



Workshop Agenda

- Recent Changes in NEORSD Construction Program Delivery
- CSO Program Overview
- Euclid Creek Tunnel Overview
 - Geologic Conditions
 - Tunnel Boring Machine Overview
 - Construction Site Overview
- Small Business Enterprise (SBE) Program



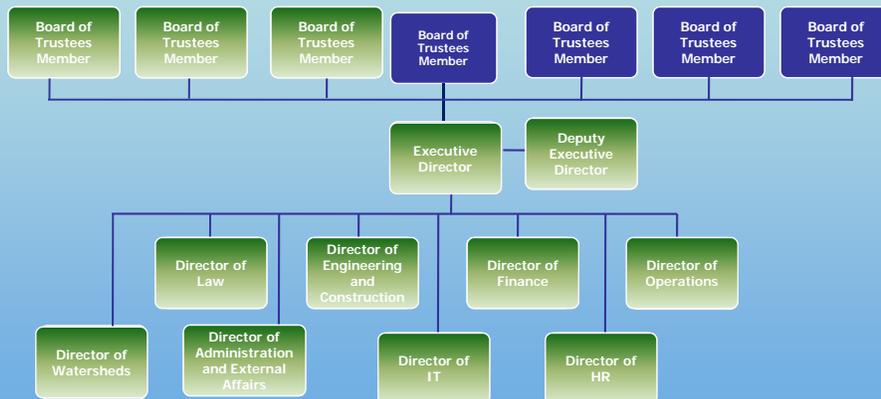
NEORSD Governance Structure

- NEORSD was established in 1972 under Court Order as a Regional Water and Sewer District under Ohio Revised Code Section 6119.
- ORC 6119.10 states:

“If the bids are for a contract for the **construction**, demolition, alteration, repair, or reconstruction of an improvement, the Board may let the contract to the **lowest AND best bidder** who meets requirements of 153.54 of the Revised Code.”



Northeast Ohio Regional Sewer District – Governance and Organizational Structure



Staff New to Position Since 2007



Northeast Ohio Regional Sewer District: A Time For Change

It is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change.

- Charles Darwin



Changes to Construction Program Delivery

Previous	Current
Bid selection based upon Lowest and responsive bidder	Bid selection based upon Lowest and Best Bidder, including qualifications
General Conditions, Supplemental General Conditions, Special Conditions	New General Conditions
Little contingency allowances in base contract	New General Allowance to manage changes up to 10% of base contract value
MBE/WBE Program with no credit for 2 nd tier subcontracting	SBE Program with credit for 2 nd tier subcontracting
No mechanism for resolving disputes	New Dispute Resolution Board process
No centralized construction contract administration, controls or systems	Deploying electronic submittal, change management, RFI and invoice processing tools
No escrow bid documents	Provisions for escrow bid documents on large projects, Including ECT

Risk Sharing Strategies

- Disputes Resolved through a DRB
- Escrow Bid Documents
- Geotechnical Data Report
- Geotechnical Baseline Report
- Builder's Risk Insurance (where applicable)
- Specific and General Allowances to manage issues within the terms of the contract



New General Contract Terms and Conditions – New Provisions

- Article 8.10: CPM Schedule requirements
 - Final CPM due within 60 days of NTP
 - Monthly updates must accompany payment applications
 - Project owns float
- Article 8.13: Testing and Inspection of Construction
 - Owner will provide and pay for Testing Laboratory
 - Contractor is responsible for quality of constructed work and coordination of testing



New General Contract Terms and Conditions – New Provisions

- Article 9 Dispute Resolution:
 - Tier 1: Contractor and Owner
 - DRB: Contractor Rep, Owner Rep, Third member appointed by first two
 - DRB Findings admissable
 - Binding arbitration at discretion of Owner
 - Litigation in state court in Cleveland, Ohio



New General Contract Terms and Conditions – New Provisions

- Article 12: Work Orders, Change Orders and Construction Change Directives
 - Pricing may be either Lump Sum, Unit Priced (as provided in Base Contract), or T&M
 - AED Green Book equipment rates
 - 15% allowable markup



New General Contract Terms and Conditions – Insurance

- Owner-purchased Builders Risk Policy for 9-mile Site
- Auto Liability: \$3M
- Worker’s Compensation: \$5M
- General Liability: \$5M
 - Subcontractors: \$3M
 - Qualified SBE Subcontractors: \$2M
- Contractors Pollution Liability: \$5M
 - Subcontractors \$1M
- Riggers Liability \$1M
- Railroad Protective Liability \$2M/occ. \$6M/agg.
- Professional Liability \$2M/occ. \$4M/agg.
 - Subcontractors \$1M/occ.



Workshop Agenda

- Recent Changes in NEORSD Construction Program Delivery
- CSO Program Overview
- Euclid Creek Tunnel Overview
 - Geologic Conditions
 - Tunnel Boring Machine Overview
 - Construction Site Overview
- Small Business Enterprise (SBE) Program



CSO Program Highlights – 25 Years of Tunnels in Cleveland



\$2.9 billion CSO program upcoming projects

- Seven CSO Tunnel Systems
 - 21 Miles in Length
 - 17' to 24' in Diameter
 - 100' to 200' in Depth
 - Five Rock Tunnels in Chagrin Shale
 - Two Soft ground Tunnels in Buried Cuyahoga River Valley
 - Three Deep Tunnel Pump Stations
 - Drop Structures
 - Near Surface Sewers and Structures



CSO Program Highlights

- Consent Decree tentatively planned for execution by end of 2010
- First tunnel project ECT, planned to bid in July 2010
- Tunnel Dewatering Pump Station planned to bid in 2011
 - 160 MGD
 - 250' deep cavern design
- Dugway Storage Tunnel planned to bid in 2014
 - 24' diameter; ~15,000 feet



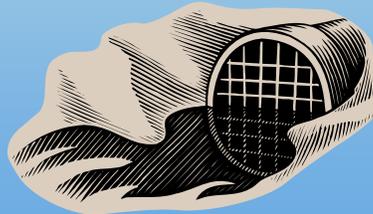
Workshop Agenda

- Recent Changes in NEORSD Construction Program Delivery
- CSO Program Overview
- Euclid Creek Tunnel Overview
 - Geologic Conditions
 - Tunnel Boring Machine Overview
 - Construction Site Overview
- Small Business Enterprise (SBE) Program



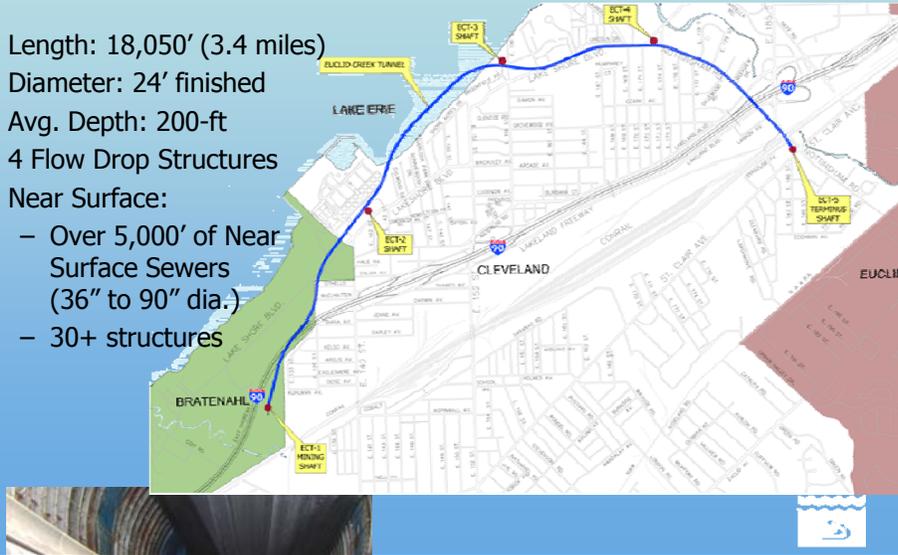
Background Information

- ECT provides significant benefits by:
 - Reducing Combined Sewer Overflows to ≤ 4 per typical year
 - Providing 60 MG of tunnel storage capacity
 - Currently, in a typical year, Easterly CSOs generate:
- | | |
|-------------------|--------|
| • Lake Erie | 767 MG |
| • Dugway Brook | 200 MG |
| • Nine Mile Creek | 311 MG |
| • Euclid Creek | 151 MG |
| • Shaw Brook | 83 MG |



Project Overview

- Length: 18,050' (3.4 miles)
- Diameter: 24' finished
- Avg. Depth: 200-ft
- 4 Flow Drop Structures
- Near Surface:
 - Over 5,000' of Near Surface Sewers (36" to 90" dia.)
 - 30+ structures



Tunnel Ground Conditions

- Chagrin Shale
 - UCS 2,807 to 16,334 psi
 - High RQD
 - Moderate slake potential
 - Crown overbreak expected over 75% of Alignment.
 - Low Conductivity / groundwater infiltration
 - Clay Seams, Bedding Plains, Vertical Joints



Potentially Gassy Tunnel

- Auto shutdown of TBM
- Gas monitors throughout entire tunnel
- Remote monitoring from the surface
- Ventilation system above OSHA requirements



Tunnel Boring Machine

- ✓ Single or Double Shield
- ✓ 360° Fully Shielded
- ✓ Grouting:
 - Through tail shield prior to next segment ring.
 - No port grouting through segments



Tunnel Lining

- Bolted, Gasketed, Steel-fiber-reinforced Precast Concrete Segments
- Vacuum Lift
- 24-ft ID x 12" thick
- Annular Grouting:
 - Through Tailskin as TBM Advances
 - 2 Part Accelerated Grout:
 - Rapid Set
 - No pea gravel
- Contact Grouting



Shafts (main tunnel)

Struct.	Type	Fin. Dia.	Support
1-1	Mining / Access	40'	Liner plate (dewatering)
2-1	Baffle	32'	Liner plate (dewatering)
3-1	Baffle	16'	Secant Pile
4-1	Baffle	16'	Liner Plate
5-1	Baffle / Surge	50'	Liner Plate



Site ECT-1



Site ECT-1



- Mining Site
- 5.4 Acres
- Access Road
- Electrical Substation (under construction)
 - 4,160 V to supply TBM
- TDPS & DST future site

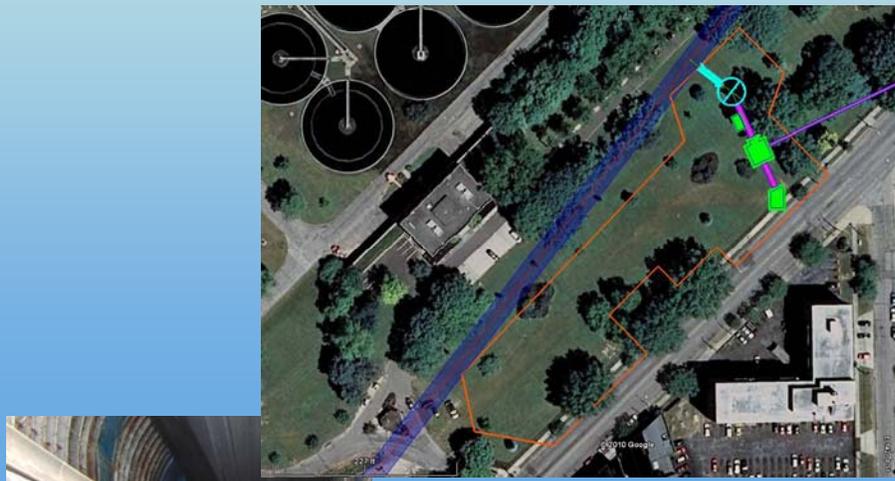


Site ECT-2



Site ECT-2

- Easterly Wastewater Treatment Plant



Site ECT-3

- ECT-3 Consolidation Sewer

- Microtunnel
- 72" dia. FRP
- 268 LF
- Depth: 35-ft
- Geology:



E. 156th St. Relief Sewer

- Open cut
- 54" dia. FRP
- 1,755 LF
- Depths: 18-ft to 20-ft



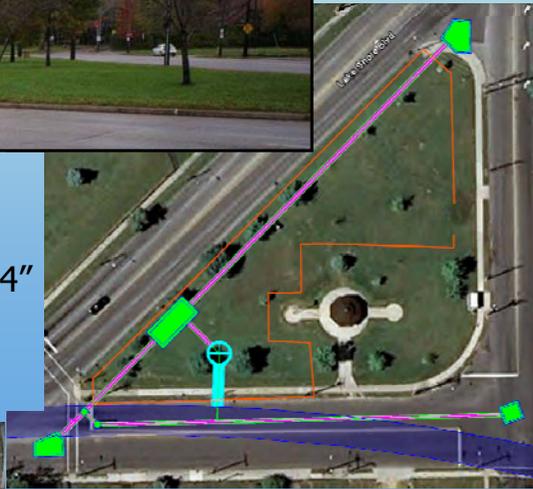
Site ECT-4



Site ECT-4

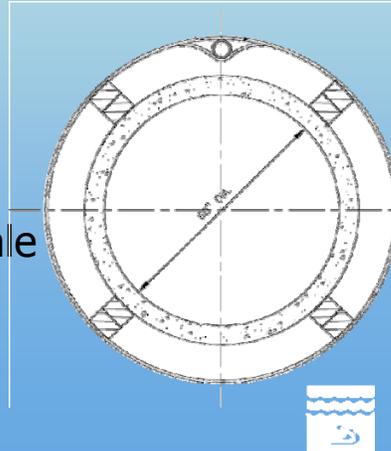


- City of Cleveland Park
- Open cut
- Diameters: 36", 48", 54"
- 850 LF
- Depths: 10-ft to 33-ft



ECT-5 Consolidation Sewer

- Open-shield Pipe Jack
- 90" steel casing / 60" CCFRPMP
- Approx. 340 LF total
- Depths: 31-ft to 42-ft
- Weathered Chagrin Shale



ECT Qualifications w/ Bid

- Company / J.V. Experience Requirements:
 - 3 projects involving TBM tunneling in rock, of which:
 - 1 rock tunnel, 20 ft. ID & 10,000 ft. long
 - 2 segment tunnels, soil or rock, with a 15-ft. ID
 - 3 projects involving controlled blasting or mechanical excavation in rock for tunnels / adits.
 - 1 shaft 200-ft deep, with 100-ft in rock.



ECT Contractor Personnel Qualifications

- **Project Manager:**
 - 10 yrs of supervisory tunneling experience & 3 yrs in a PM position
 - 2 TBM rock tunnels and 1 segmentally-lined tunnel
- **General Superintendent:**
 - 10 yrs of supervisory tunneling experience
 - Superintendent on 2 TBM rock tunnels & 1 segmentally-lined tunnel
- **Safety Coordinator:**
 - Qualifications demonstrating safety experience in underground construction.
- **TBM Operator:**
 - 1 segmentally-lined tunnel > 3,000 ft. in length & of similar size
 - Proof of training certification from manufacturer
- **TBM Mechanic or Electrician:**
 - 5 yrs as a TBM mechanic or electrician
- **Chief Tunnel Surveyor:**
 - 5 yrs supervising surveyors on heavy civil, 2 yrs supervising in tunnel construction.
 - Each surveyor - previous experience with TBM laser guidance system
 - Proof of training certification from manufacturer



ECT Potential SBE Participation Opportunities

Work Type	% Total Contract
Ready mix Concrete	2.81%
Cast-in-place Concrete Structures	
Trenchless Sewer Installation	4.26%
Open cut sewer/precast structure installation	2.73%
Buried M&E pipe/process site pipe	0.57%
Utility relocations	0.45%
Aboveground pre-construction video	0.23%
Pipe interior TV Inspection	
Sewer Lining	0.05%



ECT Potential SBE Participation Opportunities

Work Type	% Total Contract
Site Preparation/Restoration	0.87%
Concrete & Asphalt Pavement Curb & Sidewalk	
Landscaping	
Fence Installation	
Noise Wall	0.29%
Traffic Control	0.27%
Trucking & Hauling	2.38%
Site Demolition	0.02%
Geotechnical Instrumentation & Monitoring	0.10%



Anticipated SBE Goal Range 10%-12%

ECT Schedule of Activities

Activity	Anticipated Date
Pre-advertisement Workshop and SBE Showcase	June 29 th 2010
Advertise for Bidding	July 19, 2010*
Mandatory Pre-bid Meeting	August 17, 2010*
Open Bids	Late September*
Recommendation to Award to Board	Late October*
Award Contract	Early December*

* Dates Contingent Upon Board Approval

Workshop Agenda

- Recent Changes in NEORSD Construction Program Delivery
- CSO Program Overview
- Euclid Creek Tunnel Overview
 - Geologic Conditions
 - Tunnel Boring Machine Overview
 - Construction Site Overview
- Small Business Enterprise (SBE) Program

