



Schnabel
ENGINEERING

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



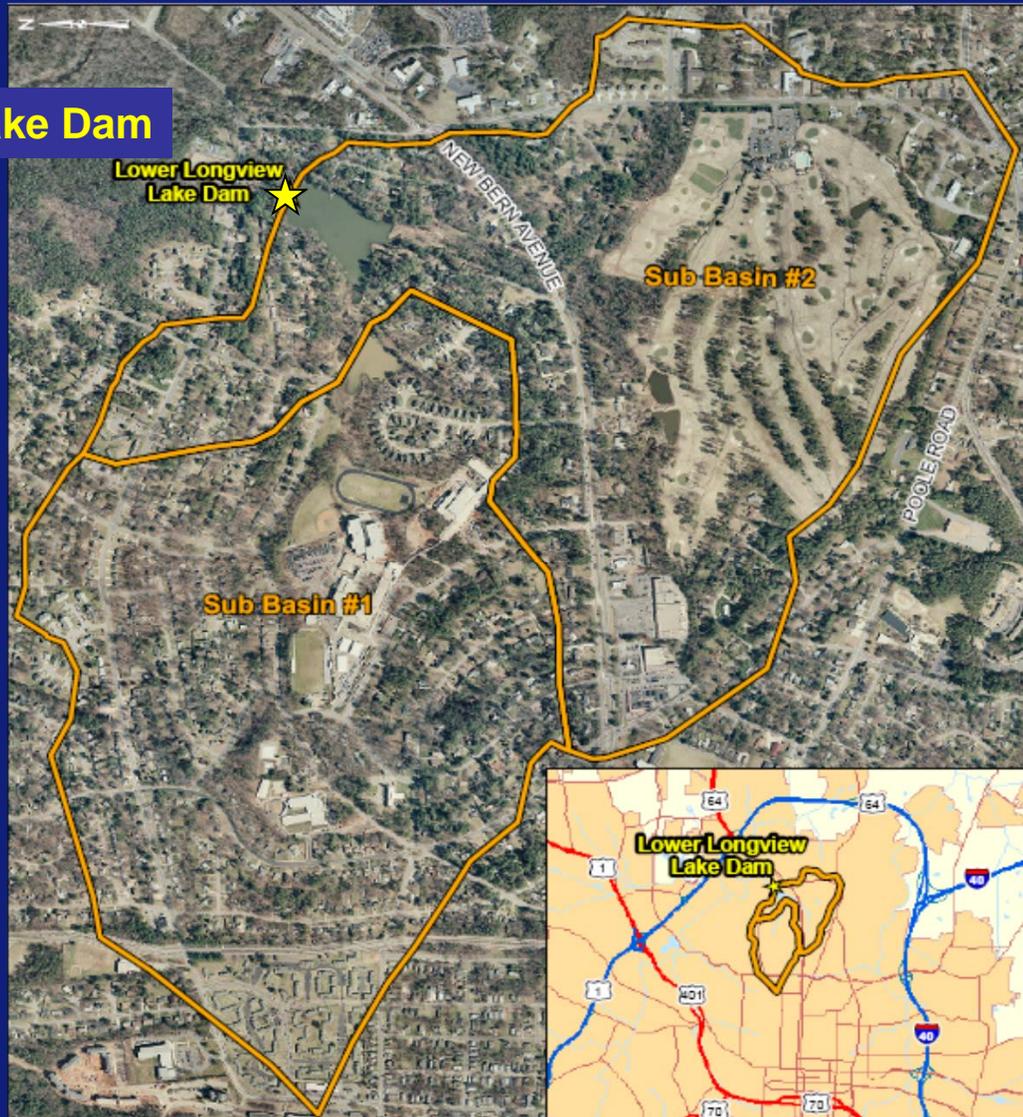
Project Authorization

- 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.



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”



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



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



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



Other Rehabilitation Goals

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



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)

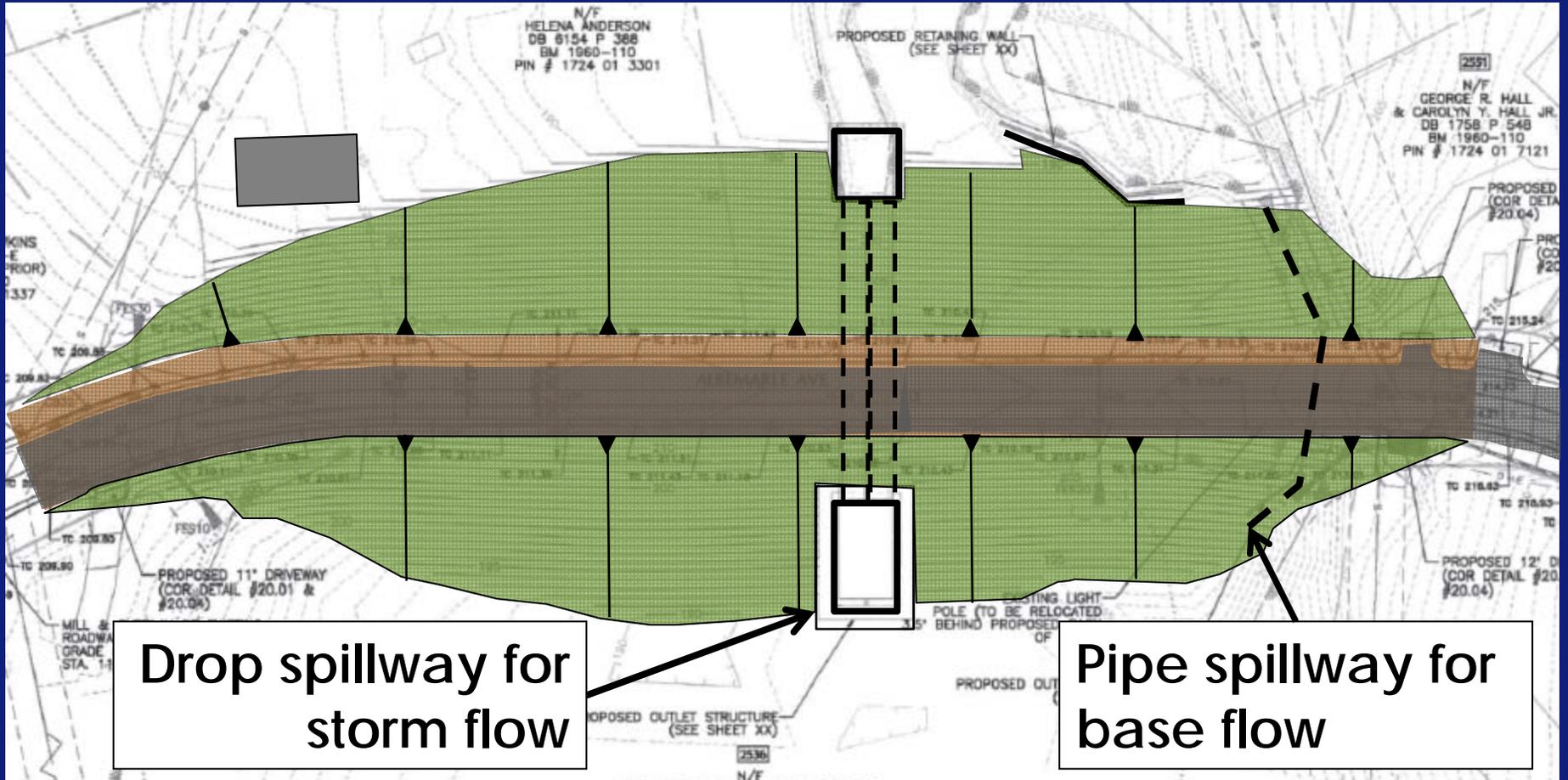


Disposition of Utilities

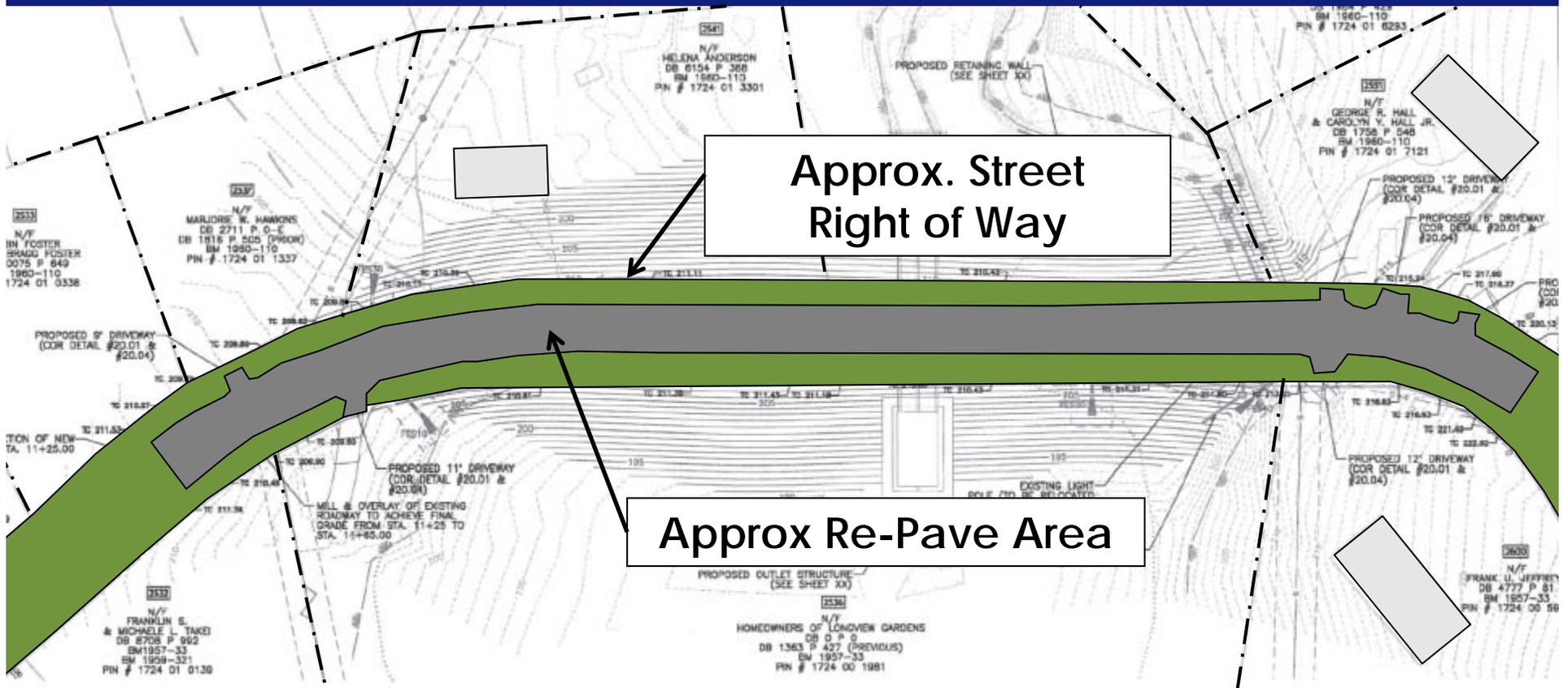
- Water Line Replaced
 - Shut-offs on abutments
 - Encased steel pipe casing with vents/drains
- Gas line re-routed and removed
- Install replacement street lights
- Install new storm drains



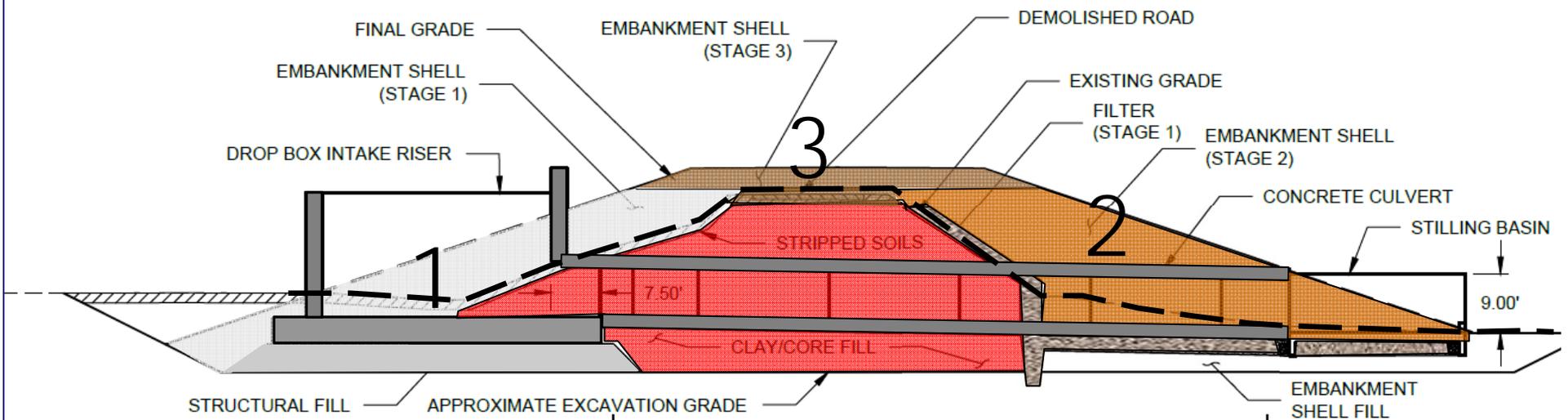
Proposed Embankment Grading



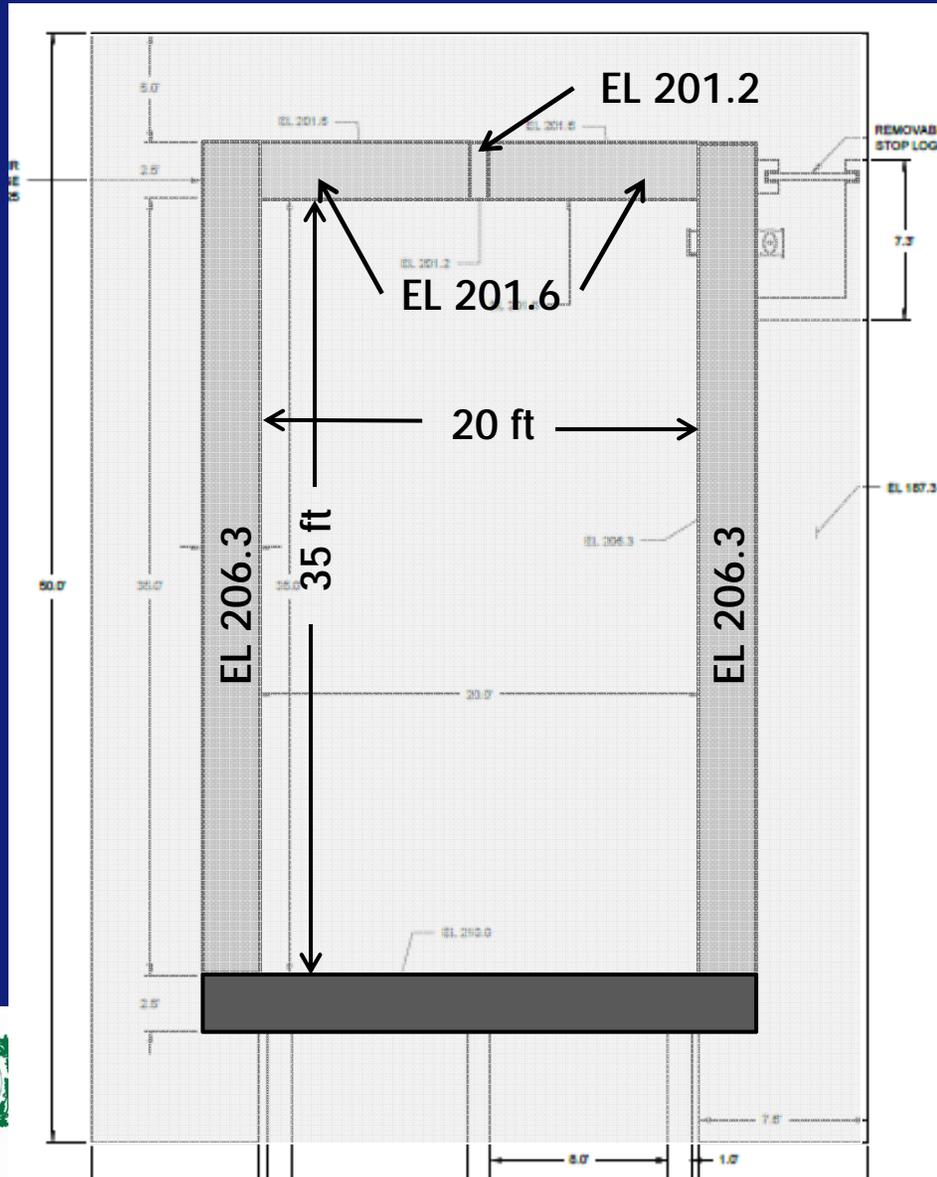
Re-Paving Limits



Section Through Dam & Drop Inlet Spillway



Spillway Plan



Base Flow Spillway
12" DIA PIPE @ EL 201.0



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



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



Construction Cost and Schedule

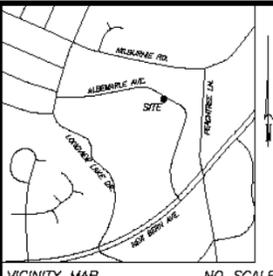
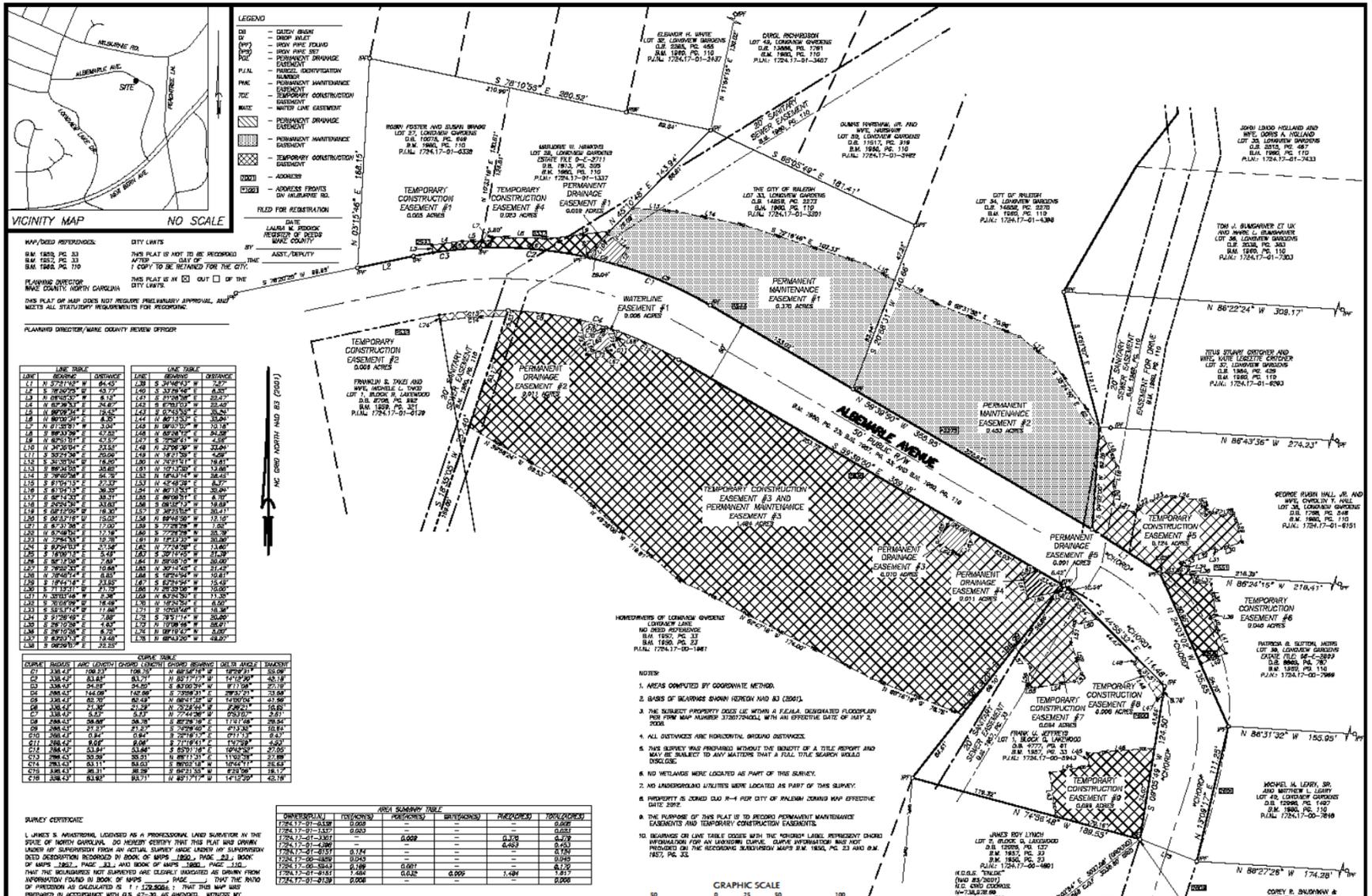
- Cost: Estimated @ \$2-1/2M to \$3M
- Schedule (tentative)
 - 12 to 15 months for construction
 - 2 to 3 months for post construction
 - Advertise – March 2014
 - Notice to Proceed - July 2014
 - Complete Construction – Sept 2015
 - Reservoir Full – Dec 2015



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

Easement Areas



LEGEND

- DR - DRAIN DITCH
- DA - DRAIN ALLEY
- IP - IRON PIPE DRAIN
- IPB - IRON PIPE BENT
- PERM - PERMANENT DRAINAGE EASEMENT
- P.L.N. - PUBLIC UTILIZATION
- PERM - PERMANENT MAINTENANCE EASEMENT
- TEMP - TEMPORARY CONSTRUCTION EASEMENT
- WATER - WATER LINE EASEMENT
- PERM - PERMANENT DRAINAGE EASEMENT
- PERM - PERMANENT MAINTENANCE EASEMENT
- TEMP - TEMPORARY CONSTRUCTION EASEMENT
- AD - ADDRESS
- AD - ADDRESS FROM DA (ALBEMARLE RD.)
- FILED FOR REGISTRATION
- DATE
- LAURENCE B. JORDAN
- REGISTERED SURVEYOR
- WAKE COUNTY

VICINITY MAP
NO SCALE

H/W/DEED REFERENCE: CITY LIMITS BY THIS PLAT IS NOT TO BE RECORDED UNLESS THE CITY OF WAKE COUNTY HAS BEEN ADVISED BY THE CITY.

T/W/DEED REFERENCE: THIS PLAT IS IN OR OUT OF THE CITY LIMITS OF WAKE COUNTY, NORTH CAROLINA.

THIS PLAT OF MAP DOES NOT REQUIRE PRELIMINARY APPROVAL AND MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

PLANNING DIRECTOR/WAKE COUNTY REVIEW OFFICER:

LINE	BEARING	DISTANCE	LINE	BEARING	DISTANCE
1	N 27°17'10" W	84.45	230	S 34°00'00" W	2.00
2	N 89°00'00" W	55.77	231	S 27°00'00" W	2.00
3	N 89°00'00" W	8.75	232	S 27°00'00" W	2.00
4	N 89°00'00" W	28.82	233	S 27°00'00" W	2.00
5	N 89°00'00" W	12.83	234	S 27°00'00" W	2.00
6	N 89°00'00" W	3.04	235	S 27°00'00" W	2.00
7	N 89°00'00" W	2.75	236	S 27°00'00" W	2.00
8	N 89°00'00" W	2.75	237	S 27°00'00" W	2.00
9	N 89°00'00" W	2.75	238	S 27°00'00" W	2.00
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159	N 89°00'00" W	2.75	388	S 27°00'00" W	2.00
160	N 89°00'00" W	2.75	389	S 27°00'00" W	2.00
161	N 89°00'00" W	2.75	390	S 27°00'00" W	2.00
162	N 89°00'				

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

