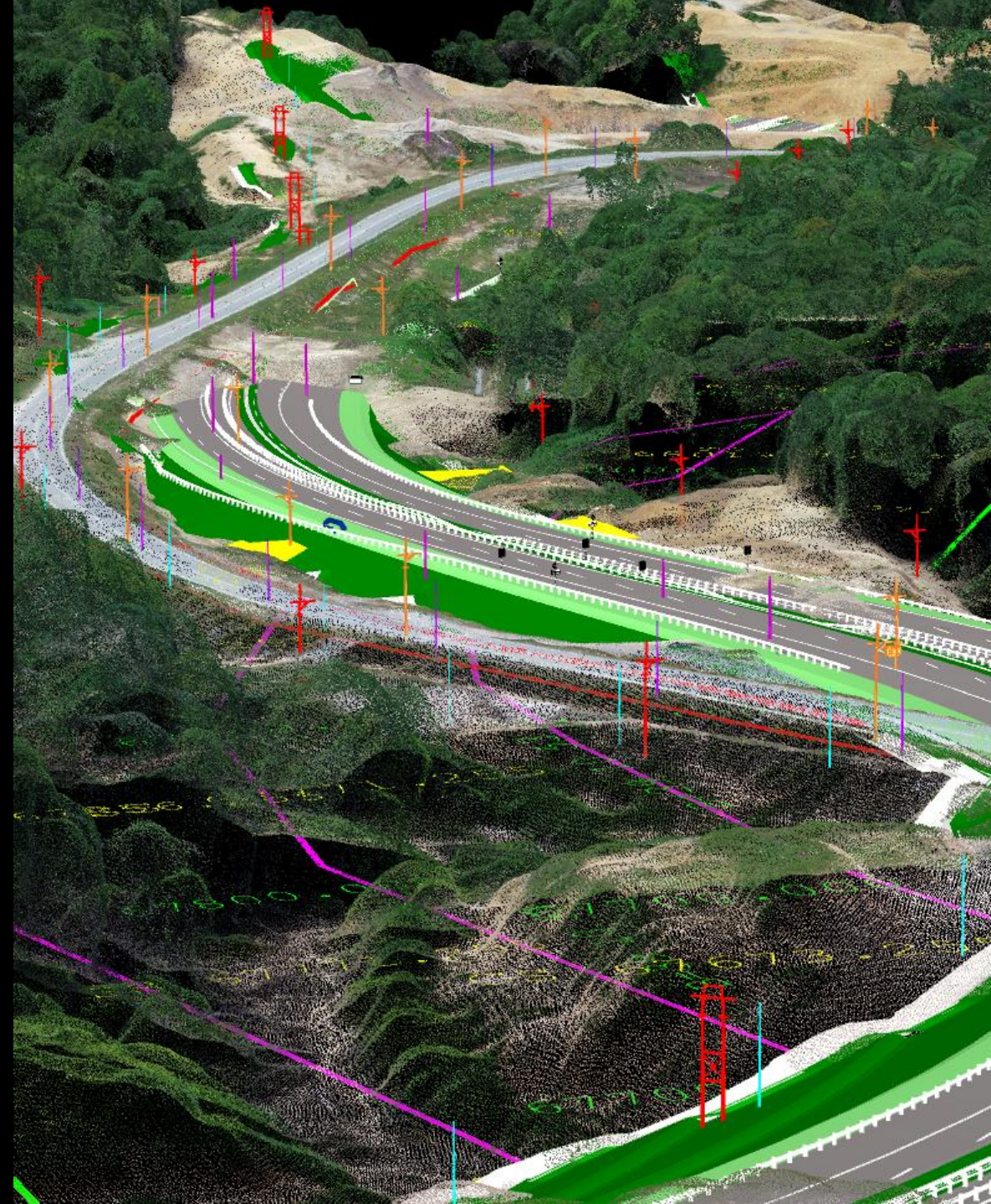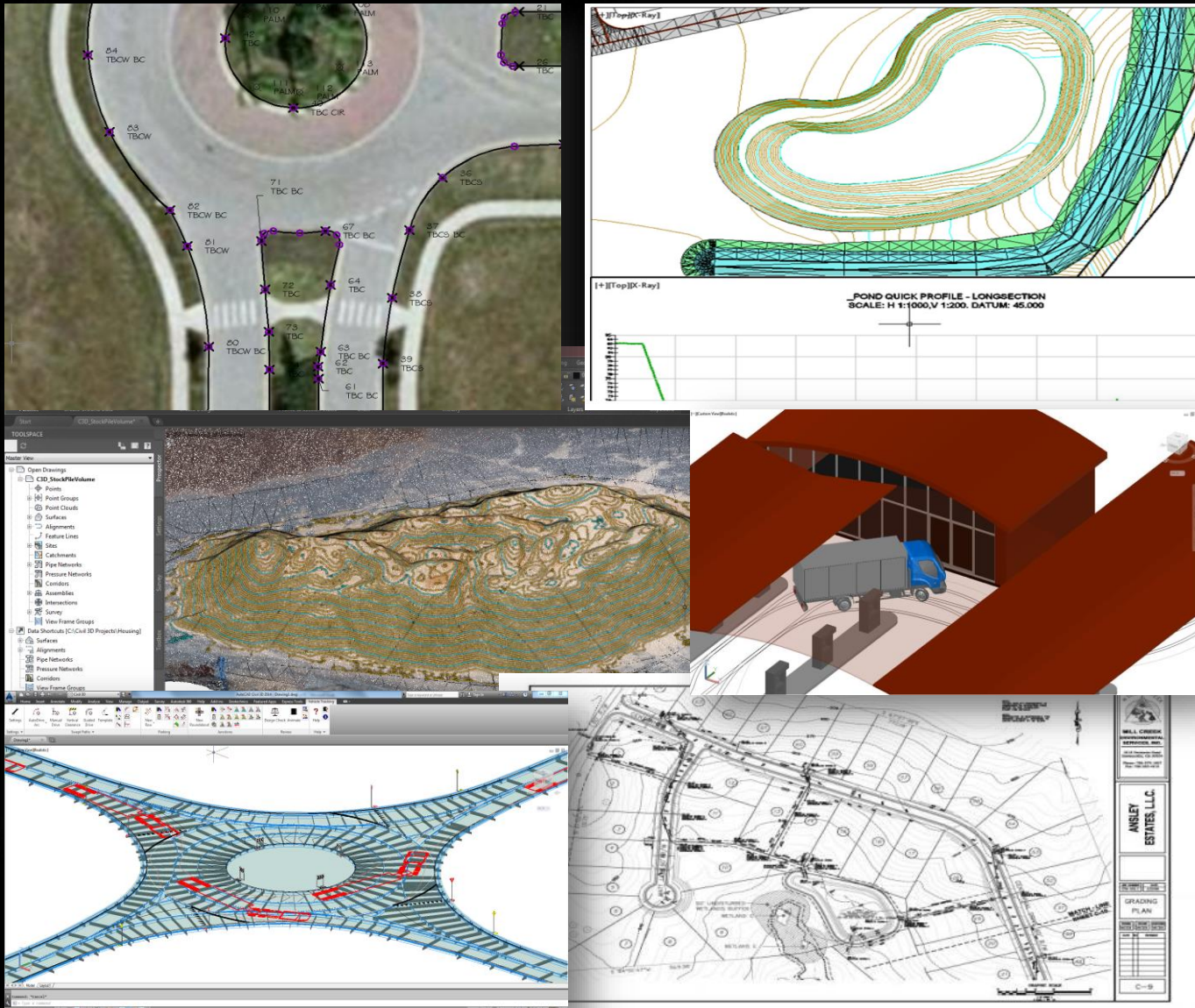# AUTODESK©
# CIVIL3D©

**Autodesk© Civil3D© Beginner and Intermediate Workshop**

Adil Kurniawan
adil@bimageconsulting.com
Senior Manager (BIM/GIS/VDC) | Infrastructure Specialist

**Civil Infrastructure Design and Documentations Software**

AUTODESK©
CIVIL3D©

✓ Supports BIM with integrated features to improve drafting, design, and construction documentation

✓ Connected with Autodesk InfraWorks to ensure …..

✓ Collaborate with  BIM Collaborate  to streamline deliverables coordination, visualize changes

✓ Works with ArcGIS data directly in your Civil 3D design model

✓ Optimize road geometry and Normative roundabouts Implementation

✓ Perform a real-time analysis and Car parks creation

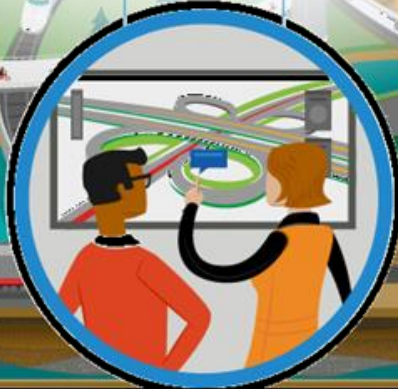# CONNECTED BIM for INFRASTRUCTURE



DESIGN

BUILD

DETAILED

CONCEPT

SIMULATE

PLAN

CONSTRUCT

MAINTAIN

MANAGE

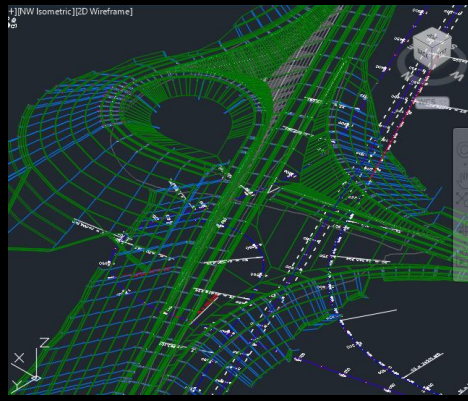OPERATE

# BIM REQUIREMENT

## LOD 100 - 200
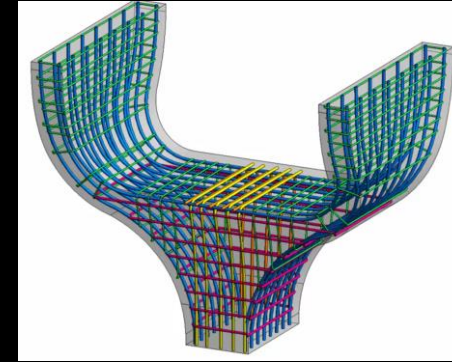*Preliminary Model*



## LOD 300
*Detailed Design Model*
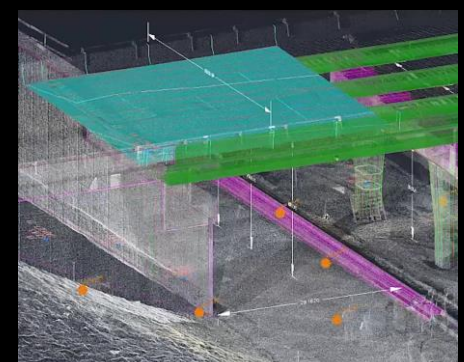


## LOD 350
*Construction Model*
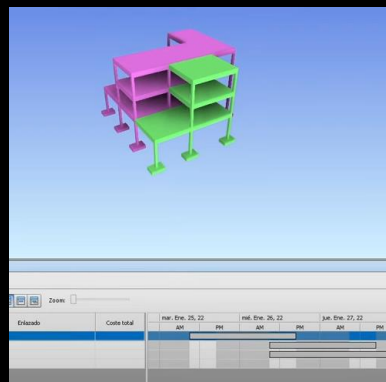


## LOD 400
*\*Fabrication Model*



## LOD 500
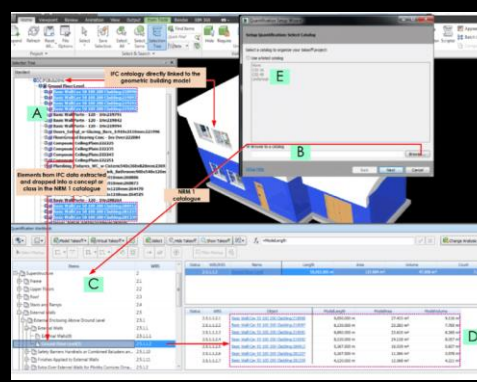*As-Built Model*



## 3D
*BIM Model*



## 4D
*Scheduling & Sequencing*



## 5D
*QTO & Costing*



## 6D
*Analysis & Sustainability*
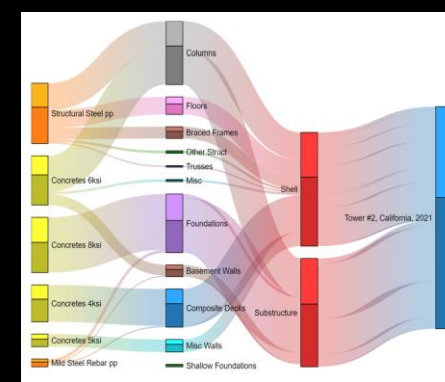


## 7D
*Asset Management*
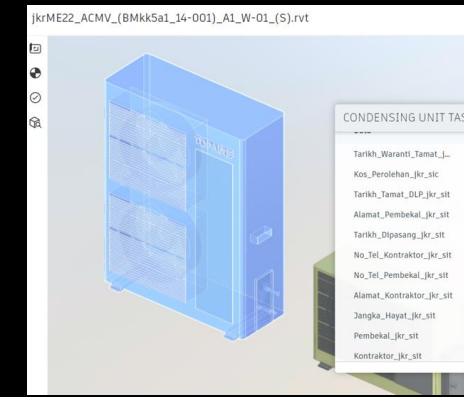
# AEC Collection - Connected Workflows - Infrastructure

**Survey** → **Conceptual Design** → **Document & Detail** → **Virtual Design and Construction**

**I** AUTODESK InfraWorks

**R** AUTODESK ReCap Pro

**C** AUTODESK Civil 3D

**I** AUTODESK InfraWorks

**N** Navisworks Manage

**A** AUTODESK AutoCAD

**R** AUTODESK ReCap Pro

**3** AUTODESK 3ds Max

**V** AUTODESK Vehicle Tracking

**D** AUTODESK Docs

**C** AUTODESK BIM Collaborate Pro

**C** AUTODESK BIM Collaborate

Outside of AEC Collection

**B** AUTODESK Build

# AUTODESK©
# CIVIL3D©

**C3D**

# BEGINNER COURSE

# INTRODUCTION

- Understanding the Ribbon & UI
- Navigating and Using Basic Functionality
- Understanding the Toolspace
- Understanding Levels & Styles
- Changing Display of an object using styles

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**CIVIL3D©**
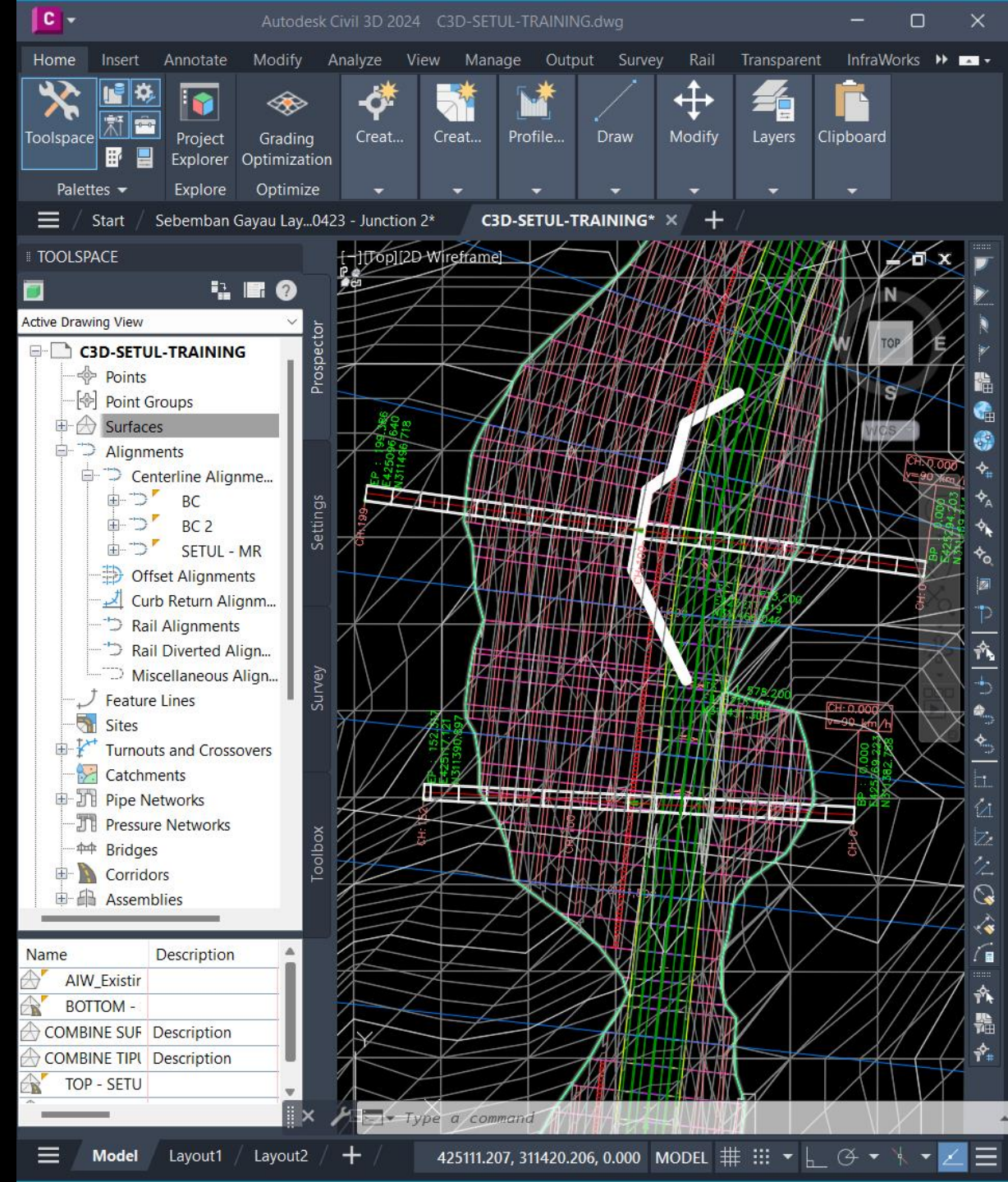
# POINTS

- Exploring the Survey Database
- Basic Point Creating and Editing
- Points and Code Sets
- Point Styles, Tables and Label Styles
- Creating Surface from points
- User-Defined Properties

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**CIVIL3D©**
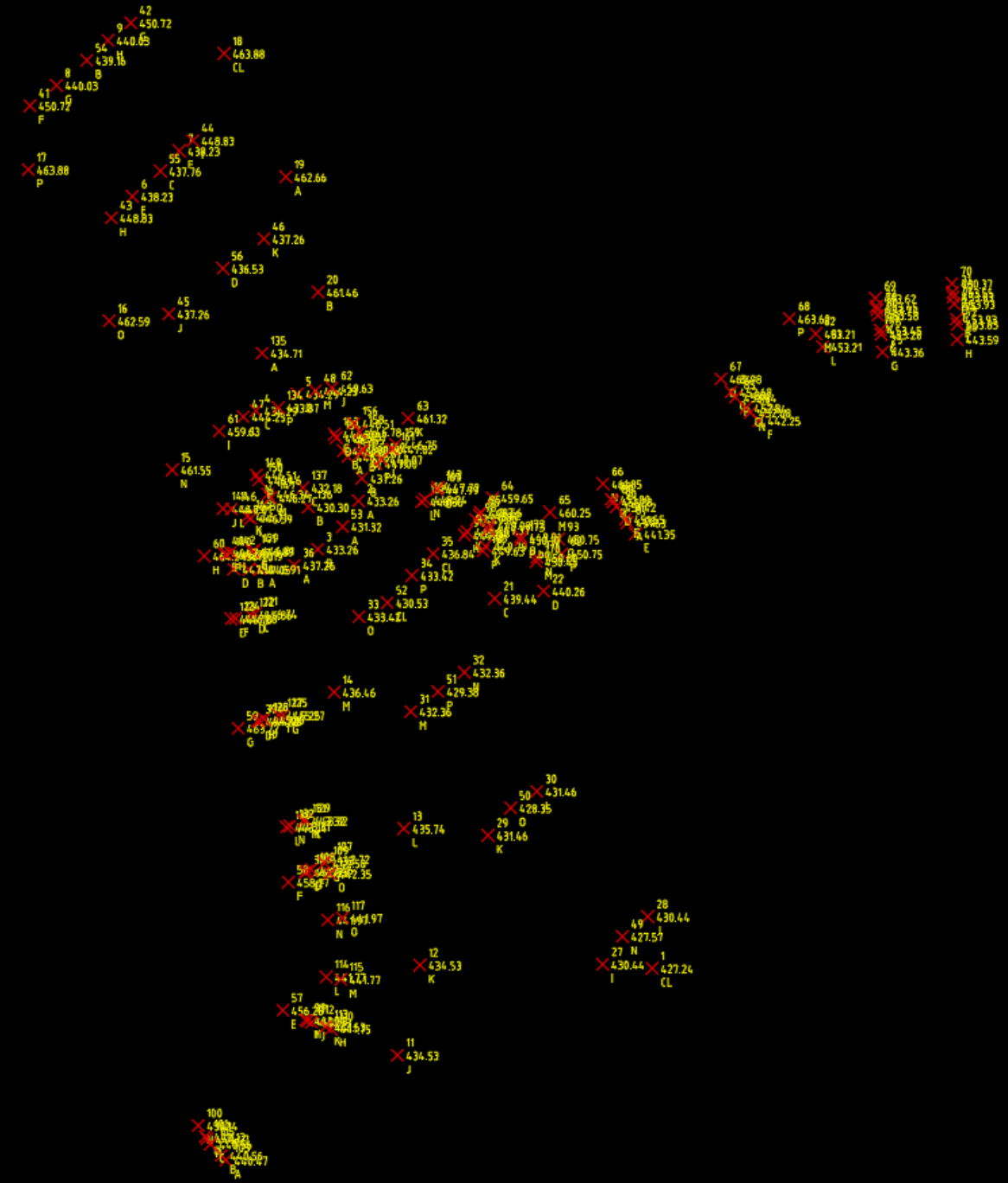
# SURFACES

- Creating Surfaces
- Refining and Editing Surfaces
- Surface Styling and Analysis
- Comparing Surfaces
- Labelling the Surface
- Calculating Volume

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**CIVIL3D©**

# ALIGNMENT DESIGN

- Creating Horizontal Alignment
- Editing Horizontal Alignment
- Alignment Labelling: Control Plan
- Alignment Labelling: Fixed Interval Coordinates
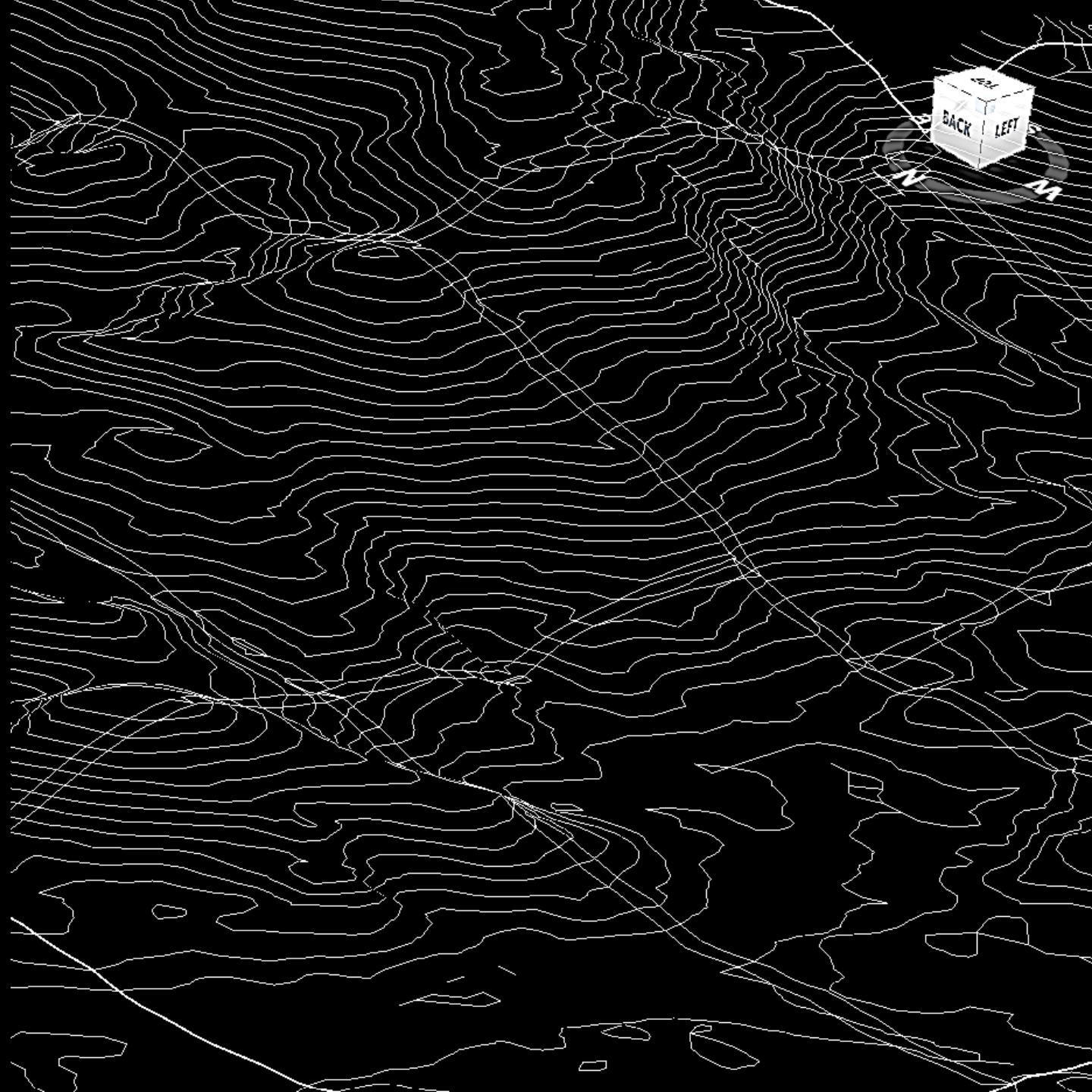
# SUPERELEVATION DESIGN

- Creating Superelevation



q=0,0%

q=2,5%

# PROFILE DESIGN

- Creating Profile
- Generating Proposed Profile
- Editing Proposed Profile
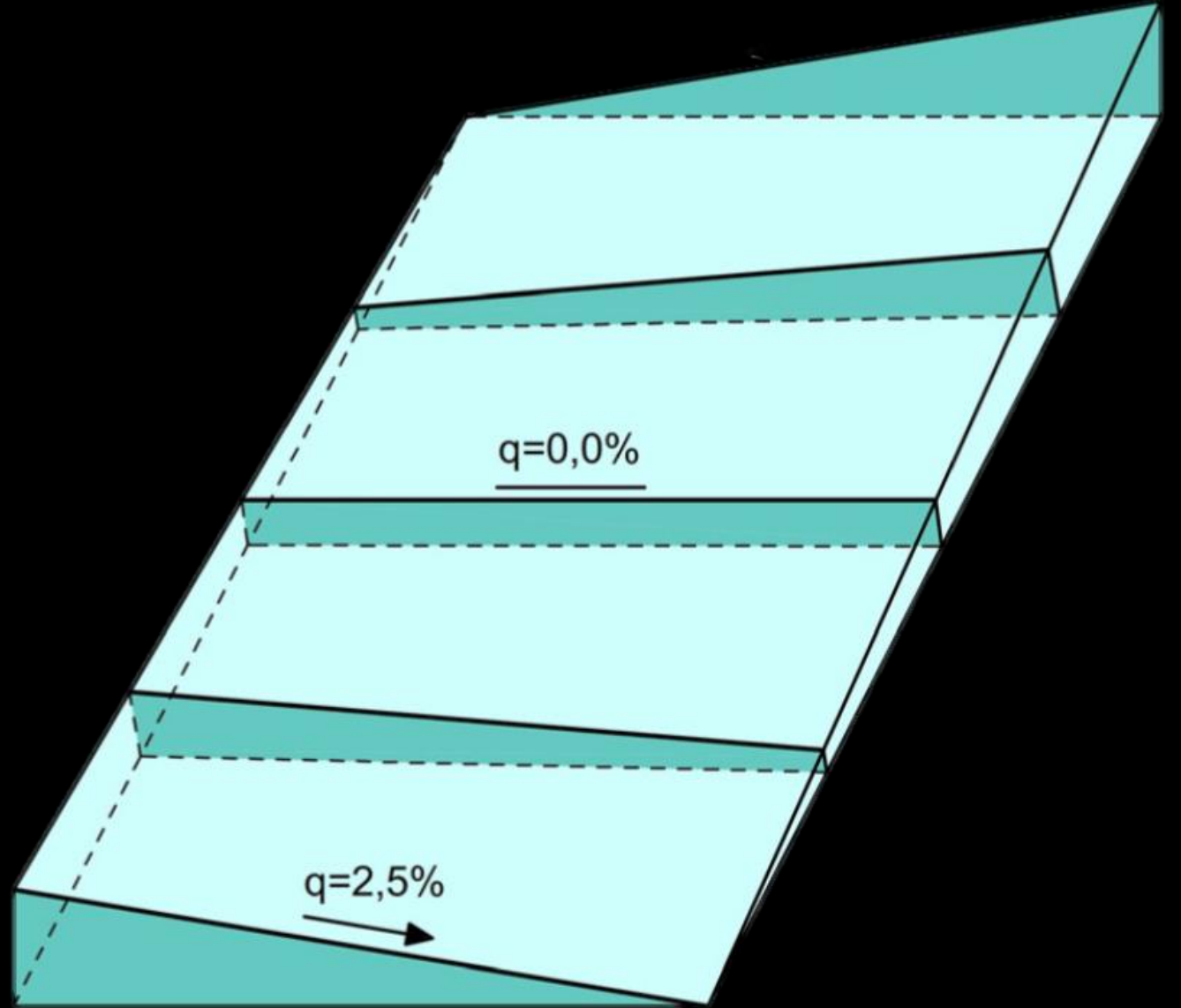
# ASSEMBLY DESIGN

- Creating Assembly
- Creating Subassembly
- Modifying Subassembly
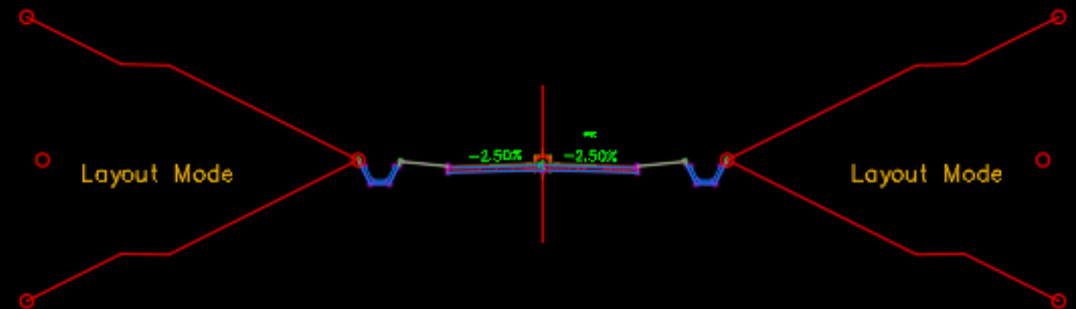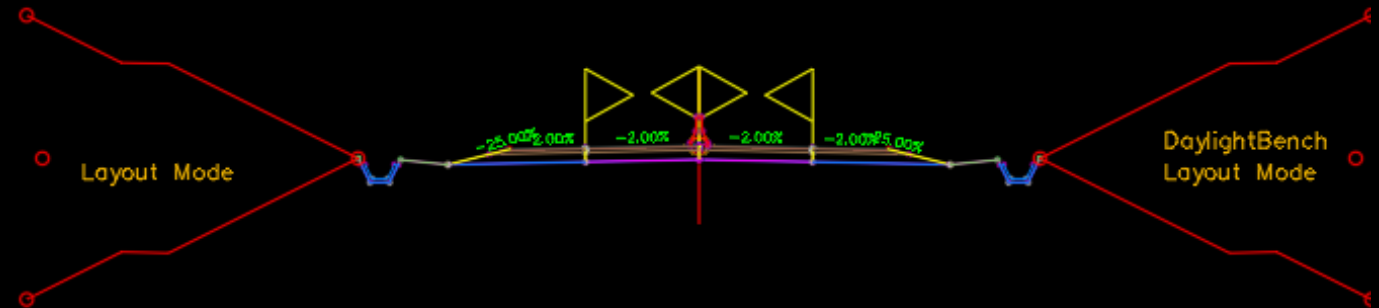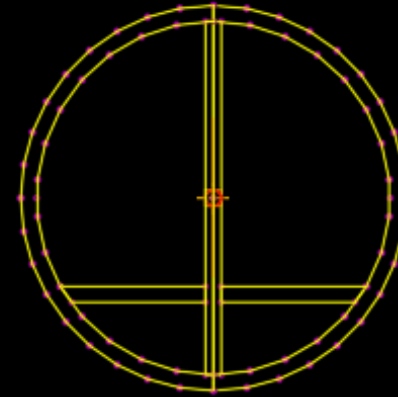
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# CORRIDOR DESIGN

- Creating Corridor
- Split Region
- Modifying Frequency
- Extract to Solid

# SAMPLE LINES

- Creating Sample Lines

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# VOLUME CALCULATION

- Cross Section Method
- TIN Volume Surface Method

## Total Volume Table

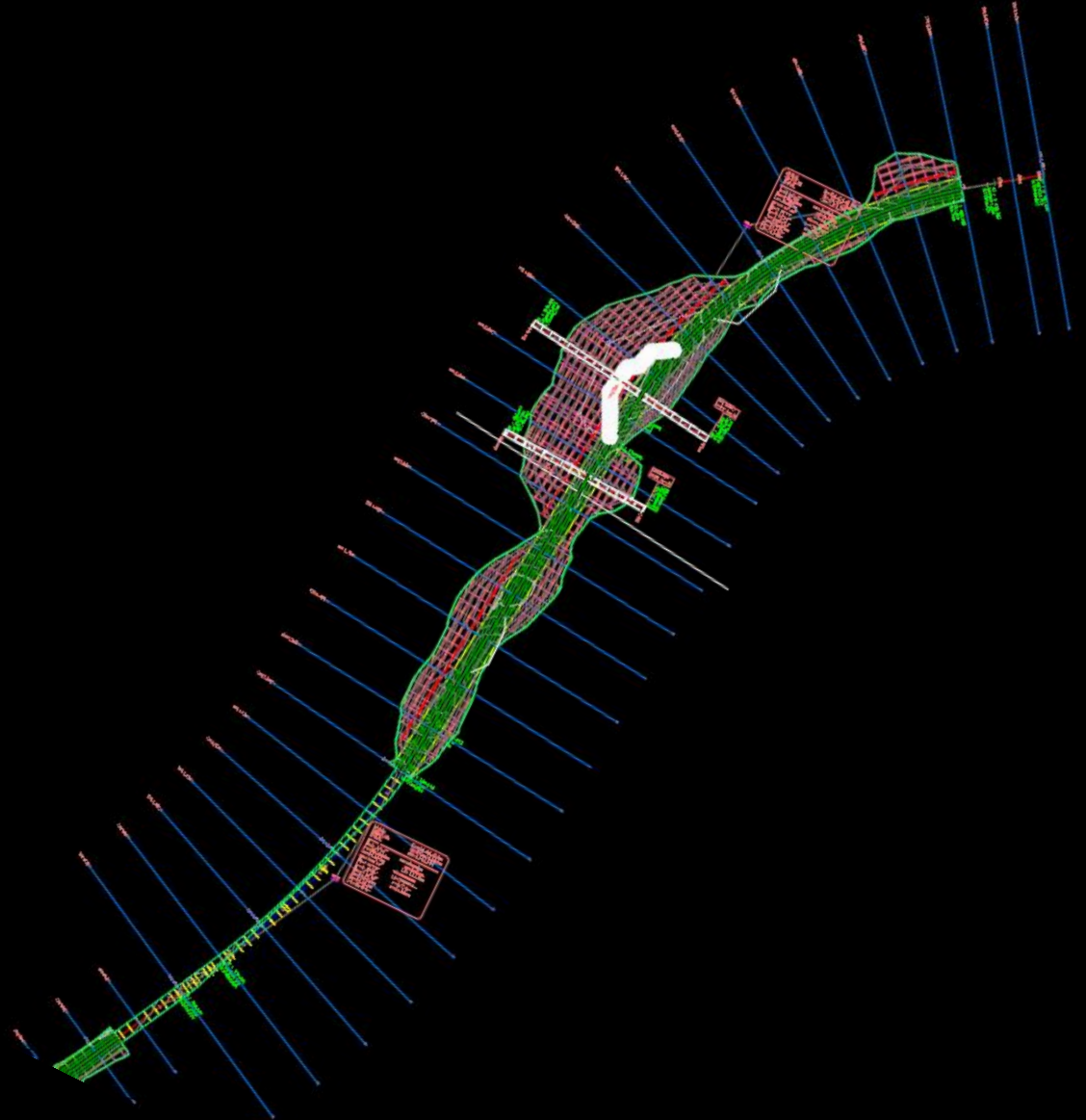| Station | Fill Area (m²) | Cut Area (m²) | Fill Volume (m³) | Cut Volume (m³) | Cumulative Fill Vol (m³) | Cumulative Cut Vol (m³) | Cum. Net Vol. (m³) |
|---|---|---|---|---|---|---|---|
| 0+000.00 | 0.00 | 13.62 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0+050.00 | 0.00 | 35.97 | 0.00 | 1239.75 | 0.00 | 1239.75 | 1239.75 |
| 0+100.00 | 0.00 | 11.42 | 0.00 | 1184.85 | 0.00 | 2424.60 | 2424.60 |
| 0+150.00 | 0.60 | 7.93 | 15.08 | 483.80 | 15.08 | 2908.40 | 2893.32 |
| 0+200.00 | 22.27 | 0.00 | 571.80 | 198.28 | 586.87 | 3106.68 | 2519.81 |
| 0+250.00 | 0.00 | 55.60 | 556.72 | 1389.97 | 1143.59 | 4496.65 | 3353.05 |
| 0+300.00 | 0.00 | 242.66 | 0.00 | 7456.58 | 1143.59 | 11953.23 | 10809.64 |
| 0+350.00 | 0.00 | 449.16 | 0.00 | 17295.51 | 1143.59 | 29248.75 | 28105.15 |
| 0+400.00 | 0.00 | 306.09 | 0.00 | 18881.05 | 1143.59 | 48129.80 | 46986.20 |
| 0+450.00 | 0.00 | 231.11 | 0.00 | 13424.58 | 1143.59 | 61554.38 | 60410.79 |
| 0+500.00 | 0.00 | 226.25 | 0.00 | 11407.56 | 1143.59 | 72961.94 | 71818.35 |
| 0+550.00 | 0.00 | 106.03 | 0.00 | 8307.03 | 1143.59 | 81268.97 | 80125.38 |
| 0+600.00 | 0.00 | 28.70 | 0.00 | 3368.19 | 1143.59 | 84637.17 | 83493.57 |
| 0+650.00 | 0.00 | 21.96 | 0.00 | 1266.50 | 1143.59 | 85903.68 | 84760.07 |
| 0+700.00 | 0.00 | 84.30 | 0.00 | 2656.44 | 1143.59 | 88560.11 | 87416.51 |
| 0+750.00 | 0.00 | 46.66 | 0.00 | 3274.06 | 1143.59 | 91834.16 | 90690.57 |
| 0+800.00 | 0.00 | 31.19 | 0.00 | 1946.34 | 1143.59 | 93780.50 | 92636.91 |
| 0+850.00 | 0.00 | 18.78 | 0.00 | 1249.33 | 1143.59 | 95029.82 | 93886.23 |
| 0+900.00 | 0.00 | 58.37 | 0.00 | 1928.97 | 1143.59 | 96958.79 | 95815.20 |
| 0+950.00 | 0.00 | 87.53 | 0.00 | 3644.87 | 1143.59 | 100603.66 | 99460.07 |

## Total Volume Table

| Station | Fill Area (m²) | Cut Area (m²) | Fill Volume (m³) | Cut Volume (m³) | Cumulative Fill Vol (m³) | Cumulative Cut Vol (m³) | Cum. Net Vol. (m³) |
|---|---|---|---|---|---|---|---|
| 1+000.00 | 0.00 | 30.39 | 0.00 | 2937.48 | 1143.59 | 103541.14 | 102397.55 |
| 1+050.00 | 0.00 | 8.47 | 0.00 | 965.78 | 1143.59 | 104506.92 | 103363.33 |
| 1+100.00 | 0.00 | 9.23 | 0.00 | 439.96 | 1143.59 | 104946.89 | 103803.29 |
| 1+150.00 | 0.00 | 26.97 | 0.00 | 902.38 | 1143.59 | 105849.27 | 104705.67 |
| 1+200.00 | 0.01 | 28.04 | 0.21 | 1369.79 | 1143.81 | 107219.05 | 106075.25 |
| 1+250.00 | 290.89 | 0.00 | 7247.21 | 698.55 | 8391.02 | 107917.60 | 99526.58 |
| 1+300.00 | 233.56 | 0.00 | 13111.27 | 0.00 | 21502.29 | 107917.60 | 86415.31 |
| 1+350.00 | 159.04 | 0.00 | 9814.89 | 0.00 | 31317.18 | 107917.60 | 76600.42 |
| 1+400.00 | 502.64 | 0.00 | 16541.83 | 0.00 | 47859.01 | 107917.60 | 60058.59 |
| 1+450.00 | 172.16 | 0.00 | 16869.84 | 0.00 | 64728.86 | 107917.60 | 43188.74 |
| 1+500.00 | 17.34 | 186.79 | 4737.47 | 4669.77 | 69466.32 | 112587.37 | 43121.05 |
| 1+550.00 | 102.53 | 457.92 | 2996.80 | 16117.88 | 72463.13 | 128705.25 | 56242.13 |
| 1+600.00 | 0.00 | 874.55 | 2563.24 | 33311.86 | 75026.37 | 162017.11 | 86990.74 |
| 1+650.00 | 0.00 | 1365.78 | 0.00 | 58410.40 | 75026.37 | 220427.51 | 145401.14 |
| 1+700.00 | 0.00 | 673.14 | 0.00 | 52826.95 | 75026.37 | 273254.46 | 198228.09 |
| 1+750.00 | 0.00 | 99.50 | 0.00 | 19765.49 | 75026.37 | 293019.95 | 217993.58 |
| 1+800.00 | 38.24 | 0.26 | 950.51 | 2535.85 | 75976.88 | 295555.79 | 219578.91 |
| 1+850.00 | 47.08 | 0.47 | 2114.58 | 18.48 | 78091.46 | 295574.28 | 217482.82 |
| 1+900.00 | 63.66 | 0.04 | 2742.41 | 12.94 | 80833.87 | 295587.22 | 214753.35 |
| 1+950.00 | 0.00 | 150.40 | 1578.34 | 3863.75 | 82412.21 | 299450.97 | 217038.76 |

## Total Volume Table

| Station | Fill Area (m²) | Cut Area (m²) | Fill Volume (m³) | Cut Volume (m³) | Cumulative Fill Vol (m³) | Cumulative Cut Vol (m³) | Cum. Net Vol. (m³) |
|---|---|---|---|---|---|---|---|
| 2+000.00 | 0.08 | 29.58 | 1.90 | 4616.71 | 82414.11 | 304067.68 | 221653.57 |
| 2+050.00 | 0.00 | 0.00 | 1.93 | 743.98 | 82416.04 | 304811.67 | 222395.63 |
| 2+079.29 | 0.00 | 0.00 | 0.00 | 0.00 | 82416.04 | 304811.67 | 222395.63 |

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# CROSS SECTION

- Creating Multiple Cross Section
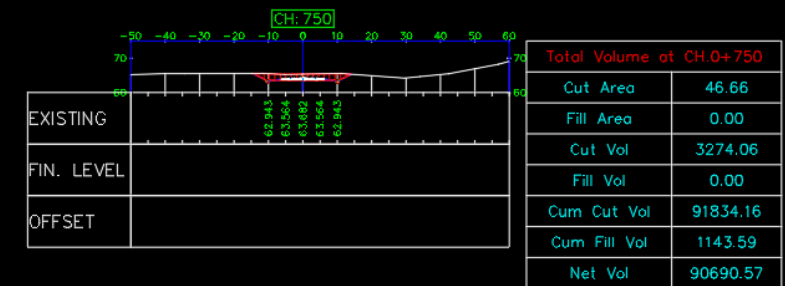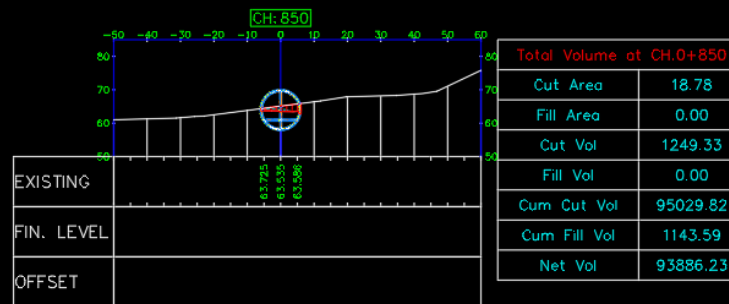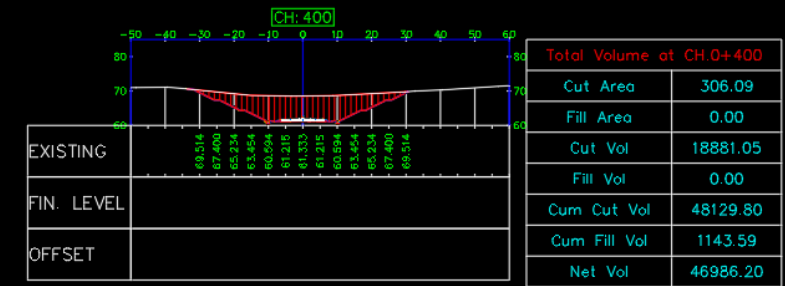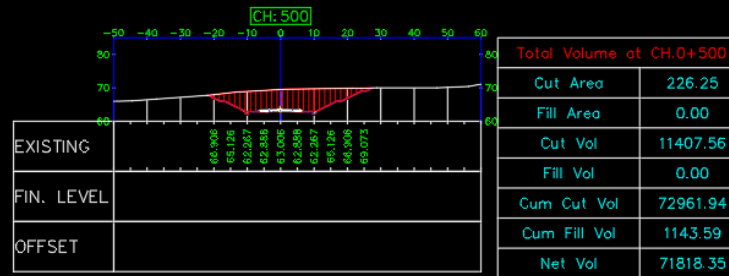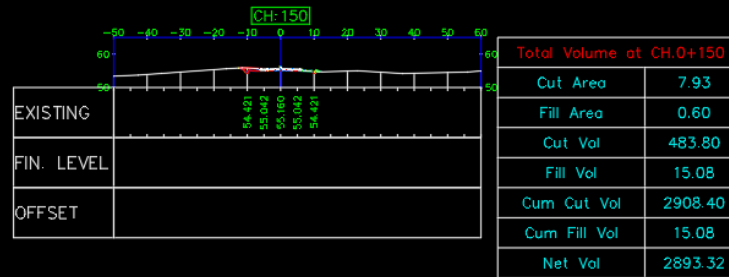
# THANK YOU

**Adil Kurniawan**

adil@bimageconsulting.com

BIMAGE
CONSULTING (M) SDN BHD

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