360° Image Technology for Stormwater Facility Inspections

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AGENDA

- 360° Technology
- Case Study: Fairfax County, VA
- Future Applications
- Questions

Hazen

360° Technology

Spherical or 360° imagery captures its entire surroundings in a single image

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Brings the viewer into the field

Hardware

Ricoh Theta S

Image Capture

- Manual images
  - User must be aware of their location in respect to the camera
- Images can be taken remotely using attachments

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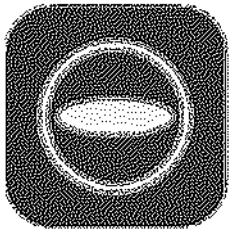
Post Processing

- Single Images
  - “Just a JPEG”
  - Images viewed using free software
  - Post processing time is no different than a traditional camera



- Virtual Tours
  - Linking single images together allowing the viewer to “navigate” a facility from a desktop
  - Proprietary Software
  - Post processing time can be significantly longer than with single images, but the market is pushing towards user friendly applications to eliminate this

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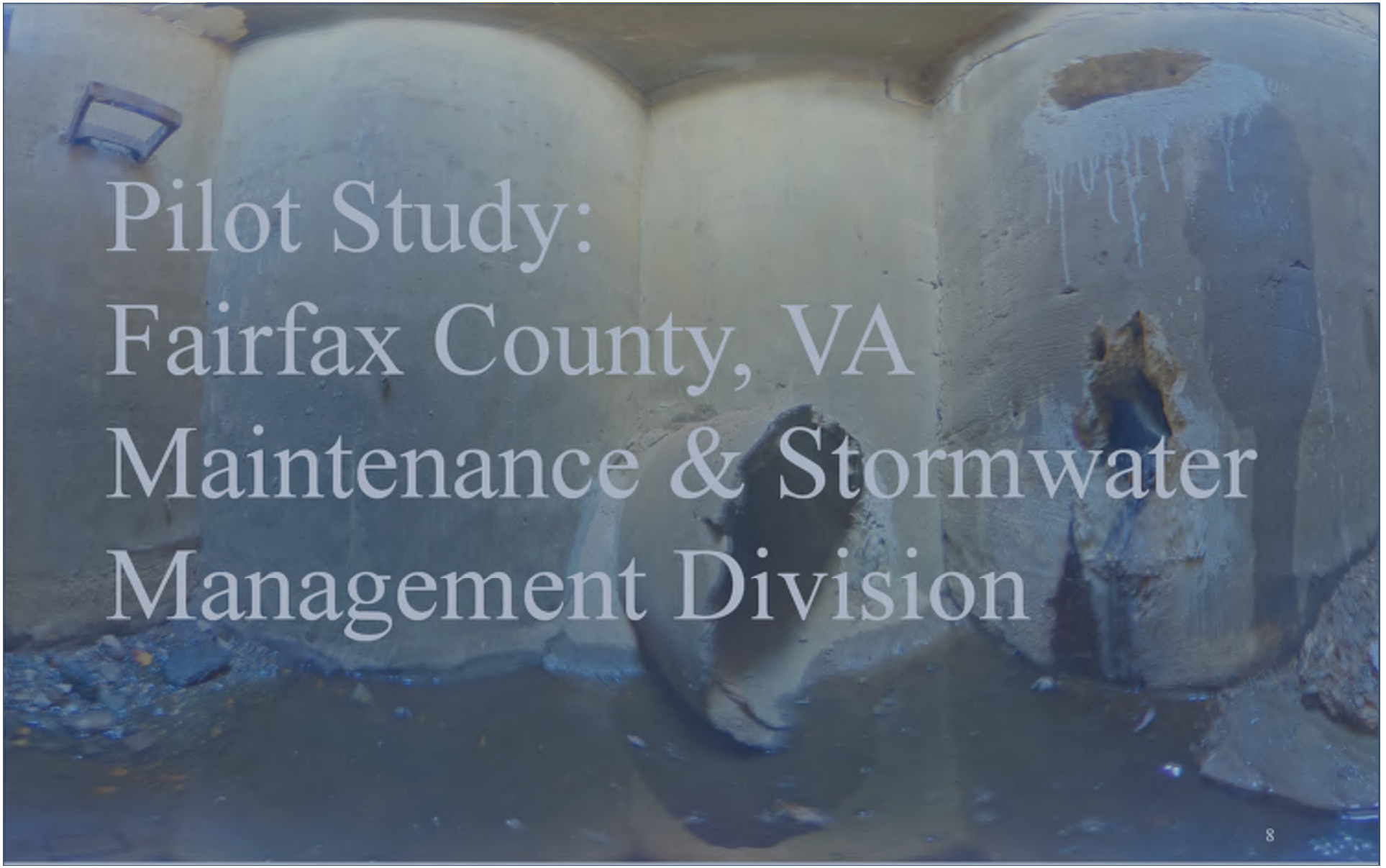
HOLO BUILDER

Single Image

Viewed in Windows Photo Viewer


Pilot Study:
Fairfax County, VA
Maintenance & Stormwater
Management Division

Fairfax County, VA

Washington, DC metropolitan area

400 square miles

30 Watersheds

- Chesapeake Bay Watershed

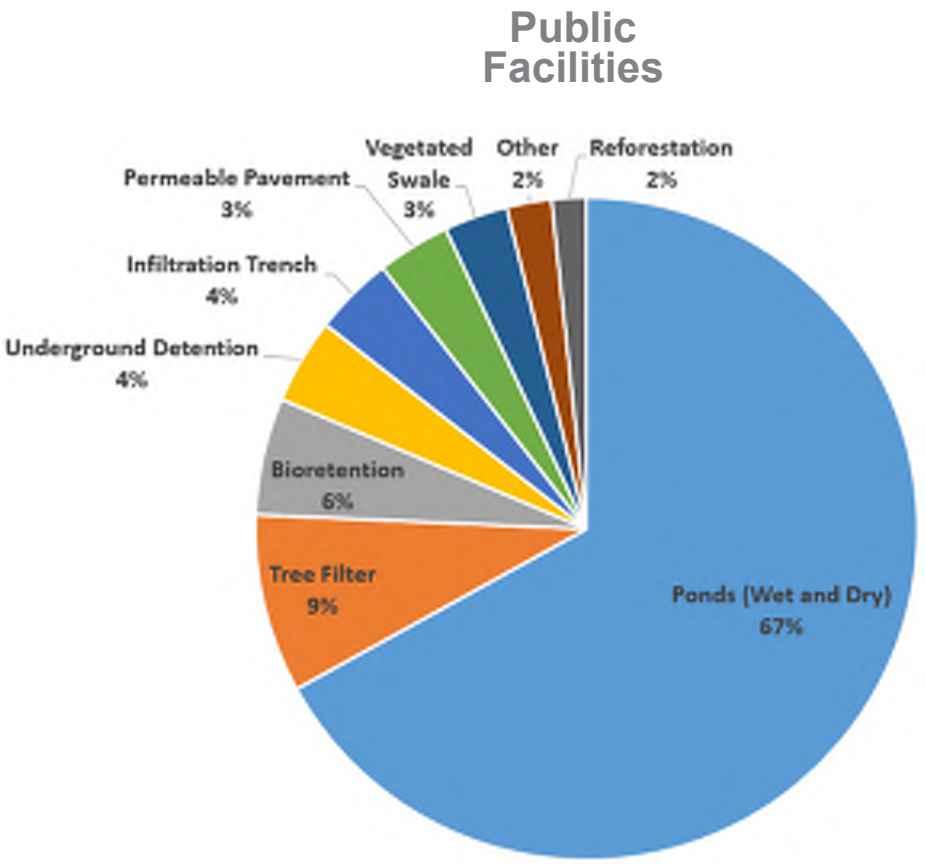
1.1 Million residents

Phase 1 MS4 Permittee

Latest Permit (VA0088587) became effective April 1, 2015

Fairfax County SCMs

- ~26% (1,900 of the 7,200) of facilities in the County inventory are publicly owned and/or maintained.
- Publicly owned facilities inspected at least once every other year.
- The County's inventory of facilities continues to grow.



Pilot Study

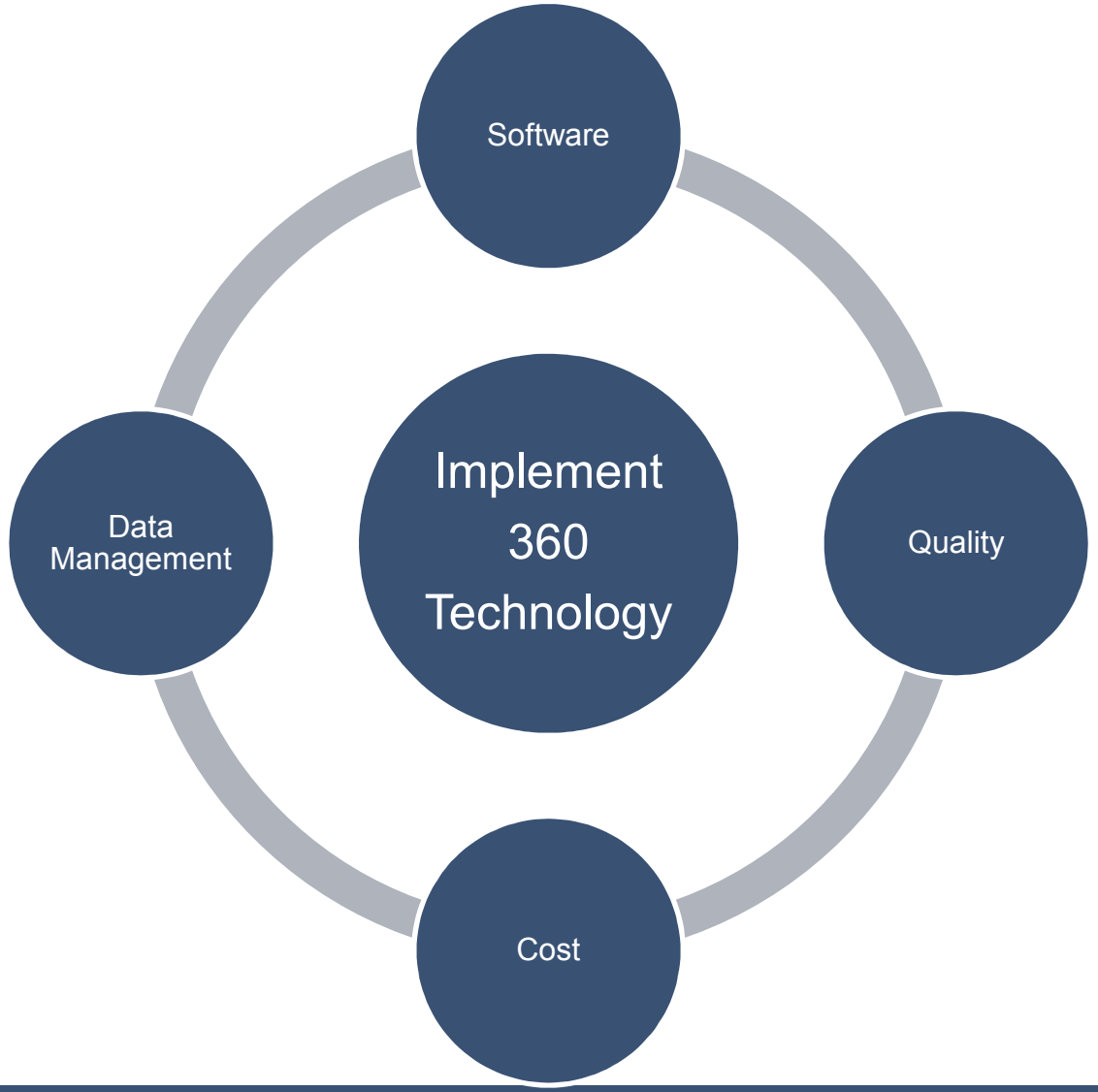
- Scope: Investigate the potential for using the 360° imagery to support stormwater facility inspections.

- Objectives:
  - *Document inspection* of stormwater facilities using 360° imagery
  - Transfer the imagery and *perform QAQC*
  - *Complete post processing* of images to investigate the utility of virtual tours

Virtual Tour

Pilot Results

360° Technology – What makes it worthwhile for a stormwater program?



Pilot Results

Fairfax County sees a potential use for this technology for public inspections using the single image.

- ✓ **Software** is compatible with municipal software restrictions
- ✓ **Quality** of inspections is higher
- ✓ **Cost** is no different from traditional inspections
- ✓ **Data** storage is no different than traditional requirements

Identified Co-Benefits

360° Imagery: Next Steps

Future Applications

Design

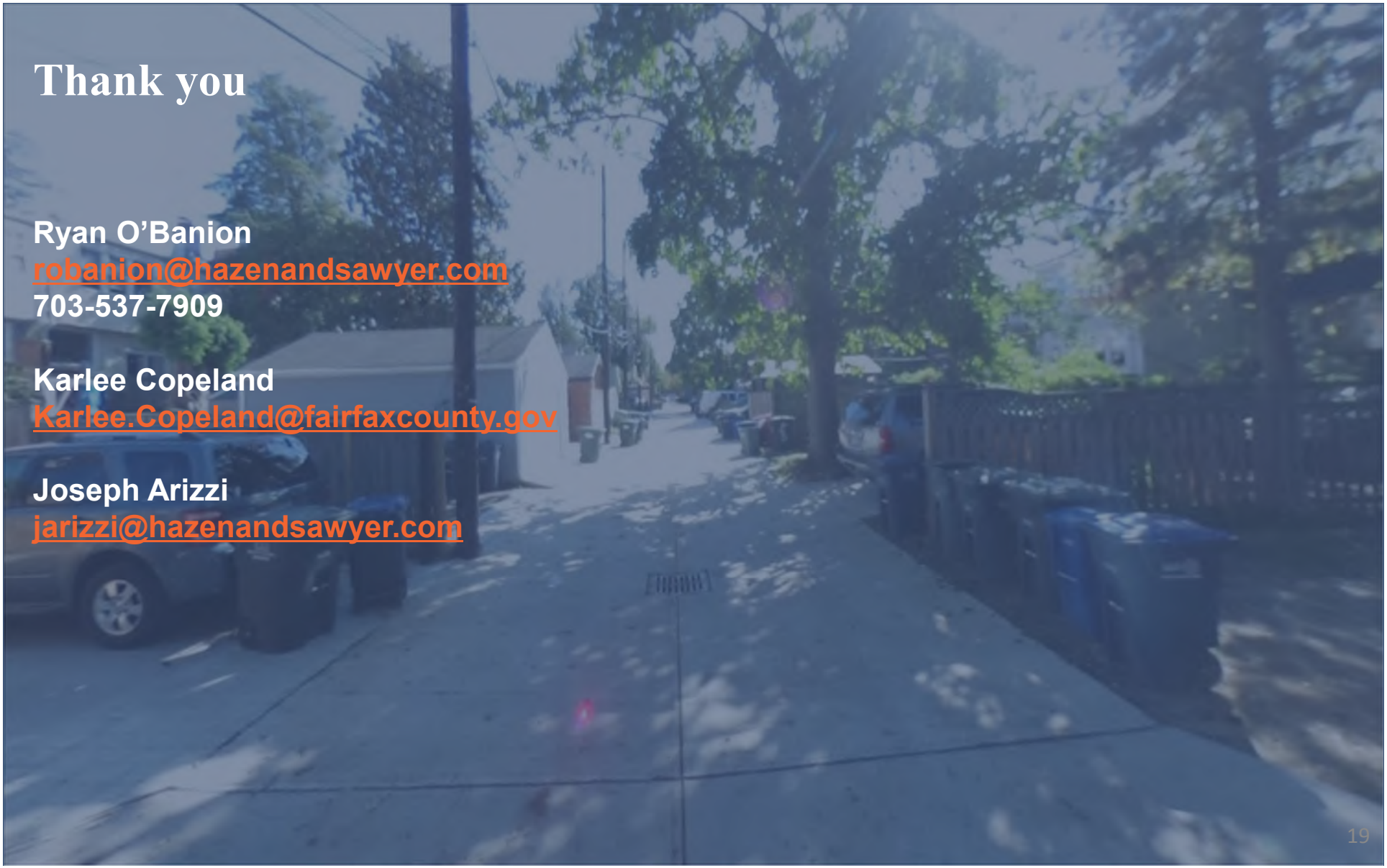
- Verify existing conditions
- Provide clarity to design team

Construction

- Daily reporting
- Construction management

Takeaways

- 360° Technology and the software is rapidly advancing
- Provides a higher quality product
  - Assist in permit compliance
  - Provides context to viewer
  - QA/QC Tool
- Improved documentation



Thank you

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Common Questions

- Does the camera have flash?
- How long does the battery last?
- **QA/QC** Tool
- Improved **documentation**
- **Accountability**

Pilot Study

Single Images

Single Image

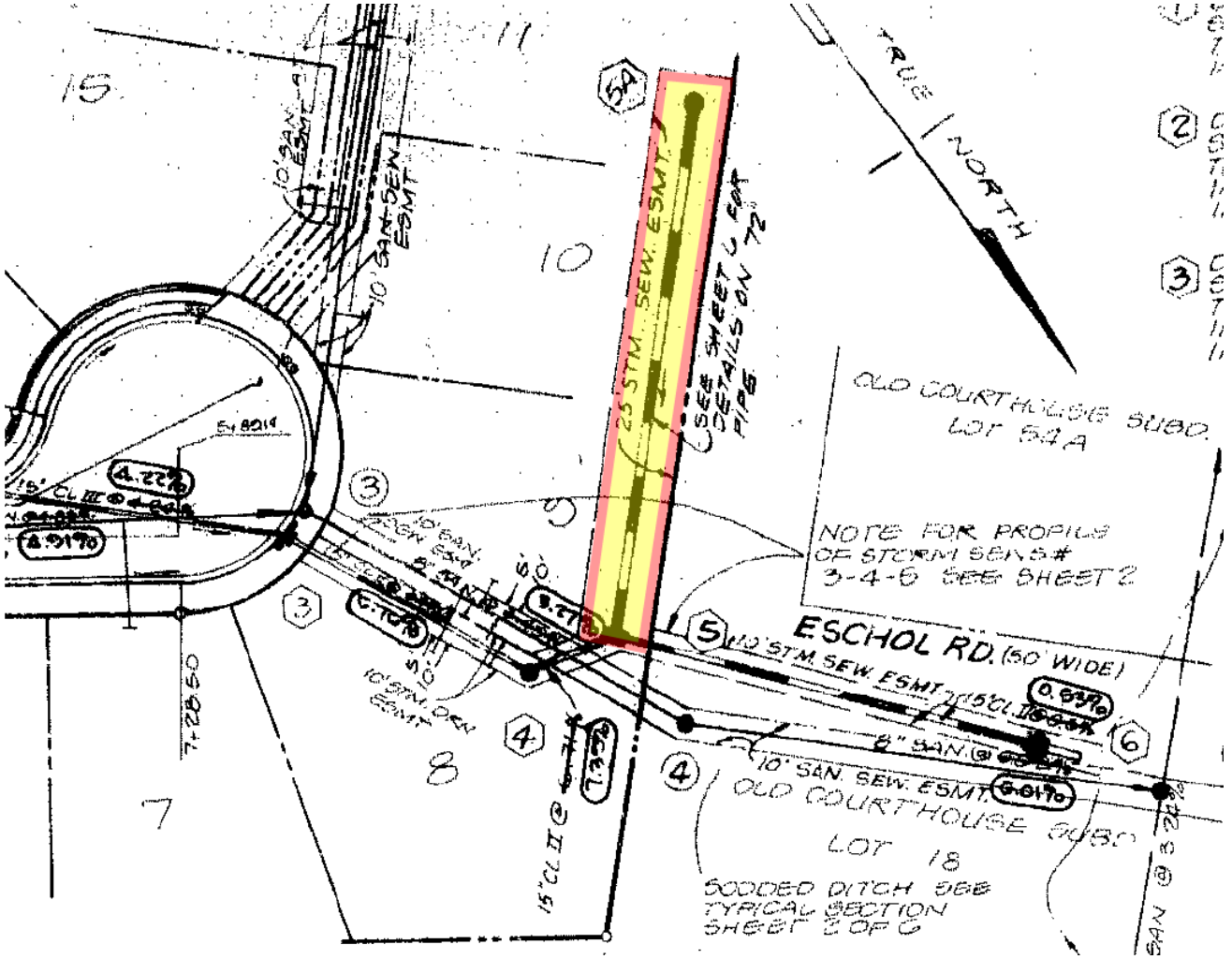
Viewed in 360° Image Software

Virtual Tour

Pilot Results

- Implementation of this technology on the private side takes more consideration
  - What is the new format of delivery to private owners?

Takeaways

Technology is Advancing
Higher Quality Product
Permit Compliance
QAQC Tool
Improved Documentation
Strong Stormwater Program

Underground Detention