Rehabilitation of Lower Longview Lake Dam

Chris Stanley, PE - City of Raleigh
Gerald Robblee, P.E. – Schnabel Engineering

Public Meeting
August 28, 2013

City of Raleigh/Schnabel Project Team

- City of Raleigh
  - Chris Stanley, PE – Project Engineer/Project Manager
  - Scott Bryant, PE – Senior Project Engineer
  - Danny Bowden – Stormwater Utility Manager
- Schnabel Engineering
  - Gerald Robblee, PE – Project Manager

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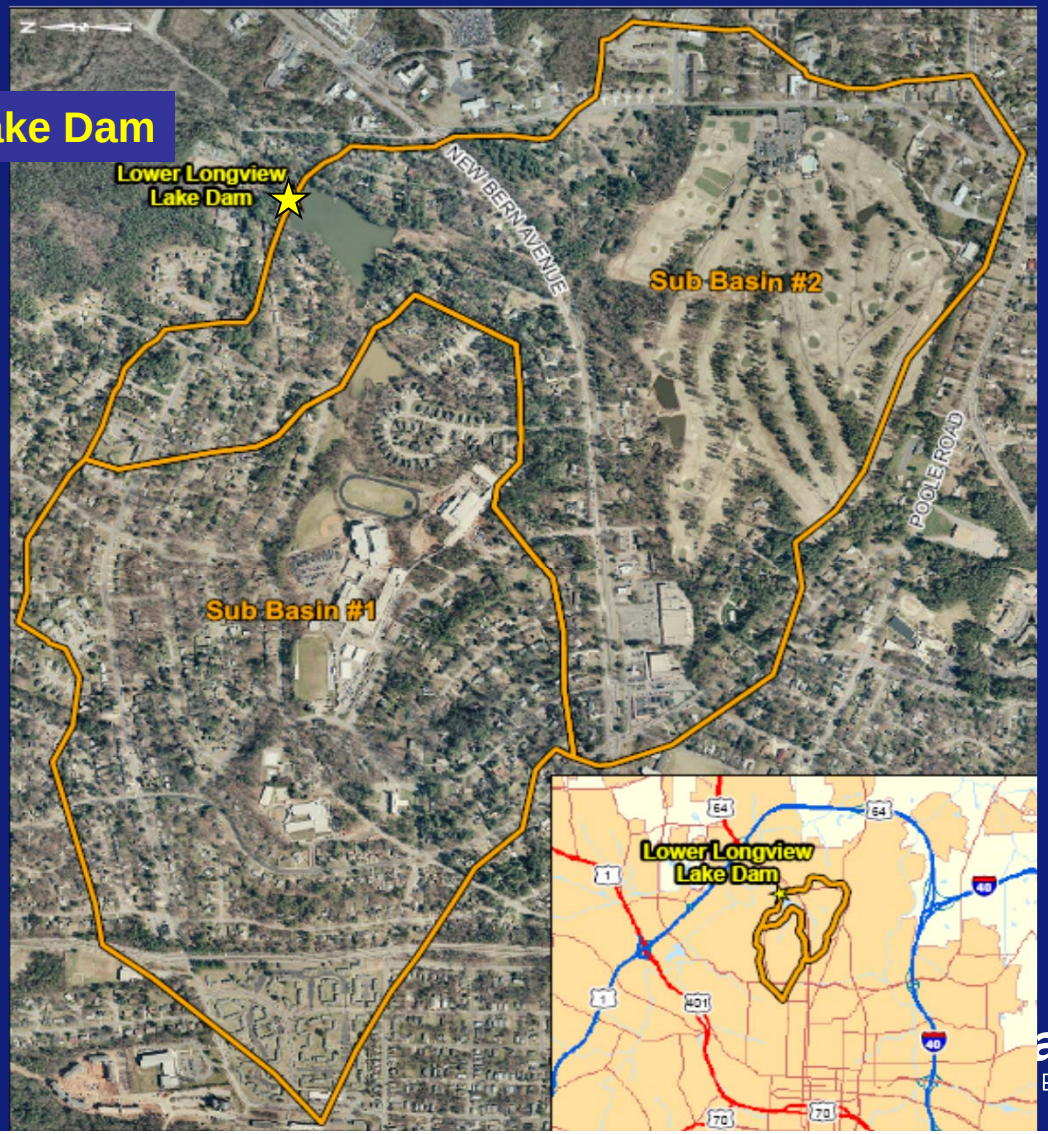
Project Authorization

- Part of City's Lake Preservation Program
  - Enhance water quality
  - Fund rehabilitation of privately owned dams
  - Owner to maintain after rehabilitation
    - Longview Garden Association
  - Subject to benefit cost analysis

Project Location & Dam Safety Classification

Lower Longview Lake Dam

Small High Hazard Dam



Dam Crest

Downstream Slope

Upstream Slope

Pertinent Dam Data – Existing Dam

- Earthfill
- Structural height of ~20 ft
- Hydraulic height of ~14 feet
- Crest width varies(~20 to ~25 feet)
- Spillway – Box Culvert ~8x16
- Crest elevation varies from El 207 ft to El 210 at abutment contacts.

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Project Goals –

- Provide Safe Structure
  - Maintain Right of Way for Albermarle Ave
- Maintain current water quality benefits of lake
- Limited enhancement to water quality
  - Contain “First Flush”

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Dam Safety Deficiencies

- Slopes too steep
- Trees and brush on slopes
- Seepage
- No operating low-level outlet
- Inadequate spillway capacity
- Scour in existing spillway outlet channel

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Other Issues

- City street over dam
  - Existing gas and water line in dam
- City sewer in spillway outlet channel
- Proximity of residences
- Millburnie Ave ~400 ft downstream

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Rehabilitation Design Constraints

- Must pass spillway design flood
- Roadway needs to meet City of Raleigh standards
- Only minor changes to dam crest elevation
- Maintain reservoir pool elevation
- Maintain hydraulic characteristics

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Other Rehabilitation Goals

- Protect sanitary sewer
- Find, then remove or abandon existing low-level outlet
- Construct a new low-level outlet

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Rehabilitation Design Configuration

- Place 12-inch pipe in existing spillway to pass base flow
- New spillway in center of dam
  - Drop structure and double barrel conduit
  - 3-stage weir – contain “first flush”
  - Pass SDF (1/3 PMP)
- Widen dam crest (road & area for sidewalk)
- Flatten slopes (3H:1V)

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Disposition of Utilities

- Water Line Replaced
  - Shut-offs on abutments
  - Encased steel pipe casing with vents/drains
- Gas line re-routed and removed
- Install replacement street lights
- Install new storm drains

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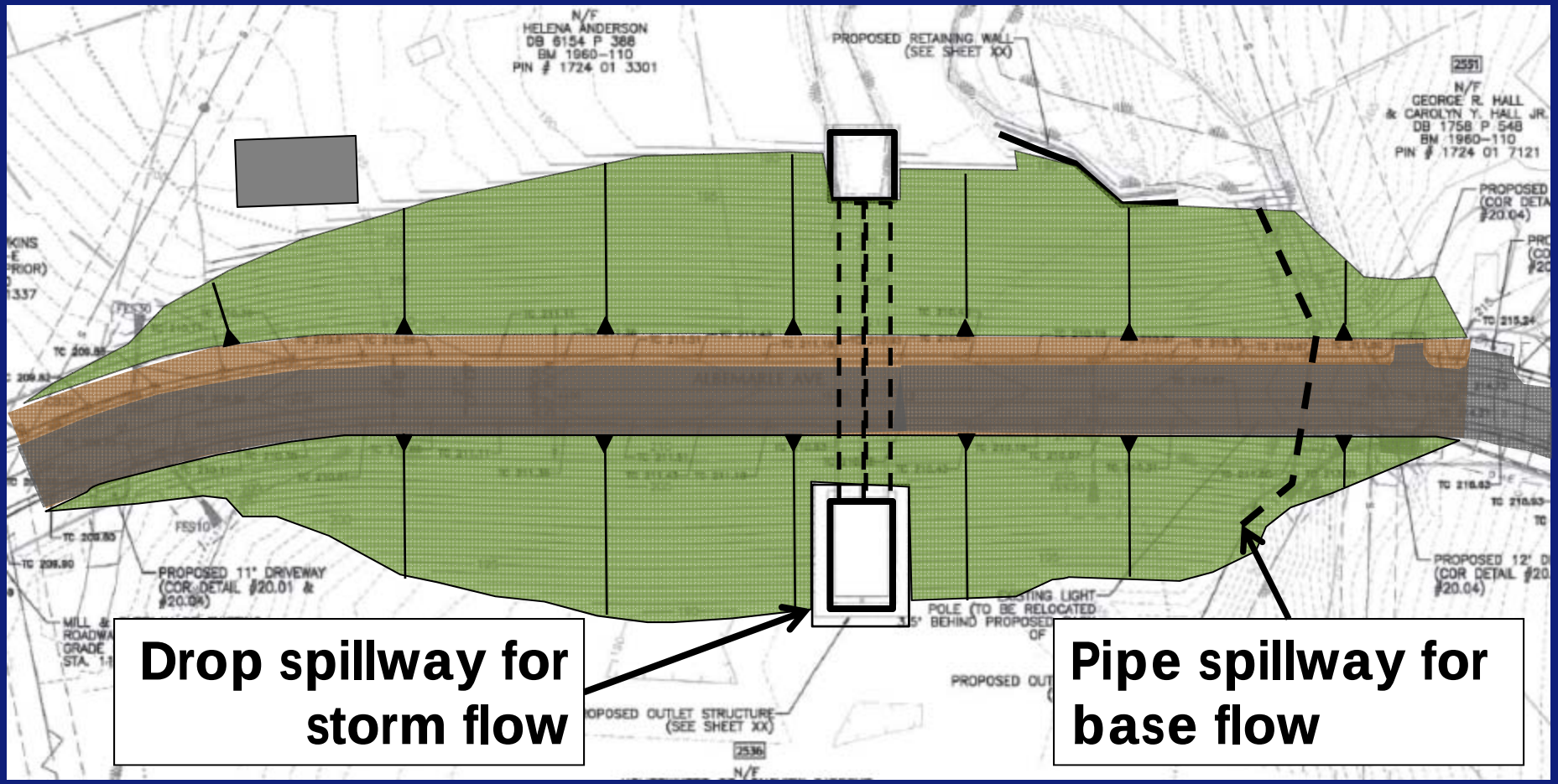
Proposed Embankment Grading



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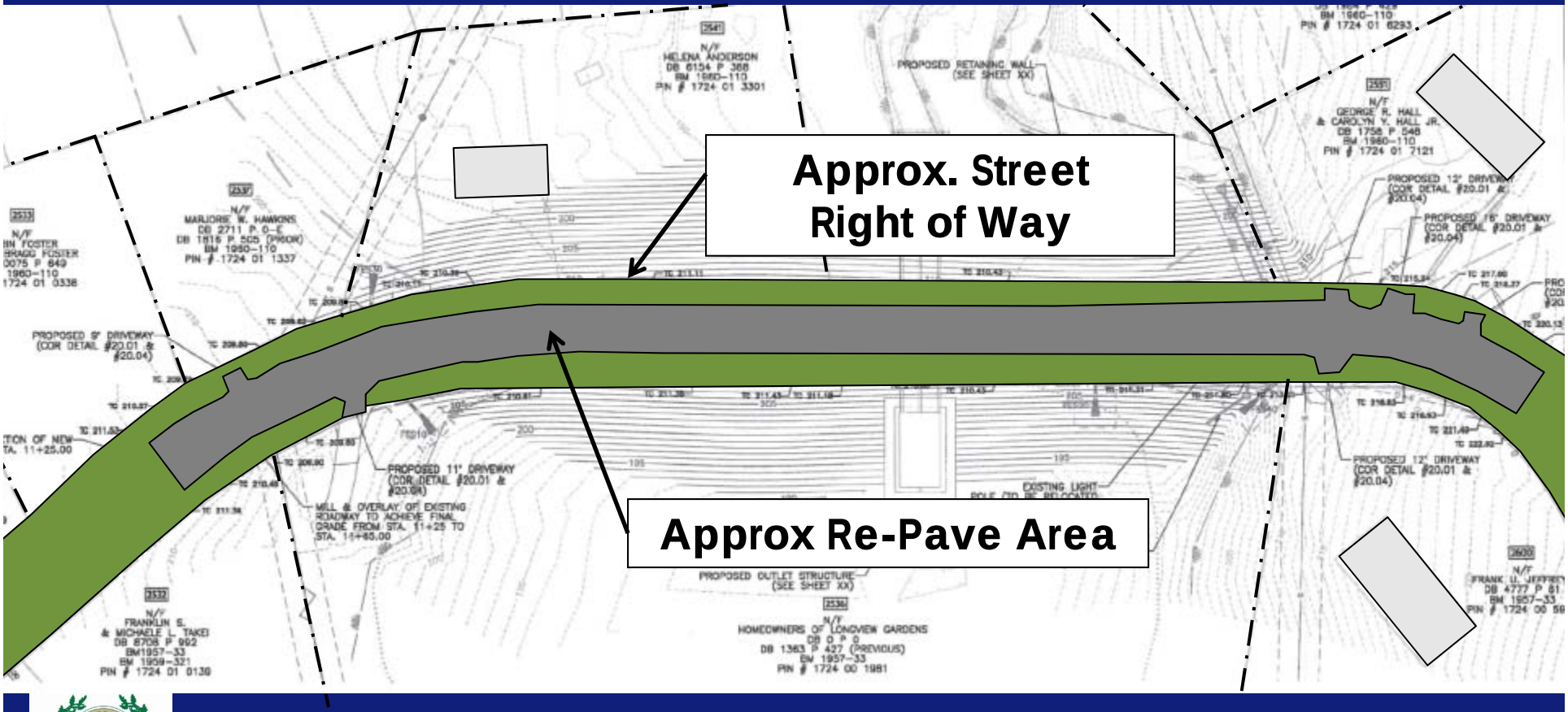
Re-Paving Limits



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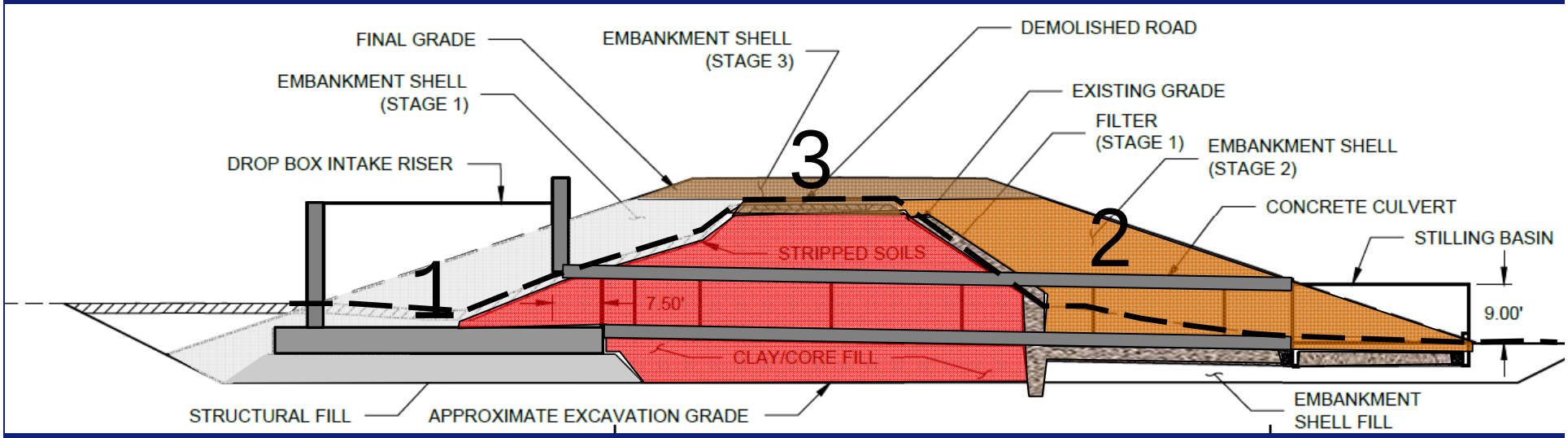
Section Through Dam & Drop Inlet Spillway



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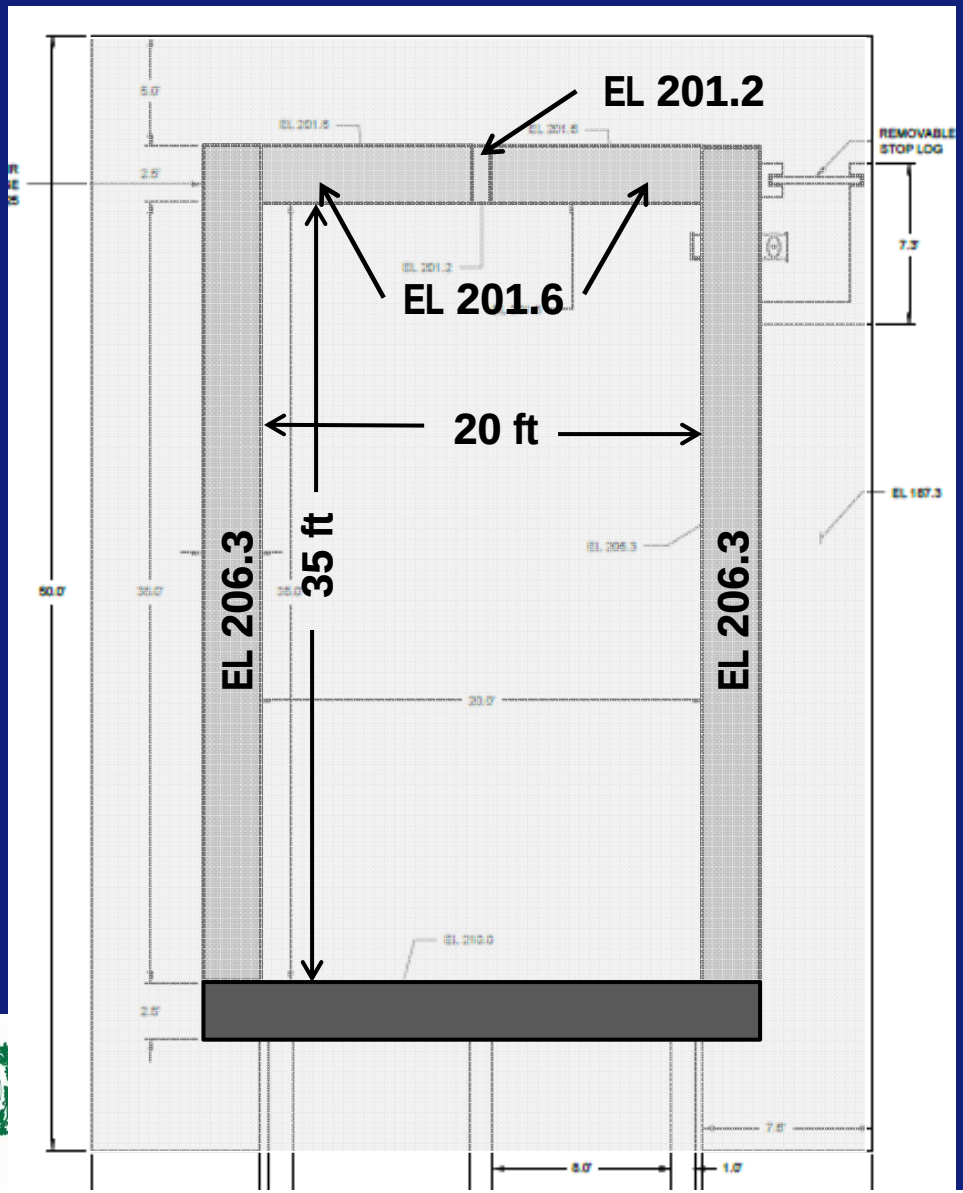
Spillway Plan



Base Flow Spillway

12” DIA PIPE @ El 201.0

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Construction and Post Construction

- Construction in Three Stages
- Stage 1
  - Drain reservoir
  - Build diversion cofferdam
  - Drop structure and double barrel conduit
  - Flatten upstream slope
- Stage 2
  - Demolish old spillway and bridge
  - Fill old spillway
  - Flatten downstream slope

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Construction and Post Construction

- Stage 3
  - Install new water line
  - Install storm drains
  - Construct new roadway
  - Install new street lights
  - Leave bottom drain open
- Post Construction
  - Prepare Record Drawings and Submit to State for Approval
  - After receiving State Approval, close bottom drain and allow reservoir to fill

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Construction Cost and Schedule

- Cost: Estimated @ $2-1/2M to $3M
- Schedule (tentative)
  - 12 to 15 months for construction
  - 2 to 3 months for post construction
  - Advertise – March 2014
  - Notice to Proceed - July 2014
  - Complete Construction – Sept 2015
  - Reservoir Full – Dec 2015

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Other Issues

- Easements (temp construction and permanent maintenance)
- Owner/Association Maintenance Agreement
- EAP & O&M Plan
  - Schnabel preparing
  - Owner/Association to maintain
  - City as partner
- Construction Impacts
  - Traffic
  - Reduced Access
  - Noise

City of Raleigh Stormwater Management

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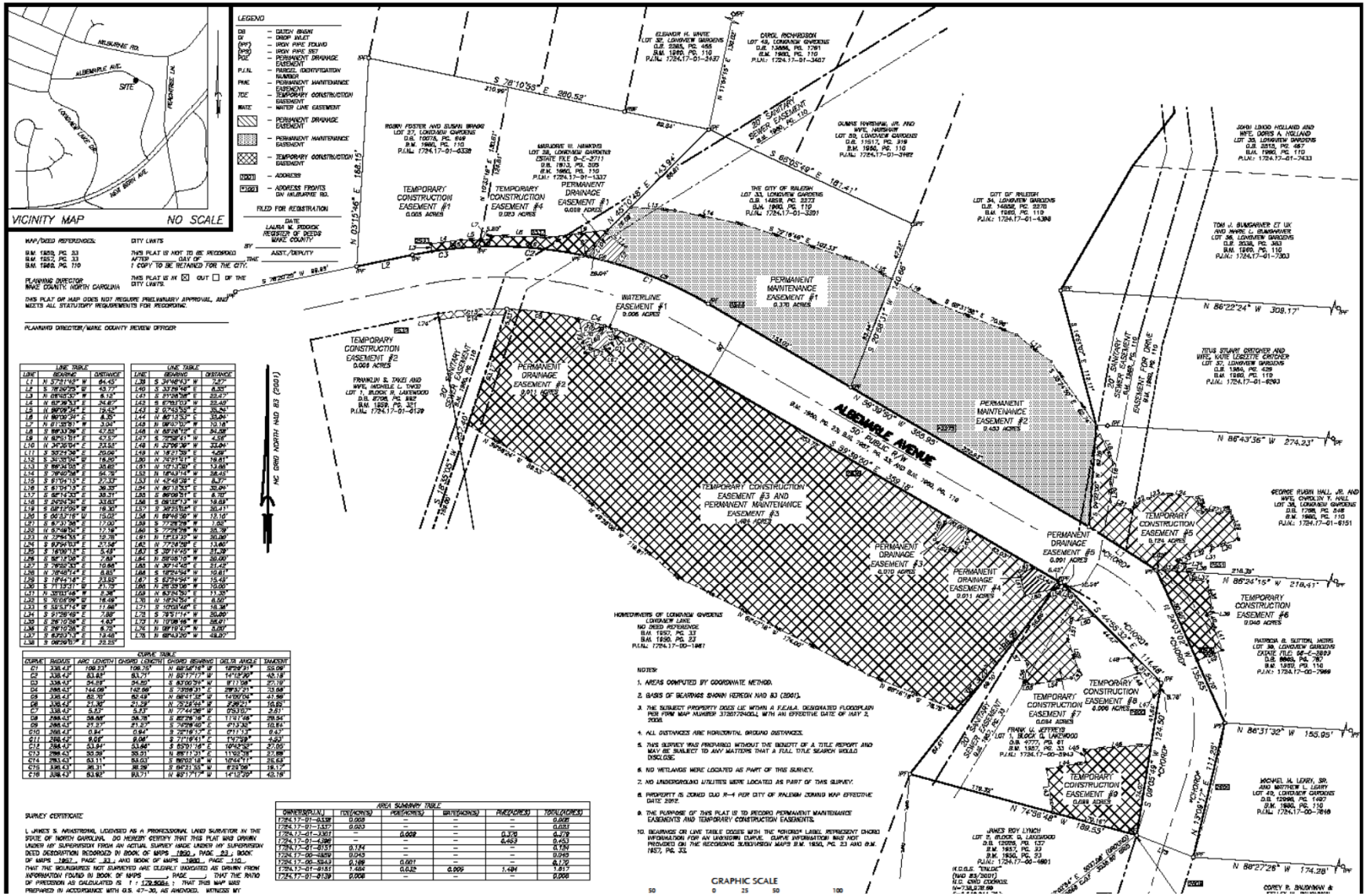
Easement Areas



Questions & Comments

- City of Raleigh:
  - Chris Stanley, PE – Project Engineer
  - 919-996-4003
  - chris.stanley@raleighnc.gov

- Schnabel Engineering:
  - Gerald Robblee, PE – Project Engineer
  - 336-274-9456
  - grobblee@schnabel-eng.com

ADDITIONAL STORMWATER PROJECT AND CIP INFORMATION:

http://www.raleighnc.gov/projects/content/PWksStormwater/Articles/StormwaterUtilityCIP.html

Stormwater Utility Division

Your Fees Working For You

Email Address:
StormwaterUtilityhelpingu@raleighnc.gov
Office Phone:
919-996-3940

Address:
222 West Hargett Street
PO Box 590 , Room #301
Raleigh, NC 27602

City of Raleigh Stormwater Management

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