



# WEST GORMLEY EXTERNAL SANITARY SEWER

**MEA Annual General Meeting**  
November 27, 2019  
Session 2 | 4:45PM

A. Carley | TMIG



# AGENDA

1. Site Location
2. Project Stakeholders
3. Site Information
4. Constructability
5. Project Details
6. Permits and Approvals
7. Pipe Materials Selection
8. Construction Highlights

# SITE LOCATION





## PROJECT TEAM

PM and Civil: **TMIG**

Geotechnical and Hydrogeological  
Investigation: **Golder**

Utility Locates: **T2UE**

Environmental: **Savanta**

Client: **DG Group**

Contractor: **ConDrain**

Tunneling: **Ward and Burke**

## KEY STAKEHOLDERS

Owner / Operator: **Richmond Hill**

Right-of-Way: **York Region**

Permitting Agencies:

**TRCA** (Regulated Areas)

**CN Rail** (Crossing)

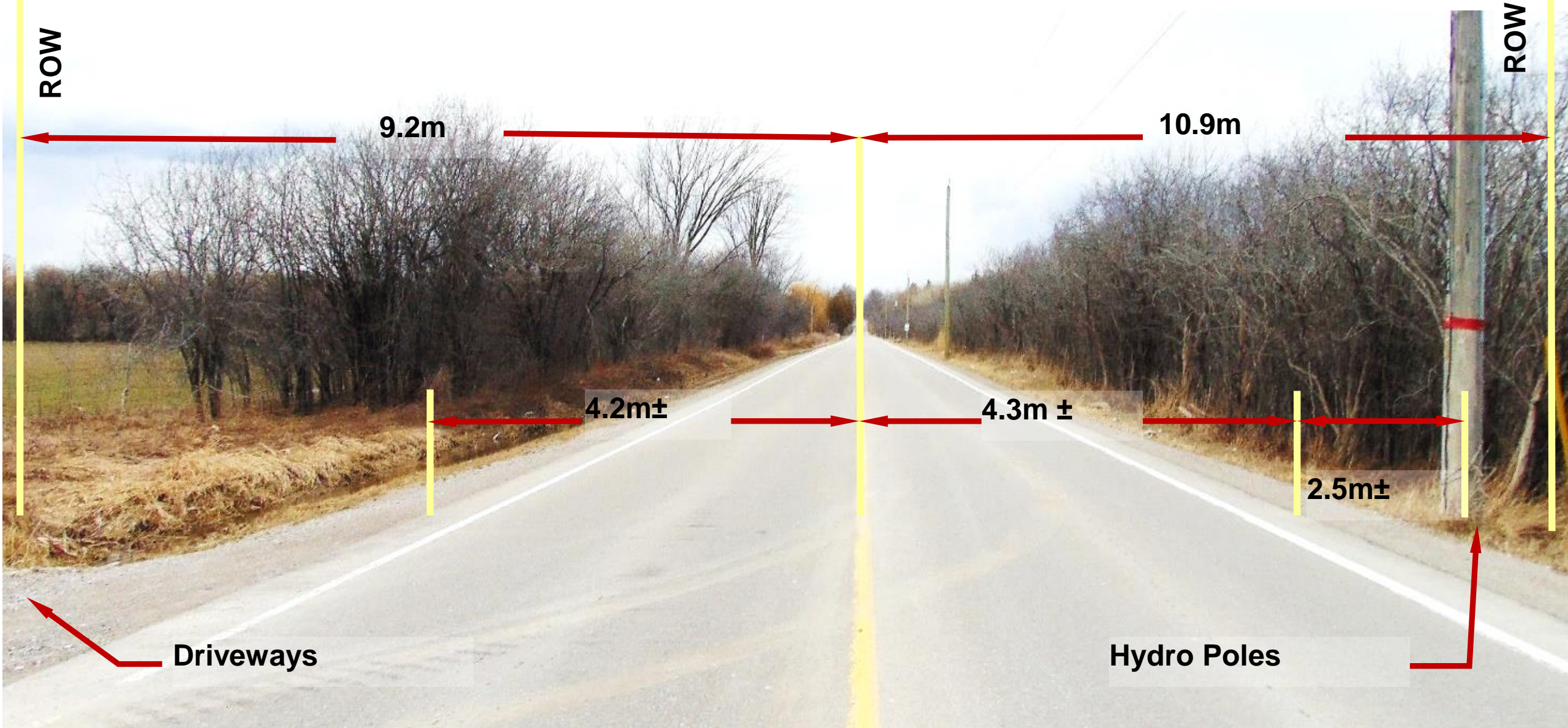
**MNRF** (Species at Risk)

**MECP** (ECA, PTTW/EASR)

**DFO** (Fisheries)

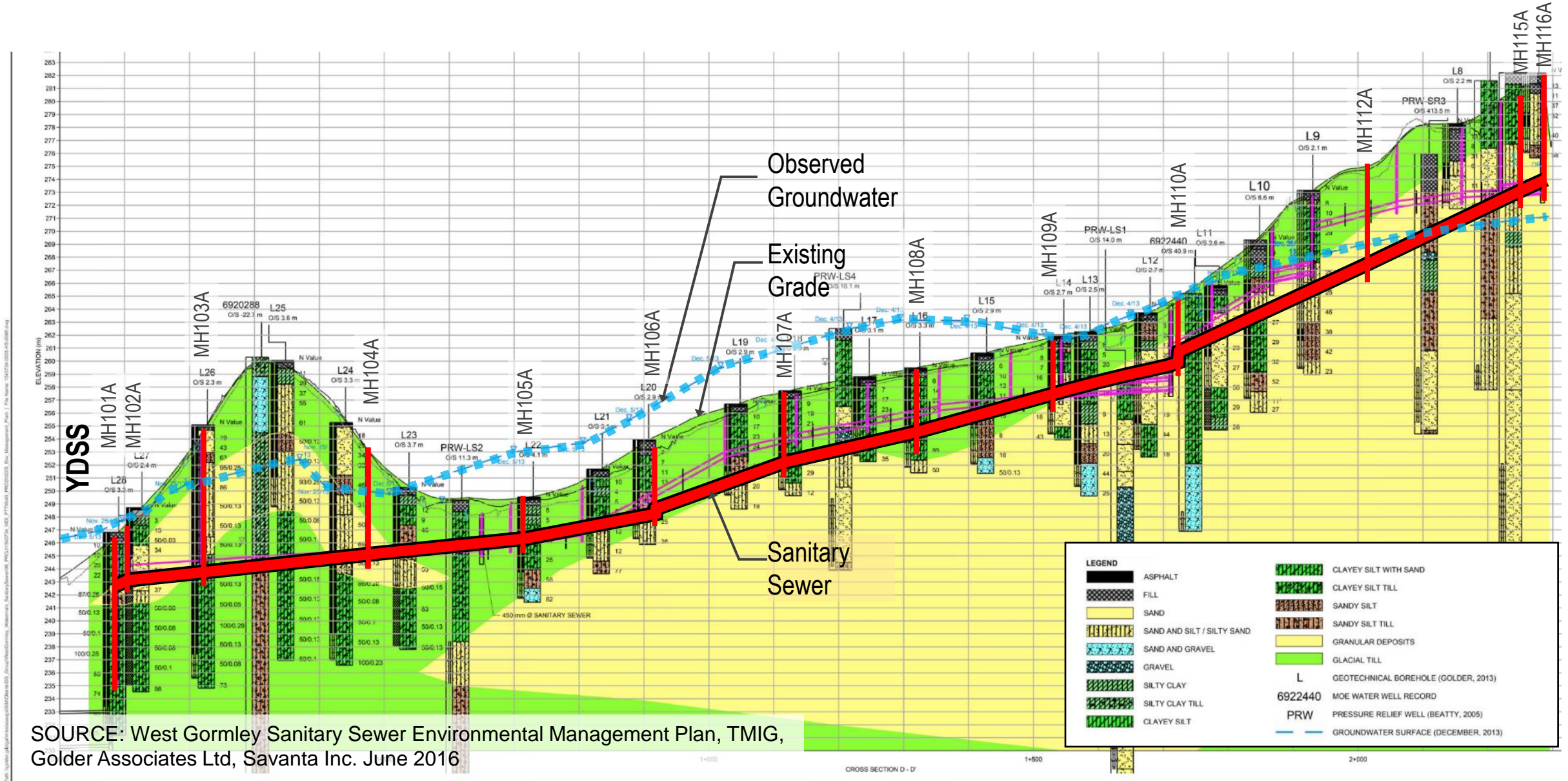


# SITE INFORMATION - LESLIE STREET: RIGHT-OF-WAY

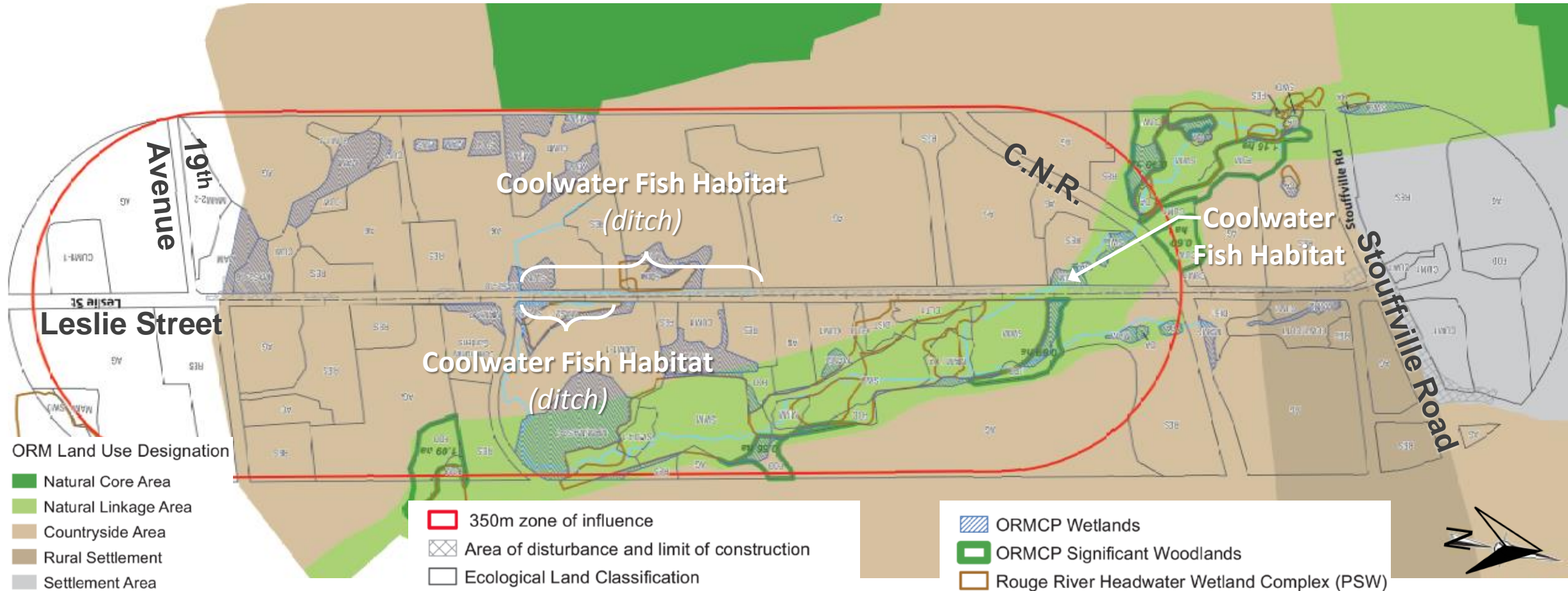




# SITE INFORMATION - SUBSURFACE CONDITIONS

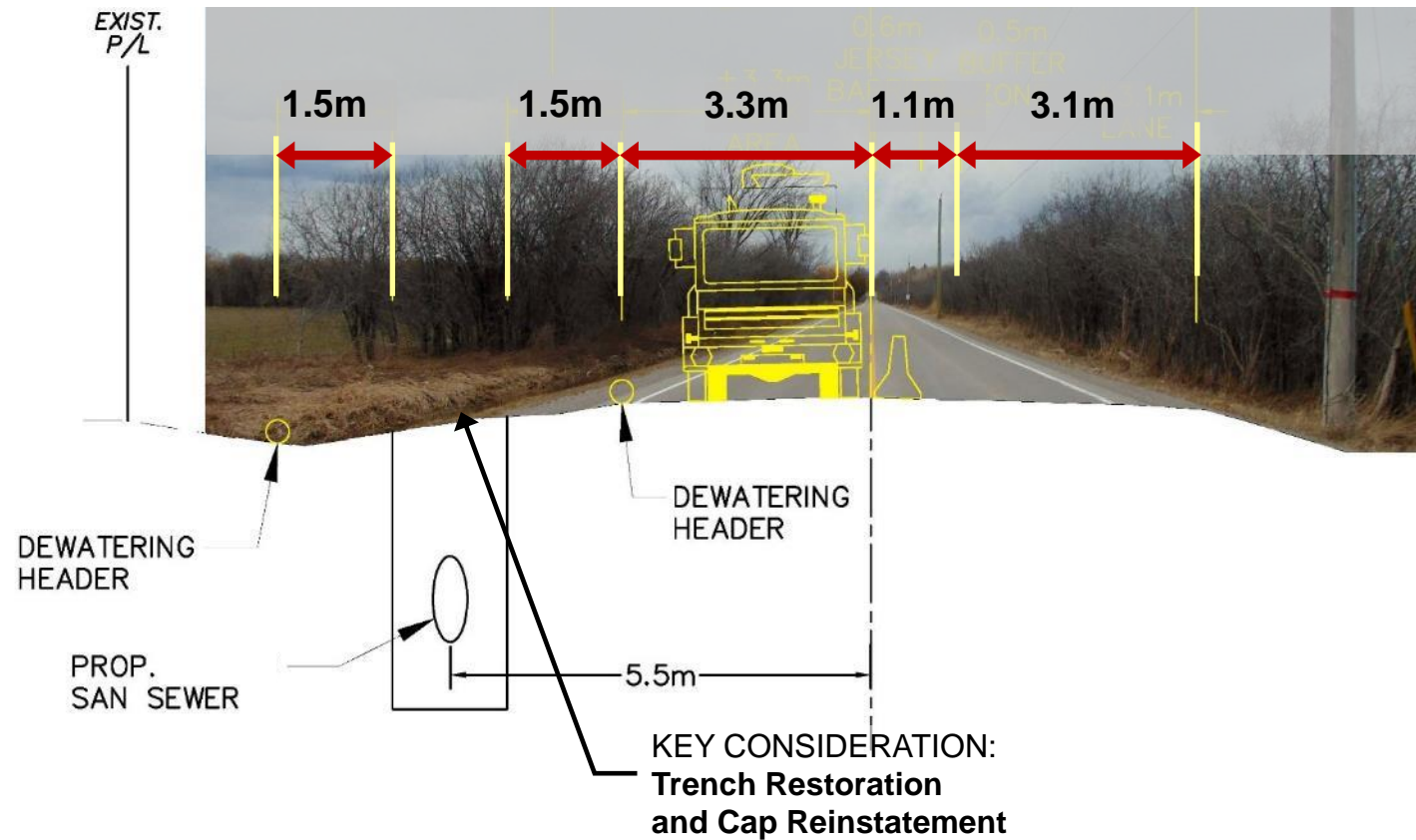


# SITE INFORMATION - NATURAL FEATURES





# CONSTRUCTABILITY: OPEN CUT





# CONSTRUCTABILITY - MICROTUNNELING

Shaft and staging compound locations

Minimized water takings – sinking  
caisson

Traffic Impacts – Road Closure

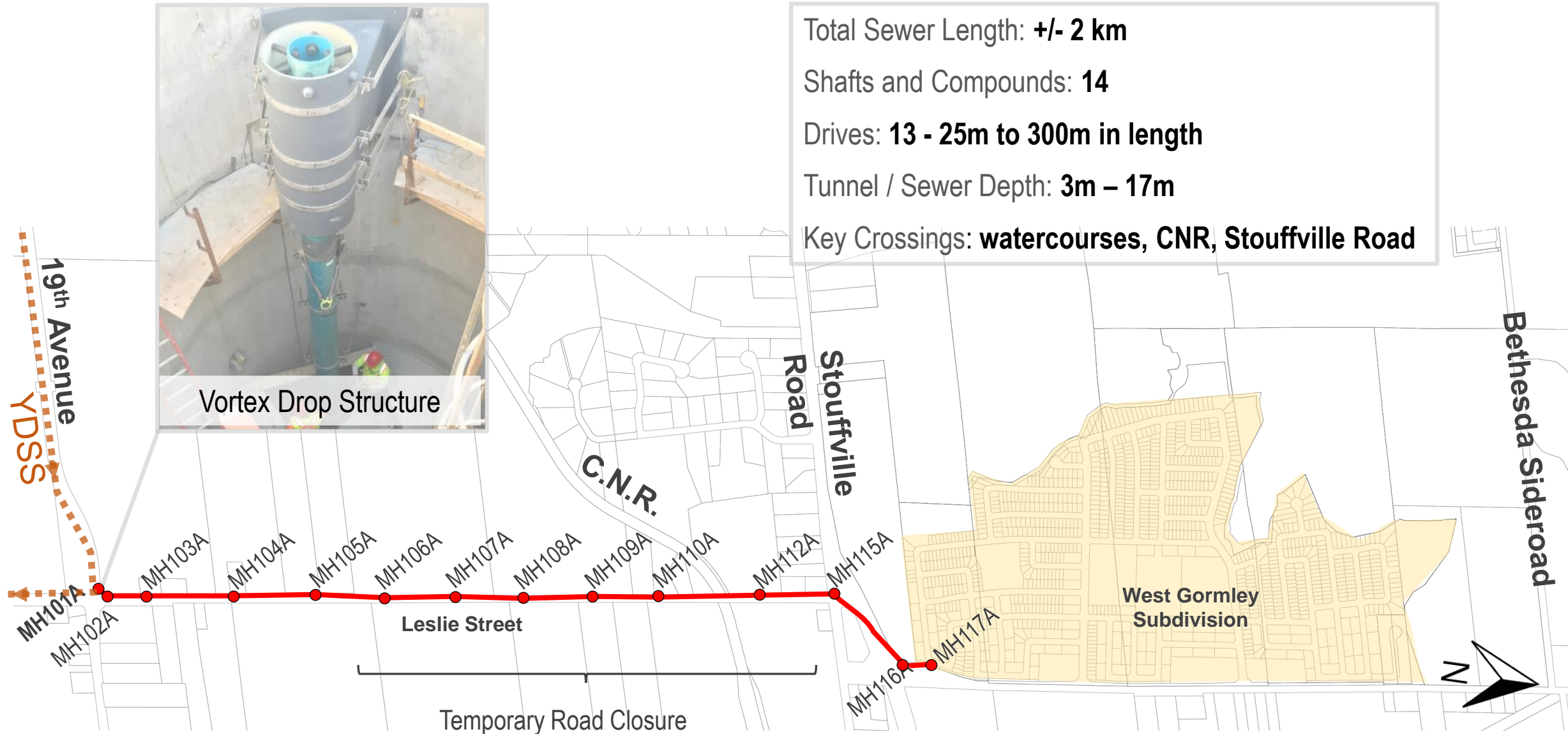
Key Crossings

Curved Drives





# PROJECT DETAILS





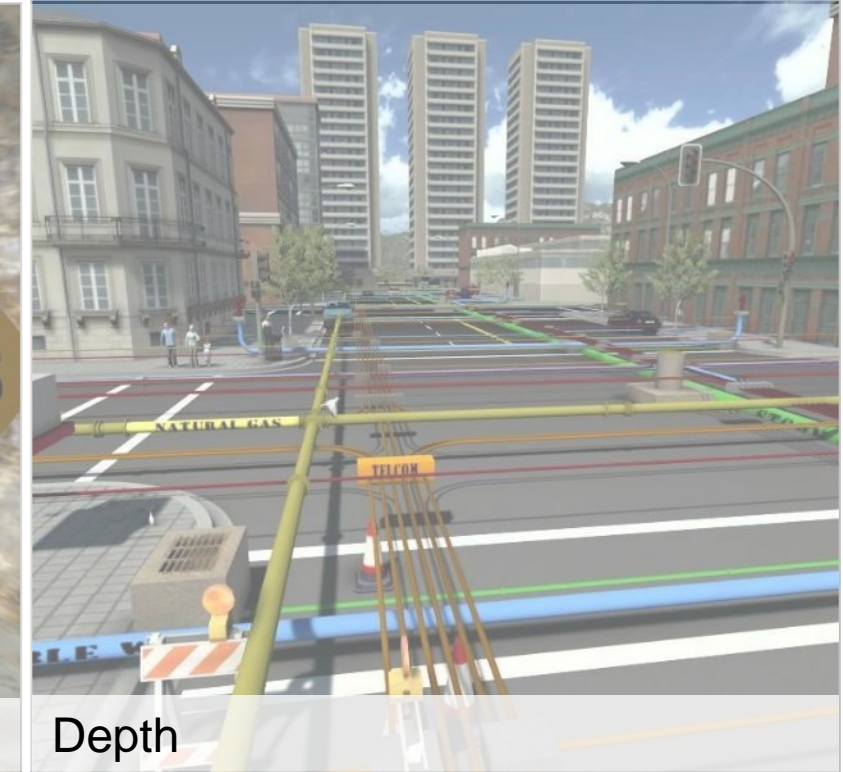
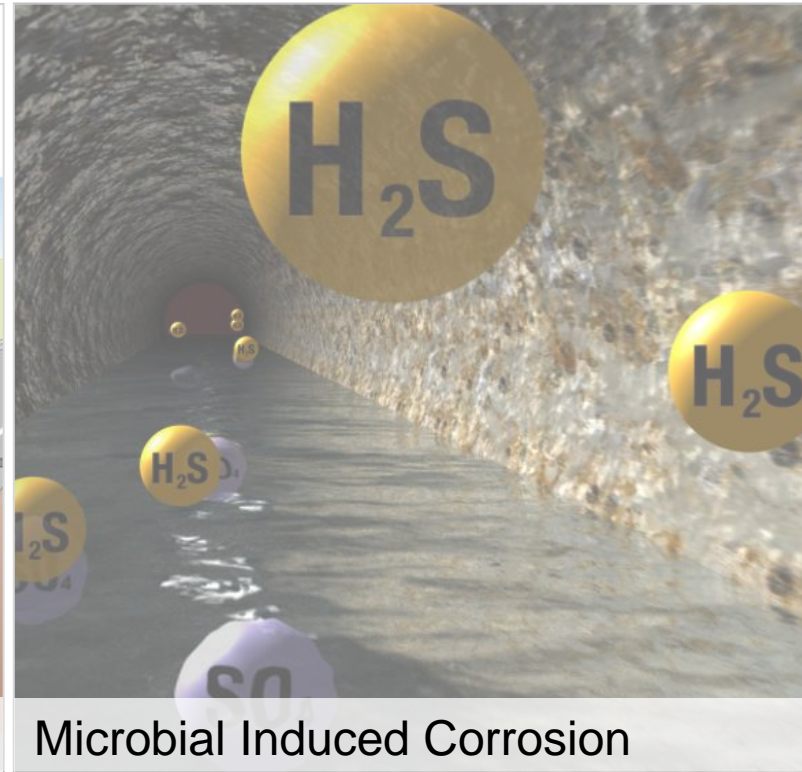
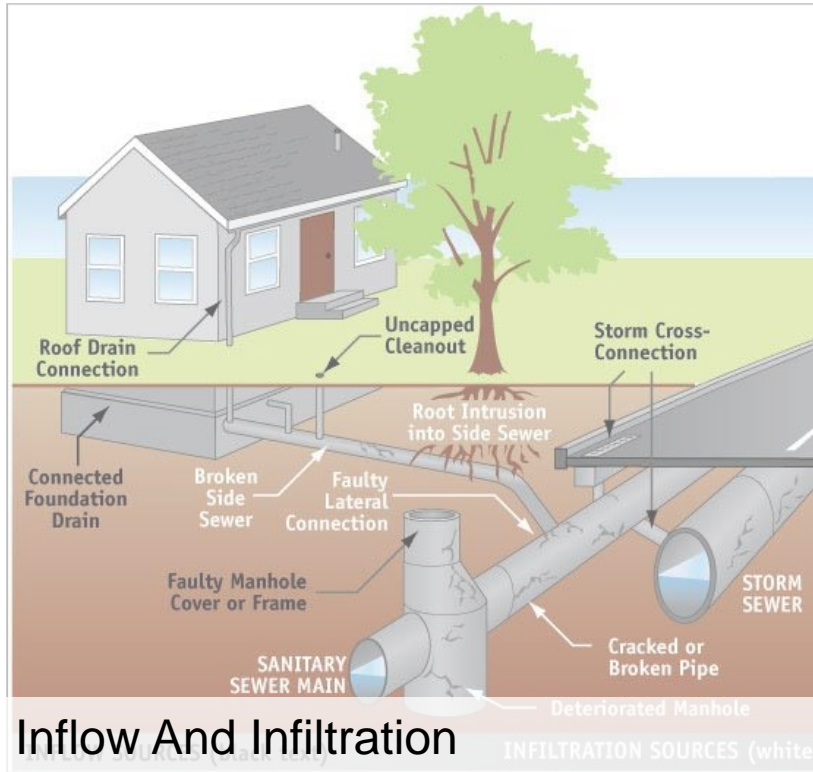
# APPROVALS AND PERMITS

- ✓ City of Richmond Hill
- ✓ York Region
- ✓ Toronto and Region Conservation Authority (TRCA)
- ✓ CN Rail
- ✓ Ministry of Natural Resources and Forestry (MNRF)
- ✓ Ministry of Environment Conservation and Parks (MECP)
- ✓ Department of Fisheries and Oceans (DFO)

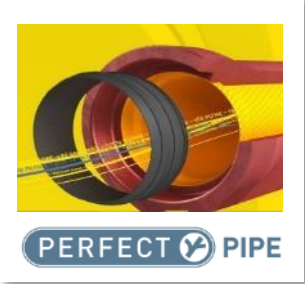




# PIPE MATERIAL - SANITARY SEWER CHALLENGES







# PERFECT PIPE

## PP Coupler with Dual Gaskets

250 kPa internal and external  
hydrostatic pressure  
Gasket materials meeting  
ASTM D412, D1415, D395, D573 etc.

## HDPE Liner

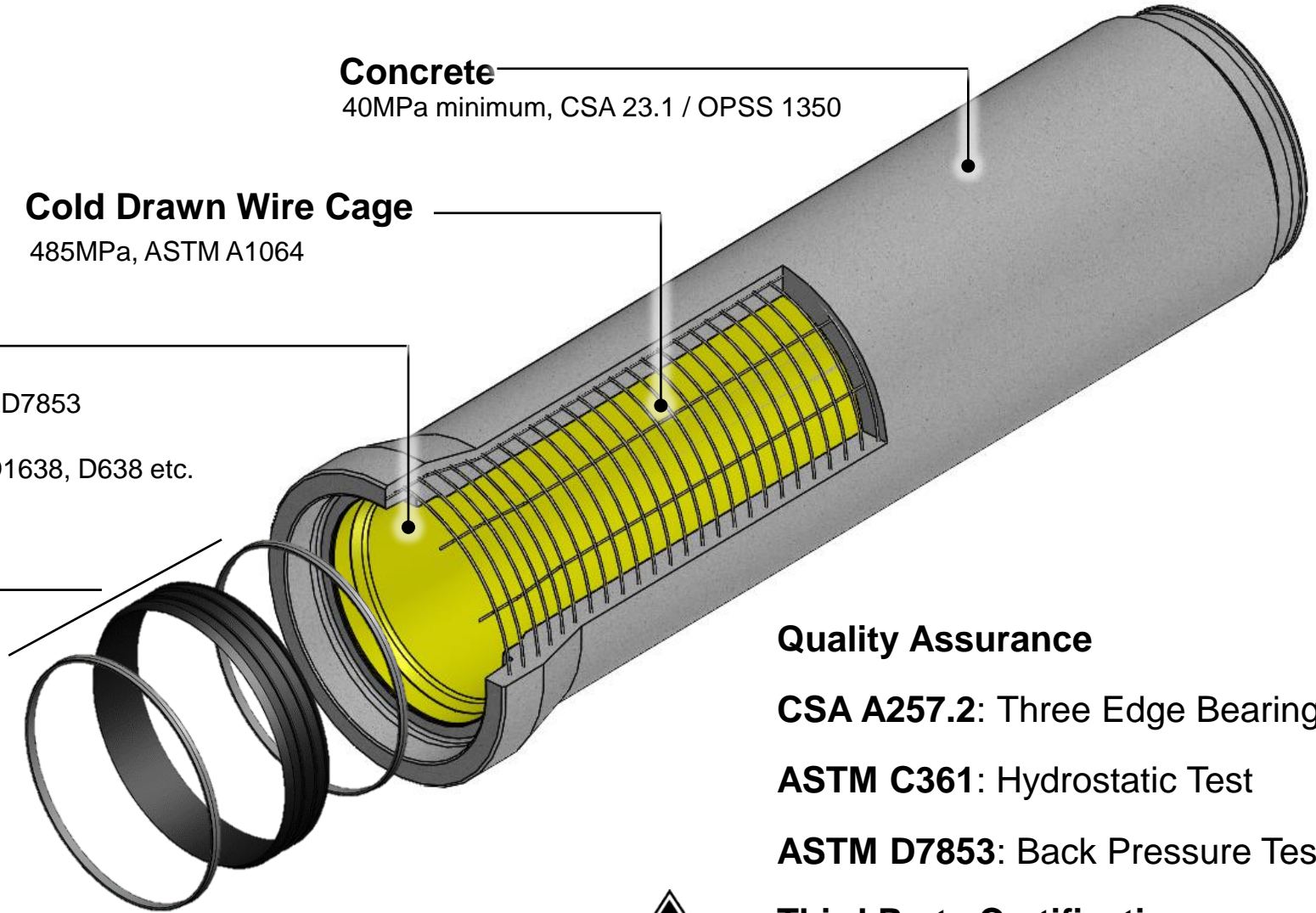
206kPa pull out ASTM D7853  
Properties meeting  
ASTM D792, D1238, D1638, D638 etc.

## Cold Drawn Wire Cage

485MPa, ASTM A1064

## Concrete

40MPa minimum, CSA 23.1 / OPSS 1350



## Quality Assurance

**CSA A257.2:** Three Edge Bearing Test

**ASTM C361:** Hydrostatic Test

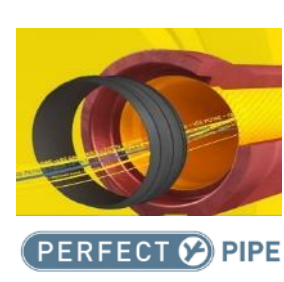
**ASTM D7853:** Back Pressure Test

## Third Party Certification

- CPCQA Certificate  
(Former Plant Prequalification Program)







# MANUFACTURING OVERVIEW



HDPE Liner Roll  
1200 anchors per m<sup>2</sup>



Liner Cut  
1.65mm thick



Heated Ends



Liner, Steel Cage over Steel Core

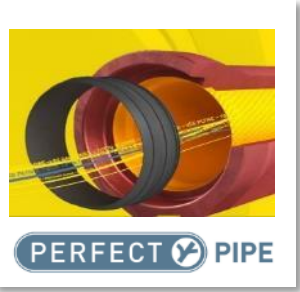


Wet-Cast Self Compaction  
Concrete



Remove from Mold. Anchor Pull-  
out strength 0.225 N/mm<sup>2</sup>

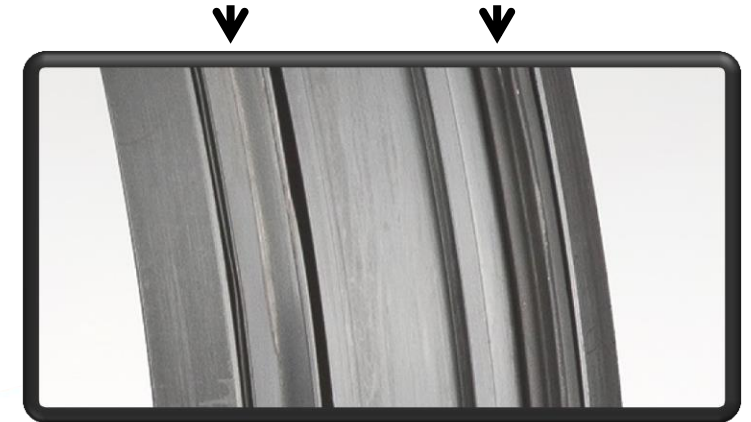
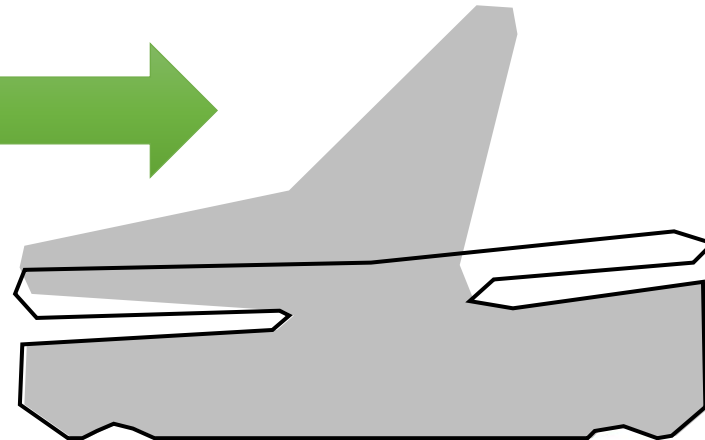




# PERFECT PIPE JOINT

- ✓ Thermoplastic coupler
- ✓ Tight fit
- ✓ No field welding
- ✓ Withstand jacking forces

- ✓ Dual elastomeric gasket
- ✓ Coupler installed in the plant
- ✓ Double tilting edge gasket





PERFECT PIPE

# MICROTUNNELING PERFECT PIPE



Wood  
Packer

Yellow  
HDPE Liner

Thermoplastic  
Coupler

**Pipe Length:** 3 m  
(23% longer than RCP &  
good for microtunneling)  
**Pipe ID:** 600 mm 900  
mm 1200 mm

Grout Ports (Lubrication)



Steel End Ring






# TECHNICAL DOCUMENTATION


Product Specification

Product Drawings

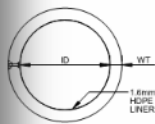
Installation Guide




PERFECT PIPE




PERFECT PIPE



PERFECT PIPE

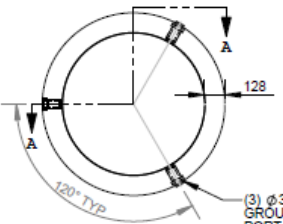


INSTALLATION GUIDE FOR PERFECT PIPE  
SEPTEMBER 2017  
DRAFT




PERFECT PIPE

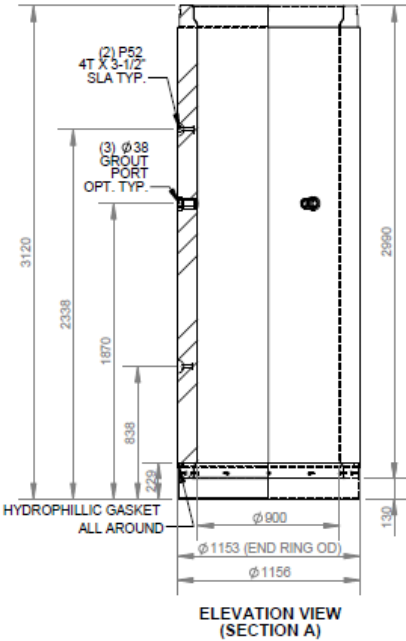
**STENCIL**  
CCP-OAKVILLE  
CSA A257.2  
900 X (CLASS)  
L = 3m  
LINED  
TYPE HSe  
(DATE OF MFG)  
3045 KG



PLAN VIEW



ISOMETRIC (BELL) VIEW  
AS INSTALLED



ELEVATION VIEW  
(SECTION A)

MATERIAL LIST		
DESCRIPTION	QTY	TYPE
P52 4T X 3-1/2" SLA	2	E
1.6mm THK X 2980mm WIDE LINER	2.9 m	E
Ø 38 GROUT PORT WITH PLUG (OPTIONAL)	3	E
Ø 1153 (OD) X 9.5 THK STEEL END RING BLACK COAT - WITH GROUT PORT ORANGE COAT - WITHOUT GROUT PORT	1	E
HYDROPHILLIC GASKET SIKA HYDROTITE CJ-0725-3K OR APPROVED EQ.	3.62m	E

TECHNICAL PERFORMANCE DATA		
MATERIALS	CONCRETE STRENGTH (f <sub>c</sub> )	50 MPa
	REINFORCING STEEL (f <sub>y</sub> )	485 MPa
THREE EDGE BEARING TEST	DESIGN LOAD	380 kN
	ULTIMATE LOAD	470 kN
PERMISSIBLE JACKING LOAD	CENTRIC	6100 kN
	ECCENTRIC	3800 kN
JOINT HYDROSTATIC TEST	INFILTRATION	250 kPa
	EXFILTRATION	250 kPa

ALL DIMENSIONS ARE IN mm.  
DRAWINGS ARE NOT TO SCALE.  
EXPOSURE CLASS = N AS PER CSA A23.1  
CDW TO ASTM A1064  
F<sub>y</sub> = 485MPa (Deformed) 450MPa (Smooth)  
STEEL TO CSA G40.20 GRADE 300W  
CLASS TO BE EVALUATED BASED ON 3EB TEST  
STEEL DESIGN NOT SHOWN  
CONCRETE MIX = WC

MIN. CONC STRENGTH 50 MPa  
CLEAR COVER = 25 mm MIN  
TOLERANCES TO: CSA A257.2  
STRIP CONC. STRENGTH 30 MPa  
AIR ENTRAINMENT 5% TO 8%  
REF TO "PML" FOR JOINT DETAIL

CON CAST PIPE (CCP) STANDARD DRAWING  
CSA A257.2  
PML0900X5  
MICRO-TUNNELLING LINED PIPE  
900mm DIAMETER  
3.0m LAY LENGTH

REV.	DESCRIPTION	ENG.	DATE
3	HYDROPHILLIC GASKET	SW	2NOV18
2	COLOR CODE STEEL RING	SW	21AUG18
1	INITIAL RELEASE	SW	1JUN17

CON CAST PIPE RR 3 Puslinch, ON N0B 2J0  
Fax: (519) 763-1956 1-800-668-7473 www.concastpipe.com

First microtunneling  
**PERFECT Pipe** project in  
North America

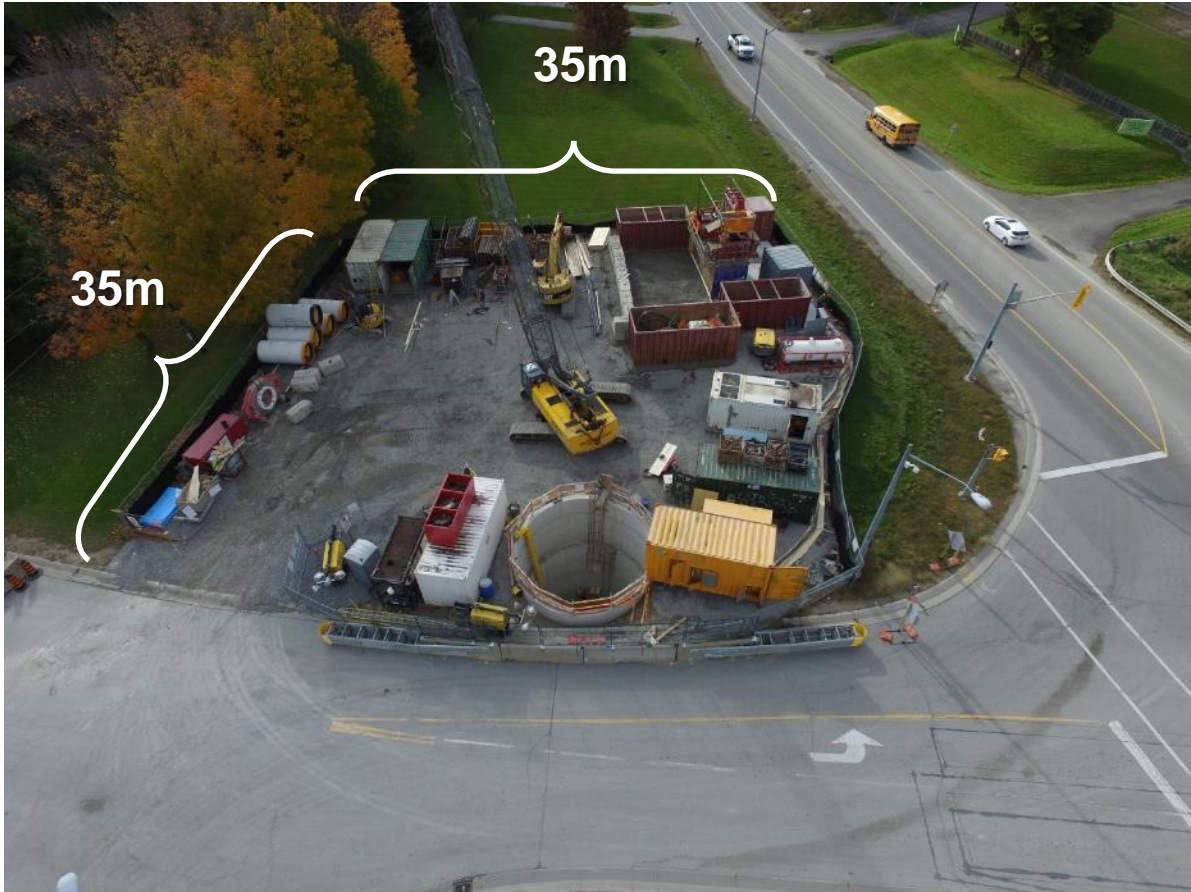
Microtunnelling Contractor:  
**Ward & Burke**

Construction: **Aug - Dec'17**  
and **Jul'18 - May'19**

WEST GORMLEY  
INSTALLATION:  
**900mm MTPP ON  
LESLIE STREET**



# SHAFT COMPOUNDS





# SHAFT CONSTRUCTION







WEST GORMLEY  
INSTALLATION:  
**LOWERING**  
**900mm MTPP**





**WEST GORMLEY  
INSTALLATION:  
900 mm MTPP  
BEING  
PREPARED FOR  
THE DRIVE**





**WEST GORMLEY  
INSTALLATION:  
1200 mm MTPP  
INTERJACK LEAD  
PIPE BEING  
LIFTED FOR  
INSTALLATION**



# PERFECT Pipe: CCTV IMAGE



PERFECT PIPE







# THANK YOU