Ohio Asphalt Paving Conference

Local Government Strategies for Building and Maintaining Asphalt Pavement: A Case Study

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Building and Maintaining Asphalt Pavements

Overview

About Archbold

- Village Data
- Street History

Case Studies

- Rutting
- Longitudinal & Fatigue Cracking
- Thermal & Reflective Cracking

Conclusion

- Current Pavement Sections
- Costs

Village of Archbold

General Info

VILLAGE DATA

Population
4,300

Workforce
6,000+

Area
5.05 sq mi

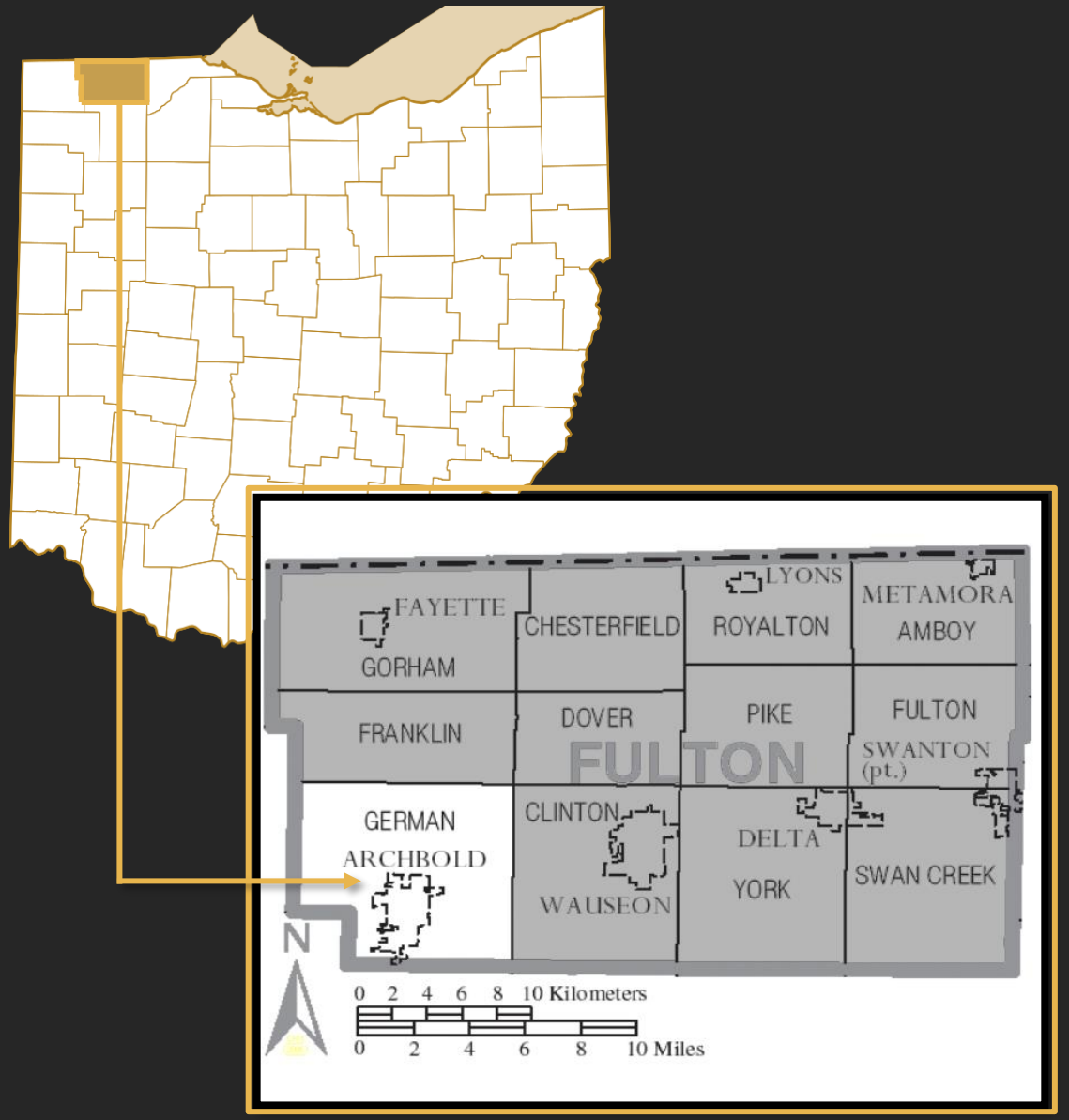
Large Industry Base

BILJAX Haulotte GROUP

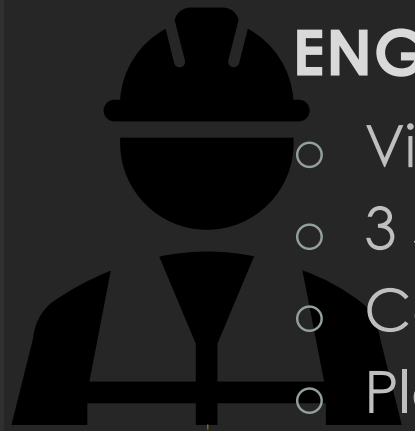
ConAgra Foods® Food you love

FSI

SAUDER



Village of Archbold

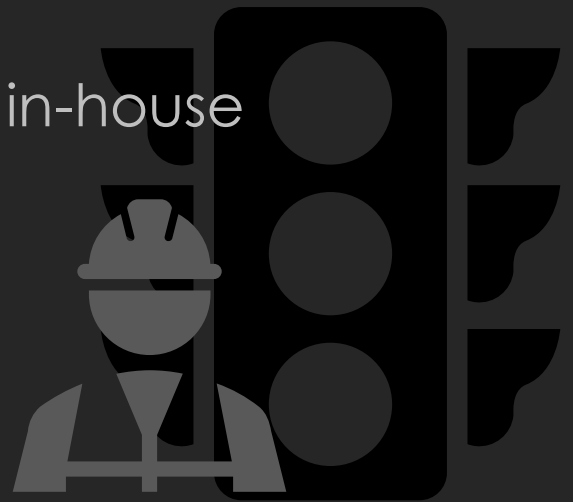


ENGINEERING DEPARTMENT

- Village Engineer
- 3 Staff Engineers
- Construction Inspector
- Planning Director

PROJECTS

- $3-4 million Yearly Capital Projects Budget
- All roadway, storm, sanitary, water, site design in-house
- Oversee water & wastewater projects
- JOAT-MON
- Rely on Flexible Pvmt's of Ohio – Jim & Bill
- *Not an Asphalt Expert!*



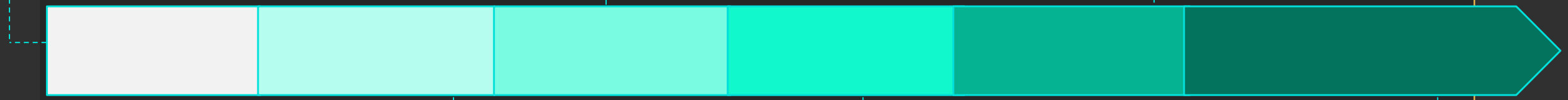
Village of Archbold

Evolution of Roadway Construction

1968
Village requires curbs & gutters for new streets; primarily concrete pavement.

1975-1994
Typical pavement section of 3" asphalt surface 5" – 8" asphalt base on subgrade.

2000
Initiative passed by voters 1/8% income tax increase earmarked for street rebuilds.



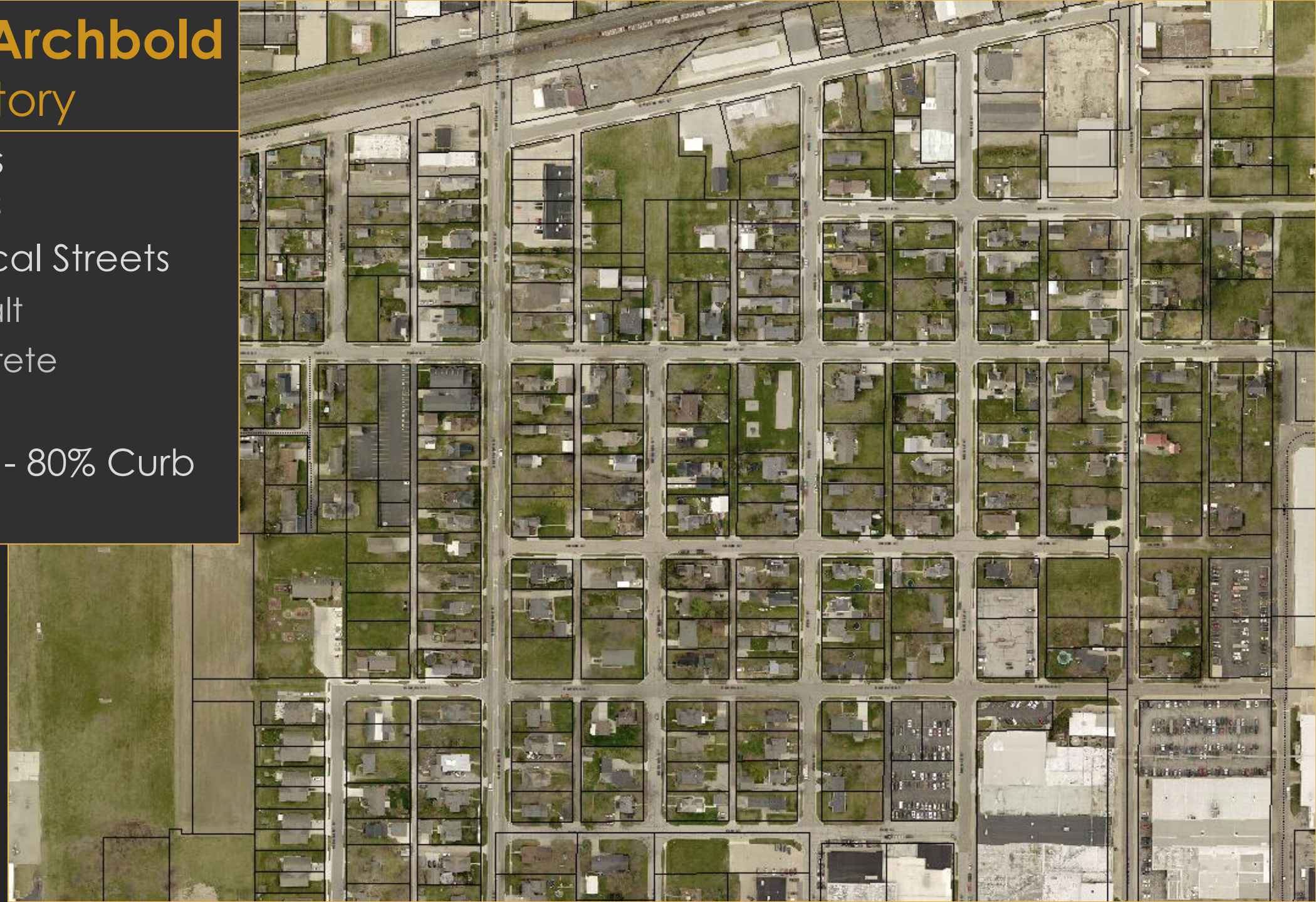
1975
Village disappointed with concrete pavement results. Begins to use full depth asphalt pavement.

1995
Implement aggregate base (ODOT 304) as part of Pavement Section

2003
Transition to Performance Graded (PG) Binder.

Village of Archbold
Street Inventory

- 60+ C/L Miles of Roadways
- Majority - Local Streets
  - 90% Asphalt
  - 10% Concrete
- Of All Streets - 80% Curb and Gutter



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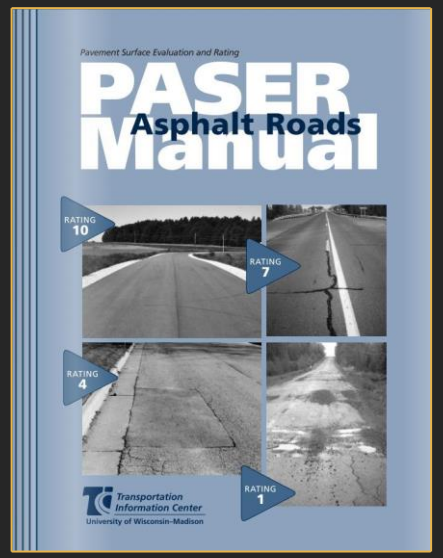
Asphalt Resurfacing Program



STREET RATINGS METHOD

- Use visual inspection methods - PASER Manual
- Developed by the University of Wisconsin-Madison
  - Rates Pavements 1-10

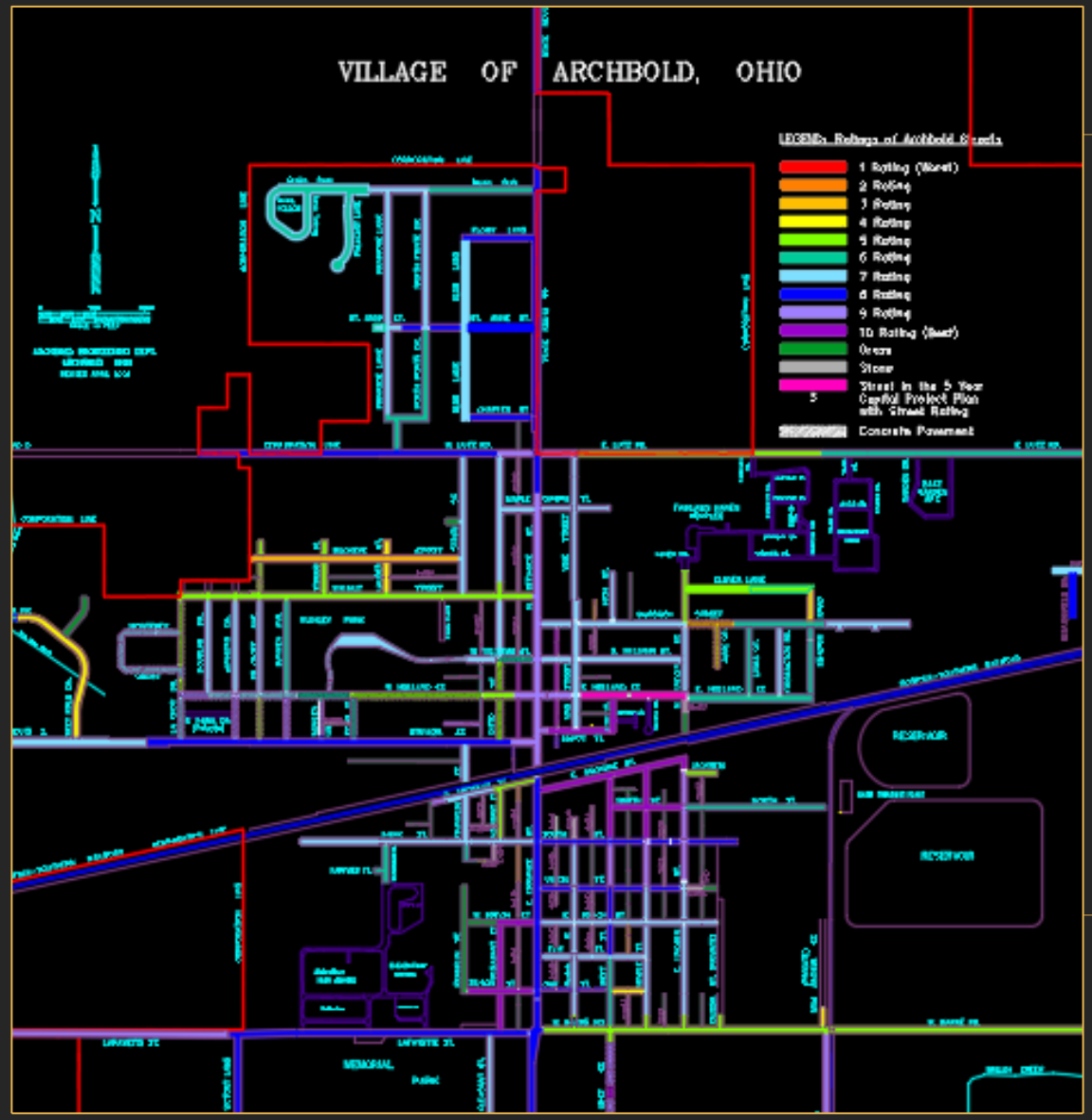
RECORDKEEPING

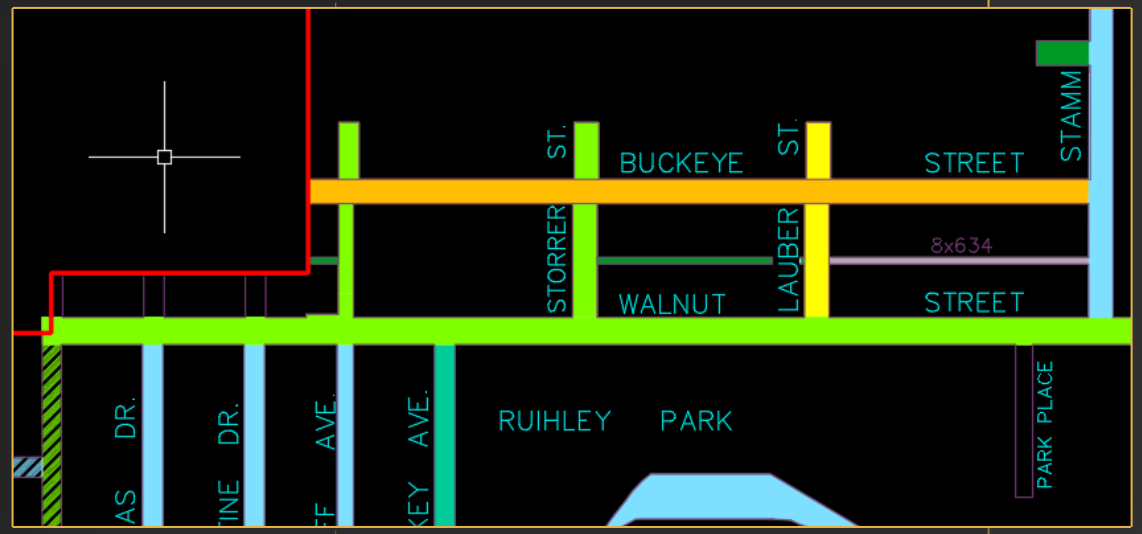
- *Basic* – Excel spreadsheet
- 2-Year Cycle

	A	H	I	J	K	L	M	N
1	Street	2012 Rating	2014 Rating	2015 Rating	2016 Rating	2019 Rating	2022 Rating	Remarks - 2022
2	Bankey Avenue Holland to Walnut	8	7	7	7	6	6	Transverse cracks and a few longitudinal cracks,centerline cracks, edge cracking, some raveling , sealed 2016
3	Bankey Avenue Stryker to Holland	10	9	9	9	9	9	Couple meander cracks, few corner cracking, sealed in 2016
4	Blue Streak Drive	8	7	7	7	6	6	Block Cracking , longitudinal , transverse cracks and centerline cracks, Slight Raveling, was sealed in 2019
5	Brussel Street Elm to Union	8	7	7	7	7	7	Centerline, longitudinal and transverse cracks open 1/4" to 1/2", some edge cracking, was sealed in 2018

Asphalt Resurfacing Program

Recordkeeping | Street Ratings Map





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Village of Archbold

CASE STUDIES

Village of Archbold
Case Study #1

RUTTING

S. Defiance Street (SR66) – Built 1993

- 4000 LF, 36’ wide, C/G
- 3” Surface (441 Type1H) on 10” Asphalt Base (301) on Subgrade
- Arterial – Commercial District
  - ADT 8,800

Village of Archbold

Case Study #1

PROBLEM

Fast-Forward 21 Years

- Moderate/Major Rutting

RUTTING

Village of Archbold

Case Study #1

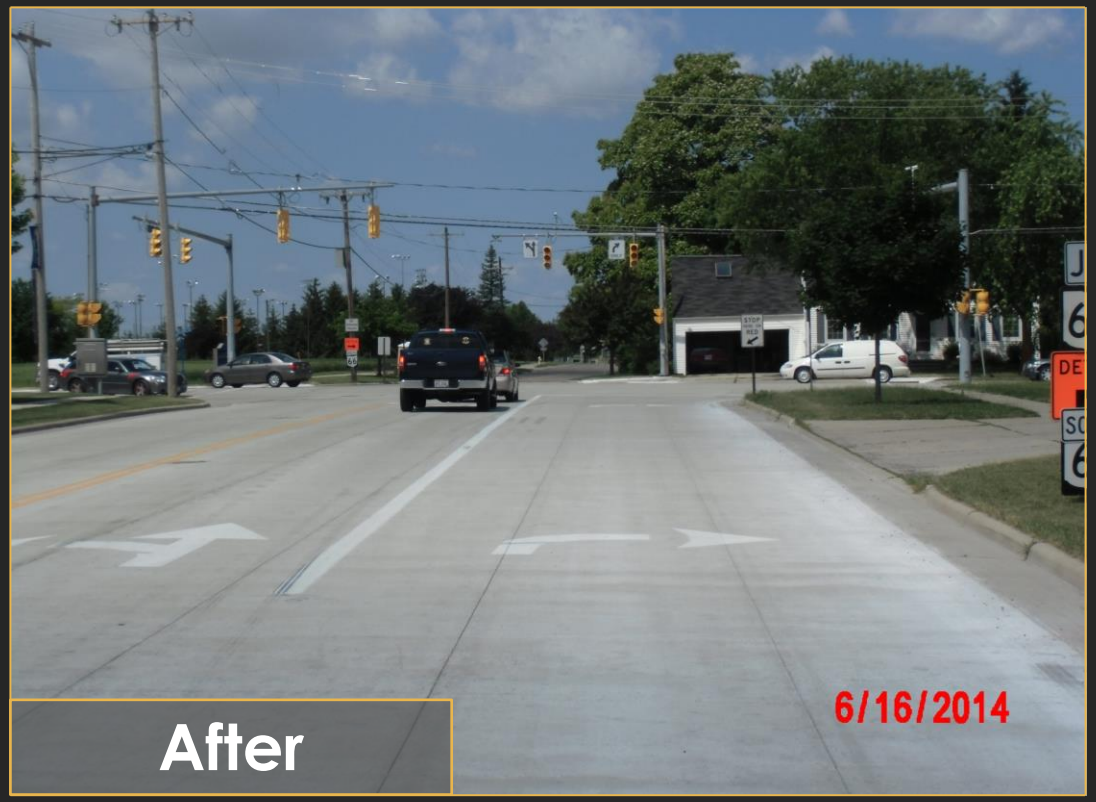
RUTTING

SOLUTION

Concrete Overlay - 2014

- Worked great to prevent rutting

Before



After

Village of Archbold

Case Study #1

RUTTING

SOLUTION

Concrete Overlay - 2014

- Durability issues

Village of Archbold
Case Study #1

RUTTING

SOLUTION

S. Defiance Street Resurface – 2014

- Milled 3.5”
- 1-1/2” Surface (ODOT 448, Type 1H, Heavy Traffic, PG 70-22M)
- 2” Interm. (ODOT 448, Type 2, Heavy Traffic, PG 70-22M)

Village of Archbold
Case Study #2

RUTTING

West Barre Road – Built 1994

- 6000+ LF, 36’ wide, C/G
- 2-1/2” Surface on 10-1/2” Asph. Base on Subgrade
- Major Collector – Heavy Industry
  - ADT 6,000

OVERSIZE AND OVERWEIGHT VEHICLE PERMIT

I, the undersigned, hereby make application to transport a vehicle over County Roads that is oversized and/or overweight as is defined in Sections 5577.01 to 5577.09 of the Ohio Revised Code.

Specifically the vehicle is:

_____OVERSIZE WIDTH_____ LENGTH_____ HEIGHT_____

_X__OVERWEIGHT TOTAL WEIGHT 154,000 MAX. AXLE WEIGHT 18,000

Village of Archbold

Case Study #2

RUTTING

PROBLEM

Fast-Forward 12 Years

- Major Rutting at intersection
- Minor Rutting elsewhere
- **2006** – Resurfaced w/ SMA
  - Coarse-graded, raveling

Fast-Forward

(…Again)

2014 – Concrete Overlay just at Intersection

Village of Archbold

Case Study #2

RUTTING

SOLUTION

West Barre Road Resurface – 2019

- Concrete Overlay from 2014 retained
- 1-1/2" Surface (ODOT 442, 12.5mm, Type A (448) PG 76-28M)

Village of Archbold
Case Study #3

LONGITUDINAL & FATIGUE CRACKING

East Lutz Road – Built 1971

- 5000 LF, 26’ wide, C/G
- 5” Asph. on 12” Agg. Base
- Major Collector
  - ADT 2,600
- Truck Traffic

Village of Archbold
Case Study #3

LONGITUDINAL & FATIGUE CRACKING

Fast-Forward

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PROBLEM

Longitudinal & Block Cracking

Village of Archbold

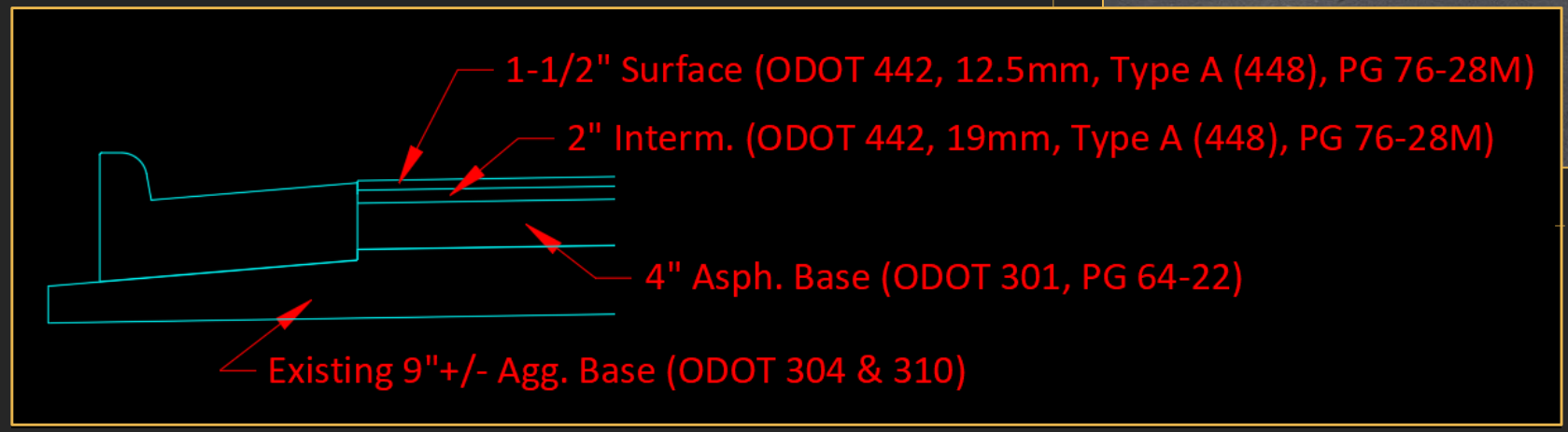
Case Study #3

SOLUTION

East Lutz Road Rebuild – 2022

- 1st Use of VRAM
- Kept most of existing concrete curb

LONGITUDINAL & FATIGUE CRACKING



Village of Archbold
Case Study #4

THERMAL & REFLECTIVE CRACKING

West Field Drive – Built 1994 & 1998

- 2000 LF, 24’ wide, C/G
- 1994 – 2-1/2” on 5-1/2” on Dirt
- 1998 – 3” on 3” on 8” on GSF
- Local Street
- Commercial & Residential Area, Archbold Medical Group

Village of Archbold
Case Study #4

Fast-Forward

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THERMAL & REFLECTIVE CRACKING

PROBLEM

- Large Traverse Cracking w/ Settlement – 80'+/- Spacing
- Spray Patching performed to improve ride quality

Village of Archbold
Case Study #4

THERMAL & REFLECTIVE CRACKING

PROBLEM

- Large Traverse Cracking w/ Settlement – 80'+/- Spacing

Village of Archbold
Case Study #4

THERMAL & REFLECTIVE CRACKING

PROBLEM

Fast-Forward

- Trench Patches
- Mod. Block Cracking

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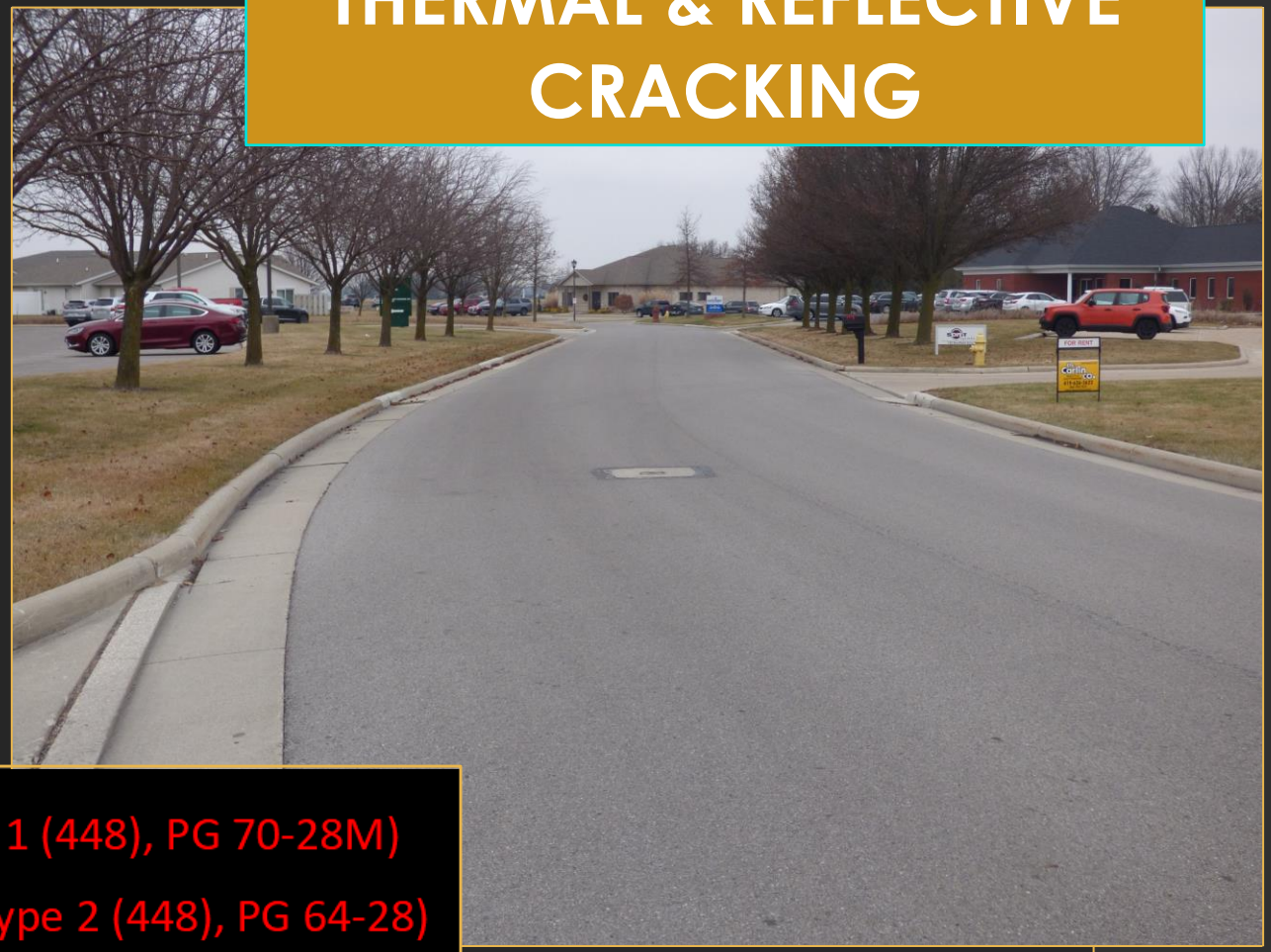
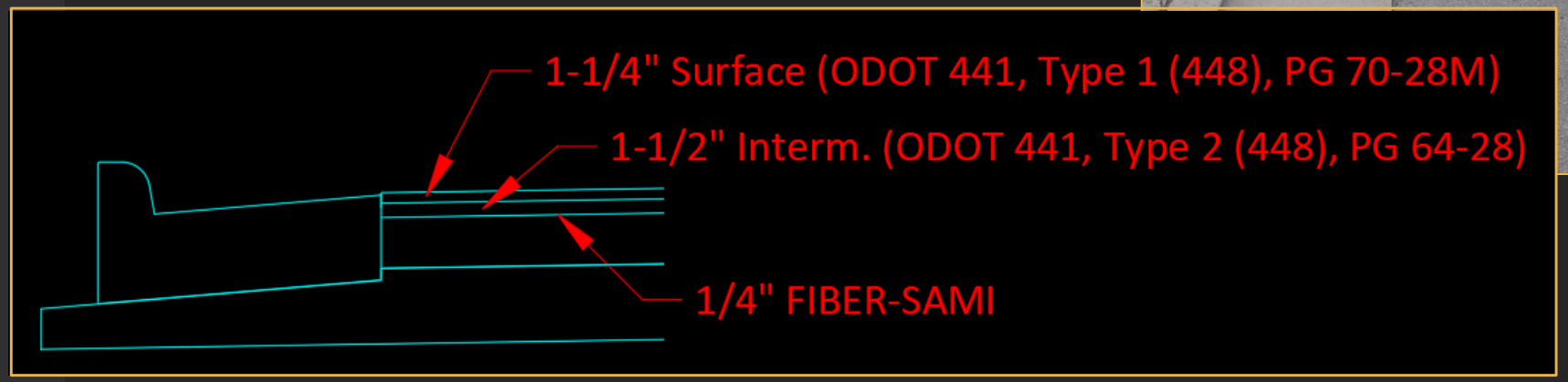
Case Study #4

THERMAL & REFLECTIVE CRACKING



SOLUTION

West Field Drive Resurface – 2019



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Case Study #4

THERMAL & REFLECTIVE CRACKING

SOLUTION

- Fiber Reinforced Bituminous Membrane Surface Treatment (FIBER-SAMI), Type B
  - **S**tress **A**bsorbing **M**embrane **I**nterlayer
  - Polymerized Asphalt Emulsion, Fiberglass Strands, Crushed Agg.

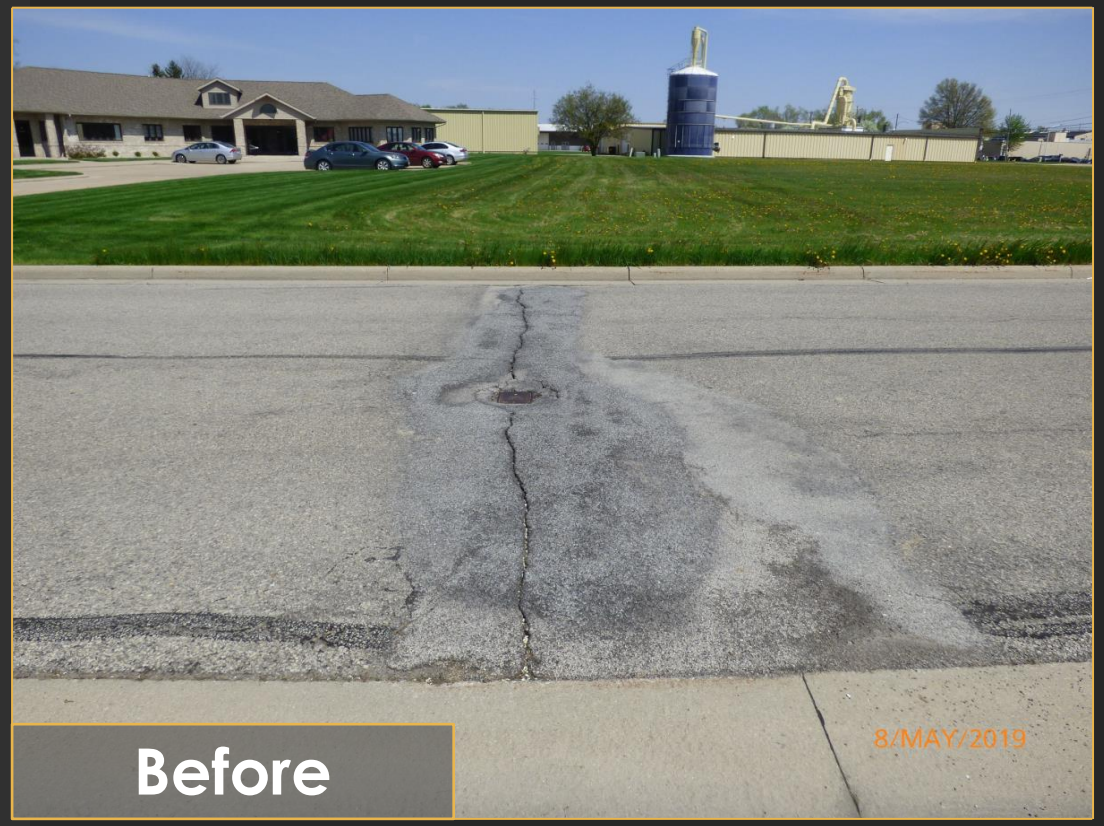
Village of Archbold

Case Study #4

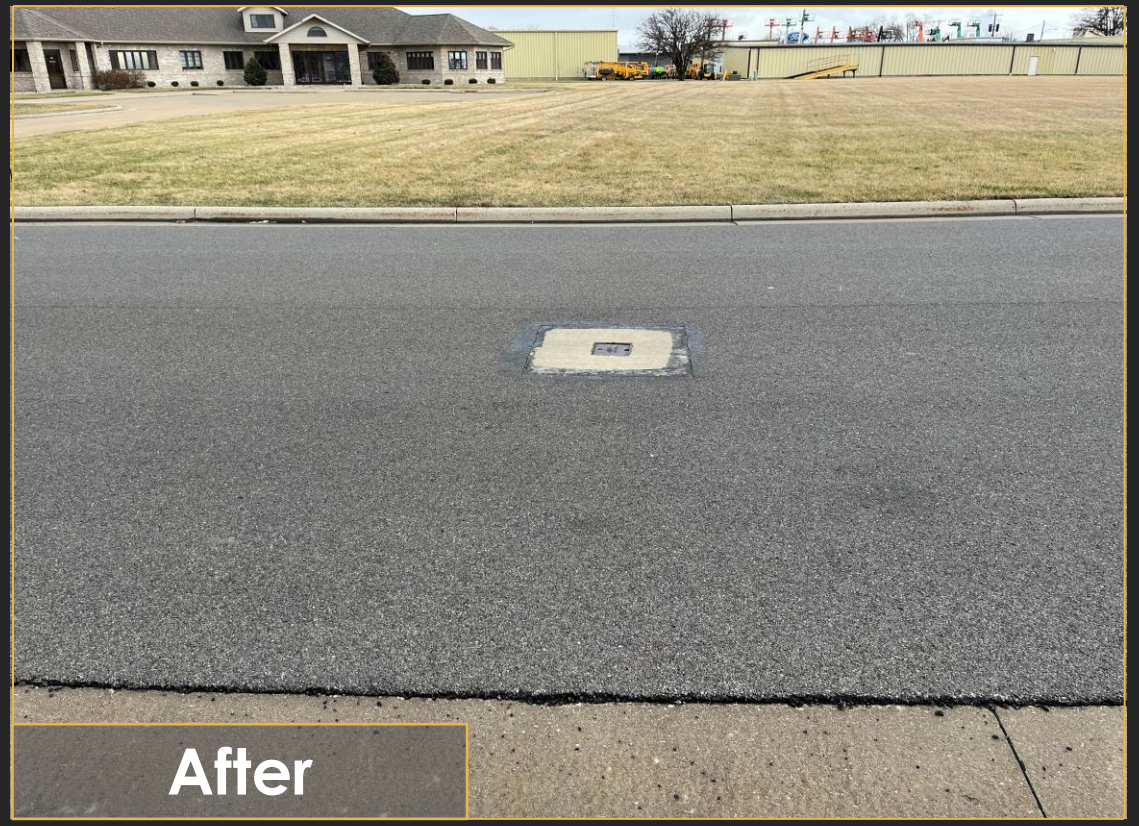
THERMAL & REFLECTIVE CRACKING

SOLUTION

- 4 Winters Later



Before



After

Village of Archbold
Case Study #4

THERMAL & REFLECTIVE CRACKING

SOLUTION

- 4 Winters Later

Village of Archbold

Case Study #4

THERMAL & REFLECTIVE CRACKING

SOLUTION

- 4 Winters Later

Village of Archbold
Case Study #5

THERMAL & REFLECTIVE CRACKING

Buckeye Street – Built 1988

- 3300 LF, 24’ wide, C/G
- 2-1/2” on 6”” on Dirt
- Local Street
- Residential Area

Village of Archbold

Case Study #5

THERMAL & REFLECTIVE CRACKING

PROBLEM

Fast-Forward – 32 Years!

- Large Traverse Cracking w/ Settlement: 40'-60' Spacing
- Spray Patching performed to improve ride quality

Village of Archbold
Case Study #5

THERMAL & REFLECTIVE CRACKING

PROBLEM

Fast-Forward

- Mod. Block Cracking

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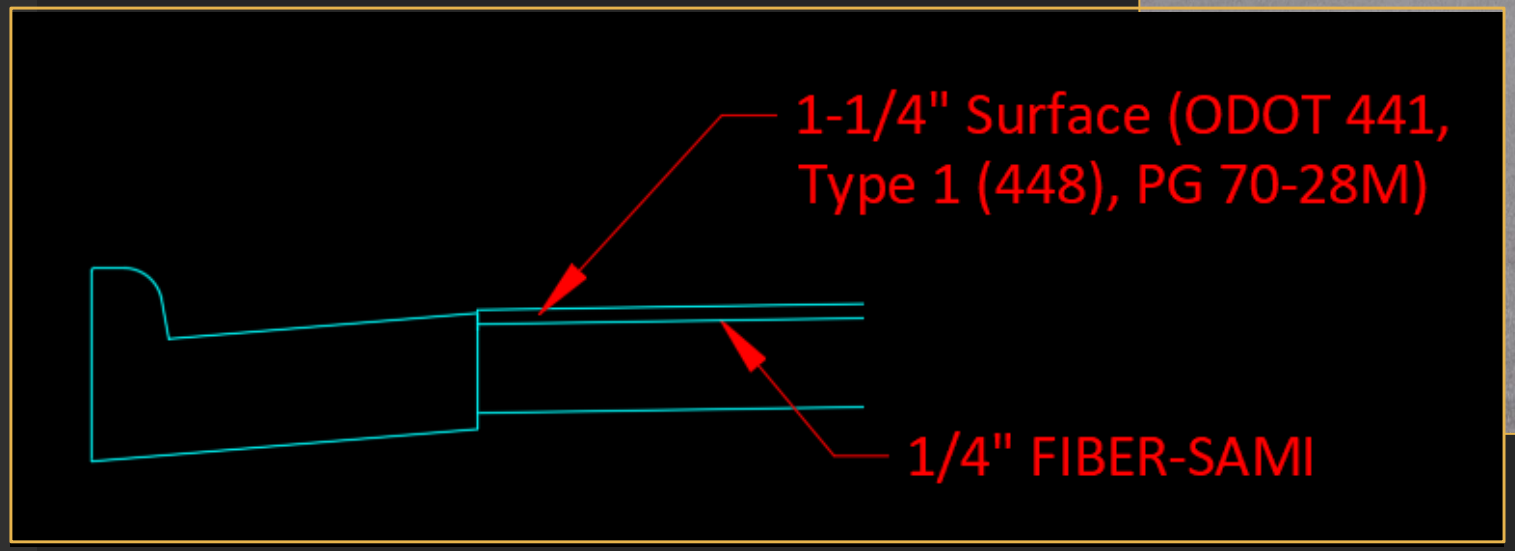
Village of Archbold

Case Study #5

THERMAL & REFLECTIVE CRACKING

SOLUTION

Buckeye Street Resurface – 2020



Village of Archbold
Case Study #5

THERMAL & REFLECTIVE CRACKING

SOLUTION

Buckeye Street Resurface – 2020

Village of Archbold

Case Study #5

SOLUTION

Buckeye Street Resurface – 2020

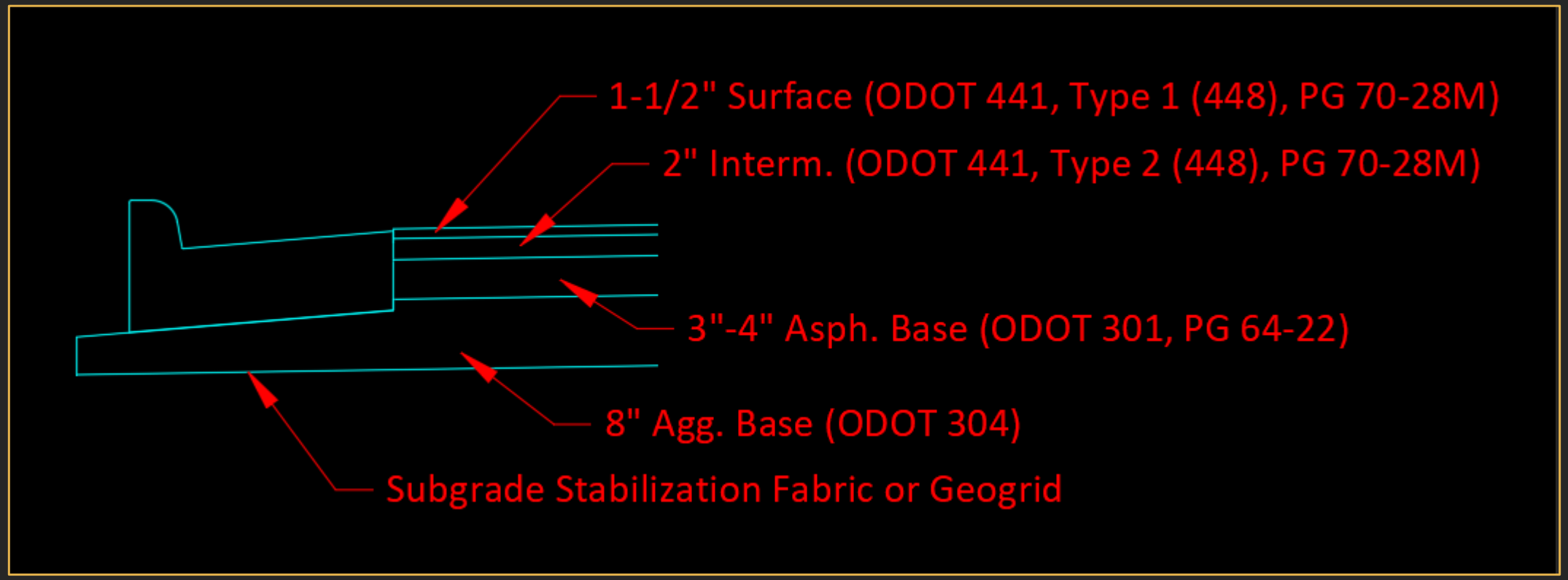
- Some issues with "Dips" at joints

THERMAL & REFLECTIVE CRACKING

Village of Archbold

NEW STREET DESIGN

- Minor Collector/Local



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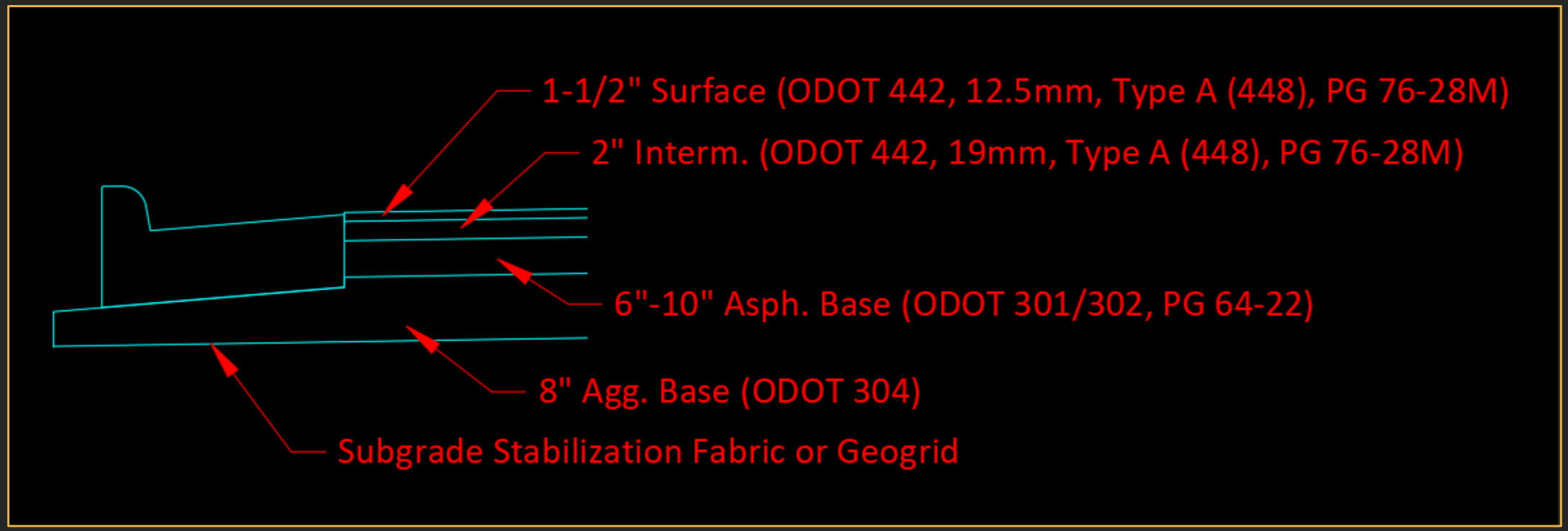
NEW STREET DESIGN

- Arterial/Major Collector



Village of Archbold

Cost

- PG 64-22 vs. PG 70-28M – 8% - 9% increase Mixed Asphalt
- PG 64-22 vs. PG 76-28M – 10% - 11% increase Mixed Asphalt
- FIBER-SAMI – $5.00 - $8.00 per Square Yard

Things to Consider

- **Binder**
  - Most cost effective for larger projects – 400+ Tons
  - Where is the binder coming from?
  - Talk to your local contractors

- **FIBER-SAMI** – 15,000+ SY likely to decrease cost


THANK YOU!