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THE BEST OPTION FOR YOUR STREAM CROSSING

Stream Crossings



Approx. 67,000 in Michigan
Of those 60,700 are culverts

NEED FOR REPLACEMENT

- Condition
- Hydraulic Capacity
- Insufficient Length
- Emergency

Condition



Hydraulic Capacity



Insufficient Length



Emergency



Material Selection

✓ Concrete

✓ Metal

✓ Timber

✓ Plastic

Concrete

⦿ Advantages

- Durable
- Smooth Pipe
- Several Geometric Options

⦿ Disadvantages

- Joints every 6'-8'
- High Initial Cost
- Weight of Material

Concrete



Metal

⦿ Advantages:

- Minimal Joints 20+'
- Light Weight
- Lower Initial Cost

⦿ Disadvantages

- Corrosion/Deflection
- Cover Limitations
- Compaction Sensitive

Metal



Timber

⦿ Advantages:

- Non-Corrosive
- Natural Appearance
- Lower Cost

⦿ Disadvantages:

- Limited Suppliers
- Limited Configuration

Timber



Plastic

⦿ Advantages:

- Lightweight
- Non-Corrosive
- Smooth Pipe/Lining

⦿ Disadvantages:

- Limited Size
- Buoyant
- Compaction Sensitive

Plastic



Culvert Shape Factors

- Hydraulic Capacity
- Stream to Road Height
- Stream Width
- Cost

Bankful Flow

- ◎ Typically 1.5/2 year storm
 - Normally the first flattened slope.
 - Usually where sediment deposit occurs.
 - Point Bars and Sand Bars are a good indicator.

3-Sided



Arch



Round



Constructability

- ✓ Stream Alignment
- ✓ Maintaining Flow
- ✓ Removal of Existing Structure
- ✓ Bedding
- ✓ Placement/Joints
- ✓ Bottom Treatment

Alignment of Stream



Maintain Flow

- ✓ Transfer Pump
- ✓ Temporary Channel
- ✓ Existing Culvert
- ✓ Sheeting

Existing Culvert

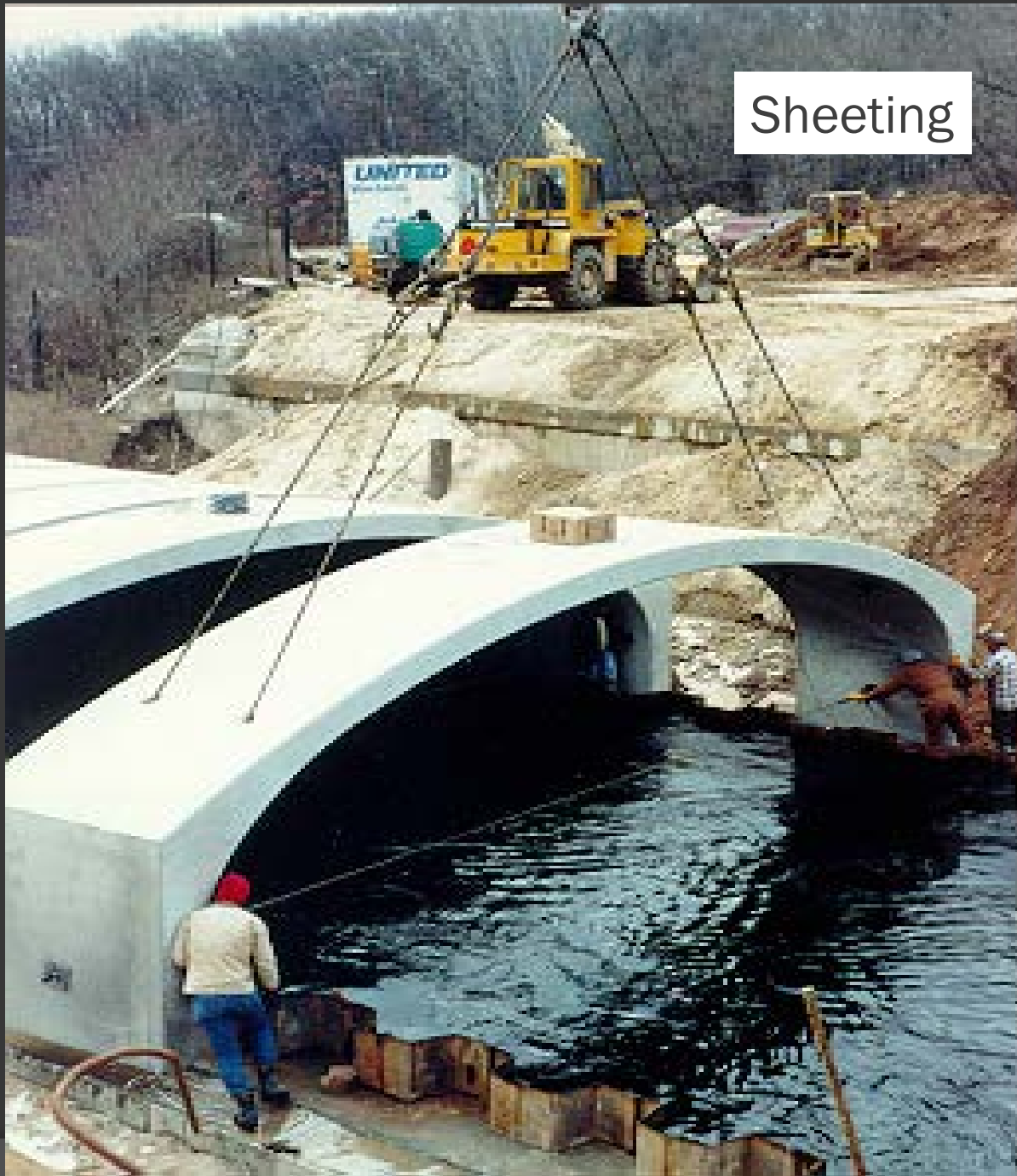




Temporary Channel



Sheeting



Removal of Existing Structure



Bedding



Placement



Bottom Treatment



Stream Scour



Perched Culvert



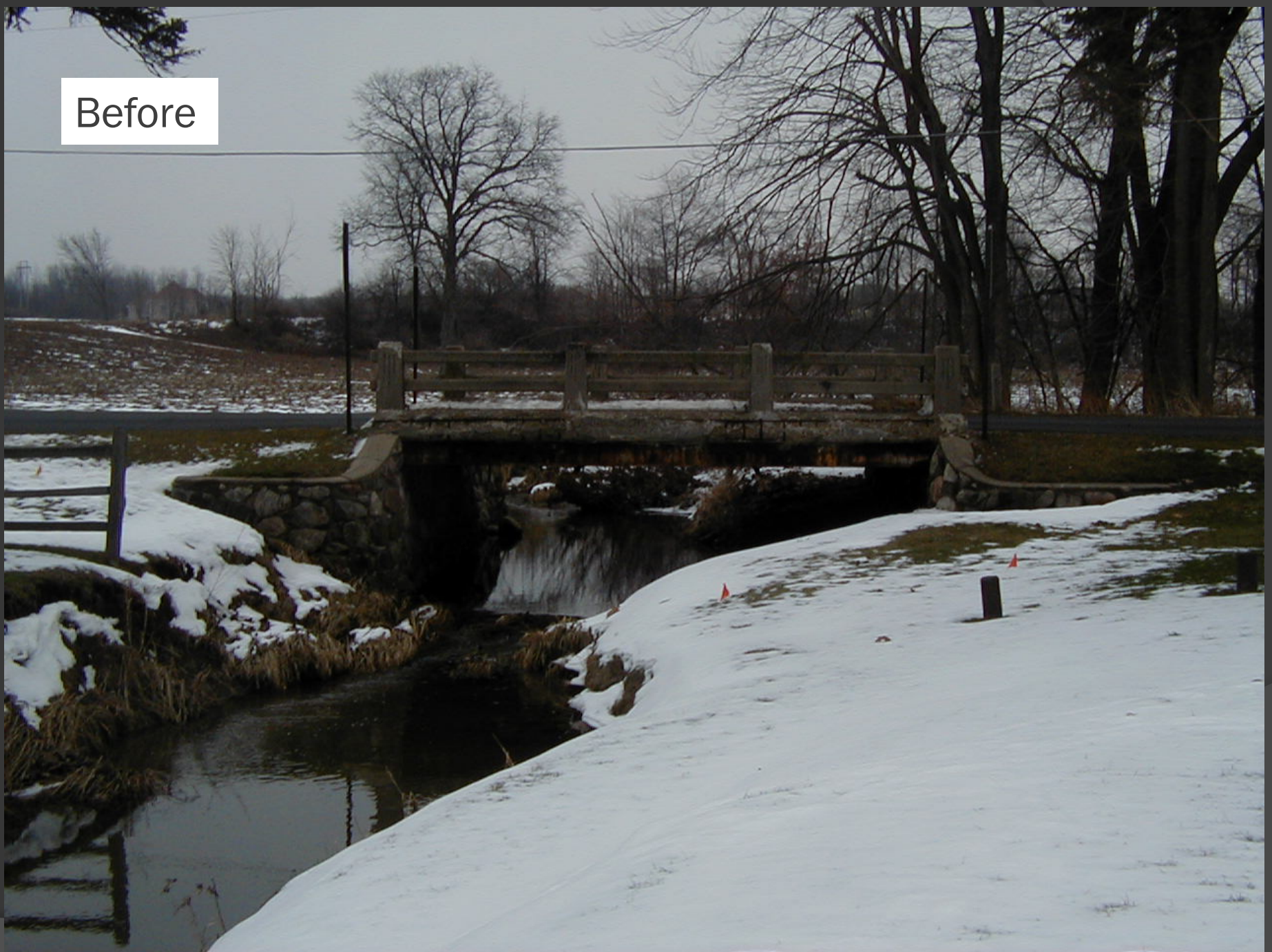
Stream Gradient



Multiple Spans



Before





After

Before



2009/05/19



After