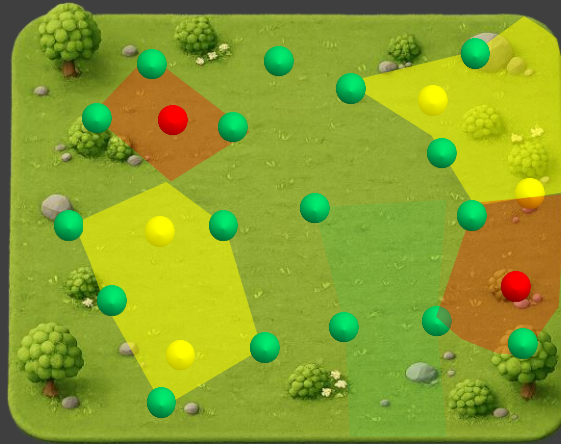


# Digital Dirt: A Guide to an AI-assisted, 3D Digital Twin Workflow

Tom Wilson  
Environmental Manager  
Protranz Earthmoving

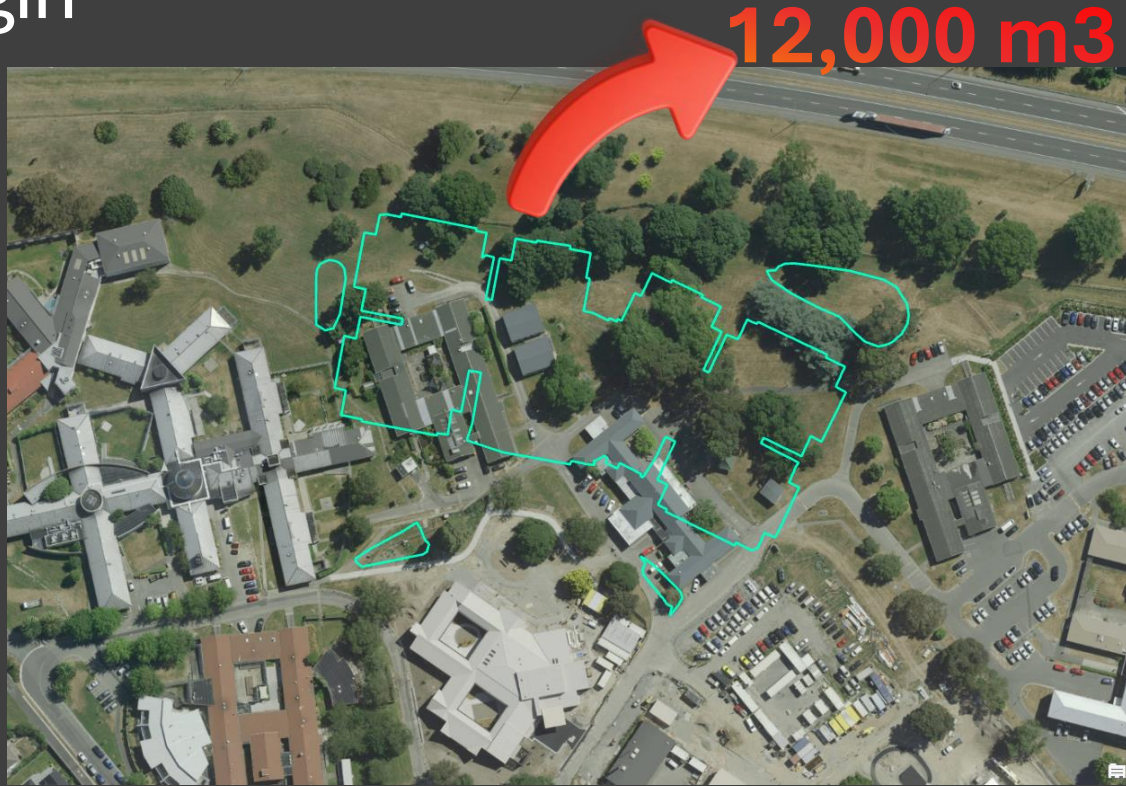
# The Usual



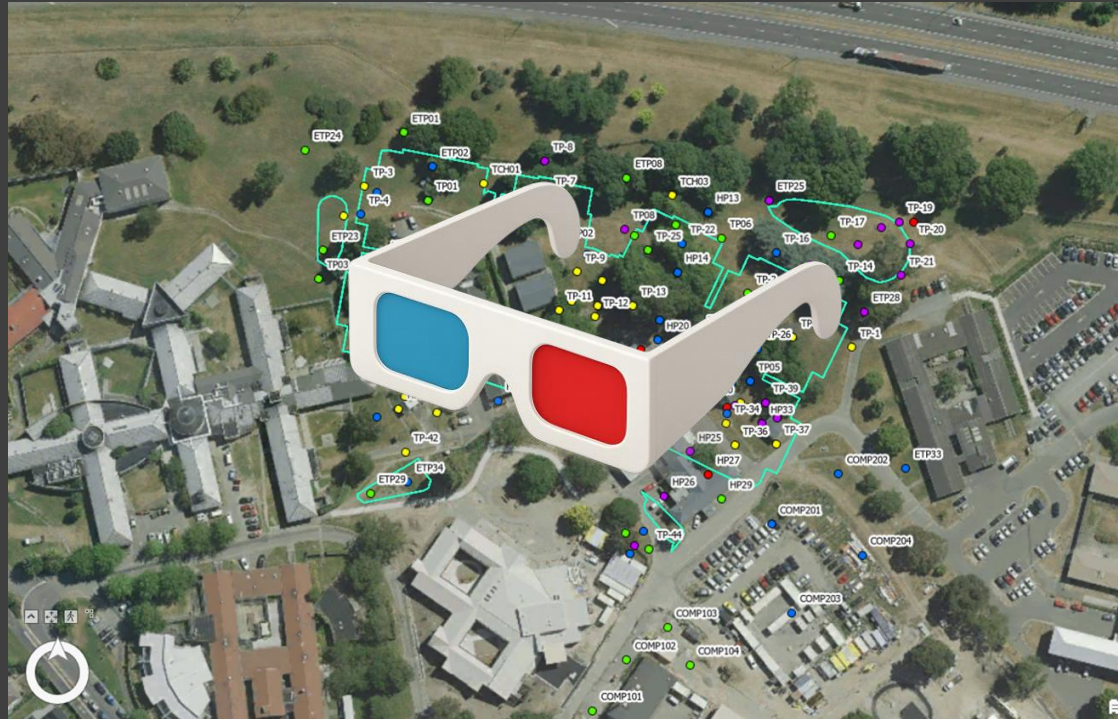
# Digital Twin



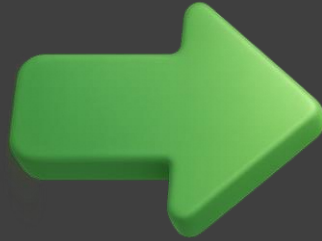
# The Origin



# It's Complicated



# Step 1: Data Extraction



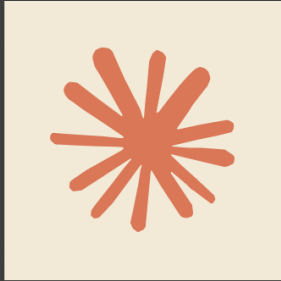
# Step 1: Data Extraction

Develop a simple python script to ingest PDF documents containing tables of soil sampling data. Return the sampling data in a csv format.

No, do it yourself.



# Step 1: Data Extraction



```
Soilpdf to csv .PY
1 #!/usr/bin/env python3
2 """
3 soil_pdf_to_csv.py
4 -----
5 Extract soil sampling tables from one or more PDF files and write the
6 data to a CSV file.
7
8 Usage:
9 python soil_pdf_to_csv.py report1.pdf report2.pdf -o results.csv
10 python soil_pdf_to_csv.py *.pdf # writes soil_data.csv
11 python soil_pdf_to_csv.py report.pdf --pages 2 4 6 # specific pages only
12
13 Dependencies:
14 pip install pdfplumber
15 """
16
17 import argparse
18 import csv
19 import sys
20 from pathlib import Path
21
22 try:
23     import pdfplumber
24 except ImportError:
25     sys.exit("Missing dependency. Run: pip install pdfplumber")
26
27
28 # -----
29 # Helpers
30 # -----
31
32 def _is_soil_header(row: list) -> bool:
33     """
34     Heuristic: decide whether a row looks like a soil-data table header.
35     Matches common column names found in lab / field sampling reports.
36     """
37     if not row:
38         return False
```



# Step 3: Digitise and Georeference



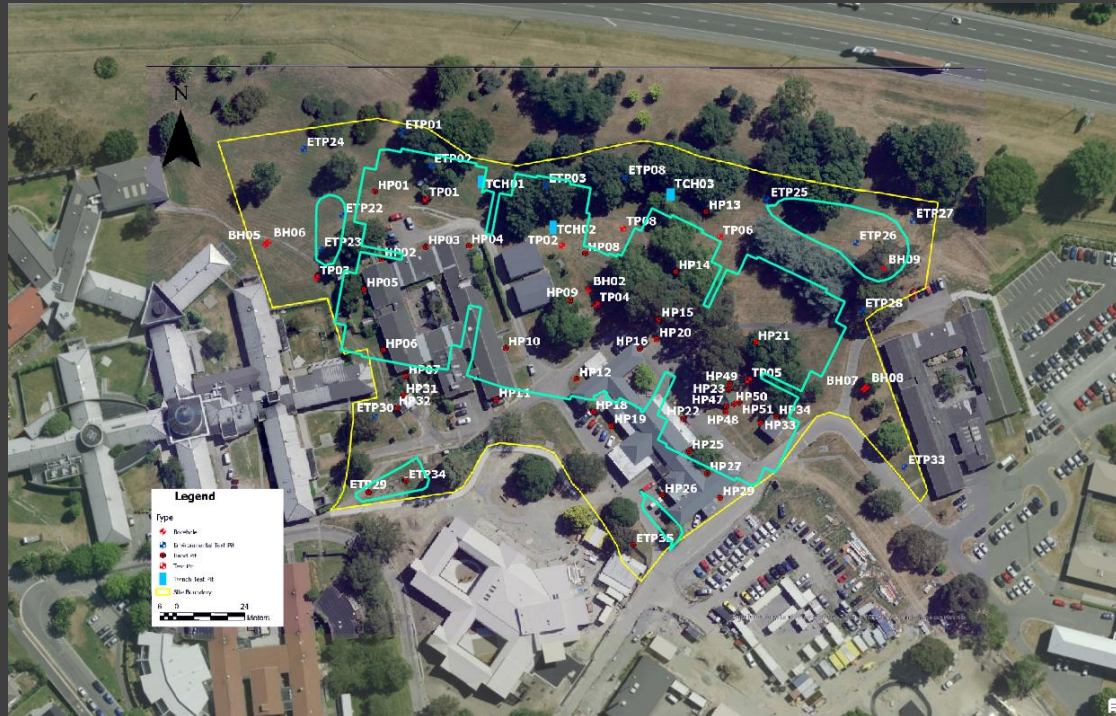
# Step 3: Digitise and Georeference

Provide me clear, step-by-step instructions to import and georeference site figures from PDF files and align digital 'Sample Location' feature classes with those in the figures.

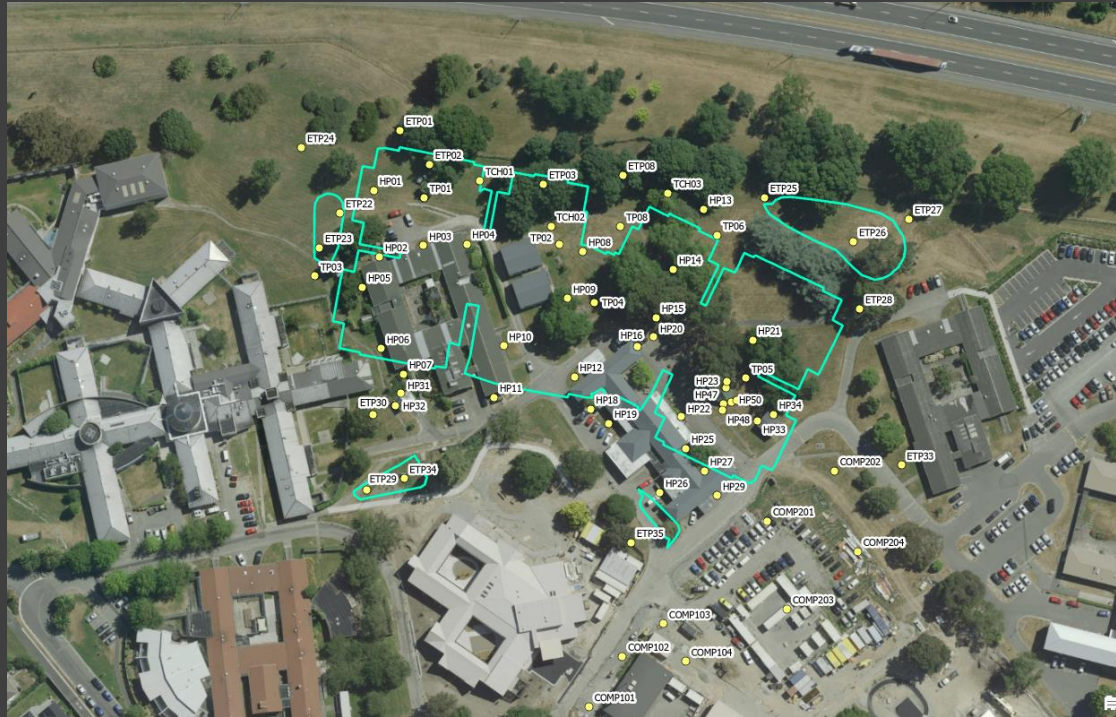
Sure. First, open ArcGIS Pro. Then spend 20 minutes wondering whether your layer disappeared, failed to load, or is simply in a different hemisphere.



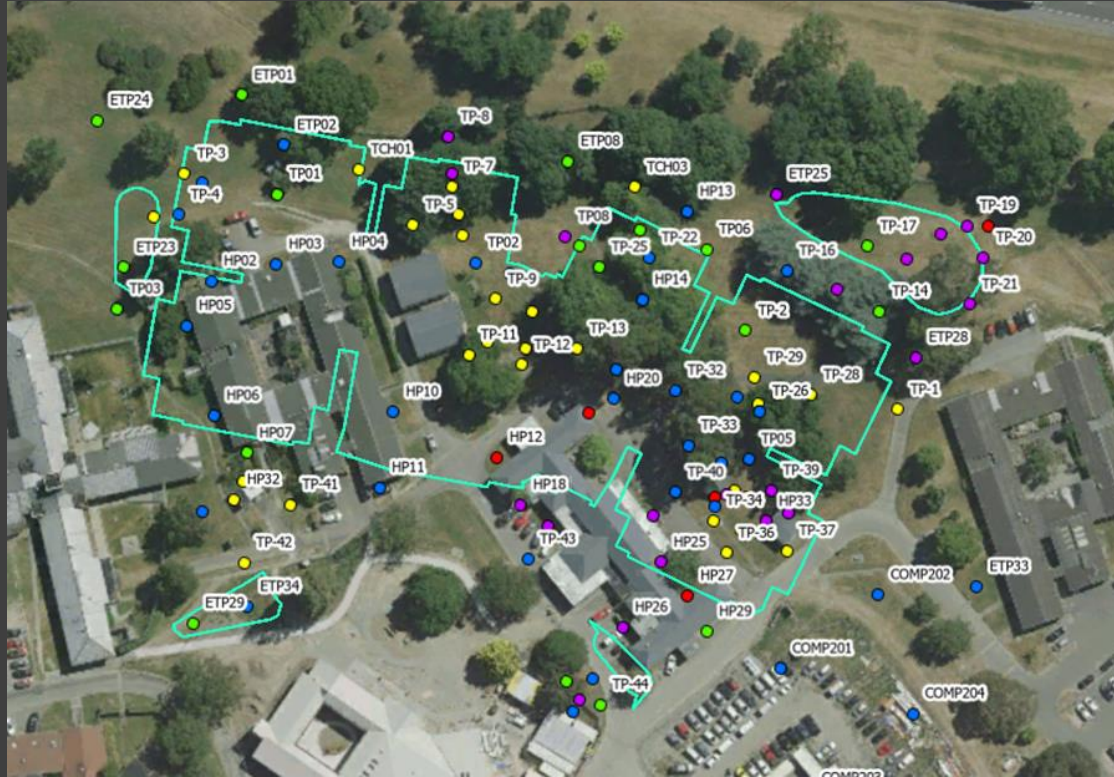
# Step 3: Digitise and Georeference



# Step 3: Digitise and Georeference



# Step 3: Join

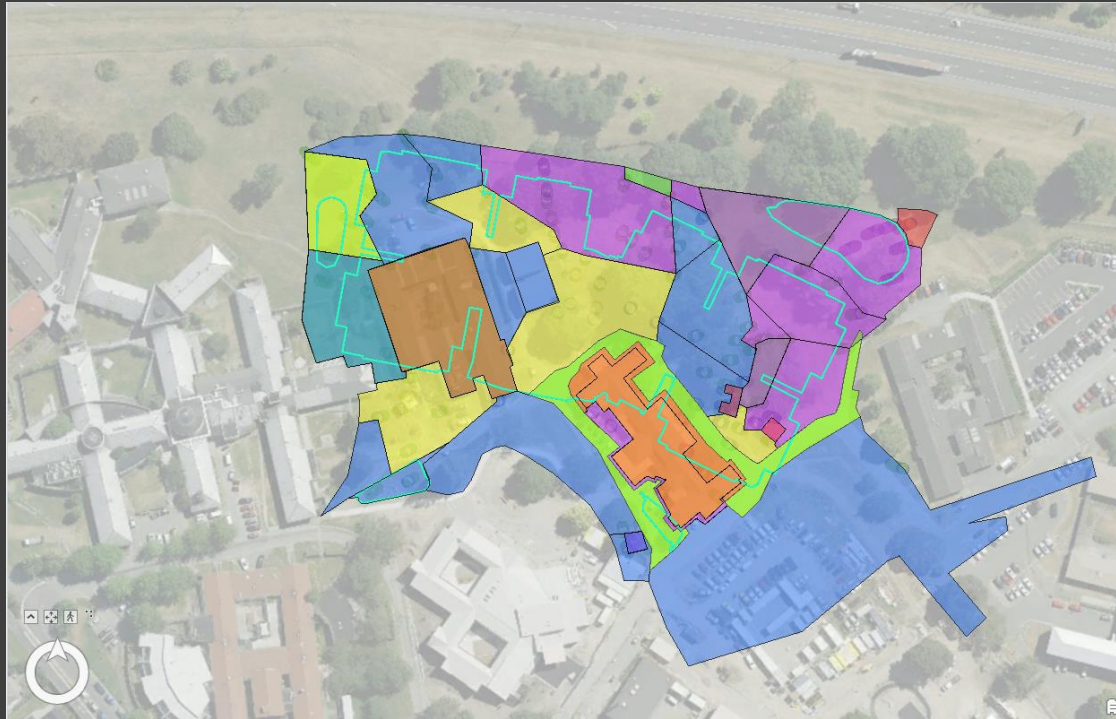


# Step 4: Automated Interpretation

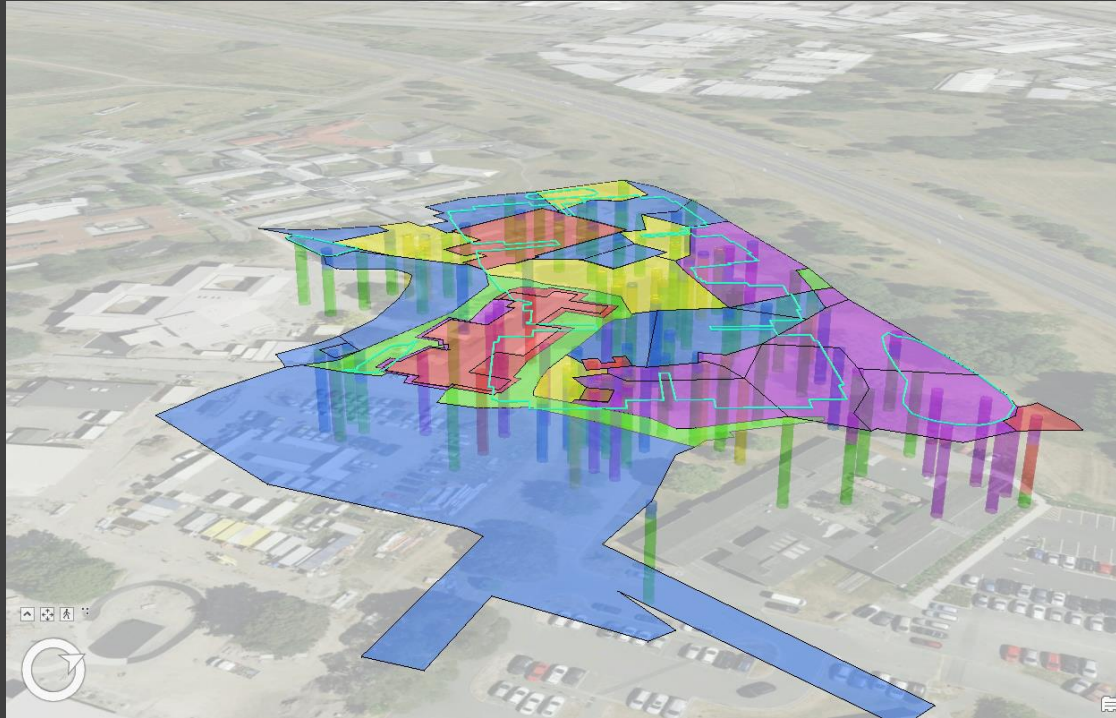




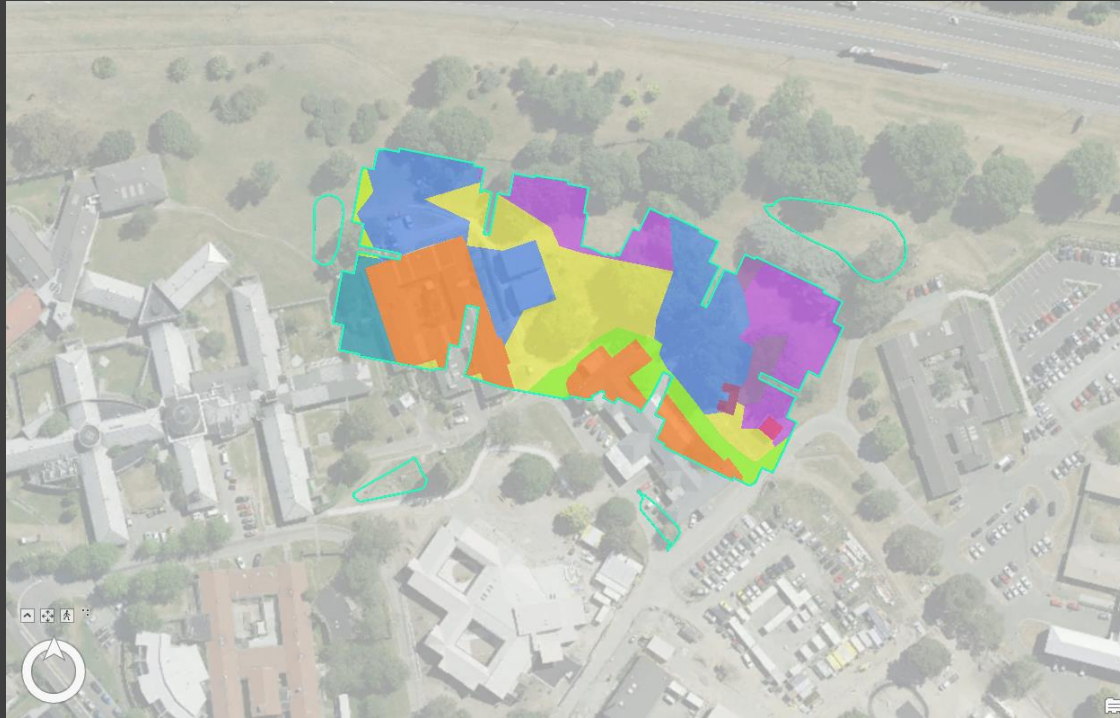
# Step 5: Polygons



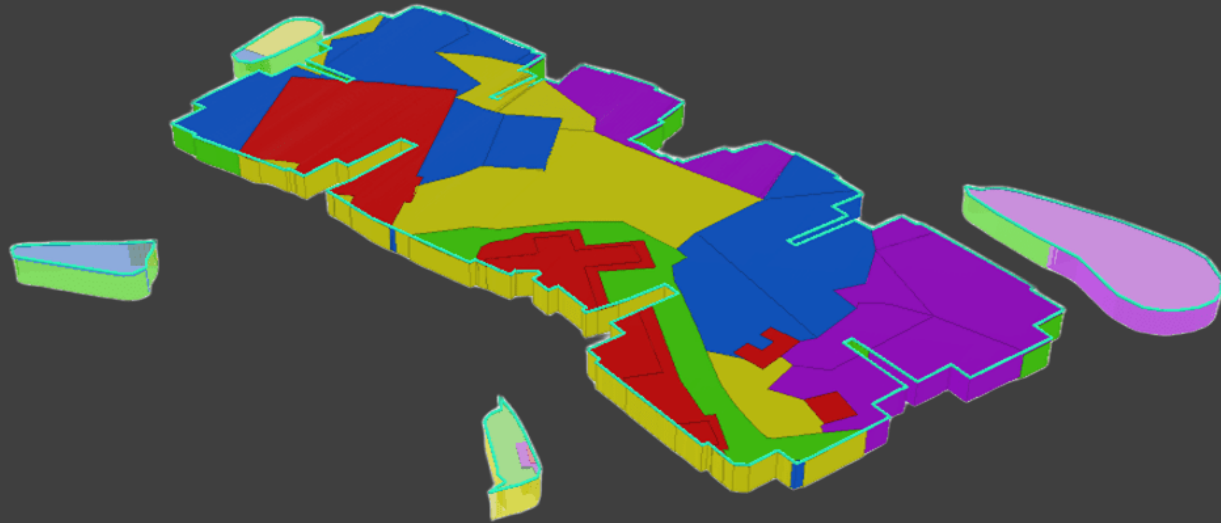
# Step 5: Polygons



# Step 5: Polygons

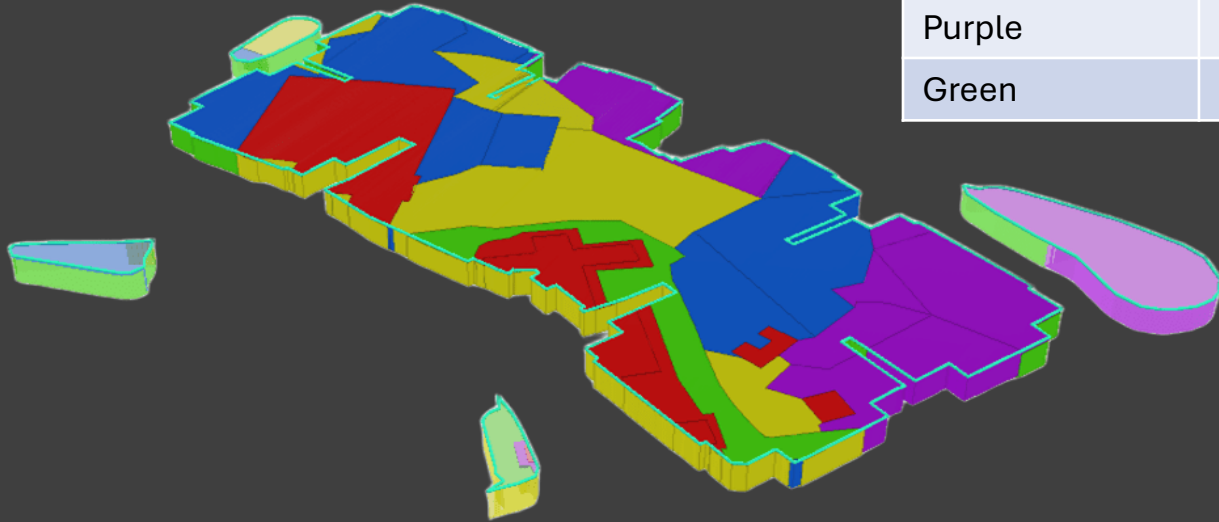


# Step 5: Polygons



# Step 6: Statistics

Disposal Type	Volume (m3)
Red	750
Blue	2,200
Yellow	4,000
Purple	2,500
Green	2,600



# Step 7: GPS Control



# Step 7: GPS Control



# Step 7: GPS Control



# OK Computer

