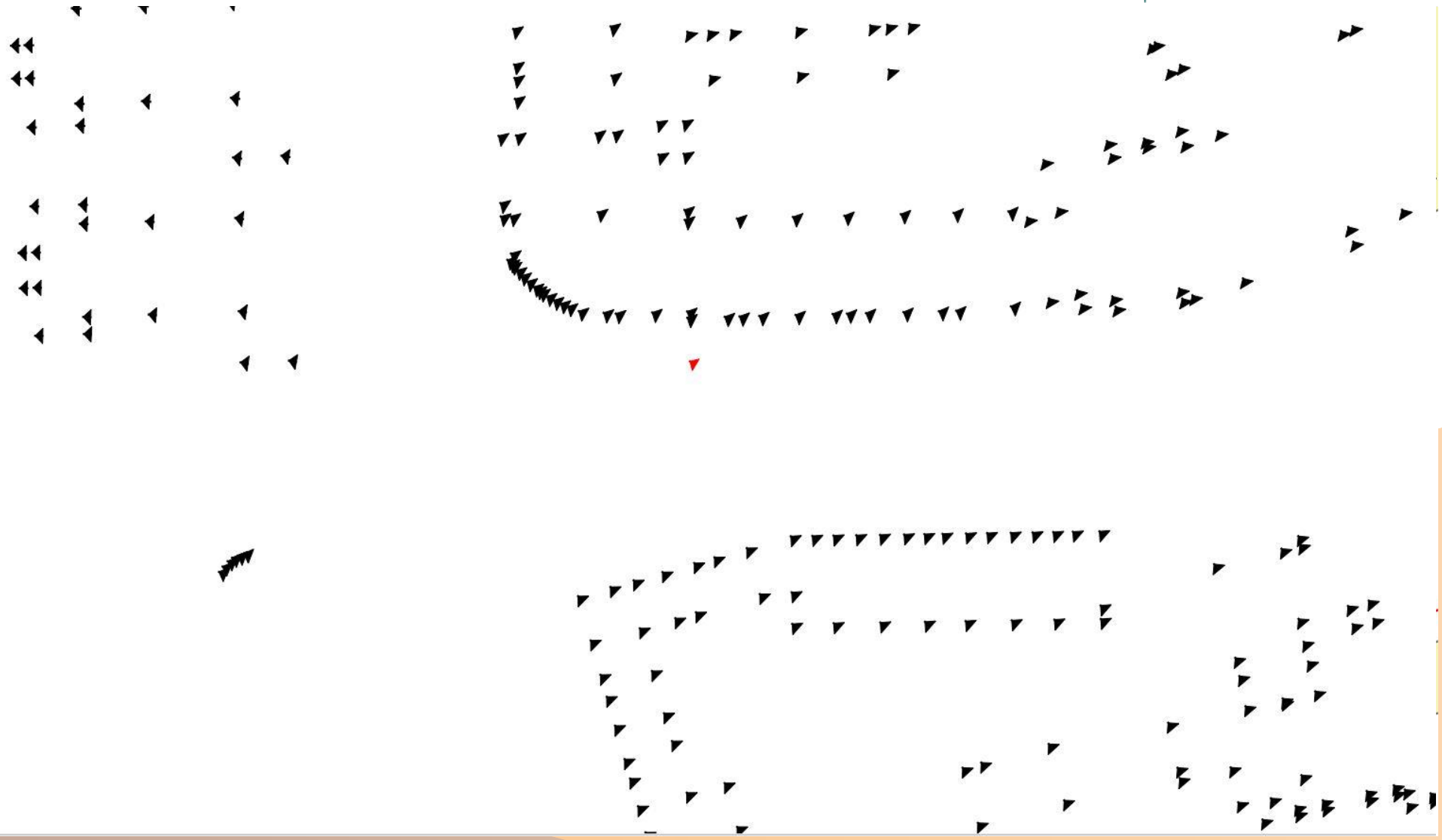

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Application of All Shift Vectors

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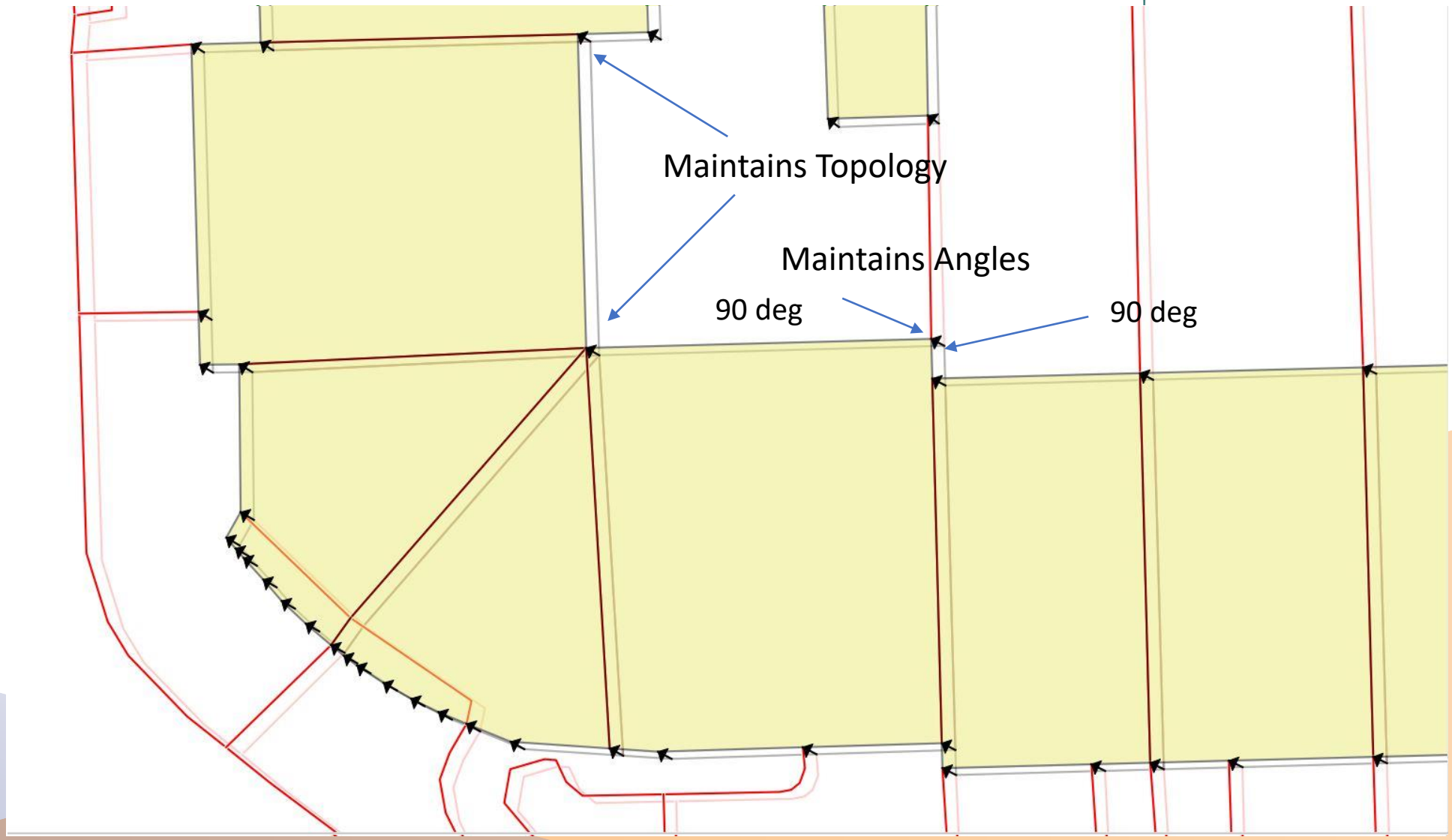

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