Apr 25th, 10:30 AM - 10:45 AM

Gilman Drive Sewer Improvement Project

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Gilman Drive Sewer Upgrade

CHASE BOWEN, DYLAN KRESGE, & JD LYLE
CIVIL ENGINEERING BROADFIELD
Outline

• Existing Project Conditions/Available Gathered Data and Information
• Design Criteria and Design Constraints
• Preliminary Design Analysis & Economic Evaluation
• Recommended Alternative Description, Technical Evaluation, and Cost Estimate
• Environmental/Societal Impacts
• Permitting
• Sustainability Evaluation
Introduction

New sewer line for anticipated growth of University of California San Diego (UCSD)

Too difficult to reach existing pipeline

- Existing depths of 30-60 feet
- Existing pipeline cannot withstand capacity

Construction of cut and fill trenching and microtunneling
Existing Project Conditions

Existing sewer pipeline runs parallel south of La Jolla Village Drive and east of Gilman Drive
- Beginning Elevation of 265 feet Mean Sea Level (MSL)
- Slopes downward at southern end to 237 feet MSL

Soil Investigation
- Couldn’t physically perform soil tests
- Boring samples provided by sponsor show that soil is adequate in strength

Existing Utilities
- Gas, water, and storm water lines run underneath Gilman and La Jolla Village
- Used provided geotechnical investigations and existing figures
Design Criteria

City of San Diego Sewer Design Manual
  ◦ Underground Construction & Cut & Fill Trenching

City of San Diego Transportation & Storm Water Design Manual
  ◦ Pavement

White Book
  ◦ City of San Diego amendments to AASHTO Green Book

City of San Diego Standard Design Drawings
Design Constraints

Construction Timeline
- No specific timeline
- Must be complete before new housing projects are completed
- Heavy traffic area

Physical Obstacles
- Crossing existing utilities
- Traffic control
- Slope of pipeline

Environmental Obstacles
- “Native” land

Budget
- $4-$5 Million
Preliminary Design

2200’ of Cut & Fill Trenching along centerline of Gilman Dr.

3086’ of underground construction along the north side of La Jolla Villa Dr.
  ◦ MicroTunneling-Meets all project requirements
  ◦ Hydraulic Directional Drilling-Meets all project requirements
  ◦ Jack & Boring-Does not meet project requirements
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Recommended Alternative

MicroTunneling
- Costlier Option
- Allows for concrete encasing pipe
- Does not require flexible pipe
- Can be drilled at very accurate slope from underground position
- Does not require as much surface equipment
- Allows for slurry to provide extra support
Final Design

2200’ Cut & Fill Trenching along centerline of Gilman Dr.

- Start at Public Manhole 65
- 24” PVC pipe
- 3’ wide trench in median
- 10’-20’ deep trench
- 3/8” Crushed rock placed with 6” below pipe & 12” above pipe
- Reuse excavation material >3” and compact to 90% of maximum dry density
  - Backfill done in 8” lifts
- 8” of Portland Cement Concrete
- 8” of ¾” Type III Class B3 AC Paving
- Connect into Public Manhole 67 for MicroTunneling
Final Design

3086’ of MicroTunneling Construction
- Start at Public Manhole 65
- Five sending and receiving pits
- Approximately 20’x30’
- Depth ranging from 15’-20’ deep
- 42” Reinforced Concrete Pipe
- 24” PVC Carrier Pipe
- Slurry mix between PVC pipe and concrete pipe
- Ends at manhole near Interstate 5
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Environmental/Societal Impacts

Native land in California that is to be kept untouched
- North of La Jolla Village Drive- seeds, lizards, frogs, and fairy shrimp
- California Environmental Quality Act (CEQA) process gives voice to community
- Microtunneling will allow more minimal disturbance

Construction disturbances – loud equipment, traffic delays, detours
- Community and university planning groups

Benefit UCSD
- Increase student population and housing opportunities
Required Permitting

County of San Diego Department of Public Works
- Requires Dig Alert identification number before excavating
- Section 4216/4217 of California Government code
- Roads in county right-of-way require permit
- 5’ depth of trenching requires Cal-OSHA permit
Sustainability

MicroTunneling
- Soil has been shown to be strong enough to support areas of underground construction
- Slurry & Reinforced Concrete Pipe provide extra support for carrier pipe

Cut & Fill
- Proper bedding material
- Backfill material is correct and compacted to standard
- Proper paving to ensure no effects from traffic

Proper slope throughout the project to allow for gravity flow
Conclusion

Existing sewer pipe will not support future housing for UCSD

Sustainable design

Microtunneling portion
- Accurate and efficient construction
- Advanced technology

Better understanding of design process