



APPLICATION ACCEPTED: November 14, 2012
PLANNING COMMISSION DECISION: November 21, 2013
BOARD OF SUPERVISORS: tbd

County of Fairfax, Virginia

November 13, 2013

STAFF REPORT ADDENDUM

APPLICATION RZ/FDP 2012-BR-020

BRADDOCK DISTRICT

APPLICANT: Eastwood Properties, Inc.

EXISTING ZONING: R-1

PROPOSED ZONING: PDH-3

PARCEL(S): 77-1((1)) 36, 37, 38

ACREAGE: 5.15 acres

DENSITY: 2.5 du/ac

OPEN SPACE: 40.0%

PLAN MAP: Residential at 2 to 3 dwelling units per acre

PROPOSAL: The applicant seeks to rezone the subject property to PDH-3 and concurrent approval of a conceptual and final development plan to permit the development of 13 single-family detached units.

Brent Krasner, AICP

STAFF RECOMMENDATIONS:

Staff recommends approval of RZ 2012-BR-020 subject to the execution of proffers consistent with those found in Attachment 2 of this report.

Staff recommends approval of FDP 2012-BR-020.

Staff recommends approval of a waiver of the service drive requirement along Rt. 123 in favor of the frontage improvements shown on the CDP/FDP.

Staff recommends approval of a modification of the trail requirement along Rt. 123 in favor of the eight foot wide asphalt trail shown on the CDP/FDP.

Staff recommends approval of a waiver of the on-road bike trail requirement along Rt. 123 in favor of the asphalt trail shown on the CDP/FDP.

Staff recommends approval of a waiver of the parallel crushed stone pedestrian path along Route 123 in favor of the asphalt path shown on the CDP/FDP.

Staff recommends approval of a modification of the sight distance requirement for corner lots to allow the entry feature and sound wall to be located as shown on the CDP/FDP.

It should be noted that it is not the intent of staff to recommend that the Board, in adopting any conditions proffered by the owner, relieve the applicant/owner from compliance with the provisions of any applicable ordinances, regulations, or adopted standards.

It should be further noted that the content of this report reflects the analysis and recommendation of staff; it does not reflect the position of the Board of Supervisors.

The approval of this special exception does not interfere with, abrogate or annul any easement, covenants, or other agreements between parties, as they may apply to the property subject to this application.

For information, contact the Zoning Evaluation Division, Department of Planning and Zoning, 12055 Government Center Parkway, Suite 801, Fairfax, Virginia 22035-5505, (703) 324-1290.

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Americans with Disabilities Act (ADA): Reasonable accommodation is available upon 48 hours advance notice. For additional information on ADA call (703) 324-1334 or TTY 711 (Virginia Relay Center).

BACKGROUND AND DISCUSSION

The applicant, Eastwood Properties, Inc., requests a rezoning from R-1 to PDH-3 and associated FDP approval on a 5.15 acre assemblage on Ox Road (Rt. 123) in order to develop 13 single family homes. The FDP shows ten homes situated along a private cul-de-sac and three along a shared driveway. Although staff has endorsed the overall density and layout, outstanding concerns were identified related to stormwater management. During the Planning Commission public hearing these and other concerns were raised by neighbors and members of the Commission. In response, the applicant revised elements of the FDP and the proffers. The following addendum to the original staff report summarizes prior concerns, reviews the new plan and proffers, and restates the Staff recommendation.

STAFF REPORT – October 2, 2013

The staff report for RZ/FDP 2012-BR-020 published on October 2, 2013, recommended approval of the applications. This recommendation was based on a finding of consistency with the Comprehensive Plan's residential development criteria and the Planned Development District Standards in the Zoning Ordinance. Specifically, staff found the proposed layout, which contained 40 percent open space (much of it usable) and met the tree preservation target, was a good response to the constraints and awkward shape of the property. Staff did acknowledge, however, significant neighborhood concerns with the stormwater management system.

PLANNING COMMISSION PUBLIC HEARING– October 16, 2013

During the course of the public hearing, multiple neighbors testified with concerns about stormwater management, traffic, density, and the proposed use of an existing off-site sanitary sewer easement. In addition, members of the Commission raised concerns about conformance with the Planned District Standards. The Planning Commission deferred decision of the application, while still keeping the record open for additional public comment to October 30, 2013. Additional deferrals to allow more time to work on revisions moved the date to November 21, 2013.

REVISED FINAL DEVELOPMENT PLAN – November 7, 2013 (Attachment 1)

The applicant's revised CDP/FDP maintains the previous layout that situates ten lots along a private cul-de-sac at the southern portion of the property and three lots along a shared driveway that runs in a north-south orientation from an extension of the Ox Road service drive. However, changes have been made to the design of the stormwater management system, as detailed below:

Stormwater Management

While the overall concept for the stormwater management system remains similar to previous plans, the applicant has made several important revisions. The plan continues to show that stormwater will be accommodated by two rain gardens built atop an underground gravel storage system, plus two vegetated swales near Rt. 123; however, the drainage diversion that would have directed additional run-off from portions of the

eastern end of the site to the rain gardens has been removed. Instead, stormwater from this area will be conveyed through new underground pipes to the existing concrete pipe in the easement on Lot 259 and out to Oak Park Court, thus respecting the existing drainage divide. Most of the remainder of the site will continue to flow into the rain gardens and underground storage system. As with the previous submission, this facility outfalls to the existing inlet in an easement, on Lot 261, and then into the storm sewer system associated with the Middleridge Section 6, Subdivision. No off-site grading or improvements of any kind are required by the PFM, and this work has been removed from the plans.

Consistent with previous submissions, a small area measuring approximately 0.44 acres at the eastern end of the subject property will sheet flow to the east and into the existing storm inlets on Shooters Hill Lane and Oak Park Court, to the northeast. On Sheet 9 the applicant has calculated the detention volume needed to meet the proportional improvement of the 100-year storm runoff in accordance with PFM requirements.

According to the revised SWM narrative, the project will reduce post-development peak flows below pre-development levels. Despite the reduction in flow to the rain gardens, the revised plan continues to exceed the current BMP requirements for 40% phosphorus removal; however, the level has been reduced to from 47.5% to 45.4%.

Tree Preservation/Conservation

The revised plan maintains the tree preservation target area at 39,875 sf. which is almost 1,000 sf. above the Zoning Ordinance requirement. The 10-year tree canopy coverage is also maintained at 30%, which exceeds the 25% ordinance requirement. The total open space provided on the site is still 2.06 acres or 40%. Also, a second conservation easement area has been added along the southern property line, in addition to the area along the eastern boundary shown on the previous plans. The applicant continues to make the necessary proffer commitments to protect and preserve the existing mature trees through monitoring and tree appraisals by a certified arborist. The applicant has also proffered to utilize proper preservation measures during construction, as approved by UFM, DPWES.

PLAN ANALYSIS

Stormwater Management Analysis

DPWES reviewed the revised CDP/FDP and concluded that as there is no longer a drainage diversion, the proposed stormwater management system as depicted on the plans should be able to be engineered to meet all PFM standards necessary for approval at the subdivision stage. This can be accomplished entirely with the improvements shown on-site and without the need for any off-site grading or work. The plans show that adequate outfall will be demonstrated by appropriately sizing the underground storage area and rain gardens to detain and treat the two- and ten-year storms and to retain a proportion of the 100-year storm (the proportional improvement) so as not to exacerbate any existing drainage problems downstream.

Unlike adequate outfall, which assumes that the proposed system is working properly, overland relief is used to account for situations where the system is partially or completely inoperable due to clogs or other malfunctions. In other words, the objective of overland relief is to ensure that in the event the underground system fails during the 100-year storm, no structures will suffer damage from flooding. Overland relief is considered acceptable as long as no *structures* flood; downstream yard flooding which acts as a form surface storage is acceptable as the goal is merely to protect homes and other structures during a catastrophic failure in the 100-year event. By detaining enough of the site's 100-year runoff on the surface of the rain gardens behind the proposed berm, the applicant's plan will meet the PFM requirement not to exacerbate an existing overland relief problem.

Staff acknowledges the existence of an existing off-site overland relief issue on Lots 261 and 262 that has resulted in ponding during heavy rain events. This appears to be a result of improper grading, possibly dating to the time the adjacent neighborhood was constructed in the 1970s. The applicant's proposed plan will greatly improve the situation as it will remove a majority of the surface runoff that currently flows overland to the inlet on Lot 261, and instead direct it to the rain gardens; the underground storage; and then directly into the existing storm drain system. The proposed improvements will not entirely alleviate the problem, however, and the PFM does not require that the applicant do so, as this is a pre-existing off-site issue. The PFM only requires that the applicant does not make the problem worse, and it prohibits the applicant from directly causing any new structure flooding during the 100-year storm event. Even if it is demonstrated that there is existing structure flooding, the PFM's requirements for adequate outfall only require that the applicant provide a proportional improvement to hold back a percentage of the 100-year storm flow on-site. The applicant has provided preliminary data that shows they can achieve this by properly sizing the underground storage area (proportional improvement rate of 35% which equates to 31,031 cubic feet of storage). This would improve the existing situation for downstream properties, but would not relieve all flooding. In order for downstream property-owners to improve the situation on their properties any further, staff recommends that portions of their property be re-graded. In addition, staff recommends that the existing manhole at the back corner of Lot 261 be replaced with a yard inlet. The applicant has proposed a proffer whereby they would undertake this work, with the owner's consent; this issue is explained in greater detail in the discussion of the revised proffers, below.

As with all projects, final engineering to include additional detailed computations and grading data, will be reviewed during subdivision review for compliance with the PFM; however, given the information provided at this stage, which is more than what is typically reviewed, it is Staff's opinion that the submitted plan is acceptable and can likely be engineered to meet all applicable County standards.

Site Design/Planned District Standards

The revised plan has not altered the proposed layout of the development. Plan. The proposed density is in the middle of the plan range (2.5 du/ac, range of 2-3 du/ac) which is equal to or less than surrounding development. Lot sizes only appear smaller than the

surrounding neighborhood when one looks at the raw numbers. In a planned district, much of the land that could have been included in the privately owned lots is instead set aside as common open space. When one looks at the effective setbacks of the homes from the neighboring properties (the private yards plus the common open space), they are equal to or greater than the neighboring properties; thus, the proposal is compatible with the surrounding area by most objective measures. The development has been designed to address the key environmental issues present at the site, including effective management of stormwater runoff and the preservation of mature trees. By concentrating the open space at the lowest portion of the property, the design allows for an oversized stormwater management facility while simultaneously providing sufficient area for active and passive recreation. In addition, the plan continues to provide 40% open space (double the requirement of 20%) and meets the tree preservation target area requirement. Staff maintains that the proposal meets the purpose and intent of the Planned Development District Standards in the Zoning Ordinance and the Residential Development Criteria in the Comprehensive Plan.

Sanitary Sewer installation on Lot 260 (see Attachment 3)

The owner of Lot 260 testified at the public hearing, expressing concerns about the proposed installation of a sewer pipe in the existing easement on her property. The easement was put in place for the express purpose of allowing for a new sewer line when the Middleridge subdivision was created in the 1970s. The plans show the pipe will be no closer than 8.7 feet from the corner the house on Lot 260 at its closest point, and perhaps as much as 10 feet or more, based subject to final engineering. (It should also be noted that as the house is at an angle, only the corner will be that close).

No waiver is necessary to allow the sewer installation, as the PFM only recommends that sanitary pipes *generally* be 15 feet from a structure. In this case, the house and easement are both existing, making a 15 foot separation impossible. As discussed in the Staff Report, Staff from the Wastewater Planning and Monitoring Division of DPWES reviewed the plans and provided a memo (included in the staff report) that states they believe the new pipe can be constructed safely without any damage to the home. In addition, the applicant stated on the record during the public hearing that they intend to use a small rubber-treaded machine during installation and will restore the area when finished. Most sewer pipes, including this one, are not under pressure and rarely, if ever, require maintenance of any kind until many decades after first installation; however, as with all sewer pipes, Fairfax County will be responsible for its maintenance and upkeep once the builder is off bond.

Rt. 123 Trail

The plans show the new section of trail entirely within the proposed right of way. As the County currently maintains the existing section of trail along this portion of Ox Road, it is anticipated that they will also maintain the new section. FCDOT staff has no outstanding issues regarding the trail.

REVISED PROFFERS (Attachment 2)

The applicant has submitted revised proffers dated November 13, 2013 in conjunction with the revised FDP. The proffer commitments are consistent with those provided in the staff report, but have been updated to address several concerns raised by Staff and members of the Commission:

- Proffer # 1 was revised to reference the new plan date of November 7, 2013.
- Proffer #12, sometimes referred to as a “ladder proffer”, was added to allow for reciprocal easements along common residential property lines. These easements allow homeowners reasonable access to edges of their neighbor’s property to perform routine maintenance like setting up a ladder that needs to encroach over the property line.
- Proffer #14 was revised to clarify that the applicant is constructing a new section of trail along Ox Road and will request that the County maintain the portions to be located in the Rt. 123 right of way.
- Proffer #39 has been added to address concerns from adjoining property owners on Lots 261 and 262 related to stormwater management. After the public hearing, staff from DPWES provided additional analyses of the affected area and identified several possible solutions to improve what is an existing drainage deficiency stemming from improper grading on Lots 261 and 262. The original subdivision plan for the Middleridge subdivision from the 1970s showed the natural drainage path flowing north along the rear of Lots 261 and 262, and then across Lots 263 and 264 to Middlegate Drive.

Staff and the applicant examined the possibility of re-grading portions of these properties to correct the inadequate overland relief; however, a field inspection revealed numerous mature trees, gardens, play sets, utilities and other improvements that would be affected; accordingly this idea was rejected by the applicant as too disruptive to surrounding properties. Even without this, staff noted that the ponding situation which occurs on Lots 261 and 262 could be improved by replacing the manhole in the northwestern corner of Lot 261 with a yard inlet, as this would relieve the situation when the exiting yard inlet becomes overwhelmed. The work could be done within the existing storm drainage easement. Additional grading within the easement and on Lot 262 could also help to ameliorate the ponding issue. Although the proposed stormwater system will remove the majority of the runoff at this point and direct it to the underground pipes, replacing the manhole and grading would provide an added benefit, especially during extreme events should the underground storm drainage system on the applicant’s property become inoperable.

While applicant has demonstrated that they can satisfy the PFM requirements without doing any of this off-site work, they have nonetheless proffered to perform grading and other work on Lots 261 and 262 at their expense, subject to the consent of the property owners. The proffer requires that the applicant reach out

to the owners via certified mail within thirty days of any rezoning approval to inquire about their willingness to enter an agreement to allow the applicant do this work. The two homeowners then have 30 days to respond to the inquiry to indicate their willingness to work with the applicant. It should be noted that the ultimate decision rests with the property owners; if they decide they would prefer not to have the applicant perform any work, the applicant will proceed with the stormwater plan as depicted in the current submission. It is staff's opinion that the CDP/FDP in conjunction with this proffer satisfactorily address the stormwater issues associated with this development application.

CONCLUSION AND RECOMMENDATIONS

Staff's overall opinion of the project and recommendations to the Planning Commission have not changed. As a partially wooded infill site surrounded by established neighborhoods, the applicant was challenged with designing a layout that is compatible with surrounding development and sensitive to the many environmental issues present on the site.

The CDP/FDP coupled with the revised proffers have, in staff's opinion, adequately addressed concerns about tree preservation, stormwater management, and traffic circulation. Staff continues to maintain that the current design strikes the appropriate balance between the density recommended in the Comprehensive Plan and a context sensitive layout. Staff and the Planning Commission advised the applicant to work with the immediately affected neighbors on the issue of stormwater. With the addition of Proffer #39, whereby the applicant has agreed, with the consent of those homeowners, to perform the offsite work at the applicant's expense, they have demonstrated a willingness to go beyond minimum County requirements to provide a better end result for the community.

In summary, staff concludes that the request for approval of a Rezoning and Conceptual/Final Development Plan continue to be in conformance with the Comprehensive Plan and all applicable provisions of the Zoning Ordinance and makes the following recommendations:

Staff recommends approval of RZ 2012-BR-020 subject to the execution of proffers consistent with those found in Attachment 2 of this report.

Staff recommends approval of FDP 2012-BR-020.

Staff recommends approval of a waiver of the service drive requirement along Rt. 123 in favor of the frontage improvements shown on the CDP/FDP.

Staff recommends approval of a modification of the trail requirement along Rt. 123 in favor of the eight foot wide asphalt trail shown on the CDP/FDP.

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Staff recommends approval of a waiver of the parallel crushed stone pedestrian path along Route 123 in favor of the asphalt path shown on the CDP/FDP.

Staff recommends approval of a modification of the sight distance requirement for corner lots to allow the entry feature and sound wall to be located as shown on the CDP/FDP.

It should be noted that it is not the intent of staff to recommend that the Board, in adopting any proffers or conditions, relieve the applicant/owner from compliance with the provisions of any applicable ordinances, regulations, or adopted standards. It should be further noted that the content of this report reflects the analysis and recommendation of staff; it does not reflect the position of the Board of Supervisors.

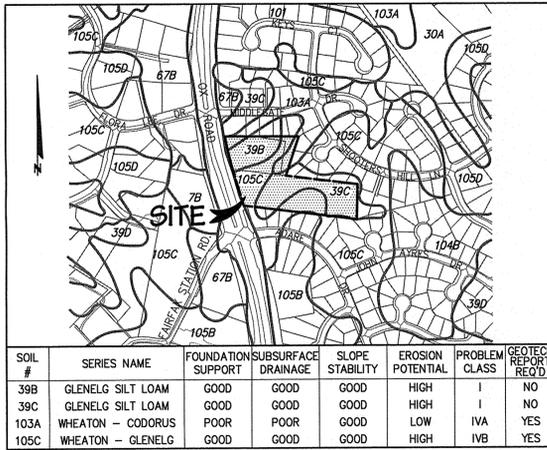
The approval of this Rezoning does not interfere with, abrogate or annul any easement, covenants, or other agreements between parties, as they may apply to the property subject to this application.

ATTACHMENTS

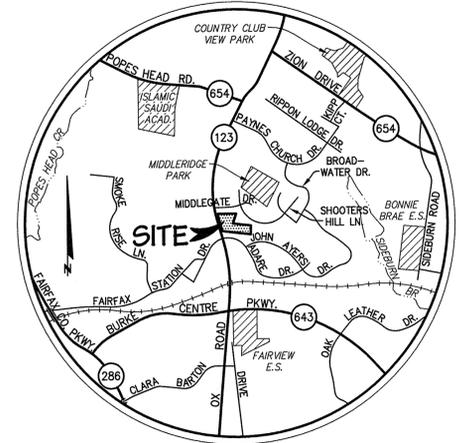
1. Final Development Plan – Ox Road Estates, Revised November 7, 2013
2. Revised Proffers (blacklined) dated November 13, 2013
3. Sanitary Sewer Exhibit

CONCEPTUAL / FINAL DEVELOPMENT PLAN OX ROAD ESTATES

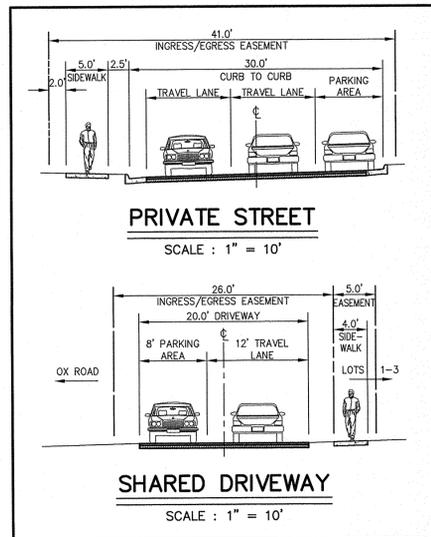
**BRADDOCK DISTRICT
FAIRFAX COUNTY, VIRGINIA
RZ 2012-BR-020**



SOILS MAP/DATA
SCALE : 1" = 500'



VICINITY MAP
SCALE : 1" = 2000'



NOTES

- THE PROPERTY DELINEATED ON THIS PLAN IS LOCATED ON FAIRFAX COUNTY TAX ASSESSMENT MAP NUMBER 77-1(1)36-38. THE SITE IS CURRENTLY ZONED R-1. THE PROPOSED ZONE IS PDH-3.
- THE PROPERTY HEREON IS CURRENTLY IN THE OWNERSHIP OF :
 - PARCEL 36 - DANIEL B. THOMPSON IN WILL BOOK 876 AT PAGE 708 AND WILL BOOK 4760 AT PAGE 758
 - PARCELS 37 & 38 - R AND D 2001, L.L.C. & CHURCH ROAD, LIMITED IN DEED BOOK 16128 AT PAGE 247 AND WILL BOOK 484 AT PAGE 61
- BOUNDARY AND TOPOGRAPHIC INFORMATION TAKEN FROM A FIELD RUN SURVEY PREPARED BY CHARLES P. JOHNSON & ASSOCIATES, DATED JULY 2012. CONTOUR INTERVAL EQUALS TWO FEET NGVD 1929.
- THERE ARE NO 100-YEAR FLOODPLAINS ON-SITE. NO FLOODPLAIN OR DRAINAGE STUDIES ARE REQUIRED FOR THIS PROJECT.
- THERE ARE NO RESOURCE PROTECTION AREAS (RPAs) OR ENVIRONMENTAL QUALITY CORRIDORS (EQCs) ON THIS SITE. A WATER QUALITY IMPACT ASSESSMENT WILL NOT BE REQUIRED.
- TO THE BEST OF OUR KNOWLEDGE, THE SITE HAS NO SCENIC ASSETS OR NATURAL FEATURES DESERVING OF PROTECTION AND PRESERVATION.
- TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO KNOWN GRAVES, OBJECTS, OR STRUCTURES MARKING A PLACE OF BURIAL.
- TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO EXISTING UTILITY EASEMENTS HAVING A WIDTH OF 25 FEET OR GREATER, NOR ANY MAJOR UNDERGROUND UTILITY EASEMENTS LOCATED WITHIN THE SITE.
- ANY EXISTING WELLS ON-SITE ARE TO BE CAPPED AND ABANDONED IN ACCORDANCE WITH HEALTH DEPARTMENT REGULATIONS.
- SEE SHEET 3 FOR A DESCRIPTION OF THE EXISTING VEGETATION.
- EXISTING STRUCTURES ARE TO BE REMOVED. THE EXISTING DWELLINGS WERE CONSTRUCTED IN 1948 (PARCEL 36) AND 1950 (PARCEL 37).
- TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO HAZARDOUS OR TOXIC SUBSTANCES AS SET FORTH IN TITLE 40, CODE OF FEDERAL REGULATIONS PART 118.4, 302.4, AND 355; ALL HAZARDOUS WASTE AS SET FORTH IN COMMONWEALTH OF VIRGINIA/DEPARTMENT OF WASTE MANAGEMENT VR 672-10-1 - VIRGINIA HAZARDOUS WASTE MANAGEMENT REGULATIONS; AND/OR PETROLEUM PRODUCTS AS DEFINED IN TITLE 40, CODE OF FEDERAL REGULATIONS PART 280; TO BE GENERATED, UTILIZED, STORED, TREATED, AND/OR DISPOSED OF ON-SITE AND THE SIZE AND CONTENTS OF ANY EXISTING OR PROPOSED STORAGE TANKS OR CONTAINERS.
- THERE ARE NO ZONING OVERLAY DISTRICTS IMPACTING THIS SITE.
- THERE ARE NO AFFORDABLE DWELLING UNITS (ADUs) REQUIRED FOR THIS PROJECT.
- NO DENSITY REDUCTIONS ARE REQUIRED BY ZONING ORDINANCE SECTION 2-308.
- IN ACCORDANCE WITH THE ADOPTED COMPREHENSIVE PLAN, THE PROPOSED DEVELOPMENT WILL PROVIDE RESIDENTIAL DEVELOPMENT AT 2.5 DWELLING UNITS PER ACRE AND WILL CONFORM TO ALL APPLICABLE ORDINANCES, REGULATIONS, AND ADOPTED STANDARDS EXCEPT FOR THE FOLLOWING WAIVERS/MODIFICATIONS HEREBY REQUESTED :
 - A WAIVER OF THE PARALLEL STONE DUST TRAIL REQUIREMENT
 - A WAIVER OF THE ON-ROAD BIKE ROUTE REQUIREMENT ALONG OX ROAD (ROUTE 123)
 - A WAIVER OF THE SERVICE DRIVE REQUIREMENT ALONG THE ENTIRE FRONTAGE OF OX ROAD (ROUTE 123)
- PROPOSED PUBLIC IMPROVEMENTS :
 - WATER SERVICE TO BE PROVIDED BY AN EXISTING 16" MAIN LOCATED IN OX ROAD
 - SANITARY SERVICE TO BE PROVIDED BY AN EXISTING 8" MAIN LOCATED IN OAK PARK COURT
- A DEVELOPMENT SCHEDULE HAS NOT BEEN DETERMINED AT THIS TIME.
- SEE SHEET 15 FOR ARCHITECTURAL ELEVATIONS.
- A TOT LOT OF AT LEAST 1,000 SF IS BEING PROPOSED AS A RECREATIONAL FACILITY FOR THIS DEVELOPMENT.
- A LANDSCAPED SEATING AREA OF APPROXIMATELY 2,000 SF IS BEING PROPOSED AS A SPECIAL AMENITY FOR THIS DEVELOPMENT.
- A MINOR PAVED TRAIL WITH A PARALLEL STONE UNPAVED TRAIL IS REQUIRED FOR THIS PROJECT PER THE FAIRFAX COUNTY TRAILS PLAN. AN ON-ROAD BIKE ROUTE IS ALSO REQUIRED ALONG OX ROAD. (SEE NOTE 16)
- PARCEL "A" WILL BE CONVEYED TO A HOMEOWNERS ASSOCIATION FOR OWNERSHIP AND MAINTENANCE.
- THE APPLICANT RESERVES THE RIGHT TO LOCATE ONE OR MORE TEMPORARY SALES OFFICES ON THE PROPERTY IN ACCORDANCE WITH ARTICLE 8-808 OF THE ZONING ORDINANCE.
- MINOR MODIFICATIONS TO THE BUILDING FOOTPRINTS, LOT AREAS, DIMENSIONS, UTILITY LAYOUT, AND LIMITS OF CLEARING AND GRADING MAY OCCUR WITH THE FINAL ENGINEERING DESIGN, IN SUBSTANTIAL CONFORMANCE WITH THE COP/FDP, PROVIDED SUCH ARE IN ACCORDANCE WITH THE MINOR MODIFICATIONS PROVISION IN SECTION 16-403 OF THE ZONING ORDINANCE.

| REVISIONS | | |
|-----------|--|----------|
| NO. | SHEET NUMBER AND REVISION DESCRIPTION | DATE |
| 1. | (1) CHANGED PROP. ZONING DISTRICT TO R-3C. REV. TABS, WAIVER REQUESTS, ADD TYP. LOT AND STREET DETAILS. (2) ADDED DIMENSIONS & SERVICE DRIVE ROUTE NUMBER. (3) ADDED TREE INFORMATION. (4) REVISED LAYOUT, REMOVED ONE LOT. (5) REVISED LANDSCAPING, TREE COVER CALCULATIONS & TARGET DEVIATION LETTER. (8&9) REVISED OUTFALL ANALYSIS AND SWM & BMP CALCS. | 1-24-13 |
| 2. | (1) CHANGED PROP. ZONING DISTRICT TO PDH-3. REV. TABS, WAIVER REQUESTS, TYP. LOT AND STREET DETAILS. (2) REVISED EXISTING TREE DRIP LINE. (3) UPDATED TREE INFORMATION. (4) REVISED LAYOUT. (5) REVISED LANDSCAPING, TREE COVER CALCULATIONS & TARGET DEVIATION LETTER. (6&7) UPDATED TREE INVENTORY FOR NEW CLEARING LIMIT. (8&9) REVISED OUTFALL ANALYSIS AND SWM & BMP CALCS. | 5-2-13 |
| 3. | (1) REMOVED WAIVER REQUEST FOR TREE TARGET AREA; REVISED SITE TABS, TYP. LOT DETAIL, SWM INFO. (4) REVISED LAYOUT & CLEARING LIMITS. (5) REVISED LANDSCAPING & TREE COVER CALCULATIONS; REMOVED TREE TARGET AREA LETTER. (6&7) UPDATED TREE INVENTORY FOR NEW CLEARING LIMITS. (8-14) REVISED OUTFALL ANALYSIS AND SWM & BMP CALCS; ADDED NEW SHEETS. (15) NEW SHEET. | 7-26-13 |
| 4. | (1) REMOVED WAIVER REQUEST FOR SANITARY SEWER. (6) REVISED SYMBOLS FOR OFF-SITE TREES. (8-14) UPDATED CALCULATIONS. (15) REVISED ELEVATION. | 8-23-13 |
| 5. | (4) REV. STONE STORAGE FOOTPRINT & CLEARING LIMITS. (5) REV. LANDSCAPING & TREE COVER CALCULATIONS. (6&7) CHANGED TREE #17392 FROM PRESERVE TO REMOVE. (9) UPDATED CALCULATIONS. | 9-6-13 |
| 6. | (1) REVISED SHARED DRIVEWAY DETAIL. (4) ADDED OVERLAND RELIEF NOTE & SIDEWALK LOTS 1-3. (15) ADDED LIGHTING, BENCH & WALL DETAILS. | 9-24-13 |
| 7. | (1) REVISED STORMWATER INFO CHART. (4) REVISED STORM DRAIN LAYOUT & CLEARING LIMITS. (5) REVISED LANDSCAPING DUE TO UTILITY CHANGES. (8-14) UPDATE CALCULATIONS BASED ON LAYOUT CHANGES. | 10-29-13 |
| 8. | (1) REVISED STORMWATER INFO CHART. (4) REMOVED OVERLAND RELIEF NOTE. (8&9) REVISED DRAINAGE DIVIDES. (10) REVISED STORM DRAIN DESIGN COMPUTATIONS. (11) REVISED DRAINAGE DIVIDES & RAIN GARDEN #2 COMPS. (12&13) REVISED SWM SUMMARY AND ROUTINGS. | 11-7-13 |

NO CHANGES, OTHER THAN THOSE SPECIFIED ABOVE, HAVE BEEN MADE TO THIS PLAN FROM WHAT WAS PREVIOUSLY SUBMITTED OR APPROVED.

MINIMUM STORMWATER INFORMATION FOR REZONING, SPECIAL EXCEPTION, SPECIAL PERMIT AND DEVELOPMENT PLAN APPLICATIONS

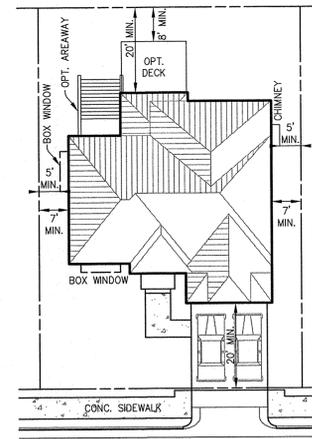
- 1. Plat is at a minimum scale of 1"=50' (unless it is depicted on one sheet with a minimum scale of 1"=100').
- 2. A graphic depicting the stormwater management facility(ies) and limits of clearing and grading accommodate the stormwater management facility(ies), storm drainage pipe systems and outlet protection, pond spillways, access roads, site outfalls, energy dissipation devices, and stream stabilization measures as shown on Sheet 4.
- 3. Provide :

| Facility Name/ Type & No. | On-site area served (acres) | Off-site area served (acres) | Drainage area (acres) | Footprint area (sf) | Storage Volume (cf) | If pond, dam height (ft) |
|--|-----------------------------|------------------------------|-----------------------|---------------------|---------------------|--------------------------|
| Bio-Retention Filter w/Underground Storage | 2.82± | 0.30± | 3.12± | 20,062± | 44,136± | 3.0± |
- 4. Onsite drainage channels, outfalls, and pipe systems are shown on Sheet 4. Pond inlet and outlet pipe systems are shown on Sheet 4.
- 5. Maintenance access (road) to stormwater management facility(ies) are shown on Sheet 4. Type of maintenance access road surface noted on the plat is permeable pavers.
- 6. Landscaping and tree preservation shown in and near the stormwater management facility is shown on Sheets 5 & 6.
- 7. A 'stormwater management narrative' which contains a description of how detention and best management practices requirements will be met is provided on Sheet 8.
- 8. A description of the existing conditions of each numbered site outfall extended downstream from the site to a point which is at least 100 times the site area or which has a drainage area of at least one square mile (640 acres) is provided on Sheets 9 & 10.
- 9. A description of how the outfall requirements, including known changes to contributing drainage areas (i.e. drainage diversions), of the Public Facilities Manual will be satisfied is provided on Sheet 9.
- 10. Existing topography with maximum contour intervals of two (2) feet and a note as to whether it is an air survey or field run is provided on Sheets 1 & 2.
- 11. A submission waiver is requested for N/A
- 12. Stormwater management is not required because N/A

SITE TABULATIONS

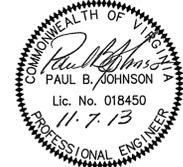
| SITE AREA : | | |
|--|------------------|-------------------|
| AREA OF PROPOSED LOTS | 88,206 ± | (2.025 Ac) |
| PARCEL "A" | 129,888 ± | (2.982 Ac) |
| RIGHT-OF-WAY DEDICATION (OX ROAD FRONTAGE) | 6,344 ± | (0.145 Ac) |
| TOTAL | 224,438 ± | (5.152 Ac) |

| ZONE : PDH-3 | REQUIRED | PROVIDED |
|-------------------------|-------------------------------------|---|
| NUMBER OF UNITS | --- | 13 single-family detached |
| MAXIMUM DENSITY | 3 DU/AC | 2.5 DU/AC |
| MINIMUM LOT AREA | N/R | 6,400 ± |
| AVERAGE LOT AREA | N/R | 6,780 ± |
| MAXIMUM BUILDING HEIGHT | N/R | 35' |
| MINIMUM YARDS | N/R | SEE TYP. LOT DETAIL |
| OPEN SPACE | 20% (1.03 Ac) | 40%± (2.06 Ac±) |
| PARKING | 3 spaces/ unit (39 total spaces) | 4 spaces/ unit (26 garage spaces + 26 driveway spaces = 52 on-lot spaces) + 19 additional visitor spaces along proposed private street = 71 parking spaces for entire subdivision |



TYPICAL LOT LAYOUT
SCALE : 1" = 20'

- NOTES :**
- EXTENSIONS INTO REQUIRED YARDS ARE TO BE PERMITTED IN ACCORDANCE WITH ARTICLE 2-412.
 - DECKS MAY BE PERMITTED IN ACCORDANCE WITH ARTICLE 2-412, WHICH ALLOWS A 12' EXTENSION INTO THE REQUIRED MINIMUM YARD, BUT SET BACK AT LEAST FIVE (5) FEET FROM PROPERTY LINE(S).
 - EACH UNIT IS TO HAVE TWO(2) 8.5' x 18.0' PARKING SPACES IN THE DRIVEWAY



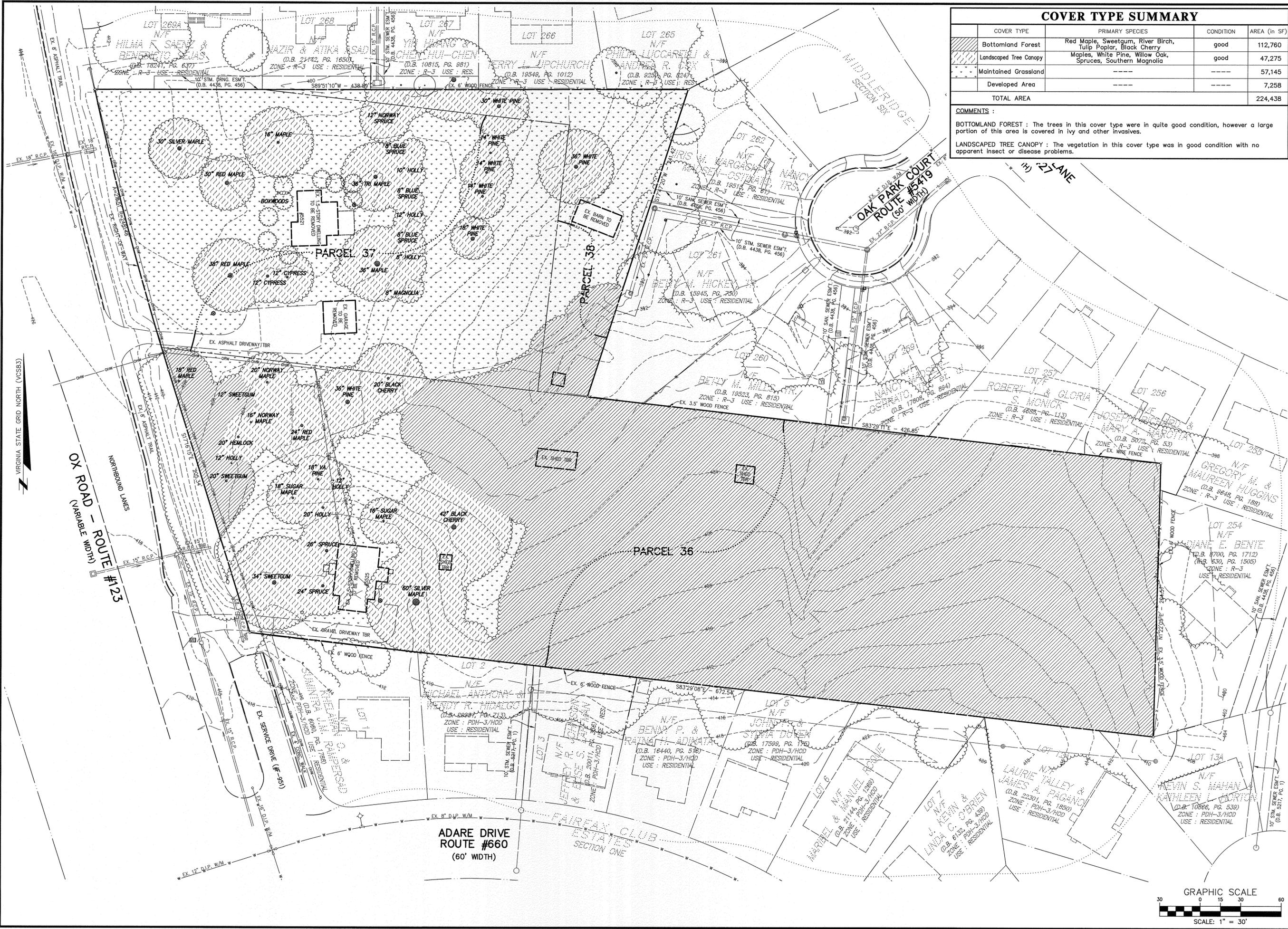
DEVELOPER
EASTWOOD PROPERTIES
3050 CHAIN BRIDGE ROAD
SUITE 103
FAIRFAX, VIRGINIA 22033
(703)383-6111

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- BMP MAP
- BMP MAPS
- OUTFALL ANALYSIS
- RAIN GARDEN & VEGETATED SWALE DETAILS
- 12 & 13 STORMWATER MANAGEMENT SUMMARY & COMPUTATIONS
- ROUTING FOR VEGETATED SWALES
- ARCHITECTURAL ELEVATION & SITE DETAILS

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DATE : NOVEMBER 5, 2012
REVISED : JANUARY 24, 2013
MAY 2, 2013
JULY 26, 2013
AUGUST 23, 2013
SEPTEMBER 6, 2013
SEPTEMBER 24, 2013
OCTOBER 29, 2013
NOVEMBER 7, 2013



| COVER TYPE SUMMARY | | | |
|------------------------|--|-----------|--------------|
| COVER TYPE | PRIMARY SPECIES | CONDITION | AREA (in SF) |
| Bottomland Forest | Red Maple, Sweetgum, River Birch, Tulip Poplar, Black Cherry | good | 112,760 |
| Landscaped Tree Canopy | Maples, White Pine, Willow Oak, Spruces, Southern Magnolia | good | 47,275 |
| Maintained Grassland | --- | --- | 57,145 |
| Developed Area | --- | --- | 7,258 |
| TOTAL AREA | | | 224,438 |

COMMENTS:

BOTTOMLAND FOREST: The trees in this cover type were in quite good condition, however a large portion of this area is covered in ivy and other invasives.

LANDSCAPED TREE CANOPY: The vegetation in this cover type was in good condition with no apparent insect or disease problems.

5-2-13 UPDATED TREE INFORMATION (KJO)
 7-24-13 ADDED TREE INFORMATION (KJO)
 NO. DATE REVISION PRIOR TO APPROVAL

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EXISTING VEGETATION MAP

OX ROAD ESTATES

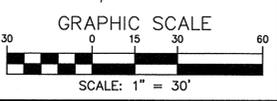
BRADDOCK DISTRICT
 FAIRFAX COUNTY, VIRGINIA

RZ 2012-BR-020

COMMONWEALTH OF VIRGINIA
 PAUL B. JOHNSON
 Lic. No. 018450
 11-7-13
 PROFESSIONAL ENGINEER

| NO. | DESCRIPTION | REVISIONS | BY | DATE |
|-----|-------------|-----------|----|------|
| | | | | |
| | | | | |

PERSON: KJV
 DATE: NOV. 2012
 SCALE: 1" = 30'
 SHEET: 3 OF 15
 PRJ NO: 12-517
 TYPE: CDP / FDP



NOTE :

TREE PRESERVATION CANOPY AREAS MEETING STANDARDS OF §12-0200 WERE CALCULATED USING THE FOLLOWING THREE GUIDELINES :

- CANOPY CREDIT IS TAKEN ONLY FOR TREES WITH MAIN TRUNKS LOCATED ON THE SITE BEING DEVELOPED WITHIN THE TREE PRESERVATION AREAS.
- TREES THAT WERE BISECTED BY THE DEVELOPMENT SITE'S OUTER PROPERTY LINE THAT ARE ASSUMED TO SURVIVE FOR THE MINIMUM 10 YEARS AFTER PLAN APPROVAL. CREDIT WAS TAKEN ONLY FOR THE PART OF THE TREE'S CANOPY THAT DIRECTLY OVERHANGS THE DEVELOPMENT SITE.
- WHERE SHARED PROPERTY LINES BISECT DENSE FOREST STANDS AND IT IS NOT PRACTICAL OR FEASIBLE TO DETERMINE WHICH PROPERTY A CANOPY ORIGINATES FROM, THE EXTENT OF ON-SITE CANOPY AREAS MAY BE DEFINED BY THE SHARED PROPERTY LINE.

PLEASE REFER TO THE TREE PRESERVATION PLAN ON SHEET 6 TO SEE INDIVIDUAL TREES 12" AND GREATER IN DIAMETER THAT CONTRIBUTE TO THE TREE PRESERVATION CANOPY AREA PER THE ABOVE GUIDELINES.

LEGEND

- CAT. III & IV SHADE TREE (2" CAL.)
(E.G. RED MAPLE, OAK, RIVER BIRCH, BEECH)
* NO CATEGORY IV TREES TO BE PLANTED IN THE RAIN GARDENS *
- CAT. I - IV EVERGREEN TREE (8' HGT.)
(E.G. HOLLY, E. REDCEDAR, LOBLOLLY PINE)
- CAT. II ORNAMENTAL TREE (2" CAL.)
(E.G. SERVICEBERRY, MAGNOLIA, DOGWOOD)
- MEDIUM DECIDUOUS SHRUB
(E.G. VIBURNUM, HYDRANGEA, DOGWOOD)
- MEDIUM EVERGREEN SHRUB
(E.G. HOLLY, JUNIPER)
- PERENNIALS / SEASONAL PLANTINGS

* THE LANDSCAPING SHOWN IS CONCEPTUAL IN NATURE. FINAL LOCATIONS AND SPECIES ARE TO BE DETERMINED WITH FINAL SITE PLAN. NATIVE AND/OR DESIRABLE SPECIES WILL BE USED WHERE POSSIBLE. TREE LOCATIONS AND SIZES MAY VARY WITH FINAL OVERHEAD & UNDERGROUND UTILITY LOCATIONS.

THIS SHEET IS FOR LANDSCAPE PURPOSES ONLY

Table 12.10 10-YEAR TREE CANOPY CALCULATION WORKSHEET

| A. Tree Preservation Target Calculations and Statement (Table 12.3) | |
|---|---|
| A | Pre-development area of existing tree canopy 160,035 SF |
| B | Percentage of gross site area covered by existing tree canopy 71.3 % |
| C | Percentage of 10-year canopy requirement that should be met through tree preservation 25 % |
| D | Proposed percentage of canopy requirement that will be met through tree preservation 73.1 % |
| E | Has the Tree Preservation Target minimum been met? YES |
| F | If no, provide sheet number where deviation request is located N/A |
| G | |

| B. Tree Canopy Requirement | |
|----------------------------|--|
| 1 | Identify gross site area 224,438 SF |
| 2 | Subtract area dedicated to road frontage and parks 6,344 SF |
| 3 | Subtract area of exemptions 0 SF |
| 4 | Adjusted gross site area (B1 - B2 - B3) 218,094 SF |
| 5 | Identify site's zoning and/or use PDH-3 |
| 6 | Percentage of 10-year canopy required 25 % |
| 7 | Area of 10-year canopy required (B4 x B6) 54,524 SF |
| 8 | Is a modification of canopy requirements being requested? NO |
| 9 | If B8 is yes, provide sheet number where modification request is located N/A |

| C. Tree Preservation | |
|----------------------|---|
| 1 | Tree Preservation Target Area 38,878 SF |
| 2 | Total canopy area meeting standards of §12-0200 31,900 SF |
| 3 | x 1.25 39,875 SF |
| 4 | Total canopy area of unique or valuable forest or woodland communities 0 SF |
| 5 | x 1.50 0 SF |
| 6 | Total canopy area of Heritage, Memorial, Specimen or Street Trees 0 SF |
| 7 | x 1.5 to 3.0 0 SF |
| 8 | Canopy area of trees within Resource Protection Areas and 100-year floodplains 0 SF |
| 9 | x 1.0 0 SF |
| 10 | Total of C3, C5, C7, and C9 39,875 SF |

| D. Tree Planting | |
|------------------|--|
| 1 | Area of canopy to be met through tree planting (B7 - C12) 14,649 SF |
| 2 | Area of canopy provided by planted trees 26,850 SF |
| 3 | x 1.0 26,850 SF |
| 4 | Area of canopy provided through tree seedlings 0 SF |
| 5 | x 1.0 0 SF |
| 6 | Area of canopy provided through native shrubs or woody seed mix 0 SF |
| 7 | x 1.0 0 SF |
| 8 | Percentage of line D4 represented by line D6 (must not exceed 33% of D4) 0 % |
| 9 | Total of canopy area to be provided through tree planting 26,850 SF |
| 10 | Is offsite planting relief requested? NO |
| 11 | Tree Bank or Tree Fund? N/A |
| 12 | Canopy area requested to be provided through offsite banking or tree fund 0 SF |
| 13 | Amount to be deposited into the Tree Preservation and Planting Fund 0 |

| E. Total of 10-year Tree Canopy Provided | |
|--|--|
| 1 | Total canopy area provided through tree preservation (C12) 39,875 SF |
| 2 | Total canopy area provided through tree planting (D9) 26,850 SF |
| 3 | Total canopy area provided through offsite mechanism (D12) N/A SF |
| 4 | Total 10-year tree canopy provided 66,725 SF |

Total 10-year tree canopy provided (% of net site area) 30.6 %

* Plant species and additional credit types (if applicable) are to be specified with the final site/landscape plan. Total 10-year tree canopy provided with the site plan shall be equivalent to that shown on the CDPI/FDP.

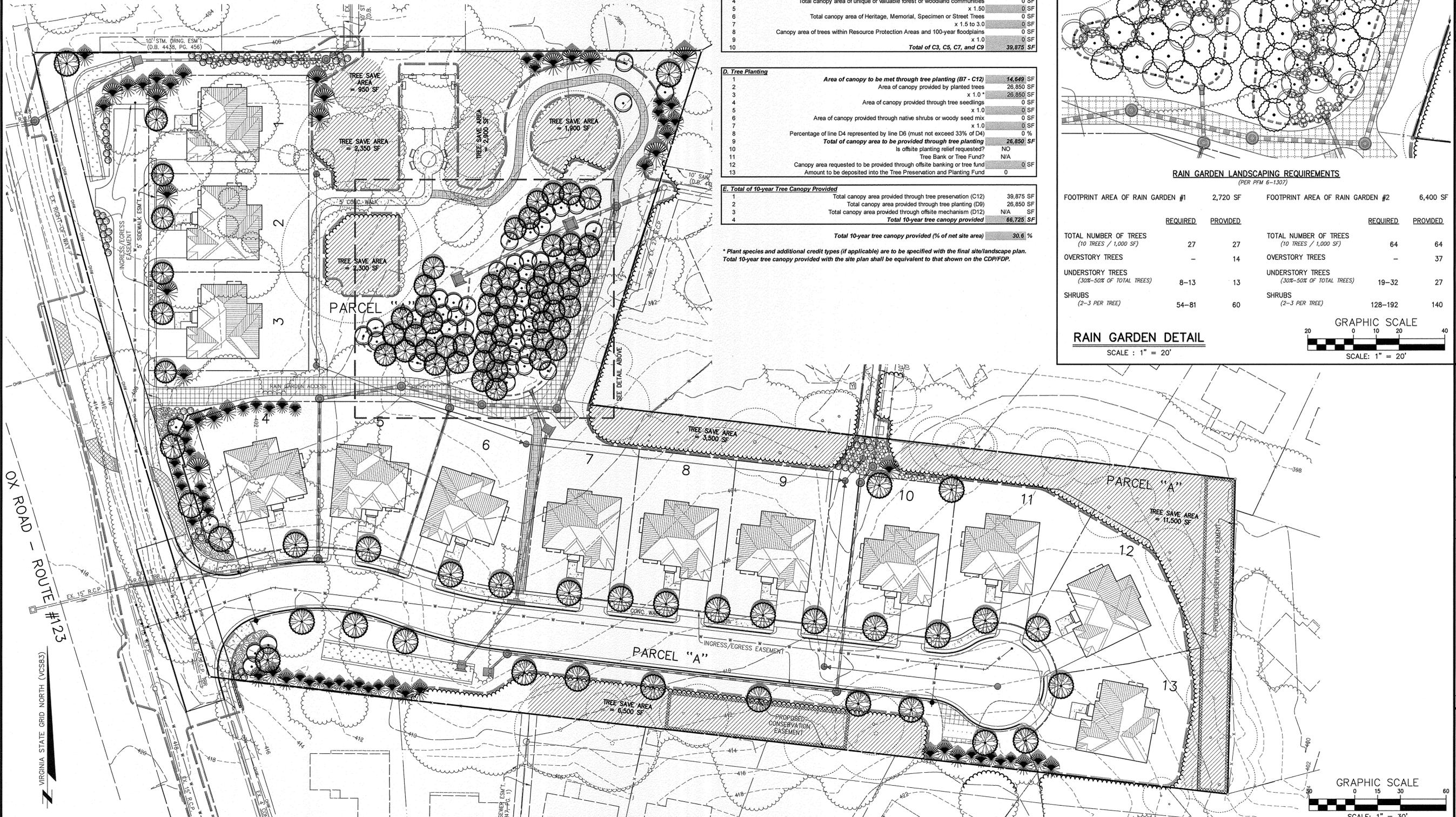
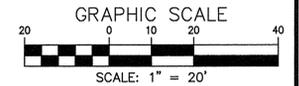


RAIN GARDEN LANDSCAPING REQUIREMENTS
(PER PFM 6-1307)

| FOOTPRINT AREA OF RAIN GARDEN #1 | 2,720 SF | FOOTPRINT AREA OF RAIN GARDEN #2 | 6,400 SF |
|---|----------|----------------------------------|----------|
| REQUIRED | | PROVIDED | |
| TOTAL NUMBER OF TREES (10 TREES / 1,000 SF) | 27 | 27 | 64 |
| OVERSTORY TREES | - | 14 | 37 |
| UNDERSTORY TREES (30%-50% OF TOTAL TREES) | 8-13 | 13 | 27 |
| SHRUBS (2-3 PER TREE) | 54-81 | 60 | 128-192 |

RAIN GARDEN DETAIL

SCALE : 1" = 20'



CONCEPTUAL LANDSCAPE PLAN

OX ROAD ESTATES

BRADDOCK DISTRICT
FAIRFAX COUNTY, VIRGINIA

RZ 2012-BR-020



| NO. | DESCRIPTION | REVISIONS | DATE |
|-----|-------------|-----------|------|
| | | | |
| | | | |
| | | | |

| | | | |
|----------|-----------|-----------|-----------|
| DESIGN | DRAFT | KJV | KJV |
| APPROVED | DATE | NOV. 2012 | SCALE 30' |
| SHEET | OF | 5 | 15 |
| PRJ NO: | 12-517 | | |
| TYPE: | CDP / FDP | | |

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TREE PRESERVATION NARRATIVE:

Trees as referred to in this document are considered those trees that are protected by limits of clearing and grading and shown for preservation on approved plans.

- Flagging/ Site Layout:** Prior to requesting a pre-construction meeting, the contractor is responsible for flagging the limits of clearing and grading. These limits shall not exceed that shown on the approved plans
- Pre-Construction Meeting:** After clearing limits have been staked a meeting shall be requested by the contractor to walk with owner or owner's designated representative, arborist/forester hired by owner, site superintendent, clearing contractor and UFMD, DPWES representative to make minor adjustments as necessary to observe trees listed in tree preservation activity schedule. Additional preservation activities will be coordinated with the Urban Forestry Division at this time.
- Tree Protection Approval:** Selective tree removals, root pruning, and tree protection fence installation should be completed prior to any demolition or land clearing operations. An UFMD, DPWES, representative shall be contacted a minimum of three (3) days prior to any site clearing, grading or demolition activities are to begin, to inspect the site to insure that the tree protection has been installed.
- Protection of Existing Understory Vegetation and Soil Conditions in Tree Preservation Areas:** All tree preservation-related work occurring in or adjacent to tree preservation areas shall be accomplished in a manner that minimizes damage to vegetation to be preserved in the lower canopy environment, and to the existing top soil and leaf litter layers that provide nourishment and protection to that vegetation. Any removal of any vegetation or soil disturbance in tree preservation areas including the removal of plant species that may be perceived as noxious or invasive, such as poison ivy, greenbrier, multi-floral rose, etc. shall be subject to the review and approval of UFMD, DPWES
- Use of Equipment:** Except as qualified herein, the use of motorized equipment in tree preservation areas will be limited to hand-operated equipment such as chainsaws, wheel barrows, rake and shovels. Any work that requires the use of motorized equipment, such as tree transplanting spades, skid loaders, tractors, trucks, stump-grinders, etc., or any accessory or attachment connected to this type of equipment shall not occur unless pre-approved by UFMD.
- Root Pruning:** Tree preservation Areas shall be root pruned along the limits of clearing adjacent to significant trees 20" dbh and greater or as noted by the project arborist in the Tree Inventory and Activity Schedule. Root pruning shall be a minimum of 18" deep and shall be accomplished using a small walk behind trencher or air spade. The root pruning trench shall be backfilled immediately. Silt fence/super silt fence installation utilizing walk behind trencher can be substituted for root pruning as long as a minimum depth of 18" is achieved.
- Mulching:** Mulch shall be placed in areas as indicated on approved plans and/or extending in a swath fifteen feet wide along the Limit of Disturbance adjacent to indicated trees at minimum. Trees/Areas indicated will be mulched with wood chips generated from on site clearing or tree removal and pruning operations when possible. Shredded hardwood mulch from offsite maybe utilized if approved by project arborist. Mulch shall be spread in a uniform depth of three (3") inches by hand.
- Tree Protection Fencing:** Tree Preservation Areas shall be protected by per the attached Tree Protection Detail. Super-Silt fencing may be used for tree protection fencing as approved by UFMD. Fencing shall be erected at the limits of clearing and grading as shown on the demolition, and erosion and sediment control sheets. The installation of all tree protection fence types should be performed under the supervision of a certified arborist, and accomplished in a manner that does not harm existing vegetation that is to be preserved. Tree protection fencing shall be made clearly visible to all construction personnel. Bilingual signs stating "TREE PRESERVATION AREA - KEEP OUT" shall be affixed to the tree preservation fence at least every 30 feet, and three (3) working days prior to the commencement of any clearing, grading, or demolition activities, but subsequent to the installation of the tree protection devices including fencing. UFMD and the district supervisor staff shall be notified and given the opportunity to inspect the site to assure that all tree protection devices have been correctly installed. If it is determined that the fencing has not been installed correctly, no grading or construction activities shall occur until the fencing is installed correctly, as determined by UFMD.
- Tree Protection Maintenance:** Fencing shall be maintained in an upright position for the duration of the project. Tree protection fencing that is damaged as a result of land clearing operations shall be repaired prior to the end of the workday that the damage occurred.
- Pruning:** All pruning shall conform to current ANSI A300-2001 pruning standards. Trees designated for pruning shall be crown cleaned of deadwood 2" and greater unless otherwise specified by the project arborist. The interior of trees shall not be stripped of live tissue, suckers, or epicormic branches. Damaged, crossing, and rubbing branches may be removed at the arborist's discretion. Debris from pruning operations may be chipped and deposited into the Tree Preservation Areas and spread by hand to a uniform depth or be removed from the site.
- Site Monitoring:** During any clearing or tree/vegetation structure removal or transplantation of vegetation on the subject site, a representative of the applicant shall be present to monitor the process and ensure that the activities are conducted as approved by UFMD. The applicant should retain the services of a certified arborist to monitor all construction work and tree preservation efforts in order to ensure conformance with all tree preservation conditions, and UFMD approvals. Monitoring inspections to ensure compliance with tree preservation plans and other jurisdictional requirements shall be conducted daily during initial site clearing operations, weekly through the erosion and sediment control phase, weekly for four weeks there after and monthly for 12 months. The district supervisor shall be notified of the name and contact information of the Applicant's representative responsible for site monitoring at the tree preservation walk-through meeting.

NOTE: AS STATED BY SECTION 12-0507.1B IN THE PUBLIC FACILITIES MANUAL, DEAD TREES AND TREES THAT REPRESENT A POTENTIAL HAZARD TO HUMAN HEALTH AND PROPERTY WHICH ARE 12 INCHES IN DIAMETER OR GREATER THAT RESIDE IN ONE OF THE TWO FOLLOWING AREAS WILL BE IDENTIFIED IN THE TREE INVENTORY.

AREA 1. 100 FEET FROM THE PROPOSED LIMITS OF CLEARING AND GRADING WITHIN THE UNDISTURBED AREA.

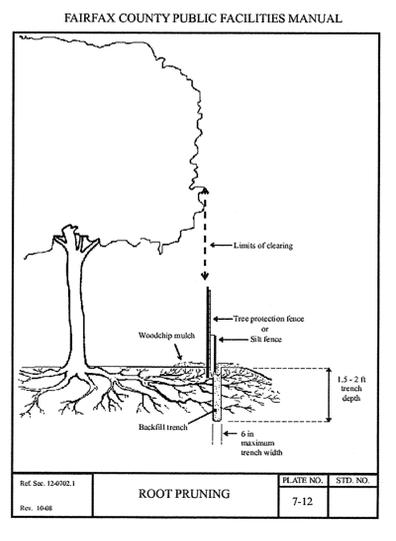
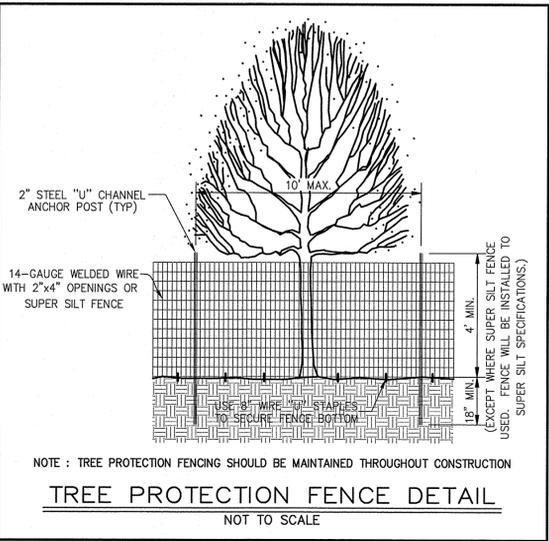
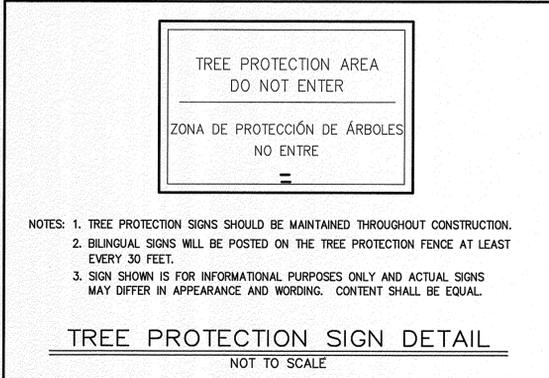
AREA 2. 10 FEET FROM THE PROPOSED LIMITS OF CLEARING AND GRADING WITHIN THE DISTURBED AREA.

THIS SHEET IS FOR TREE PRESERVATION PURPOSES ONLY

TREE INVENTORY AND ACTIVITIES SPREADSHEET

| Tree # | Survey Tree # | COMMON NAME | SCIENTIFIC BINOMIAL | DBH(in) | CONDITION | COMMENTS | STATUS | ROOT PRUNE | MULCH | TREE FENCE | PRUNE | CABLE | CAMBISTAT | TREAT PESTS | ACTIVITIES |
|--------|---------------|----------------------|-------------------------|---------|-----------|---|----------|------------|-------|------------|-------|-------|-----------|-------------|------------|
| 8 | 7286 | Red Maple | Acer rubrum | 8 | 81 | Offsite - Multi-leader, missing leader, poor form, epicormic sprouting | Preserve | X | X | X | | | | | |
| 9 | 7287 | River Birch | Betula nigra | 24 | 83 | Offsite - Buttressing roots, limb dieback, epicormic sprouting | Preserve | X | X | X | | | | | |
| 10 | 7288 | Tulip Poplar | Liriodendron tulipifera | 16 | 81 | Offsite - Epicormic sprouting, poor branching, inclusive bark | Preserve | X | X | X | | | | | |
| 11 | 7289 | Red Maple | Acer rubrum | 14 | 81 | Offsite - Dual leader, limb dieback, poor branching, ivy growing at base, inclusive bark | Preserve | X | X | X | | | | | |
| 12 | 7273 | Silver Maple | Acer saccharinum | 30 | 81 | Offsite - Triple leader, epicormic sprouting, buttressing roots, inclusive bark, limb dieback. Tree to be removed with written permission from property owner. | Remove | | | | | | | | |
| 13 | 7274 | River Birch | Betula nigra | 12 | 90 | Offsite - Limb dieback, epicormic sprouting | Preserve | X | X | X | | | | | |
| 14 | 7275 | Tulip Poplar | Liriodendron tulipifera | 22 | 90 | Offsite - Ivy beginning to grow up trunk, limb dieback, epicormic sprouting. Tree to be removed with written permission from property owner. | Preserve | X | X | X | | | | | |
| 24 | 17306 | Southern Red Oak | Quercus falcata | 22 | 84 | Extensive vine coverage on tree and through canopy, ivy beginning to grow up trunk, limb dieback | Preserve | X | X | X | | | | | |
| 25 | 7307 | American Sycamore | Platanus occidentalis | 25 | 93 | Ivy growing up the trunk, small canopy | Preserve | X | X | X | | | | | |
| 26 | 7302 | Red Maple | Acer rubrum | 18 | 81 | Offsite - Dual leaders, curved trunk, poor form, limb dieback, epicormic sprouting | Preserve | X | X | X | | | | | |
| 27 | 7301 | Red Maple | Acer rubrum | 16 | 81 | Offsite - Dual trunk, multi-leaders, epicormic sprouting, uneven one-sided growth, poor form, limb dieback | Preserve | X | X | X | | | | | |
| 28 | 7303 | Red Maple | Acer rubrum | 16 | 78 | Offsite - Removed limbs, curved trunk, inclusive bark, limb dieback, epicormic sprouting | Preserve | X | X | X | | | | | |
| 29 | 7309 | Red Maple | Acer rubrum | 12 | 78 | Offsite - Leaning trunk, poor form - jogs in the trunk, broken leader, epicormic sprouting. Tree to be removed with written permission from property owner. | Remove | | | | | | | | |
| 30 | 7308 | Sugar Maple | Acer saccharum | 16 | 84 | Offsite - Poor branching, limb dieback | Preserve | X | X | X | | | | | |
| 31 | 7300 | Sweetgum | Liquidambar styraciflua | 12 | 81 | Offsite - Epicormic sprouting, small canopy, crowding from adjacent plants and fence. | Preserve | X | X | X | | | | | |
| 32 | 7311 | Red Maple | Acer rubrum | 18 | 78 | Co-owned - Ivy growing up the trunk, large broken limb, limb dieback, poor form, epicormic sprouting | Preserve | X | X | X | | | | | |
| 33 | 7312 | Black Cherry | Prunus serotina | 14 | 78 | Offsite - Leaning trunk, canopy crowding, poor form, limb dieback, small canopy | Preserve | X | X | X | | | | | |
| 35 | 7313 | Red Maple | Acer rubrum | 16 | 78 | Offsite - Poor trunk form - jogs in the trunk, leaning trunk, ivy growing up the trunk, limb dieback, epicormic sprouting | Preserve | X | X | X | | | | | |
| 36 | 7314 | Black Cherry | Prunus serotina | 12 | 78 | Offsite - Leaning trunk, poor trunk form - jogs in the trunk, small canopy, limb dieback, ivy growing up the trunk | Preserve | X | X | X | | | | | |
| 37 | 7315 | Red Maple | Acer rubrum | 12 | 81 | Offsite - Dual trunk, ivy growing up the trunk, limb dieback, canopy crowding, epicormic sprouting | Preserve | X | X | X | | | | | |
| 38 | 7316 | Black Cherry | Prunus serotina | 14 | 71 | Offsite - Small canopy, poor form - jogs in the trunk, limb dieback, large dead limb. Tree to be removed with written permission from property owner. | Preserve | X | X | X | | | | | |
| 39 | 7317 | Red Maple | Acer rubrum | 14 | 75 | Triple trunk, ivy & vines growing up the trunk, poor branching, poor form, limb dieback, epicormic sprouting, dead leaders, canopy crowding | Preserve | X | X | X | | | | | |
| 40 | 7318 | Red Maple | Acer rubrum | 20 | 75 | Co-owned - Quadruple trunk, poor form, two of the trunks are leaning, one leader is dead and rotting, limb dieback, poor branching, epicormic sprouting, small canopy | Preserve | X | X | X | | | | | |
| 41 | 7319 | Red Maple | Acer rubrum | 20 | 81 | Offsite - Triple leader, limb dieback, sparse canopy, canopy crowding, broken limbs, epicormic sprouting. Tree to be removed with written permission from property owner. | Preserve | X | X | X | | | | | |
| 42 | 7320 | Black Cherry | Prunus serotina | 14 | 75 | Co-owned - Dual trunk, multi-leader, dead leaders, limb dieback, poor form, canopy crowding, epicormic sprouting, small canopy | Preserve | X | X | X | | | | | |
| 43 | 7324 | Tulip Poplar | Liriodendron tulipifera | 20 | 78 | Buttressing roots, large broken limbs, uneven canopy, limb dieback, epicormic sprouting | Preserve | X | X | X | | | | | |
| 46 | 7336 | Tulip Poplar | Liriodendron tulipifera | 12 | 81 | Leaning/growing at an angle, poor form, limb dieback, epicormic sprouting, small canopy | Remove | | | | | | | | |
| 47 | 7337 | Tulip Poplar | Liriodendron tulipifera | 12 | 90 | Epicormic sprouting | Remove | | | | | | | | |
| 48 | 7335 | Tulip Poplar | Liriodendron tulipifera | 14 | 81 | Poor form - jogs in the trunk, limb dieback, uneven canopy, epicormic sprouting | Preserve | X | X | X | | | | | |
| 58 | 7340 | Tulip Poplar | Liriodendron tulipifera | 20 | 84 | Ivy & vines growing up the trunk, limb dieback, epicormic sprouting | Preserve | X | X | X | | | | | |
| 59 | 7341 | Tulip Poplar | Liriodendron tulipifera | 18 | 81 | Ivy covering trunk, limb dieback, sparse canopy | Preserve | X | X | X | | | | | |
| 60 | 7342 | Virginia Pine | Pinus virginiana | 12 | 81 | Extensive ivy & vine covering the tree, limb dieback, sparse/small canopy, poor trunk form - jogs in the trunk | Preserve | X | X | X | | | | | |
| 61 | 7346 | Virginia Pine | Pinus virginiana | 16 | 78 | Offsite - Ivy growing up the trunk, limb dieback, epicormic sprouting | Preserve | X | X | X | | | | | |
| 63 | 7345 | Tulip Poplar | Liriodendron tulipifera | 18 | 81 | Co-owned - Ivy covering entire trunk, limb dieback, small canopy | Preserve | X | X | X | | | | | |
| 64 | 7348 | Virginia Pine | Pinus virginiana | 18 | 78 | Leaning trunk, multi-leader, ivy growing up the trunk, limb dieback, small canopy, epicormic sprouting | Preserve | X | X | X | | | | | |
| 65 | 7347 | Red Maple | Acer rubrum | 18 | 75 | Offsite - Dead headed, epicormic sprouting, limb dieback, poor form | Preserve | X | X | X | | | | | |
| 66 | 7351 | Red Maple | Acer rubrum | 12 | 71 | Offsite - Poor form, canopy jagged, dual leaders, broken limbs, limb dieback | Preserve | X | X | X | | | | | |
| 67 | 7350 | Red Maple | Acer rubrum | 12 | 78 | Offsite - Canopy dieback, limb dieback, vines growing up the trunk into the canopy, canopy crowding, epicormic sprouting | Preserve | X | X | X | | | | | |
| 68 | 7349 | Alleghany chinquapin | Castanea pumila | 12 | 75 | Offsite - Dual leaders, epicormic sprouting, limb dieback, buttressing roots | Preserve | X | X | X | | | | | |
| 69 | 7352 | Alleghany chinquapin | Castanea pumila | 12 | 90 | Leaning trunk, ivy & vines growing up the trunk, poor form, epicormic sprouting, limb dieback, leaning in towards the site. | Remove | | | | | | | | |
| 70 | 7354 | Tulip Poplar | Liriodendron tulipifera | 18 | 78 | Leaning and curved trunk, poor form, canopy crowding, limb dieback, epicormic sprouting, inclusive bark, dual leaders | Remove | | | | | | | | |
| 71 | 7355 | Red Maple | Acer rubrum | 12 | 75 | Dual trunk, limbed up, uneven growth, limb dieback | Remove | | | | | | | | |
| 72 | 7356 | Eastern Redcedar | Juniperus virginiana | 12 | 75 | Limb dieback, epicormic sprouting, poor form at canopy, canopy crowding, uneven canopy | Remove | | | | | | | | |
| 73 | 7357 | Tulip Poplar | Liriodendron tulipifera | 12 | 78 | | Remove | | | | | | | | |

NOTE: TREES TO BE PRESERVED WITH IVY OR VINES GROWING ON THEM SHALL HAVE ALL VINES CUT AT THE BASE OF THE VINE. VINES SHALL BE LEFT TO DIE ON THE TREE. NO VINES OR IVY SHALL BE PULLED FROM THE TRUNK OR LIMBS OF THE TREE AS THIS CAN CAUSE INJURY TO THE TRUNK OR LIMBS.



TREE PRESERVATION INVENTORY

OX ROAD ESTATES

BRADDOCK DISTRICT
FAIRFAX COUNTY, VIRGINIA

RZ 2012-BR-020

COMMONWEALTH OF VIRGINIA
PAUL B. JOHNSON
11-7-13
Lic. No. 018450
REGISTERED PROFESSIONAL LANDSCAPE ARCHITECT

DESIGN: KJV
APPROVED: KJV
DATE: NOV. 2012
SCALE: 1" = 30'
VERT: ---
HORIZ: ---

SHEET 7 OF 15
PRJ NO: 12-517
TYPE: CDP / FDP

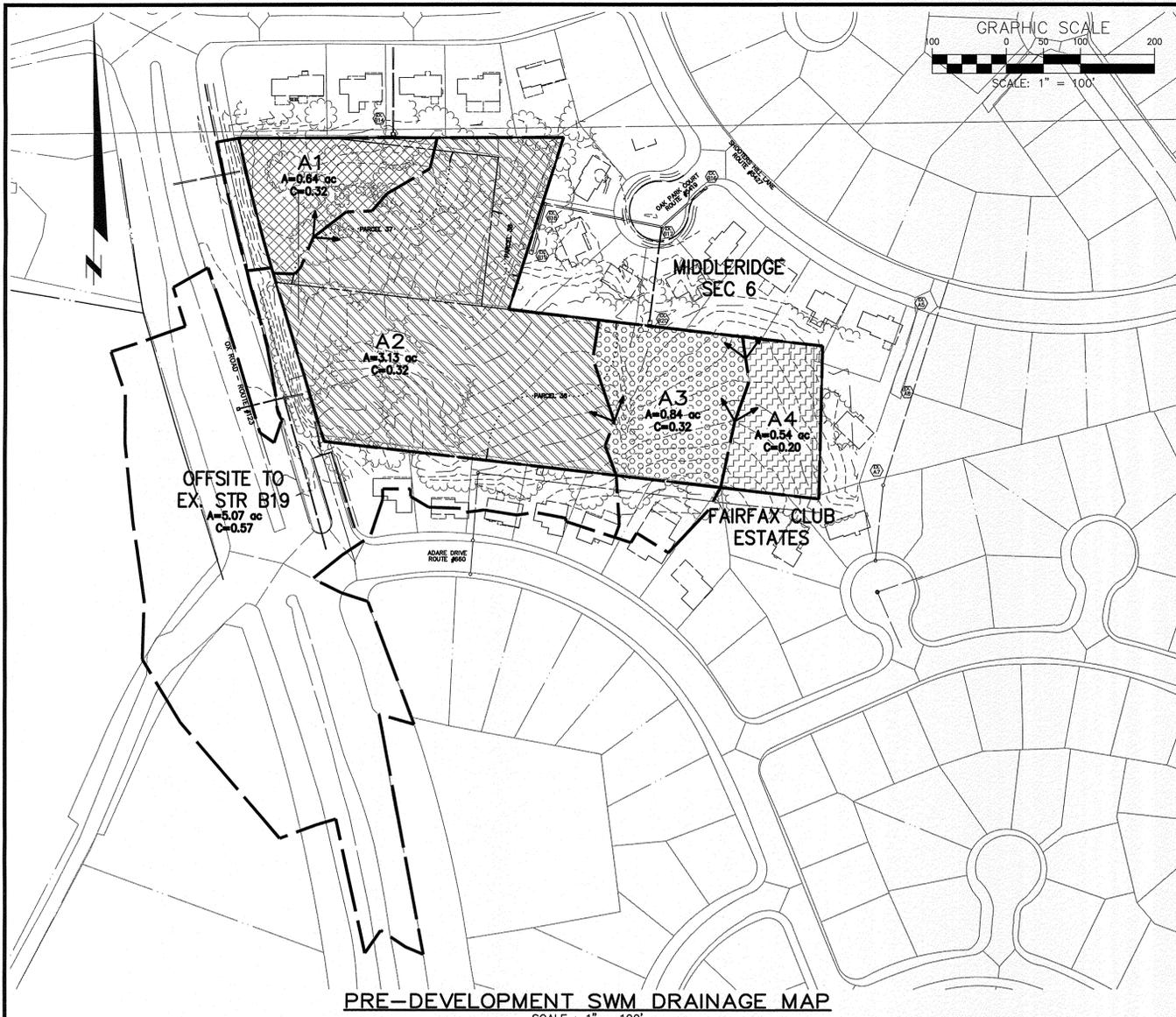
REVISIONS

NO. DESCRIPTION DATE

REVIEW APPROVED BY

CHANGED TREE #7392 FROM PRESERVE TO REMOVE (KJV)
UPDATED TREE INVENTORY FOR NEW CLEARING LIMITS (GJM)
UPDATED TREE INVENTORY FOR NEW CLEARING LIMITS (GJM)
NO. DATE REVISION PRIOR TO APPROVAL

Charles P. Johnson & Associates, Inc.
Civil and Environmental Engineers • Planners • Landscape Architects • Surveyors
3959 Pender Dr., Ste. 210 Fairfax, VA 22030 703-385-7655 Fax: 703-273-8995
www.cpa.com • Silver Spring, MD • Gaithersburg, MD • College Park, MD • Frederick, MD • Fairfax, VA



PRE-DEVELOPMENT SWM DRAINAGE MAP
SCALE: 1" = 100'

OUTFALL, SWM, AND BMP NARRATIVE

THE SITE CONSISTS OF 5.15 ACRES, ON WHICH 13 SINGLE-FAMILY DETACHED DWELLINGS ARE PROPOSED. THE SITE IS HALF-OPEN AND HALF-WOODED. THE SLOPES AVERAGE ABOUT 6%. THERE ARE TWO EXISTING HOUSES WITH ASSOCIATED DRIVEWAYS AND UTILITIES ON THE SITE. THE EXISTING BUILDINGS AND INFRASTRUCTURE ARE TO BE REMOVED.

THE SITE RECEIVES UNDETAINED RUNOFF FROM OX ROAD (ROUTE #123) AND THE UPSTREAM SINGLE FAMILY DETACHED SUBDIVISION (FAIRFAX CLUB ESTATES SECT. 1) TO THE SOUTH. THE RUNOFF FROM THE SITE DRAINS TOWARD FOUR EXISTING INLETS ASSOCIATED WITH 2 CLOSED STORM SEWER SYSTEMS LOCATED ON THE SINGLE-FAMILY SUBDIVISION TO THE NORTH (A1, A2, & A3) AND EAST (A4) (SEE MIDDLEBRIDGE SECT. 6, FAIRFAX COUNTY PLAN #SD-1719-6). THESE SYSTEMS ULTIMATELY DISCHARGE INTO AN EXISTING 100-YR FLOODPLAIN FOR SIDEBURN BRANCH TO THE NORTHEAST OF THE SITE (SEE OVERALL DRAINAGE MAP SHEET 10).

POST-DEVELOPMENT CONDITIONS

AFTER DEVELOPMENT, TWO RAIN GARDENS WITH UNDERGROUND STORAGE AND TWO VEGETATED SWALES WILL BE PROVIDED ON THE SITE. A CLOSED STORM SEWER SYSTEM WILL BE INSTALLED TO COLLECT A PORTION OF THE STORMWATER FROM ONSITE (A5) AND OFFSITE (A6) AREAS, THEN DISCHARGE AND FLOW INTO THE PROPOSED UNDERGROUND GRAVEL STORAGE SYSTEM ALONG WITH OVERLAND FLOW. A SMALL PORTION OF THE SITE (A1, A2, A3 & A4) WILL CONTINUE TO FLOW UNDETAINED INTO EXISTING OFF-SITE STORM STRUCTURES. THE UNDERGROUND STORAGE (UGS) WILL OUTFALL INTO THE EXISTING CLOSED STORM SEWER SYSTEM PROVIDED WITH MIDDLEBRIDGE SECTION 6. RUNOFF WILL BE REDUCED AFTER DEVELOPMENT. ALL EXISTING STORM SEWERS THAT THE SITE FLOWS INTO HAVE BEEN FOUND TO HAVE ADEQUATE CAPACITY TO HANDLE THE 10-YR STORM EVENT (SEE COMPUTATIONS SHEET 10).

THE OVERALL DRAINAGE AREA MAP SHOWN ON SHEET 10 DEPICTS THE DRAINAGE AREA WHERE THE SITE OUTFALLS INTO THE EXISTING FLOODPLAIN FOR SIDEBURN BRANCH. THE TOTAL SITE AREA (5.15 ACRES) DRAINING INTO THE EXISTING FLOODPLAIN AT POINT "A" IS LESS THAN 1% OF THE OVERALL DRAINAGE AREA (APPROXIMATELY 749 ACRES). THE EXISTING STREAM CHANNEL IS WELL-DEFINED WITH BED AND BANK. THEREFORE, PER PFM 6-0203.2B, THE EXTENT OF THE DOWNSTREAM DRAINAGE IS COMPLETED AT POINT "A".

DUE TO DOWNSTREAM EROSION, 1-YEAR 24 HOUR DETENTION HAS BEEN PROVIDED AND A PROPORTIONAL IMPROVEMENT FOR THE 2, 10, AND 100 YEAR FLOWS FROM THE SITE WILL BE PROVIDED (SEE COMPUTATIONS SHEET 12). IT IS THEREFORE THE ENGINEER'S OPINION THAT THIS MEETS THE ADEQUATE OUTFALL REQUIREMENT FOR THIS PROJECT, PER PFM 6-0202.3

BMPs WILL BE PROVIDED VIA TWO PROPOSED RAIN GARDENS AND TWO VEGETATED SWALES SYSTEMS. BMP CALCULATIONS HAVE BEEN PROVIDED FOR THE SITE. THE TOTAL PHOSPHORUS REMOVAL IS APPROXIMATELY 47.55% WHICH IS MORE THAN THE REQUIRED 40% PHOSPHORUS REMOVAL (SEE BMP FACILITY CALCULATION ON SHEET 8).

OVERLAND RELIEF NARRATIVE

THE FOLLOWING INFORMATION IS PROVIDED TO DEMONSTRATE COMPLIANCE WITH THE PFM REQUIREMENTS REGARDING THE SHEET FLOW FROM THE SUBJECT PROPERTY TO THE ADJACENT PARCELS. A SPECIFIC RESPONSE TO THE APPLICABLE SECTIONS OF THE PFM IS PROVIDED ALONG WITH CALCULATIONS AND GRAPHICS ILLUSTRATING THE COMPLIANCE.

TO SUMMARIZE, THE SUBJECT PROPERTY REDUCES THE RATE AND VOLUME OF SHEET FLOW AND SATISFIES THE PFM CRITERIA. THE AREA OF EXISTING SHEET FLOW FROM THIS SITE WILL BE REDUCED FROM 5.15 ACRES TO 2.25 ACRES. SIGNIFICANTLY, LARGE AREAS OF DRAINAGE WHICH NOW LEAVE THE ROUTE 123 RIGHT-OF-WAY AND FLOW TO THE ADJACENT PROPERTY WILL BE COLLECTED BY A PROPOSED STORM SEWER SYSTEM AND WILL BE CONVEYED DIRECTLY TO THE EXISTING OFFSITE STORM SEWER SYSTEM.

RECOGNIZING THAT ADJACENT PROPERTY HAS BEEN EITHER DESIGNED OR CONSTRUCTED IN SUCH A MANNER THAT THERE IS POOR DRAINAGE ON THE LOT, THE SUBJECT PROPERTY HAS PROVIDED THE STORAGE REQUIRED FOR THE PROPORTIONAL IMPROVEMENT OF THE 100-YEAR RUNOFF. THE PROPORTIONAL IMPROVEMENT RATE IS CALCULATED TO BE 35.01% AS SHOWN ON SHEET 12. THE EXISTING SITE IN THE 100-YEAR STORM WILL GENERATE 82,990 CUBIC FEET, SEE SHEET 13. THIS MEANS THE REQUIRED STORAGE VOLUME FOR THE PROPORTIONAL IMPROVEMENT WILL BE 29,055 CUBIC FEET, (82,990*0.3501). THE PROVIDED STORAGE IS 31,031 CUBIC FEET (6,734+24,317), SEE SHEET 13, MEETS THE PFM REQUIREMENT TO NOT AGGRAVATE AN EXISTING PROBLEM OR CAUSE A NEW PROBLEM.

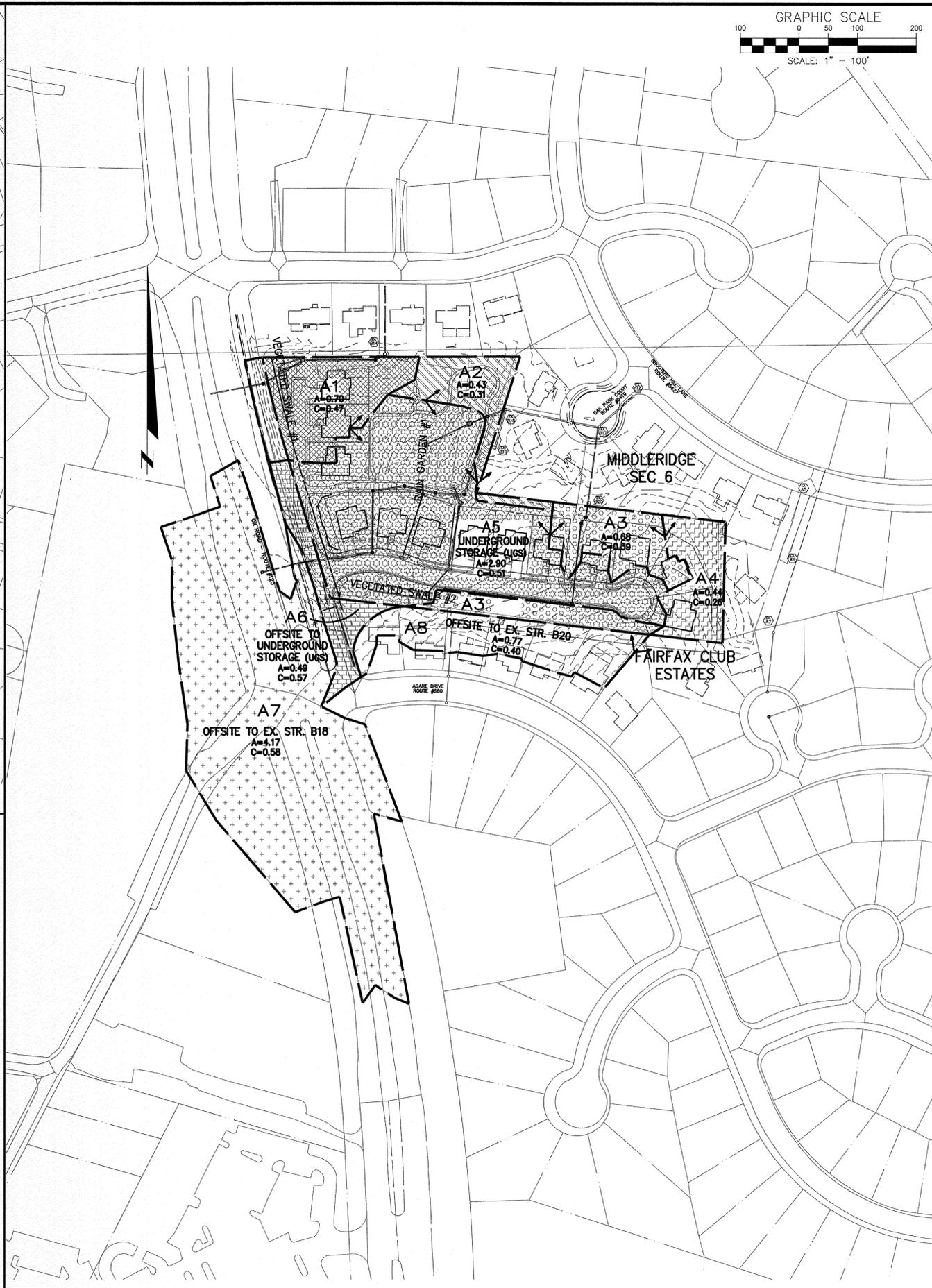
ALL LOTS ONSITE HAVE ADEQUATE OVERLAND RELIEF. THE OFFSITE OVERLAND RELIEF WILL BE HELPED WITH THE PROVISION OF A PROPORTIONAL IMPROVEMENT BEING MADE. THEREFORE, NO ADVERSE IMPACTS HAVE BEEN CREATED WITH THIS PLAN.

SWM LEGEND

- A1 - ONSITE TO MIDDLEBRIDGE SEC 6 STR B14
- A2 - ONSITE TO MIDDLEBRIDGE SEC 6 STR B18
- A3 - ONSITE TO MIDDLEBRIDGE SEC 6 STR B20
- A4 - ONSITE TO MIDDLEBRIDGE SEC 6 STR A5
- A5 - ONSITE TO UGS
- A6 - OFFSITE TO UGS
- A7 - OFFSITE TO MIDDLEBRIDGE SEC 6 STR B18
- A8 - OFFSITE TO MIDDLEBRIDGE SEC 6 STR B20

| PRE CONSTRUCTION | POST CONSTRUCTION |
|------------------|-------------------|
| A1: 0.64 AC | 0.70 AC |
| A2: 3.13 AC | 0.43 AC |
| A3: 0.84 AC | 0.68 AC |
| A4: 0.54 AC | 0.44 AC |
| A5: 0.00 AC | 2.90 AC |
| TOTAL: 5.15 AC | 5.15 AC |

NOTE: THESE AREAS AND COMPUTATIONS ARE PRELIMINARY AND MAY BE ADJUSTED WITH THE FINAL ENGINEERING PLANS.



POST-DEVELOPMENT SWM DRAINAGE MAP
SCALE: 1" = 100'

GRAPHIC SCALE
SCALE: 1" = 100'

11-27-13 REVISED DRAINAGE DIVERSION (ADD)
10-26-13 REVISED CALCULATIONS (ADD)
9-28-13 REVISED CALCULATIONS (ADD)
8-23-13 REVISED CALCULATIONS AND NARRATIVE (ADD)
7-26-13 REVISED OUTFALL ANALYSIS AND SWM & BMP CALC (ADD)
5-2-13 REVISED OUTFALL ANALYSIS AND SWM & BMP CALC (ADD)
1-24-13 REVISED OUTFALL ANALYSIS AND SWM & BMP CALC (ADD)
NO. DATE REVISION PRIOR TO APPROVAL

CPJ Charles P. Johnson & Associates, Inc.
Civil and Environmental Engineers • Planners • Landscape Architects • Surveyors
9909 Pender Dr., Ste. 210 Fairfax, VA 22030 703-385-7656 Fax: 703-275-8996
www.cpjia.com • Silver Spring, MD • Gaithersburg, MD • College Park, MD • Frederick, MD • Fairfax, VA

SWM MAPS

OX ROAD ESTATES

BRADDOCK DISTRICT
FAIRFAX COUNTY, VIRGINIA

RZ 2012-BR-020

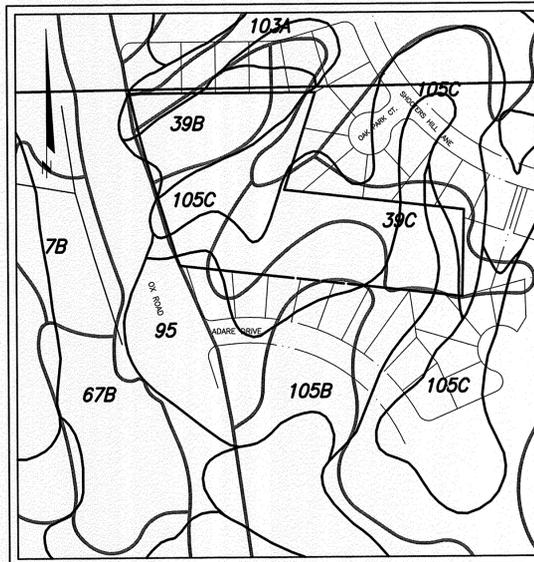
COMMONWEALTH OF VIRGINIA
PAUL B. JOHNSON
Lic. No. 018450
11-7-13
REGISTERED PROFESSIONAL ENGINEER

| DESIGN | DRAFT | ADC | ADC | APPROVED | AIO | DATE | SCALE | HORIZ: 1" = 60' | VERT: 1" = 60' | NO. | DESCRIPTION | REVISIONS | DATE |
|-----------------|-------|-----|-----|----------|-----|----------|-------|-----------------|----------------|-----|----------------|-----------|------|
| | | | | | | NOV 2012 | | | | | | | |
| SHEET 9 OF 15 | | | | | | | | | | | PRJ NO: 12-517 | | |
| TYPE: CDP / FDP | | | | | | | | | | | | | |

| EXISTING STORM DRAIN DESIGN COMPUTATIONS (10-YR) | | | | | | | | | | | | | | | | | | |
|--|--------|--------------------|----------------|-------|-------|-----------------------|---------------------|-------|---------------------------------|---------------|----------------|--------------|------------|------|----------------|-----------|-----------|---------|
| FROM | TO | DRAIN AREA (ACRES) | RUNOFF COEF. C | C x A | | TIME OF CONCENTRATION | | | AS-BUILT (FFX PLAN # SD-1719-6) | | | | | | | | | |
| | | | | INCR | ACCUM | to TO PIPE (min.) | TIME IN PIPE (sec.) | TIME | I | INCR (c.f.s.) | ACCUM (c.f.s.) | PIPE DIA. in | SLOPE F/Ft | "n" | MAX Q (c.f.s.) | VEL FVSec | LENGTH Ft | FALL Ft |
| FROM THE SITE | | | | | | | | | | | | | | | | | | |
| EX B14 | EX B13 | 0.74 | 0.35 | 0.26 | 0.26 | 5 | 7.27 | 1.88 | 1.88 | 15 | 0.0196 | 0.013 | 9.07 | 8.5 | 119.10 | 2.34 | 396.28 | 393.94 |
| EX B13 | EX B12 | | | | | 5 | 7.27 | 1.90 | 11.37 | 15 | 0.0260 | 0.013 | 10.44 | 9.8 | 41.90 | 1.09 | 393.87 | 392.78 |
| EX B12 | EX B11 | | | | | 5 | 7.27 | 2.20 | 13.57 | 18 | 0.0186 | 0.013 | 14.35 | 9.3 | 131.80 | 2.45 | 392.62 | 390.17 |
| EX B11 | EX B10 | | | | | 5 | 7.27 | 10.30 | 23.87 | 21 | 0.0204 | 1.013 | 22.70 | 10.8 | 108.10 | 2.21 | 389.67 | 387.46 |
| EX B10 | EX B9 | | | | | 5 | 7.27 | 16.90 | 40.77 | 27 | 0.0177 | 0.013 | 41.24 | 12.0 | 229.30 | 4.05 | 386.88 | 382.83 |
| EX B9 | EX B8 | | | | | 5 | 7.27 | 1.20 | 41.97 | 27 | 0.0156 | 0.013 | 38.80 | 11.2 | 116.80 | 1.81 | 382.70 | 380.89 |
| EX B8 | EX B7 | | | | | 5 | 7.27 | 4.10 | 46.07 | 30 | 0.0189 | 0.013 | 56.55 | 12.9 | 48.60 | 0.92 | 380.71 | 379.79 |
| EX B7 | EX B6 | | | | | 5 | 7.27 | 1.30 | 47.37 | 30 | 0.0106 | 0.013 | 42.31 | 9.9 | 80.20 | 0.85 | 379.65 | 378.80 |
| EX B6 | EX B5 | | | | | 5 | 7.27 | 3.70 | 51.07 | 30 | 0.0147 | 0.013 | 49.75 | 11.6 | 85.30 | 1.25 | 378.74 | 377.49 |
| FROM THE SITE | | | | | | | | | | | | | | | | | | |
| EX B19 | EX B18 | 2.57 | 0.36 | 0.93 | 0.93 | 5 | 7.27 | 6.73 | 6.73 | 27 | 0.0104 | 0.013 | 31.60 | 9.1 | 67.50 | 1.70 | 384.55 | 383.85 |
| EX B18 | EX B17 | | | | | 5 | 7.27 | 0.00 | 32.42 | 27 | 0.0100 | 0.013 | 31.04 | 9.0 | 159.90 | 1.60 | 383.75 | 382.15 |
| FROM THE SITE | | | | | | | | | | | | | | | | | | |
| EX B20 | EX B17 | 0.79 | 0.22 | 0.17 | 0.17 | 5 | 7.27 | 1.26 | 1.26 | 15 | 0.0535 | 0.013 | 14.97 | 8.6 | 128.20 | 6.86 | 393.46 | 386.60 |
| FROM THE SITE | | | | | | | | | | | | | | | | | | |
| EX B17 | EX B16 | | | | | 5 | 7.27 | 0.00 | 35.03 | 27 | 0.0116 | 0.013 | 33.37 | 9.6 | 78.70 | 0.91 | 382.02 | 381.11 |
| EX B16 | EX B5 | 0.51 | 0.24 | 0.12 | 0.12 | 5 | 7.27 | 0.89 | 0.89 | 27 | 0.0193 | 0.013 | 43.07 | 12.5 | 146.40 | 2.62 | 378.97 | 376.15 |
| FROM THE SITE | | | | | | | | | | | | | | | | | | |
| EX B5 | EX B4 | | | | | 5 | 7.27 | 4.10 | 96.80 | 33 | 0.0354 | 0.013 | 99.77 | 19.4 | 39.50 | 1.40 | 377.15 | 375.75 |
| EX B4 | EX B3 | | | | | 5 | 7.27 | 1.60 | 98.30 | 33 | 0.0350 | 0.013 | 99.20 | 19.3 | 238.90 | 8.37 | 375.55 | 367.18 |
| EX B3 | EX B2 | | | | | 5 | 7.27 | 7.20 | 105.50 | 36 | 0.0222 | 0.013 | 99.69 | 16.2 | 129.00 | 2.87 | 368.89 | 364.02 |
| EX B2 | EX B1 | | | | | 5 | 7.27 | 4.00 | 109.50 | 42 | 0.0075 | 0.013 | 87.45 | 10.4 | 90.40 | 0.68 | 363.32 | 362.64 |
| FROM THE SITE | | | | | | | | | | | | | | | | | | |
| EX A6 | EX A5 | 0.54 | 0.20 | 0.11 | 0.11 | 5 | 7.27 | 0.79 | 0.79 | 24 | 0.0240 | 0.013 | 35.14 | 12.9 | 121.10 | 2.91 | 392.15 | 389.24 |
| EX A5 | EX A4 | | | | | 5 | 7.27 | 1.30 | 36.32 | 24 | 0.0297 | 0.013 | 39.06 | 14.3 | 90.60 | 2.69 | 389.22 | 386.53 |
| EX A4 | EX A3 | | | | | 5 | 7.27 | 1.30 | 37.62 | 24 | 0.0695 | 0.013 | 59.74 | 20.1 | 149.00 | 10.35 | 388.39 | 376.04 |
| EX A3 | EX A2 | | | | | 5 | 7.27 | 3.10 | 40.72 | 27 | 0.0196 | 0.013 | 43.49 | 12.6 | 288.20 | 5.66 | 375.47 | 369.81 |
| EX A2 | EX A1 | | | | | 5 | 7.27 | 5.90 | 46.62 | 27 | 0.0342 | 0.013 | 57.37 | 16.1 | 94.50 | 3.23 | 369.44 | 366.21 |

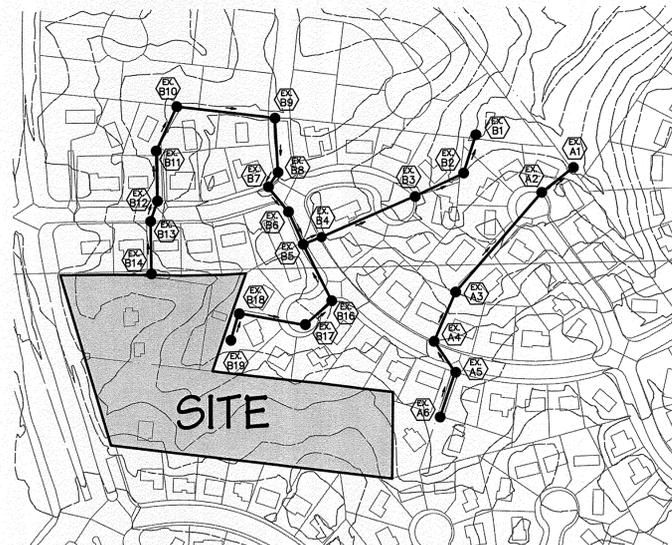
| PROP SITE TO EX STORM DRAIN DESIGN COMPUTATIONS (10-YR) | | | | | | | | | | | | | | | | | | |
|---|--------|--------------------|----------------|-------|-------|-----------------------|---------------------|-------|---------------------------------|---------------|----------------|--------------|------------|------|----------------|-----------|-----------|---------|
| FROM | TO | DRAIN AREA (ACRES) | RUNOFF COEF. C | C x A | | TIME OF CONCENTRATION | | | AS-BUILT (FFX PLAN # SD-1719-6) | | | | | | | | | |
| | | | | INCR | ACCUM | to TO PIPE (min.) | TIME IN PIPE (sec.) | TIME | I | INCR (c.f.s.) | ACCUM (c.f.s.) | PIPE DIA. in | SLOPE F/Ft | "n" | MAX Q (c.f.s.) | VEL FVSec | LENGTH Ft | FALL Ft |
| FROM THE SITE | | | | | | | | | | | | | | | | | | |
| EX B14 | EX B13 | 0.7 | 0.47 | 0.33 | 0.33 | 5 | 7.27 | 2.39 | 2.39 | 15 | 0.0196 | 0.013 | 9.07 | 7.2 | 119.10 | 2.34 | 396.28 | 393.94 |
| EX B13 | EX B12 | 0.57 | 0.43 | 0.25 | 0.25 | 5 | 7.27 | 1.78 | 4.17 | 15 | 0.0260 | 0.013 | 10.44 | 8.9 | 41.90 | 1.09 | 393.87 | 392.78 |
| EX B12 | EX B11 | 0.60 | 0.43 | 0.26 | 0.83 | 5 | 7.27 | 1.88 | 6.05 | 15 | 0.0186 | 0.013 | 14.35 | 9.3 | 131.80 | 2.45 | 392.62 | 390.17 |
| EX B11 | EX B10 | 0.70 | 0.43 | 0.30 | 1.13 | 5 | 7.27 | 2.19 | 8.24 | 18 | 0.0186 | 0.013 | 14.35 | 8.4 | 131.80 | 2.45 | 392.62 | 390.17 |
| EX B10 | EX B9 | 1.30 | 0.43 | 0.56 | 1.69 | 5 | 7.27 | 4.06 | 12.30 | 21 | 0.0204 | 1.013 | 22.70 | 9.7 | 108.10 | 2.21 | 389.67 | 387.46 |
| EX B9 | EX B8 | 5.40 | 0.43 | 2.32 | 4.01 | 5 | 7.27 | 16.88 | 29.18 | 27 | 0.0177 | 0.013 | 41.24 | 11.3 | 229.30 | 4.05 | 386.88 | 382.83 |
| EX B8 | EX B7 | 0.40 | 0.43 | 0.17 | 4.19 | 5 | 7.27 | 1.25 | 30.43 | 27 | 0.0156 | 0.013 | 38.80 | 10.8 | 116.80 | 1.81 | 382.70 | 380.89 |
| EX B7 | EX B6 | 1.30 | 0.43 | 0.56 | 4.75 | 5 | 7.27 | 4.06 | 34.50 | 30 | 0.0189 | 0.013 | 56.55 | 12.2 | 48.60 | 0.92 | 380.71 | 379.79 |
| EX B6 | EX B5 | 0.40 | 0.43 | 0.17 | 4.92 | 5 | 7.27 | 1.25 | 35.75 | 30 | 0.0106 | 0.013 | 42.31 | 9.7 | 80.20 | 0.85 | 379.65 | 378.80 |
| FROM THE SITE | | | | | | | | | | | | | | | | | | |
| EX B19 | EX B18 | 0.43 | 0.31 | 0.13 | 0.13 | 5 | 7.27 | 0.97 | 0.97 | 27 | 0.0104 | 0.013 | 31.60 | 3.81 | 67.50 | 0.70 | 384.55 | 383.85 |
| FROM UGS | | | | | | | | | | | | | | | | | | |
| EX B18 | EX B17 | 4.17 | 0.58 | 2.42 | 2.74 | 15 | 5.10 | 12.33 | 15.14 | 27 | 0.0100 | 0.013 | 31.04 | 7.7 | 159.90 | 1.60 | 383.75 | 382.15 |
| FROM THE SITE | | | | | | | | | | | | | | | | | | |
| EX B20 | EX B17 | 0.88 | 0.39 | 0.27 | 0.27 | 15 | 5.10 | 1.35 | 1.35 | 15 | 0.0535 | 0.013 | 14.97 | 9.1 | 128.20 | 6.86 | 393.46 | 386.60 |
| FROM THE SITE | | | | | | | | | | | | | | | | | | |
| EX B17 | EX B16 | | | | | 15 | 5.10 | 0.00 | 18.06 | 27 | 0.0116 | 0.013 | 33.37 | 8.6 | 78.70 | 0.91 | 382.02 | 381.11 |
| EX B16 | EX B5 | 2.10 | 0.43 | 0.90 | 4.21 | 15 | 5.10 | 4.61 | 22.67 | 27 | 0.0193 | 0.013 | 43.07 | 10.9 | 146.40 | 2.62 | 378.97 | 376.15 |
| FROM THE SITE | | | | | | | | | | | | | | | | | | |
| EX B5 | EX B4 | 1.30 | 0.43 | 0.56 | 4.77 | 15 | 5.10 | 2.85 | 25.52 | 33 | 0.0354 | 0.013 | 99.77 | 13.7 | 39.50 | 1.40 | 377.15 | 375.75 |
| EX B4 | EX B3 | 0.50 | 0.43 | 0.22 | 4.99 | 15 | 5.10 | 1.10 | 26.61 | 33 | 0.0350 | 0.013 | 99.20 | 13.8 | 238.90 | 8.37 | 375.55 | 367.18 |
| EX B3 | EX B2 | 2.30 | 0.43 | 0.99 | 5.98 | 15 | 5.10 | 5.04 | 31.66 | 36 | 0.0222 | 0.013 | 99.69 | 12.4 | 129.00 | 2.87 | 368.89 | 364.02 |
| EX B2 | EX B1 | 1.30 | 0.43 | 0.56 | 6.54 | 15 | 5.10 | 2.85 | 34.51 | 42 | 0.0075 | 0.013 | 87.45 | 8.4 | 90.40 | 0.68 | 363.32 | 362.64 |
| FROM THE SITE | | | | | | | | | | | | | | | | | | |
| EX A7 | EX A6 | 0.44 | 0.26 | 0.11 | 0.11 | 5 | 7.27 | 0.83 | 0.83 | 24 | 0.0175 | 0.013 | 29.99 | 11.0 | 78.70 | 0.91 | 382.02 | 381.11 |
| EX A6 | EX A5 | 9.50 | 0.43 | 4.09 | 4.20 | 5 | 7.27 | 29.70 | 30.53 | 24 | 0.0240 | 0.013 | 35.14 | 12.9 | 121.10 | 2.91 | 392.15 | 389.24 |
| EX A5 | EX A4 | 1.16 | 0.43 | 0.50 | 4.70 | 5 | 7.27 | 3.63 | 34.16 | 24 | 0.0240 | 0.013 | 35.14 | 12.9 | 121.10 | 2.91 | 392.15 | 389.24 |
| EX A4 | EX A3 | 0.40 | 0.43 | 0.17 | 4.87 | 5 | 7.27 | 1.25 | 36.41 | 24 | 0.0297 | 0.013 | 39.06 | 14.3 | 90.60 | 2.69 | 389.22 | 386.53 |
| EX A3 | EX A2 | 0.40 | 0.43 | 0.17 | 5.04 | 5 | 7.27 | 1.25 | 36.66 | 24 | 0.0695 | 0.013 | 59.74 | 19.9 | 149.00 | 10.35 | 388.39 | 376.04 |
| EX A2 | EX A1 | 1.00 | 0.43 | 0.43 | 5.47 | 5 | 7.27 | 3.13 | 39.78 | 27 | 0.0196 | 0.013 | 43.49 | 12.6 | 288.20 | 5.66 | 375.47 | 369.81 |
| EX A1 | EX A1 | 1.90 | 0.43 | 0.82 | 6.29 | 5 | 7.27 | 5.94 | 45.72 | 27 | 0.0342 | 0.013 | 57.37 | 16.0 | 94.50 | 3.23 | 369.44 | 366.21 |

NOTE : THESE AREAS AND COMPUTATIONS ARE PRELIMINARY AND MAY BE ADJUSTED WITH THE FINAL ENGINEERING PLANS.

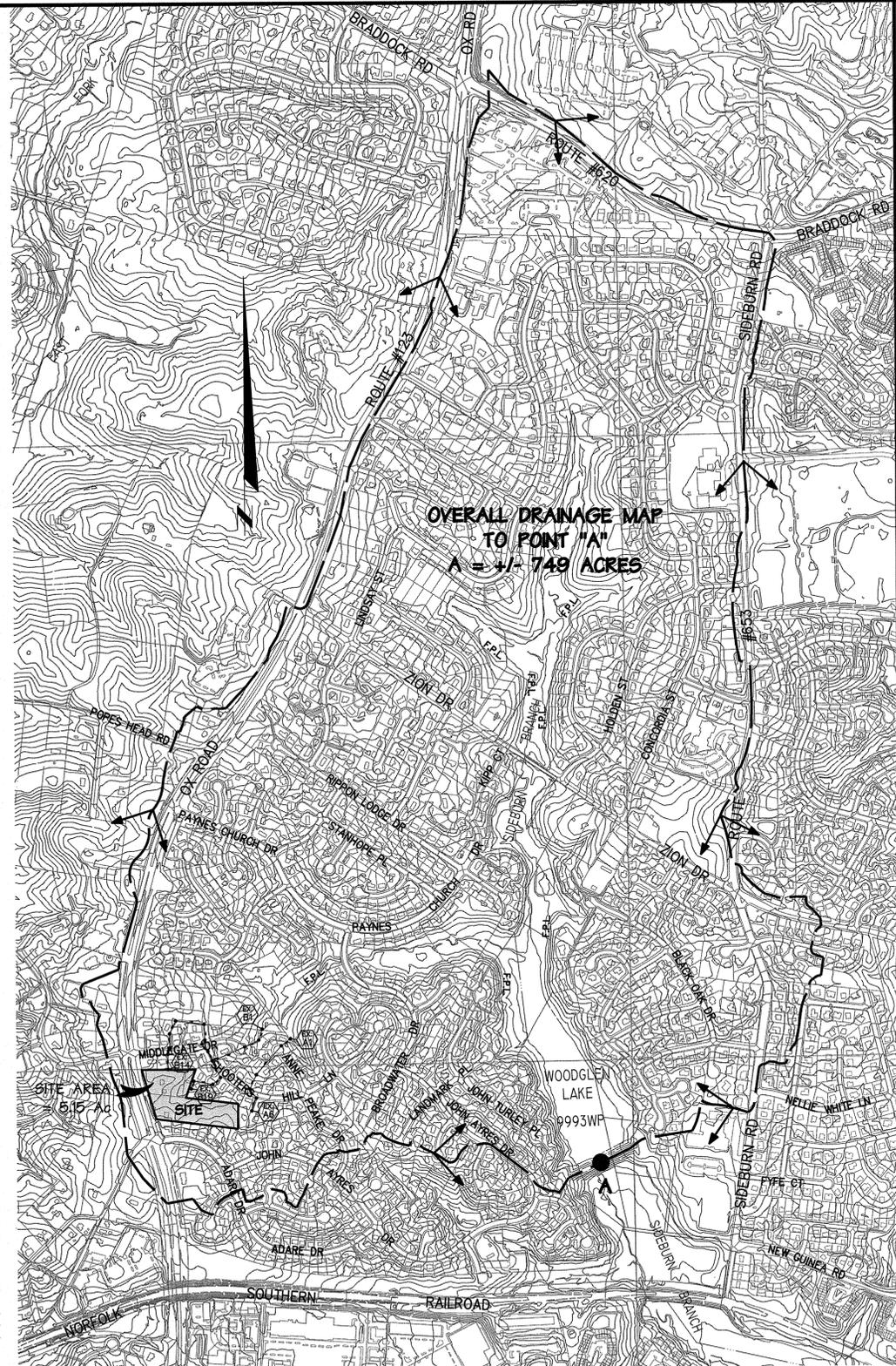


SOILS MAP
SCALE : 1" = 200'

| Ox Road Property Fairfax County, Virginia Sub-Area Land Use and Curve Number Details | | | | |
|--|--------------------------------------|-----------------------|--------------------|--------------|
| Sub-Area Identifier | Land Use | Hydrologic Soil Group | Sub-Area Area (ac) | Curve Number |
| EX Site | Residential districts (1 acre) | B | 3.07 | 68 |
| | Residential districts (1 acre) | D | 2.08 | 84 |
| Total Area / Weighted Curve Number | | | 5.15 | 74 |
| PROP SITE | Residential districts (1/4 acre) | B | 3.07 | 75 |
| | Residential districts (1/4 acre) | D | 2.08 | 87 |
| Total Area / Weighted Curve Number | | | 5.15 | 80 |
| EX WOODED | Woods (good) | B | 3.07 | 55 |
| | Woods (good) | D | 2.08 | 77 |
| Total Area / Weighted Curve Number | | | 5.15 | 64 |
| UNCONTROLLED | Residential districts (1/4 acre) | B | 1.96 | 75 |
| Total Area / Weighted Curve Number | | | 1.96 | 75 |
| OFFSITE | Paved; open ditches (w/right-of-way) | D | 1.76 | 93 |
| | Residential districts (1 acre) | D | 0.89 | 84 |
| Total Area / Weighted Curve Number | | | 2.65 | 90 |
| TOTAL UGS | Residential districts (1/4 acre) | B | 1.46 | 75 |
| | Residential districts (1/4 acre) | D | 1.73 | 87 |
| Total Area / Weighted Curve Number | | | 3.19 | 82 |



EX. OUTFALL STRUCTURES
SCALE : 1" = 200'



OVERALL DRAINAGE MAP
SCALE : 1" = 600'

REVISED STORM DRAIN DESIGN COMPUTATIONS (ADD)
 11-7-13
 10-28-13 UPDATE CALCULATIONS BASED ON LAYOUT CHANGES (MAY)
 9-23-13 UPDATED CALCULATIONS AND SWM & BMP CALCS (ADD)
 8-23-13 REVISED OUTFALL ANALYSIS AND SWM & BMP CALCS (ADD)
 5-2-13 REVISED OUTFALL ANALYSIS AND SWM & BMP CALCS (ADD)
 1-24-13 REVISED OUTFALL ANALYSIS AND SWM & BMP CALCS (ADD)
 NO. DATE REVISION PRIOR TO APPROVAL

Charles P. Johnson & Associates, Inc.
 Civil and Environmental Engineers • Planners • Landscape Architects • Surveyors
 3959 Pender Dr., Ste. 410 Fairfax, VA 22030 703-885-7555 Fax: 703-272-8595
 www.cjpa.com • Silver Spring, MD • Galhastenburg, MD • College Park, MD • Frederick, MD • Fairfax, VA • Avenel

OX ROAD ESTATES
 BRADDOCK DISTRICT
 FAIRFAX COUNTY, VIRGINIA
 RZ 2012-BR-020

COMMONWEALTH OF VIRGINIA
 PAUL B. JOHNSON
 Lic. No. 018450
 11-11-13
 PROFESSIONAL ENGINEER

| NO. | |
|-----|--|
|-----|--|

UGS

Pond No. 1 - Gravel Storage
Contours - User-defined contour areas. Average end area method used for volume calculation. Beginning Elevation = 384.00 ft. Voids = 40.00%.

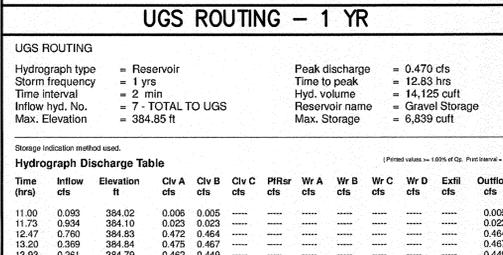
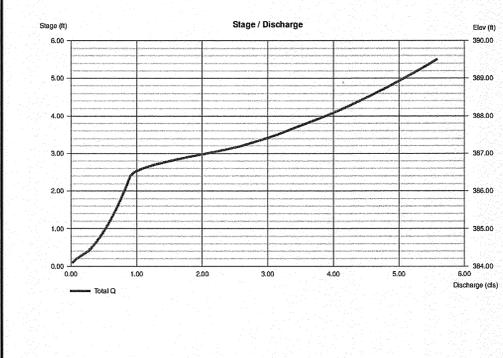
| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|------------|----------------|---------------------|----------------------|----------------------|
| 0.00 | 384.00 | 20,662 | 0 | 0 |
| 1.00 | 385.00 | 20,662 | 6,025 | 6,025 |
| 2.00 | 386.00 | 20,662 | 12,050 | 12,050 |
| 3.00 | 387.00 | 20,662 | 18,075 | 18,075 |
| 4.00 | 388.00 | 20,662 | 24,100 | 24,100 |
| 5.00 | 389.00 | 20,662 | 30,125 | 30,125 |
| 6.00 | 390.00 | 20,662 | 36,150 | 36,150 |
| 7.00 | 391.00 | 20,662 | 42,175 | 42,175 |
| 8.00 | 392.00 | 20,662 | 48,200 | 48,200 |
| 9.00 | 393.00 | 20,662 | 54,225 | 54,225 |
| 10.00 | 394.00 | 20,662 | 60,250 | 60,250 |
| 11.00 | 395.00 | 20,662 | 66,275 | 66,275 |
| 12.00 | 396.00 | 20,662 | 72,300 | 72,300 |
| 13.00 | 397.00 | 20,662 | 78,325 | 78,325 |
| 14.00 | 398.00 | 20,662 | 84,350 | 84,350 |
| 15.00 | 399.00 | 20,662 | 90,375 | 90,375 |
| 16.00 | 400.00 | 20,662 | 96,400 | 96,400 |
| 17.00 | 401.00 | 20,662 | 102,425 | 102,425 |
| 18.00 | 402.00 | 20,662 | 108,450 | 108,450 |
| 19.00 | 403.00 | 20,662 | 114,475 | 114,475 |
| 20.00 | 404.00 | 20,662 | 120,500 | 120,500 |
| 21.00 | 405.00 | 20,662 | 126,525 | 126,525 |
| 22.00 | 406.00 | 20,662 | 132,550 | 132,550 |
| 23.00 | 407.00 | 20,662 | 138,575 | 138,575 |
| 24.00 | 408.00 | 20,662 | 144,600 | 144,600 |
| 25.00 | 409.00 | 20,662 | 150,625 | 150,625 |
| 26.00 | 410.00 | 20,662 | 156,650 | 156,650 |
| 27.00 | 411.00 | 20,662 | 162,675 | 162,675 |
| 28.00 | 412.00 | 20,662 | 168,700 | 168,700 |
| 29.00 | 413.00 | 20,662 | 174,725 | 174,725 |
| 30.00 | 414.00 | 20,662 | 180,750 | 180,750 |
| 31.00 | 415.00 | 20,662 | 186,775 | 186,775 |
| 32.00 | 416.00 | 20,662 | 192,800 | 192,800 |
| 33.00 | 417.00 | 20,662 | 198,825 | 198,825 |
| 34.00 | 418.00 | 20,662 | 204,850 | 204,850 |
| 35.00 | 419.00 | 20,662 | 210,875 | 210,875 |
| 36.00 | 420.00 | 20,662 | 216,900 | 216,900 |
| 37.00 | 421.00 | 20,662 | 222,925 | 222,925 |
| 38.00 | 422.00 | 20,662 | 228,950 | 228,950 |
| 39.00 | 423.00 | 20,662 | 234,975 | 234,975 |
| 40.00 | 424.00 | 20,662 | 241,000 | 241,000 |
| 41.00 | 425.00 | 20,662 | 247,025 | 247,025 |
| 42.00 | 426.00 | 20,662 | 253,050 | 253,050 |
| 43.00 | 427.00 | 20,662 | 259,075 | 259,075 |
| 44.00 | 428.00 | 20,662 | 265,100 | 265,100 |
| 45.00 | 429.00 | 20,662 | 271,125 | 271,125 |
| 46.00 | 430.00 | 20,662 | 277,150 | 277,150 |
| 47.00 | 431.00 | 20,662 | 283,175 | 283,175 |
| 48.00 | 432.00 | 20,662 | 289,200 | 289,200 |
| 49.00 | 433.00 | 20,662 | 295,225 | 295,225 |
| 50.00 | 434.00 | 20,662 | 301,250 | 301,250 |
| 51.00 | 435.00 | 20,662 | 307,275 | 307,275 |
| 52.00 | 436.00 | 20,662 | 313,300 | 313,300 |
| 53.00 | 437.00 | 20,662 | 319,325 | 319,325 |
| 54.00 | 438.00 | 20,662 | 325,350 | 325,350 |
| 55.00 | 439.00 | 20,662 | 331,375 | 331,375 |
| 56.00 | 440.00 | 20,662 | 337,400 | 337,400 |
| 57.00 | 441.00 | 20,662 | 343,425 | 343,425 |
| 58.00 | 442.00 | 20,662 | 349,450 | 349,450 |
| 59.00 | 443.00 | 20,662 | 355,475 | 355,475 |
| 60.00 | 444.00 | 20,662 | 361,500 | 361,500 |
| 61.00 | 445.00 | 20,662 | 367,525 | 367,525 |
| 62.00 | 446.00 | 20,662 | 373,550 | 373,550 |
| 63.00 | 447.00 | 20,662 | 379,575 | 379,575 |
| 64.00 | 448.00 | 20,662 | 385,600 | 385,600 |
| 65.00 | 449.00 | 20,662 | 391,625 | 391,625 |
| 66.00 | 450.00 | 20,662 | 397,650 | 397,650 |
| 67.00 | 451.00 | 20,662 | 403,675 | 403,675 |
| 68.00 | 452.00 | 20,662 | 409,700 | 409,700 |
| 69.00 | 453.00 | 20,662 | 415,725 | 415,725 |
| 70.00 | 454.00 | 20,662 | 421,750 | 421,750 |
| 71.00 | 455.00 | 20,662 | 427,775 | 427,775 |
| 72.00 | 456.00 | 20,662 | 433,800 | 433,800 |
| 73.00 | 457.00 | 20,662 | 439,825 | 439,825 |
| 74.00 | 458.00 | 20,662 | 445,850 | 445,850 |
| 75.00 | 459.00 | 20,662 | 451,875 | 451,875 |
| 76.00 | 460.00 | 20,662 | 457,900 | 457,900 |
| 77.00 | 461.00 | 20,662 | 463,925 | 463,925 |
| 78.00 | 462.00 | 20,662 | 469,950 | 469,950 |
| 79.00 | 463.00 | 20,662 | 475,975 | 475,975 |
| 80.00 | 464.00 | 20,662 | 482,000 | 482,000 |
| 81.00 | 465.00 | 20,662 | 488,025 | 488,025 |
| 82.00 | 466.00 | 20,662 | 494,050 | 494,050 |
| 83.00 | 467.00 | 20,662 | 500,075 | 500,075 |
| 84.00 | 468.00 | 20,662 | 506,100 | 506,100 |
| 85.00 | 469.00 | 20,662 | 512,125 | 512,125 |
| 86.00 | 470.00 | 20,662 | 518,150 | 518,150 |
| 87.00 | 471.00 | 20,662 | 524,175 | 524,175 |
| 88.00 | 472.00 | 20,662 | 530,200 | 530,200 |
| 89.00 | 473.00 | 20,662 | 536,225 | 536,225 |
| 90.00 | 474.00 | 20,662 | 542,250 | 542,250 |
| 91.00 | 475.00 | 20,662 | 548,275 | 548,275 |
| 92.00 | 476.00 | 20,662 | 554,300 | 554,300 |
| 93.00 | 477.00 | 20,662 | 560,325 | 560,325 |
| 94.00 | 478.00 | 20,662 | 566,350 | 566,350 |
| 95.00 | 479.00 | 20,662 | 572,375 | 572,375 |
| 96.00 | 480.00 | 20,662 | 578,400 | 578,400 |
| 97.00 | 481.00 | 20,662 | 584,425 | 584,425 |
| 98.00 | 482.00 | 20,662 | 590,450 | 590,450 |
| 99.00 | 483.00 | 20,662 | 596,475 | 596,475 |
| 100.00 | 484.00 | 20,662 | 602,500 | 602,500 |

Culvert / Orifice Structures

| [A] | [B] | [C] | [Pr]Rsr | [A] | [B] | [C] | [D] |
|--------|--------|--------|---------|---------------------|---------------------|---------------------|---------------------|
| 18.00 | 5.00 | 10.00 | 0.00 | 18.00 | 0.00 | 0.00 | 0.00 |
| 18.00 | 5.00 | 10.00 | 0.00 | 393.50 | 0.00 | 0.00 | 0.00 |
| 1 | 1 | 1 | 0 | 3.33 | 3.33 | 3.33 | 3.33 |
| 384.00 | 384.00 | 384.00 | 0.00 | Wet | Wet | Wet | Wet |
| 38.00 | 1.00 | 1.00 | 0.00 | Multi-Stage | Multi-Stage | Multi-Stage | Multi-Stage |
| 0.50 | 0.00 | 0.00 | n/a | Yes | No | No | No |
| 0.13 | 0.13 | 0.13 | n/a | 0.000 (by Wet area) |
| 0.60 | 0.60 | 0.60 | 0.60 | 0.00 | 0.00 | 0.00 | 0.00 |
| n/a | Yes | Yes | No | 0.00 | 0.00 | 0.00 | 0.00 |

Stage / Storage

Stage / Discharge



UGS ROUTING - 1 YR

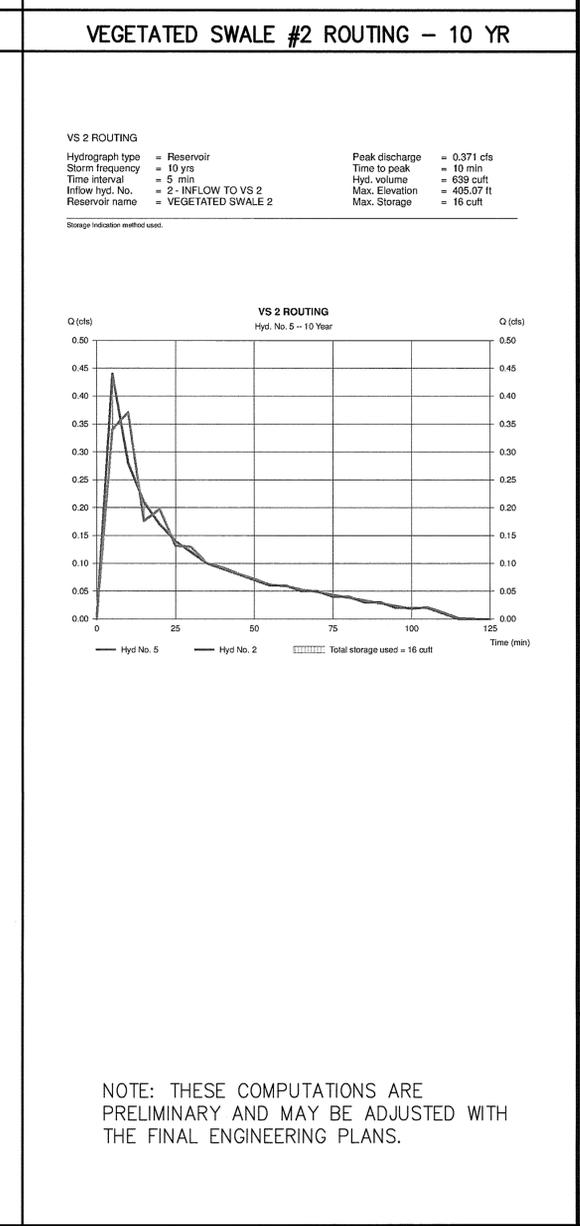
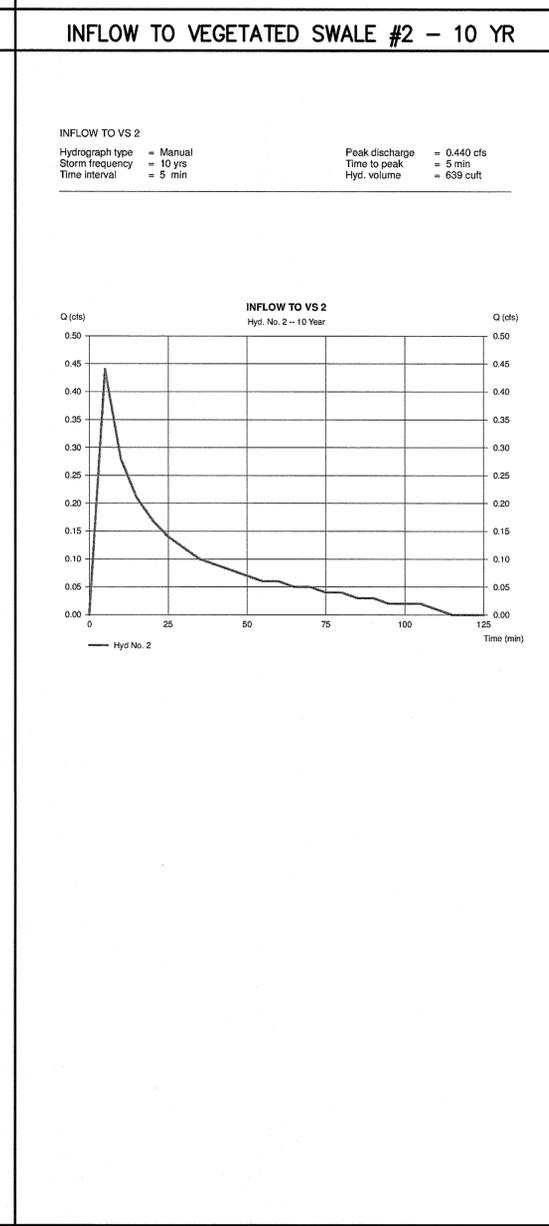
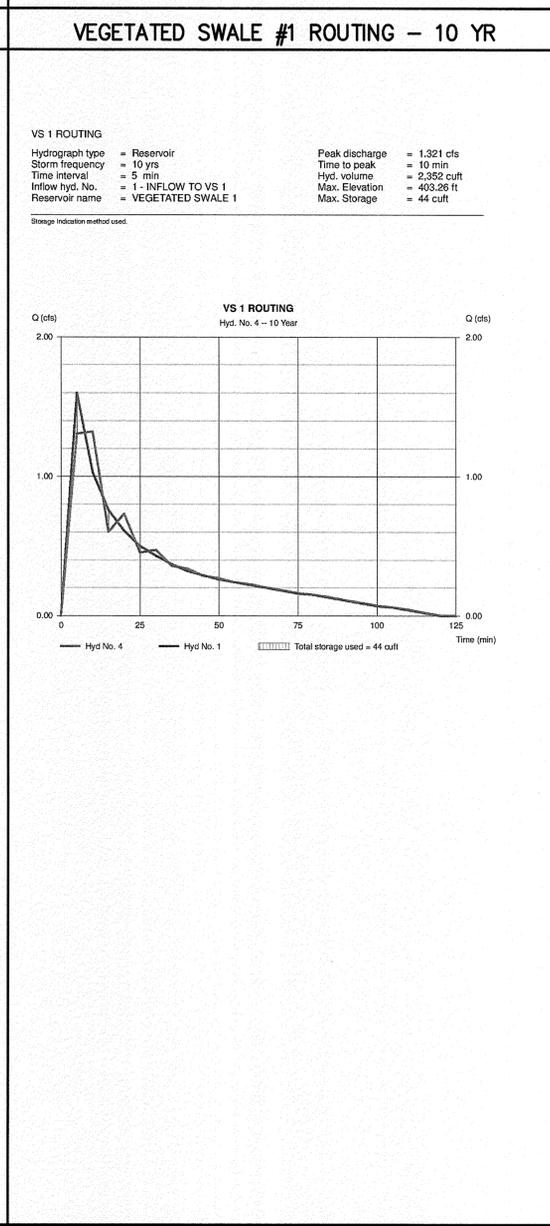
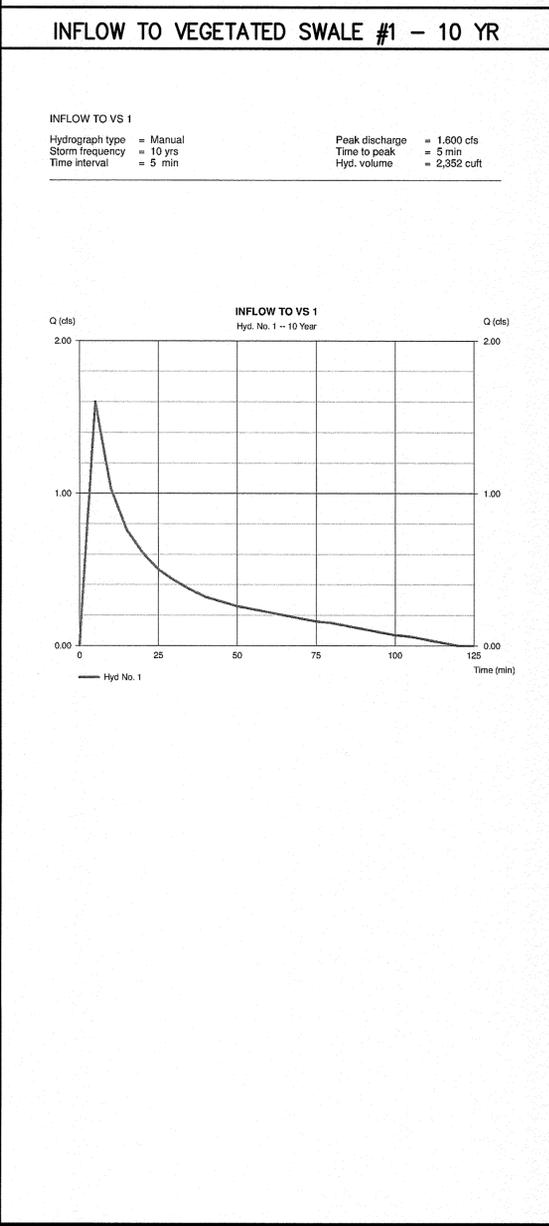
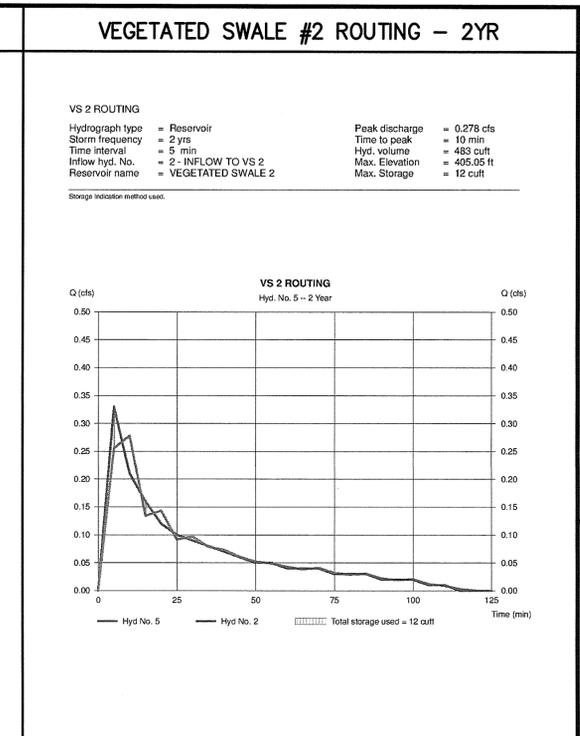
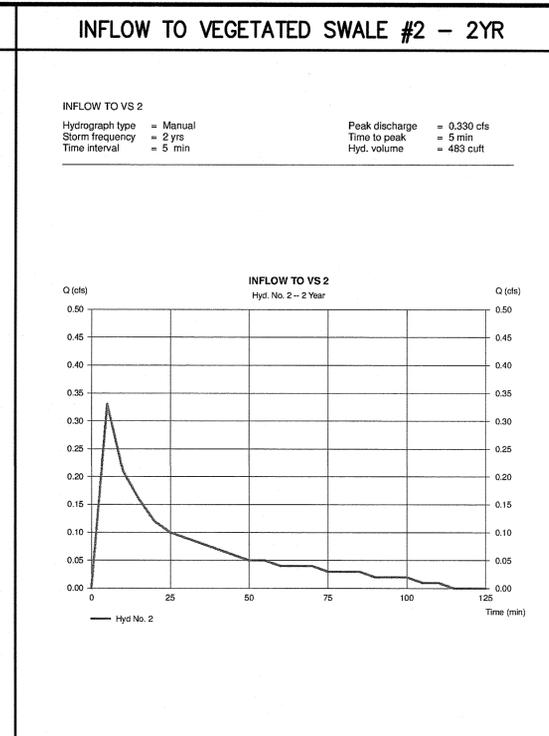
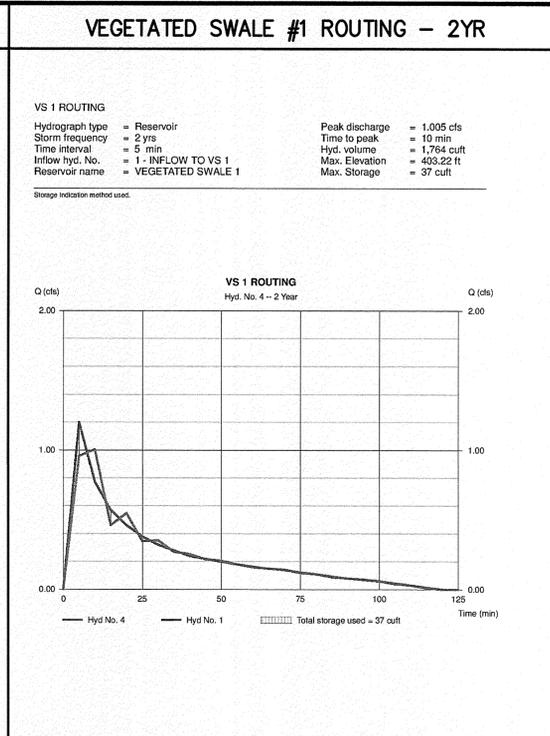
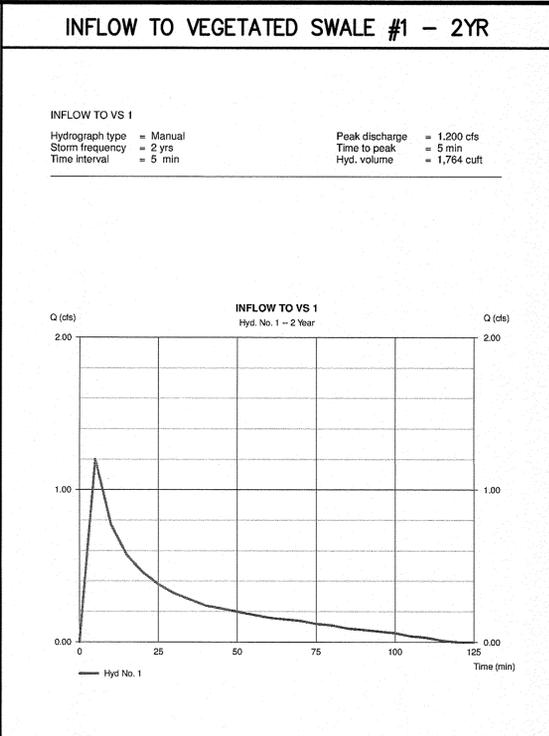
UGS ROUTING
Hydrograph type = Reservoir
Storm frequency = 1 yrs
Time interval = 2 min
Inflow hyd. No. = 7 - TOTAL TO UGS
Max. Elevation = 384.85 ft

Peak discharge = 0.470 cfs
Time to peak = 12.83 hrs
Hyd. volume = 14,125 cuft
Reservoir name = Gravel Storage
Max. Storage = 6,839 cuft

Storage indication method used.

Hydrograph Discharge Table

| Time (hrs) | Inflow cfs | Elevation ft | Civ A cfs | Civ B cfs | Civ C cfs | PrRsr | Wr A cfs | Wr B cfs | Wr C cfs | Wr D cfs | Exfil cfs | Outflow cfs |
|------------|------------|--------------|-----------|-----------|-----------|-------|----------|----------|----------|----------|-----------|-------------|
| 11.00 | 0.093 | 384.02 | 0.006 | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.005 |
| 11.73 | 0.934 | 384.10 | 0.023 | 0.023 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.023 |
| 12.47 | 0.760 | 384.83 | 0.472 | 0.464 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.464 |
| 13.20 | 0.369 | 384.84 | 0.475 | 0.467 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.467 |
| 13.93 | 0.261 | 384.79 | 0.462 | 0.449 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.449 |
| 14.67 | 0.214 | 384.73 | 0.432 | 0.422 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.422 |
| 15.40 | 0.183 | 384.66 | 0.402 | 0.392 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.392 |
| 16.13 | 0.152 | 384.59 | 0.370 | 0.361 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.361 |
| 16.87 | 0.140 | 384.52 | 0.351 | 0.329 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.329 |
| 17.60 | 0.129 | 384.47 | 0.298 | 0.298 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.298 |
| 18.33 | 0.117 | 384.41 | 0.270 | 0.269 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.269 |
| 19.07 | 0.105 | 384.37 | 0.233 | 0.232 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.232 |
| 19.80 | 0.094 | 384.33 | 0.199 | 0.198 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.198 |
| 20.53 | 0.087 | 384.30 | 0.171 | 0.170 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.170 |
| 21.27 | 0.085 | 384.27 | 0.150 | 0.149 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.149 |
| 22.00 | 0.082 | 384.26 | 0.134 | 0.132 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.132 |
| 22.73 | 0.080 | 384.24 | 0.122 | 0.119 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.119 |
| 23.47 | 0.078 | 384.23 | 0.112 | 0.109 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.109 |
| 24.20 | 0.020 | 384.22 | 0.102 | 0.099 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.099 |
| 24.93 | 0.020 | 384.19 | 0.080 | 0.077 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.077 |
| 25.67 | 0.020 | 384.17 | 0.066 | 0.063 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.063 |
| 26.40 | 0.020 | 384.15 | 0.054 | 0.052 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.052 |
| 27.13 | 0.020 | 384.13 | 0.044 | 0.042 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.042 |
| 27.87 | 0.020 | 384.12 | 0.036 | 0.035 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.035 |
| 28.60 | 0.020 | 384.11 | 0.029 | 0.028 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.028 |
| 29.33 | 0.020 | 384.10 | 0.024 | 0.023 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.023 |
| 30.07 | 0.020 | 384.09 | 0.022 | 0.021 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.021 |
| 30.80 | 0.020 | 384.09 | 0.020 | 0.020 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.020 |
| 31.53 | 0.020 | 384.08 | 0.019 | 0.018 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.018 |
| 32.27 | 0.020 | 384.07 | 0.018 | 0.017 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.017 |
| 33.00 | 0.020 | 384.07 | 0.016 | 0.016 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.016 |
| 33.73 | 0.020 | 384.06 | 0.015 | 0.015 | 0.000 | 0.000 | 0.000 | 0.000 | | | | |



NOTE: THESE COMPUTATIONS ARE PRELIMINARY AND MAY BE ADJUSTED WITH THE FINAL ENGINEERING PLANS.

ROUTING FOR VEGETATED SWALES

OX ROAD ESTATES

BRADDOCK DISTRICT
FAIRFAX COUNTY, VIRGINIA

RZ 2012-BR-020

| | | | | | |
|-----|------|-----------|--------|---------|------|
| NO. | DATE | REVISIONS | REVIEW | APPROV. | DATE |
| | | | | | |

DESIGN: BFW
 APPROVED: ATO
 DATE: NOV. 2012
 SCALE: AS SHOWN

SHEET 14 OF 15
 PRJ NO: 12-517
 TYPE: CDP / FDP

Attached Xrefs: 00-R0401/00-R0301/77-2/68-1/68-2/68-3/68-4/77-1/00-F0500/00-F0700/TPH

7. 10-28-13 UPDATE CALCULATIONS BASED ON LAYOUT CHANGES (AW)
 4. 8-23-13 UPDATED CALCULATIONS BASED ON LAYOUT CHANGES (ADC)
 3. 7-26-13 NEW SHEET

REVISION PRIOR TO APPROVAL

CPJ Associates
 Charles P. Johnson & Associates, Inc.
 Civil and Environmental Engineers • Planners • Landscape Architects • Surveyors
 9959 Pender Dr., Ste. 210 Fairfax, VA 22030 703-385-7555 Fax: 703-273-6996
 www.cpj.com • Silver Spring, MD • Gaithersburg, MD • College Park, MD • Frederick, MD • Fairfax, VA



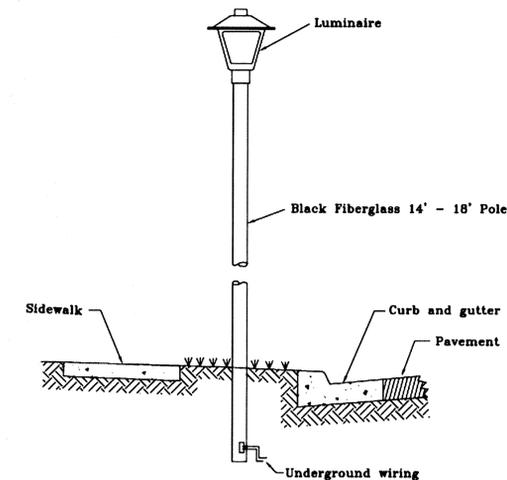
TYPICAL BENCH
OR EQUIVALENT



FRONT ELEVATION
SCALE : 1" = 5'

FAIRFAX COUNTY PUBLIC FACILITIES MANUAL

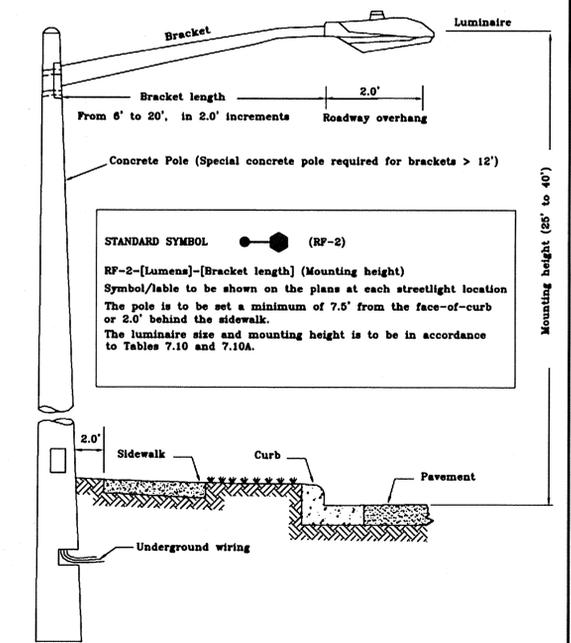
STANDARD SYMBOL  (RF-3)
RF-3-[Lumen]-[Bracket Length] (Mounting Height)
Symbol/label to be shown on the plans at each streetlight location.
The pole is to be set in the utility strip
in accordance with VDOT clear zone requirements.
The luminaire size and mounting height are to be in accordance
to Table 7.11.



| | | | |
|---|--|-------------------|------------------|
| Ref. Sec. 7-1004.14(2), 7-1004.6C, 7-1006.1B | COLONIAL STYLE FIXTURE FOR SUBDIVISION ROADWAYS WITH CURB AND GUTTER | PLATE NO. 32-7 | STD. NO. RF-3 |
|---|--|-------------------|------------------|

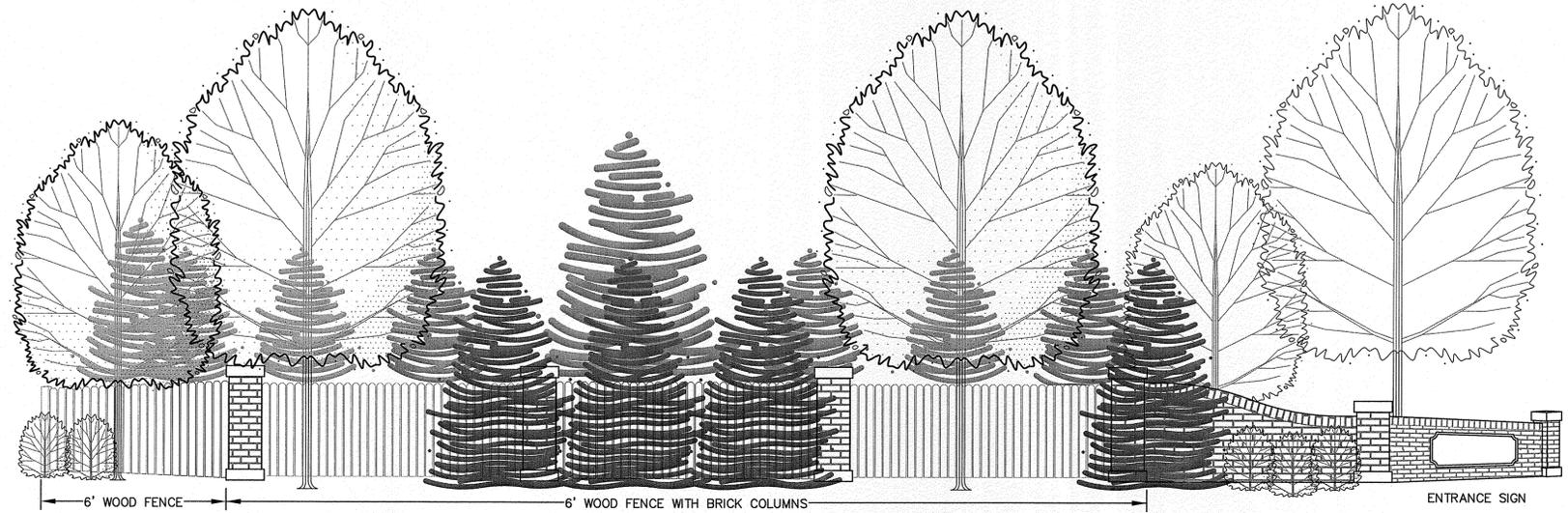
TYPICAL YARD LIGHT
OR EQUIVALENT

FAIRFAX COUNTY PUBLIC FACILITIES MANUAL



| | | | |
|---|---|-------------------|------------------|
| Ref. Sec. 7-1004.6B, 7-1004.7B, 7-1006.3 | STANDARD ROADWAY FIXTURE COBRA HEAD STYLE FOR CURB AND GUTTER ROADS | PLATE NO. 31-7 | STD. NO. RF-2 |
|---|---|-------------------|------------------|

TYPICAL ENTRANCE LIGHT
OR EQUIVALENT



NOISE FENCE W/ENTRANCE FEATURE
SCALE : 1" = 5'

9-24-13 ADDED LIGHTING, BENCH & FENCE DETAILS (KJV)
8-23-13 REVISED ELEVATION (KJV)
7-26-13 NEW SHEET (KJV)
NO. DATE REVISION PRIOR TO APPROVAL

CPJ Charles P. Johnson & Associates, Inc.
Civil and Environmental Engineers • Planners • Landscape Architects • Surveyors
3969 Fender Dr., Ste. 210 Fairfax, VA 22030 703-365-7535 Fax: 703-275-8056
www.cpj.com • Silver Spring, MD • Gaithersburg, MD • College Park, MD • Frederick, MD • Fairfax, VA

ARCHITECTURAL ELEVATION & SITE DETAILS
OX ROAD ESTATES
BRADDOCK DISTRICT
FAIRFAX COUNTY, VIRGINIA



| NO. | DESCRIPTION | REVISIONS | BY | DATE |
|-----|-------------|-----------|----|------|
| | | | | |

| | | |
|-----------------|-------------------|------------------|
| PERSON KJV | DATE NOV. 2012 | SCALE 1" = 5' |
| APPROVED HMF | DATE NOV. 2012 | SCALE 1" = 5' |
| SHEET 15 | | OF 15 |
| PRJ NO: 12-517 | | |
| TYPE: CDP / FDP | | |

THIS SHEET IS FOR ILLUSTRATIVE PURPOSES ONLY

Proffers

Eastwood Properties, Inc.

RZ 2012-BR-020

January 25, 2013

Revised May 2, 2013

Revised July 25, 2013

Revised September 24, 2013

Revised September 27, 2013

Revised October 2, 2013

Revised October 11, 2013

Revised October 30, 2013

Revised November 13, 2013

Pursuant to Section 15.2-2303(A), Code of Virginia, 1950 as amended, the undersigned Applicant, in this rezoning proffer that the development of the parcel under consideration and shown on the Fairfax County Tax Map as Tax Map Reference 77-1((1))36-38 (hereinafter referred to as the "Property") will be in accordance with the following conditions (the "Proffered Conditions"), if and only if, said rezoning request for the PDH-3 Zoning District is granted. In the event said rezoning request is denied, these Proffered Conditions shall be null and void. The Owner and the Applicant, for themselves, their successors and assigns hereby agree that these Proffered Conditions shall be binding on the future development of the Property unless modified, waived or rescinded in the future by the Board of Supervisors of Fairfax County, Virginia, in accordance with applicable County and State statutory procedures. The Proffered Conditions are:

I. GENERAL

1. Substantial Conformance. Subject to the provisions of Article 16 of the Fairfax County Zoning Ordinance (hereinafter referred to as the "Zoning Ordinance"), development of the Property shall be in substantial conformance with the Conceptual Development Plan/Final Development Plan (CDP/FDP), prepared by Charles P. Johnson & Associates, Inc., consisting of 15 sheets, dated November 5, 2012, revised through ~~September 24,~~November 7, 2013.
2. Maximum Lot Yield. The development shall consist of a maximum of 13 single family detached units.
3. Minor Modification. Except as may be further qualified by these proffered conditions, minor modifications to the building envelopes including house location and sizes may be permitted in accordance with Article 16 of the Zoning Ordinance.

4. Establishment of HOA. Prior to record plat approval, the Applicant shall either provide the Department of Public Works and Environmental Services with documentation that the subject property has been incorporated into one of the adjacent associations or the Applicant has established a Homeowners Association (HOA) in accordance with Sect. 2-700 of the Zoning Ordinance. The purpose of the HOA shall be, among other things, establishing the necessary residential covenants governing the use and operation of common open space and other facilities of the approved development and to provide a mechanism for ensuring the ability to complete the maintenance obligations and other provisions noted in these proffer conditions, including an estimated budget for such common maintenance items. At the time of bond release, or turnover of the community to the HOA, whichever first occurs, an amount of \$13,000, earmarked for future maintenance of the open space and common facilities, such as the rain garden(s) and private roads, shall be deposited in the HOA bank account as a capital contribution.
5. Dedication to HOA. At the time of record plat recordation, the open space and common features/amenities not otherwise conveyed or dedicated to the County shall be dedicated to the HOA and maintained by the same.
6. Disclosure. Prior to entering into a contract of sale, prospective purchasers shall be notified in writing by the Applicants of the maintenance responsibility for the private roadways, walkways, stormwater management facilities, tot lot, common area landscaping and any other open space amenities and shall acknowledge receipt of this information in writing. The initial deeds of conveyance and HOA governing documents shall expressly contain these disclosures.
7. Signs. No temporary signs (including “popsicle” style paper or cardboard signs), which are prohibited by Article 12 of the Zoning Ordinance and Chapter 7 of Title 33.1, and Chapter 8 of Title 46.2 of the Code of Virginia, shall be placed on or offsite by the Applicant or at the Applicant’s direction. The Applicant shall direct its agents and employees involved with the Property to adhere to this proffer.
8. Length of Driveways. The driveway on each residential lot shall have a minimum of 20 feet of pavement available for parking without infringing into the right-of-way or sidewalk area and shall be a minimum of 18 feet in width.
9. Lot Typical, Decks and Similar Appurtenances. Decks, bay windows, patios, chimneys, areaways, stairs and stoops, mechanical equipment and other similar appurtenances may encroach into minimum yards as depicted on the "lot typical" as shown on the CDP/FDP, as permitted by Section 2-412 and Article 10 of the Zoning Ordinance. Porches (including screened in porches) or sunrooms may be permitted in the rear yard in the area identified as “OPTIONAL DECK” on the lot typical included on the CDP/FDP. The specifications of this proffer shall be disclosed to future homeowners in the Homeowners Association documents.
10. Construction Activity.

- A. Outdoor construction activities, any associated construction deliveries, any construction related loading or unloading of vehicles, and any construction related trash collection on the Property shall only occur between the hours of 7:00 a.m. and 9:00 p.m., Monday through Saturday, and between the hours of 9:00 a.m. and 9:00 p.m. on Federal Holidays, exclusive of Thanksgiving, Christmas, New Year's Day, Memorial Day, the 4th of July and Labor Day, on which no construction activities shall occur.
- B. All construction related vehicular access and deliveries shall be from Route 123/Ox Road or the Rt 123/Ox Road service drive, and shall not be permitted to approach the site on Adare Drive from the east.
- C. Construction workers shall either park on-site during the construction of the improvements on the Property or shall park in a remote location and be shuttled to the Property. Construction workers shall not be permitted to park on Adare Drive or Oak Park Court.
- D. The construction activity hours, parking restrictions, the name of a contact person for the construction activities, a 24 hour contact number shall be posted on the Property during all construction activities. Any information posted on the Property during construction shall be posted in both English and Spanish.
- E. All construction site lighting shall use full cut-off or directionally shielded fixtures that are aimed and controlled so the directed light shall be substantially confined to the object intended to be illuminated. Directional control shields shall be used where necessary to limit stray light.
- F. All construction activities, including silt and dust control, and the use and disposal of any and all possible pollutants such as paint, gas, cement, etc. shall be performed in accordance with the County Code.

11. Architectural Design - The architectural design of the units shall be generally consistent with the quality of construction and materials shown on Sheet 15 of the CDP/FDP.

12. Reciprocal Easements. At the time of subdivision plan approval, the Applicant shall create reciprocal easements along common residential property lines to provide future homeowners with reasonable rights of access to adjacent lots if needed to perform routine home maintenance functions.

II. TRANSPORTATION

~~12.13.~~ Right-of-Way Dedication along Ox Road, Route 123. At the time of subdivision plan approval, or upon demand by the Virginia Department of Transportation (VDOT) or Fairfax County, whichever occurs first, the Applicant shall dedicate, at no cost to Fairfax County and in fee simple, without encumbrances except as described below in this proffer, to the Board, the right-of-way along the site frontage of Ox Road and any

associated ancillary easements, as generally shown on the CDP/FDP. The Applicant may reserve an easement for ingress and egress for the private access within the dedicated right-of-way. Density credit is reserved consistent with the provisions of the Fairfax County Zoning Ordinance for all eligible dedications described herein or as may be required by Fairfax County or VDOT.

~~13.~~14. Road/Trail Maintenance. The Applicant acknowledges that the Applicant/Homeowners Association shall be responsible for the maintenance of the portion of the private driveway ~~and the portion of the proposed trail~~**that the Applicant is constructing** that is within the future dedicated right-of-way, as described in Proffer ~~10~~13 above. Concurrent with the submission of the subdivision plan, the Applicant shall request the Board of Supervisors to petition VDOT to remove the existing service drive from the corner of Adare Drive northward to the subject property, (the area shown as shaded on Sheet 4 of the CDP), from the VDOT maintenance system so that the HOA can assume maintenance responsibility for that portion of the existing service drive.

~~14.~~15. Public Access Easement. At the time of record plat recordation, the Applicant shall cause to be recorded among the land records a public access easement running to the benefit of Fairfax County, in a form acceptable to the County Attorney, over the private road and sidewalks as generally shown on the CDP/FDP. The Applicant shall record an access and maintenance agreement vesting homeowner association responsibility and liability for the portion of the private access located in dedicated right-of-way.

~~15.~~16. Stop Sign. A “Stop Here on Red” sign or other similar wording approved by VDOT shall be installed on Adare Drive to deter motorists on Adare Drive from blocking exit or entry onto the service drive.

~~16.~~17. Use of Garages, Driveways and Common Area Parking Space

- A. Individual garages shall only be used for a purpose that will not interfere with the intended purpose of parking vehicles. There shall be 4 designated parking spaces per unit, two in the garage and two in the driveway. This restriction shall be included in the homeowner’s association documents prepared for the Application Property.
- B. No parking of recreational vehicles (RVs), boats or trailers shall be permitted on the private streets or shared driveways. This restriction shall be included in the homeowner’s association documents prepared for the Application Property.
- C. Owners shall be advised of the above use restrictions which shall be included in the initial lease/sales documents.

~~17.~~18. Sight Triangle. The private streets on the property will meet VDOT standards for sight functional distance. Elements of the CDP/FDP may be relocated to meet this standard.

~~18-19.~~ Signal Timing. Prior to subdivision plan approval, the Applicant will send a written request to VDOT requesting that they implement the recommended signal timing changes outlined in the April 30, 2013 “Transportation Impact Analysis for Eastwood Properties” prepared by Wells + Associates. Upon submittal of the written request, the Applicant’s obligation regarding this proffer shall be considered fulfilled.

III. ENVIRONMENTAL

~~19-20.~~ Noise. In order to ensure an interior noise level of no greater than DNL 45 dBA, the Applicant shall employ the following acoustical treatment measures for lots within the highway noise impact zone of DNL 65-70 dBA.:

- Exterior walls shall have a laboratory sound transmission class (STC) rating of at least 39.
- Doors and glazing shall have a laboratory STC rating of at least 28 unless glazing constitutes more than 20 percent of any façade exposed to noise levels of DNL 65 dBA or above. If glazing constitutes more than 20 percent of an exposed façade, then the glazing shall have an STC rating of at least 39.
- All surfaces shall be sealed and caulked in accordance with methods approved by the American Society of Testing and Materials (ASTM) to minimize sound transmission.
- Exterior noise levels for outdoor areas within lots shall be at or below DNL 65.

A noise barrier, architecturally solid from the ground up with no gaps or openings, 6 feet in height, as shown on the CDP/FDP, shall be constructed. Any noise attenuation measures shall be subject to the review and approval of the Environmental Branch of the Department of Planning and Zoning.

~~20-21.~~ Lighting. If lighting is installed on the property, such lighting shall conform to the requirements of Part 9 of Article 14 of the Zoning Ordinance and shall be subject to the approval of the Director, DPWES in accordance with the provisions of the Public Facilities Manual. Fixtures shall be shielded and directed downward.

~~21-22.~~ Energy Conservation. All new dwelling units shall be designed and constructed as ENERGY STAR qualified homes. The major features of ENERGY STAR homes include features such as: effective insulation, high-performance windows, tight construction and ducts, efficient heating and cooling equipment, efficient products, and Third Party Verification (Home Energy Rater).

~~22-23.~~ Landscaping. Landscaping shall be generally consistent with the quality, quantity and the locations shown illustratively on the CDP/FDP and shall be a non-invasive species. At the time of planting, the minimum caliper for deciduous trees shall be two (2) to two and a half (2 ½) inches and the minimum height for evergreen trees shall be seven (7) feet. Actual types, locations and species of vegetation shall be determined pursuant to more detailed landscape plans submitted at the time of submission of the subdivision

plans for review and approval by the UFMD. Such landscape plans shall provide tree coverage and species diversity consistent with the PFM criteria, as determined by the Urban Forester. The Applicant reserves the right to make minor modifications to such landscaping to reasonably accommodate utilities and other design considerations, subject to approval by UFMD, provided such relocated landscaping shall retain a generally equivalent number and type/quality of plantings as shown on the approved CDP/FDP.

23-24. Invasive Species Management. An invasive management plan shall be developed that provides for the management and treatment of invasive and undesirable plants, growing in all areas shown to be preserved, that are likely to endanger the long-term ecological functionality, health, and regenerative capacity of the early successional forest communities, for review and approval by the Urban Forest Management Division. The management plan shall incorporate the following information:

- Identify targeted undesirable and invasive plant species to be suppressed and managed.
- Identify targeted area of undesirable and invasive species, which shall be clearly identified on the landscape and/or tree preservation plan.
- Recommended government and industry method(s) of management, i.e. hand removal, mechanical equipment, chemical control, other.
- Identify how targeted species will be disposed.
- If chemical control is recommended, treatments shall be performed by or under direct supervision of a Virginia Certified Pesticide Applicator or Registered Technician and under the general supervision of Project Arborist).
- Provide information regarding timing of treatments, (hand removal, mechanical equipment or chemical treatments) when will treatments begin and end during a season and proposed frequency of treatments per season.
- Identify potential areas of reforestation and provide recommendation
- Monthly monitoring shall be reports provided to UFMD and SDID staff.
- Duration of management program; until Bond release or release of Conservation Deposit or prior to release if targeted plant(s) appear to be eliminated based on documentation provided by Project Arborist and an inspection by UFMD staff.

24-25. Limits of Clearing and Grading. The Applicant shall conform substantially to the limits of clearing and grading as shown on the CDP/FDP, subject to allowances specified in these proffered conditions and for the installation of utilities and/or trails as determined necessary by the Director of DPWES, as described herein. If it is determined necessary to install utilities and/or trails in areas protected by the limits of clearing and grading as shown on the CDP/FDP, they shall be located in the least disruptive manner necessary as determined by the UFMD, DPWES. Specifically, in the area of trees 17399, 17401, and 17585, the location of the concrete sidewalk, as shown on Sheet 6 may be shifted, in consultation with the Urban Forester, in order to try to save tree 17401 so the limits of clearing and grading may be altered in this area. A replanting plan shall be developed and implemented, subject to approval by the UFMD, DPWES, for any areas protected by the limits of clearing and grading that must be disturbed for such utilities. Any trees impacted within the limits of clearing and grading as specified above shall be

replaced on the site as determined by UFMD and the Chesapeake Bay Preservation Ordinance.

~~25-~~26. Tree Preservation. The applicant shall submit a Tree Preservation Plan and Narrative as part of the first and all subsequent site plan submissions. The preservation plan and narrative shall be prepared by a Certified Arborist or a Registered Consulting Arborist, and shall be subject to the review and approval of the Urban Forest Management Division, DPWES.

The tree preservation plan shall include a tree inventory that identifies the location, species, critical root zone, size, crown spread and condition analysis percentage rating for individual trees located ten (10) feet within the tree save area living or dead with trunks 12 inches in diameter and greater (measured at 4 ½ -feet from the base of the trunk or as otherwise allowed in the latest edition of the Guide for Plant Appraisal published by the International Society of Arboriculture) and 25 feet outside of the proposed limits of clearing and grading. The tree preservation plan shall provide for the preservation of those areas shown for tree preservation, those areas outside of the limits of disturbance shown on the SE and those additional areas in which trees can be preserved as a result of final engineering. The tree preservation plan and narrative shall include all items specified in PFM 12-0507 and 12-0509. Specific tree preservation activities that will maximize the survivability of any tree identified to be preserved, such as: crown pruning, root pruning, mulching, fertilization, and others as necessary, determined by the certified arborist shall be included in the plan.

~~26-~~27. Tree Preservation Walk-Through. The Applicant shall retain the services of a certified arborist or Registered Consulting Arborist, and shall have the limits of clearing and grading marked with a continuous line of flagging prior to the walk-through meeting. During the tree-preservation walk-through meeting, the Applicant's certified arborist or landscape architect or designated representative shall walk the limits of clearing and grading with an UFMD, DPWES, representative to determine where adjustments to the clearing limits can be made to increase the area of tree preservation, increasing the survivability of trees at the edge of the limits of clearing and grading, and such adjustment shall be implemented. Trees that are identified as dead or dying may be removed as part of the clearing operation. Any tree that is so designated shall be removed using a chain saw and such removal shall be accomplished in a manner that avoids damage to surrounding trees and associated understory vegetation. If a stump must be removed, this shall be done using a stump-grinding machine in a manner causing as little disturbance as possible to adjacent trees and associated understory vegetation and soil conditions.

~~27-~~28. Tree Preservation Fencing. All trees shown to be preserved on the tree preservation plan shall be protected by tree protection fence. Tree protection fencing in the form of four (4) foot high, fourteen (14) gauge welded wire attached to six (6) foot steel posts driven eighteen (18) inches into the ground and placed no further than ten (10) feet apart or, super silt fence to the extent that required trenching for super silt fence is done per the root pruning guidelines contained in these proffers. Fencing shall be erected at the limits

of clearing and grading as shown on the demolition, and phase I & II erosion and sediment control sheets.

~~28-~~29. Tree Appraisal. The Applicant shall retain a certified arborist, to determine the replacement value of all trees 12 inches in diameter or greater located on the Application Property that are shown to be saved on the Tree Preservation Plan. These trees and their value shall be identified on the Tree Preservation Plan at the time of the first submission of the respective site plan(s). The replacement value shall take into consideration the age, size and condition of these trees and shall be determined by the so-called "Trunk Formula Method" contained in the latest edition of the Guide for Plan Appraisal published by the International Society of Arboriculture, subject to review and approval by UFMD.

At the time of the respective site plan approvals, the Applicant shall post a cash bond or a letter of credit payable to the County of Fairfax to ensure preservation and/or replacement of the trees for which a tree value has been determined in accordance with the paragraph above (the "Bonded Trees") that die or are dying due to unauthorized construction activities. The letter of credit or cash deposit shall be equal to 50% of the replacement value of the Bonded Trees. At any time prior to final bond release for the improvements on the Application Property constructed adjacent to the respective tree save areas, should any Bonded Trees die, be removed, or are determined to be dying by the project arborist and/or UFMD due to unauthorized construction activities, the Applicant shall replace such trees at its expense. The replacement of the trees shall be determined by the Fairfax County Public Facilities Manual and by UFMD. Upon release of the bond for the improvements on the Application Property constructed adjacent to the respective tree save areas, any amount remaining in the tree bonds required by this proffer shall be returned/released to the Applicant.

All tree protection fencing shall be installed after the tree preservation walk-through meeting but prior to any clearing and grading activities, including the demolition of any existing structures. The installation of all tree protection fencing shall be performed under the supervision of a certified arborist, and accomplished in a manner that does not harm existing vegetation that is to be preserved. Three (3) days prior to the commencement of any clearing, grading or demolition activities, but subsequent to the installation of the tree protection devices, the UFMD, DPWES, shall be notified and given the opportunity to inspect the site to ensure that all tree protection devices have been correctly installed. If it is determined that the fencing has not been installed correctly, no grading or construction activities shall occur until the fencing is installed correctly, as determined by the UFMD, DPWES.

~~29-~~30. Demolition of Existing Structures. Within the areas protected by the limits of clearing and grading as shown on the CDP/FDP, all existing features and structures shall be removed in a manner that avoids impacting trees and/or groups of trees that are to be preserved, as reviewed and approved by UFMD, DPWES.

~~30-~~31. Root Pruning. The Applicant shall root prune, as needed to comply with the tree preservation requirements of these development conditions. Root pruning shall be clearly

identified, labeled, and detailed on the erosion and sediment control sheets of the site plan submission. Root pruning shall be accomplished in a manner that protects affected and adjacent vegetation to be preserved, and may include, but not be limited to the following:

- Root pruning shall be done with a trencher or vibratory plow to a minimum depth of 18 inches.
- Root pruning shall take place prior to any clearing and grading, or demolition of structures and in conjunction with the installation of all super silt fence being used as tree protection fence.
- Root pruning shall be conducted with the supervision of a certified arborist.
- An UFMD, DPWES, representative shall be informed when all root pruning and tree protection fence installation is complete.

~~31.~~32. Site Monitoring. During any clearing or tree/vegetation/structure removal on the Applicant Property, a representative of the Applicant shall be present to monitor the process and ensure that the activities are conducted as conditioned and as approved by the UFMD. The Applicant shall retain the services of a certified arborist or Registered Consulting Arborist to monitor all construction and demolition work and tree preservation efforts in order to ensure conformance with all tree preservation development conditions, and UFMD approvals. The monitoring schedule shall be described and detailed in the Landscaping and Tree Preservation Plan, and reviewed and approved by the UFMD, DPWES.

~~32.~~33. Stormwater Management Facilities and Best Management Practices. Unless waived or modified, stormwater management shall be provided as generally depicted on the CDP/FDP and as approved by DPWES to attain a phosphorus removal rate of 45%, which represents a standard above the current minimum required by the County. Improvements shown off-site on the CDP/FDP may be altered based on final engineering without an amendment to this rezoning subject to DPWES approval. The requirements for maintaining non-County maintained SWM improvements shall be in a standard maintenance agreement between the County and the Applicant who is the land owner, its successor and assigns. This agreement shall be recorded in the County land records and run with the land. Should any deficiencies in the existing SWM or BMP facilities/improvements be identified by the Stormwater Management Maintenance Division during regular inspections, or when investigating a drainage complaint, then

maintenance shall be performed in reasonable fashion and time in accordance with the recorded maintenance agreement.

~~33-~~34. Trail Marker. A trail marker sign shall be installed at the entrance of the site delineating the location of the trail to the north.

~~34-~~35. Tot Lot. At least three of the following elements shall be included in the tot lot: slides, swings, balance beams, spring animals and/or spring pads, play structures, spinarounds, horizontal bars, climbers, as recommended by the Public Facilities Manual.

~~35-~~36. Conservation Easement. At the time of subdivision plat recordation, the Applicant shall cause to be recorded among the land records—a conservation ~~easement~~easements running to the benefit of Fairfax County for the ~~area~~areas generally shown on the CDP/FDP as “Proposed Conservation Easement”.

~~36-~~37. Demolition Permit. Prior to the issuance of a demolition permit for the existing single family dwellings, the Applicant shall obtain the necessary permits from the Fairfax County Health Department to ensure the proper abandonment of any septic systems and the capping of any wells on the property.

~~37-~~38. Trees within County Easements. If, at the time of final engineering and the locating of County easements on the subject property, it is determined that there are existing trees within the easement area(s), those trees may be relocated on the property without affecting tree canopy or preservation calculations.

39. Off-Site Drainage Work. In addition to the required stormwater management described in Proffer 33, the Applicant shall offer to pursue certain off-site work in an effort to address certain existing drainage conditions on Middleridge Lots 261 and 262 that are unrelated to the subject development. The drainage work may include the addition of an inlet within the existing off-site storm sewer easement on Lot 261 and associated grading, some of which would be completed on Lot 262. It is understood that these efforts are not required as part of the stormwater management plan for the subject development.

Within 30 days of the approval of this application, the Applicant shall send, by certified mail, a letter to the owners of Lots 261 and 262, offering to complete the drainage work specifically described in this proffer. If the Applicant does not receive a response by certified mail postmarked within 30 days of the Applicant’s letter, from the owners of both lots indicating that they want the work described within this proffer completed, the Applicant shall have no further obligation in connection with this proffer.

This storm drainage work is to be accomplished within an area consisting of an existing storm sewer easement on Lot 261 and additional grading outside of the easement on Lot 262. The Applicant’s obligations under this proffer shall be subject

to securing a written agreement from the owner of Lot 262 at no cost beyond the construction and permitting obligations contained in the contemplated Agreement. The Applicant's obligations under this proffer shall also be subject to securing concurrence from the owner of Lot 261 to perform the work proposed within the easement on Lot 261. Any proposed grading or construction shall also require approval by Fairfax County.

Within 30 days of receiving confirmation by certified mail that the owners want the drainage related work performed, the Applicant shall submit an agreement to the owner of Lot 262 that will allow the Applicant to perform the grading and/or storm drainage improvements. Concurrently, the Applicant shall furnish the owner of Lot 261 with the proposed grading and/or storm drainage improvements to be conducted within the existing storm drainage easement. Should the Applicant and the owners of Lot 261 be unable to reach a mutual agreement as to the work to be completed within the existing storm sewer easement and the Applicant fail to execute an agreement with the owner of Lot 262 within 30 days of the Applicant's presentation of the same, the Applicant shall have no further obligation under this proffer. For the purpose of this proffer, submission to the County of the Applicant's written records and correspondence shall be deemed to be sufficient to demonstrate the inability to reach an agreement.

At a minimum, the Off Site Grading Agreement shall provide for the following: 1. the proposed grading work shall reflect commercially acceptable and reasonable standards and requirements for construction related activity of the contemplated scope; 2. the conveyance of a grading and construction easement in a form acceptable to Fairfax County; 3. Permission from the land owner to file appropriate site and grading plans; 4. Permission to enter the owners property to perform the necessary construction activities; 5. Approval by the County of all contemplated improvements; 6. Indemnification of the Applicant for any responsibility liability as to the effectiveness of any grading or infrastructure performed under this potential Agreement; 7. No responsibility by the Applicant for the maintenance of any site work performed, or infrastructure installed. These minimum requirements shall not be an exclusive list of the necessary terms of the Off-site Grading Agreement.

The Applicant's obligations under any Agreement entered into pursuant to this proffer shall not be preconditions to the review and approval of the subdivision plan for the 13 lots approved pursuant to this rezoning.

IV. CONTRIBUTIONS

38.40. Housing Trust Fund. At the time of the first building permit issuance, the Applicant shall contribute a sum equal to one-half of one percent (0.5%) of the projected sales price for each dwelling unit on the Property to the Fairfax County Housing Trust Fund, as determined by the Department of Housing and Community Development in consultation with the Applicant to assist the County in its goal to provide affordable dwellings. The

projected sales price shall be based upon the aggregate sales price of all of the units, as if those units were sold at the time of the issuance of the first building permit and is estimated through comparable sales of similar type units.

- ~~39.~~41. **Recreation Contribution.** At the time of subdivision approval, the Applicant shall contribute the sum of \$30,362 for use at off-site recreational facilities intended to serve the future residents, as determined by FCPA. The Applicant shall coordinate with the District Supervisor as to specific beneficiary of the contribution. Pursuant to Section 6-409 of the Zoning Ordinance, the Applicant shall provide recreational facilities to serve the Property as shown on the CDP/FDP. At the time of subdivision review, the Applicant shall demonstrate that the value of all proposed recreational amenities are equivalent to a minimum of \$1,700 per unit. In the event it is demonstrated that the proposed facilities do not have sufficient value, the Applicant shall contribute funds in the amount needed to achieve the overall proffered amount of \$1,700 per unit to the FCPA for off-site recreational facilities intended to serve the future residents within Braddock District.
- ~~40.~~42. **Public Schools.** A contribution of \$52,440 (5 students X \$10,488) shall be made to the Board of Supervisors for transfer to Fairfax County Public Schools (FCPS) and designated for capital improvements in the Robinson High School Pyramid. The contribution shall be made at the time of, or prior to, site plan approval. Following approval of this Application and prior to the Applicant's payment of the amount set forth in this Proffer, if Fairfax County should increase the ratio of students per unit or the amount of the contribution per student, the Applicant shall increase the amount of the contribution for that phase of development to reflect the then-current contribution. In addition, notification shall be given to FCPS when construction is anticipated to commence to assist FCPS by allowing for the timely projection of future students as a part of the Capital Improvement Program.
- ~~41.~~43. **Escalation.** All monetary contributions required by these proffers shall escalate on a yearly basis from the base year of 2013, and change effective each January 1 thereafter, based on the Consumer Price Index as published by the Bureau of Labor Statistics, the U.S. Department of Labor for the Washington-Baltimore, MD-VA-DC-WV Consolidated Metropolitan Statistical Area (the "CPI), as permitted by Virginia State Code Section 15.2-2303.3.

Successors and Assigns

These proffers shall bind and inure to the benefit of the Applicant and his/her successors and assigns.

Counterparts

These proffers may be executed in one or more counterparts, each of which when so executed and delivered shall be deemed an original document and all of which taken together shall constitute but one and the same instrument.

TITLE OWNERS AND APPLICANTS SIGNATURES TO FOLLOW ON THE NEXT PAGE:

EASTWOOD PROPERTIES, INC.
A Virginia Corporation

Agent/Attorney-in-Fact for Daniel B. Thompson,
Title Owner of TM No. 77-1((1))36 and Contract
Purchaser of TM Nos. 77-1((1))36, 37, 38

By: Eastwood Properties, Inc.

Name _____
Richard L. Labbe

Title: President/Secretary/ Treasurer

R&D 2001, LLC
Co-owner of
TM 77-1((1))37, 38

By: _____

Name: David M. Gregory

Title: _____

Church Road Limited, Inc.
Co-owner of
TM 77-1((1))37, 38

By: _____

Name: David M. Gregory

Title: _____

