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: **JR011**

DATE VERIFIED: **June 15, 2012**

QUALITY ASSURANCE TECHNICIAN: **Leah Hardenbergh**

Leah Hardenbergh

LOCATION: WILLIAMSBURG, VIRGINIA

Stormwater Division

MEMORANDUM

DATE: March 11, 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: JR011

PIN: 5230100110

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

Property Description: Golf Course #3 and Maintenance Buildings

Site Address: 8581 Pocahontas Trail

(For internal use only) **Box** 12 **Drawer:** 7

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

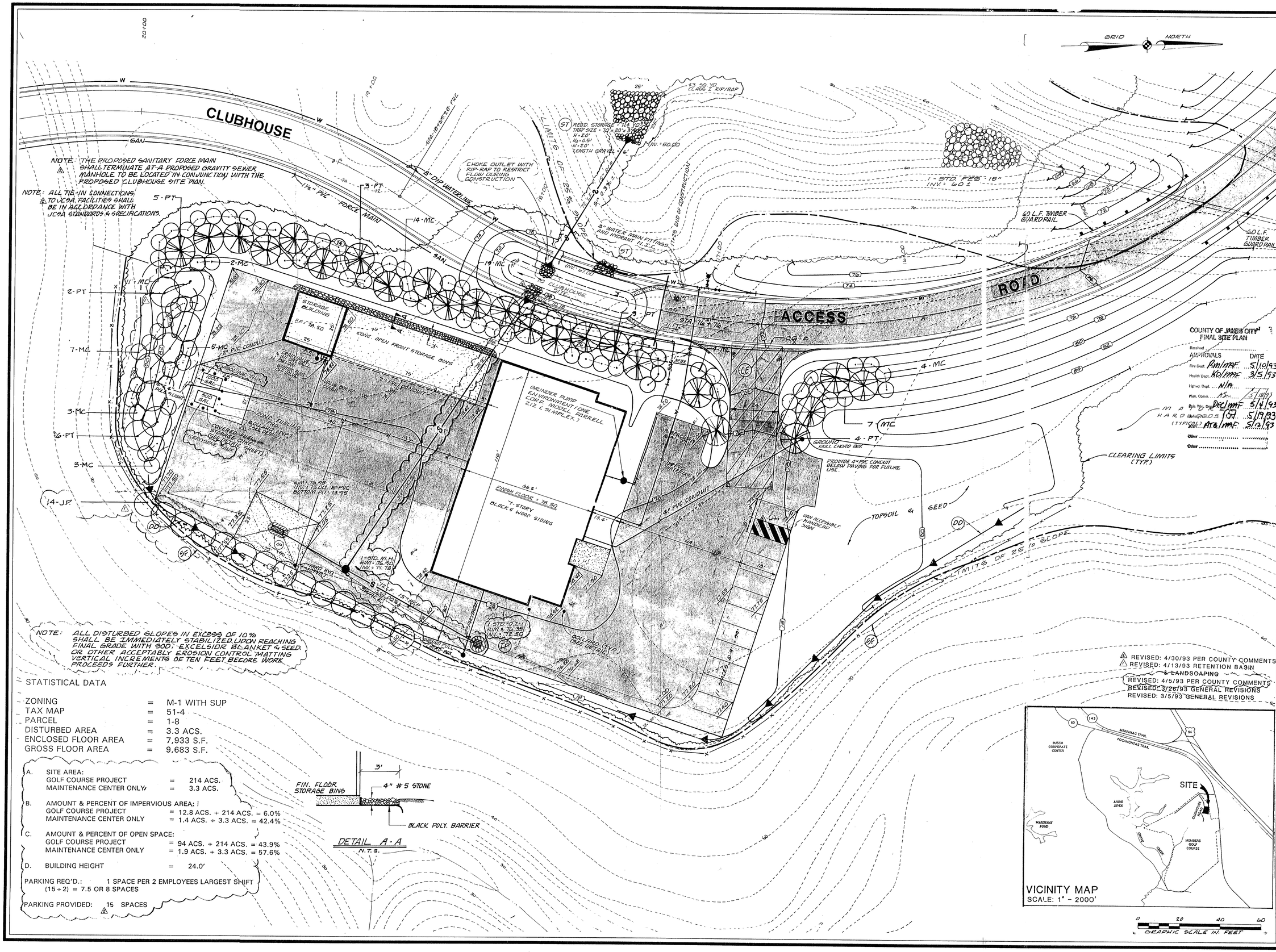
Comments
Maintenance Facility is adjacent to 8577 Pocahontas Trail

JR-011

Contents for Stormwater Management Facilities As-built Files

Each file is to contain:

1. As-built plan
2. Completed construction certification
3. Construction Plan
4. Design Calculations
5. Watershed Map
6. Maintenance Agreement
7. Correspondence with owners
8. Inspection Records
9. Enforcement Actions



NOTE: ALL DISTURBED SLOPES IN EXCESS OF 10% SHALL BE IMMEDIATELY STABILIZED UPON REACHING FINAL GRADE WITH SOD, EXCELSIOR BLANKET & SEED OR OTHER ACCEPTABLY EROSION CONTROL MATTING VERTICAL INCREMENTS OF TEN FEET BEFORE WORK PROCEEDS FURTHER.

STATISTICAL DATA

ZONING	=	M-1 WITH SUP
TAX MAP	=	51-4
PARCEL	=	1-8
DISTURBED AREA	=	3.3 ACS.
ENCLOSED FLOOR AREA	=	7,933 S.F.
GROSS FLOOR AREA	=	9,683 S.F.

A. SITE AREA:
GOLF COURSE PROJECT = 214 ACS.
MAINTENANCE CENTER ONLY = 3.3 ACS.

B. AMOUNT & PERCENT OF IMPERVIOUS AREA:
GOLF COURSE PROJECT = 12.8 ACS. ÷ 214 ACS. = 6.0%
MAINTENANCE CENTER ONLY = 1.4 ACS. ÷ 3.3 ACS. = 42.4%

C. AMOUNT & PERCENT OF OPEN SPACE:
GOLF COURSE PROJECT = 94 ACS. ÷ 214 ACS. = 43.9%
MAINTENANCE CENTER ONLY = 1.9 ACS. ÷ 3.3 ACS. = 57.6%

D. BUILDING HEIGHT = 24.0'

PARKING REQ'D.: 1 SPACE PER 2 EMPLOYEES LARGEST SHIFT (15 ÷ 2) = 7.5 OR 8 SPACES

PARKING PROVIDED: 15 SPACES

DETAIL A-A
N.T.S.

REVISED: 4/30/93 PER COUNTY COMMENTS
REVISED: 4/13/93 RETENTION BASIN & LANDSCAPING
REVISED: 4/5/93 PER COUNTY COMMENTS
REVISED: 3/26/93 GENERAL REVISIONS
REVISED: 3/5/93 GENERAL REVISIONS

VICINITY MAP
SCALE: 1" - 2000'

0 20 40 60
GRAPHIC SCALE IN FEET

MAY 1993
RECEIVED
PLANNING DEPARTMENT

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

DES.	CRO
DWN.	HTB/CLJ
CHK.	CRO
DATE	2/19/92

BUSCH PROPERTIES, INC.
KINGSMILL on the James
GOLF COURSE #3
MAINTENANCE BUILDING

SHEET	1 OF 3
DISK	
PROJ. NO.	92109
DWG.	4108W

SP-18-93

JR011_KINGSMILL_GOLF_COURSE_3 - 004

PLANTING NOTES

THE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, ETC. NECESSARY TO COMPLETE ALL PLANTING AS SHOWN ON THIS DRAWING, AS SPECIFIED HEREIN OR IN SUPPLEMENTAL SPECIFICATIONS, AND/OR AS REQUIRED BY JOB CONDITIONS. THE WORK IN GENERAL INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING: (1) PROVIDING ALL PLANT MATERIAL AS INDICATED ON PLANS; (2) PROVIDING TOPSOIL AND ALL SOIL AMENDMENTS: (3) EXCAVATION OF TREE PITS; (4) FERTILIZING, GUYING, WRAPPING; (5) CHEMICAL APPLICATION; (6) MAINTENANCE AND GUARANTEE; (7) ALL OTHER ITEMS NECESSARY TO MAKE WORK COMPLETE.

A LIST OF PLANTS, INCLUDING SIZES, QUANTITIES AND OTHER REQUIREMENTS, IS SHOWN ON THE DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE QUANTITIES AS SHOWN ON THE DRAWINGS. IF DISCREPANCIES OCCUR IN THE PLANT MATERIALS LIST, THE PLANTING PLANS SHALL GOVERN. IF DISCREPANCIES OCCUR IN PLANT SIZE INDICATED, THE LARGER SIZE SHALL BE REQUIRED.

THE NAMES OF PLANTS REQUIRED UNDER THIS CONTRACT CONFORM TO THOSE GIVEN IN HORTUS THIRD, 1976 EDITION, L.H. BAILEY , AUTHOR. NAMES OF VARIETIES NOT INCLUDED THEREIN CONFORM GENERALLY WITH NAMES ACCEPTED IN THE NURSERY TRADE. ALL PLANTS SHALL HAVE A HABIT OF GROWTH THAT IS NORMAL FOR THEIR SPECIES AND THEY SHALL BE SOUND, HEALTHY AND VIGOROUS, WITH WELL DEVELOPED ROOT SYSTEMS. ALL PLANT MATERIAL SHALL BE FREE FROM INSECT PESTS, PLANT DISEASES, AND INJURIES. ALL PLANTS SHALL EQUAL OR EXCEED THE MEASUREMENTS SPECIFIED IN THE PLANT LIST, WHICH ARE MINIMUM ACCEPTABLE SIZES. TREES SHALL HAVE SINGLE TRUNKS EXCEPT AS NOTED. ALL SHRUBS SHALL BE HEALTHY, VIGOROUS, AND OF GOOD COLOR. ONLY DAMAGED OR BROKEN BRANCHES OF PLANT MATERIAL MAY BE PRUNED AND ANY NECESSARY PRUNING SHALL BE DONE AT THE TIME OF PLANTING. HOWEVER, UNDER NO CIRCUMSTANCES SHALL THE CENTRAL LEADER OF A PLANT BE PRUNED. ALL TAGS, STRINGS OR ANY OTHER MATERIAL ATTACHED TO THE PLANTS SHALL BE REMOVED AT THE TIME OF THE PLANTING. BALLING, AND BURLAPPING OF PLANTS IN THE PLANT LIST GENERALLY FOLLOW THE CODE OF STANDARDS CURRENTLY RECOMMENDED BY THE AMERICAN STANDARD FOR NURSERY STOCK. SUBSTITUTIONS WILL BE PERMITTED ONLY UPON SUBMISSION OF PROOF THAT ANY PLANT IS NOT OBTAINABLE. ALL SUBSTITUTIONS MUST BE AUTHORIZED BY THE OWNER IN A CHANGE ORDER PROVIDING FOR USE OF THE NEAREST EQUIVALENT OBTAINABLE SIZE OR VARIETY OF PLANT HAVING THE SAME ESSENTIAL CHARACTERISTICS AS THE ORIGINAL VARIETY WITH AN EQUITABLE ADJUSTMENT OF CONTRACT PRICE.

BALLED AND BURLAPPED PLANTS ("B&B") SHALL BE DUG WITH FIRM, NATURAL BALLS OF EARTH OF SUFFICIENT DIAMETER AND DEPTH TO ENCOMPASS THE FIBROUS AND FEEDING ROOT SYSTEM NECESSARY FOR FULL RECOVERY OF THE PLANT. BALLS SHALL BE FIRMLY WRAPPED WITH BURLAP OR SIMILAR MATERIAL AND BOUND WITH TWINE OR CORD. BURLAP SHALL NOT BE PULLED OUT FROM UNDER BALLS DURING PLANTING OPERATIONS. PLANTS NOTED "CONTAINER" ON THE PLANT LIST MUST BE CONTAINER GROWN WITH WELL ESTABLISHED ROOT SYSTEMS. NO CANNED PLANT SHALL BE LOOSE IN THE ROOT BALL. ALL PLANTS INJURED AND PLANTS WITH ROOT BALLS BROKEN DURING PLANTING OPERATIONS WILL BE REJECTED.

THE BALLED AND BURLAPPED ("B & B") PLANTS WHICH CANNOT BE PLANTED IMMEDIATELY ON DELIVERY SHALL BE COVERED WITH MOIST SOIL, MULCH, OR OTHER MATERIAL TO PROVIDE PROTECTION FROM DRYING WINDS AND SUN. BARE-ROOTED PLANTS ("BR") SHALL BE PLANTED OR HEELED-IN IMMEDIATELY UPON DELIVERY. ALL PLANTS SHALL BE WATERED AS NECESSARY UNTIL PLANTED.

THE CONTRACTOR SHALL BE NOTIFIED BY THE OWNER WHEN OTHER DIVISIONS OF THE WORK HAVE PROGRESSED SUFFICIENTLY TO COMMENCE WORK ON THE PLANTING OPERATION. THEREAFTER, PLANTING OPERATIONS SHALL BE CONDUCTED UNDER FAVORABLE WEATHER CONDITIONS DURING THE NEXT SEASON OR SEASONS WHICH ARE NORMAL FOR SUCH WORK. REMOVAL OF ROCK OR OTHER UNDERGROUND OBSTRUCTIONS, RELOCATIONS OR CONSTRUCTIONS, AND PROVISION OF DRAINAGE FOR PLANTING AREAS SHALL BE DONE ONLY AS DIRECTED BY THE OWNER.

NEW PLANTINGS SHALL BE LOCATED WHERE SHOWN ON THE PLAN EXCEPT WHERE OBSTRUCTIONS BELOW GROUND ARE ENCOUNTERED OR WHERE CHANGES HAVE BEEN MADE IN THE PROPOSED CONSTRUCTION. NECESSARY ADJUSTMENTS SHALL BE MADE ONLY AFTER APPROVAL BY THE OWNER. REASONABLE CARE SHALL BE EXERCISED TO HAVE PLANTING PITS DUG AND SOIL PREPARED PRIOR TO MOVING PLANTS TO THEIR RESPECTIVE LOCATIONS TO ENSURE THAT THEY WILL NOT BE UNNECESSARILY EXPOSED TO DRYING ELEMENTS OR TO PHYSICAL DAMAGE.

PRIOR TO EXCAVATION OF PLANT PITS AN AREA EQUAL TO TEN TIMES THE DIAMETER OF THE ROOT BALL SHALL BE ROTO-TILLED TO A DEPTH EQUAL TO THE DEPTH OF THE ROOT BALL FOR PLANTS HAVING ROOT BALLS NO DEEPER THAN 12 INCHES. FOR PLANTS HAVING ROOT BALLS OVER 12 INCHES DEEP THE ROTO-TILLED AREA SHALL NOT EXCEED 12 INCHES IN DEPTH. UNDER NO CIRCUMSTANCES SHALL THE ROTO-TILLED AREA BE GREATER THAN THE DEPTH OF THE ROOT BALL. IN CONTINUOUS SHRUB BEDS THE ENTIRE SHRUB BED PLUS AN AREA AROUND THE ENTIRE PERIMETER OF THE SHRUB BED EQUAL TO FIVE TIMES THE SPREAD OF THE PLANT ROOT BALL SHALL BE ROTO-TILLED ACCORDING TO THE ABOVE SPECIFICATIONS. THE CONTRACTOR SHALL ENSURE THAT THE LOCATION OF ALL EXISTING UTILITIES HAVE BEEN ESTABLISHED AND CLEARLY MARKED PRIOR TO BEGINNING ROTO-TILLING OPERATIONS.

THE DIAMETER OF PITS FOR TREES AND SHRUBS SHALL BE AT LEAST TWICE THE DIAMETER OF THE BALL OR SPREAD OF ROOTS. SHRUB PITS FOR WELL DRAINED SOILS SHALL BE DUG SO THAT THE BOTTOM THE ROOT BALL WILL REST ON UNDISTURBED SOIL AND THE TOP OF THE ROOT BALL WILL BE FLUSH WITH FINISH GRADE. IN POORLY DRAINED SOILS THE PLANT PIT SHALL BE DUG SO THAT THE ROOT BALL RESTS ON UNDISTURBED SOIL AND THE TOP OF THE ROOT BALL IS A MINIMUM OF 1 INCH ABOVE FINISH GRADE. PLANT PIT WALLS SHALL BE SCARIFIED PRIOR TO PLANT INSTALLATION. ALL AIR POCKETS SHALL BE REMOVED FROM PLANT PIT UPON BACK FILLING WITH PLANTING SOIL BY FILLING APPROXIMATELY 1/2 TO 2/3RDS OF THE PIT WITH PLANTING BACKFILL MATERIAL AND THEN WATERING THE BACKFILL MATERIAL TO ENSURE SETTLEMENT OF THE MATERIAL AND TO ELIMINATE AIR POCKETS. BACKFILL MATERIAL SHALL THEN BE PLACED WITHIN THE REMAINING CAVITIES OF THE PLANT PIT AND WATERED AGAIN TO ENSURE SETTLEMENT OF THE BACKFILL MATERIAL. UNDER NO CIRCUMSTANCES SHALL ANY SOIL OR BACKFILL MATERIAL BE APPLIED TO THE TOPS OF THE ROOT BALLS OF PLANTS. GROUND COVERS SHALL BE PLANTED IN BEDS HAVING A MINIMUM DEPTH OF 4 INCHES BELOW THE PROPOSED ROOT DEPTH. PLANTS SHALL BE EVENLY SPACED AND SET 2 INCHES BELOW THE PROPOSED FINISHED GRADE SO AS TO MAINTAIN THE ORIGINAL GROWING DEPTH WHILE ALLOWING FOR A 2 INCH TOP DRESSING OF MULCH. ALL PLANTS OTHER THAN GROUND COVERS SHALL BE MULCHED WITH A 3-INCH (MAXIMUM) LAYER OF SHREDDED HARDWOOD OR BARK MULCH IMMEDIATELY AFTER PLANTING. THIS MULCH SHALL ENTIRELY COVER THE AREA OF THE PLANTING PIT, BED, OR SAUCER AROUND EACH PLANT WITH THE EXCEPTION OF THE AREA IMMEDIATELY ADJACENT TO THE PLANT TRUNK OR TRUNKS. MULCH SHALL NOT BE MOUNDED AROUND THE BASE OF THE PLANTS. THE AREA IMMEDIATELY ADJACENT TO THE PLANT TRUNK OR TRUNKS SHALL BE LEFT FREE OF ANY MULCH. LOW GROWING, SPREADING PLANTS SHALL NOT BE MULCHED DIRECTLY UNDER THE PLANT IN THE VICINITY OF THE TRUNK STRUCTURE, IN ORDER TO ENSURE THAT MULCH DOES NOT TOUCH THE TRUNK.

AT THE TIME OF PLANTING (AND AS MANY TIMES LATER AS SEASONAL CONDITIONS REQUIRE), EACH PLANT AND THE SOIL AROUND IT SHALL BE THOROUGHLY WATERED. CARE SHOULD BE EXERCISED WHEN WATERING TO AVOID FLOODING OF PLANTS AND BEDS, DISPLACEMENT OF MULCH MATERIAL AND EROSION OF SOIL. AVOID USE OF HIGH PRESSURE HOSES.

NECESSARY QUANTITIES OF TOPSOIL SHALL BE SUPPLIED BY THE CONTRACTOR AND APPROVED BY THE OWNER. THE CONTRACTOR MAY USE TOPSOIL AFTER SECURING SOIL TEST (V.P.I.) AND APPLYING RECOMMENDED TREATMENT THEREOF. TOPSOIL SHALL BE AS FOLLOWS:

1. CLASS A TOPSOIL SHALL BE STOCKPILED TOPSOIL THAT HAS BEEN SALVAGED IN ACCORDANCE WITH SECTION 303.04(A) OF THE V.D.O.T. SPECIFICATIONS. IT SHALL BE FREE FROM REFUSE, OR ANY MATERIAL TOXIC TO PLANT GROWTH, AND REASONABLY FREE FROM SUBSOIL, STUMPS, ROOTS, BRUSH, STONES, CLAY LUMPS, OR SIMILAR OBJECTS LARGER THAN 3 INCHES IN THEIR GREATEST DIMENSION.

2. CLASS B TOPSOIL SHALL BE TOPSOIL FURNISHED FROM SOURCES OUTSIDE THE PROJECT LIMITS AND SHALL BE THE ORIGINAL TOP LAYER OF A SOIL PROFILE FORMED UNDER NATURAL CONDITIONS, TECHNICALLY DEFINED AS THE "A" HORIZON BY THE SOIL SOCIETY OF AMERICA. IT SHALL CONSIST OF NATURAL, FRIABLE, LOAMY SOIL WITHOUT ADMIXTURES OF SUBSOIL, OR OTHER FOREIGN MATERIALS, AND SHALL BE REASONABLY FREE FROM STUMPS, ROOTS HARD LUMPS, STIFF CLAY, STONES, NOXIOUS WEEDS, BRUSH, OR OTHER LITTER. IT SHALL HAVE DEMONSTRATED BY EVIDENCE OF HEALTHY VEGETATION GROWING, OR HAVING GROWN ON IT PRIOR TO STRIPPING, THAT IT IS REASONABLY WELL DRAINED AND DOES NOT CONTAIN SUBSTANCES TOXIC TO PLANTS.

2.1 "A" HORIZON:

"A" HORIZONS SHALL BE MINERAL HORIZONS CONSISTING OF (1) HORIZONS OR ORGANIC MATTER ACCUMULATION FORMED OR FORMING AT OR ADJACENT TO THE SURFACE; (2) HORIZONS THAT HAVE LOST CLAY, IRON, OR ALUMINUM, WITH RESULTANT CONCENTRATIONS OF QUARTZ OR OTHER RESISTANT MINERALS OF SAND OR SILT SIZE; OR (3) HORIZONS DOMINATED BY 1 OR 2 ABOVE BUT TRANSITIONAL TO AN UNDERLYING B OR C.

2.2 "A" HORIZON SUBDIVISIONS:

2.2.1. A1 HORIZONS SHALL BE MINERAL HORIZONS, FORMED OR FORMING AT OR ADJACENT TO THE SURFACE, IN WHICH THE FEATURE EMPHASIZED IS AN ACCUMULATION OF HUMIDIFIED ORGANIC MATTER INTIMATELY ASSOCIATED WITH THE MINERAL FRACTION.

THE SOIL IS A DARK OR DARKER THAN UNDERLYING HORIZONS BECAUSE OF THE PRESENCE OF ORGANIC MATTER. THE ORGANIC MATERIAL IS ASSUMED TO BE DERIVED FROM PLANT AND ANIMAL REMAINS DEPOSITED ON THE SURFACE OF THE SOIL OR DEPOSITED WITHIN THE HORIZON WITHOUT APPRECIABLE TRANSLOCATION.

2.2.2. A2 HORIZONS SHALL BE MINERAL HORIZONS IN WHICH THE FEATURE EMPHASIZED IS LOSS OF CLAY, IRON, OR ALUMINUM, WITH RESULTANT CONCENTRATION OF QUARTZ OR OTHER RESISTANT MINERALS IN SAND AND SILT SIZES.

2.3 "A" HORIZON TOPSOIL CONTENT:

"A" HORIZON TOPSOIL SHALL BE IN ACCORDANCE WITH THE FOLLOWING MATERIALS BY PERCENTAGE OF VOLUME:

SILT	42-58%
SAND	15-20%
CLAY	15-20%
ORGANIC MATERIAL	12-18%

3.0 TOPSOIL FOR PLANTING PLANTS SHALL HAVE A ph IN THE RANGE OF 6.0 TO 7.0 PRIOR TO MIXING WITH AMENDMENTS. IF THE ph IS NOT WITHIN THIS RANGE, THE ph SHALL BE CORRECTED AT THE CONTRACTOR'S EXPENSE OR A DIFFERENT SOURCE OF SUPPLY SHALL BE SELECTED. TOPSOIL SHALL BE SUBJECT TO INSPECTION BY THE ENGINEER AT THE SOURCE OF SUPPLY AND IMMEDIATELY PRIOR TO USE IN THE PLANTING OPERATIONS.

WHENEVER POSSIBLE, EXISTING SOIL EXCAVATED FROM THE PLANTING PITS SHOULD BE USED AS BACKFILL MATERIAL IN ORDER TO ELIMINATE OR MINIMIZE THE OCCURRENCE OF HYDROLOGIC DISCONTINUITIES, AND/OR SOIL INTERFACE PROBLEMS COMMON TO PLANTING PITS CONTAINING SOILS OF DIFFERENT TEXTURE. WHERE THE TEXTURE OF THE EXISTING SOIL IS UNDESIRABLE FOR THE SPECIES BEING PLANTED (i.e.,HEAVY CLAY, PURE SAND) AND WHERE THE PH OF THE EXISTING SOIL IS SUITABLE FOR THE SPECIES BEING PLANTED, THE EXISTING SOIL SHALL BE BLENDED 66% EXISTING SOIL WITH 33% AMENDED SOIL IN ORDER TO MINIMIZE SOIL INTERFACE PROBLEMS. SEE BELOW FOR AMENDED SOIL.

WHERE IT IS DETERMINED THAT THE EXISTING SOIL EXCAVATED FROM A PLANTING PIT IS TOTALLY UNSUITABLE FOR USE AS BACKFILL MATERIAL BECAUSE OF IMPROPER PH OR THE PRESENCE OF DEBRIS OR OTHER DELETERIOUS MATTER, THE BACKFILL MATERIAL SHALL BE 100% PLANTING SOIL MIXTURE AS DESCRIBED BELOW WITH THE ADDITION OF 1/2 PART SAND.

PLANTING SOIL FOR AMENDING BACKFILL SHALL BE 100 % TOPSOIL WITH AMENDMENTS ADDED ACCORDING TO THE RECOMMENDATIONS OF THE SOILS TEST REPORT TO BRING THE PH VALUE OF THE PLANTING BACKFILL MIXTURE WITHIN THE RANGES DESCRIBED BELOW. THE TOPSOIL AND AMENDMENTS SHALL BE MIXED AT AN ON-SITE LOCATION. PLANTING SOIL SHALL NOT BE MIXED AT INDIVIDUAL PLANT LOCATIONS.

PLANTING SOIL FOR DECIDUOUS PLANTS SHALL HAVE A PH VALUE BETWEEN 6.0 AND 7.0. PLANTING SOIL FOR EVERGREEN OR SEMI-EVERGREEN PLANTS SHALL HAVE A PH VALUE BETWEEN 5.0 AND 6.0. A REPRESENTATIVE SAMPLE FROM THE EXCAVATED SOIL SHALL BE FIELD TESTED FOR PH UTILIZING A RELIABLE SOIL PH METER OR SOIL PH TEST KIT. THE PH VALUE OF THE NATURAL SOIL BACKFILL MIXTURE MAY BE AMENDED BY ADDING LIMESTONE OR ALUMINUM SULFATE AS NEEDED.

FERTILIZER TYPE A (MIXED WITH PLANTING SOIL): SHALL BE A COMMERCIAL GRADE FERTILIZER. A MINIMUM OF 75 PERCENT OF THE NITROGEN SHALL BE DERIVED FROM NATURAL ORGANIC SOURCES OF UREAFOAM. 40-50 PERCENT OF THE NITROGEN SHALL BE WATER INSOLUBLE. AVAILABLE PHOSPHORIC ACID SHALL BE FROM SUPERPHOSPHATE BOND OR TANKAGE. POTASH SHALL BE DERIVED FROM MURIATE OF POTASH CONTAINING 60 PERCENT POTASH. IT SHALL BE UNIFORM IN COMPOSITION, FREE FLOWING AND SUITABLE FOR APPLICATION WITH APPROVED EQUIPMENT. FERTILIZER SHALL CONTAIN THE FOLLOWING PERCENTAGE BY WEIGHT:

10% NITROGEN
10% PHOSPHORIC ACID
5% POTASH

WITH WRITTEN APPROVAL OF THE ARCHITECT, THE CONTRACTOR MAY USE A COMPLETE COMMERCIAL FERTILIZER WITH A DIFFERENT N-P-K ANALYSIS, PROVIDED THE NITROGEN CONTENT MEETS THE SPECIFIED RATE FOR APPLICATION AND THE SOURCES FOR THE COMPONENT PARTS MEET THE ABOVE REQUIREMENTS.

TYPE B (PLACED AROUND ROOTBALL): SHALL BE "MAG-AMP" OR AN INORGANIC CONTROLLED RELEASE COGRANULATED MAGNESIUM AMMONIUM PHOSPHATE AND MAGNESIUM POTASSIUM PHOSPHATE COMPOUND. IT SHALL HAVE A GUARANTEED MINIMUM ANALYSIS OF THE FOLLOWING MATERIALS EXPRESSED IN PERCENT OF TOTAL WEIGHT:

NITROGEN (N)	7%
MAX. WATER SOLUBLE AMMONIACAL NITROGEN	2%
MAX. WATER INSOLUBLE AMMONIACAL NITROGEN	5%
PHOSPHORIC ACID (AVAILABLE) (PO)	40%
POTASH (K)	6%
MAGNESIUM (MG)	12%

MULCH SHALL BE CLEAN GROUND OR SHREDDED BARK OR HARDWOOD MULCH OF APPROVED KIND AS GENERALLY AVAILABLE AT LOCAL MARKETS, APPLIED 3 INCHES MAXIMUM IN DEPTH OVER ALL BEDS, SHRUBS AND TREE PLANTINGS, EXCEPT AS NOTED ABOVE FOR GROUND COVER PLANTINGS. WHERE SLOPES INDICATE LIKELIHOOD OF WASH, CLEAN BALED PINE STRAW SHALL BE USED. AT DRAINAGE DISPERSION POINTS OR ALONG NATURAL WATER WAYS WHERE CONCENTRATIONS OF SURFACE WATER EMPTY FROM CULVERT OR PAVED DITCH, SOIL SAVER OR OTHER HEAVY JUTE MESH SHALL BE INSTALLED IN APPROVED MANNER AND TO SUCH EXTENT AS WILL PREVENT EROSION. ALL AZALEA AND CAMELLIA PLANTING BEDS, SHALL REQUIRE ONE INCH OF PINE STRAW MULCH UNDER 2 INCHES OF BARK OR SHREDDED HARDWOOD MULCH. SHREDDED HARDWOOD OR BARK MULCH SHALL HAVE BEEN COMPOSED FOR AT LEAST TWO MONTHS PRIOR TO APPLICATION. FRESHLY GROUND MULCH WILL NOT BE ACCEPTED. FINELY GROUND MULCH WHICH INHIBITS DRAINAGE, ENCOURAGES WEED GROWTH OR BECOMES WATERLOGGED WILL NOT BE ACCEPTED. MULCH SHALL BE COMPOSED OF SIMILAR SIZED FRAGMENTS AND SHALL NOT CONTAIN STICKS, CONES, LEAVES, UNSHREDDED PIECES, OR OTHER DELETERIOUS MATTER.

ALL PLANTS SHALL BE PLANTED UPRIGHT AND FACED TO GIVE THE BEST APPEARANCE OR RELATIONSHIP TO ADJACENT STRUCTURES. THE ONLY PRUNING THAT WILL BE ALLOWED WILL BE THE PRUNING OF BROKEN OR DAMAGED BRANCHES. UNDER NO CIRCUMSTANCES SHALL THE CENTRAL LEADER OF THE PLANT BE PRUNED WITHOUT THE APPROVAL OF THE LANDSCAPE ARCHITECT. ROOTS SHALL BE SPREAD IN THEIR NORMAL POSITION. ALL BROKEN OR FRAYED ROOTS SHALL BE CUT OFF CLEANLY. CIRCLING ROOTS WHICH HAVE CIRCLED MORE THAN 1/4 OF THE ROOT BALL CIRCUMFERENCE SHALL BE CUT THROUGH. THE BURLAP AND ALL TWINE AND OR FASTENING MATERIAL SHALL BE CUT AND PUSHED TO THE BOTTOM OF THE PLANT PIT PRIOR TO BACKFILL MATERIAL BEING PLACED. THE PLANT SHALL NOT BE ROCKED BACK AND FOURTH TO TRY TO ENTIRELY REMOVE THE WRAPPING MATERIAL NOR SHALL ANY OTHER PRACTICE BE PERFORMED WHICH COULD CAUSE THE ROOT BALL TO BREAK APART. WHEN WIRE BASKETS ARE USED ON THE ROOT BALL OF PLANTS THE WIRE SHALL BE REMOVED TO AT LEAST 12 INCHES BELOW THE TOP OF THE ROOT BALL.

TREES REQUIRING SUPPORT WILL BE INDICATED IN THE REMARKS SECTION OF THE PLANTING SCHEDULE. ALL TREES REQUIRING SUPPORT SHALL BE STAKED ACCORDING TO THE DETAILS PROVIDED. GALVANIZED WIRE SHALL BE ENCASED IN BLACK HOSE TO PREVENT DIRECT CONTACT WITH BARK OF THE TREE AND SHALL BE PLACED AROUND THE TRUNK AND ABOVE THE FIRST MAJOR BRANCH IN A SINGLE LOOP. WIRES SHALL BE MAINTAINED SNUG. ONLY ONE STAKE SHALL BE REQUIRED PER TREE AND SHALL BE DRIVEN VERTICALLY INTO THE GROUND TO A DEPTH OF 2 1/2 TO 3 FEET IN SUCH A MANNER AS NOT TO INJURE THE BALL OR ROOTS. STAKES FOR SUPPORTING

TREES SHALL BE 2 INCHES SQUARE OR ROUND, BY 8 FEET, SOUND WOOD, TREATED WITH CREOSOTE OR OTHER APPROVED WOOD PRESERVATIVE. WIRE FOR ANCHORING TREES TO STAKES SHALL BE NO. 12 GAUGE PLIABLE GALVANIZED. HOSE TO ENCASE GUY WIRES USED FOR ANCHORING TREES TO STAKES SHALL BE NEW OR USED 2-PLY REINFORCED BLACK RUBBER GARDEN HOSE. ONLY TREES HAVING A THIN BARK SHALL BE WRAPPED. WRAPPING MATERIAL SHALL BE EITHER TUBE-X OR COBRA TREE WRAP. IF COBRA TREE WRAP IS USED THE BANDAGE SHALL COVER THE ENTIRE SURFACE OF THE TRUNK TO THE HEIGHT OF THE FIRST BRANCHES. TREE WRAP SHALL BEGIN AT TREE BASE AND WRAP UPWARDS WITH A MIN. 1/4" OVERLAP. TUBE-X SHALL BE SPLIT AND APPLIED TO THE TRUNK FROM THE GROUND TO JUST BELOW THE FIRST BRANCHES. THE TUBE SHALL NOT BE ALLOWED TO RUB ON THE LOWEST BRANCHES AND THE TUBE SHALL NOT BE PHYSICALLY ATTACHED TO THE TRUNK.

THE CONTRACTOR SHALL MAKE, AT HIS EXPENSE, WHATEVER ARRANGEMENTS MAY BE NECESSARY TO ENSURE AN ADEQUATE SUPPLY OF WATER TO MEET THE NEEDS OF THIS CONTRACT. HE SHALL ALSO FURNISH ALL NECESSARY HOSE, EQUIPMENT ATTACHMENTS AND ACCESSORIES FOR THE ADEQUATE IRRIGATION OF LAWNS AND PLANTED AREAS AS MAY BE REQUIRED UNTIL ACCEPTED BY THE CLIENT.

ALL PESTICIDES SHALL BE PRODUCTS OF RECOGNIZED COMMERCIAL MANUFACTURERS, AND SHALL CONFORM TO ALL APPLICABLE FEDERAL, STATE, AND LOCAL PESTICIDE LAWS. PESTICIDES SHALL BE APPLIED WITH CALIBRATED EQUIPMENT ACCORDING TO EPA LABEL RESTRICTIONS AND REGULATIONS BY A CERTIFIED APPLICATOR ONLY. ANY DAMAGE INCURRED TO THE SITE, ADJACENT PROPERTIES, OR APPLICATOR DURING PESTICIDE APPLICATIONS WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING HIS WORK AFTER PLANTING. MAINTENANCE SHALL INCLUDE WATERING, WEEDING, CULTIVATING, MULCHING, REMOVAL OF DEAD MATERIALS, RESETTING OF PLANTS TO PROPER GRADES OR UPRIGHT POSITIONS, RESTORATION OF PLANTING SAUCERS, AND OTHER NECESSARY OPERATIONS. ADEQUATE PROTECTION FOR LAWN AREAS AGAINST TRESPASSING DURING PLANTING OPERATIONS AND AGAINST DAMAGE OF ANY KIND SHALL BE PROVIDED. NOTHING IN THESE NOTES IS INTENDED TO RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO REPAIR EXISTING LAWN AREAS DAMAGED BY WORKMEN ENGAGED IN THE COMPLETIONS OF THIS PROJECT. THE LANDSCAPE CONTRACTOR SHALL MAINTAIN HIS FINISHED WORK FOR A PERIOD OF ONE YEAR COMMENCING FROM THE TIME THE INSTALLATION IS ACCEPTED AS COMPLETE BY THE TENANT'S CONSTRUCTION REPRESENTATIVE.

INSPECTION OF THE WORK TO DETERMINE COMPLETION OF THE CONTRACT EXCLUSIVE OF THE POSSIBLE REPLACEMENT OF PLANTINGS, WILL BE MADE BY THE OWNER AT THE CONCLUSION OF THE INSTALLATION PERIOD UPON WRITTEN NOTICE REQUESTING SUCH INSPECTION. REQUEST SHALL BE SUBMITTED BY CONTRACTOR AT LEAST TEN DAYS PRIOR TO THE ANTICIPATED DATE FOR INSPECTION. AFTER INSPECTION, THE CONTRACTOR WILL BE NOTIFIED IN WRITING BY THE OWNER OF ACCEPTANCE OF THE WORK, EXCLUSIVE OF THE POSSIBLE REPLACEMENT OF PLANTS SUBJECT TO GUARANTY; OR, IF THERE ARE ANY DEFICIENCIES, THE CONTRACTOR WILL BE NOTIFIED OF THE REQUIREMENTS NECESSARY FOR COMPLETION OF THE WORK.

NURSERY STOCK SHALL BE FULLY GUARANTEED FOR ONE FULL YEAR. ALL PLANTS THAT FAIL TO MAKE NEW GROWTH FROM A DORMANT CONDITION OR THAT DIE DURING THE FIRST YEAR AFTER PLANTING SHALL BE REPLACED. ALL REPLACEMENTS SHALL CONFORM WITH THE ORIGINAL SPECIFICATIONS AS TO SIZE AND TYPE. ALL GUARANTEES ARE PREDICATED ON THE ASSURANCE THAT THE OWNER HAS PROPERLY CARED FOR ALL PLANTS AFTER THE CONTRACTOR HAS BEEN RELEASED FROM HIS MAINTENANCE OBLIGATIONS. ALL COSTS OF REPLACEMENTS SHALL BE BORNE BY THE CONTRACTOR.

THIS PLAN DOES NOT GUARANTEE THE EXISTENCE OR NON-EXISTENCE OF ANY UTILITIES. PRIOR TO ANY CONSTRUCTION OR EXCAVATION, THE CONTRACTOR SHALL ASSUME THE RESPONSIBILITY OF LOCATING AND VERIFYING ALL UTILITIES, ABOVE AND/OR BELOW GROUND, PUBLIC AND/OR PRIVATE THAT MAY EXIST AND CROSS THROUGH THE AREAS OF CONSTRUCTION.

LANDSCAPING WILL NOT BE MEASURED BUT SHALL INCLUDE ALL STOCK, EXCAVATION, INSTALLATION, TOPSOIL, BACKFILLING, FERTILIZER, CHEMICALS, WRAPPING, GUYING, MULCH, TESTING, MAINTENANCE, AND GUARANTEES REQUIRED FOR THE COMPLETION OF CONSTRUCTION AS SHOWN. PAYMENT FOR THE WORK SPECIFIED HEREIN SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR LANDSCAPE PLANTING UNLESS OTHERWISE SPECIFIED BY THE OWNER.

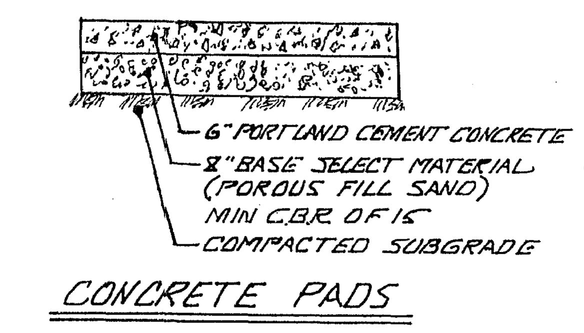
TREE PROTECTION NOTES

1. AREAS INDICATED ON THE PLANTING PLAN AS WITHIN TREE PROTECTION FENCING ARE AREAS WHERE ALL VEGETATION IS TO REMAIN UNDISTURBED. THESE AREAS SHALL BE SUBJECT TO THE FOLLOWING GUIDELINES AND SPECIFICATIONS:
2. THE LIMITS OF CLEARING SHALL BE DETERMINED BY THE LOCATION AND PLACEMENT OF PROTECTIVE FENCING MARKING THE AREAS OF THE SITE TO BE UNDISTURBED.
3. PROTECTIVE FENCING: UNDISTURBED AREAS SHALL BE IDENTIFIED BY USING BRIGHT ORANGE FENCING. FENCING SHALL BE USED TO PROTECT THE ROOTS, TRUNK AND TOP OF ALL TREES RETAINED ON THE SITE. SIGNS SHALL BE PLACED ALONG THE FENCE "TREE SAVE AREA" VISIBLE FROM ALL DIRECTIONS TO INFORM WORKERS OF THE PURPOSE OF THE BOUNDARY.
4. PROTECTIVE FENCING MATERIAL SHALL BE IN PLACE PRIOR TO THE COMMENCEMENT OF ANY WORK ON THE SITE, SHALL BE KEPT IN GOOD REPAIR FOR THE DURATION OF CONSTRUCTION ACTIVITY, AND SHALL BE THE LAST ITEM REMOVED DURING THE FINAL CLEAN-UP AFTER COMPLETION OF THE PROJECT.
5. EQUIPMENT OPERATION AND STORAGE: HEAVY EQUIPMENT, VEHICULAR TRAFFIC, OR STOCKPILES OF ANY CONSTRUCTION MATERIALS, INCLUDING TOPSOIL AND MULCH, SHALL NOT BE PERMITTED WITHIN THE DRIP LINE OF ANY TREE TO BE RETAINED. TREES BEING REMOVED SHALL NOT BE FELLED, PUSHED OR PULLED INTO TREES BEING RETAINED. EQUIPMENT OPERATORS SHALL NOT CLEAN ANY PART OF THEIR EQUIPMENT AGAINST THE TRUNKS OF TREES TO BE RETAINED.
6. NO TOXIC MATERIALS SHALL BE STORED WITHIN 100' OF "TREE SAVE AREAS."
7. BOARDS OR WIRES SHILL NOT BE NAILED OR ATTACHED TO TREES DURING BUILDING OPERATIONS.
8. HEAVY EQUIPMENT OPERATORS SHALL BE CAUTIONED TO AVOID DAMAGE TO EXISTING TREE TRUNKS AND ROOTS DURING CLEARING AND GRADING OPERATIONS.
9. TREE TRUNKS AND EXPOSED ROOTS DAMAGED DURING EQUIPMENT OPERATIONS WILL BE TREATED ACCORDING TO STANDARD ARBORICULTURAL PRACTICES. CARE FOR SERIOUS INJURY SHALL BE PRESCRIBED BY A PROFESSIONAL ARBORIST.
10. ALL TREE LIMBS DAMAGED DURING BUILDING OR LAND LEVELING OR REMOVED FOR ANY OTHER REASON SHALL BE PRUNED AS SHOWN ON THE PRUNING DIAGRAM. CUTS MUST BE MADE PROPERLY TO PREVENT ADDITIONAL BARK FROM BEING TORN FROM THE TREE. FLUSH CUTS ARE UNACCEPTABLE. ALL FINAL CUTS SHALL BE MADE SUFFICIENTLY CLOSE TO THE TRUNK OR PARENT LIMB WITHOUT CUTTING INTO THE BRANCH COLLAR OR LEAVING A PROTRUDING STUB SO THAT WOUND CLOSURE CAN READILY START UNDER NORMAL CONDITIONS.

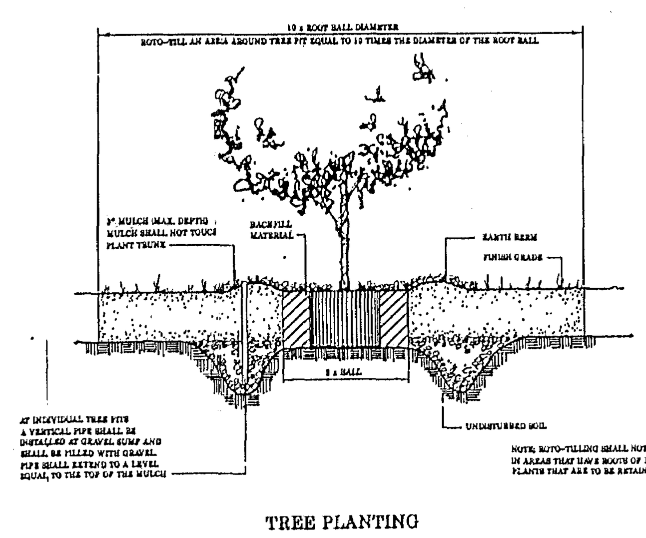
EROSION AND SEDIMENT CONTROL NOTES

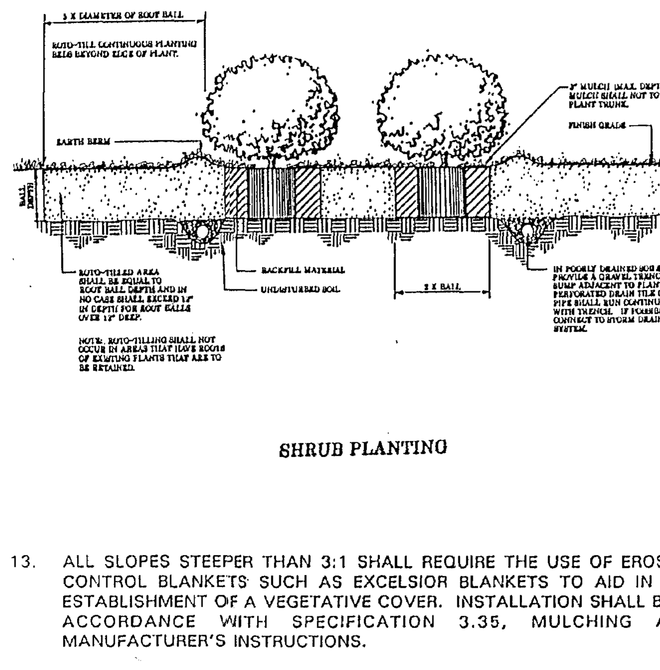
THE PURPOSE OF THE EROSION CONTROL MEASURES SHOWN ON THESE PLANS SHALL BE TO PRECLUDE THE TRANSPORT OF ALL WATERBORNE SEDIMENTS RESULTING FROM CONSTRUCTION ACTIVITIES FROM ENTERING ONTO ADJACENT PROPERTIES OR STATE WATERS. IF FIELD INSPECTION REVEALS THE INADEQUACY OF THE PLAN TO CONFINE SEDIMENT TO THE PROJECT SITE, APPROPRIATE MODIFICATIONS WILL BE MADE TO CORRECT ANY PLAN DEFICIENCIES. IN ADDITION TO THESE NOTES, ALL PROVISIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS SHALL APPLY TO THIS PROJECT.

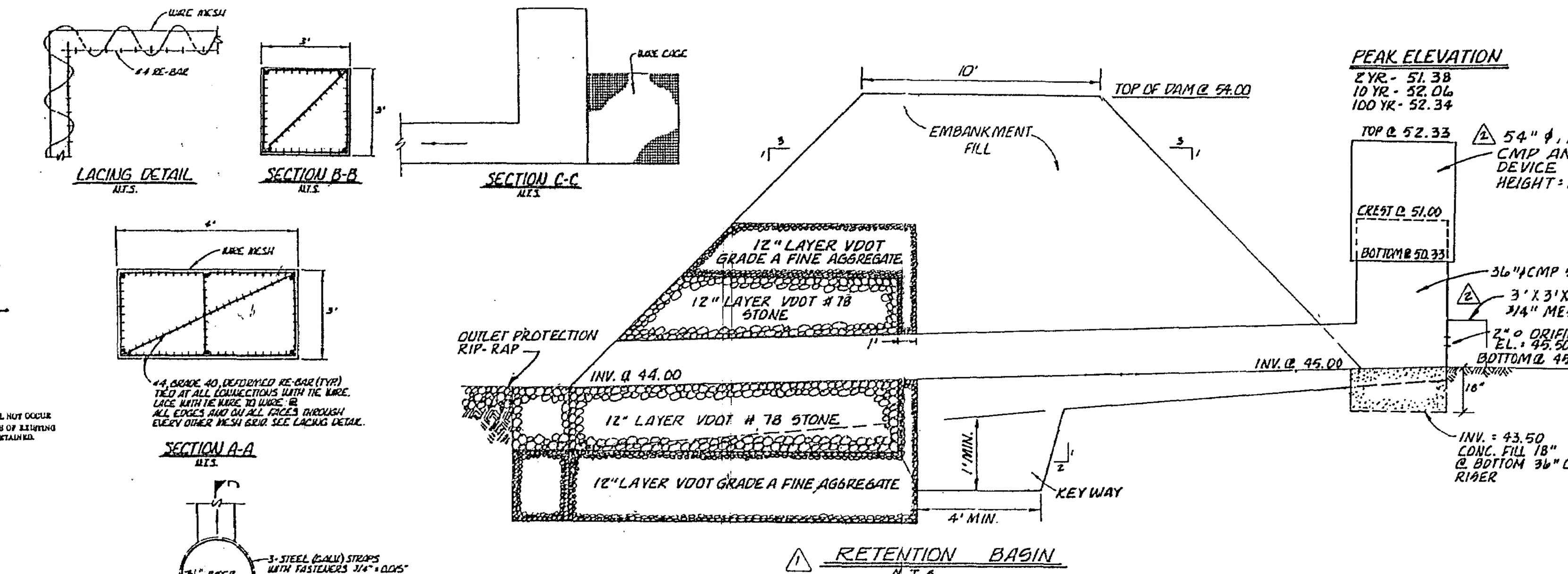
1. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK", 3RD EDITION, 1992. THE CONTRACTOR SHALL BE THOROUGHLY FAMILIAR WITH ALL APPLICABLE MEASURES CONTAINED THEREIN WHICH MAY BE PERTINENT TO THIS PROJECT.
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.
3. 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. AN ON-SITE PRE-CONSTRUCTION MEETING WILL BE HELD BETWEEN THE OFFICE OF CODE COMPLIANCE AND THE CONTRACTOR TO IDENTIFY THOSE MEASURES TO BE INITIALLY INSTALLED.
4. MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL INCLUDE THE REPAIR OF MEASURES DAMAGED BY ANY SUBCONTRACTOR INCLUDING THOSE OF THE PUBLIC UTILITY COMPANIES. AT 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.
5. SURFACE FLOWS OVER CUT AND FILL SLOPES SHALL BE CONTROLLED BY EITHER REDIRECTING FLOWS FROM TRANSVERSING THE SLOPES OR BY INSTALLING MECHANICAL DEVICES TO SAFELY LOWER WATER DOWNSLOPE WITHOUT CAUSING EROSION. A TEMPORARY FILL DIVERSION (STD. & SPEC. 1.16) 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. OFFICE 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.
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 WHERE REQUIRED. ANY DRAINAGE OUTFALLS REQUIRED FOR A STREET MUST BE COMPLETED BEFORE STREET GRADING 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.
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 A 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. OFF-SITE WASTE OR BORROW AREAS SHALL BE APPROVED BY THE OFFICE OF CODE COMPLIANCE PRIOR TO THE IMPORT OF ANY BORROW OR EXPORT OF ANY WASTE TO OR FROM THE PROJECT SITE.
19. ALL PAVED AND/OR PIPED OUTFALLS WILL BE CONSTRUCTED BEFORE ROAD GRADING AND UTILITY INSTALLATION BEGINS.



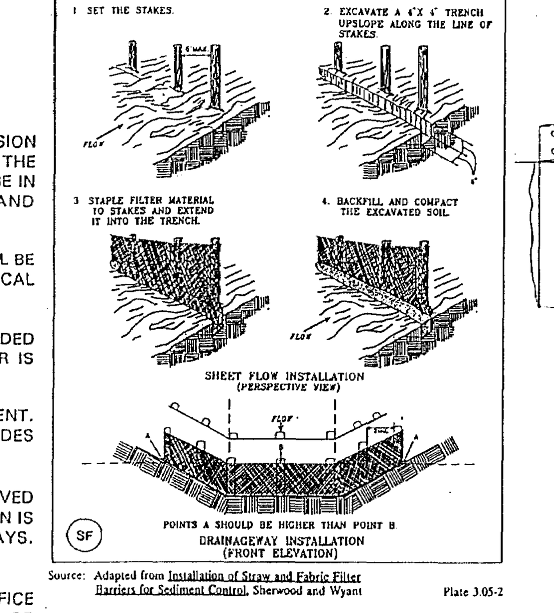
CONCRETE PADS


TREE PLANTING

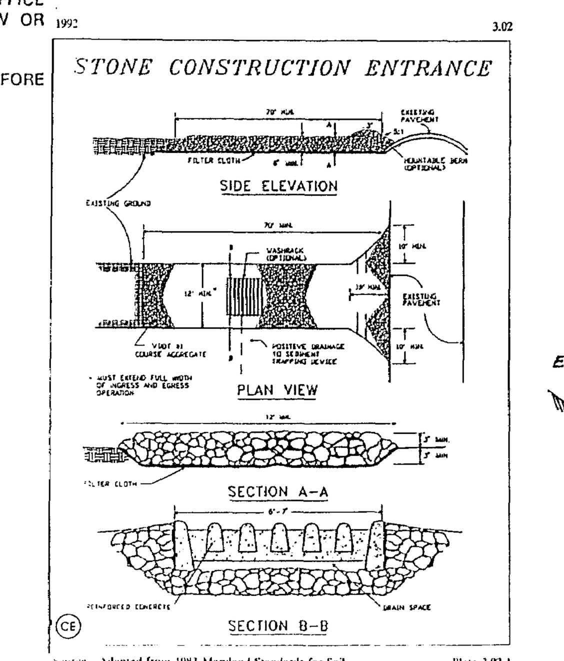

SHRUB PLANTING



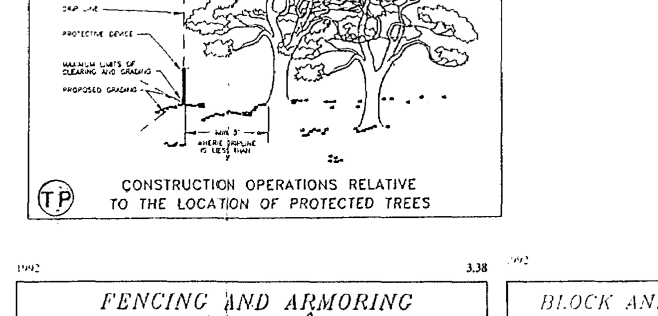
RETENTION BASIN
N.T.S.

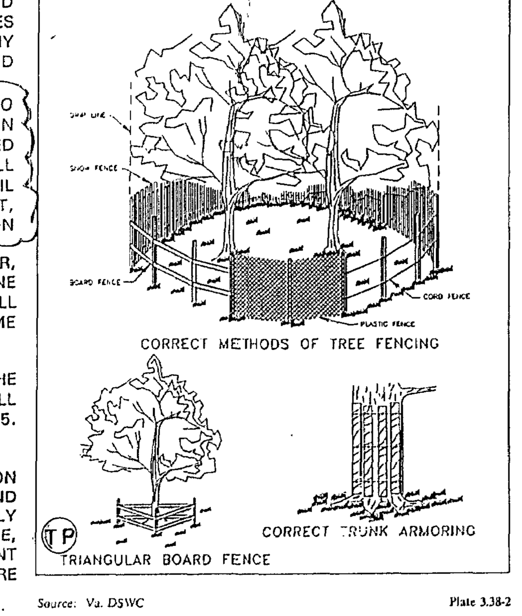


Source: Adapted from Installation of Straw and Fabric Filter Barriers for Sediment Control, Sherwood and Wyant

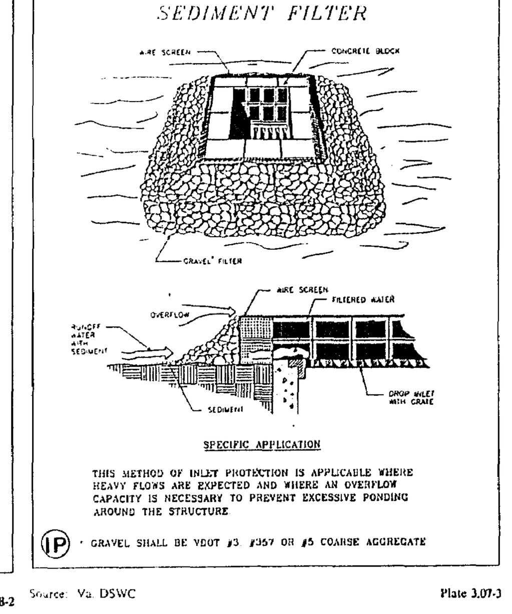


Source: Adapted from 1983 Maryland Standards for Soil Erosion and Sediment Control, and Va. DSWC

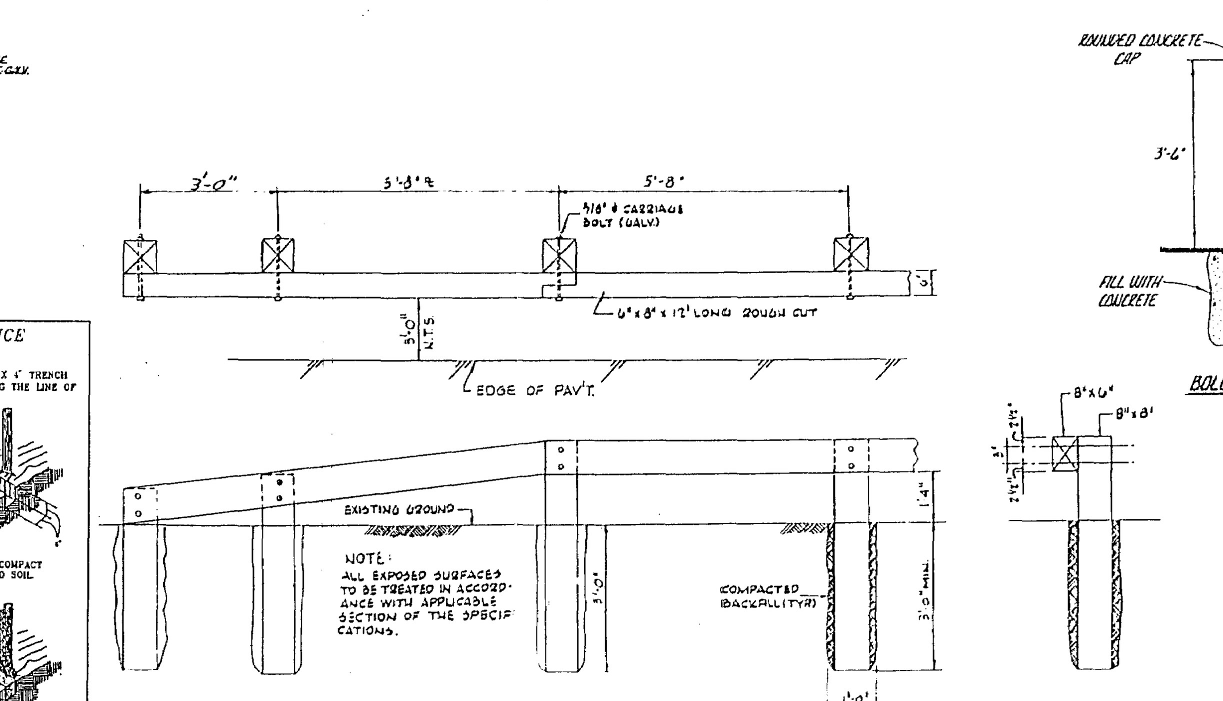




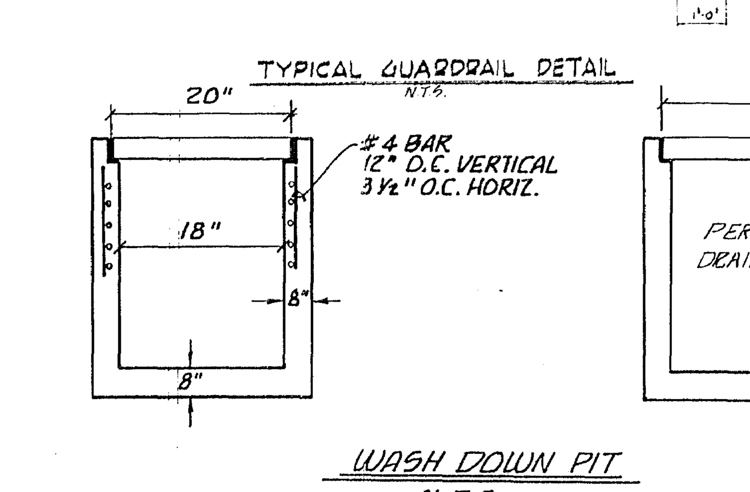
Source: Va. DSWC



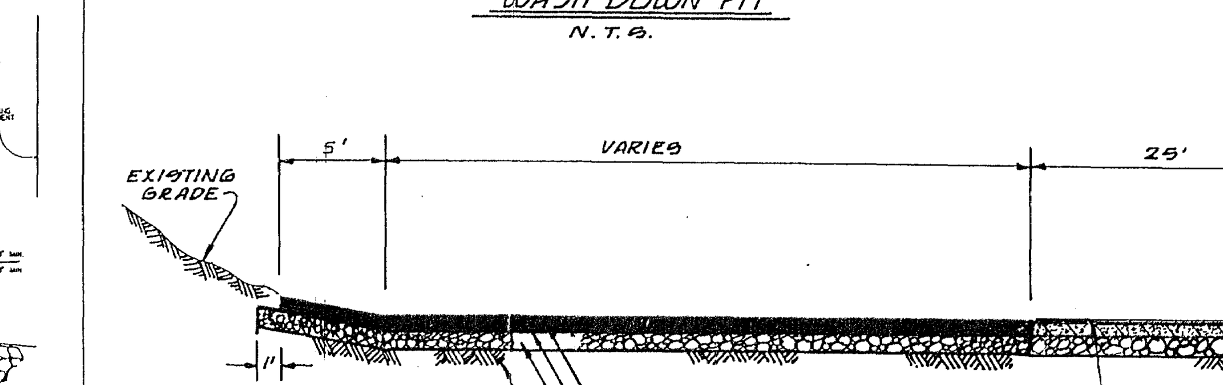
Source: Va. DSWC



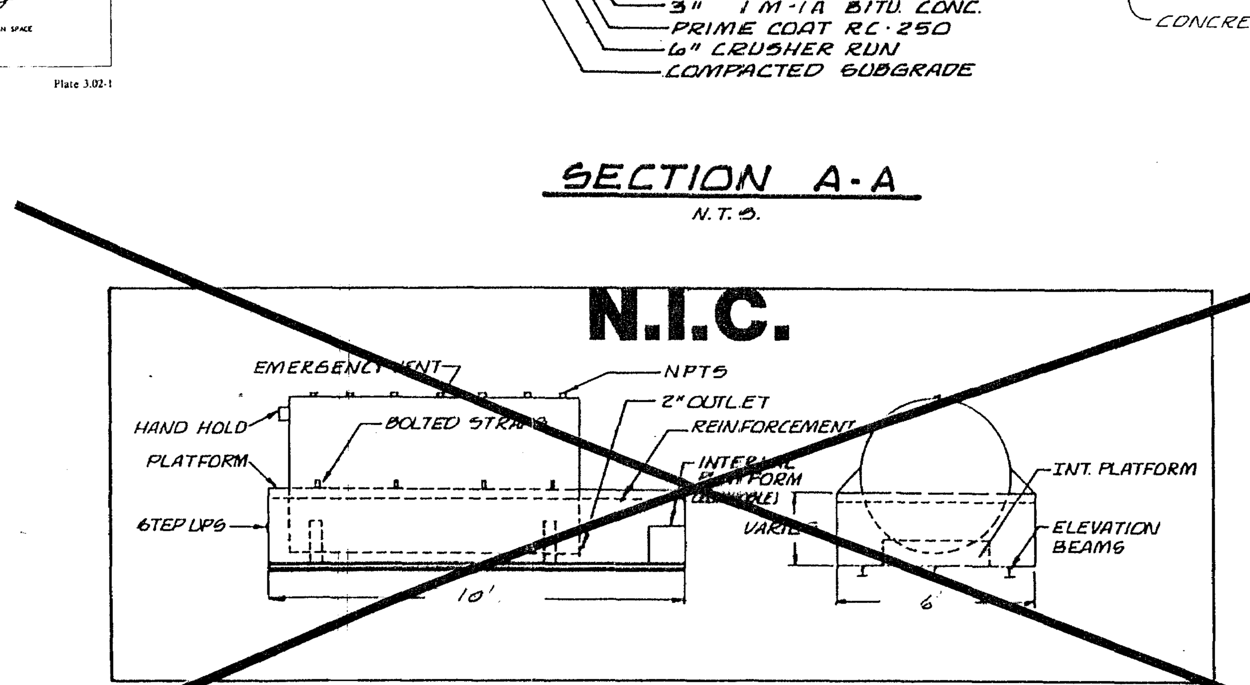
TYPICAL GUARDRAIL DETAIL
N.T.S.



WASH DOWN PIT
N.T.S.



SECTION A-A
N.T.S.



FUEL STORAGE DIKE
N.T.S.

△ PLANT SCHEDULE

ITEM NO.	KEY	QNTY.	BOTANICAL NAME	COMMON NAME	INITIAL SIZE HT.	WIDTH	CAL.	ROOT	SPACING	COMMENT
			TREE							
1	PT	31	PINUS TAEDA	LOBLOLLY PINE	10'-12'			B&B		
△ 2	JP	14	JUNIPERUS VIRGINIANA	RED CEDAR	8'-10'			B&B		
			SHRUB							
3	MC	79	MYRICA CERIFERA L.	SOUTHERN BAYBERRY	5'-6'			B&B		

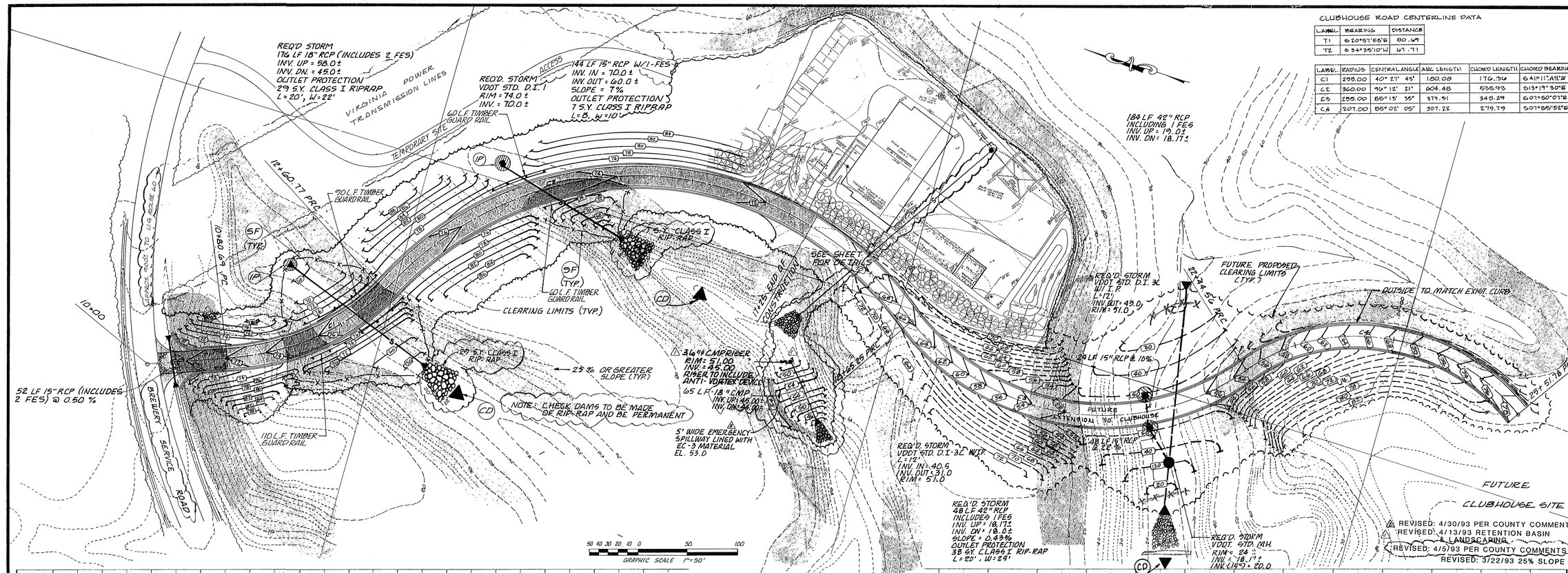
Langley and McDonald, P.C.
Engineers • Surveyors • Planners
Landscape Architects • Environmental Consultants
VIRGINIA BEACH
WILLIAMSBURG

DES.	
DWN.	HTB / CLJ
CHK.	CRO
DATE	2/19/92

BUSCH PROPERTIES, INC.
KINGSMILL on the James
GOLF COURSE #3
MAINTENANCE BUILDING

SHEET	2 OF 3
DISK	
PROJ. NO.	92109
DWG.	4108AW

△ REVISED: 4/30/93 PER COUNTY COMMENTS △ REVISED: 4/13/93 RETENTION BASIN & LANDSCAPING REVISED: 4/5/93 PER COUNTY COMMENTS



CLUBHOUSE ROAD CENTERLINE DATA

LABEL	BEARING	DISTANCE
T1	S 20°51'55"E	80.69
T2	S 54°35'10"W	67.71

LABEL	RADIUS	CENTRAL ANGLE	ARC LENGTH	CHORD LENGTH	CHORD BEARING
C1	295.00	40° 21' 49"	150.08	176.30	S 41°11'49"E
C2	360.00	90° 12' 21"	604.45	535.93	S 13°19'30"E
C3	255.00	85° 15' 35"	379.51	345.59	S 07°50'07"E
C4	207.00	85° 02' 05"	307.22	279.79	S 07°55'52"E

Langley and McDonald
A PROFESSIONAL CORPORATION
ENGINEERS • PLANNERS • SURVEYORS
VIRGINIA BEACH - WILLIAMSBURG, VIRGINIA

DES.	CRO
DWN.	HTB/CLJ
CHK.	CRO
DATE	2/19/92

BUSCH PROPERTIES, INC.
KINGSMILL on the James
GOLF COURSE #3
MAINTENANCE BUILDING
PLAN AND PROFILE

PROJ NO.	92109
SCALE	AS NOTED
SHEET	3 OF 3
DWG	4108BW

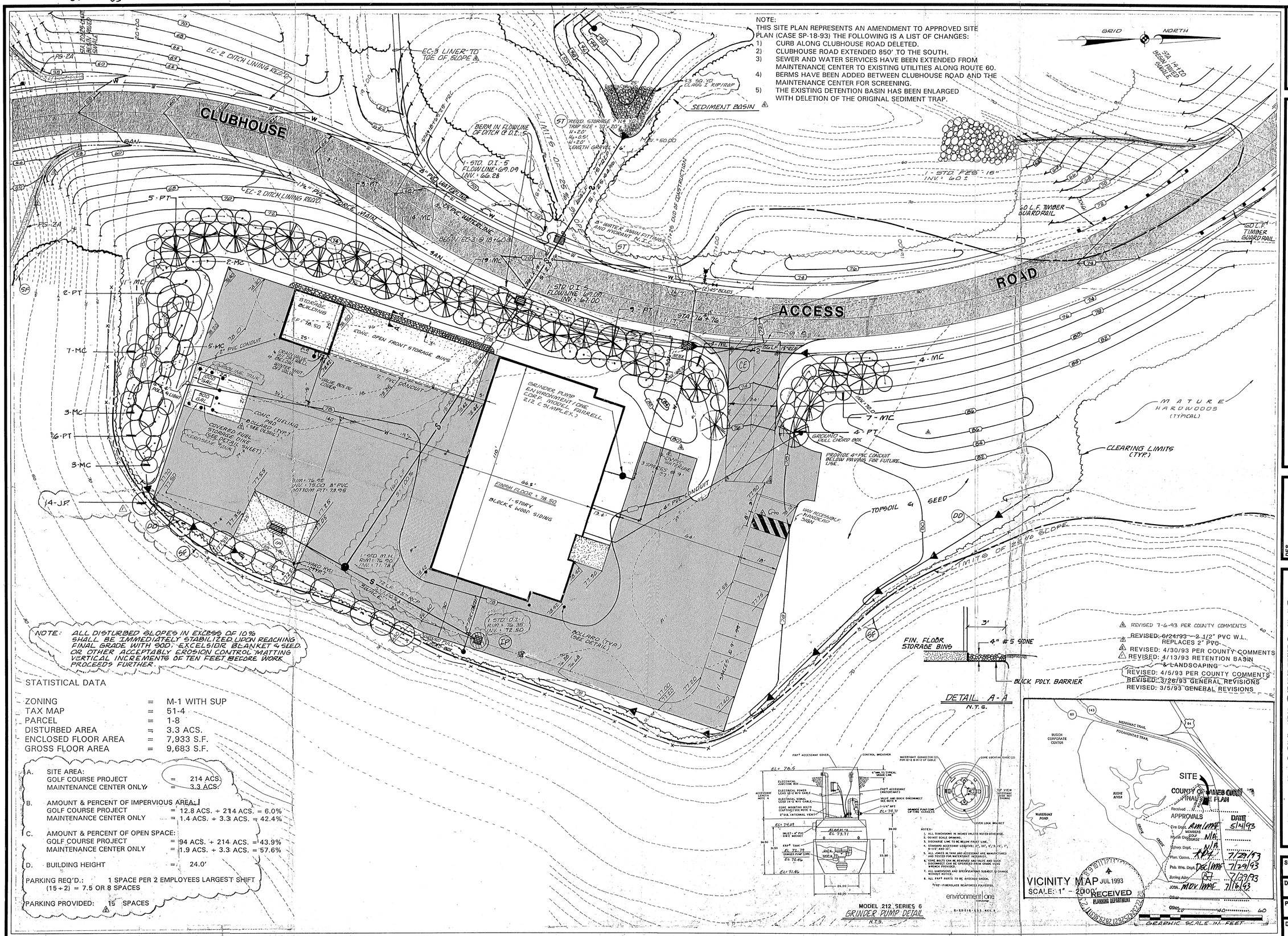
SCALE: HORZ. 1"=50'
VERT 1"=5'

JR011_KINGSMILL_GOLF_COURSE_3 - 006

SP-54-93

NOTE:
THIS SITE PLAN REPRESENTS AN AMENDMENT TO APPROVED SITE PLAN (CASE SP-18-93) THE FOLLOWING IS A LIST OF CHANGES:

1) CURB ALONG CLUBHOUSE ROAD DELETED.
2) CLUBHOUSE ROAD EXTENDED 850' TO THE SOUTH.
3) SEWER AND WATER SERVICES HAVE BEEN EXTENDED FROM MAINTENANCE CENTER TO EXISTING UTILITIES ALONG ROUTE 60.
4) BERMS HAVE BEEN ADDED BETWEEN CLUBHOUSE ROAD AND THE MAINTENANCE CENTER FOR SCREENING.
5) THE EXISTING DETENTION BASIN HAS BEEN ENLARGED WITH DELETION OF THE ORIGINAL SEDIMENT TRAP.



NOTE: ALL DISTURBED SLOPES IN EXCESS OF 10% SHALL BE IMMEDIATELY STABILIZED UPON REACHING FINAL GRADE WITH SOD, EXCELSIOR BLANKET & SEED, OR OTHER ACCEPTABLY EROSION CONTROL MATTING VERTICAL INCREMENTS OF TEN FEET BEFORE WORK PROCEEDS FURTHER.

STATISTICAL DATA

ZONING	=	M-1 WITH SUP
TAX MAP	=	51-4
PARCEL	=	1-8
DISTURBED AREA	=	3.3 ACS.
ENCLOSED FLOOR AREA	=	7,933 S.F.
GROSS FLOOR AREA	=	9,683 S.F.

A. SITE AREA:
GOLF COURSE PROJECT = 214 ACS.
MAINTENANCE CENTER ONLY = 3.3 ACS.

B. AMOUNT & PERCENT OF IMPERVIOUS AREA:
GOLF COURSE PROJECT = 12.8 ACS. ÷ 214 ACS. = 6.0%
MAINTENANCE CENTER ONLY = 1.4 ACS. ÷ 3.3 ACS. = 42.4%

C. AMOUNT & PERCENT OF OPEN SPACE:
GOLF COURSE PROJECT = 94 ACS. ÷ 214 ACS. = 43.9%
MAINTENANCE CENTER ONLY = 1.9 ACS. ÷ 3.3 ACS. = 57.6%

D. BUILDING HEIGHT = 24.0'

PARKING REQ'D.: 1 SPACE PER 2 EMPLOYEES LARGEST SHIFT (15 ÷ 2) = 7.5 OR 8 SPACES

PARKING PROVIDED: 15 SPACES

REVISED 7-6-93 PER COUNTY COMMENTS
REVISED: 6/24/93 - 2 1/2" PVC W.L. REPLACES 2" PVC
REVISED: 4/30/93 PER COUNTY COMMENTS
REVISED: 4/13/93 RETENTION BASIN & LANDSCAPING
REVISED: 4/5/93 PER COUNTY COMMENTS
REVISED: 3/26/93 GENERAL REVISIONS
REVISED: 3/5/93 GENERAL REVISIONS

COMMONWEALTH OF VIRGINIA
JOHN L. HUTCHERSON
No. 7753
CERTIFIED PROFESSIONAL ENGINEER

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

DES.	CRO
DWN.	HTB/CLJ
CHK.	CRO
DATE	4/30/93

BUSCH PROPERTIES, INC.
KINGSMILL on the James
GOLF COURSE #3
CLUBHOUSE ROAD AND UTILITIES

SHEET 1 OF 5
DISK
PROJ. NO. 71069B-228
DWG. 4860W

APPROVALS

		DATE
Fire Dept.	RMM/MAF	5/14/93
Health Dept.	N/A	
Highway Dept.	N/A	
Plan. Comm.	KPL	7/29/93
Pub. Wks. Dept.	DGC/MAF	7/29/93
Zoning Adm.	RJ	7/29/93
JCSA	MDV/MAF	7/16/93

RECEIVED PLANNING DEPARTMENT

SP-54-93

JR011_KINGSMILL_GOLF_COURSE_3 - 007

PLANTING NOTES

THE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, ETC. NECESSARY TO COMPLETE ALL PLANTING AS SHOWN ON THIS DRAWING, AS SPECIFIED HEREIN OR IN SUPPLEMENTAL SPECIFICATIONS, AND/OR AS REQUIRED BY JOB CONDITIONS. THE WORK IN GENERAL INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING: (1) PROVIDING ALL PLANT MATERIAL AS INDICATED ON PLANS; (2) PROVIDING TOPSOIL AND ALL SOIL AMENDMENTS: (3) EXCAVATION OF TREE PITS; (4) FERTILIZING, GUYING, WRAPPING; (5) CHEMICAL APPLICATION; (6) MAINTENANCE AND GUARANTEE; (7) ALL OTHER ITEMS NECESSARY TO MAKE WORK COMPLETE.

A LIST OF PLANTS, INCLUDING SIZES, QUANTITIES AND OTHER REQUIREMENTS, IS SHOWN ON THE DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE QUANTITIES AS SHOWN ON THE DRAWINGS. IF DISCREPANCIES OCCUR IN THE PLANT MATERIALS LIST, THE PLANTING PLANS SHALL GOVERN. IF DISCREPANCIES OCCUR IN PLANT SIZE INDICATED, THE LARGER SIZE SHALL BE REQUIRED.

THE NAMES OF PLANTS REQUIRED UNDER THIS CONTRACT CONFORM TO THOSE GIVEN IN HORTUS THIRD, 1976 EDITION, L.H. BAILEY , AUTHOR. NAMES OF VARIETIES NOT INCLUDED THEREIN CONFORM GENERALLY WITH NAMES ACCEPTED IN THE NURSERY TRADE. ALL PLANTS SHALL HAVE A HABIT OF GROWTH THAT IS NORMAL FOR THEIR SPECIES AND THEY SHALL BE SOUND, HEALTHY AND VIGOROUS, WITH WELL DEVELOPED ROOT SYSTEMS. ALL PLANT MATERIAL SHALL BE FREE FROM INSECT PESTS, PLANT DISEASES, AND INJURIES. ALL PLANTS SHALL EQUAL OR EXCEED THE MEASUREMENTS SPECIFIED IN THE PLANT LIST, WHICH ARE MINIMUM ACCEPTABLE SIZES. TREES SHALL HAVE SINGLE TRUNKS EXCEPT AS NOTED. ALL SHRUBS SHALL BE HEALTHY, VIGOROUS, AND OF GOOD COLOR. ONLY DAMAGED OR BROKEN BRANCHES OF PLANT MATERIAL MAY BE PRUNED AND ANY NECESSARY PRUNING SHALL BE DONE AT THE TIME OF PLANTING. HOWEVER, UNDER NO CIRCUMSTANCES SHALL THE CENTRAL LEADER OF A PLANT BE PRUNED. ALL TAGS, STRINGS OR ANY OTHER MATERIAL ATTACHED TO THE PLANTS SHALL BE REMOVED AT THE TIME OF THE PLANTING. BALLING, AND BURLAPPING OF PLANTS IN THE PLANT LIST GENERALLY FOLLOW THE CODE OF STANDARDS CURRENTLY RECOMMENDED BY THE AMERICAN STANDARD FOR NURSERY STOCK. SUBSTITUTIONS WILL BE PERMITTED ONLY UPON SUBMISSION OF PROOF THAT ANY PLANT IS NOT OBTAINABLE. ALL SUBSTITUTIONS MUST BE AUTHORIZED BY THE OWNER IN A CHANGE ORDER PROVIDING FOR USE OF THE NEAREST EQUIVALENT OBTAINABLE SIZE OR VARIETY OF PLANT HAVING THE SAME ESSENTIAL CHARACTERISTICS AS THE ORIGINAL VARIETY WITH AN EQUITABLE ADJUSTMENT OF CONTRACT PRICE.

BALLED AND BURLAPPED PLANTS ("B&B") SHALL BE DUG WITH FIRM, NATURAL BALLS OF EARTH OF SUFFICIENT DIAMETER AND DEPTH TO ENCOMPASS THE FIBROUS AND FEEDING ROOT SYSTEM NECESSARY FOR FULL RECOVERY OF THE PLANT. BALLS SHALL BE FIRMLY WRAPPED WITH BURLAP OR SIMILAR MATERIAL AND BOUND WITH TWINE OR CORD. BURLAP SHALL NOT BE PULLED OUT FROM UNDER BALLS DURING PLANTING OPERATIONS. PLANTS NOTED "CONTAINER" ON THE PLANT LIST MUST BE CONTAINER GROWN WITH WELL ESTABLISHED ROOT SYSTEMS. NO CANNED PLANT SHALL BE LOOSE IN THE ROOT BALL. ALL PLANTS INJURED AND PLANTS WITH ROOT BALLS BROKEN DURING PLANTING OPERATIONS WILL BE REJECTED.

THE BALLED AND BURLAPPED ("B & B") PLANTS WHICH CANNOT BE PLANTED IMMEDIATELY ON DELIVERY SHALL BE COVERED WITH MOIST SOIL, MULCH, OR OTHER MATERIAL TO PROVIDE PROTECTION FROM DRYING WINDS AND SUN. BARE-ROOTED PLANTS ("BR") SHALL BE PLANTED OR HEELED-IN IMMEDIATELY UPON DELIVERY. ALL PLANTS SHALL BE WATERED AS NECESSARY UNTIL PLANTED.

THE CONTRACTOR SHALL BE NOTIFIED BY THE OWNER WHEN OTHER DIVISIONS OF THE WORK HAVE PROGRESSED SUFFICIENTLY TO COMMENCE WORK ON THE PLANTING OPERATION. THEREAFTER, PLANTING OPERATIONS SHALL BE CONDUCTED UNDER FAVORABLE WEATHER CONDITIONS DURING THE NEXT SEASON OR SEASONS WHICH ARE NORMAL FOR SUCH WORK. REMOVAL OF ROCK OR OTHER UNDERGROUND OBSTRUCTIONS, RELOCATIONS OR CONSTRUCTIONS, AND PROVISION OF DRAINAGE FOR PLANTING AREAS SHALL BE DONE ONLY AS DIRECTED BY THE OWNER.

NEW PLANTINGS SHALL BE LOCATED WHERE SHOWN ON THE PLAN EXCEPT WHERE OBSTRUCTIONS BELOW GROUND ARE ENCOUNTERED OR WHERE CHANGES HAVE BEEN MADE IN THE PROPOSED CONSTRUCTION. NECESSARY ADJUSTMENTS SHALL BE MADE ONLY AFTER APPROVAL BY THE OWNER. REASONABLE CARE SHALL BE EXERCISED TO HAVE PLANTING PITS DUG AND SOIL PREPARED PRIOR TO MOVING PLANTS TO THEIR RESPECTIVE LOCATIONS TO ENSURE THAT THEY WILL NOT BE UNNECESSARILY EXPOSED TO DRYING ELEMENTS OR TO PHYSICAL DAMAGE.

PRIOR TO EXCAVATION OF PLANT PITS AN AREA EQUAL TO TEN TIMES THE DIAMETER OF THE ROOT BALL SHALL BE ROTO-TILLED TO A DEPTH EQUAL TO THE DEPTH OF THE ROOT BALL FOR PLANTS HAVING ROOT BALLS NO DEEPER THAN 12 INCHES. FOR PLANTS HAVING ROOT BALLS OVER 12 INCHES DEEP THE ROTO-TILLED AREA SHALL NOT EXCEED 12 INCHES IN DEPTH. UNDER NO CIRCUMSTANCES SHALL THE ROTO-TILLED AREA BE GREATER THAN THE DEPTH OF THE ROOT BALL. IN CONTINUOUS SHRUB BEDS THE ENTIRE SHRUB BED PLUS AN AREA AROUND THE ENTIRE PERIMETER OF THE SHRUB BED EQUAL TO FIVE TIMES THE SPREAD OF THE PLANT ROOT BALL SHALL BE ROTO-TILLED ACCORDING TO THE ABOVE SPECIFICATIONS. THE CONTRACTOR SHALL ENSURE THAT THE LOCATION OF ALL EXISTING UTILITIES HAVE BEEN ESTABLISHED AND CLEARLY MARKED PRIOR TO BEGINNING ROTO-TILLING OPERATIONS.

THE DIAMETER OF PITS FOR TREES AND SHRUBS SHALL BE AT LEAST TWICE THE DIAMETER OF THE BALL OR SPREAD OF ROOTS. SHRUB PITS FOR WELL DRAINED SOILS SHALL BE DUG SO THAT THE BOTTOM THE ROOT BALL WILL REST ON UNDISTURBED SOIL AND THE TOP OF THE ROOT BALL WILL BE FLUSH WITH FINISH GRADE. IN POORLY DRAINED SOILS THE PLANT PIT SHALL BE DUG SO THAT THE ROOT BALL RESTS ON UNDISTURBED SOIL AND THE TOP OF THE ROOT BALL IS A MINIMUM OF 1 INCH ABOVE FINISH GRADE. PLANT PIT WALLS SHALL BE SCARIFIED PRIOR TO PLANT INSTALLATION. ALL AIR POCKETS SHALL BE REMOVED FROM PLANT PIT UPON BACK FILLING WITH PLANTING SOIL BY FILLING APPROXIMATELY 1/2 TO 2/3RDS OF THE PIT WITH PLANTING BACKFILL MATERIAL AND THEN WATERING THE BACKFILL MATERIAL TO ENSURE SETTLEMENT OF THE MATERIAL AND TO ELIMINATE AIR POCKETS. BACKFILL MATERIAL SHALL THEN BE PLACED WITHIN THE REMAINING CAVITIES OF THE PLANT PIT AND WATERED AGAIN TO ENSURE SETTLEMENT OF THE BACKFILL MATERIAL. UNDER NO CIRCUMSTANCES SHALL ANY SOIL OR BACKFILL MATERIAL BE APPLIED TO THE TOPS OF THE ROOT BALLS OF PLANTS. GROUND COVERS SHALL BE PLANTED IN BEDS HAVING A MINIMUM DEPTH OF 4 INCHES BELOW THE PROPOSED ROOT DEPTH. PLANTS SHALL BE EVENLY SPACED AND SET 2 INCHES BELOW THE PROPOSED FINISHED GRADE SO AS TO MAINTAIN THE ORIGINAL GROWING DEPTH WHILE ALLOWING FOR A 2 INCH TOP DRESSING OF MULCH. ALL PLANTS OTHER THAN GROUND COVERS SHALL BE MULCHED WITH A 3-INCH (MAXIMUM) LAYER OF SHREDDED HARDWOOD OR BARK MULCH IMMEDIATELY AFTER PLANTING. THIS MULCH SHALL ENTIRELY COVER THE AREA OF THE PLANTING PIT, BED, OR SAUCER AROUND EACH PLANT WITH THE EXCEPTION OF THE AREA IMMEDIATELY ADJACENT TO THE PLANT TRUNK OR TRUNKS. MULCH SHALL NOT BE MOUNDED AROUND THE BASE OF THE PLANTS. THE AREA IMMEDIATELY ADJACENT TO THE PLANT TRUNK OR TRUNKS SHALL BE LEFT FREE OF ANY MULCH. LOW GROWING, SPREADING PLANTS SHALL NOT BE MULCHED DIRECTLY UNDER THE PLANT IN THE VICINITY OF THE TRUNK STRUCTURE, IN ORDER TO ENSURE THAT MULCH DOES NOT TOUCH THE TRUNK.

AT THE TIME OF PLANTING (AND AS MANY TIMES LATER AS SEASONAL CONDITIONS REQUIRE), EACH PLANT AND THE SOIL AROUND IT SHALL BE THOROUGHLY WATERED. CARE SHOULD BE EXERCISED WHEN WATERING TO AVOID FLOODING OF PLANTS AND BEDS, DISPLACEMENT OF MULCH MATERIAL AND EROSION OF SOIL. AVOID USE OF HIGH PRESSURE HOSES.

NECESSARY QUANTITIES OF TOPSOIL SHALL BE SUPPLIED BY THE CONTRACTOR AND APPROVED BY THE OWNER. THE CONTRACTOR MAY USE TOPSOIL AFTER SECURING SOIL TEST (V.P.I.) AND APPLYING RECOMMENDED TREATMENT THEREOF. TOPSOIL SHALL BE AS FOLLOWS:

1. CLASS A TOPSOIL SHALL BE STOCKPILED TOPSOIL THAT HAS BEEN SALVAGED IN ACCORDANCE WITH SECTION 303.04(A) OF THE V.D.O.T. SPECIFICATIONS. IT SHALL BE FREE FROM REFUSE, OR ANY MATERIAL TOXIC TO PLANT GROWTH, AND REASONABLY FREE FROM SUBSOIL, STUMPS, ROOTS, BRUSH, STONES, CLAY LUMPS, OR SIMILAR OBJECTS LARGER THAN 3 INCHES IN THEIR GREATEST DIMENSION.

2. CLASS B TOPSOIL SHALL BE TOPSOIL FURNISHED FROM SOURCES OUTSIDE THE PROJECT LIMITS AND SHALL BE THE ORIGINAL TOP LAYER OF A SOIL PROFILE FORMED UNDER NATURAL CONDITIONS, TECHNICALLY DEFINED AS THE "A" HORIZON BY THE SOIL SOCIETY OF AMERICA. IT SHALL CONSIST OF NATURAL, FRIABLE, LOAMY SOIL WITHOUT ADMIXTURES OF SUBSOIL, OR OTHER FOREIGN MATERIALS, AND SHALL BE REASONABLY FREE FROM STUMPS, ROOTS HARD LUMPS, STIFF CLAY, STONES, NOXIOUS WEEDS, BRUSH, OR OTHER LITTER. IT SHALL HAVE DEMONSTRATED BY EVIDENCE OF HEALTHY VEGETATION GROWING, OR HAVING GROWN ON IT PRIOR TO STRIPPING, THAT IT IS REASONABLY WELL DRAINED AND DOES NOT CONTAIN SUBSTANCES TOXIC TO PLANTS.

2.1 "A" HORIZON:

"A" HORIZONS SHALL BE MINERAL HORIZONS CONSISTING OF (1) HORIZONS OR ORGANIC MATTER ACCUMULATION FORMED OR FORMING AT OR ADJACENT TO THE SURFACE; (2) HORIZONS THAT HAVE LOST CLAY, IRON, OR ALUMINUM, WITH RESULTANT CONCENTRATIONS OF QUARTZ OR OTHER RESISTANT MINERALS OF SAND OR SILT SIZE; OR (3) HORIZONS DOMINATED BY 1 OR 2 ABOVE BUT TRANSITIONAL TO AN UNDERLYING B OR C.

2.2 "A" HORIZON SUBDIVISIONS:

2.2.1. A1 HORIZONS SHALL BE MINERAL HORIZONS, FORMED OR FORMING AT OR ADJACENT TO THE SURFACE, IN WHICH THE FEATURE EMPHASIZED IS AN ACCUMULATION OF HUMIDIFIED ORGANIC MATTER INTIMATELY ASSOCIATED WITH THE MINERAL FRACTION.

THE SOIL IS A DARK OR DARKER THAN UNDERLYING HORIZONS BECAUSE OF THE PRESENCE OF ORGANIC MATTER. THE ORGANIC MATERIAL IS ASSUMED TO BE DERIVED FROM PLANT AND ANIMAL REMAINS DEPOSITED ON THE SURFACE OF THE SOIL OR DEPOSITED WITHIN THE HORIZON WITHOUT APPRECIABLE TRANSLOCATION.

2.2.2. A2 HORIZONS SHALL BE MINERAL HORIZONS IN WHICH THE FEATURE EMPHASIZED IS LOSS OF CLAY, IRON, OR ALUMINUM, WITH RESULTANT CONCENTRATION OF QUARTZ OR OTHER RESISTANT MINERALS IN SAND AND SILT SIZES.

2.3 "A" HORIZON TOPSOIL CONTENT:

"A" HORIZON TOPSOIL SHALL BE IN ACCORDANCE WITH THE FOLLOWING MATERIALS BY PERCENTAGE OF VOLUME:

SILT	42-58%
SAND	15-20%
CLAY	15-20%
ORGANIC MATERIAL	12-18%

3.0 TOPSOIL FOR PLANTING PLANTS SHALL HAVE A ph IN THE RANGE OF 6.0 TO 7.0 PRIOR TO MIXING WITH AMENDMENTS. IF THE ph IS NOT WITHIN THIS RANGE, THE ph SHALL BE CORRECTED AT THE CONTRACTOR'S EXPENSE OR A DIFFERENT SOURCE OF SUPPLY SHALL BE SELECTED. TOPSOIL SHALL BE SUBJECT TO INSPECTION BY THE ENGINEER AT THE SOURCE OF SUPPLY AND IMMEDIATELY PRIOR TO USE IN THE PLANTING OPERATIONS.

WHENEVER POSSIBLE, EXISTING SOIL EXCAVATED FROM THE PLANTING PITS SHOULD BE USED AS BACKFILL MATERIAL IN ORDER TO ELIMINATE OR MINIMIZE THE OCCURRENCE OF HYDROLOGIC DISCONTINUITIES, AND/OR SOIL INTERFACE PROBLEMS COMMON TO PLANTING PITS CONTAINING SOILS OF DIFFERENT TEXTURE. WHERE THE TEXTURE OF THE EXISTING SOIL IS UNDESIRABLE FOR THE SPECIES BEING PLANTED (i.e., HEAVY CLAY, PURE SAND) AND WHERE THE PH OF THE EXISTING SOIL IS SUITABLE FOR THE SPECIES BEING PLANTED, THE EXISTING SOIL SHALL BE BLENDED 66% EXISTING SOIL WITH 33% AMENDED SOIL IN ORDER TO MINIMIZE SOIL INTERFACE PROBLEMS. SEE BELOW FOR AMENDED SOIL.

WHERE IT IS DETERMINED THAT THE EXISTING SOIL EXCAVATED FROM A PLANTING PIT IS TOTALLY UNSUITABLE FOR USE AS BACKFILL MATERIAL BECAUSE OF IMPROPER PH OR THE PRESENCE OF DEBRIS OR OTHER DELETERIOUS MATTER, THE BACKFILL MATERIAL SHALL BE 100% PLANTING SOIL MIXTURE AS DESCRIBED BELOW WITH THE ADDITION OF 1/2 PART SAND.

PLANTING SOIL FOR AMENDING BACKFILL SHALL BE 100 % TOPSOIL WITH AMENDMENTS ADDED ACCORDING TO THE RECOMMENDATIONS OF THE SOILS TEST REPORT TO BRING THE PH VALUE OF THE PLANTING BACKFILL MIXTURE WITHIN THE RANGES DESCRIBED BELOW. THE TOPSOIL AND AMENDMENTS SHALL BE MIXED AT AN ON-SITE LOCATION. PLANTING SOIL SHALL NOT BE MIXED AT INDIVIDUAL PLANT LOCATIONS.

PLANTING SOIL FOR DECIDUOUS PLANTS SHALL HAVE A PH VALUE BETWEEN 6.0 AND 7.0. PLANTING SOIL FOR EVERGREEN OR SEMI-EVERGREEN PLANTS SHALL HAVE A PH VALUE BETWEEN 5.0 AND 6.0. A REPRESENTATIVE SAMPLE FROM THE EXCAVATED SOIL SHALL BE FIELD TESTED FOR PH UTILIZING A RELIABLE SOIL PH METER OR SOIL PH TEST KIT. THE PH VALUE OF THE NATURAL SOIL BACKFILL MIXTURE MAY BE AMENDED BY ADDING LIMESTONE OR ALUMINUM SULFATE AS NEEDED.

FERTILIZER TYPE A (MIXED WITH PLANTING SOIL): SHALL BE A COMMERCIAL GRADE FERTILIZER. A MINIMUM OF 75 PERCENT OF THE NITROGEN SHALL BE DERIVED FROM NATURAL ORGANIC SOURCES OF UREAFORM. 40-50 PERCENT OF THE NITROGEN SHALL BE WATER INSOLUBLE. AVAILABLE PHOSPHORIC ACID SHALL BE FROM SUPERPHOSPHATE BOND OR TANKAGE. POTASH SHALL BE DERIVED FROM MURIATE OF POTASH CONTAINING 60 PERCENT POTASH. IT SHALL BE UNIFORM IN COMPOSITION, FREE FLOWING AND SUITABLE FOR APPLICATION WITH APPROVED EQUIPMENT. FERTILIZER SHALL CONTAIN THE FOLLOWING PERCENTAGE BY WEIGHT:

10% NITROGEN
10% PHOSPHORIC ACID
5% POTASH

WITH WRITTEN APPROVAL OF THE ARCHITECT, THE CONTRACTOR MAY USE A COMPLETE COMMERCIAL FERTILIZER WITH A DIFFERENT N-P-K ANALYSIS, PROVIDED THE NITROGEN CONTENT MEETS THE SPECIFIED RATE FOR APPLICATION AND THE SOURCES FOR THE COMPONENT PARTS MEET THE ABOVE REQUIREMENTS.

TYPE B (PLACED AROUND ROOTBALL): SHALL BE "MAG-AMP" OR AN INORGANIC CONTROLLED RELEASE COGRANULATED MAGNESIUM AMMONIUM PHOSPHATE AND MAGNESIUM POTASSIUM PHOSPHATE COMPOUND. IT SHALL HAVE A GUARANTEED MINIMUM ANALYSIS OF THE FOLLOWING MATERIALS EXPRESSED IN PERCENT OF TOTAL WEIGHT:

NITROGEN (N)	7%
MAX. WATER SOLUBLE AMMONIACAL NITROGEN	2%
MAX. WATER INSOLUBLE AMMONIACAL NITROGEN	5%
PHOSPHORIC ACID (AVAILABLE) (PO)	40%
POTASH (K)	6%
MAGNESIUM (MG)	12%

MULCH SHALL BE CLEAN GROUND OR SHREDDED BARK OR HARDWOOD MULCH OF APPROVED KIND AS GENERALLY AVAILABLE AT LOCAL MARKETS, APPLIED 3 INCHES MAXIMUM IN DEPTH OVER ALL BEDS, SHRUBS AND TREE PLANTINGS, EXCEPT AS NOTED ABOVE FOR GROUND COVER PLANTINGS. WHERE SLOPES INDICATE LIKELIHOOD OF WASH, CLEAN BALED PINE STRAW SHALL BE USED. AT DRAINAGE DISPERSION POINTS OR ALONG NATURAL WATER WAYS WHERE CONCENTRATIONS OF SURFACE WATER EMPTY FROM CULVERT OR PAVED DITCH, SOIL SAVER OR OTHER HEAVY JUTE MESH SHALL BE INSTALLED IN APPROVED MANNER AND TO SUCH EXTENT AS WILL PREVENT EROSION. ALL AZALEA AND CAMELLIA PLANTING BEDS, SHALL REQUIRE ONE INCH OF PINE STRAW MULCH UNDER 2 INCHES OF BARK OR SHREDDED HARDWOOD MULCH. SHREDDED HARDWOOD OR BARK MULCH SHALL HAVE BEEN COMPOSED FOR AT LEAST TWO MONTHS PRIOR TO APPLICATION. FRESHLY GROUND MULCH WILL NOT BE ACCEPTED. FINELY GROUND MULCH WHICH INHIBITS DRAINAGE, ENCOURAGES WEED GROWTH OR BECOMES WATERLOGGED WILL NOT BE ACCEPTED. MULCH SHALL BE COMPOSED OF SIMILAR SIZED FRAGMENTS AND SHALL NOT CONTAIN STICKS, CONES, LEAVES, UNSHREDDED PIECES, OR OTHER DELETERIOUS MATTER.

ALL PLANTS SHALL BE PLANTED UPRIGHT AND FACED TO GIVE THE BEST APPEARANCE OR RELATIONSHIP TO ADJACENT STRUCTURES. THE ONLY PRUNING THAT WILL BE ALLOWED WILL BE THE PRUNING OF BROKEN OR DAMAGED BRANCHES. UNDER NO CIRCUMSTANCES SHALL THE CENTRAL LEADER OF THE PLANT BE PRUNED WITHOUT THE APPROVAL OF THE LANDSCAPE ARCHITECT. ROOTS SHALL BE SPREAD IN THEIR NORMAL POSITION. ALL BROKEN OR FRAYED ROOTS SHALL BE CUT OFF CLEANLY. CIRCLING ROOTS WHICH HAVE CIRCLED MORE THAN 1/4 OF THE ROOT BALL CIRCUMFERENCE SHALL BE CUT THROUGH. THE BURLAP AND ALL TWINE AND OR FASTENING MATERIAL SHALL BE CUT AND PUSHED TO THE BOTTOM OF THE PLANT PIT PRIOR TO BACKFILL MATERIAL BEING PLACED. THE PLANT SHALL NOT BE ROCKED BACK AND FOURTH TO TRY TO ENTIRELY REMOVE THE WRAPPING MATERIAL NOR SHALL ANY OTHER PRACTICE BE PERFORMED WHICH COULD CAUSE THE ROOT BALL TO BREAK APART. WHEN WIRE BASKETS ARE USED ON THE ROOT BALL OF PLANTS THE WIRE SHALL BE REMOVED TO AT LEAST 12 INCHES BELOW THE TOP OF THE ROOT BALL.

TREES REQUIRING SUPPORT WILL BE INDICATED IN THE REMARKS SECTION OF THE PLANTING SCHEDULE. ALL TREES REQUIRING SUPPORT SHALL BE STAKED ACCORDING TO THE DETAILS PROVIDED. GALVANIZED WIRE SHALL BE ENCASED IN BLACK HOSE TO PREVENT DIRECT CONTACT WITH BARK OF THE TREE AND SHALL BE PLACED AROUND THE TRUNK AND ABOVE THE FIRST MAJOR BRANCH IN A SINGLE LOOP. WIRES SHALL BE MAINTAINED SNUG. ONLY ONE STAKE SHALL BE REQUIRED PER TREE AND SHALL BE DRIVEN VERTICALLY INTO THE GROUND TO A DEPTH OF 2 1/2 TO 3 FEET IN SUCH A MANNER AS NOT TO INJURE THE BALL OR ROOTS. STAKES FOR SUPPORTING TREES SHALL BE 2 INCHES SQUARE OR ROUND, BY 8 FEET, SOUND WOOD, TREATED WITH CREOSOTE OR OTHER APPROVED WOOD PRESERVATIVE. WIRE FOR ANCHORING TREES TO STAKES SHALL BE NO. 12 GAUGE PLIABLE GALVANIZED. HOSE TO ENCASE GUY WIRES USED FOR ANCHORING TREES TO STAKES SHALL BE NEW OR USED 2-PLY REINFORCED BLACK RUBBER GARDEN HOSE. ONLY TREES HAVING A THIN BARK SHALL BE WRAPPED. WRAPPING MATERIAL SHALL BE EITHER TUBE-X OR COBRA TREE WRAP. IF COBRA TREE WRAP IS USED THE BANDAGE SHALL COVER THE ENTIRE SURFACE OF THE TRUNK TO THE HEIGHT OF THE FIRST BRANCHES. TREE WRAP SHALL BEGIN AT TREE BASE AND WRAP UPWARDS WITH A MIN. 1/4" OVERLAP. TUBE-X SHALL BE SPLIT AND APPLIED TO THE TRUNK FROM THE GROUND TO JUST BELOW THE FIRST BRANCHES. THE TUBE SHALL NOT BE ALLOWED TO RUB ON THE LOWEST BRANCHES AND THE TUBE SHALL NOT BE PHYSICALLY ATTACHED TO THE TRUNK.

THE CONTRACTOR SHALL MAKE, AT HIS EXPENSE, WHATEVER ARRANGEMENTS MAY BE NECESSARY TO ENSURE AN ADEQUATE SUPPLY OF WATER TO MEET THE NEEDS OF THIS CONTRACT. HE SHALL ALSO FURNISH ALL NECESSARY HOSE, EQUIPMENT ATTACHMENTS AND ACCESSORIES FOR THE ADEQUATE IRRIGATION OF LAWNS AND PLANTED AREAS AS MAY BE REQUIRED UNTIL ACCEPTED BY THE CLIENT.

ALL PESTICIDES SHALL BE PRODUCTS OF RECOGNIZED COMMERCIAL MANUFACTURERS, AND SHALL CONFORM TO ALL APPLICABLE FEDERAL, STATE, AND LOCAL PESTICIDE LAWS. PESTICIDES SHALL BE APPLIED WITH CALIBRATED EQUIPMENT ACCORDING TO EPA LABEL RESTRICTIONS AND REGULATIONS BY A CERTIFIED APPLICATOR ONLY. ANY DAMAGE INCURRED TO THE SITE, ADJACENT PROPERTIES, OR APPLICATOR DURING PESTICIDE APPLICATIONS WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING HIS WORK AFTER PLANTING. MAINTENANCE SHALL INCLUDE WATERING, WEEDING, CULTIVATING, MULCHING, REMOVAL OF DEAD MATERIALS, RESETTING OF PLANTS TO PROPER GRADES OR UPRIGHT POSITIONS, RESTORATION OF PLANTING SAUCERS, AND OTHER NECESSARY OPERATIONS. ADEQUATE PROTECTION FOR LAWN AREAS AGAINST TRESPASSING DURING PLANTING OPERATIONS AND AGAINST DAMAGE OF ANY KIND SHALL BE PROVIDED. NOTHING IN THESE NOTES IS INTENDED TO RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO REPAIR EXISTING LAWN AREAS DAMAGED BY WORKMEN ENGAGED IN THE COMPLETIONS OF THIS PROJECT. THE LANDSCAPE CONTRACTOR SHALL MAINTAIN HIS FINISHED WORK FOR A PERIOD OF ONE YEAR COMMENCING FROM THE TIME THE INSTALLATION IS ACCEPTED AS COMPLETE BY THE TENANT'S CONSTRUCTION REPRESENTATIVE.

INSPECTION OF THE WORK TO DETERMINE COMPLETION OF THE CONTRACT EXCLUSIVE OF THE POSSIBLE REPLACEMENT OF PLANTINGS, WILL BE MADE BY THE OWNER AT THE CONCLUSION OF THE INSTALLATION PERIOD UPON WRITTEN NOTICE REQUESTING SUCH INSPECTION. REQUEST SHALL BE SUBMITTED BY CONTRACTOR AT LEAST TEN DAYS PRIOR TO THE ANTICIPATED DATE FOR INSPECTION. AFTER INSPECTION, THE CONTRACTOR WILL BE NOTIFIED IN WRITING BY THE OWNER OF ACCEPTANCE OF THE WORK, EXCLUSIVE OF THE POSSIBLE REPLACEMENT OF PLANTS SUBJECT TO GUARANTY; OR, IF THERE ARE ANY DEFICIENCIES, THE CONTRACTOR WILL BE NOTIFIED OF THE REQUIREMENTS NECESSARY FOR COMPLETION OF THE WORK.

NURSERY STOCK SHALL BE FULLY GUARANTEED FOR ONE FULL YEAR. ALL PLANTS THAT FAIL TO MAKE NEW GROWTH FROM A DORMANT CONDITION OR THAT DIE DURING THE FIRST YEAR AFTER PLANTING SHALL BE REPLACED. ALL REPLACEMENTS SHALL CONFORM WITH THE ORIGINAL SPECIFICATIONS AS TO SIZE AND TYPE. ALL GUARANTEES ARE PREDICATED ON THE ASSURANCE THAT THE OWNER HAS PROPERLY CARED FOR ALL PLANTS AFTER THE CONTRACTOR HAS BEEN RELEASED FROM HIS MAINTENANCE OBLIGATIONS. ALL COSTS OF REPLACEMENTS SHALL BE BORNE BY THE CONTRACTOR.

THIS PLAN DOES NOT GUARANTEE THE EXISTENCE OR NON-EXISTENCE OF ANY UTILITIES. PRIOR TO ANY CONSTRUCTION OR EXCAVATION, THE CONTRACTOR SHALL ASSUME THE RESPONSIBILITY OF LOCATING AND VERIFYING ALL UTILITIES, ABOVE AND/OR BELOW GROUND, PUBLIC AND/OR PRIVATE THAT MAY EXIST AND CROSS THROUGH THE AREAS OF CONSTRUCTION.

LANDSCAPING WILL NOT BE MEASURED BUT SHALL INCLUDE ALL STOCK, EXCAVATION, INSTALLATION, TOPSOIL, BACKFILLING, FERTILIZER, CHEMICALS, WRAPPING, GUYING, MULCH, TESTING, MAINTENANCE, AND GUARANTEES REQUIRED FOR THE COMPLETION OF CONSTRUCTION AS SHOWN. PAYMENT FOR THE WORK SPECIFIED HEREIN SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR LANDSCAPE PLANTING UNLESS OTHERWISE SPECIFIED BY THE OWNER.

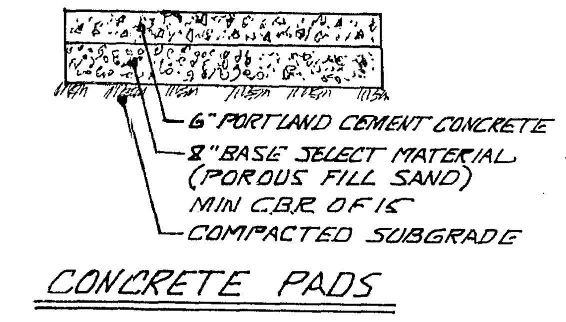
TREE PROTECTION NOTES

1. AREAS INDICATED ON THE PLANTING PLAN AS WITHIN TREE PROTECTION FENCING ARE AREAS WHERE ALL VEGETATION IS TO REMAIN UNDISTURBED. THESE AREAS SHALL BE SUBJECT TO THE FOLLOWING GUIDELINES AND SPECIFICATIONS:
2. THE LIMITS OF CLEARING SHALL BE DETERMINED BY THE LOCATION AND PLACEMENT OF PROTECTIVE FENCING MARKING THE AREAS OF THE SITE TO BE UNDISTURBED.
3. PROTECTIVE FENCING: UNDISTURBED AREAS SHALL BE IDENTIFIED BY USING BRIGHT ORANGE FENCING. FENCING SHALL BE USED TO PROTECT THE ROOTS, TRUNK AND TOP OF ALL TREES RETAINED ON THE SITE. SIGNS SHALL BE PLACED ALONG THE FENCE "TREE SAVE AREA" VISIBLE FROM ALL DIRECTIONS TO INFORM WORKERS OF THE PURPOSE OF THE BOUNDARY.
4. PROTECTIVE FENCING MATERIAL SHALL BE IN PLACE PRIOR TO THE COMMENCEMENT OF ANY WORK ON THE SITE, SHALL BE KEPT IN GOOD REPAIR FOR THE DURATION OF CONSTRUCTION ACTIVITY, AND SHALL BE THE LAST ITEM REMOVED DURING THE FINAL CLEAN-UP AFTER COMPLETION OF THE PROJECT.
5. EQUIPMENT OPERATION AND STORAGE: HEAVY EQUIPMENT, VEHICULAR TRAFFIC, OR STOCKPILES OF ANY CONSTRUCTION MATERIALS, INCLUDING TOPSOIL AND MULCH, SHALL NOT BE PERMITTED WITHIN THE DRIP LINE OF ANY TREE TO BE RETAINED. TREES BEING REMOVED SHALL NOT BE FELLED, PUSHED OR PULLED INTO TREES BEING RETAINED. EQUIPMENT OPERATORS SHALL NOT CLEAN ANY PART OF THEIR EQUIPMENT AGAINST THE TRUNKS OF TREES TO BE RETAINED.
6. NO TOXIC MATERIALS SHALL BE STORED WITHIN 100' OF "TREE SAVE AREAS."
7. BOARDS OR WIRES SHILL NOT BE NAILED OR ATTACHED TO TREES DURING BUILDING OPERATIONS.
8. HEAVY EQUIPMENT OPERATORS SHALL BE CAUTIONED TO AVOID DAMAGE TO EXISTING TREE TRUNKS AND ROOTS DURING CLEARING AND GRADING OPERATIONS.
9. TREE TRUNKS AND EXPOSED ROOTS DAMAGED DURING EQUIPMENT OPERATIONS WILL BE TREATED ACCORDING TO STANDARD ARBORICULTURAL PRACTICES. CARE FOR SERIOUS INJURY SHALL BE PRESCRIBED BY A PROFESSIONAL ARBORIST.
10. ALL TREE LIMBS DAMAGED DURING BUILDING OR LAND LEVELING OR REMOVED FOR ANY OTHER REASON SHALL BE PRUNED AS SHOWN ON THE PRUNING DIAGRAM. CUTS MUST BE MADE PROPERLY TO PREVENT ADDITIONAL BARK FROM BEING TORN FROM THE TREE. FLUSH CUTS ARE UNACCEPTABLE. ALL FINAL CUTS SHALL BE MADE SUFFICIENTLY CLOSE TO THE TRUNK OR PARENT LIMB WITHOUT CUTTING INTO THE BRANCH COLLAR OR LEAVING A PROTRUDING STUB SO THAT WOUND CLOSURE CAN READILY START UNDER NORMAL CONDITIONS.

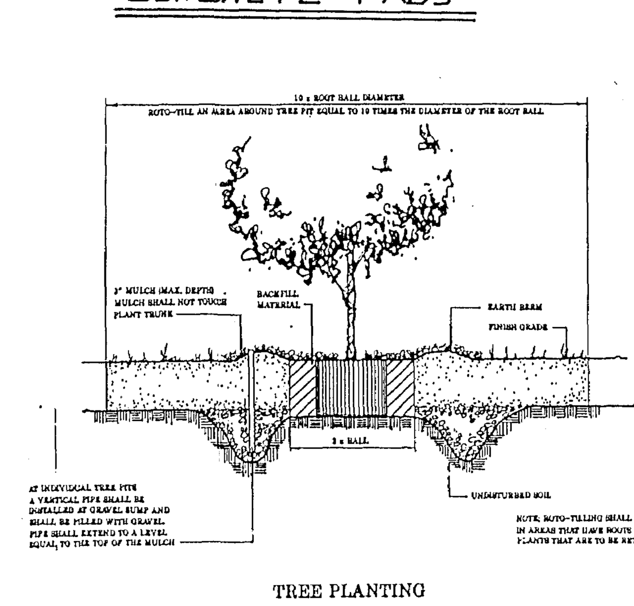
EROSION AND SEDIMENT CONTROL NOTES

THE PURPOSE OF THE EROSION CONTROL MEASURES SHOWN ON THESE PLANS SHALL BE TO PRECLUDE THE TRANSPORT OF ALL WATERBORNE SEDIMENTS RESULTING FROM CONSTRUCTION ACTIVITIES FROM ENTERING ONTO ADJACENT PROPERTIES OR STATE WATERS. IF FIELD INSPECTION REVEALS THE INADEQUACY OF THE PLAN TO CONFINE SEDIMENT TO THE PROJECT SITE, APPROPRIATE MODIFICATIONS WILL BE MADE TO CORRECT ANY PLAN DEFICIENCIES. IN ADDITION TO THESE NOTES, ALL PROVISIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL REGULATIONS SHALL APPLY TO THIS PROJECT.

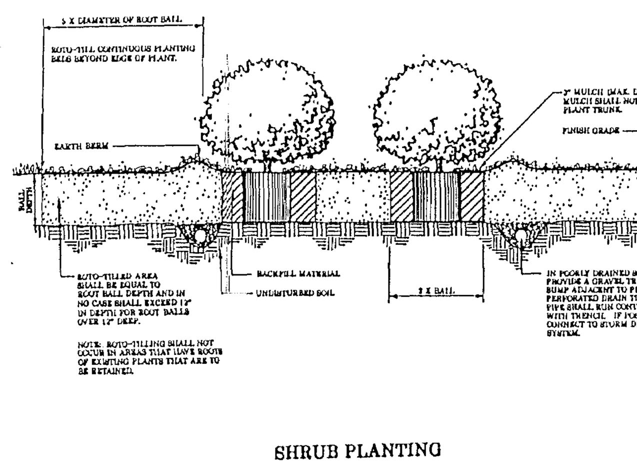
1. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK", 3RD EDITION, 1992. THE CONTRACTOR SHALL BE THOROUGHLY FAMILIAR WITH ALL APPLICABLE MEASURES CONTAINED THEREIN WHICH MAY BE PERTINENT TO THIS PROJECT.
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.
3. 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. AN ON-SITE PRE-CONSTRUCTION MEETING WILL BE HELD BETWEEN THE OFFICE OF CODE COMPLIANCE AND THE CONTRACTOR TO IDENTIFY THOSE MEASURES TO BE INITIALLY INSTALLED.
4. MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL INCLUDE THE REPAIR OF MEASURES DAMAGED BY ANY SUBCONTRACTOR INCLUDING THOSE OF THE PUBLIC UTILITY COMPANIES. AT 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.
5. SURFACE FLOWS OVER CUT AND FILL SLOPES SHALL BE CONTROLLED BY EITHER REDIRECTING FLOWS FROM TRANSVERSING THE SLOPES OR BY INSTALLING MECHANICAL DEVICES TO SAFELY LOWER WATER DOWNSLOPE WITHOUT CAUSING EROSION. A TEMPORARY FILL DIVERSION (STD. & SPEC. 1.16) 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. OFFICE 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.
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 WHERE REQUIRED. ANY DRAINAGE OUTFALLS REQUIRED FOR A STREET MUST BE COMPLETED BEFORE STREET GRADING 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.
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 A 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. OFF-SITE WASTE OR BORROW AREAS SHALL BE APPROVED BY THE OFFICE OF CODE COMPLIANCE PRIOR TO THE IMPORT OF ANY BORROW OR EXPORT OF ANY WASTE TO OR FROM THE PROJECT SITE.
19. ALL PAVED AND/OR PIPED OUTFALLS WILL BE CONSTRUCTED BEFORE ROAD GRADING AND UTILITY INSTALLATION BEGINS.



CONCRETE PADS



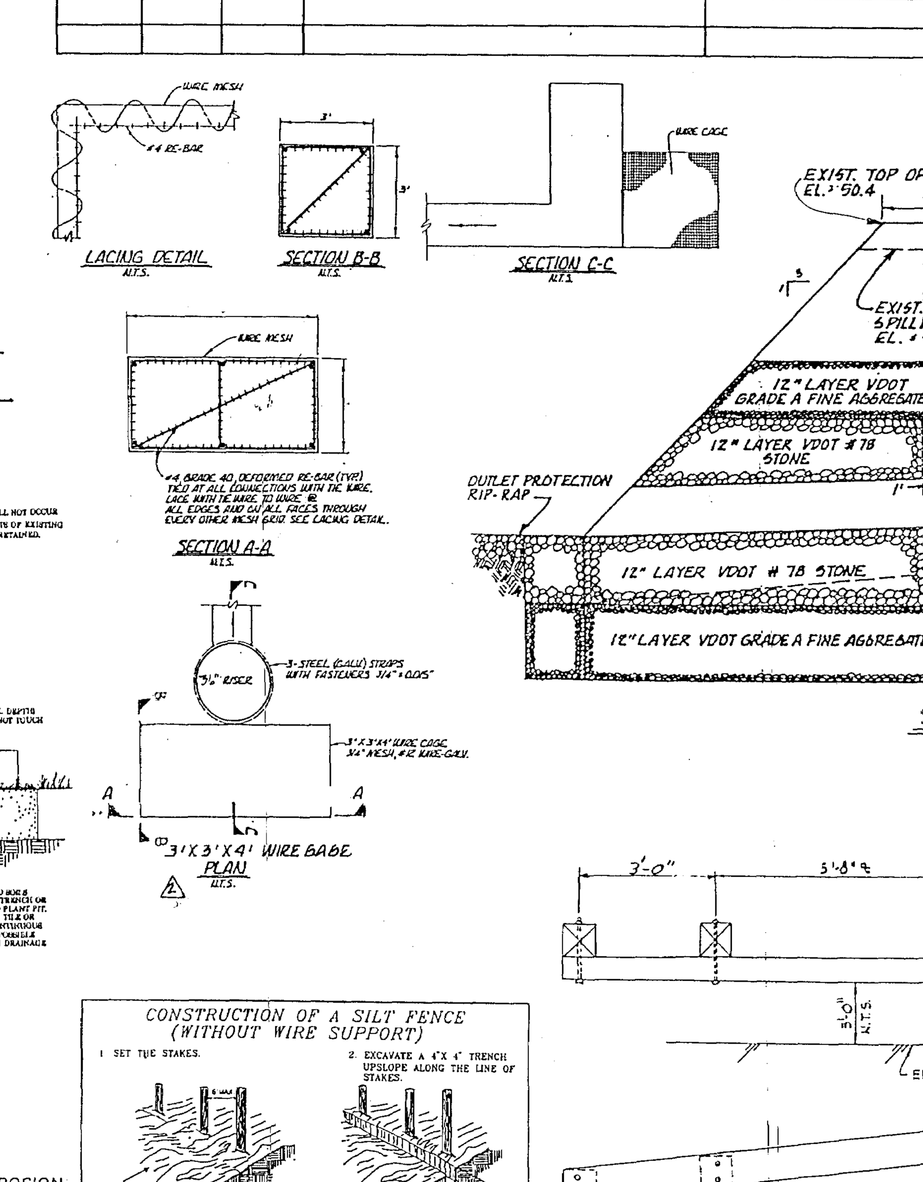
TREE PLANTING



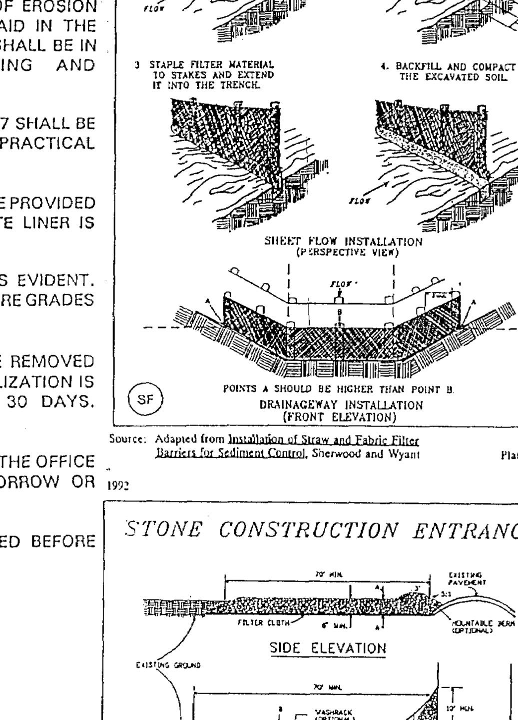
SHRUB PLANTING

△ PLANT SCHEDULE

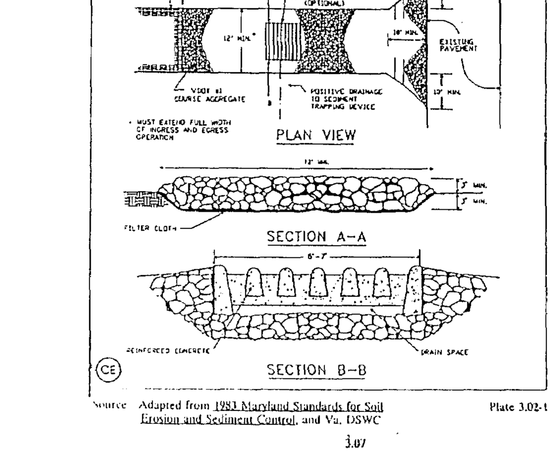
ITEM NO.	KEY	QNTY.	BOTANICAL NAME	COMMON NAME	INITIAL SIZE HT. WIDTH CAL.	ROOT	SPACING	COMMENT
			TREE					
1.	PT	31	PINUS TAEDA	LOBCOLLY PINE	10-12'	B&B		
2	JP	14	JUNIPERUS VIRGINIANA	RED CEDAR	8-10'	B&B		
			SHRUB					
3.	MC	79	MYRICA CERIFERA L.	SOUTHERN BAYBERRY	5-6'	B&B		



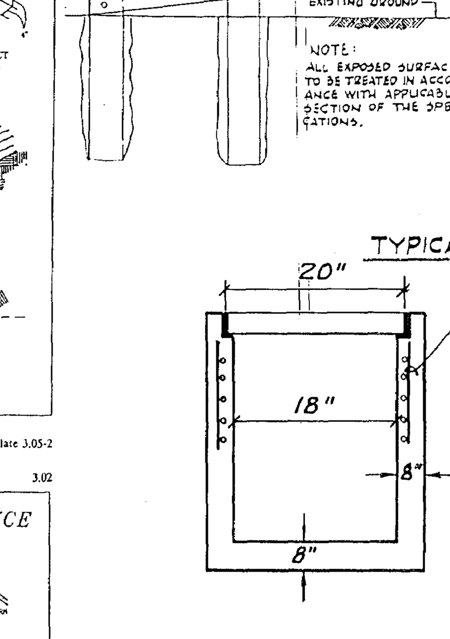
LACING DETAIL · SECTION B-B · SECTION C-C · SECTION A-A · SEDIMENT BASIN △ N.T.S. · PEAK ELEVATION · BOLLARD DETAIL



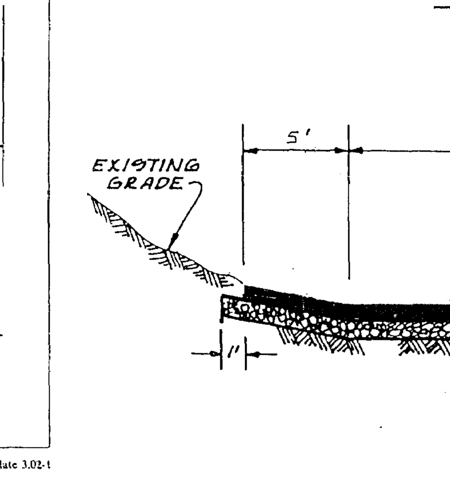
CONSTRUCTION OF A SILT FENCE (WITHOUT WIRE SUPPORT)



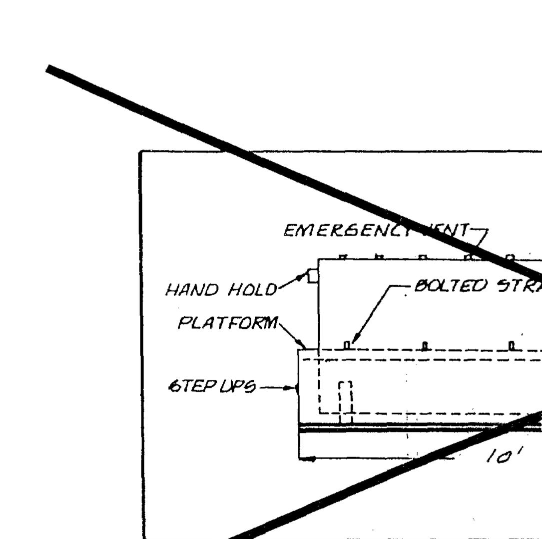
STONE CONSTRUCTION ENTRANCE



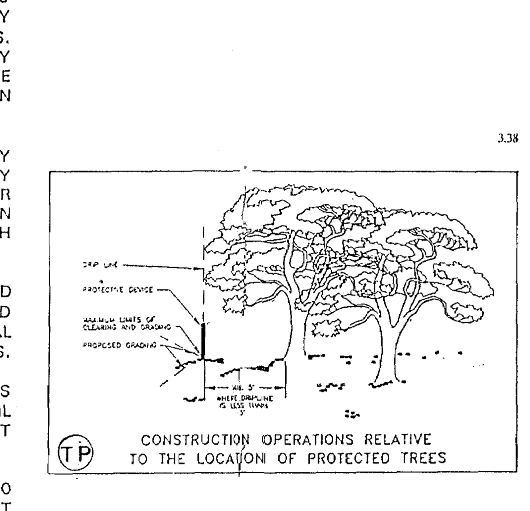
TYPICAL GUARDRAIL DETAIL · WASH DOWN PIT N.T.S.



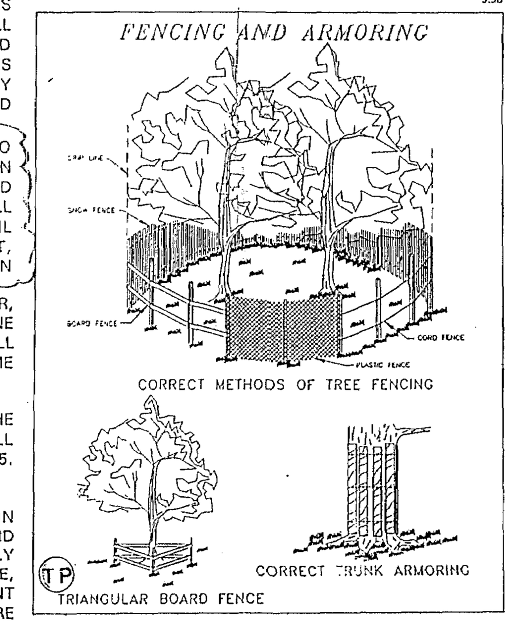
SECTION A-A N.T.S.



FUEL STORAGE DIKE N.T.S.

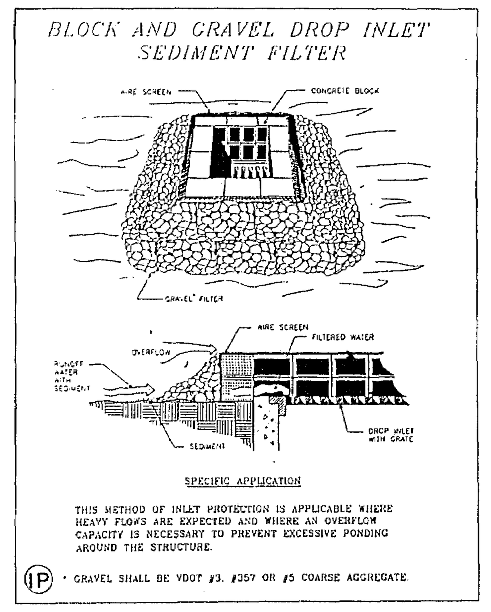


CONSTRUCTION OPERATIONS RELATIVE TO THE LOCATION OF PROTECTED TREES



FENCING AND ARMORING — CORRECT METHODS OF TREE FENCING — TRIANGULAR BOARD FENCE — CORRECT TRUNK ARMORING

Source: Va. DSWC Plate 3.38-2



BLOCK AND GRAVEL DROP INLET SEDIMENT FILTER

Source: Va. DSWC

COMMONWEALTH OF VIRGINIA — JOHN L. HUTCHERSON No. 7753 — CERTIFIED PROFESSIONAL ENGINEER

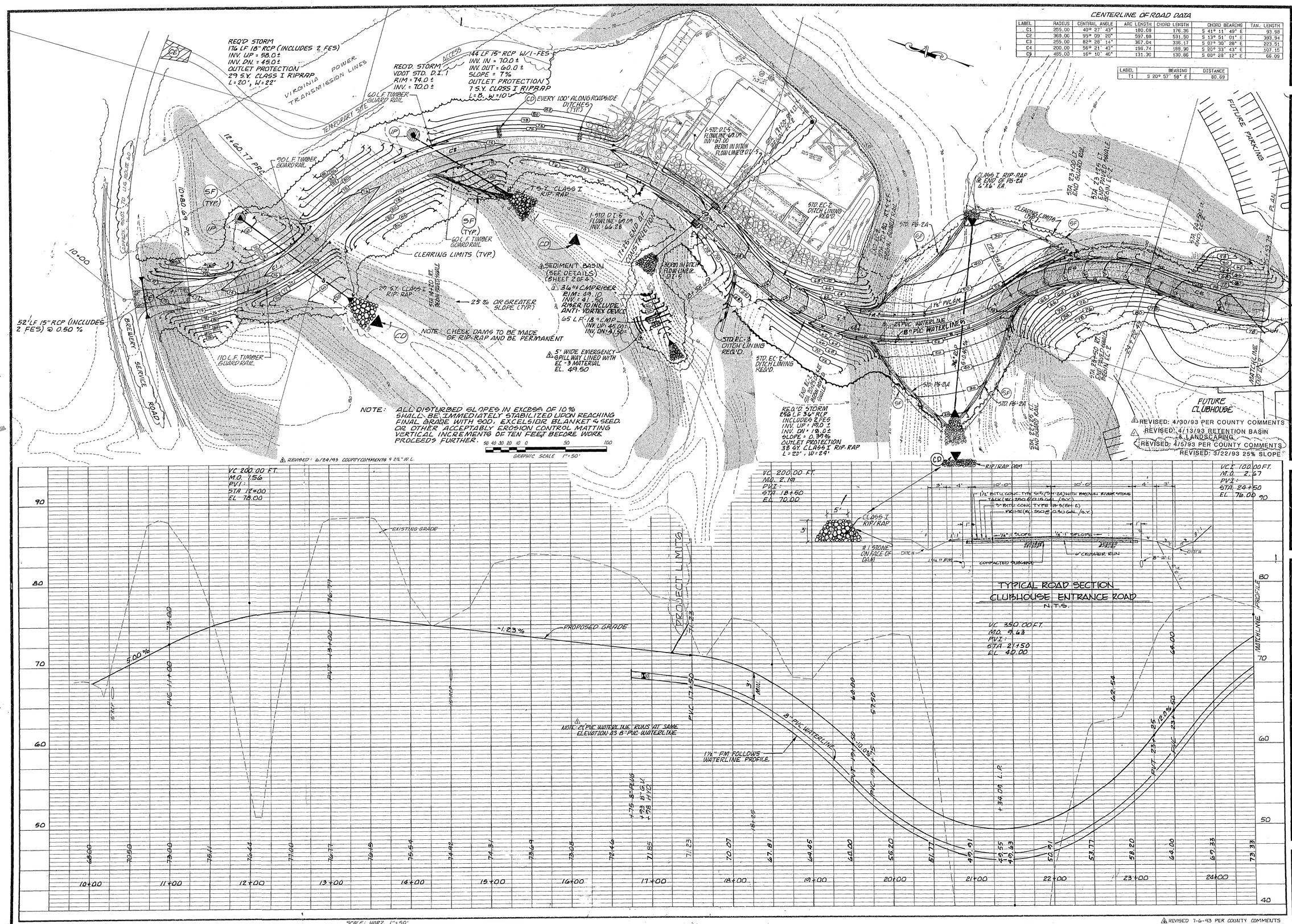
Langley and McDonald, P.C.
Engineers • Surveyors • Planners
Landscape Architects • Environmental Consultants
VIRGINIA BEACH · WILLIAMSBURG

DES.	HTB / CLJ
DWN.	HTB / CLJ
CHK.	CRO
DATE	4/30/93

BUSCH PROPERTIES, INC.
KINGSMILL on the James
GOLF COURSE #3
CLUBHOUSE ROAD AND UTILITIES

SHEET	2 OF 5
DISK	
PROJ. NO.	71069B-228
DWG.	4859W

△ REVISED 7-6-93 PER COUNTY COMMENTS · △ REVISED: 4/30/93 PER COUNTY COMMENTS · △ REVISED: 4/13/93 RETENTION BASIN & LANDSCAPING · REVISED: 4/5/93 PER COUNTY COMMENTS



CENTERLINE OF ROAD DATA

LABEL	RADIUS	CENTRAL ANGLE	ARC LENGTH	CHORD LENGTH	CHORD BEARING	TAN. LENGTH
C1	255.00	40° 27' 43"	180.08	176.36	S 41° 11' 49" E	93.98
C2	360.00	95° 09' 20"	597.88	531.50	S 13° 51' 01" E	393.94
C3	255.00	82° 28' 14"	367.04	336.17	S 07° 30' 28" E	223.51
C4	200.00	56° 21' 43"	196.74	188.90	S 20° 33' 43" E	107.15
C5	465.00	16° 10' 40"	131.30	130.86	S 00° 28' 12" E	66.09

LABEL	BEARING	DISTANCE
T1	S 20° 57' 58" E	80.69

COMMONWEALTH OF VIRGINIA
JOHN L. HUTCHESON
No. 7753
CERTIFIED PROFESSIONAL ENGINEER

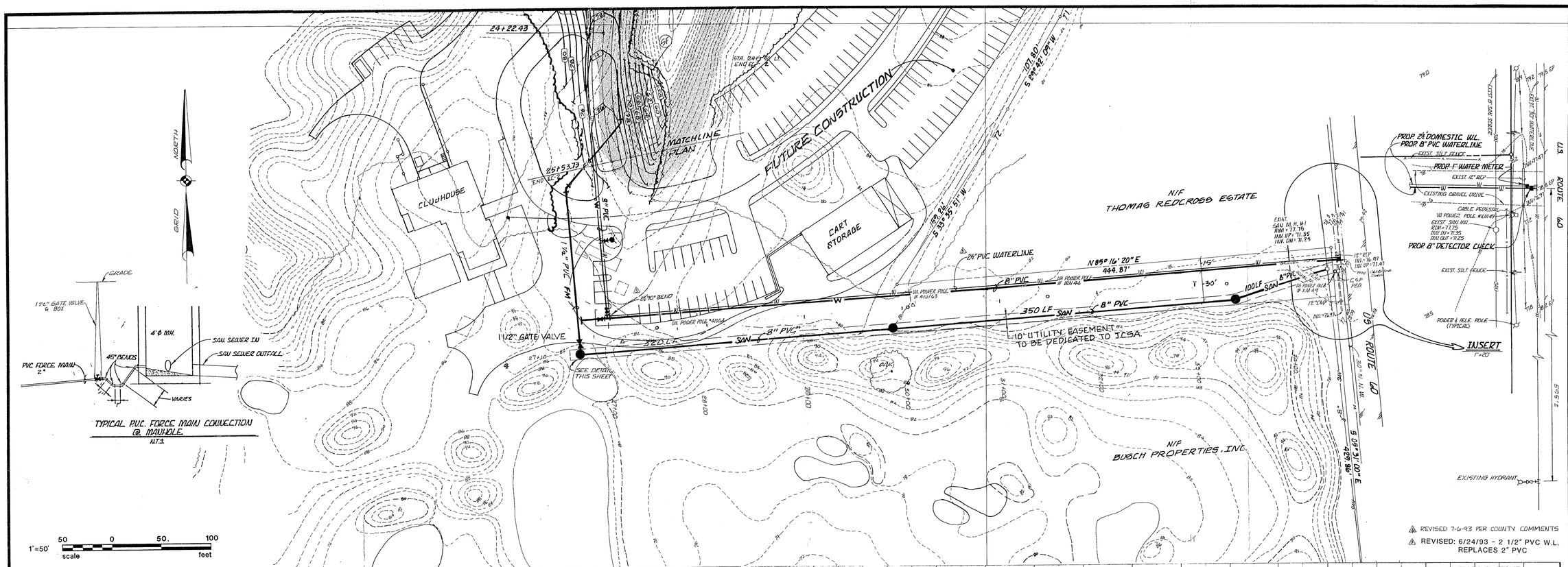
Langley and McDonald
A PROFESSIONAL CORPORATION
ENGINEERS • PLANNERS • SURVEYORS
VIRGINIA BEACH - WILLIAMSBURG, VIRGINIA

DES.	CRO
DWN.	HTB/CLJ
CHK.	CRO
DATE	4/30/93

BUSCH PROPERTIES, INC.
KINGSMILL on the James
GOLF COURSE #3
CLUBHOUSE ROAD AND UTILITIES
PLAN AND PROFILE

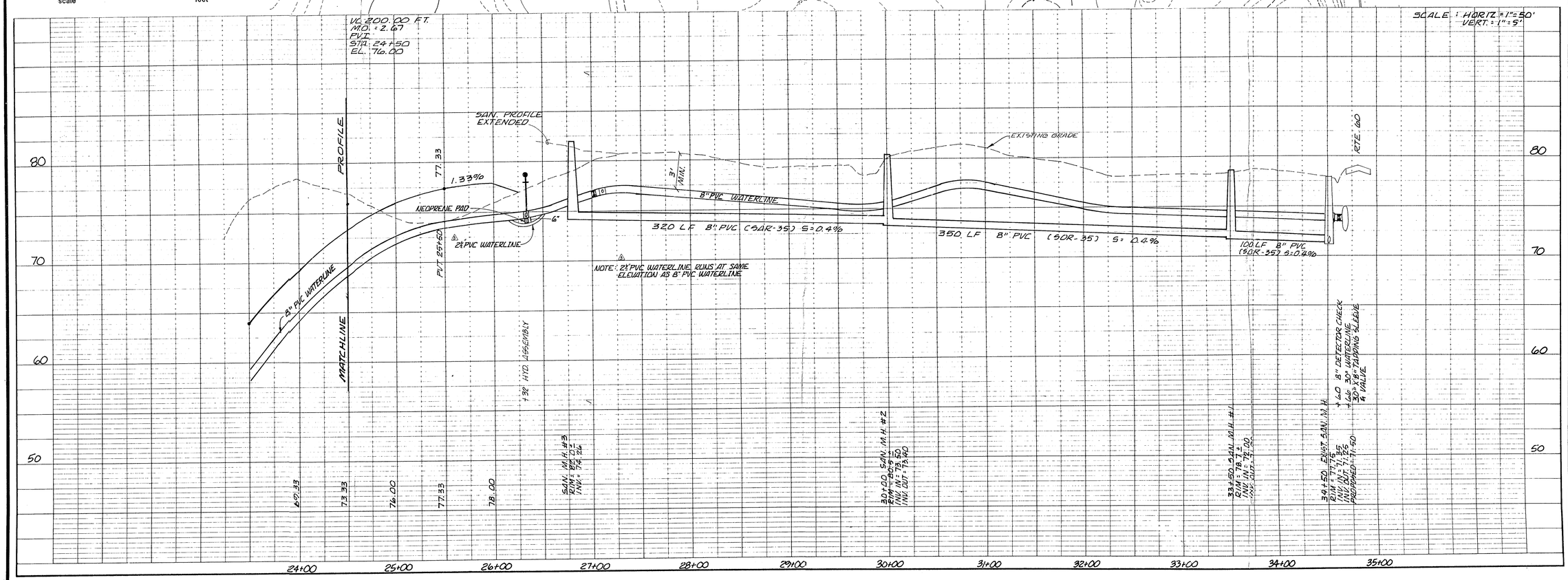
PROJ. NO.	71069B-228
SCALE:	AS NOTED
SHEET	3 OF 5
DWG.	4858W

JR011_KINGSMILL_GOLF_COURSE_3 - 009



REVISED 7-6-93 PER COUNTY COMMENTS

REVISED: 6/24/93 - 2 1/2" PVC W.L. REPLACES 2" PVC



COMMONWEALTH OF VIRGINIA
JOHN L. HUTCHERSON
No. 7753
CERTIFIED PROFESSIONAL ENGINEER

Langley and McDonald
A PROFESSIONAL CORPORATION
ENGINEERS • PLANNERS • SURVEYORS
VIRGINIA BEACH - WILLIAMSBURG, VIRGINIA

DES.	CRO
DWN.	HTB
CHK.	CRO
DATE	4/30/93

BUSCH PROPERTIES, INC.

KINGSMILL on the James

GOLF COURSE

CLUBHOUSE ROAD AND UTILITIES #3

PLAN AND PROFILE

PROJ. NO.	71069B-228
SCALE:	AS NOTED
SHEET	4 OF 5
DWG.	4857W

JR011_KINGSMILL_GOLF_COURSE_3 - 010

JAMES CITY SERVICE AUTHORITY

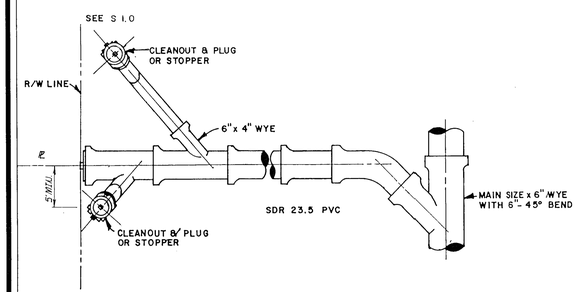
GENERAL NOTES - WATER DISTRIBUTION MAINS

1. All components of the water distribution system shall be installed and tested in accordance with the latest edition of the James City Service Authority Standards and Specifications for Water Distribution Systems and the Virginia Waterworks Regulations.
2. The developer's representative shall submit a list of materials for approval to the James City Service Authority prior to commencement of construction.
3. Water mains shall be installed after grading to 6-inch of final grade and prior to placement of base material.
4. All approved Erosion and Sediment Control requirements shall be observed during water main construction.
5. All water mains shall be disinfected and pressure tested, and satisfactory bacteriological samples obtained, in accordance with James City Service Authority standards.
6. After testing is complete and all components of the water system are acceptable to the James City Service Authority, as-built drawings shall be submitted to the Service Authority. No water meters will be installed until as-built drawings are received and checked for accuracy by the James City Service Authority. Any discrepancies noted during the as-built inspection shall be corrected by the developer's representatives within 30 days.
7. Routine periodic inspections during construction will be provided by the James City Service Authority. These inspections do not relieve the developer from his obligation and responsibility for constructing a water distribution system in strict accordance with the Standards and Specifications of the James City Service Authority.
8. Any changes to the final plans shall be approved by the James City Service Authority and shall be accurately indicated on the as-built drawings.
9. All lots shall be provided with water service connections. The connections shall be extended from the main to the property line or easement line, and shall terminate with a yoke in a meter box set at final finished grade. Meters for all lots (units) shall be paid for by the developer or builder and installed by the JCSA.
10. The developer is required to submit water data sheets and shall acquire a certificate to construct prior to commencement of construction.
11. Any required easements, permits and approvals shall be acquired by the developer prior to commencement of water main construction.
12. The water main contractor shall comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. He shall erect and maintain, as required by the conditions and progress of the work, all necessary safeguards for safety and protection. He shall also notify "Miss Utility" prior to performing any underground excavation.

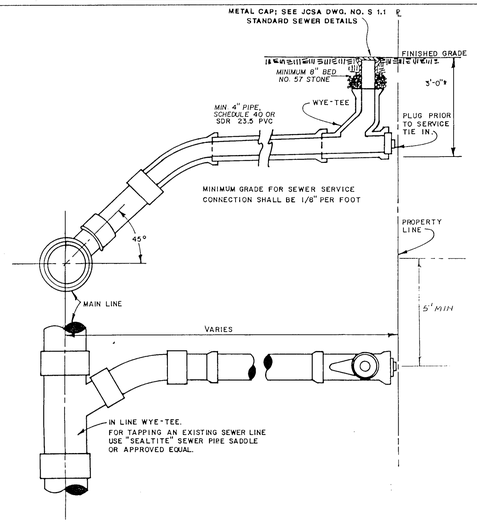
JAMES CITY SERVICE AUTHORITY

GENERAL NOTES - SANITARY SEWER

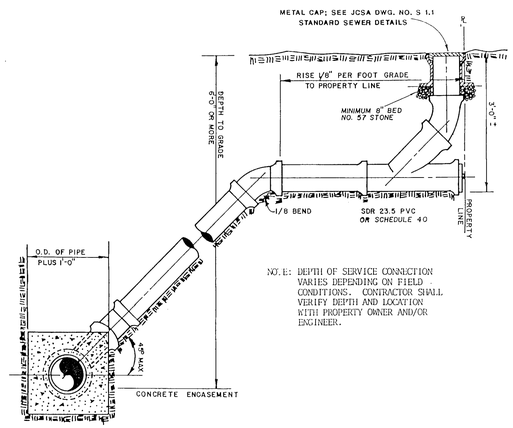
1. All components of the sanitary sewer system shall be installed and tested in accordance with the latest edition of the James City Service Authority Standards and Specifications for Sanitary Sewer Systems and the Virginia Sewerage Regulations.
2. The developer's representative shall submit a list of materials for approval to the James City Service Authority prior to commencement of construction.
3. Sewer lines shall be installed after rough grading and prior to placement of base material.
4. All approved Erosion and Sediment Control requirements shall be observed during sewer line construction.
5. All sewers shall be mirrored and pressure tested in accordance with James City Service Authority standards.
6. After testing is complete and all components of the sewer system are acceptable to the James City Service Authority, as-built drawings shall be submitted to the Service Authority. No wastewater flow shall be allowed to enter the sanitary sewer system until as-built drawings are received and checked for accuracy by the James City Service Authority. Any discrepancies noted, during the as-built inspection, shall be corrected by the developer's representatives within 30 days.
7. Routine periodic inspections during construction will be provided by the James City Service Authority. These inspections do not relieve the developer from his obligation and responsibility for constructing a sanitary sewer system in strict accordance with the standards and specifications of the James City Service Authority.
8. Any changes to the final plans shall be approved by the James City Service Authority and shall be accurately indicated on the as-built drawings.
9. All lots shall be provided with sewer service connections. The connections shall be extended from the main to the property line or easement line, and shall terminate with a wye, fitting, plug and clean out with removable plug and metal cover.
10. The developer is required to submit sewer data sheets and shall acquire a certificate to construct prior to commencement of construction.
11. Any required easements, permits and approvals shall be acquired by the developer prior to commencement of sanitary sewer construction.
12. The sewer main contractor shall comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. He shall erect and maintain, as required by the conditions and progress of the work, all necessary safeguards for safety and protection. He shall also notify "Miss Utility" prior to performing any underground excavation.



TYPICAL 6" LATERAL SERVING TWO DWELLINGS
N.T.S.



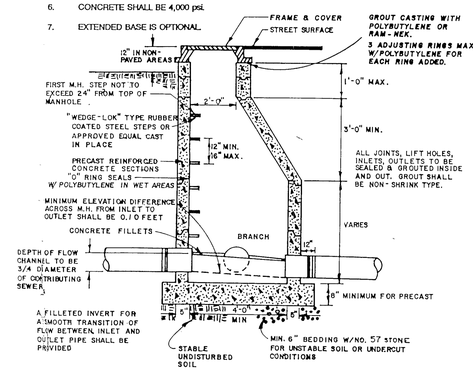
TYPICAL SEWER LATERAL CONNECTION
N.T.S.



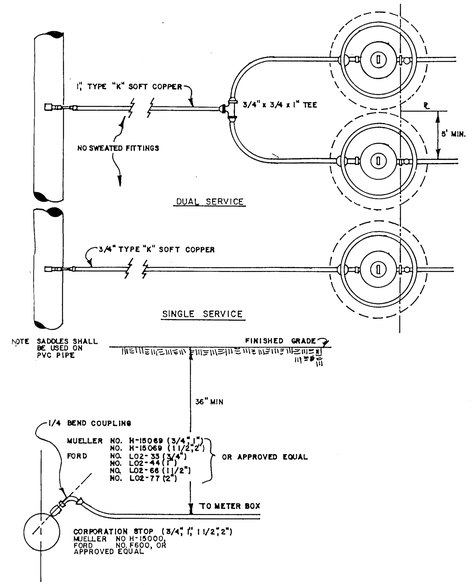
SERVICE CONNECTION FOR DEPTHS OVER 8'
N.T.S.

NOTES:

1. MANHOLE STEPS SHALL HAVE A MINIMUM EMBEDMENT OF 3" AND A MAXIMUM PROJECTION OF 5".
2. BOTTOM STEP SHALL BE A MINIMUM OF 5" AND A MAXIMUM OF 16-1/2" ABOVE WORKING LEVEL.
3. STEPS TO BE SET IN VERTICAL ALIGNMENT.
4. MAXIMUM MANHOLE DEPTH TO BE 24'-0".
5. CONNECTION BETWEEN MANHOLE AND SEWER PIPE TO BE FLEXIBLE GASKET.
6. CONCRETE SHALL BE 4,000 psi.
7. EXTENDED BASE IS OPTIONAL.



STANDARD MANHOLE
N.T.S.



DUAL & SINGLE SERVICE INSTALLATION
N.T.S.

COMMONWEALTH OF VIRGINIA
JOHN L. HOTCHERSON
No. 7753
CERTIFIED PROFESSIONAL ENGINEER

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

DES.	
DWN.	
CHK.	JLH
DATE	7/9/93

BUSCH PROPERTIES, INC.
KINGSMILL on the James
GOLF COURSE #3
CLUBHOUSE ROAD AND UTILITIES

SHEET	5 OF 5
DISK	
PROJ. NO.	71069B-228
DWG.	4860W

JR011_KINGSMILL_GOLF_COURSE_3 - 011

REVISED

DRAINAGE CALCULATIONS

AND

RETENTION BASIN

for

KINGSMILL GOLF COURSE #3

MAINTENANCE CENTER

APRIL 13, 1993

NATURAL CHANNELS

IABLES LIST:
Y - FLOW ELEVATION Q - FLOWRATE S - CHANNEL SLOPE

IABLE TO BE SOLVED (Y,Q OR S) ? Y

(CFS) ? 5.20
FT/FT) ? .048

Enter up to 20 cross-section points.
Enter <Return> only for distance to end.

CROSS-SECTION POINTS

DIST	ELEV	COEFF	DIST	ELEV	COEFF
-25.0	18.2	.045			
-6.0	8.8	.045			
0.0	7.8	.045			
7.0	8.8	.045			
25	18.2	.045			

RESULTS
==========

8.32 FT
1.77 SF
6.87 FT
2.93 FPS
1.01 SUPER-CRITICAL FLOW

ift> <Prt Sc> print <Return> repeat <Space Bar> back to menu

"B"

NATURAL CHANNELS

IABLES LIST:
Y - FLOW ELEVATION Q - FLOWRATE S - CHANNEL SLOPE

IABLE TO BE SOLVED (Y,Q OR S) ? Y.9

(CFS) ? 5.90
FT/FT) ? .051

Enter up to 20 cross-section points.
Enter <Return> only for distance to end.

CROSS-SECTION POINTS

DIST	ELEV	COEFF	DIST	ELEV	COEFF
-20.0	19.0	.045			
-2.0	8.0	.045			
0.0	7.7	.045			
2.0	8.2	.045			
20.0	19.2	.045			

RESULTS
==========
8.27 FT
1.56 SF
4.75 FT
3.77 FPS
1.14 SUPER-CRITICAL FLOW

hift> <Prt Sc> print <Return> repeat <Space Bar> back to menu

"C"

NATURAL CHANNELS

RIABLES LIST:
Y - FLOW ELEVATION Q - FLOWRATE S - CHANNEL SLOPE

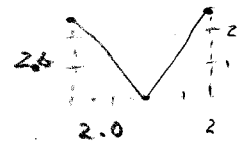
RIABLE TO BE SOLVED (Y,Q OR S) ? Y

(CFS) ? 6.50 - 3.5 - 2yr
(FT/FT) ? .04

Enter up to 20 cross-section points.
Enter <Return> only for distance to end.

CROSS-SECTION POINTS

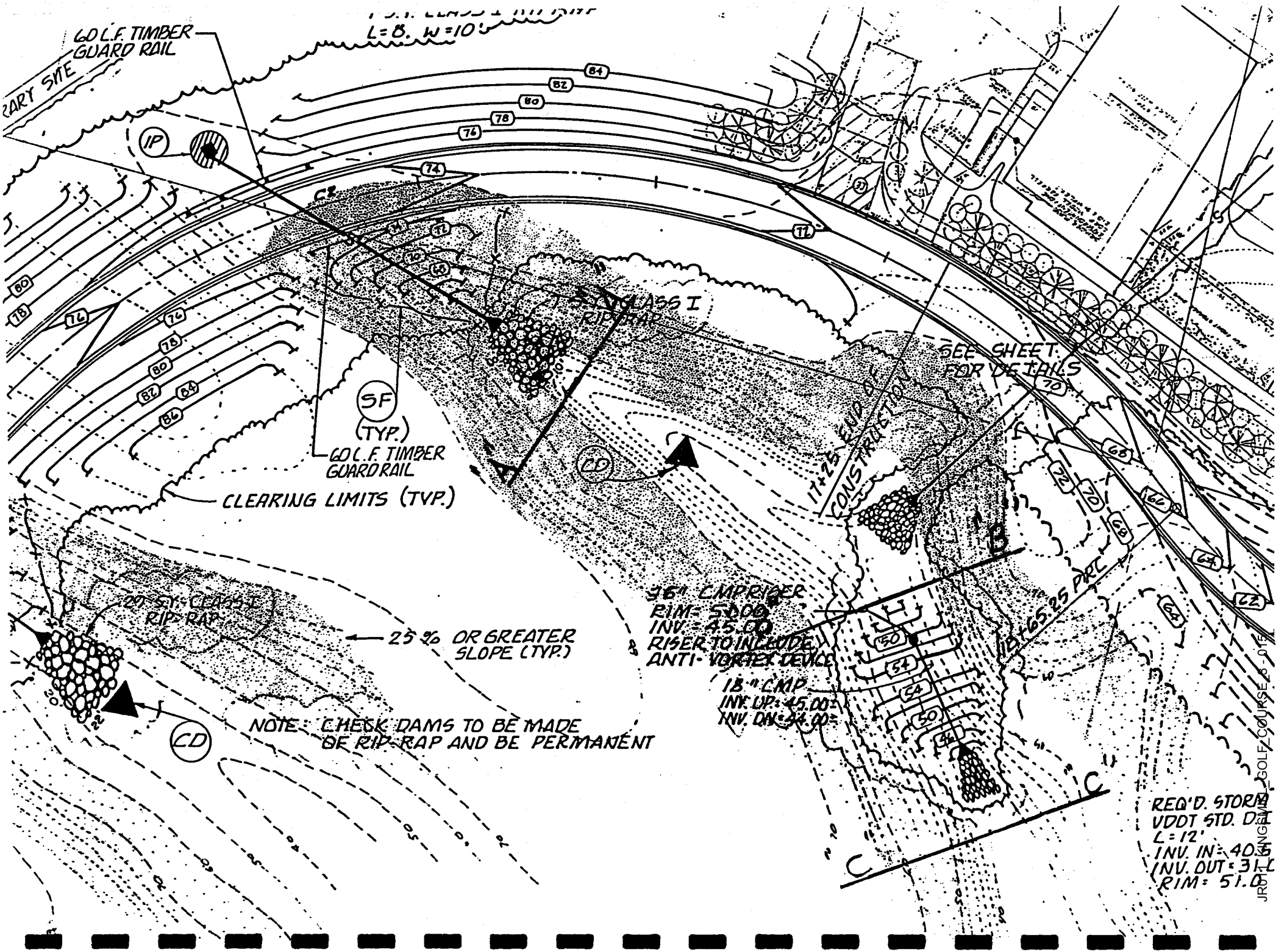
DIST	ELEV	COEFF	DIST	ELEV	COEFF
-20.0	11.3	.045			
-2.0	2.6	.045			
0	2.6	.045			
2.0	2.6	.045			
20	4.5	.045			



1:1.3

RESULTS
==========
2.96 FT
2.22 SF
8.30 FT
2.93 FPS
0.99 SUB-CRITICAL FLOW

hift> <Prt Sc> print <Return> repeat <Space Bar> back to menu


60 L.F. TIMBER GUARD RAIL
L=8, W=10'
IP
SF (TYP.)
60 L.F. TIMBER GUARDRAIL
CLEARING LIMITS (TYP.)
CLASS I RIP-RAP
CD
11+25 END OF CONSTRUCTION
SEE SHEET FOR DETAILS
20 S.Y. CLASS I RIP-RAP
25% OR GREATER SLOPE (TYP.)
36" CMP RISER
RIM = 50.00
INV. = 45.00
RISER TO INCLUDE ANTI-VORTEX DEVICE
18" CMP
INV. UP = 45.00
INV. DN = 44.00
12+65.25 PRC
NOTE: CHECK DAMS TO BE MADE OF RIP-RAP AND BE PERMANENT
REQ'D. STORM
VDOT STD. D
L = 12'
INV. IN = 40.5
INV. OUT = 31.0
RIM = 51.0

Busch Properties Inc.
Members Golf Course Maintenance Facility
Chesapeake Bay Compliance

The Chesapeake Bay Ordinance requirements for the Maintenance Facility is met through the use of a long duration detention basin. The basin detains an amount of water equal to the runoff produced by one inch of rainfall for a period of six to twelve hours. This facility is a 4 point BMP under the County's ten point procedure

The total basin area draining to the detention facility is 4.5 acres. This area contains 1.4 acres of impervious surface in the post-development condition and 2.7 acres of undisturbed natural open space. The accompanying ten point computational sheet shows that the requisite ten points are achieved.

The modified rational hydrograph was used as the basis for storm routing. For the three storms computed, the 2, 10 and 100 year storms, the calculated times of duration for maximum storage are as follows: (the page numbers refer to attached calculations)

- 2 year ; T_d = 53 min. ; Pg. 1
- 10 year ; T_d = 45 min. ; Pg. 2
- 100 year ; T_d = 41 min. ; Pg. 3

Page 14 of the calculations shows the basin volumes. The required 5390 cubic feet of storage occurs at an elevation of 49.79.

The basin outlet structure consists of a 36 inch vertical standpipe with its rim elevation at 52.00 as shown on page 17. The long duration detention is achieved by a two inch diameter orifice at invert elevation 45.5, as shown on page 18.

The two year storm routing begins on page 21. The required storage volume of 5390 cubic feet occurs at approximately 31 minutes on the rising limb of the hydrograph and at approximately 407 minutes on the falling limb. The time difference between 407 minutes and the time of basin flow termination at 870 minutes is 7.7 hours, or greater than the requisite 6 hours for a pre post BMP.

Flow attenuation by the 2, 10 and 100 year storms are as follows:

Storm	Pre-Dev. Peak Q	Post Dev. Peak Q	Page
2 year	3.5	0.30	29
10 year	4.5	1.56	33
100 year	6.4	7.32	37

The crest of the basin's impoundment dam is elevation 54. The peak elevation of the 100 year storm is 52.34. No emergency spillway is provided.

– should be 1

TABLE 3

WORKSHEET FOR BMP POINT SYSTEM

A. STRUCTURAL BMP POINT ALLOCATION

BMP	BMP Points		Fraction of Site Served by BMP		Weighted BMP Points
	4	x	$\frac{4.5}{4.5}$	=	4
		x		=	
		x		=	
		x		=	

TOTAL WEIGHTED STRUCTURAL BMP POINTS: _____

B. NATURAL OPEN SPACE CREDIT

Fraction of Site		Natural Open Space Credit		Points for Natural Open Space
$\frac{2.7}{4.5}$ = 0.60	x	(0.1 per 1%)	=	6

C. TOTAL WEIGHTED POINTS

4	+	6	=	10
Structural BMP Points		Natural Open Space Points		TOTAL

PRE-DEV.

T_c = 20 MIN. 30 min

A = 4.0 Ac.

C = 0.25

i_2 = 3.5"/HR. 2.7

i_{10} = 4.5"/HR.

i_{100} = 6.4"/HR.

$Q_2 = (4.0)(0.25)(\cancel{3.5}\ 2.7) = \cancel{3.5}\ 2.7$ c.f.s.

$Q_{10} = (4.0)(0.25)(4.5) = 4.5$ c.f.s.

$Q_{100} = (4.0)(0.25)(6.4) = 6.4$ c.f.s.

POST - DEV.

T_c = 15 MIN.

A = 4.5 Ac.

C = 1.4 x 0.9 = 1.26
3.1 x 0.25 = 0.77
2.03
2.03 ÷ 4.5 = 0.45

Q_{post} = 0.45 x 4.5 x 3.9 = 7.9 cfs

POST- DEV.

PERCENT IMPERVIOUS

1.4 Ac. ÷ 4.5 Ac = 0.31 = 31%

R = 0.05 + 0.009 I

R = 0.05 + 0.009(31)

R = 0.33

VOL. OF RUNOFF FROM 1" RAINFALL

$$Vol = \frac{(1")(0.33)}{12}(4.5Ac) = 0.12\ Ac\text{-}Ft. = 5390\ c.f.$$

need - 5510 ft^3 to reduce 2 yr to 3.5 cfs ← D = 1.17' Q = 3.5 cfs V = 3.3 '/sec

6810 ft^3 " " " " 2.7 cfs ← D = 1.05 Q = 2.7 V = 3.1

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 05:20:26 04-03-1993

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

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

BPI MAINTENANCE CENTER MOD RAT

```
*****************************************************************************
*  RETURN FREQUENCY:   2 yr      |  Allowable Outflow:      3.50 cfs      *
*  'C' Adjustment: 1.000         |  Required Storage:     5,353 cu.ft.  *
*---------------------------------------------------------------------------*
*  Peak Inflow:     3.93 cfs        Inflow .HYD stored: BPMCM2  .HYD      *
*****************************************************************************
```

```
|                Td =  53 minutes                      |  Return Freq:      2 yr
/-------- Approx. Duration for Max. Storage -------/    C adj.factor: 1.00
|                                                      |
|                                                      |
|                Tc=   15.00  minutes                  |
|                I =   4.000  in/hr                    |  Area (ac):      4.50
|              . Q =    8.10  cfs                      |  Weighted C:     0.45
|             .|.                                      |  Adjusted C:     0.45
F|            .   .                                    |
L|           .  |  .                Required Storage   |
O|          .       .          .--      5,353 cu.ft.  |  Td=       53 minutes
W|         .    |    .         |                      |  I =    1.940 in/hr
|        .     x x x x x x x x|x x x x x x x x x x x  |  Q =     3.93 cfs
c|       .                     |                       |
f|      .    x                                         x
s|     .                                                o   Q=     3.50 cfs
|    .   x                                            |x  (Allow.Outflow)
|   .  x                      .      o                |
|  .  x                 o     .       NOT TO SCALE    |   x
| . x        o                .       ============    |
| o                            .                      |       x
`-------------------------------------------------------|-------------
                                                      54.64 minutes
```

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 05:20:26 04-03-1993

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

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

BPI MAINTENANCE CENTER MOD RAT

```
*****************************************************************
*  RETURN FREQUENCY:  10 yr      |  Allowable Outflow:     4.50 cfs    *
*  'C' Adjustment: 1.000         |  Required Storage:     8,029 cu.ft. *
*---------------------------------------------------------------------*
*  Peak Inflow:    5.97 cfs        Inflow .HYD stored: BPMCM10 .HYD    *
*****************************************************************
```

```
|                Td =  45 minutes                    |  Return Freq:     10 yr
/------- Approx. Duration for Max. Storage -------/   C adj.factor: 1.00
|                                                    |
|                                                    |
|                Tc=   15.00  minutes                |
|                I =   5.250  in/hr                  |  Area (ac):      4.50
|              . Q =   10.63  cfs                    |  Weighted C:     0.45
|             .|.                                    |  Adjusted C:     0.45
F             .   .                                  |
L            .  |  .              Required Storage   |
O          .        .         .--      8,029 cu.ft. |  Td=       45 minutes
W         .    |    .        |                     |  I =    2.950 in/hr
         .     x x x x x x x|x x x x x x x x x x x  Q =     5.97 cfs
c       .                    |
f     .    x                                         x
s    .                                                 o   Q=     4.50 cfs
    .   x                                 o            |x  (Allow.Outflow)
   .  x                     .      o                  |
  .  x                 o     .        NOT TO SCALE     |   x
 . x        o                 .       ============     |
o                               .                      |       x
`-------------------------------------------------------|-------------
                                                   48.70 minutes
```

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 05:20:26 04-03-1993

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

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

BPI MAINTENANCE CENTER MOD RAT

```
*****************************************************************
*  RETURN FREQUENCY: 100 yr      |  Allowable Outflow:     6.40 cfs    *
*  'C' Adjustment: 1.000         |  Required Storage:    11,316 cu.ft. *
*---------------------------------------------------------------------*
*  Peak Inflow:     8.97 cfs        Inflow .HYD stored: BPMCM100.HYD   *
*****************************************************************
```

```
|                 Td =  41 minutes                    |  Return Freq:    100 yr
/------- Approx. Duration for Max. Storage ------/     C adj.factor: 1.00
|                                                     |
|                                                     |
|                 Tc=    15.00  minutes               |
|                 I =    7.200  in/hr                 |  Area (ac):      4.50
|               . Q =    14.58  cfs                   |  Weighted C:     0.45
|              .|.                                    |  Adjusted C:     0.45
F|             .   .                                  |
L|            .  |  .              Required Storage   |
O|          .        .         .--    11,316 cu.ft.  |  Td=       41 minutes
W|         .    |    .        |                      |  I =    4.430 in/hr
|        .     x x x x x x x x|x x x x x x x x x x x  |  Q =     8.97 cfs
c|       .                     |                      |
f|      .    x                                        |  x
s|     .                                              |    o   Q=     6.40 cfs
|    .   x                                o           |   |x  (Allow.Outflow)
|   .  x                     .     o                 |
|  .  x                 o     .       NOT TO SCALE    |    x
| . x        o                  .      ============   |
| o                                .                  |       x
`-------------------------------------------------------|-------------
                                                        45.30 minutes
```

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 05:20:26 04-03-1993

4.

BPI MAINTENANCE CENTER MOD RAT

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

Weighted C = 0.450 Area= 4.500 acres Tc = 15.00 minutes

Adjusted C = 0.450 Td= 53.00 min. I= 1.94 in/hr Qp= 3.93 cfs

RETURN FREQUENCY: 2 year storm Adj.factor = 1.00
Output file: BPMCM2 .HYD

HYDROGRAPH FOR MAXIMUM STORAGE
For the 2 Year Storm

Time increment = 5.00 Minutes
Time on left represents time for first Q in each row.

Time Minutes							
0.00	0.00	1.31	2.62	3.93	3.93	3.93	3.93
35.00	3.93	3.93	3.93	3.93	3.40	2.10	0.79

5.

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 05:20:26 04-03-1993

BPI MAINTENANCE CENTER MOD RAT

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

Weighted C = 0.450 Area= 4.500 acres Tc = 15.00 minutes

Adjusted C = 0.450 Td= 45.00 min. I= 2.95 in/hr Qp= 5.97 cfs

RETURN FREQUENCY: 10 year storm Adj.factor = 1.00
Output file: BPMCM10 .HYD

HYDROGRAPH FOR MAXIMUM STORAGE
For the 10 Year Storm

Time increment = 5.00 Minutes
Time on left represents time for first Q in each row.

Time Minutes							
0.00	0.00	1.99	3.98	5.97	5.97	5.97	5.97
35.00	5.97	5.97	5.97	3.98	1.99	0.00	

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 05:20:26 04-03-1993

BPI MAINTENANCE CENTER MOD RAT

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

Weighted C = 0.450 Area= 4.500 acres Tc = 15.00 minutes

Adjusted C = 0.450 Td= 41.00 min. I= 4.43 in/hr Qp= 8.97 cfs

RETURN FREQUENCY: 100 year storm Adj.factor = 1.00
Output file: BPMCM100.HYD

HYDROGRAPH FOR MAXIMUM STORAGE
For the 100 Year Storm

Time increment = 5.00 Minutes
Time on left represents time for first Q in each row.

Time Minutes							
0.00	0.00	2.99	5.98	8.97	8.97	8.97	8.97
35.00	8.97	8.97	6.58	3.59	0.60		

7

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 05:20:26 04-03-1993

BPI MAINTENANCE CENTER MOD RAT

* * * * * * 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)
AREA TO BPMC								
	0.450	4.50						
			15.00	0.450	0.450	4.000	4.50	8.10

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 05:20:26 04-03-1993

BPI MAINTENANCE CENTER MOD RAT

* * * * * * 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)
AREA TO BPMC								
	0.450	4.50						
			15.00	0.450	0.450	5.250	4.50	10.63

9.

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 05:20:26 04-03-1993

BPI MAINTENANCE CENTER MOD RAT

* * * * * * 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
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)
AREA TO BPMC								
	0.450	4.50						
			15.00	0.450	0.450	7.200	4.50	14.58

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 05:20:26 04-03-1993

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

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

BPI MAINTENANCE CENTER MOD RAT

Area = 4.50 acres Tc = 15.00 minutes

Frequency (years)	Adjusted 'C'	Duration minutes	Intens. in/hr	Qpeak cfs	Allowable cfs	VOLUMES Inflow (cu.ft.)	VOLUMES Storage (cu.ft.)
2	0.450	53	1.940	3.93	3.50	12,493	5,353
10	0.450	45	2.950	5.97	4.50	16,129	8,029
100	0.450	41	4.430	8.97	6.40	22,068	11,316

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 05:20:26 04-03-1993

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

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

BPI MAINTENANCE CENTER MOD RAT

RETURN FREQUENCY: 2 yr 'C' Adjustment = 1.000 Allowable Q = 3.50 cfs

Hydrograph file duration= 53.00 minutes
Hydrograph file: BPMCM2 .HYD Tc = 15.00 minutes

Weighted 'C'	Adjusted 'C'	Duration minutes	Intens. in/hr	Areas acres	Qpeak cfs	VOLUMES Inflow (cu.ft.)	Storage (cu.ft.)
0.450	0.450	15	4.000	4.50	8.10	7,290	4,140
0.450	0.450	20	3.500	4.50	7.09	8,505	4,830
0.450	0.450	30	2.750	4.50	5.57	10,024	5,299
0.450	0.450	40	2.250	4.50	4.56	10,935	5,160
0.450	0.450	50	2.000	4.50	4.05	12,150	5,325
********** Storage Maximum							
0.450	0.450	53	1.940	4.50	3.93	12,493	5,353
**********							
0.450	0.450	60	1.800	4.50	3.64	13,122	5,247
0.450	0.450	120	1.150	4.50	2.33	Qpeak < Qallow	

? This indicates basin doesn't work for 60 min. tc

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 05:20:26 04-03-1993

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

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

BPI MAINTENANCE CENTER MOD RAT

RETURN FREQUENCY: 10 yr 'C' Adjustment = 1.000 Allowable Q = 4.50 cfs

Hydrograph file duration= 45.00 minutes
Hydrograph file: BPMCM10 .HYD Tc = 15.00 minutes

Weighted 'C'	Adjusted 'C'	Duration minutes	Intens. in/hr	Areas acres	Qpeak cfs	VOLUMES Inflow (cu.ft.)	Storage (cu.ft.)
0.450	0.450	15	5.250	4.50	10.63	9,568	5,518
0.450	0.450	20	4.700	4.50	9.52	11,421	6,696
0.450	0.450	30	3.750	4.50	7.59	13,669	7,594
0.450	0.450	40	3.150	4.50	6.38	15,309	7,884
********** Storage Maximum							
0.450	0.450	45	2.950	4.50	5.97	16,129	8,029
**********							
0.450	0.450	50	2.750	4.50	5.57	16,706	7,931
0.450	0.450	60	2.450	4.50	4.96	17,861	7,735
0.450	0.450	120	1.600	4.50	3.24	Qpeak < Qallow	

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 05:20:26 04-03-1993

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

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

BPI MAINTENANCE CENTER MOD RAT

RETURN FREQUENCY: 100 yr 'C' Adjustment = 1.000 Allowable Q = 6.40 cfs

Hydrograph file duration= 41.00 minutes
Hydrograph file: BPMCM100.HYD Tc = 15.00 minutes

Weighted 'C'	Adjusted 'C'	Duration minutes	Intens. in/hr	Areas acres	Qpeak cfs	VOLUMES Inflow (cu.ft.)	Storage (cu.ft.)
0.450	0.450	15	7.200	4.50	14.58	13,122	7,362
0.450	0.450	20	6.500	4.50	13.16	15,795	9,075
0.450	0.450	30	5.250	4.50	10.63	19,136	10,496
0.450	0.450	40	4.500	4.50	9.11	21,870	11,310
********** Storage Maximum							
0.450	0.450	41	4.430	4.50	8.97	22,068	11,316
**********							
0.450	0.450	50	3.800	4.50	7.69	23,085	10,605
0.450	0.450	60	3.400	4.50	6.88	24,786	10,386
0.450	0.450	120	2.250	4.50	4.56	Qpeak < Qallow	

(14)

POND-2 Version: 5.17
S/N: 1295130250

BUSCH PROPERTIES MAINT CENTER DETENTION BASIN

CALCULATED 04-03-1993 05:25:25
DISK FILE: b:BPMC .VOL

Planimeter scale: 1 inch = 50 ft.

Elevation (ft)	Planimeter (sq.in.)	Area (sq.ft)	A1+A2+sqr(A1*A2) (sq.ft)	* Volume (cubic-ft)	Volume Sum (cubic-ft)
45.00	0.00	0	0	0	0
46.00	0.05	125	125	42	42
48.00	0.60	1,500	2,058	1,372	1,414
49.79	*I*	3,035	6,668	3,979	5,393 - 2yr
50.00	1.30	3,250	6,958	4,639	6,052 3029-10
52.00	2.10	5,250	12,631	8,420	14,473 11,36-100
54.00	2.90	7,250	18,669	12,446	26,919

I ---> Interpolated area from closest two planimeter readings.

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

Outlet Structure File: BPMC .STR

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

****
BUSCH PROPERTIES MAINT CTR DETENTION BASIN

****

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

Elevation (ft)	Q (cfs)	Contributing Structures
45.00	0.0	
45.50	0.0	
46.00	0.1	1
46.50	0.2	1
47.00	0.2	1
47.50	0.2	1
48.00	0.2	1
48.50	0.2	1
49.00	0.2	1
49.50	0.2	1
50.00	0.3	1
50.50	0.3	1
51.00	0.3	1
51.50	0.3	1
52.00	0.3	2 +1
52.50	10.6	2 +1
53.00	29.5	2 +1
53.50	42.0	2 +1
54.00	48.5	2 +1

Outlet Structure File: BPMC .STR

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

****
BUSCH PROPERTIES MAINT CTR DETENTION BASIN

****

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

Min. Elev.(ft) = 45 Max. Elev.(ft) = 54 Incr.(ft) = .5

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

****
SYSTEM CONNECTIVITY
****

Structure	No.	Q Table	Q Table
STAND PIPE	2	->	2
ORIFICE-VC	1	->	1

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

Outlet Structure File: BPMC .STR

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

****
BUSCH PROPERTIES MAINT CTR DETENTION BASIN

****

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

STAND PIPE
Stand Pipe with weir or orifice flow

E1 elev.(ft)?	52
E2 elev.(ft)?	54.001
Crest elev.(ft)?	52
Diameter (ft)?	3
Weir coefficient?	3.1
Orifice coefficient?	.6
Start transition elev.(ft) @ ?	
Transition height (ft)?	

(18)

Outlet Structure File: BPMC .STR

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

****
BUSCH PROPERTIES MAINT CTR DETENTION BASIN

****

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

ORIFICE-VC
Orifice - Vertical Circular

E1 elev.(ft)?	45.80
E2 elev.(ft)?	54.001
Orifice coeff.?	.6
Invert elev.(ft)?	45.5
Datum elev.(ft)?	44
Diameter (ft)?	.1667

Outlet Structure File: BPMC .STR

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

****
BUSCH PROPERTIES MAINT CTR DETENTION BASIN

****

Outflow Rating Table for Structure #2
STAND PIPE Stand Pipe with weir or orifice flow

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

Elevation (ft)	Q (cfs)	Computation Messages	
45.00	0.0	E < Inv.El.= 52	
45.50	0.0	E < El=52	
46.00	0.0	E < El=52	
46.50	0.0	E < El=52	
47.00	0.0	E < El=52	
47.50	0.0	E < El=52	
48.00	0.0	E < El=52	
48.50	0.0	E < El=52	
49.00	0.0	E < El=52	
49.50	0.0	E < El=52	
50.00	0.0	E < El=52	
50.50	0.0	E < El=52	
51.00	0.0	E < El=52	
51.50	0.0	E < El=52	
52.00	0.0	Weir:	H =0.0
52.50	10.3	Weir:	H =.5
53.00	29.2	Weir:	H =1.0
53.50	41.7	Orifice:	H =1.5
54.00	48.1	Orifice:	H =2.0

Weir Cw = 3.1 Weir length = 9.424779 ft
Orifice Co = .6 Orifice area = 7.068584 sq.ft.
Q (cfs) = (Cw * L * H**1.5) or (Co * A * sqr(2*g*H))
No transition used, transition height = 0.0
Weir equation = Orifice equation @ elev.= 53.16491 ft

Outlet Structure File: BPMC .STR

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

****
BUSCH PROPERTIES MAINT CTR DETENTION BASIN

****

Outflow Rating Table for Structure #1
ORIFICE-VC Orifice - Vertical Circular

Elevation (ft)	Q (cfs)	Computation Messages
45.00	0.0	E < E1=45.80
45.50	0.0	E < E1=45.80
46.00	0.1	H =2.0
46.50	0.2	H =2.5
47.00	0.2	H =3.0
47.50	0.2	H =3.5
48.00	0.2	H =4.0
48.50	0.2	H =4.5
49.00	0.2	H =5.0
49.50	0.2	H =5.5
50.00	0.3	H =6.0
50.50	0.3	H =6.5
51.00	0.3	H =7.0
51.50	0.3	H =7.5
52.00	0.3	H =8.0
52.50	0.3	H =8.5
53.00	0.3	H =9.0
53.50	0.3	H =9.5
54.00	0.3	H =10.0

C = .6 A = 2.182535E-02 sq.ft.
H (ft) = Table elev. - Datum elev. (44 ft)
Q (cfs) = C * A * sqr(2g * H)

POND-2 Version: 5.17 S/N: 1295130250
EXECUTED: 04-03-1993 05:33:29

```
*************************************************
*                                               *
*  BUSCH PROPERTIES MAINT CTR DETENTION BASIN   *
*              2 YR POST DEV STORM              *
*                                               *
*                                               *
*                                               *
*************************************************
```

Inflow Hydrograph: b:BPMCM2 .HYD
Rating Table file: b:BPMC .PND

----INITIAL CONDITIONS----
Elevation = 45.00 ft
Outflow = 0.00 cfs
Storage = 0 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
45.00	0.0	0
45.50	0.0	5
46.00	0.1	42
46.50	0.2	151
47.00	0.2	384
47.50	0.2	789
48.00	0.2	1,414
48.50	0.2	2,256
49.00	0.2	3,295
49.50	0.2	4,554
50.00	0.3	6,052
50.50	0.3	7,790
51.00	0.3	9,763
51.50	0.3	11,985
52.00	0.3	14,473
52.50	10.6	17,214
53.00	29.5	20,196
53.50	42.0	23,427
54.00	48.5	26,919

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
0.0	0.0
0.3	0.4
1.0	1.2
2.6	2.8
5.3	5.5
9.4	9.6
15.0	15.2
22.0	22.2
30.4	30.6
40.3	40.6
51.9	52.2
65.1	65.4
79.9	80.2
96.5	96.8
114.8	125.4
134.6	164.1
156.2	198.2
179.5	228.0

Time increment (t) = 5.0 min.

PND-2 Version: 5.17 S/N: 1295130250
EXECUTED: 04-03-1993 05:33:29

Pond File: b:BPMC .PND
Inflow Hydrograph: b:BPMCM2 .HYD
Outflow Hydrograph: b:OUT .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	-----	0.0	0.0	0.00	45.00
5.0	1.31	1.3	0.9	1.3	0.20	46.53
10.0	2.62	3.9	4.4	4.8	0.20	47.38
15.0	3.93	6.6	10.6	11.0	0.20	48.12
20.0	3.93	7.9	18.1	18.5	0.20	48.73
25.0	3.93	7.9	25.5	25.9	0.20	49.22
30.0	3.93	7.9	32.9	33.4	0.23	49.64
35.0	3.93	7.9	40.2	40.8	0.30	50.01
40.0	3.93	7.9	47.4	48.0	0.30	50.32
45.0	3.93	7.9	54.7	55.3	0.30	50.62
50.0	3.93	7.9	62.0	62.6	0.30	50.89
55.0	3.40	7.3	68.7	69.3	0.30	51.13
60.0	2.10	5.5	73.6	74.2	0.30	51.30
65.0	0.79	2.9	75.9	76.5	0.30	51.37
70.0	0.00	0.8	76.1	76.7	0.30	51.38 ←
75.0	0.00	0.0	75.5	76.1	0.30	51.36
80.0	0.00	0.0	74.9	75.5	0.30	51.34
85.0	0.00	0.0	74.3	74.9	0.30	51.32
90.0	0.00	0.0	73.7	74.3	0.30	51.30
95.0	0.00	0.0	73.1	73.7	0.30	51.28
100.0	0.00	0.0	72.5	73.1	0.30	51.26
105.0	0.00	0.0	71.9	72.5	0.30	51.24
110.0	0.00	0.0	71.3	71.9	0.30	51.22
115.0	0.00	0.0	70.7	71.3	0.30	51.20
120.0	0.00	0.0	70.1	70.7	0.30	51.18
125.0	0.00	0.0	69.5	70.1	0.30	51.16
130.0	0.00	0.0	68.9	69.5	0.30	51.14
135.0	0.00	0.0	68.3	68.9	0.30	51.12
140.0	0.00	0.0	67.7	68.3	0.30	51.10
145.0	0.00	0.0	67.1	67.7	0.30	51.08
150.0	0.00	0.0	66.5	67.1	0.30	51.06
155.0	0.00	0.0	65.9	66.5	0.30	51.04
160.0	0.00	0.0	65.3	65.9	0.30	51.02
165.0	0.00	0.0	64.7	65.3	0.30	51.00
170.0	0.00	0.0	64.1	64.7	0.30	50.97
175.0	0.00	0.0	63.5	64.1	0.30	50.95
180.0	0.00	0.0	62.9	63.5	0.30	50.93
185.0	0.00	0.0	62.3	62.9	0.30	50.90
190.0	0.00	0.0	61.7	62.3	0.30	50.88
195.0	0.00	0.0	61.1	61.7	0.30	50.86
200.0	0.00	0.0	60.5	61.1	0.30	50.84
205.0	0.00	0.0	59.9	60.5	0.30	50.81
210.0	0.00	0.0	59.3	59.9	0.30	50.79
215.0	0.00	0.0	58.7	59.3	0.30	50.77
220.0	0.00	0.0	58.1	58.7	0.30	50.74

ond-2 Version: 5.17 S/N: 1295130250
EXECUTED: 04-03-1993 05:33:29

ond File: b:BPMC .PND
nflow Hydrograph: b:BPMCM2 .HYD
Outflow Hydrograph: b:OUT .HYD

NFLOW HYDROGRAPH — ROUTING COMPUTATIONS

TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
225.0	0.001	0.0	57.5	58.1	0.30	50.72
230.0	0.001	0.0	56.9	57.5	0.30	50.70
235.0	0.001	0.0	56.3	56.9	0.30	50.68
240.0	0.001	0.0	55.7	56.3	0.30	50.65
245.0	0.001	0.0	55.1	55.7	0.30	50.63
250.0	0.001	0.0	54.5	55.1	0.30	50.61
255.0	0.001	0.0	53.9	54.5	0.30	50.58
260.0	0.001	0.0	53.3	53.9	0.30	50.56
265.0	0.001	0.0	52.7	53.3	0.30	50.54
270.0	0.001	0.0	52.1	52.7	0.30	50.52
275.0	0.001	0.0	51.5	52.1	0.30	50.49
280.0	0.001	0.0	50.9	51.5	0.30	50.47
285.0	0.001	0.0	50.3	50.9	0.30	50.44
290.0	0.001	0.0	49.7	50.3	0.30	50.41
295.0	0.001	0.0	49.1	49.7	0.30	50.39
300.0	0.001	0.0	48.5	49.1	0.30	50.36
305.0	0.001	0.0	47.9	48.5	0.30	50.34
310.0	0.001	0.0	47.3	47.9	0.30	50.31
315.0	0.001	0.0	46.7	47.3	0.30	50.29
320.0	0.001	0.0	46.1	46.7	0.30	50.26
325.0	0.001	0.0	45.5	46.1	0.30	50.23
330.0	0.001	0.0	44.9	45.5	0.30	50.21
335.0	0.001	0.0	44.3	44.9	0.30	50.18
340.0	0.001	0.0	43.7	44.3	0.30	50.16
345.0	0.001	0.0	43.1	43.7	0.30	50.13
350.0	0.001	0.0	42.5	43.1	0.30	50.10
355.0	0.001	0.0	41.9	42.5	0.30	50.08
360.0	0.001	0.0	41.3	41.9	0.30	50.05
365.0	0.001	0.0	40.7	41.3	0.30	50.03
370.0	0.001	0.0	40.1	40.7	0.30	50.00
375.0	0.001	0.0	39.5	40.1	0.29	49.97
380.0	0.001	0.0	38.9	39.5	0.29	49.94
385.0	0.001	0.0	38.3	38.9	0.28	49.91
390.0	0.001	0.0	37.8	38.3	0.28	49.89
395.0	0.001	0.0	37.2	37.8	0.27	49.86
400.0	0.001	0.0	36.7	37.2	0.27	49.83
405.0	0.001	0.0	36.2	36.7	0.26	49.80
410.0	0.001	0.0	35.7	36.2	0.26	49.78
415.0	0.001	0.0	35.2	35.7	0.25	49.75
420.0	0.001	0.0	34.7	35.2	0.25	49.73
425.0	0.001	0.0	34.2	34.7	0.24	49.70
430.0	0.001	0.0	33.7	34.2	0.24	49.68
435.0	0.001	0.0	33.3	33.7	0.23	49.66
440.0	0.001	0.0	32.8	33.3	0.23	49.63
445.0	0.001	0.0	32.4	32.8	0.22	49.61
450.0	0.001	0.0	31.9	32.4	0.22	49.59

PND-2 Version: 5.17 S/N: 1295130250
EXECUTED: 04-03-1993 05:33:29

Pond File: b:BPMC .PND
Inflow Hydrograph: b:BPMCM2 .HYD
Outflow Hydrograph: b:OUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
455.0	0.001	0.0	31.5	31.9	0.21	49.57
460.0	0.001	0.0	31.1	31.5	0.21	49.55
465.0	0.001	0.0	30.7	31.1	0.21	49.53
470.0	0.001	0.0	30.3	30.7	0.20	49.51
475.0	0.001	0.0	29.9	30.3	0.20	49.48
480.0	0.001	0.0	29.5	29.9	0.20	49.46
485.0	0.001	0.0	29.1	29.5	0.20	49.43
490.0	0.001	0.0	28.7	29.1	0.20	49.41
495.0	0.001	0.0	28.3	28.7	0.20	49.39
500.0	0.001	0.0	27.9	28.3	0.20	49.36
505.0	0.001	0.0	27.5	27.9	0.20	49.34
510.0	0.001	0.0	27.1	27.5	0.20	49.32
515.0	0.001	0.0	26.7	27.1	0.20	49.29
520.0	0.001	0.0	26.3	26.7	0.20	49.27
525.0	0.001	0.0	25.9	26.3	0.20	49.24
530.0	0.001	0.0	25.5	25.9	0.20	49.22
535.0	0.001	0.0	25.1	25.5	0.20	49.20
540.0	0.001	0.0	24.7	25.1	0.20	49.17
545.0	0.001	0.0	24.3	24.7	0.20	49.15
550.0	0.001	0.0	23.9	24.3	0.20	49.13
555.0	0.001	0.0	23.5	23.9	0.20	49.10
560.0	0.001	0.0	23.1	23.5	0.20	49.08
565.0	0.001	0.0	22.7	23.1	0.20	49.05
570.0	0.001	0.0	22.3	22.7	0.20	49.03
575.0	0.001	0.0	21.9	22.3	0.20	49.01
580.0	0.001	0.0	21.5	21.9	0.20	48.98
585.0	0.001	0.0	21.1	21.5	0.20	48.95
590.0	0.001	0.0	20.7	21.1	0.20	48.92
595.0	0.001	0.0	20.3	20.7	0.20	48.89
600.0	0.001	0.0	19.9	20.3	0.20	48.86
605.0	0.001	0.0	19.5	19.9	0.20	48.83
610.0	0.001	0.0	19.1	19.5	0.20	48.81
615.0	0.001	0.0	18.7	19.1	0.20	48.78
620.0	0.001	0.0	18.3	18.7	0.20	48.75
625.0	0.001	0.0	17.9	18.3	0.20	48.72
630.0	0.001	0.0	17.5	17.9	0.20	48.69
635.0	0.001	0.0	17.1	17.5	0.20	48.66
640.0	0.001	0.0	16.7	17.1	0.20	48.63
645.0	0.001	0.0	16.3	16.7	0.20	48.60
650.0	0.001	0.0	15.9	16.3	0.20	48.57
655.0	0.001	0.0	15.5	15.9	0.20	48.55
660.0	0.001	0.0	15.1	15.5	0.20	48.52
665.0	0.001	0.0	14.7	15.1	0.20	48.49
670.0	0.001	0.0	14.3	14.7	0.20	48.45
675.0	0.001	0.0	13.9	14.3	0.20	48.41
680.0	0.001	0.0	13.5	13.9	0.20	48.38

PND-2 Version: 5.17 S/N: 1295130250
EXECUTED: 04-03-1993 05:33:29

Pond File: b:BPMC .PND
Inflow Hydrograph: b:BPMCM2 .HYD
Outflow Hydrograph: b:OUT .HYD

INFLOW HYDROGRAPH — ROUTING COMPUTATIONS

TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
685.0	0.001	0.0	13.1	13.5	0.20	48.34
690.0	0.001	0.0	12.7	13.1	0.20	48.31
695.0	0.001	0.0	12.3	12.7	0.20	48.27
700.0	0.001	0.0	11.9	12.3	0.20	48.24
705.0	0.001	0.0	11.5	11.9	0.20	48.20
710.0	0.001	0.0	11.1	11.5	0.20	48.16
715.0	0.001	0.0	10.7	11.1	0.20	48.13
720.0	0.001	0.0	10.3	10.7	0.20	48.09
725.0	0.001	0.0	9.9	10.3	0.20	48.06
730.0	0.001	0.0	9.5	9.9	0.20	48.02
735.0	0.001	0.0	9.1	9.5	0.20	47.98
740.0	0.001	0.0	8.7	9.1	0.20	47.93
745.0	0.001	0.0	8.3	8.7	0.20	47.89
750.0	0.001	0.0	7.9	8.3	0.20	47.84
755.0	0.001	0.0	7.5	7.9	0.20	47.79
760.0	0.001	0.0	7.1	7.5	0.20	47.74
765.0	0.001	0.0	6.7	7.1	0.20	47.69
770.0	0.001	0.0	6.3	6.7	0.20	47.65
775.0	0.001	0.0	5.9	6.3	0.20	47.60
780.0	0.001	0.0	5.5	5.9	0.20	47.55
785.0	0.001	0.0	5.1	5.5	0.20	47.50
790.0	0.001	0.0	4.7	5.1	0.20	47.43
795.0	0.001	0.0	4.3	4.7	0.20	47.35
800.0	0.001	0.0	3.9	4.3	0.20	47.28
805.0	0.001	0.0	3.5	3.9	0.20	47.21
810.0	0.001	0.0	3.1	3.5	0.20	47.13
815.0	0.001	0.0	2.7	3.1	0.20	47.06
820.0	0.001	0.0	2.3	2.7	0.20	46.97
825.0	0.001	0.0	1.9	2.3	0.20	46.84
830.0	0.001	0.0	1.5	1.9	0.20	46.71
835.0	0.001	0.0	1.1	1.5	0.20	46.59
840.0	0.001	0.0	0.7	1.1	0.18	46.42
845.0	0.001	0.0	0.4	0.7	0.14	46.20
850.0	0.001	0.0	0.2	0.4	0.11	46.03
855.0	0.001	0.0	0.1	0.2	0.05	45.76
860.0	0.001	0.0	0.1	0.1	0.02	45.61
865.0	0.001	0.0	0.0	0.1	0.01	45.55
870.0	0.001	0.0	0.0	0.0	0.00	45.52
875.0	0.001	0.0	0.0	0.0	0.00	45.51
880.0	0.001	0.0	0.0	0.0	0.00	45.50
885.0	0.001	0.0	0.0	0.0	0.00	45.50
890.0	0.001	0.0	0.0	0.0	0.00	45.50
895.0	0.001	0.0	0.0	0.0	0.00	45.50
900.0	0.001	0.0	0.0	0.0	0.00	45.50
905.0	0.001	0.0	0.0	0.0	0.00	45.50
910.0	0.001	0.0	0.0	0.0	0.00	45.50

26

PND-2 Version: 5.17 S/N: 1295130250
EXECUTED: 04-03-1993 05:33:29

Pond File: b:BPMC .PND
Inflow Hydrograph: b:BPMCM2 .HYD
Outflow Hydrograph: b:OUT .HYD

INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
915.0	0.001	0.0	0.0	0.01	0.00	45.50
920.0	0.001	0.0	0.0	0.01	0.00	45.50
925.0	0.001	0.0	0.0	0.01	0.00	45.50
930.0	0.001	0.0	0.0	0.01	0.00	45.50
935.0	0.001	0.0	0.0	0.01	0.00	45.50
940.0	0.001	0.0	0.0	0.01	0.00	45.50
945.0	0.001	0.0	0.0	0.01	0.00	45.50
950.0	0.001	0.0	0.0	0.01	0.00	45.50
955.0	0.001	0.0	0.0	0.01	0.00	45.50
960.0	0.001	0.0	0.0	0.01	0.00	45.50
965.0	0.001	0.0	0.0	0.01	0.00	45.50
970.0	0.001	0.0	0.0	0.01	0.00	45.50
975.0	0.001	0.0	0.0	0.01	0.00	45.50
980.0	0.001	0.0	0.0	0.01	0.00	45.50
985.0	0.001	0.0	0.0	0.01	0.00	45.50
990.0	0.001	0.0	0.0	0.01	0.00	45.50
995.0	0.001	0.0	0.0	0.01	0.00	45.50
1000.0	0.001	0.0	0.0	0.01	0.00	45.50
1005.0	0.001	0.0	0.0	0.01	0.00	45.50
1010.0	0.001	0.0	0.0	0.01	0.00	45.50
1015.0	0.001	0.0	0.0	0.01	0.00	45.50
1020.0	0.001	0.0	0.0	0.01	0.00	45.50
1025.0	0.001	0.0	0.0	0.01	0.00	45.50
1030.0	0.001	0.0	0.0	0.01	0.00	45.50
1035.0	0.001	0.0	0.0	0.01	0.00	45.50
1040.0	0.001	0.0	0.0	0.01	0.00	45.50
1045.0	0.001	0.0	0.0	0.01	0.00	45.50
1050.0	0.001	0.0	0.0	0.01	0.00	45.50
1055.0	0.001	0.0	0.0	0.01	0.00	45.50
1060.0	0.001	0.0	0.0	0.01	0.00	45.50
1065.0	0.001	0.0	0.0	0.01	0.00	45.50
1070.0	0.001	0.0	0.0	0.01	0.00	45.50
1075.0	0.001	0.0	0.0	0.01	0.00	45.50
1080.0	0.001	0.0	0.0	0.01	0.00	45.50
1085.0	0.001	0.0	0.0	0.01	0.00	45.50
1090.0	0.001	0.0	0.0	0.01	0.00	45.50
1095.0	0.001	0.0	0.0	0.01	0.00	45.50
1100.0	0.001	0.0	0.0	0.01	0.00	45.50
1105.0	0.001	0.0	0.0	0.01	0.00	45.50
1110.0	0.001	0.0	0.0	0.01	0.00	45.50
1115.0	0.001	0.0	0.0	0.01	0.00	45.50
1120.0	0.001	0.0	0.0	0.01	0.00	45.50
1125.0	0.001	0.0	0.0	0.01	0.00	45.50
1130.0	0.001	0.0	0.0	0.01	0.00	45.50
1135.0	0.001	0.0	0.0	0.01	0.00	45.50
1140.0	0.001	0.0	0.0	0.01	0.00	45.50

PND-2 Version: 5.17 S/N: 1295130250
EXECUTED: 04-03-1993 05:33:29

Pond File: b:BPMC .PND
Inflow Hydrograph: b:BPMCM2 .HYD
Outflow Hydrograph: b:OUT .HYD

INFLOW HYDROGRAPH — ROUTING COMPUTATIONS

TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
1145.0	0.001	0.0	0.0	0.01	0.00	45.50
1150.0	0.001	0.0	0.0	0.01	0.00	45.50
1155.0	0.001	0.0	0.0	0.01	0.00	45.50
1160.0	0.001	0.0	0.0	0.01	0.00	45.50
1165.0	0.001	0.0	0.0	0.01	0.00	45.50
1170.0	0.001	0.0	0.0	0.01	0.00	45.50
1175.0	0.001	0.0	0.0	0.01	0.00	45.50
1180.0	0.001	0.0	0.0	0.01	0.00	45.50
1185.0	0.001	0.0	0.0	0.01	0.00	45.50
1190.0	0.001	0.0	0.0	0.01	0.00	45.50
1195.0	0.001	0.0	0.0	0.01	0.00	45.50
1200.0	0.001	0.0	0.0	0.01	0.00	45.50
1205.0	0.001	0.0	0.0	0.01	0.00	45.50
1210.0	0.001	0.0	0.0	0.01	0.00	45.50
1215.0	0.001	0.0	0.0	0.01	0.00	45.50
1220.0	0.001	0.0	0.0	0.01	0.00	45.50
1225.0	0.001	0.0	0.0	0.01	0.00	45.50
1230.0	0.001	0.0	0.0	0.01	0.00	45.50
1235.0	0.001	0.0	0.0	0.01	0.00	45.50
1240.0	0.001	0.0	0.0	0.01	0.00	45.50
1245.0	0.001	0.0	0.0	0.01	0.00	45.50
1249.9	0.001	0.0	0.0	0.01	0.00	45.50
1254.9	0.001	0.0	0.0	0.01	0.00	45.50
1259.9	0.001	0.0	0.0	0.01	0.00	45.50
1264.9	0.001	0.0	0.0	0.01	0.00	45.50
1269.9	0.001	0.0	0.0	0.01	0.00	45.50
1274.9	0.001	0.0	0.0	0.01	0.00	45.50
1279.9	0.001	0.0	0.0	0.01	0.00	45.50
1284.9	0.001	0.0	0.0	0.01	0.00	45.50
1289.9	0.001	0.0	0.0	0.01	0.00	45.50
1294.9	0.001	0.0	0.0	0.01	0.00	45.50
1299.9	0.001	0.0	0.0	0.01	0.00	45.50
1304.9	0.001	0.0	0.0	0.01	0.00	45.50
1309.9	0.001	0.0	0.0	0.01	0.00	45.50
1314.9	0.001	0.0	0.0	0.01	0.00	45.50
1319.9	0.001	0.0	0.0	0.01	0.00	45.50
1324.9	0.001	0.0	0.0	0.01	0.00	45.50
1329.9	0.001	0.0	0.0	0.01	0.00	45.50
1334.9	0.001	0.0	0.0	0.01	0.00	45.50
1339.9	0.001	0.0	0.0	0.01	0.00	45.50
1344.9	0.001	0.0	0.0	0.01	0.00	45.50
1349.9	0.001	0.0	0.0	0.01	0.00	45.50
1354.9	0.001	0.0	0.0	0.01	0.00	45.50
1359.9	0.001	0.0	0.0	0.01	0.00	45.50
1364.9	0.001	0.0	0.0	0.01	0.00	45.50
1369.9	0.001	0.0	0.0	0.01	0.00	45.50

28

PND-2 Version: 5.17 S/N: 1295130250
EXECUTED: 04-03-1993 05:33:29

Pond File: b:BPMC .PND
Inflow Hydrograph: b:BPMCM2 .HYD
Outflow Hydrograph: b:OUT .HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
1374.9	0.00
1379.9	0.00
1384.9	0.00
1389.9	0.00
1394.9	0.00
1399.9	0.00
1404.9	0.00
1409.9	0.00
1414.9	0.00
1419.9	0.00
1424.9	0.00
1429.9	0.00
1434.9	0.00
1439.9	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.0	0.0	0.00	45.50
0.0	0.0	0.0	0.00	45.50
0.0	0.0	0.0	0.00	45.50
0.0	0.0	0.0	0.00	45.50
0.0	0.0	0.0	0.00	45.50
0.0	0.0	0.0	0.00	45.50
0.0	0.0	0.0	0.00	45.50
0.0	0.0	0.0	0.00	45.50
0.0	0.0	0.0	0.00	45.50
0.0	0.0	0.0	0.00	45.50
0.0	0.0	0.0	0.00	45.50
0.0	0.0	0.0	0.00	45.50
0.0	0.0	0.0	0.00	45.50
0.0	0.0	0.0	0.00	45.50

29

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

Pond File: b:BPMC .PND
Inflow Hydrograph: b:BPMCM2 .HYD
Outflow Hydrograph: b:OUT .HYD

Starting Pond W.S. Elevation = 45.00 ft

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

Peak Inflow = 3.93 cfs
Peak Outflow = 0.30 cfs
Peak Elevation = 51.38 ft

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

Initial Storage = 0 cu-ft
Peak Storage From Storm = 11,454 cu-ft

Total Storage in Pond = 11,454 cu-ft

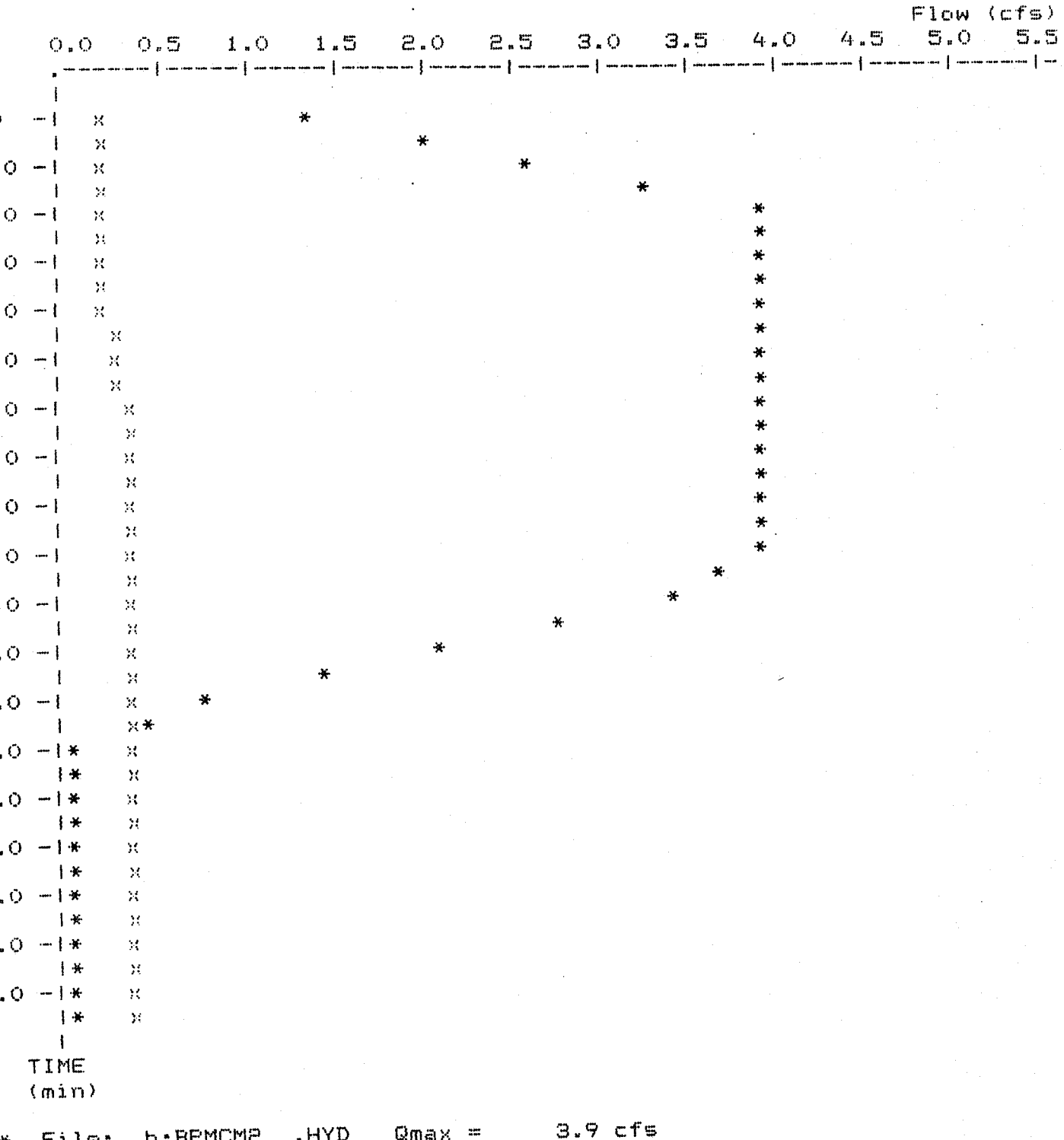
- 12,900 ft^3 - Walker

30

Pond File: b:BPMC .PND
Inflow Hydrograph: b:BPMCM2 .HYD
Outflow Hydrograph: b:OUT .HYD

EXECUTED: 04-03-1993
05:33:29

Peak Inflow = 3.93 cfs
Peak Outflow = 0.30 cfs
Peak Elevation = 51.38 ft



* File: b:BPMCM2 .HYD Qmax = 3.9 cfs
x File: b:OUT .HYD Qmax = 0.3 cfs

EXECUTED: 04-03-1993 05:38:56

```
*************************************************
*                                               *
*  BUSCH PROPERTIES MAINT CTR DETENTION BASIN   *
*              10 YR POST DEV STORM             *
*                                               *
*                                               *
*                                               *
*************************************************
```

Inflow Hydrograph: b:BPMCM10 .HYD
Rating Table file: b:BPMC .PND

-----INITIAL CONDITIONS-----
Elevation = 45.00 ft
Outflow = 0.00 cfs
Storage = 0 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
45.00	0.0	0
45.50	0.0	5
46.00	0.1	42
46.50	0.2	151
47.00	0.2	384
47.50	0.2	789
48.00	0.2	1,414
48.50	0.2	2,256
49.00	0.2	3,295
49.50	0.2	4,554
50.00	0.3	6,052
50.50	0.3	7,790
51.00	0.3	9,763
51.50	0.3	11,985
52.00	0.3	14,473
52.50	10.6	17,214
53.00	29.5	20,196
53.50	42.0	23,427
54.00	48.5	26,919

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
0.0	0.0
0.3	0.4
1.0	1.2
2.6	2.8
5.3	5.5
9.4	9.6
15.0	15.2
22.0	22.2
30.4	30.6
40.3	40.6
51.9	52.2
65.1	65.4
79.9	80.2
96.5	96.8
114.8	125.4
134.6	164.1
156.2	198.2
179.5	228.0

Time increment (t) = 5.0 min.

EXECUTED: 04-03-1993 05:38:56

32

ond File: b:BPMC .PND
nflow Hydrograph: b:BPMCM10 .HYD
Outflow Hydrograph: b:OUT .HYD

NFLOW 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	-----	0.0	0.0	0.00	45.00
5.0	1.99	2.0	1.6	2.0	0.20	46.75
10.0	3.98	6.0	7.2	7.6	0.20	47.75
15.0	5.97	9.9	16.7	17.1	0.20	48.64
20.0	5.97	11.9	28.3	28.7	0.20	49.39
25.0	5.97	11.9	39.6	40.2	0.30	49.98
30.0	5.97	11.9	50.9	51.5	0.30	50.47
35.0	5.97	11.9	62.3	62.9	0.30	50.90
40.0	5.97	11.9	73.6	74.2	0.30	51.30
45.0	5.97	11.9	85.0	85.6	0.30	51.66
50.0	3.98	9.9	94.3	94.9	0.30	51.94
55.0	1.99	6.0	97.2	100.3	1.56	52.06
60.0	0.00	2.0	96.8	99.2	1.15	52.04

33

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

Pond File: b:BPMC .PND
Inflow Hydrograph: b:BPMCM10 .HYD
Outflow Hydrograph: b:OUT .HYD

Starting Pond W.S. Elevation = 45.00 ft

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

Peak Inflow = 5.97 cfs
Peak Outflow = 1.56 cfs
Peak Elevation = 52.06 ft

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

Initial Storage = 0 cu-ft
Peak Storage From Storm = 14,808 cu-ft

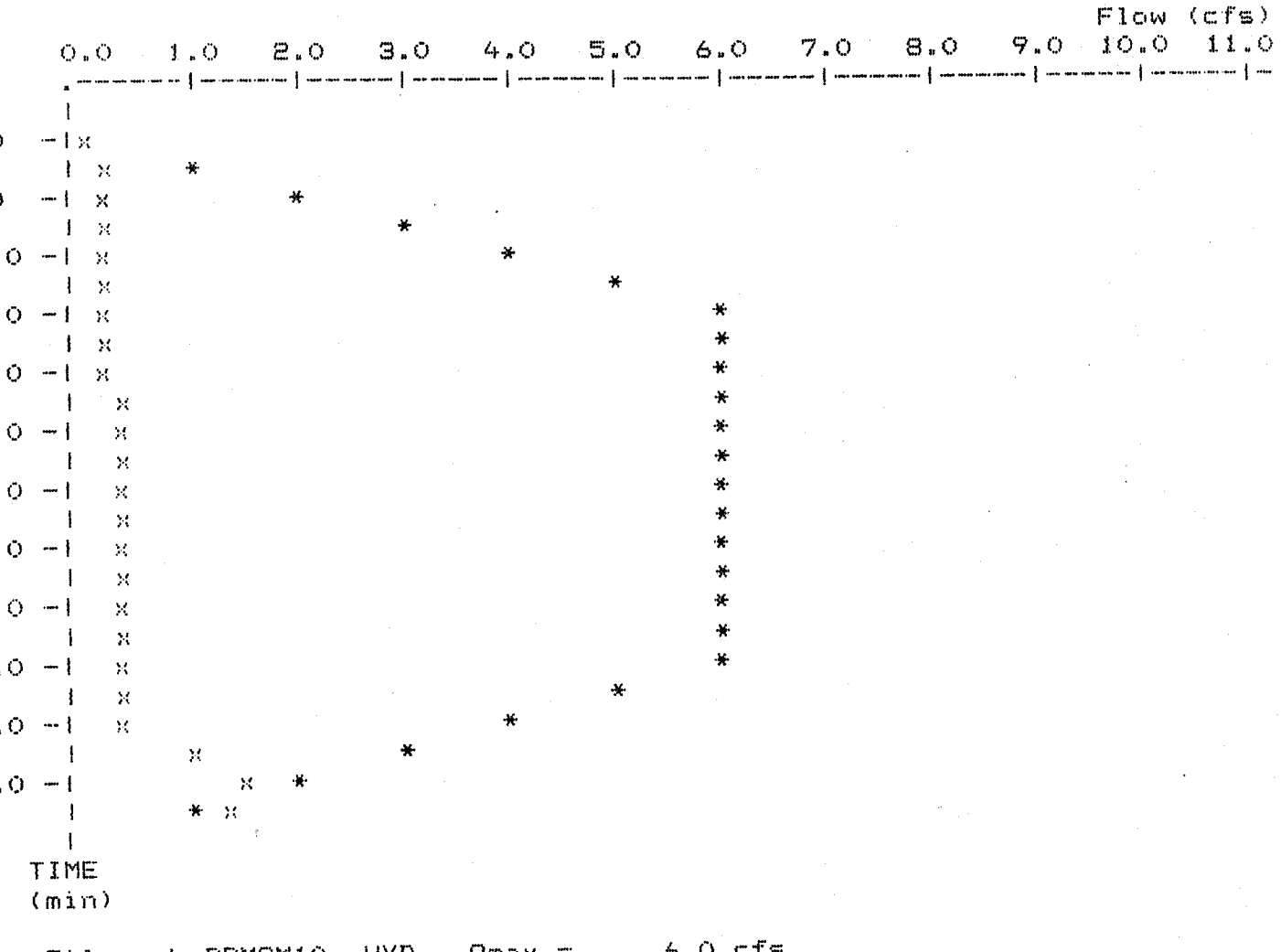
Total Storage in Pond = 14,808 cu-ft

34

Pond File: b:BPMC .PND
Inflow Hydrograph: b:BPMCM10 .HYD
Outflow Hydrograph: b:OUT .HYD

EXECUTED: 04-03-1993
05:38:56

Peak Inflow = 5.97 cfs
Peak Outflow = 1.56 cfs
Peak Elevation = 52.06 ft



* File: b:BPMCM10 .HYD Qmax = 6.0 cfs
x File: b:OUT .HYD Qmax = 1.6 cfs

EXECUTED: 04-03-1993 05:40:42

```
*************************************************
*                                               *
*  BUSCH PROPERTIES MAINT CTR DETENTION BASIN   *
*              100 YR POST DEV STORM            *
*                                               *
*                                               *
*                                               *
*************************************************
```

Inflow Hydrograph: b:BPMCM100.HYD
Rating Table file: b:BPMC .PND

-----INITIAL CONDITIONS-----
Elevation = 45.00 ft
Outflow = 0.00 cfs
Storage = 0 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
45.00	0.0	0
45.50	0.0	5
46.00	0.1	42
46.50	0.2	151
47.00	0.2	384
47.50	0.2	789
48.00	0.2	1,414
48.50	0.2	2,256
49.00	0.2	3,295
49.50	0.2	4,554
50.00	0.3	6,052
50.50	0.3	7,790
51.00	0.3	9,763
51.50	0.3	11,985
52.00	0.3	14,473
52.50	10.6	17,214
53.00	29.5	20,196
53.50	42.0	23,427
54.00	48.5	26,919

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
0.0	0.0
0.3	0.4
1.0	1.2
2.6	2.8
5.3	5.5
9.4	9.6
15.0	15.2
22.0	22.2
30.4	30.6
40.3	40.6
51.9	52.2
65.1	65.4
79.9	80.2
96.5	96.8
114.8	125.4
134.6	164.1
156.2	198.2
179.5	228.0

Time increment (t) = 5.0 min.

36

OND-2 Version: 5.17 S/N: 1295130250
EXECUTED: 04-03-1993 05:40:42

ond File: b:BPMC .PND
nflow Hydrograph: b:BPMCM100.HYD
Outflow Hydrograph: b:OUT .HYD

NFLOW 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	-----	0.0	0.0	0.00	45.00
5.0	2.99	3.0	2.6	3.0	0.20	47.04
10.0	5.98	9.0	11.2	11.6	0.20	48.17
15.0	8.97	15.0	25.7	26.1	0.20	49.23
20.0	8.97	17.9	43.1	43.7	0.30	50.13
25.0	8.97	17.9	60.4	61.0	0.30	50.83
30.0	8.97	17.9	77.7	78.3	0.30	51.44
35.0	8.97	17.9	95.1	95.7	0.30	51.97
40.0	8.97	17.9	100.7	113.0	6.15	52.28
45.0	6.58	15.6	101.6	116.3	7.32	52.34
50.0	3.59	10.2	100.4	111.8	5.71	52.26
55.0	0.60	4.2	98.4	104.6	3.10	52.14

37

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

Pond File: b:BPMC .PND
Inflow Hydrograph: b:BPMCM100.HYD
Outflow Hydrograph: b:OUT .HYD

Starting Pond W.S. Elevation = 45.00 ft

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

Peak Inflow = 8.97 cfs
Peak Outflow = 7.32 cfs
Peak Elevation = 52.34 ft

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

Initial Storage = 0 cu-ft
Peak Storage From Storm = 16,341 cu-ft

Total Storage in Pond = 16,341 cu-ft

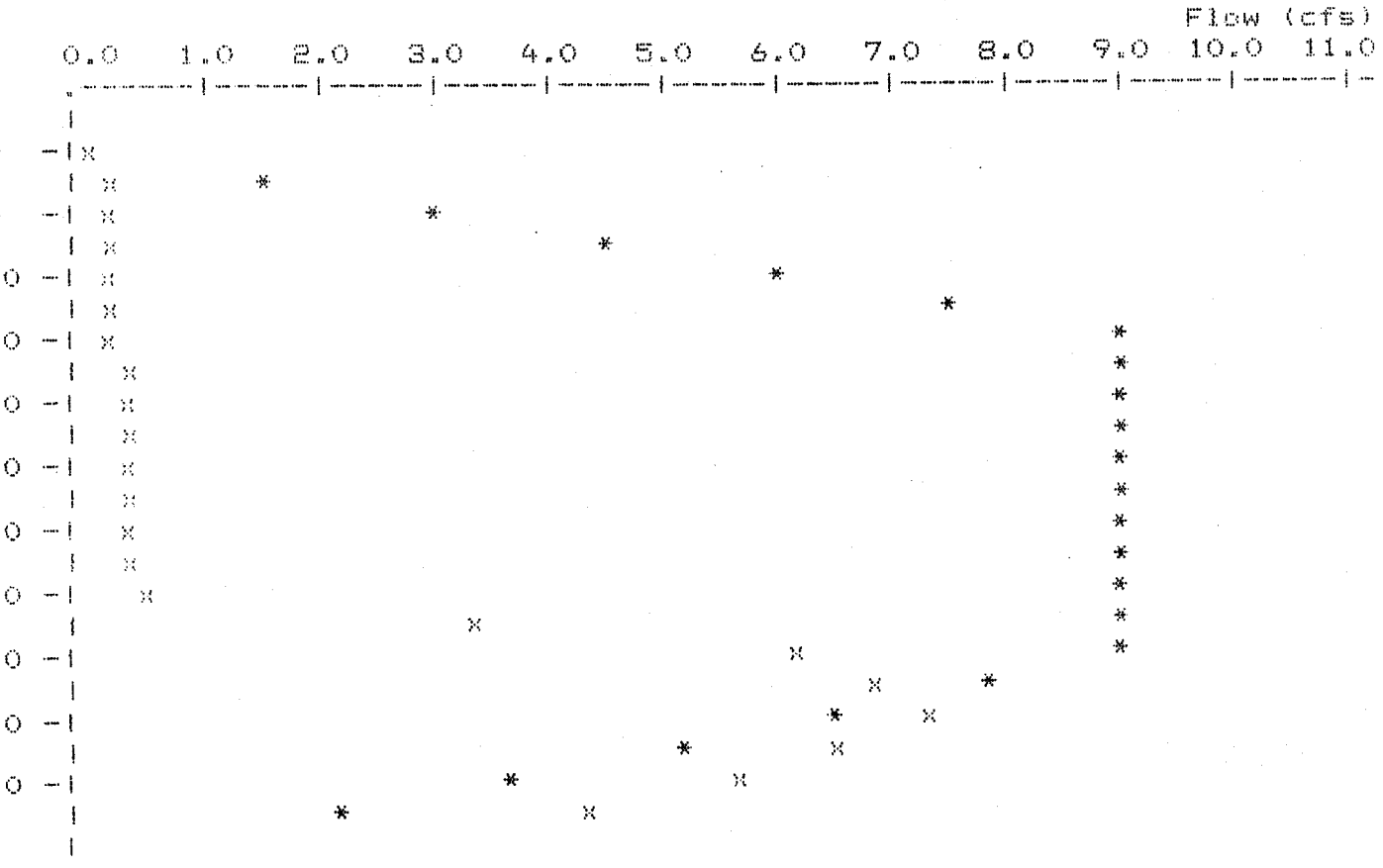
Warning: Inflow hydrograph truncated on right side.

38

Pond File: b:BPMC .PND
Inflow Hydrograph: b:BPMCM100.HYD
Outflow Hydrograph: b:OUT .HYD

EXECUTED: 04-03-1993
05:40:42

Peak Inflow = 8.97 cfs
Peak Outflow = 7.32 cfs
Peak Elevation = 52.34 ft



* File: b:BPMCM100.HYD Qmax = 9.0 cfs
x File: b:OUT .HYD Qmax = 7.3 cfs

KINGSMILL MAINTENANCE CENTER

SEDIMENT BASIN

REVISION

6/8/93

REV. 6-23-93

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 06:34:12 06-11-1993

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

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

COUNTRY CLUB
MAINTENANCE CENTER
SEDIMENT BASIN

Area = 4.50 acres Tc = 15.00 minutes

Frequency (years)	Adjusted 'C'	Duration minutes	Intens. in/hr	Qpeak cfs	Allowable cfs	VOLUMES Inflow (cu.ft.)	VOLUMES Storage (cu.ft.)
2	0.450	53	1.940	3.93	3.50	12,493	5,353
10	0.450	45	2.950	5.97	4.50	16,129	8,029
25	0.495	50	3.250	7.24	5.30	21,718	11,383
100	0.562	43	4.290	10.86	6.40	28,016	16,880

POND-2 Version: 5.17
S/N: 1295130250

COUNTRY CLUB
MAINTENANCE CENTER
SEDIMENT BASIN

CALCULATED 06-11-1993 06:51:35
DISK FILE: b:CC .VOL

Planimeter scale: 1 inch = 10 ft.

Elevation (ft)	Planimeter (sq.in.)	Area (sq.ft)	A1+A2+sqr(A1*A2) (sq.ft)	* Volume (cubic-ft)	Volume Sum (cubic-ft)
41.50	0.00	0	0	0	0
42.00	1.67	167	167	28	28
43.00	3.28	328	729	243	271
44.00	5.16	516	1,255	418	689
45.00	7.71	771	1,918	639	1,329
46.00	10.68	1,068	2,746	915	2,244
47.00	13.90	1,390	3,676	1,225	3,470
48.00	18.09	1,809	4,785	1,595	5,064
49.00	22.78	2,278	6,117	2,039	7,103
50.00	28.45	2,845	7,669	2,556	9,660
50.40	30.86	3,086	8,894	1,186	10,846
52.00	46.30	4,630	11,496	6,131	16,977
52.40	49.60	4,960	14,382	1,918	18,894

Elevations With Areas Interpolated From
The Closest Two Planimeter Readings

47.50	-----	1,593	4,470	745	4,215
49.10	-----	2,332	6,915	230	7,334
51.40	-----	4,014	10,620	3,540	14,386

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 Structure File: CC .STR

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

****
COUNTRY CLUB
MAINTENANCE CENTER
SEDIMENT BASIN

****

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

Elevation (ft)	Q (cfs)	Contributing Structures
41.50	0.0	
42.00	0.0	
42.50	0.0	
43.00	0.0	
43.50	0.0	
44.00	0.0	
44.50	0.0	
45.00	0.0	
45.50	0.0	
46.00	0.0	
46.50	0.0	
47.00	0.0	
47.50	0.0	1
48.00	10.3	1
48.50	29.2	1
49.00	41.7	1
49.50	48.1	1
50.00	53.8	1
50.50	59.0	1
51.00	63.7	1
51.50	68.5	2 +1
52.00	80.3	2 +1
52.40	95.5	2 +1

Outlet Structure File: CC .STR

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

****
COUNTRY CLUB
MAINTENANCE CENTER
SEDIMENT BASIN

****

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

Min. Elev.(ft) = 41.5 Max. Elev.(ft) = 52.4 Incr.(ft) = .5

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

****
SYSTEM CONNECTIVITY
****

Structure	No.	Q Table		Q Table
WEIR-XY	2		->	2
STAND PIPE	1		->	1

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

Outlet Structure File: CC .STR

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

****
COUNTRY CLUB
MAINTENANCE CENTER
SEDIMENT BASIN

****

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

WEIR-XY
Weir - Defined by X, Y Coordinates
E1 (ft) = 51.4 E2 (ft) = 52.401

X dist.(ft)	Y elev.(ft)
0	52.4
3	51.4
7	51.4
10	52.4

Outlet Structure File: CC .STR

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

****
COUNTRY CLUB
MAINTENANCE CENTER
SEDIMENT BASIN

****

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

STAND PIPE
Stand Pipe with weir or orifice flow

E1 elev.(ft)? 47.5
E2 elev.(ft)? 52.401
Crest elev.(ft)? 47.5
Diameter (ft)? 3.0
Weir coefficient? 3.1
Orifice coefficient? .6
Start transition elev.(ft) @ ?
Transition height (ft)?

Outlet Structure File: CC .STR

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

****
COUNTRY CLUB
MAINTENANCE CENTER
SEDIMENT BASIN

****

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

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

Elevation (ft)	Q (cfs)	Computation Messages	
41.50	0.0	E < Y min= 51.4	
42.00	0.0	E < E1= 51.4	
42.50	0.0	E < E1= 51.4	
43.00	0.0	E < E1= 51.4	
43.50	0.0	E < E1= 51.4	
44.00	0.0	E < E1= 51.4	
44.50	0.0	E < E1= 51.4	
45.00	0.0	E < E1= 51.4	
45.50	0.0	E < E1= 51.4	
46.00	0.0	E < E1= 51.4	
46.50	0.0	E < E1= 51.4	
47.00	0.0	E < E1= 51.4	
47.50	0.0	E < E1= 51.4	
48.00	0.0	E < E1= 51.4	
48.50	0.0	E < E1= 51.4	
49.00	0.0	E < E1= 51.4	
49.50	0.0	E < E1= 51.4	
50.00	0.0	E < E1= 51.4	
50.50	0.0	E < E1= 51.4	
51.00	0.0	E < E1= 51.4	
51.50	0.4	W(ft)=4.6	Max. D(ft)=.1
52.00	8.1	W(ft)=7.6	Max. D(ft)=.6
52.40	20.2	W(ft)=10.0	Max. D(ft)=1.0

Outlet Structure File: CC .STR

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

****
COUNTRY CLUB
MAINTENANCE CENTER
SEDIMENT BASIN

****

Outflow Rating Table for Structure #1
STAND PIPE Stand Pipe with weir or orifice flow

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

Elevation (ft)	Q (cfs)	Computation Messages
41.50	0.0	E < Inv.El.= 47.5
42.00	0.0	E < El= 47.5
42.50	0.0	E < El= 47.5
43.00	0.0	E < El= 47.5
43.50	0.0	E < El= 47.5
44.00	0.0	E < El= 47.5
44.50	0.0	E < El= 47.5
45.00	0.0	E < El= 47.5
45.50	0.0	E < El= 47.5
46.00	0.0	E < El= 47.5
46.50	0.0	E < El= 47.5
47.00	0.0	E < El= 47.5
47.50	0.0	Weir: H =0.0
48.00	10.3	Weir: H =.5
48.50	29.2	Weir: H =1.0
49.00	41.7	Orifice: H =1.5
49.50	48.1	Orifice: H =2.0
50.00	53.8	Orifice: H =2.5
50.50	59.0	Orifice: H =3.0
51.00	63.7	Orifice: H =3.5
51.50	68.1	Orifice: H =4.0
52.00	72.2	Orifice: H =4.5
52.40	75.3	Orifice: H =4.9

Weir Cw = 3.1 Weir length = 9.424779 ft
Orifice Co = .6 Orifice area = 7.068584 sq.ft.
Q (cfs) = (Cw * L * H**1.5) or (Co * A * sqr(2*g*H))
No transition used, transition height = 0.0
Weir equation = Orifice equation @ elev.= 48.66491 ft

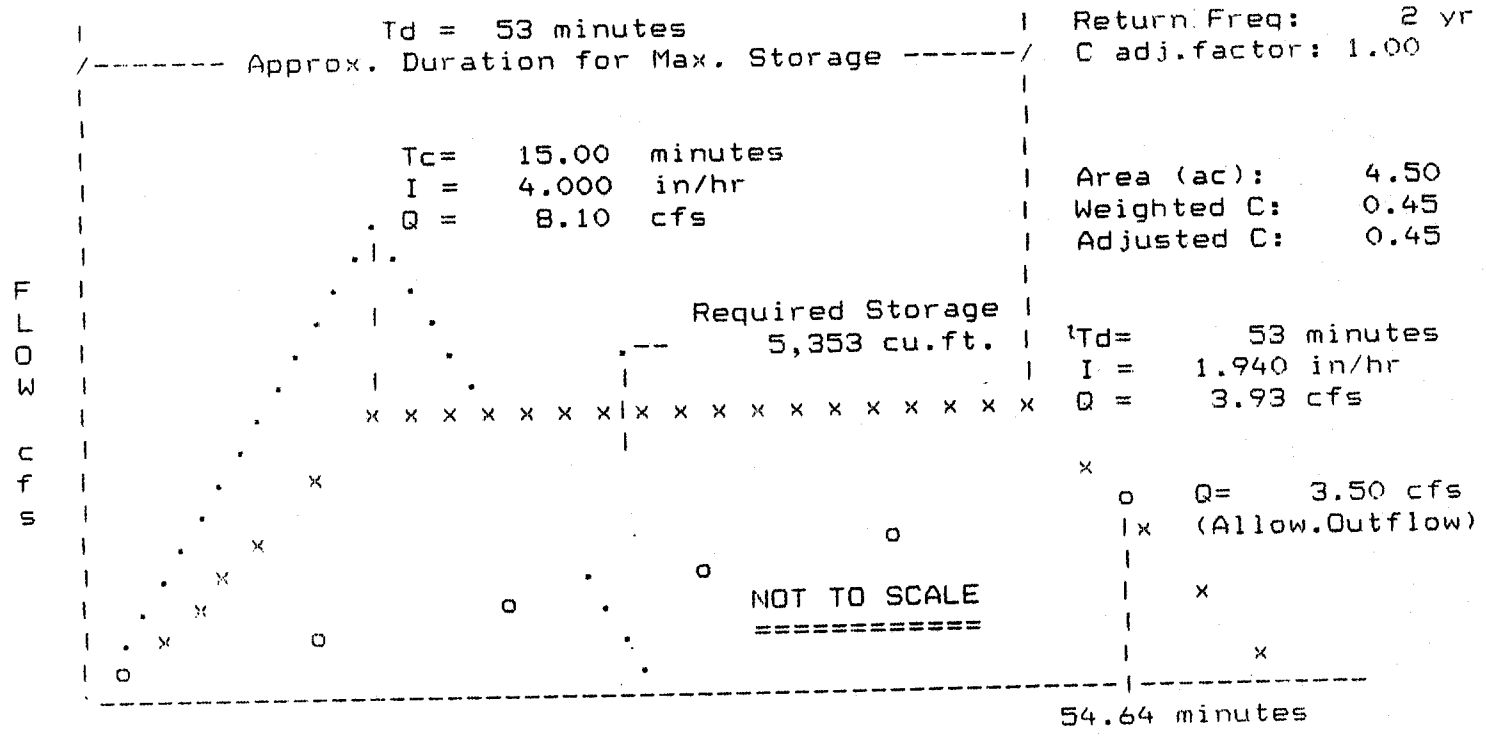
Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 06:34:12 06-11-1993

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

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

COUNTRY CLUB
MAINTENANCE CENTER
SEDIMENT BASIN

```
*****************************************************************
*  RETURN FREQUENCY:    2 yr      |  Allowable Outflow:     3.50 cfs    *
*  'C' Adjustment: 1.000          |  Required Storage:     5,353 cu.ft. *
*---------------------------------------------------------------------*
*  Peak Inflow:     3.93 cfs        Inflow .HYD stored: 2 IN    .HYD    *
*****************************************************************
```



Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 06:34:12 06-11-1993

COUNTRY CLUB
MAINTENANCE CENTER
SEDIMENT BASIN

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

Weighted C = 0.450 Area= 4.500 acres Tc = 15.00 minutes

Adjusted C = 0.450 Td= 53.00 min. I= 1.94 in/hr Qp= 3.93 cfs

RETURN FREQUENCY: 2 year storm Adj.factor = 1.00
Output file: 2 IN .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	0.26	0.52	0.79	1.05	1.31	1.57
7.00	1.83	2.10	2.36	2.62	2.88	3.14	3.40
14.00	3.67	3.93	3.93	3.93	3.93	3.93	3.93
21.00	3.93	3.93	3.93	3.93	3.93	3.93	3.93
28.00	3.93	3.93	3.93	3.93	3.93	3.93	3.93
35.00	3.93	3.93	3.93	3.93	3.93	3.93	3.93
42.00	3.93	3.93	3.93	3.93	3.93	3.93	3.93
49.00	3.93	3.93	3.93	3.93	3.93	3.67	3.40
56.00	3.14	2.88	2.62	2.36	2.10	1.83	1.57
63.00	1.31	1.05	0.79	0.52	0.26	0.00	

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 06:34:12 06-11-1993

COUNTRY CLUB
MAINTENANCE CENTER
SEDIMENT BASIN

* * * * * * 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)
	0.450	4.50						
			15.00	0.450	0.450	4.000	4.50	8.10

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 06:34:12 06-11-1993

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

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

COUNTRY CLUB
MAINTENANCE CENTER
SEDIMENT BASIN

RETURN FREQUENCY: 2 yr 'C' Adjustment = 1.000 Allowable Q = 3.50 cfs

Hydrograph file duration= 53.00 minutes
Hydrograph file: 2 IN .HYD Tc = 15.00 minutes

Weighted 'C'	Adjusted 'C'	Duration minutes	Intens. in/hr	Areas acres	Qpeak cfs	VOLUMES Inflow (cu.ft.)	Storage (cu.ft.)
0.450	0.450	15	4.000	4.50	8.10	7,290	4,140
0.450	0.450	20	3.500	4.50	7.09	8,505	4,830
0.450	0.450	30	2.750	4.50	5.57	10,024	5,299
0.450	0.450	40	2.250	4.50	4.56	10,935	5,160
0.450	0.450	50	2.000	4.50	4.05	12,150	5,325
********** Storage Maximum							
0.450	0.450	53	1.940	4.50	3.93	12,493	5,353
**********							
0.450	0.450	60	1.800	4.50	3.64	13,122	5,247
0.450	0.450	120	1.150	4.50	2.33	Qpeak < Qallow	

```
*************************
*                       *
*     COUNTRY CLUB      *
*  MAINTENANCE CENTER   *
*    SEDIMENT BASIN     *
*                       *
*                       *
*************************
```

Inflow Hydrograph: b:2 IN .HYD
Rating Table file: b:CC .PND

----INITIAL CONDITIONS----
Elevation = 41.50 ft
Outflow = 0.00 cfs
Storage = 0 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
41.50	0.0	0
42.00	0.0	28
42.50	0.0	129
43.00	0.0	271
43.50	0.0	457
44.00	0.0	689
44.50	0.0	977
45.00	0.0	1,329
45.50	0.0	1,749
46.00	0.0	2,244
46.50	0.0	2,817
47.00	0.0	3,470
47.50	0.0	4,214
48.00	10.3	5,064
48.50	29.2	6,025
49.00	41.7	7,103
49.50	48.1	8,311
50.00	53.8	9,660
50.50	59.0	11,158
51.00	63.7	12,858
51.50	68.5	14,792
52.00	80.3	16,977
52.40	95.5	18,894

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
0.9	0.9
4.3	4.3
9.0	9.0
15.2	15.2
23.0	23.0
32.6	32.6
44.3	44.3
58.3	58.3
74.8	74.8
93.9	93.9
115.6	115.6
140.5	140.5
168.8	179.1
200.8	230.0
236.7	278.4
277.0	325.1
321.9	375.7
371.9	430.9
428.5	492.2
493.0	561.5
565.8	646.1
629.7	725.2

Time increment (t) = 1.0 min.

Pond File: b:CC .PND
Inflow Hydrograph: b:2 IN .HYD
Outflow Hydrograph: b:2 OUT .HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
0.0	0.00
1.0	0.26
2.0	0.52
3.0	0.79
4.0	1.05
5.0	1.31
6.0	1.57
7.0	1.83
8.0	2.10
9.0	2.36
10.0	2.62
11.0	2.88
12.0	3.14
13.0	3.40
14.0	3.67
15.0	3.93
16.0	3.93
17.0	3.93
18.0	3.93
19.0	3.93
20.0	3.93
21.0	3.93
22.0	3.93
23.0	3.93
24.0	3.93
25.0	3.93
26.0	3.93
27.0	3.93
28.0	3.93
29.0	3.93
30.0	3.93
31.0	3.93
32.0	3.93
33.0	3.93
34.0	3.93
35.0	3.93
36.0	3.93
37.0	3.93
38.0	3.93
39.0	3.93
40.0	3.93
41.0	3.93
42.0	3.93
43.0	3.93
44.0	3.93

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
-----	0.0	0.0	0.00	41.50
0.3	0.3	0.3	0.00	41.64
0.8	1.0	1.0	0.00	42.02
1.3	2.4	2.4	0.00	42.21
1.8	4.2	4.2	0.00	42.48
2.4	6.6	6.6	0.00	42.74
2.9	9.4	9.4	0.00	43.03
3.4	12.8	12.8	0.00	43.31
3.9	16.8	16.8	0.00	43.60
4.5	21.2	21.2	0.00	43.89
5.0	26.2	26.2	0.00	44.17
5.5	31.7	31.7	0.00	44.46
6.0	37.7	37.7	0.00	44.72
6.5	44.3	44.3	0.00	45.00
7.1	51.3	51.3	0.00	45.25
7.6	58.9	58.9	0.00	45.52
7.9	66.8	66.8	0.00	45.76
7.9	74.7	74.7	0.00	46.00
7.9	82.5	82.5	0.00	46.20
7.9	90.4	90.4	0.00	46.41
7.9	98.2	98.2	0.00	46.60
7.9	106.1	106.1	0.00	46.78
7.9	114.0	114.0	0.00	46.96
7.9	121.8	121.8	0.00	47.12
7.9	129.7	129.7	0.00	47.28
7.9	137.5	137.5	0.00	47.44
7.9	142.8	145.4	1.32	47.56
7.9	145.2	150.6	2.71	47.63
7.9	146.3	153.1	3.36	47.66
7.9	146.9	154.2	3.66	47.68
7.9	147.1	154.7	3.81	47.68
7.9	147.2	155.0	3.87	47.69
7.9	147.3	155.1	3.90	47.69
7.9	147.3	155.1	3.92	47.69
7.9	147.3	155.2	3.92	47.69
7.9	147.3	155.2	3.93	47.69
7.9	147.3	155.2	3.93	47.69
7.9	147.3	155.2	3.93	47.69
7.9	147.3	155.2	3.93	47.69
7.9	147.3	155.2	3.93	47.69
7.9	147.3	155.2	3.93	47.69
7.9	147.3	155.2	3.93	47.69
7.9	147.3	155.2	3.93	47.69
7.9	147.3	155.2	3.93	47.69
7.9	147.3	155.2	3.93	47.69
7.9	147.3	155.2	3.93	47.69

Pond File: b:CC .PND
Inflow Hydrograph: b:2 IN .HYD
Outflow Hydrograph: b:2 OUT .HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
45.0	3.93
46.0	3.93
47.0	3.93
48.0	3.93
49.0	3.93
50.0	3.93
51.0	3.93
52.0	3.93
53.0	3.93
54.0	3.67
55.0	3.40
56.0	3.14
57.0	2.88
58.0	2.62
59.0	2.36
60.0	2.10
61.0	1.83
62.0	1.57
63.0	1.31
64.0	1.05
65.0	0.79
66.0	0.52
67.0	0.26
68.0	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
7.9	147.3	155.2	3.93	47.69
7.9	147.3	155.2	3.93	47.69
7.9	147.3	155.2	3.93	47.69
7.9	147.3	155.2	3.93	47.69
7.9	147.3	155.2	3.93	47.69
7.9	147.3	155.2	3.93	47.69
7.9	147.3	155.2	3.93	47.69
7.9	147.3	155.2	3.93	47.69
7.9	147.3	155.2	3.93	47.69
7.6	147.2	154.9	3.86	47.69
7.1	146.9	154.3	3.69	47.68
6.5	146.5	153.4	3.46	47.67
6.0	146.1	152.5	3.22	47.66
5.5	145.7	151.6	2.97	47.64
5.0	145.2	150.6	2.71	47.63
4.5	144.8	149.7	2.46	47.62
3.9	144.3	148.7	2.19	47.61
3.4	143.8	147.7	1.93	47.59
2.9	143.4	146.7	1.67	47.58
2.4	142.9	145.7	1.41	47.57
1.8	142.5	144.8	1.15	47.56
1.3	142.0	143.8	0.88	47.54
0.8	141.5	142.8	0.62	47.53
0.3	141.1	141.8	0.36	47.52

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

Pond File: b:CC .PND
Inflow Hydrograph: b:2 IN .HYD
Outflow Hydrograph: b:2 OUT .HYD

Starting Pond W.S. Elevation = 41.50 ft

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

Peak Inflow = 3.93 cfs
Peak Outflow = 3.93 cfs
Peak Elevation = 47.69 ft

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

Initial Storage = 0 cu-ft
Peak Storage From Storm = 4,539 cu-ft

Total Storage in Pond = 4,539 cu-ft

Quick
Executed: 06:54:12 06-11-1993

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

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

COUNTRY CLUB
MAINTENANCE CENTER
SEDIMENT BASIN

```
*****************************************************************
*  RETURN FREQUENCY:  10 yr      |  Allowable Outflow:     4.50 cfs    *
*  'C' Adjustment: 1.000         |  Required Storage:     8,029 cu.ft. *
*---------------------------------------------------------------*
*  Peak Inflow:    5.97 cfs        Inflow .HYD stored: 10 IN   .HYD   *
*****************************************************************
```

```
|                Td =  45 minutes                    |  Return Freq:     10 yr
/------- Approx. Duration for Max. Storage ------/  C adj.factor: 1.00
|                                                   |
|                                                   |
|                Tc=    15.00  minutes              |
|                I =    5.250  in/hr                |  Area (ac):       4.50
|              . Q =    10.63  cfs                  |  Weighted C:      0.45
|             .|.                                   |  Adjusted C:      0.45
F|            .   .                                  |
L|           .  |  .              Required Storage  |
O|          .       .         .--      8,029 cu.ft. |  Td=       45 minutes
W|         .    |    .        |                    |  I =    2.950 in/hr
|        .     x x x x x x x|x x x x x x x x x x x  |  Q =     5.97 cfs
c|       .                   |                      |
f|      .    x                                      |  x
s|     .                                            |    o   Q=    4.50 cfs
|    .   x                                o         |  |x  (Allow.Outflow)
|   .  x                        .     o            |
|  .  x                   o     .      NOT TO SCALE |    x
| . x        o                  .      ============ |
| o                              .                  |       x
`-------------------------------------------------|------------
                                                   48.70 minutes
```

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 06:34:12 06-11-1993

COUNTRY CLUB
MAINTENANCE CENTER
SEDIMENT BASIN

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

Weighted C = 0.450 Area= 4.500 acres Tc = 15.00 minutes

Adjusted C = 0.450 Td= 45.00 min. I= 2.95 in/hr Qp= 5.97 cfs

RETURN FREQUENCY: 10 year storm Adj.factor = 1.00
Output file: 10 IN .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	0.40	0.80	1.19	1.59	1.99	2.39
7.00	2.79	3.19	3.58	3.98	4.38	4.78	5.18
14.00	5.58	5.97	5.97	5.97	5.97	5.97	5.97
21.00	5.97	5.97	5.97	5.97	5.97	5.97	5.97
28.00	5.97	5.97	5.97	5.97	5.97	5.97	5.97
35.00	5.97	5.97	5.97	5.97	5.97	5.97	5.97
42.00	5.97	5.97	5.97	5.97	5.58	5.18	4.78
49.00	4.38	3.98	3.58	3.19	2.79	2.39	1.99
56.00	1.59	1.19	0.80	0.40	0.00		

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 06:34:12 06-11-1993

COUNTRY CLUB
MAINTENANCE CENTER
SEDIMENT BASIN

* * * * * * 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)
	0.450	4.50						
			15.00	0.450	0.450	5.250	4.50	10.63

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 06:34:12 06-11-1993

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

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

COUNTRY CLUB
MAINTENANCE CENTER
SEDIMENT BASIN

RETURN FREQUENCY: 10 yr 'C' Adjustment = 1.000 Allowable Q = 4.50 cfs

Hydrograph file duration= 45.00 minutes
Hydrograph file: 10 IN .HYD Tc = 15.00 minutes

Weighted 'C'	Adjusted 'C'	Duration minutes	Intens. in/hr	Areas acres	Qpeak cfs	VOLUMES Inflow (cu.ft.)	Storage (cu.ft.)
0.450	0.450	15	5.250	4.50	10.63	9,568	5,518
0.450	0.450	20	4.700	4.50	9.52	11,421	6,696
0.450	0.450	30	3.750	4.50	7.59	13,669	7,594
0.450	0.450	40	3.150	4.50	6.38	15,309	7,884
********** Storage Maximum							
0.450	0.450	45	2.950	4.50	5.97	16,129	8,029
**********							
0.450	0.450	50	2.750	4.50	5.57	16,706	7,931
0.450	0.450	60	2.450	4.50	4.96	17,861	7,735
0.450	0.450	120	1.600	4.50	3.24	Qpeak < Qallow	

```
************************
*                      *
*    COUNTRY CLUB      *
*  MAINTENANCE CENTER  *
*    SEDIMENT BASIN    *
*                      *
*                      *
************************
```

Inflow Hydrograph: b:10 IN .HYD
Rating Table file: b:CC .PND

----INITIAL CONDITIONS----
Elevation = 41.50 ft
Outflow = 0.00 cfs
Storage = 0 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
41.50	0.0	0
42.00	0.0	28
42.50	0.0	129
43.00	0.0	271
43.50	0.0	457
44.00	0.0	689
44.50	0.0	977
45.00	0.0	1,329
45.50	0.0	1,749
46.00	0.0	2,244
46.50	0.0	2,817
47.00	0.0	3,470
47.50	0.0	4,214
48.00	10.3	5,064
48.50	29.2	6,025
49.00	41.7	7,103
49.50	48.1	8,311
50.00	53.8	9,660
50.50	59.0	11,158
51.00	63.7	12,858
51.50	68.5	14,792
52.00	80.3	16,977
52.40	95.5	18,894

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
0.9	0.9
4.3	4.3
9.0	9.0
15.2	15.2
23.0	23.0
32.6	32.6
44.3	44.3
58.3	58.3
74.8	74.8
93.9	93.9
115.6	115.6
140.5	140.5
168.8	179.1
200.8	230.0
236.7	278.4
277.0	325.1
321.9	375.7
371.9	430.9
428.5	492.2
493.0	561.5
565.8	646.1
629.7	725.2

Time increment (t) = 1.0 min.

Pond File: b:CC .PND
Inflow Hydrograph: b:10 IN .HYD
Outflow Hydrograph: b:10 OUT .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	-----	0.0	0.0	0.00	41.50
1.0	0.40	0.4	0.4	0.4	0.00	41.72
2.0	0.80	1.2	1.6	1.6	0.00	42.10
3.0	1.19	2.0	3.6	3.6	0.00	42.39
4.0	1.59	2.8	6.4	6.4	0.00	42.72
5.0	1.99	3.6	9.9	9.9	0.00	43.07
6.0	2.39	4.4	14.3	14.3	0.00	43.43
7.0	2.79	5.2	19.5	19.5	0.00	43.78
8.0	3.19	6.0	25.5	25.5	0.00	44.13
9.0	3.58	6.8	32.3	32.3	0.00	44.48
10.0	3.98	7.6	39.8	39.8	0.00	44.81
11.0	4.38	8.4	48.2	48.2	0.00	45.14
12.0	4.78	9.2	57.3	57.3	0.00	45.47
13.0	5.18	10.0	67.3	67.3	0.00	45.77
14.0	5.58	10.8	78.1	78.1	0.00	46.09
15.0	5.97	11.6	89.6	89.6	0.00	46.39
16.0	5.97	11.9	101.6	101.6	0.00	46.68
17.0	5.97	11.9	113.5	113.5	0.00	46.95
18.0	5.97	11.9	125.4	125.4	0.00	47.20
19.0	5.97	11.9	137.4	137.4	0.00	47.44
20.0	5.97	11.9	144.6	149.3	2.36	47.61
21.0	5.97	11.9	148.0	156.5	4.29	47.71
22.0	5.97	11.9	149.5	159.9	5.18	47.75
23.0	5.97	11.9	150.3	161.5	5.60	47.77
24.0	5.97	11.9	150.6	162.2	5.80	47.78
25.0	5.97	11.9	150.8	162.5	5.89	47.79
26.0	5.97	11.9	150.8	162.7	5.93	47.79
27.0	5.97	11.9	150.9	162.8	5.95	47.79
28.0	5.97	11.9	150.9	162.8	5.96	47.79
29.0	5.97	11.9	150.9	162.8	5.97	47.79
30.0	5.97	11.9	150.9	162.8	5.97	47.79
31.0	5.97	11.9	150.9	162.8	5.97	47.79
32.0	5.97	11.9	150.9	162.8	5.97	47.79
33.0	5.97	11.9	150.9	162.8	5.97	47.79
34.0	5.97	11.9	150.9	162.8	5.97	47.79
35.0	5.97	11.9	150.9	162.8	5.97	47.79
36.0	5.97	11.9	150.9	162.8	5.97	47.79
37.0	5.97	11.9	150.9	162.8	5.97	47.79
38.0	5.97	11.9	150.9	162.8	5.97	47.79
39.0	5.97	11.9	150.9	162.8	5.97	47.79
40.0	5.97	11.9	150.9	162.8	5.97	47.79
41.0	5.97	11.9	150.9	162.8	5.97	47.79
42.0	5.97	11.9	150.9	162.8	5.97	47.79
43.0	5.97	11.9	150.9	162.8	5.97	47.79
44.0	5.97	11.9	150.9	162.8	5.97	47.79

Pond File: b:CC .PND
Inflow Hydrograph: b:10 IN .HYD
Outflow Hydrograph: b:10 OUT .HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
45.0	5.97
46.0	5.58
47.0	5.18
48.0	4.78
49.0	4.38
50.0	3.98
51.0	3.58
52.0	3.19
53.0	2.79
54.0	2.39
55.0	1.99
56.0	1.59
57.0	1.19
58.0	0.80
59.0	0.40
60.0	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
11.9	150.9	162.8	5.97	47.79
11.6	150.7	162.4	5.87	47.78
10.8	150.3	161.5	5.61	47.77
10.0	149.7	160.2	5.27	47.76
9.2	149.0	158.8	4.90	47.74
8.4	148.4	157.4	4.52	47.72
7.6	147.7	155.9	4.12	47.70
6.8	147.0	154.4	3.73	47.68
6.0	146.3	153.0	3.34	47.66
5.2	145.6	151.5	2.94	47.64
4.4	144.9	150.0	2.54	47.62
3.6	144.2	148.5	2.14	47.60
2.8	143.5	147.0	1.74	47.58
2.0	142.8	145.5	1.34	47.57
1.2	142.1	144.0	0.95	47.55
0.4	141.4	142.5	0.55	47.53

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

Pond File: b:CC .PND
Inflow Hydrograph: b:10 IN .HYD
Outflow Hydrograph: b:10 OUT .HYD

Starting Pond W.S. Elevation = 41.50 ft

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

Peak Inflow = 5.97 cfs
Peak Outflow = 5.97 cfs
Peak Elevation = 47.79 ft

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

Initial Storage = 0 cu-ft
Peak Storage From Storm = 4,707 cu-ft

Total Storage in Pond = 4,707 cu-ft

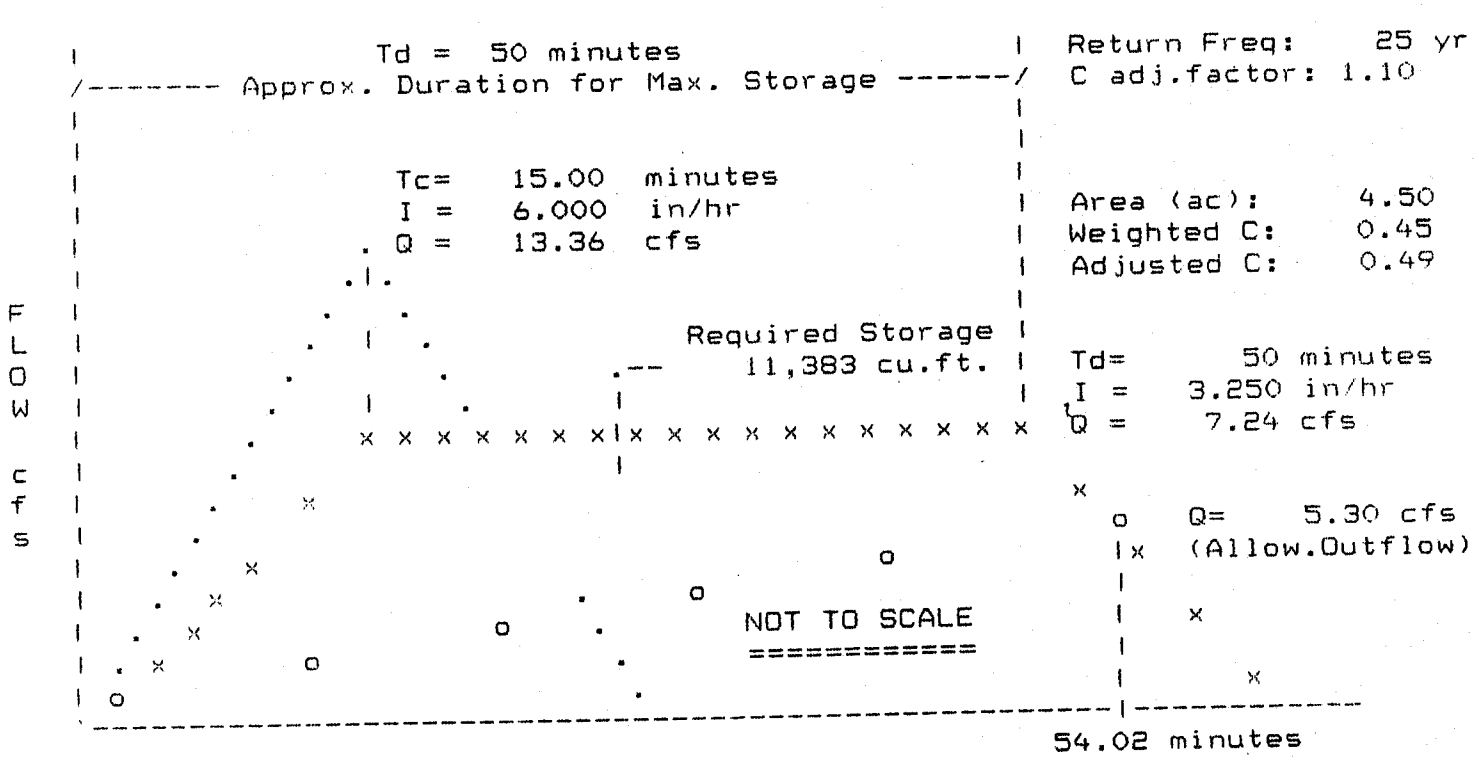
Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 06:34:12 06-11-1993

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

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

COUNTRY CLUB
MAINTENANCE CENTER
SEDIMENT BASIN

RETURN FREQUENCY: 25 yr	Allowable Outflow: 5.30 cfs
'C' Adjustment: 1.100	Required Storage: 11,383 cu.ft.
Peak Inflow: 7.24 cfs	Inflow .HYD stored: 25 IN .HYD



Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 06:34:12 06-11-1993

COUNTRY CLUB
MAINTENANCE CENTER
SEDIMENT BASIN

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

Weighted C = 0.450 Area= 4.500 acres Tc = 15.00 minutes

Adjusted C = 0.495 Td= 50.00 min. I= 3.25 in/hr Qp= 7.24 cfs

RETURN FREQUENCY: 25 year storm Adj.factor = 1.10
Output file: 25 IN .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	0.48	0.97	1.45	1.93	2.41	2.90
7.00	3.38	3.86	4.34	4.83	5.31	5.79	6.27
14.00	6.76	7.24	7.24	7.24	7.24	7.24	7.24
21.00	7.24	7.24	7.24	7.24	7.24	7.24	7.24
28.00	7.24	7.24	7.24	7.24	7.24	7.24	7.24
35.00	7.24	7.24	7.24	7.24	7.24	7.24	7.24
42.00	7.24	7.24	7.24	7.24	7.24	7.24	7.24
49.00	7.24	7.24	6.76	6.27	5.79	5.31	4.83
56.00	4.34	3.86	3.38	2.90	2.41	1.93	1.45
63.00	0.97	0.48	0.00				

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 06:34:12 06-11-1993

COUNTRY CLUB
MAINTENANCE CENTER
SEDIMENT BASIN

* * * * * * 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)
	0.450	4.50						
			15.00	0.450	0.495	6.000	4.50	13.36

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 06:34:12 06-11-1993

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

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

COUNTRY CLUB
MAINTENANCE CENTER
SEDIMENT BASIN

RETURN FREQUENCY: 25 yr 'C' Adjustment = 1.100 Allowable Q = 5.30 cfs

Hydrograph file duration= 50.00 minutes
Hydrograph file: 25 IN .HYD Tc = 15.00 minutes

Weighted 'C'	Adjusted 'C'	Duration minutes	Intens. in/hr	Areas acres	Qpeak cfs	VOLUMES Inflow (cu.ft.)	Storage (cu.ft.)
0.450	0.495	15	6.000	4.50	13.36	12,029	7,258
0.450	0.495	20	5.400	4.50	12.03	14,434	8,869
0.450	0.495	30	4.400	4.50	9.80	17,642	10,487
0.450	0.495	40	3.600	4.50	8.02	19,246	10,501
********** Storage Maximum							
0.450	0.495	50	3.250	4.50	7.24	21,718	11,383
**********							
0.450	0.495	60	2.800	4.50	6.24	22,453	10,528
0.450	0.495	120	1.750	4.50	3.90	Qpeak < Qallow	

```
************************
*                      *
*     COUNTRY CLUB     *
*  MAINTENANCE CENTER  *
*    SEDIMENT BASIN    *
*                      *
*                      *
************************
```

Inflow Hydrograph: b:25 IN .HYD
Rating Table file: b:CC .PND

----INITIAL CONDITIONS----
Elevation = 41.50 ft
Outflow = 0.00 cfs
Storage = 0 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
41.50	0.0	0
42.00	0.0	28
42.50	0.0	129
43.00	0.0	271
43.50	0.0	457
44.00	0.0	689
44.50	0.0	977
45.00	0.0	1,329
45.50	0.0	1,749
46.00	0.0	2,244
46.50	0.0	2,817
47.00	0.0	3,470
47.50	0.0	4,214
48.00	10.3	5,064
48.50	29.2	6,025
49.00	41.7	7,103
49.50	48.1	8,311
50.00	53.8	9,660
50.50	59.0	11,158
51.00	63.7	12,858
51.50	68.5	14,792
52.00	80.3	16,977
52.40	95.5	18,894

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
0.9	0.9
4.3	4.3
9.0	9.0
15.2	15.2
23.0	23.0
32.6	32.6
44.3	44.3
58.3	58.3
74.8	74.8
93.9	93.9
115.6	115.6
140.5	140.5
168.8	179.1
200.8	230.0
236.7	278.4
277.0	325.1
321.9	375.7
371.9	430.9
428.5	492.2
493.0	561.5
565.8	646.1
629.7	725.2

Time increment (t) = 1.0 min.

Pond File: b:CC .PND
Inflow Hydrograph: b:25 IN .HYD
Outflow Hydrograph: b:25 OUT .HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
0.0	0.00
1.0	0.48
2.0	0.97
3.0	1.45
4.0	1.93
5.0	2.41
6.0	2.90
7.0	3.38
8.0	3.86
9.0	4.34
10.0	4.83
11.0	5.31
12.0	5.79
13.0	6.27
14.0	6.76
15.0	7.24
16.0	7.24
17.0	7.24
18.0	7.24
19.0	7.24
20.0	7.24
21.0	7.24
22.0	7.24
23.0	7.24
24.0	7.24
25.0	7.24
26.0	7.24
27.0	7.24
28.0	7.24
29.0	7.24
30.0	7.24
31.0	7.24
32.0	7.24
33.0	7.24
34.0	7.24
35.0	7.24
36.0	7.24
37.0	7.24
38.0	7.24
39.0	7.24
40.0	7.24
41.0	7.24
42.0	7.24
43.0	7.24
44.0	7.24

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
-----	0.0	0.0	0.00	41.50
0.5	0.5	0.5	0.00	41.76
1.5	1.9	1.9	0.00	42.15
2.4	4.4	4.4	0.00	42.50
3.4	7.7	7.7	0.00	42.86
4.3	12.1	12.1	0.00	43.25
5.3	17.4	17.4	0.00	43.64
6.3	23.7	23.7	0.00	44.04
7.2	30.9	30.9	0.00	44.41
8.2	39.1	39.1	0.00	44.78
9.2	48.3	48.3	0.00	45.14
10.1	58.4	58.4	0.00	45.50
11.1	69.5	69.5	0.00	45.84
12.1	81.6	81.6	0.00	46.18
13.0	94.6	94.6	0.00	46.52
14.0	108.6	108.6	0.00	46.84
14.5	123.1	123.1	0.00	47.15
14.5	137.6	137.6	0.00	47.44
14.5	145.9	152.0	3.09	47.65
14.5	149.7	160.3	5.30	47.76
14.5	151.5	164.2	6.34	47.81
14.5	152.4	166.0	6.82	47.83
14.5	152.8	166.9	7.04	47.84
14.5	153.0	167.3	7.15	47.85
14.5	153.0	167.4	7.20	47.85
14.5	153.1	167.5	7.22	47.85
14.5	153.1	167.6	7.23	47.85
14.5	153.1	167.6	7.24	47.85
14.5	153.1	167.6	7.24	47.85
14.5	153.1	167.6	7.24	47.85
14.5	153.1	167.6	7.24	47.85
14.5	153.1	167.6	7.24	47.85
14.5	153.1	167.6	7.24	47.85
14.5	153.1	167.6	7.24	47.85
14.5	153.1	167.6	7.24	47.85
14.5	153.1	167.6	7.24	47.85
14.5	153.1	167.6	7.24	47.85
14.5	153.1	167.6	7.24	47.85
14.5	153.1	167.6	7.24	47.85
14.5	153.1	167.6	7.24	47.85
14.5	153.1	167.6	7.24	47.85
14.5	153.1	167.6	7.24	47.85
14.5	153.1	167.6	7.24	47.85
14.5	153.1	167.6	7.24	47.85
14.5	153.1	167.6	7.24	47.85
14.5	153.1	167.6	7.24	47.85

Pond File: b:CC .PND
Inflow Hydrograph: b:25 IN .HYD
Outflow Hydrograph: b:25 OUT .HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
45.0	7.24
46.0	7.24
47.0	7.24
48.0	7.24
49.0	7.24
50.0	7.24
51.0	6.76
52.0	6.27
53.0	5.79
54.0	5.31
55.0	4.83
56.0	4.34
57.0	3.86
58.0	3.38
59.0	2.90
60.0	2.41
61.0	1.93
62.0	1.45
63.0	0.97
64.0	0.48
65.0	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
14.5	153.1	167.6	7.24	47.85
14.5	153.1	167.6	7.24	47.85
14.5	153.1	167.6	7.24	47.85
14.5	153.1	167.6	7.24	47.85
14.5	153.1	167.6	7.24	47.85
14.5	153.1	167.6	7.24	47.85
14.0	152.9	167.1	7.11	47.85
13.0	152.3	165.9	6.79	47.83
12.1	151.6	164.4	6.39	47.81
11.1	150.8	162.7	5.94	47.79
10.1	150.0	161.0	5.48	47.77
9.2	149.2	159.2	5.00	47.74
8.2	148.4	157.4	4.52	47.72
7.2	147.5	155.6	4.04	47.70
6.3	146.7	153.8	3.56	47.67
5.3	145.8	152.0	3.08	47.65
4.3	145.0	150.2	2.59	47.63
3.4	144.1	148.4	2.11	47.60
2.4	143.3	146.6	1.63	47.58
1.5	142.5	144.8	1.15	47.56
0.5	141.6	142.9	0.66	47.53

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

Pond File: b:CC .PND
Inflow Hydrograph: b:25 IN .HYD
Outflow Hydrograph: b:25 OUT .HYD

Starting Pond W.S. Elevation = 41.50 ft

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

Peak Inflow = 7.24 cfs
Peak Outflow = 7.24 cfs
Peak Elevation = 47.85 ft

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

Initial Storage	=	0 cu-ft
Peak Storage From Storm	=	4,812 cu-ft
Total Storage in Pond	=	4,812 cu-ft

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 06:34:12 06-11-1993

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

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

COUNTRY CLUB
MAINTENANCE CENTER
SEDIMENT BASIN

```
*****************************************************************
*  RETURN FREQUENCY: 100 yr      |  Allowable Outflow:     6.40 cfs    *
*  'C' Adjustment: 1.250         |  Required Storage:    16,880 cu.ft. *
*---------------------------------------------------------------*
*  Peak Inflow:    10.86 cfs        Inflow .HYD stored: 100 IN  .HYD   *
*****************************************************************
```

```
|                Td =  43 minutes                    |  Return Freq:    100 yr
/------- Approx. Duration for Max. Storage ------/  C adj.factor: 1.25
|                                                   |
|                                                   |
|                Tc=   15.00  minutes               |
|                I =   7.200  in/hr                 |  Area (ac):      4.50
|              . Q =   18.22  cfs                   |  Weighted C:     0.45
|            .|.                                    |  Adjusted C:     0.56
F|          .   .                                   |
L|         .  |  .              Required Storage   |
O|       .        .         .--    16,880 cu.ft.   |  Td=       43 minutes
W|      .    |    .        |                       |  I =    4.290 in/hr
|     .     x x x x x x x|x x x x x x x x x x x x  |  Q =    10.86 cfs
c|    .                   |                         |
f|   .    x                                         |  x
s|  .                                               |    o   Q=     6.40 cfs
|  .   x                                 o          |  |x  (Allow.Outflow)
|  .  x                     .     o                |  |
|  . x                 o     .       NOT TO SCALE   |  |   x
| . x       o                .       ============   |  |
| o                          .                      |  |       x
`-------------------------------------------------|------------
                                                   49.16 minutes
```

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 06:34:12 06-11-1993

COUNTRY CLUB
MAINTENANCE CENTER
SEDIMENT BASIN

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

Weighted C = 0.450 Area= 4.500 acres Tc = 15.00 minutes

Adjusted C = 0.562 Td= 43.00 min. I= 4.29 in/hr Qp= 10.86 cfs

RETURN FREQUENCY: 100 year storm Adj.factor = 1.25
Output file: 100 IN .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	0.72	1.45	2.17	2.90	3.62	4.34
7.00	5.07	5.79	6.52	7.24	7.96	8.69	9.41
14.00	10.14	10.86	10.86	10.86	10.86	10.86	10.86
21.00	10.86	10.86	10.86	10.86	10.86	10.86	10.86
28.00	10.86	10.86	10.86	10.86	10.86	10.86	10.86
35.00	10.86	10.86	10.86	10.86	10.86	10.86	10.86
42.00	10.86	10.86	10.14	9.41	8.69	7.96	7.24
49.00	6.52	5.79	5.07	4.34	3.62	2.90	2.17
56.00	1.45	0.72	0.00				

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 06:34:12 06-11-1993

COUNTRY CLUB
MAINTENANCE CENTER
SEDIMENT BASIN

* * * * * * 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)
	0.450	4.50						
			15.00	0.450	0.562	7.200	4.50	18.22

Quick TR-55 Ver.5.46 S/N:1315430271
Executed: 06:34:12 06-11-1993

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

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

COUNTRY CLUB
MAINTENANCE CENTER
SEDIMENT BASIN

RETURN FREQUENCY: 100 yr 'C' Adjustment = 1.250 Allowable Q = 6.40 cfs

Hydrograph file duration= 43.00 minutes
Hydrograph file: 100 IN .HYD Tc = 15.00 minutes

Weighted 'C'	Adjusted 'C'	Duration minutes	Intens. in/hr	Areas acres	Qpeak cfs	VOLUMES Inflow (cu.ft.)	Storage (cu.ft.)
0.450	0.562	15	7.200	4.50	18.22	16,402	10,643
0.450	0.562	20	6.500	4.50	16.45	19,744	13,024
0.450	0.562	30	5.250	4.50	13.29	23,920	15,280
0.450	0.562	40	4.500	4.50	11.39	27,337	16,778
********** Storage Maximum							
0.450	0.562	43	4.290	4.50	10.86	28,016	16,880
**********							
0.450	0.562	50	3.800	4.50	9.62	28,856	16,376
0.450	0.562	60	3.400	4.50	8.61	30,982	16,582
0.450	0.562	120	2.250	4.50	5.70	Qpeak < Qallow	

```
************************
*                      *
*     COUNTRY CLUB     *
*  MAINTENANCE CENTER  *
*    SEDIMENT BASIN    *
*                      *
*                      *
************************
```

Inflow Hydrograph: b:100 IN .HYD
Rating Table file: b:CC .PND

----INITIAL CONDITIONS----
Elevation = 41.50 ft
Outflow = 0.00 cfs
Storage = 0 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
41.50	0.0	0
42.00	0.0	28
42.50	0.0	129
43.00	0.0	271
43.50	0.0	457
44.00	0.0	689
44.50	0.0	977
45.00	0.0	1,329
45.50	0.0	1,749
46.00	0.0	2,244
46.50	0.0	2,817
47.00	0.0	3,470
47.50	0.0	4,214
48.00	10.3	5,064
48.50	29.2	6,025
49.00	41.7	7,103
49.50	48.1	8,311
50.00	53.8	9,660
50.50	59.0	11,158
51.00	63.7	12,858
51.50	68.5	14,792
52.00	80.3	16,977
52.40	95.5	18,894

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
0.9	0.9
4.3	4.3
9.0	9.0
15.2	15.2
23.0	23.0
32.6	32.6
44.3	44.3
58.3	58.3
74.8	74.8
93.9	93.9
115.6	115.6
140.5	140.5
168.8	179.1
200.8	230.0
236.7	278.4
277.0	325.1
321.9	375.7
371.9	430.9
428.5	492.2
493.0	561.5
565.8	646.1
629.7	725.2

Time increment (t) = 1.0 min.

Pond File: b:CC .PND
Inflow Hydrograph: b:100 IN .HYD
Outflow Hydrograph: b:100 OUT .HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
0.0	0.00
1.0	0.72
2.0	1.45
3.0	2.17
4.0	2.90
5.0	3.62
6.0	4.34
7.0	5.07
8.0	5.79
9.0	6.52
10.0	7.24
11.0	7.96
12.0	8.69
13.0	9.41
14.0	10.14
15.0	10.86
16.0	10.86
17.0	10.86
18.0	10.86
19.0	10.86
20.0	10.86
21.0	10.86
22.0	10.86
23.0	10.86
24.0	10.86
25.0	10.86
26.0	10.86
27.0	10.86
28.0	10.86
29.0	10.86
30.0	10.86
31.0	10.86
32.0	10.86
33.0	10.86
34.0	10.86
35.0	10.86
36.0	10.86
37.0	10.86
38.0	10.86
39.0	10.86
40.0	10.86
41.0	10.86
42.0	10.86
43.0	10.86
44.0	10.14

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
-----	0.0	0.0	0.00	41.50
0.7	0.7	0.7	0.00	41.89
2.2	2.9	2.9	0.00	42.29
3.6	6.5	6.5	0.00	42.73
5.1	11.6	11.6	0.00	43.21
6.5	18.1	18.1	0.00	43.69
8.0	26.1	26.1	0.00	44.16
9.4	35.5	35.5	0.00	44.62
10.9	46.3	46.3	0.00	45.07
12.3	58.6	58.6	0.00	45.51
13.8	72.4	72.4	0.00	45.93
15.2	87.6	87.6	0.00	46.34
16.7	104.3	104.3	0.00	46.74
18.1	122.4	122.4	0.00	47.14
19.6	141.1	141.9	0.39	47.52
21.0	150.6	162.1	5.78	47.78
21.7	155.3	172.3	8.49	47.91
21.7	157.5	177.0	9.75	47.97
21.7	158.5	179.2	10.36	48.00
21.7	158.8	180.2	10.73	48.01
21.7	158.8	180.5	10.83	48.01
21.7	158.9	180.6	10.85	48.01
21.7	158.9	180.6	10.86	48.01
21.7	158.9	180.6	10.86	48.01
21.7	158.9	180.6	10.86	48.01
21.7	158.9	180.6	10.86	48.01
21.7	158.9	180.6	10.86	48.01
21.7	158.9	180.6	10.86	48.01
21.7	158.9	180.6	10.86	48.01
21.7	158.9	180.6	10.86	48.01
21.7	158.9	180.6	10.86	48.01
21.7	158.9	180.6	10.86	48.01
21.7	158.9	180.6	10.86	48.01
21.7	158.9	180.6	10.86	48.01
21.7	158.9	180.6	10.86	48.01
21.7	158.9	180.6	10.86	48.01
21.7	158.9	180.6	10.86	48.01
21.7	158.9	180.6	10.86	48.01
21.7	158.9	180.6	10.86	48.01
21.7	158.9	180.6	10.86	48.01
21.7	158.9	180.6	10.86	48.01
21.0	158.7	179.9	10.59	48.01

Pond File: b:CC .PND
Inflow Hydrograph: b:100 IN .HYD
Outflow Hydrograph: b:100 OUT .HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
45.0	9.41
46.0	8.69
47.0	7.96
48.0	7.24
49.0	6.52
50.0	5.79
51.0	5.07
52.0	4.34
53.0	3.62
54.0	2.90
55.0	2.17
56.0	1.45
57.0	0.72
58.0	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
19.6	158.1	178.2	10.07	47.99
18.1	157.1	176.2	9.53	47.96
16.7	156.0	173.8	8.89	47.93
15.2	154.8	171.2	8.20	47.90
13.8	153.6	168.6	7.50	47.86
12.3	152.3	165.9	6.78	47.83
10.9	151.1	163.2	6.06	47.79
9.4	149.8	160.5	5.34	47.76
8.0	148.5	157.8	4.61	47.72
6.5	147.3	155.0	3.89	47.69
5.1	146.0	152.3	3.17	47.65
3.6	144.7	149.6	2.44	47.62
2.2	143.5	146.9	1.72	47.58
0.7	142.2	144.2	0.99	47.55

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

Pond File: b:CC .PND
Inflow Hydrograph: b:100 IN .HYD
Outflow Hydrograph: b:100 OUT .HYD

Starting Pond W.S. Elevation = 41.50 ft

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

Peak Inflow = 10.86 cfs
Peak Outflow = 10.86 cfs
Peak Elevation = 48.01 ft

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

Initial Storage	=	0 cu-ft
Peak Storage From Storm	=	5,093 cu-ft
Total Storage in Pond	=	5,093 cu-ft

TRANSMITTAL

RECEIVED 8-2-93

DATE: August 2, 1993

TO: Code Compliance, Darryl Cook
Fire Department
REA
JCSA

FROM: Allen J. Murphy, Jr. Principal Planner

SUBJECT: Case No. SP-54-93. Kingsmill Golf Course #3 - Access Road & Utilities.

ITEMS ATTACHED: Final approved site plan for your files.

INSTRUCTIONS: N/A

RETURN REQUIRED BY: N/A

AGENCY COMMENTS: N/A

Date Record Created: [redacted]

Created By: [redacted]

WS_BMPNO: JR011

Print Record

PRINTED ON
Thursday, March 11, 2010
11:54:58 AM

WATERSHED	JR
BMP ID NO	011
PLAN NO	
TAX PARCEL	(51-4)(1-8)
PIN NO	5140100008
CONSTRUCTION DATE	
PROJECT NAME	KINGSMILL GOLF COURSE #3
FACILITY LOCATION	7901 POCOHONTAS TRAIL
CITY-STATE	WILLIAMSBURG,VA
CURRENT OWNER	BUSCH PROPERTIES, INC.
OWNER ADDRESS	100 KINGSMILL RD.
OWNER ADDRESS 2	WMSBRG., VA 23185
CITY-STATE-ZIP CODE	
OWNER PHONE	
MAINT AGREEMENT	No
EMERG ACTION PLAN	No

Get Last BMP No

Return to Menu

MAINTENANCE PLAN	No
SITE AREA acre	1217.4
LAND USE	
old BMP TYP	
JCC BMP CODE	
POINT VALUE	
SVC DRAIN AREA acres	10
SERVICE AREA DESCRI	
IMPERV AREA acres	
RECV STREAM	
EXT DET-WQ-CTRL	No
WTR QUAL VOL acre-ft	0
CHAN PROT CTRL	No
CHAN PROT VOL acre-ft	0
SW/FLOOD CONTROL	No
GEOTECH REPORT	No

CTRL STRUC DESC	
CTRL STRUC SIZE inches	
OTLT BARRL DESC	
OTLT BARRL SIZE inch	0
EMERG SPILLWAY	No
DESIGN HW ELEV	
PERM POOL ELEV	
2-YR OUTFLOW cfs	
10-YR OUTFLOW cfs	
REC DRAWING	No
CONSTR CERTIF	No
LAST INSP DATE	
Inspected by:	[redacted]
INTERNAL RATING	
MISC/COMMENTS	

Additional Comments: [redacted]

Golf Course #3
Holes 1-11 & 16-18
PIN: 5230100110

Directions:
Busch Service RD
to Woods Course Dr.
Adjacent to the rear of
8577 Pocahontas Trl

SP-54-93

JR 011