Creating Helical Pipes

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Purpose

- AutoCAD helix is relatively new (AutoCAD 2007 and later)
- Helix wireframes in AutoCAD can be graphically intensive and slow graphics response time
- Helix wireframes have been found to sometimes be unstable when used with pipes
- In case of problems with the model, follow the enclosed steps to approximate a helix

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Process Summary

- Create a Thermal Desktop Cylinder as scaffolding
- Create two arcs using the cylinder to form the first turn of the helix
- Copy the helix turn
- Create the FloCAD pipe

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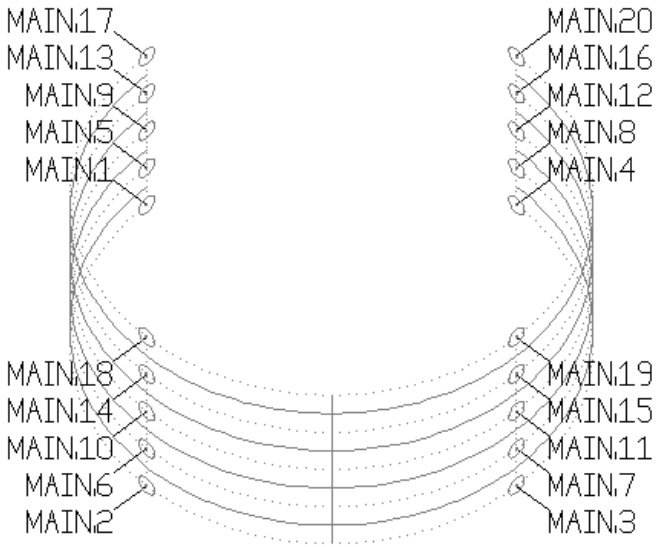
Creating Helical Pipe without the AutoCAD Helix

- Create a TD cylinder
  - ✓ Radius of helix
  - ✓ Height of one turn of helix
  - ✓ Starting angle = 0
  - ✓ Ending angle = 270*
  - ✓ Edge nodes
  - ✓ 4 angular subdivisions
  - ✓ 5 height subdivisions
- Create a new UCS
  - ✓ Tools > New UCS > 3 Point
  - ✓ Choose points
    - ✓ Origin – MAIN.6
    - ✓ X-axis – MAIN.11
    - ✓ XY-plane – MAIN.1



* This enforces the shown node numbering; the node numbers are only used to show the order and location of selection

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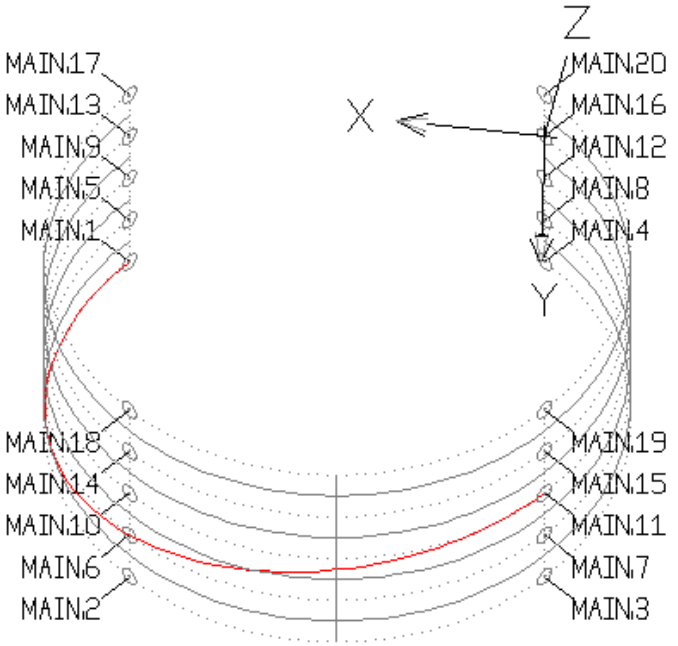
Creating Helical Pipe without the AutoCAD Helix

- Create an arc
  - ✓ Draw > Arc > 3 Point
  - ✓ 1st point – MAIN.1
  - ✓ 2nd point – MAIN.6
  - ✓ 3rd point – MAIN.11
- Create a new UCS
  - ✓ Tools > New UCS > 3 Point
  - ✓ Choose points
    - ✓ Origin – MAIN.16
    - ✓ X-axis – MAIN.17
    - ✓ XY-plane – MAIN.11



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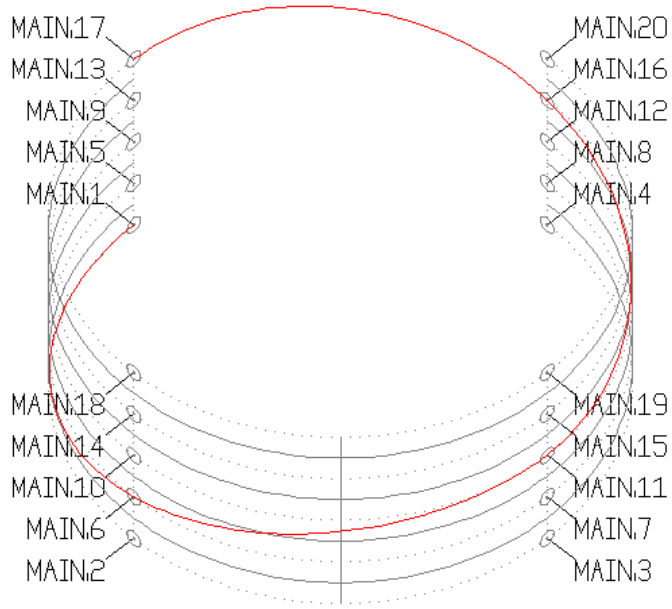
Creating Helical Pipe without the AutoCAD Helix

- Create an arc
  - ✓ Draw > Arc > 3 Point
  - ✓ 1st point – MAIN.11
  - ✓ 2nd point – MAIN.16
  - ✓ 3rd point – MAIN.17
- Delete the cylinder
- Return to world UCS
- Copy helix turn from MAIN.1 to MAIN.17 as many times as necessary
- For pipe creation, select curves in order from start to end of helix



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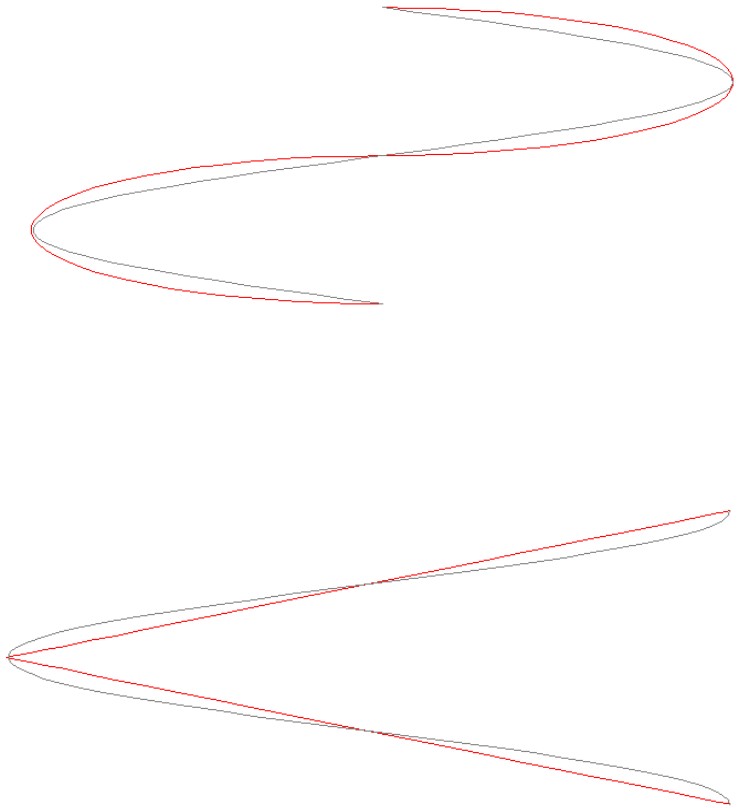
Comparison to AutoCAD Helix

- Helix in gray
- Arcs in red
- Length
  - ✓ Arc = 7.30115
  - ✓ Helix = 7.30798



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