

A wide-angle photograph of a water treatment facility. In the foreground, a green grassy slope leads down to a paved road. A white semi-truck is parked on the road, facing away from the camera. Beyond the road is a large body of water, likely a reservoir or pond, with several orange construction vehicles and workers visible in the distance. The background shows rolling green hills under a blue sky with light clouds.

***COUNTY STORM WATER  
MANAGEMENT ORDINANCES***

# COUNTY STORM WATER ORDINANCES



**WHAT ARE THEY FOR?**

**WHAT SHOULD THEY INCLUDE?**



**DON'T START FROM SCRATCH !**

# TYPICAL ORDINANCE



- **Purpose and Policy (scope)**
- **Definitions**
- **Guidelines – Applications/Plans/Permits/Fees**
- **Review Process**
- **Approval Standards - Conditions**
- **Enforcement/Penalties**



# THREE TIERED APPROACH



**Ordinance and Policy**

**They are different !**

**Design Standards**

**Plans and Permits**

- ✓ **METHODOLOGIES, DESIGN CRITERIA TECHNICAL REQUIREMENTS**
- ✓ **HYDROLOGIC & HYDRAULIC ANALYSIS; INFRASTRUCTURE, BMP'S**



## ➤ **Planning and Zoning Ordinances**

- ✓ Storm Water Conveyance and Design Requirements
  - Guidelines and Exemptions / Waivers (agriculture)
  - Review and Approval Process
  - Applications and Fees
- ✓ Flood Protection and Damage Prevention
- ✓ Erosion Control

## ➤ **Policy – Unwritten and Written**

CONTROL WHAT YOU WANT OR NEED TO

THIS MAY DUPLICATE OTHER FEDERAL AND STATE REGULATIONS



## ➤ **Storm Water Management Plan**

- ✓ Document Outline – Minimum Requirements
- ✓ Application Forms / Fees
- ✓ Design and Review Standards

## ➤ **Storm Water Permit**

- ✓ Erosion / Sediment Control
- ✓ Best Management Practices (BMP's)
- ✓ Design and Review Standards



## Storm Water Management Plan

Document Outline – Minimum Requirements

Application Forms / Fees

Design and Review Standards

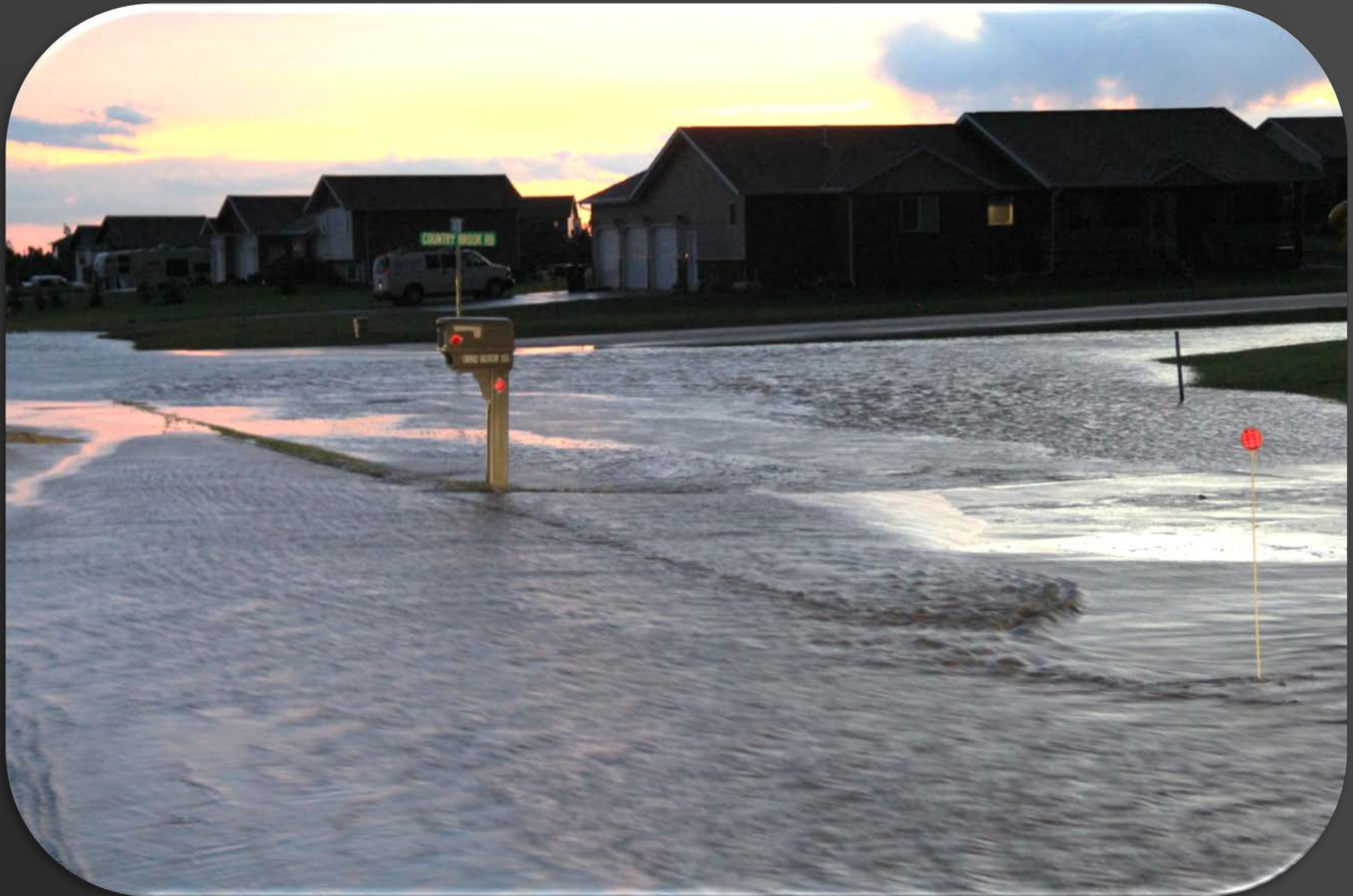


# RURAL RESIDENTIAL





# RURAL RESIDENTIAL



# STANDARDS AND REVIEW PROCESS



## ➤ APPLICATION REQUIREMENTS – CONTENT

- ✓ Design Events and Peak Flow Criteria

## ➤ HYDROLOGY

- ✓ Simple             $Q = CiA$ , HydroCAD, Regression Equations
- ✓ Complex        SSA-Civil 3D, HEC-HMS, SWMMM
  - Tools - LIDAR topography/soils mapping/GIS
  - What to use?

## ➤ APPROVAL - WITH CONDITIONS!

Do not include methods in your ordinance use policy to define [\*]



# DESIGN EVENTS



Is this a “DESIGN EVENT”?

– Do not over analyze

6-9-2001

## ➤ Storm Water Permit

- ✓ Erosion / Sediment Control
- ✓ Best Management Practices (BMP's)
- ✓ Design and Review Standards



But I installed the erosion control?

# SITE RESTORATION



Seeding vs. Hydro-Seeding



Seeding v. Matting (type)

# ACCESS CONTROL



# URBAN UNINTENDED CONSEQUENCES



# URBAN OUTFALLS



## *City to County Transfer*

**Avoidable Impacts – YES**  
**Cost \$1+ Million**





# ENFORCEMENT



- STATE - NDDH NDPDES / MS4 PERMITS
  - NON-COMPLIANCE PENALTIES
  - FEDERAL – EPA SITE VISITS
- COUNTY PLAN / PERMIT COMPLIANCE
  - MISDEMEANOR
  - PERMIT SUSPENSION/REVOCATION
  - CEASE AND DESIST ORDER
  - FINES OR CITATIONS
- ORDINANCE
  - CAN BE ENFORCED – BUT **LIMITED FLEXIBILITY**
- POLICY
  - **FLEXIBLE**, BUT HARDER TO ENFORCE



**IF YOU CAN'T ENFORCE IT WHAT IS ITS VALUE?**

- JURISDICTIONAL AUTHORITY - COUNTY VS. CITY
  - ✓ URBAN VS. RURAL INTERFACE (ETA)
  - ✓ CAN AND WILL YOU AGREE?
  - ✓ JOINT POWERS
- WATER RESOURCE DISTRICT
  - ✓ A RESOURCE WITH STATUTORY AUTHORITIES
- ENFORCEMENT
  - ✓ WHO HAS OVERSIGHT?



# TYPICAL ORDINANCE



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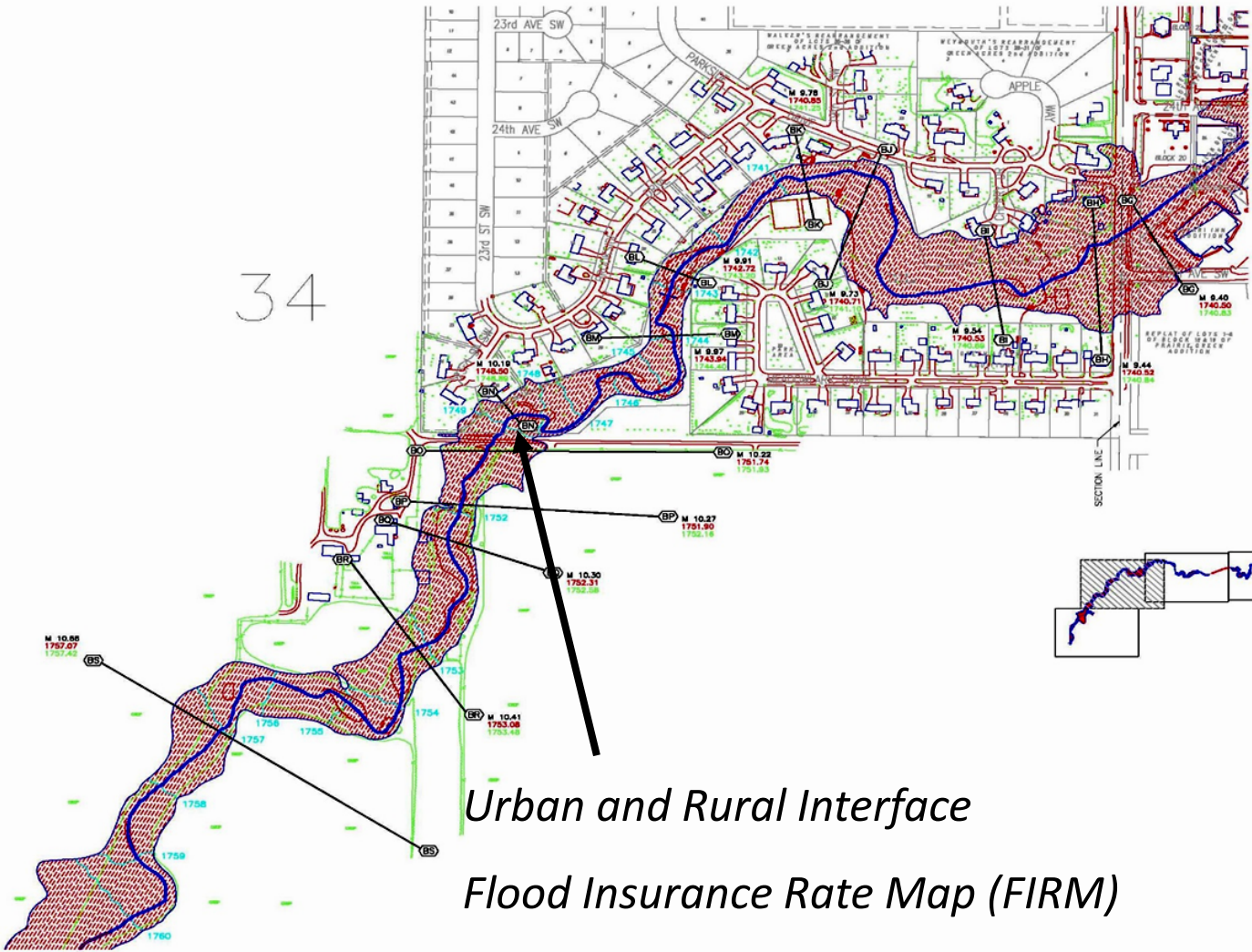
- FLOODPLAIN MANAGEMENT – FEMA
- ND STREAM CROSSING DESIGN STANDARDS
  - ✓ Article 89-14 ND Administrative Code  
Roadway Liability
- OTHER STANDARDS – LOCAL
  - ✓ Existing flows = Developed Flows

**Reference other criteria / sources where practical**

# FLOODPLAIN DELINEATION



34



**LEGEND**

100 YEAR FLOOD ELEVATION 1605.71

500 YEAR FLOOD ELEVATION 1606.80

CROSS SECTION LOCATION

BASE FLOOD ELEVATION

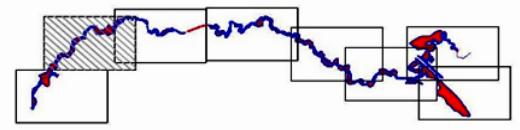
100 YEAR FLOOD PLAN

CHANNEL

RIVER MILE M 0.12

Scale: 0 200 400 Feet

N



*Urban and Rural Interface*

*Flood Insurance Rate Map (FIRM)*

NOTES:  
 VERTICAL DATUM IS NGVD 29  
 HORIZONTAL COORDINATES ARE NORTH DAKOTA STATE PLANE COORDINATE SYSTEM (NORTH ZONE)

DRAFT WORK MAPS

PUPPY DOG COULEE FLOOD INSURANCE STUDY  
 CITY OF MINOT, NORTH DAKOTA  
 MINOT, NORTH DAKOTA

Scale	Drawn by	Checked by	Project No.	Date	Sheet
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PREPARED BY

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 PHONE: (701) 237-5065 FAX: (701) 237-9101

CAD: B7, NERSP17



- ND STATE DEPARTMENT OF HEALTH
  - ✓ SWPPP – PHASE II PERMITS (CONTRACTORS)
  - ✓ BEST MANAGEMENT PRACTICES – SWPPP
  - ✓ *MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4) DESIGNATION*
  
- NDDOT EROSION CONTROL STANDARDS
  - ✓ REFERENCES - SPECIFICATIONS

North Dakota  
Department of Transportation  
(NDDOT)



Erosion and Sediment Control Handbook

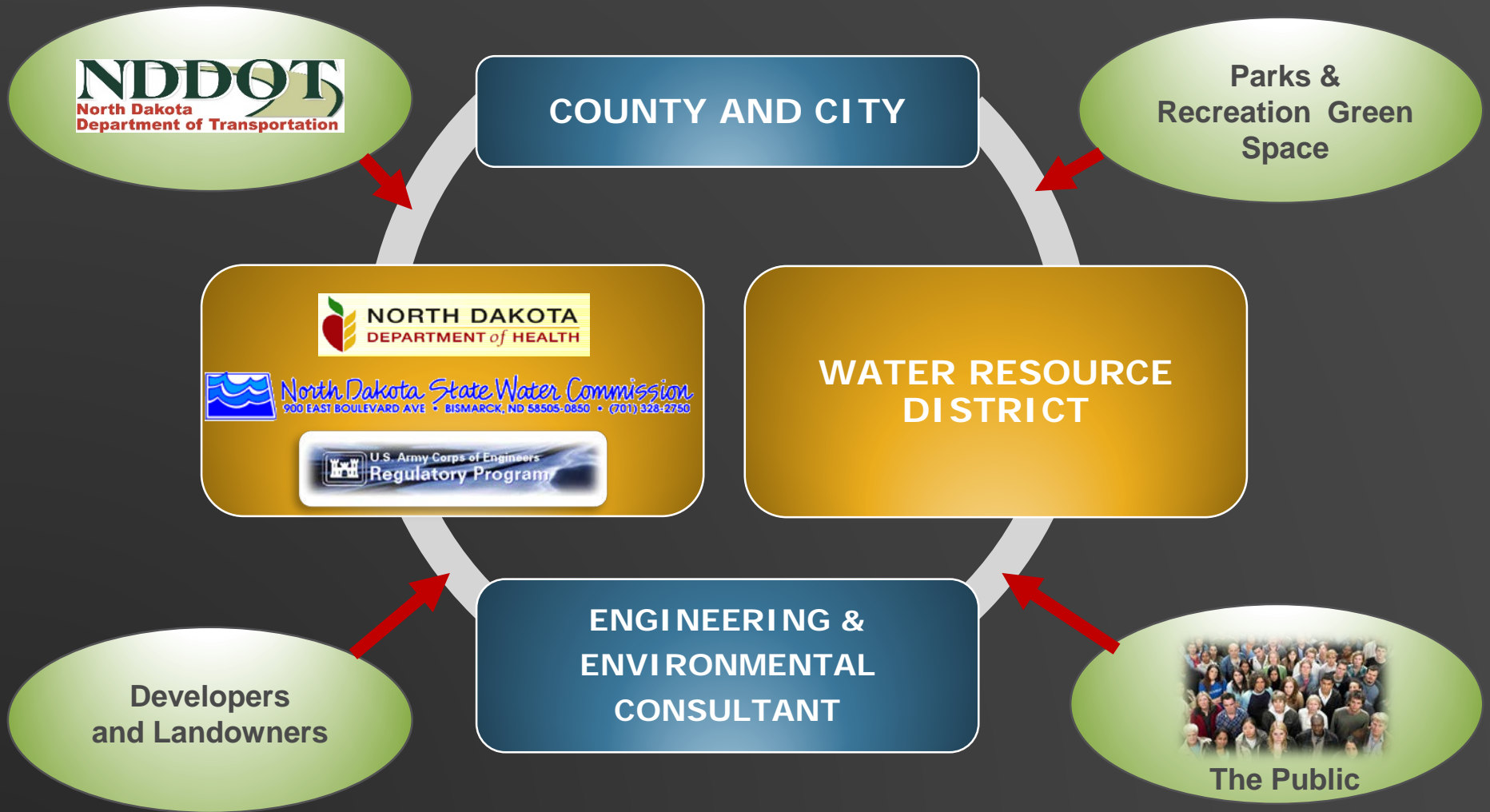
June 2004



- STATE DESIGNATED COMMUNITIES AND COUNTIES
  
- SIX MINIMUM CONTROL MEASURES STATE (MS4 PERMIT REQUIRED)
  1. PUBLIC EDUCATION AND OUTREACH
  2. PUBLIC PARTICIPATION/INVOLVEMENT
  3. ILLICIT DISCHARGE DETECTION AND ELIMINATION
  4. CONSTRUCTION RUNOFF CONTROL
  5. POST CONSTRUCTION RUNOFF CONTROL
  6. POLLUTION PREVENTION/GOOD HOUSEKEEPING
  
- ANNUAL COST
  - ✓ GENERAL TAX REVENUES (MILL LEVY)
  - ✓ STORM WATER UTILITY FUND
  - ✓ STORM WATER MAINTENANCE AND PERMIT FEES



# COLLABORATIVE PROCESS







- NATURAL WATERCOURSE
- STORM WATER EASEMENTS – DEFINITIONS
- GROUNDWATER – UNKNOWNNS
- ENGINEERING CONSULTANT SELECTION
  - **QUALIFICATION BASED SELECTION (QBS) – RECOMMENDED**



HoustonEngineering Inc.

# QUESTIONS?

January 22, 2016

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# ND STREAM CROSSING STANDARDS

Type of Crossing	State Highway System						County	
	Urban System		Rural System				Rural System	
	Regional	Urban Roads	Principal Arterial		Minor Arterial	Major Collector	Major Collector	Off <sup>4</sup> System
Interstate			Other					
Bridges & Reinforced Concrete Boxes	25 year <sup>2</sup>	25 year <sup>2</sup>	50 year <sup>2</sup>	50 year <sup>2</sup>	50 year <sup>2</sup>	25 year <sup>2</sup>	25 year <sup>2,3</sup>	15 year <sup>2,3</sup>
Roadway Culverts	25 year <sup>2</sup>	25 year <sup>2</sup>	50 year <sup>2</sup>	25 year <sup>2</sup>	25 year <sup>2</sup>	25 year <sup>2</sup>	25 year <sup>2,3</sup>	15 year <sup>2,3,5</sup>
Storm Drains	10 year <sup>1</sup>	5 year <sup>1</sup>	10 year <sup>2</sup>	10 year <sup>2</sup>	10 year <sup>2</sup>	10 year <sup>2</sup>		
Underpass Storm Drains	25 year <sup>1</sup>	25 year <sup>1</sup>	50 year <sup>2</sup>	25 year <sup>2</sup>	25 year <sup>2</sup>	25 year <sup>2</sup>		