



# NEWEA 2017 Annual Conference Solutions to Pipeline Challenges

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# Acknowledgments

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# Presentation Outline

- North Chestnut Street Sewer Separation Project
  - Lowell Street Drainage Pipe Ramming Solution
- Southeast Interceptor Repair Project
  - Helical Pile Support System Solution



# Pipeline Challenge # 1

- North Chestnut Street Sewer Separation Project
  - Installation of a 24" diameter drainage pipe in an urban environment
  - Five underground utilities
  - Overhead utilities
  - Sandy soils
  - Two historic churches from the 1800s





LOWELL NORTH BACK ST

PINE ST

LOWELL ST

1841 Church

Pipe Ramming Location

1869 Church

0 50 Feet





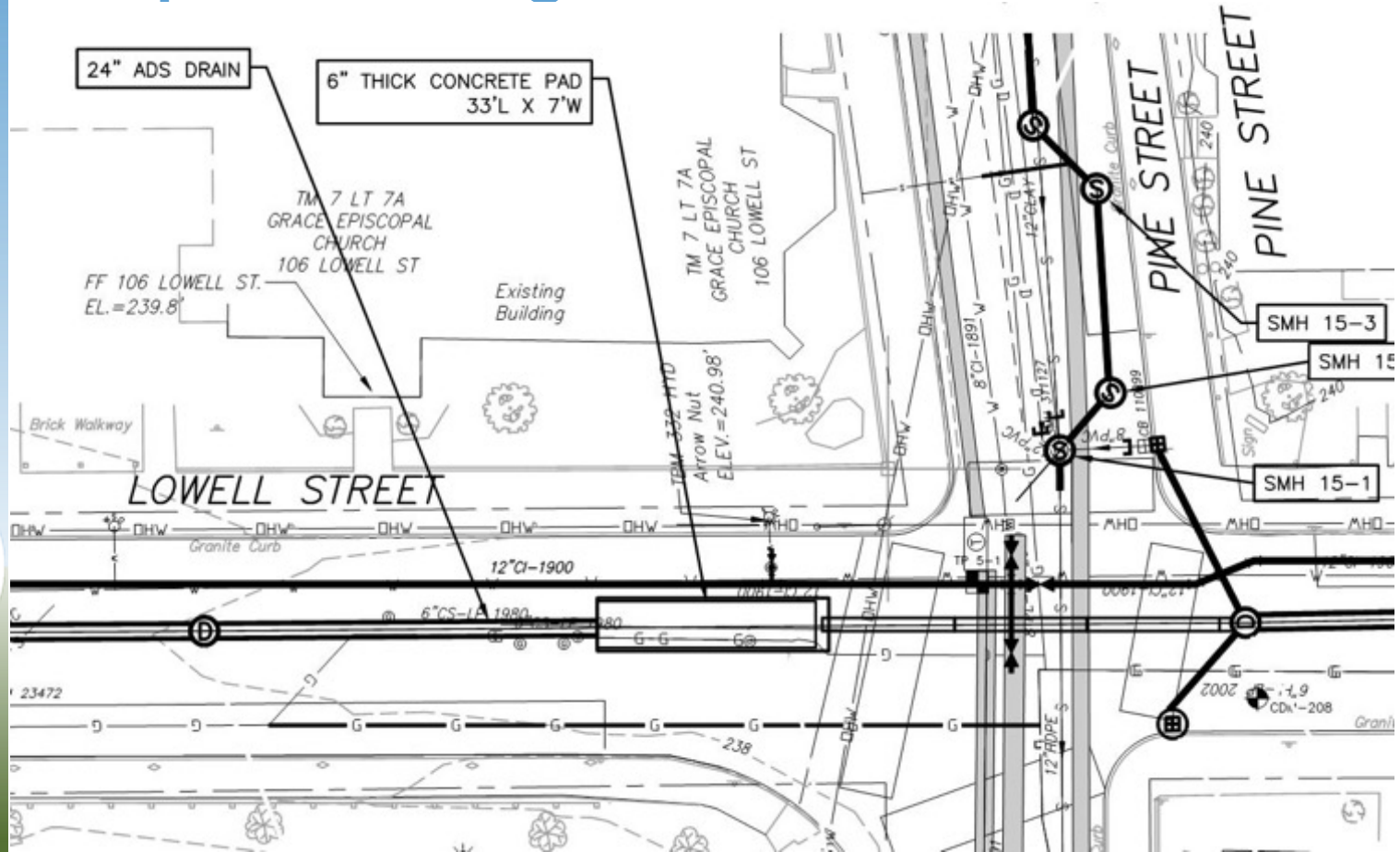
1841 Church

1869 Church

Pipe Ramming Location

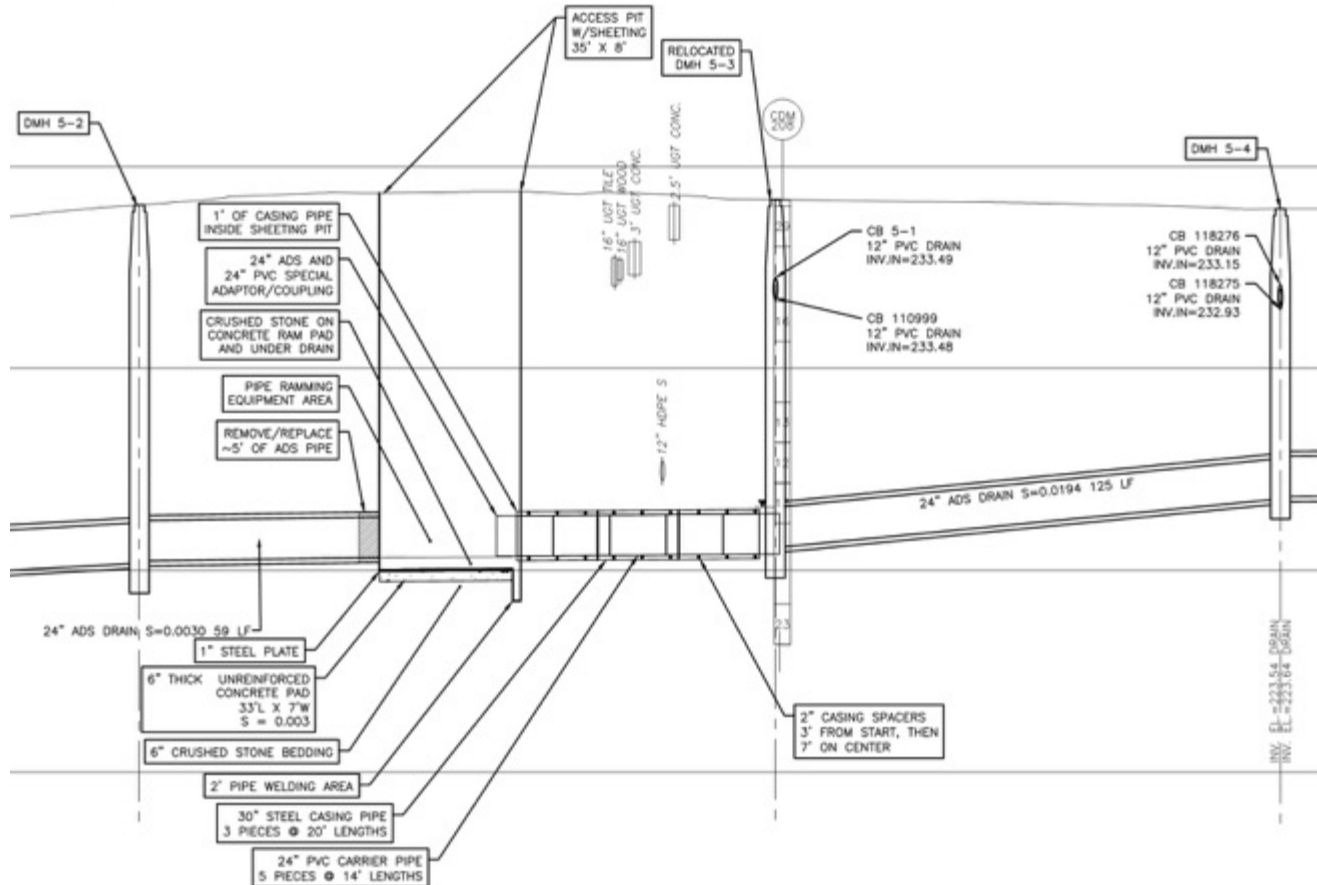


# Pipe Ramming - Plan





# Pipe Ramming - Profile





# Pipe Ramming





# Pipe Ramming – Spoils Removal



# Pipe Ramming – SaniTite HP to PVC





# Pipe Ramming – PVC with Spacers

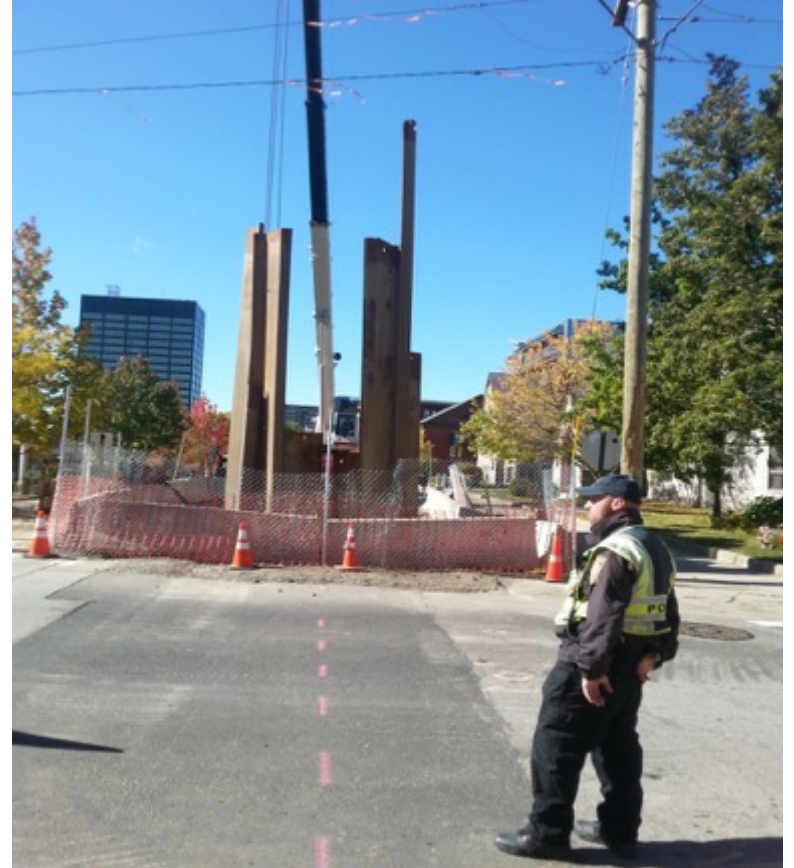


# Pipe Ramming – DMH 5-3





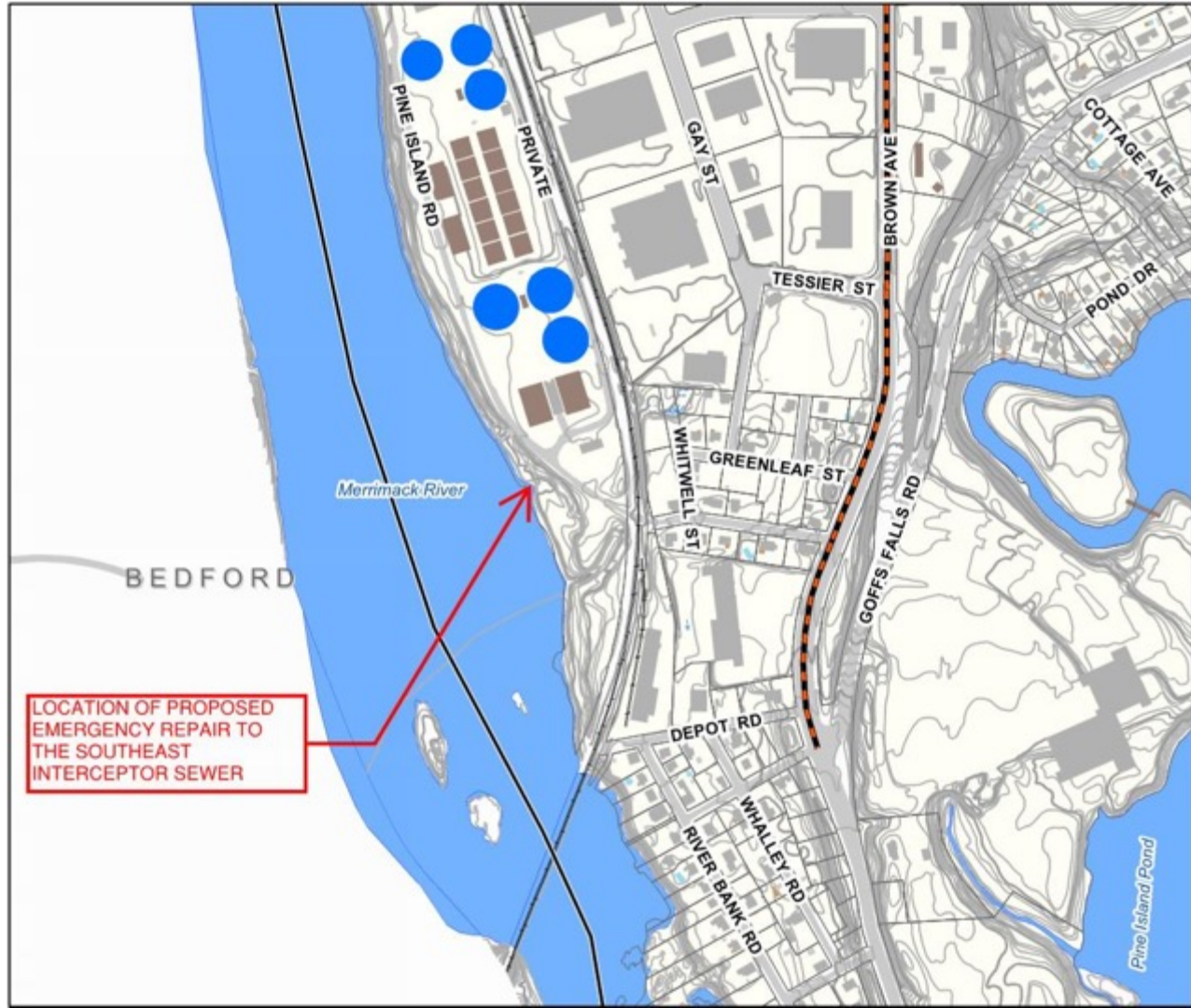
# Pipe Ramming – Removing Sheeting



# Pipeline Challenge # 2

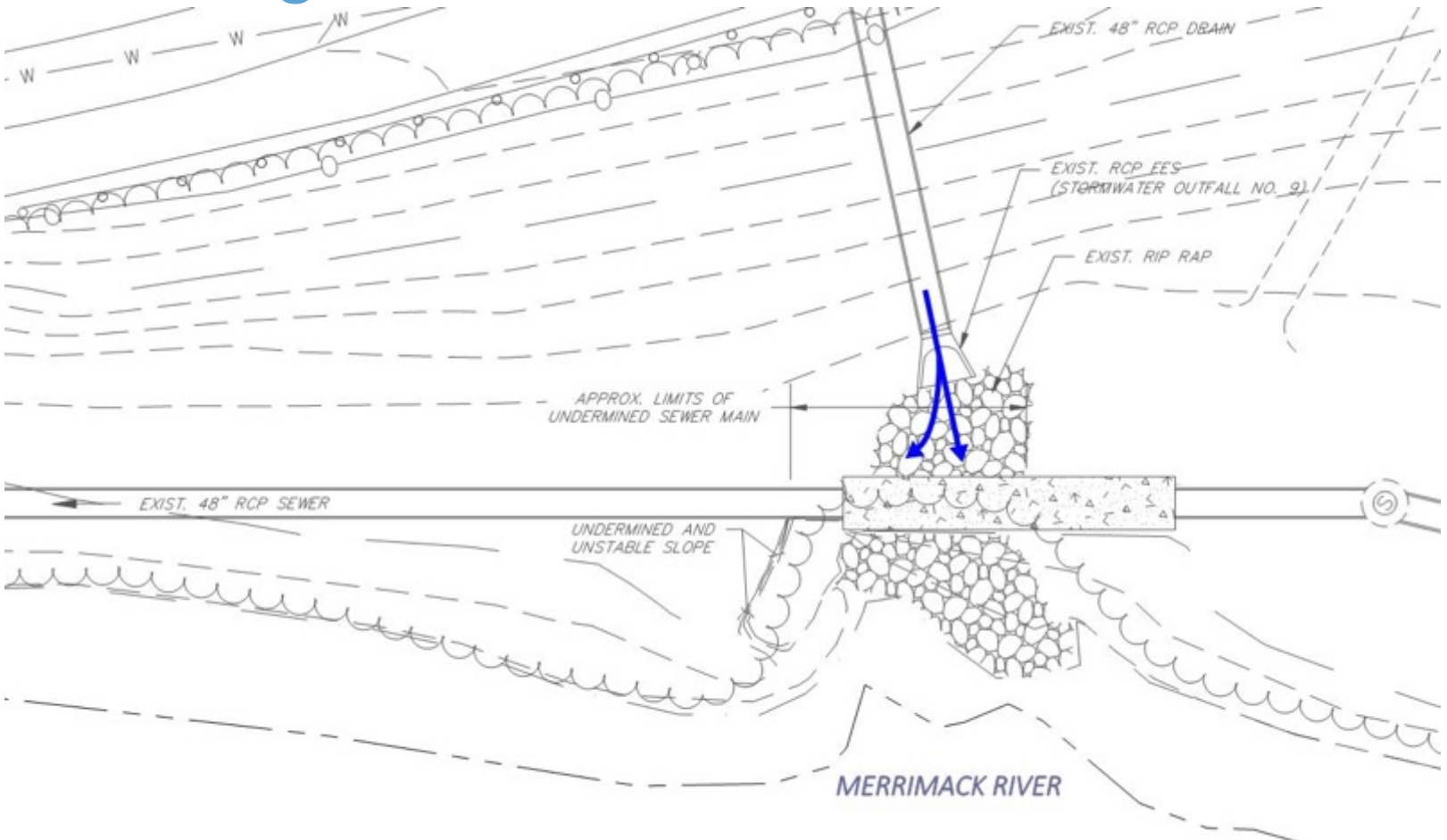
- Southeast Interceptor Repair Project
  - Existing 48" diameter sewer interceptor
  - Interceptor along the bank of the Merrimack River
  - Significant scouring of the soil material below the sewer had occurred
  - Scour was attributed to erosive flow patterns from an adjacent 48" diameter stormwater outfall



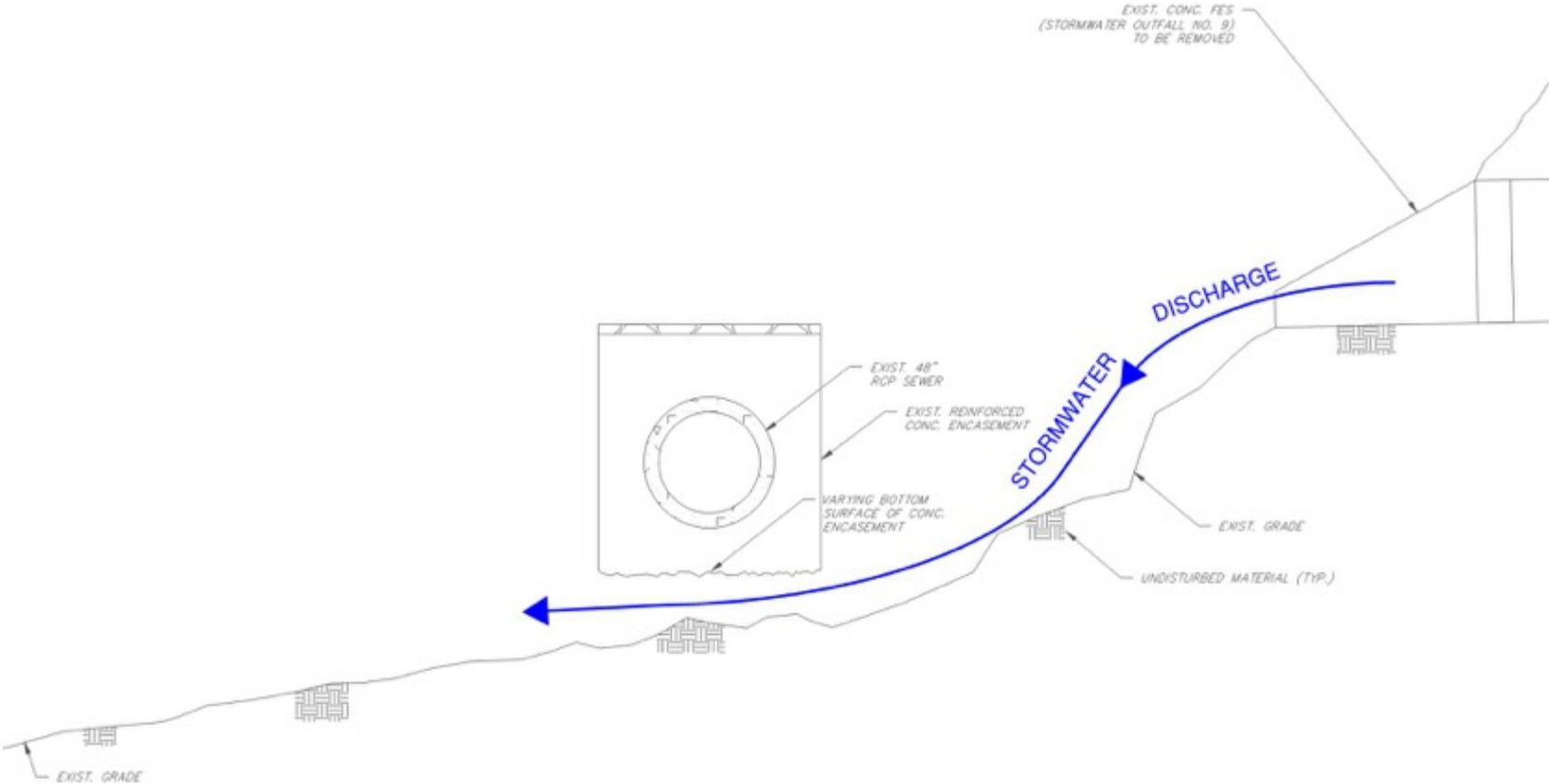




# Existing Conditions - Plan



# Existing Conditions – Section



# Existing Conditions





# Existing Conditions

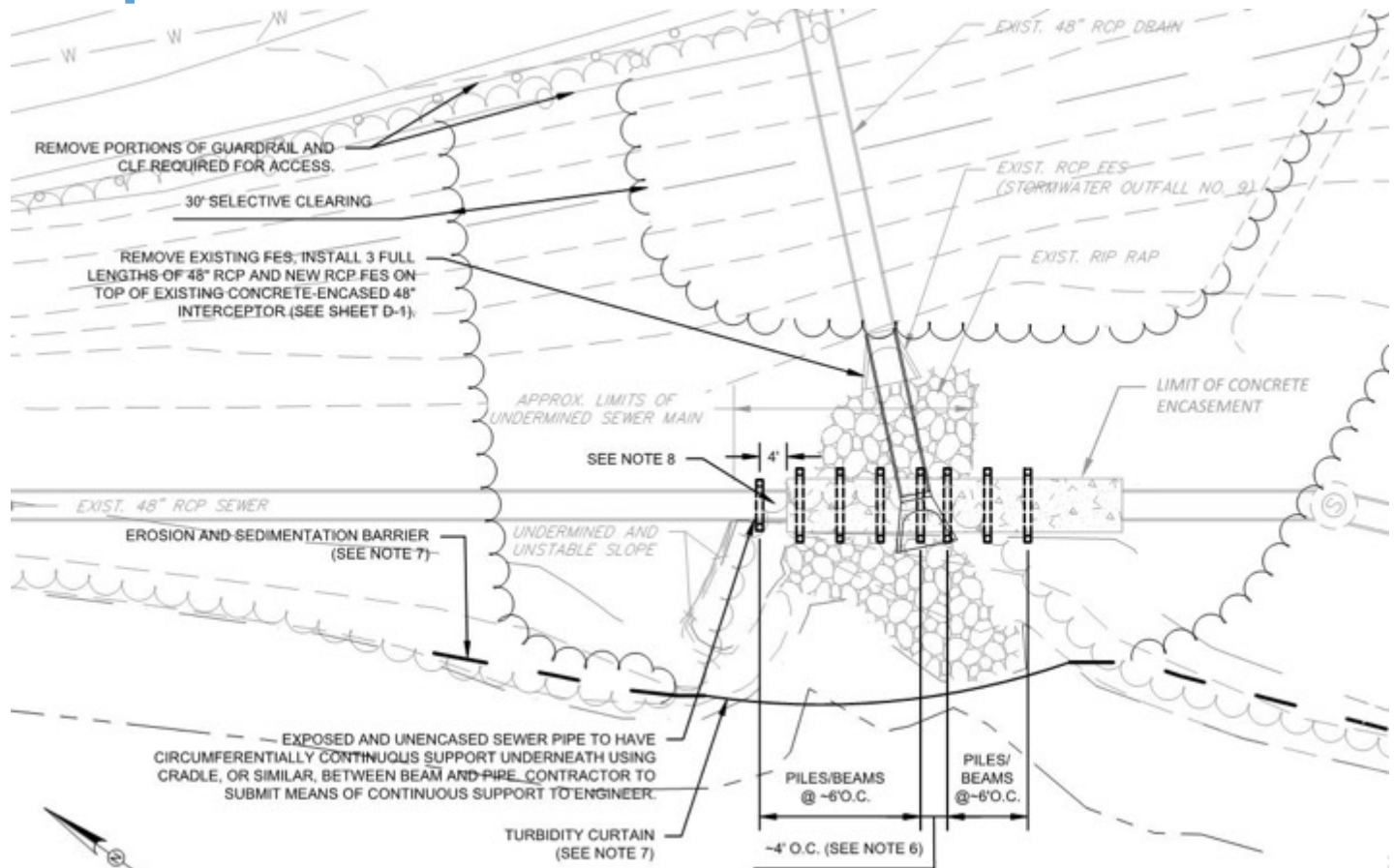


# Existing Conditions

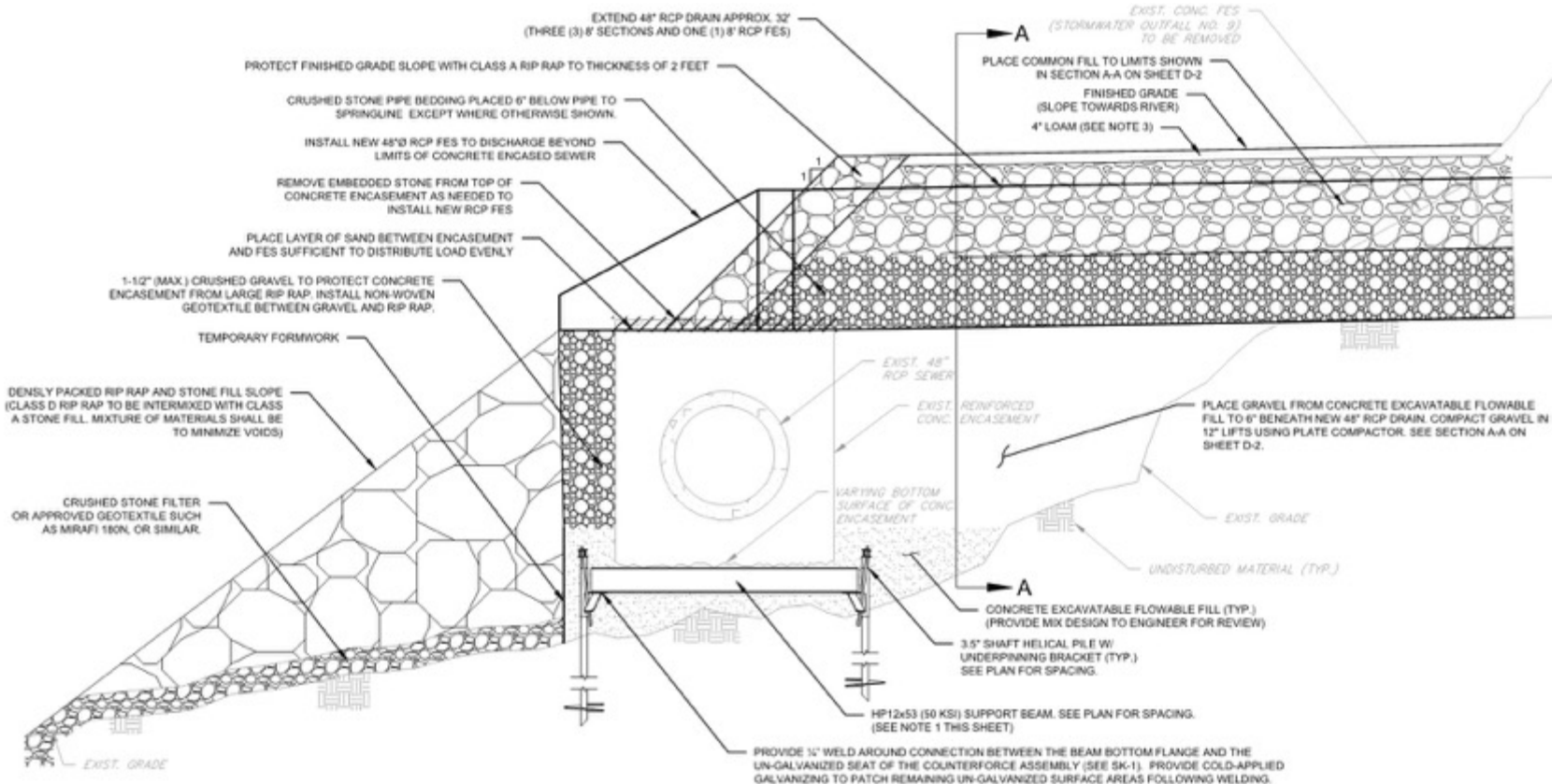




# Proposed Solution - Plan



# Proposed Solution – Section



# Coffer Dam Installation





# Helical Piles



# Helical Pile Installation



Helical Pile #	Pile Depth	Differential Hydraulic Pressure (psi)	Calculated Torque (ft-lbs)	Equivalent Ultimate Bearing Capacity (tons)	Support Beam Span (ft)
1	18'-9"	2,800	11,760	41.2	9'-4"
2	22'-0"	2,800	11,760	41.2	
3	22'-0"	2,500	10,500	36.8	9'-6"
4	22'-0"	2,500	10,500	36.8	
5	19'-6"	2,800	11,760	41.2	7'-4"
6	16'-4"	2,800	11,760	41.2	
7	20'-4"	2,800	11,760	41.2	9'-4"
8	25'-5"	2,800	11,760	41.2	
9	21'-3"	2,800	11,760	41.2	9'-0"
10	19'-11"	2,800	11,760	41.2	
11	20'-3"	2,500	10,500	36.8	9'-3"
12	19'-6"	2,500	10,500	36.8	
13	19'-11"	2,500	10,500	36.8	9'-8"
14	18'-8"	2,300	9,660	33.8	
15	16'-8"	2,500	10,500	36.8	9'-10"
16	19'-10"	2,500	10,500	36.8	





# Helical Pile Installation





# Support Beam/Pile Connection



# Concrete Flowable Fill





# Geotextile Fabric and Stone Fill





# New Extended Storm Outfall





# Contact Information

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**Thank you for your time**