Using Subsurface Utility Quality Control Tools to Ensure 100% Confidence

Presented by:

Jonathan Smith – Product Manager – Subsurface Utilities

Using Subsurface Utility Quality Control Tools to Ensure 10

0% Confidence

The Haestad storm water algorithms have been accurately designing projects for decades.

- How do you KNOW your project is correctly modeled?
- Subsurface Utilities has extensive Quality Control tools.
- In this presentation we will explore the built-in tools and what is set up for Quality Control in the delivered workspace.

Be ready! Be confident!

Subsurface Utilities

- Subsurface Utilities is the nom du jour
  - You may see it abbreviated as SU
  - Replaces the name "Subsurface Utilities Design and Analysis (SUDA)"
  - Mostly a Name and Version change
  - It's part of OpenRoads Designer
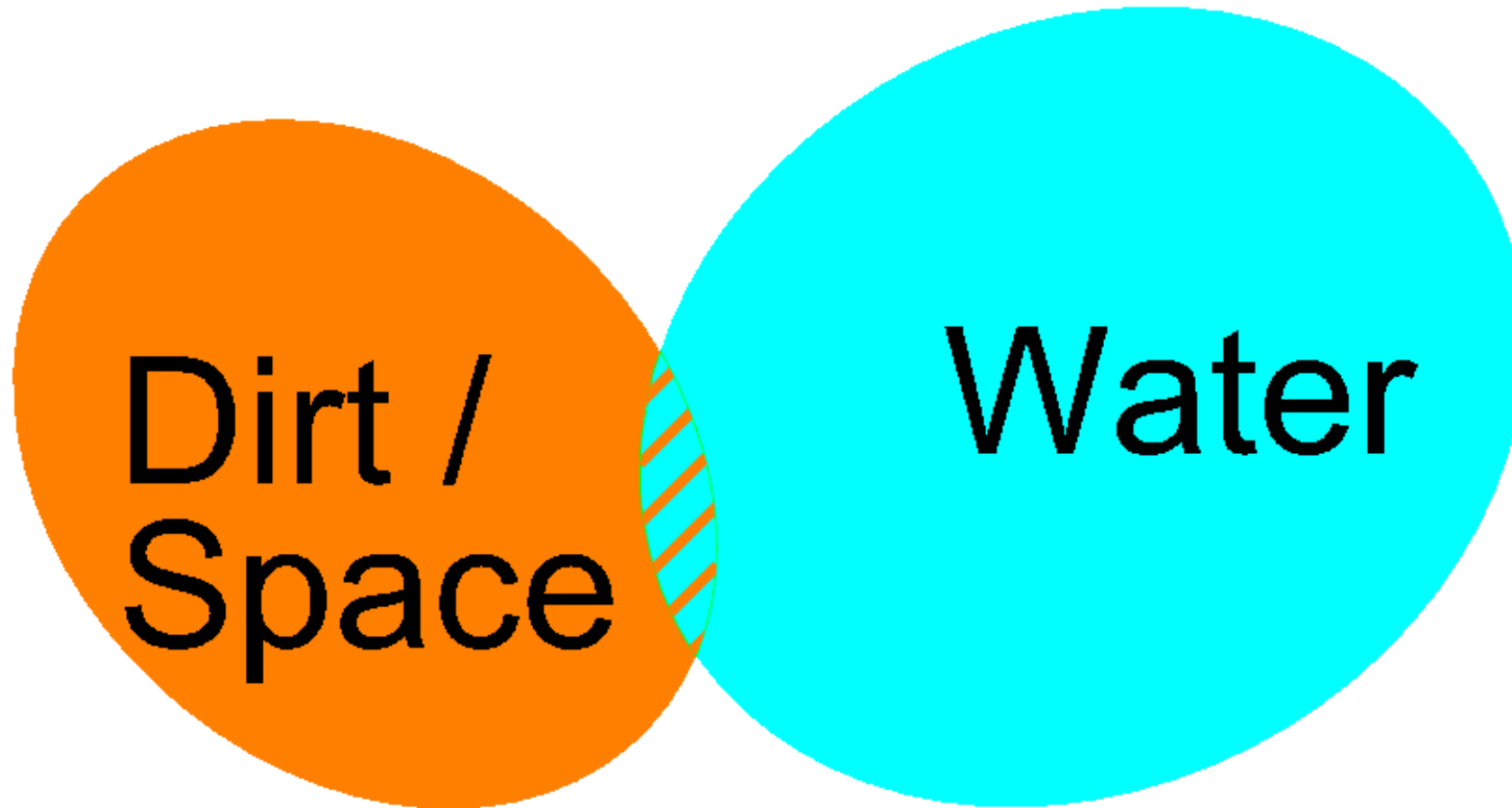 - Encompasses StormCAD/CivilStorm/SewerCAD/SewerGEM
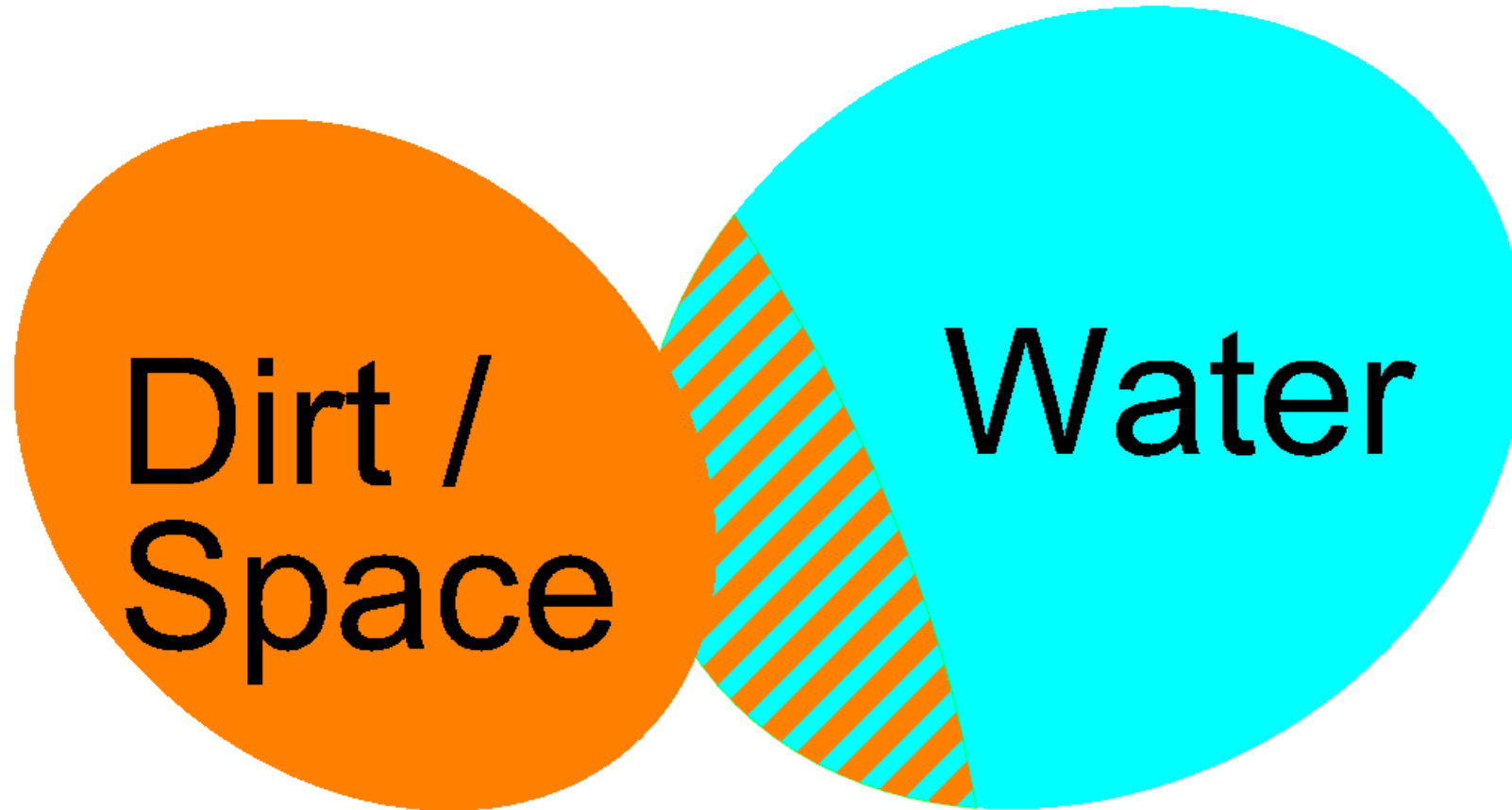
Bentley

Outline

Why QC?

What have we added/changed to the Workspace?

- "Coherent" Inlets (as opposed to "Type G")
- Color Coding…
- Tooltips works in Update 2…

Two Verticals

Dirt / Space

Water

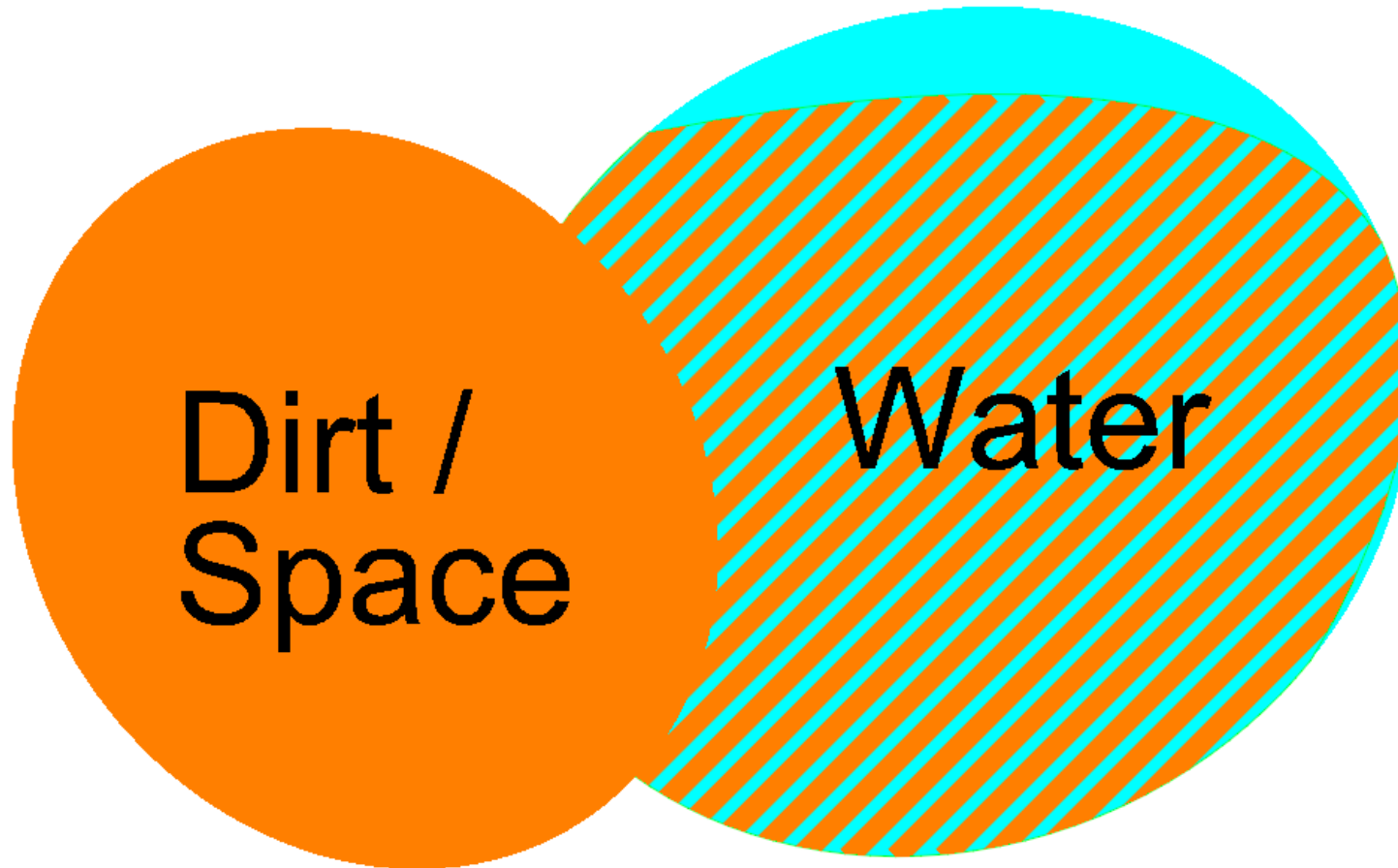Bentley®

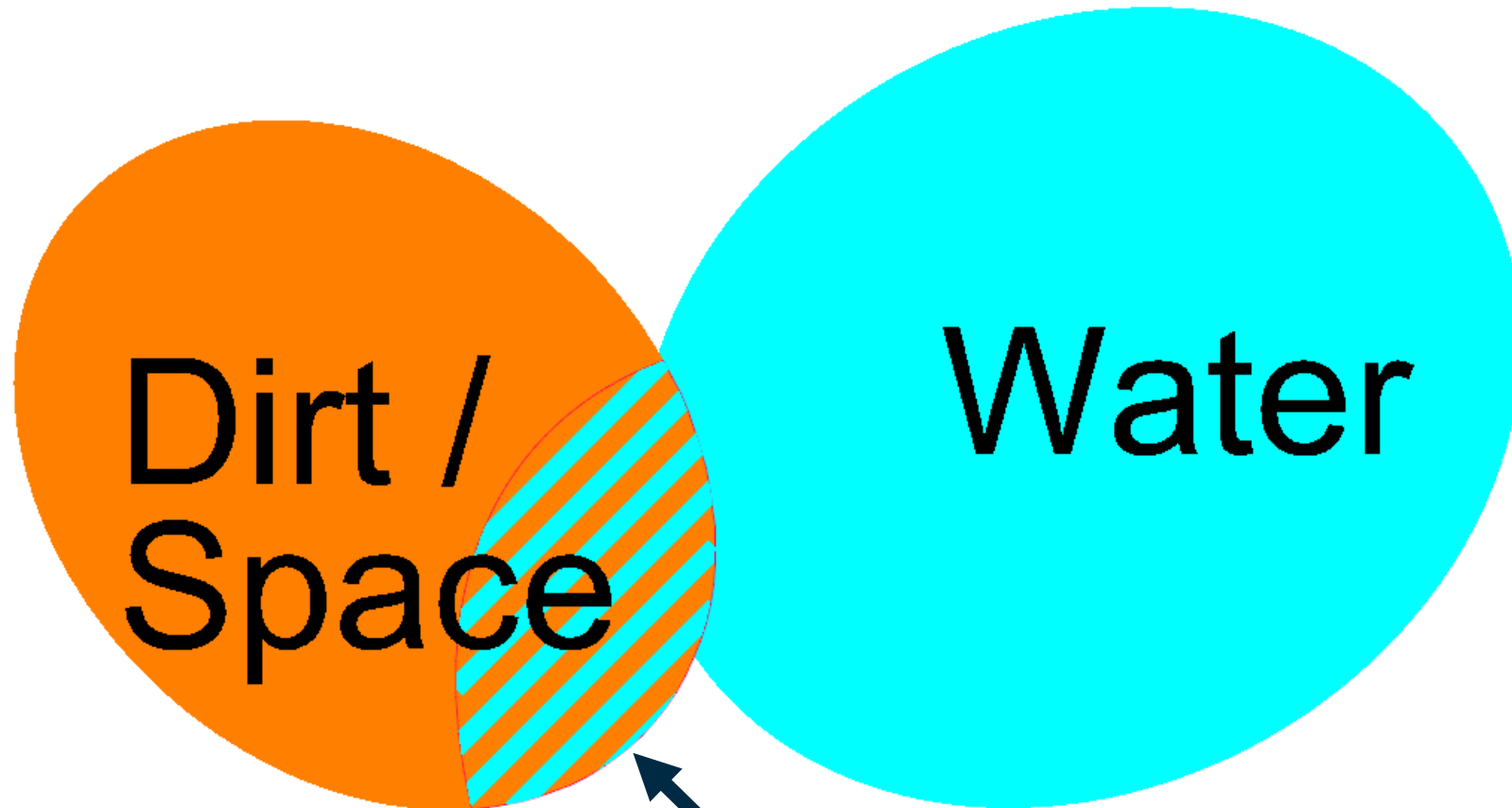# Older Civil Products with Drainage (InRoads, GEOPAK, MX)

OpenRoads & Subsurface Utilities: Expands the Scope

And uses proven Hydraulics Engines
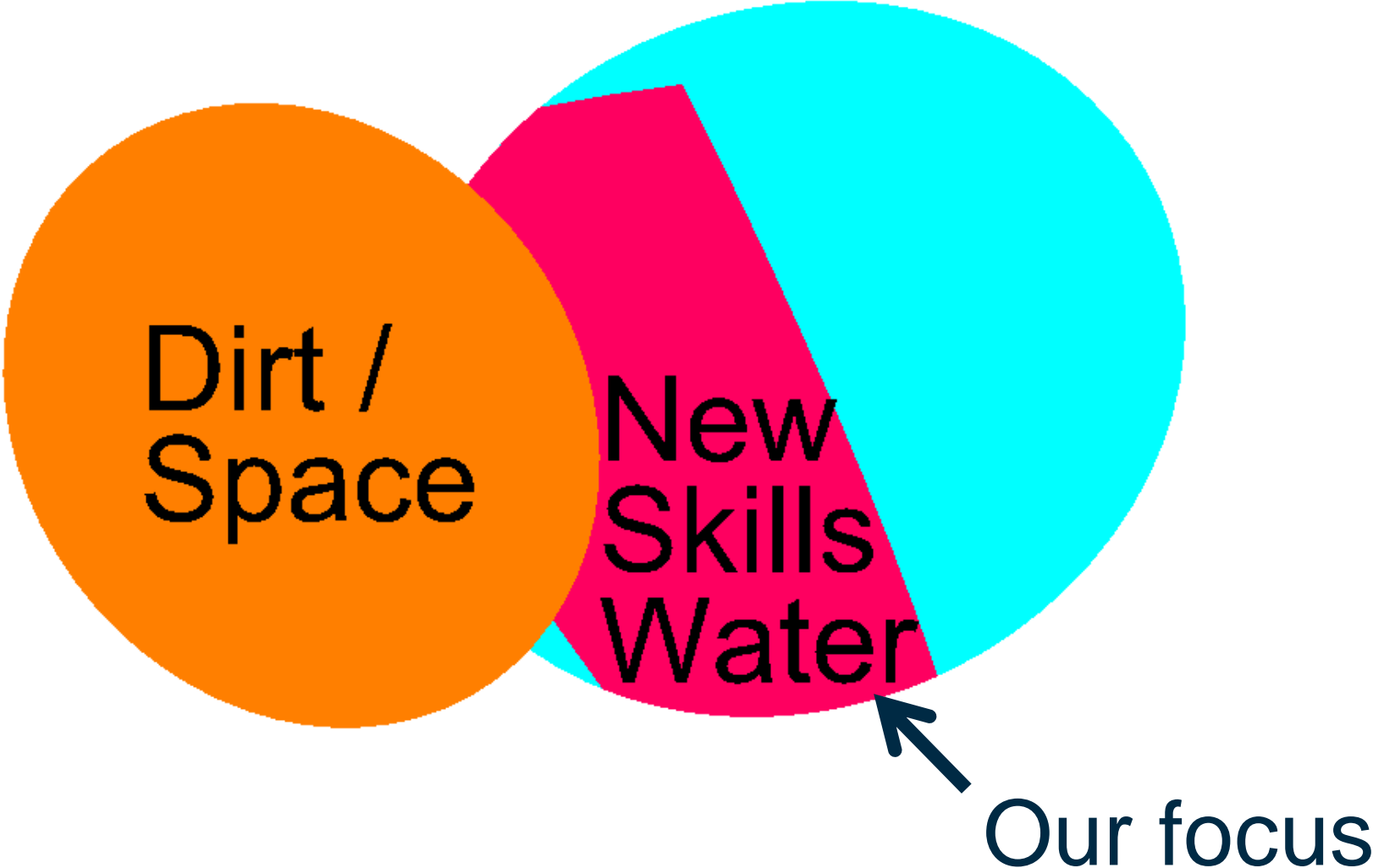
Bentley®

StormCAD/CivilStorm Users moving to OpenRoads

Dirt / Space

Water

a little OpenRoads Training

Bentley®

Non-StormCAD: New Capabilities = New Responsibilities

Dirt / Space

New Skills Water

Our focus

|

Bentley®

How do we become 100% Confident?

- Train the Gaps
  - OpenRoads Fundamentals
  - Subsurface Utilities
    - Operational (Kinesthetic) Training (What to click)
      - Subsurface Utilities Fundamentals
    - Deeper Training
      - "What Happens when you…"
    - QC Tools and Techniques
    - Your Implementation and Standards
- Training as a Process
  - Help and Communities
  - Connect Advisor

You're Trained up and CONNECTed in…

- Do you feel 100% Confident now?
  - Probably Not
  - How do we get there?

Bentley

QC Tools and QC Processes!!!

Why Quality Control?

- If you have staff, how familiar are you with each individual's strengths, weaknesses, and blindspots?

- If you are reviewing subcontractors or clients, can you assume anything at all?

- Why Assume and Hope, when you can KNOW?

Bentley®

Happens?

Bentley®

Quality Doesn't "Just Happen"
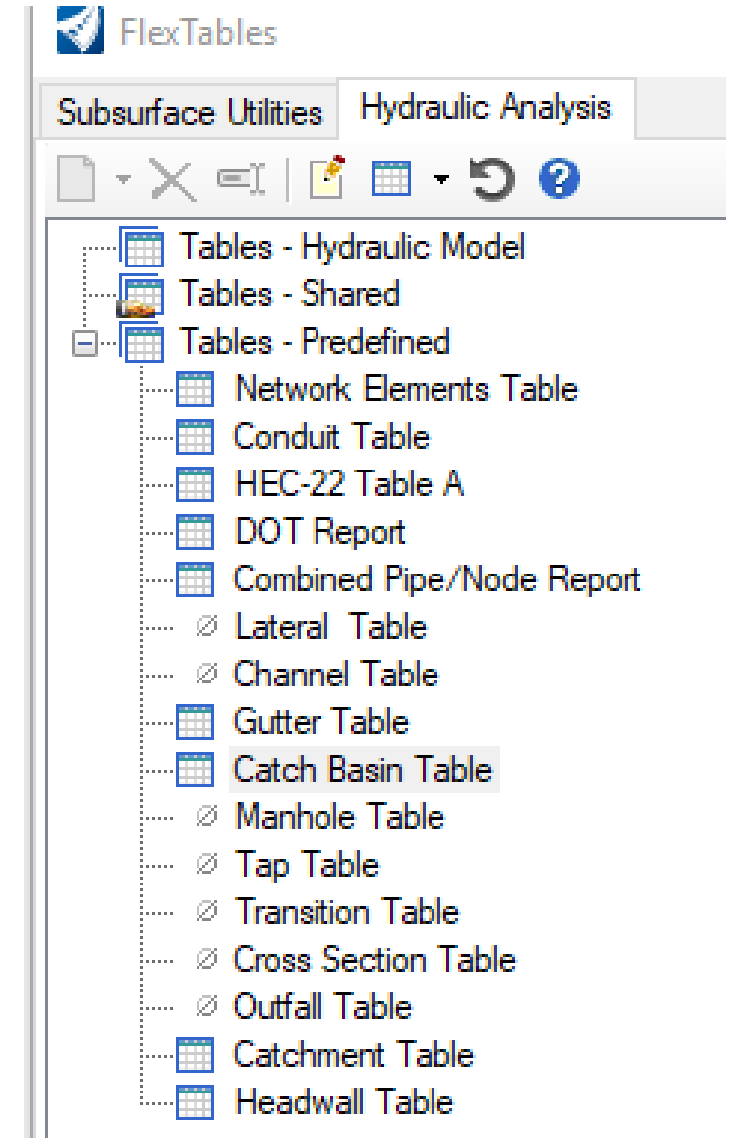
You have to **ensure** it:

- Know your vulnerabilities/opportunities

- Plan your efforts

- Look for automation

- Automate

- Document

- Confirm

How Subsurface Utilities facilitates your Quality Assurance

- **Built-in Tools**
    - **Full intrinsic database integration**
        - **All tools are based on it**
    - **User Defined Extensions**
        - **Database extensions**
        - **Fully integrated into the other tools**
        - **Formulaic!**
    - **Labels**
    - **Color Coding**
    - **Queries**
    - **Reports**
        - **Built-in**
        - **To Excel**

- **See *Evaluating Subsurface Utilities* class**

Bentley®

Many Tools are available, Some are "Predefined"

- FlexTables Provide powerful Reporting Capabilities
  - Easily User-customizable, but generally: single table (structure type)
  - Predefined FlexTables can span multiple tables (Network Elements, etc.)
  - Custom Formats (HEC-22 Table A, DOT Reports
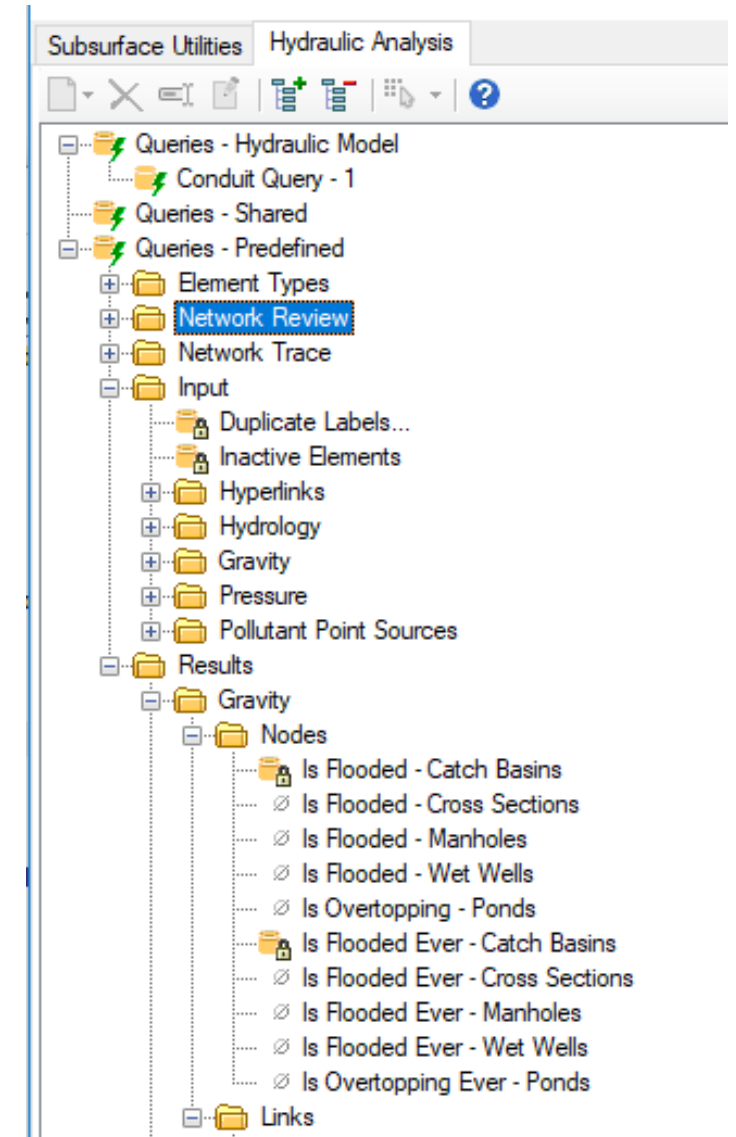- Delivered Workspaces continually add new pre-sets
- What are *your* needs?

Bentley®

Many Tools are available, Some are "Predefined"

Queries provide powerful Filtering and QC Capabilities

- Easily User-customizable, but generally: single table (structure type)
- Predefined Queries can span multiple tables (Network Trace, etc.)

- Predefined Queries are Robustly Populated.

- Don't forget to look here when you are troubleshooting or looking for QC capabilities.
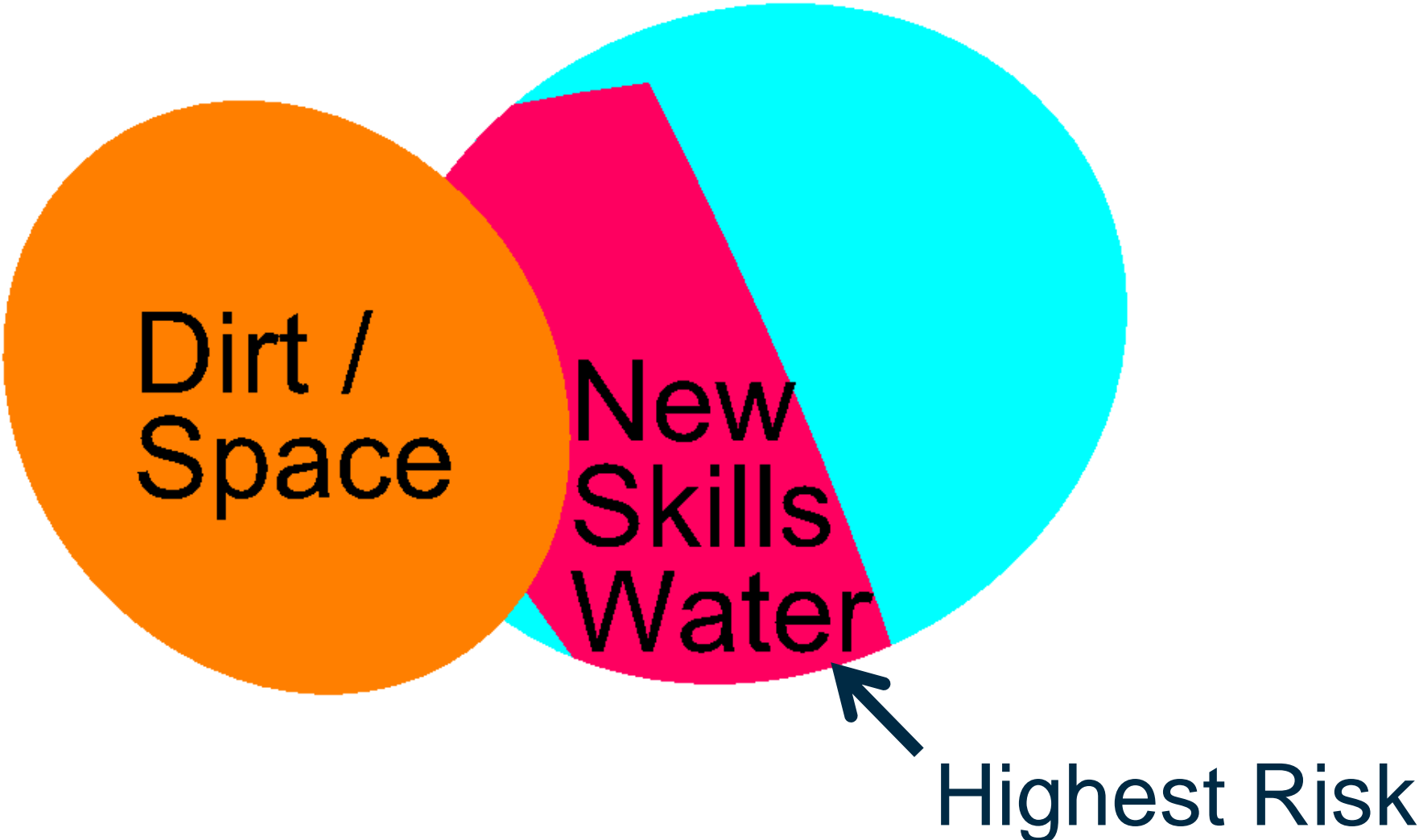
Bentley®

Many Tools are available, Training Workspace has Presets

- In addition to "Predefined", you'll want more…
- Delivered Workspaces continually add new pre-sets
- What are *your* needs?

Bentley®

Your Workspace Setup

- OpenRoads Workspace Training & Documentation
    - [OpenRoads Designer Workspace Setup Learning Path](#)
- Subsurface Utilities Training & Documentation
    - [4 Subsurface Utility Design and Analysis Learning Path](#)
        - *Meeting Subsurface Utility Standards and Streamlining Design* class

Bentley®

Biggest Delta = Biggest Need for QC

Dirt / Space

New Skills Water

Highest Risk

Bentley®

New Scope = Higher "Deviation Opportunity" = QC Priority

- SU: StormCAD > Native Drainage (InRoads, GEOPAK)
- SU: StormCAD >> Spreadsheet
- SU: CivilStorm >>> Native Drainage

Broader Scope =	Areas of less expertise
More Advanced Calcs =	More Settings and Variables
More Capability =	Options now where there was none before
More Power =	A Deeper Settings Hierarchy (e.g., Scenarios & Alternative)

Bentley®

Design Your QC tools to identify the "Deviations"

Areas of less expertise	• Anticipate what your staff or your contractors may not understand; • Set up appropriate workspace defaults; • Provide tools that flag incorrect settings.
More Settings and Variables	• Set up appropriate workspace defaults; • Provide tools that flag incorrect settings.
Options now where there was none before	• Set up appropriate workspace defaults; • Provide tools that flag incorrect settings.
A Deeper Settings Hierarchy (e.g., Scenarios & Alternative)	• Provide tools that flag incorrect settings.

Bentley®

User Defined Extensions (UDX)

Don't feel limited by the default Data Structure
- UDX = New, Custom Database Fields
    - Anything you want to track, you can add
    - Fully-integrated with other QC Tools (behaves like built-in data fields)
    - Can be included in hydraulic seed files
    - You can build fields specifically for QC
        - General Storage (BIM)
        - Calculated fields
        - True/False QC Checks

    - [Adding Your Own Data - User Data Extensions](#) class

Bentley®

The Remainder is an Exploration of Workspace QC Presets

- Customize the ideas here to meet your needs
- New Inlet Types
- Tooltips
- Labels
- Color Coding
- Queries
- Reports

Inlet Genealogy – Workspace Update

- ## Place Node
  - ## Physical Properties
  - ## Feature Definition
    - Feature Symbology (Plan, Profile, 3D)
    - Hydraulic Prototype
      - Inlet Location (On-Grade or In Sag)
      - Inlet Capture Type
      - Inlet Catalog
        - Design Sizes

Bentley

Tooltips

- Example
- Setting GUI
- How to share

Bentley®

Labels

- Analytic Symbology
- Everything in the database (including UDX)

- New "OpenRoads" Annotation

Bentley®

Network Navigator

- Has some unique queries and capabilities

Bentley®

Color Coding

- Allows Quick Visual Identification of Good/Bad structures
  - Based on anything in the database (including UDX)
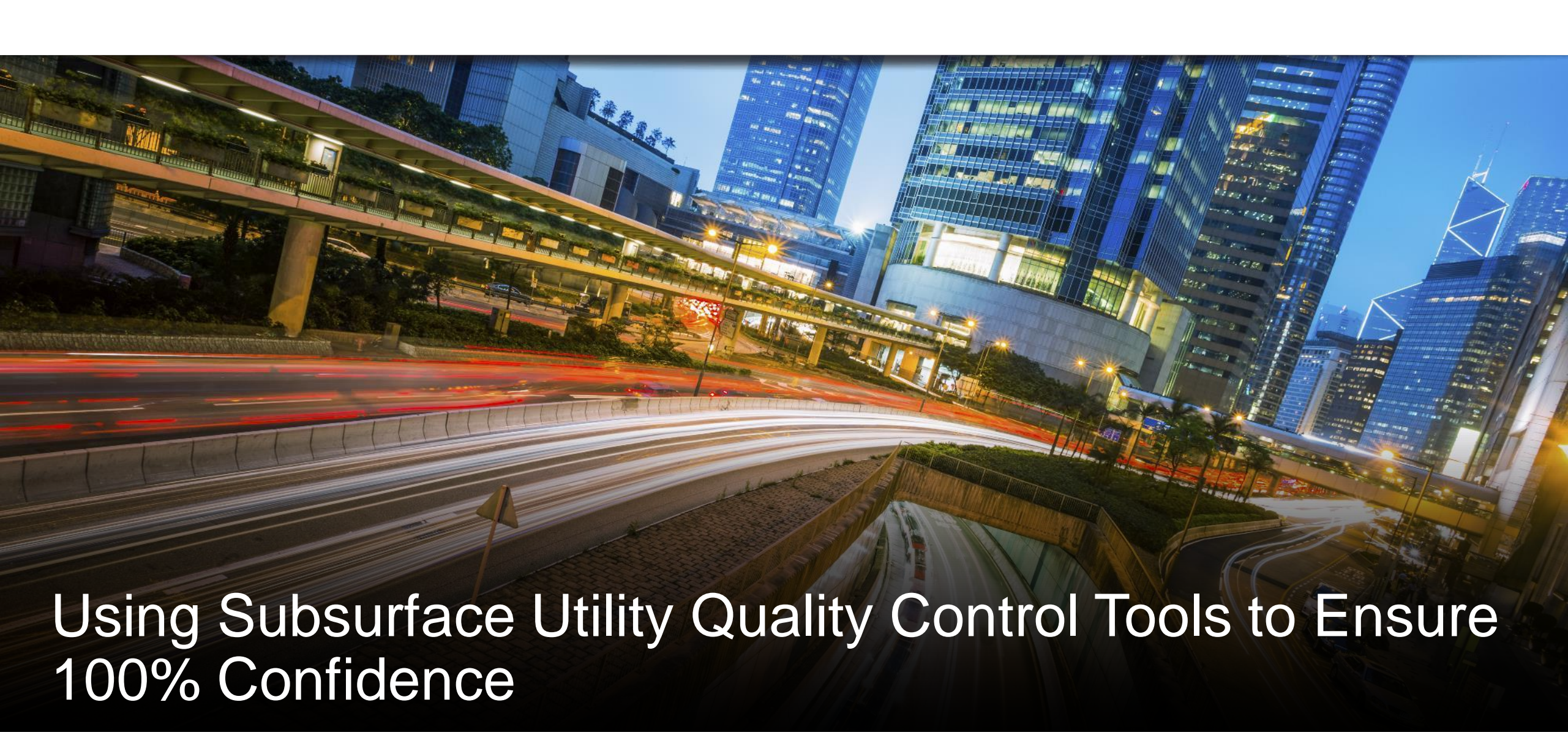 - Color Range & Weighting

  <<<example: scrolling through (mucho down-arrow) multiple ColorCodings (looking for red)>>>

FlexTables

- Let us know if there are some you need; we can add them to the "Predetermined" list

Bentley®

Queries

- Let us know if there are some you need; we can add them to the "Predetermined" list

Bentley®

Using Subsurface Utility Quality Control Tools to Ensure 100% Confidence

Thank You