More Bang for Your Buck - Tools Developed to Assist in the Sewer System Evaluation and Rehabilitation Program

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Key Points

- Overview of the Sewer System Evaluation and Rehabilitation Program (SSERP)

- The Grinder – an ArcView GIS tool

- RDSS – Rehabilitation Decision Support System
Brief Overview of SSERP

The Sewer System Evaluation & Rehabilitation Program (SSERP) is a multi-year program to identify defects in our sewer system and correct them with rehabilitation of existing sewers and construction of new facilities.

SSERP was born from the S&WB’s need to cost effectively respond to the Consent Decree imposed by the Environmental Protection Agency in 1998.

SSERP Goals

- Evaluate existing condition and capacity of collection system
- Improve structural integrity of collection system
- Implement capacity upgrades
- Preserve public health and protect surface water quality
- Customer satisfaction
Collection System Overview

- 86 sq. mi. service area
- 1,300 miles of gravity sewers
- 100 miles of force mains
- 83 pump stations
- Two treatment plants
- Flat terrain
- Facilities up to 100 years old
- Most of the city below sea level, subsidence
Evaluation and Design Process

1. **Collection System Evaluation Studies (CSES)**
   - Determine conditions which need repair or upgrade

2. **Remedial Measures Action Plan (RMAP)**
   - Determine basin rehabilitation plan for approval by the USEPA

3. **Design**
   - Determine cost effective repair methods and develop contract documents for bidding

4. **Construction**
   - Build the required improvements
Evaluation and Design Process

CSES

1998: Lakeview Basin
1999: CBD Basin
2000: Gentilly Basin

DESIGN

1999: Lakeview Basin
2000: CBD Basin
2000: Gentilly Basin

CONSTRUCTION

2001 - 2003: Lakeview Basin

Need for Specialized Tools

• Each of the ten basins were evaluated by different prime and sub-consultant entities
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• S&WB recognized the need for consistent collection and interpretation of the facilities inspection data
• Evaluations are qualitative but not arbitrary
Need for Specialized Tools

• Need to have defined process for translating design guidelines into tangible measures

• Consistency + speed = lower cost
The Grinder

- Developed by MWH to assist with the QA/QC efforts during manhole inspections (29,000 Manholes)

- ArcView based tool

The Grinder

- Compares data obtained from field inspections to existing GIS shape files of manholes and pipes:
  - Visual representation of connecting manholes from the field data to compare to the existing GIS files of the collection system
  - Output of pipe slopes from upstream and downstream manholes and pipe invert elevations
Sample Field Data Set

- Data field forms
- Microsoft Access databases
- Photos
- CCTV tapes

Benefits Developing Grinder

- Large quantity of data for review
- Prior to development of the Grinder, the QA/QC tasks for field data consisted of manual queries in Microsoft Access and ArcView
- Manhole locations from the field survey data did not always correlate with digitized files from original map sheet
- Negative pipe slopes as determined by invert elevations from field survey
Benefits Developing Grinder

- Can filter for pipes that unexpectedly change size, shape, material
- Can filter pipes that have adverse slope change

Estimated location of a manhole, based on digitized map sheets

X and Y coordinates obtained from the field topographic survey
Advantages of Grinder

- Reduces the potential errors or the failure to notice invalid data with manual database queries
- Reduces the time required for the QA/QC efforts
- Efficient and cost-savings investment

Grinder Demonstration
What is RDSS?

- Set of tools(commands in Arc View) used for analyzing the CCTV data
- The advantage of using RDSS with Arc View is it provides a visual look at repairs along with the surrounding environment
- Also helps in rationalizing a rehabilitation
- Can customize rehab layout based on the ultimate application
RDSS Purpose

• Easily Convert CCTV Data into Prioritized Rehabilitation Projects

• Provide for consistent:
  – Selection of cost-effective rehabilitation methodologies
  – Prioritization of sewer rehabilitation
  – Recording and rating of defects

• Reduce Capital Cost

• Save Time from Study to Construction
GIS Provides Quick Access to Photography

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Sewer Segment Prioritization

Selection based on:

- Rehabilitation Strategy
- Budget Availability
- Regulatory Commitments

Rehabilitation Strategy Fundamentals:

- Rehabilitate major defects to restore structural integrity
- Eliminate significant sources of Inflow and Infiltration

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Rehabilitation Decision Model

[Diagram showing decision points and outcomes]

Rehabilitation Decision Model (cont’d)

Continued from previous slide

[Diagram showing decision points and outcomes]

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Environmental Factors are Included in the Method Selection

- Location of sewer
- Capacity needs
- Depth of sewer
- Pavement condition

RDSS Identifies Projects and Prepares Construction Documents

- Prepares project plots showing location, type and surrounding area of proposed projects
- Prepares project quantity and cost estimates
- Aids in scheduling and sequencing of projects

Plots and estimates are combined with standard specifications to quickly generate complete construction bid packages
RDSS Sample Plot

RDSS Demonstration
Questions and Comments

Visit www.gosserp.com for more information about the ongoing Sewer System Evaluation and Rehabilitation Program in New Orleans.