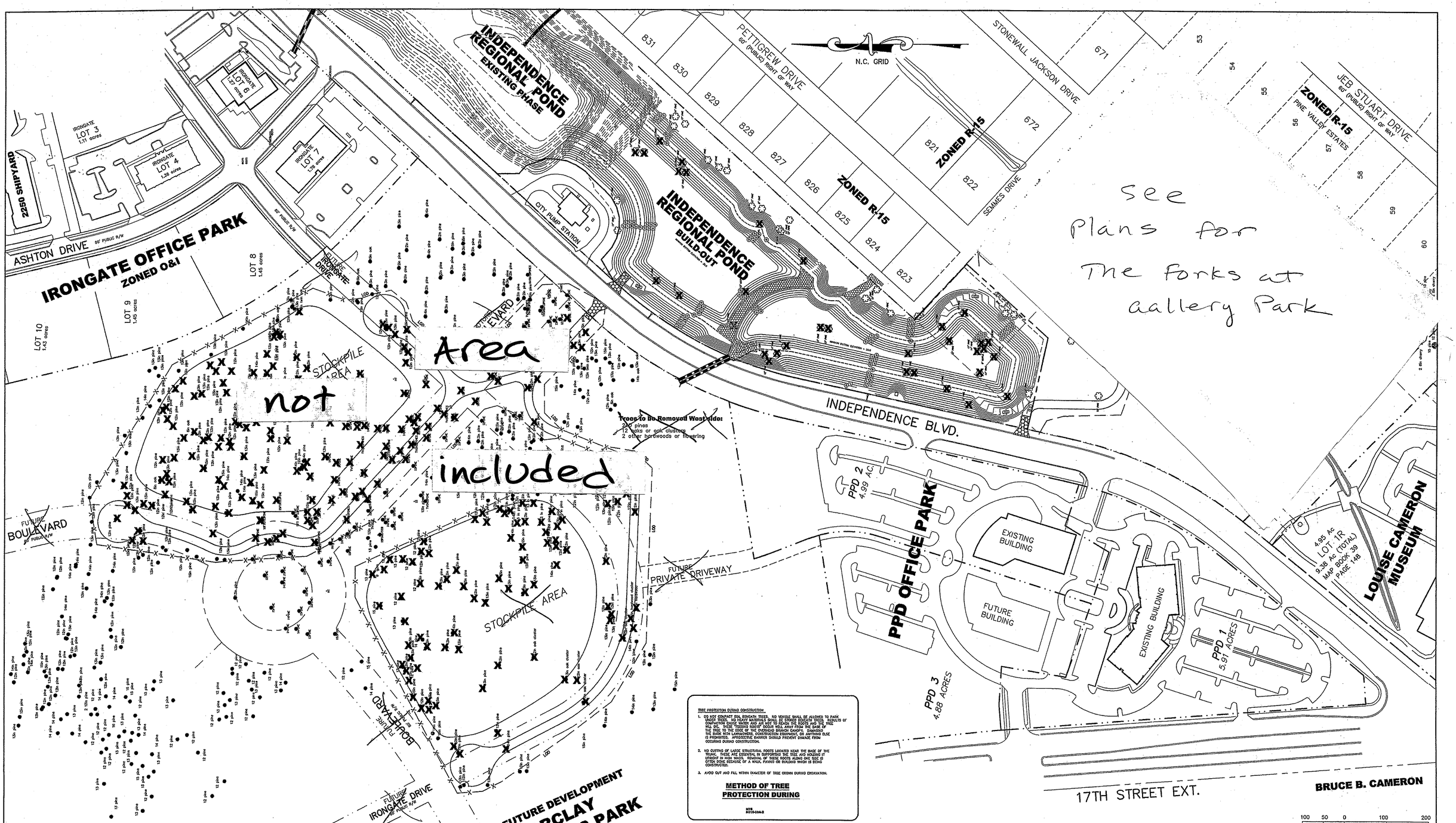
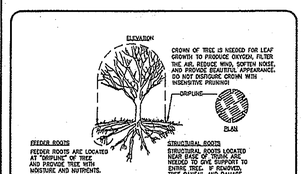




METHOD OF TREE PROTECTION DURING CONSTRUCTION

NTS
R015-06A-1

Trees to be Removed :

All trees to be removed shown are "regulated", but not "significant".

⊗ INDICATES A TREE TO BE REMOVED (TYPICAL)

13PINE

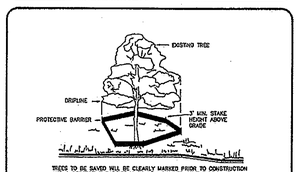
299 pines total
16 oaks or oak clusters total
6 other hardwoods or flowering total

TREE PROTECTION DURING CONSTRUCTION

1. DO NOT COMPACT SOIL BENEATH TREES. NO VEHICLE SHALL OR ALLOWED TO PARK UNDER TREES. NO HEAVY MATERIALS SHALL BE STORED BENEATH TREES. RESULTS OF COMPACTION CAUSE WATER AND AIR NOT TO REACH THE ROOTS AND THE TREE WILL DIE. THESE "FEEDING ROOTS" OCCUR WELL AWAY FROM THE BASE OF THE TREE TO THE EDGE OF THE OVERHEAD BRANCH CANOPY. DAMAGING THE BARK WITH LANDMOWER, CONSTRUCTION EQUIPMENT, OR ANYTHING ELSE IS PROHIBITED. APPROPRIATE BARRIER SHOULD PREVENT DAMAGE FROM OCCURING DURING CONSTRUCTION.
2. NO CUTTING OF LARGE STRUCTURAL ROOTS LOCATED NEAR THE BASE OF THE TREE. THESE ARE ESSENTIAL IN SUPPORTING THE TREE AND HOLDING IT UPRIGHT IN HIGH WINDS. REMOVAL OF THESE ROOTS ARE ONE WAY IT OFTEN DONE BECAUSE OF A WALK, PAVING OR BUILDING WHICH IS BEING CONSTRUCTED.
3. AVOID CUT AND FILL WITHIN DIAMETER OF TREE CROWN DURING EXCAVATION.

METHOD OF TREE PROTECTION DURING

NTS
R015-06A-2



TREES TO BE SAVED WILL BE CLEARLY MARKED FROM TO CONSTRUCTION AND A PROTECTIVE BARRIER IS TO BE INSTALLED AT THE DRIPLINE.

DRIP LINE – THE AREA OF SOIL DIRECTLY BENEATH THE TREE EXTENDING OUT TO THE TIPS OF THE OUTERMOST BRANCHES.

METHOD OF TREE PROTECTION DURING CONSTRUCTION

NTS
R015-06

REV. NO.	REVISIONS	DATE

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TREE SURVEY and REMOVAL PLAN

INDEPENDENCE REGIONAL FACILITY

(formerly CAMERON REGIONAL POND)

LOCATED IN THE CITY OF WILMINGTON
NEW HANOVER COUNTY, NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL SEAL L-3704 LAND SURVEYOR DAVID B. HOLLIS
3-24-04
dhollis @ hdslm.com

OWNER: INDEPENDENCE REGIONAL FACILITY, INC. and BBC FAMILY LIMITED PARTNERSHIP
PO BOX 3649
WILMINGTON, NC 28406, 910-762-2676

HANOVER DESIGN SERVICES, P.A.
LAND SURVEYORS, ENGINEERS & LAND PLANNERS
319 WALNUT STREET
WILMINGTON, N.C. 28401
PHONE: (910) 343-8002

Date: 2-27-04
Scale: 1" = 100'
Drawn: DSH
Checked: GAW
Project No: 5834-cltytree
Sheet No: 1 of 1

: 13:59:38 03/25/2004

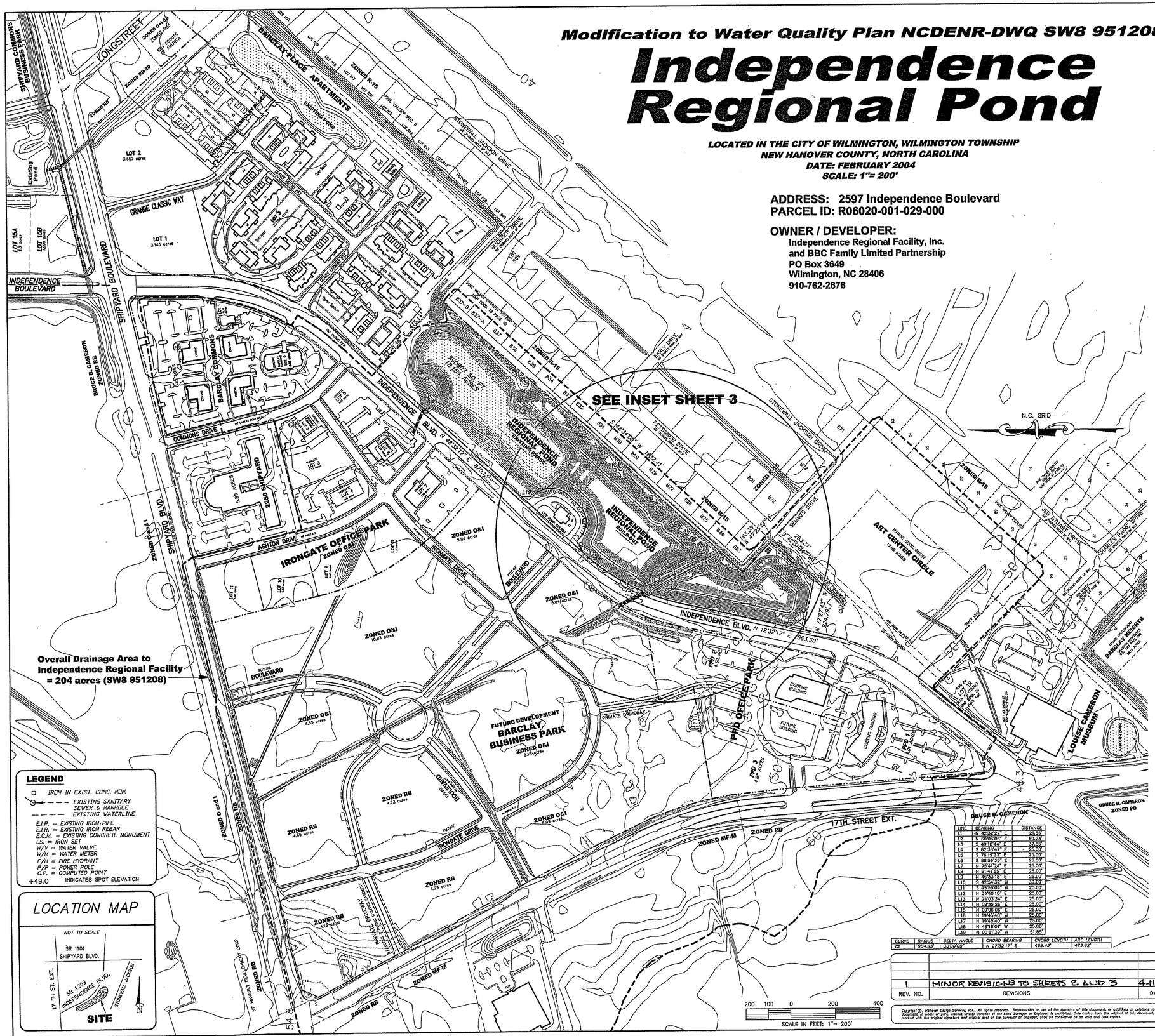
Modification to Water Quality Plan NCDENR-DWQ SW8 951208

Independence Regional Pond

LOCATED IN THE CITY OF WILMINGTON, WILMINGTON TOWNSHIP
NEW HANOVER COUNTY, NORTH CAROLINA
DATE: FEBRUARY 2004
SCALE: 1"= 200'

ADDRESS: 2597 Independence Boulevard
PARCEL ID: R06020-001-029-000

OWNER / DEVELOPER:
Independence Regional Facility, Inc.
and BBC Family Limited Partnership
PO Box 3649
Wilmington, NC 28406
910-762-2676



STANDARD NOTES:

1. Information concerning underground utilities was obtained from available records. It shall be the responsibility of the Contractor to determine the exact elevations and locations of all existing utilities at all crossings prior to commencing any excavation. If actual clearances are less than indicated on Plan, the Contractor shall contact the Design Engineer before proceeding with construction. Any condition discovered or existing that would necessitate a modification of these plans shall be brought to the attention of the Design Engineer before proceeding with construction.
2. NO CONSTRUCTION IS TO BEGIN BEFORE LOCATION OF EXISTING UTILITIES HAS BEEN DETERMINED. CALL "NC ONE-CALL" AT LEAST 48 HOURS BEFORE COMMENCING CONSTRUCTION.
3. All trees which are not required to be cleared for construction shall be preserved wherever possible unless otherwise directed.
4. The Contractor is responsible for controlling dust and erosion during construction at his expense. Graded areas shall be watered to control dust when ordered by the Engineer.
5. No geotechnical testing has been performed on site. No warranty is made for suitability of subgrade, and undercut and any required replacement with suitable material shall be the responsibility of the contractor.

GENERAL NOTES:

1. This map is not for conveyance, recordation, or sales.
2. This property is not located within a special flood hazard area according to Flood Insurance Rate Map Community Panel #370171-0010B, effective date April 2, 1986.
3. Site area: 18.154 acres.
4. This property is zoned City of Wilmington R-15.
5. If the contractor desires City water for construction he shall apply in advance for this service and must provide a reduced pressure zone (RPZ) backflow prevention device on the developer's side of the water meter box.
6. Any irrigation system supplied by City water shall comply with City of Wilmington Cross Connection Control regulations. Call 343-3910 for information.

MORE GENERAL NOTES:

1. ALL CONSTRUCTION TO CONFORM TO CITY OF WILMINGTON STANDARDS AND APPLICABLE STATE & LOCAL CODES.
2. CONTRACTOR TO COORDINATE ANY REQUIRED TRAFFIC CONTROL WITH THE CITY OF WILMINGTON.
3. CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF ANY RELOCATIONS, RE-ALIGNMENTS, DISCONNECTIONS OR CONNECTIONS OF EXISTING UTILITIES WITH APPLICABLE AUTHORITIES.
4. CLEARING AND GRUBBING OF SITE TO INCLUDE REMOVAL OF EXISTING CURB, ASPHALT, INLETS, AND ANY OTHER STRUCTURES INCLUDING TREES, STUMPS AND DEBRIS EXISTING ON SITE. TREES NOT REQUIRED TO BE CLEARED FOR CONSTRUCTION SHALL REMAIN UNLESS OTHERWISE DIRECTED.

DESIGNER'S CERTIFICATION -

"I hereby certify that this plan has been prepared in accordance with the latest Wilmington Standards and Specifications for Stormwater Management and Chapter 20 of the Code of Ordinanances of the City of Wilmington."

Signature: _____

Printed Name and Title: David S. Hollis, PE, PLS

Date: 3-01-04

Registration Number: PE # 20007

NORTH CAROLINA PROFESSIONAL SEAL 20007 ENGINEER DAVID S. HOLLIS

OWNER'S / DEVELOPER'S CERTIFICATION:

"I / We hereby certify that any clearing, grading, construction or development, or all of these, will be done pursuant to this plan and that the applicable Stormwater Management conditions and requirements of the City of Wilmington, the State of North Carolina, and the Federal Government and its agencies are hereby made part of this plan."

Signature: _____

Printed Name and Title: Jake V. Hardee, Vice-President

Date: 3.24.04

INDEX TO DRAWINGS

SHEET No.	DESCRIPTION	DRAWING No.
1 OF 3	COVER SHEET and GENERAL NOTES	5834-PND1a
2 OF 3	EROSION and SEDIMENT CONTROL	5834-PND2a
3 OF 3	GRADING and WATER QUALITY MODIFICATION PLAN	5834-PND3a

BENCHMARK LOCATIONS AND ELEVATIONS

	LOCATION:	ELEVATION
1	NAIL IN PP # 88055 AT END OF EXISTING COMMONS (BUCKNER) DRIVE	44.40

LEGEND

- IRON IN EXIST. CONC. MON.
- EXISTING SANITARY SEWER & MANHOLE
- EXISTING WATERLINE
- E.I.P. = EXISTING IRON-PIPE
- E.I.R. = EXISTING IRON REBAR
- E.C.M. = EXISTING CONCRETE MONUMENT
- I.S. = IRON SET
- W/V = WATER VALVE
- W/M = WATER METER
- F/H = FIRE HYDRANT
- P/P = POWER POLE
- C.P. = COMPUTED POINT
- +49.0 INDICATES SPOT ELEVATION

LOCATION MAP

NOT TO SCALE

LINE	BEARING	DISTANCE
L1	N 42°32'27" E	21.00'
L2	N 60°04'05" E	60.23'
L3	S 49°10'44" E	37.85'
L4	S 62°28'47" E	25.00'
L5	S 76°19'23" E	25.00'
L6	S 88°59'33" E	25.00'
L7	N 75°41'24" E	25.00'
L8	N 61°41'55" E	25.00'
L9	N 46°33'18" E	25.00'
L10	S 42°34'32" W	39.09'
L11	S 43°58'04" W	25.00'
L12	N 34°07'10" E	25.00'
L13	N 24°03'34" E	25.00'
L14	N 02°39'28" E	25.00'
L15	N 09°08'06" E	25.00'
L16	N 19°45'40" W	25.00'
L17	N 19°45'40" W	25.00'
L18	N 48°18'01" W	25.00'
L19	N 00°51'39" W	51.85'

CURVE	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH	ARC LENGTH
C1	924.93'	30°00'00"	N 27°32'17" E	468.43'	473.82'

REV. NO.	REVISIONS	DATE
1	MINOR REVISIONS TO SHEETS 2 AND 3	4-11-14

200 100 0 200 400
SCALE IN FEET: 1"= 200'

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NOTE WELL: THIS PLAN IS A MODIFICATION TO AN EXISTING PERMITTED FACILITY (SW8 951208) ALL PREVIOUSLY APPROVED DETAILS AND CONSTRUCTION SPECIFICATIONS SHALL APPLY.

Cover Sheet and General Notes - DENR / DWQ SW8 951208 MODIFICATION

INDEPENDENCE REGIONAL FACILITY
(formerly CAMERON REGIONAL POND)
LOCATED IN THE CITY OF WILMINGTON
NEW HANOVER COUNTY, NORTH CAROLINA

Date: 2-27-04
Scale: 1"= 200'
Drawn: DSH
Checked: GAW
Project No: 5834-PND1a

NORTH CAROLINA PROFESSIONAL SEAL 20007 ENGINEER DAVID S. HOLLIS
3-24-04
dhollis @ hdsilm.com

OWNER: INDEPENDENCE REGIONAL FACILITY, INC.
and BBC FAMILY LIMITED PARTNERSHIP
PO BOX 3649
WILMINGTON, NC 28406, 910-762-2676

HANOVER DESIGN SERVICES, P.A.
LAND SURVEYORS, ENGINEERS & LAND PLANNERS
319 WALNUT STREET
WILMINGTON, N.C. 28401
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Sheet No: 1 Of: 3

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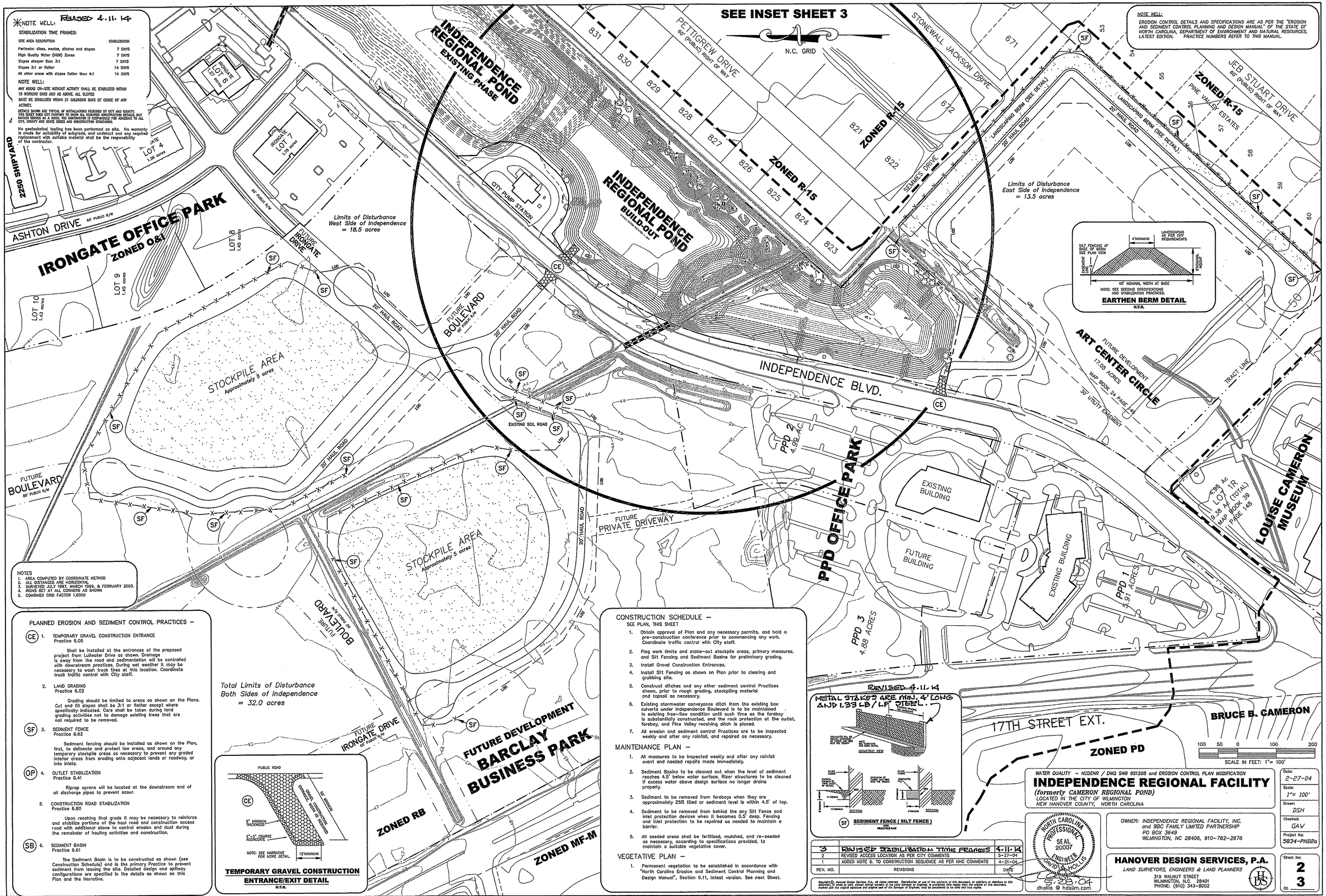

NOTE WELL: REVISED 4.11.14

STABILIZATION TIME FRAMES:

SITE AREA DESCRIPTION	STABILIZATION
Perimeter dikes, swales, ditches and slopes	7 DAYS
High Quality Water (HQW) Zones	7 DAYS
Slopes steeper than 3:1	7 DAYS
Slopes 3:1 or flatter	14 DAYS
All other areas with slopes flatter than 4:1	14 DAYS

NOTE WELL:

ANY AREAS ON-SITE WITHOUT ACTIVITY SHALL BE STABILIZED WITHIN 15 WORKING DAYS AND AS ABOVE. ALL SLOPES MUST BE STABILIZED WITHIN 21 CALENDAR DAYS OF CEASE OF ANY ACTIVITY.

DETAILS SHOWN ARE TYPICAL OF INSTALLATIONS REQUIRED BY CITY AND COUNTY. THIS SHEET DOES NOT PURPORT TO SHOW ALL REQUIRED CONSTRUCTION DETAILS, BUT RATHER SERVES AS A GUIDE. THE CONTRACTOR IS RESPONSIBLE FOR ADHERENCE TO ALL CITY, COUNTY AND STATE CODES AND CONSTRUCTION STANDARDS.

No geotechnical testing has been performed on site. No warranty is made for suitability of subgrade, and undercut and any required replacement with suitable material shall be the responsibility of the contractor.

NOTE WELL:

EROSION CONTROL DETAILS AND SPECIFICATIONS ARE AS PER THE "EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL" OF THE STATE OF NORTH CAROLINA, DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES, LATEST EDITION. PRACTICE NUMBERS REFER TO THIS MANUAL.

NOTES
1. AREA COMPUTED BY COORDINATE METHOD
2. ALL DISTANCES ARE HORIZONTAL
3. SURVEYED JULY 1997, MARCH 1999, & FEBRUARY 2003.
4. IRONS SET AT ALL CORNERS AS SHOWN
5. COMBINED GRID FACTOR 1.0000

PLANNED EROSION AND SEDIMENT CONTROL PRACTICES –

(CE) 1. TEMPORARY GRAVEL CONSTRUCTION ENTRANCE
Practice 6.05

Shall be installed at the entrances of the proposed project from Lullwater Drive as shown. Drainage is away from the road and sedimentation will be controlled with downstream practices. During wet weather it may be necessary to wash truck tires at this location. Coordinate truck traffic control with City staff.

2. LAND GRADING
Practice 6.02

Grading should be limited to areas as shown on the Plans. Cut and fill slopes shall be 3:1 or flatter except where specifically indicated. Care shall be taken during land grading activities not to damage existing trees that are not required to be removed.

(SF) 3. SEDIMENT FENCE
Practice 6.62

Sediment fencing should be installed as shown on the Plan, first, to delineate and protect low areas, and around any temporary stockpile areas as necessary to prevent any graded interior areas from eroding onto adjacent lands or roadway, or into inlets.

(OP) 4. OUTLET STABILIZATION
Practice 6.41

Riprap aprons will be located at the downstream end of all discharge pipes to prevent scour.

5. CONSTRUCTION ROAD STABILIZATION
Practice 6.80

Upon reaching final grade it may be necessary to reinforce and stabilize portions of the haul road and construction access road with additional stone to control erosion and dust during the remainder of hauling activities and construction.

(SB) 6. SEDIMENT BASIN
Practice 6.61

The Sediment Basin is to be constructed as shown (see Construction Schedule) and is the primary Practice to prevent sediment from leaving the site. Detailed design and spillway configurations are specified in the details as shown on this Plan and the Narrative.

CONSTRUCTION SCHEDULE –
SEE PLAN, THIS SHEET

1. Obtain approval of Plan and any necessary permits, and hold a pre-construction conference prior to commencing any work. Coordinate traffic control with City staff.
2. Flag work limits and stake-out stockpile areas, primary measures, and Silt Fencing and Sediment Basins for preliminary grading.
3. Install Gravel Construction Entrances.
4. Install Silt Fencing as shown on Plan prior to clearing and grubbing site.
5. Construct ditches and any other sediment control Practices shown, prior to rough grading, stockpiling material and topsoil as necessary.
6. Existing stormwater conveyance ditch from the existing box culverts under Independence Boulevard is to be maintained in existing free-flow condition until such time as the forebay is substantially constructed, and the rock protection at the outlet, forebay, and Pine Valley receiving ditch is placed.
7. All erosion and sediment control Practices are to be inspected weekly and after any rainfall, and repaired as necessary.

MAINTENANCE PLAN –

1. All measures to be inspected weekly and after any rainfall event and needed repairs made immediately.
2. Sediment Basins to be cleaned out when the level of sediment reaches 4.5' below water surface. Riser structures to be cleaned if excess water above design surface no longer drains properly.
3. Sediment to be removed from forebays when they are approximately 25% filled or sediment level is within 4.5' of top.
4. Sediment to be removed from behind the any Silt Fence and inlet protection devices when it becomes 0.5' deep. Fencing and inlet protection to be repaired as needed to maintain a barrier.
5. All seeded areas shall be fertilized, mulched, and re-seeded as necessary, according to specifications provided, to maintain a suitable vegetative cover.

VEGETATIVE PLAN –

1. Permanent vegetation to be established in accordance with "North Carolina Erosion and Sediment Control Planning and Design Manual", Section 6.11, latest version. See next Sheet.

REVISED 4.11.14
METAL STAKES ARE MIN. 4' LONG AND 1.33 LB/LF STEEL.

REV. NO.	REVISIONS	DATE
3	REVISED STABILIZATION TIME FRAMES	4-11-14
2	REVISED ACCESS LOCATION AS PER CITY COMMENTS	5-27-04
1	ADDED NOTE & TO CONSTRUCTION SEQUENCE AS PER NHC COMMENTS	4-21-04

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NORTH CAROLINA PROFESSIONAL SEAL 20007 ENGINEER DAVID HOLLIS
5.28.04
dhollis @ hdslim.com

WATER QUALITY – NCDENR / DWQ SWB 951208 and EROSION CONTROL PLAN MODIFICATION

INDEPENDENCE REGIONAL FACILITY

(formerly CAMERON REGIONAL POND)
LOCATED IN THE CITY OF WILMINGTON
NEW HANOVER COUNTY, NORTH CAROLINA

OWNER: INDEPENDENCE REGIONAL FACILITY, INC.
and BBC FAMILY LIMITED PARTNERSHIP
PO BOX 3649
WILMINGTON, NC 28406, 910-762-2676

HANOVER DESIGN SERVICES, P.A.
LAND SURVEYORS, ENGINEERS & LAND PLANNERS
319 WALNUT STREET
WILMINGTON, N.C. 28401
PHONE: (910) 343-8002

Date: 2-27-04
Scale: 1"= 100'
Drawn: DSH
Checked: GAW
Project No: 5834-PND2a
Sheet No: 2 Of: 3

: 09:40:49 05/28/2004

POND SUMMARY:

FOREBAY VOLUME:
Volume provided = 383,820 cf

STATE WATER QUALITY POND CONSIDERATIONS –
Surface Area required = 355,450 sf
Surface Area provided = 420,000 sf
Storage Volume required = 503,554 cf
Storage Volume provided = 525,810 cf
Storage Volume Drawdown Time = 3 days

PEAK DISCHARGE SUMMARY –
Q(10) post–developed = 120 cfs @ WSEL = 40.0
Q(50) post–developed = 288 cfs @ WSEL = 41.6
Q(100) post–developed = 373 cfs @ WSEL = 42.0

POND SEDIMENTATION CONSIDERATIONS –
Storage Volume required = 204 X 1800 = 367,000 cf
Storage Volume provided = 2,000,000 cf
MIN. SA = 435 x Q10 = 52,200 SF

REVISED 4-11-14

POND DESIGN DATA

INDEPENDENCE RETENTION FACILITY
(CAMERON REGIONAL POND) –
Additional Calculation Summary for DWQ – SW8 951208
WATER QUALITY CONSIDERATIONS – ULTIMATE BUILD–OUT
Impervious area calculations: See Project Data Sheet
EXISTING IMPERVIOUS = 38 acres
TOTAL IMPERVIOUS =142.8 acres
TOTAL AREA DRAINING TO POND = 204 acres

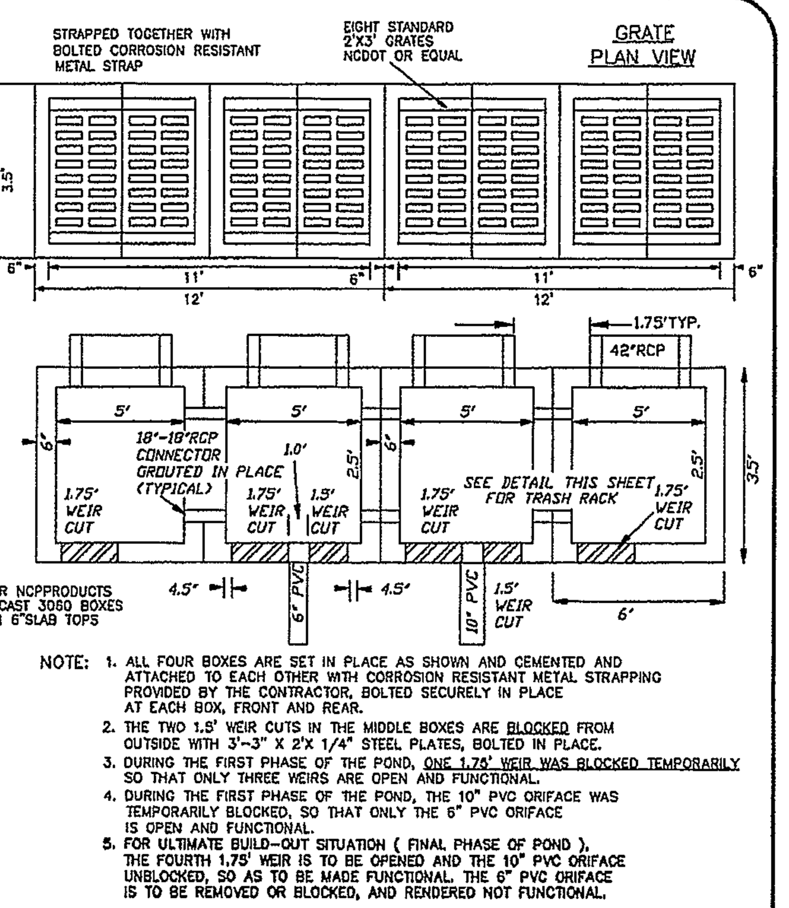
Retention of first 1" of run–off:
204 acres total – 142.8 acres impervious = 61.2 ac. green area
SA REQUIRED: 142.8 x 0.95 + 61.2 x 0.15 / 204 = 0.71, or 71%

At 7.0' depth, 90% TSS removal, from chart – SA factor = 4.0
204 x 0.01 x 4.0 = 8.16 acres = 355,450 sf SA REQUIRED
At Elev. = 36.0 SA = 9.64 acres = 420,000 sf SA PROVIDED

VOLUME REQUIRED: R=[(P)(Pj)(Rv)/12](A)

SEE PAGES A.1 and A.2, "Controllin Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs"
(P) = 1" (Pj) = 0.9 Rv = 0.05 + 0.9(142.8/204) = 0.680
R= [(1)(0.680)/12](204) = 11.56 acre–ft
REQUIRED STORAGE = 503,554 cf
PROVIDED STORAGE = 525,810 cf @ ELEVATION 37.2
DRAWDOWN –
Average head from storage elevation to orifice –
37.2 – 36.0 / 2 = 0.6'
6" PVC drain to draw–down pond:
Orifice equation: Q = CA(2gh)^1/2
Q = 0.6(.545)(64.4 X 0.6)^1/2
= 2.03 cfs
T = 258,700 sec. = 3 days OKAY

FOREBAY REQUIREMENTS –
Approximate capacity = 2,071,745 X 20% = 414,000 cf
Provided capacity = 383,820 cf



NOTE: 1. ALL FOUR BOXES ARE SET IN PLACE AS SHOWN AND CEMENTED AND ATTACHED TO EACH OTHER WITH CORROSION RESISTANT METAL STRAPPING PROVIDED BY THE CONTRACTOR, BOLTED SECURELY IN PLACE AT EACH BOX, FRONT AND REAR.
2. THE TWO 1.5" WEIR CUTS IN THE MIDDLE BOXES ARE BLOCKED FROM OUTSIDE WITH 3"–3" X 2"X 1/4" STEEL PLATES, BOLTED IN PLACE.
3. DURING THE FIRST PHASE OF THE POND, ONE 1.75" WEIR WAS BLOCKED TEMPORARILY SO THAT ONLY THREE WEIRS ARE OPEN AND FUNCTIONAL.
4. DURING THE FIRST PHASE OF THE POND, THE 10" PVC ORIFACE WAS TEMPORARILY BLOCKED, SO THAT ONLY THE 6" PVC ORIFACE IS OPEN AND FUNCTIONAL.
5. FOR ULTIMATE BUILD–OUT SITUATION (FINAL PHASE OF POND), THE FOURTH 1.75" WEIR IS TO BE OPENED AND THE 10" PVC ORIFACE UNBLOCKED, SO AS TO BE MADE FUNCTIONAL. THE 6" PVC ORIFACE IS TO BE REMOVED OR BLOCKED, AND RENDERED NOT FUNCTIONAL.

EXISTING OUTLET STRUCTURE DETAILS
NOT TO SCALE

(SF) Sediment Fence (Silt Fence)

Specification 6.62 – Construction Specifications
MATERIALS
1. Use a synthetic filter fabric or a pervious sheet of polypropylene, nylon, polyester, or polyethylene yarn, which is certified by the manufacturer or supplier as conforming to the requirements shown in Table 6.62b. Synthetic filter fabric should contain ultraviolet ray inhibitors and stabilizers to provide a minimum of 6 months of expected usable construction life at a temperature range of 0 to 120 F.
2. Ensure that posts for sediment fences are either 4–inch diameter pine, 2–inch diameter oak, or 1.33 lb/linear ft steel with a minimum length of 4 ft. Make sure that steel posts have projections to facilitate fastening the fabric.
3. For reinforcement of standard strength filter fabric, use wire fence with a minimum 14 gauge and a maximum mesh spacing of 6 inches.

Table 6.62b
Specifications For Sediment Fence Fabric
Physical Property Requirements
Filtering Efficiency – 85% (mm)
Tensile Strength at Standard Strength– 30 lb/lin in (min)
Extra Strength– 50 lb/lin in (mm)
Slurry Flow Rate – 0.3 gal/sq ft/min (min)
CONSTRUCTION
1. Construct the sediment barrier of standard strength or extra strength synthetic filter fabrics.
2. Ensure that the height of the sediment fence does not exceed 18 inches above the ground surface. (Higher fences may impound volumes of water sufficient to cause failure of the structure.)
3. Construct the filter fabric from a continuous roll cut to the length of the barrier to avoid joints. When joints are necessary, securely fasten the filter cloth only at a support post with overlap to the next post.
4. Support standard strength filter fabric by wire mesh fastened securely to the up slope side of the posts using heavy duty wire staples at least 1 inch long, or tie wires. Extend the wire mesh support to the bottom of the trench.
5. When a wire mesh support fence is used, space posts a maximum of 8 ft apart. Support posts should be driven securely into the ground to a minimum of 18 inches.
6. Extra strength filter fabric with 6ft post spacing does not require wire mesh support fence. Staple or wire the filter fabric directly to posts.
7. Excavate a trench approximately 4 inches wide and 8 inches deep along the proposed line of posts and upslope from the barrier (figure 6.62a).
8. Backfill the trench with compacted soil or gravel placed over the filter fabric.
9. Do not attach filter fabric to existing trees.
Maintenance
Inspect sediment fences at least once a week and after each rainfall. Make any required repairs immediately.
Should the fabric of a sediment fence collapse, tear, decompose or become ineffective, replace it promptly. Replace burlap every 60 days.
Remove sediment deposits as necessary to provide adequate storage volume for the next rain and to reduce pressure on the fence. Take care to avoid undermining the fence during cleanout.
Remove all fencing materials and unstable sediment deposits and bring the area to grade and stabilize it after the contributing drainage area has been properly stabilized.

(CE) Temporary Gravel Construction Entrance/Exit

Specification # 6.08 – Construction Specifications
1. Clear the entrance and exit area of all vegetation, roots and other objectionable material and properly grade it.
2. Place the gravel to the specific grade and dimensions shown on the plans and smooth it.
3. Provide drainage to carry water to a sediment trap or other suitable outlet.
4. Use geotextile fabrics because they improve stability of the foundation in locations subject to seepage or high water table.

Maintenance
Maintain the gravel pad in a condition to prevent mud or sediment from leaving the construction site. This may require periodic topdressing with 2–inch stone. After each rainfall, inspect any structure used to trap sediment and clean it out as necessary. Immediately remove all objectionable materials spilled, washed, or tracked onto public roadways.

(SB) Sediment Basin

Specifications # 6.61 – Construction Specifications
1. Site preparations–Clear, grub and strip topsoil from areas under the embankment to remove trees, vegetation, roots and other objectionable material. Delay clearing the pool area until the dam is complete and then remove brush, trees and other objectionable materials to facilitate sediment cleanout. Stockpile all topsoil or soil containing organic matter for use on the outer shell of the embankment to facilitate vegetative establishment. Place temporary sediment control measures below the basin as needed.
2. Cut–off trench–Excavate a cut–off trench along the centerline of the earth fill embankment. Cut the trench to stable soil material, but in no case make it less than 2 ft. deep. The cut–off trench must extend into both abutments to at least the elevation of the riser crest. Make the minimum bottom width wide enough to permit operation of excavation and compaction equipment but in no case less than 2 ft. Make side slopes of the trench no steeper than 1:1. Compaction requirements are the same as those for the embankment. Keep the trench dry during backfilling and compaction operations.
3. Embankment–Take fill material from the approved areas shown on the plans. It should be clean mineral soil, free of roots, woody vegetation, rocks and other objectionable material. Scarify areas on which fill is be placed before placing fill. The fill material must contain sufficient moisture so it can be formed by hand into a ball without crumbling. If water can be squeezed out of the ball, it is too wet for proper compaction. Place fill material in 6 to 8–inch continuous layers over the entire length of the fill area and then compact it. Compaction may be obtained by routing the construction hauling equipment over the fill so that the entire surface of each layer is traversed by at least one wheel or tread track of the heavy equipment, or a compactor may be used. Construct the embankment to an elevation 10% higher than the design height to allow for settling.
4. Conduit spillways–Securely attach the riser to the barrel or barrel stub to make a watertight structural connection. Secure all connections between barrel sections by approved watertight assemblies. Place the barrel and riser on a firm, smooth foundation of impervious soil. Do not use pervious material such as sand, gravel, or crushed stone as backfill around the pipe or anti–seep collars. Place the fill material around the pipe spillway in 4–inch layers and compact it under and around the pipe to at least the same density as the adjacent embankment. Care must be taken not to raise the pipe from firm contact with its foundation when compacting under the pipe haunches.
Place a minimum depth of 2ft. of hand–compacted backfill over the pipe spillway before crossing it with construction equipment. Anchor the riser in place by concrete or other satisfactory means to prevent flotation. In no case should the pipe conduit be installed by cutting a trench through the dam after the embankment is complete.
5. Emergency spillway–Install the emergency spillway in undisturbed soil. The achievement of planned elevations, grade, design width, and entrance and exit channel slopes are critical to the successful operation of emergency spillway.
6. Inlets–Discharge water into the basin in a manner to prevent erosion. Use diversions with outlet protection to divert sediment–laden water to the upper end of the pool area to improve basin trap efficiency (References: Runoff Control Measures and Outlet Protection).
7. Erosion control–Construct the structure so that the disturbed area is minimized. Divert surface water away from bare areas. Complete the embankment before the area is cleared. Stabilize the emergency spillway embankment and all other disturbed areas above the crest of the principal spillway immediately after construction (References: Surface Stabilization).
8. Safety–Sediment basins may attract children and can be dangerous. Avoid steep side slopes, and fence and mark basins with warning signs if trespassing is likely. Follow all state and local requirements.

Maintenance
Check sediment basins after periods of significant runoff. Remove sediment and restore the basin to its original dimensions when sediment accumulates to one–half the design depth.
Check the embankment, spillways, and outlet for erosion damage, and inspect the embankment for piping and settlement. Make all necessary repairs immediately. Remove all trash and other debris from the riser and pool area.

(OP) Outlet Stabilization Structure

Specification # 6.41 – Construction Specifications
1. Ensure that the subgrade for the filter and riprap follows the required lines and grades shown in the plan. Compact any fill required in the subgrade to the density of the surrounding undisturbed material. Low areas in the subgrade on undisturbed soil may also be filled by increasing the riprap thickness.
2. The riprap and gravel filter must conform to the specified grading limits shown on the plans.
3. Filter cloth, when used, must meet design requirements and be properly protected from punching or tearing during installation. Repair any damage by removing the riprap and placing another piece of filter cloth over the damaged area. All connecting joints should overlap a minimum of 1 ft. If the damage is extensive, replace the entire filter cloth.
4. Riprap may be placed by equipment, but take care to avoid damaging the filter.
5. The minimum thickness of the riprap should be 1.5 times the maximum stone diameter.
6. Riprap may be field stone or rough quarry stone. It should be hard, angular, highly weather–resistant and well graded.
6. Construct the apron on zero grade with no overfall at the end. Make the top of the riprap at the downstream end level with the receiving area or slightly below it.
8. Ensure that the apron is properly aligned with the receiving stream and preferably straight throughout its length. If a curve is needed to fit site conditions, place it in the upper section of the apron.
9. Immediately after construction, stabilize all disturbed areas with vegetation (Practice 6.10, Temporary Seeding, and 6.11, Permanent Seeding).
Maintenance
Inspect riprap outlet structures after heavy rains to see if any erosion around or below the riprap has taken place or if stones have been dislodged. Immediately make all needed repairs to prevent further damage.

NOTE : NO REGULATED WETLANDS ON SITE. PORTABLE PUMPS TO BE USED TO DRAW DOWN POND IN EMERGENCY.

Temporary Seeding

Specification # 6.10 – Specifications

Complete grading before preparing seedbeds and install all necessary erosion control practices, such as dikes, waterways and basins. Minimize steep slopes because they make seedbed preparation difficult and increase the erosion hazard. If soils become compacted during grading, loosen them to a depth of 6–8 inches using a ripper, harrow, or chisel plow.

Seedbed Preparation
Good seedbed preparation is essential to successful plant establishment. A good seedbed is well–pulverized, loose and uniform. Where hydroseeding methods are used, the surface may be left with a more irregular surface of large clods and stones.
Liming – Apply lime according to soil test recommendations. If the pH (acidity) of the soil is not known, an application of ground agricultural limestone at the rate of 1 to 1 1/2 tons/acre on coarse–textured soils and 2–3 tons/acres on fine–textured soils is usually sufficient. Apply limestone uniformly and incorporate into the top 4–6 inches of soil. Soils with a pH of 6 or higher need not be limed.
Fertilizer– Base application rates on soil tests. When these are not possible, apply a 10–10–10 grade fertilizer at 700–1,000 lb./acre. Both fertilizer and lime should be incorporated into the top 4–6 inches of soil. If a hydraulic seeder is used, do not mix seed and fertilizer more than 30 minutes before application.
Surface roughening– If recent tillage operations have resulted in a loose surface, additional roughening may not be required except to break up large clods. If rainfall causes the surface to become sealed or crusted, loosen it just prior to seeding by disking, raking, harrowing, or other suitable methods. Groove or furrow slopes steeper than 3:1 on the contour before seeding (Practice 6:03, Surface Roughening).

Plant Selection
Select an appropriate species or species mixture from Table 6.10a, for seeding in late winter and early spring, Table 6.10b for summer, and Table 6.10c for fall.

Seeding
Evenly apply seed using a cyclone seeder (broadcast), drill, cultipacker seeder, or hydroseeder. Use seeding rates given in Table 6.10a–6.10c. Broadcast seeding and hyroseeding are appropriate for steep slopes where equipment cannot be driven. Hand broadcasting is not recommended because of the difficulty in achieving a uniform distribution. Small grains should be planted no more than 1 inch deep, and grasses and legumes no more than 1/2 inch. Broadcast seed must be covered by raking or chain dragging, and then lightly firmed with a roller or cultipacker. Hydroseeded mixtures should include a wood fiber (cellulose) mulch.

Mulching
The use of appropriate mulch will help ensure establishment under normal conditions and is essential to seeding success under harsh site condition (Practice 6.14, Mulching). Harsh site conditions include:
–seeding in fall for winter cover (wood fiber mulches are not considered adequate for this use),
–slopes steeper than 3:1,
–excessively hot or dry weather,
–adverse soils(shallow, rocky, or high in clay or sand), and
–areas receiving concentrated flow.
If the area to be mulched is subject to concentrated waterflow, as in channels, anchor mulch with netting (Practice 6.14, Mulching).

Table 6.10a – Temporary Seeding Recommendation for Late Winter and Early Spring
Seeding mixture
Species– Rye(grain), Annual lespedeza (Kobe in Piedmont and Coastal Plain
Rate (lb/acre)– 120
Omit annual lespedeza when duration of temporary cover is not to extend beyond June
Seeding dates–Coastal Plain – Dec. 1 – Apr. 15.
Soil amendments– Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10–10–10 fertilizer.
Mulch–Apply 4,000lb/acre straw. Anchor straw by tacking with asphalt, netting or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.
Maintenance – Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.

Table 6.10b – Temporary Seeding Recommendations for Summer
Seeding mixture
Species–German millet
Rate(lb/acre)– 40
Seeding dates–Coastal Plain– Apr. 15–Aug. 15
Soil amendments–Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10–10–10 fertilizer.
Mulch –Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.
Maintenance–Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.

Table 6.10c – Temporary Seeding Recommendation for Fall
Seeding mixture
Species–Rye(grain)
Rate(lb/acre) – 120
Seeding dates – Coastal Plain and Piedmont–Aug 15 – Dec. 30
Soil amendments – Follow soil tests or apply 2,000 lb./acre ground agricultural limestone and 1,000 lb/acre 10–10–10 fertilizer.
Mulch– Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.
Maintenance– Repair and refertilize damaged areas immediately. Topdress with 50 lb/acre of nitrogen in March, if it is necessary to extend temporary cover beyond June 15, overseed with 50 lb/acre Kobe (Piedmont and Coastal Plain)

Land Grading

Specification # 6.02 – Construction Specifications
1. Construct and maintain all erosion and sedimentation control practices and measures in accordance with the approved sedimentation control plan and construction schedule.
2. Remove good topsoil from areas to be graded and filled, and preserve it for use in finishing the grading of all critical areas.
3. Scarify areas to be topsoiled to a minimum depth of 2 inches before placing topsoil (Practice 6.04, Topsoiling).
4. Clear and grub areas to be filled to remove trees, vegetation, roots, or other objectionable material that would affect the planned stability of the fill.
5. Ensure that fill material is free of brush, rubbish, rocks, logs, stumps, building debris, and other materials inappropriate for constructing stable fills.
6. Place all fill in layers not to exceed 9 inches in thickness, and compact the layers as required to reduce erosion, slippage, settlement, or other related problems.
7. Do not incorporate frozen material or soft, mucky, or highly compressible materials into fill slopes.
8. Do not place fill on a frozen foundation, due to possible subsidence and slippage.
9. Keep diversions and other water conveyance measures free of sediment during all phases of development.
10. Handle seeps or springs encountered during construction in accordance with approved methods (Practice 6.81, Subsurface Drain).
11. Permanently stabilize all graded areas immediately after final grading is completed on each area in the grading plan. Apply temporary stabilization measures on all graded areas when work is to be interrupted or delayed for 30 working days or longer.
12. Ensure that topsoil stockpiles, borrow areas, and spoil areas are adequately protected from erosion with temporary and final stabilization measures, including sediment fencing and temporary seeding as necessary.

Maintenance
Periodically check all graded areas and the supporting erosion and sedimentation control practices, especially after heavy rainfalls. Promptly remove all sediment from diversions and other water–disposal practices. If washouts or breaks occur, repair them immediately. Prompt maintenance of small eroded areas before they become significant gullies is an essential part of an effective erosion and sedimentation control plan.

Permanent Seeding

Specifications # 6.11 – Specifications

Seedbed Requirements
Establishment of vegetation should not be attempted on sites that are unsuitable due to inappropriate soil texture (Table 6.11a), poor drainage, concentrated overland flow, or steepness of slope until measures have been taken to correct these problems.
To maintain a good stand of vegetation, the soil must meet certain minimum requirements as a growth medium. The existing soil should have these criteria:

- Enough fine–grained (silt and clay) material to maintain adequate moisture and nutrient supply (available water capacity of at least .05 inches water to 1 inch of soil).
- Sufficient pore space to permit root penetration.
- Sufficient depth of soil to provide an adequate root zone. The depth to rock or impermeable layers such as hardpans should be 12 inches or more, except on slopes steeper than 2:1 where the addition of soil is not feasible.
- A favorable pH range for plant growth, usually 6.0–6.5.
- Freedom from large roots, branches, stones, large clods of earth, or trash of any kind. Clods and stones may be left on slopes steeper than 3:1 if they are to be hydroseeded.

If any of the above criteria are not met–i.e., if the existing soil is too coarse, dense, shallow or acidic to foster vegetation–special amendments are required. The soil conditioners described below may be beneficial or, preferably, topsoil may be applied in accordance with Practice 6.04, Topsoiling.

Soil Conditioners
In order to improve the structure or drainage characteristics of a soil, the following material may be added. These amendments should only be necessary where soils have limitations that make them poor for plant growth or for fine turf establishment (see Chapter 3, Vegetative Considerations).

Peat–Appropriate types are sphagnum moss peat, hypnum moss peat, reedsedge peat, or peat humus, all from fresh–water sources. Peat should be shredded and conditioned in storage piles for at least 6 months after excavation.
Sand–clean and free of toxic materials
Vermiculite–horticultural grade and free of toxic substances.
Rotted manure–stable or cattle manure not containing undue amounts of straw or other bedding materials.
Thoroughly rotted sawdust– free of stones and debris. Add 6 lb. Of nitrogen to each cubic yard.
Sludge–Treated sewage and industrial sludges are available in various forms: these should be used only in accordance with local, State and Federal regulations.

Species Selection
Use the key to Permanent Seeding Mixtures (Table 6.11b) to select the most appropriate seeding mixture based on the general site and maintenance factors. A listing of species, including scientific names and characteristics, is given in Appendix 8.02.

Seedbed Preparation
Install necessary mechanical erosion and sedimentation control practices before seeding, and complete grading according to the approved plan.
Lime and fertilizer needs should be determined by soil tests. Soil testing is performed free of charge by the North Carolina Department of Agriculture soil testing laboratory. Directions, sample cartons, and information sheets are available through county agricultural extension offices or from NCDA. Because the NCDA soil testing lab requires 1–6 weeks for sample turn–around, sampling must be planned well in advance of final grading. Testing is also done by commercial laboratories.
When soil test are not available, follow rates suggested on the individual specification sheet for the seeding mix chosen (Tables 6.11c through 6.11v). Applications rates usually fall into the following ranges:
- Ground agricultural limestone
  Light–textured, sandy soils: 1–1 1/2 tons/acre
  Heavy textured, clayey soils 2–3 tons/acre
- Fertilizer:
  Grasses 800–1200 lb/acre of 10–10–10 (or the equivalent)
  Grass–legume mixtures: 800–1200 lb/acre of 5–10–10 (or the equivalent)

Apply lime and fertilizer evenly and incorporate into the top 4–6 inches of soil by disking or other suitable means. Operate machinery on the contour. When using a hydroseeder, apply lime and fertilizer to a rough, loose surface.

Roughen surfaces according to Practice 6.03, Surface Roughening.
Complete seedbed preparation by breaking up large clods and raking into a smooth, uniform surface (slope less than 3:1) Fill in or level depressions than can collect water. Broadcast seed into a freshly loosened seedbed that has not been sealed by rainfall.

Note Well: See Landscaping Plan for additional specifications.

Table 6.11s – Seeding No. 4CP for:
Well–Drained Sandy loams to Dry Sands, Coastal Plain; Low to Medium–Care Lawns
Seeding mixture
Species – Centipedegrass – Rate – 10–20 lb/acre (seed) or 33 bu/acre (sprigs)
Seeding dates – Mar. – June, (Sprigging can be done through July where water is available for irrigation.)
Soil amendments – Apply lime and fertilizer according to soil test, or apply 300 lb/acre 10–10–10.
Sprigging – Plant sprigs in furrows with a tractor–drawn transplanter, or broadcast by hand.
Furrows should be 4–6 inches deep and 2ft apart. Place sprigs about 2 ft. apart in the row with one end at or above ground level (Figure 6.11d).
Broadcast at rates shown above, and press sprigs into the top 1 1/2 inches of soil with a disk set straight so that sprigs are not brought back toward the surface.
Mulch – Do not mulch
Maintenance – Fertilize very sparingly– 20 lb/acre nitrogen in spring with no phosphorus. Centipedegrass cannot tolerate high pH or excess fertilizer.

Table 6.11t – Seeding No. 5CP for: Well–Drained Sandy Loams to Dry Sands; Low Maintenance
Seeding mixture

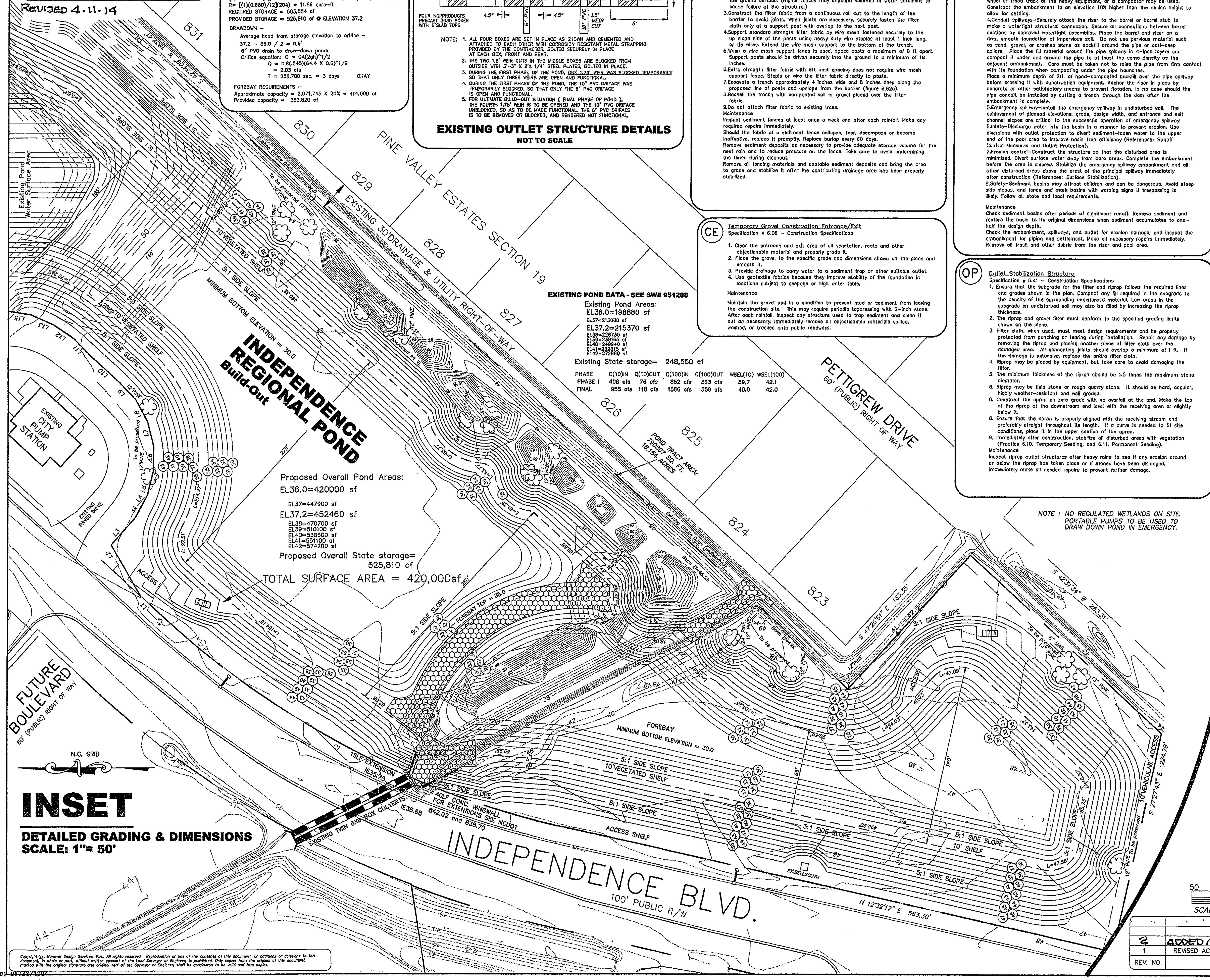
Species	Rate (lb/acre)
Pensacola Bahiagrass	50
Sericea lespedeza	30
Common Bermudagrass	10
German millet	10

Seeding notes
1. Where a neat appearance is desired, omit sericea
2. Use common Bermudagrass only on isolated sites where it cannot become a pest. Bermudagrass may be replaced with 5 lb/acre centipedgrass.

Seeding dates – Apr. 1 – July 15
Soil amendments – Apply lime and fertilizer according to soil tests, or apply 3,000 lb/acre ground agricultural limestone and 500 lb/acre 10–10–10 fertilizer.
Mulch
Apply 4,000 lb/acre grain straw or equivalent cover of another suitable mulch. Anchor by tacking with asphalt, roving and netting or by crimping with a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.
Maintenance – Refertilize the following Apr. with 50 lb/acre nitrogen. Repeat as growth requires. May be mowed only once a year. Where a neat appearance is desired, omit sericea and now as often as needed.

Table 6.11v – Seeding No. 7CP for: Grass–lined Channels; Coastal Plain
Seeding Mixture
Species – Common Bermudagrass – Rate – 40–80 (1/2 lb/1,000 ft)
Seeding dates – Coastal Plain; Apr – July
Soil amendments – Apply lime and fertilizer according to soil tests, or apply 3,000 lb/acre ground agricultural limestone and 500 lb/acre 10–10–10 fertilizer.
Mulch – Use jute, excelsior matting, or other effective channel lining material to cover the bottom of channels and ditches. The lining should extend above the highest calculated depth of flow. On channel side slopes above this height, and in drainages not requiring temporary linings, apply 4,000 lb/acre grain straw and anchor straw by stapling netting over the top.
Mulch and anchoring materials must be allowed to wash down slopes where they can clog drainage devices.
Maintenance –A minimum of 3 weeks is required for establishment. Inspect and repair mulch frequently. Refertilize the following Apr. with 50 lb/acre nitrogen.

Refer to Appendix 8.02 for botanical names



EXISTING POND DATA - SEE SW8 951208
Existing Pond Areas:
EL36.0=198880 sf
EL37=213080 sf
EL37.2=215370 sf
EL38=226730 sf
EL39=238165 sf
EL40=249940 sf
EL41=262815 sf
EL42=272960 sf
Existing State storage= 248,550 cf

PHASE	Q(10)IN	Q(10)OUT	Q(100)IN	Q(100)OUT	WSEL(10)	WSEL(100)
PHASE I	408 cfs	76 cfs	852 cfs	363 cfs	39.7	42.1
FINAL	955 cfs	118 cfs	1566 cfs	359 cfs	40.0	42.0

Proposed Overall Pond Areas:
EL36.0=420000 sf
EL37=447900 sf
EL37.2=452460 sf
EL38=470700 sf
EL39=510100 sf
EL40=538600 sf
EL41=551100 sf
EL42=574200 sf
Proposed Overall State storage= 525,810 cf
TOTAL SURFACE AREA = 420,000sf

INSET
DETAILED GRADING & DIMENSIONS
SCALE: 1"= 50'

SCALE IN FEET: 1"= 50'

GRADING and WATER QUALITY – NCDENR / DWQ SW8 951208 PLAN MODIFICATION
INDEPENDENCE REGIONAL FACILITY
(formerly CAMERON REGIONAL POND)
LOCATED IN THE CITY OF WILMINGTON
NEW HANOVER COUNTY, NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20007 DAVID S. HOLLIS
dhollis@hdsilm.com

OWNER: INDEPENDENCE REGIONAL FACILITY, INC. and BBC FAMILY LIMITED PARTNERSHIP
PO BOX 3649
WILMINGTON, NC 28406, 910–762–2676

HANOVER DESIGN SERVICES, P.A.
LAND SURVEYORS, ENGINEERS & LAND PLANNERS
319 WALNUT STREET
WILMINGTON, N.C. 28401
PHONE: (910) 343–8002

REV. NO.	REVISIONS	DATE
2	ADDED MIN. SA REQ.	4-11-14
1	REVISED ACCESS AS PER CITY	5-27-04

5-28-04

Date: 2–27–04
Scale: 1"= 50'
Drawn: DSH
Checked: GAW
Project No: 5834–PND3a
Sheet No: 3 of 3

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Modification to Water Quality Plan NCDENR-DWQ SW8 951208

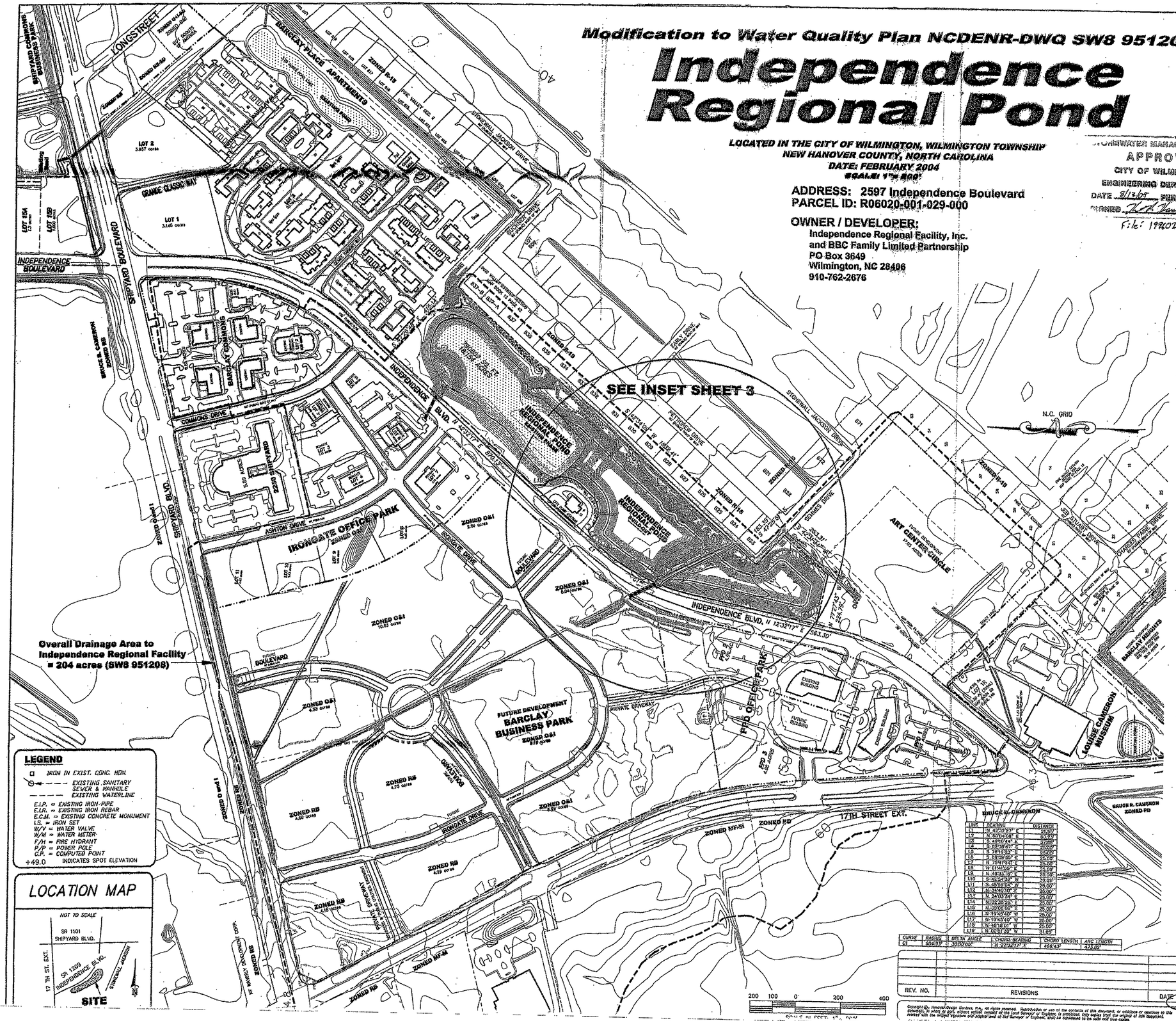
Independence Regional Pond

LOCATED IN THE CITY OF WILMINGTON, WILMINGTON TOWNSHIP
NEW HANOVER COUNTY, NORTH CAROLINA
DATE: FEBRUARY 2004
SCALE: 1"= 200'

ADDRESS: 2597 Independence Boulevard
PARCEL ID: R06020-001-029-000

OWNER / DEVELOPER:
Independence Regional Facility, Inc.
and BBC Family Limited Partnership
PO Box 3649
Wilmington, NC 28406
910-762-2676

STORMWATER MANAGEMENT PLAN
APPROVED
CITY OF WILMINGTON
ENGINEERING DEPARTMENT
DATE 3/13/04 PERMIT # 1996017
SIGNED
File: 199602)



LINE	BEARING	DISTANCE
L1	N 42°39'27" E	21.00'
L2	N 60°19'08" E	20.23'
L3	S 49°19'44" E	37.69'
L4	S 82°07'27" E	25.00'
L5	S 78°19'53" E	25.00'
L6	S 89°59'03" E	25.00'
L7	N 75°41'24" E	25.00'
L8	N 61°41'55" E	25.00'
L9	N 46°33'15" E	26.00'
L10	S 42°34'32" W	30.00'
L11	S 42°59'02" W	25.00'
L12	N 34°40'10" E	25.00'
L13	N 24°03'54" E	25.00'
L14	N 62°05'05" E	25.00'
L15	N 09°06'08" E	25.00'
L16	N 19°45'40" W	25.00'
L17	N 19°45'40" W	20.00'
L18	N 48°18'01" W	25.00'
L19	N 00°01'59" W	31.65'

CURVE	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH	ARC LENGTH
C1	504.93'	30°00'00"	N 27°32'17" E	466.43'	473.82'

REV. NO.	REVISIONS	DATE

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STANDARD NOTES:

1. Information concerning underground utilities was obtained from available records. It shall be the responsibility of the Contractor to determine the exact elevations and locations of all existing utilities at all crossings prior to commencing any excavation. If actual clearances are less than indicated on Plan, the Contractor shall contact the Design Engineer before proceeding with construction. Any condition discovered on existing that would necessitate a modification of these plans shall be brought to the attention of the Design Engineer before proceeding with construction.
2. NO CONSTRUCTION IS TO BEGIN BEFORE LOCATION OF EXISTING UTILITIES HAS BEEN DETERMINED. CALL "NC ONE-CALL" AT LEAST 48 HOURS BEFORE COMMENCING CONSTRUCTION.
3. All trees which are not required to be cleared for construction shall be preserved wherever possible unless otherwise directed.
4. The Contractor is responsible for controlling dust and erosion during construction as per approved Grading permit and shall be responsible for the cleanup.
5. No geotechnical testing has been performed on site. No warranty is made for suitability of subgrade, and undercut and any required replacement with suitable material shall be the responsibility of the contractor.

GENERAL NOTES:

1. This map is not for conveyance, recordation, or sales.
2. This property is not located within a special flood hazard area according to Flood Insurance Rate Map Community Panel #370171-0010B, effective date April 2, 1986.
3. Site area: 16.154 acres.
4. This property is zoned City of Wilmington R-15.
5. If the contractor desires City water for construction he shall apply in advance for this service and must provide a reduced pressure zone (RPZ) backflow prevention device on the developer's side of the water meter box.
6. Any irrigation system supplied by City water shall comply with City of Wilmington Cross Connection Control regulations. Call 343-3910 for information.

MORE GENERAL NOTES:

1. ALL CONSTRUCTION TO CONFORM TO CITY OF WILMINGTON STANDARDS AND APPLICABLE STATE & LOCAL CODES.
2. CONTRACTOR TO COORDINATE ANY REQUIRED TRAFFIC CONTROL WITH THE CITY OF WILMINGTON.
3. CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF ANY RELOCATIONS, RE-ALIGNMENTS, DISCONNECTIONS OR CONNECTIONS OF EXISTING UTILITIES WITH APPLICABLE AUTHORITIES.
4. CLEARING AND GRUBBING OF SITE TO INCLUDE REMOVAL OF EXISTING CURB, ASPHALT, INLETS, AND ANY OTHER STRUCTURES INCLUDING TREES, STUMPS AND DEBRIS EXISTING ON SITE. TREES NOT REQUIRED TO BE CLEARED FOR CONSTRUCTION SHALL REMAIN UNLESS OTHERWISE DIRECTED.

DESIGNER'S CERTIFICATION -

"I hereby certify that this plan has been prepared in accordance with the latest Wilmington Standards and Specifications for Stormwater Management and Chapter 20 of the Code of Ordinances of the City of Wilmington."

Signature:
Printed Name and Title: David S. Hollis, PE, PLS
Date: 3-01-04
Registration Number: PE # 20007

NORTH CAROLINA PROFESSIONAL SEAL 20007 ENGINEER DAVID S. HOLLIS

OWNER'S / DEVELOPER'S CERTIFICATION:

"I / We hereby certify that any clearing, grading, construction or development, or all of these, will be done pursuant to this plan and that the applicable Stormwater Management conditions and requirements of the City of Wilmington, the State of North Carolina, and the Federal Government and its agencies are hereby made part of this plan."

Signature:
Printed Name and Title: Jake V. Harden, Vice-President
Date: 3.24.04

INDEX TO DRAWINGS

SHEET No.	DESCRIPTION	DRAWING No.
1 OF 3	COVER SHEET and GENERAL NOTES	5834-PND1a
2 OF 3	EROSION and SEDIMENT CONTROL	5834-PND3a
3 OF 3	GRADING and WATER QUALITY MODIFICATION PLAN	5834-PND3a

BENCHMARK LOCATIONS AND ELEVATIONS

	LOCATION:	ELEVATION
1	NAIL IN PP # BB056 AT END OF EXISTING COMMONS (BUCKNER) DRIVE	44.40

NOTE WELL: THIS PLAN IS A MODIFICATION TO AN EXISTING PERMITTED FACILITY (SW8 951208) ALL PREVIOUSLY APPROVED DETAILS AND CONSTRUCTION SPECIFICATIONS SHALL APPLY.

Cover Sheet and General Notes – DENR / DWQ SW8 951208 MODIFICATION

INDEPENDENCE REGIONAL FACILITY
(formerly CAMERON REGIONAL POND)
LOCATED IN THE CITY OF WILMINGTON
NEW HANOVER COUNTY, NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL SEAL 20007 ENGINEER DAVID S. HOLLIS
3-24-04
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OWNER: INDEPENDENCE REGIONAL FACILITY, INC.
and BBC FAMILY LIMITED PARTNERSHIP
PO BOX 3649
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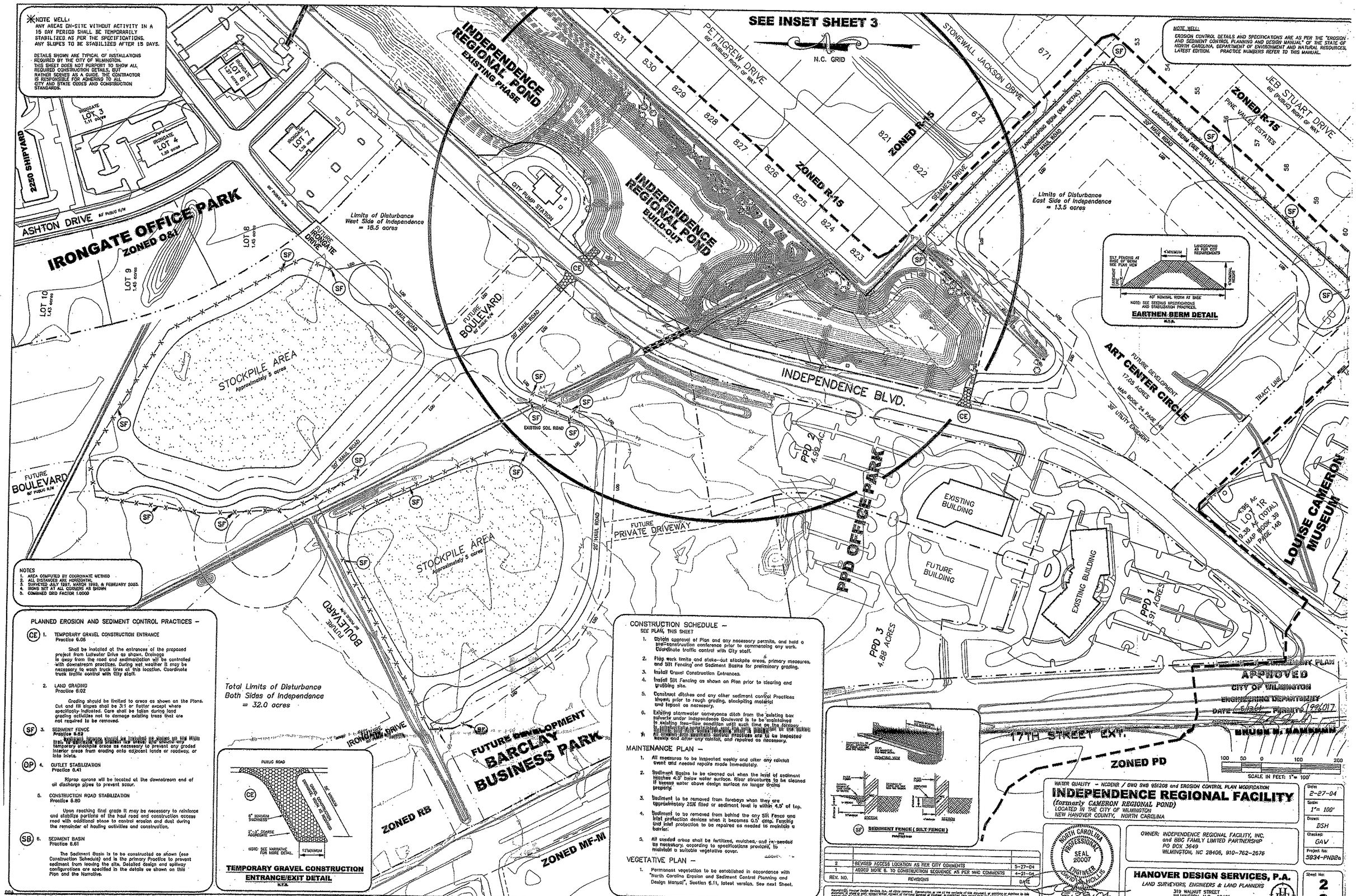
Date:	2-27-04
Scale:	1"= 200'
Drawn:	DSH
Checked:	GAW
Project No:	5834-PND1a
Sheet No:	1 of 3


SEE INSET SHEET 3
N.C. GRID
NOTE WELL:
ANY AREAS ON-SITE WITHOUT ACTIVITY IN A 15 DAY PERIOD SHALL BE TEMPORARILY STABILIZED AS PER THE SPECIFICATIONS. ANY SLOPES TO BE STABILIZED AFTER 15 DAYS.
DETAILS SHOWN ARE TYPICAL OF INSTALLATIONS REQUIRED BY THE CITY OF WILMINGTON. THIS SHEET DOES NOT PURPORT TO SHOW ALL REQUIRED CONSTRUCTION DETAILS, BUT RATHER SERVES AS A GUIDE. THE CONTRACTOR IS RESPONSIBLE FOR ADHERING TO ALL CITY AND STATE CODES AND CONSTRUCTION STANDARDS.
NOTE WELL:
EROSION CONTROL DETAILS AND SPECIFICATIONS ARE AS PER THE "EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL" OF THE STATE OF NORTH CAROLINA, DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES, LATEST EDITION. PRACTICE NUMBERS REFER TO THIS MANUAL.
INDEPENDENCE REGIONAL POND
EXISTING PHASE
INDEPENDENCE REGIONAL POND
BUILD-OUT
PETTIGREW DRIVE
60' (PUBLIC) RIGHT OF WAY
STONEWALL JACKSON DRIVE
SEMMES DRIVE
ZONED R-15
JEB STUDART DRIVE
60' (PUBLIC) RIGHT OF WAY
PINE VALLEY ESTATES
IRONGATE OFFICE PARK
ZONED O&I
IRONGATE LOT 3 1.11 acres
IRONGATE LOT 4 1.39 acres
IRONGATE LOT 6 1.39 acres
IRONGATE LOT 7 1.78 acres
LOT 8 1.45 acres
LOT 9 1.45 acres
LOT 10 1.43 acres
2250 SHIPYARD
ASHTON DRIVE
60' PUBLIC R/W
FUTURE IRONGATE DRIVE
CITY PUMP STATION
Limits of Disturbance West Side of Independence = 18.5 acres
Limits of Disturbance East Side of Independence = 13.6 acres
Total Limits of Disturbance Both Sides of Independence = 32.0 acres
FUTURE BOULEVARD
60' PUBLIC R/W
20' HAUL ROAD
STOCKPILE AREA
Approximately 5 acres
EXISTING SOIL ROAD
INDEPENDENCE BLVD.
PPD 2 4.96 AC
PPD OFFICE PARK
FUTURE PRIVATE DRIVEWAY
EXISTING BUILDING
FUTURE BUILDING
PPD 3 4.88 ACRES
PPD 1 4.91 ACRES
ART CENTER CIRCLE
FUTURE DEVELOPMENT
17.05 ACRES
MAP BOOK 24 PAGE 145
30' UTILITY EASEMENT
TRACT LINE
LOT 1R 9.38 AC (TOTAL) MAP BOOK 39 PAGE 148
LOUISE CAMERON MUSEUM
LANDSCAPING BERM (SEE DETAIL)
30' HAUL ROAD
EARTHEN BERM DETAIL
N.T.S.
40" NOMINAL WIDTH AT BASE
NOTE: SEE SEEDING SPECIFICATIONS AND STABILIZATION PRACTICES.
SILT FENCING AT EDGE OF BERM SEE PLAN VIEW
4' MINIMUM
LANDSCAPING AS PER CITY REQUIREMENTS
NOMINAL HEIGHT
FUTURE BOULEVARD
IRONGATE DRIVE
FUTURE DEVELOPMENT
BARCLAY BUSINESS PARK
ZONED RB
ZONED MF-N
ZONED PD
17TH STREET EXT.
BRUNSWICK COUNTY
SCALE IN FEET: 1" = 100'
100 50 0 100 200
SEDIMENT FENCE (SILT FENCE)
NOT TO SCALE
TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT DETAIL
N.T.S.
PUBLIC ROAD
8" MINIMUM THICKNESS
2"-3" COARSE AGGREGATE
12' MINIMUM
NOTE: SEE NARRATIVE FOR MORE DETAIL.
NOTES
1. AREA COMPUTED BY COORDINATE METHOD
2. ALL DISTANCES ARE HORIZONTAL
3. SURVEYED JULY 1997, MARCH 1998, & FEBRUARY 2003.
4. IRONS SET AT ALL CORNERS AS SHOWN
5. COMBINED GRID FACTOR 1.0000
PLANNED EROSION AND SEDIMENT CONTROL PRACTICES –
CE 1. TEMPORARY GRAVEL CONSTRUCTION ENTRANCE Practice 6.05
Shall be installed at the entrances of the proposed project from Ashwater Drive as shown. Drainage is away from the road and sedimentation will be controlled with downstream practices. During wet weather it may be necessary to wash truck tires at this location. Coordinate truck traffic control with City staff.
2. LAND GRADING Practice 6.02
Grading should be limited to areas as shown on the Plans. Cut and fill slopes shall be 3:1 or flatter except where specifically indicated. Care shall be taken during land grading activities not to damage existing trees that are not required to be removed.
SF 3. SEDIMENT FENCE Practice 6.62
Silt fence shall be installed around the perimeter of the work area, to contain the sediment on the site, and around temporary stockpile areas as necessary to prevent any graded interior areas from eroding onto adjacent lands or roadway, or into inlets.
OP 4. OUTLET STABILIZATION Practice 6.41
Riprap aprons will be located at the downstream end of all discharge pipes to prevent scour.
5. CONSTRUCTION ROAD STABILIZATION Practice 6.80
Upon reaching final grade it may be necessary to reinforce and stabilize portions of the haul road and construction access road with additional stone to control erosion and dust during the remainder of hauling activities and construction.
SB 6. SEDIMENT BASIN Practice 6.61
The Sediment Basin is to be constructed as shown (see Construction Schedule) and is the primary Practice to prevent sediment from leaving the site. Detailed design and spillway configurations are specified in the details as shown on this Plan and the Narrative.
CONSTRUCTION SCHEDULE –
SEE PLAN, THIS SHEET
1. Obtain approval of Plan and any necessary permits, and hold a pre-construction conference prior to commencing any work. Coordinate traffic control with City staff.
2. Flag work limits and stake-out stockpile areas, primary measures, and Silt Fencing and Sediment Basins for preliminary grading.
3. Install Gravel Construction Entrances.
4. Install Silt Fencing as shown on Plan prior to clearing and grubbing site.
5. Construct ditches and any other sediment control Practices shown prior to rough grading, stockpiling material and topsoil as necessary.
6. Existing stormwater conveyance ditch from the existing box culvert under Independence Boulevard is to be maintained in existing free-flow condition until such time as the forebay is installed and functional.
* All sediment and erosion control Practices are to be inspected weekly and after any rainfall, and repaired as necessary.
MAINTENANCE PLAN –
1. All measures to be inspected weekly and after any rainfall event and needed repairs made immediately.
2. Sediment Basins to be cleaned out when the level of sediment reaches 4.5' below water surface. Riser structures to be cleaned if become water above design surface no longer drains properly.
3. Sediment to be removed from forebays when they are approximately 25% filled or sediment level is within 4.5' of top.
4. Sediment to be removed from behind the any Silt Fence and inlet protection devices when it becomes 0.5' deep. Fencing and inlet protection to be repaired as needed to maintain a barrier.
5. All seeded areas shall be fertilized, mulched, and re-seeded as necessary, according to specifications provided, to maintain a suitable vegetative cover.
VEGETATIVE PLAN –
1. Permanent vegetation to be established in accordance with "North Carolina Erosion and Sediment Control Planning and Design Manual", Section 6.11, latest version. See next Sheet.
REV. NO. | REVISIONS | DATE
2 | REVISED ACCESS LOCATION AS PER CITY COMMENTS | 5-27-04
1 | ADDED NOTE 6. TO CONSTRUCTION SEQUENCE AS PER NHC COMMENTS | 4-21-04
APPROVED
CITY OF WILMINGTON
ENGINEERING DEPARTMENT
DATE 5/28/04 PERMIT# 96-017
WATER QUALITY – NCDENR / DWQ SWB 951208 and EROSION CONTROL PLAN MODIFICATION
INDEPENDENCE REGIONAL FACILITY
(formerly CAMPRON REGIONAL POND)
LOCATED IN THE CITY OF WILMINGTON
NEW HANOVER COUNTY, NORTH CAROLINA
Date 2-27-04
Scale 1" = 100'
Drawn DSH
Checked GAV
Project No. 5834-PND2a
NORTH CAROLINA PROFESSIONAL SEAL 20007 ENGINEER DAVID S. HOLLIS
5-28-04
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WILMINGTON, N.C. 28401
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Sheet No. 2 of 3

POND SUMMARY:

FOREBAY VOLUME:
Volume provided = 383,820 cf

STATE WATER QUALITY POND CONSIDERATIONS –
Surface Area required = 355,450 sf
Surface Area provided = 420,000 sf
Storage Volume required = 503,554 cf
Storage Volume provided = 525,810 cf
Storage Volume Drawdown Time = 3 days

PEAK DISCHARGE SUMMARY –
Q(10) post–developed = 120 cfs @ WSEL = 40.0
Q(50) post–developed = 288 cfs @ WSEL = 41.6
Q(100)post–developed = 373 cfs @ WSEL = 42.0

POND SEDIMENTATION CONSIDERATIONS –
Storage Volume required = 204 X 1800 = 367,000 cf
Storage Volume provided = 2,000,000 cf

POND DESIGN DATA

INDEPENDENCE RETENTION FACILITY
(CAMERON REGIONAL POND) –
Additional Calculation Summary for DWQ – SWB 951208
WATER QUALITY CONSIDERATIONS – ULTIMATE BUILD–OUT

Impervious area calculations: See Project Data Sheet
EXISTING IMPERVIOUS = 38 acres
TOTAL IMPERVIOUS =142.8 acres
TOTAL AREA DRAINING TO POND = 204 acres

Retention of first 1" of run–off:
204 acres total – 142.8 acres impervious = 61.2 ac, green area
SA REQUIRED: 142.8 x 0.95 + 61.2 x 0.15 / 204 = 0.71, or 71%

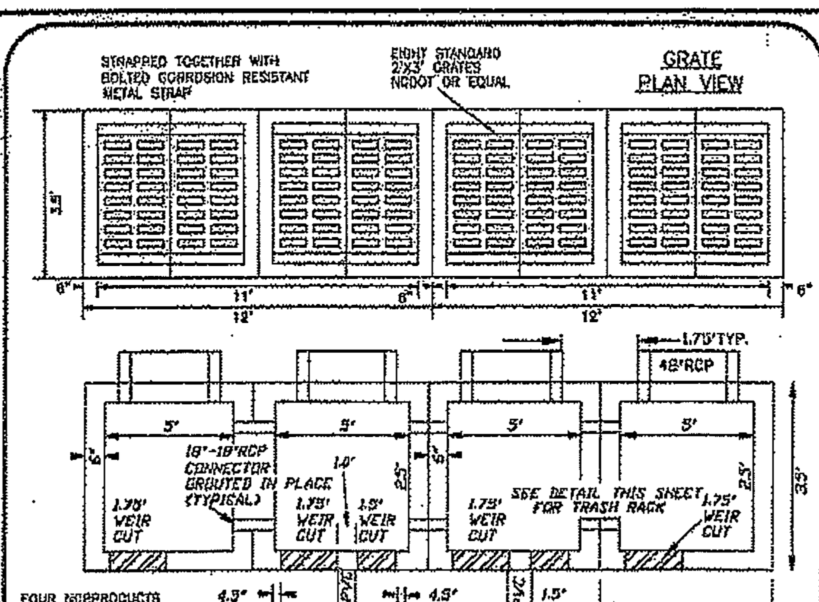
At 7.0' depth, 90% TSS removal, from chart – SA factor = 4.0
204 x 0.01 x 4.0 = 8.16 acres = 355,450 sf SA REQUIRED
At Elev. = 36.0 SA = 9.64 acres = 420,000 sf SA PROVIDED

VOLUME REQUIRED: R=[(P)(Pj)(Rv)/12](A)

SEE PAGES A.1 and A.2, "Controllin Urban Runoff:
A Practical Manual for Planning and Designing Urban BMPs"
(P) = 1" (Pj) = 0.9 Rv = 0.05 + 0.9(142.8/204) = 0.680
R= [(1)(0.680)/12](204) = 11.56 acre–ft
REQUIRED STORAGE = 503,554 cf
PROVIDED STORAGE = 525,810 cf @ ELEVATION 37.2

DRAWDOWN –
Average head from storage elevation to orifice –
37.2 – 36.0 / 2 = 0.6'
6" PVC drain to draw–down pond:
Orifice equation: Q = CA(2gh)^1/2
Q = 0.6(.545)(64.4 X 0.6)^1/2
= 2.03 cfs
T = 286,700 sec. = 3 days OKAY

FOREBAY REQUIREMENTS –
Approximate capacity = 2,071,745 X 20% = 414,000 cf
Provided capacity = 383,820 cf



NOTE: 1. ALL FOUR BOXES ARE SET IN PLACE AS SHOWN AND CEMENTED AND ATTACHED TO EACH OTHER WITH CORROSION RESISTANT METAL STRAPPING PROVIDED BY THE CONTRACTOR, BOLTED SECURELY IN PLACE AT EACH BOX, FRONT AND REAR.
2. THE TWO 1.5' WEIR CUTS IN THE MIDDLE BOXES ARE BLOCKED FROM OUTSIDE WITH 3'–3" X 2'X 1/4" STEEL PLATES, BOLTED IN PLACE.
3. DURING THE FIRST PHASE OF THE POND, ONE 1.75' WEIR WAS BLOCKED TEMPORARILY SO THAT ONLY THREE WEIRS ARE OPEN AND FUNCTIONAL.
4. DURING THE FIRST PHASE OF THE POND, THE 10" PVC ORIFACE WAS TEMPORARILY BLOCKED, SO THAT ONLY THE 6" PVC ORIFACE IS OPEN AND FUNCTIONAL.
5. FOR ULTIMATE BUILD–OUT SITUATION (FINAL PHASE OF POND), THE FOURTH 1.75' WEIR IS TO BE OPENED AND THE 10" PVC ORIFACE UNBLOCKED, SO AS TO BE MADE FUNCTIONAL. THE 6" PVC ORIFACE IS TO BE REMOVED OR BLOCKED, AND RENDERED NOT FUNCTIONAL.

EXISTING OUTLET STRUCTURE DETAILS
NOT TO SCALE

(SF) Sediment Fence (Silt Fence)

Specification 6.62 – Construction Specifications
MATERIALS
1. Use a synthetic filter fabric or a pervious sheet of polypropylene, nylon, polyester, or polyethylene yarn, which is certified by the manufacturer or supplier as conforming to the requirements shown in Table 6.62b. Synthetic filter fabric should contain ultraviolet ray inhibitors and stabilizers to provide a minimum of 6 months of expected usable construction life at a temperature range of 0 to 120 F.
2. Ensure that posts for sediment fences are either 4–inch diameter pine, 2–inch diameter oak, or 1.33 lb/linear ft steel with a minimum length of 4 ft. Make sure that steel posts have projections to facilitate fastening the fabric.
3. For reinforcement of standard strength filter fabric, use wire fence with a minimum 14 gauge and a maximum mesh spacing of 6 inches.

Table 6.62b
Specifications For Sediment Fence Fabric
Physical Property Requirements
Filtering Efficiency – 85% (mm)
Tensile Strength at Standard Strength– 30 lb/lin in (min)
Extra Strength– 50 lb/lin in (mm)
Slurry Flow Rate – 0.3 gal/sq ft/min (min)
CONSTRUCTION
1. Construct the sediment barrier of standard strength or extra strength synthetic filter fabrics.
2. Ensure that the height of the sediment fence does not exceed 18 inches above the ground surface. (Higher fences may impound volumes of water sufficient to cause failure of the structure.)
3. Construct the filter fabric from a continuous roll cut to the length of the barrier to avoid joints. When joints are necessary, securely fasten the filter cloth only at a support post with overlap to the next post.
4. Support standard strength filter fabric by wire mesh fastened securely to the up slope side of the posts using heavy duty wire staples at least 1 inch long, or tie wires. Extend the wire mesh support to the bottom of the trench.
5. When a wire mesh support fence is used, space posts a maximum of 8 ft apart. Support posts should be driven securely into the ground to a minimum of 18 inches.
6. Extra strength filter fabric with 6ft post spacing does not require wire mesh support fence. Staple or wire the filter fabric directly to posts.
7. Excavate a trench approximately 4 inches wide and 8 inches deep along the proposed line of posts and upslope from the barrier (figure 6.62a).
8. Backfill the trench with compacted soil or gravel placed over the filter fabric.
9. Do not attach filter fabric to existing trees.
Maintenance
Inspect sediment fences at least once a week and after each rainfall. Make any required repairs immediately.
Should the fabric of a sediment fence collapse, tear, decompose or become ineffective, replace it promptly. Replace burlap every 60 days.
Remove sediment deposits as necessary to provide adequate storage volume for the next rain and to reduce pressure on the fence. Take care to avoid undermining the fence during cleanout.
Remove all fencing materials and unstable sediment deposits and bring the area to grade and stabilize it after the contributing drainage area has been properly stabilized.

(CE) Temporary Gravel Construction Entrance/Exit

Specification # 6.06 – Construction Specifications

1. Clear the entrance and exit area of all vegetation, roots and other objectionable material and properly grade it.
2. Place the gravel to the specific grade and dimensions shown on the plans and smooth it.
3. Provide drainage to carry water to a sediment trap or other suitable outlet.
4. Use geotextile fabrics because they improve stability of the foundation in locations subject to seepage or high water table.

Maintenance
Maintain the gravel pad in a condition to prevent mud or sediment from leaving the construction site. This may require periodic topdressing with 2–inch stone. After each rainfall, inspect any structure used to trap sediment and clean it out as necessary. Immediately remove all objectionable materials spilled, washed, or tracked onto public roadways.

(SB) Sediment Basin

Specifications # 6.61 ~ Construction Specifications
1. Site preparations–Clear, grub and strip topsoil from areas under the embankment to remove trees, vegetation, roots and other objectionable material. Delay clearing the pool area until the dam is complete and then remove brush, trees and other objectionable materials to facilitate sediment cleanout. Stockpile all topsoil or soil containing organic matter for use on the outer shell of the embankment to facilitate vegetative establishment. Place temporary sediment control measures below the basin as needed.
2. Cut–off trench–Excavate a cut–off trench along the centerline of the earth fill embankment. Cut the trench to stable soil material, but in no case make it less than 2 ft. deep. The cut–off trench must extend into both abutments to at least the elevation of the riser crest. Make the minimum bottom width wide enough to permit operation of excavation and compaction equipment but in no case less than 2 ft. Make side slopes of the trench no steeper than 1:1. Compaction requirements are the same as those for the embankment. Keep the trench dry during backfilling and compaction operations.
3. Embankment–Take fill material from the approved areas shown on the plans. It should be clean mineral soil, free of roots, woody vegetation, rocks and other objectionable material. Scarify areas on which fill is be placed before placing fill. The fill material must contain sufficient moisture so it can be formed by hand into a ball without crumbling. If water can be squeezed out of the ball, it is too wet for proper compaction. Place fill material in 6 to 8–inch continuous layers over the entire length of the fill area and then compact it. Compaction may be obtained by routing the construction hauling equipment over the fill so that the entire surface of each layer is traversed by at least one wheel or tread track of the heavy equipment, or a compactor may be used. Construct the embankment to an elevation 10% higher than the design height to allow for settling.
4. Conduit spillways–Securely attach the riser to the barrel or barrel stub to make a watertight structural connection. Secure all connections between barrel sections by approved watertight assemblies. Place the barrel and riser on a firm, smooth foundation of impervious soil. Do not use pervious material such as sand, gravel, or crushed stone as backfill around the pipe or anti–seep collars. Place the fill material around the pipe spillway in 4–inch layers and compact it under and around the pipe to at least the same density as the adjacent embankment. Care must be taken not to raise the pipe from firm contact with its foundation when compacting under the pipe haunches.
Place a minimum depth of 2ft. of hand–compacted backfill over the pipe spillway before crossing it with construction equipment. Anchor the riser in place by concrete or other satisfactory means to prevent flotation. In no case should the pipe conduit be installed by cutting a trench through the dam after the embankment is complete.
5. Emergency spillway–Install the emergency spillway in undisturbed soil. The achievement of planned elevations, grade, design width, and entrance and exit channel slopes are critical to the successful operation of emergency spillway.
6. Inlets–Discharge water into the basin in a manner to prevent erosion. Use diversions with outlet protection to divert sediment–laden water to the upper end of the pool area to improve basin trap efficiency (References: Runoff Control Measures and Outlet Protection).
7. Erosion control–Construct the structure so that the disturbed area is minimized. Divert surface water away from bare areas. Complete the embankment before the area is cleared. Stabilize the emergency spillway embankment and all other disturbed areas above the crest of the principal spillway immediately after construction (References: Surface Stabilization).
8. Safety–Sediment basins may attract children and can be dangerous. Avoid steep side slopes, and fence and mark basins with warning signs if trespassing is likely. Follow all state and local requirements.

Maintenance
Check sediment basins after periods of significant runoff. Remove sediment and restore the basin to its original dimensions when sediment accumulates to one–half the design depth.
Check the embankment, spillways, and outlet for erosion damage, and inspect the embankment for piping and settlement. Make all necessary repairs immediately. Remove all trash and other debris from the riser and pool area.

(OP) Outlet Stabilization Structure

Specification # 6.41 – Construction Specifications
1. Ensure that the subgrade for the filter and riprap follows the required lines and grades shown in the plan. Compact any fill required in the subgrade to the density of the surrounding undisturbed material. Low areas in the subgrade on undisturbed soil may also be filled by increasing the riprap thickness.
2. The riprap and gravel filter must conform to the specified grading limits shown on the plans.
3. Filter cloth, when used, must meet design requirements and be properly protected from punching or tearing during installation. Repair any damage by removing the riprap and placing another piece of filter cloth over the damaged area. All connecting joints should overlap a minimum of 1 ft. If the damage is extensive, replace the entire filter cloth.
4. Riprap may be placed by equipment, but take care to avoid damaging the filter.
5. The minimum thickness of the riprap should be 1.5 times the maximum stone diameter.
6. Riprap may be field stone or rough quarry stone. It should be hard, angular, highly weather–resistant and well graded.
8. Construct the apron on zero grade with no overfall at the end. Make the top of the riprap at the downstream end level with the receiving area or slightly below it.
8. Ensure that the apron is properly aligned with the receiving stream and preferably straight throughout its length. If a curve is needed to fit site conditions, place it in the upper section of the apron.
9. Immediately after construction, stabilize all disturbed areas with vegetation (Practice 6.10, Temporary Seeding, and 6.11, Permanent Seeding).
Maintenance
Inspect riprap outlet structures after heavy rains to see if any erosion around or below the riprap has taken place or if stones have been dislodged. Immediately make all needed repairs to prevent further damage.

Temporary Seeding

Specification # 6.10 – Specifications

Complete grading before preparing seedbeds and install all necessary erosion control practices, such as dikes, waterways and basins. Minimize steep slopes because they make seedbed preparation difficult and increase the erosion hazard. If soils become compacted during grading, loosen them to a depth of 6–8 inches using a ripper, harrow, or chisel plow.

Seedbed Preparation
Good seedbed preparation is essential to successful plant establishment. A good seedbed is well–pulverized, loose and uniform. Where hydroseeding methods are used, the surface may be left with a more irregular surface of large clods and stones.
Liming – Apply lime according to soil test recommendations. If the pH (acidity) of the soil is not known, an application of ground agricultural limestone at the rate of 1 to 1 1/2 tons/acre on coarse–textured soils and 2–3 tons/acres on fine–textured soils is usually sufficient. Apply limestone uniformly and incorporate into the top 4–6 inches of soil. Soils with a pH of 6 or higher need not be limed.
Fertilizer– Base application rates on soil tests. When these are not possible, apply a 10–10–10 grade fertilizer at 700–1,000 lb./acre. Both fertilizer and lime should be incorporated into the top 4–6 inches of soil. If a hydraulic seeder is used, do not mix seed and fertilizer more than 30 minutes before application.
Surface roughening– If recent tillage operations have resulted in a loose surface, additional roughening may not be required except to break up large clods. If rainfall causes the surface to become sealed or crusted, loosen it just prior to seeding by disking, raking, harrowing, or other suitable methods. Groove or furrow slopes steeper than 3:1 on the contour before seeding (Practice 6.03, Surface Roughening).

Plant Selection
Select an appropriate species or species mixture from Table 6.10a, for seeding in late winter and early spring, Table 6.10b for summer, and Table 6.10c for fall.

Seeding
Evenly apply seed using a cyclone seeder (broadcast), drill, cultipacker seeder, or hydroseeder. Use seeding rates given in Table 6.10a–6.10c. Broadcast seeding and hyroseeding are appropriate for steep slopes where equipment cannot be driven. Hand broadcasting is not recommended because of the difficulty in achieving a uniform distribution. Small grains should be planted no more than 1 inch deep, and grasses and legumes no more than 1/2 inch. Broadcast seed must be covered by raking or chain dragging, and then lightly firmed with a roller or cultipacker. Hydroseeded mixtures should include a wood fiber (cellulose) mulch.

Mulching
The use of appropriate mulch will help ensure establishment under normal conditions and is essential to seeding success under harsh site condition (Practice 6.14, Mulching). Harsh site conditions include:
–seeding in fall for winter cover (wood fiber mulches are not considered adequate for this use),
–slopes steeper than 3:1,
–excessively hot or dry weather,
–adverse soils(shallow, rocky, or high in clay or sand), and
–areas receiving concentrated flow.
If the area to be mulched is subject to concentrated waterflow, as in channels, anchor mulch with netting (Practice 6.14, Mulching).

Table 6.10a – Temporary Seeding Recommendation for Late Winter and Early Spring
Seeding mixture
Species– Rye(grain), Annual lespedeza (Kobe in Piedmont and Coastal Plain
Rate (lb/acre)– 120
Omit annual lespedeza when duration of temporary cover is not to extend beyond June
Seeding dates–Coastal Plain – Dec. 1 – Apr. 15.
Soil amendments– Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10–10–10 fertilizer.
Mulch–Apply 4,000lb/acre straw. Anchor straw by tacking with asphalt, netting or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.
Maintenance – Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.

Table 6.10b – Temporary Seeding Recommendations for Summer
Seeding mixture
Species–German millet
Rate(lb/acre)– 40
Seeding dates–Coastal Plain– Apr. 15–Aug. 15
Soil amendments–Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10–10–10 fertilizer.
Mulch –Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.
Maintenance–Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.

Table 6.10c – Temporary Seeding Recommendation for Fall
Seeding mixture
Species–Rye(grain)
Rate(lb/acre) – 120
Seeding dates – Coastal Plain and Piedmont–Aug 15 – Dec. 30
Soil amendments – Follow soil tests or apply 2,000 lb./acre ground agricultural limestone and 1,000 lb/acre 10–10–10 fertilizer.
Mulch– Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.
Maintenance– Repair and refertilize damaged areas immediately. Topdress with 50 lb/acre of nitrogen in March, if it is necessary to extend temporary cover beyond June 15, overseed with 50 lb/acre Kobe (Piedmont and Coastal Plain)

Land Grading

Specification # 6.02 – Construction Specifications
1. Construct and maintain all erosion and sedimentation control practices and measures in accordance with the approved sedimentation control plan and construction schedule.
2. Remove good topsoil from areas to be graded and filled, and preserve it for use in finishing the grading of all critical areas.
3. Scarify areas to be topsoiled to a minimum depth of 2 inches before placing topsoil (Practice 6.04, Topsoiling).
4. Clear and grub areas to be filled to remove trees, vegetation, roots, or other objectionable material that would affect the planned stability of the fill.
5. Ensure that fill material is free of brush, rubbish, rocks, logs, stumps, building debris, and other materials inappropriate for constructing stable fills.
6. Place all fill in layers not to exceed 9 inches in thickness, and compact the layers as required to reduce erosion, slippage, settlement, or other related problems.
7. Do not incorporate frozen material or soft, mucky, or highly compressible materials into fill slopes.
8. Do not place fill on a frozen foundation, due to possible subsidence and slippage.
9. Keep diversions and other water conveyance measures free of sediment during all phases of development.
10. Handle seeps or springs encountered during construction in accordance with approved methods (Practice 6.81, Subsurface Drain).
11. Permanently stabilize all graded areas immediately after final grading is completed on each area in the grading plan. Apply temporary stabilization measures on all graded areas when work is to be interrupted or delayed for 30 working days or longer.
12. Ensure that topsoil stockpiles, borrow areas, and spoil areas are adequately protected from erosion with temporary and final stabilization measures, including sediment fencing and temporary seeding as necessary.

Maintenance
Periodically check all graded areas and the supporting erosion and sedimentation [illegible] before they become significant gullies is an essential part of an effective erosion and sedimentation control plan.

Permanent Seeding

Specifications # 6.11 ~ Specifications

Seedbed Requirements
Establishment of vegetation should not be attempted on sites that are unsuitable due to inappropriate soil texture (Table 6.11a), poor drainage, concentrated overland flow, or steepness of slope until measures have been taken to correct these problems.
To maintain a good stand of vegetation, the soil must meet certain minimum requirements as a growth medium. The existing soil should have these criteria:

– Enough fine–grained (silt and clay) material to maintain adequate moisture and nutrient supply (available water capacity of at least .05 inches water to 1 inch of soil).
– Sufficient pore space to permit root penetration.
– Sufficient depth of soil to provide an adequate root zone. The depth to rock or impermeable layers such as hardpans should be 12 inches or more, except on slopes steeper than 2:1 where the addition of soil is not feasible.
– A favorable pH range for plant growth, usually 6.0–6.5.
– Freedom from large roots, branches, stones, large clods of earth, or trash of any kind. Clods and stones may be left on slopes steeper than 3:1 if they are to be hydroseeded.
If any of the above criteria are not met–i.e., if the existing soil is too coarse, dense, shallow or acidic to foster vegetation–special amendments are required. The soil conditioners described below may be beneficial or, preferably, topsoil may be applied in accordance with Practice 6.04, Topsoiling.

Soil Conditioners
In order to improve the structure or drainage characteristics of a soil, the following material may be added. These amendments should only be necessary where soils have limitations that make them poor for plant growth or for fine turf establishment (see Chapter 3, Vegetative Considerations).

Peat–Appropriate types are sphagnum moss peat, hypnum moss peat, reedsedge peat, or peat humus, all from fresh–water sources. Peat should be shredded and conditioned in storage piles for at least 6 months after excavation.
Sand–clean and free of toxic materials
Vermiculite–horticultural grade and free of toxic substances.
Rotted manure–stable or cattle manure not containing undue amounts of straw or other bedding materials.
Thoroughly rotted sawdust– free of stones and debris. Add 6 lb. Of nitrogen to each cubic yard.
Sludge–Treated sewage and industrial sludges are available in various forms; these should be used only in accordance with local, State and Federal regulations.

Species Selection
Use the key to Permanent Seeding Mixtures (Table 6.11b) to select the most appropriate seeding mixture based on the general site and maintenance factors. A listing of species, including scientific names and characteristics, is given in Appendix 8.02.

Seedbed Preparation
Install necessary mechanical erosion and sedimentation control practices before seeding, and complete grading according to the approved plan.
Lime and fertilizer needs should be determined by soil tests. Soil testing is performed free of charge by the North Carolina Department of Agriculture soil testing laboratory. Directions, sample cartons, and information sheets are available through county agricultural extension offices or from NCDA. Because the NCDA soil testing lab requires 1–6 weeks for sample turn–around, sampling must be planned well in advance of final grading. Testing is also done by commercial laboratories.
When soil test are not available, follow rates suggested on the individual specification sheet for the seeding mix chosen (Tables 6.11c through 6.11v). Applications rates usually fall into the following ranges:
– Ground agricultural limestone
Light–textured, sandy soils: 1–1 1/2 tons/acre
Heavy textured, clayey soils 2–3 tons/acre
– Fertilizer:
Grasses 800–1200 lb/acre of 10–10–10 (or the equivalent)
Grass–legume mixtures: 800–1200 lb/acre of 5–10–10 (or the equivalent)
Apply lime and fertilizer evenly and incorporate into the top 4–6 inches of soil by disking or other suitable means. Operate machinery on the contour. When using a hydroseeder, apply lime and fertilizer to a rough, loose surface.

Roughen surfaces according to Practice 6.03, Surface Roughening.
Complete seedbed preparation by breaking up large clods and raking into a smooth, uniform surface (slope less than 3:1) Fill in or level depressions than can collect water. Broadcast seed into a freshly loosened seedbed that has not been sealed by rainfall.

Note Well: See Landscaping Plan for additional specifications.

Table 6.11s – Seeding No. 4CP for:
Well–Drained Sandy loams to Dry Sands, Coastal Plain; Low to Medium–Care Lawns
Seeding mixture
Species – Centipedegrass – Rate – 10–20 lb/acre (seed) or 33 bu/acre (sprigs)
Seeding dates – Mar. – June, (Sprigging can be done through July where water is available for irrigation.)
Soil amendments – Apply lime and fertilizer according to soil test, or apply 300 lb/acre 10–10–10.
Sprigging – Plant sprigs in furrows with a tractor–drawn transplanter, or broadcast by hand.
Furrows should be 4–6 inches deep and 2ft apart. Place sprigs about 2 ft. apart in the row with one end at or above ground level (Figure 6.11d).
Broadcast at rates shown above, and press sprigs into the top 1 1/2 inches of soil with a disk set straight so that sprigs are not brought back toward the surface.
Mulch – Do not mulch
Maintenance – Fertilize very sparingly– 20 lb/acre nitrogen in spring with no phosphorus. Centipedegrass cannot tolerate high pH or excess fertilizer.

Table 6.11t – Seeding No. 5CP for: Well–Drained Sandy Loams to Dry Sands; Low Maintenance
Seeding mixture

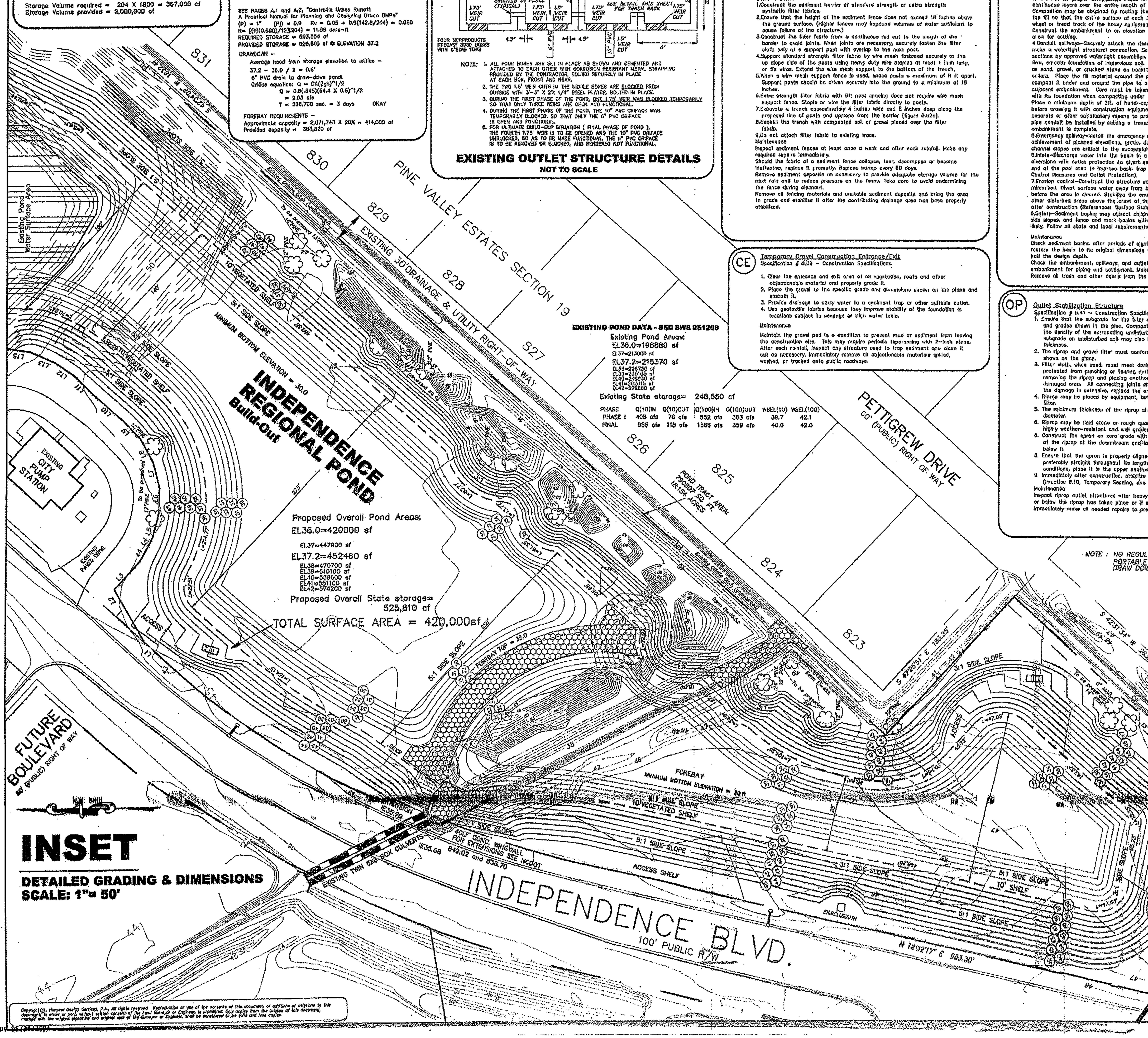
Species Rate	(lb/acre)
Pensacola Bahiagrass	50
Sericea lespedeza	30
Common Bermudagrass	10
German millet	10

Seeding notes
1. Where a neat appearance is desired, omit sericea
2. Use common Bermudagrass only on isolated sites where it cannot become a pest. Bermudagrass may be replaced with 5 lb/acre centipedgrass.

Seeding dates – Apr. 1 – July 15
Soil amendments – Apply lime and fertilizer according to soil tests, or apply 3,000 lb/acre ground agricultural limestone and 500 lb/acre 10–10–10 fertilizer.
Mulch
Apply 4,000 lb/acre grain straw or equivalent cover of another suitable mulch. Anchor by tacking with asphalt, roving and netting or by crimping with a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.
Maintenance – Refertilize the following Apr. with 50 lb/acre nitrogen. Repeat as growth requires. May be moved only once a year. Where a neat appearance is desired, omit sericea and mow as often as needed.

Table 6.11v – Seeding No. 7CP for: Grass–lined Channels; Coastal Plain
Seeding Mixture
Species – Common Bermudagrass – Rate – 40–80 (1/2 lb/1,000 ft)
Seeding dates – Coastal Plain; Apr – July
Soil amendments – Apply lime and fertilizer according to soil tests, or apply 3,000 lb/acre ground agricultural limestone and 500 lb/acre 10–10–10 fertilizer.
Mulch – Use jute, excelsior matting, or other effective channel lining material to cover the bottom of channels and ditches. The lining should extend above the highest calculated depth of flow. On channel side slopes above this height, and in drainages not requiring temporary linings, apply 4,000 lb/acre grain straw [illegible]
Maintenance–A minimum of 3 weeks is required for establishment. Inspect and repair mulch frequently. Refertilize the following Apr. with 50 lb/acre nitrogen.

Refer to Appendix 8.02 for botanical names



PHASE	Q(10)IN	Q(10)OUT	Q(100)IN	Q(100)OUT	WSEL(10)	WSEL(100)
PHASE I	408 cfs	76 cfs	852 cfs	363 cfs	39.7	42.1
FINAL	955 cfs	118 cfs	1566 cfs	359 cfs	40.0	42.0

NOTE : NO REGULATED WETLANDS ON SITE. PORTABLE PUMPS TO BE USED TO DRAW DOWN POND IN EMERGENCY.

INSET

DETAILED GRADING & DIMENSIONS
SCALE: 1"= 50'

STORMWATER MANAGEMENT PLAN
APPROVED
CITY OF WILMINGTON
ENGINEERING DEPARTMENT
DATE 8/13/04 PERMIT# 1996017
SIGNED [signature]

50 25 0 50
SCALE IN FEET: 1"= 50'

REV. NO.	REVISIONS	DATE
1	REVISED ACCESS AS PER CITY	5-27-04

GRADING and WATER QUALITY – NCDENR / DWQ SWB 951208 PLAN MODIFICATION

INDEPENDENCE REGIONAL FACILITY

(formerly CAMERON REGIONAL POND)
LOCATED IN THE CITY OF WILMINGTON
NEW HANOVER COUNTY, NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL SEAL 20007 ENGINEER DAVID S. HOLLIS
5-28-04
dhollis@hdsilm.com

OWNER: INDEPENDENCE REGIONAL FACILITY, INC.
and BBC FAMILY LIMITED PARTNERSHIP
PO BOX 3649
WILMINGTON, NC 28406, 910–762–2676

HANOVER DESIGN SERVICES, P.A.
LAND SURVEYORS, ENGINEERS & LAND PLANNERS
319 WALNUT STREET
WILMINGTON, N.C. 28401
PHONE: (910) 343-8002

Date: 2-27-04
Scale: 1"= 50'
Drawn: DSH
Checked: GAW
Project No: 5834-PND3a
Sheet No: 3 Of 3

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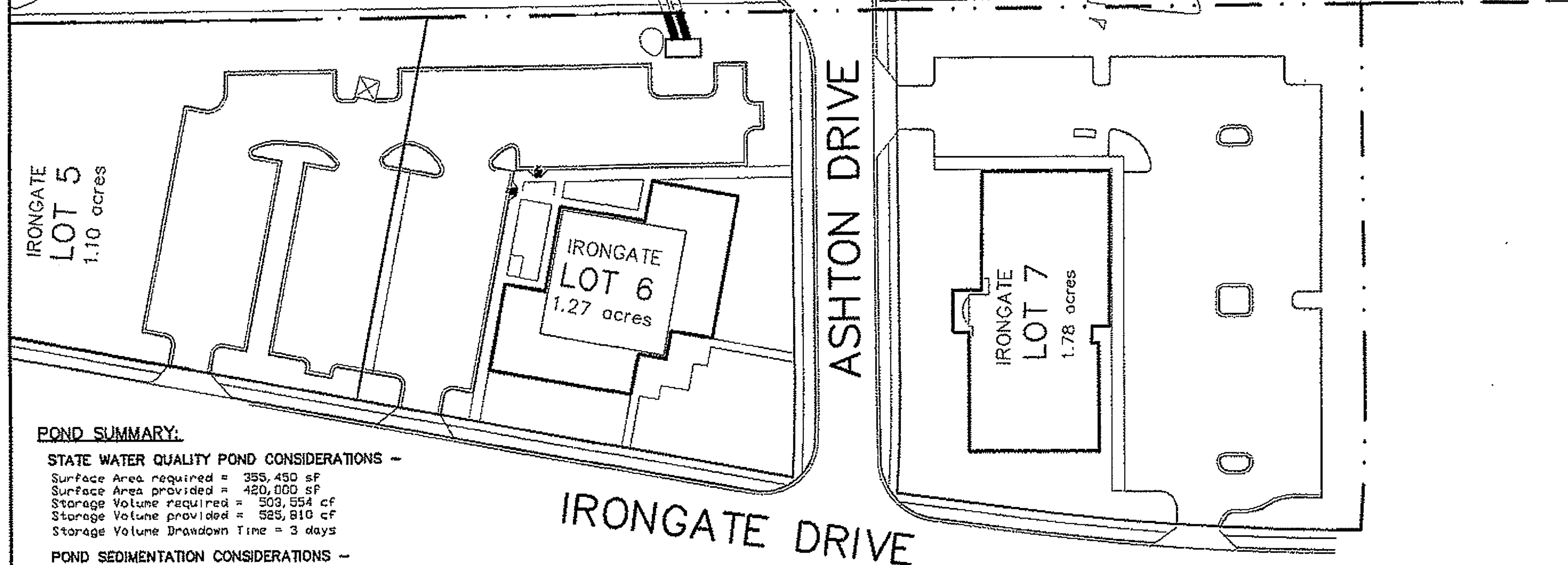


NOTE WELL:

ANY AREAS ON-SITE WITHOUT ACTIVITY IN A 15 WORKING DAY PERIOD OR A 21 CALENDAR DAY PERIOD SHALL BE TEMPORARILY STABILIZED AS PER THE SPECIFICATIONS. ANY SLOPES TO BE STABILIZED AFTER 15 WORKING DAYS OR 21 CALENDAR DAYS, WHICHEVER COMES FIRST.

DETAILS SHOWN ARE TYPICAL OF INSTALLATIONS REQUIRED BY THE STATE & CITY. THIS SHEET DOES NOT PURPORT TO SHOW ALL REQUIRED CONSTRUCTION DETAILS, BUT RATHER SERVES AS A GUIDE. THE CONTRACTOR IS RESPONSIBLE FOR ADHERING TO ALL CITY AND STATE CODES AND CONSTRUCTION STANDARDS.

POND SUMMARY:

STATE WATER QUALITY POND CONSIDERATIONS –

Surface Area required = 355,450 sf
Surface Area provided = 420,000 sf
Storage Volume required = 503,554 cf
Storage Volume provided = 525,810 cf
Storage Volume Drawdown Time = 3 days

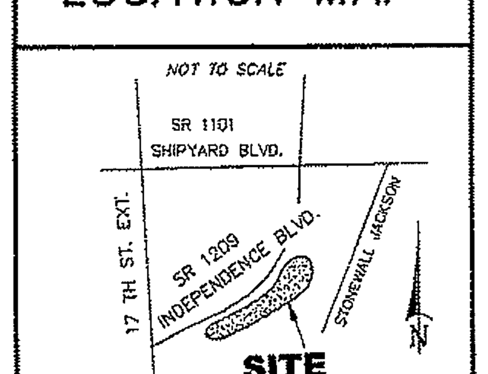
POND SEDIMENTATION CONSIDERATIONS –

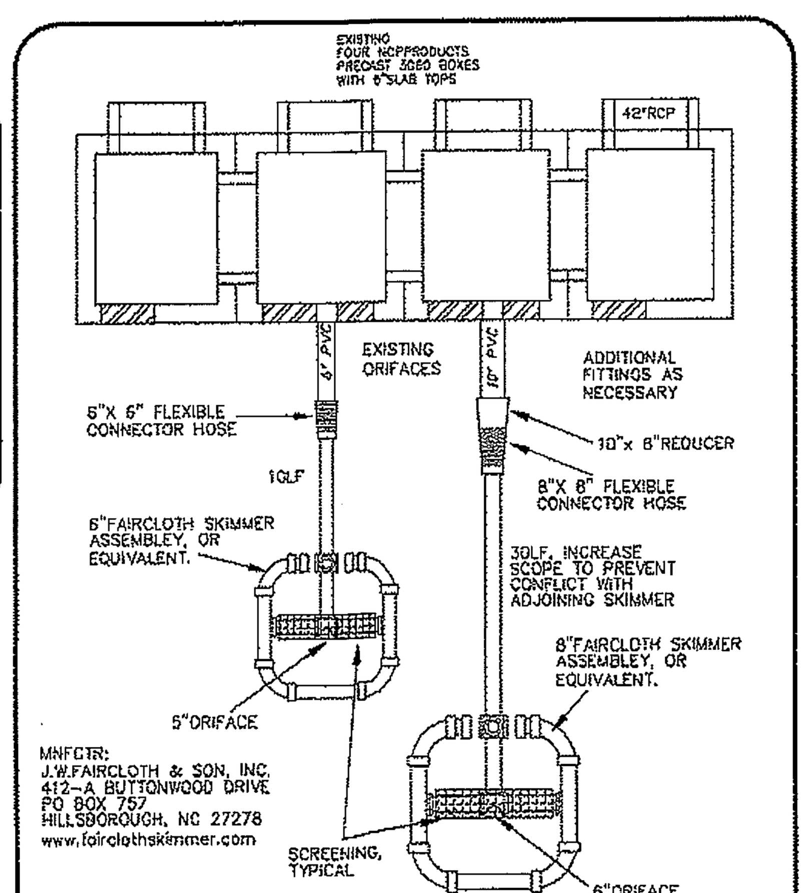
Storage Volume required = 204 X 1800 = 367,000 cf
Storage Volume provided > 525,800 cf

LEGEND

- IRON IN EXIST. CONC. MON.
- EXISTING SANITARY SEWER & MANHOLE
- EXISTING WATERLINE
- E.I.P. = EXISTING IRON PIPE
- E.I.R. = EXISTING IRON REBAR
- E.C.M. = EXISTING CONCRETE MONUMENT
- I.S. = IRON SET
- W/V = WATER VALVE
- W/M = WATER METER
- F/H = FIRE HYDRANT
- P/P = POWER POLE
- C.P. = COMPUTED POINT
- +49.0 INDICATES SPOT ELEVATION

LOCATION MAP





SKIMMER ATTACHMENT DETAIL
NOT TO SCALE

ADDITIONAL CONSTRUCTION SCHEDULE –

SEE PLAN THIS SHEET and ADDITIONAL DETAILS

1. All previously approved scheduling applies.
2. Install baffles and skimmers prior to opening up earthen bridge between existing pond and new section.

MAINTENANCE PLAN –

1. All measures to be inspected weekly and after any rainfall event and needed repairs made immediately.
2. Repair baffles as necessary and reanchor if required. Unclog skimmers and remove any trash buildup as necessary.
3. All previously approved maintenance requirements apply.

VEGETATIVE PLAN –

1. Permanent vegetation to be established in accordance with "North Carolina Erosion and Sediment Control Planning and Design Manual", Section 6.11, latest version. See next Sheet.

ADDITIONAL PRACTICES –

(SK) 1. **SKIMMER SEDIMENT BASIN**
Practice 6.64

Skimmers are to be attached to the existing oriface pipes on the existing outlet structure box prior to opening the earthen bridge between the existing pond and the new excavation, converting the pond to a skimmer sediment basin. Dewatering will be accomplished from the top of the storage down to normal pool during sedimentation function until new excavation is completed and watershed is permanently stabilized and pond is converted to permanent stormwater management detention / retention function, at which time skimmers and baffles are to be removed.

(B) 2. **BAFFLES**
Practice 6.65

Porous baffles are to be installed after pond excavation to spread stormwater flow and decrease velocity. The installation should be similar to a sediment fence with materials such as 700 g/m^2 coir erosion blanket, coir mesh, or tree protection fence folded over to reduce pore size. See this Sheet for specifications, and the Narrative or Erosion Control Manual for additional details.

NOTE WELL:
EROSION CONTROL DETAILS AND SPECIFICATIONS ARE AS PER THE "EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL" OF THE STATE OF NORTH CAROLINA, DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES, LATEST EDITION. PRACTICE NUMBERS REFER TO THIS MANUAL.

SCALE IN FEET: 1"= 60'

(SK) <u>Skimmer Sediment Basin</u>

Specifications # 6.64 – Construction Specifications

1. Clear, grub, and strip the area under the embankment of all vegetation and root map. Remove all surface soil containing high amounts of organic matter and stockpile or dispose of it properly. Haul all objectionable material to the designated disposal area. Place temporary sediment control measures below basin as needed.
2. Ensure that fill material for the embankment is free of roots, woody vegetation, organic matter, and other objectionable material. Place the fill in lifts not to exceed 9 inches, and machine compact it. Over fill the embankment 6 inches to allow for settlement.
3. Shape the basin to the specified dimensions. Prevent the skimming device from settling into the mud by excavating a shallow pit under the skimmer or providing a low support under the skimmer of stone or timber.
4. NA
5. Assemble the skimmer following the manufacturere's instructions, or as designed.
6. Lay the assembled skimmer on the bottom of the basin with the flexible joint at the inlet of the barrel pipe (or structure). Attach the flexible joint and position the skimmer over the excavated pit or support. Be sure to attach a rope to the skimmer and anchor it to the side of the basin. This will be used to pull the skimmer to the side for maintenance.
7. NA
8. Inlets – Discharge water into the basin in a manner to prevent erosion. Use temporary slope drains or diversions with outlet protection to divert sediment laden water to the upper end of the pool area to improve basin trap efficiency.
9. Erosion Control – Construct the structure so that the disturbed area is minimized. Divert surface water away from bare areas. Complete the embankment before the area is cleared. Stabilize the emergency spillway embankment and all other disturbed areas above the crest of the principal spillway immediately after construction.
10. Install porous baffles as specified in Practice 6.65, Porous Baffles.
11. After all the sediment producing areas have been permanently stabilized, remove the structure (skimmers and baffles) and all the unstable sediment. Smoothe the area to blend with adjoining areas and stabilize properly.

Maintenance

Inspect skimmer sediment basins at least weekly and after each significant (one-half inch or greater) rainfall event and repair immediately. Remove sediment and restore the basin to its original dimensions when sediment accumulates to one-half the height of the first baffle. Pull the skimmer to one side so that the sediment underneath it can be excavated. Excavate the sediment from the entire basin, not just around the skimmer or the first cell. Make sure vegetation growing in the bottom of the basin does not hold down the skimmer.

Repair the baffles if they are damaged. Re-anchor the baffles if water is flowing underneath or around them.

If the skimmer is clogged with trash and there is water in the basin, usually jerking on the rope will make the skimmer bob up and down and dislodge the debris and restore flow. If this does not work, pull the skimmer over to the side of the basin and remove the debris. Also check the oriface inside the skimmer to see if it is clogged; if so remove the debris.

If the skimmer arm or pipe is clogged, the oriface can be removed and the obstruction cleared with a plumber's snake or by flushing with water. Be sure and replace the oriface before repositioning the skimmer.
Check the fabric lined spillway for damage and make any required repairs with fabric that spans the full width of the spillway. Check the embankment, spillways, and outlet for erosion damage, and inspect the embankment for piping and settlement. Make all necessary repairs immediately. Remove all trash and debris from the skimmer and pool areas.

See narrative for additional details and descriptions, including pictures.

(B) <u>Baffles</u>

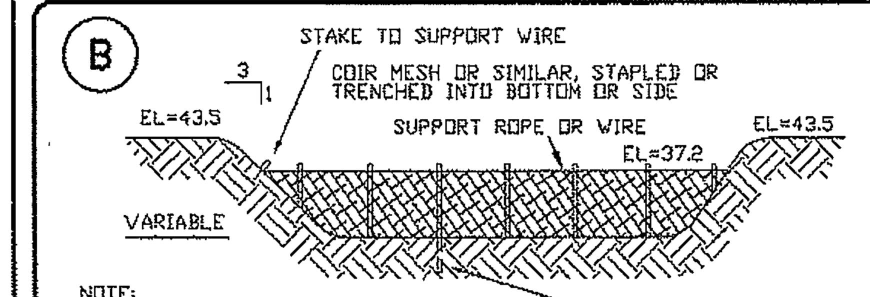
Specifications # 6.65 – Construction Specifications

1. Grade the basin so that the bottom is level front to back and side to side.
2. Install posts or saw horses across the width of the sediment basin (Practice 6.62, Sediment Fence).
3. Steel posts should be driven to a depth of 24 inches, spaced a maximum of 4 feet apart, and installed up the sides of the basin as well. The top of the fabric should be 6 inches higher than the invert of the spillway (El=25.5)
4. Install at least three rows of baffles between the inlet and outlet discharge point. Basins less than 20 feet in length may use 2 baffles.
5. When using posts, add a support wire or rope across the top of the measure to prevent sagging.
6. Wrap porous material, like jute backed by coir material, over a sawhorse or the top wire. Hammer rebar into the sawhorse legs for anchoring. The fabric should have five to ten percent openings in the weave. Attach fabric to a rope and a support structure with zip ties, wires, or staples.
7. The bottom and sides of the fabric should be anchored in a trench or pinned with 8-inch erosion control matting staples.
8. Do not splice the fabric, but use a continuous piece across the basin.

Maintenance

Inspect baffles at least once a week and after each rainfall. Make any required repairs immediately.
Be sure to maintain access to the baffles. Should the fabric of a baffle collapse, tear, or decompose, or become ineffective, replace it promptly.
Remove sediment deposits when it reaches half full to provide adequate storage volume for the next rain and to reduce pressure on the baffles. Take care to avoid damaging the baffles during cleanout. Sediment depth should never exceed half the designed storage depth.
After the contributing drainage area has been properly stabilized, remove all baffle materials and unstable sediment deposits, bring the area to grade, and stabilize it.

See narrative for additional details and descriptions, including pictures.

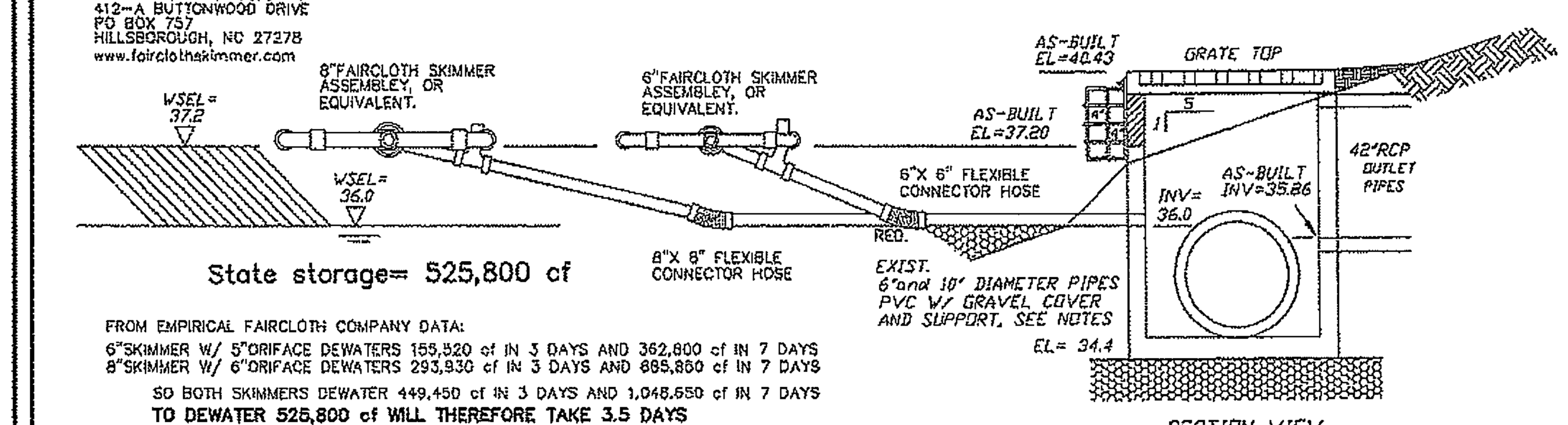


NOTE:
SEE STANDARDS AND SPECIFICATIONS, PRACTICE 6.65 FOR ADDITIONAL DETAIL.
METAL STAKES/POSTS ARE 1.33 lb/LF STEEL.

SUPPORT POSTS 24"INTO BOTTOM OR SIDE, TYPICAL MAXIMUM 4' SPACING

BAFFLE CROSS SECTION DETAIL
NOT TO SCALE

MNFCTR:
J.W.FAIRCLOTH & SON, INC.
412-A BUTTONWOOD DRIVE
PO BOX 757
HILLSBOROUGH, NC 27278
www.fairclothskimmer.com



FROM EMPIRICAL FAIRCLOTH COMPANY DATA:
6"SKIMMER W/ 5"ORIFACE DEWATERS 155,520 cf IN 3 DAYS AND 362,800 cf IN 7 DAYS
8"SKIMMER W/ 6"ORIFACE DEWATERS 293,930 cf IN 3 DAYS AND 685,850 cf IN 7 DAYS
SO BOTH SKIMMERS DEWATER 449,450 cf IN 3 DAYS AND 1,048,650 cf IN 7 DAYS
TO DEWATER 525,800 cf WILL THEREFORE TAKE 3.5 DAYS

OUTLET STRUCTURE SKIMMER CONNECTION DETAILS
NOT TO SCALE

NOTE WELL:
THIS PLAN IS AN ADDITION TO AN EXISTING PERMITTED FACILITY (DWQ SWB 951208 & NHC GP#107-95)
ALL PREVIOUSLY APPROVED DETAILS AND CONSTRUCTION SPECIFICATIONS SHALL APPLY.

REV. NO.	REVISIONS	DATE

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NORTH CAROLINA PROFESSIONAL SEAL 20007 ENGINEER DAVID S. HOLLIS
10.02.07
dhollis @ hdsilm.com

ADDITIONAL EROSION & SEDIMENT CONTROL PLAN SHEET – SKIMMERS & BAFFLES

INDEPENDENCE REGIONAL FACILITY

(formerly CAMERON REGIONAL POND)
LOCATED IN THE CITY OF WILMINGTON
NEW HANOVER COUNTY, NORTH CAROLINA

OWNER: INDEPENDENCE REGIONAL FACILITY, INC.
and BBC FAMILY LIMITED PARTNERSHIP
PO BOX 3649
WILMINGTON, NC 28406, 910-762-2676

HANOVER DESIGN SERVICES, P.A.
LAND SURVEYORS, ENGINEERS & LAND PLANNERS
319 WALNUT STREET
WILMINGTON, N.C. 28401
PHONE: (910) 343-8002

Date: 10-05-07
Scale: 1"= 60'
Drawn: DSH
Checked: GAW
Project No: 5834-PND6
Sheet No: 1 Of: 1