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: **PC097**

DATE VERIFIED: **May 18, 2012**

QUALITY ASSURANCE TECHNICIAN: **Leah Hardenbergh**

Leah Hardenbergh

LOCATION: WILLIAMSBURG, VIRGINIA

Stormwater Division

MEMORANDUM

DATE: March 13, 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: PC097

PIN: 4640300001A

Subdivision, Tract, Business or Owner Name (if known): Foxfield

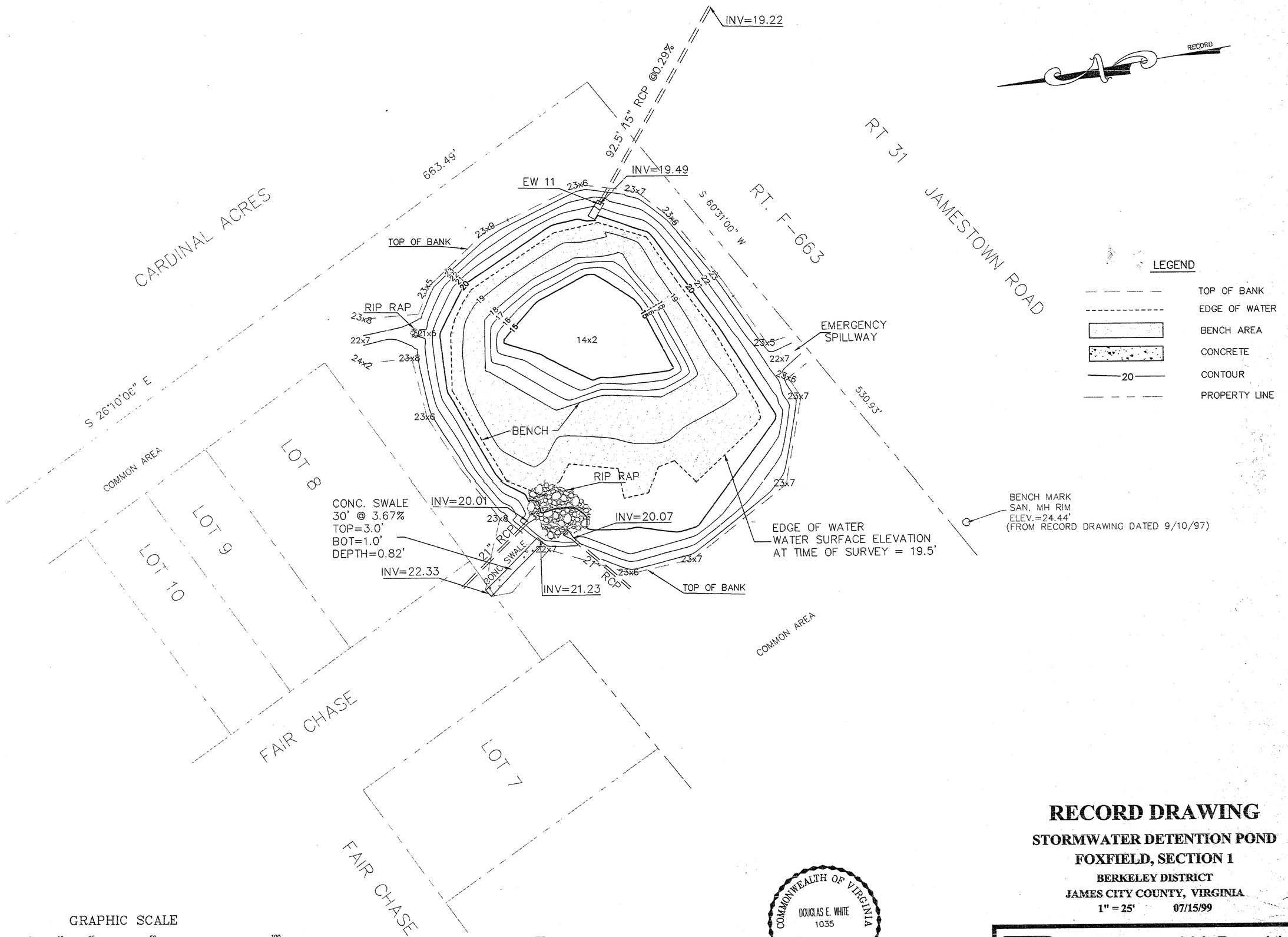
Property Description: Open Space Section 1

Site Address:

(For internal use only) **Box** 1 **Drawer:** 1

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

Comments



NOTE:
THIS RECORD DRAWING IS BASED ON AN ACTUAL FIELD SURVEY PERFORMED BY LANGLEY & MCDONALD ON JULY, 12, 1999

RECORD DRAWING

STORMWATER DETENTION POND
FOXFIELD, SECTION 1

BERKELEY DISTRICT
JAMES CITY COUNTY, VIRGINIA
1" = 25' **07/15/99**

Langley and McDonald, P.C.
Engineers • Surveyors • Planners
Landscape Architects • Environmental Consultants
VIRGINIA BEACH WILLIAMSBURG

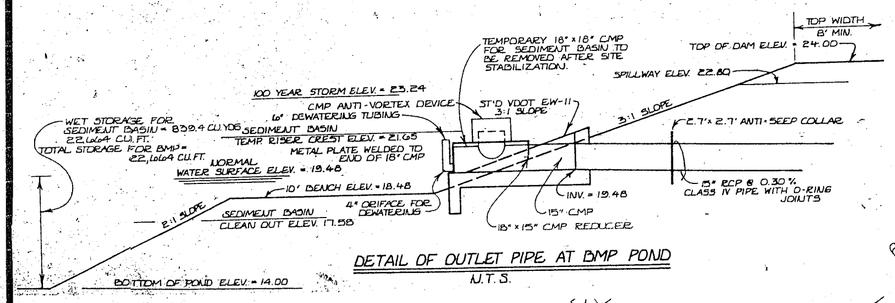
DRAWN BY : PF	PROJ. NO. : 1950033-000.10
CHKD. BY : DEW	DWG. NO. : 10481W

1950033-000.10 FOXFIELD BMP AS BUILT.DWG

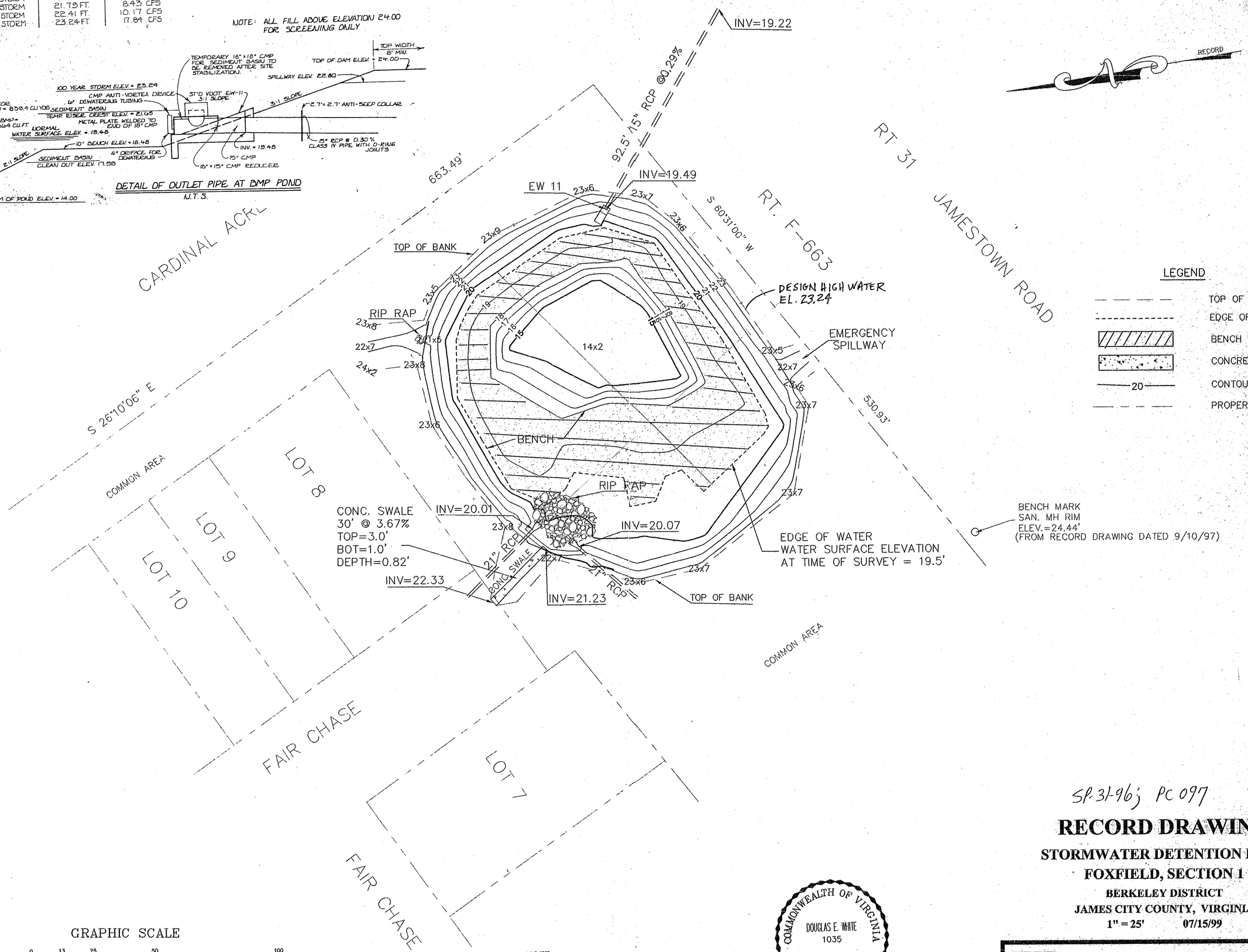
PC097_FOXFIELD_SEC_1_WET_POND - 003

	PEAK ELEV.	PEAK OUTFLOW
2 YEAR STORM	21.29 FT.	6.74 CFS
10 YEAR STORM	21.79 FT.	8.43 CFS
25 YEAR STORM	22.41 FT.	10.17 CFS
100 YEAR STORM	23.24 FT.	17.84 CFS

NOTE: ALL FILL ABOVE ELEVATION 24.00 FOR SCREENING ONLY



DETAIL OF OUTLET PIPE AT BMP POND
N.T.S.



LEGEND

- TOP OF BANK
- EDGE OF WATER
- BENCH AREA
- CONCRETE
- 20 CONTOUR
- PROPERTY LINE

SP-31-96; PC 097

RECORD DRAWING

STORMWATER DETENTION POND
FOXFIELD, SECTION 1

BERKELEY DISTRICT
JAMES CITY COUNTY, VIRGINIA
1" = 25' 07/15/99

GRAPHIC SCALE
25 0 13 25 50 100
(IN FEET)
1 inch = 25 ft.

NOTE:
THIS RECORD DRAWING IS BASED ON AN ACTUAL FIELD SURVEY PERFORMED BY LANGLEY & MCDONALD ON JULY, 12, 1999

COMMONWEALTH OF VIRGINIA
DOUGLAS E. WHITE
1035
LAND SURVEYOR
7-13-99

Langley and McDonald, P.C.
Engineers • Surveyors • Planners
Landscape Architects • Environmental Consultants
VIRGINIA BEACH WILLIAMSBURG

DRAWN BY : PF	PROJ. NO. : 1950033-000.10
CHKD. BY : DEW	DWG. NO. : 10481W

1950033-000.10 FOXFIELD BMP AS BUILT BMP-ASBUILT.DWG

JAMES CITY COUNTY
EROSION AND SEDIMENT CONTROL NOTES

REVISED 2/3/95

THE PURPOSE OF THE EROSION CONTROL MEASURES SHOWN ON THESE PLANS SHALL BE TO PRECLUDE THE TRANSPORT OF ALL WATERBORNE SEDIMENT SRESULTING FROM CONSTRUCTION ACTIVITIES FROM ENTERING ONTO ADJACENT PROPERTIES OR STATE WATERS.

IN ADDITION TO THESE NOTES, ALL PROVISIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS SHALL APPLY TO THIS PROJECT.

1. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK", CURRENT EDITION. THE CONTRACTOR SHALL BE THOROUGHLY FAMILIAR WITH ALL APPLICABLE MEASURES CONTAINED THEREIN WHICH MAY BE PERTINENT TO THIS PROJECT.

2. ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS SHALL BE PROTECTED BY A TEMPORARY CONSTRUCTION ENTRANCE TO PREVENT TRACKING OF MUD ONTO PUBLIC RIGHT-OF-WAYS. AN ENTRANCE PERMIT FROM VDOT IS REQUIRED PRIOR TO ANY CONSTRUCTION ACTIVITIES WITHIN STATE RIGHT-OF-WAYS. WHERE SEDIMENT IS TRANSPORTED ONTO A PUBLIC ROAD SURFACE, THE ROAD SHALL BE THOROUGHLY CLEANED AT THE END OF EACH DAY.

3. A PRECONSTRUCTION MEETING SHALL BE HELD ON-SITE BETWEEN THE COUNTY, THE DEVELOPER, THE PROJECT ENGINEER, AND THE CONTRACTOR PRIOR TO ISSUANCE OF THE LAND-DISTURBING PERMIT. THE CONTRACTOR SHALL SUBMIT A SEQUENCE OF CONSTRUCTION TO THE COUNTY FOR APPROVAL PRIOR TO THE PRECONSTRUCTION MEETING. THE CONTRACTOR WILL SUPPLY CODE COMPLIANCE WITH THE NAME OF THE INDIVIDUAL WHO WILL BE RESPONSIBLE FOR ENSURING MAINTENANCE OF INSTALLED MEASURES ON A DAILY BASIS.

4. SEDIMENT BASINS AND TRAPS, PERIMETER DIKES, SEDIMENT BARRIERS AND OTHER MEASURES INTENDED TO TRAP SEDIMENT ON-SITE MUST BE CONSTRUCTED AS A FIRST STEP IN GRADING AND BE MADE FUNCTIONAL BEFORE UPSLOPE LAND DISTURBANCE TAKES PLACE. EARTHEN STRUCTURES SUCH AS DAMS, DIKES, AND DIVERSIONS MUST BE SEEDED AND MULCHED IMMEDIATELY AFTER INSTALLATION. PERIODIC INSPECTIONS OF THE EROSION CONTROL MEASURES SHALL BE MADE TO ASSESS THEIR CONDITION. ANY NECESSARY MAINTENANCE OF THE MEASURES SHALL BE ACCOMPLISHED IMMEDIATELY UPON NOTIFICATION BY THE COUNTY AND SHALL INCLUDE THE REPAIR OF MEASURES DAMAGED BY ANY SUBCONTRACTOR INCLUDING THOSE OF THE PUBLIC UTILITY COMPANIES.

5. SURFACE FLOWS OVER CUT AND FILL SLOPES SHALL BE CONTROLLED BY EITHER REDIRECTING FLOWS FROM TRANSVERSING THE SLOPES OR BY MECHANICAL DEVICES TO SAFELY LOWER WATER DOWNSLOPE WITHOUT CAUSING EROSION. A TEMPORARY FILL DIVERSION (STD. & SPEC. 3.10) SHALL BE INSTALLED PRIOR TO THE END OF EACH WORKING DAY.

6. SEDIMENT CONTROL MEASURES MAY REQUIRE MINOR FIELD ADJUSTMENTS AT TIME OF CONSTRUCTION TO INSURE THEIR INTENDED PURPOSE IS ACCOMPLISHED. DIVISION OF CODE COMPLIANCE APPROVAL WILL BE REQUIRED FOR OTHER DEVIATIONS FROM THE APPROVED PLANS.

7. THE CONTRACTOR SHALL PLACE SOIL STOCKPILES AT THE LOCATIONS SHOWN ON THIS PLAN OR AS DIRECTED BY THE ENGINEER. SOIL STOCKPILES SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. OFF-SITE WASTE OR BORROW AREAS SHALL BE APPROVED BY THE DIVISION OF CODE COMPLIANCE PRIOR TO THE IMPORT OF ANY BORROW OR EXPORT OF ANY WASTE TO OR FROM THE PROJECT SITE.

8. THE CONTRACTOR SHALL COMPLETE DRAINAGE FACILITIES WITHIN 30 DAYS FOLLOWING COMPLETION OF ROUGH GRADING AT ANY POINT WITHIN THE PROJECT. THE INSTALLATION OF DRAINAGE FACILITIES SHALL TAKE PRECEDENCE OVER ALL UNDERGROUND UTILITIES. OUTFALL DITCHES FROM DRAINAGE STRUCTURES SHALL BE STABILIZED IMMEDIATELY AFTER CONSTRUCTION OF SAME. THIS INCLUDES INSTALLATION OF EROSION CONTROL STONE OR PAVED DITCHES WHERE REQUIRED. ANY DRAINAGE OUTFALLS REQUIRED FOR A STREET MUST BE COMPLETED BEFORE STREET GRADING OR UTILITY INSTALLATION BEGINS.

9. PERMANENT OR TEMPORARY SOIL STABILIZATION MUST BE APPLIED TO ALL DENUDED AREAS WITHIN 7 DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. SOIL STABILIZATION MUST ALSO BE APPLIED TO DENUDED AREAS WHICH MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT (UNDISTURBED) FOR LONGER THAN 30 DAYS. SOIL STABILIZATION MEASURES INCLUDE VEGETATIVE ESTABLISHMENT, MULCHING AND THE EARLY APPLICATION OF GRAVEL BASE MATERIAL ON AREAS TO BE PAVED.

10. NO MORE THAN 300 FEET OF SANITARY SEWER, STORM SEWER, WATERLINES, OR UNDERGROUND UTILITY LINES ARE TO BE OPEN AT ONE TIME. FOLLOWING INSTALLATION OF ANY PORTION OF THESE ITEMS, ALL DISTURBED AREAS ARE TO BE IMMEDIATELY STABILIZED (I.E., THE SAME DAY).

11. IF DISTURBED AREA STABILIZATION IS TO BE ACCOMPLISHED DURING THE MONTHS OF DECEMBER, JANUARY, OR FEBRUARY, STABILIZATION SHALL CONSIST OF MULCHING IN ACCORDANCE WITH SPECIFICATION 3.35. SEEDING WILL THEN TAKE PLACE AS SOON AS THE SEASON PERMITS.

12. THE TERM SEEDING, FINAL VEGETATIVE COVER OR STABILIZATION, ON THIS PLAN SHALL MEAN THE SUCCESSFUL GERMINATION AND ESTABLISHMENT OF A STABLE GRASS COVER FROM A PROPERLY PREPARED SEEDBED CONTAINING THE SPECIFIED AMOUNTS OF SEED, LIME, AND FERTILIZER IN ACCORDANCE WITH SPECIFICATION 3.32, PERMANENT SEEDING. IRRIGATION SHALL BE REQUIRED AS NECESSARY TO ENSURE ESTABLISHMENT OF GRASS COVER.

13. ALL SLOPES STEEPER THAN 3:1 SHALL REQUIRE THE USE OF EROSION CONTROL BLANKETS SUCH AS EXCELSIOR BLANKETS TO AID IN THE ESTABLISHMENT OF A VEGETATIVE COVER. INSTALLATION SHALL BE IN ACCORDANCE WITH SPECIFICATION 3.35, MULCHING AND MANUFACTURER'S INSTRUCTIONS. NO SLOPES SHALL BE CREATED STEEPER THAN 2:1.

14. INLET PROTECTION IN ACCORDANCE WITH SPECIFICATION 3.07 SHALL BE PROVIDED FOR ALL STORM DRAIN INLETS AS SOON AS PRACTICAL FOLLOWING CONSTRUCTION OF SAME.

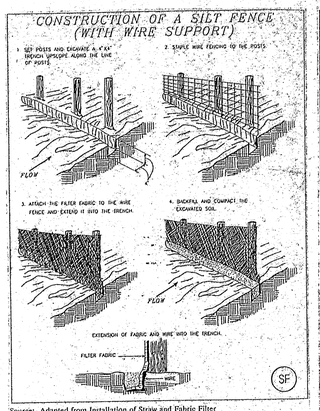
15. TEMPORARY LINERS, SUCH AS POLYETHYLENE SHEETS, SHALL BE PROVIDED FOR ALL PAVED DITCHES UNTIL THE PERMANENT CONCRETE LINER IS INSTALLED.

16. PAVED DITCHES SHALL BE REQUIRED WHEREVER EROSION IS EVIDENT. PARTICULAR ATTENTION SHALL BE PAID TO THOSE AREAS WHERE GRADES EXCEED 3 PERCENT.

17. TEMPORARY EROSION CONTROL MEASURES ARE NOT TO BE REMOVED UNTIL ALL DISTURBED AREAS ARE STABILIZED. AFTER STABILIZATION IS COMPLETE, ALL MEASURES SHALL BE REMOVED WITHIN 30 DAYS. TRAPPED SEDIMENT SHALL BE SPREAD AND SEEDED.

18. AS-BUILT DRAWINGS MUST BE PROVIDED FOR ALL DETENTION/BMP FACILITIES. ALSO UPON COMPLETION, THE CONSTRUCTION OF ALL DETENTION/BMP FACILITIES SHALL BE CERTIFIED BY A PROFESSIONAL ENGINEER WHO INSPECTED THE STRUCTURE DURING CONSTRUCTION. THE CERTIFICATION SHALL STATE THAT TO THE BEST OF HIS/HER JUDGEMENT, KNOWLEDGE, AND BELIEF THE STRUCTURE WAS CONSTRUCTED IN ACCORDANCE WITH THE APPROVAL PLANS AND SPECIFICATIONS.

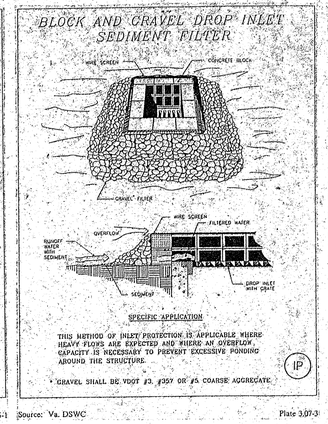
CONSTRUCTION OF A SILT FENCE (WITH WIRE SUPPORT)



Source: Adapted from Installation of Straw and Fabric Filter Barriers for Sediment Control, Sherwood and Wyant

Plate 3.05-1

BLOCK AND GRAVEL DROP INLET SEDIMENT FILTER



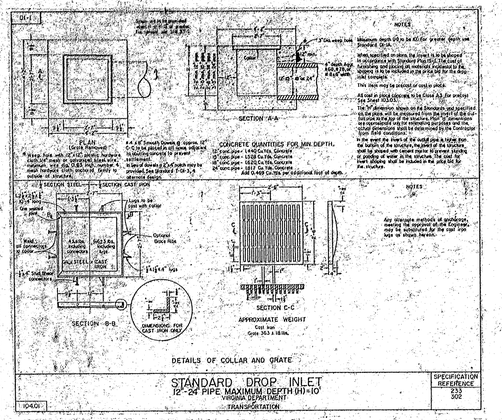
SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY FLOWS ARE EXPECTED AND WHERE AN OVERFLOW CAPACITY IS NECESSARY TO PREVENT EXCESSIVE PONDING AROUND THE STRUCTURE.

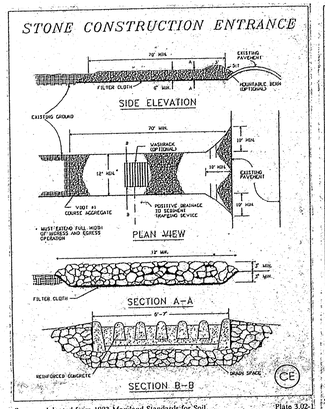
- GRAVEL SHALL BE VDOT #3, #357 OR #5 COARSE AGGREGATE.

Source: Va. DSWC

Plate 3.07-3



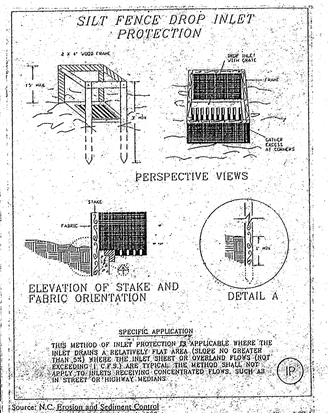
STONE CONSTRUCTION ENTRANCE



Source: Adapted from 1983 Maryland Standards for Soil Erosion and Sediment Control, and Va. DSWC

Plate 3.02-1

SILT FENCE DROP INLET PROTECTION



SPECIFIC APPLICATION

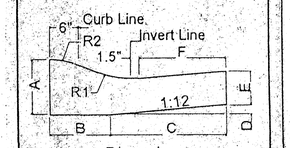
THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPE NO GREATER THAN 5%), WHERE THE INLET SHEET OR OVERLAND FLOWS (NOT EXCEEDING 1 CFS), AND TYPICALLY THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS, SUCH AS IN STREET OR HIGHWAY MEDIANS.

Source: N.C. Erosion and Sediment Control Planning and Design Manual, 1988

Plate 3.07-1

ROLL TOP

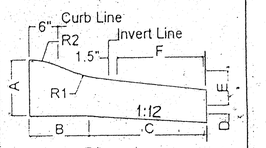
(6" at top of curb ≈ 155mm)
(1.5" at invert line ≈ 40mm)



Dimensions		
A	11.5 in	(290mm)
B	1 ft 0 in	(310mm)
C	2 ft 0 in	(610mm)
D	2 in	(50mm)
E	7 in	(180mm)
F	1 ft 6 in	(460mm)
R1	1 ft 6 in	(460mm)
R2	1 ft 3 in	(380mm)

ROLL TOP MODIFIED REVERSE CURB

(6" at top of curb ≈ 155mm)
(1.5" at invert line ≈ 40mm)



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F	1 ft 6 in	(460mm)
R1	1 ft 6 in	(460mm)
R2	1 ft 3 in	(380mm)

TYPICAL ROLL TOP CURB & GUTTER

N.T.S.

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE VIRGINIA DEPARTMENT OF TRANSPORTATION "ROAD AND BRIDGE SPECIFICATIONS" DATED 1994, THE VIRGINIA DEPARTMENT OF TRANSPORTATION "ROAD AND BRIDGE STANDARDS" DATED 1993.

2. SELECT CLEARING AND GRUBBING TO CONSIST OF REMOVAL OF ALL TREES, ROOTS, STUMPS AND SNAGS EXCEPT THOSE TREES DESIGNATED BY THE OWNER TO REMAIN. ALL TREES SO DESIGNATED WILL BE PROTECTED FROM DAMAGE TO THE TRUNK AND ROOT SYSTEMS.

3. ALL DRAINAGE STRUCTURES TO CONFORM TO THE VIRGINIA DEPARTMENT OF TRANSPORTATION, "ROAD AND BRIDGE STANDARDS" DATED 1993, UNLESS OTHERWISE INDICATED. ALL INLET STRUCTURES TO INCORPORATE INLET SHAPING.

4. ALL PIPE LENGTHS TO INCLUDE STANDARD ES-1 FLARED END SECTIONS WHERE NOTED.

5. ALL LOCATIONS OF UNDERGROUND UTILITIES ON THIS PLAN ARE APPROXIMATE ONLY. PRIOR TO COMMENCEMENT OF CONSTRUCTION CONTRACTOR IS TO NOTIFY OWNERS OF ALL UTILITIES (VIRGINIA POWER, BELL ATLANTIC, JAMES CITY SERVICE AUTHORITY, ETC.) OF PROPOSED CONSTRUCTION SO THAT THEY MAY LOCATE AND SAFEGUARD THEIR FACILITIES. ANY DAMAGES TO EXISTING UTILITIES AND OR EXPENSE ACCRUED FROM SAID DAMAGES WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. ALL REPAIRS WILL BE IMMEDIATELY MADE AT THE CONTRACTOR'S EXPENSE.

6. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING EXCAVATION. VERIFICATION SHALL CONSIST OF EXPOSING THE UTILITY BY EXCAVATION AND ESTABLISHING THE EXACT HORIZONTAL AND VERTICAL LOCATION.

7. THE VIRGINIA DEPARTMENT OF TRANSPORTATION IS TO RECEIVE WRITTEN NOTIFICATION BY THE CONTRACTOR 48 HOURS PRIOR TO STARTING ANY WORK ON VDOT R/W.

8. CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING SURE THAT TRUCKS LEAVING ARE CLEANED SUFFICIENTLY SO AS NOT TO CREATE A ROADWAY NUISANCE AND/OR HAZARD.

9. ALL STOCKPILES (IMPORTED FILL MATERIAL, TOPSOIL, ETC.) TO BE LOCATED ON-SITE AT THE DIRECTION OF THE OWNER. SILT FENCE AND OTHER EROSION CONTROL MEASURES NECESSARY SHALL BE PLACED AT THE TOE OF THE STOCKPILE.

10. ALL CONCRETE SHALL BE CLASS "A3AE" AIR ENTRAINED WITH A MINIMUM LABORATORY COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS.

11. THE CONTRACTOR IS TO FURNISH AND INSTALL STOP SIGNS, NO PARKING SIGNS AND ANY OTHER SIGNAGE AS REQUIRED. ALL ROADWAY SIGNS AND THEIR INSTALLATION WILL BE IN ACCORDANCE WITH THE VIRGINIA DEPARTMENT OF TRANSPORTATION STANDARD AND SPECIFICATIONS.

12. ALL STREET LIGHTS ARE TO BE LOCATED A MINIMUM OF 5' BEHIND THE CURB.

13. ALL FIRE HYDRANTS AND UTILITY PEDESTALS ARE TO BE LOCATED A MINIMUM OF 5' BEHIND THE CURB.

14. ALL UNDERGROUND UTILITIES WITHIN THE VIRGINIA DEPARTMENT OF TRANSPORTATION RIGHT-OF-WAY AND/OR EASEMENTS SHALL HAVE A MINIMUM OF 3.0' COVER MEASURED FROM FINISHED GRADE.

15. A 4" COMPACTED AGGREGATE BASE SHALL BE PLACED UNDER CURB AND GUTTER AND EXTENDED A MINIMUM OF 6" BEYOND BACK OF CURB.

16. ANY SUBSEQUENT REVISIONS, ADDITIONS AND/OR DELETIONS SHALL REQUIRE SPECIFIC WRITTEN APPROVAL OF THE ENGINEER.

17. STORM SEWER PIPE SHALL BE REINFORCED CONCRETE PIPE (RCP) CONFORMING TO ASTM C76, CLASS III, B-WALL THICKNESS TONGUE AND GROOVE, UNLESS OTHERWISE NOTED.

18. BACKFILLING: BACKFILLING SHALL BE IN ACCORDANCE WITH THE FOLLOWING:

A. THE CONTRACTOR SHALL REFILL ALL EXCAVATIONS AS RAPIDLY AS PRACTICABLE AFTER INSPECTION OF THE PIPE. BACKFILL SHALL BE CAREFULLY PLACED AROUND AND OVER THE PIPE AND STRUCTURES AND SHALL NOT BE PERMITTED TO FALL DIRECTLY ON THE PIPE OR STRUCTURES FROM A HEIGHT WHICH WOULD CAUSE DAMAGE OR DISTURB THE PIPE OR STRUCTURES.

B. BACKFILL MATERIAL SHALL BE PLACED IN LAYERS OF NOT MORE THAN SIX (6) INCHES AND SIMULTANEOUSLY COMPACTED ON BOTH SIDES OF THE PIPE TO A POINT TWO (2) FEET ABOVE THE PIPE. EACH LAYER SHALL BE COMPACTED TO 95% MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT IN ACCORDANCE WITH ASTM D-698. PRIOR TO THE PLACEMENT OF THE NEXT SUCCESSIVE LAYER, SPECIAL CARE SHALL BE TAKEN TO THOROUGHLY COMPACT THE MATERIAL UNDER THE HAUNCHES OF THE PIPE HAVING A TAMPING FACE OF NOT MORE THAN 23 SQUARE INCHES. THE BACKFILL SHALL THEN BE CONTINUED IN SIX (6") INCH LIFTS AND MACHINE COMPACTED AT OPTIMUM MOISTURE CONTENT WITH ROLLERS OR TAMPERS WITHIN A TOLERANCE OF PLUS OR MINUS 2.0 PERCENT OF OPTIMUM TO A MINIMUM DENSITY OF NOT LESS THAN 95% AS COMPARED TO THE THEORETICAL MAXIMUM DENSITY DETERMINED IN ACCORDANCE WITH ASTM D-698.

C. NO ASHES, PUTRESCIBLE REFUSE, LARGE STONES, OR OTHER MATERIAL OF AN UNSATISFACTORY CHARACTER SHALL BE USED AS EMBANKMENT OR BACKFILL. THE CONTRACTOR SHALL NOT PERMIT EXCAVATIONS TO BE USED AS A DUMPING GROUND FOR REFUSE.

D. AFTER COMPLETION OF BACKFILLING, ALL MATERIAL NOT USED THEREIN, INCLUDING SUCH EARTH AS THE ENGINEER SHALL DECIDE CANNOT BE PROPERLY USED TO REFILL THE EXCAVATION, SHALL BE REMOVED AND DISPOSED OF ALL ROADS, AND OTHER PLACES ON THE LINE OF THE WORK SHALL BE LEFT FREE, CLEAN AND IN GOOD ORDER. SAID CLEANING UP SHALL BE DONE BY THE CONTRACTOR.

19. THE CONTRACTOR SHALL FURNISH THE ENGINEER CBR TESTS ON SUBGRADE AT INTERVALS NOT TO EXCEED 500 FEET. CBR TESTS SHALL BE PROVIDED FOR CONFIRMATION OF PAVEMENT DESIGN PRIOR TO PLACEMENT OF BASE COURSE AGGREGATE.

20. THE CONTRACTOR SHALL PROVIDE TO THE ENGINEER COMPACTION REPORTS ON ALL BACKFILL OF UTILITIES AND STRUCTURES, FILL EMBANKMENTS, AND SUBGRADE BASE BY A CERTIFIED MATERIALS TESTING COMPANY AS FOLLOWS:

A. ON ALL UTILITY AND STORM DRAIN TRENCHES WITHIN THE RIGHT-OF-WAY, COMPACTION SHALL BE TESTED EVERY (4') FEET VERTICALLY AND AT HORIZONTAL INTERVALS NOT TO EXCEED 100 FEET.

B. ON ALL FILL EMBANKMENTS, COMPACTION SHALL BE TESTED EVERY FOUR (4') FEET VERTICALLY AND AT HORIZONTAL INTERVALS NOT TO EXCEED 50 FEET.

C. ON SUBGRADE BASE, COMPACTION SHALL BE TESTED EVERY 300 FEET. TESTS TO BE AT CENTER OF LANES ON ALTERNATING BASIS.

IF ANY AREAS ARE FOUND TO HAVE INADEQUATE COMPACTION, SUCH AREAS SHALL BE EXPOSED AND RE-COMPACTED UNTIL PROPER COMPACTION IS ACHIEVED. SHOULD IT BE IMPOSSIBLE TO COMPACT THE MATERIAL TO SPECIFIED LIMITS, MATERIAL SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.

21. THE CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH COMPLETION OF REQUIRED EARTHWORK. IF ADDITIONAL FILL MATERIAL IS REQUIRED, IT SHALL BE PROVIDED AT CONTRACTOR'S EXPENSE. SUCH FILL MATERIAL MUST BE APPROVED BY THE OWNER.

22. SHOULD UNSUITABLE MATERIAL BE ENCOUNTERED DURING CONSTRUCTION OF STORM DRAINAGE SYSTEM, UTILITIES, ROADWAYS OR ANY OTHER PHASE OF THE WORK FOR WHICH MATERIAL IS UNSUITABLE, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REMOVE AND REPLACE UNSUITABLE MATERIAL WITH SELECT MATERIAL. THE CONTRACTOR WILL BE PERMITTED AND IS ENCOURAGED TO VISIT THE SITE IN ADVANCE OF THE BID DATE TO SAMPLE AND EVALUATE INSITU MATERIAL AS NECESSARY TO PREPARE HIS/HER BID AND AT HIS/HER EXPENSE.

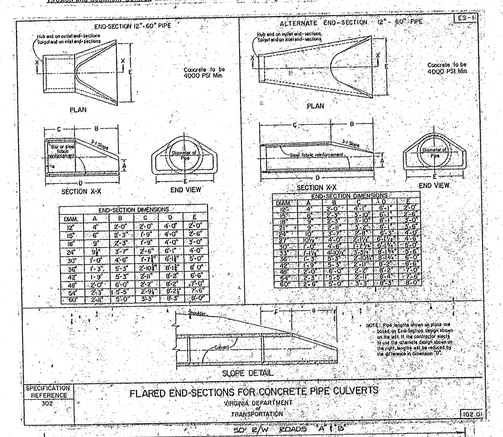
23. ALL STORM SEWER PIPES, DROP INLETS, AND CURB INLETS SHALL BE CLEANED OF DEBRIS AND ERODED MATERIAL DURING LAST STAGES OF CONSTRUCTION.

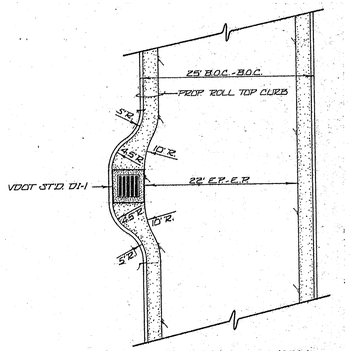
24. ANY ERRORS, CONFLICTS, OR DISCREPANCIES IN THIS PLAN SHALL BE REPORTED TO THE ENGINEER FOR RESOLUTION BEFORE PROCEEDING WITH THE WORK.

25. INSTALLATION OF PIPE CULVERTS, STORM SEWERS, AND DRAINAGE STRUCTURES SHALL HAVE BEDDING MATERIAL IN ACCORDANCE WITH VDOT SPECIFICATIONS AND STANDARDS. BACKFILL SHALL BE SUITABLE MATERIAL FREE OF DEBRIS, TREE ROOTS, AND EXCESSIVE MOISTURE, AND COMPACTED.

26. AN ACTUAL COPY OF THE CBR REPORT IS TO BE SUBMITTED TO THE ENGINEER PRIOR TO APPROVAL OF THE PAVEMENT TYPICAL DESIGN. IF THE CBR VALUES ARE LESS THAN 10, THE CONTRACTOR WILL BE REQUIRED TO SUBMIT FOR OUR APPROVAL, HIS PROPOSED METHOD OF CONSTRUCTION.

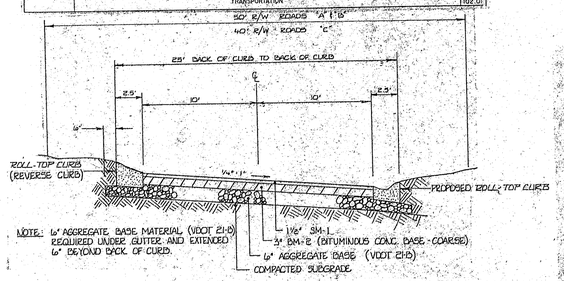
27. THE CONTRACTOR SHALL PERFORM ALL FINISH GRADING TO A POINT 5' OUTSIDE THE PROPOSED BUILDING FOOTPRINT AS SHOWN ON THE GRADING PLANS.





TYPICAL CURB TRANSITION FOR DROP INLETS

SCALE: 1"=10'

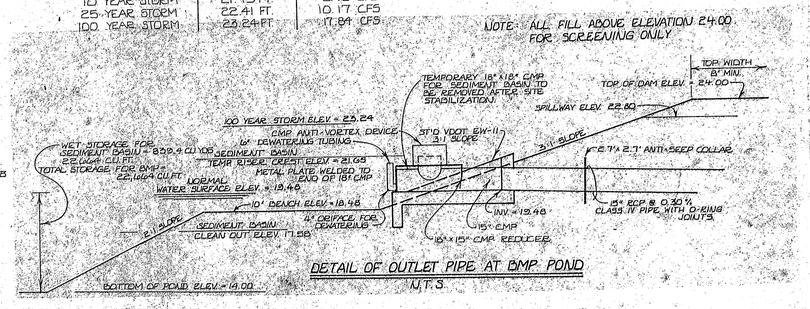


TYPICAL ROAD SECTION

SECTION A-A

N.T.S.

	PEAK ELEV.	PEAK OUTFLOW
2 YEAR STORM	21.29 FT.	6.74 CFS
10 YEAR STORM	21.79 FT.	8.43 CFS
25 YEAR STORM	22.41 FT.	10.17 CFS
100 YEAR STORM	23.24 FT.	17.84 CFS



DETAIL OF OUTLET PIPE AT BMP POND

N.T.S.

COMMONWEALTH OF VIRGINIA
3-8-96
STEPHEN A. ROMEO
No. 1449
LAND SURVEYOR

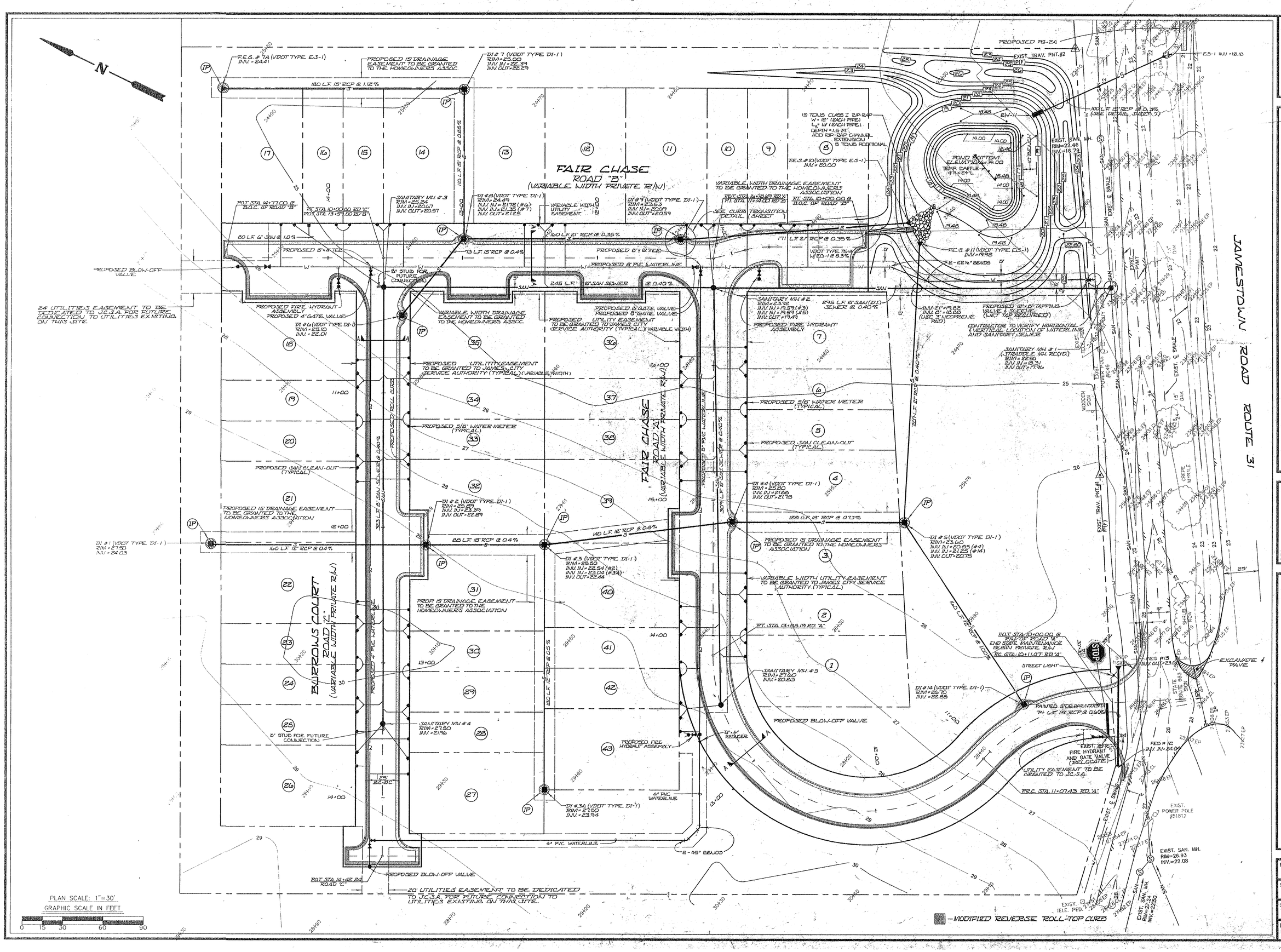
Langley and McDonald, P.C.
Engineers • Surveyors • Planners
Landscape Architects • Environmental Consultants
VIRGINIA BEACH WILLIAMSBURG

DES	DEW
DWN	EEE
CHK	
DATE	3/1/96

Rev. 3/26/96

GENERAL DETAILS
FOXFIELD
TOWNHOUSE/CONDOMINIUM DEVELOPMENT
FOR:
THJ LIMITED LIABILITY, INC.
JAMES CITY COUNTY, VIRGINIA

PROJ NO. 95033-5
SCALE:
SHEET 7 OF 11
DWG. 6001W



COMMONWEALTH OF VIRGINIA
STEPHEN A. POLEO
No. 1348-B
LAND SURVEYOR
3-8-96

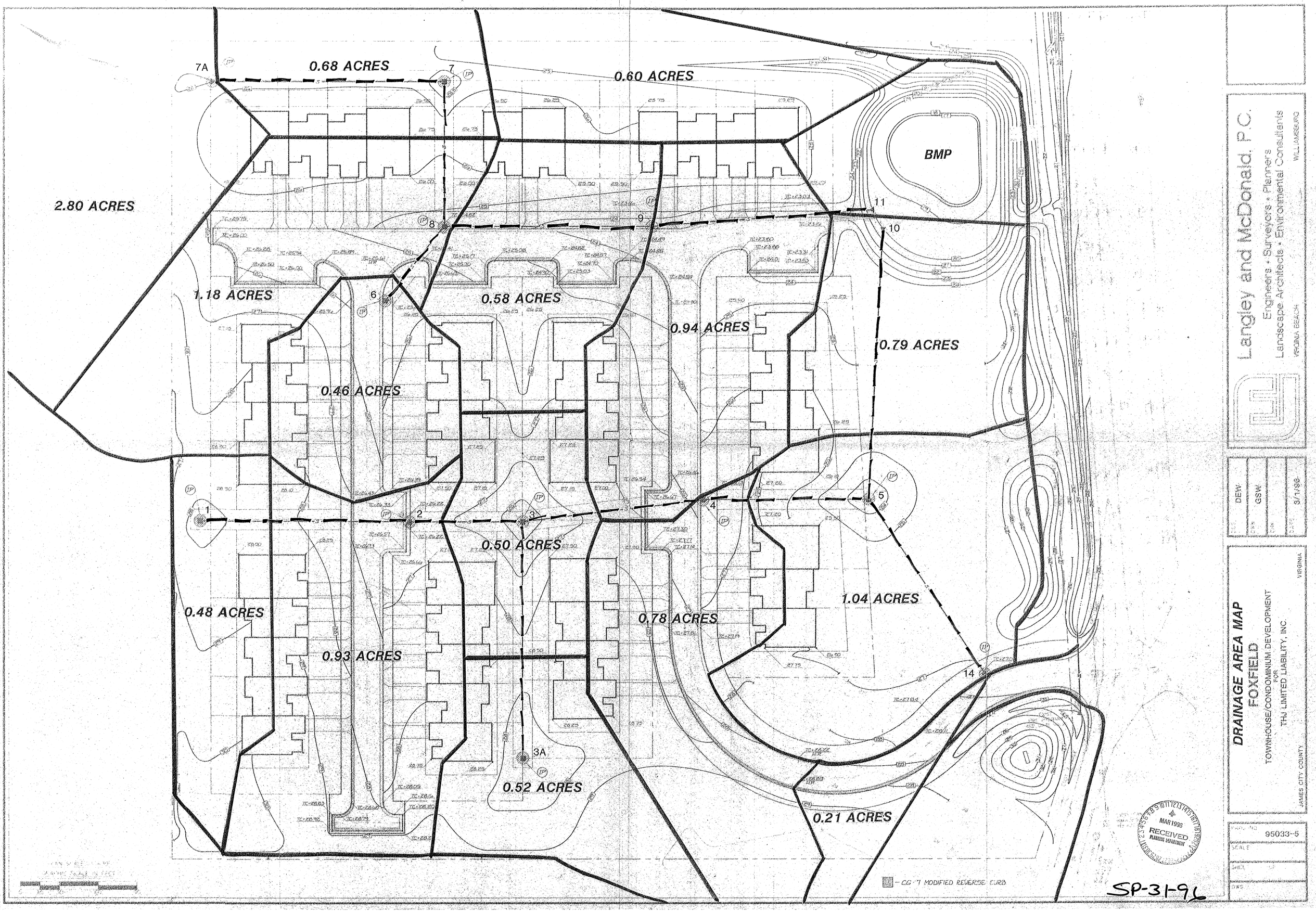
Langley and McDonald, P.C.
Engineers • Surveyors • Planners
Landscape Architects • Environmental Consultants
WILLIAMSBURG VIRGINIA BEACH

DES.	DEW
DWN.	GSW
CHK.	
DATE	3/1/96

UTILITIES PLAN
FOXFIELD
TOWNHOUSE/CONDOMINIUM DEVELOPMENT
FOR
THJ LIMITED LIABILITY, INC.
JAMES CITY COUNTY, VIRGINIA

PROJ. NO.	95033-5
SCALE:	
SHEET	4 OF 11
DWG.	6004W

PC097_FOXFIELD_SEC_1_WET_POND - 006



PC097_FOXFIELD_SEC_1_WET_POND - 007

DEVELOPMENT MANAGEMENT

101-E MOUNTS BAY ROAD, P.O. BOX 8784, WILLIAMSBURG, VIRGINIA 23187-8784
(757) 253-6671 Fax: (757) 259-4032 E-MAIL: devtman@james-city.va.us

ENVIRONMENTAL DIVISION (757) 253-6670 environ@james-city.va.us
PLANNING (757) 253-6685 planning@james-city.va.us
COUNTY ENGINEER (757) 253-6678
MOSQUITO CONTROL (757) 259-4116

December 7, 2005

Mr. Ed Wigley
Foxfield HOA
2500 Burrows Court
Williamsburg, Va. 23185

PROTECTED WITH PRIDE IN JAMES CITY COUNTY

Re: Foxfield Subdivision
County Plan No. SP-31-96
Stormwater Management Facility
County BMP ID Code: PC 097

Dear Mr. Wigley:

In follow-up to several discussions that we had over the last few months and our "first contact" letter issued on October 10, 2005, the Foxfield HOA performed routine maintenance on the existing dry pond stormwater management facility within the Foxfield Subdivision. Work generally consisted of restoring the existing rock outlet protection pad in the northwest corner of the stormwater basin and cleaning and removing all obstructive debris, sediment and vegetation from within and around the principal flow control structure (riser) and outflow pipe (barrel) from the stormwater basin. The riser/barrel is situated in the southeast corner of the basin and the outfall barrel conveys drainage from the pond to an existing VDOT roadside drainage channel along Jamestown Road.

Our Division commends the Homeowner Association (and you) for taking a proactive, rather than reactive approach, to performing obligated routine maintenance on the stormwater management/BMP which services Foxfield Subdivision. Performing routine maintenance is an important aspect to ensure the stormwater basin functions as per the original design and to ensure it maintains an acceptable level of stormwater function, structural integrity and safety.

As this BMP maintenance activity was being performed, homeowner association representatives inquired about the need to obtain permits for the above-related BMP maintenance activities. As maintenance recommendations were made by our Division for the HOA to pursue and this was considered obligated maintenance of an existing stormwater management facility, a Land-Disturbing permit was not required through our office. In addition, normally the U.S. Army Corp. of Engineers would not take jurisdiction over wetlands associated with this type of man-made stormwater management detention pond due to it's size and general location (ie. offline). Any wetland impacts (if needed) would have been accounted for as part of the original plan of development for the subdivision. If they would be deemed as jurisdictional now, it is likely that maintenance activities (as recently performed or as recommended by our Division) would fall under the provisions of Nationwide Permit 3 (Maintenance) or other similar general permits through the Norfolk District of the U.S. Army Corp. of Engineers.

Our Division has no authority to determine whether wetlands are jurisdictional and to ensure owners or developers are compliant with applicable wetland permit regulations. However, we are generally aware of regulations as they pertain to BMP maintenance and just to be certain, I personally contacted Ms. Leslie Leonard with the District as it pertained to this specific issue. If you need to contact Ms. Leonard, she can be reached at (757) 201-7540 or by email at Lesley.D.Leonard@nao02.usace.army.mil . General information about the Norfolk District and wetland regulations can be accessed at their website at http://www.nao.usace.army.mil/ .

For your information, I've attached a copy of our "first contact" letter to the HOA and a copy of Nationwide Permit # 3. Thank you for your assistance in this matter. If you have any additional questions or comments, call me at 757-253-6639.

Sincerely,

Scott J. Thomas, P.E.
Senior Engineer
Environmental Division

Attachments
SJT/sjt

SWMProg\Education\Subdivisions\Foxfield.letter2

October 10, 2005

Mr. Ed Wigley
Foxfield HOA
2500 Burrows Court
Williamsburg, Va. 23185

Re: Foxfield Subdivision, Section 1
Stormwater Management Facility
County BMP ID Code: PC 097

PROTECTED WITH PRIDE IN JAMES CITY COUNTY

Dear Mr. Wigley:

It was a pleasure to talk with you over the last few weeks about the stormwater management facility at Foxfield Subdivision. As discussed, I am providing you with some of our "***first contact***" information for your community association to use relative to maintenance issues. The subject stormwater management facility (PC 097) is a small wet pond situated in the southeast corner of the site.

Information as attached includes: a watershed education brochure from our PRIDE program (www.protectedwithpride.org); landscaping tips for stormwater management BMP's; watershed awareness tips, a maintenance plan for the wet pond stormwater management facility; and three brochures related to liability and maintenance. One of these brochures is a good informational handout entitled *A Guide for Maintaining and Operating BMP's*. This publication is distributed through our office in response to a cooperative effort from the Hampton Roads Regional Stormwater Management Committee and HR STORM, a regional stormwater education program offered by the Hampton Roads Planning District Commission.

I am also attaching some other information including an aerial map of the community which shows the location of the BMP and a copy of a printout from our County BMP database. The printout gives some specific information about the BMP.

Our Division is always readily available to assist owners and HOA representatives with guidance related to stormwater management facilities and drainage. We sincerely look forward working with you in the future. If you have any additional questions or comments, call me at 757-253-6639.

Sincerely,

Scott J. Thomas, P.E.
Senior Engineer
Environmental Division

Attachments
SJT/sjt

SWMProg\Education\Subdivisions\Foxfield.fc

Scott Thomas

From: Leonard, Lesley D NAO [Lesley.D.Leonard@nao02.usace.army.mil]
Sent: Wednesday, December 07, 2005 11:54 AM
To: Scott Thomas
Subject: RE: Foxfield Subdivision

Scott,

I would agree that it looks like the BMP was constructed in uplands, outside of our jurisdiction. The landscape position just doesn't look quite "right". But anyway, even if I'm wrong on that, a Nationwide Permit number 3 would cover the work that was performed (and described by you on the phone this morning).

In regard to wetlands that form in upland ditches or BMPs: we normally do not regulate them unless they become naturalized/abandoned. I would say that is a atypical for us to regulate them, even considering naturalization, unless they begin to perform important habitat or water quality functions.

I think that you all did the right thing. I don't see any problem. Thanks for being so conscientious, we really do appreciate it.

~Lesley

From: Scott Thomas [mailto:SCOTTT@james-city.va.us]
Sent: Wednesday, December 07, 2005 11:25 AM
To: Leonard, Lesley D NAO
Subject: Foxfield Subdivision

Here are some photos of what I talked to you about this morning. It is a very small dry pond BMP in the Foxfield Subdivision. Foxfield is a condominium project about 10 acres in size. The BMP is a small existing dry detention pond with a shallow marsh. The subdivision/BMP is about 10 years old. Two storm pipes and an open channel (flume) converge at the northwest corner of the basin and bring storm flow from the development into the basin. The rock outlet protection pad at the outfall of these pipes/flume had filled with sediment and was growing vegetation. Our recommendation to the BMP owner (HOA) was to restore this outlet protection pad back to it's original design so as to not back drainage up in the pipes back into the subdivision. The hired a landscape contractor and did this work.

Photographs 1, 4 and 5 are provided to give you an overall vision of what the BMP looks like. Photograph # 3 shows the outlet protection pad where they did the work at our direction (it is before the work was done).

Let me know if anything else comes to mind.

Scott J. Thomas, P.E.
James City County
Environmental Division

STORMWATER MANAGEMENT
AND
B.M.P. CALCULATIONS

FOXFIELD

PC097

MARCH 1, 1996
REVISED MAY 1, 1996

Langley and McDonald, P.C.

Engineers
Surveyors
Planners
Landscape Architects
Environmental Consultants

Langley and McDonald
1956-1996
40
Years of Service
and Excellence

5544 Greenwich Road, Virginia Beach, VA 23462
(804) 473-2000 FAX: (804) 497-7933

201 Packets Court, Williamsburg, VA 23185
(804) 253-2975 FAX: (804) 229-0049

STORMWATER MANAGEMENT
B.M.P.

SUMMARY

FOXFIELD STORMWATER MANAGEMENT SUMMARY			
STORM FREQUENCY	PRE DEVELOPED Q.	POST DEVELOPMENT RELEASED FROM POND	WATER SURFACE ELEVATION
2 YEAR STORM	8.53 CFS	6.74 CFS	21.29
10 YEAR STORM	12.01 CFS	8.43 CFS	21.79
25 YEAR STORM	13.27 CFS	10.17 CFS	22.41
100 YEAR STORM	16.75 CFS	17.84 CFS	23.24

B.M.P. CALCULATIONS

TOTAL AREA OF PROPERTY: 9.75 AC.
OPEN SPACE: 151,547 SQ. FT. 3.48 AC.

IMPERVIOUS AREA:

LOTS:	196,457 SQ.FT. X 0.45 (IMPERV)	=	2.03 AC.
RIGHT-OF-WAY:	76,804 SQ.FT. X 0.65 (IMPERV)	=	1.14 AC.
	TOTAL IMPERVIOUS AREA	=	3.17 AC.

TOTAL IMPERVIOUS AREA 3.17 AC. ÷ TOTAL SITE 9.75 AC. = 0.325

USE 35% IMPERVIOUS AREA

The Drainage, Stormwater Management, and Erosion control facilities for this project have been developed in basic conformance with the "Overall Drainage and Stormwater Management Plan." We have designed the wet pond as an 8 point BMP using 2.5 times the volume required by the Chesapeake Bay Preservation Act. The design volume required is as follows:

REQUIRED VOLUME OF BMP

$$V = \frac{(R_m)(R_v)}{12} \times AC.$$

$R_v = (0.05 + 0.009\ I) = [0.05 + 0.009(35)] = 0.365$

$R_m = 0.45"$

$A_c = 13.54$

$$\frac{0.45 \times 0.365}{12} \times 13.54 = 0.1853 \text{ AC.FT.} = 8{,}071.67 \text{ SQ.FT.}$$

8,071.67 SQ.FT. X 2.5 FOR 8 POINT BMP = 20,179.18 CU. FT.
BMP STORAGE REQUIRED

The BMP pond was designed using the Modified Rational Method and run on Haestad Methods Inc.'s Quick TR-55 and Pond-2 software. Intensity, Duration, and Frequency Curve data used was taken from the VDOT Drainage Manual for Norfolk (Rev. 6/92).

Design @ 2.5 V WET Pond

DA = 12.4 / AC.

3.0
9.41
12.4 / AC.

MAP SHOWS

TABLE 3

WORKSHEET FOR BMP POINT SYSTEM

A. STRUCTURAL BMP POINT ALLOCATION

BMP	BMP Points		Fraction of Site Served by BMP		Weighted BMP Points
	OFF-SITE 8	x	3.0 / 9.75	=	2.46
	8	x	9.41 / 9.75	=	7.72
		x		=	
		x		=	

TOTAL WEIGHTED STRUCTURAL BMP POINTS: _____

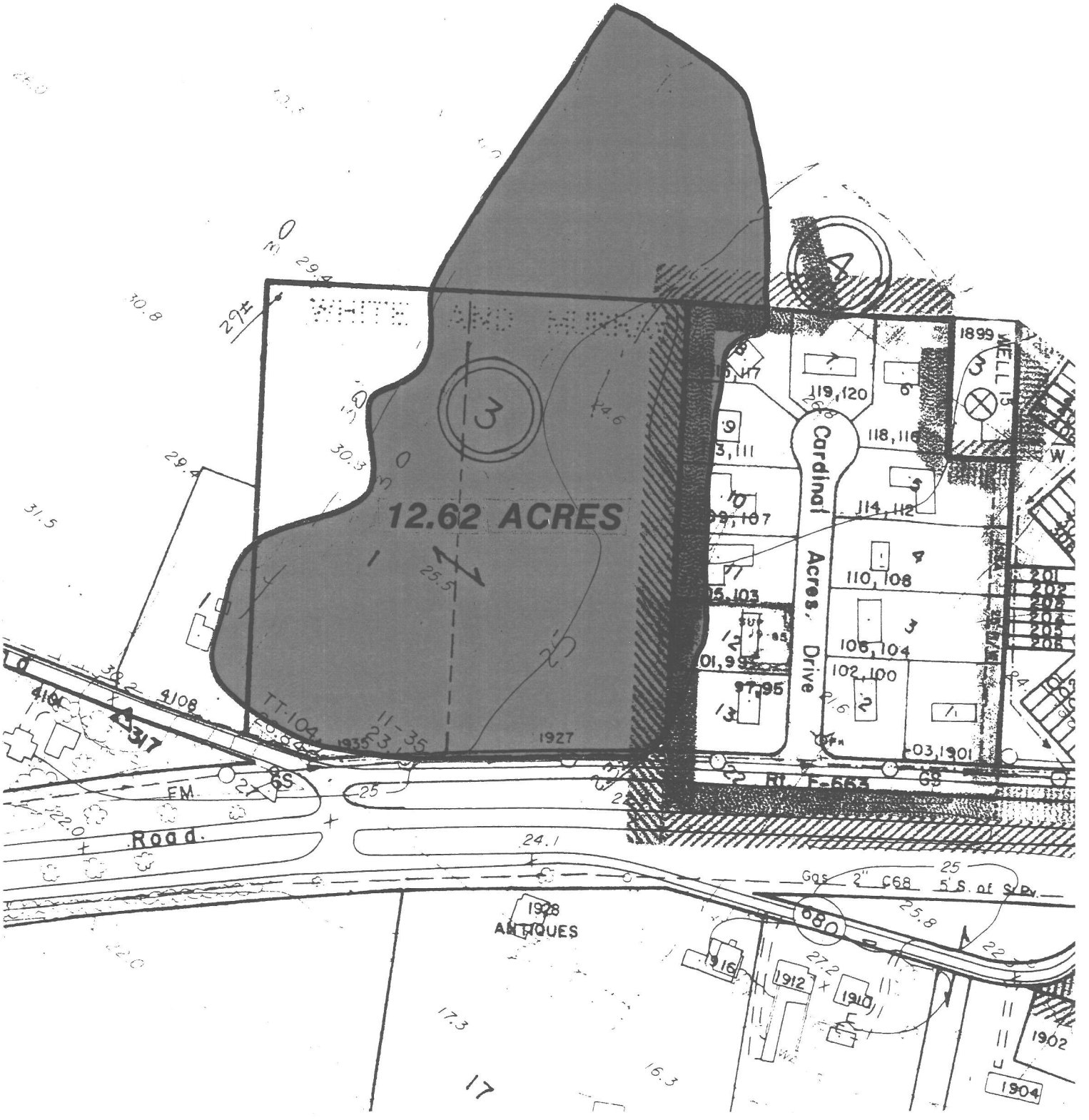
B. NATURAL OPEN SPACE CREDIT

Fraction of Site		Natural Open Space Credit		Points for Natural Open Space
	x	10 (0.1 per 1%)	=	

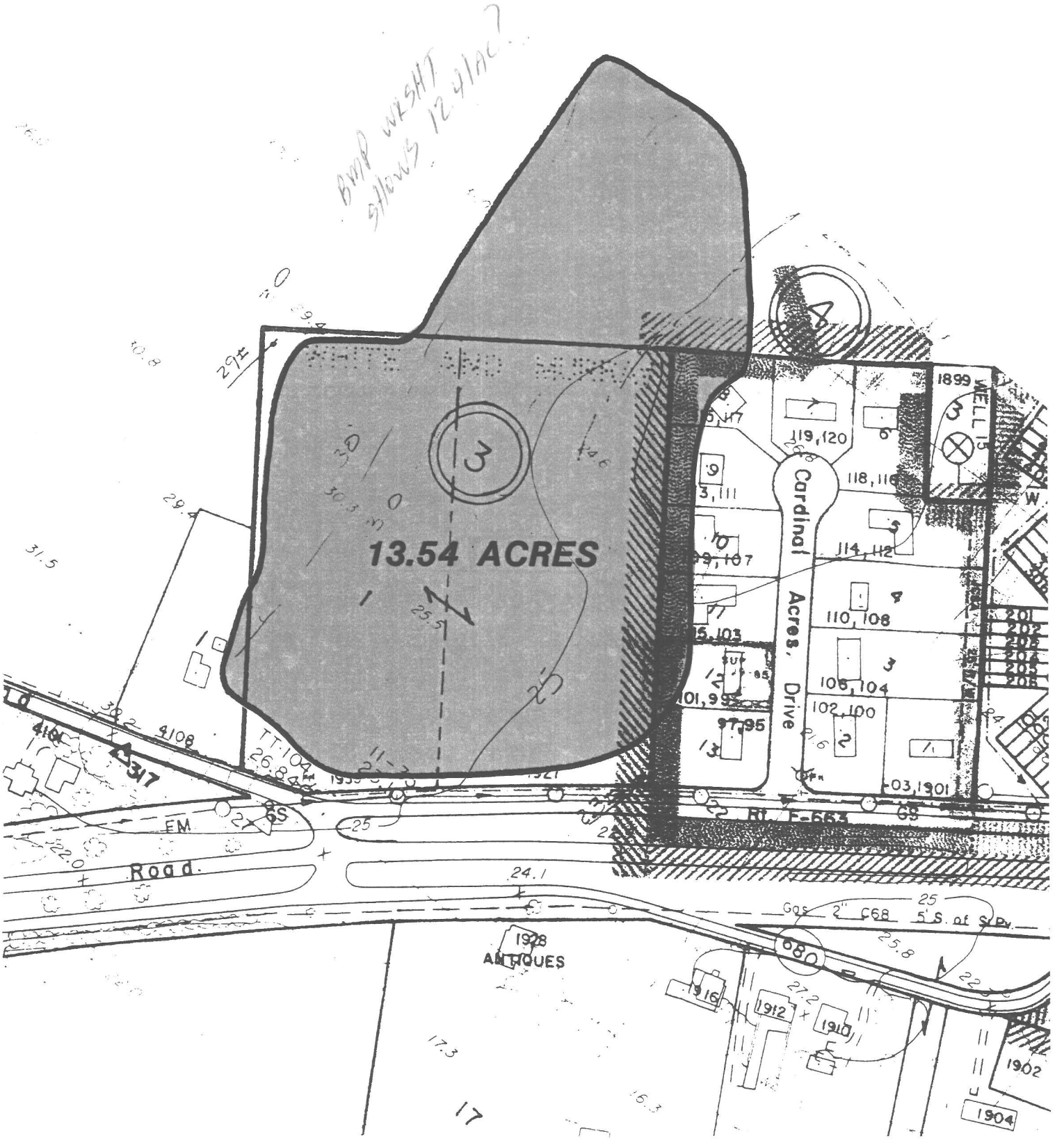
C. TOTAL WEIGHTED POINTS

2.46 + 7.72	+		=	10.18
Structural BMP Points		Natural Open Space Points		TOTAL

PRE AND POST DEVELOPMENT CALCULATIONS



FOXFIELD
PRE-DEVELOPED WATERSHED



FOXFIELD
POST-DEVELOPED WATERSHED

FOXFIELD
STORMWATER MANAGEMENT

WATERSHED AREAS

PRE-DEVELOPED AREA	=	12.62 ACRES
POST-DEVELOPED AREA	=	13.54 ACRES

RUNOFF COEFFICIENT

PRE-DEVELOPED COEFFICIENT	=	0.25
POST-DEVELOPED COEFFICIENT (WEIGHTED)	=	0.42
1. 3.55 AC. OFF-SITE @ 0.25 .35	=	0.89 1.24
2. 3.48 AC. OPEN SPACE @ 0.30	=	1.04
3. 5.74 AC. DEVELOPED AREA 0.60	=	3.44
TOTAL	=	5.37 5.72
COEFFICIENT 5.36 ÷ ACRES 12.77	=	0.42 0.45

TIME OF CONCENTRATION

300' overland flow @ 1.67 = 2.5 min
500' shallow conc. = $\frac{8}{33}$ ok

PRE-DEVELOPED T_c	=	30.22 MINUTES
POST-DEVELOPED T_c	=	20 MINUTES (FROM DRAINAGE CALCULATIONS)

RAINFALL INTENSITIES

PRE-DEVELOPED (30.22 MINUTES)

2 YEAR STORM	=	2.7 INTENSITY
10 YEAR STORM	=	3.8 INTENSITY
25 YEAR STORM	=	4.2 INTENSITY
100 YEAR STORM	=	5.3 INTENSITY

FOXFIELD
STORMWATER MANAGEMENT

POST-DEVELOPED (20 MINUTES)

2 YEAR STORM	=	3.5 INTENSITY
10 YEAR STORM	=	4.7 INTENSITY
25 YEAR STORM	=	5.4 INTENSITY
100 YEAR STORM	=	6.5 INTENSITY

FLOWS

PRE-DEVELOPED Q

AREA X COEFFICIENT				=	CA	
12.62 X 0.25				=	3.16	
2 YEAR STORM	3.16	X	2.7	=	Q_2	8.53
10 YEAR STORM	3.16	X	3.8	=	Q_{10}	12.01
25 YEAR STORM	3.16	X	4.2	=	Q_{25}	13.27
100 YEAR STORM	3.16	X	5.3	=	Q_{100}	16.75

POST-DEVELOPED Q

AREA X COEFFICIENT				=	CA	
13.54 X 0.42				=	5.68	
	6.09					21.32
2 YEAR STORM	5.68	X	3.5	=	Q_2	19.88
10 YEAR STORM	5.68	X	4.7	=	Q_{10}	26.70
25 YEAR STORM	5.68	X	5.4	=	Q_{25}	30.67 + 1.1%
100 YEAR STORM	5.68	X	6.5	=	Q_{100}	36.92 + 1.25%

INFLOW HYDROGRAPH

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 14:47:03 05-01-1996

```
*****************************************************************************
*****************************************************************************
*                                                                           *
*                                                                           *
*                        MODIFIED RATIONAL METHOD                           *
*            ---- Grand Summary For All Storm Frequencies ----              *
*                                                                           *
*                                                                           *
*****************************************************************************
*****************************************************************************
```

First peak outflow point assumed to occur at inflow recession leg.

FOXFIELD
STORMWATER MANAGEMENT/B.M.P.

Area = 13.54 acres Tc = 20.00 minutes

Frequency (years)	Adjusted 'C'	Duration minutes	Intens. in/hr	Qpeak cfs	Allowable cfs	VOLUMES Inflow (cu.ft.)	Storage (cu.ft.)
2	0.418	78	1.605	9.08	8.53	42,512	17,434
10	0.418	46	2.910	16.47	12.01	45,457	21,677
25	0.460	50	3.250	20.23	13.27	60,701	32,833
100	0.522	88	2.863	20.26	16.75	106,957	52,687

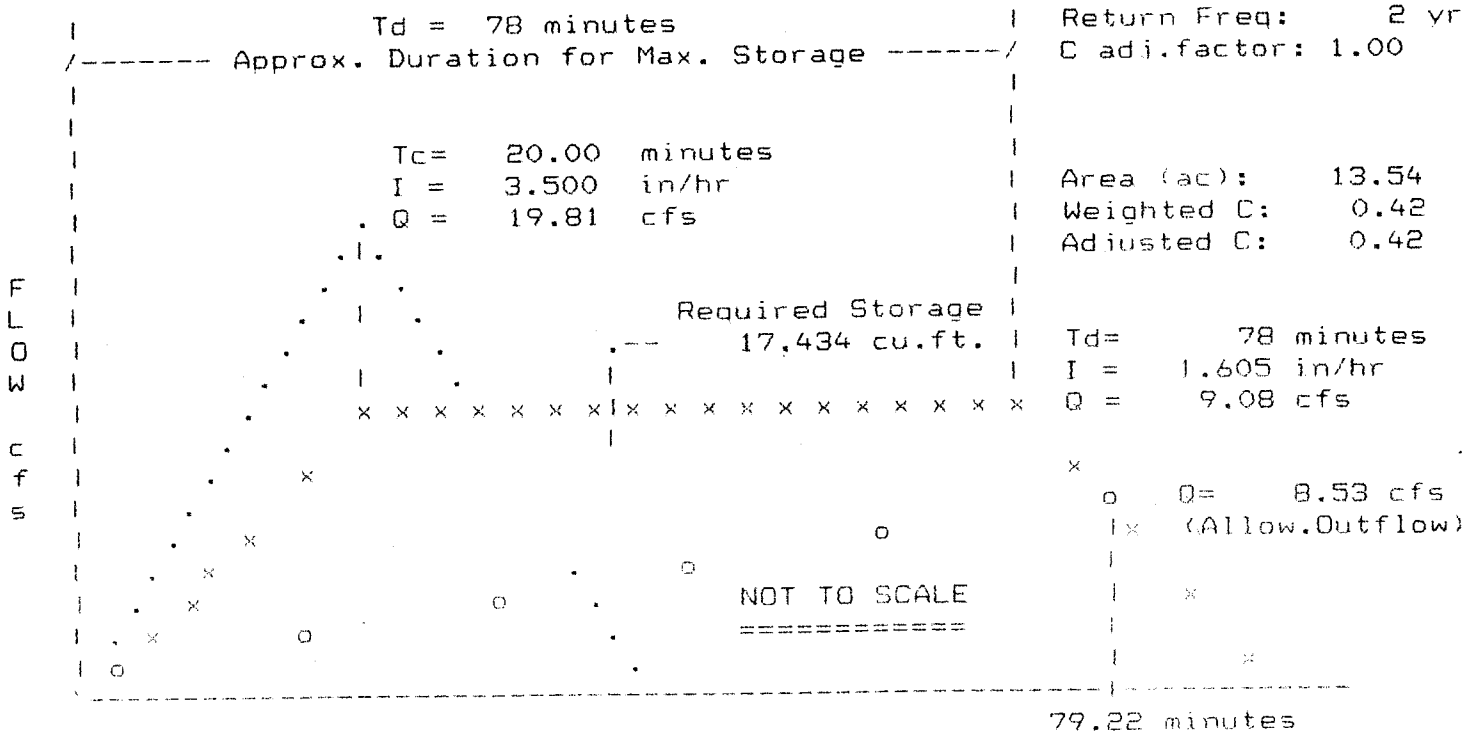
Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 14:47:03 05-01-1996

MODIFIED RATIONAL METHOD
---- Graphical Summary for Maximum Required Storage ----

First peak outflow point assumed to occur at inflow recession leg.

FOXFIELD
STORMWATER MANAGEMENT/B.M.P.

```
*****************************************************************
*  RETURN FREQUENCY:   2 yr     |  Allowable Outflow:     8.53 cfs    *
*  'C' Adjustment: 1.000        |  Required Storage:    17,434 cu.ft. *
*---------------------------------------------------------------*
*  Peak Inflow:    9.08 cfs        Inflow .HYD stored: FF2IN   .HYD   *
*****************************************************************
```



Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 14:47:03 05-01-1996

FOXFIELD
STORMWATER MANAGEMENT/B.M.P.

**** Modified Rational Hydrograph *****

Weighted C = 0.418 Area= 13.540 acres Tc = 20.00 minutes

Adjusted C = 0.418 Td= 78.00 min. I= 1.61 in/hr Qp= 9.08 cfs

RETURN FREQUENCY: 2 year storm Adj.factor = 1.00
Output file: FF2IN .HYD

HYDROGRAPH FOR MAXIMUM STORAGE
For the 2 Year Storm

Time increment = 1.00 Minutes
Time on left represents time for first Q in each row.

Time Minutes							
0.00	0.00	0.45	0.91	1.36	1.82	2.27	2.73
7.00	3.18	3.63	4.09	4.54	5.00	5.45	5.90
14.00	6.36	6.81	7.27	7.72	8.18	8.63	9.08
21.00	9.08	9.08	9.08	9.08	9.08	9.08	9.08
28.00	9.08	9.08	9.08	9.08	9.08	9.08	9.08
35.00	9.08	9.08	9.08	9.08	9.08	9.08	9.08
42.00	9.08	9.08	9.08	9.08	9.08	9.08	9.08
49.00	9.08	9.08	9.08	9.08	9.08	9.08	9.08
56.00	9.08	9.08	9.08	9.08	9.08	9.08	9.08
63.00	9.08	9.08	9.08	9.08	9.08	9.08	9.08
70.00	9.08	9.08	9.08	9.08	9.08	9.08	9.08
77.00	9.08	9.08	8.63	8.18	7.72	7.27	6.81
84.00	6.36	5.90	5.45	5.00	4.54	4.09	3.63
91.00	3.18	2.73	2.27	1.82	1.36	0.91	0.45
98.00	0.00						

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 14:47:03 05-01-1996

FOXFIELD
STORMWATER MANAGEMENT/B.M.P.

* * * * * * SUMMARY OF RATIONAL METHOD PEAK DISCHARGES * * * * * *

Q = adj * C * I * A
Where: Q=cfs, C=Weighted Runoff Coefficient, I=in/hour, A=acres
adj = 'C' adjustment factor for each return frequency

RETURN FREQUENCY = 2 years
'C' adjustment, k = 1
Adj. 'C' = Wtd.'C' x 1

Subarea Descr.	Runoff 'C'	Area acres	Tc (min)	Wtd. 'C'	Adj. 'C'	I in/hr	Total acres	Peak Q (cfs)
	0.418	13.54						
			20.00	0.418	0.418	3.500	13.54	19.81

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 14:47:03 05-01-1996

MODIFIED RATIONAL METHOD
---- Summary for Single Storm Frequency ----

First peak outflow point assumed to occur at inflow recession leg.

FOXFIELD
STORMWATER MANAGEMENT/B.M.P.

RETURN FREQUENCY: 2 yr 'C' Adjustment = 1.000 Allowable Q = 8.53 cfs

Hydrograph file duration= 78.00 minutes
Hydrograph file: FF2IN .HYD Tc = 20.00 minutes

Weighted 'C'	Adjusted 'C'	Duration minutes	Intens. in/hr	Areas acres	Qpeak cfs	VOLUMES Inflow (cu.ft.)	Storage (cu.ft.)
0.418	0.418	20	3.500	13.54	19.81	23,771	13,535
0.418	0.418	30	2.750	13.54	15.56	28,016	15,221
0.418	0.418	40	2.250	13.54	12.73	30,562	15,208
0.418	0.418	50	2.000	13.54	11.32	33,958	16,045
0.418	0.418	60	1.800	13.54	10.19	36,675	16,203
********** Storage Maximum							
0.418	0.418	78	1.605	13.54	9.08	42,512	17,434
**********							
0.418	0.418	120	1.150	13.54	6.51	Qpeak < Qallow	

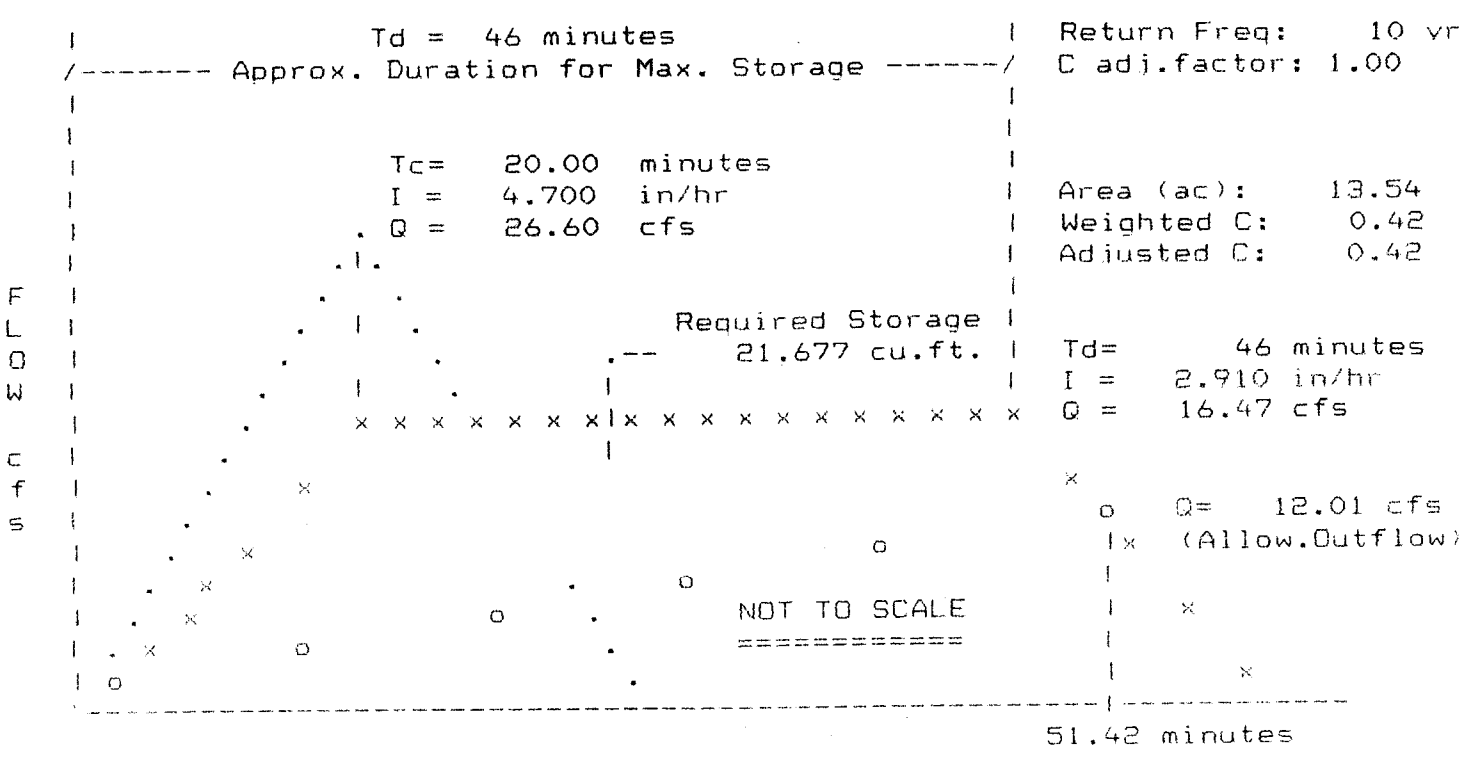
Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 14:47:03 05-01-1996

MODIFIED RATIONAL METHOD
---- Graphical Summary for Maximum Required Storage ----

First peak outflow point assumed to occur at inflow recession leg.

FOXFIELD
STORMWATER MANAGEMENT/B.M.P.

```
*****************************************************************
*  RETURN FREQUENCY:  10 yr      |  Allowable Outflow:    12.01 cfs    *
*  'C' Adjustment: 1.000         |  Required Storage:    21,677 cu.ft. *
*---------------------------------------------------------------*
*  Peak Inflow:   16.47 cfs        Inflow .HYD stored: FF10IN  .HYD   *
*****************************************************************
```



Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 14:47:03 05-01-1996

FOXFIELD
STORMWATER MANAGEMENT/B.M.P.

**** Modified Rational Hydrograph *****

Weighted C = 0.418 Area= 13.540 acres Tc = 20.00 minutes

Adjusted C = 0.418 Td= 46.00 min. I= 2.91 in/hr Qp= 16.47 cfs

RETURN FREQUENCY: 10 year storm Adj.factor = 1.00
Output file: FF10IN .HYD

HYDROGRAPH FOR MAXIMUM STORAGE
For the 10 Year Storm

Time increment = 1.00 Minutes
Time on left represents time for first Q in each row.

Time Minutes							
0.00	0.00	0.82	1.65	2.47	3.29	4.12	4.94
7.00	5.76	6.59	7.41	8.23	9.06	9.88	10.71
14.00	11.53	12.35	13.18	14.00	14.82	15.65	16.47
21.00	16.47	16.47	16.47	16.47	16.47	16.47	16.47
28.00	16.47	16.47	16.47	16.47	16.47	16.47	16.47
35.00	16.47	16.47	16.47	16.47	16.47	16.47	16.47
42.00	16.47	16.47	16.47	16.47	16.47	15.65	14.82
49.00	14.00	13.18	12.35	11.53	10.71	9.88	9.06
56.00	8.23	7.41	6.59	5.76	4.94	4.12	3.29
63.00	2.47	1.65	0.82	0.00			

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 14:47:03 05-01-1996

FOXFIELD
STORMWATER MANAGEMENT/B.M.P.

* * * * * * SUMMARY OF RATIONAL METHOD PEAK DISCHARGES * * * * * *

Q = adj * C * I * A
Where: Q=cfs, C=Weighted Runoff Coefficient, I=in/hour, A=acres
adj = 'C' adjustment factor for each return frequency

RETURN FREQUENCY = 10 years
'C' adjustment, k = 1
Adj. 'C' = Wtd.'C' x 1

Subarea Descr.	Runoff "C"	Area acres	Tc (min)	Wtd. "C"	Adj. "C"	I (in/hr)	Total acres	Peak Q (cfs)
	0.418	13.54						
			20.00	0.418	0.418	4.700	13.54	26.60

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 14:47:03 05-01-1996

MODIFIED RATIONAL METHOD
---- Summary for Single Storm Frequency ----

First peak outflow point assumed to occur at inflow recession leg.

FOXFIELD
STORMWATER MANAGEMENT/B.M.P.

RETURN FREQUENCY: 10 yr 'C' Adjustment = 1.000 Allowable Q = 12.01 cfs

Hydrograph file duration= 46.00 minutes
Hydrograph file: FF10IN .HYD Tc = 20.00 minutes

Weighted 'C'	Adjusted 'C'	Duration minutes	Intens. in/hr	Areas acres	Qpeak cfs	VOLUMES Inflow (cu.ft.)	Storage (cu.ft.)
0.418	0.418	20	4.700	13.54	26.60	31,921	17,509
0.418	0.418	30	3.750	13.54	21.22	38,203	20,188
0.418	0.418	40	3.150	13.54	17.83	42,787	21,169
**********						Storage	Maximum
0.418	0.418	46	2.910	13.54	16.47	45,457	21,677
**********							
0.418	0.418	50	2.750	13.54	15.56	46,693	21,472
0.418	0.418	60	2.450	13.54	13.87	49,919	21,095
0.418	0.418	120	1.600	13.54	9.06	Qpeak < Qallow	

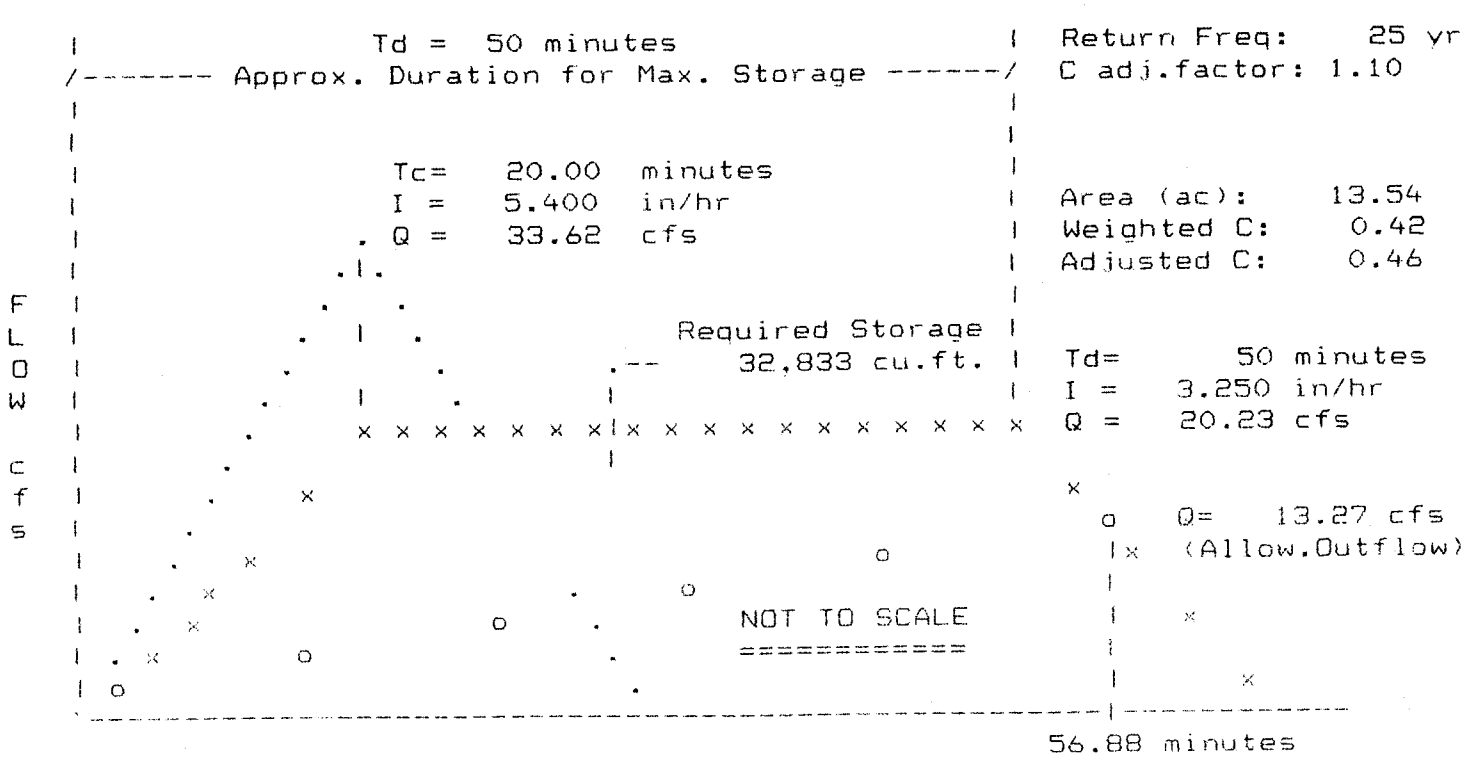
Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 14:47:03 05-01-1996

MODIFIED RATIONAL METHOD
---- Graphical Summary for Maximum Required Storage ----

First peak outflow point assumed to occur at inflow recession leg.

FOXFIELD
STORMWATER MANAGEMENT/B.M.P.

```
*****************************************************************
*  RETURN FREQUENCY:  25 yr      |  Allowable Outflow:    13.27 cfs    *
*  'C' Adjustment: 1.100         |  Required Storage:    32,833 cu.ft. *
*---------------------------------------------------------------*
*  Peak Inflow:   20.23 cfs        Inflow .HYD stored: FF25IN  .HYD   *
*****************************************************************
```



Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 14:47:03 05-01-1996

FOXFIELD
STORMWATER MANAGEMENT/B.M.P.

**** Modified Rational Hydrograph *****

Weighted C = 0.418 Area= 13.540 acres Tc = 20.00 minutes

Adjusted C = 0.460 Td= 50.00 min. I= 3.25 in/hr Qp= 20.23 cfs

RETURN FREQUENCY: 25 year storm Adj.factor = 1.10
Output file: FF25IN .HYD

HYDROGRAPH FOR MAXIMUM STORAGE
For the 25 Year Storm

Time increment = 1.00 Minutes
Time on left represents time for first Q in each row.

Time Minutes							
0.00	0.00	1.01	2.02	3.04	4.05	5.06	6.07
7.00	7.08	8.09	9.11	10.12	11.13	12.14	13.15
14.00	14.16	15.18	16.19	17.20	18.21	19.22	20.23
21.00	20.23	20.23	20.23	20.23	20.23	20.23	20.23
28.00	20.23	20.23	20.23	20.23	20.23	20.23	20.23
35.00	20.23	20.23	20.23	20.23	20.23	20.23	20.23
42.00	20.23	20.23	20.23	20.23	20.23	20.23	20.23
49.00	20.23	20.23	19.22	18.21	17.20	16.19	15.18
56.00	14.16	13.15	12.14	11.13	10.12	9.11	8.09
63.00	7.08	6.07	5.06	4.05	3.04	2.02	1.01
70.00	0.00						

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 14:47:03 05-01-1996

FOXFIELD
STORMWATER MANAGEMENT/B.M.P.

* * * * * * SUMMARY OF RATIONAL METHOD PEAK DISCHARGES * * * * * *

Q = adj * C * I * A
Where: Q=cfs, C=Weighted Runoff Coefficient, I=in/hour, A=acres
adj = 'C' adjustment factor for each return frequency

RETURN FREQUENCY = 25 years
'C' adjustment, k = 1.1
Adj. 'C' = Wtd.'C' x 1.1

Subarea Descr.	Runoff 'C'	Area acres	Tc (min)	Wtd. 'C'	Adj. 'C'	I in/hr	Total acres	Peak Q (cfs)
	0.418	13.54						
			20.00	0.418	0.460	5.400	13.54	33.62

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 14:47:03 05-01-1996

MODIFIED RATIONAL METHOD
---- Summary for Single Storm Frequency ----

First peak outflow point assumed to occur at inflow recession leg.

FOXFIELD
STORMWATER MANAGEMENT/B.M.P.

RETURN FREQUENCY: 25 yr 'C' Adjustment = 1.100 Allowable Q = 13.27 cfs

Hydrograph file duration= 50.00 minutes
Hydrograph file: FF25IN .HYD Tc = 20.00 minutes

Weighted 'C'	Adjusted 'C'	Duration minutes	Intens. in/hr	Areas acres	Qpeak cfs	VOLUMES Inflow (cu.ft.)	Storage (cu.ft.)
0.418	0.460	20	5.400	13.54	33.62	40,342	24,418
0.418	0.460	30	4.400	13.54	27.39	49,307	29,402
0.418	0.460	40	3.600	13.54	22.41	53,790	29,904
**********						Storage	Maximum
0.418	0.460	50	3.250	13.54	20.23	60,701	32,833
**********							
0.418	0.460	60	2.800	13.54	17.43	62,755	30,907
0.418	0.460	120	1.750	13.54	10.89	Qpeak < Qallow	

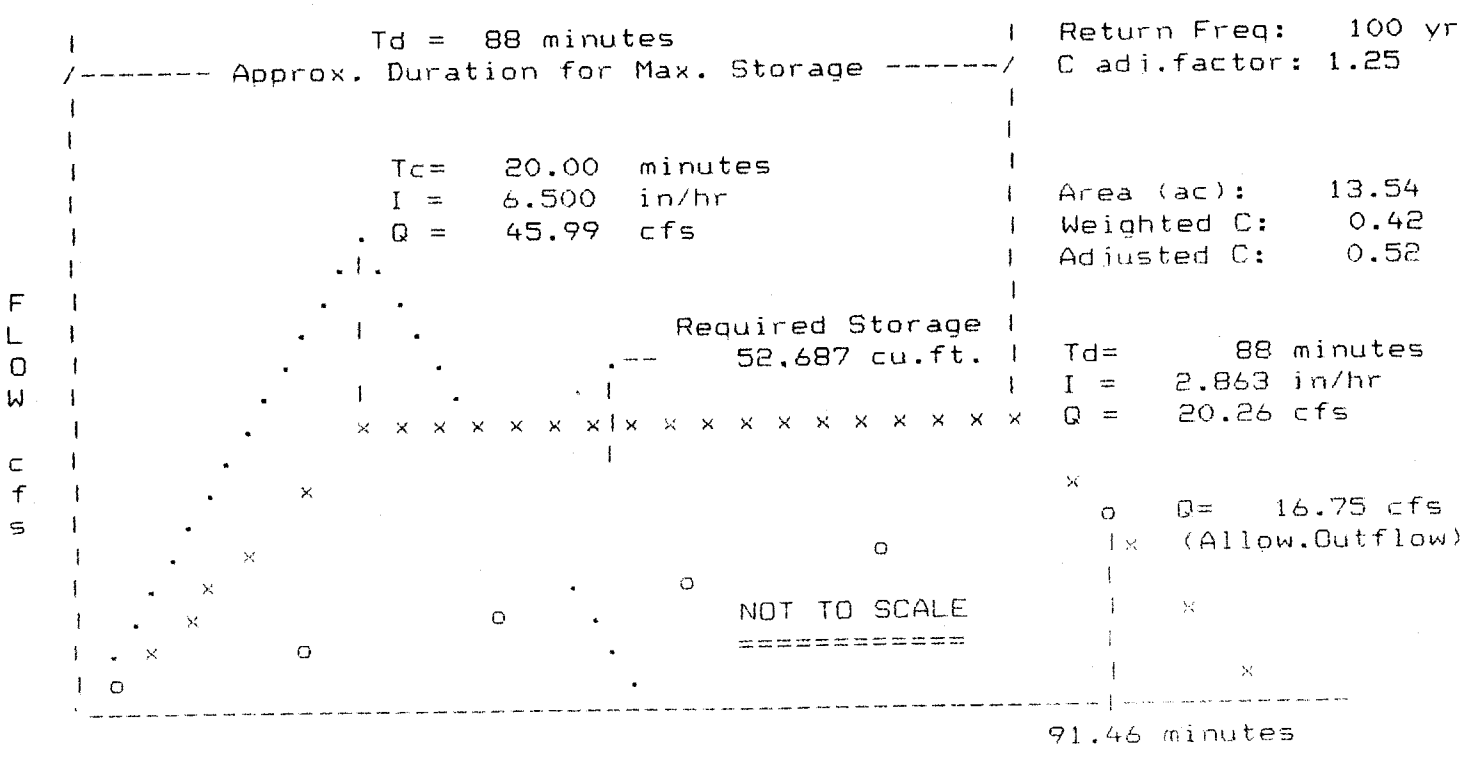
Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 14:47:03 05-01-1996

MODIFIED RATIONAL METHOD
---- Graphical Summary for Maximum Required Storage ----

First peak outflow point assumed to occur at inflow recession leg.

FOXFIELD
STORMWATER MANAGEMENT/B.M.P.

```
*****************************************************************
*  RETURN FREQUENCY: 100 yr     |  Allowable Outflow:    16.75 cfs    *
*  'C' Adjustment: 1.250        |  Required Storage:    52.687 cu.ft. *
*---------------------------------------------------------------*
*  Peak Inflow:   20.26 cfs       Inflow .HYD stored: FF100IN .HYD   *
*****************************************************************
```



Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 14:47:03 05-01-1996

FOXFIELD
STORMWATER MANAGEMENT/B.M.P.

**** Modified Rational Hydrograph *****

Weighted C = 0.418 Area= 13.540 acres Tc = 20.00 minutes

Adjusted C = 0.522 Td= 88.00 min. I= 2.86 in/hr Qp= 20.26 cfs

RETURN FREQUENCY: 100 year storm Adj.factor = 1.25
Output file: FF100IN .HYD

HYDROGRAPH FOR MAXIMUM STORAGE
For the 100 Year Storm

Time increment = 1.00 Minutes
Time on left represents time for first Q in each row.

Time Minutes							
0.00	0.00	1.01	2.03	3.04	4.05	5.06	6.08
7.00	7.09	8.10	9.12	10.13	11.14	12.15	13.17
14.00	14.18	15.19	16.21	17.22	18.23	19.24	20.26
21.00	20.26	20.26	20.26	20.26	20.26	20.26	20.26
28.00	20.26	20.26	20.26	20.26	20.26	20.26	20.26
35.00	20.26	20.26	20.26	20.26	20.26	20.26	20.26
42.00	20.26	20.26	20.26	20.26	20.26	20.26	20.26
49.00	20.26	20.26	20.26	20.26	20.26	20.26	20.26
56.00	20.26	20.26	20.26	20.26	20.26	20.26	20.26
63.00	20.26	20.26	20.26	20.26	20.26	20.26	20.26
70.00	20.26	20.26	20.26	20.26	20.26	20.26	20.26
77.00	20.26	20.26	20.26	20.26	20.26	20.26	20.26
84.00	20.26	20.26	20.26	20.26	20.26	19.24	18.23
91.00	17.22	16.21	15.19	14.18	13.17	12.15	11.14
98.00	10.13	9.12	8.10	7.09	6.08	5.06	4.05
105.00	3.04	2.03	1.01	0.00			

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 14:47:03 05-01-1996

FOXFIELD
STORMWATER MANAGEMENT/B.M.P.

* * * * * * SUMMARY OF RATIONAL METHOD PEAK DISCHARGES * * * * * *

Q = adj * C * I * A
Where: Q=cfs, C=Weighted Runoff Coefficient, I=in/hour, A=acres
adj = 'C' adjustment factor for each return frequency

RETURN FREQUENCY = 100 years
'C' adjustment, k = 1.25
Adj. 'C' = Wtd.'C' x 1.25

Subarea Descr.	Runoff 'C'	Area acres	Tc (min)	Wtd. 'C'	Adj. 'C'	I in/hr	Total acres	Peak Q (cfs)
	0.418	13.54						
			20.00	0.418	0.522	6.500	13.54	45.99

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 14:47:03 05-01-1996

MODIFIED RATIONAL METHOD
---- Summary for Single Storm Frequency ----

First peak outflow point assumed to occur at inflow recession leg.

FOXFIELD
STORMWATER MANAGEMENT/B.M.P.

RETURN FREQUENCY: 100 yr 'C' Adjustment = 1.250 Allowable Q = 16.75 cfs

Hydrograph file duration= 88.00 minutes
Hydrograph file: FF100IN .HYD Tc = 20.00 minutes

Weighted 'C'	Adjusted 'C'	Duration minutes	Intens. in/hr	Areas acres	Qpeak cfs	VOLUMES Inflow (cu.ft.)	Storage (cu.ft.)
0.418	0.522	20	6.500	13.54	45.99	55,182	35,082
0.418	0.522	30	5.250	13.54	37.14	66,855	41,730
0.418	0.522	40	4.500	13.54	31.84	76,406	46,256
0.418	0.522	50	3.800	13.54	26.88	80,651	45,476
0.418	0.522	60	3.400	13.54	24.05	86,594	46,394
**********						Storage	Maximum
0.418	0.522	88	2.863	13.54	20.26	106,957	52,687
**********							
0.418	0.522	120	2.250	13.54	15.92	Qpeak < Qallow	

VOLUME CALCULATIONS

8/26/99

As built Foxfield

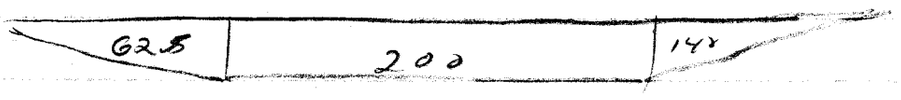
15' contour	1840 SF 1812 1826 SF	X		1,216
16	(2518) 2451	2112 2139 X 1	=	2172 ~~2139~~
		2790 X 1 2874	=	~~2790~~ 2874
17	(3167) 3,129			
		3502 X 1 (3555)	=	~~3502~~ 3555
18	(3942) 3875			
19	(7411) 7130	5503 X 1 5577	=	~~5503~~ 5577
		8569 X .05 8506 X 0.5	=	4285 ~~4253~~
WATER/SURFACE ELEV.		9726 9881		(19,679) 22,664
20	12,283 12,264	11,073 X .5 11,005		~~5,537~~ 5,503
21	14,095 13,995	13,189 X 1		13,189
22	15,500 14,823	14,798 X 1		14,798
23	17,050 17,100	16,275 X 1		16,275
(1,216)				
		FROM STORMWATER CALC'S		69,444 (70,057)

Computed By Gerald E. Lewis
8/25/99

	87 AS BUILT	86' ORIGINAL
20 ACROSS	130' " "	127'
20	114	100'

$\frac{0+5}{2} \times 25$ $\frac{5+5}{2} \times 40$ $5 \times$ 576

AS BUILT



402 (14.9 C.Y.)

2436

2229

POND-2 Version: 5.17
S/N: 1295130250

FOXFIELD
STORMWATER MANAGEMENT / B.M.P.

CALCULATED 05-01-1996 15:27:06
DISK FILE: b:FFIELD .VOL

Planimeter scale: 1 inch = 30 ft.

Elevation (ft)	Planimeter (sq.in.)	Area (sq.ft)	A1+A2+sqr(A1*A2) (sq.ft)	* Volume (cubic-ft)	Volume Sum (cubic-ft)
14.00	2.61	2,349	0	0	0
15.00	3.11	2,799	7,712	2,571	2,571
16.00	3.60	3,240	9,050	3,017	5,588
17.00	4.09	3,681	10,374	3,458	9,046
18.00	4.58	4,122	11,698	3,899	12,945
18.48	4.90	4,410	12,796	2,047	14,992
18.49	8.15	7,335	17,432	58	15,051
19.00	8.52	7,668	22,503	3,825	18,876
19.48	9.02	8,118	23,676	3,788	22,664
20.00	12.97	11,673	29,526	5,118	27,782
21.00	14.55	13,095	37,132	12,377	40,159
22.00	16.47	14,823	41,850	13,950	54,109
23.00	19.00	17,100	47,844	15,948	70,057
24.00	21.95	19,755	55,235	18,412	88,469

Elevations With Areas Interpolated From
The Closest Two Planimeter Readings

17.58	-----	3,934	11,420	2,208	11,254
20.20	-----	11,951	35,435	2,362	30,144
21.41	-----	13,791	40,324	5,511	45,670
21.87	-----	14,592	41,511	12,038	52,197
22.61	-----	16,193	46,508	9,457	63,566

$$IA = (sq.rt(Area1) + ((Ei-E1)/(E2-E1))*(sq.rt(Area2)-sq.rt(Area1)))^2$$

where: E1, E2 = Closest two elevations with planimeter data
Ei = Elevation at which to interpolate area
Area1,Area2 = Areas computed for E1, E2, respectively
IA = Interpolated area for Ei

* Incremental volume computed by the Conic Method for Reservoir Volumes.

$$Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))$$

where: EL1, EL2 = Lower and upper elevations of the increment
Area1,Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

OUTLET STRUCTURES

Outlet Structure File: FFIELD .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****

FOXFIELD
STORMWATER MANAGEMENT / B.M.P.

****

***** COMPOSITE OUTFLOW SUMMARY ****

Elevation (ft)	Q (cfs)	Contributing Structures
16.70	0.0	
17.05	0.0	
17.40	0.0	
17.75	0.0	
18.10	0.0	
18.45	0.0	
18.80	0.0	
19.15	0.0	
19.50	0.0	
19.85	0.6	1
20.20	2.1	1
20.55	3.6	1
20.90	5.1	1
21.25	6.6	1
21.60	7.9	1
21.95	8.9	1
22.30	9.9	1
22.65	10.8	1
23.00	13.1	1 +2
23.35	20.1	1 +2
23.70	31.3	1 +2
24.00	0.0	

Outlet Structure File: FFIELD .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****

FOXFIELD
STORMWATER MANAGEMENT / B.M.P.

****

Outlet Structure File: b:FFIELD .STR
Planimeter Input File: b:FFIELD .VOL
Rating Table Output File: b:FFIELD .PND

Min. Elev.(ft) = 16.7 Max. Elev.(ft) = 24 Incr.(ft) = .35

Additional elevations (ft) to be included in table:
* *

****
SYSTEM CONNECTIVITY
****

Structure	No.	Q Table		Q Table
CULVERT-CR	1		->	1
WEIR-XY	2		->	2

Outflow rating table summary was stored in file:
b:FFIELD .PND

Outlet Structure File: FFIELD .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****

FOXFIELD
STORMWATER MANAGEMENT / B.M.P.

****

>>>>>> Structure No. 1 <<<<<<
(Input Data)

CULVERT-CR
Circular Culvert (With Inlet Control)

E1 elev.(ft)?	19.60
E2 elev.(ft)?	24.00
Diam. (ft)?	1.25
Inv. el.(ft)?	19.48
Slope (ft/ft)?	.003
T1 ratio?	.25
T2 ratio?	1.50
K Coeff.?	.0078
M Coeff.?	2.0
c Coeff.?	.0292
Y Coeff.?	.74
Form 1 or 2?	1
Slope factor?	-0.5

Outlet Structure File: FFIELD .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****

FOXFIELD
STORMWATER MANAGEMENT / B.M.P.

****

>>>>>> Structure No. 2 <<<<<<
(Input Data)

WEIR-XY
Weir - Defined by X, Y Coordinates
E1 (ft) =22.80 E2 (ft) =24.00

X dist.(ft)	Y elev.(ft)
0	24
3.6	22.8
8.6	22.8
12.2	24

Outlet Structure File: FFIELD .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****

FOXFIELD
STORMWATER MANAGEMENT / B.M.P.

****

Outflow Rating Table for Structure #1
CULVERT-CR Circular Culvert (With Inlet Control)

***** INLET CONTROL ASSUMED *****

Elevation (ft)	Q (cfs)	Computation Messages
16.70	0.0	E < Inv.El.= 19.48
17.05	0.0	E < Inv.El.= 19.48
17.40	0.0	E < Inv.El.= 19.48
17.75	0.0	E < Inv.El.= 19.48
18.10	0.0	E < Inv.El.= 19.48
18.45	0.0	E < Inv.El.= 19.48
18.80	0.0	E < Inv.El.= 19.48
19.15	0.0	E < Inv.El.= 19.48
19.50	0.0	E < E1=19.60
19.85	0.6	Transition: HW =.37
20.20	2.1	Transition: HW =.72
20.55	3.6	Transition: HW =1.07
20.90	5.1	Transition: HW =1.42
21.25	6.6	Transition: HW =1.77
21.60	7.9	Submerged: HW =2.12
21.95	8.9	Submerged: HW =2.47
22.30	9.9	Submerged: HW =2.82
22.65	10.8	Submerged: HW =3.17
23.00	11.6	Submerged: HW =3.52
23.35	12.3	Submerged: HW =3.87
23.70	13.0	Submerged: HW =4.22
24.00	0.0	E = or > E2=24.00

Used Unsubmerged Equ. Form (1) for elev. less than 19.79 ft
Used Submerged Equation for elevations greater than 21.36 ft
HW=Headwater (ft) dc=Critical depth (ft) Ac=Area (sq.ft) at dc

Transition flows interpolated from the following values:
E1=19.79 ft; Q1=.38 cfs; E2=21.36 ft; Q2=7.01 cfs

Outlet Structure File: FFIELD .STR

POND-2 Version: 5.17 S/N: 1295130250
Date Executed: Time Executed:

****

FOXFIELD
STORMWATER MANAGEMENT / B.M.P.

****

Outflow Rating Table for Structure #2
WEIR-XY Weir - Defined by X, Y Coordinates

***** INLET CONTROL ASSUMED *****

Elevation (ft)	Q (cfs)	Computation Messages	
16.70	0.0	E < Y min= 22.8	
17.05	0.0	E < Y min= 22.8	
17.40	0.0	E < Y min= 22.8	
17.75	0.0	E < Y min= 22.8	
18.10	0.0	E < Y min= 22.8	
18.45	0.0	E < Y min= 22.8	
18.80	0.0	E < Y min= 22.8	
19.15	0.0	E < Y min= 22.8	
19.50	0.0	E < E1=22.80	
19.85	0.0	E < E1=22.80	
20.20	0.0	E < E1=22.80	
20.55	0.0	E < E1=22.80	
20.90	0.0	E < E1=22.80	
21.25	0.0	E < E1=22.80	
21.60	0.0	E < E1=22.80	
21.95	0.0	E < E1=22.80	
22.30	0.0	E < E1=22.80	
22.65	0.0	E < E1=22.80	
23.00	1.5	W(ft)=6.2	Max. D(ft)=.2
23.35	7.8	W(ft)=8.3	Max. D(ft)=.55
23.70	18.3	W(ft)=10.4	Max. D(ft)=.9
24.00	0.0	E = or > E2=24.00	

ROUTING CALCULATIONS

```
*************************************
*                                   *
*              FOXFIELD             *
*  STORMWATER MANAGEMENT / B.M.P.   *
*                                   *
*                                   *
*                                   *
*************************************
```

Inflow Hydrograph: b:FF2IN .HYD
Rating Table file: b:FFIELD .PND

----INITIAL CONDITIONS----
Elevation = 19.48 ft
Outflow = 0.00 cfs
Storage = 22,668 cu-ft

GIVEN POND DATA			INTERMEDIATE ROUTING COMPUTATIONS	
ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)	2S/t (cfs)	2S/t + O (cfs)
16.70	0.0	7,962	265.3	265.3
17.05	0.0	9,230	307.6	307.6
17.40	0.0	10,553	351.7	351.7
17.75	0.0	11,929	397.6	397.6
18.10	0.0	13,360	445.3	445.3
18.45	0.0	14,860	495.3	495.3
18.80	0.0	17,356	578.4	578.4
19.15	0.0	20,037	667.8	667.8
19.50	0.0	22,828	760.8	760.8
19.85	0.6	26,113	870.3	870.9
20.20	2.1	30,144	1004.6	1006.7
20.55	3.6	34,413	1146.9	1150.5
20.90	5.1	38,857	1295.0	1300.1
21.25	6.6	43,486	1449.2	1455.8
21.60	7.9	48,321	1610.4	1618.3
21.95	8.9	53,370	1778.6	1787.5
22.30	9.9	58,656	1954.8	1964.7
22.65	10.8	64,215	2140.1	2150.9
23.00	13.1	70,057	2334.8	2347.9
23.35	20.1	76,200	2539.5	2559.6
23.70	31.3	82,665	2755.0	2786.3

Time increment (t) = 1.0 min.

Pond File: b:FFIELD .PND
Inflow Hydrograph: b:FF2IN .HYD
Outflow Hydrograph: b:FF2OUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00	-----	755.5	755.5	0.00	19.48
1.0	0.45	0.5	755.9	755.9	0.00	19.48
2.0	0.91	1.4	757.3	757.3	0.00	19.49
3.0	1.36	2.3	759.5	759.5	0.00	19.50
4.0	1.82	3.2	762.7	762.7	0.01	19.51
5.0	2.27	4.1	766.7	766.8	0.03	19.52
6.0	2.73	5.0	771.6	771.7	0.06	19.53
7.0	3.18	5.9	777.3	777.5	0.09	19.55
8.0	3.63	6.8	783.9	784.1	0.13	19.57
9.0	4.09	7.7	791.3	791.6	0.17	19.60
10.0	4.54	8.6	799.5	799.9	0.21	19.62
11.0	5.00	9.5	808.5	809.0	0.26	19.65
12.0	5.45	10.5	818.3	818.9	0.32	19.68
13.0	5.90	11.4	828.9	829.6	0.38	19.72
14.0	6.36	12.3	840.3	841.2	0.44	19.76
15.0	6.81	13.2	852.4	853.5	0.51	19.79
16.0	7.27	14.1	865.4	866.5	0.58	19.84
17.0	7.72	15.0	878.9	880.4	0.70	19.87
18.0	8.18	15.9	893.1	894.8	0.86	19.91
19.0	8.63	16.8	907.9	909.9	1.03	19.95
20.0	9.08	17.7	923.2	925.6	1.20	19.99
21.0	9.08	18.2	938.6	941.3	1.38	20.03
22.0	9.08	18.2	953.6	956.7	1.55	20.07
23.0	9.08	18.2	968.4	971.8	1.71	20.11
24.0	9.08	18.2	982.8	986.5	1.88	20.15
25.0	9.08	18.2	996.9	1000.9	2.04	20.19
26.0	9.08	18.2	1010.6	1015.0	2.19	20.22
27.0	9.08	18.2	1024.1	1028.8	2.33	20.25
28.0	9.08	18.2	1037.4	1042.3	2.47	20.29
29.0	9.08	18.2	1050.3	1055.5	2.61	20.32
30.0	9.08	18.2	1063.0	1068.5	2.74	20.35
31.0	9.08	18.2	1075.4	1081.1	2.88	20.38
32.0	9.08	18.2	1087.5	1093.5	3.01	20.41
33.0	9.08	18.2	1099.4	1105.7	3.13	20.44
34.0	9.08	18.2	1111.1	1117.6	3.26	20.47
35.0	9.08	18.2	1122.5	1129.2	3.38	20.50
36.0	9.08	18.2	1133.6	1140.6	3.50	20.53
37.0	9.08	18.2	1144.6	1151.8	3.61	20.55
38.0	9.08	18.2	1155.3	1162.7	3.72	20.58
39.0	9.08	18.2	1165.8	1173.4	3.83	20.60
40.0	9.08	18.2	1176.1	1183.9	3.94	20.63
41.0	9.08	18.2	1186.2	1194.2	4.04	20.65
42.0	9.08	18.2	1196.0	1204.3	4.14	20.68
43.0	9.08	18.2	1205.7	1214.2	4.24	20.70
44.0	9.08	18.2	1215.2	1223.9	4.34	20.72

Pond File: b:FFIELD .PND
Inflow Hydrograph: b:FF2IN .HYD
Outflow Hydrograph: b:FF2OUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
45.0	9.08	18.2	1224.5	1233.4	4.43	20.74
46.0	9.08	18.2	1233.6	1242.7	4.52	20.77
47.0	9.08	18.2	1242.5	1251.8	4.62	20.79
48.0	9.08	18.2	1251.3	1260.7	4.71	20.81
49.0	9.08	18.2	1259.9	1269.5	4.79	20.83
50.0	9.08	18.2	1268.3	1278.0	4.88	20.85
51.0	9.08	18.2	1276.5	1286.4	4.96	20.87
52.0	9.08	18.2	1284.6	1294.7	5.05	20.89
53.0	9.08	18.2	1292.5	1302.7	5.13	20.91
54.0	9.08	18.2	1300.2	1310.6	5.20	20.92
55.0	9.08	18.2	1307.8	1318.4	5.28	20.94
56.0	9.08	18.2	1315.3	1326.0	5.35	20.96
57.0	9.08	18.2	1322.6	1333.5	5.42	20.98
58.0	9.08	18.2	1329.8	1340.8	5.49	20.99
59.0	9.08	18.2	1336.8	1348.0	5.56	21.01
60.0	9.08	18.2	1343.7	1355.0	5.63	21.02
61.0	9.08	18.2	1350.5	1361.9	5.70	21.04
62.0	9.08	18.2	1357.1	1368.7	5.76	21.05
63.0	9.08	18.2	1363.7	1375.3	5.82	21.07
64.0	9.08	18.2	1370.0	1381.8	5.89	21.08
65.0	9.08	18.2	1376.3	1388.2	5.95	21.10
66.0	9.08	18.2	1382.4	1394.5	6.01	21.11
67.0	9.08	18.2	1388.5	1400.6	6.07	21.13
68.0	9.08	18.2	1394.4	1406.6	6.13	21.14
69.0	9.08	18.2	1400.2	1412.5	6.18	21.15
70.0	9.08	18.2	1405.9	1418.3	6.24	21.17
71.0	9.08	18.2	1411.4	1424.0	6.29	21.18
72.0	9.08	18.2	1416.9	1429.6	6.35	21.19
73.0	9.08	18.2	1422.3	1435.1	6.40	21.20
74.0	9.08	18.2	1427.5	1440.4	6.45	21.22
75.0	9.08	18.2	1432.7	1445.7	6.50	21.23
76.0	9.08	18.2	1437.7	1450.8	6.55	21.24
77.0	9.08	18.2	1442.7	1455.9	6.60	21.25
78.0	9.08	18.2	1447.6	1460.8	6.64	21.26
79.0	8.63	17.7	1451.9	1465.3	6.68	21.27
80.0	8.18	16.8	1455.3	1468.7	6.70	21.28
81.0	7.72	15.9	1457.8	1471.2	6.72	21.28
82.0	7.27	15.0	1459.3	1472.8	6.74	21.29
83.0	6.81	14.1	1459.9	1473.4	6.74	21.29
84.0	6.36	13.2	1459.6	1473.1	6.74	21.29
85.0	5.90	12.3	1458.4	1471.8	6.73	21.28
86.0	5.45	11.4	1456.3	1469.7	6.71	21.28
87.0	5.00	10.5	1453.4	1466.8	6.69	21.27
88.0	4.54	9.5	1449.6	1462.9	6.66	21.27
89.0	4.09	8.6	1445.0	1458.3	6.62	21.26
90.0	3.63	7.7	1439.6	1452.7	6.57	21.24

Pond File: b:FFIELD .PND
Inflow Hydrograph: b:FF2IN .HYD
Outflow Hydrograph: b:FF2OUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
91.0	3.18	6.8	1433.4	1446.4	6.51	21.23
92.0	2.73	5.9	1426.4	1439.3	6.44	21.21
93.0	2.27	5.0	1418.7	1431.4	6.36	21.20
94.0	1.82	4.1	1410.2	1422.8	6.28	21.18
95.0	1.36	3.2	1401.0	1413.4	6.19	21.15
96.0	0.91	2.3	1391.1	1403.3	6.09	21.13
97.0	0.45	1.4	1380.5	1392.4	5.99	21.11
98.0	0.00	0.5	1369.2	1380.9	5.88	21.08

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: b:FFIELD .PND
Inflow Hydrograph: b:FF2IN .HYD
Outflow Hydrograph: b:FF2OUT .HYD

Starting Pond W.S. Elevation = 19.48 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow = 9.08 cfs
Peak Outflow = 6.74 cfs
Peak Elevation = 21.29 ft

***** Summary of Approximate Peak Storage *****

Initial Storage = 22,668 cu-ft
Peak Storage From Storm = 21,340 cu-ft

Total Storage in Pond = 44,008 cu-ft

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*                               *
*            FOXFIELD           *
*  STORMWATER MANAGEMENT / B.M.P.  *
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*                               *
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Inflow Hydrograph: b:FF10IN .HYD
Rating Table file: b:FFIELD .PND

----INITIAL CONDITIONS----
Elevation = 19.48 ft
Outflow = 0.00 cfs
Storage = 22,668 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
16.70	0.0	7,962
17.05	0.0	9,230
17.40	0.0	10,553
17.75	0.0	11,929
18.10	0.0	13,360
18.45	0.0	14,860
18.80	0.0	17,356
19.15	0.0	20,037
19.50	0.0	22,828
19.85	0.6	26,113
20.20	2.1	30,144
20.55	3.6	34,413
20.90	5.1	38,857
21.25	6.6	43,486
21.60	7.9	48,321
21.95	8.9	53,370
22.30	9.9	58,656
22.65	10.8	64,215
23.00	13.1	70,057
23.35	20.1	76,200
23.70	31.3	82,665

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
265.3	265.3
307.6	307.6
351.7	351.7
397.6	397.6
445.3	445.3
495.3	495.3
578.4	578.4
667.8	667.8
760.8	760.8
870.3	870.9
1004.6	1006.7
1146.9	1150.5
1295.0	1300.1
1449.2	1455.8
1610.4	1618.3
1778.6	1787.5
1954.8	1964.7
2140.1	2150.9
2334.8	2347.9
2539.5	2559.6
2755.0	2786.3

Time increment (t) = 1.0 min.

Pond File: b:FFIELD .PND
Inflow Hydrograph: b:FF10IN .HYD
Outflow Hydrograph: b:FF10OUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00	-----	755.5	755.5	0.00	19.48
1.0	0.82	0.8	756.3	756.3	0.00	19.48
2.0	1.65	2.5	758.7	758.7	0.00	19.49
3.0	2.47	4.1	762.8	762.9	0.01	19.51
4.0	3.29	5.8	768.5	768.6	0.04	19.52
5.0	4.12	7.4	775.8	775.9	0.08	19.55
6.0	4.94	9.1	784.6	784.8	0.13	19.58
7.0	5.76	10.7	794.9	795.3	0.19	19.61
8.0	6.59	12.4	806.7	807.2	0.25	19.65
9.0	7.41	14.0	820.1	820.7	0.33	19.69
10.0	8.23	15.6	834.9	835.7	0.41	19.74
11.0	9.06	17.3	851.2	852.2	0.50	19.79
12.0	9.88	18.9	868.9	870.1	0.60	19.85
13.0	10.71	20.6	887.9	889.5	0.81	19.90
14.0	11.53	22.2	908.1	910.2	1.03	19.95
15.0	12.35	23.9	929.4	932.0	1.27	20.01
16.0	13.18	25.5	951.9	954.9	1.53	20.07
17.0	14.00	27.2	975.5	979.1	1.79	20.13
18.0	14.82	28.8	1000.2	1004.3	2.07	20.19
19.0	15.65	30.5	1025.9	1030.6	2.35	20.26
20.0	16.47	32.1	1052.8	1058.0	2.64	20.32
21.0	16.47	32.9	1079.9	1085.7	2.92	20.39
22.0	16.47	32.9	1106.4	1112.8	3.21	20.46
23.0	16.47	32.9	1132.4	1139.3	3.48	20.52
24.0	16.47	32.9	1157.8	1165.3	3.75	20.58
25.0	16.47	32.9	1182.7	1190.7	4.00	20.64
26.0	16.47	32.9	1207.2	1215.7	4.25	20.70
27.0	16.47	32.9	1231.1	1240.1	4.50	20.76
28.0	16.47	32.9	1254.6	1264.1	4.74	20.82
29.0	16.47	32.9	1277.6	1287.5	4.97	20.87
30.0	16.47	32.9	1300.1	1310.5	5.20	20.92
31.0	16.47	32.9	1322.2	1333.0	5.42	20.97
32.0	16.47	32.9	1343.9	1355.2	5.63	21.02
33.0	16.47	32.9	1365.2	1376.8	5.84	21.07
34.0	16.47	32.9	1386.0	1398.1	6.04	21.12
35.0	16.47	32.9	1406.5	1418.9	6.24	21.17
36.0	16.47	32.9	1426.5	1439.4	6.44	21.21
37.0	16.47	32.9	1446.2	1459.5	6.63	21.26
38.0	16.47	32.9	1465.6	1479.1	6.79	21.30
39.0	16.47	32.9	1484.6	1498.5	6.94	21.34
40.0	16.47	32.9	1503.4	1517.6	7.09	21.38
41.0	16.47	32.9	1521.8	1536.3	7.24	21.42
42.0	16.47	32.9	1540.0	1554.8	7.39	21.46
43.0	16.47	32.9	1557.8	1572.9	7.54	21.50
44.0	16.47	32.9	1575.4	1590.8	7.68	21.54

Pond File: b:FFIELD .PND
Inflow Hydrograph: b:FF10IN .HYD
Outflow Hydrograph: b:FF10OUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
45.0	16.47	32.9	1592.7	1608.4	7.82	21.58
46.0	16.47	32.9	1609.8	1625.7	7.94	21.62
47.0	15.65	32.1	1625.8	1641.9	8.04	21.65
48.0	14.82	30.5	1640.0	1656.3	8.12	21.68
49.0	14.00	28.8	1652.5	1668.9	8.20	21.70
50.0	13.18	27.2	1663.1	1679.6	8.26	21.73
51.0	12.35	25.5	1672.0	1688.6	8.32	21.75
52.0	11.53	23.9	1679.2	1695.9	8.36	21.76
53.0	10.71	22.2	1684.6	1701.4	8.39	21.77
54.0	9.88	20.6	1688.4	1705.2	8.41	21.78
55.0	9.06	18.9	1690.5	1707.3	8.43	21.78
56.0	8.23	17.3	1690.9	1707.8	8.43	21.79
57.0	7.41	15.6	1689.7	1706.6	8.42	21.78
58.0	6.59	14.0	1686.9	1703.7	8.40	21.78
59.0	5.76	12.4	1682.5	1699.3	8.38	21.77
60.0	4.94	10.7	1676.5	1693.2	8.34	21.75
61.0	4.12	9.1	1669.0	1685.6	8.30	21.74
62.0	3.29	7.4	1659.9	1676.4	8.24	21.72
63.0	2.47	5.8	1649.3	1665.7	8.18	21.70
64.0	1.65	4.1	1637.2	1653.4	8.11	21.67
65.0	0.82	2.5	1623.6	1639.7	8.03	21.64
66.0	0.00	0.8	1608.6	1624.4	7.94	21.61

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: b:FFIELD .PND
Inflow Hydrograph: b:FF10IN .HYD
Outflow Hydrograph: b:FF10OUT .HYD

Starting Pond W.S. Elevation = 19.48 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow = 16.47 cfs
Peak Outflow = 8.43 cfs
Peak Elevation = 21.79 ft

***** Summary of Approximate Peak Storage *****

Initial Storage = 22,668 cu-ft
Peak Storage From Storm = 28,322 cu-ft

Total Storage in Pond = 50,991 cu-ft

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*              FOXFIELD           *
*  STORMWATER MANAGEMENT / B.M.P. *
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Inflow Hydrograph: b:FF25IN .HYD
Rating Table file: b:FFIELD .PND

----INITIAL CONDITIONS----
Elevation = 19.48 ft
Outflow = 0.00 cfs
Storage = 22,668 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
16.70	0.0	7,962
17.05	0.0	9,230
17.40	0.0	10,553
17.75	0.0	11,929
18.10	0.0	13,360
18.45	0.0	14,860
18.80	0.0	17,356
19.15	0.0	20,037
19.50	0.0	22,828
19.85	0.6	26,113
20.20	2.1	30,144
20.55	3.6	34,413
20.90	5.1	38,857
21.25	6.6	43,486
21.60	7.9	48,321
21.95	8.9	53,370
22.30	9.9	58,656
22.65	10.8	64,215
23.00	13.1	70,057
23.35	20.1	76,200
23.70	31.3	82,665

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
265.3	265.3
307.6	307.6
351.7	351.7
397.6	397.6
445.3	445.3
495.3	495.3
578.4	578.4
667.8	667.8
760.8	760.8
870.3	870.9
1004.6	1006.7
1146.9	1150.5
1295.0	1300.1
1449.2	1455.8
1610.4	1618.3
1778.6	1787.5
1954.8	1964.7
2140.1	2150.9
2334.8	2347.9
2539.5	2559.6
2755.0	2786.3

Time increment (t) = 1.0 min.

Pond File: b:FFIELD .PND
Inflow Hydrograph: b:FF25IN .HYD
Outflow Hydrograph: b:FF25OUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00	-----	755.5	755.5	0.00	19.48
1.0	1.01	1.0	756.5	756.5	0.00	19.48
2.0	2.02	3.0	759.5	759.5	0.00	19.50
3.0	3.04	5.1	764.5	764.6	0.02	19.51
4.0	4.05	7.1	771.5	771.6	0.06	19.53
5.0	5.06	9.1	780.4	780.6	0.11	19.56
6.0	6.07	11.1	791.2	791.5	0.17	19.60
7.0	7.08	13.2	803.8	804.3	0.24	19.64
8.0	8.09	15.2	818.4	819.0	0.32	19.69
9.0	9.11	17.2	834.8	835.6	0.41	19.74
10.0	10.12	19.2	853.0	854.0	0.51	19.80
11.0	11.13	21.3	873.0	874.2	0.64	19.86
12.0	12.14	23.3	894.5	896.2	0.88	19.92
13.0	13.15	25.3	917.5	919.8	1.14	19.98
14.0	14.16	27.3	942.0	944.8	1.42	20.04
15.0	15.18	29.3	967.9	971.3	1.71	20.11
16.0	16.19	31.4	995.2	999.2	2.02	20.18
17.0	17.20	33.4	1023.9	1028.6	2.33	20.25
18.0	18.21	35.4	1054.1	1059.4	2.65	20.33
19.0	19.22	37.4	1085.5	1091.5	2.98	20.41
20.0	20.23	39.5	1118.3	1125.0	3.33	20.49
21.0	20.23	40.5	1151.4	1158.8	3.68	20.57
22.0	20.23	40.5	1183.8	1191.9	4.01	20.65
23.0	20.23	40.5	1215.6	1224.3	4.34	20.72
24.0	20.23	40.5	1246.7	1256.1	4.66	20.80
25.0	20.23	40.5	1277.3	1287.2	4.97	20.87
26.0	20.23	40.5	1307.2	1317.7	5.27	20.94
27.0	20.23	40.5	1336.5	1347.6	5.56	21.01
28.0	20.23	40.5	1365.3	1377.0	5.84	21.07
29.0	20.23	40.5	1393.5	1405.8	6.12	21.14
30.0	20.23	40.5	1421.2	1434.0	6.39	21.20
31.0	20.23	40.5	1448.4	1461.7	6.65	21.26
32.0	20.23	40.5	1475.1	1488.8	6.86	21.32
33.0	20.23	40.5	1501.4	1515.6	7.08	21.38
34.0	20.23	40.5	1527.3	1541.9	7.29	21.44
35.0	20.23	40.5	1552.8	1567.8	7.50	21.49
36.0	20.23	40.5	1577.8	1593.2	7.70	21.55
37.0	20.23	40.5	1602.5	1618.3	7.90	21.60
38.0	20.23	40.5	1626.9	1642.9	8.05	21.65
39.0	20.23	40.5	1650.9	1667.3	8.19	21.70
40.0	20.23	40.5	1674.7	1691.4	8.33	21.75
41.0	20.23	40.5	1698.2	1715.2	8.47	21.80
42.0	20.23	40.5	1721.5	1738.7	8.61	21.85
43.0	20.23	40.5	1744.4	1761.9	8.75	21.90
44.0	20.23	40.5	1767.1	1784.9	8.88	21.94

Pond File: b:FFIELD .PND
Inflow Hydrograph: b:FF25IN .HYD
Outflow Hydrograph: b:FF25OUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
45.0	20.23	40.5	1789.6	1807.6	9.01	21.99
46.0	20.23	40.5	1811.8	1830.0	9.14	22.03
47.0	20.23	40.5	1833.7	1852.2	9.27	22.08
48.0	20.23	40.5	1855.4	1874.1	9.39	22.12
49.0	20.23	40.5	1876.8	1895.8	9.51	22.16
50.0	20.23	40.5	1898.0	1917.3	9.63	22.21
51.0	19.22	39.5	1918.0	1937.4	9.75	22.25
52.0	18.21	37.4	1935.7	1955.4	9.85	22.28
53.0	17.20	35.4	1951.2	1971.1	9.93	22.31
54.0	16.19	33.4	1964.6	1984.6	10.00	22.34
55.0	15.18	31.4	1975.9	1996.0	10.05	22.36
56.0	14.16	29.3	1985.1	2005.2	10.10	22.38
57.0	13.15	27.3	1992.1	2012.4	10.13	22.39
58.0	12.14	25.3	1997.1	2017.4	10.15	22.40
59.0	11.13	23.3	2000.0	2020.4	10.17	22.40
60.0	10.12	21.3	2000.9	2021.3	10.17	22.41
61.0	9.11	19.2	1999.8	2020.1	10.17	22.40
62.0	8.09	17.2	1996.7	2017.0	10.15	22.40
63.0	7.08	15.2	1991.6	2011.9	10.13	22.39
64.0	6.07	13.2	1984.6	2004.8	10.09	22.38
65.0	5.06	11.1	1975.6	1995.7	10.05	22.36
66.0	4.05	9.1	1964.7	1984.7	10.00	22.34
67.0	3.04	7.1	1951.9	1971.8	9.93	22.31
68.0	2.02	5.1	1937.3	1957.0	9.86	22.28
69.0	1.01	3.0	1920.8	1940.3	9.76	22.25
70.0	0.00	1.0	1902.5	1921.8	9.66	22.22

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: b:FFIELD .PND
Inflow Hydrograph: b:FF25IN .HYD
Outflow Hydrograph: b:FF25OUT .HYD

Starting Pond W.S. Elevation = 19.48 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow = 20.23 cfs
Peak Outflow = 10.17 cfs
Peak Elevation = 22.41 ft

***** Summary of Approximate Peak Storage *****

Initial Storage = 22,668 cu-ft
Peak Storage From Storm = 37,677 cu-ft

Total Storage in Pond = 60,345 cu-ft

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*************************************
*                                   *
*              FOXFIELD             *
*  STORMWATER MANAGEMENT / B.M.P.   *
*                                   *
*                                   *
*                                   *
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Inflow Hydrograph: b:FF100IN .HYD
Rating Table file: b:FFIELD .PND

----INITIAL CONDITIONS----
Elevation = 19.48 ft
Outflow = 0.00 cfs
Storage = 22,668 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
16.70	0.0	7,962
17.05	0.0	9,230
17.40	0.0	10,553
17.75	0.0	11,929
18.10	0.0	13,360
18.45	0.0	14,860
18.80	0.0	17,356
19.15	0.0	20,037
19.50	0.0	22,828
19.85	0.6	26,113
20.20	2.1	30,144
20.55	3.6	34,413
20.90	5.1	38,857
21.25	6.6	43,486
21.60	7.9	48,321
21.95	8.9	53,370
22.30	9.9	58,656
22.65	10.8	64,215
23.00	13.1	70,057
23.35	20.1	76,200
23.70	31.3	82,665

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
265.3	265.3
307.6	307.6
351.7	351.7
397.6	397.6
445.3	445.3
495.3	495.3
578.4	578.4
667.8	667.8
760.8	760.8
870.3	870.9
1004.6	1006.7
1146.9	1150.5
1295.0	1300.1
1449.2	1455.8
1610.4	1618.3
1778.6	1787.5
1954.8	1964.7
2140.1	2150.9
2334.8	2347.9
2539.5	2559.6
2755.0	2786.3

Time increment (t) = 1.0 min.

Pond File: b:FFIELD .PND
Inflow Hydrograph: b:FF100IN .HYD
Outflow Hydrograph: b:FF100OUT.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00	-----	755.5	755.5	0.00	19.48
1.0	1.01	1.0	756.5	756.5	0.00	19.48
2.0	2.03	3.0	759.5	759.5	0.00	19.50
3.0	3.04	5.1	764.5	764.6	0.02	19.51
4.0	4.05	7.1	771.5	771.6	0.06	19.53
5.0	5.06	9.1	780.4	780.6	0.11	19.56
6.0	6.08	11.1	791.2	791.5	0.17	19.60
7.0	7.09	13.2	803.9	804.4	0.24	19.64
8.0	8.10	15.2	818.5	819.1	0.32	19.69
9.0	9.12	17.2	834.9	835.7	0.41	19.74
10.0	10.13	19.3	853.1	854.1	0.51	19.80
11.0	11.14	21.3	873.1	874.4	0.64	19.86
12.0	12.15	23.3	894.6	896.4	0.88	19.92
13.0	13.17	25.3	917.6	919.9	1.14	19.98
14.0	14.18	27.4	942.2	945.0	1.42	20.04
15.0	15.19	29.4	968.1	971.5	1.71	20.11
16.0	16.21	31.4	995.5	999.5	2.02	20.18
17.0	17.22	33.4	1024.2	1028.9	2.33	20.25
18.0	18.23	35.5	1054.4	1059.7	2.65	20.33
19.0	19.24	37.5	1085.9	1091.8	2.99	20.41
20.0	20.26	39.5	1118.7	1125.4	3.34	20.49
21.0	20.26	40.5	1151.8	1159.2	3.69	20.57
22.0	20.26	40.5	1184.3	1192.4	4.02	20.65
23.0	20.26	40.5	1216.1	1224.8	4.35	20.72
24.0	20.26	40.5	1247.3	1256.7	4.66	20.80
25.0	20.26	40.5	1277.9	1287.9	4.98	20.87
26.0	20.26	40.5	1307.9	1318.4	5.28	20.94
27.0	20.26	40.5	1337.3	1348.4	5.57	21.01
28.0	20.26	40.5	1366.1	1377.8	5.85	21.07
29.0	20.26	40.5	1394.3	1406.6	6.13	21.14
30.0	20.26	40.5	1422.1	1434.9	6.40	21.20
31.0	20.26	40.5	1449.3	1462.6	6.65	21.26
32.0	20.26	40.5	1476.1	1489.8	6.87	21.32
33.0	20.26	40.5	1502.4	1516.6	7.09	21.38
34.0	20.26	40.5	1528.3	1542.9	7.30	21.44
35.0	20.26	40.5	1553.8	1568.9	7.50	21.49
36.0	20.26	40.5	1578.9	1594.4	7.71	21.55
37.0	20.26	40.5	1603.7	1619.5	7.91	21.60
38.0	20.26	40.5	1628.1	1644.2	8.05	21.65
39.0	20.26	40.5	1652.2	1668.6	8.20	21.70
40.0	20.26	40.5	1676.0	1692.7	8.34	21.75
41.0	20.26	40.5	1699.6	1716.6	8.48	21.80
42.0	20.26	40.5	1722.9	1740.1	8.62	21.85
43.0	20.26	40.5	1745.9	1763.4	8.76	21.90
44.0	20.26	40.5	1768.6	1786.4	8.89	21.95

Pond File: b:FFIELD .PND
Inflow Hydrograph: b:FF100IN .HYD
Outflow Hydrograph: b:FF100OUT.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
45.0	20.26	40.5	1791.1	1809.1	9.02	21.99
46.0	20.26	40.5	1813.3	1831.6	9.15	22.04
47.0	20.26	40.5	1835.3	1853.8	9.27	22.08
48.0	20.26	40.5	1857.0	1875.8	9.40	22.12
49.0	20.26	40.5	1878.5	1897.5	9.52	22.17
50.0	20.26	40.5	1899.7	1919.0	9.64	22.21
51.0	20.26	40.5	1920.7	1940.2	9.76	22.25
52.0	20.26	40.5	1941.5	1961.2	9.88	22.29
53.0	20.26	40.5	1962.0	1982.0	9.98	22.33
54.0	20.26	40.5	1982.4	2002.5	10.08	22.37
55.0	20.26	40.5	2002.5	2022.9	10.18	22.41
56.0	20.26	40.5	2022.5	2043.1	10.28	22.45
57.0	20.26	40.5	2042.3	2063.0	10.38	22.48
58.0	20.26	40.5	2061.9	2082.8	10.47	22.52
59.0	20.26	40.5	2081.2	2102.4	10.57	22.56
60.0	20.26	40.5	2100.4	2121.8	10.66	22.60
61.0	20.26	40.5	2119.5	2141.0	10.75	22.63
62.0	20.26	40.5	2138.2	2160.0	10.91	22.67
63.0	20.26	40.5	2156.4	2178.7	11.12	22.70
64.0	20.26	40.5	2174.3	2197.0	11.34	22.73
65.0	20.26	40.5	2191.7	2214.8	11.55	22.76
66.0	20.26	40.5	2208.7	2232.2	11.75	22.79
67.0	20.26	40.5	2225.4	2249.2	11.95	22.82
68.0	20.26	40.5	2241.6	2265.9	12.14	22.85
69.0	20.26	40.5	2257.4	2282.1	12.33	22.88
70.0	20.26	40.5	2272.9	2298.0	12.52	22.91
71.0	20.26	40.5	2288.1	2313.4	12.70	22.94
72.0	20.26	40.5	2302.8	2328.6	12.87	22.97
73.0	20.26	40.5	2317.2	2343.3	13.05	22.99
74.0	20.26	40.5	2330.9	2357.8	13.43	23.02
75.0	20.26	40.5	2343.7	2371.4	13.88	23.04
76.0	20.26	40.5	2355.6	2384.2	14.30	23.06
77.0	20.26	40.5	2366.7	2396.1	14.69	23.08
78.0	20.26	40.5	2377.1	2407.2	15.06	23.10
79.0	20.26	40.5	2386.8	2417.6	15.41	23.12
80.0	20.26	40.5	2395.9	2427.3	15.73	23.13
81.0	20.26	40.5	2404.4	2436.4	16.03	23.15
82.0	20.26	40.5	2412.3	2444.9	16.31	23.16
83.0	20.26	40.5	2419.6	2452.8	16.57	23.17
84.0	20.26	40.5	2426.5	2460.2	16.81	23.19
85.0	20.26	40.5	2433.0	2467.1	17.04	23.20
86.0	20.26	40.5	2439.0	2473.5	17.25	23.21
87.0	20.26	40.5	2444.6	2479.5	17.45	23.22
88.0	20.26	40.5	2449.9	2485.1	17.64	23.23
89.0	19.24	39.5	2453.8	2489.4	17.78	23.23
90.0	18.23	37.5	2455.6	2491.3	17.84	23.24

Pond File: b:FFIELD .PND
Inflow Hydrograph: b:FF100IN .HYD
Outflow Hydrograph: b:FF100OUT.HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
91.0	17.22	35.5	2455.4	2491.0	17.83	23.24
92.0	16.21	33.4	2453.3	2488.8	17.76	23.23
93.0	15.19	31.4	2449.4	2484.7	17.62	23.23
94.0	14.18	29.4	2443.9	2478.8	17.43	23.22
95.0	13.17	27.4	2436.9	2471.3	17.18	23.20
96.0	12.15	25.3	2428.5	2462.3	16.88	23.19
97.0	11.14	23.3	2418.7	2451.8	16.54	23.17
98.0	10.13	21.3	2407.7	2440.0	16.15	23.15
99.0	9.12	19.3	2395.5	2426.9	15.71	23.13
100.0	8.10	17.2	2382.2	2412.7	15.24	23.11
101.0	7.09	15.2	2368.0	2397.4	14.74	23.08
102.0	6.08	13.2	2352.7	2381.1	14.20	23.05
103.0	5.06	11.1	2336.6	2363.9	13.63	23.03
104.0	4.05	9.1	2319.6	2345.7	13.07	23.00
105.0	3.04	7.1	2301.0	2326.7	12.85	22.96
106.0	2.03	5.1	2280.8	2306.0	12.61	22.93
107.0	1.01	3.0	2259.1	2283.8	12.35	22.89
108.0	0.00	1.0	2236.0	2260.1	12.08	22.84

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: b:FFIELD .PND
Inflow Hydrograph: b:FF100IN .HYD
Outflow Hydrograph: b:FF100OUT.HYD

Starting Pond W.S. Elevation = 19.48 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow = 20.26 cfs
Peak Outflow = 17.84 cfs
Peak Elevation = 23.24 ft DHW

***** Summary of Approximate Peak Storage *****

Initial Storage = 22,668 cu-ft
Peak Storage From Storm = 51,550 cu-ft

Total Storage in Pond = 74,218 cu-ft

PC097

DHW 23.24 15" BARREL / 5' WIDE E.S.

Site 9.75 AC
IMPERV 3.17 (35% IMPERV)

8 point BMP
2.5 V
OLD Design 6 (2.5V) 8 Pt.
DA = 12.41 OR 13.54 AC

Allow	Routed
2 - 8.53 CFS	2 - 6.74 ~~CFS~~ @ 19.48
10 - 12.01 CFS	10 - 8.43 @ 20.79
	100 - 17.84 CFS 23.24

GRN 4640300001A
FOXFIELD
PDA
pg. 51

9-31-96

Maintenance Plan for the Wet Pond BMP at Foxfield Subdivision

A maintenance program is required to ensure the Stormwater Management (SWM) / Best Management Practice (BMP) facility functions as designed and to provide for reasonable aesthetic conditions. Proper maintenance is encouraged to prevent the introduction of debris and sediment at inflow locations, the BMP storage area, the principal and emergency spillway control structures and downstream waterways. Following installation and establishment of vegetation in upland disturbed site areas, inspections for sediment buildups should be performed at least quarterly. It is anticipated that under normal conditions, sediment removal will be required once every 5 to 10 years. If other construction or related land-disturbing activities are performed upslope of the BMP, adequate protection measures should be implemented with inspections performed at least once weekly.

The Owner or its designated representative should inspect the SWM/BMP structure after each significant rainfall event or the following working day if a weekend or holiday occurs. A significant rainfall for this structure is defined as one (1) inch or more of gauged rainfall within a 24 hour period. Once per year (more or less) a representative of the County may jointly inspect the structure. Appropriate action, performed at the cost of the owner will be taken to ensure appropriate maintenance. Keys to locked access points or structures shall be made available to the County upon request.

BMP Description: The wet pond BMP (County ID Code: PC 097) serves a drainage area of 13.5 acres. The facility is an 8- point, wet extended detention facility with designation as an old County "Design 6" type BMP. A wet pond has a normal wet pool and has storage area above the normal pool elevation for rain storm events. After a rainfall event, the pond will fill with water and then slowly release or drawdown back to the normal pool elevation in about 24 to 72 hours following the storm event. The principal flow control structure for this BMP is a VDOT standard EW-11 endwall and grate structure situated at the southeast corner of the pond. A 15-inch concrete pipe (outlet barrel) conveys water from the EW-11 structure to an existing drainage channel along Jamestown Road. In addition to the principal spillway, the pond has a 10 ft. wide emergency "overflow" spillway situated at the southwest corner of the dam and a fairly wide aquatic bench around the entire pond perimeter. The aquatic bench ranges in width from 10-35 feet. During the 100-year storm, the maximum water level should rise to near top of dam elevation and flow out the emergency spillway about ½ ft. deep. If functioning properly, normal storm events should reach a depth about 2 or 2.5 feet above the principal flow control structure (EW-11) but still be about 1-1/2 feet below top of dam.

Inspection and maintenance of the facility will consist of the following additional measures:

1. Inspect for sediment buildup by visual observation and a physical determination of sediment depth within pond storage areas. The main pond storage area is the central water pool area situated below the perimeter aquatic bench. If the depth of sediment completely fills the storage area and reaches a depth to within 1 ft. of the perimeter bench, (ie. Cleanout Elevation of 17.5), removal is required. At the same time, or at least once per year clean inflow locations, the EW-11 area and the end of the outlet barrel of accumulated sediments. Dispose of sediments removed from the facility at an acceptable disposal area.

2. Perform maintenance mowing of the dam at least twice each year. This includes the downstream and upstream faces of the dam and top of dam. Grasses such as tall fescue should be mowed in early summer after emergence of the heads on cool season grasses and in late fall to prevent seeds of annual weeds from maturing. Mowing of legumes can be less frequent. Trees, shrubs and woody vegetation are <u>not</u> permitted to grow along or on any part of the embankment that was constructed using engineered (compacted) fills.

3. Perform soil sampling on dam soils at least once every 4 years. Soil sampling and testing should be performed by qualified independent soil testing laboratory such as VPI&SU. Apply additional lime and fertilizer in accordance with test recommendations.

4. In stabilized dam embankment areas, if vegetation covers less than 40 % of soil surfaces, lime, fertilize and seed in accordance with recommendations for new seedlings. If vegetation covers more than 40 % but less than 70 % of soil surfaces, lime, fertilize and over seed in accordance with current seeding recommendations or requirements of the Virginia Erosion and Sediment Control Handbook (VESCH).

5. Perform quarterly inspections of the EW-11 principal flow control structure and 15-inch outlet barrel for the observance of collected trash, debris and sediment. Immediately remove any trash, debris or sediment that prevents the movement of water. It is very important to keep the outfall end of the 15-inch barrel through the dam (at the Jamestown Road ditch) free and clear of trash, litter, debris and sediment. Also remove any accumulated trash, litter, debris and sediment at storm drain and channel inflow locations (at the north end of the pond near to Fair Chase) to maintain the integrity of the structure and provide for an attractive appearance.

6. Perform yearly structural inspections of the facility for damage. Structural inspection shall be performed on the EW-11 principal flow control structure, trash rack grate, and outlet barrel. Exposed metal surfaces shall be re-painted or re-galvanized to minimize rust damage or replaced if rust damage is irreversible. If damage is evident, further investigation by a professional engineer may be required to assess the integrity of the structure.

7. Perform quarterly inspections of the graded side slopes of the dam for signs of animal/rodent borrows or slope erosion. Immediately perform necessary repairs, refilling or reseeding.

8. Perform yearly observations of perimeter areas surrounding the facility to ensure changes in land use, topography or access have not occurred and do not affect the operation, maintenance, access or safety features as provided. Appropriate action is required to ensure adequacy and to provide a clear, safe passage for maintenance vehicles to the engineered embankment and principal flow control structures.

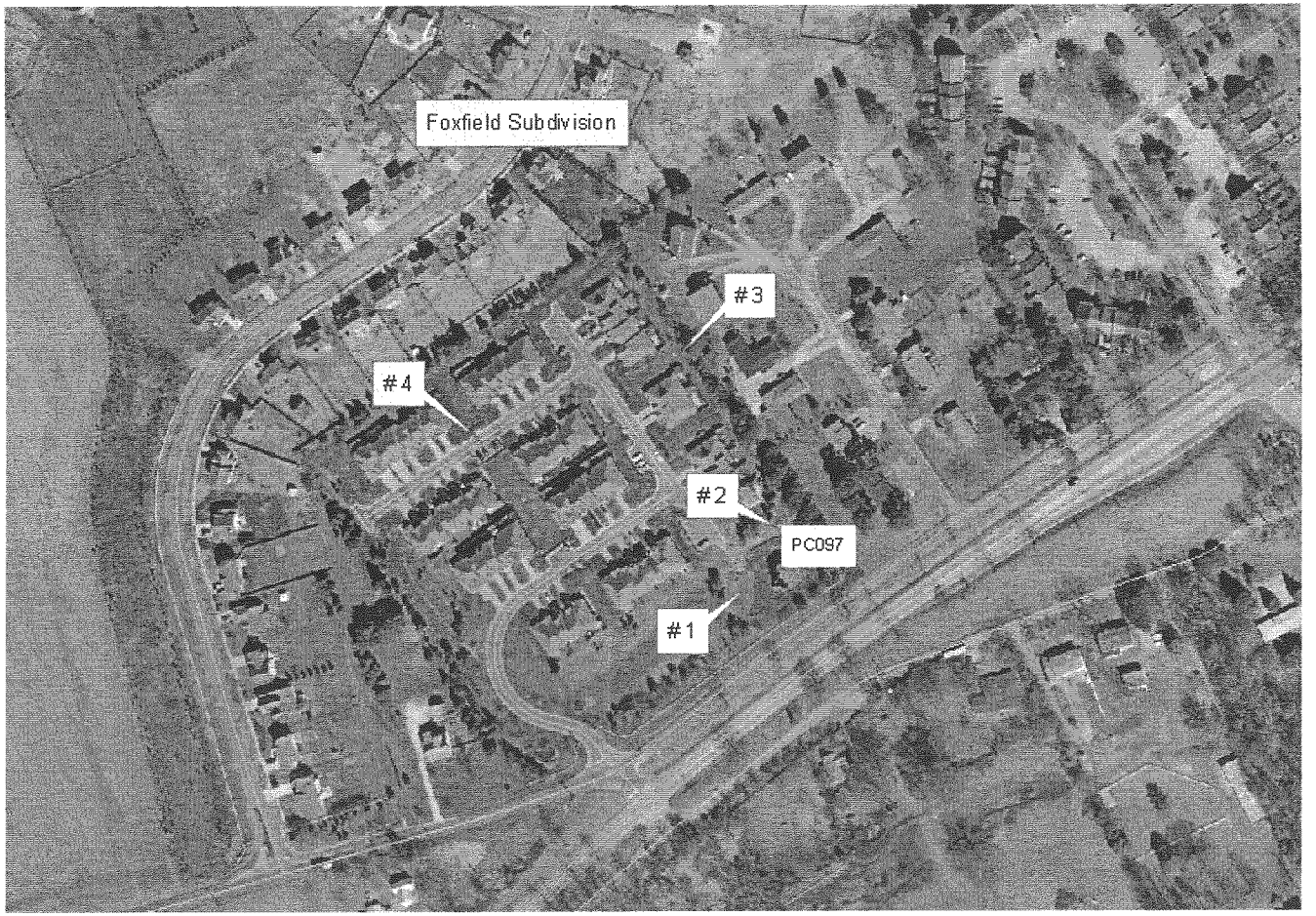
9. Record Keeping. The owner or designated representative shall keep reasonable, accurate written records of inspections performed for the structure. Records shall document routine maintenance and/or repairs performed. Copies shall be provided to the County upon request.

10. The facility shall not accept additional drainage or be modified in any way without prior consent or approval by the Environmental Division of James City County.

(End)

Ed
Wigley
Foxfield HOA
2500 Burrows Court
Williamsburg VA 23185
229-4496

PRIDE Demonstration Project # 10 – Foxfield Subdivision



Work Areas

1 – Pond wetland planting

2 – Erosion repair project

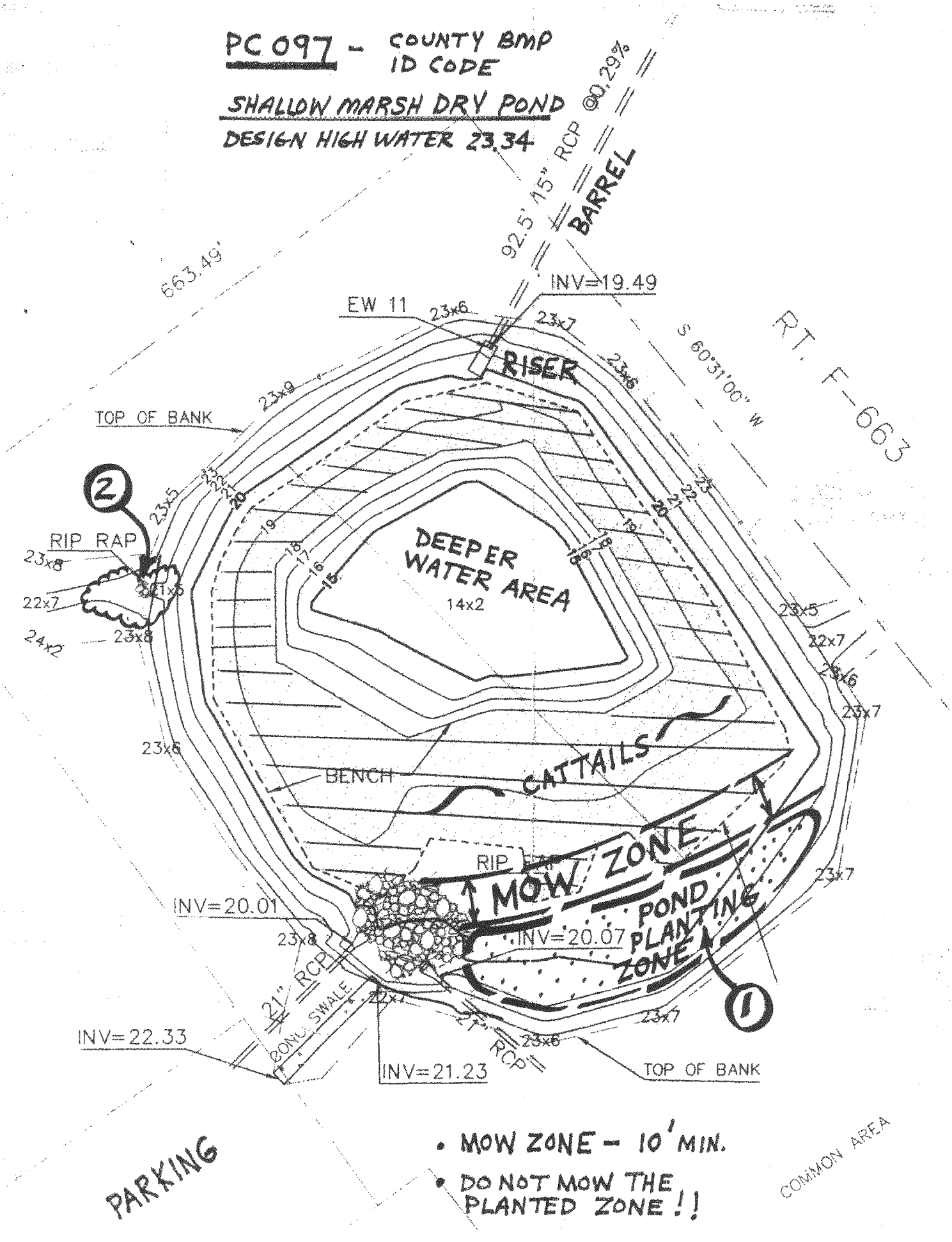
3 – Perimeter buffer tree/shrub planting

4 – Road inlet marking

PC 097 - COUNTY BMP ID CODE

SHALLOW MARSH DRY POND

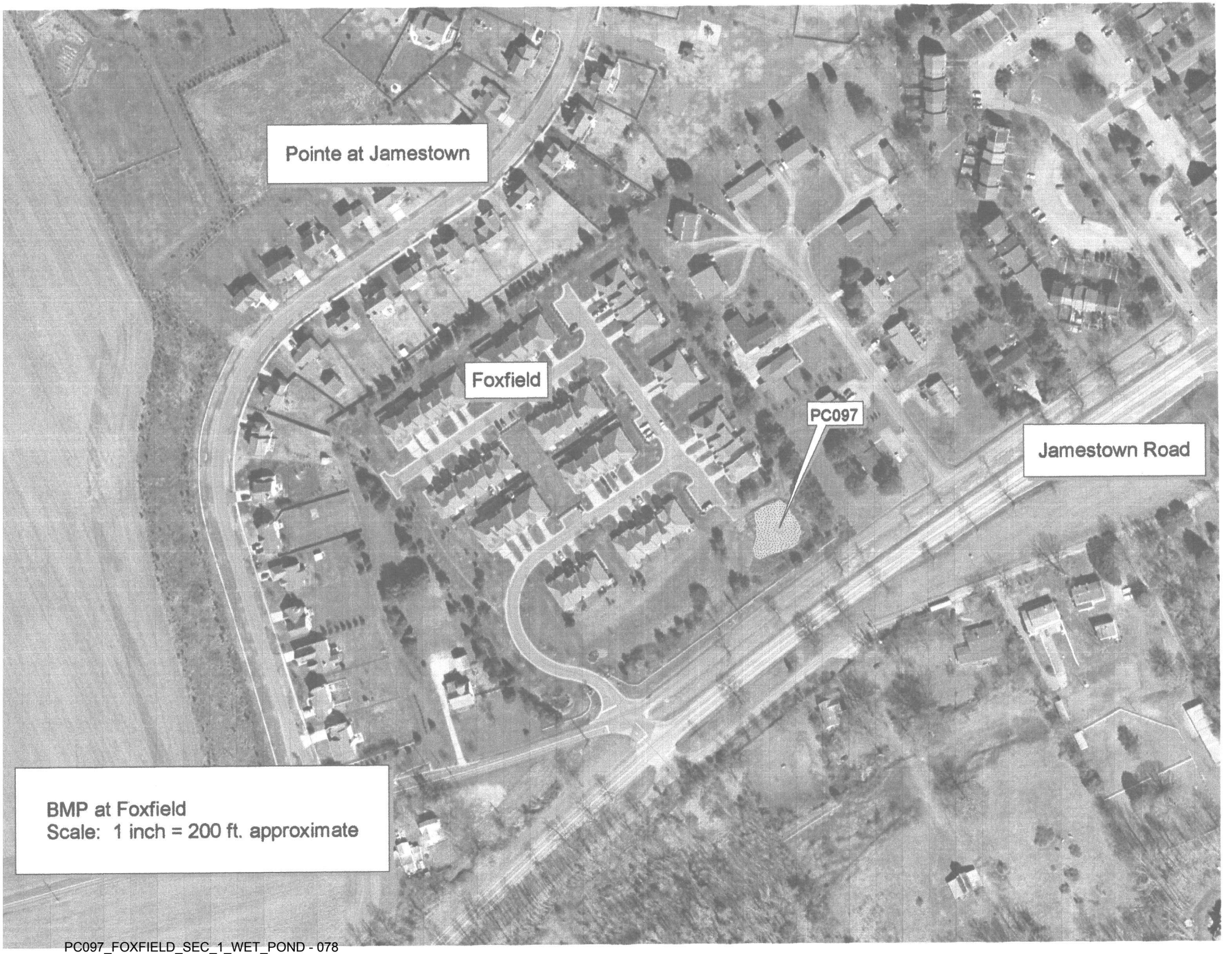
DESIGN HIGH WATER 23.34



- MOW ZONE - 10' MIN.
- DO NOT MOW THE PLANTED ZONE!!

Foxfield Subdivision – Location of Inlets for Marking

12 Inlets


Pointe at Jamestown
Foxfield
PC097
Jamestown Road
BMP at Foxfield
Scale: 1 inch = 200 ft. approximate