# CERTIFICATE OF AUTHENTICITY

**THIS IS TO CERTIFY THAT THE FOLLOWING ELECTRONIC RECORDS ARE TRUE AND ACCURATE REPRODUCTIONS OF THE ORIGINAL RECORDS OF JAMES CITY COUNTY GENERAL SERVICES DEPARTMENT- STORMWATER DIVISION; WERE SCANNED IN THE REGULAR COURSE OF BUSINESS PURSUANT TO GUIDELINES ESTABLISHED BY THE LIBRARY OF VIRGINIA AND ARCHIVES; AND HAVE BEEN VERIFIED IN THE CUSTODY OF THE INDIVIDUAL LISTED BELOW.**

**BMP NUMBER:** **WC067**

**DATE VERIFIED:** **September 18, 2012**

**QUALITY ASSURANCE TECHNICIAN:** **Leah Hardenbergh**

Leah Hardenbergh

**LOCATION: WILLIAMSBURG, VIRGINIA**

# Stormwater Division

## MEMORANDUM

**DATE:** March 12, 2010

**TO:** Michael J. Gillis, Virginia Correctional Enterprises Document Management Services

**FROM:** Jo Anna Ripley, Stormwater

**PO:** 270712

**RE:** Files Approved for Scanning

---

**General File ID or BMP ID:** WC067

**PIN:** 1330100012

**Subdivision, Tract, Business or Owner Name** (if known): Boca Land Investors LLC

**Property Description:** Part of Parcel A Nice Properties

**Site Address:**

*(For internal use only)* **Box** 22 **Drawer:** 8

**Agreements:** (in file as of scan date) N **Book or Doc#:** **Page:**

Comments

Large Pond in the Wellington Subdivision Note: Wellington LLC sold to Boca Land Investors 9/17/09

RECEIVED
MAY 31 2006
ENVIRONMENTAL DIVISION

**James City County, Virginia**
**Environmental Division**

# Stormwater Management / BMP Facilities
# Record Drawing and Construction Certification Forms

***( Note: In accordance with the requirements of the Chesapeake Bay Preservation Ordinance, Chapter 23, Section 23-10(4), BMP's shall be designed and constructed in accordance with the manual entitled James City County Guidelines for Design and Construction of Stormwater Management BMP's. Erosion and sediment control policy and approved plans generally require that at the completion of the project and prior to release of surety, an "as-built" plan prepared by a registered Professional Engineer or Certified Land Surveyor must be provided for the drainage system for the project, including any Best Management Practice (BMP) facilities. In addition, for BMP facilities involving the construction of an impounding structure or dam embankment, certification is required by a Professional Engineer who has inspected the structure during its construction. Currently there are over 20 water quality type BMP's accepted by the County. )***

**Section 1 - Site Information:**

Project Name: WELLINGTON
Structure/BMP Name: LAKE NICE
Project Location: SOUTH OF ROCHAMBEAU DRIVE,
BMP Location: CENTER OF PROJECT
County Plan No.: _____ - _____ - _____ REFERENCED ON ALL WELLINGTON PLANS

Project Type: ☑ Residential ☐ Business ☐ Commercial ☐ Office ☐ Institutional ☐ Industrial ☐ Public ☐ Roadway ☐ Other _____

Tax Map/Parcel No.: (13-2)(01-12)
BMP ID Code (if known): _____
Zoning District:: R-2
Land Use: RESIDENTIAL
Site Area (sf or acres): _____

Brief Description of Stormwater Management/BMP Facility: EXISTING "FARM POND", (WET POND) APPROXIMATELY 11.3-ACRE SURFACE AREA, 144-ACRE ± DRAINAGE AREA

Nearest Visible Landmark to SWM/BMP Facility: CUL-DE-SAC OF APPLEBOROUGH WAY (TO THE NORTH)

Nearest Vertical Ground Control ( if known ):
☒ JCC Geodetic Ground Control ☐ USGS ☐ Temporary ☐ Arbitrary ☐ Other
Station Number or Name: 302
Datum or Reference Elevation: 80.90
Control Description: MAIN STATION
Control Location from Subject Facility: ON ROCHAMBEAU DRIVE AT STAGE ROAD



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 003

**Section 2 - Stormwater Management / BMP Facility Construction Information:**

PreConstruction Meeting Held for Construction of SWM/BMP Facility: ☐ Yes ☐ No ☑ Unknown
Approx. Construction Start Date for SWM/BMP Facility: UNKNOWN
Facility Monitored by County Representative during Construction: ☐ Yes ☐ No ☑ Unknown
Name of Site Work Contractor Who Constructed Facility: UNKNOWN
Name of Professional Firm Who Routinely Monitored Construction: UNKNOWN
Date of Completion for SWM/BMP Facility: UNKNOWN
Date of Record Drawing/Construction Certification Submittal: 5/30/06

***( Note: Record Drawing and Construction Certifications are required within thirty (30) days of the completion of Stormwater Management and/or BMP facility construction. Record Drawings and Construction Certifications must be reviewed and approved by the James City County Environmental Division prior to final inspection, acceptance and bond or surety release. )***

**Section 3 - Owner / Designer / Contractor Information:**

Owner/Developer: *(Note: Site Owner or Applicant responsible for development of the project.)*

Name: AMERICAN EASTERN
Mailing Address: 632 HAMPTON HIGHWAY
YORKTOWN VIRGINIA 23693
Business Phone: 757-867-8800 Fax: 757-867-7188
Contact Person: DICK ASHE Title: PRESIDENT

Design Professional: *( Note: Professional Engineer or Certified Land Surveyor responsible for the design and preparation of plans and specifications for the Stormwater Management / BMP facility. )*

Firm Name:
Mailing Address:
Business Phone:
Fax:
Responsible Plan Preparer:
Title:
Plan Name:
Firm's Project No.
Plan Date:
Sheet No.'s Applicable to SWM/BMP Facility: ____ / ____ / ____ / ____ / ____

UNKNOWN EXISTING FACILITY

BMP Contractor: *(Note: Site Work Contractor directly responsible for construction of the Stormwater Management / BMP facility.)*

Name:
Mailing Address:
Business Phone:
Fax:
Contact Person:
Site Foreman/Supervisor:
Specialty Subcontractors & Purpose (for BMP Construction Only):

UNKNOWN EXISTING FACILITY



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 004

## Section 4 - Professional Certifications:

Certifying Professionals: *( Note: A Registered Professional Engineer or Certified Land Surveyor is responsible for preparation of a Record Drawing, sometimes referred to as an As-Built plan, for the drainage system for the project including any Stormwater Management/BMP Facilities. A Registered Professional Engineer is responsible for the inspection, monitoring and certification of Stormwater Management / BMP facilities during its construction. )*

### Record Drawing and Construction Certifications for Stormwater Management / BMP Facilities

**Record Drawing Certification**

Firm Name: AES Consulting Engineers
Mailing Address: 5248 Olde Towne Road, Suite 1
Williamsburg VA 23188
Business Phone: 757-253-0040
Fax: 757-220-8994

Name: V. Marc Bennett
Title: Senior Project Manager

Signature: V. Marc Bennett
Date: 5/30/06

I hereby certify to the best of my knowledge and belief that this record drawing represents the actual condition of the Stormwater Management / BMP facility. ~~The facility appears to conform with the provisions of the approved design plan, specifications and stormwater management plan, except as specifically noted.~~

**Construction Certification**

Firm Name: _____
Mailing Address: _____
_____
Business Phone: _____
Fax: _____

Name: _____
Title: _____

Signature: _____
Date: _____

I hereby certify to the best of my knowledge and belief that this Stormwater Management/BMP facility was monitored and constructed in accordance with the provisions of the approved design plan, specifications and stormwater management plan, except as specifically noted.

COMMONWEALTH OF VIRGINIA
VAN MARC BENNETT
5/30/06
No. 26628
PROFESSIONAL ENGINEER

V. Marc Bennett ( Seal )

Virginia Registered Professional Engineer or Certified Land Surveyor

_____ ( Seal )

Virginia Registered Professional Engineer

# STORMWATER MANAGEMENT / BMP FACILITIES
## RECORD DRAWING CHECKLIST

*( Key for Checklist is as follows: XX Acceptable N/A Not Applicable Inc Incomplete )* UNK (UNKNOWN)

## I. Methods and Presentation: *( Required for all Stormwater Management / BMP facilities.)*

UNK 1. All constructed facilities meet approved design plans, unless otherwise shown. Record information or deviations from approved design plan shown in clearly annotated format and/or boxed beside design values.

XX 2. Elevations to the nearest 0.1' unless higher accuracy is needed to show positive drainage.

INC 3. All plan sheets labeled with "RECORD DRAWING" in large text in lower right hand corner (Approved County Plan Number and BMP ID Code can be included if known).

N/A 4. All plan sheet revision blocks modified to indicate date and record drawing status.

INC 5. All plan sheets have certification statements and certifying professional's signature and seal.

## II. Minimum Standards: *(Required for all Stormwater Management / BMP facilities, as applicable.)*

INC 1. All requirements of Section I (Methods and Presentation) apply to this section.

XX 2. Plan Views: Show general location, arrangement and dimensions. L~~ocation and alignment shall generally match approved design plan~~s.

N/A 3. Profile or elevations along top or berm of the facility. At a minimum, elevations are required at each end, at intervals not to exceed 50 feet and where low spots may be present. Top of embankment or berm elevations must be no less than design elevation plus any settlement allowances.

XX 4. Top widths, berm widths and embankment side slopes.

XX 5. Show length, width and depth of facility or grading, contours or spot elevations as required ~~to verify permanent pool and design storage volumes were met or were reasonably close to the approved design. Evaluation of as-built grading, contours, spot elevations, or cross-sections, may be necessary by the professional to ensure approved design configurations, depths and volumes were closely maintained. If grading or elevations are significantly different from the approved plan, the Environmental Division shall be contacted immediately to determine whether the variation is acceptable or whether further evidence will be required. Facilities which do not closely resemble approved plan grades, elevations or configurations may require regrading by the Contractor; check volumetric computations; and/or a check hydraulic routing to ensure approved design water surface elevations, discharges or freeboard were closely maintained.~~

INC 6. Cross-section of the embankment through the principal spillway or outlet barrel. Must extend at least 100 ft. downstream of the pipe outlet or to recorded site property line, whichever is closer. Proper correlation is required between principal spillway (control structure) crest, emergency spillway crest, orifice and weirs and the top of the dam or facility. All elevations and dimensions must reasonably match the design plan or be sequentially relative to each other and the facility must reflect the required design storage volume(s) and/or design depth.

INC 7. Profile or elevations along the entire centerline of the emergency spillway. Emergency spillway may be steeper, but no flatter or narrower than design.

XX 8. Elevation of the principal spillway crest or outlet crest of the structure.

| | | |
|---|---|---|
| XY | 9. | Primary control structure (riser) diameter or dimensions, height, type of material and base size. Indicate provisions for access that are present such as steps, ladders, etc. |
| N/A | 10. | Dimensions, locations and elevations of outlet orifices, weirs, slots and drains. |
| N/A | 11. | Type and size of anti-vortex and trash rack device. Height, diameter, dimensions, bar spacings (if applicable) and elevations relative to the principal spillway crest. Indicate if lockable hatch is present or not. |
| N/A | 12. | Type, location, size and number of anti-seep collars or documentation of other methods utilized for seepage control. **May need to obtain this information during construction.** |
| INC | 13. | Top of impervious core embankment, core trench limits and elevation of cut-off trench bottom. **May need to obtain this information during construction.** |
| XY | 14. | Elevation of the principal spillway barrel (outlet pipe) inlet and outlet invert. |
| XY | 15. | Outlet barrel diameter, length, slope, type and thickness class of material and type of flared end sections, headwall or endwall. |
| XY | 16. | Outfall protection dimension, type and depth of rock and if underlain filter fabric is present. |
| N/A | 17. | BMP interior and periphery landscaping zones conform with arrangements and requirements of the approved design plan. |
| N/A | 18. | Maintenance plan taken from approved design plan transposed onto record drawing set. |
| N/A | 19. | Fencing location and type, if applicable to facility. |
| XY | 20. | BMP vicinity properly cleaned of stockpiles and construction debris. |
| VNK | 21. | No visual signs of erosion or channel degradation immediately downstream of facility. |
| XY | 22. | Any other information formally requested by the Environmental Division specific to the constructed SWM/BMP facility. |

***( Key for Checklist is as follows: XX Acceptable N/A Not Applicable Inc Incomplete )*** UNK (UNKNOWN)

## III. Group A - Wet Ponds *( Includes A-1 Small Wet Ponds; A-2 Wet Ponds; A-3 Wet Ext Det Ponds. )*

INC A1. All requirements of Section II, Minimum Standards, apply to Group A facilities.

UNK A2. Principal spillway consists of reinforced concrete pipe with O-Ring gaskets for watertight joint construction.

XX A3. Sediment forebays or pretreatment devices provided at inlets to pond. Generally 4 to 6 ft. deep.

XX A4. Access for maintenance and equipment is provided to the forebay(s). ~~Access corridors are at least 12 ft. wide, have a maximum slope of 15 percent and are adequately stabilized to withstand heavy equipment or vehicle use.~~

INC A5. Adequate fixed vertical sediment depth markers installed in the forebay(s) for future sediment monitoring purposes.

N/A A6. Pond liner (if required) provided. Either clay liners, polyliners, bentonite liners or use of chemical soil additives based on requirements of the approved plan.

N/A A7. Minimum 6 percent slope safety bench extending a minimum of 15 feet outward from normal pool edge and/or an aquatic bench extending a minimum of 10 feet inward from the normal shoreline with a maximum depth of 12 inches below the normal pool elevation, if applicable, per the approved design plans. (Note: Safety benches may be waived if pond side slopes are no steeper than 4H:1V).

XX A8. No trees are present within a zone 15 feet around the embankment toe and 25 feet from the principal spillway structure.

XX A9. Wet permanent pool, typically 3 to 6 feet deep, is provided and maintains level within facility.

N/A A10. Low flow orifice has a non-clogging mechanism.

N/A A11. A pond drain pipe with valve was provided.

UNK A12. Pond side slopes are not steeper than 3H:1V, unless approved plan allowed for steeper slope.

N/A A13. End walls above barrels (outlet pipe) greater than 48 inch in diameter are fenced to prevent a fall hazard.

***( Key for Checklist is as follows: XX Acceptable N/A Not Applicable Inc Incomplete )***

## IV. Group B - Wetlands *( Includes B-1 Shallow Marsh; B-2 Ext Det Shallow Wetlands; B-3 Pond Wetland System and B-4 Pocket Wetland )*

N/A B1. Same requirements as Group A Wet Ponds.

N/A B2. Minimum 2:1 length to width flow path provided across the facility.

N/A B3. Micropool provided at or around outlet from BMP (generally 3 to 6 ft. deep).

N/A B4. Wetland type landscaping provided in accordance with approved plan. Includes correct pondscaping zones, plant species, planting arrangements, wetland beds, etc. Wetland plants include 5 to 7 emergent wetland species. Individual plants at 18 inches on center in clumps.

N/A B5. Adequate wetland buffer provided (Typically 25 ft. outward from maximum design water surface elevation and 15 ft. setback to structures).

N/A B6. No more than one-half (½) of the wetland surface area is planted.

N/A B7. Topsoil or wetland mulch provided to support vigorous growth of wetland plants.

N/A B8. Planting zones staked or flagged in field and locations subsequently established by appropriate field surveying methods for record drawing presentation.

***( Key for Checklist is as follows: XX Acceptable N/A Not Applicable Inc Incomplete )***

## V. Group C - Infiltration Practices

*( Includes C-1 Infiltration Trench; C-2 Infiltration Trench; C-3 Infiltration Basin; and C-4 Infiltration Basin )*

N/A C1. All requirements of Section II, Minimum Standards, apply to Group C facilities as applicable.

N/A C2. Facility is not located on fill slopes or on natural ground in excess of six (6) percent.

N/A C3. Pretreatment devices provided prior to entry into the infiltration facility. Acceptable pretreatment devices include sediment forebays, sediment basins, sediment traps, sump pits or inlets, grass channels, plunge pools or other acceptable measures.

N/A C4. Three (3) or more of the following pretreatment devices provided to protect long term integrity of structure: grass channel; grass filter strip; bottom sand layer; upper filter fabric layer; use of washed bank run gravel aggregate.

N/A C5. Sides of infiltration practice lined with filter fabric.

N/A C6. Facility was not used for erosion and sediment control purposes and sediment was prevented from entering the facility to the greatest extent possible during construction.

N/A C7. Stabilization and acceptable vegetative cover established over contributing drainage area prior to conveyance of stormwater to the facility.

N/A C8. Minimum one hundred (100) foot separation horizontally from any known water supply well and minimum one hundred (100) foot separation upslope from any building.

N/A C9. Minimum twenty-five (25) foot separation down gradient from any structure.

N/A C10. Stormwater outfalls provided for overflow associated with larger design storms.

N/A C11. No visual signs of erosion or channel degradation immediately downstream of facility.

N/A C12. Facility does not currently cause any apparent surface or subsurface water problems to downgrade properties.

N/A C13. Observation well provided.

N/A C14. Adequate, direct access provided to the facility for future maintenance, operation and inspection.

*( Key for Checklist is as follows: XX Acceptable N/A Not Applicable Inc Incomplete )*

## VI. Group D - Filtering Systems

*( Includes D-1 Bioretention Cells; D-2 Surface Sand Filters; D-3 Underground Sand Filters; D-4 Perimeter Sand Filters; D-5 Organic Filters; and D-6 Pocket Sand Filters )*

N/A D1. All requirements of Section II, Minimum Standards, apply to Group D facilities.

N/A D2. Sediment pretreatment devices provided.

N/A D3. For D-1 BMPs (Bioretention Cells), pretreatment consisting of a grass filter strip below level spreader (deflector); a gravel diaphragm; and mulch and planting soil layers were provided.

N/A D4. For D-1 BMPs (Bioretention Cells), plantings consist of native plant species; vegetation provided was based on zones of hydric tolerances; trees and understory of shrubs and herbaceous materials were provided; woody vegetation is absent from inflow locations; and trees are located around facility perimeter.

N/A D5. Facility was not used for erosion and sediment control purposes and sediment was prevented from entering the facility to the greatest extent possible during construction.

N/A D6. No visible signs of accumulated silt/sediment were present in the facility following construction or alternately, accumulated silt/sediment was properly removed .

N/A D7. Filtering system is off-line from storm drainage conveyance system.

N/A D8. Overflow outlet has adequate erosion protection.

N/A D9. Deflector, diversion, flow splitter or regulator structure provided to divert the water quality volume to the filtering structure.

N/A D10. Minimum four (4) inch perforated underdrain provided in a clean aggregate envelope layer beneath the facility.

N/A D11. Minimum fifty (50) foot separation from any slope fifteen (15) percent or greater. Minimum one hundred (100) foot separation horizontally from any known water supply well. Minimum one hundred (100) foot separation upslope and twenty-five (25) foot separation downslope from any building.

N/A D12. Stabilization and acceptable vegetative cover established over contributing drainage area prior to conveyance of stormwater to the facility.

N/A D13. No visual signs of erosion or channel degradation immediately downstream of facility.

N/A D14. Adequate, direct access provided to the pretreatment area and/or filter bed for future maintenance.

*( Key for Checklist is as follows: XX Acceptable N/A Not Applicable Inc Incomplete )*

## VII. Group E - Open Channel Systems

*( Includes E-1 Wet Swales (Check Dams); E-2 Dry Swales;and E-3 Biofilters )*

N/A E1. All requirements of Section II, Minimum Standards, apply to Group E facilities as applicable.

N/A E2. Open channel system has constructed longitudinal slope of less than four (4) percent.

N/A E3. No visual signs of erosion in the open channel system's soil and/or vegetative cover.

N/A E4. Open channel side slopes are no steeper than 2H:1V at any location. Preferred channel sideslope is 3H:1V or flatter.

N/A E5. No visual signs of ponding are present at any location in the open channel system, except at rock check dam locations for E-1 systems (Wet Swales).

N/A E6. For E-2 BMPs (Dry Swales), an underdrain system was provided.

N/A E7. Treated timber or rock check dams provided as pretreatment devices for the open channel system.

N/A E8. Gravel diaphragm provided in areas where lateral sheet flow from impervious surfaces are directly connected to the open channel system.

N/A E9. Grass cover/stabilization in the open channel system appears adaptable to the specific soils and hydric conditions for the site and along the channel system.

N/A E10. Open channel system areas with grass covers higher than four (4) to six (6) inches were properly mowed.

N/A E11. Facility was not used for erosion and sediment control purposes and sediment was prevented from entering the facility to the greatest extent possible during construction.

N/A E12. No visible signs of accumulated silt/sediment were present in the facility following construction or alternately, accumulated silt/sediment was properly removed and no adverse affects to the function of the facility are anticipated.

N/A E13. For E-3 BMPs (Biofilters), the bottom width is six (6) feet maximum at any location.

N/A E14. For E-3 BMPs (Biofilters), sideslopes are 3H:1V maximum at any location.

N/A E15. For E-3 BMPs (Biofilters), the constructed channel slope is less than or equal to three (3) percent at any location.

N/A E16. For E-3 BMPs (Biofilters), the constructed grass channel is approximately equivalent to the constructed roadway length.

*( Key for Checklist is as follows: XX Acceptable N/A Not Applicable Inc Incomplete )*

## VIII. Group F - Extended Dry Detention

*( Includes F-1 Timber Walls; and F-2 Dry Extended Detention with Forebay )*

N/A F1. All requirements of Section II, Minimum Standards, apply to Group F facilities.

N/A F2. Basin bottom has positive slope and drainage from all basin inflow points to the riser (or outflow) location.

N/A F3. Timber wall BMP used in intermittent stream only. (ie. Prohibited in perennial streams.)

N/A F4. Forebay provided approximately 20 ft. upstream of the facility. Forebays generally 4 to 6 feet in depth.

N/A F5. A reverse slope pipe, vertical stand pipe or mini-barrel and riser was provided to prevent clogging.

N/A F6. Principal spillway and outlet barrel provided consisting of reinforced concrete pipe with O-Ring gaskets for watertight joint construction.

N/A F7. Mini-barrel and riser, if used, contains a removable trash rack to reduce clogging.

N/A F8. Low flow orifice, if used, has a minimum diameter of three (3) inches or two (2) inches if internal orifice control was utilized and a small, cage type external trash rack.

N/A F9. Timbers properly reinforced or concrete footing provided if soil conditions were prohibitive.

N/A F10. Timber wall cross members extended to a minimum depth of two (2) feet below ground elevation.

N/A F11. Protection against erosion and scour from the low flow orifice and weir-flow trajectory provided.

N/A F12. Stilling basin or standard outlet protection provided at principal spillway outlet.

N/A F13. Adequate, direct access provided to the facility. Access corridor to facility is at least ten (10) feet wide, slope is less than twenty (20) percent and appropriate stabilization provided for equipment and vehicle use. Access extends to forebay, standpipe and timber wall, as applicable.

N/A F14. No visual signs of undercutting of timber walls or clogging of the low orifice were present.

N/A F15. No visual signs of erosion or channel degradation immediately downstream of facility.

N/A F16. No visible signs of accumulated silt/sediment were present in the facility following construction or alternately, accumulated silt/sediment was properly removed and no adverse affects to the function of the facility are anticipated.

***( Key for Checklist is as follows: XX Acceptable N/A Not Applicable Inc Incomplete )***

## IX. Group G - Open Spaces *( Includes All Open Space Types G-1; G-2; and G-3 )*

N/A G1. All requirements of Section II, Minimum Standards, apply to Group G facilities as applicable.

N/A G2. Constructed impervious areas appear to conform with locations indicated on the approved plan and appear less than sixty (60) percent impervious in accordance with the requirements of the James City County Chesapeake Bay Preservation Ordinance.

N/A G3. Dedicated open space areas are in undisturbed common areas, conservation easements or are protected by other enforceable instruments that ensures perpetual protection.

N/A G4. Provisions included to clearly specify how the natural vegetated areas utilized as dedicated open space will be managed and field identified (marked).

N/A G5. Adequate protection measures were implemented during construction to protect the defined dedicated open space areas.

N/A G6. Dedicated open space areas were not disturbed during construction (ie. cleared, grubbed or graded).

*( Key for Checklist is as follows: XX Acceptable N/A Not Applicable Inc Incomplete )*

## X. Storm Drainage Systems (Associated with BMP's Only)

*( Includes all incidental stormwater drainage conveyance systems associated with SWM/BMP facilities such as onsite or offsite storm drains, open channels, inlets, manholes, junctions, outlet protections, deflectors, etc. These facilities are external to the treatment function of, but are directly associated with drainage to and/or from a constructed SWM/BMP facility. The intent of this portion of the certification is to accurately identify the type and quantity of inflow or outflow points associated with the facility for future reference. The Professional may use his/her own discretion to determine inclusive facilities to meet the intent of this section. As a general rule, storm drainage systems would include incidental facilities to the nearest access structure upslope or downslope from the normal physical limits of the facility or 800 feet of storm drainage conveyance system length, whichever is less. )*

INC SD1. All requirements of Section II, Minimum Standards, apply to Storm Drainage Systems.

N/A SD2. Horizontal location of all pipe and structures relative to the SWM/BMP facility.

N/A SD3. Type, top elevation and invert elevation of all access type structures (inlets, manholes, etc.).

N/A SD4. Material type, size or diameter, class, invert elevations, lengths and slopes for all pipe segments.

N/A SD5. Class, length, width and depth of riprap and outlet protections or dimensions of special energy dissipation structures.

## XII. Other Systems

*( Includes any non-typical, specialty, manufactured or innovative stormwater management/BMP practices or systems generally accepted for use as or in conjunction with other acceptable stormwater management / BMP practices. Requires evidence of prior satisfactory industry use and prior Environmental Division approval, waiver or exception .)*

N/A O1. All requirements of Section II, Minimum Standards, apply to this section.

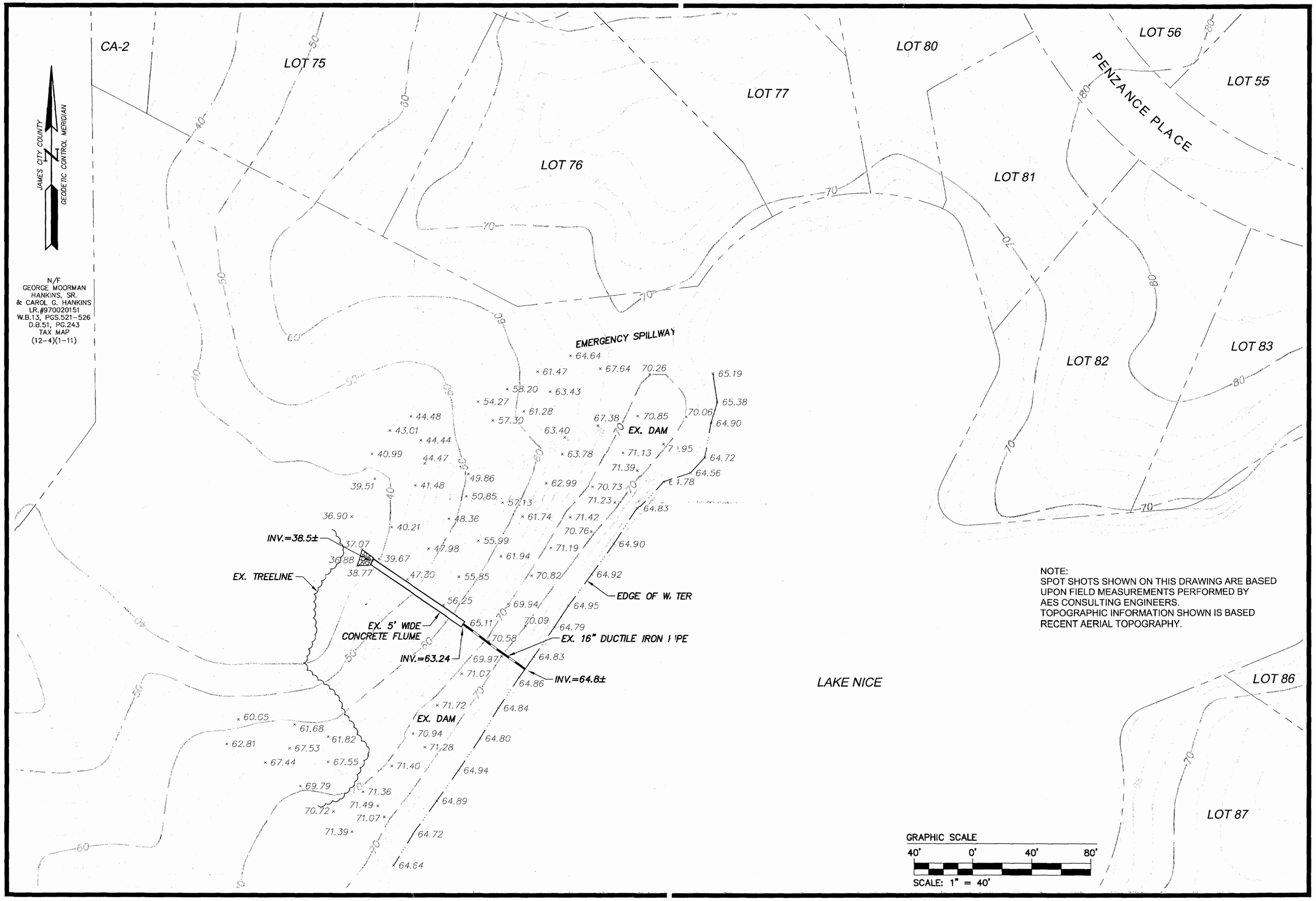
XX O2. Certification criteria to be determined on a case-by-case basis by the Environmental Division specific to the proposed SWM/BMP facility.

## XIII. References

*( The James City County Record Drawing and Construction Certification Forms and Checklists for Stormwater Management / BMP facilities were developed using the following sources and references. )*


- ❒ Baltimore County, Maryland Soil Conservation District, As-Built Stormwater Management Pond Checklist.
- ❒ James City County, Virginia, Guidelines for Design and Construction of Stormwater Management BMP's (October 1999).
- ❒ James City County, Virginia, Stormwater Detention/Retention Basin Design Checklist and Erosion and Sediment Control and Stormwater Management Design Plan Checklists.
- ❒ James City County Stormwater Policy Framework, Final Report of the James City County BMP Policy Project, October 1998, The Center for Watershed Protection.
- ❒ Prince Georges County, Maryland, As-Built Requirements Retention or Detention Pond/Basin.
- ❒ Prince William County, Virginia, Stormwater Management Fact Sheet.
- ❒ Stafford County, Virginia, As-Built Plan Checklist.
- ❒ Stormwater Management Design Manual, NRCS Maryland Code No. 378, Pond Standards and Specifications.
- ❒ USEPA/Watershed Management Institute, Stormwater Management Inspection Forms.
- ❒ Virginia Impounding Structure Regulations (Dam Safety), Department of Conservation & Recreation, 1997.
- ❒ Virginia Erosion and Sediment Control Handbook, Third Edition 1992, Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation.
- ❒ Virginia Stormwater Management Handbook, 1999 edition, Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation.


File: Shared\SWMProg\BMP\Certif\RDCC.wpd





AES
CONSULTING ENGINEERS
WILLIAMSBURG • RICHMOND

5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(757) 253-0040
Fax (757) 220-8994


AS-BUILT OF DAM

# WELLINGTON

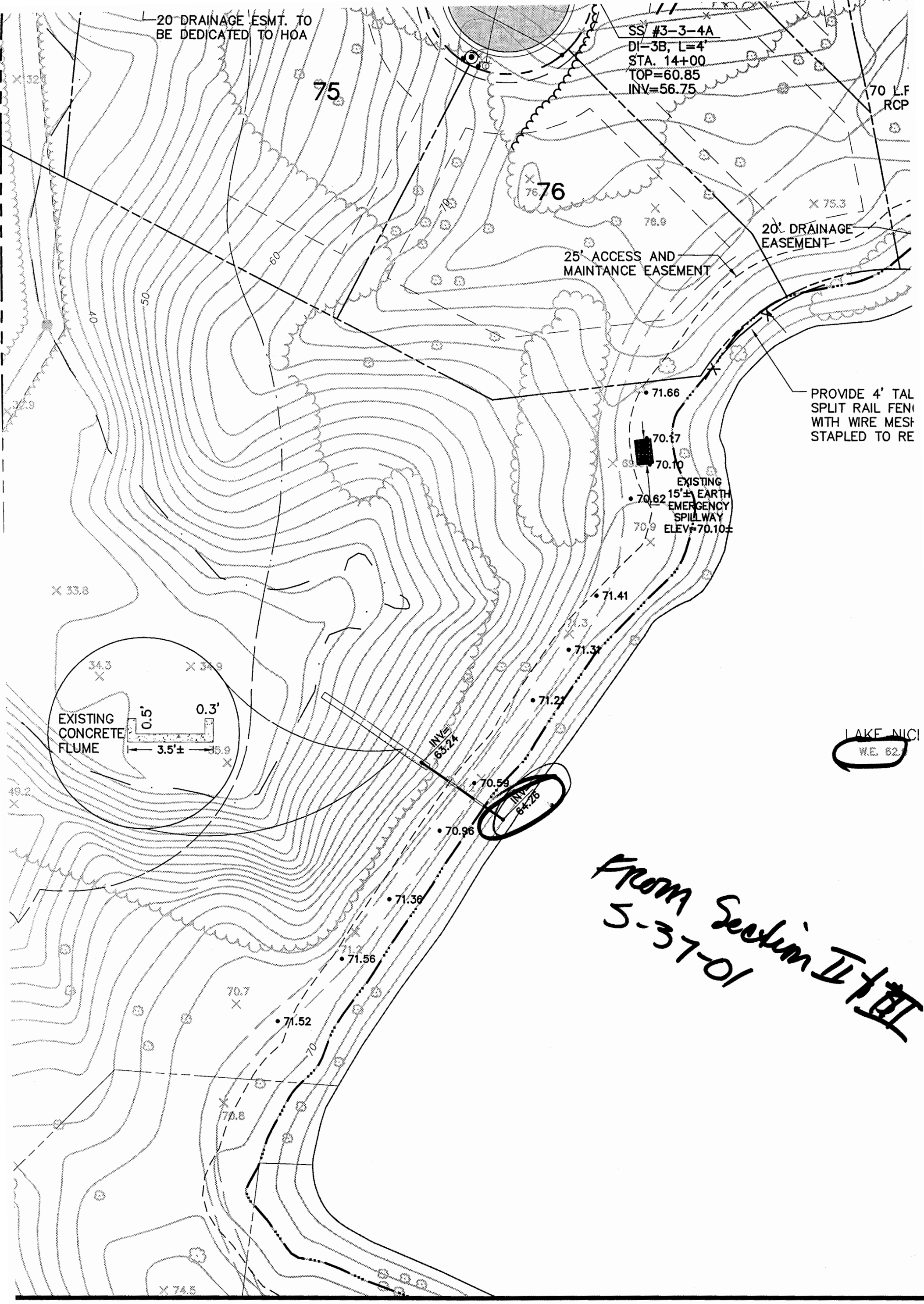
BEING THE PROPERTY OF
WELLINGTON, L.L.C.

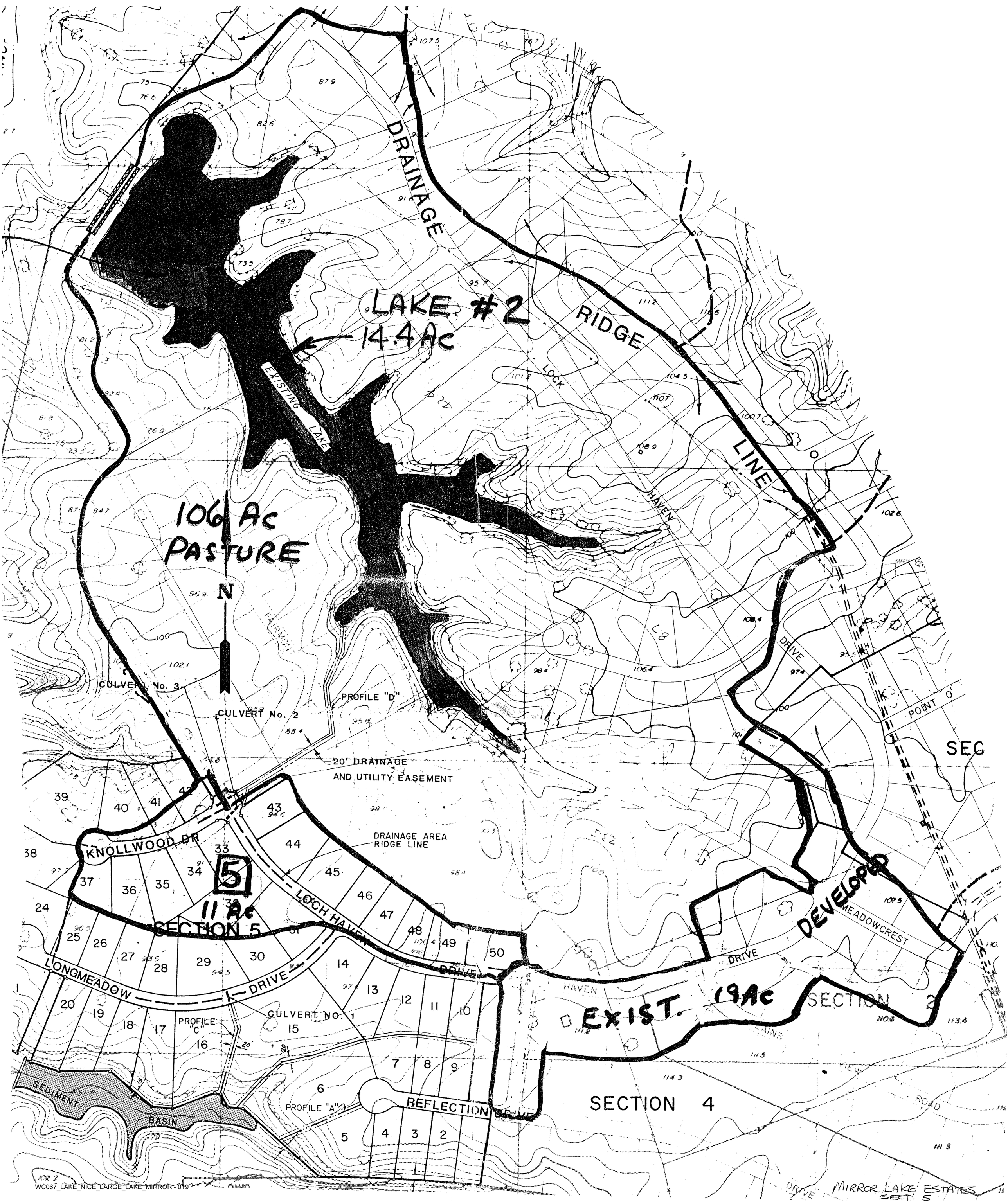
STONEHOUSE DISTRICT JAMES CITY COUNTY VIRGINIA

COMMONWEALTH OF VIRGINIA
VAN MARC BENNETT
No. 26628
4/5/04
PROFESSIONAL ENGINEER

| No. | DATE | REVISION / COMMENT / NOTE | BY |
|---|---|---|---|

| | |
|---|---|
| Designed VMB/JAG | Drawn AWT |
| Scale 1"=40' | Date 4/5/04 |
| Project No. 8223-6 | |
| Drawing No. 1 of 1 | |

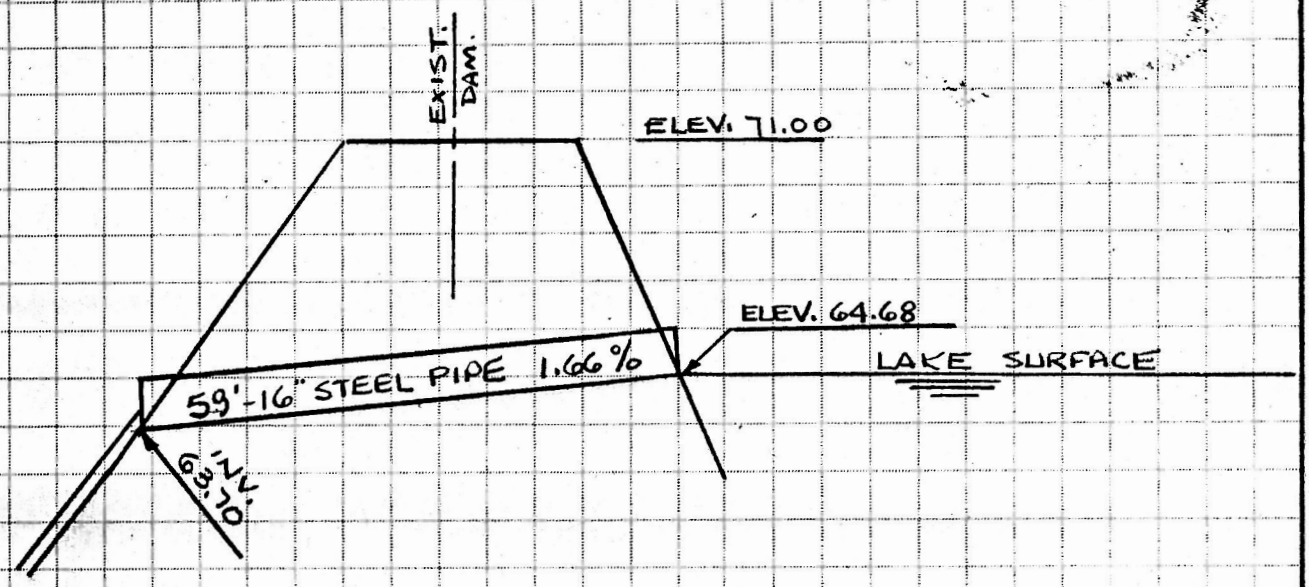

20 DRAINAGE ESMT. TO BE DEDICATED TO HOA
SS #3-3-4A
DI-3B, L=4'
STA. 14+00
TOP=60.85
INV=56.75
70 L.F
RCP
75
76
20' DRAINAGE EASEMENT
25' ACCESS AND MAINTANCE EASEMENT
PROVIDE 4' TAL
SPLIT RAIL FEN
WITH WIRE MESH
STAPLED TO RE
71.66
70.17
70.10
EXISTING 15'± EARTH EMERGENCY SPILLWAY ELEV=70.10±
70.62
71.41
71.31
71.21
EXISTING CONCRETE FLUME
0.5'
0.3'
3.5'±
INV= 63.24
70.59
INV= 64.26
70.96
71.36
71.56
71.52
LAKE NICI
W.E. 62.
From Section II-II
5-37-01


DRAINAGE
RIDGE
LINE
LAKE #2
14.4 Ac
EXISTING LAKE
106 Ac
PASTURE
N
CULVERT No. 3
CULVERT No. 2
PROFILE "D"
20' DRAINAGE
AND UTILITY EASEMENT
DRAINAGE AREA
RIDGE LINE
KNOLLWOOD DR
5
11 Ac
SECTION 5
LOCH HAVEN
DRIVE
LONGMEADOW
DRIVE
CULVERT NO. 1
PROFILE "C"
PROFILE "A"
SEDIMENT
BASIN
REFLECTION
DRIVE
SECTION 4
EXIST. 19 Ac
DEVELOPED
MEADOWCREST
DRIVE
SECTION 2
POINT O'
SEG
MIRROR LAKE ESTATES
SECT. 5

THE DeYOUNG-JOHNSON GROUP, INC.
P. O. Box 197
WILLIAMSBURG, VA 23187
(804) 253-0673

JOB MIRROR LAKE ESTATES - SECTION 5
SHEET NO. 1 OF
CALCULATED BY DPC DATE 8/24/87
CHECKED BY DATE
SCALE

# RUNOFF ANALYSIS - LAKE # 2 (EXISTING LAKE)




## LAKE # 2 - DRAINAGE AREA - BEFORE SECTION 5

H. LENGTH = 3900'
W. S. = 5%
IMPERVIOUS = 4.5% EXIST
H.L. MOD =
PONDS = 9.7%

CN: EXISTING

106 Ac @ CN = 57 (PASTURE) 58
17.5 Ac @ CN 55 (RES) 70
14.4 Ac @ CN = 100 (LAKE)
1.5 Ac @ CN = 89 (ROADS)
139.4 Ac @ CN 61 63.4 64

106 Ac PASTURE
- 50 Ac CN = 39 TYPE A
- 50 Ac CN = 74 TYPE C
- 6 Ac CN = 61 TYPE B

CN = 57

19 Ac DEV.
- 1.5 Ac ROAD w/ DITCHES (IMP.) CN 89
- 17.5 Ac RES w/ 27% imp. CN 55

Im. Area = .27 x 19 = 5.13 ac = 18,622 ft³ storage

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JOB MIRROR LAKE ESTATES SECTION 5
SHEET NO. 2 OF
CALCULATED BY DPC DATE
CHECKED BY DATE
SCALE

## LAKE # 2 - DRAINAGE AREA - WITH SECTION 5

106 Ac (PASTURE) @ CN = 57
17.5 Ac (RES) @ CN = 55
14.4 Ac (LAKE) @ CN = 100
10.0 Ac (SECTION 5) @ CN = 39
2.40 ROAD W/ DITCHES CN 89

**150.30 Ac CN = 60**

HYD. LENGTH = 3900
W.S. = 5%
IMP. AREA = 6.5%
H.L. MOD. 25%
POND = 9.5%

SECTION 5

10 Ac RES @ 27% imp CN = 39 (TYPE A SOIL)
90 Ac ROAD @ CN 89

IMP. AREA

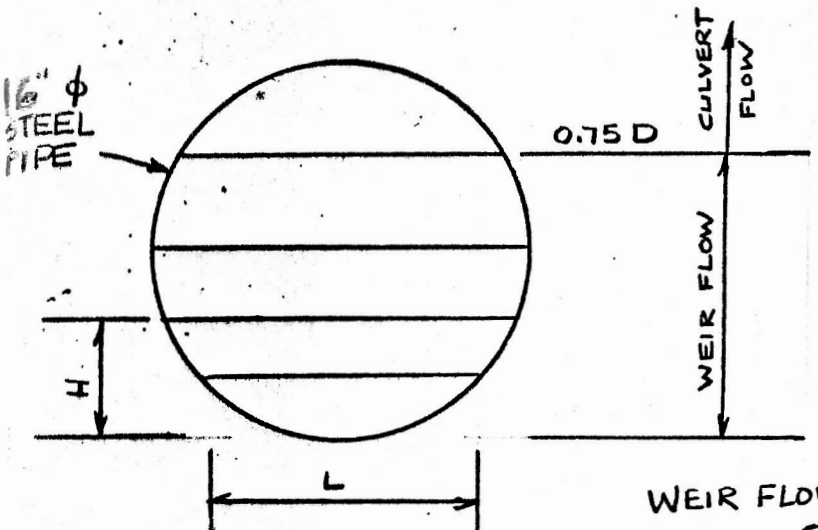
27.5 Ac @ 27% 7.42 Ac
+ 2.4 Ac @ 100% 2.40 Ac
9.82 Ac

$\frac{9.84}{150.30}$ = 6.5%

1" R.O. = 12.5 ac ft = 545,590 ft³ × 24×60×60 = 4.3 cfs

## LAKE STORAGE :

| CONTOUR | AREA | $\Sigma(A_1+A_2)/2$ | VOLUME (cf) | $\Sigma$ VOL |
|---|---|---|---|---|
| 64.7 (65) | 627,250 | 0 | — | — |
| 70.0 | 901,700 | 764,475 | 4,051,717 | 4,051,717 |
| 75.0 | 1,141,000 | 1,021,350 | 5,106,750 | 9158467 |




| H | L | Q |
|---|---|---|
| .3 | 1.11 | 0.49 |
| .5 | 1.29 | 1.23 |
| .7 | 1.33 | 2.10 |
| .9 | 1.25 | 2.88 |

WEIR FLOW = $Q = CLH^{3/2}$

C = 2.7

THE DeYOUNG-JOHNSON GROUP, INC.
P. O. Box 197
WILLIAMSBURG, VA 23187
(804) 253-0673

JOB MIRROR LAKE ESTATES SECTION 5
SHEET NO. 3 OF
CALCULATED BY DPC DATE
CHECKED BY DATE
SCALE

| SURFACE ELEV | AREA | $\Sigma(A_1+A_2)/2$ | VOL (cf) | $\Sigma$VOL (cf) | H | OUTFLOW (16" STEEL) |
|---|---|---|---|---|---|---|
| 64.7 | 627,250 | 0 | 0 | 0 | 0 | 0 |
| 65.0 | 642785 | 635,017 | 190,505 | 190505 | .3 | 0.49 |
| 65.2 | 653 141 | 647963 | 129592 | 320,097 | .5 | 1.23 |
| 65.4 | 663,498 | 658319 | 131,663 | 451,760 | .7 | 2.10 |
| 65.6 | 673,854 | 668.676 | 133735 | 585,495 | .9 | 2.88 |
| 65.8 | 684,211 | 679032 | 135806 | 721,301 | 1.1 | 3.5 |
| 66.0 | 694,568 | 689,389 | 137878 | 859,179 | 1.3 | 4.5 |
| 66.2 | 704924 | 699745 | 139949 | 999,128 | 1.5 | 5.5 |
| 66.4 | 715,281 | 710102 | 142020 | 1,141,148 | 1.7 | 6.3 |
| 66.6 | 725637 | 720459 | 144092 | 1,285,240 | 1.9 | 7.2 |
| 66.8 | 735,994 | 730815 | 146,163 | 1431403 | 2.1 | 8 |
| 67.0 | 746351 | 741,172 | 148,234 | 1579637 | 2.3 | 8.5 |
| 67.2 | 756707 | 751,529 | 150,304 | 1729941 | 2.5 | 9 |

MIRROR LAKE ESTATES - SECTION 5
(LAKE # 2 - BEFORE SECTION 5)

2YR / 24 HR

INPUT DESIGN DATA

DESIGN STORM FOR ANALYSIS = 2 YEAR
DRAINAGE AREA (ACRES) = 139.4
AVERAGE SLOPE OF DRAINAGE AREA (%) = 5
HYDRAULIC LENGTH (FT) = 3900
IMPERVIOUS SURFACE (%) = 4.5
HYDRAULIC LENGTH MODIFIED (%) = 5
COMPOSITE CURVE NUMBER = 61
SLOPE ADJUSTMENT FACTOR = 1
PONDING ADJUSTMENT FACTOR = 1

RESULTS OF HYDRAULIC CALCULATIONS
(SCS TR-55 & TP-149 PROCEDURES)

WATERSHED LAG ADJUSTED (IMPER. AREAS & CHAN. IMPROV.) IS .66 HOURS
TIME OF CONCENTRATION ADJUSTED IS 1.1 HOURS
THE PEAK DISCHARGE FROM THIS WATERSHED IS 25 C.F.S.

THE FOLLOWING ARE TIME INCREMENTS AND ORDINATES OF THE
INFLOW HYDROGRAPH

| HOURS) | (C.F.S.) |
|---|---|
| 0,0 | |
| .12 | 0 |
| .24 | 0 |
| .36 | 0 |
| .481 | 0 |
| .601 | 0 |
| .721 | 0 |
| .841 | 0 |
| .961 | .174 |
| 1.081 | .377 |
| 1.201 | 2.552 |
| 1.321 | 6.363 |
| 1.442 | 10.65 |
| 1.562 | 15.363 |
| 1.682 | 20.449 |
| 1.802 | 25.259 |
| 1.922 | 27.191 |
| 2.042 | 26.506 |
| 2.162 | 25.06 |
| 2.282 | 22.932 |
| 2.403 | 20.208 |
| 2.523 | 16.96 |
| 2.643 | 13.713 |
| 2.763 | 10.465 |
| 2.883 | 7.217 |
| 3.003 | 4.195 |
| 3.123 | 2.253 |
| 3.244 | 1.292 |
| 3.364 | .616 |
| 3.484 | .196 |
| 3.604 | 0 |

MIRROR LAKE ESTATES - SECTION 5
(LAKE # 2 - AFTER SECTION 5)

2YR / 24 HR

INPUT DESIGN DATA

DESIGN STORM FOR ANALYSIS = 2 YEAR
DRAINAGE AREA (ACRES) = 150.3
AVERAGE SLOPE OF DRAINAGE AREA (%) = 5
HYDRAULIC LENGTH (FT) = 3900
IMPERVIOUS SURFACE (%) = 6.5
HYDRAULIC LENGTH MODIFIED (%) = 10
COMPOSITE CURVE NUMBER = 60
SLOPE ADJUSTMENT FACTOR = 1
PONDING ADJUSTMENT FACTOR = 1

RESULTS OF HYDRAULIC CALCULATIONS
(SCS TR-55 & TP-149 PROCEDURES)

WATERSHED LAG ADJUSTED (IMPER. AREAS & CHAN. IMPROV.) IS .637 HOURS
TIME OF CONCENTRATION ADJUSTED IS 1.062 HOURS
THE PEAK DISCHARGE FROM THIS WATERSHED IS 25 C.F.S.

THE FOLLOWING ARE TIME INCREMENTS AND ORDINATES OF THE
INFLOW HYDROGRAPH

| (HOURS) | (C.F.S.) |
|---|---|
| 0,0 | |
| .116 | 0 |
| .232 | 0 |
| .348 | 0 |
| .464 | 0 |
| .58 | 0 |
| .696 | 0 |
| .812 | 0 |
| .928 | .176 |
| 1.044 | .277 |
| 1.16 | 2.259 |
| 1.276 | 5.94 |
| 1.392 | 10.1 |
| 1.508 | 14.692 |
| 1.624 | 19.67 |
| 1.74 | 24.541 |
| 1.856 | 26.683 |
| 1.972 | 26.107 |
| 2.088 | 24.765 |
| 2.204 | 22.732 |
| 2.32 | 20.082 |
| 2.436 | 16.893 |
| 2.552 | 13.705 |
| 2.668 | 10.517 |
| 2.784 | 7.328 |
| 2.9 | 4.306 |
| 3.016 | 2.307 |
| 3.132 | 1.327 |
| 3.248 | .635 |
| 3.364 | .202 |
| 3.48 | 0 |

MIRROR LAKE ESTATES - SECTION 5
(LAKE # 2 - AFTER SECTION 5)

10 YR
24 HR

INPUT DESIGN DATA

DESIGN STORM FOR ANALYSIS = 10 YEAR
DRAINAGE AREA (ACRES) = 150.3
AVERAGE SLOPE OF DRAINAGE AREA (%) = 5
HYDRAULIC LENGTH (FT) = 3900
IMPERVIOUS SURFACE (%) = 6.5
HYDRAULIC LENGTH MODIFIED (%) = 10
COMPOSITE CURVE NUMBER = 60
SLOPE ADJUSTMENT FACTOR = 1
PONDING ADJUSTMENT FACTOR = 1

RESULTS OF HYDRAULIC CALCULATIONS
(SCS TR-55 & TP-149 PROCEDURES)

WATERSHED LAG ADJUSTED (IMPER. AREAS & CHAN. IMPROV.) IS .637 HOURS
TIME OF CONCENTRATION ADJUSTED IS 1.062 HOURS
THE PEAK DISCHARGE FROM THIS WATERSHED IS 116 C.F.S.

THE FOLLOWING ARE TIME INCREMENTS AND ORDINATES OF THE
INFLOW HYDROGRAPH

| (HOURS) | (C.F.S.) |
|---|---|
| 0,0 | |
| .116 | 0 |
| .232 | 0 |
| .348 | .021 |
| .464 | .093 |
| .58 | .254 |
| .696 | .552 |
| .812 | 1.258 |
| .928 | 4.622 |
| 1.044 | 9.057 |
| 1.16 | 22.311 |
| 1.276 | 41.11 |
| 1.392 | 61.177 |
| 1.508 | 81.9 |
| 1.624 | 101.785 |
| 1.74 | 116.357 |
| 1.856 | 118.953 |
| 1.972 | 112.452 |
| 2.088 | 103.57 |
| 2.204 | 92.606 |
| 2.32 | 79.836 |
| 2.436 | 65.54 |
| 2.552 | 51.326 |
| 2.668 | 37.357 |
| 2.784 | 24.132 |
| 2.9 | 13.271 |
| 3.016 | 6.899 |
| 3.132 | 3.94 |
| 3.248 | 1.874 |
| 3.364 | .593 |
| 3.48 | 0 |

| STAGE | DISCHARGE | STORAGE |
|---|---|---|
| (FT) | (CFS) | (CF) |

| | | |
|---|---|---|
| 0 | 0 | 0 |
| .3 | .49 | 190505 |
| .5 | 1.23 | 320097 |
| .7 | 2.1 | 451760 |
| .9 | 2.88 | 585495 |
| 1.1 | 3.5 | 721301 |
| 1.3 | 4.5 | 859179 |

THE FOLLOWING ARE TIME INCREMENTS AND ORDINATES OF THE OUTFLOW HYDOGRAPH

| (HOURS) | (C.F.S.) |
|---|---|
| 0.000 | 0.000 |
| 0.116 | 0.000 |
| 0.232 | 0.000 |
| 0.348 | 0.000 |
| 0.464 | 0.000 |
| 0.580 | 0.001 |
| 0.696 | 0.002 |
| 0.812 | 0.005 |
| 0.928 | 0.012 |
| 1.044 | 0.029 |
| 1.160 | 0.063 |
| 1.276 | 0.118 |
| 1.392 | 0.195 |
| 1.508 | 0.293 |
| 1.624 | 0.410 |
| 1.740 | 0.591 |
| 1.856 | 0.865 |
| 1.972 | 1.121 |
| 2.088 | 1.371 |
| 2.204 | 1.604 |
| 2.320 | 1.800 |
| 2.436 | 1.956 |
| 2.552 | 2.073 |
| 2.668 | 2.146 |
| 2.784 | 2.186 |
| 2.900 | 2.206 |
| 3.016 | 2.213 |
| 3.132 | 2.215 |
| 3.248 | 2.213 |
| 3.364 | 2.208 |
| 3.480 | 2.203 |
| 3.596 | 2.197 |
| 3.712 | 2.192 |
| 3.828 | 2.187 |
| 3.944 | 2.181 |
| 4.060 | 2.176 |
| 4.176 | 2.171 |
| 4.292 | 2.165 |
| 4.408 | 2.160 |

MAXIMUM OUTFLOW IS 2.22 C.F.S.

MAXIMUM STAGE IS .69375 FT.

MAXIMUM STORAGE IS 451319 CUBIC FEET

| (FT) | (CFS) | (CF) |
|---|---|---|
| ) | 0 | 0 |
| .3 | .49 | 190505 |
| .5 | 1.23 | 320097 |
| 7 | 2.1 | 451760 |
| 9 | 2.88 | 585495 |
| .1 | 3.5 | 721301 |
| .3 | 4.5 | 859179 |
| .5 | 5.5 | 999128 |

THE FOLLOWING ARE TIME INCREMENTS AND ORDINATES OF THE
OUTFLOW HYDOGRAPH

| HOURS) | (C.F.S.) |
|---|---|
| 0.000 | 0.000 |
| 0.120 | 0.000 |
| 0.240 | 0.000 |
| 0.360 | 0.000 |
| 0.481 | 0.000 |
| 0.601 | 0.000 |
| 0.721 | 0.000 |
| 0.841 | 0.000 |
| 0.961 | 0.000 |
| 1.081 | 0.002 |
| 1.201 | 0.007 |
| 1.321 | 0.016 |
| 1.442 | 0.031 |
| 1.562 | 0.051 |
| 1.682 | 0.076 |
| 1.802 | 0.105 |
| 1.922 | 0.135 |
| 2.042 | 0.163 |
| 2.162 | 0.190 |
| 2.282 | 0.214 |
| 2.403 | 0.234 |
| 2.523 | 0.251 |
| 2.643 | 0.264 |
| 2.763 | 0.274 |
| 2.883 | 0.280 |
| 3.003 | 0.283 |
| 3.123 | 0.285 |
| 3.244 | 0.285 |
| 3.364 | 0.285 |
| 3.484 | 0.285 |
| 3.604 | 0.285 |
| 3.724 | 0.285 |
| 3.844 | 0.284 |
| 3.964 | 0.284 |
| .084 | 0.284 |
| .205 | 0.283 |
| .325 | 0.283 |
| .445 | 0.283 |
| .565 | 0.282 |

AXIMUM OUTFLOW IS .29 C.F.S.
AXIMUM STAGE IS .177551 FT.
AXIMUM STORAGE IS 112747 CUBIC FEET

| STAGE (FT) | DISCHARGE (CFS) | STORAGE (CF) |
|---|---|---|
| 0 | 0 | 0 |
| .3 | .49 | 190505 |
| .5 | 1.23 | 320097 |
| .7 | 2.1 | 451760 |

THE FOLLOWING ARE TIME INCREMENTS AND ORDINATES OF THE OUTFLOW HYDOGRAPH

| (HOURS) | (C.F.S.) |
|---|---|
| 0.000 | 0.000 |
| 0.116 | 0.000 |
| 0.232 | 0.000 |
| 0.348 | 0.000 |
| 0.464 | 0.000 |
| 0.580 | 0.000 |
| 0.696 | 0.000 |
| 0.812 | 0.000 |
| 0.928 | 0.000 |
| 1.044 | 0.002 |
| 1.160 | 0.006 |
| 1.276 | 0.015 |
| 1.392 | 0.028 |
| 1.508 | 0.046 |
| 1.624 | 0.070 |
| 1.740 | 0.098 |
| 1.856 | 0.126 |
| 1.972 | 0.153 |
| 2.088 | 0.178 |
| 2.204 | 0.201 |
| 2.320 | 0.221 |
| 2.436 | 0.237 |
| 2.552 | 0.250 |
| 2.668 | 0.259 |
| 2.784 | 0.265 |
| 2.900 | 0.268 |
| 3.016 | 0.270 |
| 3.132 | 0.271 |
| 3.248 | 0.271 |
| 3.364 | 0.271 |
| 3.480 | 0.270 |
| 3.596 | 0.270 |
| 3.712 | 0.270 |
| 3.828 | 0.269 |
| 3.944 | 0.269 |
| 4.060 | 0.269 |
| 4.176 | 0.269 |
| 4.292 | 0.268 |
| 4.408 | 0.268 |

MAXIMUM OUTFLOW IS .275 C.F.S.

MAXIMUM STAGE IS .1683674 FT.

MAXIMUM STORAGE IS 106916 CUBIC FEET

ATTN: D. COOK.

THE DeYOUNG-JOHNSON GROUP, INC.
P. O. Box 197
WILLIAMSBURG, VA 23187
(804) 253-0673

JOB MIRROR LAKE SECT. 5

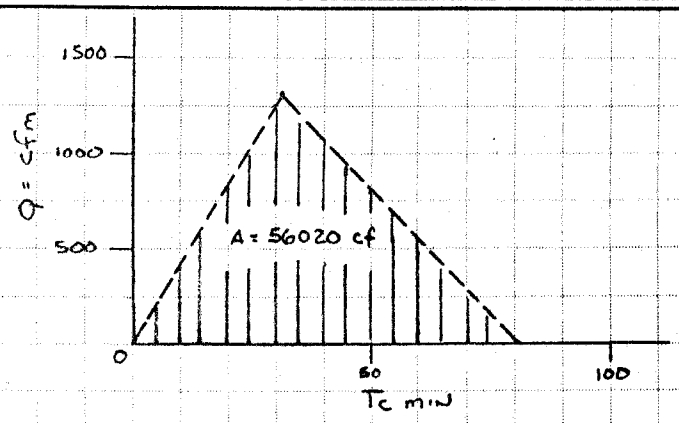
EXISTING LAKE

CALCULATED BY DPC DATE 7-1-87

CHECKED BY DATE

SCALE

$Q_{10}$ = 23.16 cfs
= 1390 cfm
$T_c$ = 31 min




TOTAL VOLUME OF WATER
OF 10 YR STORM INTO LAKE = 56020 CF
= 672240 SF @ 1" DEPTH

AREA OF EXISTING LAKE = 14.4 Ac × 43560 = 627264 SF

$\frac{672420}{627264}$ = 1.07" ADDITIONAL DEPTH TO EXISTING LAKE



PRODUCT 204-1 NEBS Inc. Groton, Mass. 01471

# Pond Report

REVISIED LAKE NICE POND ROUTING

Hydraflow Hydrographs by Intelisolve

Tuesday, Nov 30 2004, 5:15 PM

11/30/04
JAG

**Pond No. 1 - ORIGINAL WET POND**

**Pond Data**

Pond storage is based on known contour areas. Average end area method used.

**Stage / Storage Table**

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|---|---|---|---|---|
| 0.00 | 64.25 | 646,223 | 0 | 0 |
| 1.75 | 66.00 | 718,875 | 1,194,461 | 1,194,461 |
| 3.75 | 68.00 | 800,845 | 1,519,720 | 2,714,181 |
| 5.75 | 70.00 | 895,175 | 1,696,020 | 4,410,201 |
| 7.75 | 72.00 | 1,008,361 | 1,903,536 | 6,313,737 |
| 9.75 | 74.00 | 1,135,267 | 2,143,628 | 8,457,365 |

**Culvert / Orifice Structures**

| | [A] | [B] | [C] | [D] |
|---|---|---|---|---|
| **Rise (in)** | = 15.00 | 0.00 | 0.00 | 0.00 |
| **Span (in)** | = 15.00 | 0.00 | 0.00 | 0.00 |
| **No. Barrels** | = 1 | 0 | 0 | 0 |
| **Invert El. (ft)** | = 64.25 | 0.00 | 0.00 | 0.00 |
| **Length (ft)** | = 60.00 | 0.00 | 0.00 | 0.00 |
| **Slope (%)** | = 1.70 | 0.00 | 0.00 | 0.00 |
| **N-Value** | = .013 | .000 | .000 | .000 |
| **Orif. Coeff.** | = 0.60 | 0.00 | 0.00 | 0.00 |
| **Multi-Stage** | = n/a | No | No | No |

**Weir Structures**

| | [A] | [B] | [C] | [D] |
|---|---|---|---|---|
| **Crest Len (ft)** | = 15.00 | 0.00 | 0.00 | 0.00 |
| **Crest El. (ft)** | = 70.10 | 0.00 | 0.00 | 0.00 |
| **Weir Coeff.** | = 3.33 | 0.00 | 0.00 | 0.00 |
| **Weir Type** | = Rect | --- | --- | --- |
| **Multi-Stage** | = No | No | No | No |

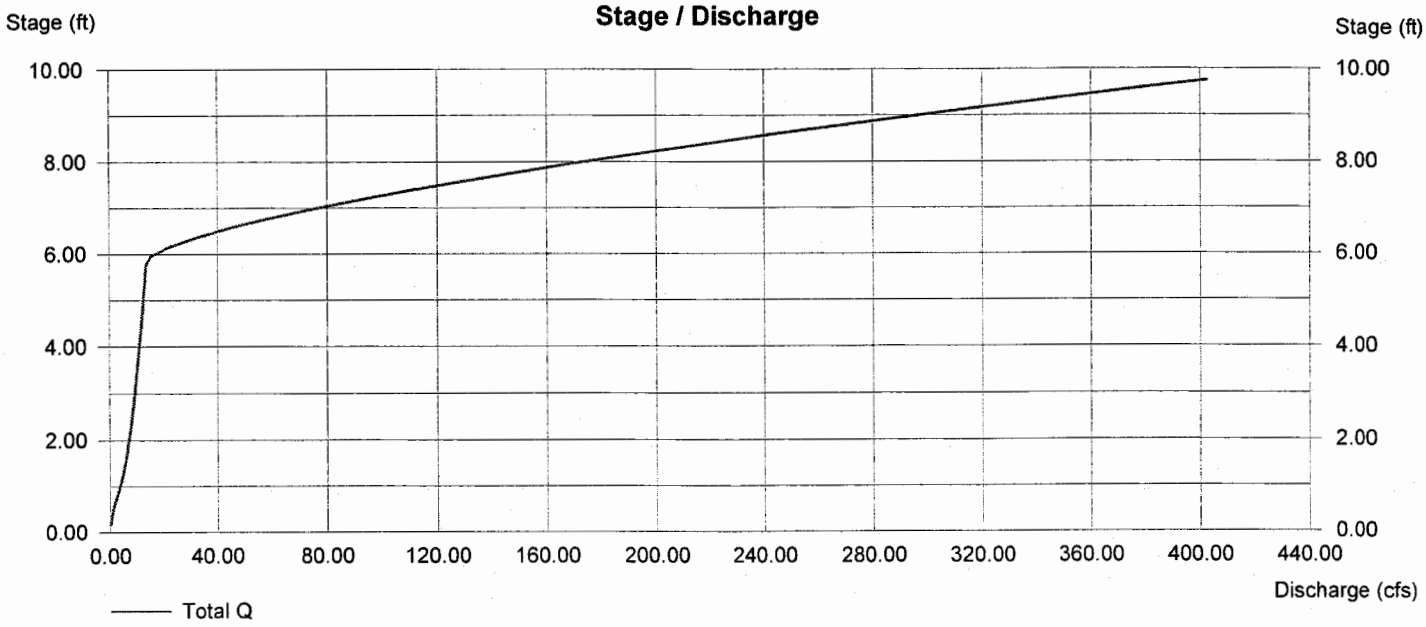
**Exfiltration** = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.

AS SUBMITTED WITH S-112-04 (WELLINGTON 6 & 7)

JCL# WC067
BMP

**Stage / Discharge**



# Pond Report

Hydraflow Hydrographs by Intelisolve — Tuesday, Nov 30 2004, 5:15 PM

## Pond No. 2 - REVISED WET POND

### Pond Data

Pond storage is based on known contour areas. Average end area method used.

### Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|---|---|---|---|---|
| 0.00 | 64.25 | 646,223 | 0 | 0 |
| 1.75 | 66.00 | 715,528 | 1,191,532 | 1,191,532 |
| 3.75 | 68.00 | 775,492 | 1,491,020 | 2,682,552 |
| 5.75 | 70.00 | 895,175 | 1,670,667 | 4,353,219 |
| 7.75 | 72.00 | 1,008,361 | 1,903,536 | 6,256,755 |
| 9.75 | 74.00 | 1,135,267 | 2,143,628 | 8,400,383 |

REVISED FOR GRADING

### Culvert / Orifice Structures

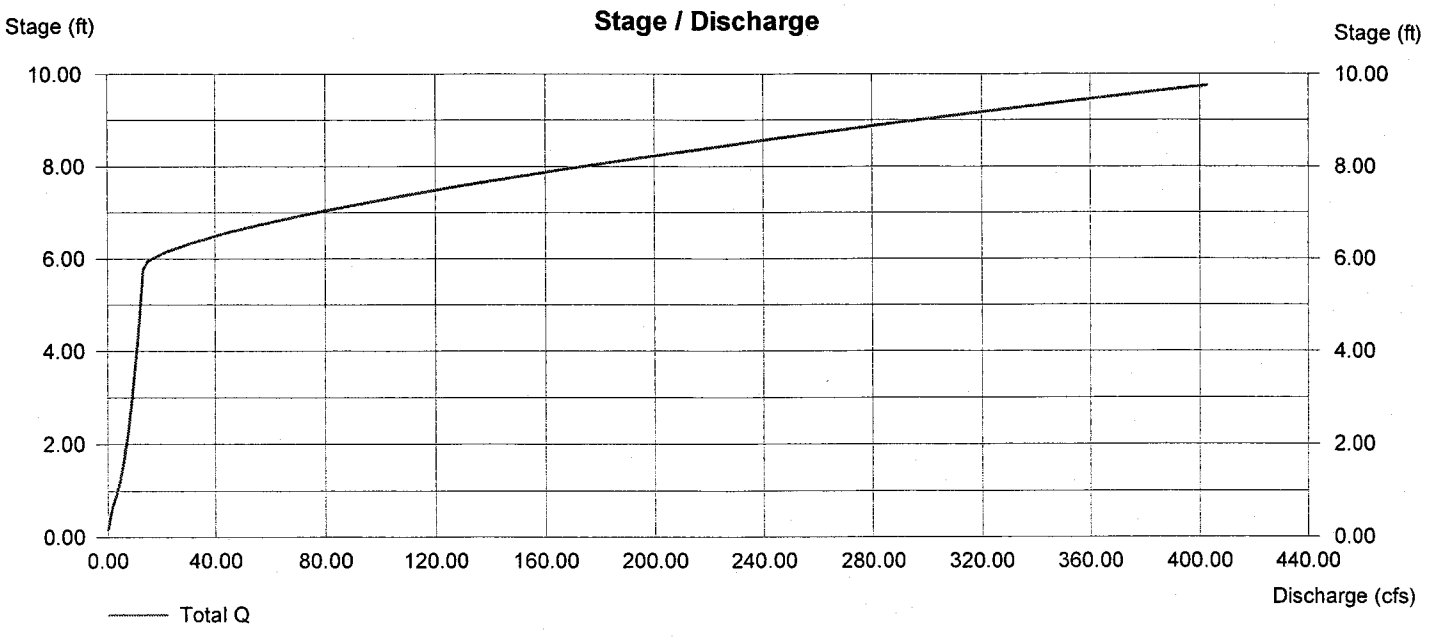
| | [A] | [B] | [C] | [D] |
|---|---|---|---|---|
| Rise (in) | = 15.00 | 0.00 | 0.00 | 0.00 |
| Span (in) | = 15.00 | 0.00 | 0.00 | 0.00 |
| No. Barrels | = 1 | 0 | 0 | 0 |
| Invert El. (ft) | = 64.25 | 0.00 | 0.00 | 0.00 |
| Length (ft) | = 60.00 | 0.00 | 0.00 | 0.00 |
| Slope (%) | = 1.70 | 0.00 | 0.00 | 0.00 |
| N-Value | = .013 | .000 | .000 | .000 |
| Orif. Coeff. | = 0.60 | 0.00 | 0.00 | 0.00 |
| Multi-Stage | = n/a | No | No | No |

### Weir Structures

| | [A] | [B] | [C] | [D] |
|---|---|---|---|---|
| Crest Len (ft) | = 15.00 | 0.00 | 0.00 | 0.00 |
| Crest El. (ft) | = 70.10 | 0.00 | 0.00 | 0.00 |
| Weir Coeff. | = 3.33 | 0.00 | 0.00 | 0.00 |
| Weir Type | = Rect | --- | --- | --- |
| Multi-Stage | = No | No | No | No |

**Exfiltration =** 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.



# Hydrograph Plot

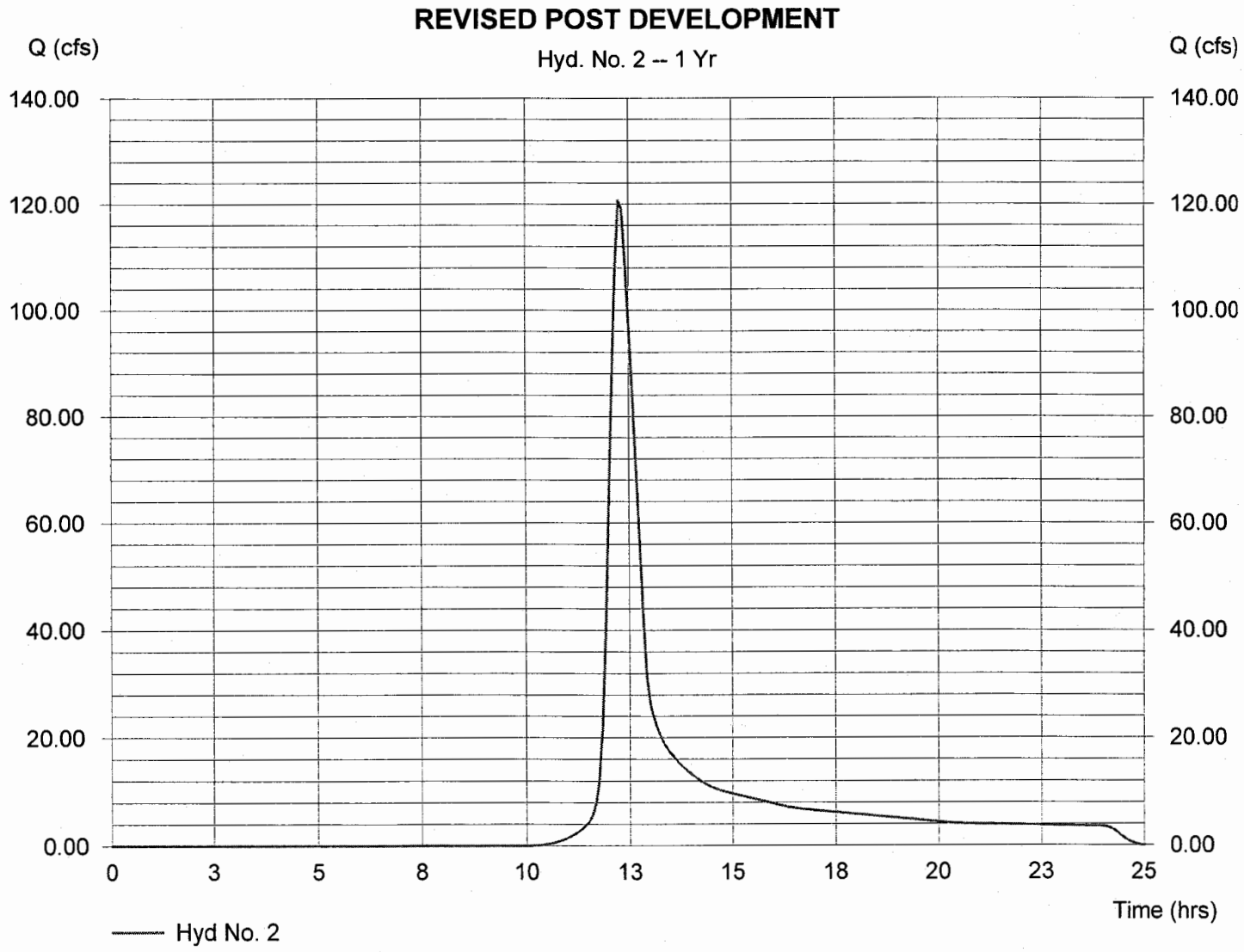
Hydraflow Hydrographs by Intelisolve | Tuesday, Nov 30 2004, 5:24 PM

## Hyd. No. 2

REVISED POST DEVELOPMENT

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 120.75 cfs |
| Storm frequency | = 1 yrs | Time interval | = 5 min |
| Drainage area | = 157.67 ac | Curve number | = 80 |
| Basin Slope | = 2.4 % | Hydraulic length | = 1950 ft |
| Tc method | = LAG | Time of conc. (Tc) | = 35.0658 min |
| Total precip. | = 2.80 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |

Hydrograph Volume = 614,998 cuft



# Hydrograph Plot

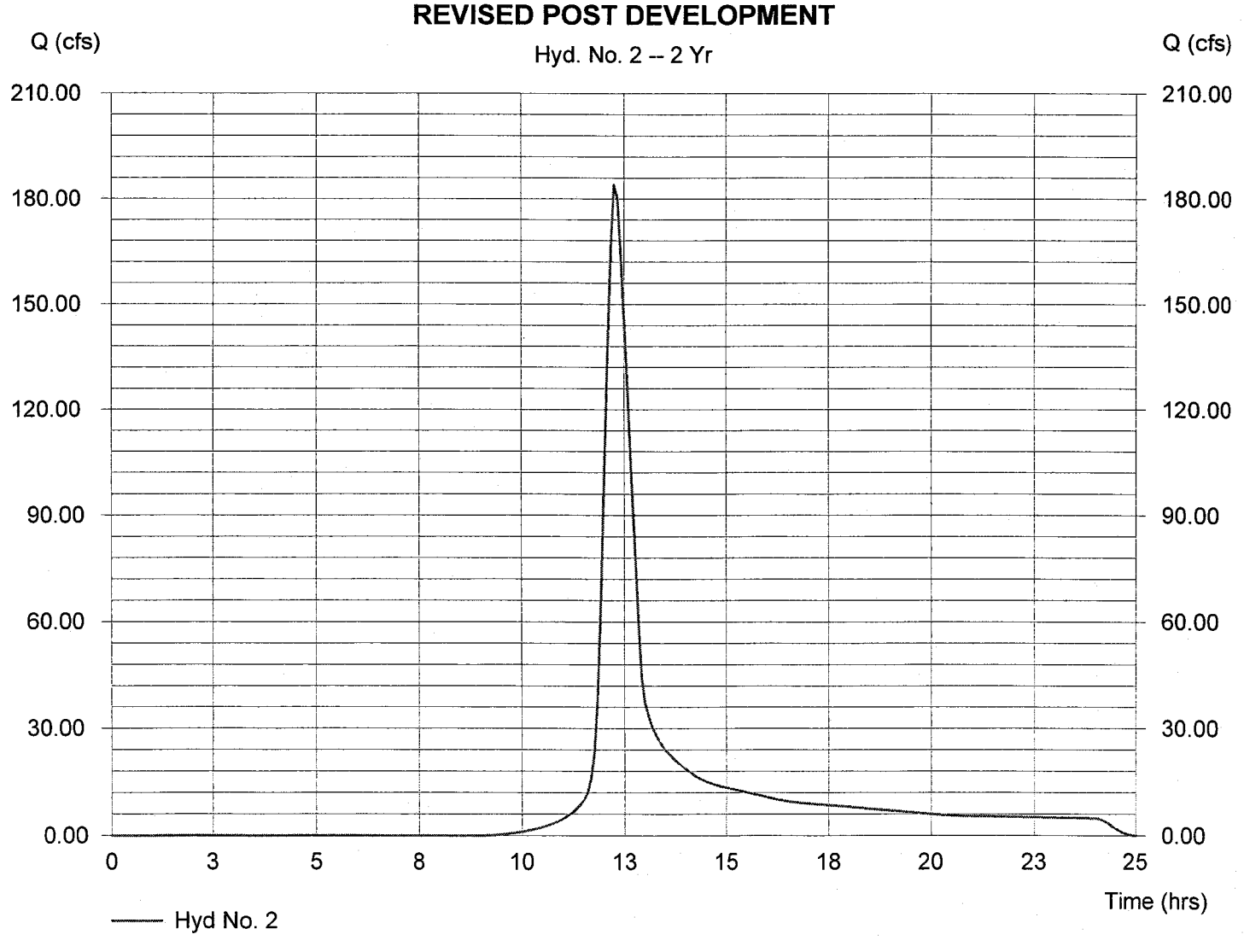
Hydraflow Hydrographs by Intelisolve | Tuesday, Nov 30 2004, 5:24 PM

## Hyd. No. 2

REVISED POST DEVELOPMENT

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 184.16 cfs |
| Storm frequency | = 2 yrs | Time interval | = 5 min |
| Drainage area | = 157.67 ac | Curve number | = 80 |
| Basin Slope | = 2.4 % | Hydraulic length | = 1950 ft |
| Tc method | = LAG | Time of conc. (Tc) | = 35.0658 min |
| Total precip. | = 3.50 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |

Hydrograph Volume = 913,143 cuft



# Hydrograph Plot

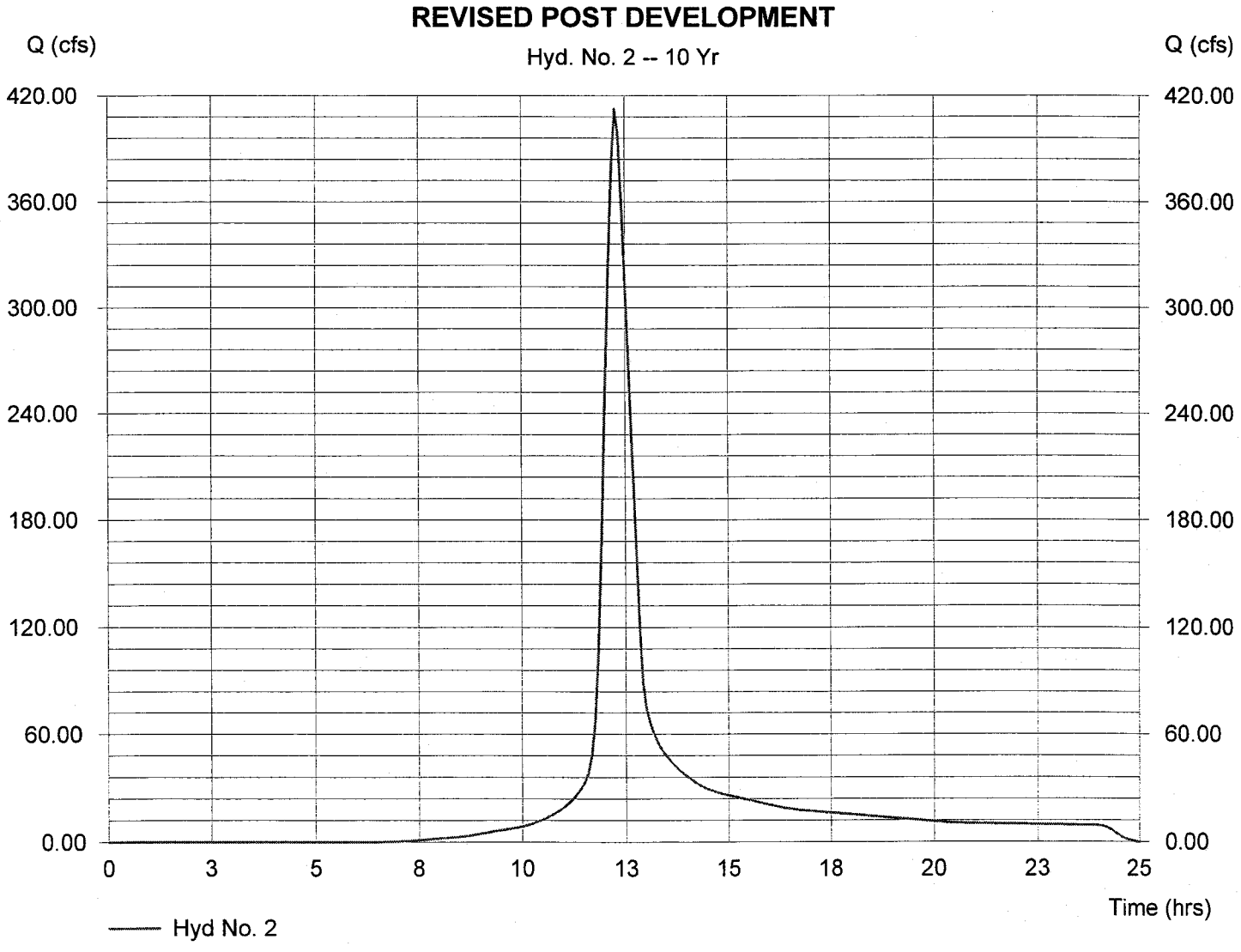
Hydraflow Hydrographs by Intelisolve | Tuesday, Nov 30 2004, 5:24 PM

## Hyd. No. 2

REVISED POST DEVELOPMENT

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 412.51 cfs |
| Storm frequency | = 10 yrs | Time interval | = 5 min |
| Drainage area | = 157.67 ac | Curve number | = 80 |
| Basin Slope | = 2.4 % | Hydraulic length | = 1950 ft |
| Tc method | = LAG | Time of conc. (Tc) | = 35.0658 min |
| Total precip. | = 5.80 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |

Hydrograph Volume = 2,009,636 cuft



# Hydrograph Plot

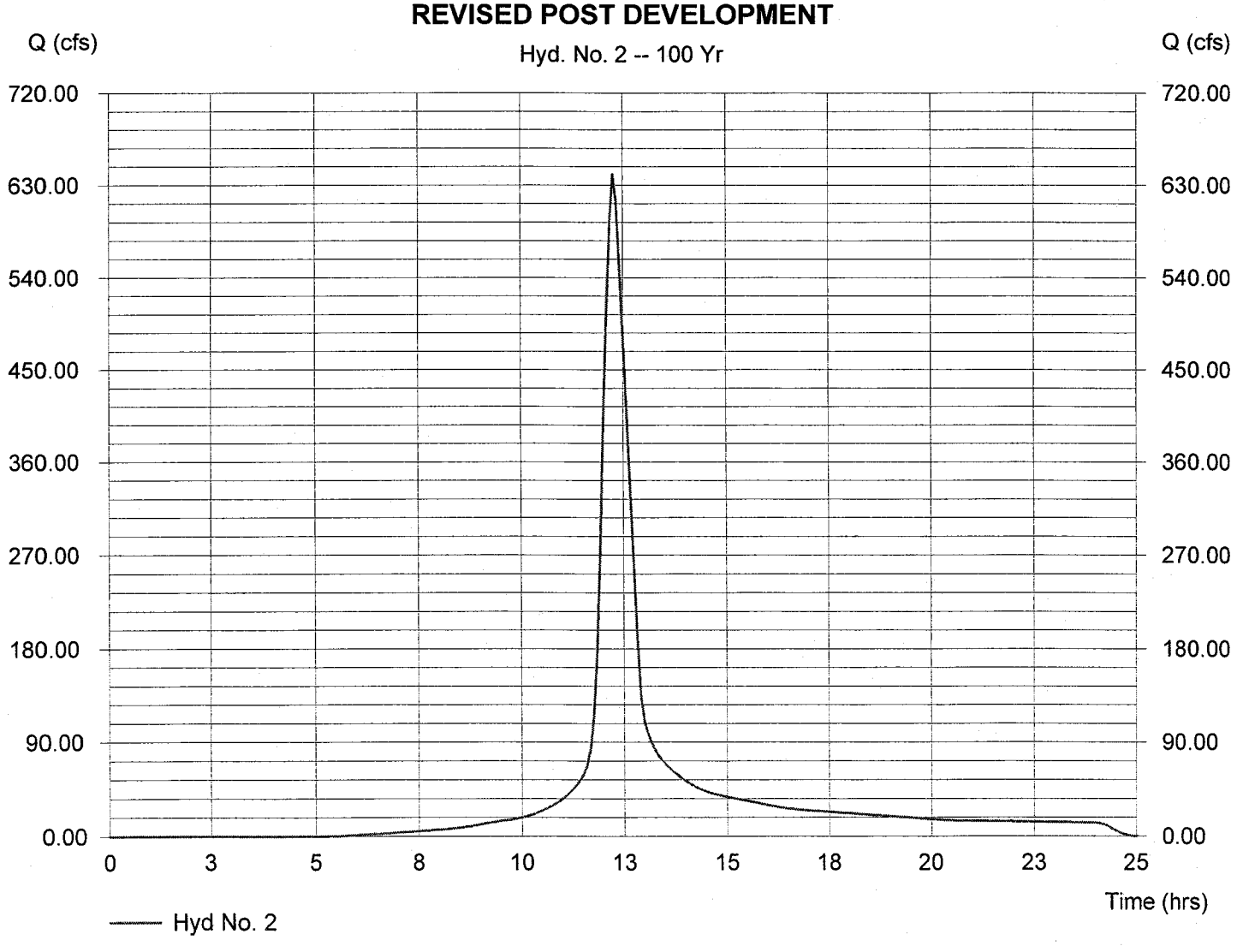
Hydraflow Hydrographs by Intelisolve | Tuesday, Nov 30 2004, 5:24 PM

## Hyd. No. 2

REVISED POST DEVELOPMENT

| | | | |
|---|---|---|---|
| Hydrograph type | = SCS Runoff | Peak discharge | = 640.65 cfs |
| Storm frequency | = 100 yrs | Time interval | = 5 min |
| Drainage area | = 157.67 ac | Curve number | = 80 |
| Basin Slope | = 2.4 % | Hydraulic length | = 1950 ft |
| Tc method | = LAG | Time of conc. (Tc) | = 35.0658 min |
| Total precip. | = 8.00 in | Distribution | = Type II |
| Storm duration | = 24 hrs | Shape factor | = 484 |

Hydrograph Volume = 3,138,936 cuft



# Hydrograph Plot

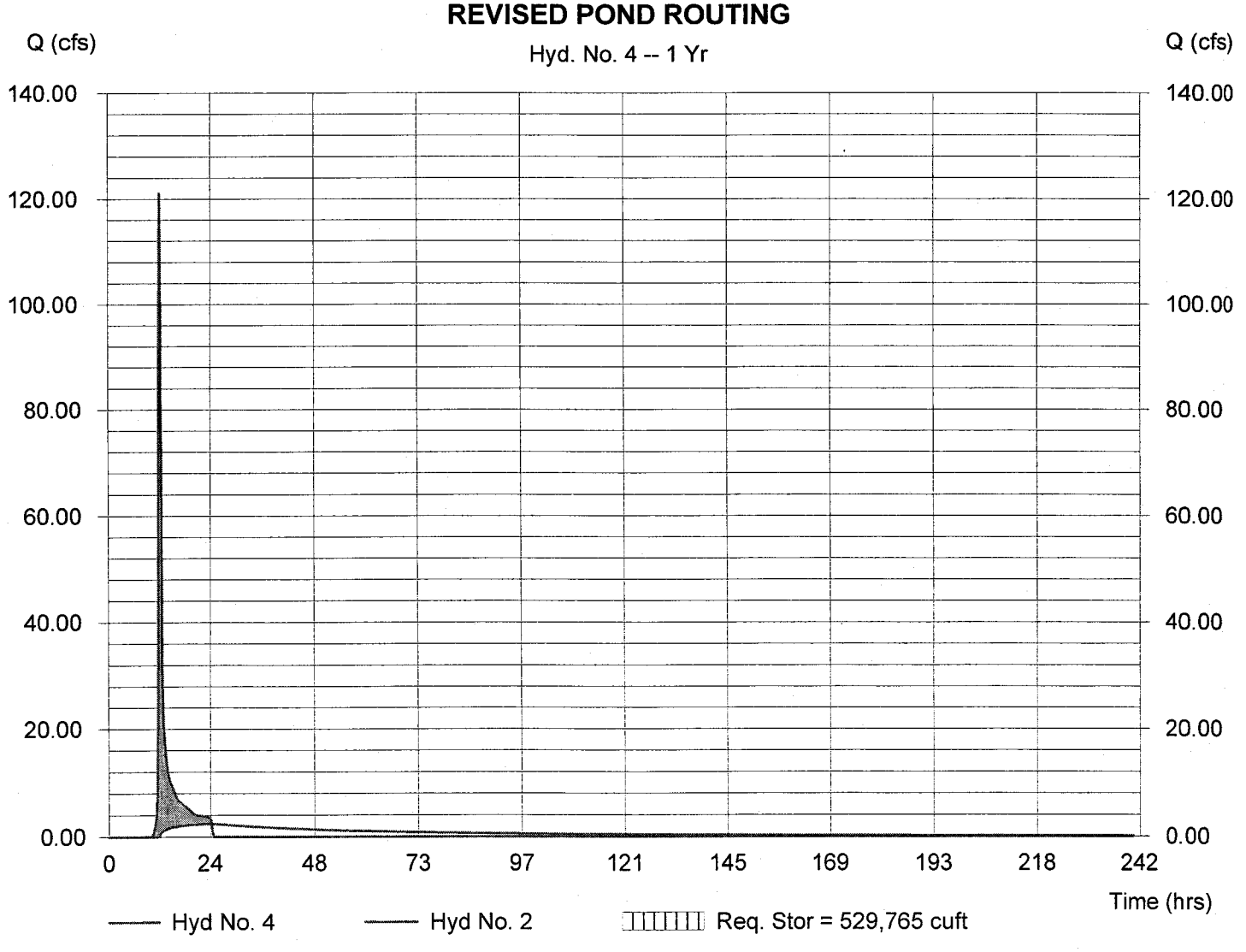
Hydraflow Hydrographs by Intelisolve | Tuesday, Nov 30 2004, 5:14 PM

## Hyd. No. 4

REVISED POND ROUTING

| | | | |
|---|---|---|---|
| Hydrograph type | = Reservoir | Peak discharge | = 2.42 cfs |
| Storm frequency | = 1 yrs | Time interval | = 5 min |
| Inflow hyd. No. | = 2 | Max. Elevation | = 65.03 ft |
| Reservoir name | = REVISED WET POND | Max. Storage | = 529,765 cuft |

Storage Indication method used. | Hydrograph Volume = 518,836 cuft



# Hydrograph Plot

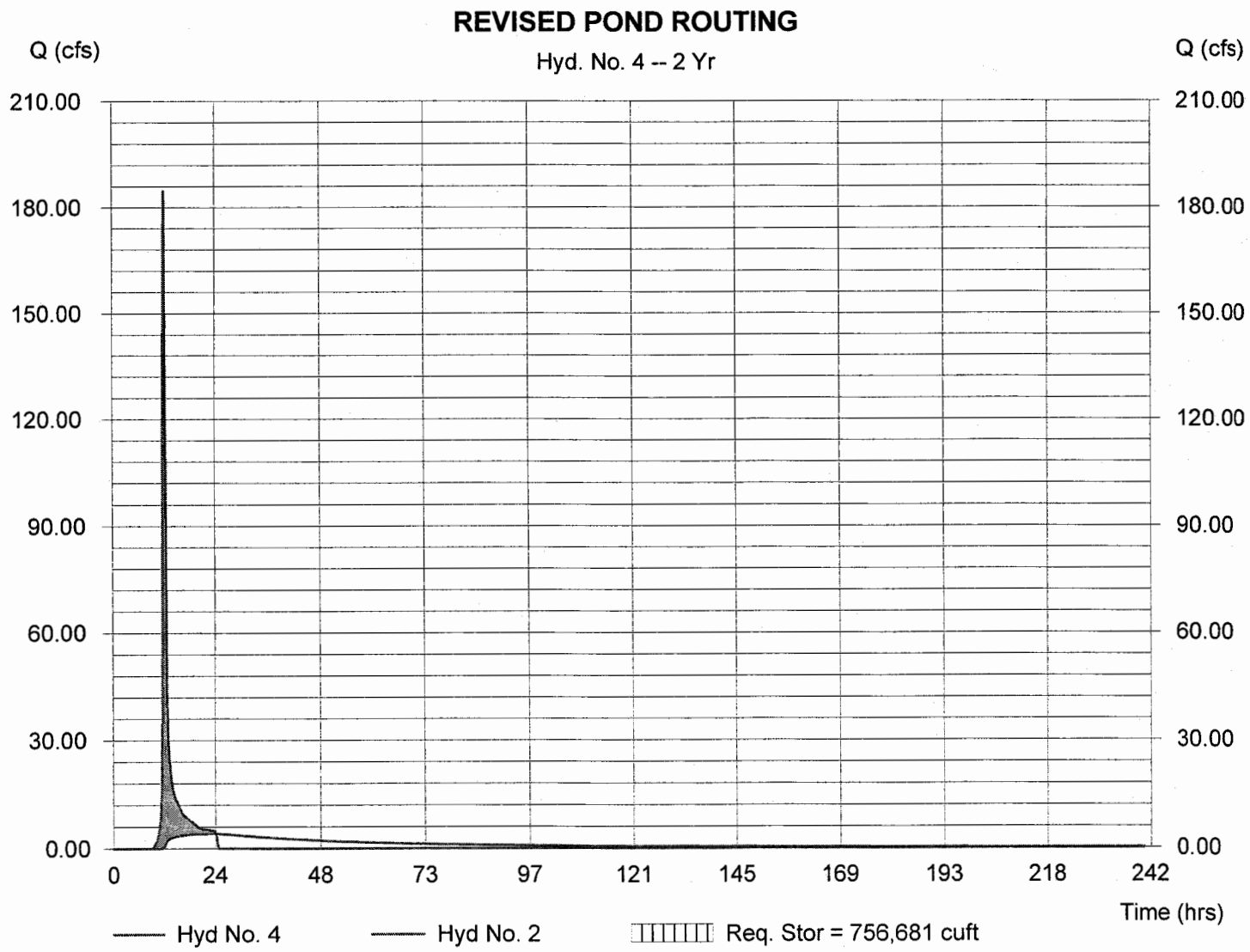
Hydraflow Hydrographs by Intelisolve | Tuesday, Nov 30 2004, 5:14 PM

## Hyd. No. 4

REVISED POND ROUTING

| | | | |
|---|---|---|---|
| Hydrograph type | = Reservoir | Peak discharge | = 4.11 cfs |
| Storm frequency | = 2 yrs | Time interval | = 5 min |
| Inflow hyd. No. | = 2 | Max. Elevation | = 65.36 ft |
| Reservoir name | = REVISED WET POND | Max. Storage | = 756,681 cuft |

Storage Indication method used. | Hydrograph Volume = 808,874 cuft



# Hydrograph Plot

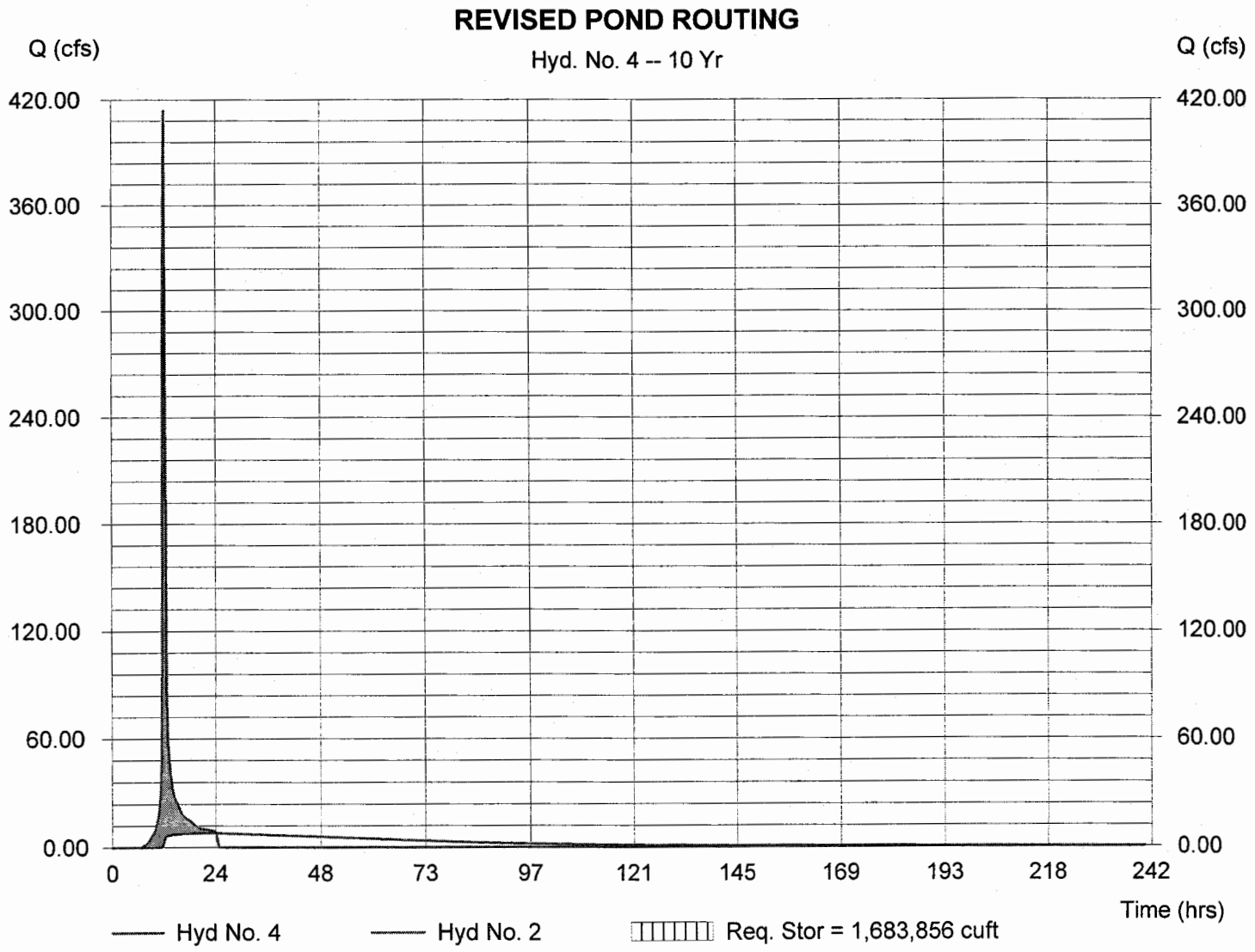
Hydraflow Hydrographs by Intelisolve | Tuesday, Nov 30 2004, 5:14 PM

## Hyd. No. 4

REVISED POND ROUTING

| | | | |
|---|---|---|---|
| Hydrograph type | = Reservoir | Peak discharge | = 7.89 cfs |
| Storm frequency | = 10 yrs | Time interval | = 5 min |
| Inflow hyd. No. | = 2 | Max. Elevation | = 66.66 ft |
| Reservoir name | = REVISED WET POND | Max. Storage | = 1,683,856 cuft |

Storage Indication method used. | Hydrograph Volume = 1,885,308 cuft



# Hydrograph Plot

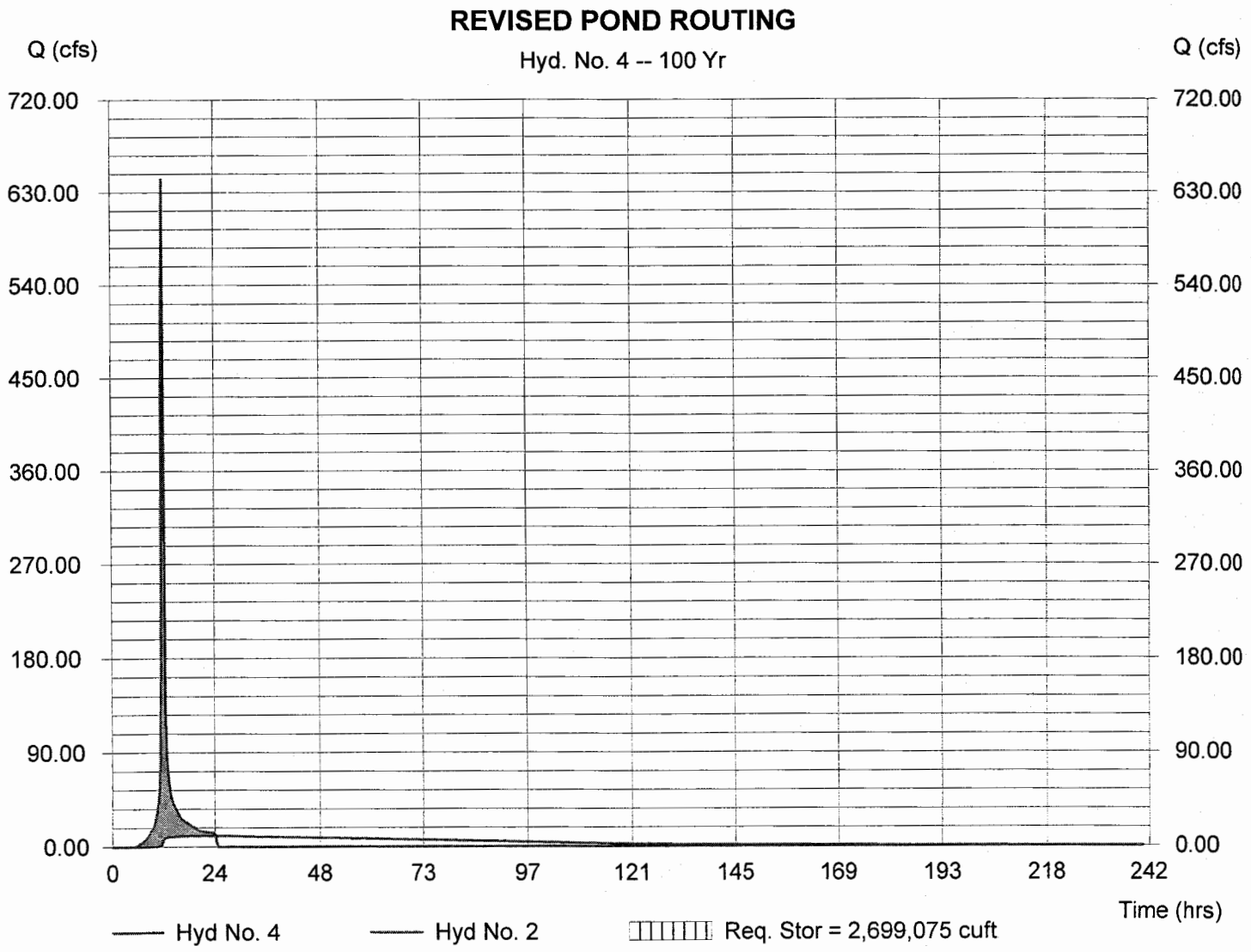
Hydraflow Hydrographs by Intelisolve | Tuesday, Nov 30 2004, 5:14 PM

## Hyd. No. 4

REVISED POND ROUTING

| | | | |
|---|---|---|---|
| Hydrograph type | = Reservoir | Peak discharge | = 10.48 cfs |
| Storm frequency | = 100 yrs | Time interval | = 5 min |
| Inflow hyd. No. | = 2 | Max. Elevation | = 68.02 ft |
| Reservoir name | = REVISED WET POND | Max. Storage | = 2,699,075 cuft |

Storage Indication method used. | Hydrograph Volume = 2,992,565 cuft



# TEMPORARY SEDIMENT BASIN DESIGN DATA SHEET

(with or without an emergency spillway)

Project Wellington VI & VII

Basin # 1 Location Lots 113, 114

Total area draining to basin 7.71 acres. (Maximum drainage area to basin)

Basin Volume Design

**Wet Storage:**

1. Minimum required volume = 67 cu. yds. x Total Drainage Area (acres).

   67 cu. yds. x 7.71 acres = 516.6 cu. yds.

2. Available basin volume = 591 cu. yds. at elevation 79 . (From storage - elevation curve)

3. Excavate 1165 cu. yds. to obtain required volume*.

   * Elevation corresponding to required volume = invert of the dewatering orifice.

4. Available volume before cleanout required.

   33 cu. yds. x 7.71 acres = 254.4 cu. yds.

5. Elevation corresponding to cleanout level = 78 .

   (Form Storage - Elevation Curve)

6. Distance from invert of the dewatering orifice to cleanout level = 1 ft. (Min. = 1.0 ft.)

**Dry Storage:**

7. Minimum required volume = 67 cu. yds. x Total Drainage Area (acres).

   67 cu. yds. x 7.71 acres = 516.6 cu. yds.

8. Total available basin volume at crest of riser* = 573 cu. yds. at elevation 82 . (From Storage - Elevation Curve)

*Minimum = 134 cu. yds./acre of total drainage area.

9. Diameter of dewatering orifice = 6 in.

10. Diameter of flexible tubing = 8 in. (diameter of dewatering orifice plus 2 inches).

Preliminary Design Elevations

11. Crest of Riser = 82

Top of Dam = 84

Design High Water = 82.37

Upstream Toe of Dam = 74

Basin Shape

12. $\frac{\text{Length of Flow}}{\text{Effective Width}}$ $\frac{L}{We}$ = 0.62

If > 2, baffles are not required _____

If < 2, baffles are required ✓

Runoff

13. $Q_2$ = 17.24 cfs (From Chapter 5)

14. $Q_{25}$ = 26 cfs (From Chapter 5)

Principal Spillway Design

15. With emergency spillway, required spillway capacity $Q_p = Q_2$ = 17.24 cfs. (riser and barrel)

Without emergency spillway, required spillway capacity $Q_p = Q_{25}$ n/a cfs. (riser and barrel)



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 041

16. With emergency spillway:

Assumed available head (h) = 1 ft. (Using $Q_2$)

h = Crest of Emergency Spillway Elevation - Crest of Riser Elevation

Without emergency spillway:

Assumed available head (h) = n/a ft. (Using $Q_{25}$)

h = Design High Water Elevation - Crest of Riser Elevation

17. Riser diameter ($D_r$) = 30 in. Actual head (h) = 0.79 ft.

(From Plate 3.14-8.)

Note: Avoid orifice flow conditions.

18. Barrel length (l) = 40 ft.

Head (H) on barrel through embankment = 10 ft.

(From Plate 3.14-7).

19. Barrel diameter = 18 in.

(From Plate 3.14-B [concrete pipe] or Plate 3.14-A [corrugated pipe]).

20. Trash rack and anti-vortex device

Diameter = 42 inches.

Height = 15 inches.

(From Table 3.14-D).

Emergency Spillway Design

21. Required spillway capacity $Q_e = Q_{25} - Q_p$ = 8.76 cfs.

22. Bottom width (b) = n/a* ft.; the slope of the exit channel (s) = n/a ft./foot; and the minimum length of the exit channel (x) = n/a ft.
(From Table 3.14-C)
* Token Spillway



Anti-Seep Collar Design

23. Depth of water at principal spillway crest (Y) = 5 ft.

Slope of upstream face of embankment (Z) = 2 :1.

Slope of principal spillway barrel ($S_b$) = 1 %

Length of barrel in saturated zone ($L_s$) = 30 ft.

24. Number of collars required = 1 dimensions = 4.5

(from Plate 3.14-12).

Final Design Elevations

25. Top of Dam = 84

Design High Water = 82.37

Emergency Spillway Crest = 83

Principal Spillway Crest = 82

Dewatering Orifice Invert = 79

Cleanout Elevation = 78

Elevation of Upstream Toe of Dam
or Excavated Bottom of "Wet Storage
Area" (if excavation was performed) = 74



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 043

**Wellington Sections VI & VII**

# CALCULATION OF DIAMETER OF DEWATERING ORIFICE FOR SEDIMENT BASIN

**8223-08**

11/22/2004

Revision Date

Sediment Basin #1

Using the equation,

Diameter of Dewatering Orifice = 2 * ( Q / ((64.32 * h) ^ (1/2) * 0.6 * 3.14))) ^ (1/2)

where, Q equals volumetric flowrate through orifice needed for 6-hour drawdown , in cfs

h equals Average Head, in feet

$$h = \frac{\text{Elevation of crest of riser - Elevation of Wet storage volume}}{2}$$

$$h = \frac{82.0 - 79.0}{2} = 1.5 \text{ feet}$$

Q = Total Dry Storage / 21,600 seconds

Total Dry Storage for sediment basin = 573 cubic yards, or 15,471 cubic feet

Q = 0.7 cfs

So,

Diameter of Orifice = 0.4 feet, or 5 inches

round to 6 inches

# Hydrograph Plot

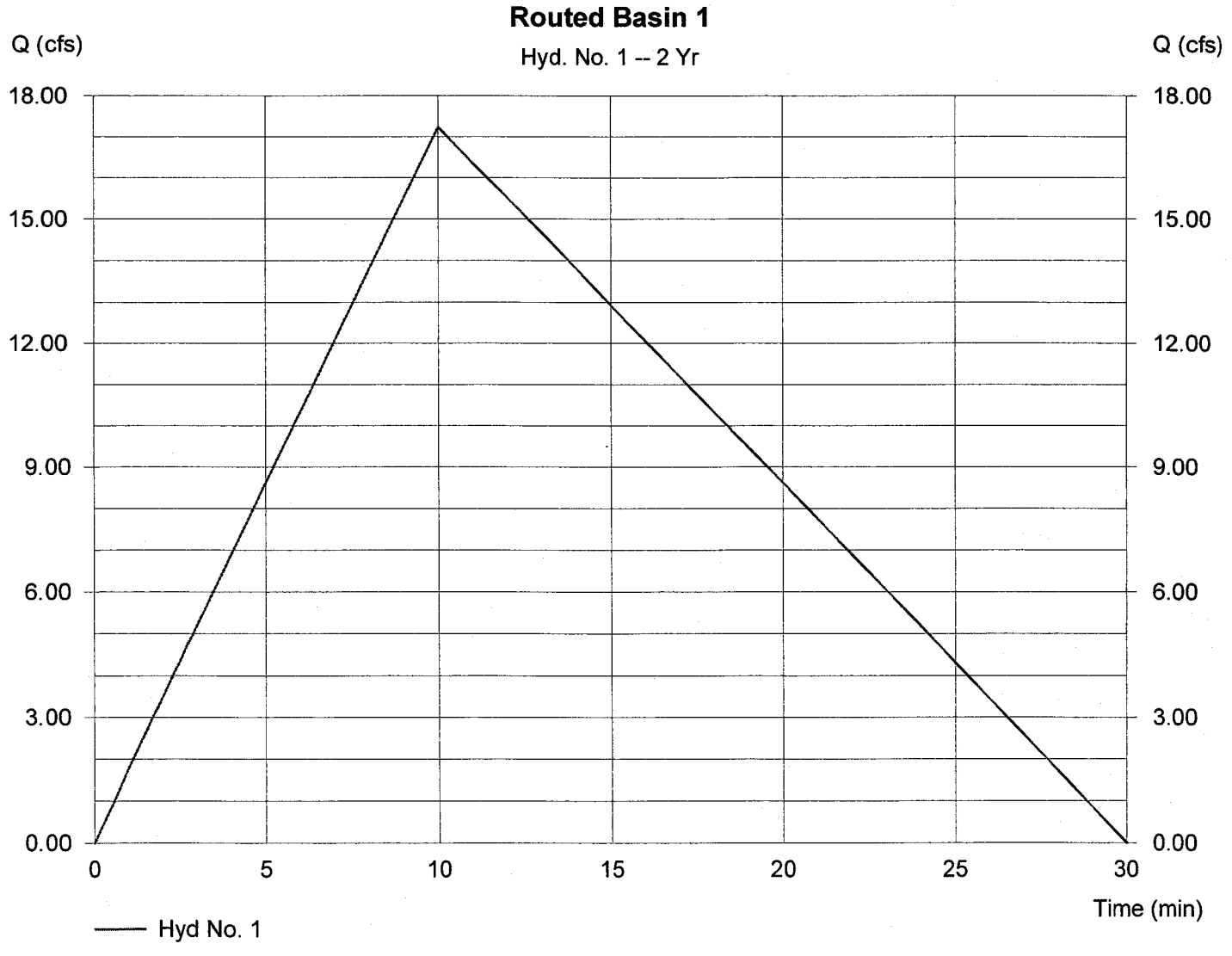
Hydraflow Hydrographs by Intelisolve | Wednesday, Dec 1 2004, 9:8 AM

## Hyd. No. 1

Routed Basin 1

| | | | |
|---|---|---|---|
| Hydrograph type | = Rational | Peak discharge | = 17.24 cfs |
| Storm frequency | = 2 yrs | Time interval | = 1 min |
| Drainage area | = 7.7 ac | Runoff coeff. | = 0.5 |
| Intensity | = 4.471 in/hr | Tc by User | = 10 min |
| IDF Curve | = JCCstormsewer.IDF | Asc/Rec limb fact | = 1/2 |

Hydrograph Volume = 15,512 cuft



# Hydrograph Plot

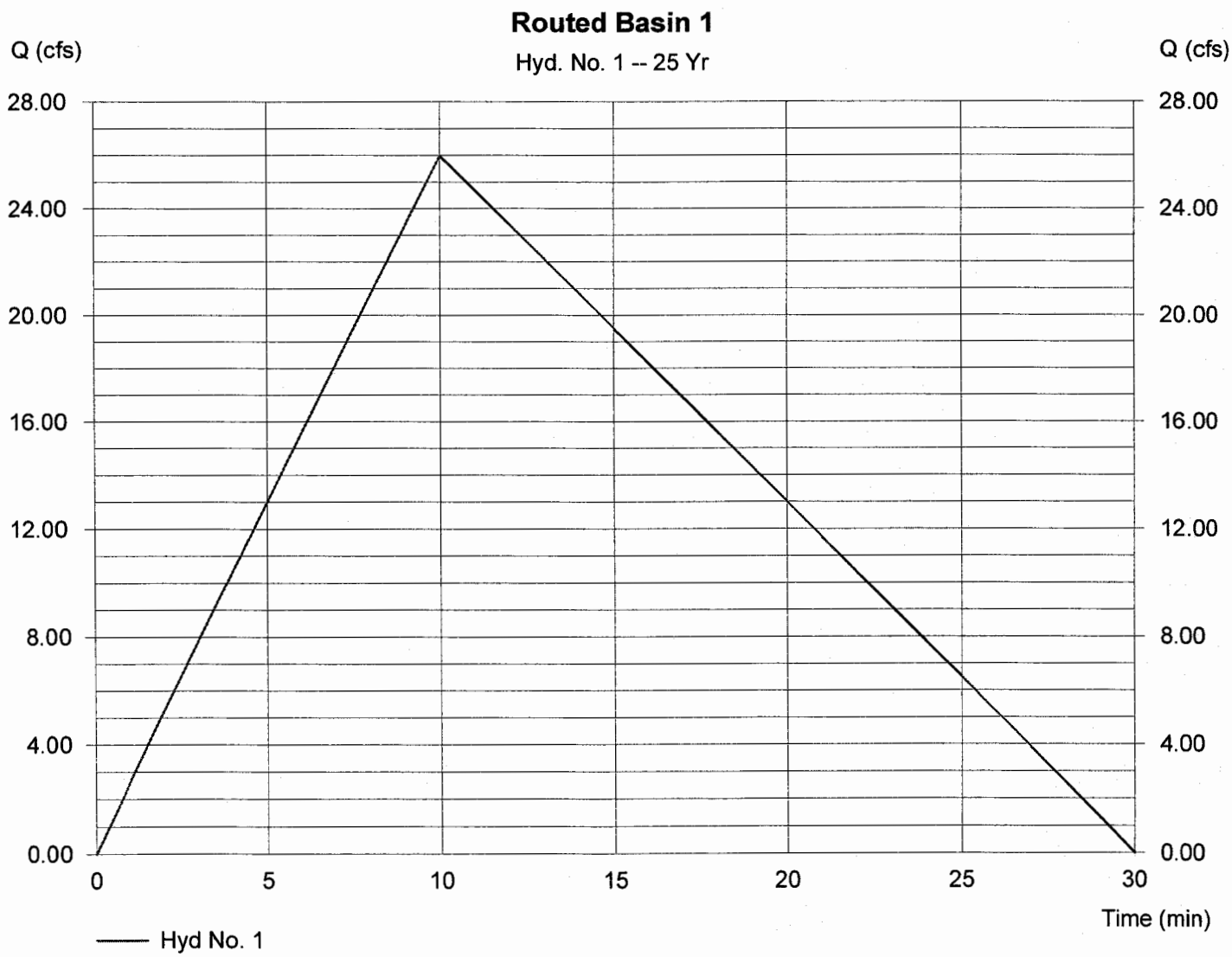
Hydraflow Hydrographs by Intelisolve | Wednesday, Dec 1 2004, 9:8 AM

## Hyd. No. 1

Routed Basin 1

| | | | |
|---|---|---|---|
| Hydrograph type | = Rational | Peak discharge | = 26.00 cfs |
| Storm frequency | = 25 yrs | Time interval | = 1 min |
| Drainage area | = 7.7 ac | Runoff coeff. | = 0.5 |
| Intensity | = 6.744 in/hr | Tc by User | = 10 min |
| IDF Curve | = JCCstormsewer.IDF | Asc/Rec limb fact | = 1/2 |

Hydrograph Volume = 23,397 cuft



# Hydrograph Plot

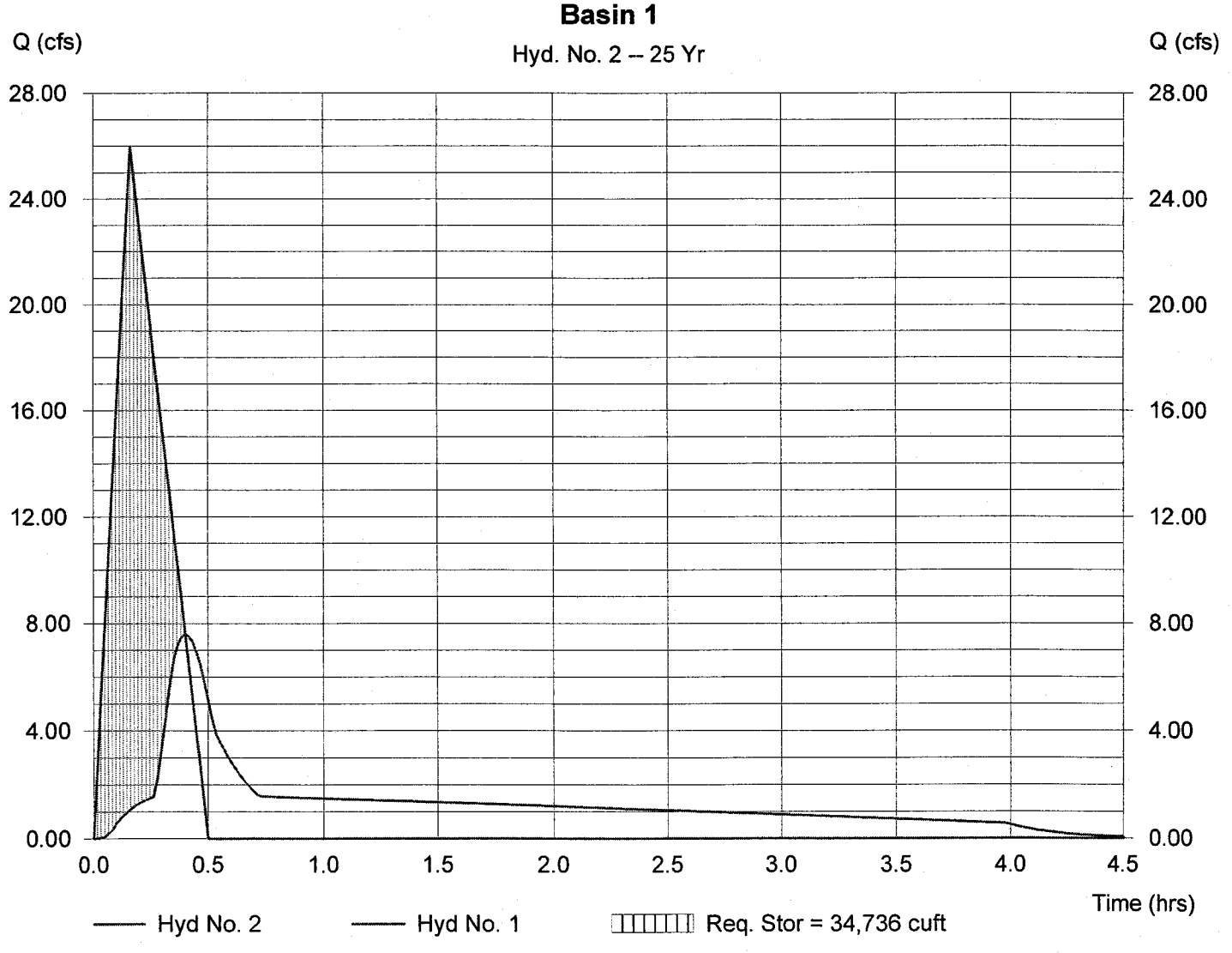
Hydraflow Hydrographs by Intelisolve | Wednesday, Dec 1 2004, 9:8 AM

## Hyd. No. 2

Basin 1

| | | | |
|---|---|---|---|
| Hydrograph type | = Reservoir | Peak discharge | = 7.60 cfs |
| Storm frequency | = 25 yrs | Time interval | = 1 min |
| Inflow hyd. No. | = 1 | Max. Elevation | = 82.37 ft |
| Reservoir name | = #1 | Max. Storage | = 34,736 cuft |

Storage Indication method used. Wet pond routing start elevation = 79.00 ft. | Hydrograph Volume = 21,092 cuft



# TEMPORARY SEDIMENT BASIN DESIGN DATA SHEET

(with or without an emergency spillway)

Project Wellington VI & VII

Basin # 2 Location End of Penzance

Total area draining to basin 4.6 acres. (Maximum drainage area to basin)

Basin Volume Design

**Wet Storage:**

1. Minimum required volume = 67 cu. yds. x Total Drainage Area (acres).

   67 cu. yds. x 4.6 acres = 308.2 cu. yds.

2. Available basin volume = 350 cu. yds. at elevation 69 . (From storage - elevation curve)

3. Excavate 768 cu. yds. to obtain required volume*.

   * Elevation corresponding to required volume = invert of the dewatering orifice.

4. Available volume before cleanout required.

   33 cu. yds. x 4.6 acres = 151.8 cu. yds.

5. Elevation corresponding to cleanout level = 67 .

   (Form Storage - Elevation Curve)

6. Distance from invert of the dewatering orifice to cleanout level = 2 ft. (Min. = 1.0 ft.)

**Dry Storage:**

7. Minimum required volume = 67 cu. yds. x Total Drainage Area (acres).

   67 cu. yds. x 4.6 acres = 308.2 cu. yds.



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 048

8. Total available basin volume at crest of riser* = 336 cu. yds. at elevation 71.5 . (From Storage - Elevation Curve)

*Minimum = 134 cu. yds./acre of total drainage area.

9. Diameter of dewatering orifice = 4 in.

10. Diameter of flexible tubing = 6 in. (diameter of dewatering orifice plus 2 inches).

Preliminary Design Elevations

11. Crest of Riser = 71.5

Top of Dam = 73.5

Design High Water = 71.6

Upstream Toe of Dam = 64

Basin Shape

12. $\frac{\text{Length of Flow}}{\text{Effective Width}}$ $\frac{L}{We}$ = 0.71

If > 2, baffles are not required _____

If < 2, baffles are required ✓

Runoff

13. $Q_2$ = 11.31 cfs (From Chapter 5)

14. $Q_{25}$ = 17.06 cfs (From Chapter 5)

Principal Spillway Design

15. With emergency spillway, required spillway capacity $Q_p = Q_2$ = 11.31 cfs. (riser and barrel)

Without emergency spillway, required spillway capacity $Q_p = Q_{25}$ n/a cfs. (riser and barrel)



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 049

16. With emergency spillway:

Assumed available head (h) = 1 ft. (Using $Q_2$)

h = Crest of Emergency Spillway Elevation - Crest of Riser Elevation

Without emergency spillway:

Assumed available head (h) = n/a ft. (Using $Q_{25}$)

h = Design High Water Elevation - Crest of Riser Elevation

17. Riser diameter ($D_r$) = 24 in. Actual head (h) = 0.7 ft.

(From Plate 3.14-8.)

Note: Avoid orifice flow conditions.

18. Barrel length (l) = 40 ft.

Head (H) on barrel through embankment = 8.5 ft.

(From Plate 3.14-7).

19. Barrel diameter = 15 in.

(From Plate 3.14-B [concrete pipe] or Plate 3.14-A [corrugated pipe]).

20. Trash rack and anti-vortex device

Diameter = 36 inches.

Height = 13 inches.

(From Table 3.14-D).

Emergency Spillway Design

21. Required spillway capacity $Q_e = Q_{25} - Q_p$ = 5.75 cfs.

22. Bottom width (b) = n/a* ft.; the slope of the exit channel (s) = n/a ft./foot; and the minimum length of the exit channel (x) = n/a ft.
(From Table 3.14-C)
* Token Spillway



Anti-Seep Collar Design

23. Depth of water at principal spillway crest (Y) = 7.5 ft.

Slope of upstream face of embankment (Z) = 2 :1.

Slope of principal spillway barrel ($S_b$) = 1 %

Length of barrel in saturated zone ($L_s$) = 48.28 ft.

24. Number of collars required = 2 dimensions = 3.5

(from Plate 3.14-12).

Final Design Elevations

25. Top of Dam = 73.5

Design High Water = 71.6

Emergency Spillway Crest = 72.5

Principal Spillway Crest = 71.5

Dewatering Orifice Invert = 69

Cleanout Elevation = 67

Elevation of Upstream Toe of Dam or Excavated Bottom of "Wet Storage Area" (if excavation was performed) = 64



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 051

**Wellington Sections VI & VII**

# CALCULATION OF DIAMETER OF DEWATERING ORIFICE FOR SEDIMENT BASIN

**8223-08**

11/22/2004

Revision Date

Sediment Basin #2

Using the equation,

Diameter of Dewatering Orifice = 2 * ( Q / ((64.32 * h) ^ (1/2) * 0.6 * 3.14))) ^ (1/2)

where, Q equals volumetric flowrate through orifice needed for 6-hour drawdown , in cfs

h equals Average Head, in feet

$$h = \frac{\text{Elevation of crest of riser - Elevation of Wet storage volume}}{2}$$

$$h = \frac{71.5 - 69.0}{2} = 1.25 \text{ feet}$$

Q = Total Dry Storage / 21,600 seconds

Total Dry Storage for sediment basin = 336 cubic yards, or 9,072 cubic feet

Q = 0.4 cfs

So,

Diameter of Orifice = 0.3 feet, or 4 inches

# Hydrograph Plot

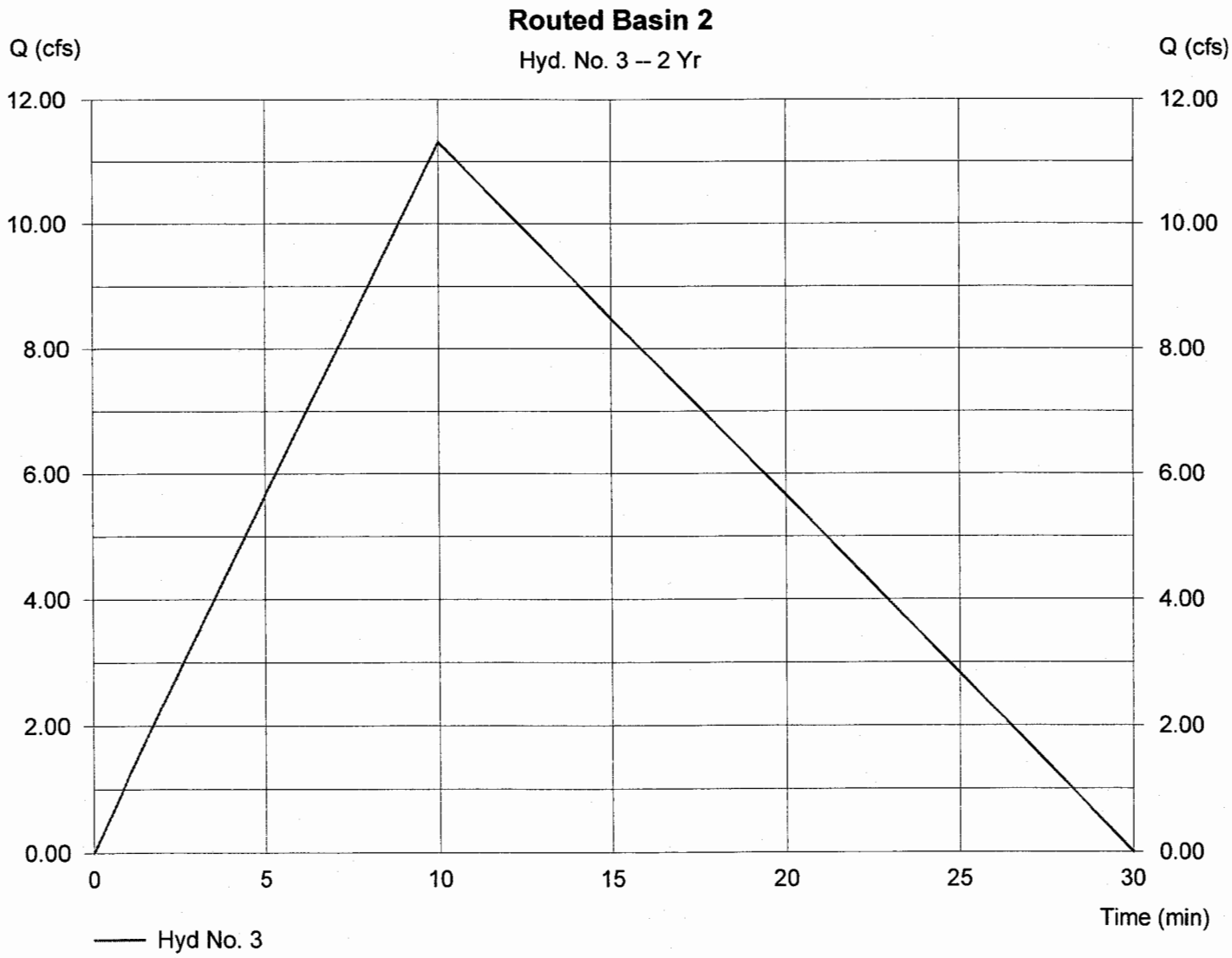
Hydraflow Hydrographs by Intelisolve | Wednesday, Dec 1 2004, 9:8 AM

## Hyd. No. 3

Routed Basin 2

| | | | |
|---|---|---|---|
| Hydrograph type | = Rational | Peak discharge | = 11.31 cfs |
| Storm frequency | = 2 yrs | Time interval | = 1 min |
| Drainage area | = 4.6 ac | Runoff coeff. | = 0.55 |
| Intensity | = 4.471 in/hr | Tc by User | = 10 min |
| IDF Curve | = JCCstormsewer.IDF | Asc/Rec limb fact | = 1/2 |

Hydrograph Volume = 10,180 cuft



# Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

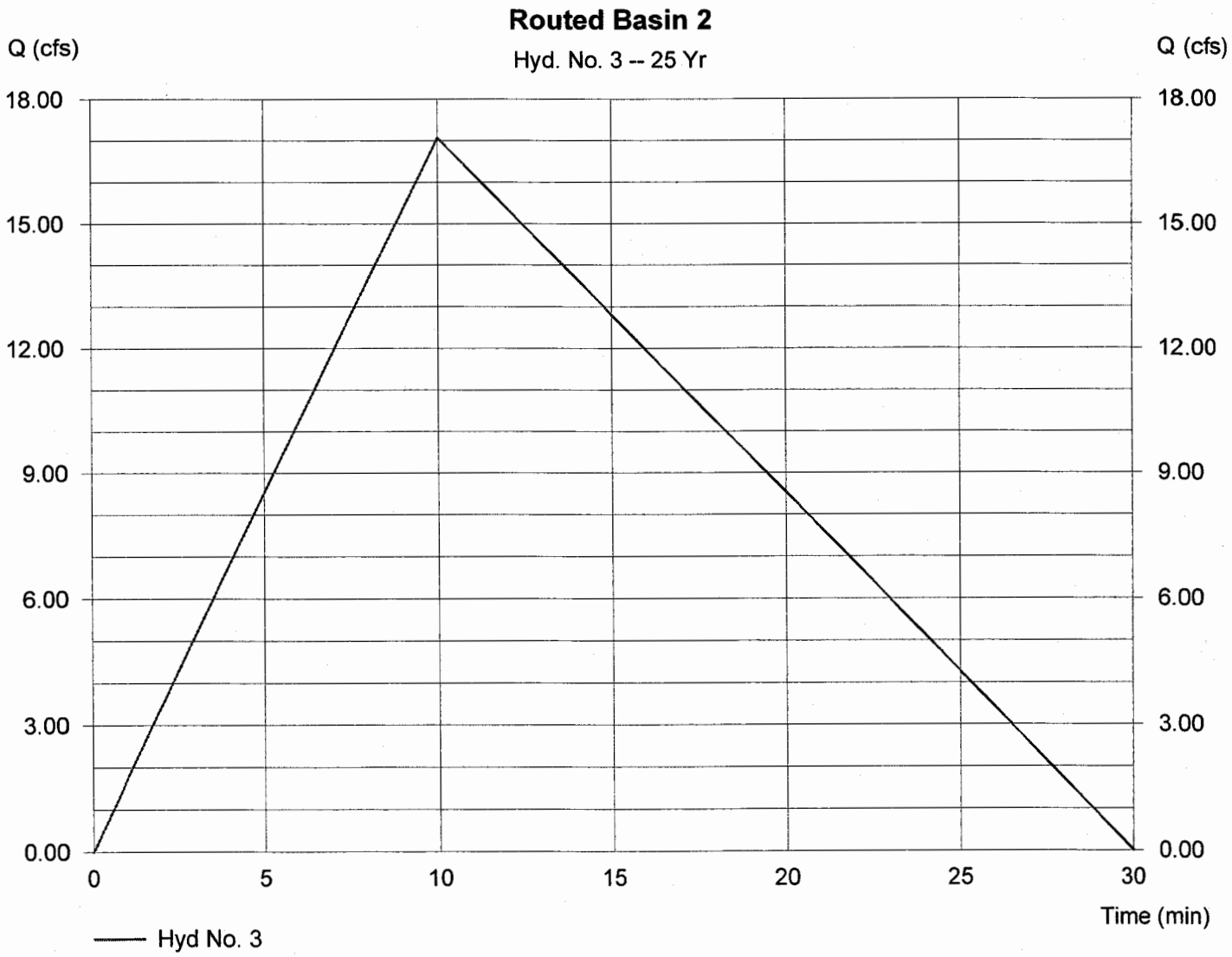
Wednesday, Dec 1 2004, 9:8 AM

## Hyd. No. 3

Routed Basin 2

| | | | |
|---|---|---|---|
| Hydrograph type | = Rational | Peak discharge | = 17.06 cfs |
| Storm frequency | = 25 yrs | Time interval | = 1 min |
| Drainage area | = 4.6 ac | Runoff coeff. | = 0.55 |
| Intensity | = 6.744 in/hr | Tc by User | = 10 min |
| IDF Curve | = JCCstormsewer.IDF | Asc/Rec limb fact | = 1/2 |

Hydrograph Volume = 15,355 cuft



# Hydrograph Plot

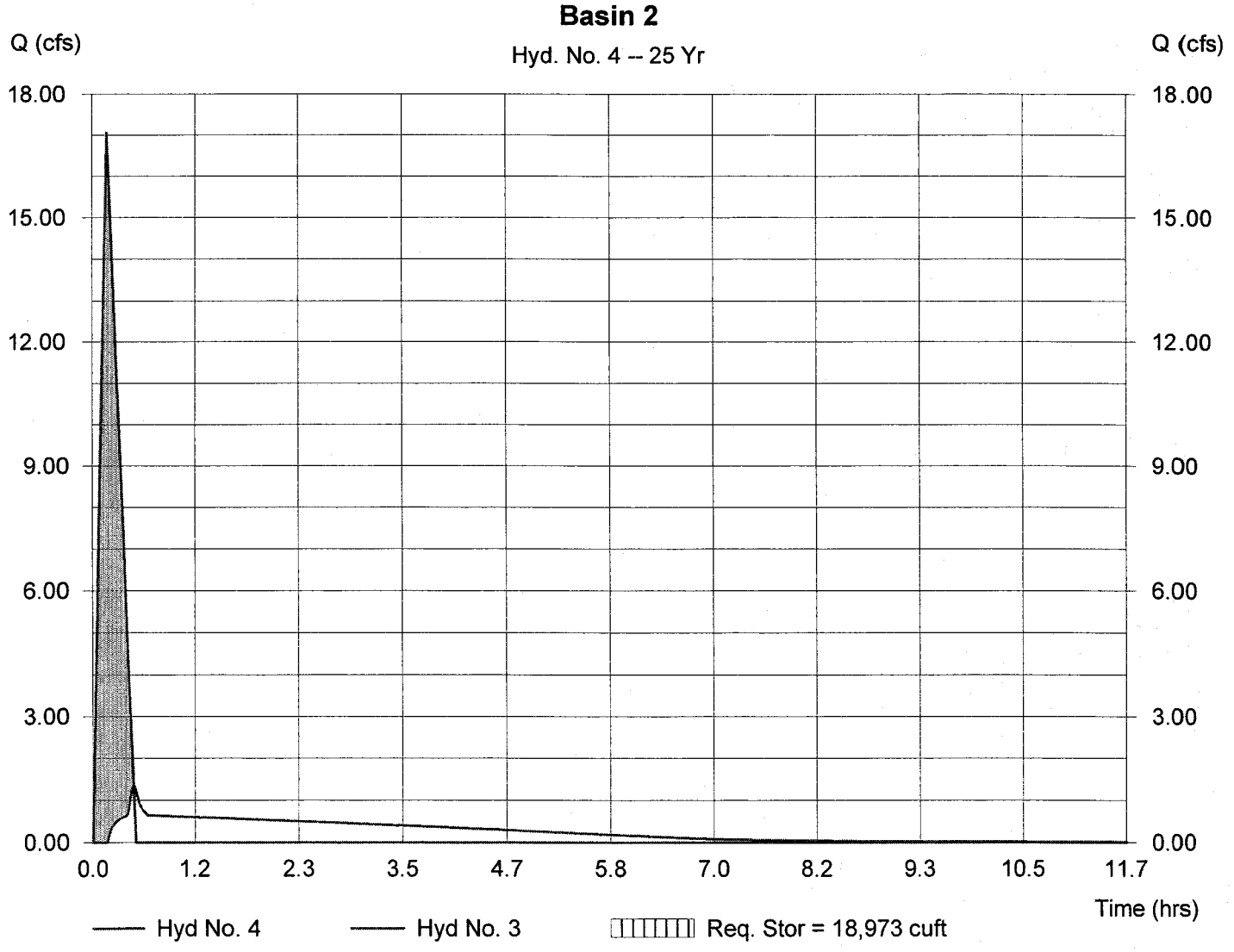
Hydraflow Hydrographs by Intelisolve | Wednesday, Dec 1 2004, 9:8 AM

## Hyd. No. 4

Basin 2

| | | | |
|---|---|---|---|
| Hydrograph type | = Reservoir | Peak discharge | = 1.33 cfs |
| Storm frequency | = 25 yrs | Time interval | = 1 min |
| Inflow hyd. No. | = 3 | Max. Elevation | = 71.60 ft |
| Reservoir name | = #2 | Max. Storage | = 18,973 cuft |

Storage Indication method used. Wet pond routing start elevation = 67.00 ft. | Hydrograph Volume = 10,267 cuft



**SEDIMENT TRAP 3**
**Wellington VI & VII**
AES Project No.: 8223-08

**DRAINAGE AREA TO POINT OF CONCERN** 2.52 Acres

**STORAGE REQUIRED**

A. Wet Pond Volume = Drainage Area x 67 cy/ac = 169 cy 4558.68 cf

B. Dry Pond Volume = Drainage Area x 67 cy/ac = 169 cy 4558.68 cf

**STORAGE PROVIDED**

| Elev: | Depth | Area (sq. ft.) | Incremental Volume (cu. ft.) | Total Volume (cu. ft.) |
|---|---|---|---|---|
| 62.0 | 0.0 | 1,075 | 0 | 0 |
| 64.0 | 2.0 | 1,686 | 2,761 | 2,761 |
| 65.0 | 1.0 | 2,042 | 1,864 | 4,625 |
| 66.0 | 1.0 | 2,430 | 2,236 | 6,861 |
| 67.0 | 1.0 | 2,850 | 2,640 | 9,501 |
| 68.0 | 1.0 | 3,296 | 3,073 | 12,574 |

**SEDIMENT TRAP DATA**

Pond Bottom Elevation = 62.0 feet

Base of Aggregate & Rip Rap = 65.0 feet

Top of Aggregate & Rip Rap = 66.0 feet

Top of Berm = 67.0 feet

Length of Aggr. & Rip Rap = 6 x Drain. Area (6' min.) = 15.1 feet

Height of Aggregate & Rip Rap = 1.0 feet

Top Width Aggregate & Rip Rap (Plate 3.13-1) = 4.0 feet (min distance)

Berm Height = Top of D.D. - Base of Aggregate = 2.0 feet

# TEMPORARY SEDIMENT BASIN DESIGN DATA SHEET

(with or without an emergency spillway)

Project Wellington VI & VII

Basin # 4 Location Lot 293,294,295

Total area draining to basin 25.23 acres. (Maximum drainage area to basin)

Basin Volume Design

**Wet Storage:**

1. Minimum required volume = 67 cu. yds. x Total Drainage Area (acres).

   67 cu. yds. x 25.23 acres = 1690 cu. yds.

2. Available basin volume = 1720 cu. yds. at elevation 68 . (From storage - elevation curve)

3. Excavate 4528 cu. yds. to obtain required volume*.

   * Elevation corresponding to required volume = invert of the dewatering orifice.

4. Available volume before cleanout required.

   33 cu. yds. x 25.23 acres = 832.6 cu. yds.

5. Elevation corresponding to cleanout level = 65.5 .

   (Form Storage - Elevation Curve)

6. Distance from invert of the dewatering orifice to cleanout level = 2.5 ft. (Min. = 1.0 ft.)

**Dry Storage:**

7. Minimum required volume = 67 cu. yds. x Total Drainage Area (acres).

   67 cu. yds. x 25.23 acres = 1690 cu. yds.



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 057

8. Total available basin volume at crest of riser* = 1739 cu. yds. at elevation 72 . (From Storage - Elevation Curve)

*Minimum = 134 cu. yds./acre of total drainage area.

9. Diameter of dewatering orifice = 8 in.

10. Diameter of flexible tubing = 10 in. (diameter of dewatering orifice plus 2 inches).

Preliminary Design Elevations

11. Crest of Riser = 72

Top of Dam = 74

Design High Water = 72.92

Upstream Toe of Dam = 62

Basin Shape

12. $\frac{\text{Length of Flow}}{\text{Effective Width}}$ $\frac{L}{We}$ = 2.09

If > 2, baffles are not required ✓

If < 2, baffles are required _____

Runoff

13. $Q_2$ = 47.5 cfs (From Chapter 5)

14. $Q_{25}$ = 73.96 cfs (From Chapter 5)

Principal Spillway Design

15. With emergency spillway, required spillway capacity $Q_p = Q_2$ = 47.5 cfs. (riser and barrel)

Without emergency spillway, required spillway capacity $Q_p = Q_{25}$ n/a cfs. (riser and barrel)



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 058

16. With emergency spillway:

Assumed available head (h) = 1 ft. (Using $Q_2$)

h = Crest of Emergency Spillway Elevation - Crest of Riser Elevation

Without emergency spillway:

Assumed available head (h) = n/a ft. (Using $Q_{25}$)

h = Design High Water Elevation - Crest of Riser Elevation

17. Riser diameter ($D_r$) = 42 in. Actual head (h) = 1.25 ft.

(From Plate 3.14-8.)

Note: Avoid orifice flow conditions.

18. Barrel length (l) = 50 ft.

Head (H) on barrel through embankment = 10 ft.

(From Plate 3.14-7).

19. Barrel diameter = 24 in.

(From Plate 3.14-B [concrete pipe] or Plate 3.14-A [corrugated pipe]).

20. Trash rack and anti-vortex device

Diameter = 60 inches.

Height = 19 inches.

(From Table 3.14-D).

Emergency Spillway Design

21. Required spillway capacity $Q_e = Q_{25} - Q_p$ = 26.46 cfs.

22. Bottom width (b) = n/a* ft.; the slope of the exit channel (s) = n/a ft./foot; and the minimum length of the exit channel (x) = n/a ft.
(From Table 3.14-C)
*Token Spillway



Anti-Seep Collar Design

23. Depth of water at principal spillway crest (Y) = 10 ft.

Slope of upstream face of embankment (Z) = 2 :1.

Slope of principal spillway barrel ($S_b$) = 1 %

Length of barrel in saturated zone ($L_s$) = 69 ft.

24. Number of collars required = 2 dimensions = 5.5

(from Plate 3.14-12).

Final Design Elevations

25. Top of Dam = 74

Design High Water = 72.92

Emergency Spillway Crest = 73

Principal Spillway Crest = 72

Dewatering Orifice Invert = 68

Cleanout Elevation = 65.5

Elevation of Upstream Toe of Dam
or Excavated Bottom of "Wet Storage
Area" (if excavation was performed) = 62



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 060

**Wellington Sections VI & VII**

# CALCULATION OF DIAMETER OF DEWATERING ORIFICE FOR SEDIMENT BASIN

**8223-08**

11/22/2004

Revision Date

Sediment Basin #4

Using the equation,

Diameter of Dewatering Orifice = 2 * ( Q / ((64.32 * h) ^ (1/2) * 0.6 * 3.14))) ^ (1/2)

where, Q equals volumetric flowrate through orifice needed for 6-hour drawdown , in cfs

h equals Average Head, in feet

$$h = \frac{\text{Elevation of crest of riser - Elevation of Wet storage volume}}{2}$$

$$h = \frac{72.0 - 68.0}{2} = 2 \text{ feet}$$

Q = Total Dry Storage / 21,600 seconds

Total Dry Storage for sediment basin = 1739 cubic yards, or 46,953 cubic feet

Q = 2.2 cfs

So,

Diameter of Orifice = 0.6 feet, or 8 inches

# Hydrograph Plot

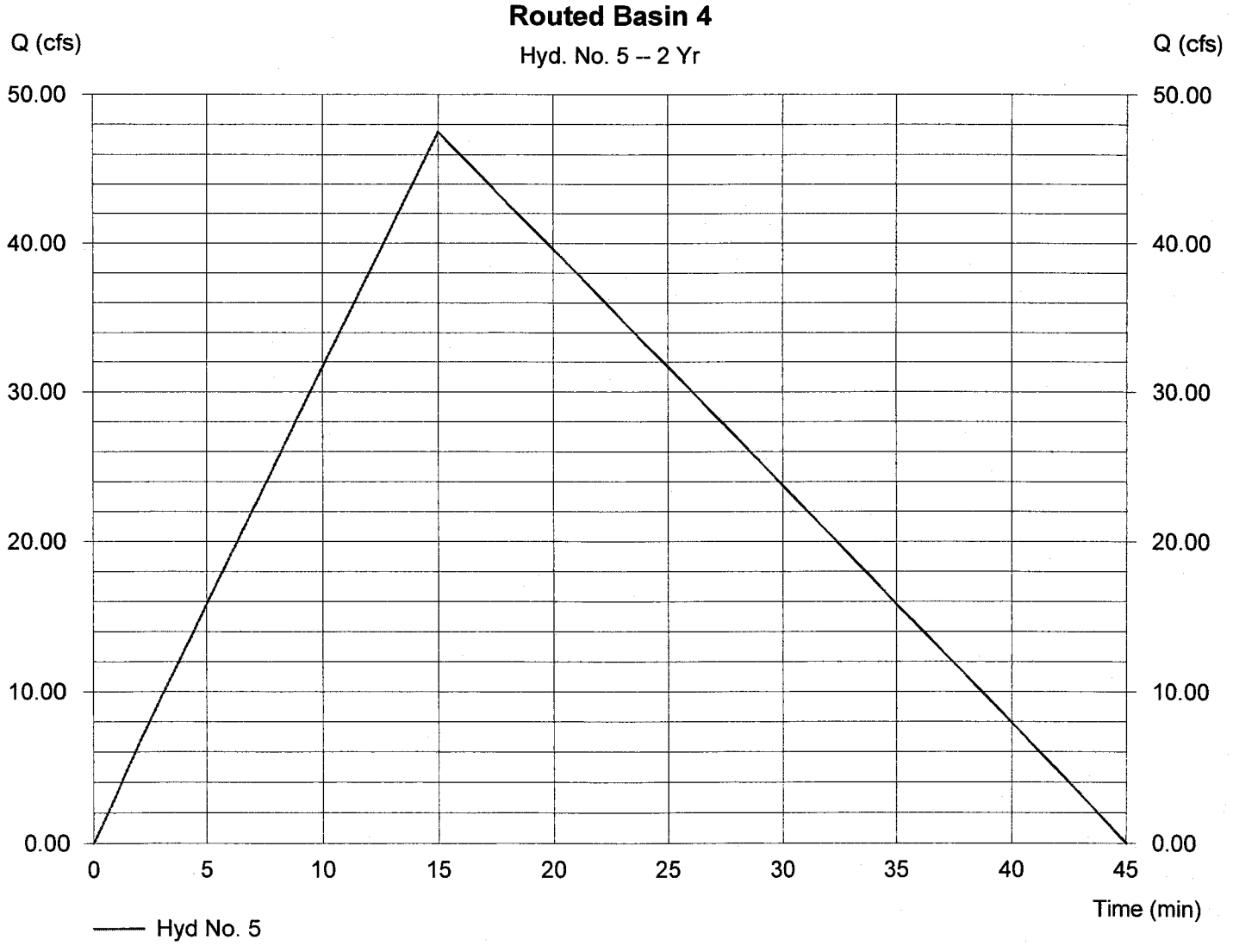
Hydraflow Hydrographs by Intelisolve | Wednesday, Dec 1 2004, 9:9 AM

## Hyd. No. 5

Routed Basin 4

| | | | |
|---|---|---|---|
| Hydrograph type | = Rational | Peak discharge | = 47.50 cfs |
| Storm frequency | = 2 yrs | Time interval | = 1 min |
| Drainage area | = 25.2 ac | Runoff coeff. | = 0.5 |
| Intensity | = 3.766 in/hr | Tc by User | = 15 min |
| IDF Curve | = JCCstormsewer.IDF | Asc/Rec limb fact | = 1/2 |

Hydrograph Volume = 64,131 cuft



# Hydrograph Plot

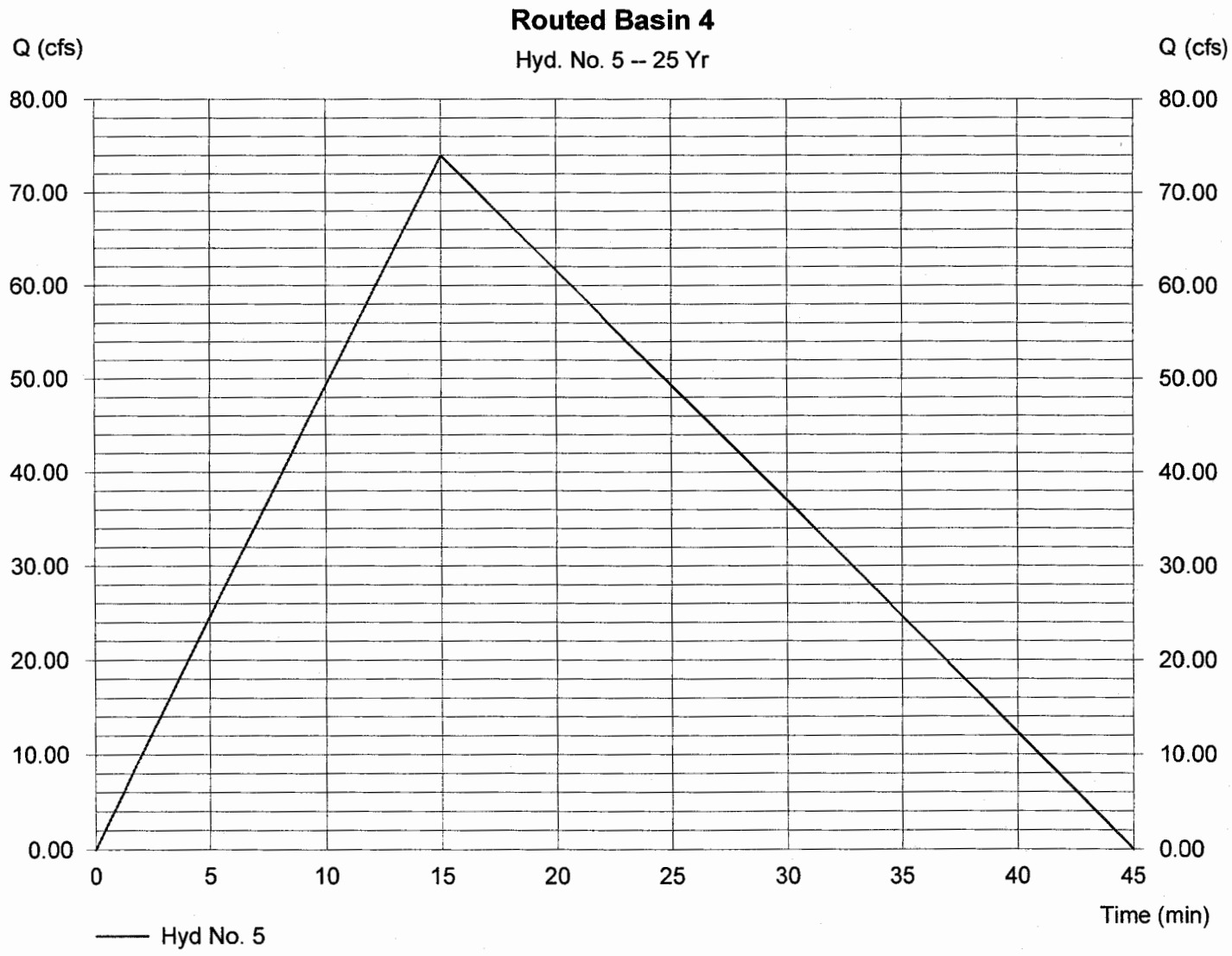
Hydraflow Hydrographs by Intelisolve | Wednesday, Dec 1 2004, 9:9 AM

## Hyd. No. 5

Routed Basin 4

| | | | |
|---|---|---|---|
| Hydrograph type | = Rational | Peak discharge | = 73.96 cfs |
| Storm frequency | = 25 yrs | Time interval | = 1 min |
| Drainage area | = 25.2 ac | Runoff coeff. | = 0.5 |
| Intensity | = 5.863 in/hr | Tc by User | = 15 min |
| IDF Curve | = JCCstormsewer.IDF | Asc/Rec limb fact | = 1/2 |

Hydrograph Volume = 99,846 cuft



# Hydrograph Plot

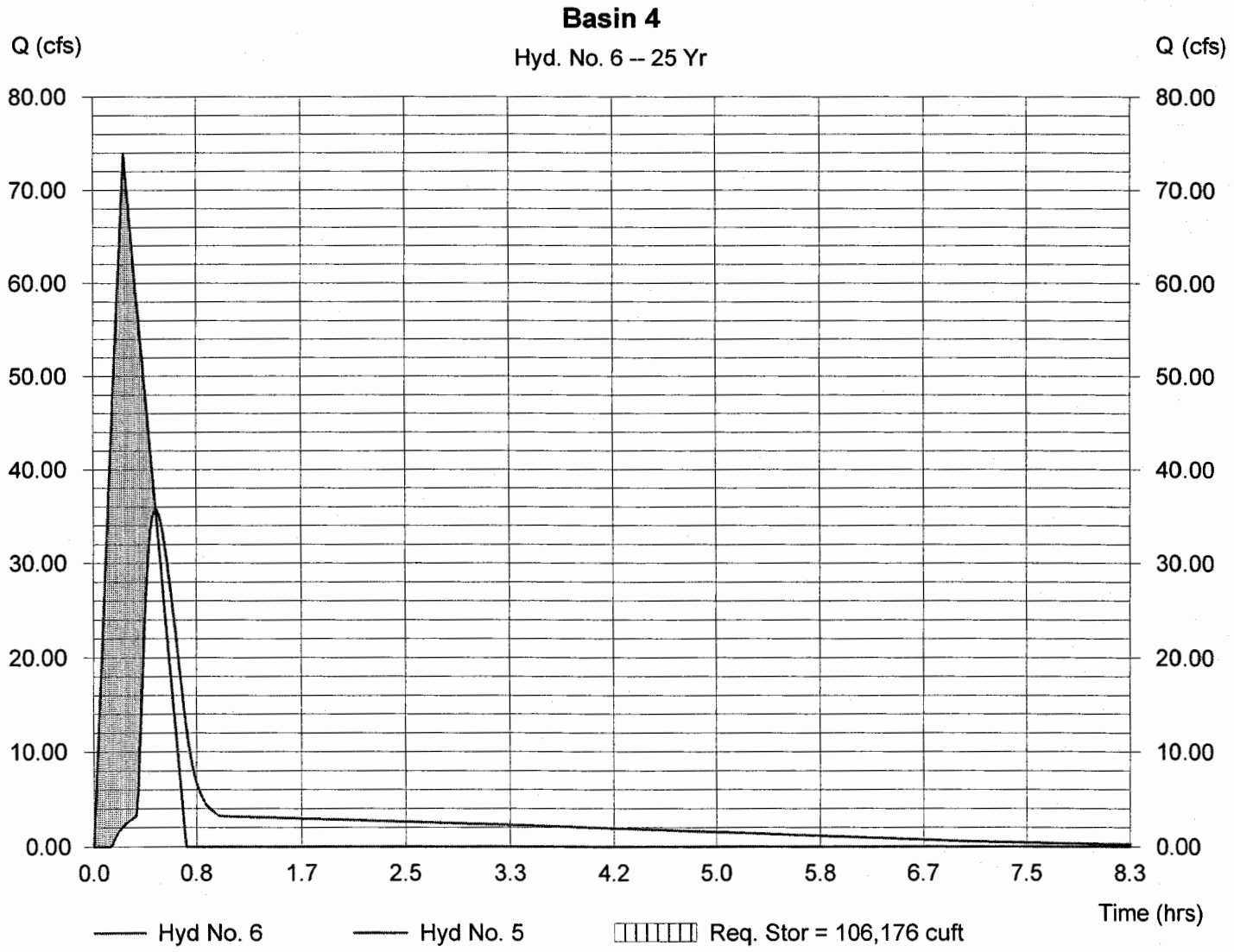
Hydraflow Hydrographs by Intelisolve | Wednesday, Dec 1 2004, 9:8 AM

## Hyd. No. 6

Basin 4

| | | | |
|---|---|---|---|
| Hydrograph type | = Reservoir | Peak discharge | = 35.63 cfs |
| Storm frequency | = 25 yrs | Time interval | = 1 min |
| Inflow hyd. No. | = 5 | Max. Elevation | = 72.92 ft |
| Reservoir name | = #4 | Max. Storage | = 106,176 cuft |

Storage Indication method used. Wet pond routing start elevation = 67.00 ft. | Hydrograph Volume = 90,200 cuft



# TEMPORARY SEDIMENT BASIN DESIGN DATA SHEET

(with or without an emergency spillway)

Project Wellington VI & VII

Basin # 5 Location Between Lots 305,306

Total area draining to basin 15.24 acres. (Maximum drainage area to basin)

Basin Volume Design

**Wet Storage:**

1. Minimum required volume = 67 cu. yds. x Total Drainage Area (acres).

   67 cu. yds. x 15.24 acres = 1021 cu. yds.

2. Available basin volume = 1063 cu. yds. at elevation 66.5 . (From storage - elevation curve)

3. Excavate 2915 cu. yds. to obtain required volume*.

   * Elevation corresponding to required volume = invert of the dewatering orifice.

4. Available volume before cleanout required.

   33 cu. yds. x 15.24 acres = 502.9 cu. yds.

5. Elevation corresponding to cleanout level = 65.5 .

   (Form Storage - Elevation Curve)

6. Distance from invert of the dewatering orifice to cleanout level = 1 ft. (Min. = 1.0 ft.)

**Dry Storage:**

7. Minimum required volume = 67 cu. yds. x Total Drainage Area (acres).

   67 cu. yds. x 15.24 acres = 1021 cu. yds.

8. Total available basin volume at crest of riser* = 1277 cu. yds. at elevation 69 . (From Storage - Elevation Curve)

*Minimum = 134 cu. yds./acre of total drainage area.

9. Diameter of dewatering orifice = 8 in.

10. Diameter of flexible tubing = 10 in. (diameter of dewatering orifice plus 2 inches).

Preliminary Design Elevations

11. Crest of Riser = 69

Top of Dam = 71

Design High Water = 69.52

Upstream Toe of Dam = 64

Basin Shape

12. $\frac{\text{Length of Flow}}{\text{Effective Width}}$ $\frac{L}{We}$ = 1.24

If > 2, baffles are not required _____

If < 2, baffles are required ✓

Runoff

13. $Q_2$ = 37.47 cfs (From Chapter 5)

14. $Q_{25}$ = 56.53 cfs (From Chapter 5)

Principal Spillway Design

15. With emergency spillway, required spillway capacity $Q_p = Q_2$ = 37.47 cfs. (riser and barrel)

Without emergency spillway, required spillway capacity $Q_p = Q_{25}$ n/a cfs. (riser and barrel)

16. With emergency spillway:

Assumed available head (h) = 1 ft. (Using $Q_2$)

h = Crest of Emergency Spillway Elevation - Crest of Riser Elevation

Without emergency spillway:

Assumed available head (h) = n/a ft. (Using $Q_{25}$)

h = Design High Water Elevation - Crest of Riser Elevation

17. Riser diameter ($D_r$) = 42 in. Actual head (h) = 1.07 ft.

(From Plate 3.14-8.)

Note: Avoid orifice flow conditions.

18. Barrel length (l) = 50 ft.

Head (H) on barrel through embankment = 6 ft.

(From Plate 3.14-7).

19. Barrel diameter = 24 in.

(From Plate 3.14-B [concrete pipe] or Plate 3.14-A [corrugated pipe]).

20. Trash rack and anti-vortex device

Diameter = 60 inches.

Height = 19 inches.

(From Table 3.14-D).

Emergency Spillway Design

21. Required spillway capacity $Q_e = Q_{25} - Q_p$ = 19.06 cfs.

22. Bottom width (b) = 10 ft.; the slope of the exit channel (s) = 0.068 ft./foot; and the minimum length of the exit channel (x) = 33 ft.
(From Table 3.14-C)



Anti-Seep Collar Design

23. Depth of water at principal spillway crest (Y) = 5 ft.

Slope of upstream face of embankment (Z) = 2 :1.

Slope of principal spillway barrel ($S_b$) = 1 %

Length of barrel in saturated zone ($L_s$) = 33 ft.

24. Number of collars required = 2 dimensions = 3.75

(from Plate 3.14-12).

Final Design Elevations

25. Top of Dam = 71

Design High Water = 69.52

Emergency Spillway Crest = 70

Principal Spillway Crest = 69

Dewatering Orifice Invert = 66.5

Cleanout Elevation = 65.5

Elevation of Upstream Toe of Dam or Excavated Bottom of "Wet Storage Area" (if excavation was performed) = 64



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 068

**Wellington Sections VI & VII**

# CALCULATION OF DIAMETER OF DEWATERING ORIFICE FOR SEDIMENT BASIN

**8223-08**

11/22/2004

Revision Date

Sediment Basin #5

Using the equation,

Diameter of Dewatering Orifice = 2 * ( Q / ((64.32 * h) ^ (1/2) * 0.6 * 3.14))) ^ (1/2)

where, Q equals volumetric flowrate through orifice needed for 6-hour drawdown , in cfs

h equals Average Head, in feet

$$h = \frac{\text{Elevation of crest of riser - Elevation of Wet storage volume}}{2}$$

$$h = \frac{69.0 - 66.5}{2} = 1.25 \text{ feet}$$

Q = Total Dry Storage / 21,600 seconds

Total Dry Storage for sediment basin = 1277 cubic yards, or 34,479 cubic feet

Q = 1.6 cfs

So,

| | | | | |
|---|---|---|---|---|
| Diameter of Orifice = | 0.6 | feet, or | 7 | inches |
| | | round to | 8 | inches |

# Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

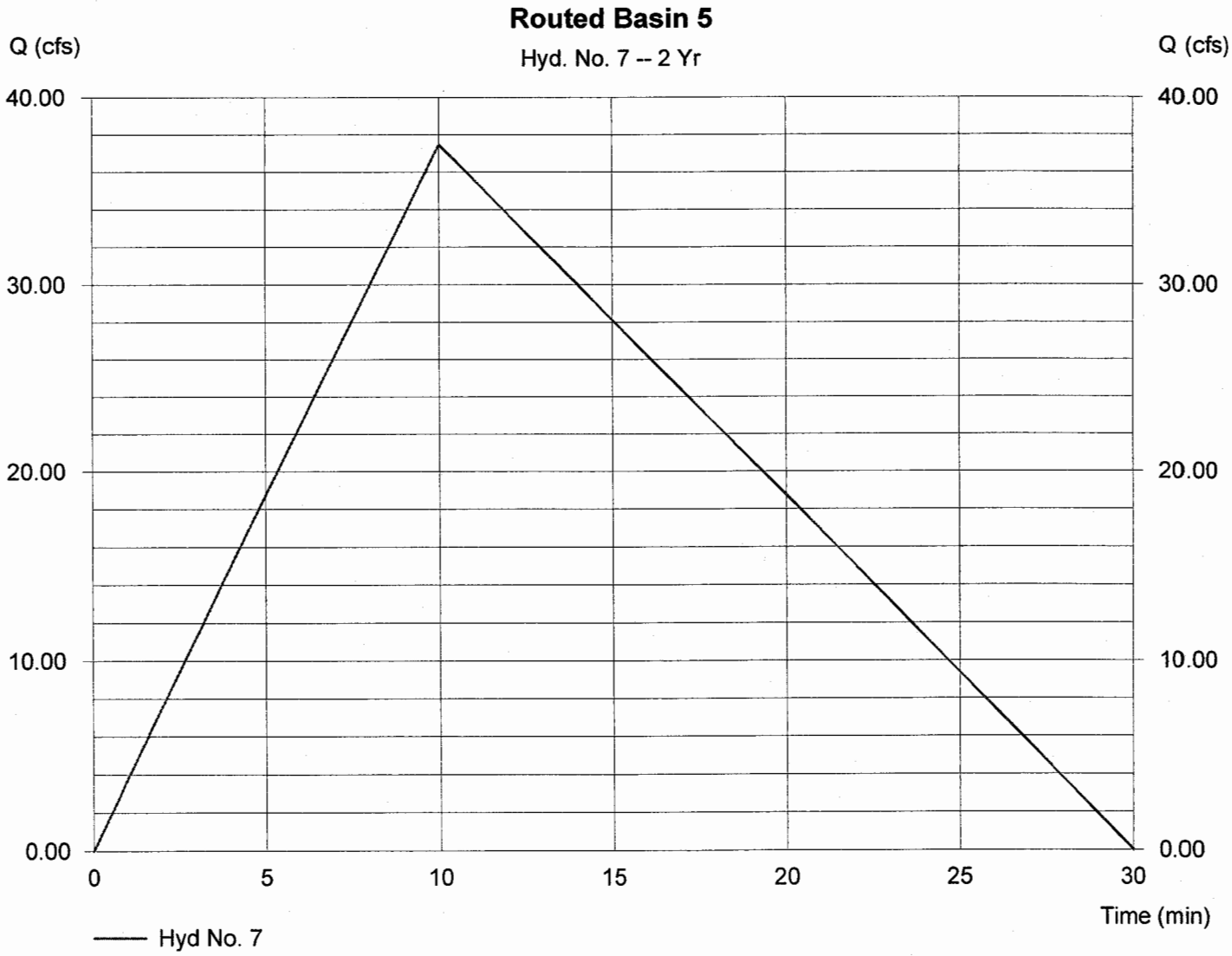
Wednesday, Dec 1 2004, 9:9 AM

## Hyd. No. 7

Routed Basin 5

| | | | |
|---|---|---|---|
| Hydrograph type | = Rational | Peak discharge | = 37.47 cfs |
| Storm frequency | = 2 yrs | Time interval | = 1 min |
| Drainage area | = 15.2 ac | Runoff coeff. | = 0.55 |
| Intensity | = 4.471 in/hr | Tc by User | = 10 min |
| IDF Curve | = JCCstormsewer.IDF | Asc/Rec limb fact | = 1/2 |

Hydrograph Volume = 33,727 cuft



# Hydrograph Plot

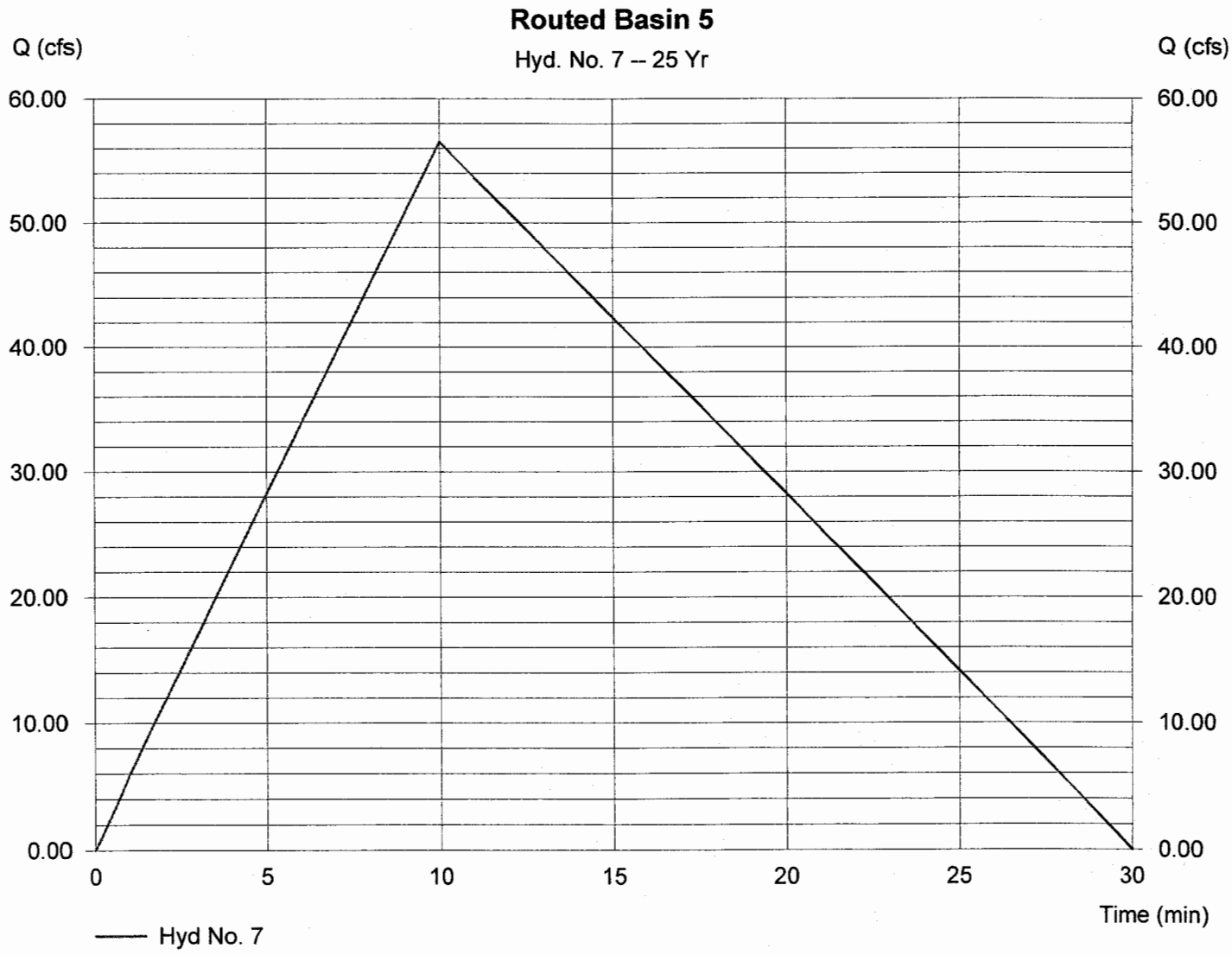
Hydraflow Hydrographs by Intelisolve | Wednesday, Dec 1 2004, 9:9 AM

## Hyd. No. 7

Routed Basin 5

| | | | |
|---|---|---|---|
| Hydrograph type | = Rational | Peak discharge | = 56.53 cfs |
| Storm frequency | = 25 yrs | Time interval | = 1 min |
| Drainage area | = 15.2 ac | Runoff coeff. | = 0.55 |
| Intensity | = 6.744 in/hr | Tc by User | = 10 min |
| IDF Curve | = JCCstormsewer.IDF | Asc/Rec limb fact | = 1/2 |

Hydrograph Volume = 50,873 cuft



# Hydrograph Plot

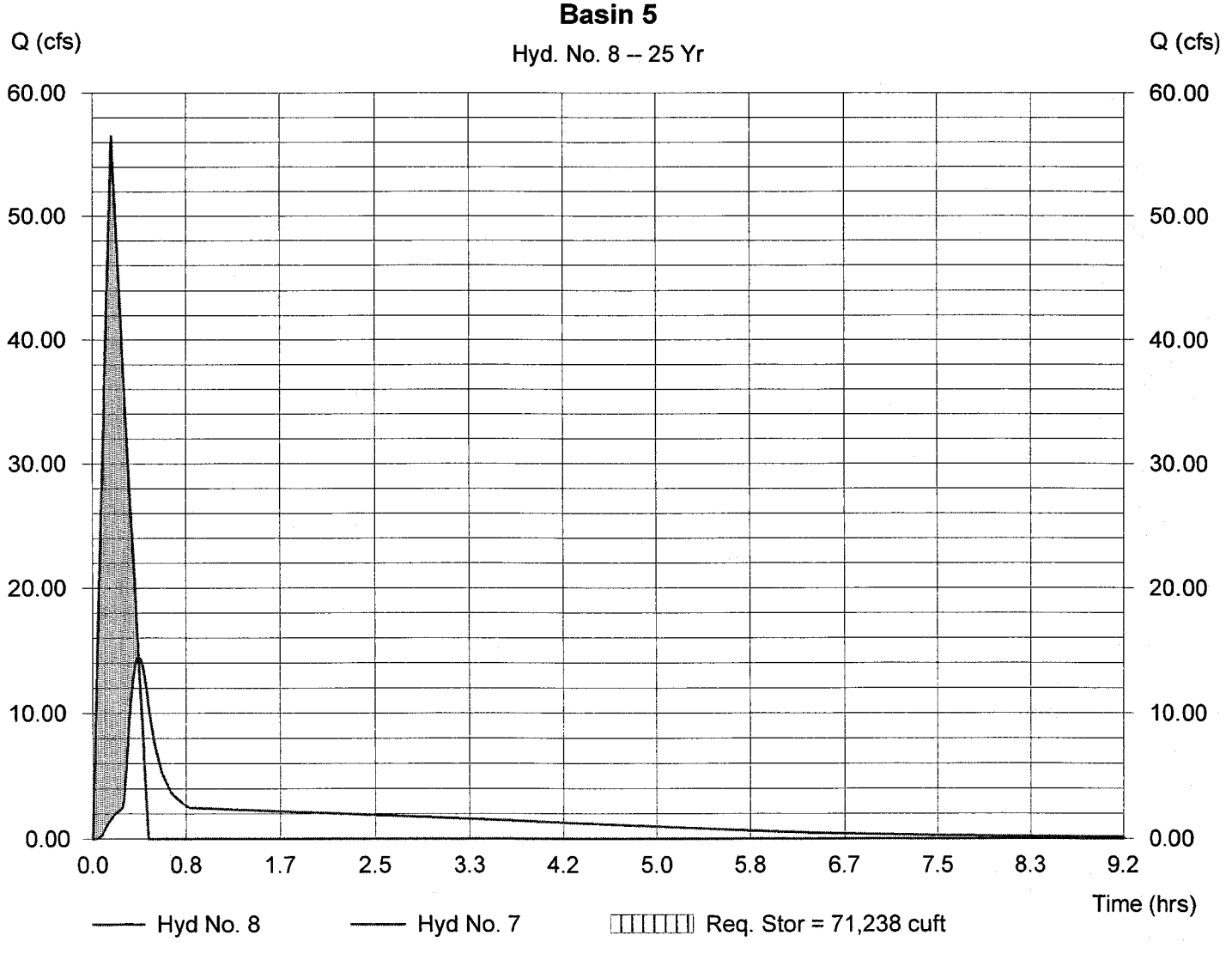
Hydraflow Hydrographs by Intelisolve | Wednesday, Dec 1 2004, 9:8 AM

## Hyd. No. 8

Basin 5

| | | | |
|---|---|---|---|
| Hydrograph type | = Reservoir | Peak discharge | = 14.52 cfs |
| Storm frequency | = 25 yrs | Time interval | = 1 min |
| Inflow hyd. No. | = 7 | Max. Elevation | = 69.52 ft |
| Reservoir name | = #5 | Max. Storage | = 71,238 cuft |

Storage Indication method used. Wet pond routing start elevation = 66.50 ft. | Hydrograph Volume = 50,704 cuft



# TEMPORARY SEDIMENT BASIN DESIGN DATA SHEET

(with or without an emergency spillway)

Project Wellington VI & VII

Basin # 6 Location Between lots 311,312

Total area draining to basin 4.3 acres. (Maximum drainage area to basin)

Basin Volume Design

**Wet Storage:**

1. Minimum required volume = 67 cu. yds. x Total Drainage Area (acres).

   67 cu. yds. x 4.3 acres = 288.1 cu. yds.

2. Available basin volume = 318 cu. yds. at elevation 57 . (From storage - elevation curve)

3. Excavate 805 cu. yds. to obtain required volume*.

   * Elevation corresponding to required volume = invert of the dewatering orifice.

4. Available volume before cleanout required.

   33 cu. yds. x 4.3 acres = 141.9 cu. yds.

5. Elevation corresponding to cleanout level = 56 .

   (Form Storage - Elevation Curve)

6. Distance from invert of the dewatering orifice to cleanout level = 1 ft. (Min. = 1.0 ft.)

**Dry Storage:**

7. Minimum required volume = 67 cu. yds. x Total Drainage Area (acres).

   67 cu. yds. x 4.3 acres = 288.1 cu. yds.



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 073

8. Total available basin volume at crest of riser* = 304 cu. yds. at elevation 59 . (From Storage - Elevation Curve)

*Minimum = 134 cu. yds./acre of total drainage area.

9. Diameter of dewatering orifice = 4 in.

10. Diameter of flexible tubing = 6 in. (diameter of dewatering orifice plus 2 inches).

Preliminary Design Elevations

11. Crest of Riser = 59

Top of Dam = 61

Design High Water = 59.51

Upstream Toe of Dam = 54

Basin Shape

12. $\frac{\text{Length of Flow}}{\text{Effective Width}}$ $\frac{L}{We}$ = 1

If > 2, baffles are not required _____

If < 2, baffles are required ✓

Runoff

13. $Q_2$ = 11.53 cfs (From Chapter 5)

14. $Q_{25}$ = 17.4 cfs (From Chapter 5)

Principal Spillway Design

15. With emergency spillway, required spillway capacity $Q_p = Q_2$ = 11.53 cfs. (riser and barrel)

Without emergency spillway, required spillway capacity $Q_p = Q_{25}$ n/a cfs. (riser and barrel)



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 074

16. With emergency spillway:

Assumed available head (h) = 1 ft. (Using $Q_2$)

h = Crest of Emergency Spillway Elevation - Crest of Riser Elevation

Without emergency spillway:

Assumed available head (h) = n/a ft. (Using $Q_{25}$)

h = Design High Water Elevation - Crest of Riser Elevation

17. Riser diameter ($D_r$) = 24 in. Actual head (h) = 0.71 ft.

(From Plate 3.14-8.)

Note: Avoid orifice flow conditions.

18. Barrel length (l) = 50 ft.

Head (H) on barrel through embankment = 5 ft.

(From Plate 3.14-7).

19. Barrel diameter = 15 in.

(From Plate 3.14-B [concrete pipe] or Plate 3.14-A [corrugated pipe]).

20. Trash rack and anti-vortex device

Diameter = 36 inches.

Height = 13 inches.

(From Table 3.14-D).

Emergency Spillway Design

21. Required spillway capacity $Q_e = Q_{25} - Q_p$ = 5.87 cfs.

22. Bottom width (b) = n/a* ft.; the slope of the exit channel (s) = n/a ft./foot; and the minimum length of the exit channel (x) = n/a ft.
(From Table 3.14-C)
* Token Spillway



Anti-Seep Collar Design

23. Depth of water at principal spillway crest (Y) = 5 ft.

Slope of upstream face of embankment (Z) = 2 :1.

Slope of principal spillway barrel ($S_b$) = 1 %

Length of barrel in saturated zone ($L_s$) = 32.3 ft.

24. Number of collars required = 2 dimensions = 3.0'

(from Plate 3.14-12).

Final Design Elevations

25. Top of Dam = 61

Design High Water = 59.51

Emergency Spillway Crest = 60

Principal Spillway Crest = 59

Dewatering Orifice Invert = 57

Cleanout Elevation = 56

Elevation of Upstream Toe of Dam or Excavated Bottom of "Wet Storage Area" (if excavation was performed) = 54

**Wellington Sections VI & VII**

# CALCULATION OF DIAMETER OF DEWATERING ORIFICE FOR SEDIMENT BASIN

**8223-08**

11/22/2004

Revision Date

Sediment Basin #6

Using the equation,

Diameter of Dewatering Orifice = 2 * ( Q / ((64.32 * h) ^ (1/2) * 0.6 * 3.14))) ^ (1/2)

where, Q equals volumetric flowrate through orifice needed for 6-hour drawdown , in cfs

h equals Average Head, in feet

$$h = \frac{\text{Elevation of crest of riser - Elevation of Wet storage volume}}{2}$$

$$h = \frac{59.0 - 57.0}{2} = 1 \text{ feet}$$

Q = Total Dry Storage / 21,600 seconds

Total Dry Storage for sediment basin = 304 cubic yards, or 8,208 cubic feet

Q = 0.4 cfs

So,

Diameter of Orifice = 0.3 feet, or 4 inches

# Hydrograph Plot

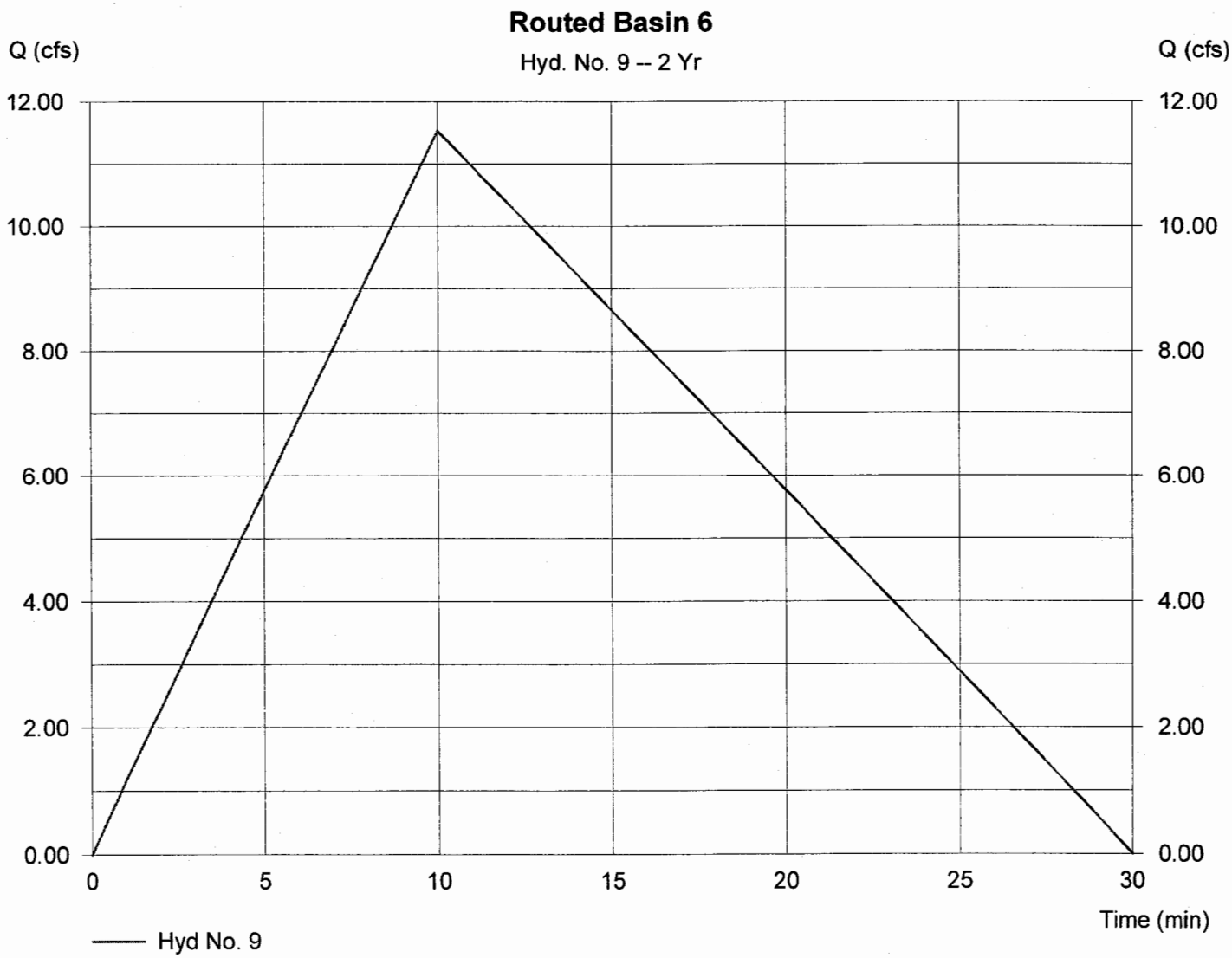
Hydraflow Hydrographs by Intelisolve | Wednesday, Dec 1 2004, 9:9 AM

## Hyd. No. 9

Routed Basin 6

| | | | |
|---|---|---|---|
| Hydrograph type | = Rational | Peak discharge | = 11.53 cfs |
| Storm frequency | = 2 yrs | Time interval | = 1 min |
| Drainage area | = 4.3 ac | Runoff coeff. | = 0.6 |
| Intensity | = 4.471 in/hr | Tc by User | = 10 min |
| IDF Curve | = JCCstormsewer.IDF | Asc/Rec limb fact | = 1/2 |

Hydrograph Volume = 10,381 cuft



# Hydrograph Plot

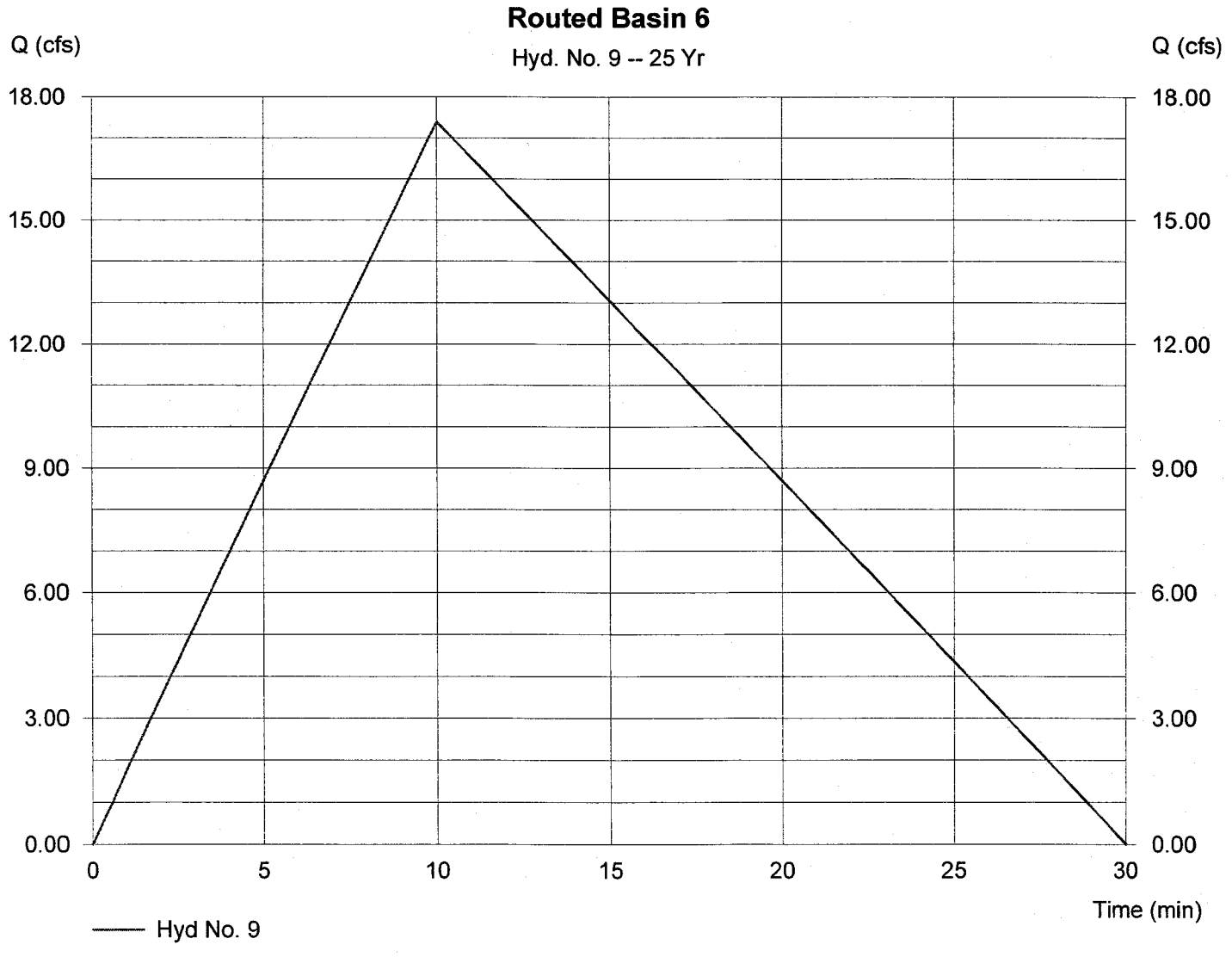
Hydraflow Hydrographs by Intelisolve | Wednesday, Dec 1 2004, 9:9 AM

## Hyd. No. 9

Routed Basin 6

| | | | |
|---|---|---|---|
| Hydrograph type | = Rational | Peak discharge | = 17.40 cfs |
| Storm frequency | = 25 yrs | Time interval | = 1 min |
| Drainage area | = 4.3 ac | Runoff coeff. | = 0.6 |
| Intensity | = 6.744 in/hr | Tc by User | = 10 min |
| IDF Curve | = JCCstormsewer.IDF | Asc/Rec limb fact | = 1/2 |

Hydrograph Volume = 15,659 cuft



# Hydrograph Plot

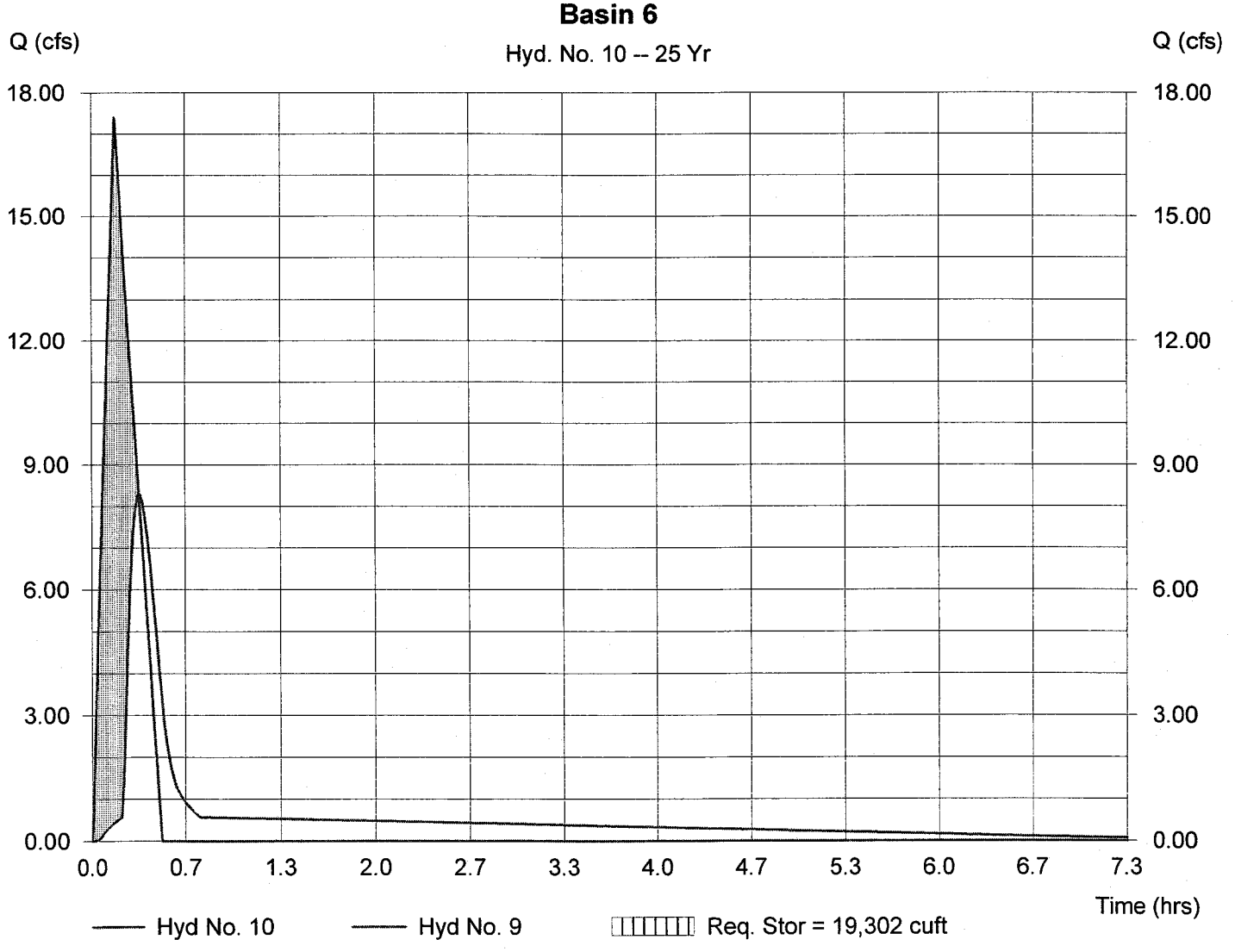
Hydraflow Hydrographs by Intelisolve | Wednesday, Dec 1 2004, 9:8 AM

## Hyd. No. 10

Basin 6

| | | | |
|---|---|---|---|
| Hydrograph type | = Reservoir | Peak discharge | = 8.26 cfs |
| Storm frequency | = 25 yrs | Time interval | = 1 min |
| Inflow hyd. No. | = 9 | Max. Elevation | = 59.51 ft |
| Reservoir name | = #6 | Max. Storage | = 19,302 cuft |

Storage Indication method used. Wet pond routing start elevation = 57.00 ft. | Hydrograph Volume = 15,643 cuft



**SEDIMENT TRAP 7**
**Wellington VI & VII**
AES Project No.: 8223-08

**DRAINAGE AREA TO POINT OF CONCERN** 2.95 Acres

**STORAGE REQUIRED**

A. Wet Pond Volume = Drainage Area x 67 cy/ac = 198 cy 5336.55 cf

B. Dry Pond Volume = Drainage Area x 67 cy/ac = 198 cy 5336.55 cf

**STORAGE PROVIDED**

| Elev: | Depth | Area (sq. ft.) | Incremental Volume (cu. ft.) | Total Volume (cu. ft.) |
|---|---|---|---|---|
| 58.0 | 0.0 | 2,856 | 0 | 0 |
| 59.0 | 1.0 | 3,302 | 3,079 | 3,079 |
| 60.0 | 1.0 | 3,777 | 3,540 | 6,619 |
| 61.0 | 1.0 | 4,279 | 4,028 | 10,647 |
| 61.5 | 0.5 | 4,540 | 2,205 | 12,851 |
| 62.0 | 0.5 | 4,808 | 2,337 | 15,188 |

**SEDIMENT TRAP DATA**

Pond Bottom Elevation = 58.0 feet

Base of Aggregate & Rip Rap = 60.0 feet

Top of Aggregate & Rip Rap = 61.5 feet

Top of Berm = 62.0 feet

Length of Aggr. & Rip Rap = 6 x Drain. Area (6' min.) = 17.7 feet

Height of Aggregate & Rip Rap = 1.5 feet

Top Width Aggregate & Rip Rap (Plate 3.13-1) = 4.0 feet (min distance)

Berm Height = Top of D.D. - Base of Aggregate = 2.0 feet

**SEDIMENT TRAP 8**
**Wellington VI & VII**
AES Project No.: 8223-08

**DRAINAGE AREA TO POINT OF CONCERN** 2.97 Acres

**STORAGE REQUIRED**

A. Wet Pond Volume = Drainage Area x 67 cy/ac = 199 cy 5372.73 cf

B. Dry Pond Volume = Drainage Area x 67 cy/ac = 199 cy 5372.73 cf

**STORAGE PROVIDED**

| Elev. | Depth | Area (sq. ft.) | Incremental Volume (cu. ft.) | Total Volume (cu. ft.) |
|---|---|---|---|---|
| 74.0 | 0.0 | 2,856 | 0 | 0 |
| 76.0 | 2.0 | 3,302 | 6,158 | 6,158 |
| 78.0 | 2.0 | 3,777 | 7,079 | 13,237 |

**SEDIMENT TRAP DATA**

Pond Bottom Elevation = 74.0 feet

Base of Aggregate & Rip Rap = N/A feet

Top of Aggregate & Rip Rap = N/A feet

Top of Berm = 78.0 feet

Length of Aggr. & Rip Rap = 6 x Drain. Area (6' min.) = N/A feet

Height of Aggregate & Rip Rap = N/A feet

Top Width Aggregate & Rip Rap (Plate 3.13-1) = N/A feet (min distance)

Berm Height = Top of D.D. - Base of Aggregate = N/A feet

A piped outfall is provided for the sediment trap to discharge beyond the limits of construction. This outfall will be 15" HDPE pipe with a perforated section provided above the wet storage area. See attached routings for 2 and 25 year storm flows.

# Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

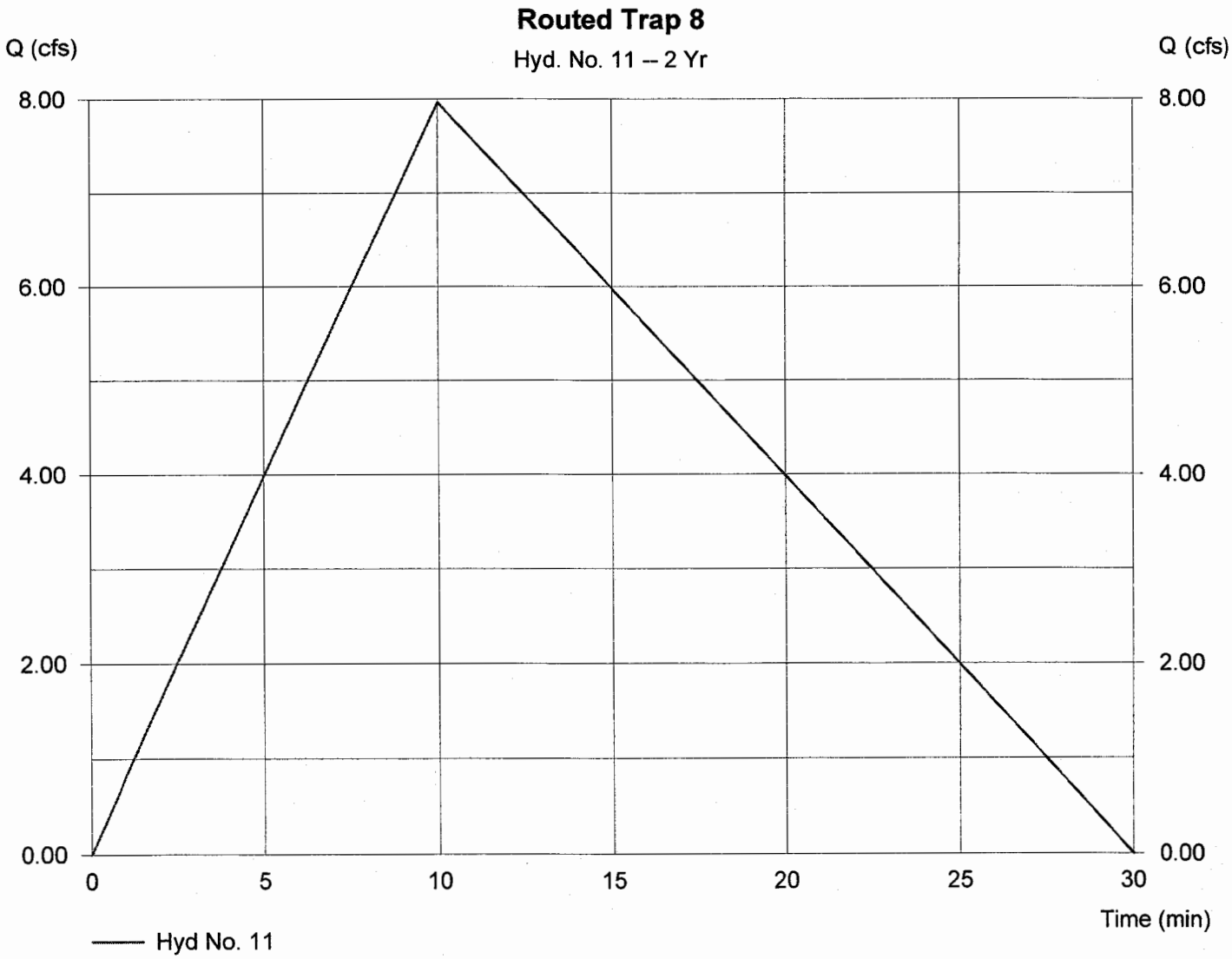
Wednesday, Dec 1 2004, 9:9 AM

## Hyd. No. 11

Routed Trap 8

| | | | |
|---|---|---|---|
| Hydrograph type | = Rational | Peak discharge | = 7.97 cfs |
| Storm frequency | = 2 yrs | Time interval | = 1 min |
| Drainage area | = 3.0 ac | Runoff coeff. | = 0.6 |
| Intensity | = 4.471 in/hr | Tc by User | = 10 min |
| IDF Curve | = JCCstormsewer.IDF | Asc/Rec limb fact | = 1/2 |

Hydrograph Volume = 7,170 cuft



# Hydrograph Plot

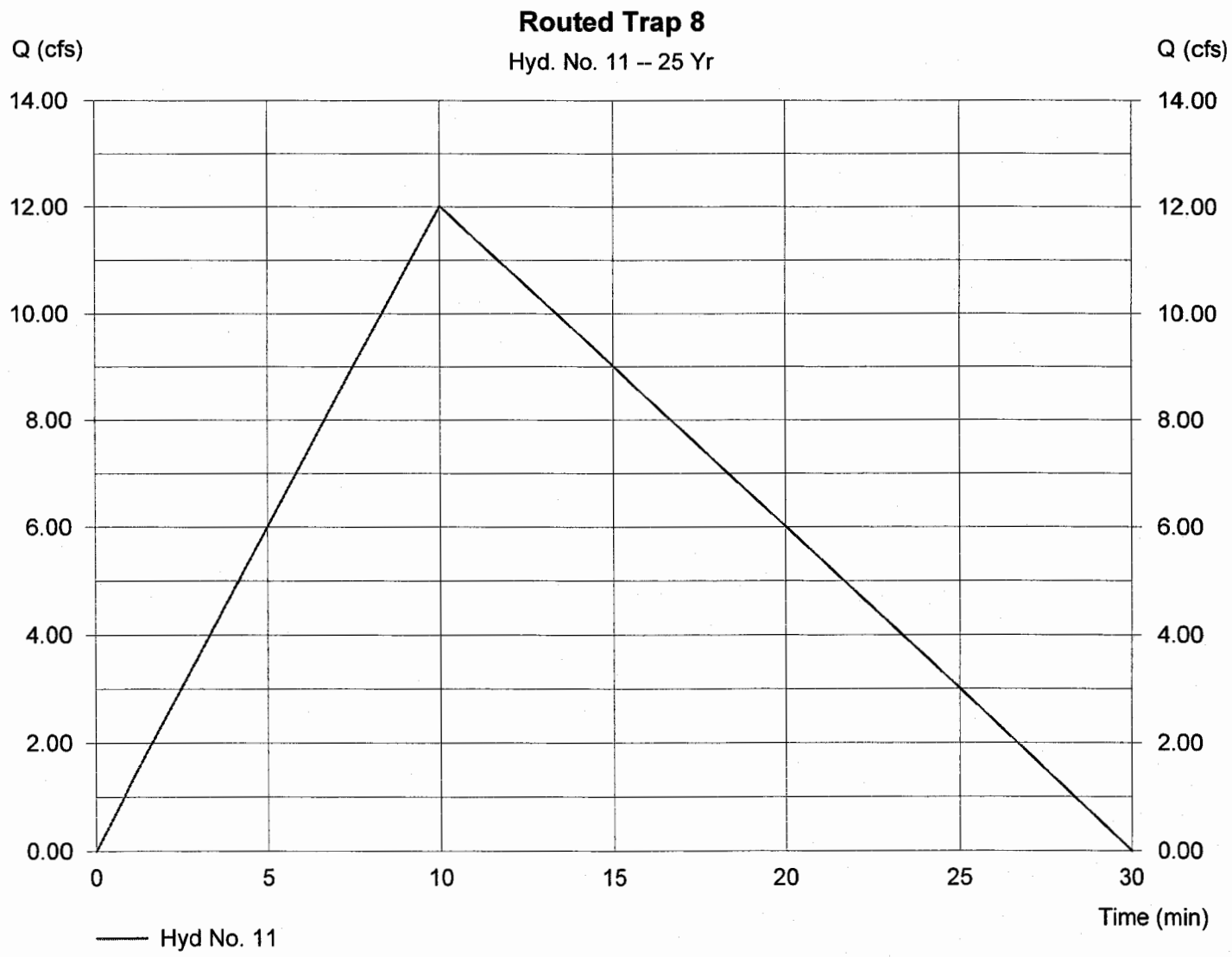
Hydraflow Hydrographs by Intelisolve | Wednesday, Dec 1 2004, 9:9 AM

## Hyd. No. 11

Routed Trap 8

| | | | |
|---|---|---|---|
| Hydrograph type | = Rational | Peak discharge | = 12.02 cfs |
| Storm frequency | = 25 yrs | Time interval | = 1 min |
| Drainage area | = 3.0 ac | Runoff coeff. | = 0.6 |
| Intensity | = 6.744 in/hr | Tc by User | = 10 min |
| IDF Curve | = JCCstormsewer.IDF | Asc/Rec limb fact | = 1/2 |

Hydrograph Volume = 10,815 cuft



# Hydrograph Plot

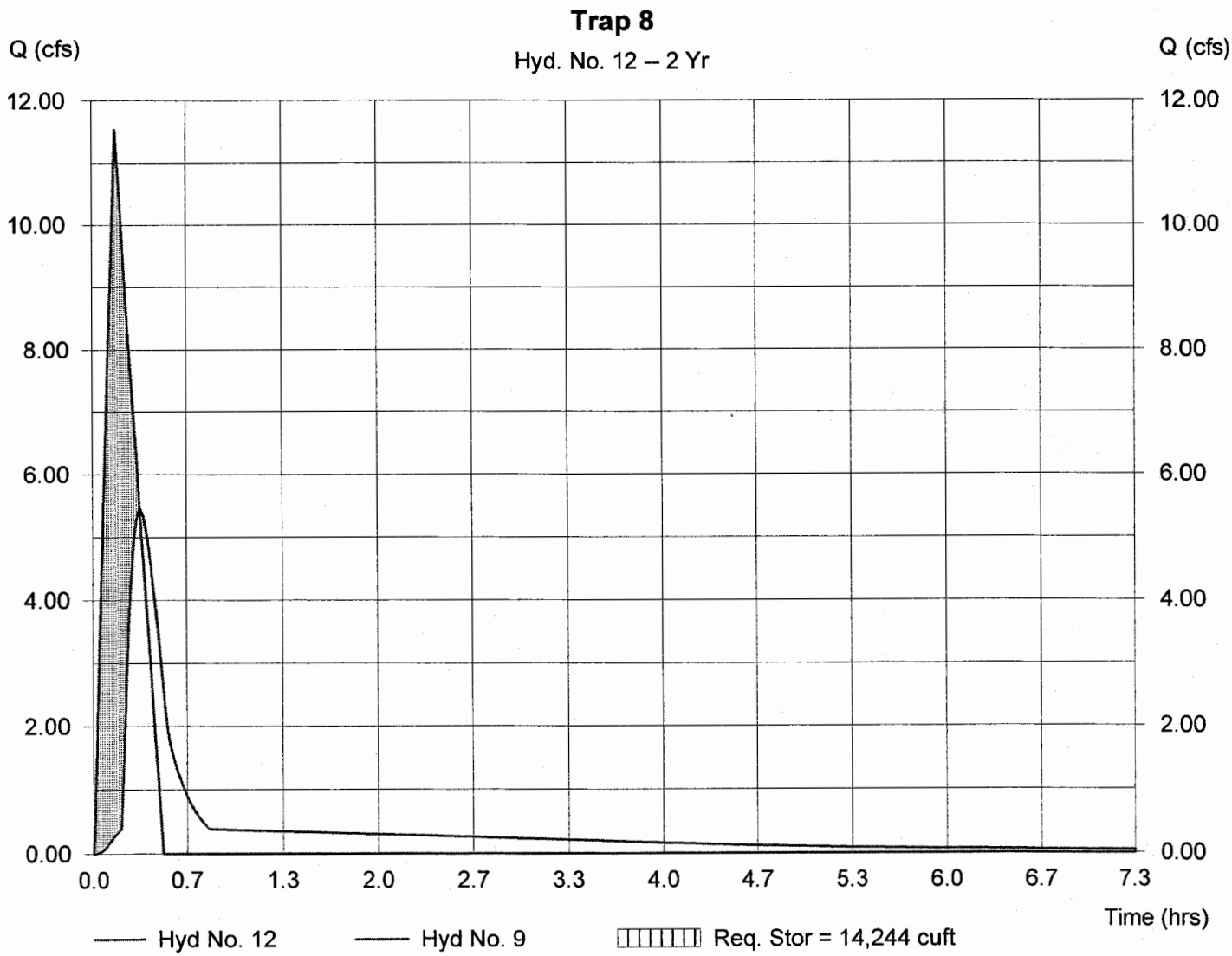
Hydraflow Hydrographs by Intelisolve | Wednesday, Dec 1 2004, 9:7 AM

## Hyd. No. 12

Trap 8

| | | | |
|---|---|---|---|
| Hydrograph type | = Reservoir | Peak discharge | = 5.43 cfs |
| Storm frequency | = 2 yrs | Time interval | = 1 min |
| Inflow hyd. No. | = 9 | Max. Elevation | = 77.46 ft |
| Reservoir name | = #8 | Max. Storage | = 14,244 cuft |

Storage Indication method used. Wet pond routing start elevation = 76.00 ft. | Hydrograph Volume = 10,370 cuft



# Hydrograph Plot

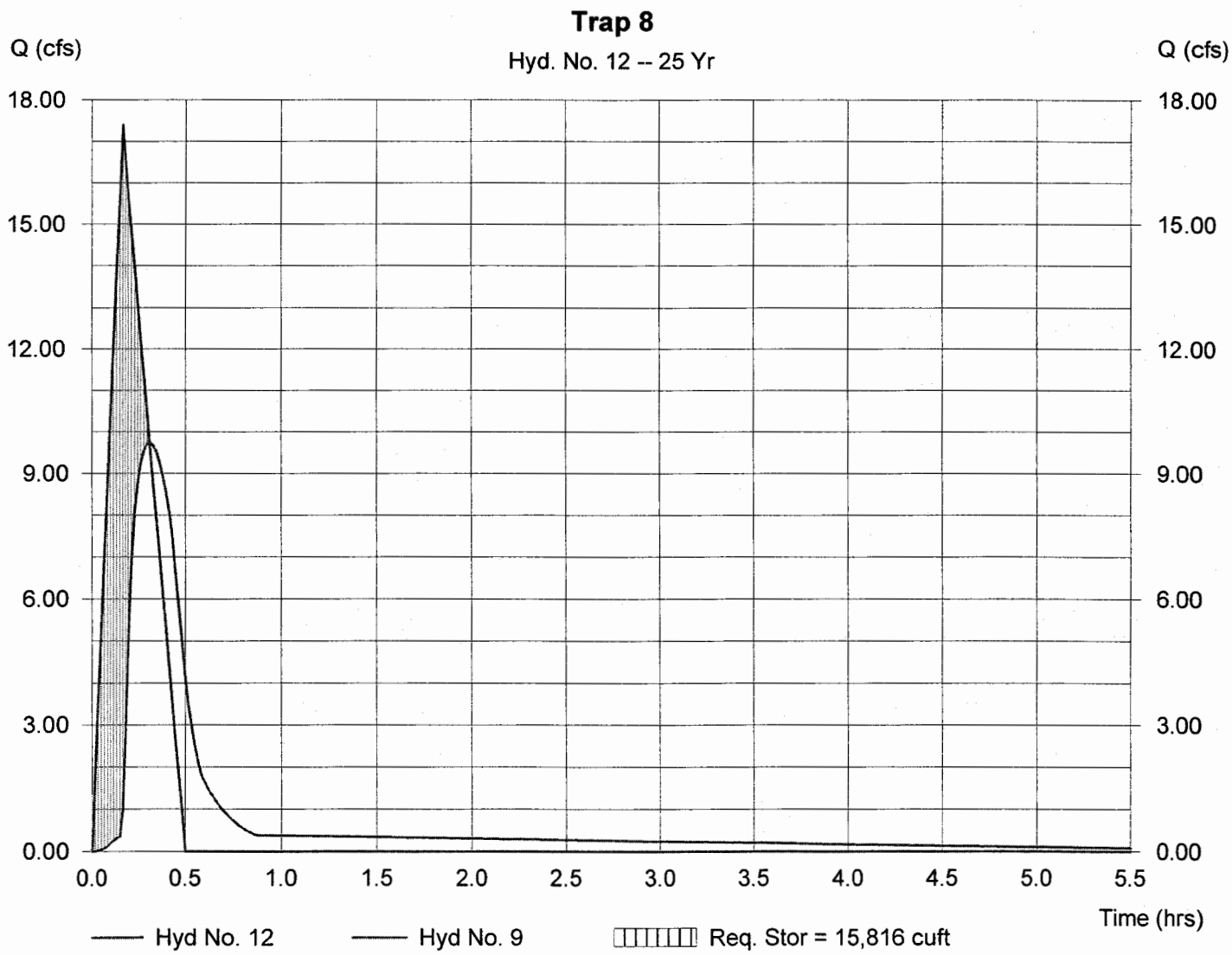
Hydraflow Hydrographs by Intelisolve | Wednesday, Dec 1 2004, 9:7 AM

## Hyd. No. 12

Trap 8

| | | | |
|---|---|---|---|
| Hydrograph type | = Reservoir | Peak discharge | = 9.75 cfs |
| Storm frequency | = 25 yrs | Time interval | = 1 min |
| Inflow hyd. No. | = 9 | Max. Elevation | = 77.79 ft |
| Reservoir name | = #8 | Max. Storage | = 15,816 cuft |

Storage Indication method used. Wet pond routing start elevation = 76.00 ft. | Hydrograph Volume = 15,647 cuft



**SEDIMENT TRAP 9**
**Wellington VI & VII**
AES Project No.: 8223-08

**DRAINAGE AREA TO POINT OF CONCERN** 1.63 Acres

**STORAGE REQUIRED**

A. Wet Pond Volume = Drainage Area x 67 cy/ac = 109 cy 2948.67 cf

B. Dry Pond Volume = Drainage Area x 67 cy/ac = 109 cy 2948.67 cf

**STORAGE PROVIDED**

| Elev. | Depth | Area (sq. ft.) | Incremental Volume (cu. ft.) | Total Volume (cu. ft.) |
|---|---|---|---|---|
| 60.0 | 0.0 | 1,366 | 0 | 0 |
| 61.0 | 1.0 | 1,723 | 1,545 | 1,545 |
| 62.0 | 1.0 | 2,110 | 1,917 | 3,461 |
| 63.0 | 1.0 | 2,526 | 2,318 | 5,779 |
| 63.5 | 0.5 | 2,744 | 1,318 | 7,097 |
| 64.0 | 0.5 | 2,969 | 1,428 | 8,525 |

**SEDIMENT TRAP DATA**

Pond Bottom Elevation = 60.0 feet

Base of Aggregate & Rip Rap = 62.0 feet

Top of Aggregate & Rip Rap = 63.5 feet

Top of Berm = 64.0 feet

Length of Aggr. & Rip Rap = 6 x Drain. Area (6' min.) = 9.8 feet

Height of Aggregate & Rip Rap = 1.5 feet

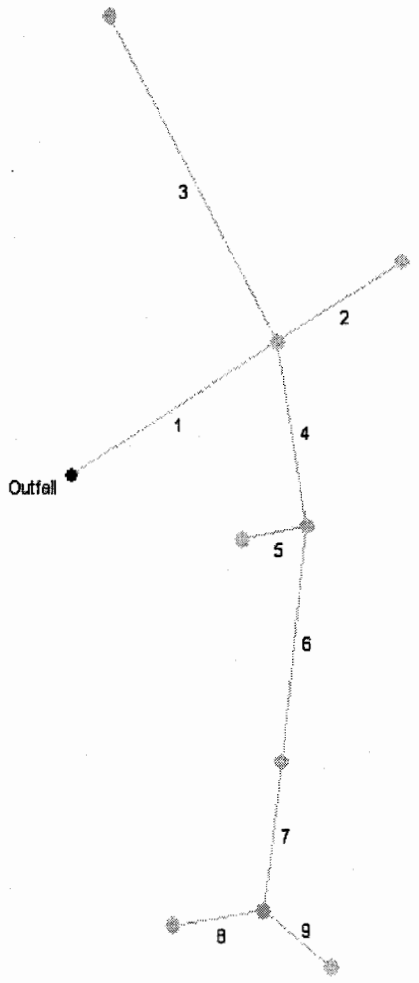
Top Width Aggregate & Rip Rap (Plate 3.13-1) = 4.0 feet (min distance)

Berm Height = Top of D.D. - Base of Aggregate = 2.0 feet

# Hydraflow Plan View

AES Project No 3223-08
11/30/04

Storm System 6-1




| Project file: STORM 6-1.stm | No. Lines: 9 | 11-30-2004 |
|---|---|---|

Hydraflow Storm Sewers 2003

# Storm Sewer Tabulation



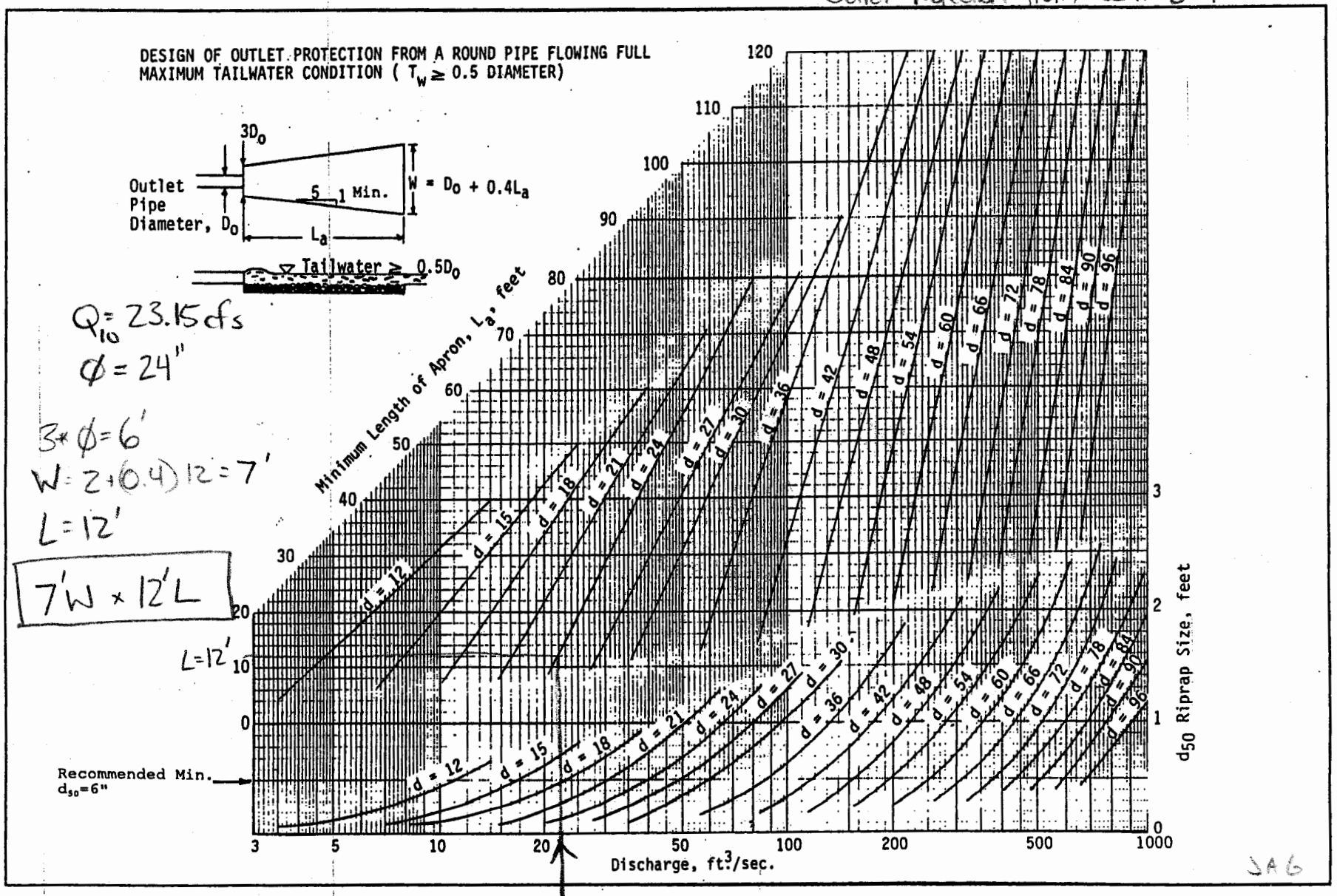
| Station | | Len | Drng Area | | Rnoff coeff | Area x C | | Tc | | Rain (I) | Total flow | Cap full | Vel | Pipe | | Invert Elev | | HGL Elev | | Grnd / Rim Elev | | Line ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Line | To Line | (ft) | Incr (ac) | Total (ac) | (C) | Incr | Total | Inlet (min) | Syst (min) | (in/hr) | (cfs) | (cfs) | (ft/s) | Size (in) | Slope (%) | Up (ft) | Dn (ft) | Up (ft) | Dn (ft) | Up (ft) | Dn (ft) | |
| 1 | End | 140.0 | 0.40 | 6.99 | 0.50 | 0.20 | 3.65 | 5.0 | 10.3 | 5.8 | 21.07 | 39.82 | 7.54 | 24 | 3.10 | 78.34 | 74.00 | 79.97 | 75.71 | 88.50 | 74.00 | 6-1-2 TO 6-1-1 |
| 2 | 1 | 84.0 | 3.39 | 3.39 | 0.50 | 1.70 | 1.70 | 10.0 | 10.0 | 5.8 | 9.88 | 18.69 | 6.06 | 18 | 3.17 | 81.00 | 78.34 | 82.20 | 80.89 | 84.00 | 88.50 | 6-1-3 TO 6-1-2 |
| 3 | 1 | 196.0 | 0.21 | 0.21 | 0.60 | 0.13 | 0.13 | 5.0 | 5.0 | 7.0 | 0.88 | 19.44 | 1.78 | 15 | 9.06 | 96.10 | 78.34 | 96.48 | 80.89 | 100.10 | 88.50 | 6-1-4 TO 6-1-2 |
| 4 | 1 | 98.0 | 0.54 | 2.99 | 0.50 | 0.27 | 1.63 | 5.0 | 9.4 | 5.9 | 9.67 | 13.85 | 7.97 | 15 | 4.60 | 82.85 | 78.34 | 84.03 | 80.89 | 87.03 | 88.50 | 6-1-5 TO 6-1-2 |
| 5 | 4 | 38.0 | 0.44 | 0.44 | 0.70 | 0.31 | 0.31 | 5.0 | 5.0 | 7.0 | 2.16 | 4.57 | 1.76 | 15 | 0.50 | 83.04 | 82.85 | 85.08 | 85.04 | 87.04 | 87.03 | 6-1-6 TO 6-1-5 |
| 6 | 4 | 123.0 | 0.21 | 2.01 | 0.70 | 0.15 | 1.05 | 5.0 | 9.0 | 6.0 | 6.31 | 9.57 | 5.56 | 15 | 2.20 | 85.55 | 82.85 | 86.56 | 85.04 | 89.55 | 87.03 | 6-1-7 TO 6-1-5 |
| 7 | 6 | 78.0 | 0.44 | 1.80 | 0.50 | 0.22 | 0.90 | 8.0 | 8.7 | 6.1 | 5.48 | 14.25 | 5.19 | 15 | 4.87 | 89.35 | 85.55 | 90.29 | 86.64 | 93.35 | 89.55 | 6-1-8 TO 6-1-7 |
| 8 | 7 | 54.0 | 0.51 | 0.51 | 0.50 | 0.26 | 0.26 | 8.0 | 8.0 | 6.2 | 1.59 | 7.40 | 1.91 | 15 | 1.31 | 90.06 | 89.35 | 90.70 | 90.69 | 94.06 | 93.35 | 6-1-9 TO 6-1-8 |
| 9 | 7 | 49.0 | 0.85 | 0.85 | 0.50 | 0.43 | 0.43 | 8.0 | 8.0 | 6.2 | 2.65 | 15.82 | 3.13 | 15 | 6.00 | 92.29 | 89.35 | 92.94 | 90.69 | 96.29 | 93.35 | 6-1-10 TO 6-1-8 |

Project File: STORM 6-1.stm | Number of lines: 9 | Run Date: 11-30-2004

NOTES: Intensity = 80.56 / (Inlet time + 14.90) ^ 0.82; Return period = 10 Yrs.

Hydraflow Storm Sewers 2003

Wellington Section 6+7
Outlet Protection from SS# 6-1




$Q_{10} = 23.15$ cfs
$\phi = 24''$
$3 * \phi = 6'$
$W = 2 + (0.4)12 = 7'$
$L = 12'$
$\boxed{7'W \times 12'L}$
$L = 12'$
23cfs

JAG

Source: USDA-SCS



Plate 3.18-4



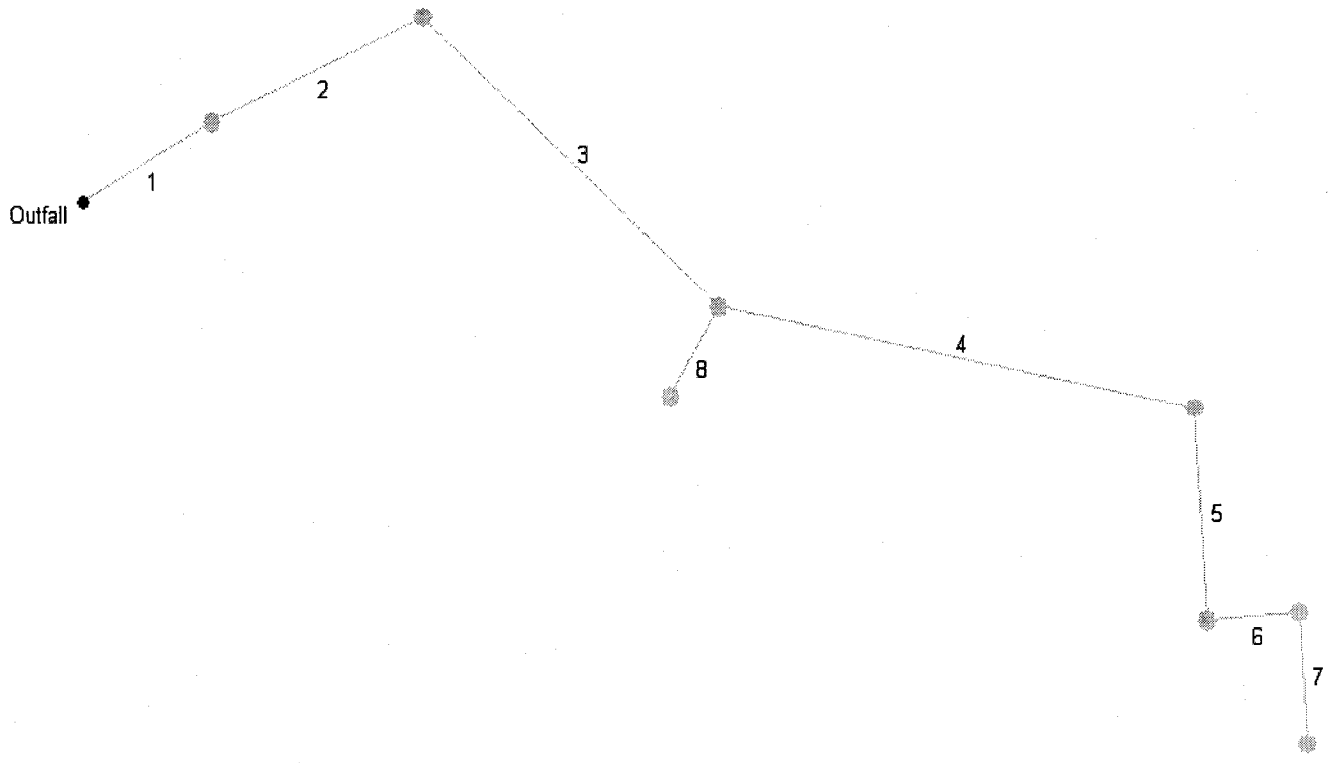


WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 090

AES PROJECT No. [redacted]8223-08
11/30/04

# Hydraflow Plan View

STORM SEWER SYSTEM 6-2




| Project file: STORM 6-2.stm | No. Lines: 8 | 11-30-2004 |
|---|---|---|

Hydraflow Storm Sewers 2003

# Storm Sewer Tabulation



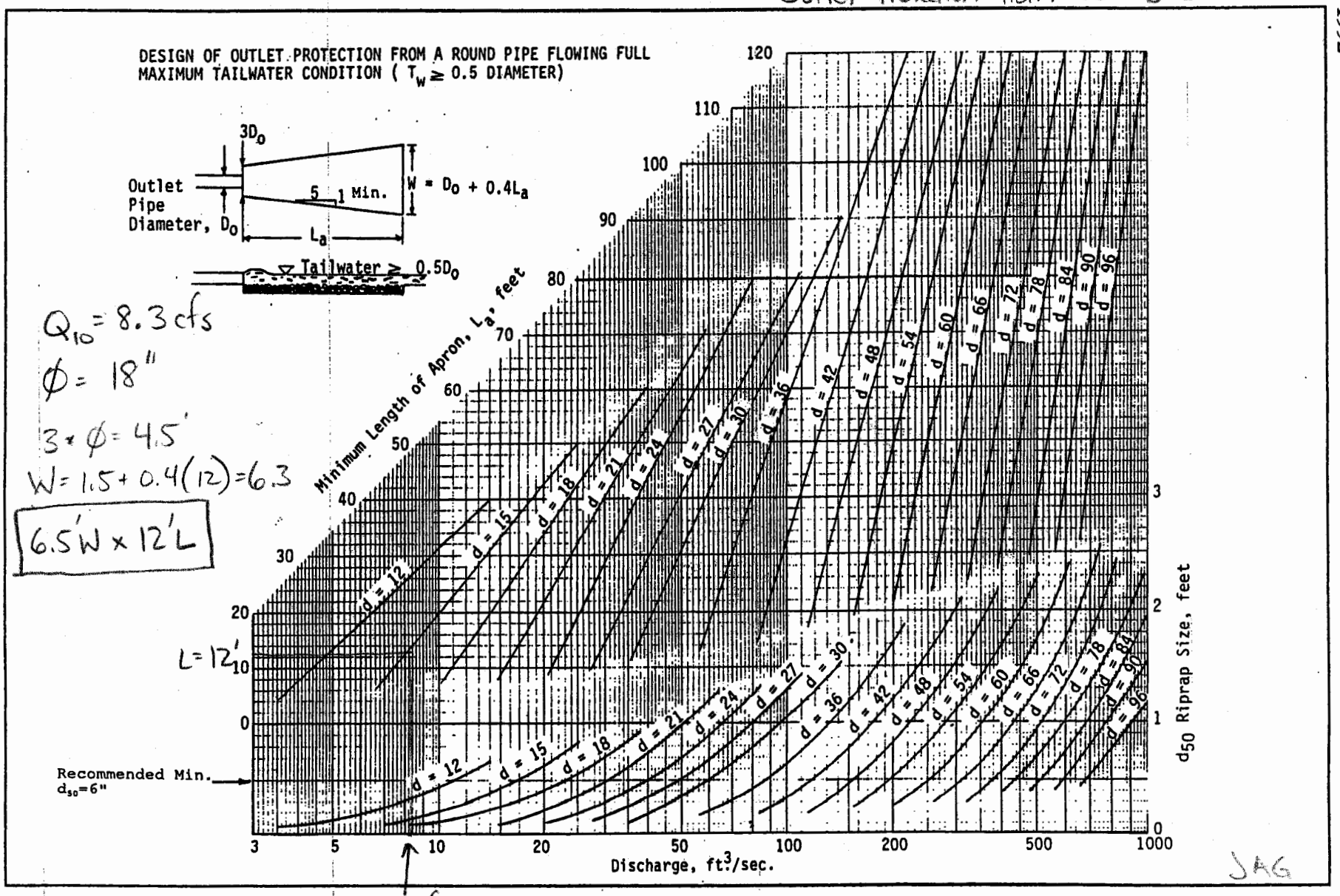
| Station | | Len | Drng Area | | Rnoff coeff | Area x C | | Tc | | Rain (I) | Total flow | Cap full | Vel | Pipe | | Invert Elev | | HGL Elev | | Grnd / Rim Elev | | Line ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Line | To Line | | Incr | Total | | Incr | Total | Inlet | Syst | | | | | Size | Slope | Up | Dn | Up | Dn | Up | Dn | |
| | | (ft) | (ac) | (ac) | (C) | | | (min) | (min) | (in/hr) | (cfs) | (cfs) | (ft/s) | (in) | (%) | (ft) | (ft) | (ft) | (ft) | (ft) | (ft) | |
| 1 | End | 53.0 | 0.30 | 3.08 | 0.70 | 0.21 | 1.46 | 5.0 | 10.9 | 5.7 | 8.28 | 20.25 | 5.74 | 18 | 3.72 | 70.97 | 69.00 | 72.07 | 70.19 | 78.43 | 69.00 | 6-2-2 TO 6-2-1 |
| 2 | 1 | 83.0 | 0.19 | 2.78 | 0.45 | 0.09 | 1.25 | 5.0 | 10.6 | 5.7 | 7.17 | 7.47 | 4.81 | 18 | 0.51 | 71.39 | 70.97 | 72.57 | 72.15 | 78.07 | 78.43 | 6-2-3 TO 6-2-2 |
| 3 | 2 | 142.0 | 0.42 | 2.59 | 0.45 | 0.19 | 1.17 | 8.0 | 10.2 | 5.8 | 6.77 | 11.33 | 5.86 | 15 | 3.08 | 75.76 | 71.39 | 76.80 | 72.87 | 79.92 | 78.07 | 6-2-4 TO 6-2-3 |
| 4 | 3 | 175.0 | 0.21 | 1.69 | 0.45 | 0.09 | 0.64 | 5.0 | 9.2 | 6.0 | 3.84 | 15.95 | 3.93 | 15 | 6.10 | 86.44 | 75.76 | 87.22 | 77.40 | 90.44 | 79.92 | 6-2-6 TO 6-2-4 |
| 5 | 4 | 68.0 | 0.11 | 1.48 | 0.70 | 0.08 | 0.55 | 5.0 | 8.8 | 6.1 | 3.32 | 5.19 | 3.57 | 15 | 0.65 | 86.88 | 86.44 | 87.65 | 87.52 | 91.04 | 90.44 | 6-2-7 TO 6-2-6 |
| 6 | 5 | 33.0 | 0.60 | 1.37 | 0.40 | 0.24 | 0.47 | 5.0 | 8.6 | 6.1 | 2.88 | 4.50 | 2.79 | 15 | 0.48 | 87.04 | 86.88 | 87.97 | 87.92 | 91.04 | 91.04 | 6-2-8 TO 6-2-7 |
| 7 | 6 | 42.0 | 0.77 | 0.77 | 0.30 | 0.23 | 0.23 | 8.0 | 8.0 | 6.2 | 1.44 | 5.64 | 1.59 | 15 | 0.76 | 87.36 | 87.04 | 88.11 | 88.10 | 91.36 | 91.04 | 6-2-9 TO 6-2-8 |
| 8 | 3 | 34.0 | 0.48 | 0.48 | 0.70 | 0.34 | 0.34 | 8.0 | 8.0 | 6.2 | 2.10 | 4.43 | 1.71 | 15 | 0.47 | 75.92 | 75.76 | 77.43 | 77.40 | 79.92 | 79.92 | 6-2-5 TO 6-2-4 |

Project File: STORM 6-2.stm | Number of lines: 8 | Run Date: 11-30-2004

NOTES: Intensity = 80.56 / (Inlet time + 14.90) ^ 0.82; Return period = 10 Yrs.

Hydraflow Storm Sewers 2003

Wellington Section 6+7
Outlet Protection from SS# 6-2




Source: USDA-SCS



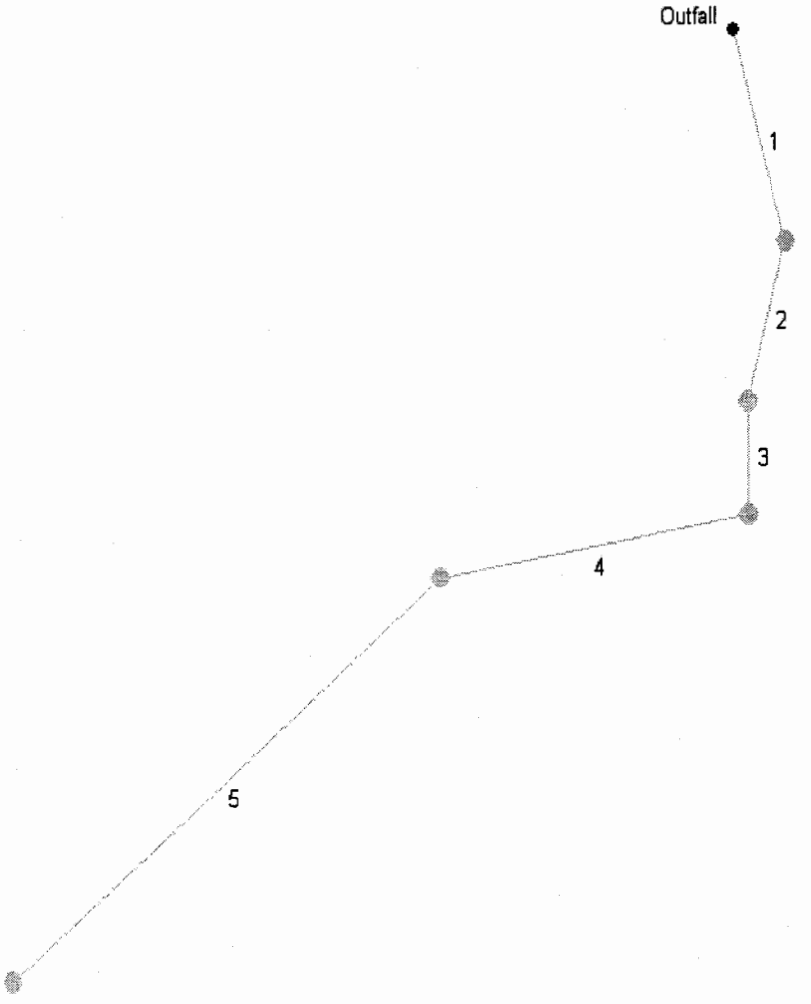
Plate 3.18-4



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 093

# Hydraflow Plan View

AES PROJECT NUMBER 8223-08
11/30/04
STORM SYSTEM 6-3




| | | |
|---|---|---|
| Project file: STORM 6-3.stm | No. Lines: 5 | 11-30-2004 |

Hydraflow Storm Sewers 2003

# Storm Sewer Tabulation



| Station | | Len | Drng Area | | Rnoff coeff | Area x C | | Tc | | Rain (I) | Total flow | Cap full | Vel | Pipe | | Invert Elev | | HGL Elev | | Grnd / Rim Elev | | Line ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Line | To Line | (ft) | Incr (ac) | Total (ac) | (C) | Incr | Total | Inlet (min) | Syst (min) | (in/hr) | (cfs) | (cfs) | (ft/s) | Size (in) | Slope (%) | Up (ft) | Dn (ft) | Up (ft) | Dn (ft) | Up (ft) | Dn (ft) | |
| 1 | End | 64.0 | 0.00 | 3.82 | 0.00 | 0.00 | 2.10 | 5.0 | 5.8 | 6.8 | 14.24 | 21.96 | 11.60 | 15 | 11.56 | 69.00 | 61.60 | 71.11 | 68.00 | 73.00 | 61.60 | 6-3-2 TO 6-3-1 |
| 2 | 1 | 48.0 | 0.39 | 3.82 | 0.70 | 0.27 | 2.10 | 5.0 | 5.7 | 6.8 | 14.28 | 22.83 | 11.65 | 15 | 12.50 | 75.00 | 69.00 | 76.23 | 72.05 | 82.00 | 73.00 | 6-3-3 TO 6-3-2 |
| 3 | 2 | 33.0 | 0.56 | 3.43 | 0.70 | 0.39 | 1.83 | 5.0 | 5.7 | 6.8 | 12.45 | 15.90 | 10.15 | 15 | 6.06 | 77.00 | 75.00 | 78.41 | 77.19 | 82.00 | 82.00 | 6-3-4 TO 6-3-3 |
| 4 | 3 | 102.0 | 0.48 | 2.87 | 0.50 | 0.24 | 1.44 | 5.0 | 5.4 | 6.9 | 9.86 | 11.07 | 8.04 | 15 | 2.94 | 80.00 | 77.00 | 82.39 | 80.01 | 84.00 | 82.00 | 6-3-5 TO 6-3-4 |
| 5 | 4 | 182.0 | 2.39 | 2.39 | 0.50 | 1.20 | 1.20 | 5.0 | 5.0 | 7.0 | 8.36 | 10.70 | 6.98 | 15 | 2.75 | 85.00 | 80.00 | 86.13 | 82.85 | 93.00 | 84.00 | 6-3-6 TO 6-3-5 |

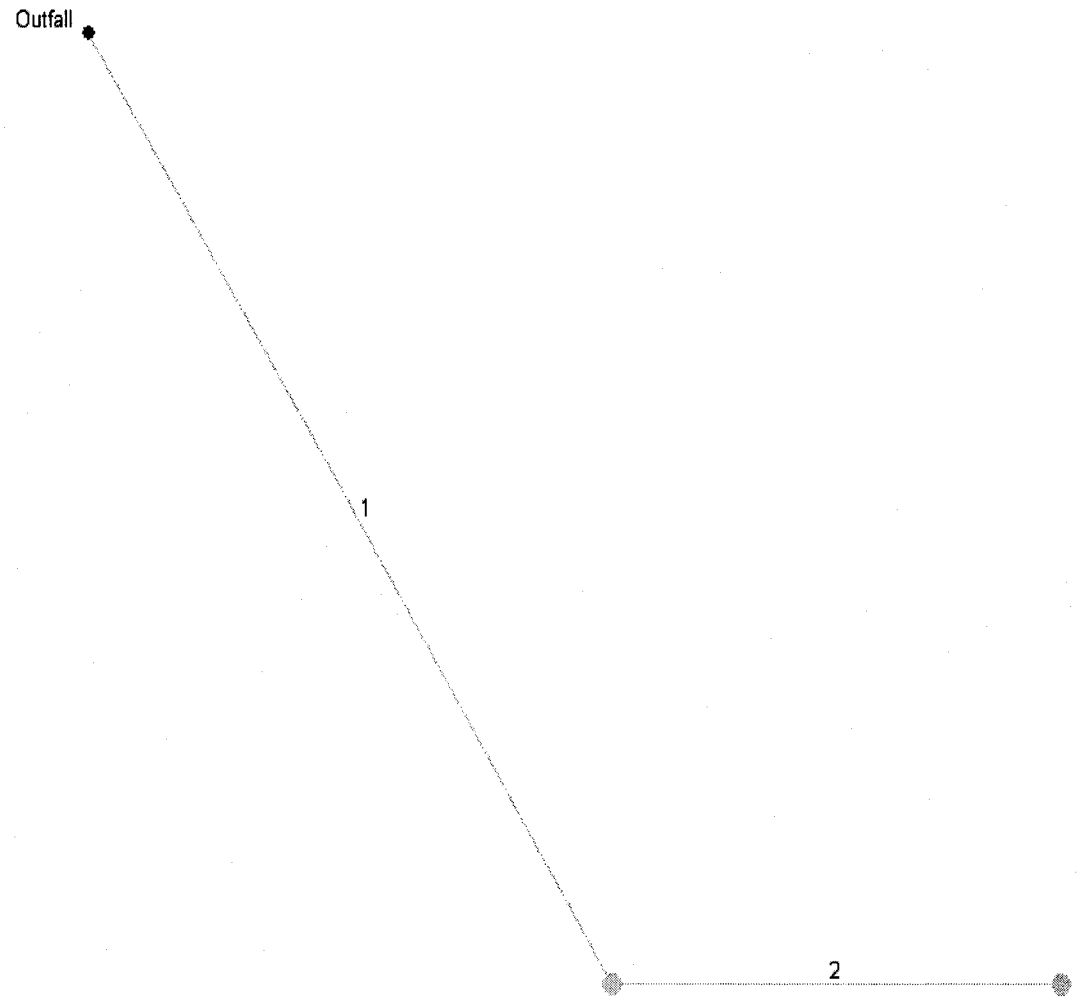
Project File: STORM 6-3.stm | Number of lines: 5 | Run Date: 11-30-2004

NOTES: Intensity = 80.56 / (Inlet time + 14.90) ^ 0.82; Return period = 10 Yrs.

Hydraflow Storm Sewers 2003

# Hydraflow Plan View

AES PROJECT NUMBER 8223-08
11/30/04
STORM SYSTEM 6-4




| Project file: STORM 6-4.stm | No. Lines: 2 | 11-30-2004 |
|---|---|---|

Hydraflow Storm Sewers 2003

# Storm Sewer Tabulation

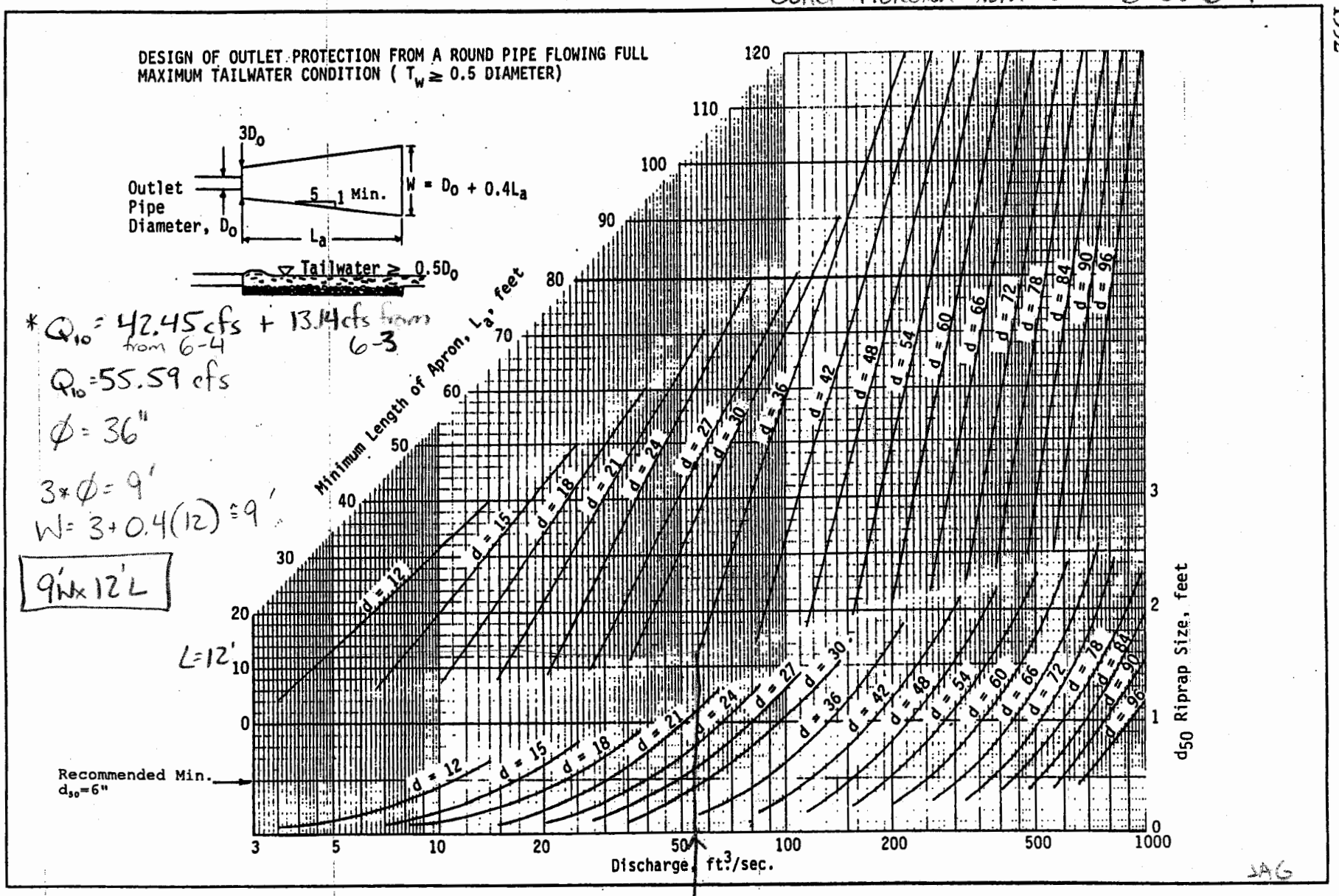


| Station | | Len | Drng Area | | Rnoff coeff | Area x C | | Tc | | Rain (I) | Total flow | Cap full | Vel | Pipe | | Invert Elev | | HGL Elev | | Grnd / Rim Elev | | Line ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Line | To Line | (ft) | Incr (ac) | Total (ac) | (C) | Incr | Total | Inlet (min) | Syst (min) | (in/hr) | (cfs) | (cfs) | (ft/s) | Size (in) | Slope (%) | Up (ft) | Dn (ft) | Up (ft) | Dn (ft) | Up (ft) | Dn (ft) | |
| 1 | End | 211.0 | 2.50 | 30.55 | 0.50 | 1.25 | 9.67 | 5.0 | 20.3 | 4.4 | 42.45 | 68.10 | 7.07 | 36 | 1.04 | 63.80 | 61.60 | 65.88 | 64.97 | 72.00 | 61.60 | 6-4-2 TO 6-4-1 |
| 2 | 1 | 95.0 | 28.05 | 28.05 | 0.30 | 8.42 | 8.42 | 20.0 | 20.0 | 4.4 | 37.22 | 48.38 | 5.45 | 36 | 0.53 | 64.30 | 63.80 | 66.96 | 66.75 | 69.00 | 72.00 | 6-4-3 TO 6-4-2 |

Project File: STORM 6-4.stm | Number of lines: 2 | Run Date: 11-30-2004

NOTES: Intensity = 80.56 / (Inlet time + 14.90) ^ 0.82; Return period = 10 Yrs.

Wellington Section 6+7
Outlet Protection from SS# 6-3 & 6-4




* $Q_{10}$ = 42.45 cfs + 13.14 cfs from 6-3
from 6-4

$Q_{10}$ = 55.59 cfs

$\phi$ = 36"

$3 * \phi = 9'$

$W = 3 + 0.4(12) \approx 9'$

$\boxed{9'W \times 12'L}$

L=12'

55.6 cfs

JAG

Source: USDA-SCS



Plate 3.18-4

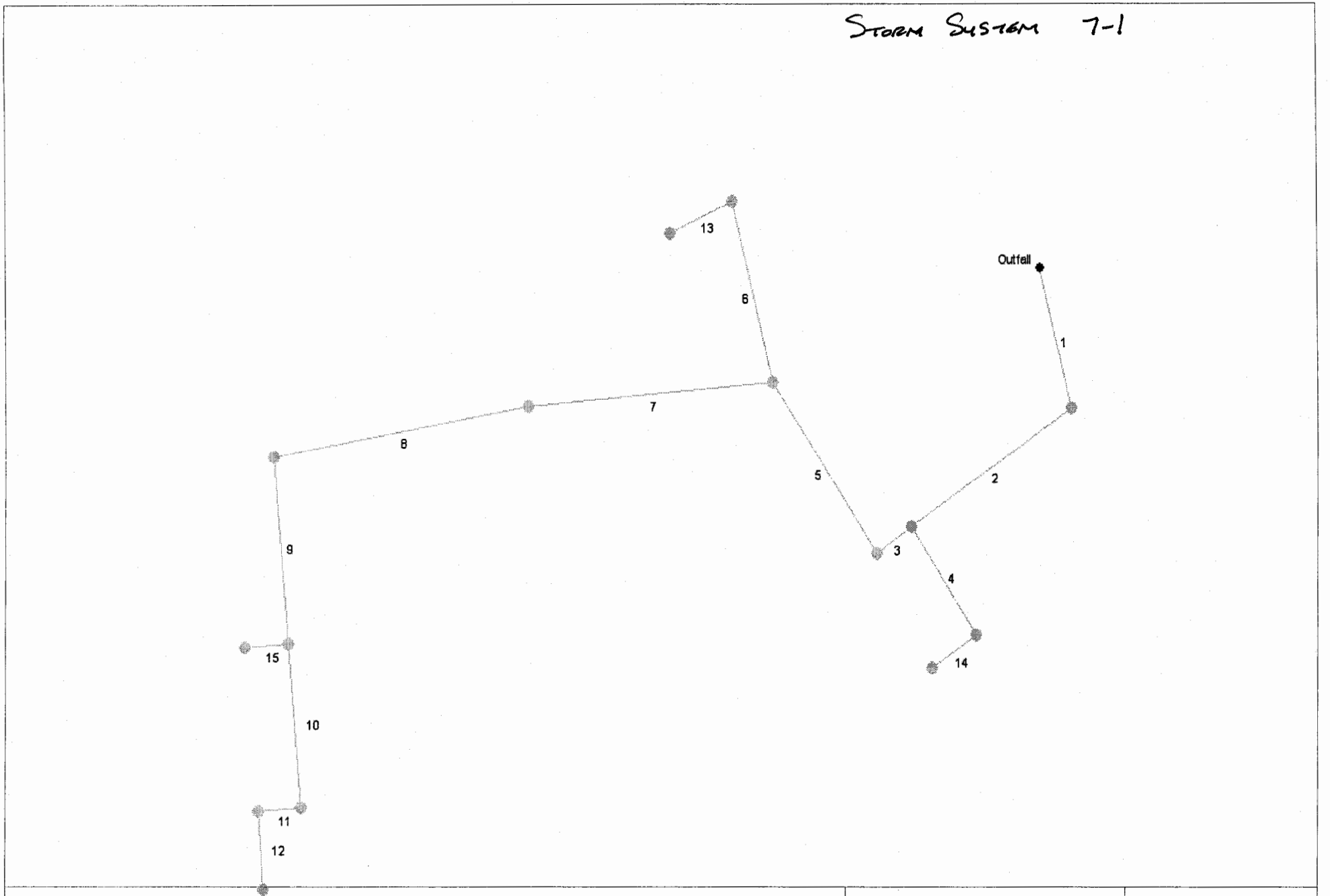




WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 098

WELLINGTON - SECTION 7
AES PROJECT NUMBER 8223-8
11/30/04
STORM SYSTEM 7-1

# Hydraflow Plan View




| Project file: STORM 7-1.stm | No. Lines: 15 | 11-29-2004 |
|---|---|---|

Hydraflow Storm Sewers 2003

# Storm Sewer Tabulation

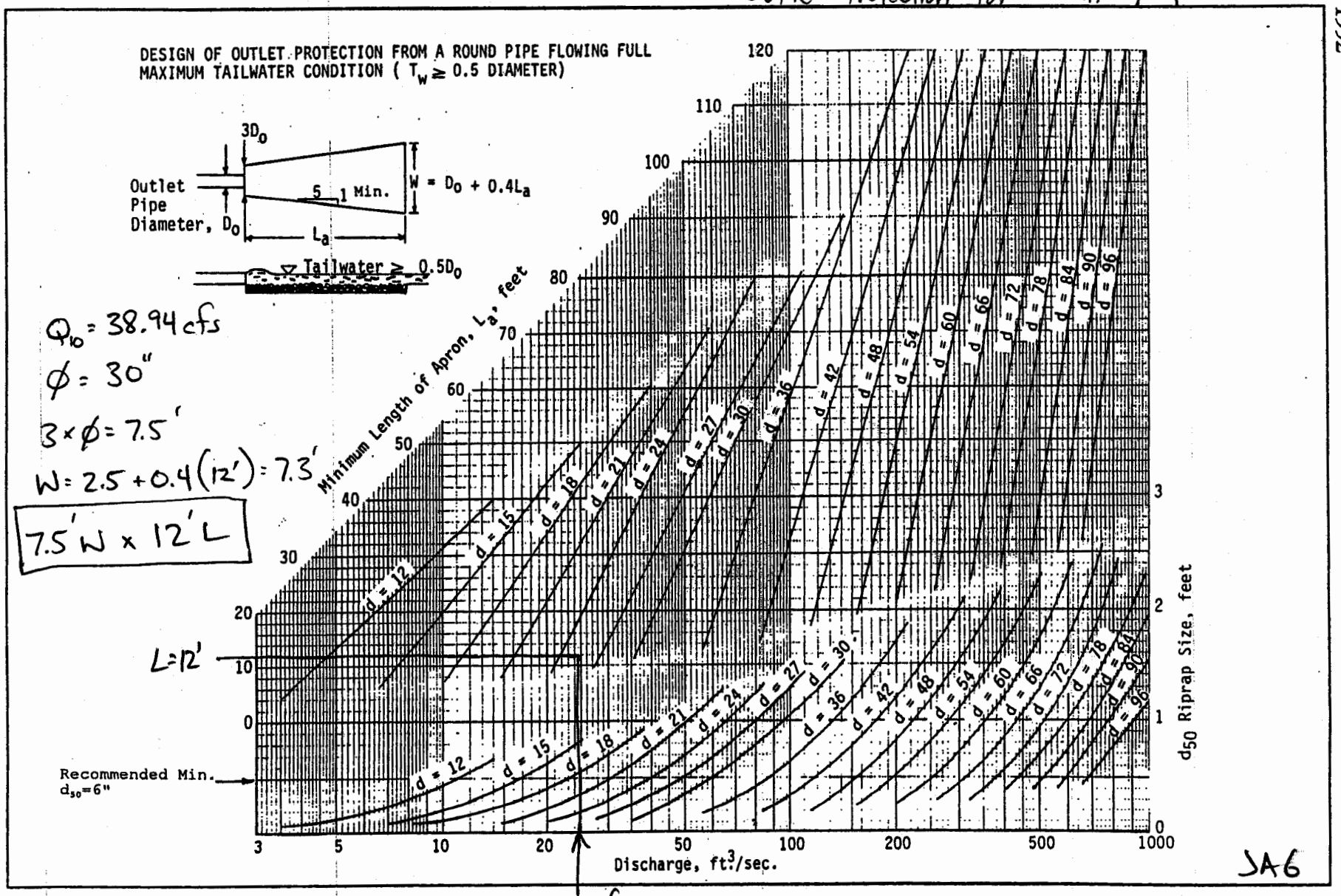


| Station | | Len | Drng Area | | Rnoff coeff | Area x C | | Tc | | Rain (I) | Total flow | Cap full | Vel | Pipe | | Invert Elev | | HGL Elev | | Grnd / Rim Elev | | Line ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Line | To Line | | Incr | Total | | Incr | Total | Inlet | Syst | | | | | Size | Slope | Up | Dn | Up | Dn | Up | Dn | |
| | | (ft) | (ac) | (ac) | (C) | | | (min) | (min) | (in/hr) | (cfs) | (cfs) | (ft/s) | (in) | (%) | (ft) | (ft) | (ft) | (ft) | (ft) | (ft) | |
| 1 | End | 140.0 | 0.00 | 20.65 | 0.00 | 0.00 | 8.76 | 0.0 | 25.8 | 3.9 | 34.17 | 46.89 | 8.05 | 30 | 1.31 | 73.83 | 72.00 | 75.78 | 74.09 | 78.00 | 0.00 | 7-1-2 TO 7-1-1 |
| 2 | 1 | 147.0 | 0.28 | 20.65 | 0.75 | 0.21 | 8.76 | 5.0 | 25.4 | 3.9 | 34.41 | 48.78 | 7.67 | 30 | 1.41 | 75.91 | 73.83 | 77.87 | 76.69 | 83.53 | 78.00 | 7-1-3 TO 7-1-2 |
| 3 | 2 | 33.0 | 0.66 | 5.07 | 0.50 | 0.33 | 2.37 | 5.0 | 14.0 | 5.2 | 12.22 | 20.94 | 9.99 | 15 | 10.52 | 79.38 | 75.91 | 80.60 | 78.95 | 83.53 | 83.53 | 7-1-6 TO 7-1-3 |
| 4 | 2 | 89.0 | 0.60 | 15.30 | 0.50 | 0.30 | 6.18 | 15.0 | 25.1 | 4.0 | 24.43 | 53.42 | 6.04 | 30 | 1.70 | 77.42 | 75.91 | 79.07 | 78.95 | 82.00 | 83.53 | 7-1-4 TO 7-1-3 |
| 5 | 3 | 143.0 | 0.34 | 4.41 | 0.50 | 0.17 | 2.04 | 5.0 | 13.3 | 5.3 | 10.73 | 17.33 | 3.42 | 24 | 0.59 | 80.22 | 79.38 | 82.48 | 82.16 | 85.23 | 83.53 | 7-1-7 TO 7-1-6 |
| 6 | 5 | 127.0 | 0.15 | 1.14 | 0.50 | 0.08 | 0.47 | 5.0 | 5.4 | 6.9 | 3.24 | 11.29 | 3.54 | 15 | 3.06 | 84.10 | 80.22 | 84.82 | 82.64 | 88.10 | 85.23 | 7-1-8 TO 7-1-7 |
| 7 | 5 | 190.0 | 0.77 | 2.93 | 0.40 | 0.31 | 1.40 | 12.0 | 12.0 | 5.5 | 7.64 | 15.99 | 2.59 | 24 | 0.50 | 81.17 | 80.22 | 82.82 | 82.64 | 96.00 | 85.23 | 7-1-10 TO 7-1-7 |
| 8 | 7 | 198.0 | 0.54 | 2.16 | 0.50 | 0.27 | 1.09 | 5.0 | 7.2 | 6.4 | 6.99 | 7.43 | 3.96 | 18 | 0.50 | 82.16 | 81.17 | 83.64 | 82.84 | 93.57 | 96.00 | 7-1-11 TO 7-1-10 |
| 9 | 8 | 129.0 | 0.38 | 1.62 | 0.50 | 0.19 | 0.82 | 5.0 | 6.5 | 6.6 | 5.40 | 7.45 | 3.11 | 18 | 0.50 | 82.81 | 82.16 | 84.19 | 83.89 | 89.64 | 93.57 | 7-1-12 TO 7-1-11 |
| 10 | 9 | 114.0 | 0.21 | 1.06 | 0.45 | 0.09 | 0.49 | 5.0 | 5.8 | 6.8 | 3.34 | 4.53 | 2.73 | 15 | 0.49 | 83.37 | 82.81 | 84.62 | 84.35 | 87.53 | 89.64 | 7-1-14 TO 7-1-12 |
| 11 | 10 | 33.0 | 0.17 | 0.85 | 0.75 | 0.13 | 0.40 | 5.0 | 5.6 | 6.8 | 2.73 | 4.50 | 2.23 | 15 | 0.48 | 83.53 | 83.37 | 84.78 | 84.73 | 87.53 | 87.53 | 7-1-15 TO 7-1-14 |
| 12 | 11 | 54.0 | 0.68 | 0.68 | 0.40 | 0.27 | 0.27 | 5.0 | 5.0 | 7.0 | 1.90 | 10.65 | 2.60 | 15 | 2.72 | 85.00 | 83.53 | 85.55 | 84.86 | 87.50 | 87.53 | 7-1-16 TO 7-1-15 |
| 13 | 6 | 53.0 | 0.99 | 0.99 | 0.40 | 0.40 | 0.40 | 5.0 | 5.0 | 7.0 | 2.77 | 8.41 | 3.37 | 15 | 1.70 | 85.00 | 84.10 | 85.67 | 85.13 | 89.00 | 88.10 | 7-1-9 TO 7-1-8 |
| 14 | 4 | 41.0 | 14.70 | 14.70 | 0.40 | 5.88 | 5.88 | 25.0 | 25.0 | 4.0 | 23.31 | 41.01 | 5.10 | 30 | 1.00 | 77.83 | 77.42 | 79.88 | 79.86 | 82.00 | 82.00 | 7-1-5 TO 7-1-4 |
| 15 | 9 | 33.0 | 0.18 | 0.18 | 0.75 | 0.14 | 0.14 | 5.0 | 5.0 | 7.0 | 0.94 | 18.91 | 1.84 | 15 | 8.58 | 85.64 | 82.81 | 86.03 | 84.35 | 89.64 | 89.64 | 7-1-13 TO 7-1-12 |

Project File: STORM 7-1.stm | Number of lines: 15 | Run Date: 12-01-2004

NOTES: Intensity = 80.56 / (Inlet time + 14.90) ^ 0.82; Return period = 10 Yrs.

Wellington Sections 6+7
Outlet Protection for SS # 7-1




$Q_{10} = 38.94$ cfs

$\phi = 30''$

$3 \times \phi = 7.5'$

$W = 2.5 + 0.4(12') = 7.3'$

$\boxed{7.5' W \times 12' L}$

L=12'

39cfs

JA6

Source: USDA-SCS

Plate 3.18-4





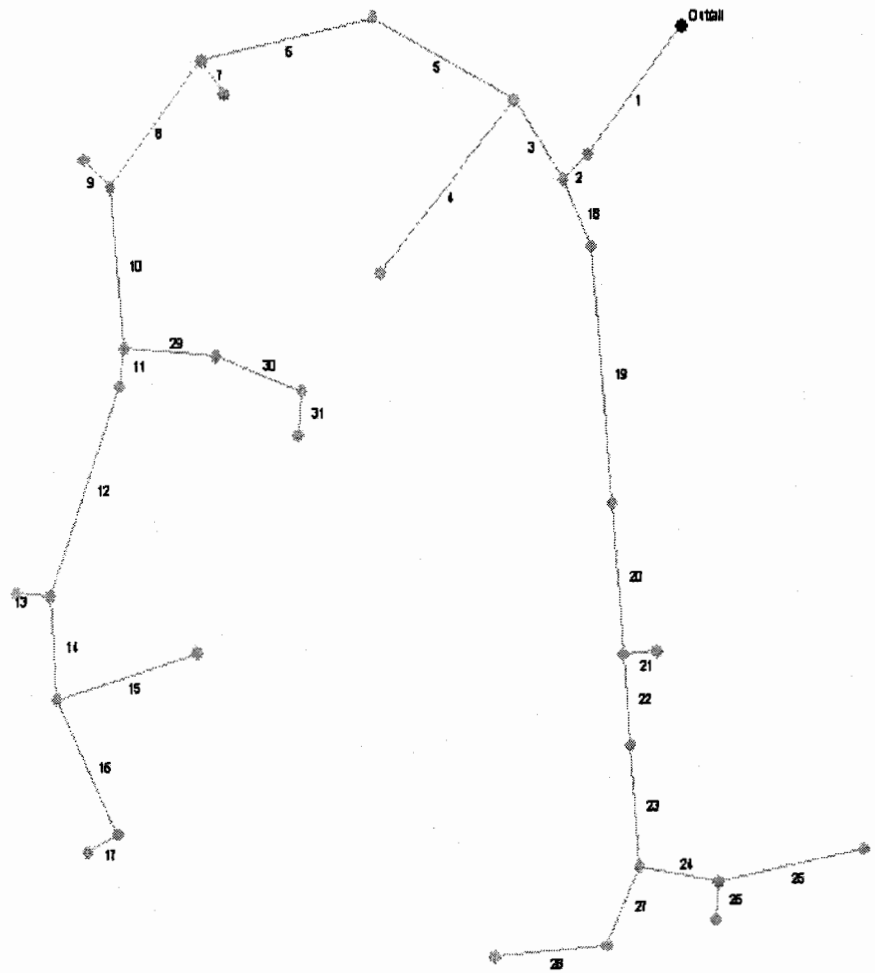


WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 101

WELLINGTON SECTION 7
AES PROJECT NUMBER 8223-08
11/30/2004

# Hydraflow Plan View

STORM SYSTEM 7-2




| Project file: STORM 7-2.stm | No. Lines: 31 | 11-30-2004 |
|---|---|---|

Hydraflow Storm Sewers 2003

# Storm Sewer Tabulation



| Station | | Len | Drng Area | | Rnoff coeff | Area x C | | Tc | | Rain (I) | Total flow | Cap full | Vel | Pipe | | Invert Elev | | HGL Elev | | Grnd / Rim Elev | | Line ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Line | To Line | (ft) | Incr (ac) | Total (ac) | (C) | Incr | Total | Inlet (min) | Syst (min) | (in/hr) | (cfs) | (cfs) | (ft/s) | Size (in) | Slope (%) | Up (ft) | Dn (ft) | Up (ft) | Dn (ft) | Up (ft) | Dn (ft) | |
| 1 | End | 145.0 | 0.35 | 14.14 | 0.70 | 0.25 | 7.04 | 5.0 | 18.1 | 4.6 | 32.61 | 85.62 | 7.09 | 36 | 1.65 | 63.39 | 61.00 | 65.21 | 62.90 | 73.61 | 0.00 | 7-2-2 TO 7-2-1 |
| 2 | 1 | 33.0 | 0.39 | 13.79 | 0.50 | 0.20 | 6.79 | 5.0 | 17.9 | 4.6 | 31.58 | 46.44 | 6.81 | 36 | 0.48 | 63.55 | 63.39 | 65.36 | 65.33 | 73.61 | 73.61 | 7-2-3 TO 7-2-2 |
| 3 | 2 | 83.0 | 0.37 | 10.38 | 0.50 | 0.19 | 4.90 | 5.0 | 17.5 | 4.7 | 23.01 | 46.87 | 3.83 | 36 | 0.49 | 63.96 | 63.55 | 66.18 | 66.14 | 75.19 | 73.61 | 7-2-4 TO 7-2-3 |
| 4 | 3 | 200.0 | 1.58 | 1.58 | 0.40 | 0.63 | 0.63 | 12.0 | 12.0 | 5.5 | 3.46 | 13.73 | 3.68 | 15 | 4.52 | 73.00 | 63.96 | 73.74 | 66.44 | 77.00 | 75.19 | 7-2-5 TO 7-2-4 |
| 5 | 3 | 156.0 | 0.00 | 8.43 | 0.00 | 0.00 | 4.08 | 5.0 | 16.8 | 4.8 | 19.50 | 29.00 | 4.35 | 30 | 0.50 | 64.74 | 63.96 | 66.70 | 66.44 | 79.05 | 75.19 | 7-2-6 TO 7-2-4 |
| 6 | 5 | 173.0 | 0.15 | 8.43 | 0.70 | 0.11 | 4.08 | 5.0 | 16.1 | 4.9 | 19.86 | 28.92 | 5.05 | 30 | 0.50 | 65.60 | 64.74 | 67.25 | 66.96 | 77.91 | 79.05 | 7-2-7 TO 7-2-6 |
| 7 | 6 | 36.0 | 1.22 | 1.22 | 0.40 | 0.49 | 0.49 | 5.0 | 5.0 | 7.0 | 3.42 | 11.07 | 1.93 | 18 | 1.11 | 66.00 | 65.60 | 67.81 | 67.77 | 68.00 | 77.91 | 7-2-8 TO 7-2-7 |
| 8 | 6 | 140.0 | 0.09 | 7.06 | 0.70 | 0.06 | 3.49 | 5.0 | 15.5 | 5.0 | 17.28 | 29.00 | 4.49 | 30 | 0.50 | 66.30 | 65.60 | 67.92 | 67.77 | 76.36 | 77.91 | 7-2-9 TO 7-2-7 |
| 9 | 8 | 34.0 | 0.19 | 0.19 | 0.70 | 0.13 | 0.13 | 5.0 | 5.0 | 7.0 | 0.93 | 27.69 | 1.82 | 15 | 18.38 | 72.55 | 66.30 | 72.94 | 68.33 | 76.47 | 76.36 | 7-2-10 TO 7-2-9 |
| 10 | 8 | 140.0 | 0.40 | 6.78 | 0.50 | 0.20 | 3.29 | 5.0 | 14.8 | 5.0 | 16.61 | 29.00 | 4.71 | 30 | 0.50 | 67.00 | 66.30 | 68.47 | 68.33 | 74.45 | 76.36 | 7-2-11 TO 7-2-9 |
| 11 | 10 | 33.0 | 0.37 | 4.08 | 0.50 | 0.19 | 1.94 | 5.0 | 14.6 | 5.1 | 9.85 | 15.75 | 3.21 | 24 | 0.48 | 67.16 | 67.00 | 68.99 | 68.95 | 74.45 | 74.45 | 7-2-12 TO 7-2-11 |
| 12 | 11 | 196.0 | 0.59 | 3.71 | 0.50 | 0.30 | 1.76 | 5.0 | 13.5 | 5.2 | 9.19 | 15.99 | 3.78 | 24 | 0.50 | 68.14 | 67.16 | 69.36 | 69.07 | 72.81 | 74.45 | 7-2-13 TO 7-2-12 |
| 13 | 12 | 33.0 | 0.34 | 0.34 | 0.70 | 0.24 | 0.24 | 5.0 | 5.0 | 7.0 | 1.67 | 9.73 | 1.79 | 15 | 2.27 | 68.89 | 68.14 | 69.62 | 69.64 | 72.81 | 72.81 | 7-2-14 TO 7-2-13 |
| 14 | 12 | 90.0 | 0.38 | 2.78 | 0.50 | 0.19 | 1.22 | 5.0 | 13.1 | 5.3 | 6.48 | 14.09 | 4.51 | 18 | 1.80 | 69.76 | 68.14 | 70.73 | 69.64 | 71.57 | 72.81 | 7-2-15 TO 7-2-13 |
| 15 | 14 | 143.0 | 1.39 | 1.39 | 0.35 | 0.49 | 0.49 | 12.0 | 12.0 | 5.5 | 2.66 | 14.53 | 3.14 | 15 | 5.06 | 77.00 | 69.76 | 77.65 | 71.18 | 82.00 | 71.57 | 7-2-16 TO 7-2-15 |
| 16 | 14 | 132.0 | 0.80 | 1.01 | 0.50 | 0.40 | 0.55 | 5.0 | 5.7 | 6.8 | 3.73 | 13.65 | 3.86 | 15 | 4.47 | 75.66 | 69.76 | 76.43 | 71.18 | 79.74 | 71.57 | 7-2-17 TO 7-2-15 |
| 17 | 16 | 33.0 | 0.21 | 0.21 | 0.70 | 0.15 | 0.15 | 5.0 | 5.0 | 7.0 | 1.03 | 4.50 | 0.96 | 15 | 0.48 | 75.82 | 75.66 | 76.78 | 76.77 | 79.74 | 79.74 | 7-2-18 TO 7-2-17 |
| 18 | 2 | 65.0 | 0.57 | 3.02 | 0.50 | 0.29 | 1.70 | 5.0 | 10.5 | 5.7 | 9.73 | 71.47 | 4.28 | 24 | 9.98 | 70.04 | 63.55 | 71.15 | 66.14 | 74.71 | 73.61 | 7-2-22 TO 7-2-3 |
| 19 | 18 | 223.0 | 0.00 | 2.45 | 0.00 | 0.00 | 1.42 | 5.0 | 9.2 | 6.0 | 8.46 | 24.93 | 4.53 | 24 | 1.22 | 72.75 | 70.04 | 73.78 | 71.35 | 79.00 | 74.71 | 7-2-23 TO 7-2-22 |
| 20 | 19 | 133.0 | 0.55 | 2.45 | 0.50 | 0.28 | 1.42 | 5.0 | 8.5 | 6.1 | 8.69 | 15.93 | 5.08 | 24 | 0.50 | 73.41 | 72.75 | 74.46 | 73.84 | 78.08 | 79.00 | 7-2-24 TO 7-2-23 |
| 21 | 20 | 33.0 | 0.20 | 0.20 | 0.70 | 0.14 | 0.14 | 5.0 | 5.0 | 7.0 | 0.98 | 9.73 | 1.07 | 15 | 2.27 | 74.16 | 73.41 | 74.88 | 74.88 | 78.08 | 78.08 | 7-2-25 TO 7-2-24 |

Project File: STORM 7-2.stm | Number of lines: 31 | Run Date: 11-30-2004

NOTES: Intensity = 80.56 / (Inlet time + 14.90) ^ 0.82; Return period = 10 Yrs.

# Storm Sewer Tabulation

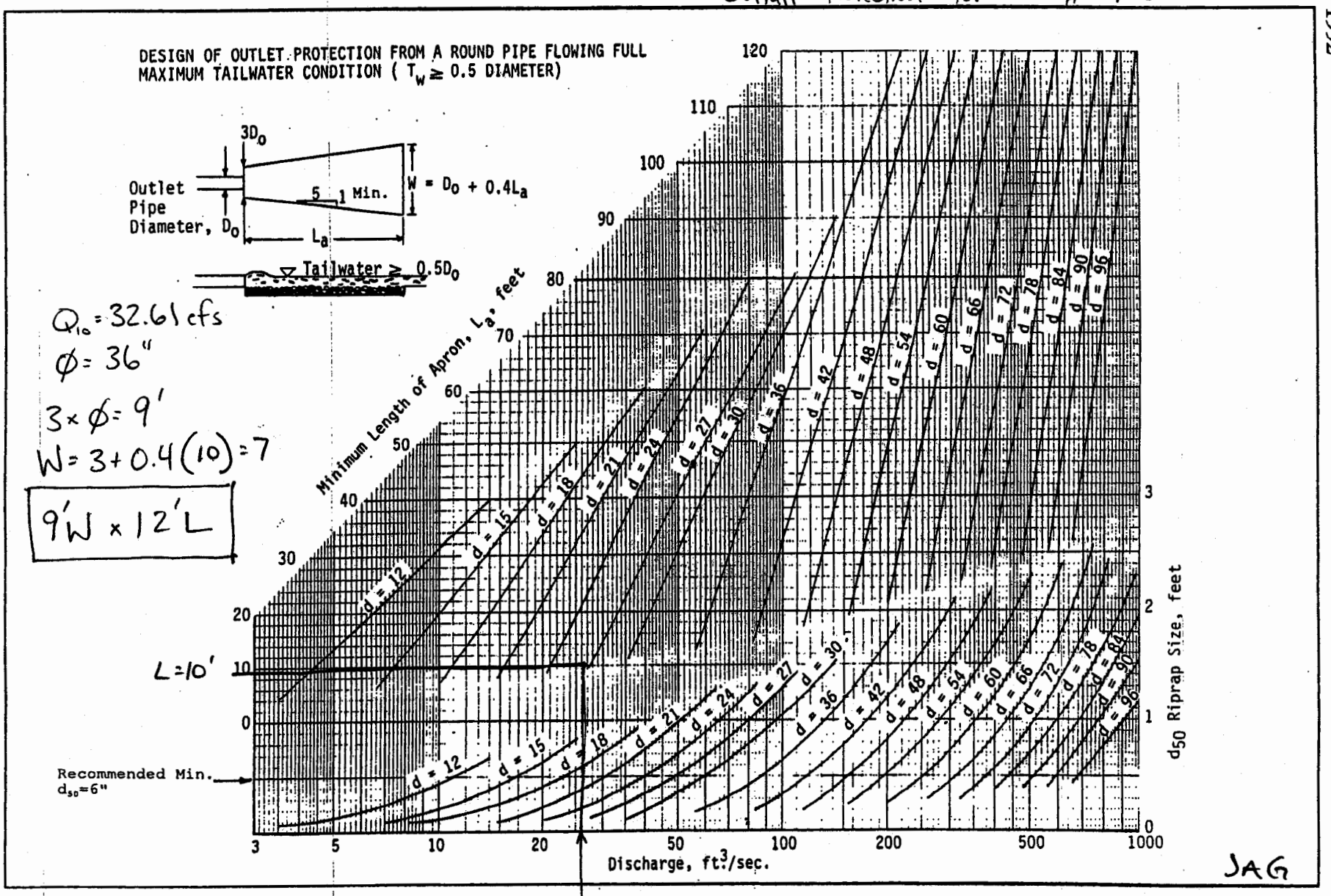


| Station | | Len | Drng Area | | Rnoff coeff | Area x C | | Tc | | Rain (I) | Total flow | Cap full | Vel | Pipe | | Invert Elev | | HGL Elev | | Grnd / Rim Elev | | Line ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Line | To Line | (ft) | Incr (ac) | Total (ac) | (C) | Incr | Total | Inlet (min) | Syst (min) | (in/hr) | (cfs) | (cfs) | (ft/s) | Size (in) | Slope (%) | Up (ft) | Dn (ft) | Up (ft) | Dn (ft) | Up (ft) | Dn (ft) | |
| 22 | 20 | 79.0 | 0.28 | 1.70 | 0.50 | 0.14 | 1.00 | 5.0 | 8.2 | 6.2 | 6.20 | 10.63 | 5.48 | 15 | 2.71 | 75.55 | 73.41 | 76.55 | 74.88 | 79.47 | 78.08 | 7-2-26 TO 7-2-24 |
| 23 | 22 | 105.0 | 0.39 | 1.42 | 0.60 | 0.23 | 0.86 | 5.0 | 7.8 | 6.3 | 5.40 | 14.56 | 5.16 | 15 | 5.09 | 80.89 | 75.55 | 81.82 | 76.63 | 85.16 | 79.47 | 7-2-27 TO 7-2-26 |
| 24 | 23 | 79.0 | 0.03 | 0.37 | 0.80 | 0.02 | 0.30 | 5.0 | 7.0 | 6.5 | 1.91 | 4.59 | 1.64 | 15 | 0.51 | 81.29 | 80.89 | 82.35 | 82.29 | 87.25 | 85.16 | 7-2-30 TO 7-2-27 |
| 25 | 24 | 144.0 | 0.26 | 0.26 | 0.80 | 0.21 | 0.21 | 5.0 | 5.0 | 7.0 | 1.46 | 4.57 | 2.03 | 15 | 0.50 | 82.01 | 81.29 | 82.56 | 82.40 | 86.01 | 87.25 | 7-2-32 TO 7-2-30 |
| 26 | 24 | 33.0 | 0.08 | 0.08 | 0.80 | 0.06 | 0.06 | 5.0 | 5.0 | 7.0 | 0.45 | 15.74 | 1.36 | 15 | 5.94 | 83.25 | 81.29 | 83.52 | 82.40 | 87.25 | 87.25 | 7-2-31 TO 7-2-30 |
| 27 | 23 | 75.0 | 0.35 | 0.66 | 0.50 | 0.18 | 0.33 | 5.0 | 7.1 | 6.4 | 2.13 | 11.79 | 2.76 | 15 | 3.33 | 83.39 | 80.89 | 83.97 | 82.29 | 87.35 | 85.16 | 7-2-28 TO 7-2-27 |
| 28 | 27 | 111.0 | 0.31 | 0.31 | 0.50 | 0.16 | 0.16 | 5.0 | 5.0 | 7.0 | 1.08 | 12.20 | 2.19 | 15 | 3.57 | 87.35 | 83.39 | 87.77 | 84.16 | 91.35 | 87.35 | 7-2-29 TO 7-2-28 |
| 29 | 10 | 90.0 | 0.18 | 2.30 | 0.50 | 0.09 | 1.15 | 5.0 | 5.5 | 6.9 | 7.90 | 12.86 | 6.64 | 15 | 3.97 | 70.57 | 67.00 | 71.68 | 68.95 | 74.57 | 74.45 | 7-2-19 TO 7-2-11 |
| 30 | 29 | 90.0 | 1.01 | 2.12 | 0.50 | 0.51 | 1.06 | 5.0 | 5.2 | 6.9 | 7.36 | 14.60 | 6.25 | 15 | 5.11 | 75.17 | 70.57 | 76.25 | 72.01 | 79.09 | 74.57 | 7-2-20 TO 7-2-19 |
| 31 | 30 | 39.0 | 1.11 | 1.11 | 0.50 | 0.56 | 0.56 | 5.0 | 5.0 | 7.0 | 3.88 | 6.03 | 3.17 | 15 | 0.87 | 75.51 | 75.17 | 76.95 | 76.81 | 79.43 | 79.09 | 7-2-21 TO 7-2-20 |

Project File: STORM 7-2.stm | Number of lines: 31 | Run Date: 11-30-2004

NOTES: Intensity = 80.56 / (Inlet time + 14.90) ^ 0.82; Return period = 10 Yrs.

Wellington Sect 6 + 7
Outfall Protection for SS # 7-2




$Q_{10} = 32.6$ cfs
$\phi = 36''$
$3 \times \phi = 9'$
$W = 3 + 0.4(10) = 7$

$\boxed{9'W \times 12'L}$

L=10'

32.6 cfs

Source: USDA-SCS

Plate 3.18-4

AES CONSULTING ENGINEERS
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(757) 253-0040
Fax: (757) 220-8994

PROJECT: WELLINGTON SECTION VI & VII
PROJECT NO.: 8223-08
SUBJECT: FAIRMOUNT DRIVE
SHEET NO.: 1
DATE: November 30, 2004
BY: MJR

# STORM WATER INLET COMPUTATIONS

| INLET Number | Type | Length | Station | Drainage Area (Sq Ft) | C | CA | Σ CA | I in/hr | Q-Inter (CFS) | Q Carry-Over (CFS) | Qt Gutter Flow | S Gutter Slope (ft/ft) | Sx Cross Slope (ft/ft) | T(Spread) | W (ft) | W/T | Sw (ft/ft) | Sw/Sx | Eo(#10) | n | Local Dep. | a | Sw =a/(12W) | Se (ft/ft) =Sx+SwEo | Lt (ft) 15 P Effec L | L/Lt (ft) d | E(#16) (ft) h | Q Int CFS d/h | Q Carryover Spread | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FAIRMOUNT DRIVE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Right Side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T allow = 12'/2 + 2' = 8.00' | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0.05 | 0.70 | 0.035 | 0.035 | 4 | 0.14 | 0 | 0.14 | 0.001 | 0.02 | 3.6 | Flow Approaching From Down Station | | | | | | | | | | | | | | |
| SUMP | DI-3A | 2.5 | 10+85 | | | | | | | | 0.624 | 0.00 | 0.02 | | 2 | | 0.08 | | | | | | | | 6.1 | 0.12 | 0.42 | 0.286 | 6 | |
| | | | | 0.16 | 0.45 | 0.072 | 0.072 | 4 | 0.288 | 0.196 | 0.484 | 0.001 | 0.02 | 7.1 | Flow Approaching From Up Station | | | | | | | | | | | | | | |
| GRADE | DI-3B | 6 | 12+00 | 0.38 | 0.50 | 0.19 | 0.19 | 4 | 0.76 | 0.563 | 1.323 | 0.03 | 0.02 | 4.5 | 2 | 0.444 | 0.08 | 4 | 0.902 | 0.015 | 2 | 3.44 | 0.143 | 0.149 | 9.171 | 0.654 | 0.852 | 1.128 | 0.196 | |
| GRADE | DI-3A | 2.5 | 13+29 | 0.54 | 0.50 | 0.27 | 0.27 | 4 | 1.08 | 0 | 1.08 | 0.03 | 0.02 | 3.9 | 2 | 0.513 | 0.08 | 4 | 0.941 | 0.015 | 2 | 3.44 | 0.143 | 0.155 | 8.237 | 0.304 | 0.479 | 0.517 | 0.563 | |
| HIGH POINT | | | 15+14 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GRADE | DI-3B | 4 | 19+00 | 0.80 | 0.50 | 0.4 | 0.4 | 4 | 1.6 | 0 | 1.6 | 0.025 | 0.02 | 5.6 | 2 | 0.357 | 0.08 | 4 | 0.767 | 0.015 | 2 | 3.44 | 0.143 | 0.13 | 10.22 | 0.392 | 0.591 | 0.946 | 0.654 | |
| GRADE | DI-3B | 8 | 20+43 | 0.38 | 0.50 | 0.19 | 0.19 | 4 | 0.76 | 0.654 | 1.414 | 0.025 | 0.02 | 5.2 | 2 | 0.385 | 0.08 | 4 | 0.848 | 0.015 | 2 | 3.44 | 0.143 | 0.142 | 9.214 | 0.868 | 0.974 | 1.377 | 0.037 | |
| | | | | 0.23 | 0.55 | 0.127 | 0.127 | 4 | 0.506 | 0.037 | 0.543 | 0.001 | 0.02 | 7.4 | Flow Approaching From Down Station | | | | | | | | | | | | | | |
| SUMP | DI-3C | 4 | 21+39 | | | | | | | | 1.191 | 0.00 | 0.02 | | 2 | | 0.08 | | | | | | | | 7.6 | 0.144 | 0.42 | 0.343 | 7.2 | |
| | | | | 0.36 | 0.45 | 0.162 | 0.162 | 4 | 0.648 | 0 | 0.648 | 0.001 | 0.02 | 7.9 | Flow Approaching From Up Station | | | | | | | | | | | | | | |
| GRADE | DI-3B | 6 | 25+00 | 0.09 | 0.70 | 0.063 | 0.063 | 4 | 0.252 | 0.121 | 0.373 | 0.024 | 0.02 | 1.8 | 2 | 1.111 | 0.08 | 4 | 1 | 0.015 | 2 | 3.44 | 0.143 | 0.163 | 4.775 | 1 | 1 | 0.373 | 0 | |
| GRADE | DI-3A | 2.5 | 26+51 | 0.15 | 0.70 | 0.105 | 0.105 | 4 | 0.42 | 0 | 0.42 | 0.024 | 0.02 | 2 | 2 | 1 | 0.08 | 4 | 1 | 0.015 | 2 | 3.44 | 0.143 | 0.163 | 5.017 | 0.498 | 0.711 | 0.299 | 0.121 | |
| HIGH POINT | | | 28+20 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GRADE | DI-3A | 2.5 | 30+10 | 0.37 | 0.50 | 0.185 | 0.185 | 4 | 0.74 | 0 | 0.74 | 0.024 | 0.02 | 3.3 | 2 | 0.606 | 0.08 | 4 | 0.977 | 0.015 | 2 | 3.44 | 0.143 | 0.16 | 6.444 | 0.388 | 0.587 | 0.434 | 0.306 | |
| | | | | 0.12 | 0.50 | 0.06 | 0.06 | 4 | 0.24 | 0.306 | 0.546 | 0.001 | 0.02 | 7.4 | Flow Approaching From Down Station | | | | | | | | | | | | | | |
| SUMP | DI-3C | 4 | 30+75 | | | | | | | | 1.187 | 0.00 | 0.02 | | 2 | | 0.08 | | | | | | | | 7.6 | 0.144 | 0.42 | 0.343 | 7.2 | |
| | | | | 0.27 | 0.50 | 0.135 | 0.135 | 4 | 0.54 | 0.102 | 0.642 | 0.001 | 0.02 | 7.9 | Flow Approaching From Up Station | | | | | | | | | | | | | | |
| GRADE | DI-3B | 6 | 31+70 | 0.57 | 0.50 | 0.285 | 0.285 | 4 | 1.14 | 0 | 1.14 | 0.024 | 0.02 | 4.6 | 2 | 0.435 | 0.08 | 4 | 0.888 | 0.015 | 2 | 3.44 | 0.143 | 0.147 | 8.118 | 0.739 | 0.911 | 1.038 | 0.102 | |
| HIGH POINT | | | 34+00 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0.32 | 0.50 | 0.16 | 0.16 | 4 | 0.64 | 0 | 0.64 | 0.001 | 0.02 | 7.9 | Flow Approaching From Down Station | | | | | | | | | | | | | | |
| SUMP | DI-3C | 6 | 35+25 | | | | | | | | 1.213 | 0.00 | 0.02 | | 2 | | 0.08 | | | | | | | | 9.6 | 0.132 | 0.42 | 0.314 | 6.6 | |
| | | | | 0.23 | 0.50 | 0.115 | 0.115 | 4 | 0.46 | 0.113 | 0.573 | 0.001 | 0.02 | 7.5 | Flow Approaching From Up Station | | | | | | | | | | | | | | |
| GRADE | DI-3B | 4 | 36+05 | 0.28 | 0.50 | 0.14 | 0.14 | 4 | 0.56 | 0.354 | 0.914 | 0.01 | 0.02 | 5.2 | 2 | 0.385 | 0.08 | 4 | 0.848 | 0.015 | 2 | 3.44 | 0.143 | 0.142 | 5.826 | 0.687 | 0.876 | 0.8 | 0.113 | |
| GRADE | DI-3A | 2.5 | 37+08 | 0.39 | 0.60 | 0.234 | 0.234 | 4 | 0.936 | 0 | 0.936 | 0.01 | 0.02 | 5.3 | 2 | 0.377 | 0.08 | 4 | 0.821 | 0.015 | 2 | 3.44 | 0.143 | 0.138 | 5.985 | 0.418 | 0.622 | 0.582 | 0.354 | |
| HIGH POINT | | | 38+50 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GRADE | DI-3A | 2.5 | 39+47 | 0.15 | 0.50 | 0.075 | 0.075 | 4 | 0.3 | 0 | 0.3 | 0.023 | 0.02 | 1.6 | 2 | 1.25 | 0.08 | 4 | 1 | 0.015 | 2 | 3.44 | 0.143 | 0.163 | 4.301 | 0.581 | 0.791 | 0.237 | 0.063 | |
| GRADE | DI-3B | 6 | 40+70 | 0.34 | 0.50 | 0.17 | 0.17 | 4 | 0.68 | 0.063 | 0.743 | 0.023 | 0.02 | 3.4 | 2 | 0.588 | 0.08 | 4 | 0.97 | 0.015 | 2 | 3.44 | 0.143 | 0.159 | 6.396 | 0.938 | 0.993 | 0.738 | 0.005 | |
| | | | | 0.33 | 0.50 | 0.165 | 0.165 | 4 | 0.66 | 0.005 | 0.665 | 0.001 | 0.02 | 8 | Flow Approaching From Down Station | | | | | | | | | | | | | | |
| SUMP | DI-3C | 4 | 42+12 | | | | | | | | 1.325 | 0.00 | 0.02 | | 2 | | 0.08 | | | | | | | | 7.6 | 0.16 | 0.42 | 0.381 | 8 | |
| | | | | 0.33 | 0.50 | 0.165 | 0.165 | 4 | 0.66 | 0 | 0.66 | 0.001 | 0.02 | 8 | Flow Approaching From Up Station | | | | | | | | | | | | | | |

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| | |
|---|---|
| PROJECT | WELLINGTON SECTION VI & VII |
| PROJECT NO. | 8223-08 |
| SUBJECT | FAIRMOUNT DRIVE SPREAD CALCS |
| SHEET NO. | 2 |
| DATE | November 30, 2004 |
| BY | MJR |

# STORM WATER INLET COMPUTATIONS

| INLET Number | Type | Length | Station | Drainage Area (Sq Ft) | C | CA | Σ CA | I in/hr | Q-Inter (CFS) | Q Carry-Over (CFS) | Qt Gutter Flow | S Gutter Slope (ft/ft) | Sx Cross Slope (ft/ft) | T(Spread) | W (ft) | W/T | Sw (ft/ft) | Sw/Sx | Eo(#10) | n | Local Dep. | a | Sw =a/(12W) | Se (ft/ft) =Sx+SwEo | Lt (ft) 15 P Effec L | L/Lt (ft) | d | E(#16) (ft) | h | Q Int CFS d/h | Q Carryover Spread | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FAIRMOUNT DRIVE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Left Side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T allow = 12'/2 + 2' = 8.00' | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0.05 | 0.75 | 0.038 | 0.038 | 4 | 0.15 | 0 | 0.15 | 0.001 | 0.02 | 3.7 | Flow Approaching From Down Station | | | | | | | | | | | | | | | | |
| SUMP | DI-3A | 2.5 | 10+85 | | | | | | | | 0.696 | 0.00 | 0.02 | | 2 | | 0.08 | | | | | | | | 6.1 | 0.12 | 0.42 | 0.286 | 6 | | |
| | | | | 0.12 | 0.75 | 0.09 | 0.09 | 4 | 0.36 | 0.186 | 0.546 | 0.001 | 0.02 | 7.4 | Flow Approaching From Up Station | | | | | | | | | | | | | | | | |
| GRADE | DI-3B | 2.5 | 12+00 | 0.18 | 0.75 | 0.135 | 0.135 | 4 | 0.54 | 0 | 0.54 | 0.024 | 0.02 | 2.5 | 2 | 0.8 | 0.08 | 4 | 0.995 | 0.015 | 2 | 3.44 | 0.143 | 0.163 | 5.592 | 0.447 | 0.656 | 0.354 | 0.186 | | |
| HIGH POINT | | | 15+14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GRADE | DI-3A | 2.5 | 19+00 | 0.21 | 0.70 | 0.147 | 0.147 | 4 | 0.588 | 0 | 0.588 | 0.025 | 0.02 | 2.6 | 2 | 0.769 | 0.08 | 4 | 0.989 | 0.015 | 2 | 3.44 | 0.143 | 0.162 | 5.884 | 0.425 | 0.631 | 0.371 | 0.217 | | |
| | | | | 0.14 | 0.70 | 0.098 | 0.098 | 4 | 0.392 | 0.217 | 0.609 | 0.001 | 0.02 | 7.7 | Flow Approaching From Down Station | | | | | | | | | | | | | | | | |
| SUMP | DI-3C | 6 | 21+39 | | | | | | | | 1.223 | 0.00 | 0.02 | | 2 | | 0.08 | | | | | | | | 9.6 | 0.132 | 0.42 | 0.314 | 6.6 | | |
| | | | | 0.20 | 0.70 | 0.14 | 0.14 | 4 | 0.56 | 0.054 | 0.614 | 0.001 | 0.02 | 7.7 | Flow Approaching From Up Station | | | | | | | | | | | | | | | | |
| GRADE | DI-3B | 4 | 25+07 | 0.19 | 0.70 | 0.133 | 0.133 | 4 | 0.532 | 0 | 0.532 | 0.024 | 0.02 | 2.5 | 2 | 0.8 | 0.08 | 4 | 0.995 | 0.015 | 2 | 3.44 | 0.143 | 0.163 | 5.557 | 0.72 | 0.899 | 0.478 | 0.054 | | |
| HIGH POINT | | | 28+20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0.16 | 0.70 | 0.112 | 0.112 | 4 | 0.448 | 0 | 0.448 | 0.001 | 0.02 | 6.8 | Flow Approaching From Down Station | | | | | | | | | | | | | | | | |
| SUMP | DI-3C | 4 | 30+75 | | | | | | | | 1.008 | 0.00 | 0.02 | | 2 | | 0.08 | | | | | | | | 7.6 | 0.136 | 0.42 | 0.324 | 6.8 | | |
| | | | | 0.20 | 0.70 | 0.14 | 0.14 | 4 | 0.56 | 0 | 0.56 | 0.001 | 0.02 | 7.4 | Flow Approaching From Up Station | | | | | | | | | | | | | | | | |
| HIGH POINT | | | 34+00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0.07 | 0.70 | 0.049 | 0.049 | 4 | 0.196 | 0 | 0.196 | 0.001 | 0.02 | 4.1 | Flow Approaching From Down Station | | | | | | | | | | | | | | | | |
| SUMP | DI-3A | 2.5 | 35+25 | | | | | | | | 0.56 | 0.00 | 0.02 | | 2 | | 0.08 | | | | | | | | 6.1 | 0.112 | 0.42 | 0.267 | 5.6 | | |
| | | | | 0.13 | 0.70 | 0.091 | 0.091 | 4 | 0.364 | 0 | 0.364 | 0.001 | 0.02 | 6.1 | Flow Approaching From Up Station | | | | | | | | | | | | | | | | |
| HIGH POINT | | | 38+50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0.20 | 0.75 | 0.15 | 0.15 | 4 | 0.6 | 0 | 0.6 | 0.001 | 0.02 | 7.7 | Flow Approaching From Down Station | | | | | | | | | | | | | | | | |
| SUMP | DI-3A | 2.5 | 42+12 | | | | | | | | 0.84 | 0.00 | 0.02 | | 2 | | 0.08 | | | | | | | | 6.1 | 0.136 | 0.42 | 0.324 | 6.8 | | |
| | | | | 0.08 | 0.75 | 0.06 | 0.06 | 4 | 0.24 | 0 | 0.24 | 0.001 | 0.02 | 4.7 | Flow Approaching From Up Station | | | | | | | | | | | | | | | | |

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PROJECT: WELLINGTON SECTION VI & VII
PROJECT NO.: 8223-08
SUBJECT: LONDONDERRY
SHEET NO.: 3
DATE: November 30, 2004
BY: MJR

# STORM WATER INLET COMPUTATIONS

| INLET Number | Type | Length | Station | Drainage Area (Ac) | C | CA | Σ CA | I in/hr | Q-Inter (CFS) | Q Carry-Over (CFS) | Qt Gutter Flow | S Gutter Slope (ft/ft) | Sx Cross Slope (ft/ft) | T(Spread) | W (ft) | W/T | Sw (ft/ft) | Sw/Sx | Eo(#10) | n | Local Dep. | a | S'w =a/(12W) | Se (ft/ft) =Sx+SwEo | Lt (ft) 15 P Effec L | L/Lt (ft) | d | E(#16) (ft) | h | Q Int CFS d/h | Q Carryover Spread | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **LONDONDERRY** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Right Side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T allow = 12'/2 + 2' = 8.00' | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0.05 | 0.65 | 0.033 | 0.033 | 4 | 0.13 | 0 | 0.13 | 0.001 | 0.02 | 3.5 | Flow Approaching From Down Station | | | | | | | | | | | | | | | | |
| SUMP | DI-3A | 2.5 | 10+50 | | | | | | | | 0.799 | 0.00 | 0.02 | | 2 | | 0.08 | | | | | | | | 6.1 | 0.128 | 0.42 | 0.305 | 6.4 | | |
| | | | | 0.32 | 0.50 | 0.16 | 0.16 | 4 | 0.64 | 0.029 | 0.669 | 0.001 | 0.02 | 8 | Flow Approaching From Up Station | | | | | | | | | | | | | | | | |
| GRADE | DI-3B | 12 | 12+24 | 1.11 | 0.50 | 0.555 | 0.555 | 4 | 2.22 | 0 | 2.22 | 0.037 | 0.02 | 6.1 | 2 | 0.328 | 0.08 | 4 | 0.767 | 0.015 | 2 | 3.44 | 0.143 | 0.13 | 13.19 | 0.91 | 0.987 | 2.191 | 0.029 | | |
| HIGH POINT | | | 16+83 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GRADE | DI-3A | 2.5 | 17+80 | 0.31 | 0.50 | 0.155 | 0.155 | 4 | 0.62 | 0 | 0.62 | 0.01 | 0.02 | 4 | 2 | 0.5 | 0.08 | 4 | 0.941 | 0.015 | 2 | 3.44 | 0.143 | 0.155 | 4.692 | 0.533 | 0.746 | 0.462 | 0.158 | | |
| | | | | 0.24 | 0.50 | 0.12 | 0.12 | 4 | 0.48 | 0 | 0.48 | 0.001 | 0.02 | 7.1 | Flow Approaching From Down Station | | | | | | | | | | | | | | | | |
| SUMP | DI-3A | 2.5 | 18+92 | | | | | | | | 0.7 | 0.00 | 0.02 | | 2 | | 0.08 | | | | | | | | 6.1 | 0.128 | 0.42 | 0.305 | 6.4 | | |
| | | | | 0.11 | 0.50 | 0.055 | 0.055 | 4 | 0.22 | 0 | 0.22 | 0.001 | 0.02 | 4.4 | Flow Approaching From Up Station | | | | | | | | | | | | | | | | |
| HIGH POINT | | | 19+45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **LONDONDERRY** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Left Side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T allow = 12'/2 + 2' = 8.00' | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0.18 | 0.50 | 0.09 | 0.09 | 4 | 0.36 | 0 | 0.36 | 0.001 | 0.02 | 6.1 | Flow Approaching From Down Station | | | | | | | | | | | | | | | | |
| SUMP | DI-3A | 2.5 | 10+50 | | | | | | | | 0.955 | 0.00 | 0.02 | | 2 | | 0.08 | | | | | | | | 6.1 | 0.142 | 0.42 | 0.338 | 7.1 | | |
| | | | | 0.22 | 0.50 | 0.11 | 0.11 | 4 | 0.44 | 0.155 | 0.595 | 0.001 | 0.02 | 7.6 | Flow Approaching From Up Station | | | | | | | | | | | | | | | | |
| GRADE | DI-3B | 4 | 11+36 | 0.18 | 0.50 | 0.09 | 0.09 | 4 | 0.36 | 0.335 | 0.695 | 0.037 | 0.02 | 2.4 | 2 | 0.833 | 0.08 | 4 | 0.995 | 0.015 | 2 | 3.44 | 0.143 | 0.163 | 7.081 | 0.565 | 0.776 | 0.54 | 0.155 | | |
| GRADE | DI-3B | 8 | 12+06 | 1.01 | 0.50 | 0.505 | 0.505 | 4 | 2.02 | 0 | 2.02 | 0.037 | 0.02 | 5.9 | 2 | 0.339 | 0.08 | 4 | 0.767 | 0.015 | 2 | 3.44 | 0.143 | 0.13 | 12.67 | 0.631 | 0.834 | 1.685 | 0.335 | | |
| HIGH POINT | | | 16+83 | | | | | | | | | | | | | | | | | | | | | | | | | | | | To Loop B Sta. 37+08 |
| HIGH POINT | | | 19+45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GRADE | DI-3A | 2.5 | 20+01 | 0.03 | 0.80 | 0.024 | 0.024 | 4 | 0.096 | 0 | 0.096 | 0.01 | 0.02 | 0 | 2 | 0 | 0.08 | 4 | 0 | 0.015 | 2 | 3.44 | 0.143 | 0.02 | 7.319 | 0.342 | 0.529 | 0.051 | 0 | Low Flow | |
| | | | | 0.13 | 0.80 | 0.104 | 0.104 | 4 | 0.416 | 0 | 0.416 | 0.001 | 0.02 | 6.6 | Flow Approaching From Down Station | | | | | | | | | | | | | | | | |
| SUMP | DI-3A | 2.5 | 21+58 | | | | | | | | 0.846 | 0.00 | 0.02 | | 2 | | 0.08 | | | | | | | | 6.1 | 0.136 | 0.42 | 0.324 | 6.8 | | |
| | | | | 0.13 | 0.80 | 0.104 | 0.104 | 4 | 0.416 | 0.014 | 0.43 | 0.001 | 0.02 | 6.7 | Flow Approaching From Up Station | | | | | | | | | | | | | | | | |
| GRADE | DI-3A | 2.5 | 20+01 | 0.08 | 0.80 | 0.064 | 0.064 | 4 | 0.256 | 0 | 0.256 | 0.01 | 0.02 | 1.8 | 2 | 1.111 | 0.08 | 4 | 1 | 0.015 | 2 | 3.44 | 0.143 | 0.163 | 3.134 | 0.798 | 0.944 | 0.242 | 0.014 | Flanking from Right Side of the Road | |

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PROJECT WELLINGTON SECTION VI & VII
PROJECT NO. 8223-08
SUBJECT BRIDLINGTON WAY
SHEET NO. 4
DATE November 30, 2004
BY MJR

# STORM WATER INLET COMPUTATIONS

| INLET Number | Type | Length | Station | Drainage Area (Ac) | C | CA | Σ CA | I in/hr | Q-Inter (CFS) | Q Carry-Over (CFS) | Qt Gutter Flow | S Gutter Slope (ft/ft) | Sx Cross Slope (ft/ft) | T(Spread) | W (ft) | W/T | Sw (ft/ft) | Sw/Sx | Eo(#10) | n | Local Dep. | a | Sw =a/(12W) | Se (ft/ft) =Sx+SwEo | Lt (ft) 15 P Effec L | L/Lt (ft) | d E(#16) (ft) | h | Q Int CFS d/h | Q Carryover Spread | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **BRIDLINGTON WAY** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Right Side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T allow = 12'/2 + 2' = 8.00' | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GRADE | DI-3B | 8 | 12+20 | 0.48 | 0.50 | 0.24 | 0.24 | 4 | 0.96 | 0 | 0.96 | 0.04 | 0.02 | 3.1 | 2 | 0.645 | 0.08 | 4 | 0.982 | 0.015 | 2 | 3.44 | 0.143 | 0.161 | 8.357 | 0.957 | 0.997 | | 0.957 | 0.003 | |
| | | | | 0.33 | 0.50 | 0.165 | 0.165 | 4 | 0.66 | 0.003 | 0.663 | 0.001 | 0.02 | 8 | Flow Approaching From Down Station | | | | | | | | | | | | | | | | |
| SUMP | DI-3C | 6 | 13+29 | | | | | | | | 1.307 | 0.00 | 0.02 | | 2 | | 0.08 | | | | | | | | 9.6 | 0.136 | 0.42 | | 0.324 | 6.8 | |
| | | | | 0.23 | 0.70 | 0.161 | 0.161 | 4 | 0.644 | 0 | 0.644 | 0.001 | 0.02 | 7.9 | Flow Approaching From Up Station | | | | | | | | | | | | | | | | |
| HIGH POINT | | | 17+08 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GRADE | DI-3B | 6 | 18+38 | 0.77 | 0.30 | 0.231 | 0.231 | 4 | 0.924 | 0 | 0.924 | 0.04 | 0.02 | 2.9 | 2 | 0.69 | 0.08 | 4 | 0.987 | 0.015 | 2 | 3.44 | 0.143 | 0.161 | 8.202 | 0.731 | 0.906 | | 0.837 | 0.087 | |
| | | | | 0.32 | 0.30 | 0.096 | 0.096 | 4 | 0.384 | 0.087 | 0.471 | 0.001 | 0.02 | 6.9 | Flow Approaching From Down Station | | | | | | | | | | | | | | | | |
| SUMP | DI-3C | 4 | 18+81 | | | | | | | | 1.031 | 0.00 | 0.02 | | 2 | | 0.08 | | | | | | | | 7.6 | 0.136 | 0.42 | | 0.324 | 6.8 | |
| | | | | 0.28 | 0.50 | 0.14 | 0.14 | 4 | 0.56 | 0 | 0.56 | 0.001 | 0.02 | 7.5 | Flow Approaching From Up Station | | | | | | | | | | | | | | | | |
| **BRIDLINGTON WAY** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Left Side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T allow = 12'/2 + 2' = 8.00' | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0.19 | 0.70 | 0.133 | 0.133 | 4 | 0.532 | 0 | 0.532 | 0.001 | 0.02 | 7.3 | Flow Approaching From Down Station | | | | | | | | | | | | | | | | |
| SUMP | DI-3C | 6 | 13+29 | | | | | | | | 1.092 | 0.00 | 0.02 | | 2 | | 0.08 | | | | | | | | 9.6 | 0.126 | 0.27 | | 0.467 | 6.3 | |
| | | | | 0.20 | 0.70 | 0.14 | 0.14 | 4 | 0.56 | 0 | 0.56 | 0.001 | 0.02 | 7.4 | Flow Approaching From Up Station | | | | | | | | | | | | | | | | |
| HIGH POINT | | | 17+08 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0.06 | 0.70 | 0.042 | 0.042 | 4 | 0.168 | 0 | 0.168 | 0.001 | 0.02 | 3.9 | Flow Approaching From Down Station | | | | | | | | | | | | | | | | |
| SUMP | DI-3A | 2.5 | 18+81 | | | | | | | | 0.308 | 0.00 | 0.02 | | 2 | | 0.08 | | | | | | | | 6.1 | #N/A | 0.42 | | #N/A | #N/A | Negligible Spread |
| | | | | 0.05 | 0.70 | 0.035 | 0.035 | 4 | 0.14 | 0 | 0.14 | 0.001 | 0.02 | 3.6 | Flow Approaching From Up Station | | | | | | | | | | | | | | | | |

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| | |
|---|---|
| PROJECT | WELLINGTON SECTION VI & VII |
| PROJECT NO. | 8223-08 |
| SUBJECT | Penzance |
| SHEET NO. | 2 |
| DATE | November 30, 2004 |
| BY | MJR |

# STORM WATER INLET COMPUTATIONS

| INLET Number | Type | Length | Station | Drainage Area (Ac) | C | CA | Σ CA | I in/hr | Q-Inter (CFS) | Q Carry-Over (CFS) | Qt Gutter Flow | S Gutter Slope (ft/ft) | Sx Cross Slope (ft/ft) | T(Spread) | W (ft) | W/T | Sw (ft/ft) | Sw/Sx | Eo(#10) | n | Local Dep. | a | Sw =a/(12W) | Se (ft/ft) =Sx+SwEo | Lt (ft) 15 P Effec L | L/Lt (ft) | d E(#16) (ft) | h Q Int CFS d/h | Q Carryover Spread | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Penzance** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Right Side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T allow = 16'/2 + 2' = 10.00' from Begining to STA. 51+50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T allow = 12'/2 + 2' = 8.00' from STA. 51+50 to End | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HIGH POINT | | | 45+79 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0.22 | 0.70 | 0.154 | 0.154 | 4 | 0.616 | 0 | 0.616 | 0.001 | 0.02 | 7.7 | Flow Approaching From Down Station | | | | | | | | | | | | | | | |
| SUMP | DI-3C | 6 | 49+87 | | | | | | | | 1.232 | 0.00 | 0.02 | | 2 | | 0.08 | | | | | | | | 9.6 | 0.132 | 0.42 | 0.314 | 6.6 | |
| | | | | 0.22 | 0.70 | 0.154 | 0.154 | 4 | 0.616 | 0 | 0.616 | 0.001 | 0.02 | 7.7 | Flow Approaching From Up Station | | | | | | | | | | | | | | | |
| HIGH POINT | | | 53+71 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GRADE | DI-3A | 2.5 | 55+86 | 0.21 | 0.45 | 0.095 | 0.095 | 4 | 0.378 | 0 | 0.378 | 0.066 | 0.02 | 1.3 | 2 | 1.538 | 0.08 | 4 | 1 | 0.015 | 2 | 3.44 | 0.143 | 0.163 | 6.502 | 0.384 | 0.583 | 0.22 | 0.158 | |
| GRADE | DI-3A | 2.5 | 57+76 | 0.42 | 0.45 | 0.189 | 0.189 | 4 | 0.756 | 0.158 | 0.914 | 0.024 | 0.02 | 4 | 2 | 0.5 | 0.08 | 4 | 0.941 | 0.015 | 2 | 3.44 | 0.143 | 0.155 | 7.181 | 0.348 | 0.537 | 0.491 | 0.423 | |
| GRADE | DI-3A | 2.5 | 59+17 | 0.19 | 0.45 | 0.086 | 0.086 | 4 | 0.342 | 0.423 | 0.765 | 0.024 | 0.02 | 3.4 | 2 | 0.588 | 0.08 | 4 | 0.97 | 0.015 | 2 | 3.44 | 0.143 | 0.159 | 6.56 | 0.381 | 0.578 | 0.442 | 0.323 | |
| **Penzance** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Left Side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T allow = 16'/2 + 2' = 10.00' from Begining to STA. 51+50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T allow = 12'/2 + 2' = 8.00' from STA. 51+50 to End | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HIGH POINT | | | 45+79 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GRADE | DI-3B | 6 | 47+02 | 0.21 | 0.50 | 0.105 | 0.105 | 4 | 0.42 | 0 | 0.42 | 0.05 | 0.02 | 1.5 | 2 | 1.333 | 0.08 | 4 | 1 | 0.015 | 2 | 3.44 | 0.143 | 0.163 | 6.253 | 0.959 | 0.997 | 0.419 | 0.001 | |
| GRADE | DI-3B | 6 | 48+96 | 0.40 | 0.50 | 0.2 | 0.2 | 4 | 0.8 | 0.001 | 0.801 | 0.05 | 0.02 | 2.5 | 2 | 0.8 | 0.08 | 4 | 0.995 | 0.015 | 2 | 3.44 | 0.143 | 0.163 | 8.226 | 0.729 | 0.905 | 0.725 | 0.076 | |
| | | | | 0.22 | 0.50 | 0.11 | 0.11 | 4 | 0.44 | 0.076 | 0.516 | 0.001 | 0.02 | 7.2 | Flow Approaching From Down Station | | | | | | | | | | | | | | | |
| SUMP | DI-3C | 4 | 49+87 | | | | | | | | 1.174 | 0.00 | 0.02 | | 2 | | 0.08 | | | | | | | | 7.6 | 0.144 | 0.42 | 0.343 | 7.2 | |
| | | | | 0.32 | 0.50 | 0.16 | 0.16 | 4 | 0.64 | 0.018 | 0.658 | 0.001 | 0.02 | 8 | Flow Approaching From Up Station | | | | | | | | | | | | | | | |
| GRADE | DI-3B | 6 | 51+00 | 0.21 | 0.70 | 0.147 | 0.147 | 4 | 0.588 | 0.015 | 0.603 | 0.044 | 0.02 | 1.9 | 2 | 1.053 | 0.08 | 4 | 1 | 0.015 | 2 | 3.44 | 0.143 | 0.163 | 7.003 | 0.857 | 0.97 | 0.584 | 0.018 | |
| GRADE | DI-3B | 8 | 52+00 | 0.51 | 0.50 | 0.255 | 0.255 | 4 | 1.02 | 0 | 1.02 | 0.044 | 0.02 | 3.2 | 2 | 0.625 | 0.08 | 4 | 0.979 | 0.015 | 2 | 3.44 | 0.143 | 0.16 | 8.832 | 0.906 | 0.986 | 1.005 | 0.015 | |
| HIGH POINT | | | 53+71 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GRADE | DI-3A | 2.5 | 57+69 | 0.11 | 0.70 | 0.077 | 0.077 | 4 | 0.308 | 0 | 0.308 | 0.044 | 0.02 | 1.2 | 2 | 1.667 | 0.08 | 4 | 1 | 0.015 | 2 | 3.44 | 0.143 | 0.163 | 5.283 | 0.473 | 0.685 | 0.211 | 0.097 | |
| | | | | 0.10 | 0.70 | 0.07 | 0.07 | 4 | 0.28 | 0.097 | 0.377 | 0.001 | 0.02 | 6.2 | Flow Approaching From Down Station | | | | | | | | | | | | | | | |
| SUMP | DI-3A | 2.5 | 59+61 | | | | | | | | 0.937 | 0.00 | 0.02 | | 2 | | 0.08 | | | | | | | | 6.1 | 0.142 | 0.42 | 0.338 | 7.1 | |
| | | | | 0.20 | 0.70 | 0.14 | 0.14 | 4 | 0.56 | 0 | 0.56 | 0.001 | 0.02 | 7.4 | Flow Approaching From Up Station | | | | | | | | | | | | | | | |

AES CONSULTING ENGINEERS
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(757) 253-0040
Fax: (757) 220-8994

PROJECT: WELLINGTON SECTION VI & VII
PROJECT NO.: 8223-08
SUBJECT: Lochaven
SHEET NO.: 2
DATE: November 30, 2004
BY: MJR

# STORM WATER INLET COMPUTATIONS

| INLET Number | Type | Length | Station | Drainage Area (Ac) | C | CA | Σ CA | I in/hr | Q-Inter (CFS) | Q Carry-Over (CFS) | Qt Gutter Flow | S Gutter Slope (ft/ft) | Sx Cross Slope (ft/ft) | T(Spread) | W (ft) | W/T | Sw (ft/ft) | Sw/Sx | Eo(#10) | n | Local Dep. | a | Sw =a/(12W) | Se (ft/ft) =Sx+SwEo | Lt (ft) 15 P Effec L | L/Lt (ft) d | E(#16) (ft) h | Q Int CFS d/h | Q Carryover Spread | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOCHAVEN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Right Side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T allow = 12'/2 + 2' = 8.00' | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HIGH POINT | | | 12+76 | | | | | | | | | | | | | | | | | | | | | | | | | | | To Penzance Place |
| LOCHAVEN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Left Side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T allow = 12'/2 + 2' = 8.00' | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0.22 | 0.50 | 0.11 | 0.11 | 4 | 0.44 | 0 | 0.44 | 0.001 | 0.02 | 6.7 | Flow Approaching From Down Station | | | | | | | | | | | | | | |
| SUMP | DI-3C | 4 | 10+50 | | | | | | | | 0.998 | 0.00 | 0.02 | | 2 | | 0.08 | | | | | | | | 7.6 | 0.13 | 0.42 | 0.31 | 6.5 | |
| | | | | 0.22 | 0.50 | 0.11 | 0.11 | 4 | 0.44 | 0.118 | 0.558 | 0.001 | 0.02 | 7.4 | Flow Approaching From Up Station | | | | | | | | | | | | | | |
| GRADE | DI-3B | 8 | 11+00 | 0.85 | 0.50 | 0.425 | 0.425 | 4 | 1.7 | 0 | 1.7 | 0.024 | 0.02 | 6 | 2 | 0.333 | 0.08 | 4 | 0.767 | 0.015 | 2 | 3.44 | 0.143 | 0.13 | 10.35 | 0.773 | 0.931 | 1.582 | 0.118 | |
| HIGH POINT | | | 12+76 | | | | | | | | | | | | | | | | | | | | | | | | | | | |

## CALCULATIONS FOR SEDIMENT FOREBAY (SS#6-1)
## FOR WELLINGTON, SECTION 6&7

AES Project No.: 8223-8
December 1, 2004

### I. SEDIMENT FOREBAY SIZING

Forebay Volume (V) = 0.1" per Impervious Acre

| | |
|---|---|
| Percent Impervious of the BMP Watershed, Post-Development | 25.0% |
| Drainage Area to Forebay | 7.00 acres |
| Impervious Acres to Forebay | 1.75 acres |
| Volume Req'd = | 635 cu.ft. |

A 15'W X 20'L Stilling basin is proposed to act as a forebay for Lake Nice. (Approx volume equals 634 cu.ft. storage.

## CALCULATIONS FOR SEDIMENT FOREBAY (SS#6-2)
## FOR WELLINGTON, SECTION 6&7

AES Project No.: 8223-8
December 1, 2004

### I. SEDIMENT FOREBAY SIZING

Forebay Volume (V) = 0.1" per Impervious Acre

| | |
|---|---|
| Percent Impervious of the BMP Watershed, Post-Development | 24.4% |
| Drainage Area to Forebay | 3.08 acres |
| Impervious Acres to Forebay | 0.75 acres |
| Volume Req'd = | 272 cu.ft. |

A 10'W X 10'L Stilling basin is proposed to act as a forebay for Lake Nice. (Approx volume equals 296 cu.ft. storage.

## CALCULATIONS FOR SEDIMENT FOREBAY (SS#6-3&4) FOR WELLINGTON, SECTION 6&7

AES Project No.: 8223-8
December 1, 2004

### I. SEDIMENT FOREBAY SIZING

Forebay Volume (V) = 0.1" per Impervious Acre

| | |
|---|---|
| Percent Impervious of the BMP Watershed, Post-Development | 13.0% |
| Drainage Area to Forebay | 34.37 acres |
| Impervious Acres to Forebay | 4.48 acres |
| Volume Req'd = | 1,626 cu.ft. |

A 20'W X 35'L Stilling basin is proposed to act as a forebay for Lake Nice. (Approx volume equals 1,636 cu.ft. storage.

## CALCULATIONS FOR SEDIMENT FOREBAY (SS#7-1)
## FOR WELLINGTON, SECTION 6&7

AES Project No.: 8223-8
December 1, 2004

### I. SEDIMENT FOREBAY SIZING

Forebay Volume (V) = 0.1" per Impervious Acre

| | |
|---|---|
| Percent Impervious of the BMP Watershed, Post-Development | 26.4% |
| Drainage Area to Forebay | 20.65 acres |
| Impervious Acres to Forebay | 5.45 acres |
| Volume Req'd = | 1,978 cu.ft. |

A 20'W X 45'L Stilling basin is proposed to act as a forebay for Lake Nice. (Approx volume equals 2,076 cu.ft. storage.

## CALCULATIONS FOR SEDIMENT FOREBAY (SS#7-2)
## FOR WELLINGTON, SECTION 6&7

AES Project No.: 8223-8
December 1, 2004

### I. SEDIMENT FOREBAY SIZING

Forebay Volume (V) = 0.1" per Impervious Acre

| | |
|---|---|
| Percent Impervious of the BMP Watershed, Post-Development | 26.5% |
| Drainage Area to Forebay | 14.14 acres |
| Impervious Acres to Forebay | 3.75 acres |
| Volume Req'd = | 1,361 cu.ft. |

A 20'W X 30'L Stilling basin is proposed to act as a forebay for Lake Nice. (Approx volume equals 1,420 cu.ft. storage.

1987

10-YEAR WSEL = 0.69'

2-YEAR WSEL = 0.17'

4.5% IMP. 2001 DA = 139.4

SECTION II + III

10-YEAR WSEL = 66.49

2-YEAR WSEL = 65.27

100-YEAR WSEL = 67.75

DA = 150.0 AC

10-YEAR WSEL = 66.66

2-YEAR WSEL = 65.36

DA = 157.67 AC

3 WS

1 W.

Herbert and Associates, Ltd.
TESTING • ENGINEERING • INSPECTING
POST OFFICE BOX 64758 • VIRGINIA BEACH, VA 23464 • PHONE (757) 545-5234

November 4, 2003

NOV 0 5 2003

American Eastern
632 Hampton Highway
Yorktown, Virginia 23693

RE: Existing Wellington Dam
James City County, Virginia

Gentlemen:

Transmitted herein are Logs of Boring secured in conjunction with the referenced project.

We would like to thank you for giving us this opportunity to be of service. If we may be of further assistance in this or any other matter, please do not hesitate to call upon us.

Respectfully submitted,
Herbert and Associates, Ltd.

John A. Herbert

John A. Herbert, S.E.T.
President


04/21/2004 10:53 7578677188

**Herbert and Associates, Ltd.**
TESTING • ENGINEERING • INSPECTING
POST OFFICE BOX 64758 • VIRGINIA BEACH, VA 23464 • PHONE (757) 420-2797

# LOG OF BORING

FILE NO. 99-8557

ROJECT IDENTIFICATION Existing Wellington Dam LOCATION James City Co.

ORING NO. B-1 TYPE DRILL CME 55 CLIENT American Eastern

ATE STARTED 11-3-03 DATE COMPLETED 11-3-03 DRILLER F. Cereske

ASING LENGTH 40' DIA. 2¼" Augers WATER ELEV: IMMEDIATE 20.5' AFTER ____ HRS. ____

YPE SAMPLER SS LENGTH 30" DIA. 2" OD SURF. ELEV. Not Obtained

| DEPTH | STD. PEN. (N)* | SAMPLE DESCRIPTION | SAMPLE NO. |
|---|---|---|---|
| | | Topsoil 1" | |
| | 5-4 | Orange, moist, loose to medium dense, fine to veryfine sand with some clay (SP) Fill | S-1 |
| | 4-5 | | |
| | 3-4 | | S-2 |
| | 8-7 | | |
| | 7-8 | | S-3 |
| | 9-9 | | |
| | 4-4 | | S-4 |
| | 5-3 | | |
| | 5-4 | Orange, wet, loose to medium dense, clayey sand, (SC)Fill | S-5 |
| | 5-7 | | |
| | 14-14 | | S-6 |
| | 18-10 | | |
| | | Lt. gray mottle orange, moist, medium dense, clayey sand, Fill (SC) | |
| | 16-22 | White, wet, medium dense, fine to very fine sand, Fill (SP) | S-7 |
| | 23-24 | | |
| | | Gray & orange, moist, medium dense, clayey sand, Fill (SC) | |
| | 4-5 | | S-8 |
| | 7-8 | Tan, saturated, medium dense, fine to very fine sand (SP) | |
| | 6-6 | | S-9 |
| | 5-5 | | |
| | 4-4 | Olive, saturated, loose, fine to very fine sand (SP) | S-10 |
| | 4-4 | | |
| | | Brown mottle orange, saturated, medium stiff, clay (CL) | |
| | | Lt. gray & olive, saturated, medium stiff, sandy clay (CL) | |
| | 2-2 | | S-11 |
| | 3-3 | | |
| | | Olive mottle light gray, saturated, very loose, clayey sand (SC) | |

ARD PENETRATION INDICATED FOR EACH 6 INCHES OF DRIVE OF SPLIT TUBE SAMPLED, utilizing a 140 pound hammer with a 30 inch fall.

04/21/2004 10:53 AMERICAN ENGINEERING 5/98/7/88 WC067_LAKE_NICE_LARGE_LAKE_MIRROR 119

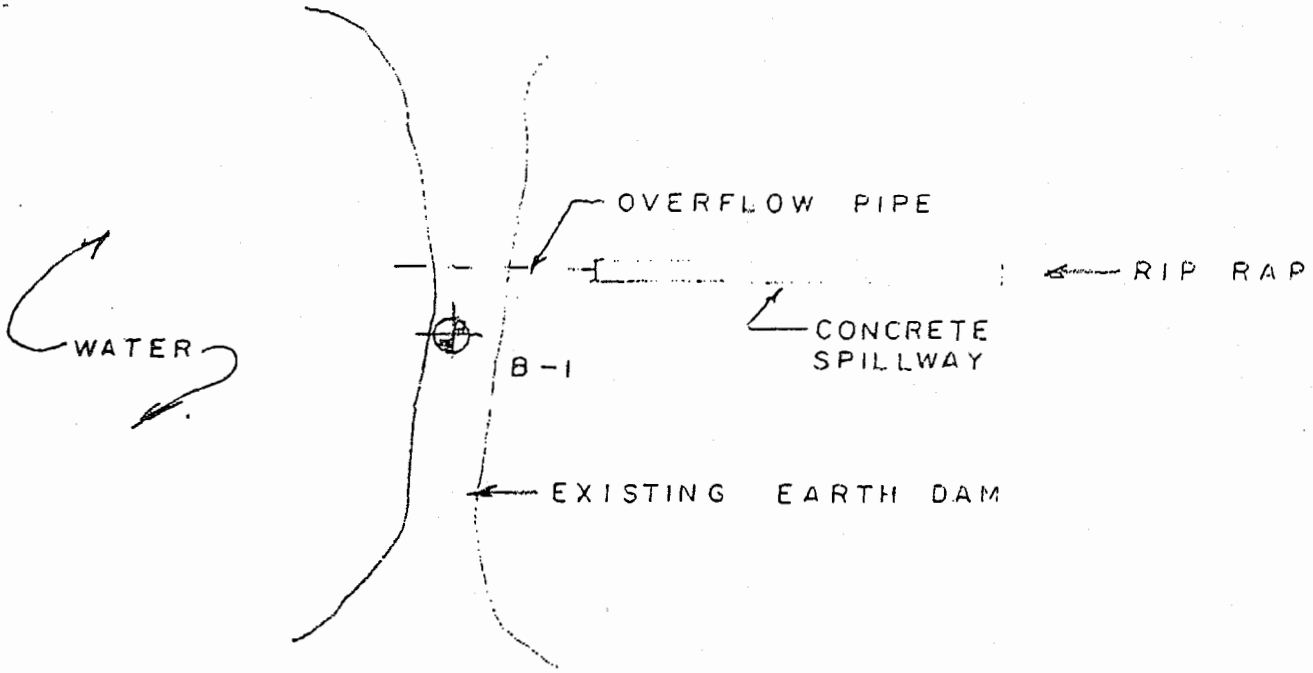
# LOG OF BORING

PROJECT IDENTIFICATION Existing Wellington Dam BORING NO. B-1

| DEPTH | STD. PEN. (N)* | SAMPLE DESCRIPTION | SAMPLE NO |
|---|---|---|---|
| 40 | | | |
| 42 | 1-1<br>2-1 | Olive mottle light gray, saturated, very loose, clayey sand (SC) | S-12 |
| 44 | | | |
| 46 | | Bottom of Boring 42.0' | |
| 48 | | | |
| 50 | | | |
| 52 | | | |
| 54 | | | |
| 56 | | | |
| 58 | | | |
| 60 | | | |
| 62 | | | |
| 64 | | | |
| 66 | | | |
| 68 | | | |
| 70 | | | |
| 72 | | | |
| 74 | | | |
| 76 | | | |
| 78 | | | |

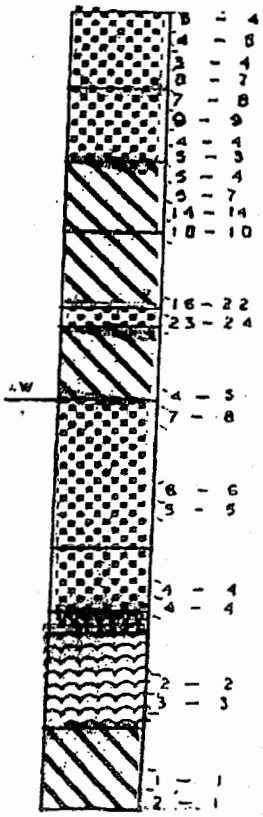
NDARD PENETRATION INDICATED FOR EACH 6 INCHES OF DRIVE OF SPLIT TUBE SAMPLED, utilizing a 140 pound hammer with a 30 inch fall.

tters and reports are for the exclusive use of the client to whom they are addressed. The use of our name must receive our prior written approval. Our letters and reports apply o the sample tested and/or inspected, and are not necessarily indicative of the qualities of apparently identical or similar products.




## BORING LOCATION PLAN

NOT TO SCALE




## PROFILE VIEW

SCALE: 1" = 10'-0"

## LEGEND

- TOPSOIL
- FINE TO VERY FINE SAND
- CLAYEY SAND
- CLAY
- SANDY CLAY

## SOIL PROFILE

EXISTING WELLINGTON DAM

JAMES CITY COUNTY VIRGINIA

HERBERT & ASSOCIATES, LTD.

NORFOLK VIRGINIA

NOV. 3, 2003 | JOB: 99-8557

04/21/2004 10:53 7578677188 AMERICAN EXPLORATION INC PAGE 11
TWC087_LAKE_NICE_LARGE_LAKE_MIRROR_123

**Herbert and Associates, Ltd.**
TESTING • ENGINEERING • INSPECTING
POST OFFICE BOX 64758 • VIRGINIA BEACH, VA 23464 • PHONE (757) 420-2797

# LOG OF BORING

FILE NO. 99-8557

PROJECT IDENTIFICATION Existing Wellington Dam LOCATION James City Co.

BORING NO. B-1 TYPE DRILL CME 55 CLIENT American Eastern

DATE STARTED 11-3-03 DATE COMPLETED 11-3-03 DRILLER F. Cereske

CASING LENGTH 40' DIA. 2¼" Augers WATER ELEV: IMMEDIATE 20.5' AFTER ____ HRS. ____

TYPE SAMPLER SS LENGTH 30" DIA. 2" OD SURF. ELEV. Not Obtained

| DEPTH | STD. PEN. (N)* | SAMPLE DESCRIPTION | SAMPLE NO. |
|---|---|---|---|
| | | Topsoil 1" | |
| | 5-4 | Orange, moist, loose to medium dense, fine to veryfine sand with some clay (SP) Fill | S-1 |
| | 4-5 | | |
| | 3-4 | | S-2 |
| | 8-7 | | |
| | 7-8 | | S-3 |
| | 9-9 | | |
| | 4-4 | | S-4 |
| | 5-3 | | |
| | 5-4 | Orange, wet, loose to medium dense, clayey sand, (SC)Fill | S-5 |
| | 5-7 | | |
| | 14-14 | | S-6 |
| | 18-10 | | |
| | | Lt. gray mottle orange, moist, medium dense, clayey sand, Fill (SC) | |
| | 16-22 | White, wet, medium dense, fine to very fine sand, Fill (SP) | S-7 |
| | 23-24 | | |
| | | Gray & orange, moist, medium dense, clayey sand, Fill (SC) | |
| | 4-5 | | S-8 |
| | 7-8 | Tan, saturated, medium dense, fine to very fine sand (SP) | |
| | 6-6 | | S-9 |
| | 5-5 | | |
| | 4-4 | Olive, saturated, loose, fine to very fine sand (SP) | S-10 |
| | 4-4 | | |
| | | Brown mottle orange, saturated, medium stiff, clay (CL) | |
| | | Lt. gray & olive, saturated, medium stiff, sandy clay (CL) | |
| | 2-2 | | S-11 |
| | 3-3 | | |
| | | Olive mottle light gray, saturated, very loose, clayey sand (SC) | |

*STANDARD PENETRATION INDICATED FOR EACH 6 INCHES OF DRIVE OF SPLIT TUBE SAMPLED, utilizing a 140 pound hammer with a 30 inch fall.

Letters and reports are for the exclusive use of the client to whom they are addressed. The use of our name must receive our prior written consent.

04/21/2004 10:53 7578677188 AMERICAN EASTERN CORP. PAGE 22
WC067_LAKE_NICE_LARGE_LAKE_MIRROR.JPG

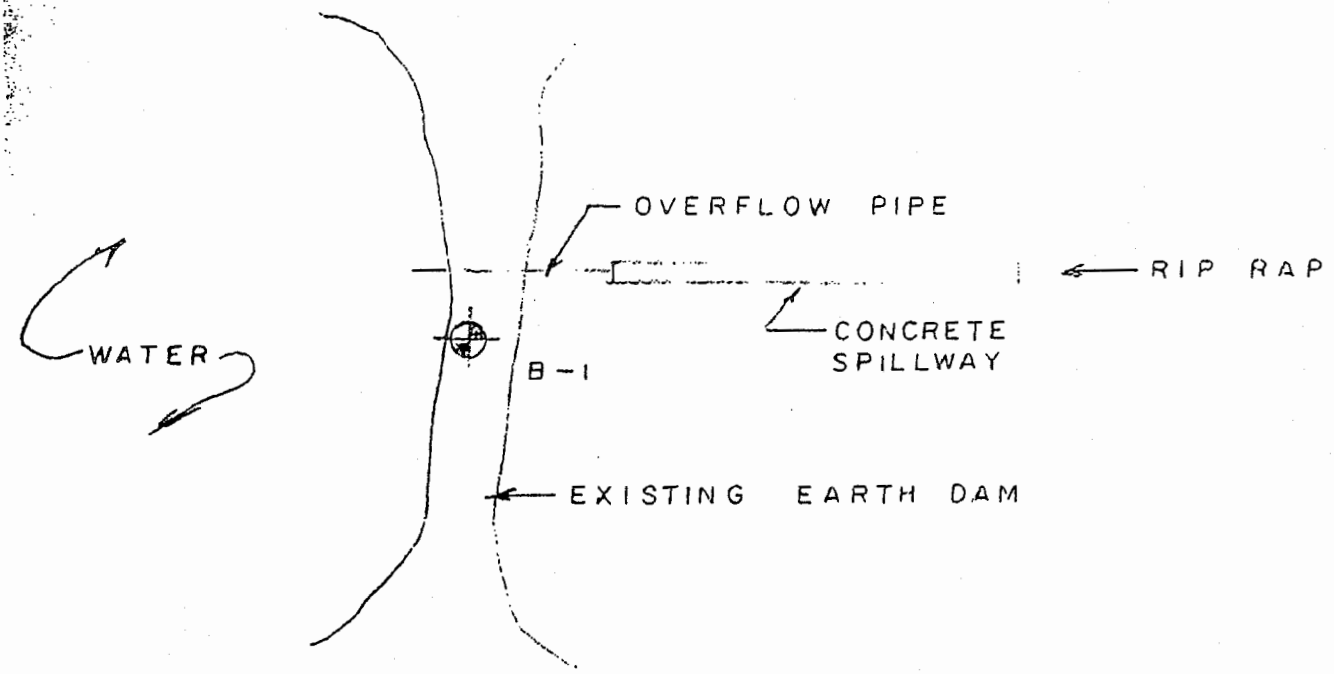
# LOG OF BORING

PROJECT IDENTIFICATION Existing Wellington Dam BORING NO. B-1

| DEPTH | STD. PEN. (N)* | SAMPLE DESCRIPTION | SAMPLE NO. |
|---|---|---|---|
| 40 | | | |
| 42 | 1-1<br>2-1 | Olive mottle light gray, saturated, very loose, clayey sand (SC) | S-12 |
| 44 | | | |
| 46 | | Bottom of Boring 42.0' | |
| 48 | | | |
| 50 | | | |
| 52 | | | |
| 54 | | | |
| 56 | | | |
| 58 | | | |
| 60 | | | |
| 62 | | | |
| 64 | | | |
| 66 | | | |
| 68 | | | |
| 70 | | | |
| 72 | | | |
| 74 | | | |
| 76 | | | |
| 78 | | | |
| 80 | | | |
| 82 | | | |

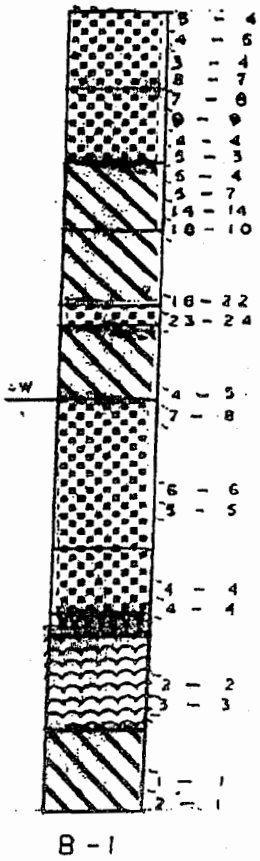
*NDARD PENETRATION INDICATED FOR EACH 6 INCHES OF DRIVE OF SPLIT TUBE SAMPLED, utilizing a 140 pound hammer with a 30 inch fall.

etters and reports are for the exclusive use of the client to whom they are addressed. The use of out name must receive our prior written approval. Our letters and reports apply io the sample tested and/or inspected, and are not necessarily indicative of the qualities of apparently identical or similar products.




## BORING LOCATION PLAN

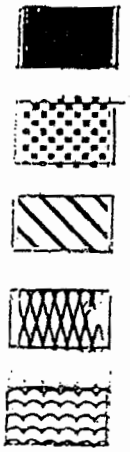
NOT TO SCALE




## PROFILE VIEW

SCALE: 1" = 10'-0"

## LEGEND




## SOIL PROFILE

EXISTING WELLINGTON DAM

JAMES CITY COUNTY VIRGINIA

HERBERT & ASSOCIATES, LTD.

NORFOLK VIRGINIA

WC067_LAKE_NICE_LARGE_LAKE_MIRROR_124

Herbert and Associates, Ltd.
TESTING • ENGINEERING • INSPECTING
POST OFFICE BOX 64758 • VIRGINIA BEACH, VA 23464 • PHONE (757) 420-2797

# LOG OF BORING

FILE NO. 99-8557

PROJECT IDENTIFICATION Existing Wellington Dam LOCATION James City Co.

BORING NO. B-1 TYPE DRILL CME 55 CLIENT American Eastern

DATE STARTED 11-3-03 DATE COMPLETED 11-3-03 DRILLER F. Cereske

CASING LENGTH 40' DIA. 2¼" Augers WATER ELEV: IMMEDIATE 20.5' AFTER ____ HRS. ____

TYPE SAMPLER SS LENGTH 30" DIA. 2" OD SURF. ELEV. Not Obtained

| DEPTH | STD. PEN. (N)* | SAMPLE DESCRIPTION | SAMPLE NO. |
|---|---|---|---|
| | | Topsoil 1" | |
| | 5-4 | Orange, moist, loose to medium dense, fine to veryfine sand with some clay (SP) Fill | S-1 |
| | 4-5 | | |
| | 3-4 | | S-2 |
| | 8-7 | | |
| | 7-8 | | S-3 |
| | 9-9 | | |
| | 4-4 | | S-4 |
| | 5-3 | | |
| | 5-4 | Orange, wet, loose to medium dense, clayey sand, (SC)Fill | S-5 |
| | 5-7 | | |
| | 14-14 | | S-6 |
| | 18-10 | | |
| | | Lt. gray mottle orange, moist, medium dense, clayey sand, Fill (SC) | |
| | 16-22 | White, wet, medium dense, fine to very fine sand, Fill (SP) | S-7 |
| | 23-24 | | |
| | | Gray & orange, moist, medium dense, clayey sand, Fill (SC) | |
| | 4-5 | | S-8 |
| | 7-8 | Tan, saturated, medium dense, fine to very fine sand (SP) | |
| | 6-6 | | S-9 |
| | 5-5 | | |
| | 4-4 | Olive, saturated, loose, fine to very fine sand (SP) | S-10 |
| | 4-4 | | |
| | | Brown mottle orange, saturated, medium stiff, clay (CL) | |
| | | Lt. gray & olive, saturated, medium stiff, sandy clay (CL) | |
| | 2-2 | | S-11 |
| | 3-3 | | |
| | | Olive mottle light gray, saturated, very loose, clayey sand (SC) | |

*BLOWS PER 6 INCHES OF DRIVE OF SPLIT TUBE SAMPLED, utilizing a 140 pound hammer with a 30 inch fall.

Letters and reports are for the exclusive use of the client to whom they are addressed. The use of our name must receive our prior written approval. Our letters and reports apply only to the sample tested and/or inspected, and are not necessarily indicative of the qualities of apparently identical or similar products.

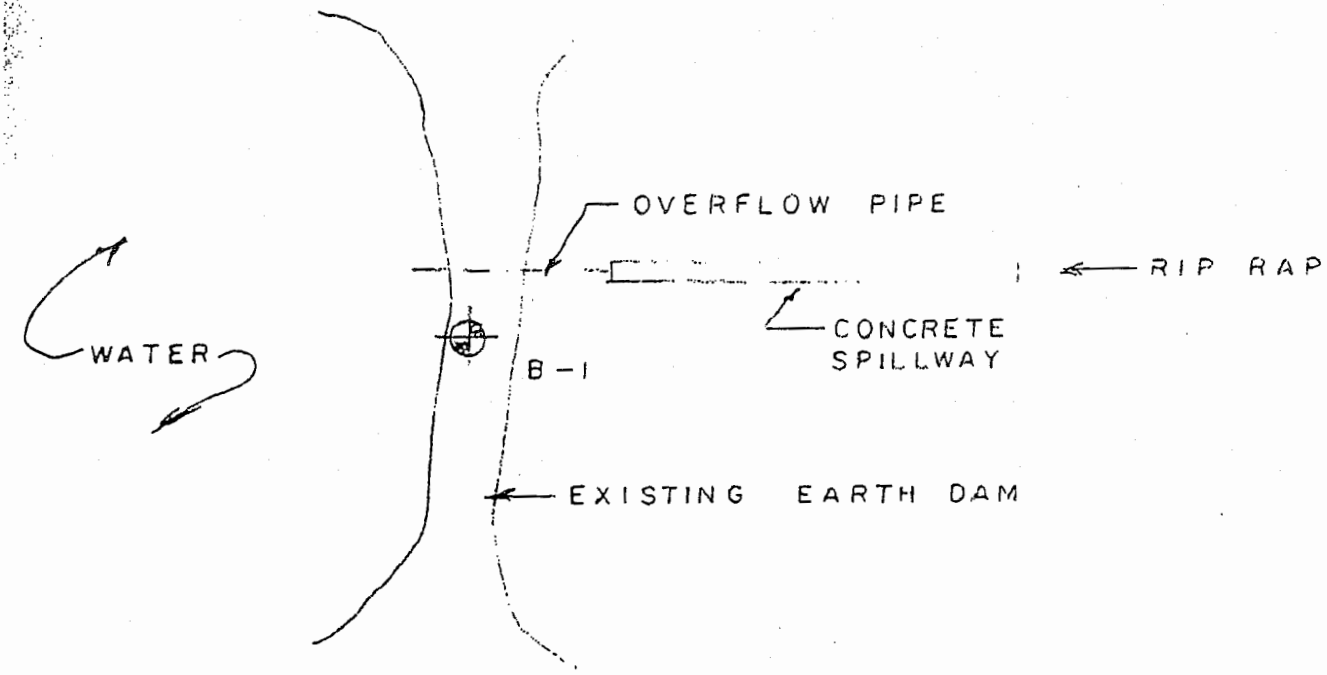
# LOG OF BORING

PROJECT IDENTIFICATION Existing Wellington Dam BORING NO. B-1

| DEPTH | STD. PEN. (N)* | SAMPLE DESCRIPTION | SAMPLE NO |
|---|---|---|---|
| 40 | | | |
| 42 | 1-1<br>2-1 | Olive mottle light gray, saturated, very loose, clayey sand (SC) | S-12 |
| 44 | | | |
| 46 | | Bottom of Boring 42.0' | |
| 48 | | | |
| 50 | | | |
| 52 | | | |
| 54 | | | |
| 56 | | | |
| 58 | | | |
| 60 | | | |
| 62 | | | |
| 64 | | | |
| 66 | | | |
| 68 | | | |
| 70 | | | |
| 72 | | | |
| 74 | | | |
| 76 | | | |

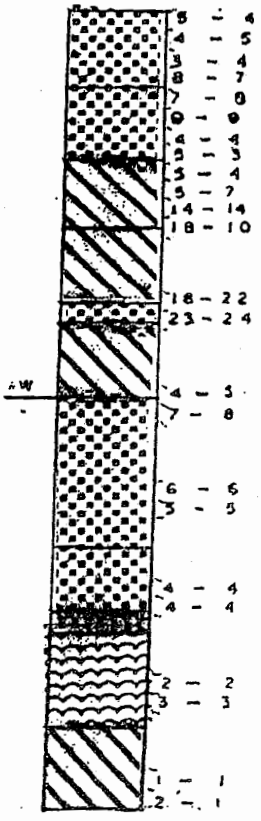
NDARD PENETRATION INDICATED FOR EACH 6 INCHES OF DRIVE OF SPLIT TUBE SAMPLED, utilizing a 140 pound hammer with a 30 inch fall.

tters and reports are for the exclusive use of the client to whom they are addressed. The use of our name must receive our prior written approval. Our letters and reports apply




## BORING LOCATION PLAN

NOT TO SCALE




B-1

## PROFILE VIEW

SCALE: 1" = 10'-0"

## LEGEND

- TOPSOIL
- FINE TO VERY FINE SAND
- CLAYEY SAND
- CLAY
- SANDY CLAY

## SOIL PROFILE

EXISTING WELLINGTON DAM

JAMES CITY COUNTY VIRGINIA

HERBERT & ASSOCIATES, LTD.

NORFOLK VIRGINIA

NOV 3 2003

04/21/2004 10:53 7578677188 AMERICAN ENGINEERING INC PAGE 17
MC067_LAKE_NICE_LARGE_LAKE_MIRROR_1.127

James City County
VIRGINIA
Jamestown 1607

# TRANSMITTAL SHEET

## ENGINEERING & RESOURCE PROTECTION → STORMWATER

Project: Wellington Section 4 (Lake Nice)

County Plan No. _____

Assigned BMP No.: WC067

BMP Type: LAKE Nice

Information Enclosed:

☐ Record Drawings (Asbuilts)

☐ Construction Certification

☐ Computations

☒ Other : Pond buffer/setback waiver, Lot 101 8408 Torbay Bend. Lot on perimeter of Lake Nice.

ADD TO ASBUILT FILE records.

Note: this was something we traditionally did, add a copy of PB/S program approvals to the BMP asbuilt file. However, now with the world of scanning this may not be possible. We keep a log of all PB/S waivers granted.

Name: Scott J. Thomas

Date: 01-08-13

Signature: Scott J Thomas

WAYNE HARBIN
BUILDER, INC.

General Contractor
State Licensed
#2701-026661A

Environmental Division

JAN 8 2013

RECEIVED

January 7, 2013

Mr. Scott Thomas, P.E.

Director, Environmental Division

101 Mounts Bay Road

Williamsburg, VA 23187-8784

RE: 8408 Torbay Bend, Lot 101 Wellington, Pond Buffer A13-0006

Dear Mr. Thomas,

During construction of the residence on the referenced lot, we will encroach upon the 25' pond buffer of Lake Nice and possibly disrupt existing vegetation within the buffer..

To remediate any disruption of vegetation during our construction process, we will replace vegetation with native plants and grasses.

We have submitted a check in the amount of $25.00 for processing and have attached a copy of the site plan for your review.

Please let me know if you have any questions or comments.

Sincerely

Robert E Lucas, Jr.

***LOCATION: LOT 101, WELLINGTON SEC 4***
***8408 TORBAY ROAD (County BMP ID Code: WC067)***

Variance request as submitted by Owner dated January 7, 2013 for clearing in the pond buffer/setback was reviewed and found to be acceptable. The pond buffer/setback extends 25 feet outward from the maximum water surface elevation of the adjacent stormwater management pond facility. Based on available information, it appears the 100-year design high water elevation for the adjacent stormwater management facility (Lake Nice, County BMP ID Code: WC067) is at Elevation 68.8.

As a condition of approval, efforts should be made to preserve existing trees and vegetation in the buffer during construction; to landscape or stabilize impacted buffer to resemble meadow or forest area with native trees, shrubs and ground cover; and to refrain from turfing to the water's edge to the greatest extent possible.

This information shall be passed on to the future homeowner/tenant of the lot.

Scott J. Thomas, P.E.
Director
Engineering and Resource Protection Division

01-08-13
Date

Environmental Division

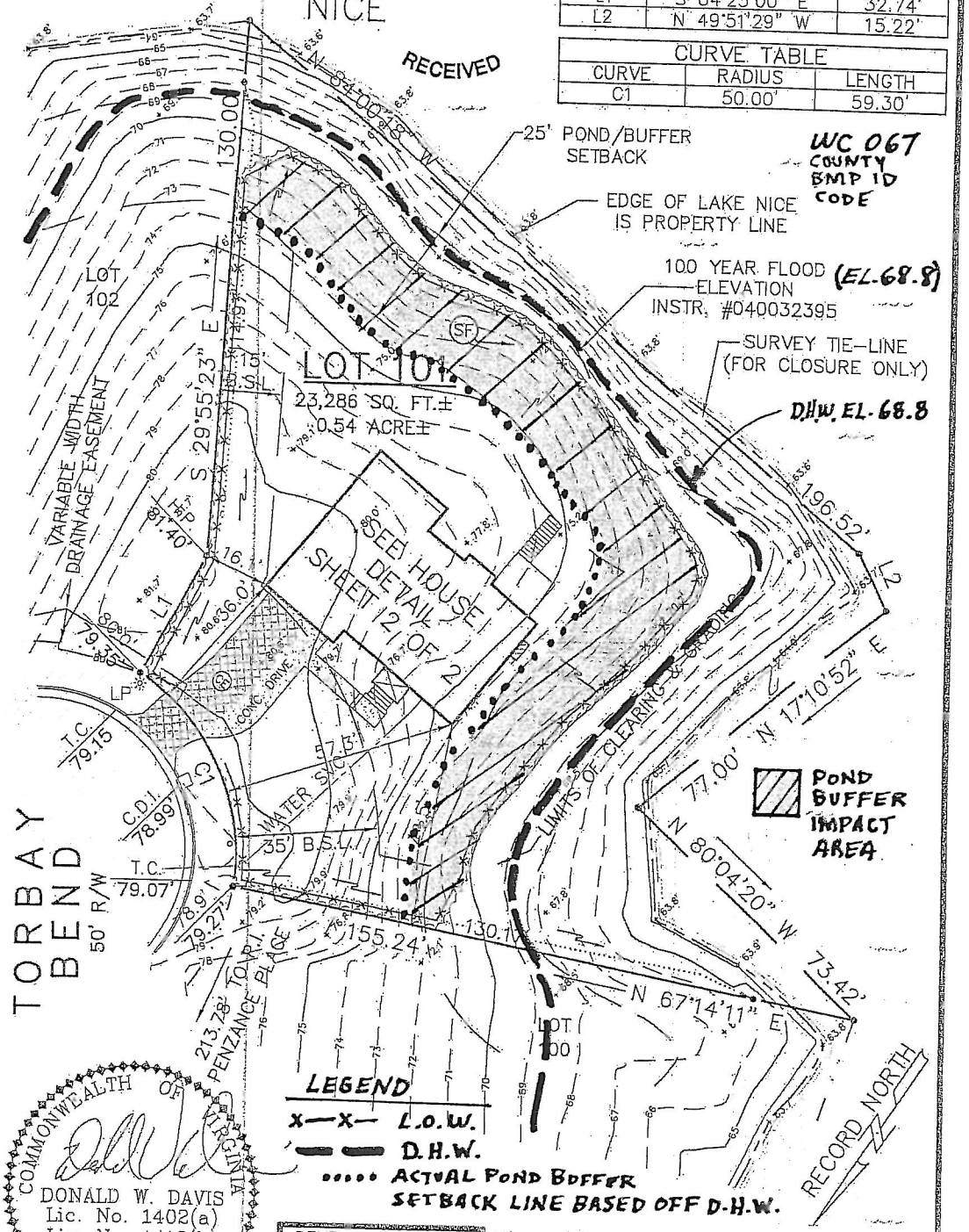
LAKE NICE

JAN 8 2013

RECEIVED

| LINE TABLE | | |
|---|---|---|
| LINE | BEARING | LENGTH |
| L1 | S 04°23'00" E | 32.74' |
| L2 | N 49°51'29" W | 15.22' |

| CURVE TABLE | | |
|---|---|---|
| CURVE | RADIUS | LENGTH |
| C1 | 50.00' | 59.30' |




COMMONWEALTH OF VIRGINIA
DONALD W. DAVIS
Lic. No. 1402(a)
Lic. No. 1418(b)
12/6/12
LAND SURVEYOR

(CE) –DENOTES CONSTRUCTION ENTRANCE.
(SF) –DENOTES SILT FENCE.

DAVIS & ASSOCIATES, P.C.
SURVEYORS – PLANNERS
YORK COUNTY, VIRGINIA

DEVELOPMENT PLAN | JOB LOCATION: #8408 TORBAY BEND

LOT 101 — 8408 TORBAY BEND

PLAT OF SUBDIVISION

WELLINGTON — GPIN 1330800111

SECTION FOUR

LOTS 90–96, 98–107, 109–111, 121–123, 141–153, 153A & 154–155

STONEHOUSE DISTRICT – JAMES CITY COUNTY, VIRGINIA

INSTRUMENT # 040032395

| CODE: 12–0551 | DWN.BY: S.J.M. | SCALE: 1" = 30' | TO: HARBIN | DATE: 6 DEC. 2012 |
|---|---|---|---|---|

SHEET 1 OF 2

WAYNE HARBIN
BUILDER, INC.

General Contractor
State Licensed
#2701-026661A

Environmental Division

JAN 8 2013

RECEIVED

January 7, 2013

Mr. Scott Thomas, P.E.

Director, Environmental Division

101 Mounts Bay Road

Williamsburg, VA 23187-8784

RE: 8408 Torbay Bend, Lot 101 Wellington, Pond Buffer A13-0006

Dear Mr. Thomas,

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We have submitted a check in the amount of $25.00 for processing and have attached a copy of the site plan for your review.

Please let me know if you have any questions or comments.

Sincerely

Robert E Lucas, Jr.

3705-D Strawberry Plains Road • Williamsburg, VA 23188 • (757) 220-8860 • Fax (757) 220-8853

# JAMES CITY COUNTY - ENVIRONMENTAL DIVISION
## Office - 757-253-6670

DATE: 1/8/13 RECEIPT# 2154

RECEIVED FROM: Wayne Harbin Bldr

PROJECT NAME: 8404 Torby Bend. Pond Buffer Variance A-13-0006

**001-303-3375** Erosion & Sedimentation Control Plan Review & Inspection Fee
Non-Residential Site Plan $600 per acre for first 15 acres
plus $400 for each additional acre over 15 acres $_____

Residential Site Plan $840 per acre for first 15 acres
plus $560 for each additional acre over 15 acres $_____

Residential Subdivisions:
$70.00 per lot $_____

**001-303-3375** Wetlands Board/Chesapeake Bay Board
$100 per case $_____

$25 Administrative Fee for all cases $ 25 00

**001-303-3380** Stormwater Facilities Inspection Fee $_____

**001-308-3780** Administrative $_____

**001-309-3920** Streetlight Fee ($7.76 ea. x 12 mo.) $_____

**001-192-6815** (Fee Reimbursement to C...

38879
68-490/514
41

**WAYNE HARBIN BUILDER INC.**
3705 STRAWBERRY PLAINS RD., SUITE D
WILLIAMSBURG, VA 23188
PH. 757-220-8860

CITIZENS & FARMERS BANK
NEWPORT NEWS, VA 23606
www.cffc.com

01/07/2013 $ *25.00

EXACTLY TWENTY-FIVE DOLLARS

DATE AMOUNT

Details on Back.

Security Features Included

PAY TO THE ORDER OF

Treasurer, James City County

P.O. Box 8701
Williamsburg VA 23187-0283

WAYNE HARBIN BUILDER INC.

Bonnie A. Harbin

AUTHORIZED SIGNATURE

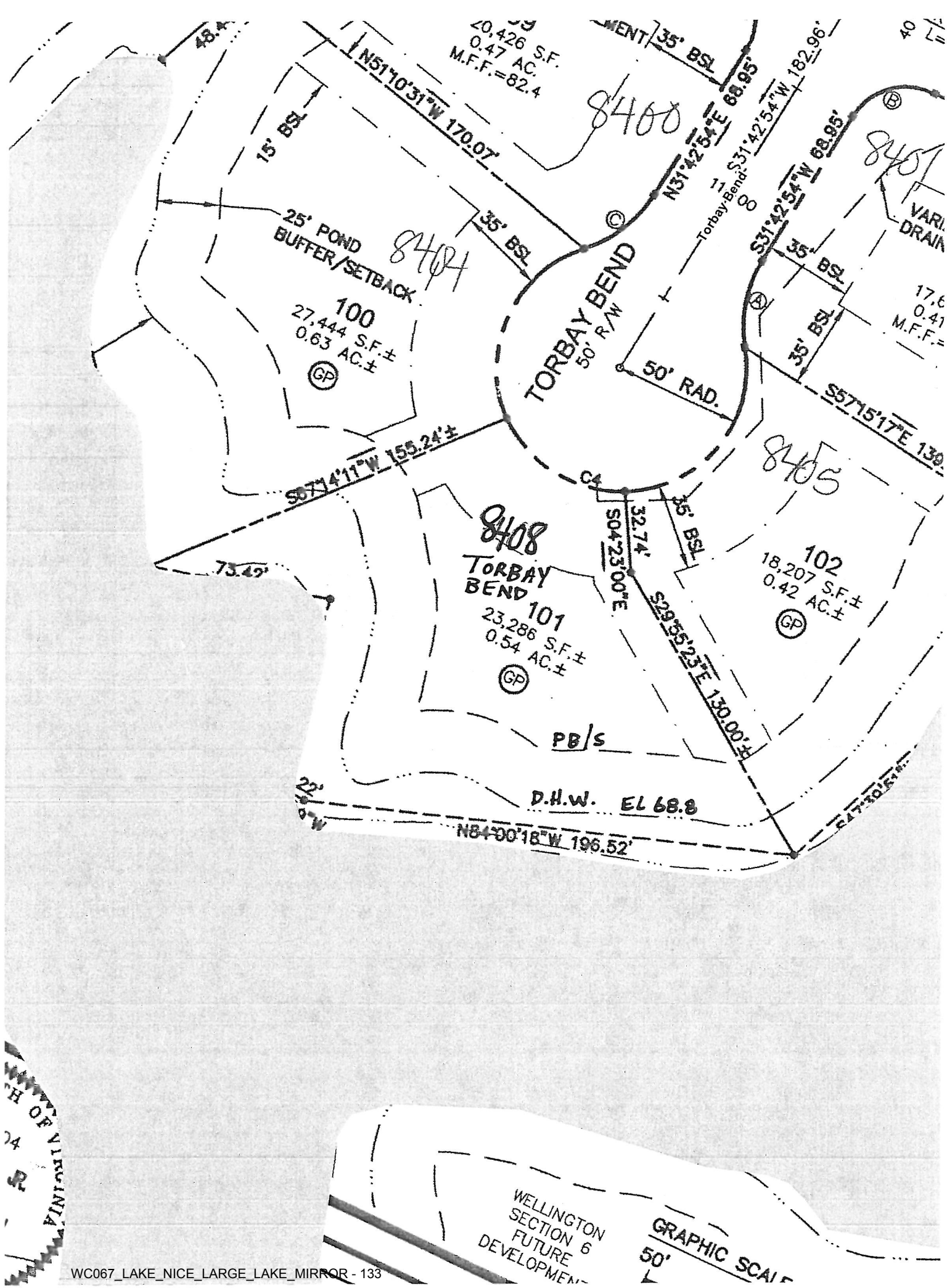
⑈038879⑈ ⑆051404901⑆ 0418000522⑈

$_____

TOTAL RECEIVED: ck# 38879 $ 25 00

rev 11/10

WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 132


20,426 S.F.
0.47 AC.
M.F.F.=82.4
35' BSL
N51°10'31"W 170.07'
15' BSL
8400
N31°42'54"E 68.95'
S31°42'54"W 182.96'
S31°42'54"W 68.95'
8401
25' POND BUFFER/SETBACK
8404
35' BSL
100
27,444 S.F.±
0.63 AC.±
GP
TORBAY BEND
50' R/W
Torbay Bend
11
00
35' BSL
35' BSL
50' RAD.
S57°15'17"E 139.
S67°14'11"W 155.24'±
8405
C4
32.74'
S04°23'00"E
35' BSL
8408
TORBAY BEND
101
23,286 S.F.±
0.54 AC.±
GP
102
18,207 S.F.±
0.42 AC.±
GP
S29°55'23"E 130.00'±
PB/S
D.H.W. EL 68.8
N84°00'18"W 196.52'
WELLINGTON SECTION 6 FUTURE DEVELOPMENT
GRAPHIC SCALE
50'

For your Files -

here is a copy of a letter that was sent to DCR concerning the Lake Nice Dam - Wellington

Mike - Would you know which BMP this would be for WC067 ?
Let me know - Scott

SCOTT,
THIS IS FOR LAKE NICE
MIKE
TRIBE IN 6 !

[redacted]

* inspection report due 9/2005

COPY

-Terri

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

Joseph H. Maroon
Director

# COMMONWEALTH of VIRGINIA

## DEPARTMENT OF CONSERVATION AND RECREATION

203 Governor Street, Suite 206
Richmond, Virginia 23219-2010
Phone: (804) 371-6095 Fax: (804) 786-1798

October 13, 2004

RECEIVED
OCT 22 2004

Wellington LLC
632 Hampton Highway
Yorktown, VA 23693-4100

RE: Lake Nice Dam, Inventory Number 09527

Dear Sir or Madam:

The Operation and Maintenance Certificate Application for Lake Nice Dam and the required supporting documents have been reviewed for compliance with the provisions of the Code of Virginia, Dam Safety Act, (Section 10.1-604 et. seq.) and the regulations promulgated by the Virginia Soil and Water Conservation Board (Board). Based on this information, on September 16, 2004 the Board issued a six year (09/16/04 – 09/30/2010) Regular Class II Operation and Maintenance Certificate. The Certificate and other pertinent data are enclosed.

The Dam Safety Act requires dam owners to maintain their dam in a condition to prevent unreasonable threats to life and property of others. The classification of your dam and the Certificate issued were based on the current known downstream hazard potential from upstream characteristics, a re-inspection/inventory/as-built report, operation and maintenance plan, inspection schedule and an emergency action plan. The actions contained in the documents accompanying your Certificate Application must be adhered to for the duration of the terms contained in the Operation and Maintenance Certificate.

Should you have questions, please direct them to Robert E. Cooper, P.E., Dam Safety Engineer, Department of Conservation and Recreation, Dam Safety and Floodplain Management, 203 Governor Street, Suite 206, Richmond, VA 23219, telephone 804-786-1359, robert.cooper@dcr.virginia.gov.

Sincerely,

William G. Browning
Dam Safety & Floodplain Management Director

Enclosures:

CC: Robert E. Cooper, P. E.

# COMMONWEALTH of VIRGINIA

*DEPARTMENT OF CONSERVATION AND RECREATION*
*DIVISION OF DAM SAFETY*
*VIRGINIA SOIL AND WATER CONSERVATION BOARD*

**DAM SAFETY CERTIFICATE**
**REGULAR**
**CLASS II OPERATION & MAINTENANCE CERTIFICATE NUMBER 09527**

Wellington LLC, owner of Lake Nice Dam in James City County, is entitled to operate and maintain this dam pursuant to the provisions of the Dam Safety Act (Section 10.1-604 et seq., Code of Virginia) and Regulations promulgated thereunder.

This certificate is for a term of six years. It becomes effective September 16, 2004 and expires September 30, 2010. In accordance with §4VAC50-20-100F of the Regulations, the owner shall apply for a new certificate 90 days prior to its expiration.

Joseph H. Maroon
Secretary, Virginia Soil and Water
Conservation Board

**DATA SHEET - OPERATION AND MAINTENANCE CERTIFICATE**
**Department of Conservation & Recreation**
**Division of Dam Safety and Floodplain Management**
**203 Governor Street, Suite 206**
**Richmond, VA 23219**

| | |
|---|---|
| Name of Dam: **Lake Nice Dam** | Inventory Number: **09527** |
| Location: **Francec Swamp** | City/County: **James City County** |
| Owner: **Wellington LLC**<br>Address: **632 Hampton Highway**<br>City/Town/Zip: **Yorktown, VA 23693-4100** | Designed by: **SCS**<br>Constructed by: **Jack L. Massie**<br>Year Constructed (Modified): **1969** |
| Type of Dam: **Earth** | Purpose: **Stormwater Management** |
| Drainage Area (Sq. Mi.): **0.233** SHOULD BE 0.245 | Type of Watershed: **N/A** |
| Total Height (Ft.): **34.8** | Elevation: **71.7** |
| Normal Pool Height (Ft.): **27.3** | Elevation: **64.2** |
| Maximum Capacity (Acre Ft.): **446** | Maximum Area (Acres): **18.4** |
| Normal Capacity (Acre Ft.): **301** | Normal Area (Acres): **14.8** |
| Size Classification: **Small** | Hazard Classification: **II** |
| Required Spillway Design Flood: **100 YEAR** | Available Spillway Design Flood: **100 YEAR** |
| Type of Spillway: **Grass** | *(Note if Section 130):* |

Operation and Maintenance Plans & Schedule by: **AES Consulting Engineer-Marc Bennett VA PE # 26628**

( ) Reinspection or (X) Inventory Report by: **AES Consulting Engineer-Marc Bennett VA PE # 26628**

Emergency Action Plan filed with:
(X) Virginia Dept. of Emergency Management
(X) Local Coordinator of Emergency Services City/County: **James City County**

Application Reviewed and Recommended for: **Regular O & M Certificate (9/16/04-9/30/10)**
If Conditional Certificate, the conditions are:

By: **Robert E. Cooper, PE VA #0402 025273** Date: **September 16, 2004**

Concurrence with the Recommendation:

By: **William G. Browning, Director** Date: **September 16, 2004**

# ANNUAL INSPECTION REQUIREMENTS

**for**

## CLASS II REGULAR CERTIFICATES

Inventory Number: 09527

Date Certificate Issued: **September 16, 2004**

DUE DATES ARE:

| **Annual Owner's Inspection Report** | **Three-year Reinspection by a Professional Engineer** | **Six-Year Renewal of Certificate by a Professional Engineer** |
|---|---|---|
| 9/30/2005 | 9/30/2007 | 6/30/2010 |
| 9/30/2006 | | |
| 9/30/2008 | | |
| 9/30/2009 | | |

---

Reference: **Virginia Dam Safety Regulations, 4VAC50-20-100**

1. The owner of a **Class II** dam shall update the certificate by filing a new inspection report certified by a professional engineer **every three years**.

2. Provide the director an annual owner's inspection report on official forms in years when no professional reinspection is required and which may be done by the owner or his/her representative.

3. Apply for the renewal of the six-year certificate 90 days prior to its expiration.

DCR
Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

**INVENTORY REPORT FOR ~~CLASS III AND CLASS~~ CLASS II IV IMPOUNDING STRUCTURES**

Reference: Impounding Structure Regulations, 4VAC50-20-00 et seq., Virginia Soil and Water Conservation Board

1. Project Information:
   a. Name of Impounding Structure LAKE NICE DAM EMBANKMENT
   b. Inventory Number _____ Other Name (if any) _____
   c. Name of Reservoir LAKE NICE
   d. Purpose of Reservoir STORMWATER MANAGEMENT

2. Location of Impounding Structure:
   a. City/County JAMES CITY COUNTY Magisterial District STONEHOUSE
   b. Located 2500' feet/miles upstream/downstream of Highway. No. ROUTE 30
   c. Name of River or Stream FRANCE SWAMP
   d. Latitude N 37° 23.345' Longitude W 76° 47.201'

3. Ownership:
   a. Owner's Name WELLINGTON LLC
   b. Mailing Address 632 HAMPTON HIGHWAY
      YORKTOWN, VIRGINIA 23693-4100
   c. Telephone (757) 867-8800

4. Owner's Engineer:
   a. Engineering Firm/Engineer AES CONSULTING ENGINEERS / VAN MARC BENNETT
   b. Professional Engineer Virginia Number 26628
   c. Mailing Address 5249 OLDE TOWNE ROAD, SUITE 1
      WILLIAMSBURG, VA 23188
   d. Telephone (757) 253-0040

(DCR 199-104) (12/01)

5. Impounding Structure Data (All elevations NGVD unless noted):

a. Type of Material earth ✓ concrete_____ masonry_____

Other_____

| | Design Configuration | |
|---|---|---|
| b. Top of Dam | 71.7 ± | Elev. (if known) |
| c. Downstream Toe (Lowest) | 36.9 ± | Elev. (if known) |
| d. Height of Dam | 34.8 ± | Feet |
| e. Crest Length (Exclusive of Spillway) | 500' ± | Feet |
| f. Crest Width | 15-17' | Feet |
| g. Upstream Slope | 3 H: 1 V | |
| h. Downstream Slope | 3 H: 1 V | |

6. Reservoir Data

| | Design Configuration | |
|---|---|---|
| a. Maximum Capacity | 446 ± | Acre-feet |
| b. Maximum Pool | 67.7 | Elev. (if known) |
| c. Maximum Pool Surface Area | 18.4 | Acres |
| d. Normal Capacity | 301 ± | Acre-feet |
| e. Normal Pool | 64.2 ± | Elev. (if known) |
| f. Normal Pool Surface Area | 14.8 | Acres |
| g. Freeboard (Normal Pool to Top) | 6.9 | Feet |
| h. Freeboard (Normal Pool to Emergency) | 5.3 | Feet |

7. Spillway Data

| | Type | Construction Material | Maximum Capacity |
|---|---|---|---|
| a. Low Level Drain | N/A | | |
| b. Principal Spillway | 16" PIPE | DUCTILE IRON | 16 CFS |
| c. Emergency Spillway | TRAPEZOIDAL | EARTH | 131 CFS |

| | Design Configuration | |
|---|---|---|
| d. Low Level Drain | N/A | Elev. (if known) |
| e. Principal Spillway | 64.8 | Elev. (if known) |
| f. Emergency Spillway | 70.1 ± | Elev. (if known) |



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 140

g. Briefly describe the ~~low level drain~~ and principal spillway to include dimensions, materials of construction, trash guards, location in reservoir and through dam, and orientation of intake and discharge to dam if looking downstream: PRINCIPAL SPILLWAY IS 16" BARREL DISCHARGING TO CONCRETE FLUME; NO TRASH GUARDS; LOCATED MIDPOINT OF EMBANKMENT. CONCRETE FLUME IS APPROXIMATELY 5' WIDE AND 70 FEET LONG TO TOE OF DAM.

h. Describe the emergency spillway to include dimensions, whether the spillway is an earth channel or other construction, spillway surface protection, and orientation to dam if looking downstream: EMERGENCY SPILLWAY FORMED IN NORTH SIDE; GRASS LINED. APPROXIMATELY 25' WIDE WITH 10:1 SIDE SLOPE (OR LESS)

8. Watershed Data (Class III only):

a. Drainage Area _____ Sq. Miles

b. Type and Extent of Watershed Development _____

c. Time of Concentration _____ Method _____

d. Spillway Design Flood used (mark appropriate box)

_____PMF, source _____

_____1/2 PMF, source _____

_____100 Year, source _____

_____50 Year, source _____

_____Other, source _____

e.. Design inflow hydrograph: Volume _____acre-feet;

Peak inflow _____C.F.S.;

Rainfall duration of design inflow hydrograph _____hours

f. Freeboard during passage of spillway design flood _____feet

9. Impounding Structure History

a. Date construction completed CIRCA 1969

b. Design by SOIL CONSERVATION SERVICE Date: CIRCA 1969

c. Built by JACK L. MASSIE Date: CIRCA 1969



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 141

d. Inspection dates LAST INSPECTION 2/10/04, 4/24/03

e. Inspections by HERBERT AND ASSOCIATES, LTD.

f. Description of repairs REMOVE VEGETATION, MOWING

g. Has the impounding structure ever been overtopped? _____ Yes _____ No UNKNOWN

10. Impounding Structure Assessment:

a. Provide brief descriptions for each item:

i. Condition of the impounding structure REFER TO CORRESPONDENCE BY HERBERT AND ASSOCIATES DATED 2/10/04, 4/24/03

ii. Condition of the reservoir REFER TO CORRESPONDENCE BY HERBERT AND ASSOCIATES DATED 2/10/04, 4/24/04

iii. Condition of the upstream area FALLOW FIELDS, CURRENT RESIDENTIAL CONSTRUCTION

iv. Condition of the downstream area NATIVE WOODED AREAS AND WETLAND HABITATS.

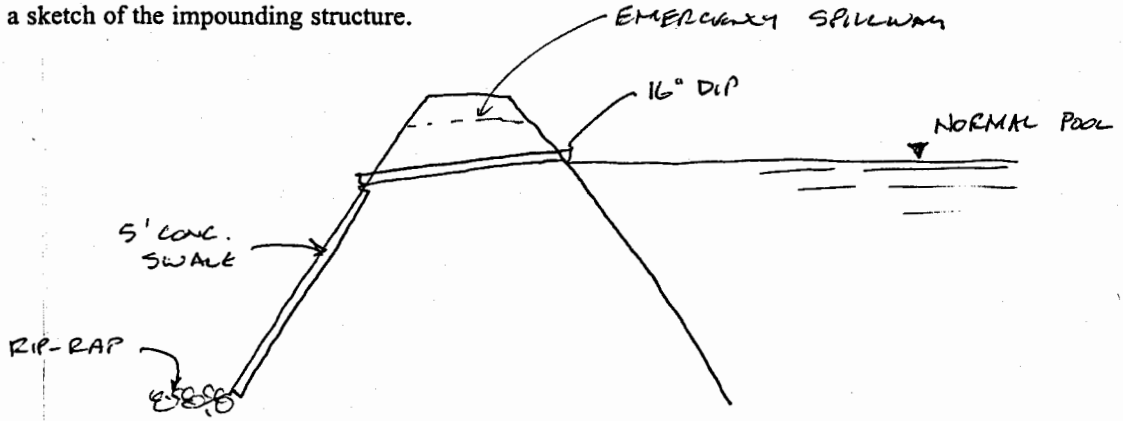
b. Provide a narrative describing any recent changes in the impounding structure, reservoir, upstream area, and downstream area: MINOR REPAIRS TO IMPOUNDMENT STRUCTURE; UPSTREAM AREA CURRENTLY BEING DEVELOPED AS RESIDENTIAL COMMUNITY; NO CHANGES DOWNSTREAM

c. Recommendations for remedial measures: REFER TO CORRESPONDENCE BY HERBERT AND ASSOCIATES DATED 2/10/04; 4/24/04



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 142

11. Provide a sketch of the impounding structure.




CERTIFICATION BY OWNER'S ENGINEER (Class III only)

I hereby certify that the information provided in this Inventory Report has been examined by me and found to be true and correct ~~in my professional judgment~~ TO THE BEST OF MY KNOWLEDGE.

Signed V. Mac Bowe
(Professional Engineer)

Virginia Number 26628

This 21ST day of JUNE, 2004.

CERTIFICATION BY OWNER (Class IV only)

I hereby certify that the information provided in this Inventory Report is true and correct.

Signed _____
(Owner)

This _____ day of _____, 20_____

**Please fill out and mail to:**
**Department of Conservation and Recreation**
**Division of Dam Safety**
**203 Governor Street**
**Richmond, Virginia 232192094**



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 143

DCR
Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

# OPERATION AND MAINTENANCE APPLICATION
# CLASS I, II AND III IMPOUNDING STRUCTURES

Reference: Impounding Structures Regulations, 4VAC 50-20-00 et seq., Virginia Soil and Water Conservation Board

1. Name of Impounding Structure: LAKE NICE DAM EMBANKMENT

   Inventory Number: _____ Other Name (if any) _____

2. Hazard Potential Classification from Table 1, Impounding Structure Regulations:

   (Circle One) Class I (Class II) Class III

3. Name of Owner: WELLINGTON LLC

   Address: 632 HAMPTON HIGHWAY, YORKTOWN VA 23693

   Telephone: (Business) (757) 867-8800 (Residential) (___) _____

4. Operating Plan and Schedule.
   Provide a narrative for each item:

   a. Operation of ~~control gates~~ and spillways. GRAVITY DAM

   b. Operation of Reservoir Drain (not to exceed ½ foot drawdown per day on embankment dams).
   NO RESERVOIR DRAIN

5. Maintenance Plan and Schedule
   Provide a narrative for each item:

   a. Embankment Dams:
      (1) embankment: MOWING 3 TIMES A YEAR, REMOVAL OF VEGETATION 1 TIMES PER YEAR, VISUAL INSPECTION 1 TIME PER YEAR, GENERAL REPAIRS ONCE/YR.
      (2) principal spillway: CLEARING OF DEBRIS ONCE / MONTH. INSPECTION ONCE / YEAR.
      (3) emergency spillway: MOWING 3 TIMES A YEAR, REMOVAL OF VEGETATION AND GENERAL REPAIR ONCE A YEAR
      (4) low level outlet: NONE.
      (5) reservoir area: MAINTENANCE OF PERIMETER BUFFER TO REMOVE DEADWOOD ONCE / 2-YEARS.
      (6) downstream channel: NATURAL AREA / WETLAND, NO MAINTENANCE.
      (7) other: _____

   b. Concrete dams (including masonry and others):
      (1) upstream face: N/A

(DCR 199-099) (12/01)

(2) downstream face: N/A

(3) crest: N/A

(4) galleries: N/A

(5) tunnels, etc.: N/A

(6) abutments: N/A

(7) spillways: N/A

(8) gates and outlets: N/A

(9) other: N/A

6. Inspection schedule (attach schedule and checklist):

(1) operator inspection (daily, weekly, etc.)

(2) maintenance inspection (monthly, quarterly, semi-annual, annual)

(3) technical safety reinspection by a professional engineer. (required for certification update: Class I dams every two years, Class II dams every three years. All dams inspected after overtopping).

7. Emergency Action Plan Schedule.

Provide the information that initiates the Emergency Action Plan:

a. rainfall amounts and/or: FLOW > 1.5 FT THRU EMERGENCY SPILLWAY, STAGE III CONDITION

b. spillway flows: FLOW > 0 FT THRU EMERGENCY SPILLWAY, STAGE II CONDITION

c. frequency of observation:

8. For a newly constructed impounding structure, provide certification from a Professional Engineer who has inspected the impounding structure during construction that, to the best of the engineer's judgment, knowledge and belief, the impounding structure and all appurtenances have been constructed in conformance with the plans, specifications and drawings submitted to the Department of Conservation and Recreation.

N/A



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 145

# OPERATION AND MAINTENANCE PERMIT APPLICATION

## OPERATION AND MAINTENANCE SCHEDULES
## CERTIFICATION BY OWNER

I hereby certify that the operation and maintenance plans and schedules provided herewith will be adhered to during the life of the project except in cases of unanticipated emergency requiring departure therefrom in order to mitigate hazards to life and property, at which time my engineer and the Department of Conservation and Recreation will be notified.

Signed: _____
(Owner)

This 23rd day of June, 20 04.

## CERTIFICATE BY OWNER'S ENGINEER

I hereby certify that the information provided in this form has been examined by me and found in my professional judgment to be appropriate to operation and maintenance considerations for this dam.

Signed: _____ Virginia Number: 26628
Professional Engineer

This 21st day of June, 20 04.

Remarks: _____

**Please fill out and mail this form to:**
**Department of Conservation and Recreation**
**Division of Dam Safety**
**203 Governor Street**
**Richmond, Virginia 23219-2094**



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 146

Lake Nice Dam Embankment
Maintenance Schedule

Operator Inspections and Maintenance (Quarterly)

1. Inspect structure after significant rainfall events
2. Clear debris from entrance to discharge pipe
3. Note any erosion or damage to embankment caused by borrowing wildlife. Repair damage.
4. Record inspection and repairs completed.

Maintenance Inspection and Maintenance

1. Inspect structure after each significant rainfall event (more than 2 inches in 24-hour period).
2. Perform maintenance mowing 3 times a year (spring, summer, and fall).
3. Inspect structure for growing woody vegetation once per year, and remove vegetation.
4. Perform soil sampling on embankment once every 4 years to ensue proper grass growth. Maintain 40% vegetation coverage.
5. Perform inspections of barrel, and concrete flume quarterly. Make repairs as necessary.
6. Perform yearly inspections of structure for damage and seeps. Contact professional engineer for further investigation and assessment.
7. Perform yearly observations of pond perimeter noting changes in land use or topography.
8. Keep records of all activities, inspections, and repairs.
9. Have technical safety inspection performed every 3 years by professional engineer, and after each event of overtopping.

DCR
Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

# EMERGENCY ACTION PLAN FOR CLASS I, CLASS II AND CLASS III IMPOUNDING STRUCTURES

Reference: Impounding Structure Regulations, 4VAC52-20-00 et seq., Virginia Soil and Water Conservation Board

1. Name of Impounding Structure: LAKE NICE DAM EMBANKMENT

   Inventory Number: _____

   Other Name (if any): _____

2. Hazard Potential Classification from Table I, Virginia Dam Safety Regulations:
   Class I  Class II  Class III (Underline One)

3. Name of Owner: WELLINGTON LLC

   Address: 632 HAMPTON HIGHWAY, YORKTOWN, VA 23693-4100

   Telephone: (Business)(757) 867-8800 (Residential)(____)_____

4. Name of Dam Operator: WELLINGTON LLC

   Address: 632 HAMPTON HIGHWAY, YORKTOWN, VA 23693-4100

   Telephone: (Business)(757) 867-8800 (Residential)(____)_____

   Name of Alternate Operator: WELLINGTON ESTATES HOMEOWNERS ASSOCIATION

   Telephone: (Business)(757) 867-8800 (Residential)(____)_____

5. Name of Rainfall or Staff Gage Observer for Dam: _____

   Address: _____

   Telephone: (Business)(____) _____(Residential)(____)_____

   Name of Alternate Observer: _____

   Telephone: (Business)(____) _____(Residential)(____)_____

6. 24-Hour Dispatch Center Nearest Dam-Police/Fire/Sheriff's Departments: JAMES CITY COUNTY EMERGENCY OPERATIONS CENTER

Address: 3135 FORGE ROAD, TOANO, VA 23168

Telephone: (Business)(757) 566-0112 (Residential)(____)_____

7. Name of City/County Emergency Services Coordinator(s): CHIEF RICHARD MILLER

Address: JAMES CITY COUNTY FIRE DEPARTMENT
5077 JOHN TYLER HIGHWAY
WILLIAMSBURG VA 23185

Telephone: (Business)(757) 565-7603 (Residential)(____)_____

8. Name, address and telephone number of all occupied dwellings that would be affected in the event of a dam failure, and/or inundation mapping of affected areas.

| Name | Address | Telephone Number |
|---|---|---|
| NONE | | |



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 149

9. Name, address and telephone numbers of owners of all commercial or recreational establishments that would be affected in the event of dam failure, and/or an inundation mapping of affected areas.

| Name | Address | Telephone Number |
|---|---|---|
| None | | |

10. Name, address and telephone number of owners of property, land and unoccupied buildings that would be affected in the event of a dam failure, and/or an inundation mapping of the affected area.

| Name | Address | Telephone Number |
|---|---|---|
| Stonehouse at Williamsburg, LLC | 8214 Westchester, Suite 635<br>Dallas, Texas 75225-6124 | |
| Fieldstone Investment, LLC | 8214 Westchester, Suite 635<br>Dallas, Texas 75225-6124 | |
| Williamsburg Christian Academy | 309 Waltz Farm Drive<br>Williamsburg, VA 23185-2601 | 757-220-1978 |
| George Hankins, Jr | 3408 Lynnwood Drive<br>Virginia Beach, VA 23452-6042 | 757-486-8208 |



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 150

11. If there are public roads downstream from the impounding structure, identify by highway number and distance below dam:

Route # 30, 0.6 Miles; Route # _____, _____ Miles;
Route # _____, _____ Miles; Route # _____, _____ Miles.

Provide name of resident engineer, VA Dept. of Transportation, (or City/County engineer)

STEVEN W. HICKS
VIRGINIA DEPARTMENT OF TRANSPORTATION
Address: 4451 IRONBOUND ROAD
WILLIAMSBURG, VA 23188

Telephone: (Business)(757) 253-4832 (Residential)(____)_____

NOTE: Items 12 and 13 should be provided from the Operation and Maintenance Application.

Definitions:
Stage I Condition – A flood watch, or heavy continuous rain or excessive flow of water from ice or snow melt.

Stage II Condition – A flood warning; or emergency spillway activated or dam overtopping/ breach may be possible.

Stage III Condition – Emergency spillway activated, dam overtopping or imminent failure is probable.

12. Amount of rainfall that will initiate a:

Stage II Condition _____ inches per 6 hrs.
_____ inches per 12 hrs.
_____ inches per 24 hrs.
Stage III Condition _____ inches per 6 hrs.
_____ inches per 12 hrs.
_____ inches per 24 hrs.

And/or the amount of flow in the emergency spillway that will initiate a:

Stage II Condition > 0 feet (depth of flow)
Stage III Condition > 1.5 feet (depth of flow)

Total depth of emergency spillway available before crest of dam is overtopped:
1.6' ± feet.

13. Frequency of observations by rainfall/staff gage observer during a:
Stage I Condition _____ Stage II ONCE AN HOUR
Stage III CONTINUOUS (recommend continuous)
Please identify access route and means of travel during flood conditions.
CROAKER RD (RT. 607) TO POINT-OF-WOODS ROAD, TO LOCKHAVEN ROAD, TO END AND PICK UP "WOODS" ROAD.



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 151

Note: It is recommended that the Observer remain on post until pool elevation starts to recede.

14. Surveillance and Notification

a.. The dam owner/operator **IS RESPONSIBLE** for notifying local government of any problem or potential problem at the dam site.

b. The dam owner/operator **WILL INITIATE** dam surveillance under Stage I conditions, ie, when a flood watch is issued.

c. The dam owner/operator **WILL NOTIFY** the 24-hour dispatch center and the local Emergency Services Coordinator when Stage II conditions are met in order to alert them to review actions that may be required for the safety and protection of people and property.

d. The dam owner/operator **WILL NOTIFY** the 24-hour dispatch center and the local Emergency Services Coordinator to initiate warning of residents when Stage III conditions or imminent dam failure are probable.

e. The owner/operator **WILL BE RESPONSIBLE** for operating such devices as spillway gates and low level outlets such as to cause the dam to function effectively. Attach narrative if required.

f. 24-hour dispatch center should prepare Standard Operating Procedures (SOP's) to implement dam overtopping/failure evacuation plans.

15. Evacuation Procedures:

Note: The dam owner/operator should notify the City/County 24-hour Dispatch Center, as required in paragraph 14d above. Phone # should be listed in [a (1)].

Note: Once the local government has been notified of any problem at a dam site, it should take appropriate protective measures in accordance with the local Emergency Operations Plan and accompanying Emergency Action Plan and Standing Operations Procedures. Other local government actions might include:

(1) Notify the individuals who are directly downstream and in immediate danger. A list of the names, addresses, and telephone numbers of these individuals should be listed in [a (2]).
(2) Monitoring the situation and, if time permits, review of evacuation plans.
(3) Begin Alert, Notification, and Warning
(4) Immediately evacuating the inundation areas, if conditions warrant.
(5) Expanding Direction and Control as well as beginning Emergency Public Information and operating shelters.
(6) Provide Situation Reports to the State Emergency Operations Center (804-674-2400 or 800-468-8892)



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 152

a. Once the local government has been notified of a condition requiring evacuation, the dam owner/operator and local government are mutually responsible for effecting evacuation.

(1) The dam owner/operator will: NO DOWNSTREAM DWELLINGS, BUSINESSES OR RECREATION AREAS THUS NO EVACUATION NEEDED

(2) Local government will: NO DOWNSTREAM DWELLINGS, BUSINESS OR RECREATION AREAS, THUS NO EVACUATION NEEDED.

Individuals who are directly downstream and in immediate danger include:

| NAME | ADDRESS | TELEPHONE |
|---|---|---|
| NO HABITATED AREAS | | |

b. Methods for notification and warning to evacuate include:

Check appropriate method(s)

✓ (1) Telephone TO EMERGENCY OPERATIONS CENTER

____ (2) Police/fire/sheriff radio dispatch vehicles with loudspeakers, bullhorns, etc.

____ (3) Personal runners for door-to-door alerting

____ (4) Radio/television broadcasts for area involved



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 153

16. Certification of Coordination between Owner/Operator and Local Government

**Certification by Owner/Operator**

I certify that procedures for implementation of this plan have been coordinated with _____ (City/County) and the local Emergency Services Coordinator. Also, that a copy of this Form has been filed with the State Department of Emergency Management; that this plan shall be adhered to during the life of the project; and that the information contained herein is current and correct to the best of my knowledge.

_____
(Signature of Owner/Operator)

This 23RD day of JUNE 20 04.

Printed Name HR ASHE

**Certification by Local Government**

I certify that procedures for the warning and evacuation of James City County (City/County) residents as required in the event of actual or impending failure of the Lake Nice Dam (name of dam) have been coordinated with the dam owner/operator.

_____
(Signature of City/County Official)

This _____ day of _____, 20_____.

Printed Name Richard M. Miller

Position Emer Management Coordinator

Please fill out and mail to:

**Virginia Department of Emergency Management**
**Emergency Services**
**10501 Trade Ct.**
**Richmond, Virginia 23236-3713**

**Dept. of Conservation and Recreation**
**Division of Dam Safety**
**203 Governor Street**
**Richmond, Virginia 23219-2094**

## EMERGENCY ACTION PLAN WORK/DATA SHEET

1. Name of Impounding Structure: LAKE NICE DAM EMBANKMENT

2. Inventory #: _____ Other Name (if any): _____

3. Total Height: 34.8 feet (Measured vertically from top of structure to streambed at downstream toe).

4. Total Impoundment Capacity at top of structure: 446 ± acre-feet.

5. Size Classification (Circle one): Large (Medium) Small

6. Hazard Classification (Circle one): Class I (Class II) Class III

7. Spillway Design (Circle one): PMF ½PMF 100-YR 50-YR UNKNOWN

8. Downstream Inundation Area determined by (Mark one):

   _____ (1) Judgement

   _____ (2) Empirical Formulas Type used: _____

   ✓ (3) Computer Programs Type used: HYDROFLOW HYDROGRAPHS

9. Critical Conditions used for structure failure (Mark one):

   _____ (1) Failure due to overtopping using:

   _____ PMF

   _____ % PMF

   _____ 100-YR

   _____ Other

   ✓ (2) Failure not due to flooding

   Describe: DAM BREACH COLLECTIVELY WITH A 100-YEAR, 24-HOUR STORM EVENT.



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 155

CONSULTING ENGINEERS

5248 Olde Towne Road • Suite 1 • Williamsburg, Virginia 23188
(757) 253-0040 • Fax (757) 220-8994 • E-mail aes@aesva.com

June 21, 2004

Mr. Darryl E. Cook
Director – Environmental Division
101-E Mounts Bay Road
Williamsburg, Virginia 23188

**RE: Lake Nice**
**Wellington Subdivision, Section 4**
**AES Project Number 8223-07**

Dear Mr. Cook:

As a result of our conversation last week regarding Wellington, Section 4, and the dam for Lake Nice, there are several items worth mentioning:

- Wellington, LLC, and Mr. Dick Ashe, completed all repairs and suggestions to the embankment and spillways of Lake Nice as mentioned in Mr. Robert Cooper's letter (from the Department of Conservation and Recreation) of July 1, 2003.
- Additional requirements, in the form of formal Inventory Reports, As-Built Reports, Operation and Maintenance Application, and Emergency Action Plans, were recently identified by Mr. Cooper. These items were not clearly identified in earlier correspondence. Mr. Ashe attempted on his own to fulfill these requirements some time ago, but without success. AES is now completing the documentation.
- When attempting to clarify needs in fulfilling obligations, it has been challenging to contact Mr. Cooper. (This difficulty was experienced by both Mr. Ashe and AES staff.)
- The embankment has had several limited, visual inspections by Herbert and Associates (geo-technical engineers), with copies of findings forward to your office noting satisfactory conditions at the site.
- The geo-technical engineers completed soil borings along the embankment.
- The historical performance of the embankment has proven satisfactory during extreme climatic conditions.
- The site has been inspected twice in recent history by a dam safety engineer from the Department of Conservation and Recreation.
- There has been a good faith effort by Wellington, LLC, and Mr. Ashe, to cooperate with DCR.

William Bobo - 564-2141

The above list is healthy. Although the Environmental Division has held fast to withholding the issuance of the Land Disturbing Permit for Wellington, Section 4, until the issues with the dam embankment have been resolved, a re-consideration is perhaps warranted upon reflection of the successes and efforts accomplished to date.

A re-evaluation would be appreciated.

Again, thank you for the assistance and time you have given on this matter.

Very Truly Yours,
AES Consulting Engineers

V. Marc Bennett

V. Marc Bennett, P.E.
Senior Project Manager

Attachments

S:\Jobs\8223\07-SECTION 4\Wordproc\Document\822307l07.DEQ.vmb.doc

Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

RECEIVED
MAY 31 2006
ENVIRONMENTAL DIVISION

# EMERGENCY ACTION PLAN FOR CLASS I, CLASS II AND CLASS III IMPOUNDING STRUCTURES

Reference: Impounding Structure Regulations, 4VAC52-20-00 et seq., Virginia Soil and Water Conservation Board

1. Name of Impounding Structure: LAKE NICE DAM EMBANKMENT

   Inventory Number: _____

   Other Name (if any): _____

2. Hazard Potential Classification from Table I, Virginia Dam Safety Regulations:
   Class I  Class II  Class III (Underline One)

3. Name of Owner: WELLINGTON LLC

   Address: 632 HAMPTON HIGHWAY, YORKTOWN, VA 23693-4100

   Telephone: (Business)(757) 867-8800 (Residential)(____)_____

4. Name of Dam Operator: WELLINGTON LLC

   Address: 632 HAMPTON HIGHWAY, YORKTOWN, VA 23693-4100

   Telephone: (Business)(757) 867-8800 (Residential)(____)_____

   Name of Alternate Operator: WELLINGTON ESTATES HOMEOWNERS ASSOCIATION

   Telephone: (Business)(757) 867-8800 (Residential)(____)_____

5. Name of Rainfall or Staff Gage Observer for Dam: _____

   Address: _____

   Telephone: (Business)(____) _____(Residential)(____)_____

   Name of Alternate Observer: _____

   Telephone: (Business)(____) _____(Residential)(____)_____



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 158

6. 24-Hour Dispatch Center Nearest Dam-Police/Fire/Sheriff's Departments: James City County Emergency Operations Center

Address: 3135 Forge Road, Toano, VA 23168

Telephone: (Business)(757) 566-0112 (Residential)(____)_____

7. Name of City/County Emergency Services Coordinator(s): Chief Richard Miller

Address: James City County Fire Department
5077 John Tyler Highway
Williamsburg VA 23185

Telephone: (Business)(757) 565-7603 (Residential)(____)_____

8. Name, address and telephone number of all occupied dwellings that would be affected in the event of a dam failure, and/or inundation mapping of affected areas.

| Name | Address | Telephone Number |
|---|---|---|
| None | | |



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 159

9. Name, address and telephone numbers of owners of all commercial or recreational establishments that would be affected in the event of dam failure, and/or an inundation mapping of affected areas.

| Name | Address | Telephone Number |
|---|---|---|
| None | | |

10. Name, address and telephone number of owners of property, land and unoccupied buildings that would be affected in the event of a dam failure, and/or an inundation mapping of the affected area.

| Name | Address | Telephone Number |
|---|---|---|
| Stonehouse at Williamsburg, LLC | 8214 Westchester, Suite 635<br>Dallas, Texas 75225-6124 | |
| Fieldstone Investment, LLC | 8214 Westchester, Suite 635<br>Dallas, Texas 75225-6124 | |
| Williamsburg Christian Academy | 309 Waltz Farm Drive<br>Williamsburg, VA 23185-2601 | 757-220-1978 |
| George Hankins, Jr | 3408 Lynnwood Drive<br>Virginia Beach, VA 23452-6042 | 757-486-8208 |



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 160

11. If there are public roads downstream from the impounding structure, identify by highway number and distance below dam:

Route # 30, 0.6 Miles; Route # _____, _____Miles;
Route # _____, _____Miles; Route # _____, _____Miles.

Provide name of resident engineer, VA Dept. of Transportation, (or City/County engineer)

STEVEN W. HICKS
VIRGINIA DEPARTMENT OF TRANSPORTATION
Address: 4451 IRONBOUND ROAD
WILLIAMSBURG, VA 23188

Telephone: (Business)(757) 253-4832 (Residential)(_____)_____

NOTE: Items 12 and 13 should be provided from the Operation and Maintenance Application.

Definitions:
Stage I Condition – A flood watch, or heavy continuous rain or excessive flow of water from ice or snow melt.

Stage II Condition – A flood warning; or emergency spillway activated or dam overtopping/ breach may be possible.

Stage III Condition – Emergency spillway activated, dam overtopping or imminent failure is probable.

12. Amount of rainfall that will initiate a:

Stage II Condition _____inches per 6 hrs.
_____inches per 12 hrs.
_____inches per 24 hrs.
Stage III Condition _____inches per 6 hrs.
_____inches per 12 hrs.
_____inches per 24 hrs.

And/or the amount of flow in the emergency spillway that will initiate a:

Stage II Condition > 0 feet (depth of flow)
Stage III Condition > 1.5 feet (depth of flow)

Total depth of emergency spillway available before crest of dam is overtopped:
1.6' ± feet.

13. Frequency of observations by rainfall/staff gage observer during a:
Stage I Condition _____ Stage II ONCE AN HOUR
Stage III CONTINUOUS (recommend continuous)
Please identify access route and means of travel during flood conditions.
CROAKER RD (RT 607) TO POINT-OF-WOODS ROAD, TO LOCKHAVEN ROAD, TO END AND PICK UP "WOODS" ROAD.

Note: It is recommended that the Observer remain on post until pool elevation starts to recede.

14. Surveillance and Notification

a. The dam owner/operator **IS RESPONSIBLE** for notifying local government of any problem or potential problem at the dam site.

b. The dam owner/operator **WILL INITIATE** dam surveillance under Stage I conditions, ie, when a flood watch is issued.

c. The dam owner/operator **WILL NOTIFY** the 24-hour dispatch center and the local Emergency Services Coordinator when Stage II conditions are met in order to alert them to review actions that may be required for the safety and protection of people and property.

d. The dam owner/operator **WILL NOTIFY** the 24-hour dispatch center and the local Emergency Services Coordinator to initiate warning of residents when Stage III conditions or imminent dam failure are probable.

e. The owner/operator **WILL BE RESPONSIBLE** for operating such devices as spillway gates and low level outlets such as to cause the dam to function effectively. Attach narrative if required.

f. 24-hour dispatch center should prepare Standard Operating Procedures (SOP's) to implement dam overtopping/failure evacuation plans.

15. Evacuation Procedures:

Note: The dam owner/operator should notify the City/County 24-hour Dispatch Center, as required in paragraph 14d above. Phone # should be listed in [a (1)].

Note: Once the local government has been notified of any problem at a dam site, it should take appropriate protective measures in accordance with the local Emergency Operations Plan and accompanying Emergency Action Plan and Standing Operations Procedures. Other local government actions might include:

(1) Notify the individuals who are directly downstream and in immediate danger. A list of the names, addresses, and telephone numbers of these individuals should be listed in [a (2]).
(2) Monitoring the situation and, if time permits, review of evacuation plans.
(3) Begin Alert, Notification, and Warning
(4) Immediately evacuating the inundation areas, if conditions warrant.
(5) Expanding Direction and Control as well as beginning Emergency Public Information and operating shelters.
(6) Provide Situation Reports to the State Emergency Operations Center (804-674-2400 or 800-468-8892)

a. Once the local government has been notified of a condition requiring evacuation, the dam owner/operator and local government are mutually responsible for effecting evacuation.

(1) The dam owner/operator will: NO DOWNSTREAM DWELLINGS, BUSINESSES OR RECREATION AREAS THUS NO EVACUATION NEEDED

(2) Local government will: NO DOWNSTREAM DWELLINGS, BUSINESS OR RECREATION AREAS, THUS NO EVACUATION NEEDED.

Individuals who are directly downstream and in immediate danger include:

| NAME | ADDRESS | TELEPHONE |
|---|---|---|
| NO HABITATED AREAS | | |

b. Methods for notification and warning to evacuate include:
Check appropriate method(s)

✓ (1) Telephone TO EMERGENCY OPERATIONS CENTER

____ (2) Police/fire/sheriff radio dispatch vehicles with loudspeakers, bullhorns, etc.

____ (3) Personal runners for door-to-door alerting

____ (4) Radio/television broadcasts for area involved



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 163

16. Certification of Coordination between Owner/Operator and Local Government

**Certification by Owner/Operator**

I certify that procedures for implementation of this plan have been coordinated with _____ (City/County) and the local Emergency Services Coordinator. Also, that a copy of this Form has been filed with the State Department of Emergency Management; that this plan shall be adhered to during the life of the project; and that the information contained herein is current and correct to the best of my knowledge.

_____
(Signature of Owner/Operator)

This 23RD day of JUNE 20 04.

Printed Name HR ASHE

**Certification by Local Government**

I certify that procedures for the warning and evacuation of _____ (City/County) residents as required in the event of actual or impending failure of the _____ (name of dam) have been coordinated with the dam owner/operator.

_____
(Signature of City/County Official)

This _____ day of _____, 20_____.

Printed Name _____

Position _____

Please fill out and mail to:

**Virginia Department of Emergency Management**
**Emergency Services**
**10501 Trade Ct.**
**Richmond, Virginia 23236-3713**

**Dept. of Conservation and Recreation**
**Division of Dam Safety**
**203 Governor Street**
**Richmond, Virginia 23219-2094**



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 164

## EMERGENCY ACTION PLAN WORK/DATA SHEET

1. Name of Impounding Structure: LAKE NICE DAM EMBANKMENT

2. Inventory #: _____ Other Name (if any): _____

3. Total Height: 34.8 feet (Measured vertically from top of structure to streambed at downstream toe).

4. Total Impoundment Capacity at top of structure: 446 ± acre-feet.

5. Size Classification (Circle one): Large (Medium) Small

6. Hazard Classification (Circle one): Class I (Class II) Class III

7. Spillway Design (Circle one): PMF ½PMF 100-YR 50-YR UNKNOWN

8. Downstream Inundation Area determined by (Mark one):

   _____ (1) Judgement

   _____ (2) Empirical Formulas Type used: _____

   ✓ (3) Computer Programs Type used: HYDROFLOW HYDROGRAPHS

9. Critical Conditions used for structure failure (Mark one):

   _____ (1) Failure due to overtopping using:

   _____ PMF

   _____ % PMF

   _____ 100-YR

   _____ Other

   ✓ (2) Failure not due to flooding

   Describe: DAM BREACH COLLECTIVELY WITH A 100-YEAR, 24-HOUR STORM EVENT



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 165

Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

# OPERATION AND MAINTENANCE APPLICATION
# CLASS I, II AND III IMPOUNDING STRUCTURES

Reference: Impounding Structures Regulations, 4VAC 50-20-00 et seq., Virginia Soil and Water Conservation Board

1. Name of Impounding Structure: LAKE NICE DAM EMBANKMENT

   Inventory Number: _____ Other Name (if any) _____

2. Hazard Potential Classification from Table 1, Impounding Structure Regulations:

   (Circle One) Class I (Class II) Class III

3. Name of Owner: WELLINGTON LLC

   Address: 632 HAMPTON HIGHWAY, YORKTOWN VA 23693

   Telephone: (Business) (757) 867-8800 (Residential) (___) _____

4. Operating Plan and Schedule.
   Provide a narrative for each item:

   a. Operation of ~~control gates~~ and spillways. GRAVITY DAM

   b. Operation of Reservoir Drain (not to exceed ½ foot drawdown per day on embankment dams).
   NO RESERVOIR DRAIN

5. Maintenance Plan and Schedule
   Provide a narrative for each item:

   a. Embankment Dams:

      (1) embankment: MOWING 3 TIMES A YEAR, REMOVAL OF VEGETATION 1 TIMES PER YEAR, VISUAL INSPECTION 1 TIME PER YEAR, GENERAL REPAIRS ONCE/YR

      (2) principal spillway: CLEARING OF DEBRIS ONCE / MONTH. INSPECTION ONCE / YEAR.

      (3) emergency spillway: MOWING 3 TIMES A YEAR, REMOVAL OF VEGETATION AND GENERAL REPAIR ONCE A YEAR

      (4) low level outlet: NONE.

      (5) reservoir area: MAINTENANCE OF PERIMETER BUFFER TO REMOVE DEADWOOD ONCE / 2-YEARS.

      (6) downstream channel: NATURAL AREA / WETLAND, NO MAINTENANCE.

      (7) other: _____

   b. Concrete dams (including masonry and others):

      (1) upstream face: N/A

(DCR 199-099) (12/01)

(2) downstream face: N/A

(3) crest: N/A

(4) galleries: N/A

(5) tunnels, etc.: N/A

(6) abutments: N/A

(7) spillways: N/A

(8) gates and outlets: N/A

(9) other: N/A

6. Inspection schedule (attach schedule and checklist):

(1) operator inspection (daily, weekly, etc.)

(2) maintenance inspection (monthly, quarterly, semi-annual, annual)

(3) technical safety reinspection by a professional engineer. (required for certification update: Class I dams every two years, Class II dams every three years. All dams inspected after overtopping).

7. Emergency Action Plan Schedule.

Provide the information that initiates the Emergency Action Plan:

a. rainfall amounts and/or: FLOW > 1.5 FT THRU EMERGENCY SPILLWAY, STAGE III CONDITION

b. spillway flows: FLOW > 0 FT THRU EMERGENCY SPILLWAY, STAGE II CONDITION

c. frequency of observation:

8. For a newly constructed impounding structure, provide certification from a Professional Engineer who has inspected the impounding structure during construction that, to the best of the engineer's judgment, knowledge and belief, the impounding structure and all appurtenances have been constructed in conformance with the plans, specifications and drawings submitted to the Department of Conservation and Recreation.

N/A



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 167

# OPERATION AND MAINTENANCE PERMIT APPLICATION

## OPERATION AND MAINTENANCE SCHEDULES
## CERTIFICATION BY OWNER

I hereby certify that the operation and maintenance plans and schedules provided herewith will be adhered to during the life of the project except in cases of unanticipated emergency requiring departure therefrom in order to mitigate hazards to life and property, at which time my engineer and the Department of Conservation and Recreation will be notified.

Signed: MR Ashe
(Owner)

This 23rd day of June, 20 04.

## CERTIFICATE BY OWNER'S ENGINEER

I hereby certify that the information provided in this form has been examined by me and found in my professional judgment to be appropriate to operation and maintenance considerations for this dam.

Signed: [illegible] Virginia Number: 26628
Professional Engineer

This 21st day of June, 20 04.

Remarks: _____

**Please fill out and mail this form to:**
**Department of Conservation and Recreation**
**Division of Dam Safety**
**203 Governor Street**
**Richmond, Virginia 23219-2094**



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 168

Lake Nice Dam Embankment
Maintenance Schedule

Operator Inspections and Maintenance (Quarterly)

1. Inspect structure after significant rainfall events
2. Clear debris from entrance to discharge pipe
3. Note any erosion or damage to embankment caused by borrowing wildlife. Repair damage.
4. Record inspection and repairs completed.

Maintenance Inspection and Maintenance

1. Inspect structure after each significant rainfall event (more than 2 inches in 24-hour period).
2. Perform maintenance mowing 3 times a year (spring, summer, and fall).
3. Inspect structure for growing woody vegetation once per year, and remove vegetation.
4. Perform soil sampling on embankment once every 4 years to ensue proper grass growth. Maintain 40% vegetation coverage.
5. Perform inspections of barrel, and concrete flume quarterly. Make repairs as necessary.
6. Perform yearly inspections of structure for damage and seeps. Contact professional engineer for further investigation and assessment.
7. Perform yearly observations of pond perimeter noting changes in land use or topography.
8. Keep records of all activities, inspections, and repairs.
9. Have technical safety inspection performed every 3 years by professional engineer, and after each event of overtopping.

CONSULTING ENGINEERS

5248 Olde Towne Road • Suite 1 • Williamsburg, Virginia 23188
(757) 253-0040 • Fax (757) 220-8994 • E-mail aes@aesva.com

June 21, 2004

Mr. Darryl E. Cook
Director – Environmental Division
101-E Mounts Bay Road
Williamsburg, Virginia 23188

**RE: Lake Nice**
**Wellington Subdivision, Section 4**
**AES Project Number 8223-07**

Dear Mr. Cook:

As a result of our conversation last week regarding Wellington, Section 4, and the dam for Lake Nice, there are several items worth mentioning:

- Wellington, LLC, and Mr. Dick Ashe, completed all repairs and suggestions to the embankment and spillways of Lake Nice as mentioned in Mr. Robert Cooper's letter (from the Department of Conservation and Recreation) of July 1, 2003.
- Additional requirements, in the form of formal Inventory Reports, As-Built Reports, Operation and Maintenance Application, and Emergency Action Plans, were recently identified by Mr. Cooper. These items were not clearly identified in earlier correspondence. Mr. Ashe attempted on his own to fulfill these requirements some time ago, but without success. AES is now completing the documentation.
- When attempting to clarify needs in fulfilling obligations, it has been challenging to contact Mr. Cooper. (This difficulty was experienced by both Mr. Ashe and AES staff.)
- The embankment has had several limited, visual inspections by Herbert and Associates (geo-technical engineers), with copies of findings forward to your office noting satisfactory conditions at the site.
- The geo-technical engineers completed soil borings along the embankment.
- The historical performance of the embankment has proven satisfactory during extreme climatic conditions.
- The site has been inspected twice in recent history by a dam safety engineer from the Department of Conservation and Recreation.
- There has been a good faith effort by Wellington, LLC, and Mr. Ashe, to cooperate with DCR.

The above list is healthy. Although the Environmental Division has held fast to withholding the issuance of the Land Disturbing Permit for Wellington, Section 4, until the issues with the dam embankment have been resolved, a re-consideration is perhaps warranted upon reflection of the successes and efforts accomplished to date.

A re-evaluation would be appreciated.

Again, thank you for the assistance and time you have given on this matter.

Very Truly Yours,
AES Consulting Engineers

V. Marc Bennett

V. Marc Bennett, P.E.
Senior Project Manager

Attachments

S:\Jobs\8223\07-SECTION 4\Wordproc\Document\822307l07.DEQ.vmb.doc

DCR
Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

**AS-BUILT REPORT FOR CLASS I, II, AND III IMPOUNDING STRUCTURES**

Reference: Impounding Structure Regulations, 4VAC50-20-00 et seq., Virginia Soil and Water Conservation Board

1. Project Information:
   a. Name of Impounding Structure: LAKE NICE DAM EMBANKMENT
   b. Inventory Number: _____
   Other Name (if any): _____
   c. Name of Reservoir: LAKE NICE
2. Location of Impounding Structure:
   a. City/County: JAMES CITY COUNTY Magisterial District: STONEHOUSE
   b. Located 2500' feet/miles upstream/downstream of Hwy. # ROUTE 30
   c. Name of River or Stream: FRANCE SWAMP
   d. Latitude: N 37° 23.345' Longitude: W 76° 47.201'
3. Ownership:
   a. Owner's Name: WELLINGTON LLC
   b. Mailing Address: 632 HAMPTON HIGHWAY
   YORKTOWN, VA 23693-4100
   c. Telephone: (757) 867-8800
4. Construction/Alteration Design Report:
   a. Design Report Prepared by: _____
   b. Design Report Date: _____
   c. Construction/Alteration Permit #: _____ Date Issued: _____

The following As-Built Report is to provide the necessary information of a Safety Inspection Report for future reinspection:

5. Safety Inspection Report (if applicable):
   a. Safety Inspection Report Prepared By: _____
   b. Safety Inspection Report date: _____
6. Project Information: Provide a narrative describing the impounding structure:
   a. Description of dam and appurtenances; Embankment Length 500'; Height 34.8; Top Elevation 71.7; Top Width 15-17'; Sideslopes Upstream 3:1; Downstream 3:1; Principal Spillway (size & type) 16" DUCTILE IRON PIPE; Emergency Spillway Elevation 70.1; Width of Spillway 25' ±.

(DCR 199-100) (12/01)

b. Location: LOCATED ON UNNAMED TRIBUTARY OF FRANCE SWAMP CENTRALLY LOCATED WITHIN THE WELLINGTON ESTATES SUBDIVISION

c. Size Classification: Height: 34.8 ft. Maximum Capacity 446± Ac-Ft

Size Classification - Small (Medium) Large (Circle One)

d. Hazard classification: Downstream condition: WETLANDS, FRANCE SWAMP NO HABITABLE DWELLINGS, LOW HAZARD, EASTBOUND LANE OF ROUTE 30 MAY BE OVERTOPPED

Hazard Classification - Class I (Class II) Class III (Circle One)

e. Ownership: WELLINGTON LLC

f. Purpose of dam, describe: STORMWATER MANAGEMENT AND WATER QUALITY FACILITY

g. Design and construction history: DESIGN BY SOIL CONSERVATION SERVICE AND CONSTRUCTED BY JACK L. MASSIE CIRCA 1969

h. Normal operating procedures: NONE - GRAVITY DAM

i. Drainage area: ULTIMATELY 149.5 ACRES.

j. Discharge at dam site:

Low Level Outlet: NONE

Principal Spillway: 16" DUCTILE IRON PIPE / CONCRETE FLUME - 16 CFS

Emergency Spillway: 131 CFS

k. Dam and reservoir data, describe (Use Regulatory Table 1 Descriptions):



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 173

7. Engineering Data: Provide a narrative describing the engineering data:

a. Designed by: SOIL CONSERVATION SERVICE

b. Constructed by: JACK L. MASSIE

Date of Construction: CIRCA 1969

c. Evaluation of Design and Construction:

8. Visual Inspection: Provide a Description of the final As-Built Inspection:

a. Inspection date: 2/10/04, 4/24/03

b. Inspection by: HERBERT AND ASSOCIATES

c. General observations: REMOVAL OF VEGETATION, MOWING

d. Dam: MOWING, VEGETATION, SEEPS

e. Principal Spillway: REMOVE DEBRIS AT INTAKE, CLEAN PIPE/ GOOD CONDITION

f. Emergency Spillway: GRASSED

g. Low Level Outlet: NONE

h. Other Appurtenances: CONCRETE FLUME, GOOD CONDITION

i. Reservoir Area: NO REPORT

j. Downstream Channel/Area: NO REPORT

k. Instrumentation: NONE

l. Evaluation: "DAM, DISCHARGE AND SPILLWAY... PERFORMING ADEQUATELY AND SHOULD CONTINUE TO DO SO ...."



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 174

9. Operational Procedures: Provide a narrative describing the impounding structure procedures:

a. Operation: GRAVITY DAM, NO VALVES OR ~~[illegible]~~ GATES

b. Maintenance: SEE ATTACH MAINTENANCE SCHEDULE

c. Emergency Action Plan: LOW HAZARDS DOWNSTREAM
FLOW OVER EMERGENCY SPILLWAY 70 FT, STAGE II CONDITIONS
FLOWS OVER EMERGENCY SPILLWAY 71.5 FT, STAGE III CONDITIONS

d. Evaluation:

10. Hydraulic/Hydrologic Data: Provide a narrative describing hydraulic/hydrologic data:

a. Design: ORIGINAL DESIGN NOT KNOWN

b. Hydrologic records: UNKNOWN

c. Flood experience: UNKNOWN

d. Flood potential: WATER SURFACE ELEVATION @ 100-YEAR 24-HOUR STORM ESTIMATED @ EL. 67.7 (NOT OVERTOPPING EMERGENCY SPILLWAY)

e. Reservoir regulation:



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 175

f. Overtopping potential: SMALL; EMERGENCY SPILLWAY NOT OVERTOPPED DURING 100-YEAR STORM

g. Reservoir emptying potential: NONE

h. Evaluation: REGULAR MAINTENANCE AND INSPECTION REQUIRED.

11. Dam Stability: Provide a narrative describing impounding structure stability:

a. Foundation/abutments: SEE CORRESPONDENCE PROVIDED BY HERBERT AND ASSOCIATES.

b. Embankment materials: SEE CORRESPONDENCE FROM HERBERT AND ASSOCIATES

c. Embankment stability: SEE CORRESPONDENCE FROM HERBERT AND ASSOCIATES

d. Evaluation: SEE CORRESPONDENCE FROM HERBERT AND ASSOCIATES

12. Assessment/Remedial Measures: Provide a narrative describing the As-Built condition of the impounding structure:

a. Dam assessment: SEE CORRESPONDENCE FROM HERBERT AND ASSOCIATES

b. Recommended remedial measures: SEE CORRESPONDENCE FROM HERBERT AND ASSOCIATES.



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 176

CERTIFICATION BY OWNER'S ENGINEER

I hereby certify that the information provided in this As-Built Report has been examined by me and found to be true and correct ~~in my professional judgment.~~ TO THE BEST OF MY KNOWLEDGE.

Signed _____

(Professional Engineer)

Virginia Number 26628

This 21st day of JUNE, 20 04.

**Please fill out and mail this form to:**
**Department of Conservation and Recreation**
**Division of Dam Safety**
**203 Governor Street**
**Richmond, Virginia 23219-2094**



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 177

Lake Nice Dam Embankment
Maintenance Schedule

Operator Inspections and Maintenance (Quarterly)

1. Inspect structure after significant rainfall events
2. Clear debris from entrance to discharge pipe
3. Note any erosion or damage to embankment caused by borrowing wildlife. Repair damage.
4. Record inspection and repairs completed.

Maintenance Inspection and Maintenance

1. Inspect structure after each significant rainfall event (more than 2 inches in 24-hour period).
2. Perform maintenance mowing 3 times a year (spring, summer, and fall).
3. Inspect structure for growing woody vegetation once per year, and remove vegetation.
4. Perform soil sampling on embankment once every 4 years to ensue proper grass growth. Maintain 40% vegetation coverage.
5. Perform inspections of barrel, and concrete flume quarterly. Make repairs as necessary.
6. Perform yearly inspections of structure for damage and seeps. Contact professional engineer for further investigation and assessment.
7. Perform yearly observations of pond perimeter noting changes in land use or topography.
8. Keep records of all activities, inspections, and repairs.
9. Have technical safety inspection performed every 3 years by professional engineer, and after each event of overtopping.

Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

**INVENTORY REPORT FOR ~~CLASS III AND CLASS~~ CLASS II IV IMPOUNDING STRUCTURES**

Reference: Impounding Structure Regulations, 4VAC50-20-00 et seq., Virginia Soil and Water Conservation Board

1. Project Information:
   a. Name of Impounding Structure LAKE NICE DAM EMBANKMENT
   b. Inventory Number _____ Other Name (if any) _____
   c. Name of Reservoir LAKE NICE
   d. Purpose of Reservoir STORMWATER MANAGEMENT

2. Location of Impounding Structure:
   a. City/County JAMES CITY COUNTY Magisterial District STONEHOUSE
   b. Located 2500' feet/miles upstream/downstream of Highway. No. ROUTE 30
   c. Name of River or Stream FRANCE SWAMP
   d. Latitude N 37° 23.345' Longitude W 76° 47.201'

3. Ownership:
   a. Owner's Name WELLINGTON LLC
   b. Mailing Address 632 HAMPTON HIGHWAY
      YORKTOWN, VIRGINIA 23693-4100
   c. Telephone (757) 867-8800

4. Owner's Engineer:
   a. Engineering Firm/Engineer AES CONSULTING ENGINEERS / VAN MARC BENNETT
   b. Professional Engineer Virginia Number 26628
   c. Mailing Address 5248 OLDE TOWNE ROAD, SUITE 1
      WILLIAMSBURG, VA 23188
   d. Telephone (757) 253-0040

(DCR 199-104) (12/01)

5. Impounding Structure Data (All elevations NGVD unless noted):

a. Type of Material earth ✓ concrete_____ masonry_____

Other_____

| | Design Configuration | |
|---|---|---|
| b. Top of Dam | 71.7 ± | Elev. (if known) |
| c. Downstream Toe (Lowest) | 36.9 ± | Elev. (if known) |
| d. Height of Dam | 34.8 ± | Feet |
| e. Crest Length (Exclusive of Spillway) | 500' ± | Feet |
| f. Crest Width | 15-17' | Feet |
| g. Upstream Slope | 3 H: 1 V | |
| h. Downstream Slope | 3 H: 1 V | |

6. Reservoir Data

| | Design Configuration | |
|---|---|---|
| a. Maximum Capacity | 446 ± | Acre-feet |
| b. Maximum Pool | 67.7 | Elev. (if known) |
| c. Maximum Pool Surface Area | 18.4 | Acres |
| d. Normal Capacity | 301 ± | Acre-feet |
| e. Normal Pool | 64.2 ± | Elev. (if known) |
| f. Normal Pool Surface Area | 14.8 | Acres |
| g. Freeboard (Normal Pool to Top) | 6.9 | Feet |
| h. Freeboard (Normal Pool to Emergency) | 5.3 | Feet |

7. Spillway Data

| | Type | Construction Material | Maximum Capacity |
|---|---|---|---|
| a. Low Level Drain | N/A | | |
| b. Principal Spillway | 16" PIPE | DUCTILE IRON | 16 cfs |
| c. Emergency Spillway | TRAPEZOIDAL | EARTH | 131 cfs |

| | Design Configuration | |
|---|---|---|
| d. Low Level Drain | N/A | Elev. (if known) |
| e. Principal Spillway | 64.8 | Elev. (if known) |
| f. Emergency Spillway | 70.1 ± | Elev. (if known) |



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 180

g. Briefly describe the ~~low level drain~~ and principal spillway to include dimensions, materials of construction, trash guards, location in reservoir and through dam, and orientation of intake and discharge to dam if looking downstream: PRINCIPAL SPILLWAY IS 16" BARREL. DISCHARGING TO CONCRETE FLUME; NO TRASH GUARDS; LOCATED MIDPOINT OF EMBANKMENT. CONCRETE FLUME IS APPROXIMATELY 5' WIDE AND 70 FEET LONG TO TOE OF DAM.

h. Describe the emergency spillway to include dimensions, whether the spillway is an earth channel or other construction, spillway surface protection, and orientation to dam if looking downstream: EMERGENCY SPILLWAY FORMED IN NORTH SIDE; GRASS LINED, APPROXIMATELY 25' WIDE WITH 10:1 SIDE SLOPE (OR LESS)

8. Watershed Data (Class III only):

a. Drainage Area _____ Sq. Miles

b. Type and Extent of Watershed Development _____

c. Time of Concentration _____ Method _____

d. Spillway Design Flood used (mark appropriate box)

_____PMF, source _____

_____1/2 PMF, source _____

_____100 Year, source _____

_____50 Year, source _____

_____Other, source _____

e.. Design inflow hydrograph: Volume _____acre-feet;

Peak inflow _____C.F.S.;

Rainfall duration of design inflow hydrograph _____hours

f. Freeboard during passage of spillway design flood _____feet

9. Impounding Structure History

a. Date construction completed CIRCA 1969

b. Design by SOIL CONSERVATION SERVICE Date: CIRCA 1969

c. Built by JACK L. MASSIE Date: CIRCA 1969



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 181

d. Inspection dates LAST INSPECTION 2/10/04, 4/24/03

e. Inspections by HERBERT AND ASSOCIATES, LTD.

f. Description of repairs REMOVE VEGETATION, MOWING

g. Has the impounding structure ever been overtopped? _____ Yes _____ No UNKNOWN

10. Impounding Structure Assessment:

a. Provide brief descriptions for each item:

i. Condition of the impounding structure REFER TO CORRESPONDENCE BY HERBERT AND ASSOCIATES DATED 2/10/04, 4/24/03

ii. Condition of the reservoir REFER TO CORRESPONDENCE BY HERBERT AND ASSOCIATES DATED 2/10/04, 4/24/04

iii. Condition of the upstream area FALLOW FIELDS, CURRENT RESIDENTIAL CONSTRUCTION

iv. Condition of the downstream area NATIVE WOODED AREAS AND WETLAND HABITATS.

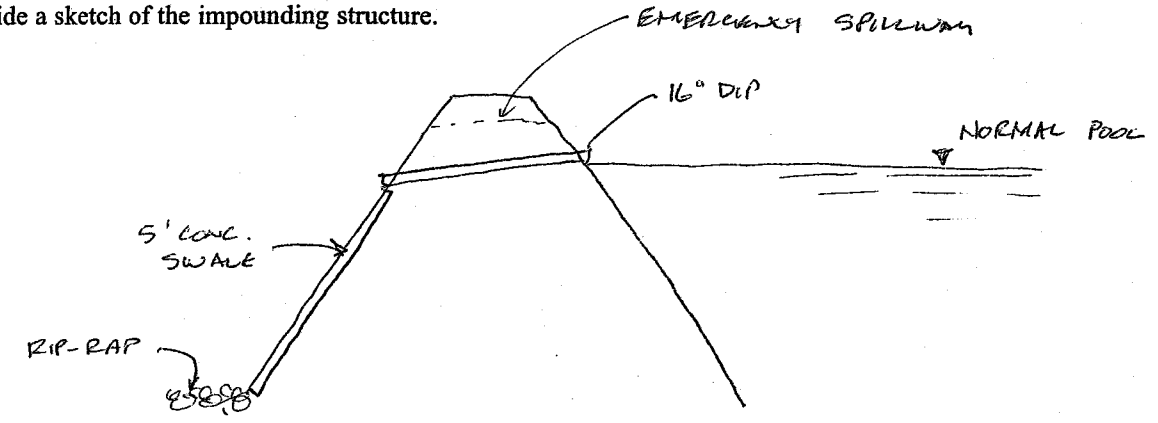
b. Provide a narrative describing any recent changes in the impounding structure, reservoir, upstream area, and downstream area: MINOR REPAIRS TO IMPOUNDMENT STRUCTURE; UPSTREAM AREA CURRENTLY BEING DEVELOPED AS RESIDENTIAL COMMUNITY; NO CHANGES DOWNSTREAM

c. Recommendations for remedial measures: REFER TO CORRESPONDENCE BY HERBERT AND ASSOCIATES DATED 2/10/04; 4/24/04



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 182

11. Provide a sketch of the impounding structure.




CERTIFICATION BY OWNER'S ENGINEER (Class III only)

I hereby certify that the information provided in this Inventory Report has been examined by me and found to be true and correct ~~in my professional judgment~~. TO THE BEST OF MY KNOWLEDGE.

Signed _____
(Professional Engineer)

Virginia Number 26628

This 21ST day of JUNE, 20 04.

CERTIFICATION BY OWNER (Class IV only)

I hereby certify that the information provided in this Inventory Report is true and correct.

Signed _____
(Owner)

This _____ day of _____, 20_____

**Please fill out and mail to:**
**Department of Conservation and Recreation**
**Division of Dam Safety**
**203 Governor Street**
**Richmond, Virginia 232192094**



WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 183

8557

Herbert and Associates, Ltd.
TESTING • ENGINEERING • INSPECTING
POST OFFICE BOX 64758 • VIRGINIA BEACH, VA 23464 • PHONE (757) 545-5234

April 24, 2003

Mr. Chuck Glissan
American Eastern
632 Hampton Highway
Yorktown, Virginia 23693

RE: Wellington – Section One, James City County, Virginia

Dear Mr. Glissan:

I am writing in regards to my recent inspection of the earthen dam at the referenced project. Please note we did not perform hand auger sampling as we feel it is not needed. Should this be required we can take samples as a follow up to this letter.

Purpose – prior to deeding the dam to the homeowners, the city has requested a determination as to the current state and the future state of dam stability.

Site Visit – I visited the site on April 21, 2003 and visually inspection the dam. The structure is an earthen dam based on the size of tree growth, I estimate the dam to be 20 to 30 years old.

No wet spots or piping was observed. Trees and underbrush cover the down stream face. Tall grass, underbrush and vines covered the up stream face.

The method of overflow control is by a single 16-inch I.D. cast iron pipe. For a short distance at the intake end, a section of corrugated metal pipe was observed. I could look all the way through the pipe and observed it to be very clean, except at the mouth of the intake end. The pipe appeared in a very good state of repair. The intake invert was several feet above the lake water level.

The pipe discharged into a concrete spillway approximately four feet wide, which ran down the slope to the marsh area below. The spillway appeared in a good state of repair.

Conclusion – The dam, discharge pipe and spillway appear to be performing adequately and should continue to do so in the upcoming years.

*Herbert and Associates, Ltd.*

Recommendations

(1) Remove all trees greater than 12"Φ by cutting at the base then grub all roots greater than 1 inch in diameter. Fill, compact and grade to adjacent contour.

(2) Cut all other vegetation flush with the ground and remove all debris from the site.

(3) Rake and remove all debris and leaves to allow seeding.

(4) Seed and fertilize the entire dam. Maintain the grass until it is well established.

(5) All grubbing, clearing, seeding, etc. shall continue for a distance of 50-feet beyond the abutment contacts.

(6) Regular mowing throughout the year (maintain grass at a height of 6 inches or less) is essential so that the surface can be readily traversed by foot for bi-annual inspections and potential dam safety problems, such as misalignment, cracks, animal burrows, surface erosion, seepage, wet spots, etc. can be spotted early.

(7) Bi-annual inspections by a licensed Engineer should be conducted. Mowing should occur just prior to the inspection.

In hope this meets with your approval.

COMMONWEALTH OF PENNSYLVANIA
4.24.03
DONALD P. COGHLAN
No.
14829
PROFESSIONAL ENGINEER

Respectfully submitted,
Herbert and Associates, Ltd.,

Donald P. Coghlan, P.E.,
Geotechnical Engineer

Herbert and Associates, Ltd.
TESTING & ENGINEERING & INSPECTING
POST OFFICE BOX 64758 • VIRGINIA BEACH, VA 23464 • PHONE (757) 546-5934

February 10, 2004

Mr. R. N. Ashe
American Eastern, Inc.,
632 Hampton Highway
Yorktown, Virginia 23693

RE: Earthen dam at Wellington Subdivision,
Section One, James City County, Virginia

Dear Mr. Ashe:

We are writing to address the overall dam stability and the source of water at the downhill toe.

We performed one Standard Penetration test atop the dam. This test indicates the dam consist of clayey sand (SC) fill material to a depth of approximately twenty (20) feet. The water table is coincidental with the depth of fill. The water at the toe of the slope is one flow net just below the dense clayey sands and in the in-situ poorly graded sands (SP).

Based on our field investigations, analysis and since the dam has functioned for over thirty (30) years, our conclusion is the dam is stable and will remain so for the near future.

As discussed in our letter of April 24, 2003 the following recommendations should be met to ensure dam safety:

1. Remove all vegetation on the lake side slope and roots greater than one inch in diameter. Fill, compact, grade and seed.

2. Regular mowing throughout the year (maintain grass at a height of 6-inches or less) is essential so the surface can be readily traversed by foot for bi-annual inspection and to identify dam safety problems.

Herbert and Associates, Ltd.

3. Annual inspection by a licensed Professional Engineer should be conducted. Mowing should occur just prior to the inspections.

All other items addressed in the department of Conservation and recreation latter dated 7-1-03 will be addressed by others.

In hope this meets with your approval.

Respectfully submitted,
Herbert and Associates, Ltd.,

Donald P. Coghlan, P.E.,
Geotechnical Engineer

COMMONWEALTH OF VIRGINIA
4.20.04
DONALD P. COGHLAN
No.
14829
PROFESSIONAL ENGINEER

8557

Herbert and Associates, Ltd.
TESTING • ENGINEERING • INSPECTING
POST OFFICE BOX 64758 • VIRGINIA BEACH, VA 23464 • PHONE (757) 545-5234

April 24, 2003

Mr. Chuck Glissan
American Eastern
632 Hampton Highway
Yorktown, Virginia 23693

RE: Wellington – Section One, James City County, Virginia

Dear Mr. Glissan:

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Conclusion – The dam, discharge pipe and spillway appear to be performing adequately and should continue to do so in the upcoming years.

*Herbert and Associates, Ltd.*

Recommendations

(1) Remove all trees greater than 12"Φ by cutting at the base then grub all roots greater than 1 inch in diameter. Fill, compact and grade to adjacent contour.

(2) Cut all other vegetation flush with the ground and remove all debris from the site.

(3) Rake and remove all debris and leaves to allow seeding.

(4) Seed and fertilize the entire dam. Maintain the grass until it is well established.

(5) All grubbing, clearing, seeding, etc. shall continue for a distance of 50-feet beyond the abutment contacts.

(6) Regular mowing throughout the year (maintain grass at a height of 6 inches or less) is essential so that the surface can be readily traversed by foot for bi-annual inspections and potential dam safety problems, such as misalignment, cracks, animal burrows, surface erosion, seepage, wet spots, etc. can be spotted early.

(7) Bi-annual inspections by a licensed Engineer should be conducted. Mowing should occur just prior to the inspection.

In hope this meets with your approval.

COMMONWEALTH OF PENNSYLVANIA
4.24.03
DONALD P. COGHLAN
No. 14829
PROFESSIONAL ENGINEER

Respectfully submitted,
Herbert and Associates, Ltd.,

Donald P. Coghlan, P.E.,
Geotechnical Engineer

WELLINGTON LLC
632 HAMPTON HWY. YORKTOWN, VA 23693
(757) 867-8800 FAX (757) 867-7188

COPY
*MAILED
9-25-07
mcl

RECEIVED
OCT 18 2007
ENVIRONMENTAL DIVISION

September 25, 2007

Robert E. Cooper, P.E.
Dam Safety Engineer
Commonwealth of Virginia
Department of Conservation and Recreation
203 Governor Street, Suite 206
Richmond, VA 23219-2010

RE: Lake Nice Dam, Inventory Number 09527

Dear Mr. Cooper,

Attached, please find the dam inspection report on the dam located at Wellington Subdivision, Section 1, James City County, Virginia as required as part of our annual inspection. Please call my office if you have any questions.

Sincerely,

HRAshe/mcl

H. R. Ashe

HRA/mcl

Attachment

# DONALD P. COGHLAN, P. E.
## 1418 MOORES POINT ROAD
### SUFFOLK, VIRGINIA 23436
### (757) 535-6772


Sept 18, 2007

RECEIVED
SEP 19 2007

Mr. R.N. Ashe
American Eastern, Inc
632 Hampton Highway
Yorktown, Virginia 23693

Re. Earthen Dam at Wellington Subdivision, Section One James, City County, Virginia

Dear Mr. Ashe

On Sept 16, 2007 I visited the referenced earthen dam to perform the annual inspection. Just prior to my inspection the dam surface had been mowed allowing good visual observations. The dam surface was traversed and inspected for changes in contour and water seepage. All surfaces appeared in continual good condition. The overflow corrugated pipe and concrete spillway also appeared in good condition with no signs of excessive deterioration.

Based on this inspection, I conclude the dam remains in stable condition and will remain so for the near future.

As before, continued mowing to limit vegetation height to 6 inches and annual inspections are essential.

In hopes this meets with your approval.

COMMONWEALTH OF VIRGINIA
9-18-07
DONALD P. COGHLAN
No. 14829
PROFESSIONAL ENGINEER

Respectfully

Donald P. Coghlan, P.E.

Date Record Created:

Created By:

WS_BMPNO: WC067

Print Form

**PRINTED ON:**
**Friday, March 12, 2010**
**2:54:14 PM**

| | |
|---|---|
| WATERSHED | WC |
| BMP ID NO | 067 |
| PLAN NO | |
| TAX PARCEL | (13-3) (1-12) |
| PIN NO | 1330100012 |
| CONSTRUCTION DATE | 12/7/1941 |
| PROJECT NAME | Lake Nice |
| FACILITY LOCATION | Directly in the middle of Wellington |
| CITY-STATE | Williamsburg |
| CURRENT OWNER | Wellington LLC |
| OWNER ADDRESS | |
| OWNER ADDRESS 2 | |
| CITY-STATE-ZIP CODE | |
| OWNER PHONE | |
| MAINT AGREEMENT | No |
| EMERG ACTION PLAN | No |

Get Last BMP No

Return to Menu

| | |
|---|---|
| MAINTENANCE PLAN | Yes |
| SITE AREA acre | 157 |
| LAND USE | R-1 |
| old BMP TYP | Wet Pond |
| JCC BMP CODE | A3 Wet ED Pond |
| POINT VALUE | 10 |
| SVC DRAIN AREA acres | 150 |
| SERVICE AREA DESCRI | Mirror Lakes/Wellington |
| IMPERV AREA acres | 15.00 |
| RECV STREAM | Ware Creek |
| EXT DET-WQ-CTRL | No |
| WTR QUAL VOL acre-ft | |
| CHAN PROT CTRL | No |
| CHAN PROT VOL acre-ft | |
| SW/FLOOD CONTROL | No |
| GEOTECH REPORT | Yes |

| | |
|---|---|
| CTRL STRUC DESC | N/A |
| CTRL STRUC SIZE inches | |
| OTLT BARRL DESC | DIP |
| OTLT BARRL SIZE inch | 15 |
| EMERG SPILLWAY | No |
| DESIGN HW ELEV | 68.00 |
| PERM POOL ELEV | 62.9 |
| 2-YR OUTFLOW cfs | 4.11 |
| 10-YR OUTFLOW cfs | 7.89 |
| REC DRAWING | No |
| CONSTR CERTIF | No |

LAST INSP DATE 12/16/2004 Inspected by:

INTERNAL RATING 2

MISC/COMMENTS

NWSEL area = 14.4 acres. Dam Safety Class II O&M Cert.#09527 Expires 9/30/2010

Additional Comments:

James City County
VIRGINIA
Jamestown 1607

# TRANSMITTAL SHEET

## ENGINEERING & RESOURCE PROTECTION → STORMWATER

Project: Windsor Ridge Section 3 (Wellington)

County Plan No. _____

Assigned BMP No.: WC 067

BMP Type: Lake - Wet Pond

RECEIVED ON
JUN 15 '12
Stormwater Division

Information Enclosed:

- ☐ Record Drawings (Asbuilts)
- ☐ Construction Certification
- ☐ Computations
- ☒ Other : This DCR dam safety information for Lake Nice was provided as part of the review of a new (one of last) remaining sections in Wellington.

Lake Nice designation for use as BMP was based on other plan reviews.

This case was called Windsor Ridge Section 3 County Plan No. S-27-11.

Name: Scott J. Thomas

Date: 6/13/12

Signature: Scott J Thomas

Dam Safety Permit

**Wellington H.O.A.**
632 Hampton Highway
Yorktown, VA 23693
(757) 867-8800
Fax (757) 867-7188

COPY
*MAILED
8-17-09
mcl

Environmental Division

August 17, 2009

JUN 05 2012

PLANNING DIVISION

JUN 01 2012

RECEIVED

RECEIVED

Commonwealth of Virginia
Department of Conservation & Recreation
203 Governor Street
Suite 206
Richmond, VA 23219

Attn: William G. Browning
Director, Division of Dam Safety & Floodplain Management

Dear Mr. Browning,

Enclosed you will find a copy of a letter from Donald P. Coghlan, P.E. referencing your letter of July 10, 2009, Lake Nice Dam inventory number 09527. I trust that Mr. Coghlan's letter will suffice in the information you requested in your letter. Also, in reference to the 100-year flood elevation, we submitted all of this information to you about 4 years ago with certifications from AES Engineering on the 100-year flood, the Dam itself and the overflow elevations. Also the certification included the fact that that the overflow was on the backside of a ridge, away from the original valley that was filled to make the dam, therefore in an overflow situation, there should never be an erosion problem of the dam itself. Should you require additional information, please send a request to me in writing.

Sincerely,

HRAshe/mcl

H. R. Ashe, President
Wellington HOA

HRA/mcl

Enclosure

County BMP ID Code: WC 067
Lake Nice
Information as submitted as
part of plan review application
5-27-11
Windsor Ridge Sec 3
8 Lots
(form. Wellington)

# DONALD P. COGHLAN, P. E.
## 1418 MOORES POINT ROAD
## SUFFOLK, VIRGINIA 23436
## (757) 535-6772


Aug. 12, 2009

AUG 1 3 2009

Mr. R.N. Ashe
American Eastern, Inc
632 Hampton Highway
Yorktown, Virginia 23693

Re. Lake Nice Earthen Dam, Inventory Number 09527, Wellington Subdivision, James City County, Virginia

Dear Mr. Ashe

I have reviewed the Department of Conservation and Recreation letter dated July 10, 2009. In particular, the application of 4VAC50-20-40 and 4VAC50-20-50 to the referenced dam.

My review indicates the referenced structure will have a "Low Hazard Potential" resulting in no expected loss of life and would cause no more than minimal economic damage. "No expected loss of life" means no loss of human life is expected.

In addition, I recommend you contact your civil engineer and establish the top of spillway is at or below the 100 year flood elevation as required in Table 1, Impounding Structures Regulations, 4VAC50-20-50.

In hopes this meets with your approval.

COMMONWEALTH OF VIRGINIA
8·12·09
DONALD P. COGHLAN
No. 14829
PROFESSIONAL ENGINEER

Respectfully

Donald P. Coghlan, P.E.

Forwarded to County per HEA 1770-01 TLCK
Forwarded to D. Coghlan per HEA 1770-01 TLCK
dcoghlan@aol.com

L. Preston Bryant, Jr.
Secretary of Natural Resources

Joseph H. Maroon
Director

# COMMONWEALTH of VIRGINIA

## DEPARTMENT OF CONSERVATION AND RECREATION

203 Governor Street, Suite 206
Richmond, Virginia 23219-2010
(804) 371-6095 Fax (804) 371-2630

JUL 16 2009

July 10, 2009

American Eastern Inc.
Wellington LLC
632 Hampton Highway
Yorktown, VA 23693

Re: Lake Nice Dam, Inventory Number 09527

The September 26, 2008 revisions to Virginia's Impounding Structure Regulations resulted in changes to spillway design flood requirements for dams in the Commonwealth. These changes are contained in Table 1 of section 4VAC50-20-50 (enclosed). In some cases, these new standards may require spillway upgrades to dams that have previously been issued a Regular Operation and Maintenance Certificates under previous regulatory standards. The purpose of this letter is to remind the owners of dams that held Regular Operation and Maintenance Certificates as of the effective date of the new regulations of the new requirements, and to alert you of an option that may be available for complying with the new spillway design flood criteria if an upgrade is required for your dam.

All dam owners are encouraged to consult with their professional engineers to determine whether the new regulations will impact the spillway design flood requirements for their dams. This evaluation may include the preparation of a dam break inundation zone map if such a map has not previously been prepared since September 26, 2008. In many instances, this analysis may show that no additional spillway design flood requirements apply. In this case, and assuming that no other areas of concern are identified by your engineer, your dam remains in compliance with the Regulations and you may continue to operate under your existing Regular Operation and Maintenance Certificate or Conditional Operation and Maintenance Certificate until its expiration. For informational purposes, I do request that you notify me of any such conclusion reached by your engineer at the above address.

If, however, your engineer determines that the new regulations will require an upgrade to your dam's spillway, section 4VAC50-20-125 of the regulations provides an extended period of time for the upgrade to occur (although the owner always remains free to make upgrades sooner if desired). Specifically, that section states that if an impounding structure was determined to have an adequate spillway capacity prior to September 26, 2008 (the effective date of the new regulations) and is currently operating under a Regular Operation and Maintenance Certificate, but will now require spillway modifications due to changes in the regulations, the owner shall submit an Alteration Permit Application to the Virginia Soil and Water Conservation Board



Dam Safety Permit
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 196
Apr 26 12 02:26p 757-874-2879

(Board) through the Dam Safety Regional Engineer in accordance with Section 4VAC50-20-80 of the Regulations to address spillway capacity at the time of the expiration of the Regular Operation and Maintenance Certificate for the dam or by September 26, 2011, whichever is later. For dam owners whose Regular Operation and Maintenance Certificates have already expired or will expire prior to the September 26, 2011 date, this will provide extra time for planning a spillway upgrade. The Design Report for your Alteration Permit will then need to include a construction sequence and milestones for completing the necessary improvements within five years of the Board's issuance of the Alteration Permit. This five year period represents a significant extension of time from the normal term assigned to an Alteration Permit, which is intended to allow dam owners an even greater amount of time to complete any necessary spillway upgrades.

Although the new regulations do allow for this extended time period for upgrades to certain dams, it is important to note that other regulatory requirements still apply. Dam owners are required to address other deficiencies that may exist, and the Board, if circumstances warrant, may direct that alterations be completed sooner than specified by section 4VAC50-20-125. Additionally, in all cases the requirements for reapplying for an Operation and Maintenance Certificate remain applicable. This means that you will need to submit an Operation and Maintenance Certificate Application, Emergency Action Plan or Emergency Preparedness Plan (as may be applicable), an Annual Inspection Report, a Dam Break Inundation Zone Map and any other required documentation and fees 90 days prior to the expiration of your current Regular Operation and Maintenance Certificate, whether or not you intend to utilize the section 4VAC50-20-125 process.

Please direct all questions to Steven M. Snell, telephone 804-786-1359, or via e-mail at Steven.Snell@dcr.virginia.gov.

Sincerely,

William G. Browning,
Director, Division of Dam Safety and Floodplain Management

c: James M. Robinson, P. E., Dam Safety Program Manager
Steven M. Snell, P.E., Dam Safety Regional Engineer

COPY *MAILED 9-28-09 JMC

DCR
Virginia Department of Conservation & Recreation
State Parks • Soil & Water Conservation • Natural Heritage
Chesapeake Bay Local Assistance • Land Conservation
Outdoor Recreation Planning • Dam Safety & Floodplains

Date Prepared: 9-28-09
Prepared By: H.R. ASHE

# ANNUAL INSPECTION REPORT FOR VIRGINIA REGULATED IMPOUNDING STRUCTURES

Reference: Impounding Structures Regulations, 4VAC 50-20-10 et seq., including 4VAC 50-20-105, Virginia Soil and Water Conservation Board

**Owner's Information**

Name of Dam: LAKE NICE DAM
Inventory Number: 09527
Owner's Name: WELLINGTON LLC
Location-County/City: JAMES City COUNTY
Contact Person (if different from above): WELLINGTON LLC
Owner's Address: 632 HAMPTON HWY YORKTOWN VA 23693
Hazard Classification: II
Name of reservoir:
Purpose of reservoir:
Telephone No.: (Residential) (Business) 757-867-8800
Other means of communication:

**Owner's Engineer**

Name of Engineering Firm and Engineer: DONALD P. COGHLAN P.E.
Professional Engineer Virginia License Number: 14829
Mailing Address: 1418 MOORE'S POINT ROAD SUFFOLK VA 23436

Telephone No.: (Business) 757-535-6772

**Directions: Make note of all pertinent conditions and changes since the last inspection, or, if this is the first inspection, since the filing of a design report.**

**Date of This Inspection** 9-22-09
**Date of Last Inspection** 9-23-09

**1. EMBANKMENT**

a. Any alteration made to the embankment? NO

b. Erosion on embankment? NO

c. Settlement, misalignment or cracks in embankment? NO

d. Seepage? If so, seepage flow rate and location (describe any turbidity and observed color within the flow): NO

**2. UPSTREAM SLOPE**

a. Woody vegetation discovered? NO
b. Rodent burrows discovered? NO
c. Remedial work performed? NO

**3. INTAKE STRUCTURE**

a. Deterioration of concrete? N/A
b. Exposure of rebar reinforcement? N/A
c. Is there a need to repair or replace the trash rack? N/A
d. Any problems with debris? NO
e. Was the drawdown valve operated? N/A



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WC067_LAKE_NICE_LARGE_LAKE_MIRROR_198
9-d 757-874-2879

4. **ABUTMENT CONTACTS**
   a. Any seepage? If so, estimate the flow rate and describe the location of the seep or damp areas (describe any turbidity and observed color within the flow): NO

5. **EARTHEN EMERGENCY SPILLWAY**
   a. Obstructions to flow? If so, describe plans to correct: NO
   b. Rodent burrows discovered? NO
   c. Any deterioration in the approach or discharge channel? NO

6. **CONCRETE EMERGENCY SPILLWAY**
   a. Deterioration of concrete? NO
   b. Exposed steel reinforcement? NO
   c. Any leakage below concrete spillway? NO
   d. Obstructions to flow? If so, lists plans to correct: NO

7. **DOWNSTREAM SLOPE**
   a. Woody vegetation discovered? NO
   b. Rodent burrows discovered? NO
   c. Are seepage drains flowing? NO
   d. Any seepage or wet areas? YES 1.5 GPM (at bottom of slope)

8. **OUTLET PIPE**
   a. Any water flowing outside of discharge pipe through the Impounding Structure? NO
   b. Describe any deflection or damage to the pipe: NO

9. **STILLING BASIN**
   a. Deterioration of concrete structures? N/A
   b. Exposure of rebar reinforcement? N/A
   c. Deterioration of the basin slopes? N/A
   d. Repairs made? N/A
   e. Any obstruction to flow? N/A

10. **GATES**
    a. Gate malfunctions or repairs? N/A
    b. Corrosion or damage? N/A
    c. Were any gates operated? If so, how often and to what extreme? N/A

11. **RESERVOIR/WATERSHED**
    a. New developments upstream of dam? ONLY PER APPROVED PLANS OF 1999
    b. Slides or erosion of lake banks around the rim? NONE
    c. General comments to include silt, algae or other influence factors: NONE



Dam Safety Permit
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WC067_LAKE_NICE_LARGE_LAKE_MIRROR/199 757-874-2879

12. INSTRUMENTS

a. List all instruments NONE (ONLY VISUAL)

b. Any readings of instruments?

c. Any installation of new instruments?

13. DOWNSTREAM/HAZARD ISSUES

a. New development in downstream inundation zone? NONE

b. Note the maximum storm water discharge or peak elevation during the previous year. overflow only thru overflow pipe - has never observed flow thru earth overflow

c. Was general maintenance performed on dam? If so, when? Yes-periodically when needed

d. List actions that need to be accomplished before the next inspection: general maintenance

14. OVERALL EVAULATION OF IMPOUNDING STRUCTURE AND APPURTENANCES

(Check one) ☐ EXCELLENT ☑ GOOD ☐ POOR

General Comments:

Recommendations:



Dam Safety Permit
Apr 26 12 02:27p 757-874-2879
WC067_LAKE_NICE_LARGE_LAKE_MIRROR.JPG/200

**CERTIFICATION BY OWNER'S ENGINEER (required only when an inspection by an engineer is required)**

I hereby certify that the information provided in this report has been examined by me and found to be true and correct in my professional judgment.

Signed: _____ Virginia Number: _____
Professional Engineer's Signature Print Name

This _____ day of _____ , 20 ____ .

Engineer's Virginia Seal:

**CERTIFICATION BY OWNER**

I hereby certify that the information provided in this report has been examined by me.

Signed: HRashe HRASHE
Owner's Signature Print Name

This 22 day of September , 20 09 .

**Mail the executed form to the appropriate**
**Department of Conservation and Recreation**
**Division of Dam Safety and Floodplain Management**
**Regional Engineer**



Dam Safety Permit
WC067_LAKE_NICE_LARGE_LAKE_MIRROR_201 757-874-2879 Apr 26 12 02:27p p.9

Herbert and Associates, Ltd.
TESTING • ENGINEERING & INSPECTING
POST OFFICE BOX 64758 • VIRGINIA BEACH, VA 23464 • PHONE (757) 546-5234

RECEIVED
APR 26 2004

February 10, 2004

Mr. R. N. Ashe
American Eastern, Inc.,
632 Hampton Highway
Yorktown, Virginia 23693

RE: Earthen dam at Wellington Subdivision,
Section One, James City County, Virginia

Dear Mr. Ashe:

We are writing to address the overall dam stability and the source of water at the downhill toe.

We performed one Standard Penetration test atop the dam. This test indicates the dam consist of clayey sand (SC) fill material to a depth of approximately twenty (20) feet. The water table is coincidental with the depth of fill. The water at the toe of the slope is one flow net just below the dense clayey sands and in the in-situ poorly graded sands (SP).

Based on our field investigations, analysis and since the dam has functioned for over thirty (30) years, our conclusion is the dam is stable and will remain so for the near future.

As discussed in our letter of April 24, 2003 the following recommendations should be met to ensure dam safety:

1. Remove all vegetation on the lake side slope and roots greater than one inch in diameter. Fill, compact, grade and seed.

2. Regular mowing throughout the year (maintain grass at a height of 6-inches or less) is essential so the surface can be readily traversed by foot for bi-annual inspection and to identify dam safety problems.

3. Annual inspection by a licensed Professional Engineer should be conducted. Mowing should occur just prior to the inspections.

All other items addressed in the department of Conservation and recreation latter dated 7-1-03 will be addressed by others.

In hope this meets with your approval.

Respectfully submitted,
Herbert and Associates, Ltd.,

Donald P. Coghlan, P.E.,
Geotechnical Engineer

COMMONWEALTH OF VIRGINIA
4.20.04
DONALD P. COGHLAN
No.
14829
PROFESSIONAL ENGINEER

# AMERICAN EASTERN, INC.

BUILDER • DEVELOPER

632 HAMPTON HWY. • YORKTOWN, VIRGINIA 23693 (757) 867-8800 • Fax (757) 867-7188


COPY

*MAILED
Certified
8/18/04
mcl

August 17, 2004

Robert Cooper
Department of Conservation and Recreation
Division of Dam Safety
203 Governor Street
Richmond, VA 23219-2094

Dear Mr. Cooper,

Enclosed, please find information on Lake Nice in the Wellington Subdivision. All items in your letter dated July 1, 2003 have been complied with and all submittals requested are enclosed. Please contact me if you have any further questions or need any further information.

Sincerely,

HRAshe/mcl

H. R. Ashe

HRA/mcl

Enclosures

Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

# OPERATION AND MAINTENANCE APPLICATION
# CLASS I, II AND III IMPOUNDING STRUCTURES

Reference: Impounding Structures Regulations, 4VAC 50-20-00 et seq., Virginia Soil and Water Conservation Board

1. Name of Impounding Structure: LAKE NICE DAM EMBANKMENT

   Inventory Number: _____ Other Name (if any) _____

2. Hazard Potential Classification from Table 1, Impounding Structure Regulations:

   (Circle One) Class I (Class II) Class III

3. Name of Owner: WEMINGTON LLC

   Address: 632 HAMPTON HIGHWAY, YORKTOWN VA 23693

   Telephone: (Business) (757) 867-8800 (Residential) (___) _____

4. Operating Plan and Schedule.
   Provide a narrative for each item:

   a. Operation of ~~control gates~~ and spillways. GRAVITY DAM

   b. Operation of Reservoir Drain (not to exceed ½ foot drawdown per day on embankment dams).
   NO RESERVOIR DRAIN

5. Maintenance Plan and Schedule
   Provide a narrative for each item:

   a. Embankment Dams:
      (1) embankment: MOWING 3 TIMES A YEAR, REMOVAL OF VEGETATION 1 TIMES PER YEAR, VISUAL INSPECTION 1 TIME PER YEAR, GENERAL REPAIRS ONCE/YR.
      (2) principal spillway: CLEARING OF DEBRIS ONCE / MONTH. INSPECTION ONCE / YEAR.
      (3) emergency spillway: MOWING 3 TIMES A YEAR, REMOVAL OF VEGETATION AND GENERAL REPAIR ONCE A YEAR
      (4) low level outlet: NONE.
      (5) reservoir area: MAINTENANCE OF PERIMETER BUFFER TO REMOVE DEADWOOD ONCE / 2-YEARS
      (6) downstream channel: NATURAL AREA / WETLAND, NO MAINTENANCE.
      (7) other: _____

   b. Concrete dams (including masonry and others):
      (1) upstream face: N/A

(DCR 199-099) (12/01)

(2) downstream face: N/A

(3) crest: N/A

(4) galleries: N/A

(5) tunnels, etc.: N/A

(6) abutments: N/A

(7) spillways: N/A

(8) gates and outlets: N/A

(9) other: N/A

6. Inspection schedule (attach schedule and checklist):

(1) operator inspection (daily, weekly, etc.)

(2) maintenance inspection (monthly, quarterly, semi-annual, annual)

(3) technical safety reinspection by a professional engineer. (required for certification update: Class I dams every two years, Class II dams every three years. All dams inspected after overtopping).

7. Emergency Action Plan Schedule.

Provide the information that initiates the Emergency Action Plan:

a. rainfall amounts and/or: FLOW > 1.5 FT THRU EMERGENCY SPILLWAY, STAGE III CONDITION

b. spillway flows: FLOW > 0 FT THRU EMERGENCY SPILLWAY, STAGE II CONDITION

c. frequency of observation: _____

8. For a newly constructed impounding structure, provide certification from a Professional Engineer who has inspected the impounding structure during construction that, to the best of the engineer's judgment, knowledge and belief, the impounding structure and all appurtenances have been constructed in conformance with the plans, specifications and drawings submitted to the Department of Conservation and Recreation.

N/A



Dam Safety Permit
WC067_LAKE_NICE_LARGE_LAKE_MIRROR / 206 757-874-2879 Apr 26 12 02:28p p.14

CERTIFICATE BY OWNER'S ENGINEER

I hereby certify that the information provided in this form has been examined by me and found in my professional judgment to be appropriate to operation and maintenance considerations for this dam.

Signed: _____ Virginia Number: 26628
Professional Engineer

This 21st day of June, 20 04.

Remarks: _____

**Please fill out and mail this form to:**
**Department of Conservation and Recreation**
**Division of Dam Safety**
**203 Governor Street**
**Richmond, Virginia 23219-2094**



Dam Safety Permit
Apr 26 12 02:28p 757-874-2879
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 207
757-874-2879 p.15

American Eastern

1003 Brick Kiln Blvd.

Newport News, Virginia 23602

757-867-8800

757-874-2879

# Fax

To: Marc Bennett From : H R Ashe

Fax: 220-8994 Pages:

Phone: Date:

Re: Wellington Dam Cc:

11. If there are public roads downstream from the impounding structure, identify by highway number and distance below dam:

Route # 30, 0.6 Miles; Route # _____, _____ Miles;
Route # _____, _____ Miles; Route # _____, _____ Miles.

Provide name of resident engineer, VA Dept. of Transportation, (or City/County engineer)

STEVEN W. HICKS
VIRGINIA DEPARTMENT OF TRANSPORTATION
Address: 4451 IRONBOUND ROAD
WILLIAMSBURG, VA 23188

Telephone: (Business)( 757 ) 253-4832 (Residential)( ____ ) _____

NOTE: Items 12 and 13 should be provided from the Operation and Maintenance Application.

Definitions:
Stage I Condition – A flood watch, or heavy continuous rain or excessive flow of water from ice or snow melt.

Stage II Condition – A flood warning; or emergency spillway activated or dam overtopping/ breach may be possible.

Stage III Condition – Emergency spillway activated, dam overtopping or imminent failure is probable.

12. Amount of rainfall that will initiate a:

Stage II Condition _____ inches per 6 hrs.
_____ inches per 12 hrs.
_____ inches per 24 hrs.
Stage III Condition _____ inches per 6 hrs.
_____ inches per 12 hrs.
_____ inches per 24 hrs.

And/or the amount of flow in the emergency spillway that will initiate a:

Stage II Condition > 0 feet (depth of flow)
Stage III Condition > 1.5 feet (depth of flow)

Total depth of emergency spillway available before crest of dam is overtopped:
1.6' ± feet.

13. Frequency of observations by rainfall/staff gage observer during a:
Stage I Condition _____ Stage II ONCE AN HOUR
Stage III CONTINUOUS (recommend continuous)
Please identify access route and means of travel during flood conditions.
CROAKER RD (RT. 607) TO POINT-OF-WOODS ROAD, TO LOCKHAVEN ROAD, TO END AND PICK UP "WOODS" ROAD.



Dam Safety Permit
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 209 757-874-2879 Apr 26 12 02:35p p.2

Note: It is recommended that the Observer remain on post until pool elevation starts to recede.

14. Surveillance and Notification

a. The dam owner/operator **IS RESPONSIBLE** for notifying local government of any problem or potential problem at the dam site.

b. The dam owner/operator **WILL INITIATE** dam surveillance under Stage I conditions, ie, when a flood watch is issued.

c. The dam owner/operator **WILL NOTIFY** the 24-hour dispatch center and the local Emergency Services Coordinator when Stage II conditions are met in order to alert them to review actions that may be required for the safety and protection of people and property.

d. The dam owner/operator **WILL NOTIFY** the 24-hour dispatch center and the local Emergency Services Coordinator to initiate warning of residents when Stage III conditions or imminent dam failure are probable.

e. The owner/operator **WILL BE RESPONSIBLE** for operating such devices as spillway gates and low level outlets such as to cause the dam to function effectively. Attach narrative if required.

f. 24-hour dispatch center should prepare Standard Operating Procedures (SOP's) to implement dam overtopping/failure evacuation plans.

15. Evacuation Procedures:

Note: The dam owner/operator should notify the City/County 24-hour Dispatch Center, as required in paragraph 14d above. Phone # should be listed in [a (1)].

Note: Once the local government has been notified of any problem at a dam site, it should take appropriate protective measures in accordance with the local Emergency Operations Plan and accompanying Emergency Action Plan and Standing Operations Procedures. Other local government actions might include:

(1) Notify the individuals who are directly downstream and in immediate danger. A list of the names, addresses, and telephone numbers of these individuals should be listed in [a (2]).
(2) Monitoring the situation and, if time permits, review of evacuation plans.
(3) Begin Alert, Notification, and Warning
(4) Immediately evacuating the inundation areas, if conditions warrant.
(5) Expanding Direction and Control as well as beginning Emergency Public Information and operating shelters.
(6) Provide Situation Reports to the State Emergency Operations Center (804-674-2400 or 800-468-8892)

a. Once the local government has been notified of a condition requiring evacuation, the dam owner/operator and local government are mutually responsible for effecting evacuation.

(1) The dam owner/operator will: NO DOWNSTREAM DWELLINGS, BUSINESSES OR RECREATION AREAS THUS NO EVACUATION NEEDED

(2) Local government will: NO DOWNSTREAM DWELLINGS, BUSINESS OR RECREATION AREAS, THUS NO EVACUATION NEEDED.

Individuals who are directly downstream and in immediate danger include:

| NAME | ADDRESS | TELEPHONE |
|---|---|---|
| NO HABITATED AREAS | | |

b. Methods for notification and warning to evacuate include:

Check appropriate method(s)

✓ (1) Telephone TO EMERGENCY OPERATIONS CENTER 757-566-4315

____ (2) Police/fire/sheriff radio dispatch vehicles with loudspeakers, bullhorns, etc.

____ (3) Personal runners for door-to-door alerting

____ (4) Radio/television broadcasts for area involved



Dam Safety Permit
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 211 757-874-2879 Apr 26 12 02:35p

16. Certification of Coordination between Owner/Operator and Local Government

**Certification by Owner/Operator**

I certify that procedures for implementation of this plan have been coordinated with _____ (City/County) and the local Emergency Services Coordinator. Also, that a copy of this Form has been filed with the State Department of Emergency Management; that this plan shall be adhered to during the life of the project; and that the information contained herein is current and correct to the best of my knowledge.

_____
(Signature of Owner/Operator)

This 23rd day of June 20 04.

Printed Name HR ASHE

**Certification by Local Government**

I certify that procedures for the warning and evacuation of James City County (City/County) residents as required in the event of actual or impending failure of the Lake Nice Dam (name of dam) have been coordinated with the dam owner/operator.

_____
(Signature of City/County Official)

This 16 day of AUGUST, 20 04.

Printed Name Richard M. Miller

Position Emer Management Coordinator

Please fill out and mail to:

**Virginia Department of Emergency Management**
**Emergency Services**
**10501 Trade Ct.**
**Richmond, Virginia 23236-3713**

**Dept. of Conservation and Recreation**
**Division of Dam Safety**
**203 Governor Street**
**Richmond, Virginia 23219-2094**



Dam Safety Permit
WC067_LAKE_NICE_LARGE_DAM_MIRROR - 212
Apr 26 12 02:35p 757-874-2879 p.8

## EMERGENCY ACTION PLAN WORK/DATA SHEET

1. Name of Impounding Structure: LAKE NICE DAM EMBANKMENT
2. Inventory #: _____ Other Name (if any): _____
3. Total Height: 34.8 feet (Measured vertically from top of structure to streambed at downstream toe).
4. Total Impoundment Capacity at top of structure: 446.1 acre-feet.
5. Size Classification (Circle one): Large (Medium) Small
6. Hazard Classification (Circle one): Class I (Class II) Class III
7. Spillway Design (Circle one): PMF ½PMF 100-YR 50-YR UNKNOWN
8. Downstream Inundation Area determined by (Mark one):
   - _____ (1) Judgement
   - _____ (2) Empirical Formulas Type used: _____
   - ✓ (3) Computer Programs Type used: HYDROFLOW HYDROGRAPHS
9. Critical Conditions used for structure failure (Mark one):
   - _____ (1) Failure due to overtopping using:
     - _____ PMF
     - _____ % PMF
     - _____ 100-YR
     - _____ Other
   - ✓ (2) Failure not due to flooding

     Describe: DAM BREACH COLLECTIVELY WITH A 100-YEAR, 24-HOUR STORM EVENT



Dam Safety Permit
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 213
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James City County
Rochambeau Dr
Interstate 64 W
Interstate 64 E
Wellington
Lake Nice
Mirror Lakes
1 inch equals 805 feet

DCR
Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

# INVENTORY REPORT FOR ~~CLASS III AND CLASS~~ CLASS II IV IMPOUNDING STRUCTURES

Reference: Impounding Structure Regulations, 4VAC50-20-00 et seq., Virginia Soil and Water Conservation Board

1. Project Information:
   a. Name of Impounding Structure LAKE NICE DAM EMBANKMENT
   b. Inventory Number _____ Other Name (if any) _____
   c. Name of Reservoir LAKE NICE
   d. Purpose of Reservoir STORMWATER MANAGEMENT

2. Location of Impounding Structure:
   a. City/County JAMES CITY COUNTY Magisterial District STONEHOUSE
   b. Located 2500' feet/miles upstream/downstream of Highway. No. ROUTE 30
   c. Name of River or Stream FRANCE SWAMP
   d. Latitude N 37° 23 345' Longitude W 76° 47.201'

3. Ownership:
   a. Owner's Name WELLINGTON LLC
   b. Mailing Address 632 HAMPTON HIGHWAY
      YORKTOWN, VIRGINIA 23693-4100
   c. Telephone (757) 867-8900

4. Owner's Engineer:
   a. Engineering Firm/Engineer AES CONSULTING ENGINEERS / VAN MARC BENNETT
   b. Professional Engineer Virginia Number 26028
   c. Mailing Address 5249 OLDE TOWNE ROAD, SUITE 1
      WILLIAMSBURG, VA 23188
   d. Telephone (757) 253-0040

(DCR 199-104) (12/01)

5. Impounding Structure Data (All elevations NGVD unless noted):

a. Type of Material earth ✓ concrete_____ masonry_____

Other_____

| | Design Configuration | |
|---|---|---|
| b. Top of Dam | 71.7 ± | Elev. (if known) |
| c. Downstream Toe (Lowest) | 36.9 ± | Elev. (if known) |
| d. Height of Dam | 34.8 ± | Feet |
| e. Crest Length (Exclusive of Spillway) | 500' ± | Feet |
| f. Crest Width | 15-17' | Feet |
| g. Upstream Slope | 3 H: 1 V | |
| h. Downstream Slope | 3 H: 1 V | |

6. Reservoir Data

| | Design Configuration | |
|---|---|---|
| a. Maximum Capacity | 446 ± | Acre-feet |
| b. Maximum Pool | 67.7 | Elev. (if known) |
| c. Maximum Pool Surface Area | 19.4 | Acres |
| d. Normal Capacity | 301 ± | Acre-feet |
| e. Normal Pool | 64.2 ± | Elev. (if known) |
| f. Normal Pool Surface Area | 14.8 | Acres |
| g. Freeboard (Normal Pool to Top) | 6.9 | Feet |
| h. Freeboard (Normal Pool to Emergency) | 5.3 | Feet |

7. Spillway Data

| | Type | Construction Material | Maximum Capacity |
|---|---|---|---|
| a. Low Level Drain | N/A | | |
| b. Principal Spillway | 16" PIPE | DUCTILE IRON | 16 cfs |
| c. Emergency Spillway | TRAPEZOIDAL | EARTH | 131 cfs |

| | Design Configuration | |
|---|---|---|
| d. Low Level Drain | N/A | Elev. (if known) |
| e. Principal Spillway | 64.8 | Elev. (if known) |
| f. Emergency Spillway | 70.1 ± | Elev. (if known) |



Dam Safety Permit
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 216
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g. Briefly describe the ~~low level~~ drain and principal spillway to include dimensions, materials of construction, trash guards, location in reservoir and through dam, and orientation of intake and discharge to dam if looking downstream: PRINCIPAL SPILLWAY IS 16" BARREL DISCHARGING TO CONCRETE FLUME; NO TRASH GUARDS; LOCATED MIDPOINT OF EMBANKMENT. CONCRETE FLUME IS APPROXIMATELY 5' WIDE AND 70 FEET LONG TO TOE OF DAM.

h. Describe the emergency spillway to include dimensions, whether the spillway is an earth channel or other construction, spillway surface protection, and orientation to dam if looking downstream: EMERGENCY SPILLWAY FORMED IN NORTH SIDE; GRASS LINED. APPROXIMATELY 25' WIDE WITH 10:1 SIDE SLOPE (OR LESS)

8. Watershed Data (Class III only):

a. Drainage Area _____ Sq. Miles

b. Type and Extent of Watershed Development _____

c. Time of Concentration _____ Method _____

d. Spillway Design Flood used (mark appropriate box)

_____PMF, source _____

_____1/2 PMF, source _____

_____100 Year, source _____

_____50 Year, source _____

_____Other, source _____

e.. Design inflow hydrograph: Volume _____acre-feet;

Peak inflow _____C.F.S.;

Rainfall duration of design inflow hydrograph _____hours

f. Freeboard during passage of spillway design flood _____feet

9. Impounding Structure History

a. Date construction completed CIRCA 1969

b. Design by SOIL CONSERVATION SERVICE Date: CIRCA 1969

c. Built by JACK C. MISSIE Date: CIRCA 1969



Dam Safety Permit

WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 217

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d. Inspection dates LAST INSPECTION 2/10/04, 4/24/03

e. Inspections by HERBERT AND ASSOCIATES, LTD.

f. Description of repairs REMOVE VEGETATION, MOWING

g. Has the impounding structure ever been overtopped? _____ Yes _____ No UNKNOWN

10. Impounding Structure Assessment:

a. Provide brief descriptions for each item:

i. Condition of the impounding structure REFER TO CORRESPONDENCE BY HERBERT AND ASSOCIATES DATED 2/10/04, 4/24/03

ii. Condition of the reservoir REFER TO CORRESPONDENCE BY HERBERT AND ASSOCIATES DATED 2/10/04, 4/24/04

iii. Condition of the upstream area FALLOW FIELDS, CURRENT RESIDENTIAL CONSTRUCTION

iv. Condition of the downstream area NATIVE WOODED AREAS AND WETLAND HABITATS.

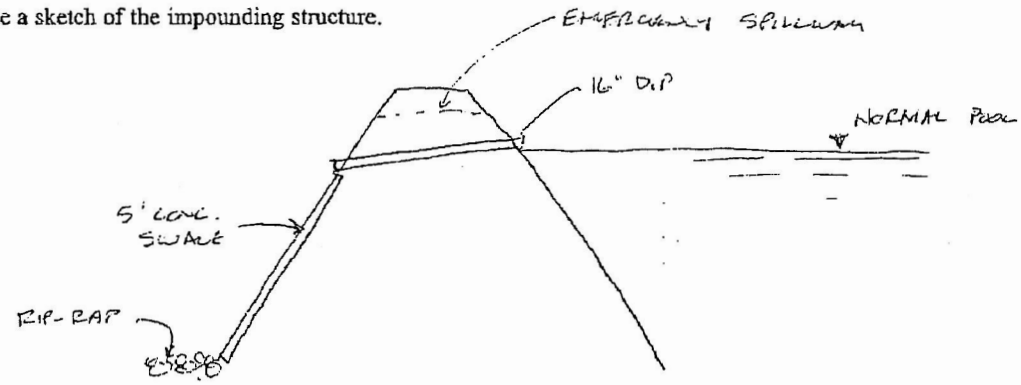
b. Provide a narrative describing any recent changes in the impounding structure, reservoir, upstream area, and downstream area: MINOR REPAIRS TO IMPOUNDMENT STRUCTURE; UPSTREAM AREA CURRENTLY BEING DEVELOPED AS RESIDENTIAL COMMUNITY; NO CHANGES DOWNSTREAM

c. Recommendations for remedial measures: REFER TO CORRESPONDENCE BY HERBERT AND ASSOCIATES DATED 2/10/04; 4/24/04



Dam Safety Permit
WC067_LAKE_NICE_LARGE_CASE_MIRROR - 218 757-874-2879 Apr 26 12 02:36p

11. Provide a sketch of the impounding structure.




CERTIFICATION BY OWNER'S ENGINEER (Class III only)

I hereby certify that the information provided in this Inventory Report has been examined by me and found to be true and correct ~~in my professional judgment~~ TO THE BEST OF MY KNOWLEDGE.

Signed _____
(Professional Engineer)

Virginia Number 26628

This 21ST day of June, 20 04.

CERTIFICATION BY OWNER (Class IV only)

I hereby certify that the information provided in this Inventory Report is true and correct.

Signed _____
(Owner)

This _____ day of _____, 20_____

**Please fill out and mail to:**
**Department of Conservation and Recreation**
**Division of Dam Safety**
**203 Governor Street**
**Richmond, Virginia 232192094**



Dam Safety Permit
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 219
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8557

Herbert and Associates, Ltd.
TESTING • ENGINEERING • INSPECTING
POST OFFICE BOX 64758 • VIRGINIA BEACH, VA 23464 • PHONE (757) 545-5234

April 24, 2003

Mr. Chuck Glissan
American Eastern
632 Hampton Highway
Yorktown, Virginia 23693

RE: Wellington – Section One, James City County, Virginia

Dear Mr. Glissan:

I am writing in regards to my recent inspection of the earthen dam at the referenced project. Please note we did not perform hand auger sampling as we feel it is not needed. Should this be required we can take samples as a follow up to this letter.

Purpose – prior to deeding the dam to the homeowners, the city has requested a determination as to the current state and the future state of dam stability.

Site Visit – I visited the site on April 21, 2003 and visually inspection the dam. The structure is an earthen dam based on the size of tree growth, I estimate the dam to be 20 to 30 years old.

No wet spots or piping was observed. Trees and underbrush cover the down stream face. Tall grass, underbrush and vines covered the up stream face.

The method of overflow control is by a single 16-inch I.D. cast iron pipe. For a short distance at the intake end, a section of corrugated metal pipe was observed. I could look all the way through the pipe and observed it to be very clean, except at the mouth of the intake end. The pipe appeared in a very good state of repair. The intake invert was several feet above the lake water level.

The pipe discharged into a concrete spillway approximately four feet wide, which ran down the slope to the marsh area below. The spillway appeared in a good state of repair.

Conclusion – The dam, discharge pipe and spillway appear to be performing adequately and should continue to do so in the upcoming years.

*Herbert and Associates, Ltd.*

Recommendations

(1) Remove all trees greater than 12"Φ by cutting at the base then grub all roots greater than 1 inch in diameter. Fill, compact and grade to adjacent contour.

(2) Cut all other vegetation flush with the ground and remove all debris from the site.

(3) Rake and remove all debris and leaves to allow seeding.

(4) Seed and fertilize the entire dam. Maintain the grass until it is well established.

(5) All grubbing, clearing, seeding, etc. shall continue for a distance of 50-feet beyond the abutment contacts.

(6) Regular mowing throughout the year (maintain grass at a height of 6 inches or less) is essential so that the surface can be readily traversed by foot for bi-annual inspections and potential dam safety problems, such as misalignment, cracks, animal burrows, surface erosion, seepage, wet spots, etc. can be spotted early.

(7) Bi-annual inspections by a licensed Engineer should be conducted. Mowing should occur just prior to the inspection.

In hope this meets with your approval.

Respectfully submitted,
Herbert and Associates, Ltd.,

COMMONWEALTH OF PENNSYLVANIA
4.24.03
DONALD P. COGHLAN
No. 14829
PROFESSIONAL ENGINEER

Donald P. Coghlan, P.E.,
Geotechnical Engineer

Herbert and Associates, Ltd.
TESTING & ENGINEERING & INSPECTING
POST OFFICE BOX 64748 • VIRGINIA BEACH, VA 23464 • PHONE (757) 546-5234

February 10, 2004

Mr. R. N. Ashe
American Eastern, Inc.,
632 Hampton Highway
Yorktown, Virginia 23693

RE: Earthen dam at Wellington Subdivision,
Section One, James City County, Virginia

Dear Mr. Ashe:

We are writing to address the overall dam stability and the source of water at the downhill toe.

We performed one Standard Penetration test atop the dam. This test indicates the dam consist of clayey sand (SC) fill material to a depth of approximately twenty (20) feet. The water table is coincidental with the depth of fill. The water at the toe of the slope is the flow net just below the dense clayey sands and in the in-situ poorly graded sands (SP).

Based on our field investigations, analysis and since the dam has functioned for over thirty (30) years, our conclusion is the dam is stable and will remain so for the near future.

As discussed in our letter of April 24, 2003 the following recommendations should be met to ensure dam safety:

1. Remove all vegetation on the lake side slope and roots greater than one inch in diameter. Fill, compact, grade and seed.

2. Regular mowing throughout the year (maintain grass at a height of 6-inches or less) is essential so the surface can be readily traversed by foot for bi-annual inspection and to identify dam safety problems.

Herbert and Associates, Ltd.

3. Annual inspection by a licensed Professional Engineer should be conducted. Mowing should occur just prior to the Inspections.

All other items addressed in the department of Conservation and recreation letter dated 7-1-03 will be addressed by others.

In hope this meets with your approval.

Respectfully submitted,
Herbert and Associates, Ltd.,

Donald P. Coghlan, P.E.,
Geotechnical Engineer

COMMONWEALTH OF VIRGINIA
4.20.04
DONALD P. COGHLAN
No.
14829
PROFESSIONAL ENGINEER

DCR
Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

## AS-BUILT REPORT FOR CLASS I, II, AND III IMPOUNDING STRUCTURES

Reference: Impounding Structure Regulations, 4VAC50-20-00 et seq., Virginia Soil and Water Conservation Board

1. Project Information:
   a. Name of Impounding Structure: LAKE NICE DAM EMBANKMENT
   b. Inventory Number: _____
   Other Name (if any): _____
   c. Name of Reservoir: LAKE NICE
2. Location of Impounding Structure:
   a. City/County: JAMES CITY COUNTY Magisterial District: STONEHOUSE
   b. Located 2500' feet/miles upstream/downstream of Hwy. # ROUTE 30
   c. Name of River or Stream: FRANCE SWAMP
   d. Latitude: N 37° 23 345' Longitude: W 76° 47.201'
3. Ownership:
   a. Owner's Name: WELLINGTON LLC
   b. Mailing Address: 632 HAMPTON HIGHWAY
   YORKTOWN, VA 23693-4100
   c. Telephone: (757) 867-8800
4. Construction/Alteration Design Report:
   a. Design Report Prepared by: _____
   b. Design Report Date: _____
   c. Construction/Alteration Permit #: _____ Date Issued: _____

The following As-Built Report is to provide the necessary information of a Safety Inspection Report for future reinspection:

5. Safety Inspection Report (if applicable):
   a. Safety Inspection Report Prepared By: _____
   b. Safety Inspection Report date: _____
6. Project Information: Provide a narrative describing the impounding structure:
   a. Description of dam and appurtenances; Embankment Length 500'; Height 34.8; Top Elevation 71.7; Top Width 15-17'; Sideslopes Upstream 3:1; Downstream 3:1; Principal Spillway (size & type) 16" DUCTILE IRON PIPE; Emergency Spillway Elevation 70.1; Width of Spillway 25' ±.

(DCR 199-100) (12/01)

b. Location: LOCATED ON UNNAMED TRIBUTARY OF FRANCE SWAMP CENTRALLY LOCATED WITHIN THE WELLINGTON ESTATES SUBDIVISION

c. Size Classification: Height: 34.8 ft. Maximum Capacity 446± Ac-Ft

Size Classification - Small (Medium) Large (Circle One)

d. Hazard classification: Downstream condition: WETLANDS, FRANCE SWAMP NO HABITABLE DWELLINGS, LOW HAZARD, EASTBOUND LANE OF ROUTE 30 MAY BE OVERTOPPED

Hazard Classification - Class I (Class II) Class III (Circle One)

e. Ownership: WELLINGTON LLC

f. Purpose of dam, describe: STORMWATER MANAGEMENT AND WATER QUALITY FACILITY

g. Design and construction history: DESIGN BY SOIL CONSERVATION SERVICE AND CONSTRUCTED BY JACK L. MASSIE CIRCA 1969

h. Normal operating procedures: NONE - GRAVITY DAM

i. Drainage area: ULTIMATELY 149.5 ACRES.

j. Discharge at dam site:

Low Level Outlet: NONE

Principal Spillway: 16" DUCTILE IRON PIPE / CONCRETE FLUME -- 16 CFS

Emergency Spillway: 131 CFS

k. Dam and reservoir data, describe (Use Regulatory Table 1 Descriptions):





WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 225
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7. Engineering Data: Provide a narrative describing the engineering data:

a. Designed by: SOIL CONSERVATION SERVICE

b. Constructed by: JACK L. MASSIE

Date of Construction: CIRCA 1969

c. Evaluation of Design and Construction:

8. Visual Inspection: Provide a Description of the final As-Built Inspection:

a. Inspection date: 2/10/04, 4/24/03

b. Inspection by: HERBERM AND ASSOCIATES

c. General observations: REMOVAL OF VEGETATION, MOWING

d. Dam: MOWING, VEGETATION, SEEPS

e. Principal Spillway: REMOVE DEBRIS AT INTAKE, CLEAN PIPE/ GOOD CONDITION

f. Emergency Spillway: GRASSED

g. Low Level Outlet: NONE

h. Other Appurtenances: CONCRETE FLUME, GOOD CONDITION

i. Reservoir Area: NO REPORT

j. Downstream Channel/Area: NO REPORT

k. Instrumentation: NONE

l. Evaluation: "DAM, DISCHARGE AND SPILLWAY... PERFORMING ADEQUATELY AND SHOULD CONTINUE TO DO SO ...."



Dam Safety Permit

WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 226 757-874-2879 Apr 26 12 02:38p

9. Operational Procedures: Provide a narrative describing the impounding structure procedures:

a. Operation: GRAVITY DAM, NO VALVES OR ~~[illegible]~~ GATES

b. Maintenance: SEE ATTACH MAINTENANCE SCHEDULE

c. Emergency Action Plan: LOW HAZARDS DOWNSTREAM
FLOW OVER EMERGENCY SPILLWAY 70 FT, STAGE II CONDITIONS
FLOWS OVER EMERGENCY SPILLWAY 71.5 FT, STAGE III CONDITIONS

d. Evaluation:

10. Hydraulic/Hydrologic Data: Provide a narrative describing hydraulic/hydrologic data:

a. Design: ORIGINAL DESIGN NOT KNOWN

b. Hydrologic records: UNKNOWN

c. Flood experience: UNKNOWN

d. Flood potential: WATER SURFACE ELEVATION @ 100-YEAR 24-HOUR STORM ESTIMATED @ EL. 67.7 (NOT OVERTOPPING EMERGENCY SPILLWAY)

e. Reservoir regulation:



Dam Safety Permit
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 227
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f. Overtopping potential: SMALL; EMERGENCY SPILLWAY NOT OVERTOPPED DURING 100-YEAR STORM

g. Reservoir emptying potential: NONE

h. Evaluation: REGULAR MAINTENANCE AND INSPECTION REQUIRED.

11. Dam Stability: Provide a narrative describing impounding structure stability:

a. Foundation/abutments: SEE CORRESPONDENCE PROVIDED BY HERBERT AND ASSOCIATES.

b. Embankment materials: SEE CORRESPONDENCE FROM HERBERT AND ASSOCIATES

c. Embankment stability: SEE CORRESPONDENCE FROM HERBERT AND ASSOCIATES

d. Evaluation: SEE CORRESPONDENCE FROM HERBERT AND ASSOCIATES

12. Assessment/Remedial Measures: Provide a narrative describing the As-Built condition of the impounding structure:

a. Dam assessment: SEE CORRESPONDENCE FROM HERBERT AND ASSOCIATES

b. Recommended remedial measures: SEE CORRESPONDENCE FROM HERBERT AND ASSOCIATES.



Dam Safety Permit
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 228
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CERTIFICATION BY OWNER'S ENGINEER

I hereby certify that the information provided in this As-Built Report has been examined by me and found to be true and correct in ~~my professional judgment.~~ TO THE BEST OF MY KNOWLEDGE.

Signed _____

(Professional Engineer)

Virginia Number 26678

This 21st day of June, 20 04.

**Please fill out and mail this form to:**
**Department of Conservation and Recreation**
**Division of Dam Safety**
**203 Governor Street**
**Richmond, Virginia 23219-2094**



Dam Safety Permit
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 229
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Lake Nice Dam Embankment
Maintenance Schedule

Operator Inspections and Maintenance (Quarterly)

1. Inspect structure after significant rainfall events
2. Clear debris from entrance to discharge pipe
3. Note any erosion or damage to embankment caused by borrowing wildlife. Repair damage.
4. Record inspection and repairs completed.

Maintenance Inspection and Maintenance

1. Inspect structure after each significant rainfall event (more than 2 inches in 24-hour period).
2. Perform maintenance mowing 3 times a year (spring, summer, and fall).
3. Inspect structure for growing woody vegetation once per year, and remove vegetation.
4. Perform soil sampling on embankment once every 4 years to ensue proper grass growth. Maintain 40% vegetation coverage.
5. Perform inspections of barrel, and concrete flume quarterly. Make repairs as necessary.
6. Perform yearly inspections of structure for damage and seeps. Contact professional engineer for further investigation and assessment.
7. Perform yearly observations of pond perimeter noting changes in land use or topography.
8. Keep records of all activities, inspections, and repairs.
9. Have technical safety inspection performed every 3 years by professional engineer, and after each event of overtopping.

Herbert and Associates, Ltd.
TESTING & ENGINEERING & INSPECTING
POST OFFICE BOX 04768 • VIRGINIA BEACH, VA 23464 • PHONE (757) 546-5234

February 10, 2004

Mr. R. N. Ashe
American Eastern, Inc.,
632 Hampton Highway
Yorktown, Virginia 23693

RE: Earthen dam at Wellington Subdivision,
Section One, James City County, Virginia

Dear Mr. Ashe:

We are writing to address the overall dam stability and the source of water at the downhill toe.

We performed one Standard Penetration test atop the dam. This test indicates the dam consist of clayey sand (SC) fill material to a depth of approximately twenty (20) feet. The water table is coincidental with the depth of fill. The water at the toe of the slope is one flow net just below the dense clayey sands and in the in-situ poorly graded sands (SP).

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As discussed in our letter of April 24, 2003 the following recommendations should be met to ensure dam safety:

1. Remove all vegetation on the lake side slope and roots greater than one inch in diameter. Fill, compact, grade and seed.

2. Regular mowing throughout the year (maintain grass at a height of 6-inches or less) is essential so the surface can be readily traversed by foot for bi-annual inspection and to identify dam safety problems.

8557

Herbert and Associates, Ltd.
TESTING • ENGINEERING • INSPECTING
POST OFFICE BOX 64758 • VIRGINIA BEACH, VA 23464 • PHONE (757) 545-5234

April 24, 2003

Mr. Chuck Glissan
American Eastern
632 Hampton Highway
Yorktown, Virginia 23693

RE: Wellington – Section One, James City County, Virginia

Dear Mr. Glissan:

I am writing in regards to my recent inspection of the earthen dam at the referenced project. Please note we did not perform hand auger sampling as we feel it is not needed. Should this be required we can take samples as a follow up to this letter.

Purpose – prior to deeding the dam to the homeowners, the city has requested a determination as to the current state and the future state of dam stability.

Site Visit – I visited the site on April 21, 2003 and visually inspection the dam. The structure is an earthen dam based on the size of tree growth, I estimate the dam to be 20 to 30 years old.

No wet spots or piping was observed. Trees and underbrush cover the down stream face. Tall grass, underbrush and vines covered the up stream face.

The method of overflow control is by a single 16-inch I.D. cast iron pipe. For a short distance at the intake end, a section of corrugated metal pipe was observed. I could look all the way through the pipe and observed it to be very clean, except at the mouth of the intake end. The pipe appeared in a very good state of repair. The intake invert was several feet above the lake water level.

The pipe discharged into a concrete spillway approximately four feet wide, which ran down the slope to the marsh area below. The spillway appeared in a good state of repair.

Conclusion – The dam, discharge pipe and spillway appear to be performing adequately and should continue to do so in the upcoming years.

Herbert and Associates, Ltd.

Recommendations

(1) Remove all trees greater than 12"Φ by cutting at the base then grub all roots greater than 1 inch in diameter. Fill, compact and grade to adjacent contour.

(2) Cut all other vegetation flush with the ground and remove all debris from the site.

(3) Rake and remove all debris and leaves to allow seeding.

(4) Seed and fertilize the entire dam. Maintain the grass until it is well established.

(5) All grubbing, clearing, seeding, etc. shall continue for a distance of 50-feet beyond the abutment contacts.

(6) Regular mowing throughout the year (maintain grass at a height of 6 inches or less) is essential so that the surface can be readily traversed by foot for bi-annual inspections and potential dam safety problems, such as misalignment, cracks, animal burrows, surface erosion, seepage, wet spots, etc. can be spotted early.

(7) Bi-annual inspections by a licensed Engineer should be conducted. Mowing should occur just prior to the inspection.

In hope this meets with your approval.

Respectfully submitted,
Herbert and Associates, Ltd.,

COMMONWEALTH OF PENNSYLVANIA
4.24.03
DONALD P. COGHLAN
No. 14829
PROFESSIONAL ENGINEER

Donald P. Coghlan, P.E.,
Geotechnical Engineer

Herbert and Associates, Ltd.
TESTING • ENGINEERING • INSPECTING
POST OFFICE BOX 64758 • VIRGINIA BEACH, VA 23464 • PHONE (757) 545-5234

November 4, 2003

NOV 0 5 2003

American Eastern
632 Hampton Highway
Yorktown, Virginia 23693

RE: Existing Wellington Dam
James City County, Virginia

Gentlemen:

Transmitted herein are Logs of Boring secured in conjunction with the referenced project.

We would like to thank you for giving us this opportunity to be of service. If we may be of further assistance in this or any other matter, please do not hesitate to call upon us.

Respectfully submitted,
Herbert and Associates, Ltd.

John A. Herbert, S.E.T.
President

**Herbert and Associates, Ltd.**
TESTING • ENGINEERING • INSPECTING
POST OFFICE BOX 64758 • VIRGINIA BEACH, VA 23464 • PHONE (757) 420-2797

# LOG OF BORING

FILE NO. 99-8557

PROJECT IDENTIFICATION Existing Wellington Dam LOCATION James City Co.

BORING NO. B-1 TYPE DRILL CME 55 CLIENT American Eastern

DATE STARTED 11-3-03 DATE COMPLETED 11-3-03 DRILLER F. Cereske

CASING LENGTH 40' DIA. 2¼" Augers WATER ELEV: IMMEDIATE 20.5' AFTER ____ HRS. ____

TYPE SAMPLER SS LENGTH 30" DIA. 2" OD SURF. ELEV. Not Obtained

| DEPTH | STD. PEN. (N)* | SAMPLE DESCRIPTION | SAMPLE NO. |
|---|---|---|---|
| | | Topsoil 1" | |
| | 5-4<br>4-5<br>3-4<br>8-7<br>7-8<br>9-9<br>4-4<br>5-3 | Orange, moist, loose to medium dense, fine to veryfine sand with some clay (SP) Fill | S-1<br>S-2<br>S-3<br>S-4 |
| | 5-4<br>5-7<br>14-14<br>18-10 | Orange, wet, loose to medium dense, clayey sand, (SC)Fill | S-5<br>S-6 |
| | | Lt. gray mottle orange, moist, medium dense, clayey sand, Fill (SC) | |
| | 16-22<br>23-24 | White, wet, medium dense, fine to very fine sand, Fill (SP) | S-7 |
| | | Gray & orange, moist, medium dense, clayey sand, Fill (SC) | |
| | 4-5<br>7-8 | Tan, saturated, medium dense, fine to very fine sand (SP) | S-8 |
| | 6-6<br>5-5 | | S-9 |
| | 4-4<br>4-4 | Olive, saturated, loose, fine to very fine sand (SP) | S-10 |
| | | Brown mottle orange, saturated, medium stiff, clay (CL) | |
| | 2-2<br>3-3 | Lt. gray & olive, saturated, medium stiff, sandy clay (CL) | S-11 |
| | | Olive mottle light gray, saturated, very loose, clayey sand (SC) | |

NDARD PENETRATION INDICATED FOR EACH 6 INCHES OF DRIVE OF SPLIT TUBE SAMPLED utilizing a 140 pound hammer with a 30 inch fall.

Dam Safety Permit
Apr 26 12 02:41p 757-874-2879
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 235

# LOG OF BORING

PROJECT IDENTIFICATION Existing Wellington Dam BORING NO. B-1

| DEPTH | STD. PEN. (N)* | SAMPLE DESCRIPTION | SAMPLE NO |
|---|---|---|---|
| 40 | | | |
| 42 | 1-1<br>2-1 | Olive mottle light gray, saturated, very loose, clayey sand (SC) | S-12 |
| 44 | | | |
| 46 | | Bottom of Boring 42.0' | |
| 48 | | | |
| 50 | | | |
| 52 | | | |
| 54 | | | |
| 56 | | | |
| 58 | | | |
| 60 | | | |
| 62 | | | |
| 64 | | | |
| 66 | | | |
| 68 | | | |
| 70 | | | |
| 72 | | | |
| 74 | | | |
| 76 | | | |
| 78 | | | |
| 80 | | | |
| 82 | | | |
| 84 | | | |
| 86 | | | |
| 88 | | | |
| 90 | | | |

*STANDARD PENETRATION INDICATED FOR EACH 6 INCHES OF DRIVE OF SPLIT TUBE SAMPLER, utilizing a 140 pound hammer with a 30 inch fall.

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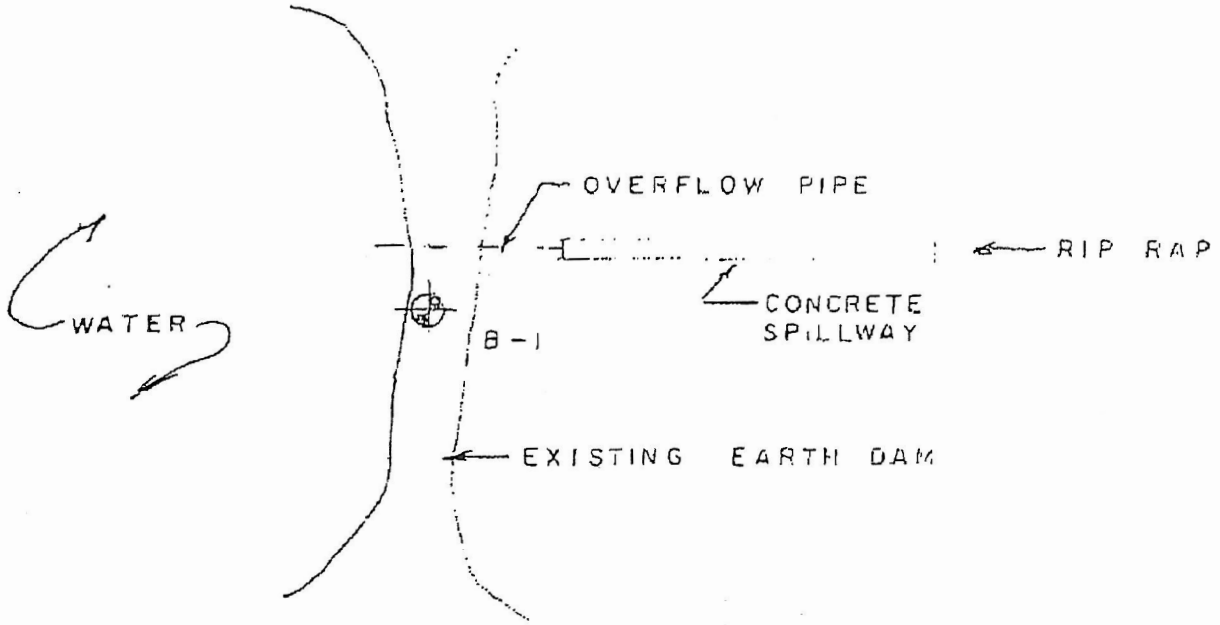
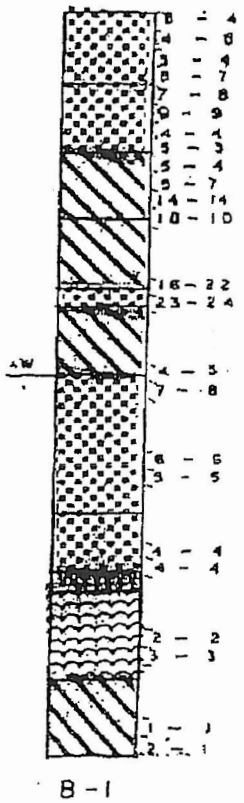



## BORING LOCATION PLAN

NOT TO SCALE




## PROFILE VIEW

SCALE: 1" = 10'-0"

## LEGEND

- TOPSOIL
- FINE TO VERY FINE SAND
- CLAYEY SAND
- CLAY
- SANDY CLAY

## SOIL PROFILE

EXISTING WELLINGTON DAM

JAMES CITY COUNTY VIRGINIA

HERBERT & ASSOCIATES, LTD.

NORFOLK VIRGINIA

NOV. 3, 2003 | JOB: 99-8557

**Herbert and Associates, Ltd.**
TESTING • ENGINEERING • INSPECTING
POST OFFICE BOX 64758 • VIRGINIA BEACH, VA 23464 • PHONE (757) 420-2737

# LOG OF BORING

FILE NO. 99-8557

PROJECT IDENTIFICATION Existing Wellingron Dam LOCATION James City Co.

BORING NO. B-1 TYPE DRILL CME 55 CLIENT American Eastern

DATE STARTED 11-3-03 DATE COMPLETED 11-3-03 DRILLER F. Cereske

CASING LENGTH 40' DIA. 2¼" Augers WATER ELEV: IMMEDIATE 20.5' AFTER ____ HRS. ____

TYPE SAMPLER SS LENGTH 30" DIA. 2" OD SURF. ELEV. Not Obtained

| DEPTH | STD. PEN. (N)* | SAMPLE DESCRIPTION | SAMPLE NO. |
|---|---|---|---|
| 0 | | Topsoil 1" | |
| | 5-4 | Orange, moist, loose to medium dense, fine to veryfine sand with some clay (SP) Fill | S-1 |
| 2 | 4-5 | | |
| | 3-4 | | S-2 |
| 4 | 8-7 | | |
| | 7-8 | | S-3 |
| 5 | 9-9 | | |
| | 4-4 | | S-4 |
| | 5-3 | | |
| | 5-4 | Orange, wet, loose to medium dense, clayey sand, (SC)Fill | S-5 |
| | 5-7 | | |
| | 14-14 | | S-6 |
| | 18-10 | | |
| | | Lt. gray mottle orange, moist, medium dense, clayey sand, Fill (SC) | |
| | 16-22 | White, wet, medium dense, fine to very fine sand, Fill (SP) | S-7 |
| | 23-24 | | |
| | | Gray & orange, moist, medium dense, clayey sand, Fill (SC) | |
| | 4-5 | | S-8 |
| | 7-8 | Tan, saturated, medium dense, fine to very fine sand (SP) | |
| | 6-6 | | S-9 |
| | 5-5 | | |
| | | Olive, saturated, loose, fine to very fine sand (SP) | |
| | 4-4 | | S-10 |
| | 4-4 | | |
| | | Brown mottle orange, saturated, medium stiff, clay (CL) | |
| | | Lt. gray & olive, saturated, medium stiff, sandy clay (CL) | |
| | 2-2 | | S-11 |
| | 3-3 | | |
| | | Olive mottle light gray, saturated, very loose, clayey sand (SC) | |

NDARD PENETRATION INDICATED FOR EACH 6 INCHES OF DRIVE OF SPLIT TUBE SAMPLED, utilizing a 140 pound hammer with a 30 inch fall.

letters and reports are for the exclusive use of the client to whom they are addressed. The use of our name must receive our prior written approval.

Apr 26 12 02:42p 757-874-2879 p.31 AMERICAN EASTERN INC 7578677188 PAGE 12
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 238

# LOG OF BORING

PROJECT IDENTIFICATION Existing Wellington Dam BORING NO. B-1

| DEPTH | STD. PEN. (N)* | SAMPLE DESCRIPTION | SAMPLE NO. |
|---|---|---|---|
| 40 | | | |
| 42 | 1-1<br>2-1 | Olive mottle light gray, saturated, very loose, clayey sand (SC) | S-12 |
| 44 | | | |
| 46 | | Bottom of Boring 42.0' | |
| 48 | | | |
| 50 | | | |
| 52 | | | |
| 54 | | | |
| 56 | | | |
| 58 | | | |
| 60 | | | |
| 62 | | | |
| 64 | | | |
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| 72 | | | |
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| 78 | | | |
| 80 | | | |
| 82 | | | |
| 84 | | | |
| 86 | | | |
| 88 | | | |
| 90 | | | |

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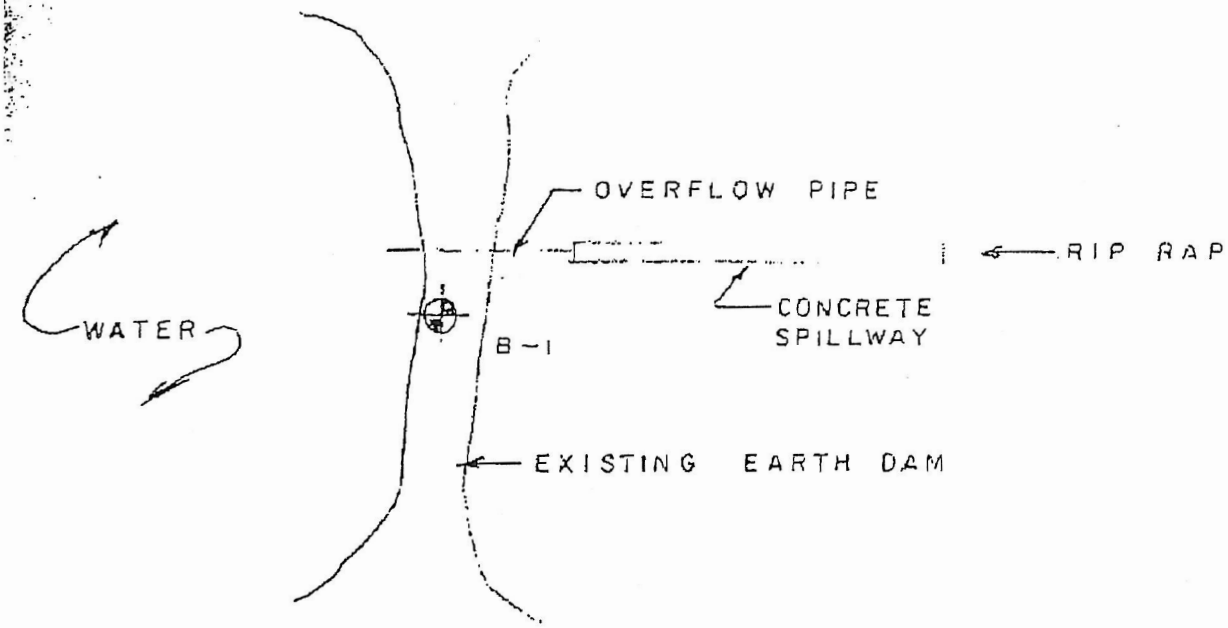
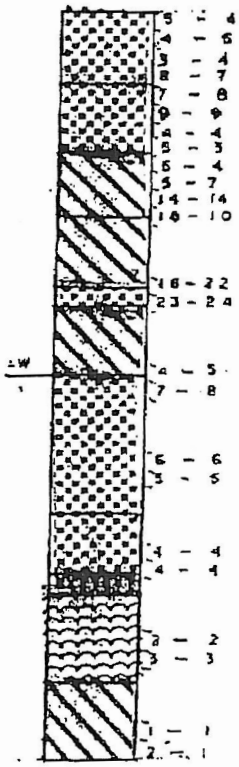



## BORING LOCATION PLAN

NOT TO SCALE




## PROFILE VIEW

SCALE: 1" = 10'-0"

## LEGEND

- TOPSOIL
- FINE TO VERY FINE SAND
- CLAYEY SAND
- CLAY
- SANDY CLAY

## SOIL PROFILE

EXISTING WELLINGTON DAM

JAMES CITY COUNTY VIRGINIA

HERBERT & ASSOCIATES, LTD.

NORFOLK VIRGINIA

Dam Safety Permit
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 240

**Herbert and Associates, Ltd.**
TESTING • ENGINEERING • INSPECTING
POST OFFICE BOX 64758 • VIRGINIA BEACH, VA 23464 • PHONE (757) 420-2797

# LOG OF BORING

FILE NO. 99-8557

PROJECT IDENTIFICATION Existing Wellington Dam LOCATION James City Co.

BORING NO. B-1 TYPE DRILL CME 55 CLIENT American Eastern

DATE STARTED 11-3-03 DATE COMPLETED 11-3-03 DRILLER F. Cereske

CASING LENGTH 40' DIA. 2¼" Augers WATER ELEV: IMMEDIATE 20.5' AFTER ____ HRS. ____

TYPE SAMPLER SS LENGTH 30" DIA. 2"OD SURF. ELEV. Not Obtained

| DEPTH | STD. PEN. (N)* | SAMPLE DESCRIPTION | SAMPLE NO. |
|---|---|---|---|
| 0 | | Topsoil 1" | |
| | 5-4 | Orange, moist, loose to medium dense, fine to veryfine sand with some clay (SP) Fill | S-1 |
| 2 | 4-5 | | |
| | 3-4 | | S-2 |
| 4 | 8-7 | | |
| | 7-8 | | S-3 |
| 6 | 9-9 | | |
| | 4-4 | | S-4 |
| 8 | 5-3 | | |
| | 5-4 | Orange, wet, loose to medium dense, clayey sand, (SC)Fill | S-5 |
| 0 | 5-7 | | |
| | 14-14 | | S-6 |
| 2 | 18-10 | | |
| 4 | | Lt. gray mottle orange, moist, medium dense, clayey sand, Fill (SC) | |
| 6 | 16-22 | White, wet, medium dense, fine to very fine sand, Fill (SP) | S-7 |
| | 23-24 | | |
| 8 | | Gray & orange, moist, medium dense, clayey sand, Fill (SC) | |
| | 4-5 | | S-8 |
| | 7-8 | Tan, saturated, medium dense, fine to very fine sand (SP) | |
| | 6-6 | | S-9 |
| | 5-5 | | |
| | 4-4 | Olive, saturated, loose, fine to very fine sand (SP) | S-10 |
| | 4-4 | | |
| | | Brown mottle orange, saturated, medium stiff, clay (CL) | |
| | 2-2 | Lt. gray & olive, saturated, medium stiff, sandy clay (CL) | S-11 |
| | 3-3 | | |
| | | Olive mottle light gray, saturated, very loose, clayey sand (SC) | |

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Apr 26 12 02:43p 757-874-2879 AMERICAN EASTERN INC PAGE 13
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 241 Dam Safety Permit p.34

# LOG OF BORING

PROJECT IDENTIFICATION Existing Wellington Dam BORING NO. B-1

| DEPTH | STD. PEN. (N)* | SAMPLE DESCRIPTION | SAMPLE NO |
|---|---|---|---|
| 40 | | | |
| 42 | 1-1<br>2-1 | Olive mottle light gray, saturated, very loose, clayey sand (SC) | S-12 |
| 44 | | | |
| 46 | | Bottom of Boring 42.0' | |
| 48 | | | |
| 50 | | | |
| 52 | | | |
| 54 | | | |
| 56 | | | |
| 58 | | | |
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| 80 | | | |
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| 86 | | | |
| 88 | | | |
| 90 | | | |

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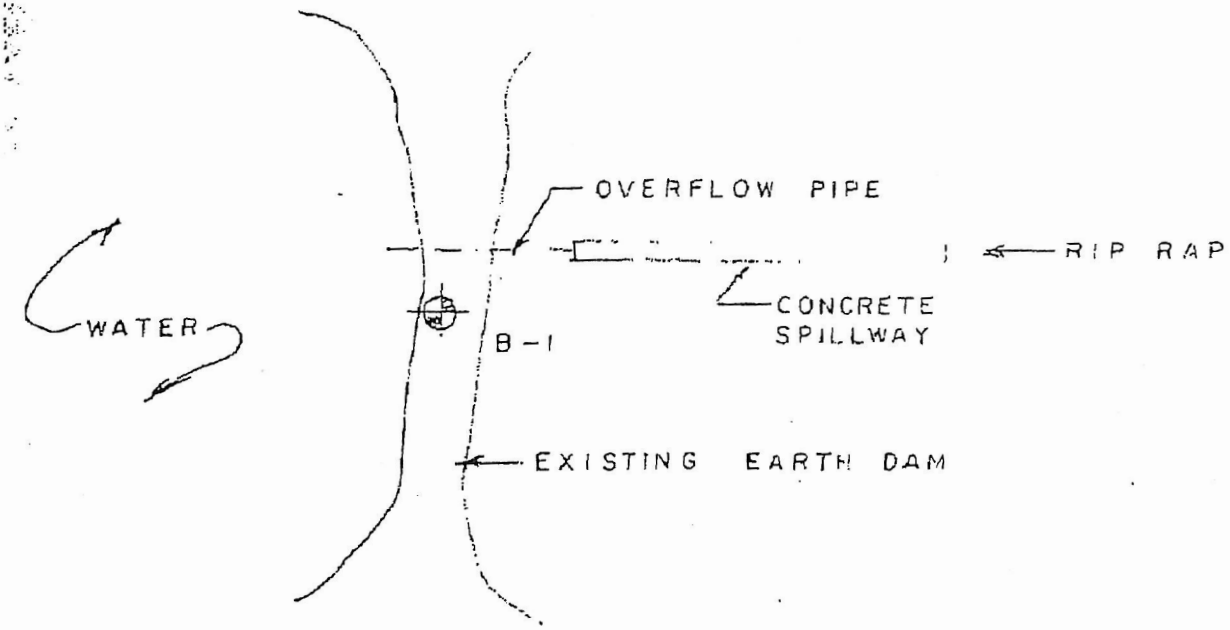
Dam Safety Permit

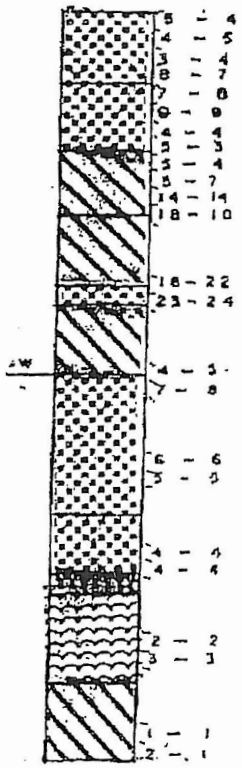
WC007_LAKE_NICE_LARGE_LAKE_MIRROR - 242

757-874-2879 Apr 26 12 02:43p p.35




## BORING LOCATION PLAN

NOT TO SCALE




## PROFILE VIEW

SCALE: 1" = 10' - 0"

## LEGEND

- TOPSOIL
- FINE TO VERY FINE SAND
- CLAYEY SAND
- CLAY
- SANDY CLAY

## SOIL PROFILE

EXISTING WELLINGTON DAM

JAMES CITY COUNTY VIRGINIA

HERBERT & ASSOCIATES, LTD.

NORFOLK VIRGINIA

NOV 3 2003

Dam Safety Permit
Apr 26 12:02:43p 757-874-2879 p.36
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 243

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

RECEIVED
JUL 03 2003

Joseph H. Maroon
Director

# COMMONWEALTH of VIRGINIA

## DEPARTMENT OF CONSERVATION AND RECREATION

203 Governor Street
Richmond, Virginia 23219-2010
TDD (804) 786-2121

7/01/2003

Mr. H.R. Ashe
American Eastern, Inc.
632 Hampton Highway
Yorktown, Virginia 23693

Re: Lake and Dam at Wellington-James City County

Dear Mr. Ashe:

Thank you for your letter dated June 17th, 2003 about the dam located at Wellington. Based the inspection of your dam and our conservation the following items need to be addressed. These items are:

1) Determine source of water at the toe of the dam.
2) Remove all vegetation on the upstream/downstream face of the dam.
3) The concrete flume has some cracking and surface roughness. Also the downstream end of the flume was undercut. Please install a stilling basin at the end of the flume and stabilize undercut area. Please inspect the condition of the flume regularly. The flume may require repair in the near future.
4) An emergency spillway was not clearly defined for this dam. Please have an engineer design a spillway that can be constructed.
5) Clear and stabilize upstream inflow pipe.
6) The following forms are required to be submitted to this office:
   A) Emergency Action Plan
   B) As-built report
   C) Operation and Maintenance
   D) Inventory Report
7) A set of the subdivision plans show drainage to the lake and the lots that surround the lake.

If you have any questions call me at (804) 786-1359 or e-mail at recooper@dcr.state.va.us.

Sincerely:

Robert E. Cooper, P.E
Dam Safety Engineer

CC: Daryl E. Cook-James City County

DCR

Department of Conservation & Recreation

CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

**INVENTORY REPORT FOR CLASS III AND CLASS IV IMPOUNDING STRUCTURES**

Reference: Impounding Structure Regulations, 4VAC50-20-00 et seq., Virginia Soil and Water Conservation Board

1. Project Information:
   - a. Name of Impounding Structure LAKE NICE DAM EMBANKMENT
   - b. Inventory Number _____ Other Name (if any) _____
   - c. Name of Reservoir LAKE NICE
   - d. Purpose of Reservoir STORMWATER MANAGEMENT

2. Location of Impounding Structure:
   - a. City/County JAMES CITY COUNTY Magisterial District _____
   - b. Located _____ feet/miles upstream/downstream of Highway. No. 30
   - c. Name of River or Stream Unnamed Tributary of France Swamp
   - d. Latitude _____ Longitude _____

3. Ownership:
   - a. Owner's Name Wellington H.O.A.
   - b. Mailing Address 632 Hampton Hwy.
     Yorktown, VA 23693
   - c. Telephone (757) 867-8800

4. Owner's Engineer:
   - a. Engineering Firm/Engineer _____
   - b. Professional Engineer Virginia Number _____
   - c. Mailing Address _____
     _____
   - d. Telephone (___) _____

(DCR 199-104) (12/01)

5. Impounding Structure Data (All elevations NGVD unless noted):

a. Type of Material earth X concrete_____ masonry_____

Other_____

| | Design Configuration | |
|---|---|---|
| b. Top of Dam | 71.7 | Elev. (if known) |
| c. Downstream Toe (Lowest) | 36.9 | Elev. (if known) |
| d. Height of Dam | 34.8 | Feet |
| e. Crest Length (Exclusive of Spillway) | 500 | Feet |
| f. Crest Width | 20 | Feet |
| g. Upstream Slope | 3 H: 1 | V |
| h. Downstream Slope | 3 H: 1 | V |

6. Reservoir Data

| | Design Configuration | |
|---|---|---|
| a. Maximum Capacity | | Acre-feet |
| b. Maximum Pool | 67.72 | Elev. (if known) |
| c. Maximum Pool Surface Area | 18.4 | Acres |
| d. Normal Capacity | | Acre-feet |
| e. Normal Pool | 64.25 | Elev. (if known) |
| f. Normal Pool Surface Area | 14.8 | Acres |
| g. Freeboard (Normal Pool to Top) | 6.9 | Feet |
| h. Freeboard (Normal Pool to Emergency) | 5.3 | Feet |

7. Spillway Data

| | Type | Construction Material | Maximum Capacity |
|---|---|---|---|
| a. Low Level Drain | — | — | — |
| b. Principal Spillway | 16" | DUCTILE IRON PIPE | 16 cfs |
| c. Emergency Spillway | | EARTH | 131 cfs |

| | Design Configuration | |
|---|---|---|
| d. Low Level Drain | — | Elev. (if known) |
| e. Principal Spillway | 64.8 | Elev. (if known) |
| f. Emergency Spillway | 70.1 | Elev. (if known) |



Dam Safety Permit
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 246
Apr 26 12 02:44p 757-874-2879 p.39

g. Briefly describe the low level drain and principal spillway to include dimensions, materials of construction, trash guards, location in reservoir and through dam, and orientation of intake and discharge to dam if looking downstream: The ponds principal spillway is a 16" ductile iron pipe which discharges into a concrete flume (carrying water to the toe of dam). The concrete flume is 5 feet wide and 70 feet long.

h. Describe the emergency spillway to include dimensions, whether the spillway is an earth channel or other construction, spillway surface protection, and orientation to dam if looking downstream: The earthen emergency spillway is located on the north side of the dam in native soil (outside of dam fill). No protective surface/hardening exists. This spillway is taken and is not used during 100-YR storm events.

8. Watershed Data (Class III only):

a. Drainage Area N/A Sq. Miles

b. Type and Extent of Watershed Development N/A

c. Time of Concentration N/A Method _____

d. ~~Spillway Design~~ Flood used (mark appropriate box)

_____PMF, source N/A

_____1/2 PMF, source _____

_____100 Year, source _____

_____50 Year, source _____

_____Other, source _____

e. Design inflow hydrograph: Volume N/A acre-feet;

Peak inflow N/A C.F.S.;

Rainfall duration of design inflow hydrograph N/A hours

f. Freeboard during passage of spillway design flood N/A feet

9. Impounding Structure History

a. Date construction completed Dam was constructed 1969

b. Design by Soil Conservation Service Date: 1969

c. Built by Jack L. Massie, Contractor, Inc Date: 1969



Dam Safety Permit

WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 247 757-874-2879 p.40 Apr 26 12 02:45p 757-874-2879

d. Inspection dates last known inspection on Feb. 10, 2004

e. Inspections by HERBERT + ASSOCIATES, LTD. (Donald Coghlan, P.E.)

f. Description of repairs REMOVED VEGETATION

g. Has the impounding structure ever been overtopped? _____ Yes _____ No UNKNOWN

10. Impounding Structure Assessment:

a. Provide brief descriptions for each item:

i. Condition of the impounding structure SEE ATTACHED LETTER BY HERBERT AND ASSOCIATES, LTD. DATED FEB. 10, 2004

ii. Condition of the reservoir

iii. Condition of the upstream area The upstream area is Residential subdivison

iv. Condition of the downstream area The downstream area is a tributary of France Swamp, a low lying wetland environmental. Adjacent properties are undeveloped.

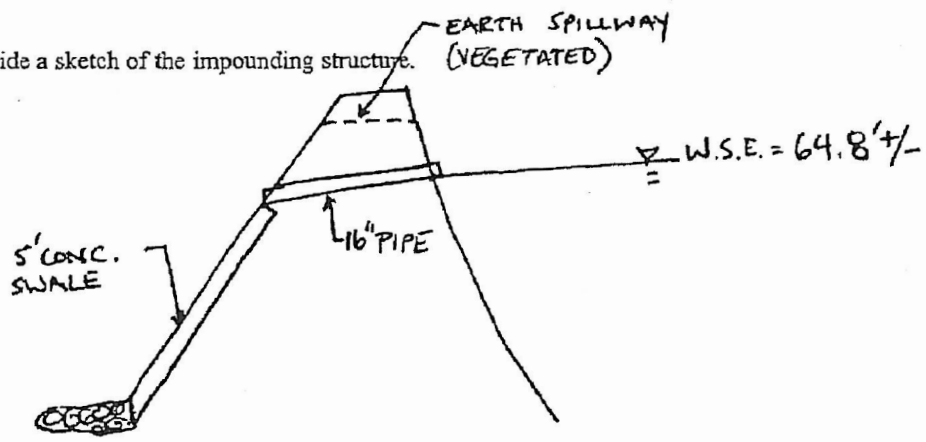
b. Provide a narrative describing any recent changes in the impounding structure, reservoir, upstream area, and downstream area:

c. Recommendations for remedial measures:



Dam Safety Permit
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 248
757-874-2879 p.41
Apr 26 12 02:45p 757-874-2879

11. Provide a sketch of the impounding structure.




CERTIFICATION BY OWNER'S ENGINEER (Class III only)

I hereby certify that the information provided in this Inventory Report has been examined by me and found to be true and correct in my professional judgment.

Signed_____
(Professional Engineer)

Virginia Number _____

This _____day of _____, 20_____.

CERTIFICATION BY OWNER (Class IV only)

I hereby certify that the information provided in this Inventory Report is true and correct.

Signed_____
(Owner)

This _____day of _____,20_____

**Please fill out and mail to:**
**Department of Conservation and Recreation**
**Division of Dam Safety**
**203 Governor Street**
**Richmond, Virginia 232192094**



Dam Safety Permit
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 249
757-874-2879 p.42
Apr 26 12 02:45p 757-874-2879

American Eastern

1003 Brick Kiln Blvd.

Newport News, Virginia 23602

757-867-8800

757-874-2879

# Fax

To: Marc Kennett From : H R Ashe

Fax: 220-8994 Pages:

Phone: Date:

Re: Wellington Dam Cc:

Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

# OPERATION AND MAINTENANCE APPLICATION
# CLASS I, II AND III IMPOUNDING STRUCTURES

Reference: Impounding Structures Regulations, 4VAC 50-20-00 et seq., Virginia Soil and Water Conservation Board

1. Name of Impounding Structure: LAKE NICE DAM EMBANKMENT

   Inventory Number: _____ Other Name (if any) _____

2. Hazard Potential Classification from Table 1, Impounding Structure Regulations:

   (Circle One) Class I (Class II) Class III

3. Name of Owner: Wellington H.O.A.

   Address: 632 Hampton Highway Yorktown, VA 23693

   Telephone: (Business) (757) 867-8800 (Residential) (___) N/A

4. Operating Plan and Schedule.

   Provide a narrative for each item:

   a. Operation of control gates and spillways. ALL SPILLWAYS OPERATE BASED ON HEAD GENERATED BY WATER SURFACE ELEVATION (NO GATES/VALVES)

   b. Operation of Reservoir Drain (not to exceed ½ foot drawdown per day on embankment dams).

   NO POND DRAINS

5. Maintenance Plan and Schedule

   Provide a narrative for each item:

   a. Embankment Dams:

      (1) embankment: MOWING 3 TIMES A YEAR, REMOVAL OF ALL TREES + BRUSH ONCE A YEAR, VISUAL INSPECTION FOR SEEPS

      (2) principal spillway: PIPES SHALL BE INSPECTED AND CLEARED OF ANY DEBRIS

      (3) emergency spillway: MOW CONCURRENTLY WITH EMBANKMENT, REMOVE TREES + BRUSH AND REPAIR, REPAIR ANY EROSION AND STABILIZE

      (4) low level outlet: N/A

      (5) reservoir area: MAINTAIN PERIMETER BUFFER TO WATER SURFACE

      (6) downstream channel: Natural swamp / wetlands area No maintenance will be provided

      (7) other: _____

   b. Concrete dams (including masonry and others):

      (1) upstream face: N/A

(DCR 199-099) (12/01)

(2) downstream face: N/A

(3) crest: N/A

(4) galleries: N/A

(5) tunnels, etc.: N/A

(6) abutments: N/A

(7) spillways: N/A

(8) gates and outlets: N/A

(9) other:

6. Inspection schedule (attach schedule and checklist):

(1) operator inspection (daily, weekly, etc.)

(2) maintenance inspection (monthly, quarterly, semi-annual, annual)

(3) technical safety reinspection by a professional engineer. (required for certification update: Class I dams every two years, Class II dams every three years. All dams inspected after overtopping).

7. Emergency Action Plan Schedule.

Provide the information that initiates the Emergency Action Plan:

a. rainfall amounts and/or: 100 YEAR 9 INCHES IN 24 HOUR OR LAST [illegible]

b. spillway flows: EMERGENCY SPILLWAY OVERFLOWS

c. frequency of observation:

8. For a newly constructed impounding structure, provide certification from a Professional Engineer who has inspected the impounding structure during construction that, to the best of the engineer's judgment, knowledge and belief, the impounding structure and all appurtenances have been constructed in conformance with the plans, specifications and drawings submitted to the Department of Conservation and Recreation. N/A

## OPERATION AND MAINTENANCE PERMIT APPLICATION

### OPERATION AND MAINTENANCE SCHEDULES
### CERTIFICATION BY OWNER

I hereby certify that the operation and maintenance plans and schedules provided herewith will be adhered to during the life of the project except in cases of unanticipated emergency requiring departure therefrom in order to mitigate hazards to life and property, at which time my engineer and the Department of Conservation and Recreation will be notified.

Signed: _____
(Owner)

This _____ day of _____, 20_____.

### CERTIFICATE BY OWNER'S ENGINEER

I hereby certify that the information provided in this form has been examined by me and found in my professional judgment to be appropriate to operation and maintenance considerations for this dam.

Signed: _____ Virginia Number: _____
Professional Engineer

This _____ day of _____, 20 _____.

Remarks: _____

_____

_____

_____

**Please fill out and mail this form to:**
**Department of Conservation and Recreation**
**Division of Dam Safety**
**203 Governor Street**
**Richmond, Virginia 23219-2094**

Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

# EMERGENCY ACTION PLAN FOR CLASS I, CLASS II AND CLASS III IMPOUNDING STRUCTURES

Reference: Impounding Structure Regulations, 4VAC52-20-00 et seq., Virginia Soil and Water Conservation Board

1. Name of Impounding Structure: LAKE NICE DAM EMBANKMENT

   Inventory Number: _____

   Other Name (if any): _____

2. Hazard Potential Classification from Table I, Virginia Dam Safety Regulations:
   Class I (Class II) Class III (Underline One)

3. Name of Owner: Wellington H.O.A.

   Address: 632 Hampton Hwy. YORKTOWN, VA 23693

   Telephone: (Business)(757) 867-8800 (Residential)(—) N/A

4. Name of Dam Operator: _____

   Address: _____

   Telephone: (Business)(____) _____ (Residential)(____) _____

   Name of Alternate Operator: _____

   Telephone: (Business)(____) _____ (Residential)(____) _____

5. Name of Rainfall or Staff Gage Observer for Dam: N/A

   Address: _____

   Telephone: (Business)(____) _____ (Residential)(____) _____

   Name of Alternate Observer: N/A

   Telephone: (Business)(____) _____ (Residential)(____) _____



Dam Safety Permit
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 254

6. 24-Hour Dispatch Center Nearest Dam-Police/Fire/Sheriff's

Departments: EMERGENCY DISPATCH

Address: 3135 FORGE RD ; TOANO, VA 23168

Telephone: (Business)(757) 566-0112 (Residential)( — ) N/A

7. Name of City/County Emergency Services Coordinator(s): CHIEF RICHARD MILLER

Address: JCC FIRE DEPARTMENT

5077 JOHN TYLER HWY

WILLIAMSBURG, VA 23185

Telephone: (Business)(757) 565-7603 (Residential)( )

8. Name, address and telephone number of all occupied dwellings that would be affected in the event of a dam failure, and/or inundation mapping of affected areas.

| Name | Address | Telephone Number |
|---|---|---|
| NO DOWNSTREAM DWELLINGS | | |



Dam Safety Permit
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 255
Apr 26 12 02:52p 757-874-2879

9. Name, address and telephone numbers of owners of all commercial or recreational establishments that would be affected in the event of dam failure, and/or an inundation mapping of affected areas.

| Name | Address | Telephone Number |
|---|---|---|
| No Downstream Commercial Areas | | |

10. Name, address and telephone number of owners of property, land and unoccupied buildings that would be affected in the event of a dam failure, and/or an inundation mapping of the affected area.

| Name | Address | Telephone Number |
|---|---|---|
| Williamsburg Christian Academy | 101 School House Ln<br>Williamsburg, VA 23185 | |
| George Hankins Jr. | 8290 Richmond Rd<br>Toano, VA 23168 | |



Dam Safety Permit
WC067_LAKE_NICE_LARGE_DAM_PRR - 256
Apr 26 12:02:52p 757-874-2879

11. If there are public roads downstream from the impounding structure, identify by highway number and distance below dam:

Route # 30, 0.6 Miles; Route # _____, _____ Miles;
Route # _____, _____ Miles; Route # _____, _____ Miles.

Provide name of resident engineer, VA Dept. of Transportation, (or City/County engineer)

Steven W. Hicks

Address: 4451 IRONBOUND RD

WILLIAMSBURG, VA 23188

Telephone: (Business)(757) 253-4832 (~~Residential~~ FAX)(757) 253-5148

NOTE: Items 12 and 13 should be provided from the Operation and Maintenance Application.

Definitions:

Stage I Condition – A flood watch, or heavy continuous rain or excessive flow of water from ice or snow melt.

Stage II Condition – A flood warning; or emergency spillway activated or dam overtopping/ breach may be possible.

Stage III Condition – Emergency spillway activated, dam overtopping or imminent failure is probable.

12. Amount of rainfall that will initiate a: coord. w/JCC

Stage II Condition _____ inches per 6 hrs.
_____ inches per 12 hrs.
_____ inches per 24 hrs.

Stage III Condition _____ inches per 6 hrs.
_____ inches per 12 hrs.
_____ inches per 24 hrs.

And/or the amount of flow in the emergency spillway that will initiate a:

Stage II Condition _____ feet (depth of flow)
Stage III Condition _____ feet (depth of flow)

Total depth of emergency spillway available before crest of dam is overtopped:
1.6 feet.

13. Frequency of observations by rainfall/staff gage observer during a:
Stage I Condition N/A Stage II N/A
Stage III N/A (recommend continuous)
Please identify access route and means of travel during flood conditions.
N/A



Dam Safety Permit
WC067 LAKE_NICE_LARGE LAKE MIRROR - 257

Note: It is recommended that the Observer remain on post until pool elevation starts to recede.

14. Surveillance and Notification

a. The dam owner/operator **IS RESPONSIBLE** for notifying local government of any problem or potential problem at the dam site.

b. The dam owner/operator **WILL INITIATE** dam surveillance under Stage I conditions, ie, when a flood watch is issued.

c. The dam owner/operator **WILL NOTIFY** the 24-hour dispatch center and the local Emergency Services Coordinator when Stage II conditions are met in order to alert them to review actions that may be required for the safety and protection of people and property.

d. The dam owner/operator **WILL NOTIFY** the 24-hour dispatch center and the local Emergency Services Coordinator to initiate warning of residents when Stage III conditions or imminent dam failure are probable.

e. The owner/operator **WILL BE RESPONSIBLE** for operating such devices as spillway gates and low level outlets such as to cause the dam to function effectively. Attach narrative if required.

f 24-hour dispatch center should prepare Standard Operating Procedures (SOP's) to implement dam overtopping/failure evacuation plans.

15. Evacuation Procedures: Coord. w/JCC

Note: The dam owner/operator should notify the City/County 24-hour Dispatch Center, as required in paragraph 14d above. Phone # should be listed in [a (1)].

Note: Once the local government has been notified of any problem at a dam site, it should take appropriate protective measures in accordance with the local Emergency Operations Plan and accompanying Emergency Action Plan and Standing Operations Procedures. Other local government actions might include:

(1) Notify the individuals who are directly downstream and in immediate danger. A list of the names, addresses, and telephone numbers of these individuals should be listed in [a (2]).
(2) Monitoring the situation and, if time permits, review of evacuation plans.
(3) Begin Alert, Notification, and Warning
(4) Immediately evacuating the inundation areas, if conditions warrant.
(5) Expanding Direction and Control as well as beginning Emergency Public Information and operating shelters.
(6) Provide Situation Reports to the State Emergency Operations Center (804-674-2400 or 800-468-8892)



Dam Safety Permit
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 258
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a. Once the local government has been notified of a condition requiring evacuation, the dam owner/operator and local government are mutually responsible for effecting evacuation.

(1) The dam owner/operator will: _____

_____

_____

_____

_____

_____

_____

(2) Local government will: _____

_____

_____

_____

_____

_____

_____

_____

Individuals who are directly downstream and in immediate danger include:

| NAME | ADDRESS | TELEPHONE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

b. Methods for notification and warning to evacuate include:

Check appropriate method(s)

_____ (1) Telephone

_____ (2) Police/fire/sheriff radio dispatch vehicles with loudspeakers, bullhorns, etc.

_____ (3) Personal runners for door-to-door alerting

_____ (4) Radio/television broadcasts for area involved

(City/County) residents as required in the event of actual or impending failure of the

_____ (name of dam) have been coordinated

with the dam owner/operator.

_____

(Signature of City/County Official)

This _____ day of _____, 20_____.

Printed Name _____

Position _____

Please fill out and mail to:

**Virginia Department of Emergency Management**
**Emergency Services**
**10501 Trade Ct.**
**Richmond, Virginia 23236-3713**

**Dept. of Conservation and Recreation**
**Division of Dam Safety**
**203 Governor Street**
**Richmond, Virginia 23219-2094**



Dam Safety Permit
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 260
Apr 26 12 02:53p 757-874-2879 p.11

American Eastern

1003 Brick Kiln Blvd.

Newport News, Virginia 23602

757-867-8800

757-874-2879

# Fax

To: Marc Kennett From: H R Ashe

Fax: 220-8994 Pages:

Phone: Date:

Re: Wellington Dam Cc:

9. Operational Procedures: Provide a narrative describing the impounding structure procedures:

a. Operation: THE DAM HAS NO VALVES OR GATES REQUIRING OPERATION.

b. Maintenance: REGULAR MOWING DURING GROWING SEASON (APROX 3 TIMES A YEAR), CLEAR TREES + SHRUB/BRUSH

c. Emergency Action Plan:*

d. Evaluation: REGULAR MAINTENANCE / INSPECTION IS THE MOST CRUCIAL ASPECT TO THE LONG TERM FUNCTION OF THE DAM.

10. Hydraulic/Hydrologic Data: Provide a narrative describing hydraulic/hydrologic data:

a. Design: Original design was in 1969. Recent development has required modification to drainage areas but no changes have been required to the structure.

b. Hydrologic records: Unknown

c. Flood experience: Unknown

d. Flood potential: 100-YR STORM ELEVATION ~ 67.7 This elevation is platted on all adjacent upstream lots

e. Reservoir regulation: The pond has a county controlled pond buffer to allow maintenance and access



Dam Safety Permit

WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 262

f. Overtopping potential: Current design has high water elevation of 67.7 (100 YR STORM).

g. Reservoir emptying potential: No pond drain is provided to empty/dewater the reservoir.

h. Evaluation: Principal spillway can adequately pass all design storms. Regular maintenance should be preformed to ensure principal spillway remains clear of debris.

11. Dam Stability: Provide a narrative describing impounding structure stability:

a. Foundation/abutments: N/A

b. Embankment materials: SEE GEOTECHNICAL REPORT / BORING LOGS BY HERBERT AND ASSOCIATES, LTD.

c. Embankment stability: SEE ATTACHED LETTER

d. Evaluation:

12. Assessment/Remedial Measures: Provide a narrative describing the As-Built condition of the impounding structure:

a. Dam assessment:

b. Recommended remedial measures:





WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 263

CERTIFICATION BY OWNER'S ENGINEER

I hereby certify that the information provided in this As-Built Report has been examined by me and found to be true and correct in my professional judgment.

Signed _____

(Professional Engineer)

Virginia Number _____

This _____ day of _____, 20_____.

**Please fill out and mail this form to:**
**Department of Conservation and Recreation**
**Division of Dam Safety**
**203 Governor Street**
**Richmond, Virginia 23219-2094**



Dam Safety Permit
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 264
757-874-2879 p.4
Apr 26 12 02:57p 757-874-2879

Herbert and Associates, Ltd.
TESTING & ENGINEERING & INSPECTING
POST OFFICE BOX 64788 • VIRGINIA BEACH, VA 23464 • PHONE (757) 545-5234

February 10, 2004

Mr. R. N. Jushe
American Eastern, Inc.,
632 Hampton Highway
Yorktown, Virginia 23693

RE: Earthen dam at Wellington Subdivision,
Section One, James City County, Virginia

Dear Mr. Jushe:

We are writing to address the overall dam stability and the source of water at the downhill toe.

We performed one Standard Penetration test atop the dam. This test indicates the dam consist of clayey sand (SC) fill material to a depth of approximately twenty (20) feet. The water table is coincidental with the depth of fill. The water at the toe of the slope is one flow net just below the dense clayey sands and in the in-situ poorly graded sands (SP).

Based on our field investigations, analysis and since the dam has functioned for over thirty (30) years, our conclusion is the dam is stable and will remain so for the near future.

As discussed in our letter of April 24, 2003 the following recommendations should be met to ensure dam safety:

1. Remove all vegetation on the lake side slope and roots greater than one inch in diameter. Fill, compact, grade and seed.

2. Regular mowing throughout the year (maintain grass at a height of 6-inches or less) is essential so the surface can be readily traversed by foot for bi-annual inspection and to identify dam safety problems.

Herbert and Associates, Ltd.

3. Annual inspection by a licensed Professional Engineer should be conducted. Mowing should occur just prior to the Inspections.

All other items addressed in the department of Conservation and recreation letter dated 7-1-03 will be addressed by others.

In hope this meets with your approval.

Respectfully submitted,
Herbert and Associates, Ltd.,

Donald P. Coghlan, P.E.,
Geotechnical Engineer

COMMONWEALTH OF VIRGINIA
4-20-04
DONALD P. COGHLAN
No.
14829
PROFESSIONAL ENGINEER

8557

Herbert and Associates, Ltd.
TESTING • ENGINEERING • INSPECTING
POST OFFICE BOX 64758 • VIRGINIA BEACH, VA 23484 • PHONE (757) 545-5234

April 24, 2003

Mr. Chuck Glissan
American Eastern
632 Hampton Highway
Yorktown, Virginia 23693

RE: Wellington – Section One, James City County, Virginia

Dear Mr. Glissan:

I am writing in regards to my recent inspection of the earthen dam at the referenced project. Please note we did not perform hand auger sampling as we feel it is not needed. Should this be required we can take samples as a follow up to this letter.

Purpose – prior to deeding the dam to the homeowners, the city has requested a determination as to the current state and the future state of dam stability.

Site Visit – I visited the site on April 21, 2003 and visually inspection the dam. The structure is an earthen dam based on the size of tree growth, I estimate the dam to be 20 to 30 years old.

No wet spots or piping was observed. Trees and underbrush cover the down stream face. Tall grass, underbrush and vines covered the up stream face.

The method of overflow control is by a single 16-inch I.D. cast iron pipe. For a short distance at the intake end, a section of corrugated metal pipe was observed. I could look all the way through the pipe and observed it to be very clean, except at the mouth of the intake end. The pipe appeared in a very good state of repair. The intake invert was several feet above the lake water level.

The pipe discharged into a concrete spillway approximately four feet wide, which ran down the slope to the marsh area below. The spillway appeared in a good state of repair.

Conclusion – The dam, discharge pipe and spillway appear to be performing adequately and should continue to do so in the upcoming years.

Dennis Rager
~~545-5234~~

Herbert and Associates, Ltd.

Recommendations

(1) Remove all trees greater than 12"Φ by cutting at the base then grub all roots greater than 1 inch in diameter. Fill, compact and grade to adjacent contour.

(2) Cut all other vegetation flush with the ground and remove all debris from the site.

(3) Rake and remove all debris and leaves to allow seeding.

(4) Seed and fertilize the entire dam. Maintain the grass until it is well established.

(5) All grubbing, clearing, seeding, etc. shall continue for a distance of 50-feet beyond the abutment contacts.

(6) Regular mowing throughout the year (maintain grass at a height of 6 inches or less) is essential so that the surface can be readily traversed by foot for bi-annual inspections and potential dam safety problems, such as misalignment, cracks, animal burrows, surface erosion, seepage, wet spots, etc. can be spotted early.

(7) Bi-annual inspections by a licensed Engineer should be conducted. Mowing should occur just prior to the inspection.

In hope this meets with your approval.

COMMONWEALTH OF VIRGINIA
4.24.03
DONALD P. COGHLAN
No. 14829
PROFESSIONAL ENGINEER

Respectfully submitted,
Herbert and Associates, Ltd.,

Donald P. Coghlan, P.E.,
Geotechnical Engineer

Herbert and Associates, Ltd.
TESTING • ENGINEERING • INSPECTING
POST OFFICE BOX 64758 • VIRGINIA BEACH, VA 23464 • PHONE (757) 545-5234

November 4, 2003

NOV 0 5 2003

American Eastern
632 Hampton Highway
Yorktown, Virginia 23693

RE: Existing Wellington Dam
James City County, Virginia

Gentlemen:

Transmitted herein are Logs of Boring secured in conjunction with the referenced project.

We would like to thank you for giving us this opportunity to be of service. If we may be of further assistance in this or any other matter, please do not hesitate to call upon us.

Respectfully submitted,
Herbert and Associates, Ltd.

John A. Herbert

John A. Herbert, S.E.T.
President

**Herbert and Associates, Ltd.**
TESTING • ENGINEERING • INSPECTING
POST OFFICE BOX 64758 • VIRGINIA BEACH, VA 23464 • PHONE (757) 420-2797

# LOG OF BORING

FILE NO. 99-8557

PROJECT IDENTIFICATION Existing Wellington Dam LOCATION James City Co.

BORING NO. B-1 TYPE DRILL CME 55 CLIENT American Eastern

DATE STARTED 11-3-03 DATE COMPLETED 11-3-03 DRILLER F. Cereske

CASING LENGTH 40' DIA. 7¼" Augers WATER ELEV: IMMEDIATE 20.5' AFTER ____ HRS. ____

TYPE SAMPLER SS LENGTH 30" DIA. 2"OD SURF. ELEV. Not Obtained

| DEPTH | STD. PEN. (N)* | SAMPLE DESCRIPTION | SAMPLE NO. |
|---|---|---|---|
| | | Topsoil 1" | |
| | 5-4<br>4-5<br>3-4<br>8-7<br>7-8<br>9-9<br>4-4<br>5-3 | Orange, moist, loose to medium dense, fine to veryfine sand with some clay (SP) Fill | S-1<br>S-2<br>S-3<br>S-4 |
| | 5-4<br>5-7<br>14-14<br>18-10 | Orange, wet, loose to medium dense, clayey sand, (SC)Fill | S-5<br>S-6 |
| | | Lt. gray mottle orange, moist, medium dense, clayey sand, Fill (SC) | |
| | 16-22<br>23-24 | White, wet, medium dense, fine to very fine sand, Fill (SP) | S-7 |
| | | Gray & orange, moist, medium dense, clayey sand, Fill (SC) | |
| | 4-5<br>7-8 | Tan, saturated, medium dense, fine to very fine sand (SP) | S-8 |
| | 6-6<br>5-5 | | S-9 |
| | 4-4<br>4-4 | Olive, saturated, loose, fine to very fine sand (SP) | S-10 |
| | | Brown mottle orange, saturated, medium stiff, clay (CL) | |
| | 2-2<br>3-3 | Lt. gray & olive, saturated, medium stiff, sandy clay (CL) | S-11 |
| | | Olive mottle light gray, saturated, very loose, clayey sand (SC) | |

*STANDARD PENETRATION INDICATED FOR EACH 6 INCHES OF DRIVE OF SPLIT TUBE SAMPLER utilizing a 140 pound hammer with a 30 inch fall

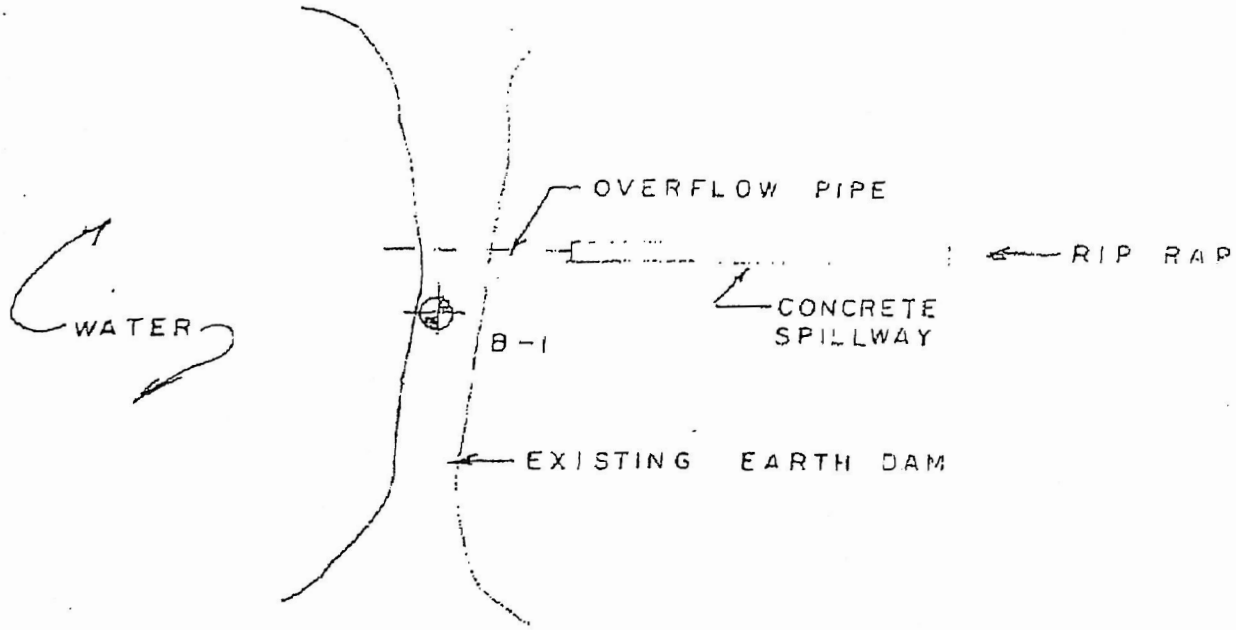
# LOG OF BORING

PROJECT IDENTIFICATION Existing Wellington Dam BORING NO. S-1

| DEPTH | STD. PEN. (N)* | SAMPLE DESCRIPTION | SAMPLE NO |
|---|---|---|---|
| 40 | | | |
| 42 | 1-1<br>2-1 | Olive mottle light gray, saturated, very loose, clayey sand (SC) | S-12 |
| 44 | | | |
| 46 | | Bottom of Boring 42.0' | |
| 48 | | | |
| 50 | | | |
| 52 | | | |
| 54 | | | |
| 56 | | | |
| 58 | | | |
| 60 | | | |
| 62 | | | |
| 64 | | | |
| 66 | | | |
| 68 | | | |
| 70 | | | |
| 72 | | | |
| 74 | | | |
| 76 | | | |
| 78 | | | |
| 80 | | | |
| 82 | | | |
| 84 | | | |
| 85 | | | |
| 88 | | | |
| 90 | | | |

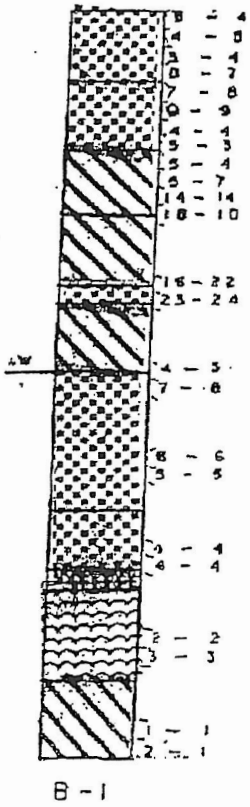
TANDARD PENETRATION INDICATED FOR EACH 6 INCHES OF DRIVE OF SPLIT TUBE SAMPLED, utilizing a 140 pound hammer with a 30 inch fall.

r letters and reports are for the exclusive use of the client to whom they are addressed. The use of our name must receive our prior written approval. Our letters and reports apply




## BORING LOCATION PLAN

NOT TO SCALE




## PROFILE VIEW

SCALE: 1" = 10'-0"

## LEGEND

- TOPSOIL
- FINE TO VERY FINE SAND
- CLAYEY SAND
- CLAY
- SANDY CLAY

## SOIL PROFILE

EXISTING WELLINGTON DAM

JAMES CITY COUNTY VIRGINIA

HERBERT & ASSOCIATES, LTD.

NORFOLK VIRGINIA

NOV. 3, 2003 | JOB: 99-8557

Herbert and Associates, Ltd.
TESTING • ENGINEERING • INSPECTING
POST OFFICE BOX 64758 • VIRGINIA BEACH, VA 23464 • PHONE (757) 420-2797

# LOG OF BORING

FILE NO. 99-8557

PROJECT IDENTIFICATION Existing Wellington Dam LOCATION James City Co

BORING NO. B-1 TYPE DRILL CME 55 CLIENT American Eastern

DATE STARTED 11-3-03 DATE COMPLETED 11-3-03 DRILLER E. Cereske

CASING LENGTH 40' DIA. 2¼" Augers WATER ELEV: IMMEDIATE 20.5' AFTER ____ HRS. ____

TYPE SAMPLER SS LENGTH 30" DIA. 2" OD SURF. ELEV. Not Obtained

| DEPTH | STD. PEN. (N)* | SAMPLE DESCRIPTION | SAMPLE NO. |
|---|---|---|---|
| 0 | | Topsoil 1" | |
| | 5-4 | Orange, moist, loose to medium dense, fine to veryfine sand with some clay (SP) Fill | S-1 |
| 2 | 4-5 | | |
| | 3-4 | | S-2 |
| 4 | 8-7 | | |
| | 7-8 | | S-3 |
| 5 | 9-9 | | |
| | 4-4 | | S-4 |
| | 5-3 | | |
| | 5-4 | Orange, wet, loose to medium dense, clayey sand, (SC) Fill | S-5 |
| | 5-7 | | |
| | 14-14 | | S-6 |
| | 18-10 | | |
| | | Lt. gray mottle orange, moist, medium dense, clayey sand, Fill (SC) | |
| | 16-22 | White, wet, medium dense, fine to very fine sand, Fill (SP) | S-7 |
| | 23-24 | | |
| | | Gray & orange, moist, medium dense, clayey sand, Fill (SC) | |
| | 4-5 | | S-8 |
| | 7-8 | Tan, saturated, medium dense, fine to very fine sand (SP) | |
| | 6-6 | | S-9 |
| | 5-5 | | |
| | | Olive, saturated, loose, fine to very fine sand (SP) | |
| | 4-4 | | S-10 |
| | 4-4 | | |
| | | Brown mottle orange, saturated, medium stiff, clay (CL) | |
| | | Lt. gray & olive, saturated, medium stiff, sandy clay (CL) | |
| | 2-2 | | S-11 |
| | 3-3 | | |
| | | Olive mottle light gray, saturated, very loose, clayey sand (SC) | |

*STANDARD PENETRATION INDICATED FOR EACH 6 INCHES OF DRIVE OF SPLIT TUBE SAMPLED, utilizing a 140 pound hammer with a 30 inch drop.

Dam Safety Permit
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 273

# LOG OF BORING

PROJECT IDENTIFICATION Existing Wellington Dam BORING NO. B-1

| DEPTH | STD. PEN (N)* | SAMPLE DESCRIPTION | SAMPLE NO. |
|---|---|---|---|
| 40 | | | |
| 42 | 1-1<br>2-1 | Olive mottle light gray, saturated, very loose, clayey sand (SC) | S-12 |
| 44 | | | |
| 46 | | Bottom of Boring 42.0' | |
| 48 | | | |
| 50 | | | |
| 52 | | | |
| 54 | | | |
| 56 | | | |
| 58 | | | |
| 60 | | | |
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| 68 | | | |
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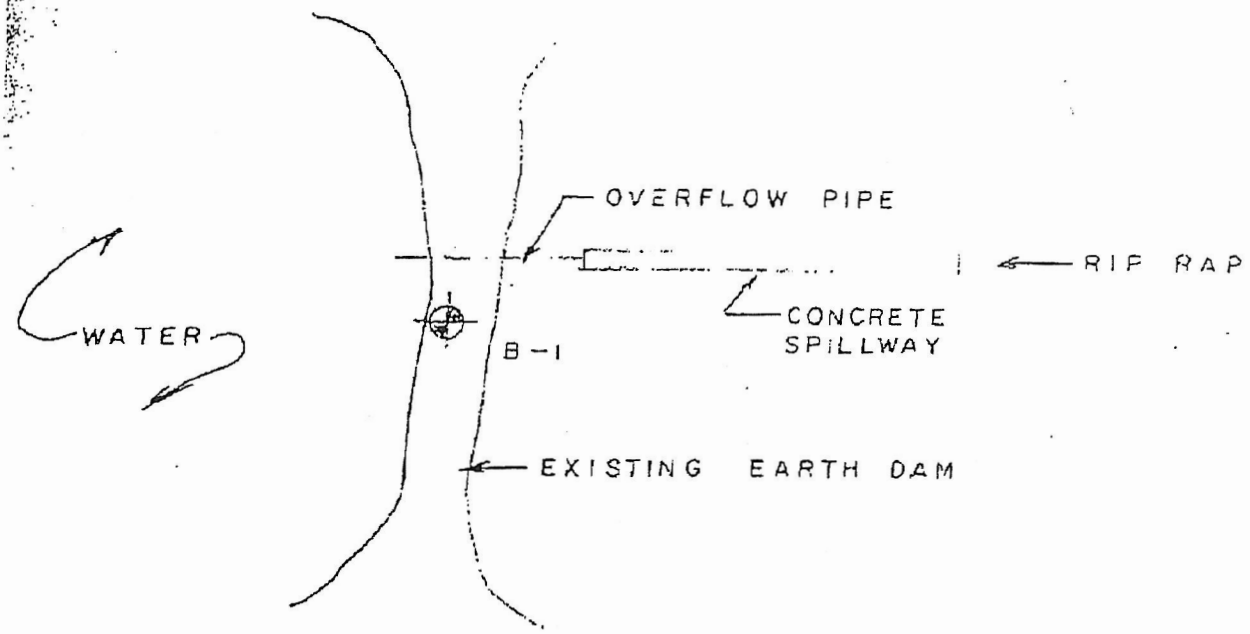
| 80 | | | |
| 82 | | | |
| 84 | | | |
| 86 | | | |
| 88 | | | |
| 90 | | | |

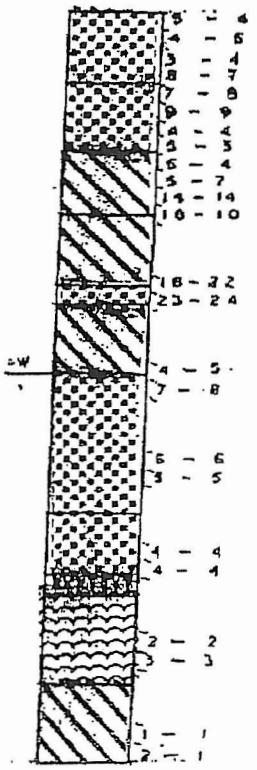
*STANDARD PENETRATION INDICATED FOR EACH 6 INCHES OF DRIVE OF SPLIT TUBE SAMPLED, utilizing a 140 pound hammer with a 30 inch fall.

Our letters and reports are for the exclusive use of the client to whom they are addressed. The use of our name must receive our prior written approval. Our letters and reports apply only to the sample tested and/or inspected, and are not necessarily indicative of the qualities of apparently identical or similar products




## BORING LOCATION PLAN

NOT TO SCALE




## PROFILE VIEW

SCALE: 1" = 10' - 0"

## LEGEND

- TOPSOIL
- FINE TO VERY FINE SAND
- CLAYEY SAND
- CLAY
- SANDY CLAY

## SOIL PROFILE

EXISTING WELLINGTON DAM

JAMES CITY COUNTY VIRGINIA

HERBERT & ASSOCIATES, LTD.

NORFOLK VIRGINIA

Dam Safety Permit
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 275
Apr 26 12 02:59p 757-874-2879 p.15

Herbert and Associates, Ltd.
TESTING • ENGINEERING • INSPECTING
POST OFFICE BOX 64758 • VIRGINIA BEACH, VA 23464 • PHONE (757) 420-2797

# LOG OF BORING

FILE NO. 99-8557

PROJECT IDENTIFICATION Existing Wellington Dam LOCATION James City Co

BORING NO. B-1 TYPE DRILL CME 55 CLIENT American Eagtern

DATE STARTED 11-3-03 DATE COMPLETED 11-3-03 DRILLER F. Cereske

CASING LENGTH 40' DIA. 2¼" Augers WATER ELEV: IMMEDIATE 20.5' AFTER ____ HRS. ____

TYPE SAMPLER SS LENGTH 30" DIA. 2" OD SURF. ELEV. Not Obtained

| DEPTH | STD. PEN. (N)* | SAMPLE DESCRIPTION | SAMPLE NO. |
|---|---|---|---|
| 0 | | Topsoil 1" | |
| 2 | 5-4<br>4-5<br>3-4 | Orange, moist, loose to medium dense, fine to veryfine sand with some clay (SP) Fill | S-1<br>S-2 |
| 4 | 8-7<br>7-8 | | S-3 |
| 6 | 9-9<br>4-4 | | S-4 |
| 8 | 5-3<br>5-4 | Orange, wet, loose to medium dense, clayey sand, (SC)Fill | S-5 |
| 10 | 5-7<br>14-14 | | S-6 |
| 12 | 18-10 | Lt. gray mottle orange, moist, medium dense, clayey sand, Fill (SC) | |
| 14 | 16-22<br>23-24 | White, wet, medium dense, fine to very fine sand, Fill (SP) | S-7 |
| 16 | | Gray & orange, moist, medium dense, clayey sand, Fill (SC) | |
| 18 | 4-5<br>7-8 | Tan, saturated, medium dense, fine to very fine sand (SP) | S-8 |
| 20 | 6-6<br>5-5 | | S-9 |
| 22 | 4-4<br>4-4 | Olive, saturated, loose, fine to very fine sand (SP) | S-10 |
| | | Brown mottle orange, saturated, medium stiff, clay (CL) | |
| 24 | 2-2<br>3-3 | Lt. gray & olive, saturated, medium stiff, sandy clay (CL) | S-11 |
| | | Olive mottle light gray, saturated, very loose, clayey sand (SC) | |

*STANDARD PENETRATION INDICATED FOR EACH 6 INCHES OF DRIVE OF SPLIT TUBE SAMPLED, utilizing a 140 pound hammer with a 30 inch drop.

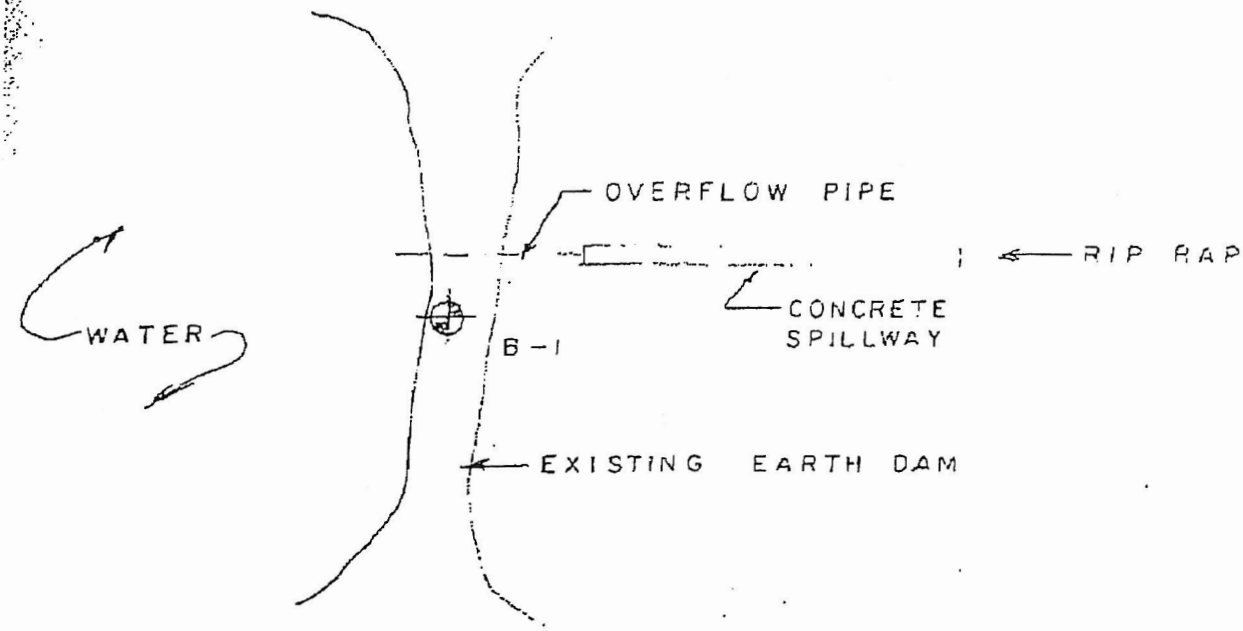
Letters and reports are for the exclusive use of the client to whom they are addressed. The use of our name must receive our prior written approval.

# LOG OF BORING

PROJECT IDENTIFICATION Existing Wellington Dam BORING NO. B-1

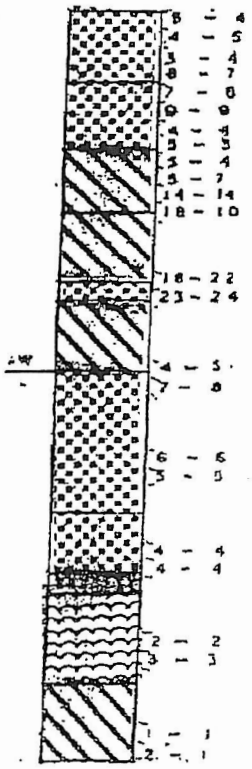
| DEPTH | STD. PEN. (N) | SAMPLE DESCRIPTION | SAMPLE NO |
|---|---|---|---|
| 40 | | | |
| 42 | 1-1<br>2-1 | Olive mottle light gray, saturated, very loose, clayey sand (SC) | S-12 |
| 44 | | | |
| 46 | | Bottom of Boring 42.0' | |
| 48 | | | |
| 50 | | | |
| 52 | | | |
| 54 | | | |
| 56 | | | |
| 58 | | | |
| 60 | | | |
| 62 | | | |
| 64 | | | |
| 66 | | | |
| 68 | | | |
| 70 | | | |
| 72 | | | |
| 74 | | | |
| 76 | | | |
| 78 | | | |
| 80 | | | |
| 82 | | | |
| 84 | | | |
| 86 | | | |
| 88 | | | |
| 90 | | | |

TANDARD PENETRATION INDICATED FOR EACH 6 INCHES OF DRIVE OF SPLIT TUBE SAMPLED, utilizing a 140 pound hammer with a 30 inch fall.




## BORING LOCATION PLAN

NOT TO SCALE




## PROFILE VIEW

SCALE: 1" = 10'-0"

## LEGEND

- TOPSOIL
- FINE TO VERY FINE SAND
- CLAYEY SAND
- CLAY
- SANDY CLAY

## SOIL PROFILE

EXISTING WELLINGTON DAM

JAMES CITY COUNTY VIRGINIA

HERBERT & ASSOCIATES, LTD.

NORFOLK VIRGINIA

Dam Safety Permit



Apr 26 12 03:00p 757-874-2879 p.18

DCR

Department of Conservation & Recreation

CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

COPY *MAILED 9-6-05 gmcl

# DAM OWNER'S ANNUAL INSPECTION FORM

Name of Dam: Lake Nice Dam

Inventory Number: 09527

Name of Reservoir:

County/City: James City County

Owner's Name: Wellington LLC

Hazard Class I, (II), III, or IV:

Address: 632 Hampton Hwy
Yorktown VA 23693

Inspected by: owner

Telephone: (757) 867-8800

Date: 9-6-05

DIRECTIONS: MARK "X" IN YES, NO or N/A COLUMN

| ITEM | YES | NO | N/A | REMARKS |
|---|---|---|---|---|
| 1. GENERAL CONDITION | | | | |
| A. Alterations to dam? | | ✓ | | |
| B. Development in downstream flood plain? | | ✓ | | |
| C. Grass cover adequate? (embankment & spillway) | | ✓ | | |
| D. Settlements, misalignment, or cracks? | | ✓ | | |
| E. Recent high water marks? | | | | Elevation: below overflow pipe -1'3" |
| 2. UPSTREAM SLOPE | | | | |
| A. Erosion? | | ✓ | | |
| B. Trees? | | ✓ | | |
| C. Rodent holes? | | ✓ | | |
| D. Cracks, settlement, or bulges? | | ✓ | | |
| E. Adequate and sound riprap? | | ✓ | | |
| 3. INTAKE STRUCTURE | | | | Water Surface Elevation: |
| ___Concrete ✓ Metal ___Other Material | | | | |
| A. Spalling, cracking, scaling? | | ✓ | | |
| B. Exposed reinforcement? | | ✓ | | |
| C. Corrosion present? | | ✓ | | |
| D. Coating adequate? | | ✓ | | |
| E. Leakage? | | ✓ | | |
| F. Trash rack adequate? | | | ✓ | |
| G. Obstacles to Inlet? | | ✓ | | |
| H. Drawdown Operative? ____Closed ____Open | | | ✓ | |
| 4. ABUTMENT CONTACTS | | | | |
| A. Erosion, cracks or slides? | | ✓ | | |
| B. Seepage? | | ✓ | | Estimated GPM: |
| 5. EMERGENCY SPILLWAY | | | | |
| A. Obstructions? | | ✓ | | |
| B. Erosion? | | ✓ | | |
| C. Rodent holes? | | ✓ | | |
| 6. DOWNSTREAM SLOPE | | | | |
| A. Erosion? | | ✓ | | |
| B. Trees? | | ✓ | | |
| C. Rodent holes? | | ✓ | | |
| D. Cracks, settlements or bulges? | | ✓ | | |
| E. Drains or wells flowing? | | ✓ | | Estimated GPM: |
| F. Seepage or boils? | ✓ | | | Estimated GPM: 1 1/2 |

(DCR 199-098) (12/01)

Dam Safety Permit



Apr 26 12 03:00p 757-874-2879

| ITEM | YES | NO | N/A | REMARKS |
|---|---|---|---|---|
| 7. CONDUIT AND OUTLET | | | ✓ | Tail Water Elevation and Flow: |
| ___Concrete ____Metal ____Other Material | | | | |
| A. Spalling, cracking, scaling? | | | | |
| B. Exposed reinforcement? | | | | |
| C. Joints displaced or offset? | | | | |
| D. Joint material lost? | | | | |
| E. Leakage? | | | | |
| F. Earth erosion? | | | | |
| G. Conduit misaligned? | | | | |
| H. Outlet channel obstructed? | | | | |
| 8. STILLING BASIN | | | ✓ | |
| A. Spalling, cracking, scaling? | | | | |
| B. Exposed reinforcement? | | | | |
| C. Joints displaced or offset? | | | | |
| D. Joint material lost? | | | | |
| E. Joints leak? | | | | |
| F. Rock adequate? | | | | |
| G. Dissipaters deteriorating? | | | | |
| H. Dissipaters clean of debris? | | | | |
| 9. CONCRETE SPILLWAY | | | | |
| A. Spalling, cracking, scaling? | ✓ | | | repaired crack |
| B. Exposed reinforcement? | | ✓ | | |
| C. Joints displaced or offset? | | ✓ | | |
| D. Joint material lost? | | ✓ | | |
| E. Leakage? | | ✓ | | |
| F. Dissipaters deteriorating? | | ✓ | | |
| G. Dissipaters clean of debris? | ✓ | | | |
| H. Earth erosion? | | ✓ | | |
| I. Outlet channel eroding? | | ✓ | | |
| 10. GATES | | | ✓ | |
| A. Floodgates broken/ bent? | | | | |
| B. Floodgates eroded or rusted? | | | | |
| C. Floodgates operational? | | | | |
| 11. RESERVOIR | | | ✓ | |
| A. Development? | | | | |
| B. Slides or erosion on banks? | | | | |
| C. Reservoir managed? | | | | |
| 12. INSTRUMENTS | | | | |
| A. Is structure instrumented? | | ✓ | | |
| B. Monitoring performed? | | ✓ | | |
| 13. DAM SHOULD BE INSPECTED BY ENGINEER? | | ✓ | | |
| 14. REEVALUATE HAZARD CLASSIFICATION? | | ✓ | | |
| 15. IS EMERGENCY ACTION PLAN CURRENT? | ✓ | | | |

REMARKS:

Dam is in Same condition as before

**Please fill out and mail this form to:**
**Department of Conservation and Recreation**
**Division of Dam Safety**
**203 Governor Street**
**Richmond, Virginia 23219-2094**



Dam Safety Permit
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 280
Apr 26 12 03:00p 757-874-2879 p.20

DCR
Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

COPY MAILED 9-24-08

# DAM OWNER'S ANNUAL INSPECTION FORM

Name of Dam: Lake Nice Dam
Inventory Number: 09527
Name of Reservoir:
County/City: JAMES CITY COUNTY
Owner's Name: Wellington LLC
Hazard Class I, II, III, or IV:
Address: 632 Hampton Hwy
Yorktown VA 23693
Inspected by: owner
Telephone: (757) 867-8800
Date: 9-23-2008

DIRECTIONS: MARK "X" IN YES, NO or N/A COLUMN

| ITEM | YES | NO | N/A | REMARKS |
|---|---|---|---|---|
| 1. GENERAL CONDITION | | | | |
| A. Alterations to dam? | | ✓ | | |
| B. Development in downstream flood plain? | | ✓ | | |
| C. Grass cover adequate? (embankment & spillway) | | ✓ | | |
| D. Settlements, misalignment, or cracks? | | ✓ | | |
| E. Recent high water marks? | | | | Elevation: Below overflow 1'-3" |
| 2. UPSTREAM SLOPE | | | | |
| A. Erosion? | | ✓ | | |
| B. Trees? | | ✓ | | |
| C. Rodent holes? | | ✓ | | |
| D. Cracks, settlement, or bulges? | | ✓ | | |
| E. Adequate and sound riprap? | | ✓ | | |
| 3. INTAKE STRUCTURE | | | | Water Surface Elevation: |
| ___Concrete ✓ Metal ___Other Material | | | | |
| A. Spalling, cracking, scaling? | | ✓ | | |
| B. Exposed reinforcement? | | ✓ | | |
| C. Corrosion present? | | ✓ | | |
| D. Coating adequate? | | ✓ | | |
| E. Leakage? | | ✓ | | |
| F. Trash rack adequate? | | | ✓ | |
| G. Obstacles to Inlet? | | ✓ | | |
| H. Drawdown Operative? ____Closed ____Open | | | ✓ | |
| 4. ABUTMENT CONTACTS | | | | |
| A. Erosion, cracks or slides? | | ✓ | | |
| B. Seepage? | | ✓ | | Estimated GPM: |
| 5. EMERGENCY SPILLWAY | | | | |
| A. Obstructions? | | ✓ | | |
| B. Erosion? | | ✓ | | |
| C. Rodent holes? | | ✓ | | |
| 6. DOWNSTREAM SLOPE | | | | |
| A. Erosion? | | ✓ | | |
| B. Trees? | | ✓ | | |
| C. Rodent holes? | | ✓ | | |
| D. Cracks, settlements or bulges? | | ✓ | | |
| E. Drains or wells flowing? | | ✓ | | Estimated GPM: |
| F. Seepage or boils? | ✓ | | | Estimated GPM: 1½ |

(DCR 199-098) (12/01)

| ITEM | YES | NO | N/A | REMARKS |
|---|---|---|---|---|
| 7. CONDUIT AND OUTLET | | | ✓ | Tail Water Elevation and Flow: |
| ___Concrete ___Metal ___Other Material | | | | |
| A. Spalling, cracking, scaling? | | | | |
| B. Exposed reinforcement? | | | | |
| C. Joints displaced or offset? | | | | |
| D. Joint material lost? | | | | |
| E. Leakage? | | | | |
| F. Earth erosion? | | | | |
| G. Conduit misaligned? | | | | |
| H. Outlet channel obstructed? | | | | |
| 8. STILLING BASIN | | | ✓ | |
| A. Spalling, cracking, scaling? | | | | |
| B. Exposed reinforcement? | | | | |
| C. Joints displaced or offset? | | | | |
| D. Joint material lost? | | | | |
| E. Joints leak? | | | | |
| F. Rock adequate? | | | | |
| G. Dissipaters deteriorating? | | | | |
| H. Dissipaters clean of debris? | | | | |
| 9. CONCRETE SPILLWAY | | | | |
| A. Spalling, cracking, scaling? | | ✓ | | |
| B. Exposed reinforcement? | | ✓ | | |
| C. Joints displaced or offset? | | ✓ | | |
| D. Joint material lost? | | ✓ | | |
| E. Leakage? | | ✓ | | |
| F. Dissipaters deteriorating? | | ✓ | | |
| G. Dissipaters clean of debris? | | ✓ | | |
| H. Earth erosion? | | ✓ | | |
| I. Outlet channel eroding? | | ✓ | | |
| 10. GATES | | | ✓ | |
| A. Floodgates broken/ bent? | | | | |
| B. Floodgates eroded or rusted? | | | | |
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| 11. RESERVOIR | | | ✓ | |
| A. Development? | | | | |
| B. Slides or erosion on banks? | | | | |
| C. Reservoir managed? | | | | |
| 12. INSTRUMENTS | | | | |
| A. Is structure instrumented? | | ✓ | | |
| B. Monitoring performed? | | ✓ | | |
| 13. DAM SHOULD BE INSPECTED BY ENGINEER? | | ✓ | | |
| 14. REEVALUATE HAZARD CLASSIFICATION? | | ✓ | | |
| 15. IS EMERGENCY ACTION PLAN CURRENT? | ✓ | | | |

REMARKS: Dam is in good condition like before

**Please fill out and mail this form to:**
**Department of Conservation and Recreation**
**Division of Dam Safety**
**203 Governor Street**
**Richmond, Virginia 23219-2094**



Dam Safety Permit
WC067_LAKE_NICE_LARGE_LAKE_MIRROR - 282
Apr 26 12 03:01p 757-874-2879 p.22

Herbert and Associates, Ltd.
P. O. Box 64758
Virginia Beach, Virginia 23464
Phone: (757) 545-5234
Fax: (757) 545-6889

**Herbert & Associates**

# Fax

To: Mr Dick Rose
From:
Fax: 867-7188
Date: 4-25-03
Phone:
Pages: Cover + 2
Re: Wellington Section
CC:

☐ Urgent ☒ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

Comments: Original in the mail

Herbert and Associates, Ltd.
TESTING • ENGINEERING • INSPECTING
POST OFFICE BOX 64758 • VIRGINIA BEACH, VA 23464 • PHONE (757) 545-5234

April 24, 2003

Mr. Chuck Glissan
American Eastern
632 Hampton Highway
Yorktown, Virginia 23693

RE: Wellington – Section One, James City County, Virginia

Dear Mr. Glissan:

I am writing in regards to my recent inspection of the earthen dam at the referenced project. Please note we did not perform hand auger sampling as we feel it is not needed. Should this be required we can take samples as a follow up to this letter.

Purpose – prior to deeding the dam to the homeowners, the city has requested a determination as to the current state and the future state of dam stability.

Site Visit – I visited the site on April 21, 2003 and visually inspection the dam. The structure is an earthen dam based on the size of tree growth, I estimate the dam to be 20 to 30 years old.

No wet spots or piping was observed. Trees and underbrush cover the down stream face. Tall grass, underbrush and vines covered the up stream face.

The method of overflow control is by a single 16-inch I.D. cast iron pipe. For a short distance at the intake end, a section of corrugated metal pipe was observed. I could look all the way through the pipe and observed it to be very clean, except at the mouth of the intake end. The pipe appeared in a very good state of repair. The intake invert was several feet above the lake water level.

The pipe discharged into a concrete spillway approximately four feet wide, which ran down the slope to the marsh area below. The spillway appeared in a good state of repair.

Conclusion – The dam, discharge pipe and spillway appear to be performing adequately and should continue to do so in the upcoming years.

*Herbert and Associates, Ltd.*

Recommendations

(1) Remove all trees greater than 12"Φ by cutting at the base then grub all roots greater than 1 inch in diameter. Fill, compact and grade to adjacent contour.

(2) Cut all other vegetation flush with the ground and remove all debris from the site.

(3) Rake and remove all debris and leaves to allow seeding.

(4) Seed and fertilize the entire dam. Maintain the grass until it is well established.

(5) All grubbing, clearing, seeding, etc. shall continue for a distance of 50-feet beyond the abutment contacts.

(6) Regular mowing throughout the year (maintain grass at a height of 6 inches or less) is essential so that the surface can be readily traversed by foot for bi-annual inspections and potential dam safety problems, such as misalignment, cracks, animal burrows, surface erosion, seepage, wet spots, etc. can be spotted early.

(7) Bi-annual inspections by a licensed Engineer should be conducted. Mowing should occur just prior to the inspection.

In hope this meets with your approval.

COMMONWEALTH OF VIRGINIA
4.24.03
DONALD P. COGHLAN
No. 14829
PROFESSIONAL ENGINEER

Respectfully submitted,
Herbert and Associates, Ltd.,

Donald P. Coghlan, P.E.,
Geotechnical Engineer

From this point forward the file is not certified. The list below details the documents that have been added to the file, the person that added the documents and the date they were added.

| Name | Content | Date |
|---|---|---|
| Jo Anna Ripley | Map showing BMPs in Mirror Lakes/Wellington and the date of the maintenance agreement | 6/20/2013 |
| | | |
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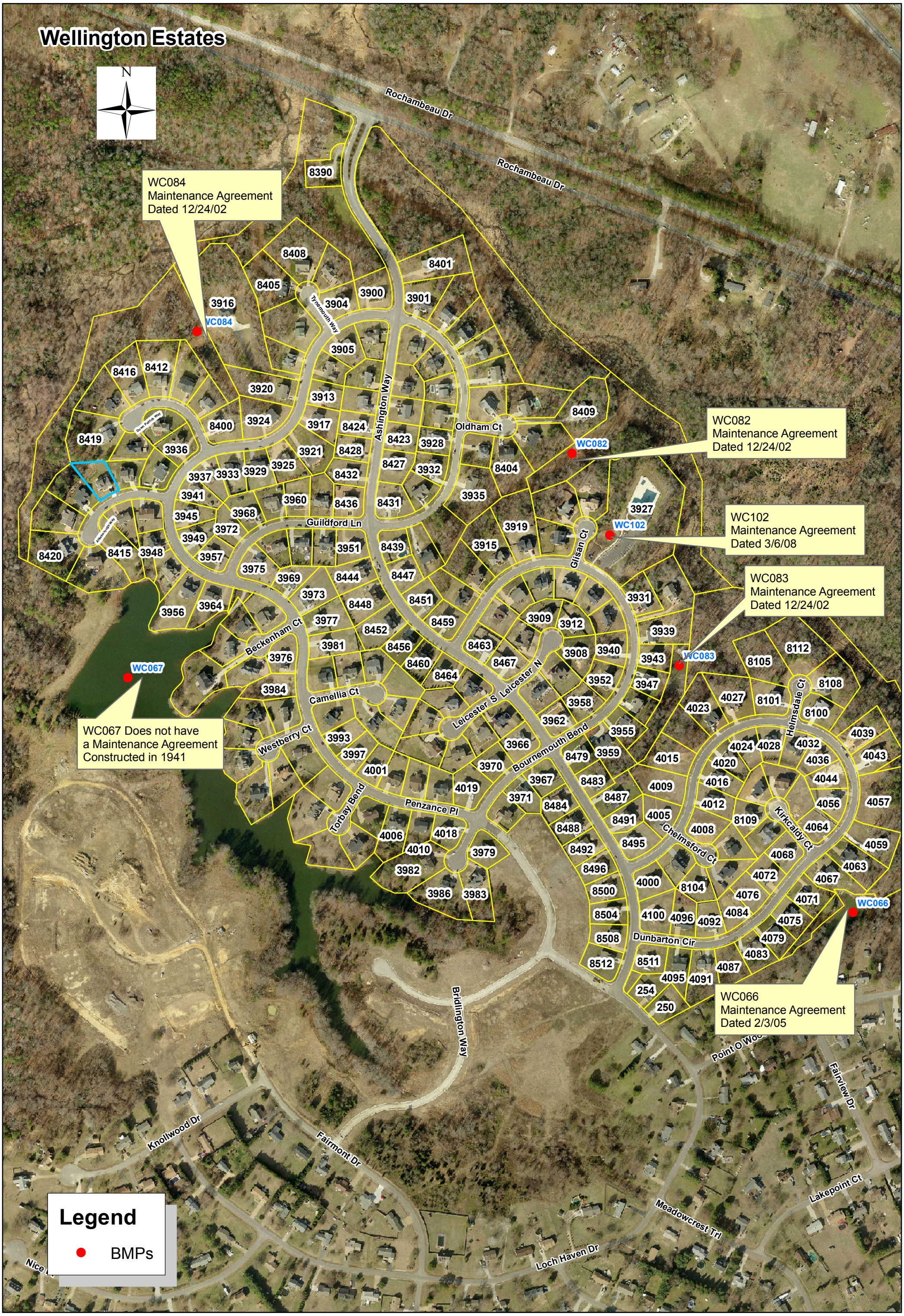
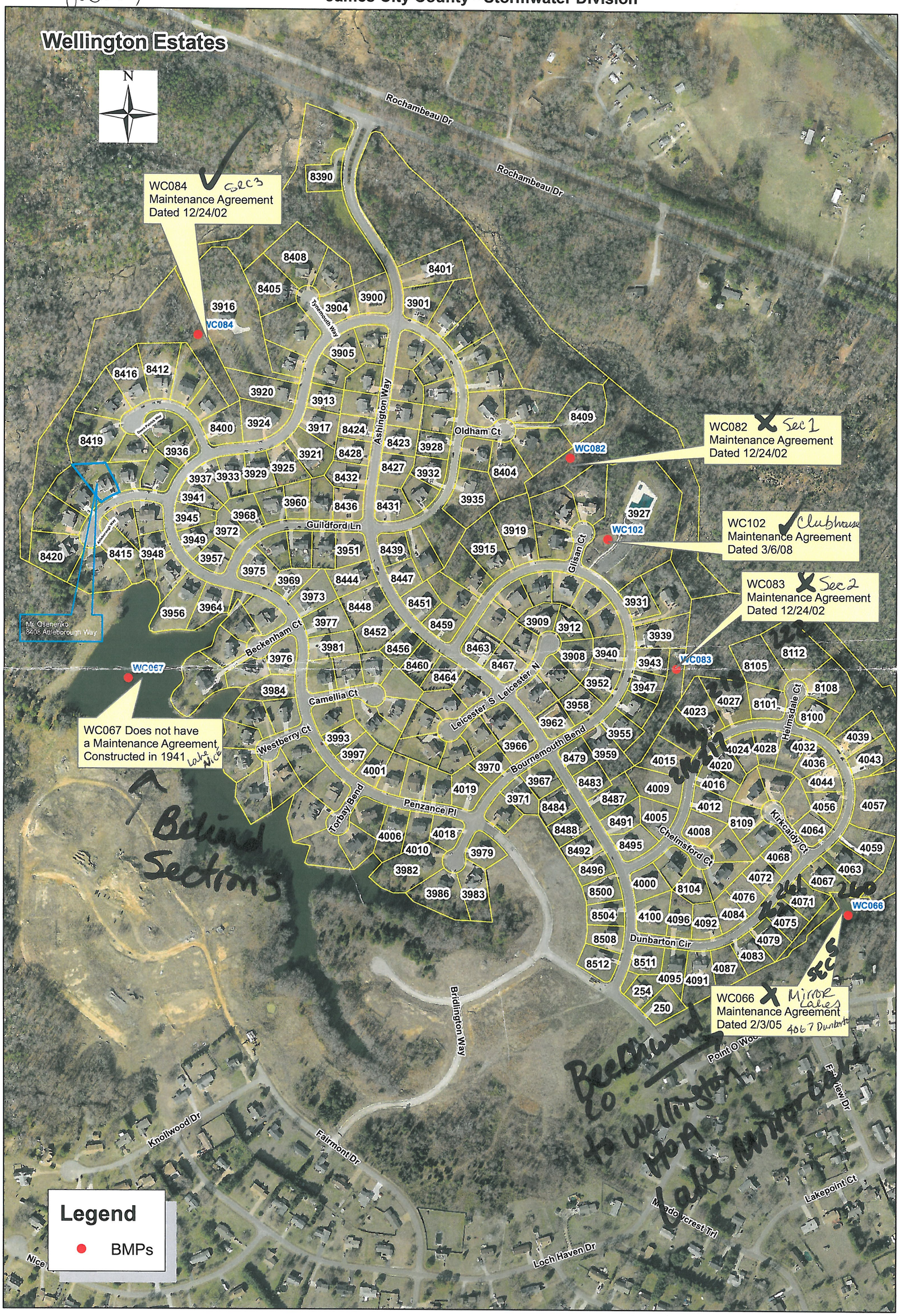
# James City County - Stormwater Division

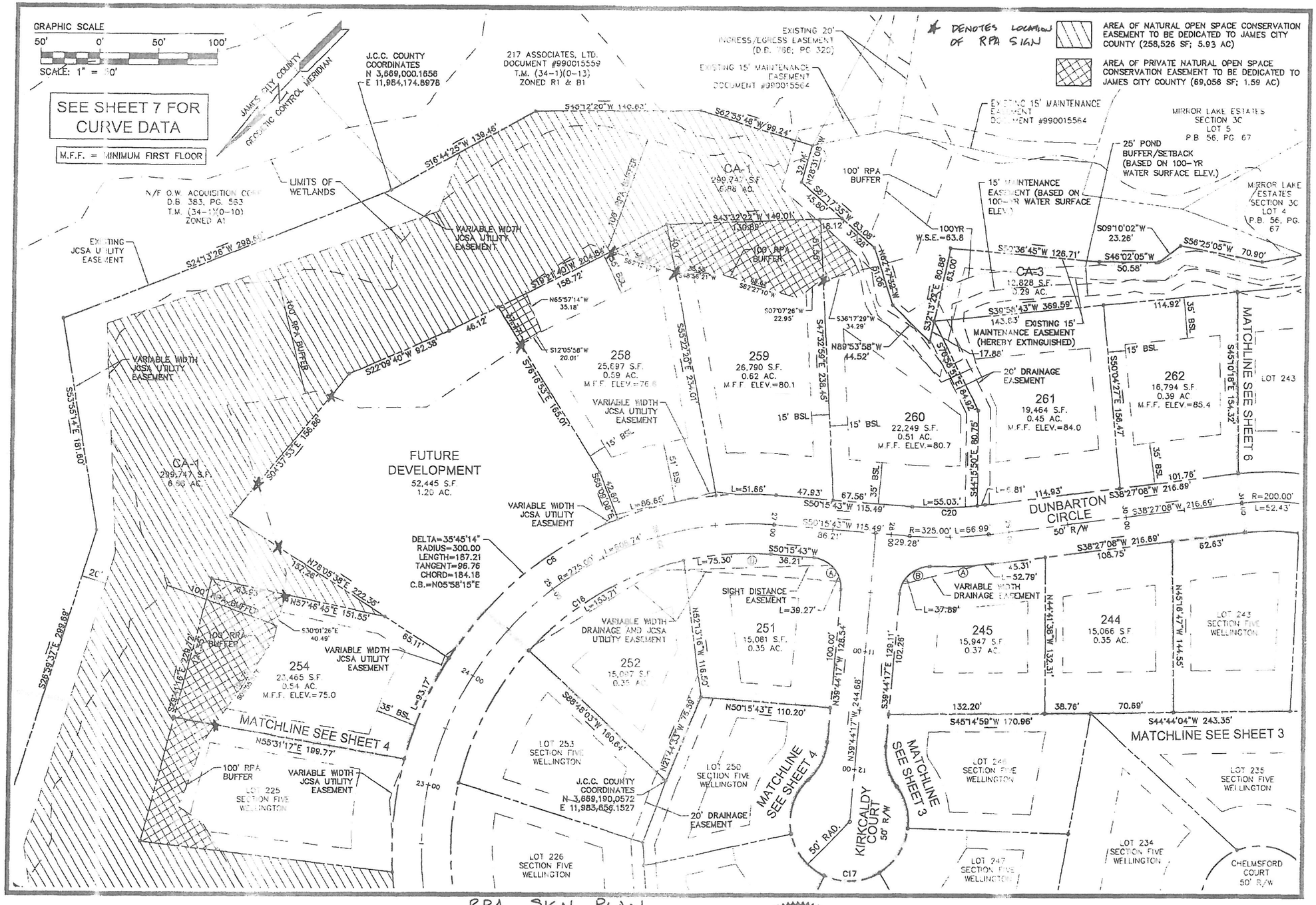


WC066, WC 082, WC083, WC084, WC102, WC 067

James City County - Stormwater Division



WC066




RPA SIGN PLAN


AES
CONSULTING ENGINEERS
WILLIAMSBURG • RICHMOND

5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(757) 253-0040
Fax (757) 220-8994


PLAT OF SUBDIVISION
WELLINGTON
SECTION FIVE
LOTS 124-131, 210-254, 258-270 (65 LOTS)
BEING THE PROPERTY OF
WELLINGTON, L.L.C.
STONEHOUSE DISTRICT JAMES CITY COUNTY VIRGINIA

COMMONWEALTH OF VIRGINIA
2/21/05
G.T. WILSON, JR.
No. 1183
LAND SURVEYOR

| No. | DATE | REVISION / COMMENT / NOTE | BY |
|---|---|---|---|
| 1 | 5/4/05 | REVISED PER JCC COMMENT LETTER DATED 4/27/05 | VMB |

| | |
|---|---|
| Designed VMB/JAG | Drawn AWT |
| Scale 1"=50' | Date 2/21/05 |
| Project No. 8223-9 | |
| Drawing No. 5 of 7 | |

WC066

5-29-03

JUL 2005 RECEIVED

AREA OF NATURAL OPEN SPACE CONSERVATION EASEMENT TO BE DEDICATED TO JAMES CITY COUNTY (258,526 SF; 5.93 AC)

AREA OF PRIVATE NATURAL OPEN SPACE CONSERVATION EASEMENT TO BE DEDICATED TO JAMES CITY COUNTY (69,056 SF; 1.59 AC)

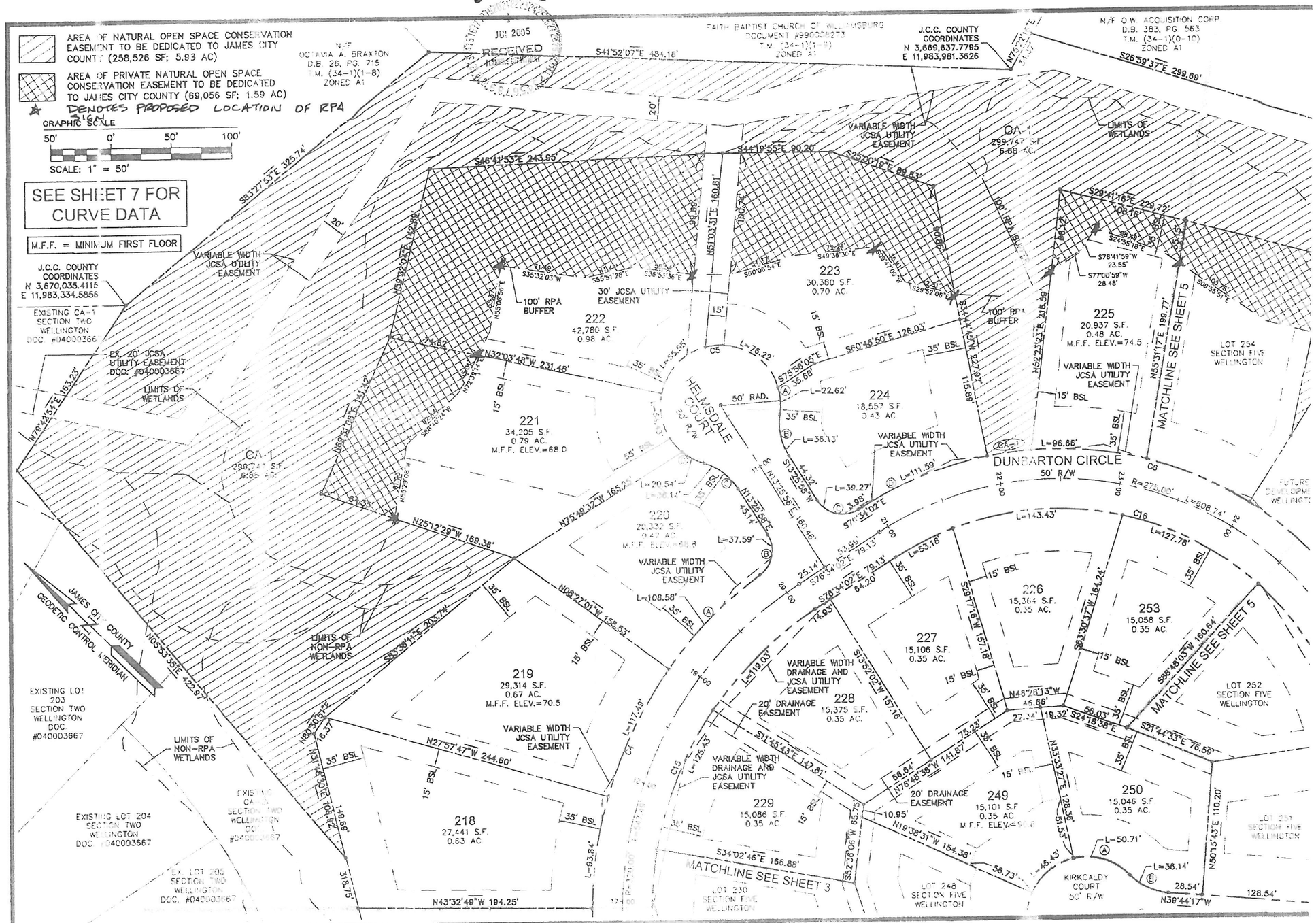
☆ DENOTES PROPOSED LOCATION OF RPA SIGN

GRAPHIC SCALE 50' 0' 50' 100'

SCALE: 1" = 50'

SEE SHEET 7 FOR CURVE DATA

M.F.F. = MINIMUM FIRST FLOOR




RPA SIGN PLAN


AES CONSULTING ENGINEERS
WILLIAMSBURG • RICHMOND

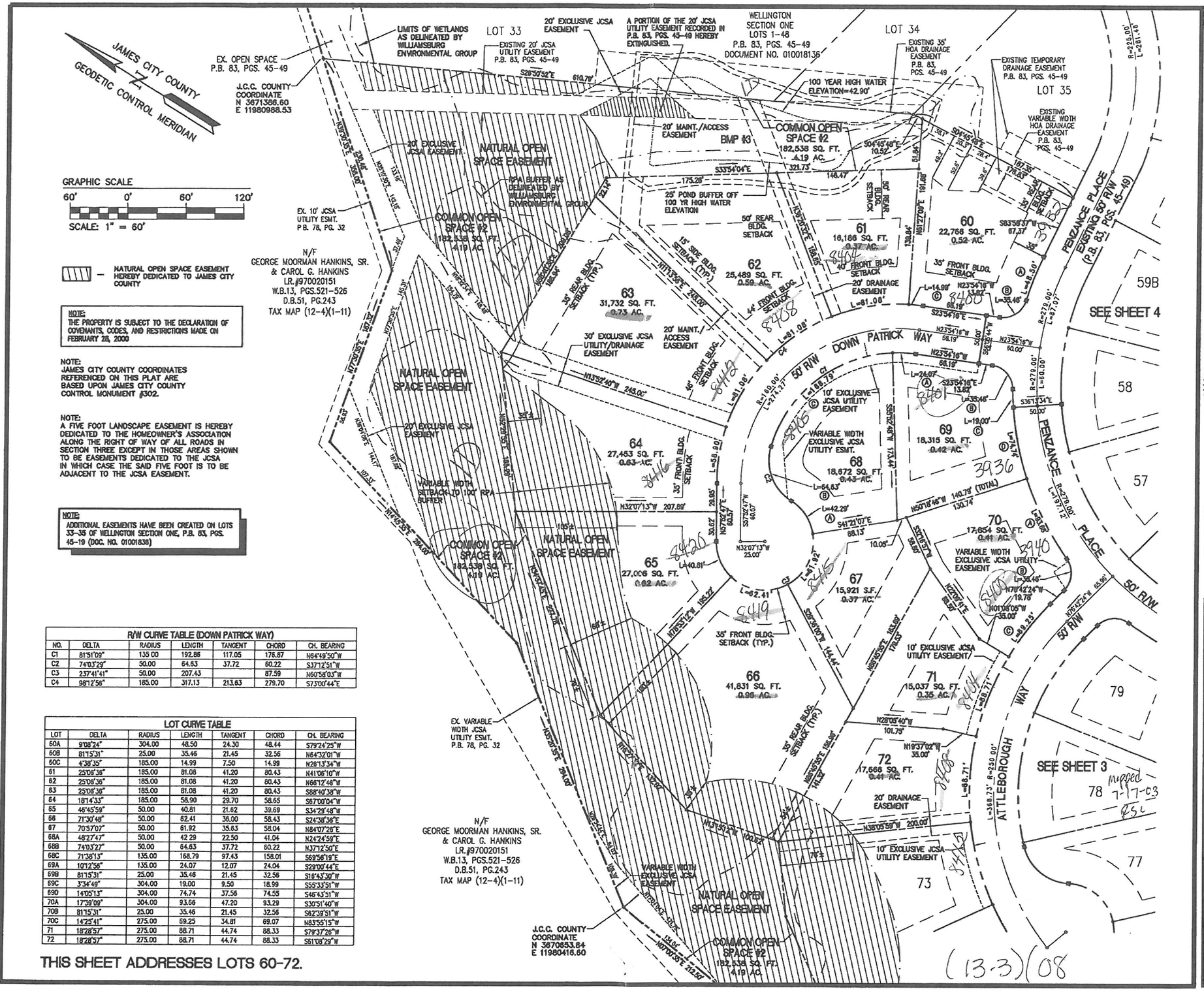
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(757) 253-0040
Fax (757) 220-8994


PLAT OF SUBDIVISION
WELLINGTON
SECTION FIVE
LOTS 124–131, 210–254, 258–270 (66 LOTS)
BEING THE PROPERTY OF
WELLINGTON, L.L.C.
STONEHOUSE DISTRICT JAMES CITY COUNTY VIRGINIA

COMMONWEALTH OF VIRGINIA
2/2/05
G.T. WILSON, JR.
No. 1183
LAND SURVEYOR

| No. | DATE | REVISION / COMMENT / NOTE | BY |
|---|---|---|---|
| 1 | 5/4/05 | REVISED PER J.C.C. COMMENT LETTER DATED 4/27/05 | VMB |

| | |
|---|---|
| Designed VMB/JAG | Drawn AV |
| Scale 1"=50' | Date 2/2 |
| Project No. 8223-9 | |
| Drawing No. 4 of 7 | |




| R/W CURVE TABLE (DOWN PATRICK WAY) | | | | | | |
|---|---|---|---|---|---|---|
| NO. | DELTA | RADIUS | LENGTH | TANGENT | CHORD | CH. BEARING |
| C1 | 81°51'09" | 135.00 | 192.86 | 117.05 | 176.87 | N64°49'50"W |
| C2 | 74°03'29" | 50.00 | 64.63 | 37.72 | 60.22 | S37°12'51"W |
| C3 | 237°41'41" | 50.00 | 207.43 | | 87.59 | N60°58'03"W |
| C4 | 98°12'56" | 185.00 | 317.13 | 213.63 | 279.70 | S73°00'44"E |

| LOT CURVE TABLE | | | | | | |
|---|---|---|---|---|---|---|
| LOT | DELTA | RADIUS | LENGTH | TANGENT | CHORD | CH. BEARING |
| 60A | 9°08'24" | 304.00 | 48.50 | 24.30 | 48.44 | S79°24'25"W |
| 60B | 81°15'31" | 25.00 | 35.46 | 21.45 | 32.56 | N64°32'01"W |
| 60C | 4°38'35" | 185.00 | 14.99 | 7.50 | 14.99 | N26°13'34"W |
| 61 | 25°08'36" | 185.00 | 81.08 | 41.20 | 80.43 | N41°06'10"W |
| 62 | 25°08'36" | 185.00 | 81.08 | 41.20 | 80.43 | N66°12'46"W |
| 63 | 25°08'36" | 185.00 | 81.08 | 41.20 | 80.43 | S88°40'38"W |
| 64 | 18°14'33" | 185.00 | 58.90 | 29.70 | 58.65 | S67°00'04"W |
| 65 | 46°45'59" | 50.00 | 40.81 | 21.62 | 39.69 | S34°29'48"W |
| 66 | 71°30'48" | 50.00 | 62.41 | 36.00 | 58.43 | S24°38'36"E |
| 67 | 70°57'07" | 50.00 | 61.92 | 35.63 | 58.04 | N84°07'26"E |
| 68A | 48°27'47" | 50.00 | 42.29 | 22.50 | 41.04 | N24°24'59"E |
| 68B | 74°03'27" | 50.00 | 64.63 | 37.72 | 60.22 | N37°12'50"E |
| 68C | 71°38'13" | 135.00 | 168.79 | 97.43 | 158.01 | S69°56'19"E |
| 69A | 10°12'56" | 135.00 | 24.07 | 12.07 | 24.04 | S29°00'44"E |
| 69B | 81°15'31" | 25.00 | 35.46 | 21.45 | 32.56 | S16°43'30"W |
| 69C | 3°34'49" | 304.00 | 19.00 | 9.50 | 18.99 | S55°33'51"W |
| 69D | 14°05'13" | 304.00 | 74.74 | 37.56 | 74.55 | S46°43'51"W |
| 70A | 17°39'09" | 304.00 | 93.66 | 47.20 | 93.29 | S30°51'40"W |
| 70B | 81°15'31" | 25.00 | 35.46 | 21.45 | 32.56 | S82°39'51"W |
| 70C | 14°25'41" | 275.00 | 69.25 | 34.81 | 69.07 | N83°55'15"W |
| 71 | 18°28'57" | 275.00 | 88.71 | 44.74 | 88.33 | S79°37'26"W |
| 72 | 18°28'57" | 275.00 | 88.71 | 44.74 | 88.33 | S61°08'29"W |

THIS SHEET ADDRESSES LOTS 60-72.

| No. | DATE | REVISION / COMMENT / NOTE | BY |
|---|---|---|---|
| 1 | 4/17/03 | REVISED PER COUNTY COMMENTS | JFS |

COMMONWEALTH OF VIRGINIA
G.T. WILSON, JR.
CERTIFICATE No. 1183
CERTIFIED LAND SURVEYOR
3/17/03


CONSULTING ENGINEERS
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(757) 253-0040
Fax (757) 220-8994


# PLAT OF SUBDIVISION WELLINGTON SECTION THREE

LOTS 49-58, 59A, 59B, 60-89 AND 132-140
BEING THE PROPERTY OF
WELLINGTON, L.L.C.

STONEHOUSE DISTRICT JAMES CITY COUNTY VIRGINIA

| Designed | Drawn |
|---|---|
| HWP | JFS |
| Scale | Date |
| 1"=60' | 3/17/03 |

Project No. 8223-6

Drawing No. 2 OF 4

03.21.03-13:56 822306P02.dwg

JFS

CONSULTING ENGINEERS

# AES Consulting Engineers Fax Memorandum

5248 Olde Towne Road, Suite 1 • Williamsburg, Virginia 23188
*Telephone:* (757) 253-0040 • *Facsimile:* (757) 220-8994 • *Email:* aes@aesva.com

| | |
|---|---|
| **To:** Darryl Cook / Bill Cain | Org./Firm: JCC Environmental |
| Fax Number: 259-4032 | Date: 12/20/04 |
| **From:** Marc Bennett | Pages, including cover page: 5 |
| **cc:** | cc Fax Number: |

**Subject:** Wellington - Lake Nice Dam

☐ *Urgent* ☐ *For Your Information* ☐ *For Review* ☐ *Please Comment* ☐ *Please Reply*

## Comments:

For Your Files

Marc

LAKE NICE

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WELLINGTON AS-BUILTS