



County of Fairfax, Virginia

To protect and enrich the quality of life for the people, neighborhoods and diverse communities of Fairfax County

March 19, 2009

Inda E. Stagg
Walsh, Colucci, Lubeley, Emrich & Walsh, P.C.
2200 Clarendon Boulevard, 13th Floor
Arlington, Virginia 22201

RE: Proffered Condition Amendment Application PCA 78-S-063-06
(Concurrent with Special Exception Application SE 2008-SU-026)

Dear Ms. Stagg:

Enclosed you will find a copy of an Ordinance adopted by the Board of Supervisors at a regular meeting held on February 23, 2009, approving Proffered Condition Amendment Application PCA 78-S-063-06 in the name of The Aerospace Corporation. The Board's action amends the proffers for Rezoning Application RZ 78-S-063, previously approved for office to permit modifications to proffers and site design with an overall Floor Area Ratio (FAR) of 0.50. The subject property is located in the southeast quadrant of the intersection of Stonecroft Boulevard and Lee Road on approximately 40.41 acres of land zoned I-3 and WS [Tax Map 44-1 ((4)) 35], in the Sully District and is subject to the proffers dated March 9, 2009, as corrected.

Sincerely,

Nancy Vehrs
Clerk to the Board of Supervisors
NV/dms
Enclosure

Office of the Clerk to the Board of Supervisors
12000 Government Center Parkway, Suite 533
Fairfax, Virginia 22035

Phone: 703-324-3151 ♦ Fax: 703-324-3926 ♦ TTY: 703-324-3903
Email: clerktothebos@fairfaxcounty.gov
<http://www.fairfaxcounty.gov/bosclerk>

March 19, 2009

Cc: Chairman Sharon Bulova
Supervisor Michael Frey, Sully District
Janet Coldsmith, Director, Real Estate Division, Dept. of Tax Administration
Regina Coyle, Director, Zoning Evaluation Division, DPZ
Diane Johnson-Quinn, Deputy Zoning Administrator, Dept. of Planning and Zoning
Angela K. Rodeheaver, Section Chief, Transportation, Planning Division
Ellen Gallagher, Capital Projects and Operations Div., Dept. of Transportation
Ken Williams, Plans & Document Control, ESRD, DPWES
Department of Highways-VDOT
Sandy Stallman, Park Planning Branch Manager, FCPA
Charlene Fuhrman-Schulz, Development Officer, DHCD/Design Development Division
District Planning Commissioner
Barbara J. Lippa, Executive Director, Planning Commission
Denise James, Office of Capital Facilities/Fairfax County Public Schools
Karyn Moreland, Chief Capital Projects Sections, Dept. of Transportation

At a regular meeting of the Board of Supervisors of Fairfax County, Virginia, held in the Board Auditorium in the Government Center at Fairfax, Virginia, on the 23rd day of February, 2009, the following ordinance was adopted.

**AN ORDINANCE AMENDING THE ZONING ORDINANCE
PROFFERED CONDITION AMENDMENT PCA 78-S-063-06
(CONCURRENT WITH SE 2008-SU-026)**

WHEREAS, The Aerospace Corporation, filed in the proper form an application to amend the proffers for RZ 78-S-063 hereinafter described, by amending conditions proffered and accepted pursuant to Virginia Code Ann. 15.2-2303(a), and

WHEREAS, at a duly called public hearing the Planning Commission considered the application and the propriety of amending the Zoning Ordinance in accordance therewith, and thereafter did submit to this Board its recommendation, and

WHEREAS, this Board has today held a duly called public hearing and after due consideration of the reports, recommendation, testimony and facts pertinent to the proposed amendment, the Board is of the opinion that the Ordinance should be amended,

NOW, THEREFORE, BE IT ORDAINED, that that certain parcel of land situated in the Sully District, and more particularly described as follows (see attached legal description):

Be, and hereby is further restricted by the amended conditions proffered and accepted pursuant to Virginia Code Ann., 15.2-2303(a), which conditions are incorporated into the Zoning Ordinance as it affects said parcel, and

BE IT FURTHER ENACTED, that the boundaries of the Zoning Map heretofore adopted as a part of the Zoning Ordinance be, and they hereby are, amended in accordance with this enactment, and that said zoning map shall annotate and incorporate by reference the additional conditions governing said parcels.

GIVEN under my hand this 23rd day of February, 2009.



Nancy Vebs
Clerk to the Board of Supervisors



PLEASE TYPE OR PRINT IN BLACK INK

COMMONWEALTH OF VIRGINIA
COUNTY OF FAIRFAX
APPLICATION FOR Proffered Condition Amendment

RECEIVED
Department of Planning & Zoning

JUN 04 2008

APPLICATION NO. PCA 78-S-01306 concurrent with SE 2008-SU-024
(Assigned by Staff)

PETITION

Zoning Evaluation Division

TO: THE BOARD OF SUPERVISORS OF FAIRFAX COUNTY, VIRGINIA
I (We), The Aerospace Corporation

, the applicant(s), petition you to adopt an ordinance amending the Zoning Map of Fairfax County, Virginia, by reclassifying from the I-3/WS District to the I-3/WS District the property described below and outlined in red on the Zoning Section Sheet(s) accompanying and made a part of this application.

PROPERTY DESCRIPTION

1. LEGAL DESCRIPTION:

pt. Pcl Bl Lot(s)	Block(s)	Long and McArver Property Subdivision	19656 Deed Book	0519 Page No.
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2. TAX MAP DESCRIPTION:

Map No.	Double Circle No.	Single Circle No.	Parcel(s)/Lot(s) No.	Total Area(Ac.or Sq.Ft.)
44-1	4		35	1,760,386 sq. ft./ 40.41 ac.

3. POSTAL ADDRESS OF PROPERTY: (If any)

4801 Stonecroft Boulevard

4. ADVERTISING DESCRIPTION: (Ex. South of Rt. 236, 1000 feet west of Rt. 274)
N.E. quadrant of Stonecroft Boulevard (Route 8460) and Lee Road (Route 8461)

5. PRESENT USE: Vacant

6. PROPOSED USE: Office/Research and Development

7. SUPERVISOR DISTRICT: Sully

The name(s) and address(es) of owner(s) of record shall be provided on the affidavit form attached and made part of this application.

The undersigned has the power to authorize and does hereby authorize Fairfax County staff representatives on official business to enter on the subject property as necessary to process the application.

Martin D. Walsh, Agent/Attorney
Type or Print Name of Applicant or Agent

Martin D. Walsh / by: Inda E. Stagg
Signature of Applicant or Agent

WALSH, COLUCCI, LUBELEY, ENRICH & WALSH, PC
2200 Clarendon Boulevard, Suite 1300, Arlington, VA 22201
Address

(703) 528-4700

Telephone No. Home Work

Please provide name and telephone number of contact person if different from above.

Inda E. Stagg Istagg@arl.thelandlawyers.com; Phone: 703-528-4700, ext. 5423

DO NOT WRITE IN THIS SPACE

PCA 2008-0163 um 713108

Date application received: _____ Application Fee Paid: \$12,005.00

Date application accepted: 7/23/08 Christina Truffe Form RZ (10/89)

PROFFER INFORMATION

PROFFER STATEMENT DATE: 03-09-2009

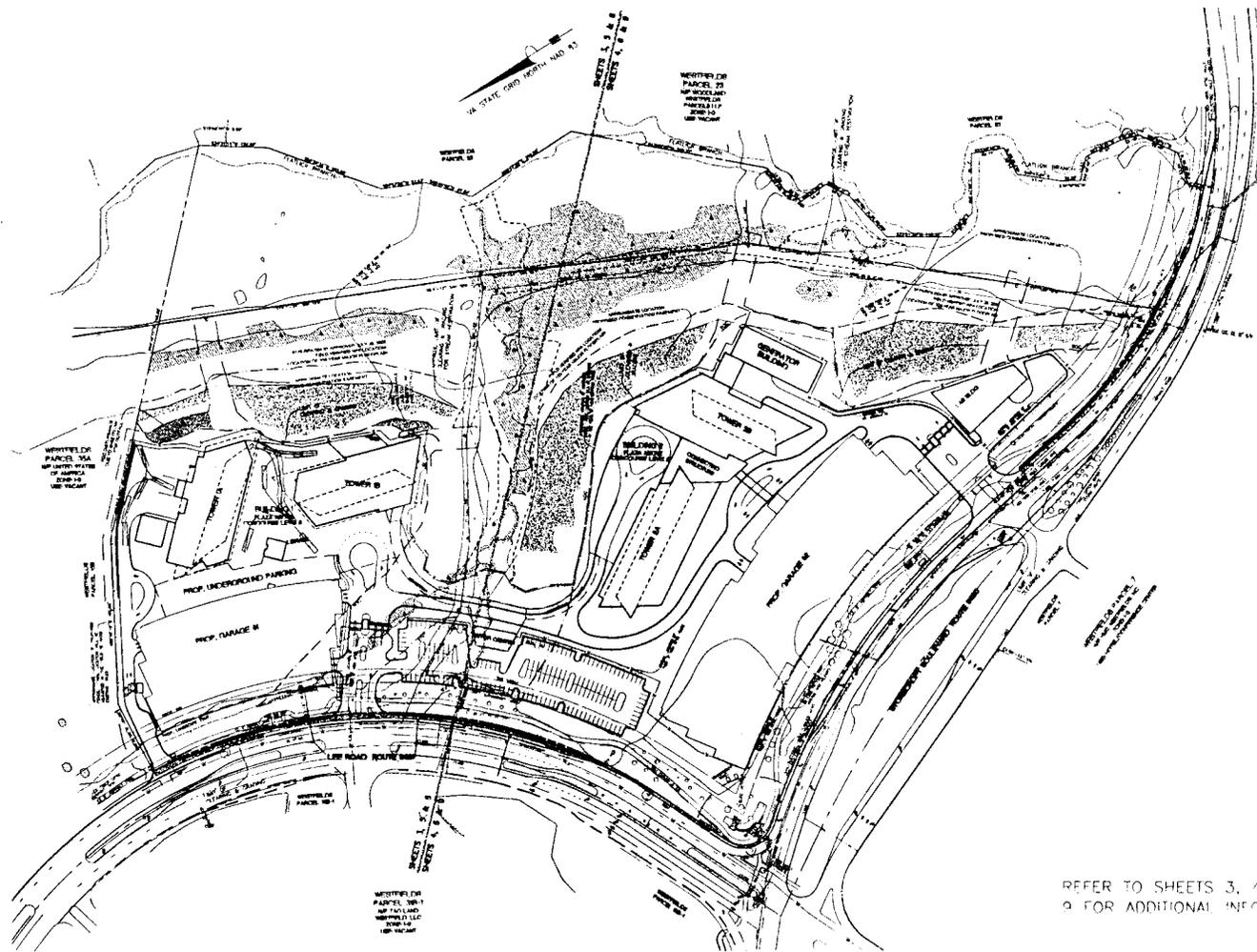
<u>ITEM</u>	<u>DUE DATE</u>	<u>TRIGGER NO.</u>	<u>TRIGGER EVENT</u>	<u>CONTRIB AMT</u>	<u>EXPIRATION DATE</u>
BEST MANAGEMENT PRACTICES (BMP)	01-01-0001	0	N/A	\$	01-01-0001
CONSERVATION EASEMENT	01-01-0001	0	N/A	\$	01-01-0001
ENVIRONMENTAL QUALITY CORRIDOR (I	01-01-0001	0	N/A	\$	01-01-0001
FLOOR AREA RATIO (FAR) / GROSS FLOO	01-01-0001	0	N/A	\$	01-01-0001
LANDSCAPE PLAN REQUIRED	01-01-0001	0	NON-RUF	\$	01-01-0001
LIGHTING / GLARE	01-01-0001	0	N/A	\$	01-01-0001
LIMITS OF CLEARING AND GRADING	01-01-0001	0	N/A	\$	01-01-0001
LOW IMPACT DESIGN (LID) / RAINGARDE	01-01-0001	0	N/A	\$	01-01-0001
OFF-SITE CONTRIBUTION - RECREATION	01-01-0001	0	SITE PLAN	\$350,000	01-01-0001
POND MAINTENANCE AGREEMENT	01-01-0001	0	N/A	\$	01-01-0001
RIGHT OF WAY - DEDICATION	01-01-0001	0	SITE PLAN	\$	01-01-0001
SIDEWALK / TRAIL	01-01-0001	0	SITE PLAN	\$82,000	01-01-0001
SIGNAGE	01-01-0001	0	N/A	\$	01-01-0001
TRAFFIC SIGNAL / TIMING	01-01-0001	0	SITE PLAN	\$	01-01-0001
TRANSPORTATION DEMAND MANAGEME	01-01-0001	0	NON-RUP	\$	01-01-0001
TREE PRESERVATION / SURVEY	01-01-0001	0	SITE PLAN	\$	01-01-0001
TREE SAVE FENCING	01-01-0001	0	N/A	\$	01-01-0001
TURN LANE(S) (INCLUDES ACCEL AND D	01-01-0001	0	NON-RUP	\$	01-01-0001
URBAN FORESTRY REVIEW	01-01-0001	0	N/A	\$	01-01-0001
ALTERNATIVE SWM MEASURES	01-01-0001	0	N/A	\$	01-01-0001

WAIVERS/MODIFICATIONS

APPROVED WAIVERS/MODIFICATIONS

SUPPLEMENTAL MOTIONS

SUPPLEMENTAL MOTIONS APPROVED



REFER TO SHEETS 3, 4, 5, 6, 8 AND 9 FOR ADDITIONAL INFORMATION/DETAILS



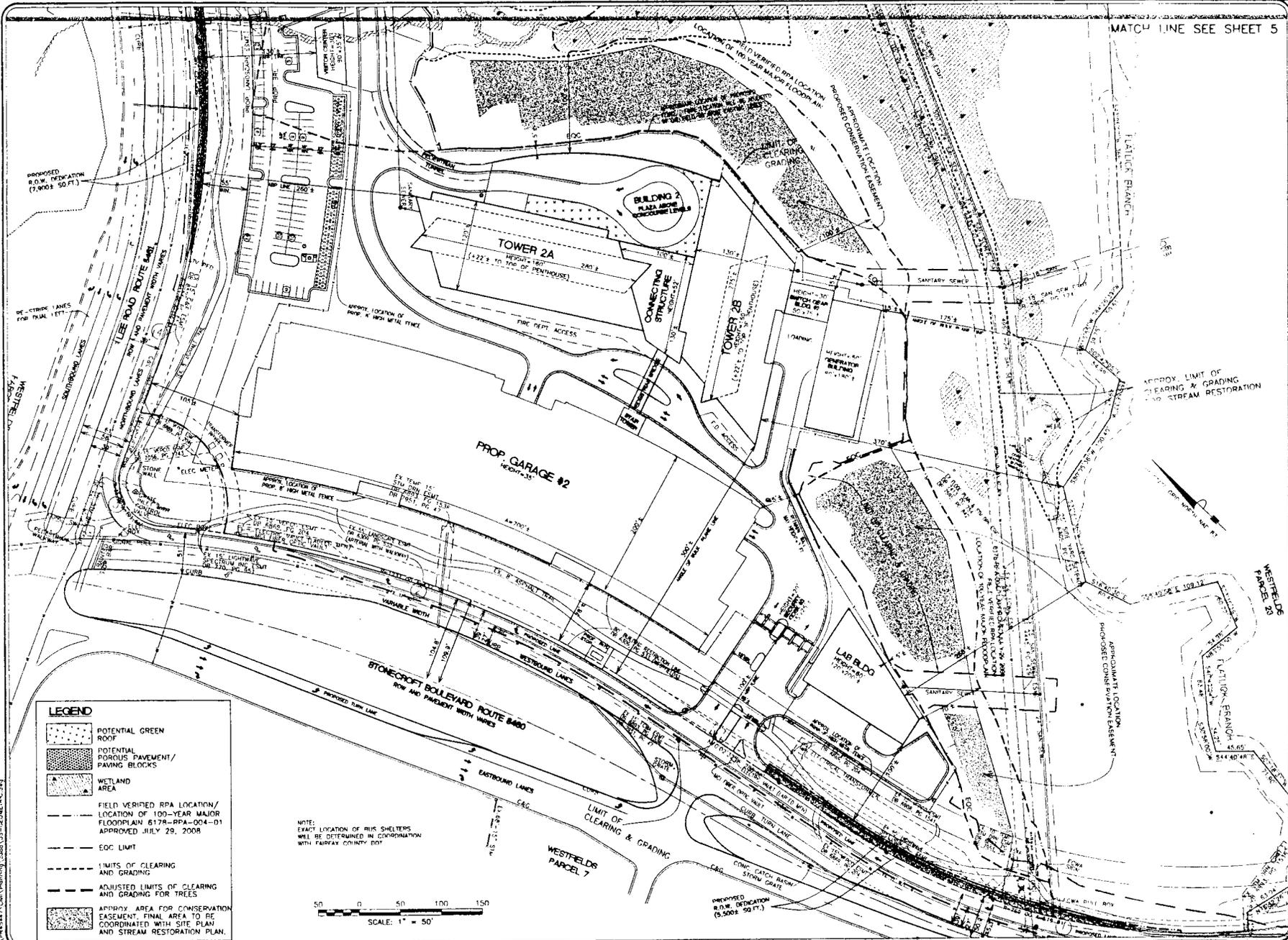
BURGESS & NIPLE
 1400 PAVILION DRIVE, SUITE 400, WESTFIELD, MA 01095
 TEL: 413-253-1234 FAX: 413-253-1235

NO.	DATE	DESCRIPTION
1	05/11/00	ISSUED FOR PERMITTING
2	05/11/00	ISSUED FOR PERMITTING
3	05/11/00	ISSUED FOR PERMITTING
4	05/11/00	ISSUED FOR PERMITTING
5	05/11/00	ISSUED FOR PERMITTING
6	05/11/00	ISSUED FOR PERMITTING
7	05/11/00	ISSUED FOR PERMITTING
8	05/11/00	ISSUED FOR PERMITTING
9	05/11/00	ISSUED FOR PERMITTING
10	05/11/00	ISSUED FOR PERMITTING

SPECIAL EXCEPTION AND GENERALIZED DEVELOPMENT PLAN OVERVIEW
AEROSPACE CORPORATION
WESTFIELDS, PARCEL 35



DATE: MAY, 2000
 SCALE: 1" = 100'
 DESIGN: JPC, TPA, WPC
 CHECK: DJF, JPC, WPC
 JOB NO.: 0044447
 P.R. NO.: 45447
 SHEET: 2 OF 10
 FILE NO.: C-4702



MATCH LINE SEE SHEET 5

BURGESS & NIPLE

DATE: 11/20/08	SCALE: 1" = 50'
DESIGNER: JPC	CHECKER: DUT
PROJECT NO.: 08-4447	SHEET: 8 OF 24
FILE NO.: C-4702	

GEOMETRIC PLAN
AEROSPACE CORPORATION
WESTFIELDS PARCEL 35



DATE: MAY 2008	SCALE: 1" = 50'
DESIGNER: JPC	CHECKER: DUT
PROJECT NO.: 08-4447	SHEET: 8 OF 24
FILE NO.: C-4702	

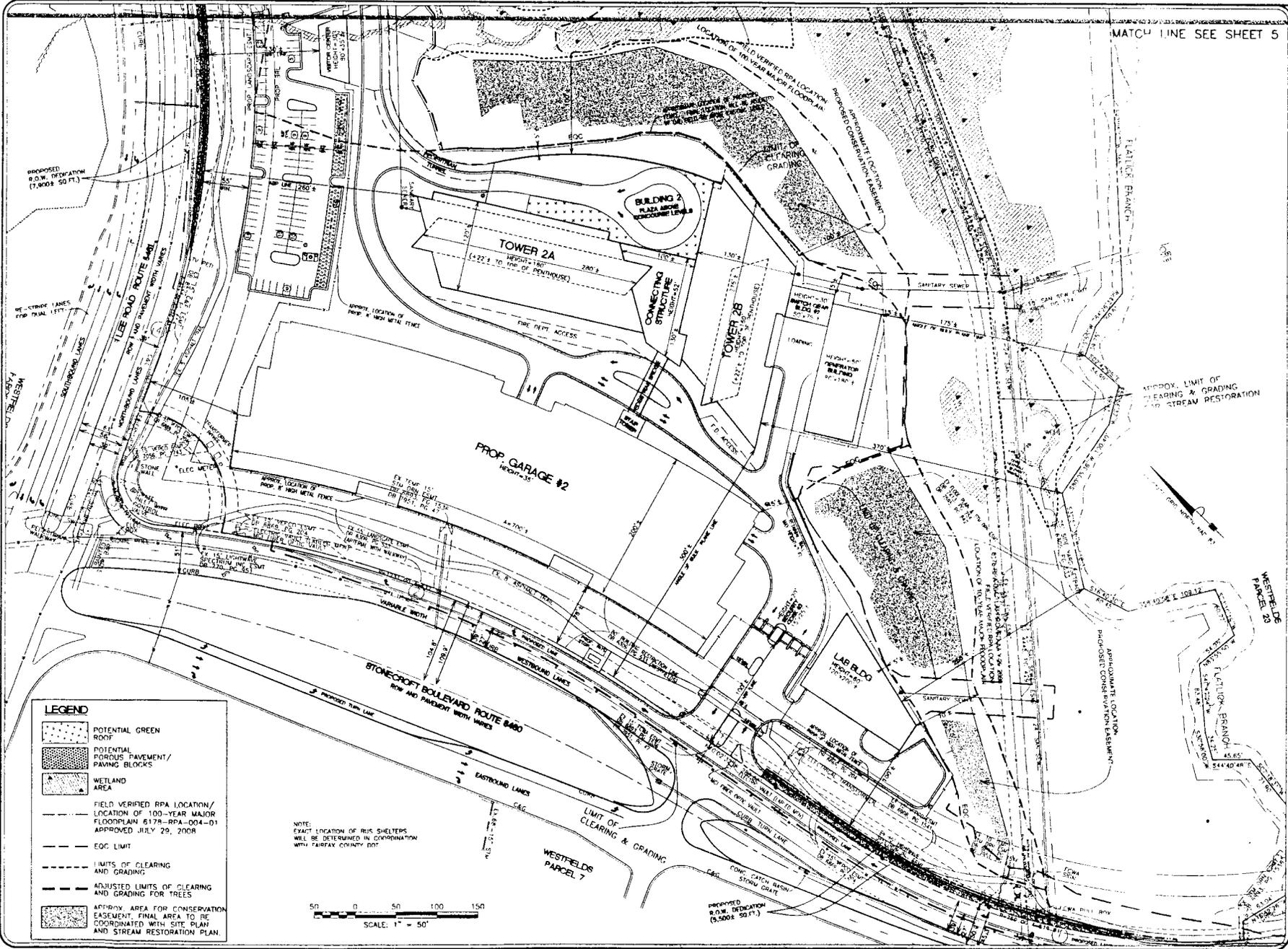
LEGEND

- POTENTIAL GREEN ROOF
- POTENTIAL POROUS PAVEMENT/PAVING BLOCKS
- WETLAND AREA
- FIELD VERIFIED RPA LOCATION/ LOCATION OF 100-YEAR MAJOR FLOODPLAIN #178-RPA-004-01 APPROVED JULY 29, 2008
- EGC LIMIT
- LIMITS OF CLEARING AND GRADING
- ADJUSTED LIMITS OF CLEARING AND GRADING FOR TREES
- APPROX AREA FOR CONSERVATION EASEMENT, FINAL AREA TO BE COORDINATED WITH SITE PLAN AND STREAM RESTORATION PLAN.

NOTE:
 EXACT LOCATION OF RUS SHELTERS
 WILL BE DETERMINED IN COORDINATION
 WITH FAIRFAX COUNTY DOW

SCALE: 1" = 50'

BY: JPC/JAN 11/20/08, PROJECT NO.: 08-4447, SHEET: 8 OF 24, SCALE: 1" = 50'



MATCH LINE SEE SHEET 5



DATE	DESCRIPTION
DEC 11, 2009	ISSUED FOR PERMIT
MAY 1, 2008	ISSUED FOR PERMIT
MAY 1, 2008	ISSUED FOR PERMIT
MAY 1, 2008	ISSUED FOR PERMIT
MAY 1, 2008	ISSUED FOR PERMIT
MAY 1, 2008	ISSUED FOR PERMIT
MAY 1, 2008	ISSUED FOR PERMIT
MAY 1, 2008	ISSUED FOR PERMIT
MAY 1, 2008	ISSUED FOR PERMIT
MAY 1, 2008	ISSUED FOR PERMIT

GEOMETRIC PLAN
AEROSPACE CORPORATION
WESTFIELDS, PARCEL 35

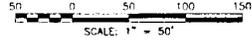


DATE	MAY 2008
SCALE	1" = 50'
DESIGN	DRP, TBA, WML, WPC
CHECK	DMT, TWY, JPC
JOB NO.	0907447
P.P. NO.	45447
SHEET	6 OF 7
FILE NO.	C-4702

LEGEND

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NOTE: EXACT LOCATION OF RIS SHELTERS WILL BE DETERMINED IN COORDINATION WITH FAIRFAX COUNTY DOT



A:\PROJECTS\2008\Westfields\000135-GEOMETRIC.dwg



NOTES

- The Existing Vegetation Map is based upon examination of background materials, such as the USGS Monocote, VA, 1964 & Handon, VA 1964 topographic quadrangle, existing topography, the Fairfax County Soil Map, the National Wetlands Inventory Map, and aerial photography, as well as a field verification performed by Sean M. Tufts, WRIT, and Jeffrey A. Browning, WRIT, of Wetland Studies and Solutions, Inc. (WSSI) on January 25, 2008.
- Topography and boundary information provided by Burgess & Nole, Inc., and a Spring 2004 WSSI Color Infrared Aerial Photograph, were used as the base for this exhibit.
- Waters of the U.S. delineation information shown herein, was performed by WSSI as described in a report dated February 13, 2008. A jurisdictional determination from the U.S. Army Corps of Engineers verifying these boundaries is pending.

LEGEND

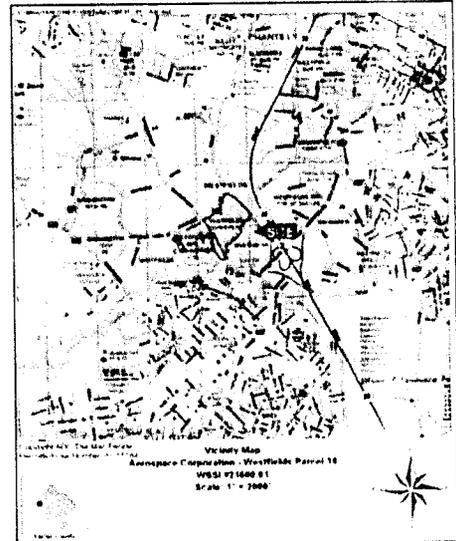
SITE BOUNDARY

VEGETATION BOUNDARY BESHAW

POTENTIAL STREAM (PER FIELD INVESTIGATION AND FAIRFAX COUNTY CHARTERED SURVEYING, SEE NOTE 3)

INTERMITTENT STREAM (PER FIELD INVESTIGATION AND FAIRFAX COUNTY CHARTERED SURVEYING, SEE NOTE 3)

WETLAND BOUNDARY (SEE NOTE 3)



EXISTING VEGETATION MAP SUMMARY TABLE

VEGETATION BOUNDARY	VEGETATION TYPE	PRIMARY SPECIES	STAGE	CONDITION	ACTUAL %	COMMENTS
A	Upland Forest	American sycamore (Populus nigra)	Mid/Early	Good	100	See Vegetation Description
B	Lowland Forest	American sycamore (Populus nigra)	Mid/Early	Good	100	See Vegetation Description
C	Bottomland Forest	American sycamore (Populus nigra)	Mid/Early	Good	100	See Vegetation Description
D	Upland Forest	American sycamore (Populus nigra)	Mid/Early	Good	100	See Vegetation Description
E	Upland Forest	American sycamore (Populus nigra)	Mid/Early	Good	100	See Vegetation Description
F	Field	American sycamore (Populus nigra)	Mid/Early	Good	100	See Vegetation Description
G	Upland Forest	American sycamore (Populus nigra)	Mid/Early	Good	100	See Vegetation Description
H	Upland Forest	American sycamore (Populus nigra)	Mid/Early	Good	100	See Vegetation Description

CONDITION DESCRIPTION

- Area A is a mature upland forest in good overall condition and comprises the majority of the site. The canopy is dominated by white oak (*Quercus alba*). Sub-dominants include northern red pine (*Pinus strobus*), silver birch (*Betula papyrifera*), American beech (*Fagus grandifolia*), and red oak (*Quercus rubra*). The understory includes the species found in the canopy. The herbaceous layer is virtually absent due to the time of year the field verification was conducted, and there are only a few sparse crochets of blueberry (*Vaccinium*) in some areas. Few mature dead trees were noted within the stand.
- Area B is a mature lowland forest in good overall condition in the southeastern portion of the site and is associated with the riparian of Flattop Branch. The canopy is dominated by mature American sycamore (*Platanus occidentalis*), oaks (*Quercus rubra*), and bald cypress (*Taxodium distichum*). Other tree species include green ash (*Fraxinus pennsylvanica*), American elm (*Ulmus americana*), and red maple (*Acer rubrum*). The understory includes greeneyes (*Azalea nitida*) and corymbus (*Symphoricarpos reticulata*). Few mature dead standing trees are present within the stand. Younger pioneer species occur along the edge of the utility right-of-way, primarily river birch (*Betula nigra*).
- Area C consists of a young bottomland forest in the central portion of the site and is associated with unnamed tributaries to Flattop Branch. A non-minimalist assessment is also located in this area. Dominant species include sweet gum (*Liquidambar styraciflua*) and red maple (*Acer rubrum*). Other tree species include black gum (*Nyssa sylvatica*) and river birch (*Betula nigra*). Herbaceous dominants include stinkwood (*Clusia americana*), greenbrier (*Smeathmania*), and heart broken sedge (*Carex flaccidula*).
- Area D consists solely of a group of young Virginia pines (*Pinus virginiana*) in the northwestern portion of the site. No other species are present within the stand.
- Area E consists of a mature forest (that includes a dirt path) along the northern and western boundaries of the site. Scattered mature trees include some native and some non-native tree species including white oak, red oak, hickory (*Carya*), eastern red cedar (*Juniperus virginiana*), Redstart pine (*Pinus strobus*), Virginia pine and red maple. Area E also includes a utility right-of-way in the central portion of the site.
- Area F consists of an open field dominated by eastern red cedar. Redstart pine is also naturalizing in the field. The trees are young, but well established.
- Area G consists of a developed area including several utility easements. Several mature white pine (*Pinus strobus*) are planted between Shenandoah Boulevard and the easements.

EXISTING VEGETATION MAP

WETLAND STUDIES AND SOLUTIONS, INC.

11115 FREDERICKSBURG AVENUE, SUITE 100, FREDERICKSBURG, VA 22405

TEL: 540-251-1111 FAX: 540-251-1112

WWW.WSSOL.COM

DATE: 01/25/08

SCALE: 1" = 2000'

PROJECT NO: 08-001

SHEET NO: 1 OF 1

DESIGNER: J. TUFTS

CHECKER: J. TUFTS

APPROVER: J. TUFTS

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APPROVER: J. TUFTS

DATE: 01/25/08

SCALE: 1" = 2000'

PROJECT NO: 08-001

SHEET NO: 1 OF 1

DESIGNER: J. TUFTS

CHECKER: J. TUFTS

APPROVER: J. TUFTS

DATE: 01/25/08

SCALE: 1" = 2000'

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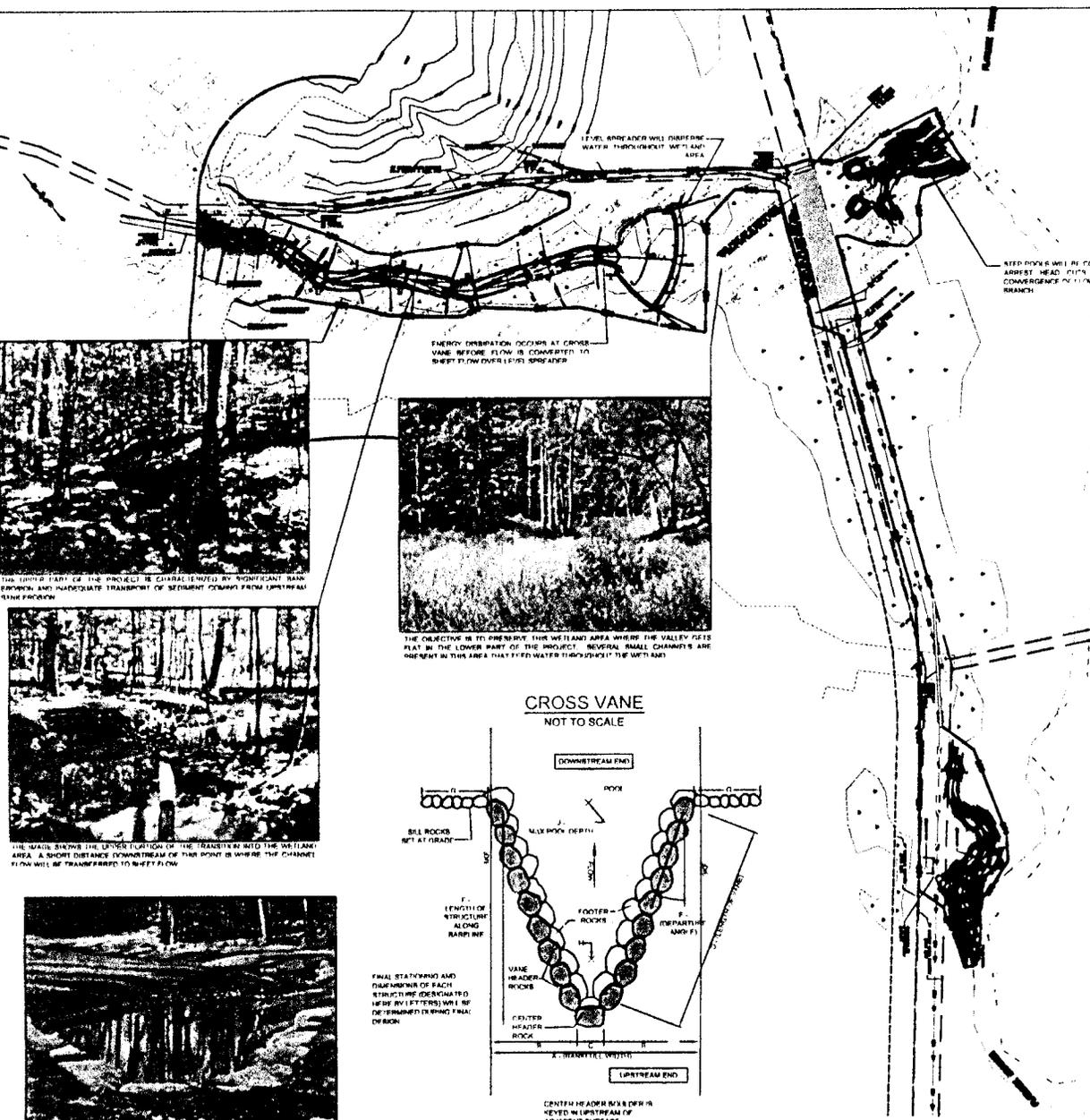
APPROVER: J. TUFTS

DATE: 01/25/08

SCALE: 1" = 2000'

PROJECT NO: 08-001

SHEET



THIS VIEW SHOWS THE NORTHERN VIRGINIA STREAM RESTORATION BANK, MAUREEN REACH 1, LOOKING DOWNSTREAM TO ILLUSTRATE THE CONNECTION OF THE CHANNEL WITH A RIPARIAN AREA. FOR THE PROJECT, THE BURE OF THE FLOORPLAN WILL BE VIRTUALLY FLAT TO PROMOTE THE GREAT ACCESS OF HIGH FLOW TO THE ADJACENT WETLAND AREA

DESIGN SUMMARY:

STREAM RESTORATION IS PROPOSED FOR THE UNNAMED TRIBUTARY TO FLATLICK BRANCH AS PART OF THE AEROSPACE CORP WESTFIELDS PARCEL 35 DEVELOPMENT. BASED ON SITE PLANS AND HYDROLOGIC DATA PROVIDED BY BURGESS AND NIPLE, GRADING CHANGES ON THE SITE REDIRECT THE MAJORITY OF STORMWATER THROUGH A PROPOSED 54" RCP INTO THE UNNAMED TRIBUTARY. THIS DISCHARGE IS CONVEYED THROUGH A STABLE PATTERN AND PROFILE USING NATURAL CHANNEL DESIGN CONCEPTS. A LEVEL SPREADER IS INCORPORATED IN ORDER TO PRESERVE THE STABLE FORESTED WETLAND LOCATED DOWNSTREAM OF THE PROPOSED 54" RCP. THE LEVEL SPREADER IS DESIGNED TO EVENLY DISTRIBUTE THE FLOW INTO THE EXISTING WETLAND AT NON-EROSIVE VELOCITIES. CHANNEL STABILIZATION IS PROPOSED WHERE THE FLOW CONVERGES AND RETURNS TO FLATLICK BRANCH. CROSS VANES AND STEP POOLS ARE ADDED TO PREVENT CHANNEL EROSION FROM ADVANCING UPSTREAM, WHICH COULD PUT UTILITIES AND TIES AND AREAS AT RISK.

CONCEPTUAL LAYOUT NOTES:

1. THIS PLAN IS FOR CONCEPTUAL PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION.
2. PRIOR TO THE DEVELOPMENT OF A FINAL DESIGN PLAN, FURTHER HYDROLOGIC/HYDRAULIC STUDY SHALL BE CONDUCTED TO REFINE THE DIMENSIONS OF THE PROPOSED CHANNEL. THE CURRENT DIMENSIONS ARE BASED ON THE 2-YR OUTFALL DISCHARGE PROVIDED BY BURGESS AND NIPLE AND MAY CHANGE.
3. THE DIMENSIONS OF THE FLOW DISSIPATION STRUCTURE MAY BE ALTERED AFTER HAZ MODELING OF THE STRUCTURE.
4. LOCATION AND DETAILS OF STRUCTURES MAY CHANGE DURING FINAL DESIGN.
5. THE DETAIL SHOWN IS FOR ILLUSTRATIVE PURPOSES AND MAY NOT DEPIC FINAL DESIGN DIMENSIONS OR SPECIFICATIONS. OTHER DETAILS WILL ALSO BE DEVELOPED FOR FINAL DESIGN.
6. REVEGETATION PLAN WILL CONSIST OF RIPARIAN AND FORESTED WETLAND PLANTINGS AS APPROPRIATE.



THE UPPER PART OF THE PROJECT IS CHARACTERIZED BY NONPOINT BANK EROSION AND INADEQUATE TRANSPORT OF SEDIMENT FROM UPSTREAM TO THIS POINT.



THE LOWER PORTION OF THE STREAMER INTO THE WETLAND AREA, A SHORT DISTANCE DOWNSTREAM OF THIS POINT IS WHERE THE CHANNEL FLOW WILL BE TRANSFERRED TO SHEET FLOW.



THIS VIEW SHOWS CROSS VANE CONSTRUCTED AT THE NORTHERN VIRGINIA STREAM RESTORATION BANK, MAUREEN REACH 1. THESE ARE SIMILAR TO WHAT WILL BE CONSTRUCTED AT THE DOWNSTREAM COLLECTION POINTS AND AT THE UPSTREAM END OF THE PROJECT AT THE OFFICE.

Wetland

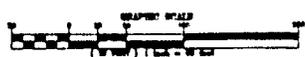
AEROSPACE CORP WESTFIELDS PARCEL 35
STREAM RESTORATION PROJECT PLAN



NO.	DATE	DESCRIPTION
1		
2		
3		
4		
5		

Design	Draw	Approved

CONCEPTUAL PLAN. NOT FOR CONSTRUCTION



Stream Restoration Success Criteria: The initial success criteria shall be:

(1) With respect to reforested riparian buffer areas:

- (a) Plant density of at least 400 living wood stems (including volunteers) per acre of trees and shrubs must be achieved by the end of the first growing season following planting and maintained through the end of the monitoring period or until canopy coverage is greater than 30%. And
- (b) Herbaceous plant coverage of at least 60% must be achieved by the end of the first growing season, and at least 80% each monitoring year thereafter.
- (c) Woody plant coverage (from live-stakes, tublings, container grown material, and volunteers) along stream banks shall achieve a density of at least 5 l.f./stem by the end of the first growing season and for each monitoring year thereafter.

(2) With respect to the stream and riparian system, the following elements of the restored stream reach shall be assessed using the stated criteria:

- (a) Dimension - The analysis of each permanent cross-section specified on the Stream Restoration Site Plan shall indicate that:
 - (i) The bankfull Cross-Sectional Area did not increase or decrease by an amount greater than 20% of the as-built cross-section.
- (b) Pattern - The analysis of the plan-view survey of field measurements shall indicate that:
 - (i) The Sinuosity of the stream (defined as the stream length along the thalweg divided by the valley length) did not increase or decrease by an amount greater than 0.2 of the as-built pattern.
- (c) Profile - The analysis of the longitudinal profile shall indicate that the slope of the longitudinal profile did not increase or decrease by an amount greater than 0.3% of the as-built slope.
- (d) Structure - The analysis of each in-stream structure shall indicate that:
 - (i) The angle of any rock vane, j-hook, or cross vane did not increase or decrease by an amount greater than 3 degrees from the as-built angle, and remains between 20 and 30 degrees from the tangent to the bankfull at the end of the outside vane arm.
 - (ii) The slope of any rock vane, j-hook, or cross vane did not increase or decrease by an amount greater than 2% from the as-built slope (i.e. if the design slope was 5%, then any slope from 3% to 7% would be acceptable) and remains between 2% and 7%.

Stream Restoration Monitoring: The monitoring period shall be no more than ten (10) years, unless deficiencies exist at the end of the 10th year, in which case the monitoring period shall be extended (see Section 3c). The Applicant shall perform all necessary work to monitor the restoration in order to demonstrate compliance with the Success Criteria. The Monitoring Program shall follow the guidelines established below:

(1) With respect to reforested riparian buffer areas:

- (a) Visual Description - Visual descriptions shall be provided with each monitoring report to Fairfax County. Visual descriptions shall be accomplished by the provision of ground level photographs, taken facing north, south, east, and west, from stations located adjacent to each vegetation plot and hydrology monitoring station (permanent markers shall be established to ensure that the same locations (and view directions) are monitored in each monitoring period).
- (b) Vegetation - Sample plots shall be located on a stratified random basis over areas of the site that are reforested riparian buffer areas in order to sample all habitat areas of buffer areas at locations adjacent to each photo location marker. A minimum of 3 plots/area shall be sampled.

Each plot shall be of a size no less than a 30 foot radius for woody plants and a 3 foot diameter for herbaceous plants. Alternative sampling methods may be submitted for DEQ review and approval. The vegetation data shall be collected in the July - November time period and shall include:

- (i) Dominant vegetation species identification;
- (ii) Coverage assessment;
- (iii) Number of woody plant stems (total and #/acm);
- (iv) Indicator Status.

(2) With respect to the stream and riparian system:

- (a) Woody plant coverage (from live stakes, tublings, container grown material, and volunteers) along stream banks shall be quantified by species and density (5 l.f./stem along the stream bank edge).
- (b) Exposure of bank pins (with locations specified on the Stream Restoration Site Plan) shall be measured to provide an assessment of bank erosion in the restored reach.
- (c) Snout chains (with locations specified on the Stream Restoration Site Plans) shall be assessed to provide data on sediment movement in the stream bed.
- (d) Each Stream Stabilization Structure shall be surveyed, photographed from a permanent monitoring post, or otherwise designated location, established in the first report, visually evaluated for stability, and

a narrative statement provided as to whether or not specific Success Criteria have been violated.

- (a) To assess channel stability Success Criteria related to cross-sections, four cross sections shall be provided (with permanent markers established the first time in locations specified in the Stream Restoration Site Plan) on a representative mix of riffes and pools at these same time periods.
 - (f) A surveyed profile of the stream along its thalweg provided as soon as practicable after completion, and in years 1, 3, 5 and 10 and compared to the original design to assess compliance with Success Criteria.
 - (g) Location of any riparian areas with excessive erosion that needs replanting or protection with rock or coir logs shall be identified.
 - (h) Within one week after any storm event that exceeds 3.2 inches in 24 hours or 2.0 inches in 2 hours (Fairfax County 2 year storm), the subject stream reach shall be visually inspected for damages. Any damage noted shall be immediately reported to Fairfax County in writing, with supporting photographs, and accompanied by a remediation plan. Photographs and narrative shall be utilized to summarize performance and remediation efforts in the next monitoring report, and shall also be submitted to Fairfax County immediately upon completion of restoration efforts.
- (3) Timing of Monitoring Activities: Monitoring activities shall occur during the growing season, and at least:
- (a) Prior to restoration activities, as soon as practicable after completion of restoration, and once during the 1st, 2nd, 3rd, 5th, 7th and 10th growing seasons following completion of grading (note that field surveys will be conducted in years 1, 3, 5 and 10);
 - (b) Monitoring of woody vegetation for the first year or any year following planting shall take place between August and November;
 - (c) If all Success Criteria have not been met in the 10th year, then a monitoring report (and any necessary corrective actions as noted in the Stream Restoration section's preamble) shall be required for each consecutive year until two annual sequential reports indicate that all criteria have been successfully satisfied (which is an indication that corrective actions were successful);
 - (d) A final monitoring report (typically prepared the 10th growing season following completion of grading).

Stream Restoration Reports: The Applicant shall submit reports to Fairfax County DPWES describing the conditions of the restoration and relating those conditions to the Success Criteria. Reports shall be submitted by November 30th of each monitoring year and shall contain all data and photos collected in the Monitoring Program, comparison of the data relevant to the Success Criteria with respect to the design plans and previous monitoring reports and as-builts. In the event that the stream restoration fails to meet the success criteria specified herein, the Applicant shall develop the necessary contingency plans and implement appropriate remedial actions until the success criteria are met.

Stream Restoration Maintenance: The stream restoration project shall be placed in a private drainage easement and shall be maintained by the Applicant in perpetuity. The Applicant shall perform all necessary work to maintain the Stream Restoration consistent with the Success Criteria. Corrective actions shall be undertaken to bring deficiencies up to the performance standards described herein, if necessary.

Wetland
AERINSPACE CORP WESTFIELD PARKWAY
STREAM RESTORATION CONSENT PLAN



REVISIONS	DATE		SCALE
	NO.	DATE	
1	5/2		
2	5/2		
3	5/2		
4	5/2		
5	5/2		
6	5/2		
7	5/2		
8	5/2		
9	5/2		
10	5/2		

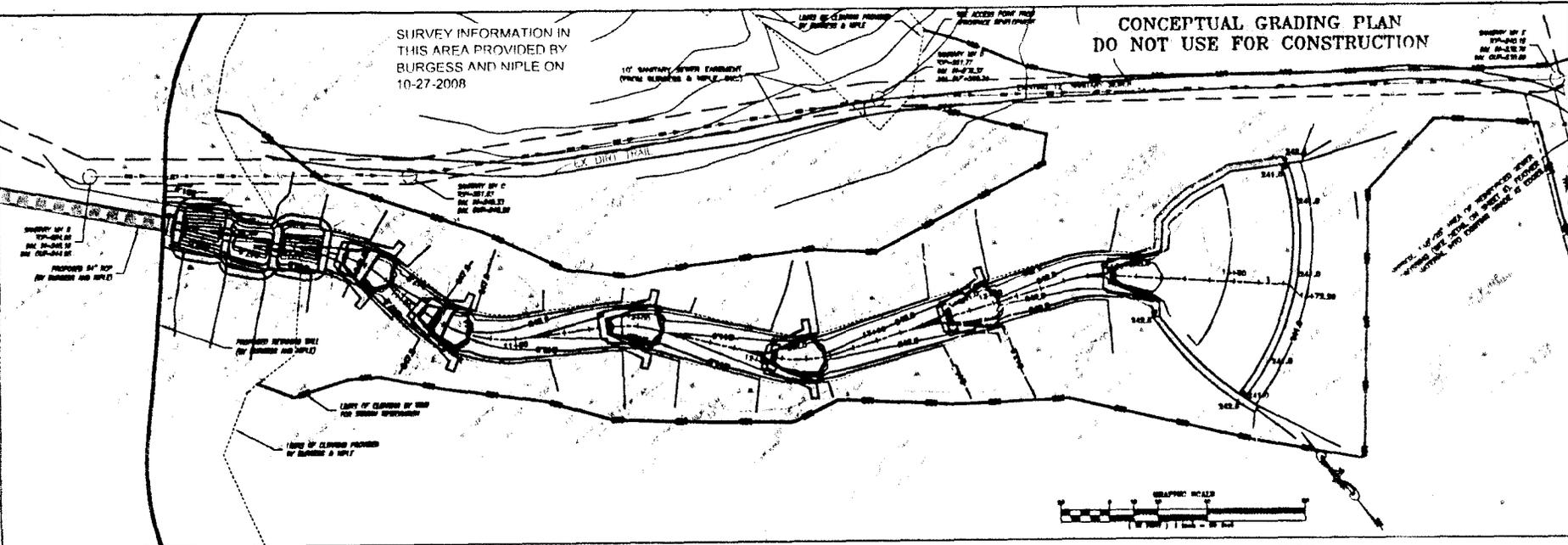
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 Boundary and Elevation: _____

Design	Check	Approval

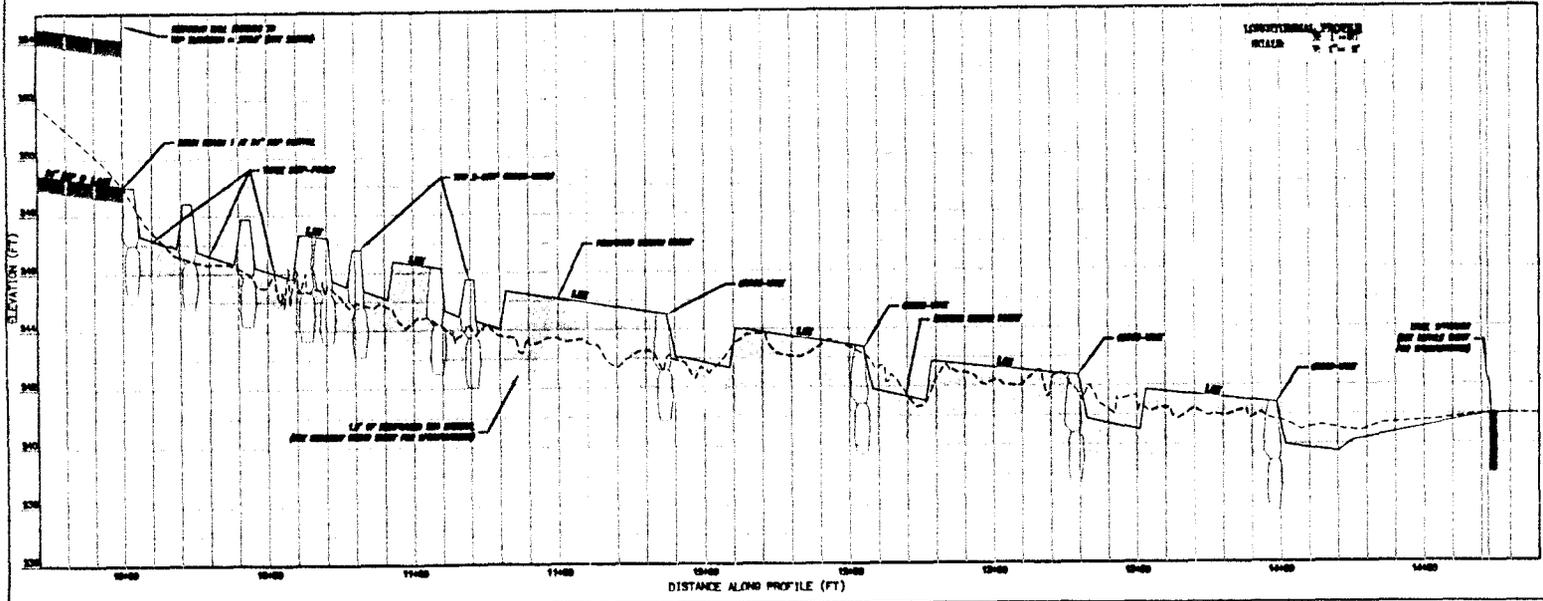
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**CONCEPTUAL GRADING PLAN
DO NOT USE FOR CONSTRUCTION**

SURVEY INFORMATION IN THIS AREA PROVIDED BY BURGESS AND NIPLE ON 10-27-2008



LONGITUDINAL PROFILE - REACH 1



GRADING LEGEND

- BURGESS AND NIPLE 7' CONTOUR
- BURGESS AND NIPLE 5' CONTOUR
- EXISTING CONTOURS (5' & 10')
- EXISTING INFRASTRUCTURE
- EXISTING FARMMENTS
- PROPOSED CONTOURS (5' & 10')
- PROPOSED STREAM CENTERLINE
- LINE OF CLEARING
- PROPOSED BANQUET CHANNEL LINTE
- PROPOSED GROSS VANE
- PROPOSED STEP POOL

PROFILE LEGEND

- EXISTING STREAM INVERT PROJECTED TO PROPOSED CENTERLINE
- PROPOSED STREAM INVERT ALONG PROPOSED CENTERLINE
- STRUCTURE ROCKS
- REINFORCED BED (SEE TYPICAL DETAILS SHEET FOR SPECIFICATIONS)

Wetland
AEROSPACE CORP WESTFIELD PARCEL 15
STREAM RESTORATION CONCEPT PLAN



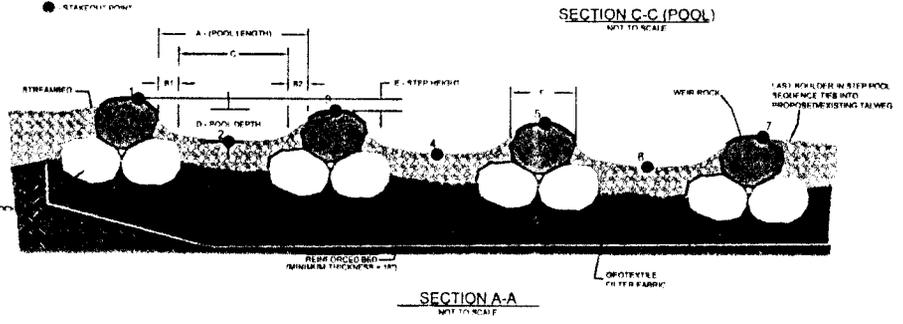
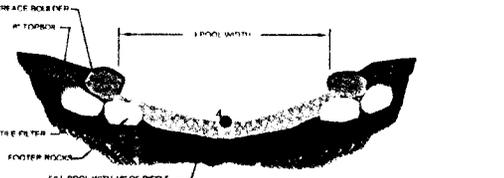
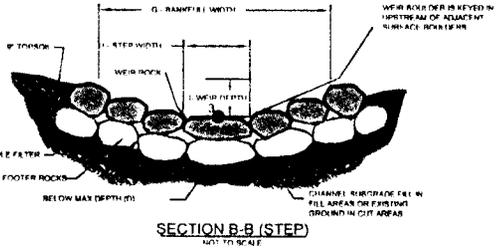
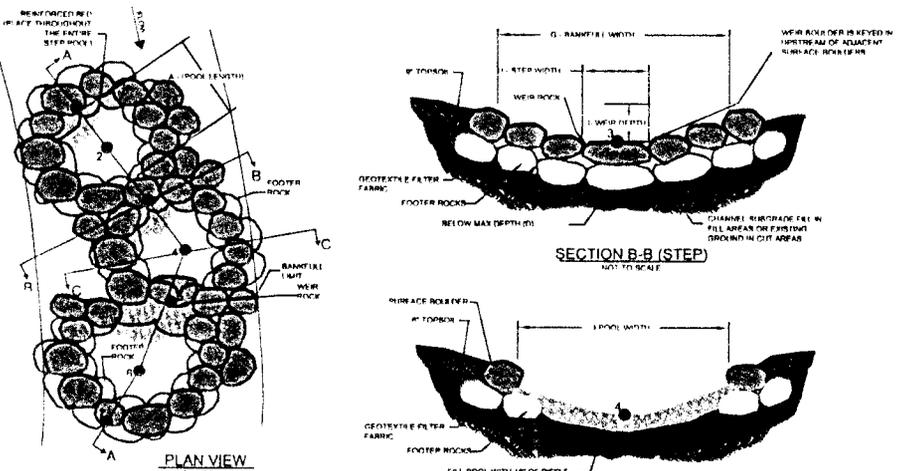
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No.	Description

Horizontal Datum		
Vertical Datum		
Boundary and Tree Status		
Design	Check	Approved

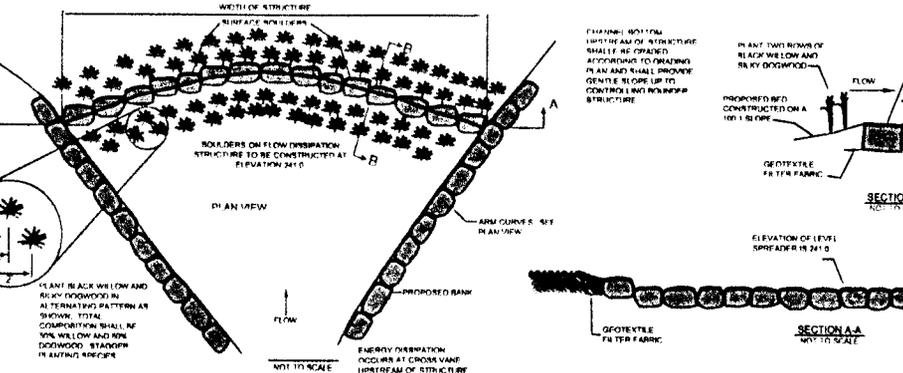
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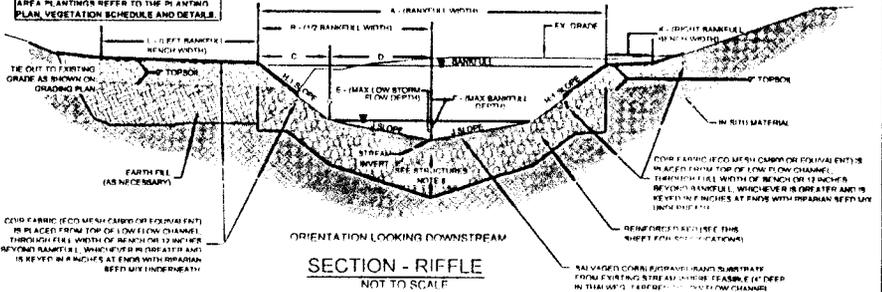


STEP POOL
NOT TO SCALE



LEVEL SPREADER DETAIL
NOT TO SCALE

NOTE FOR STEPS AND LEVEL SPREADER AREA PLANTING: REFER TO THE PLANTING PLAN VEGETATION SCHEDULE AND DETAILS.



SEQUENCE OF CONSTRUCTION

1. PRIOR TO THE START OF ANY EARTH DISTURBING ACTIVITY THE CONTRACTOR SHALL NOTIFY THE FIELD ENGINEER IN ACCORDANCE WITH THE APPROVED PERMIT. IN ADDITION, AN ON-SITE PRE-CONSTRUCTION MEETING SHALL BE HELD TO FAMILIARIZE ALL AFFECTED FIELD ENGINEERS, CONTRACTOR, COUNTY STAFF, OWNER, AND PROJECT MANAGERS FULLY UNDERSTAND THE CONSTRUCTION REQUIREMENTS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING UTILITY AT 1 AND 800 700 FOR THE LOCATION OF ALL PUBLIC AND PRIVATE UTILITY LINES, PIPES, CABLES, AND ASSOCIATED FEATURES PRIOR TO ANY CONSTRUCTION WORK. ALL UTILITIES SHALL BE CLEARLY IDENTIFIED PRIOR TO CONSTRUCTION BY CONTRACTOR.
3. PRIOR TO ANY EARTH DISTURBING ACTIVITIES ALL NECESSARY EROSION AND SEDIMENT CONTROL MEASURES AND DEVICES SHALL BE INSTALLED AS SPECIFIED ON THE PROPOSED SEDIMENT CONTROL PLAN.
4. STAKE OUT THE NEW STREAM ALIGNMENT AS SHOWN ON THE GEOMETRY PLAN (PC AND PT POINTS SHALL BE STAKED ALONG THE CENTERLINE AND AT 25 FOOT OFFSETS, IDENTIFIED BY CORRESPONDING CENTERLINE STATION ON EACH SIDE OF THE PROPOSED CHANNEL. THE CENTER OF EACH CURVE SHALL BE STAKED AND MARKED WITH THE CORRESPONDING RADIUS OF CURVATURE. VERTICAL CONTROL SHALL BE CLEARLY MARKED AT SEVERAL LOCATIONS ALONG THE PROPOSED CHANNEL.
5. CONSTRUCTION SHALL PROCEED FROM UPSTREAM TO DOWNSTREAM, UNLESS AN ALTERNATIVE SEQUENCE IS APPROVED BY THE FIELD ENGINEER.
6. NO WORK SHALL BE STARTED THAT CANNOT BE COMPLETED AND STABILIZED IN ONE DAY.
7. EXCAVATE STREAM CHANNEL TO THE SURGRADE.
8. PLACE REINFORCED SUBSTRATE MIXTURE IN THE CHANNEL BOTTOM (SEE THIS SHEET FOR MIXTURE SPECIFICATIONS). PRIOR TO PLACING THE ROCK IN THE CHANNEL THE CONTRACTOR SHALL MIX ALL SUBSTRATE COMPONENTS TOGETHER TO OBTAIN A UNIFORM MIX IS PLACED THROUGHOUT THE CHANNEL.
9. GRADE THE REMAINING PORTION OF THE CHANNEL AS SHOWN ON THE PLAN (UNLESS SHOWN OTHERWISE, THE OBTAIN SLOPE SHALL NOT EXCEED 1:1).
10. UPON COMPLETION OF WORK, ALL EAS MEASURES ARE TO REMAIN IN PLACE UNTIL FINAL SPT STABILIZATION IS ACHIEVED, WITH THE EXISTENCE OF THE SANDBAG DIKES AND THE PLANT AROUND DIVERSION.

REINFORCED BED¹ MIXTURE SPECIFICATIONS

THE REINFORCED BED MIXTURE SPECIFIED BELOW MUST BE APPROVED BY THE PROJECT ENGINEER PRIOR TO BEING IN ACTION BY THE CONTRACTOR.

MATERIAL	SIZE (D ₅₀)	BATCH MIX RATIO	PERCENTAGE
Rock ²	10.0 in (254 mm)	1 SICKETS	53.00%
FINE GRAVEL	2.0 in (51 mm)	2 SICKETS	28.00%
COARSE SAND	0.075 in (1.9 mm)	1.5 SICKETS	7.8-12.5%
TOPSOIL	LEAST 0.075 in (1.9 mm) SIEVE	0.5 SICKETS	5.00%

1. THE REINFORCED BED SHALL BE A MINIMUM OF 18" IN DEPTH. PORTIONS OF THE STREAM WITH CHANNEL SLOPES GREATER THAN 2:1 SHALL HAVE A SUBSTRATE REINFORCED BED MATERIAL THICKNESS OF 24" OF BED MATERIAL (DO NOT EXCEED INDIVIDUAL PROFILE FOR LOCATIONS AND PROFILES).
2. IF ROCK PORTION OF THE MIXTURE SHALL CONSIST OF CRUSHED STONE (CLASS A TOPSOIL), THE VOLUMES FILLED WITH A MIXTURE OF SAND, GRAVEL, AND TOPSOIL, THE ANGULARITY OF THE CRUSHED ROCK, ALONG WITH THE FILLING OF THE VOLUMES, WILL RESULT IN A VERY RESISTANT, ARMORED SUBSTRATE THAT WILL BE CAPABLE OF WITHSTANDING MUCH GREATER SHEAR STRESS THAN THE COMPUTATION OF THE REQUIRED D₅₀ WOULD SUGGEST. PROVED MIXTURES (WHITE, TAN, YELLOW, OR BROWN) WITH THE SPECIFIED D₅₀ SHALL BE OF AN ACCEPTABLE ALTERNATE ALLONG AS IT IS WELL GRADED IN SIZE DISTRIBUTION (PER ASTM) TO PROVIDE THE ARMOR METHOD. SUBJECT TO ENGINEER APPROVAL.
3. SAND (FINE GRAVEL) MAY INCLUDE UP TO 5% 25, 40, 60, 80, AND UP TO 20% COMPLETE (UP TO 30% GRAVEL) SIBT MIXTURES (WHITE, TAN, YELLOW, OR BROWN).
4. THE SAND PORTION OF THE MIXTURE SHALL CONSIST OF A WELL SORTED SAND (APPROXIMATELY 1.0 MILLIMETERS TO 2.0 MILLIMETERS IN SIZE, SUBJECT TO ENGINEER APPROVAL). (E-WASHED CONCRETE SAND IS NOT REQUIRED). SAND MUST BE WHITE, TAN, YELLOW, OR BROWN.

SUBSTRATE SIZING CALCULATION FOR THE REINFORCED BED

WEIR STRESS

$$W = \frac{1}{2} \rho g H^3$$

WHERE:

- W = SPECIFIC WEIGHT OF WATER (LBS/FT³)
- H = MAXIMUM RIFFLE DEPTH (FT)
- ρ = CHANNEL SLOPE (FT/FT)

THEREFORE:

WEIR STRESS (SI) = 1.40 (89.97) = 125.96

SUBSTRATE PARTICLE SIZE

$$D_{50} = 1.00 (0.42)$$

WHERE:

$$D_{50} = \frac{W}{\rho g}$$

THEREFORE:

REACH 1	REACH 2	REACH 3
4.7 in	4.8 in	2.8 in

THE VALUES OF D₅₀ SHOWN IN THE TABLE ABOVE ARE THE MINIMUM PARTICLE SIZE TO RESIST INERTIAL MOTION AT BANKPILE SLOPES FOR EACH REACH AND ARE NOT DESIGN VALUES. THE REINFORCED BED IS DESIGNED FOR THE MAXIMUM SHEAR STRESS COMPUTED FOR THE DEEPEST PORTION OF THE CHANNEL IN THE DEEPEST BANKPILE. ELEVATION IN ORDER TO PROVIDE A FACTOR OF SAFETY IN SHEAR STRESS IS TYPICALLY COMPUTED USING THE MEAN RIFFLE DEPTH, WHICH IS LESS THAN MAXIMUM DEPTH. THE SUBSTRATE IS THEN DESIGNED TO ARMOR THE ENTIRE CHANNEL BOTTOM REPRESENTING A SIGNIFICANT FACTOR OF SAFETY. IN ADDITION, SHEAR STRESS COMPUTATIONS GENERALLY REPRESENT THE REQUIRED FORCE TO INITIATE MOVEMENT OF LOOSE, NON-ARMORED PARTICLES. THE SUBSTRATE IN THE REINFORCED AREAS WILL BE CONSTRUCTED USING CRUSHED STONE (CLASS A TOPSOIL) SAND AND FINE GRAVEL (MINIMUM 1.0 MILLIMETER) EXCEEDING THESE CALCULATED REQUIREMENTS) WITH THE VOLUMES FILLED WITH A SAND, GRAVEL, TOPSOIL MIXTURE WITH A D₅₀ OF 10.0 INCHES. THE ANGULARITY OF THE CRUSHED ROCK, ALONG WITH THE FILLING OF THE VOLUMES, WILL RESULT IN A VERY RESISTANT, ARMORED SUBSTRATE THAT WILL BE CAPABLE OF WITHSTANDING MUCH GREATER SHEAR STRESS THAN THE COMPUTATION OF THE REFORMED D₅₀ WOULD SUGGEST.

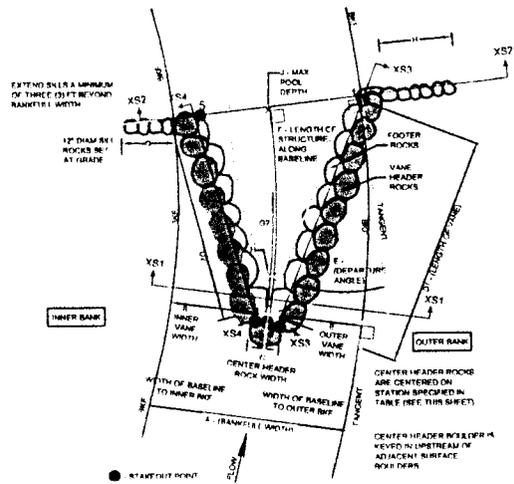
REVISIONS
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REVISIONS	Description	Date	By	Check	Approved
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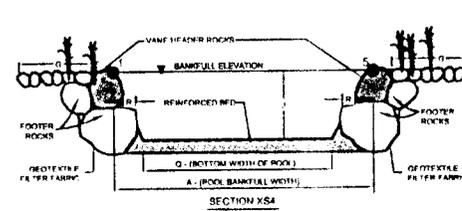
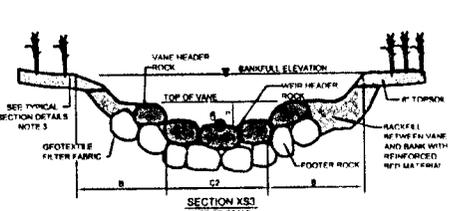
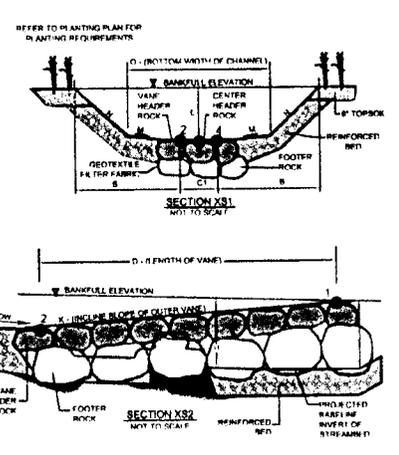
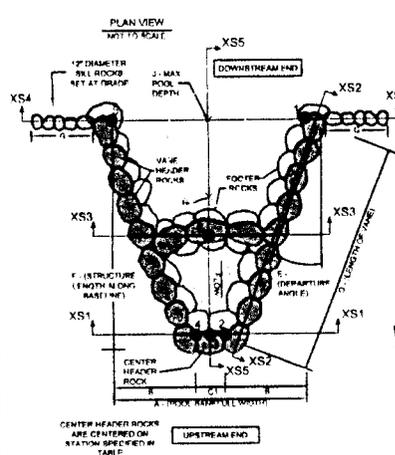
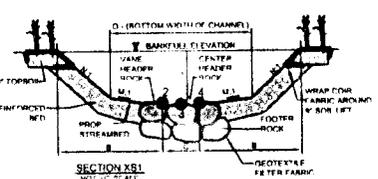
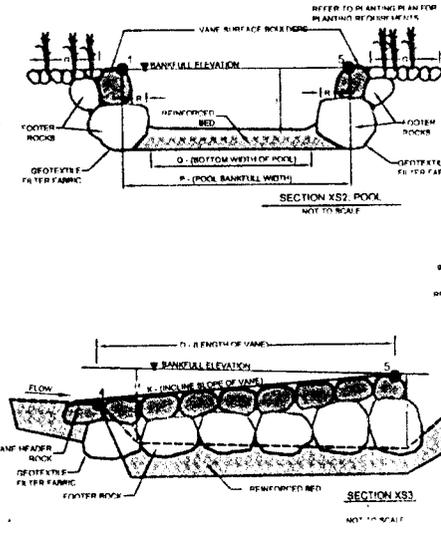
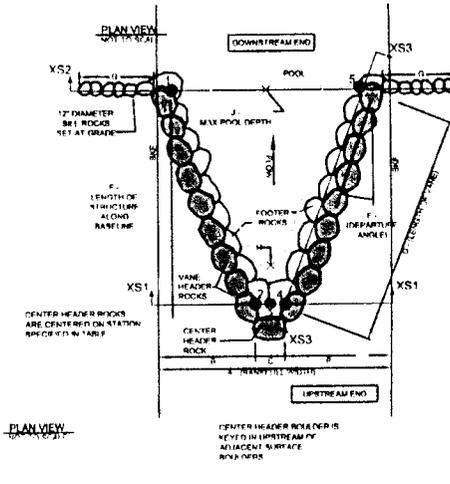
MEANDER CROSS VANE

NOT TO SCALE



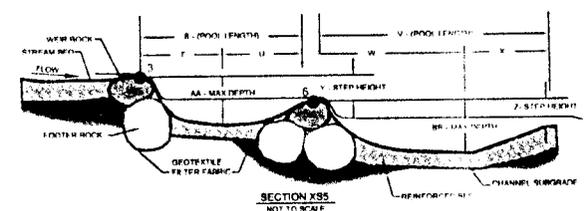
STRAIGHT CROSS VANE

NOT TO SCALE



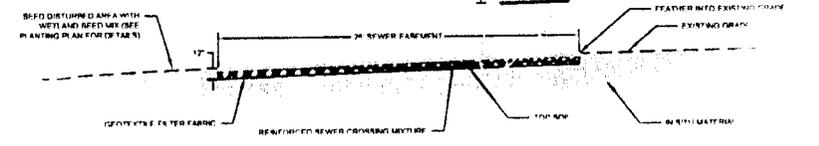
2-STEP CROSS VANE

NOT TO SCALE



REINFORCED SEWER CROSSING

NOT TO SCALE



"REINFORCED SEWER CROSSING" MIXTURE SPECIFICATIONS

MATERIAL	SIZE (D ₅₀)	BATCH MIX RATIO	PERCENTAGE
AGGREGATE	0.18 - 1.0 in (4.75 - 25 mm)	2 BUCKETS	66.6%
COARSE SAND	0.04 - 0.08 in (1 - 2 mm)	0.15 BUCKETS	20.2%
TOPSOIL	1.5 mm OR LESS (1/16 IN) MAX. PARTICLE SIZE	0.5 BUCKETS	12.5 - 12.5%

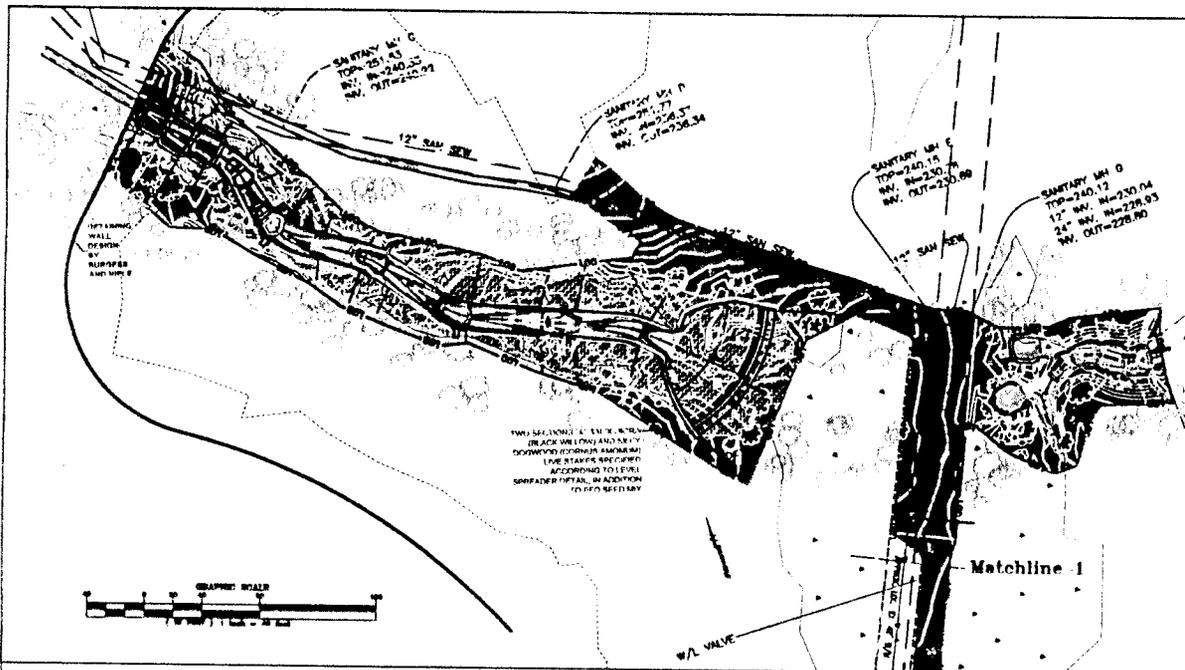
1. THE REINFORCED SEWER CROSSING SHALL BE 8" IN DEPTH.
2. SAND DOES NOT NEED TO BE CLEAN SAND.

CONCEPTUAL PLAN. NOT FOR CONSTRUCTION

VERIPAC (TOP) WESTER HILLS PARKS
 10000 S. VERIPAC AVENUE, SUITE 100
 WESTER HILLS, MO 64116
 TEL: (816) 234-1100 FAX: (816) 234-1101
 WWW.VERIPAC.COM

REVISIONS
 No. Description Date Drawn By
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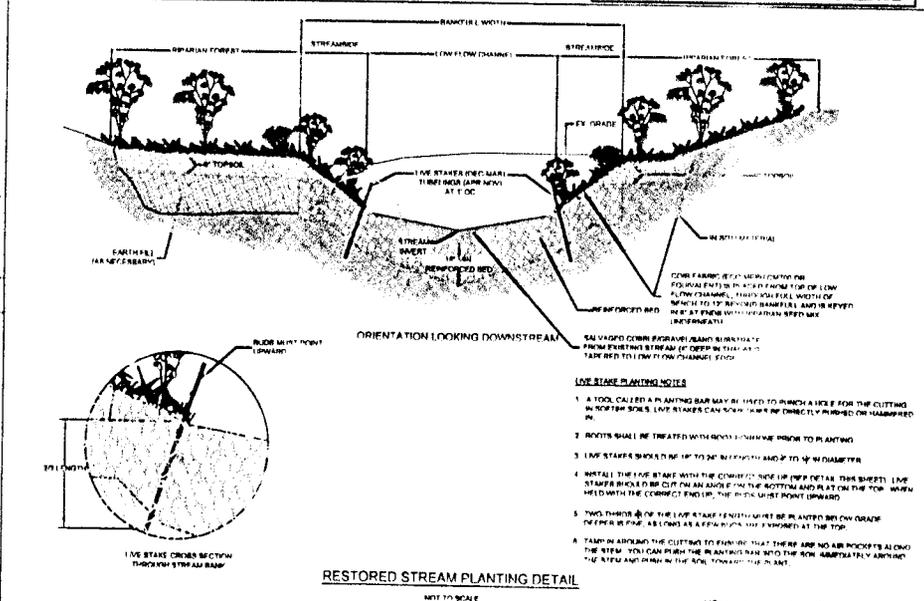
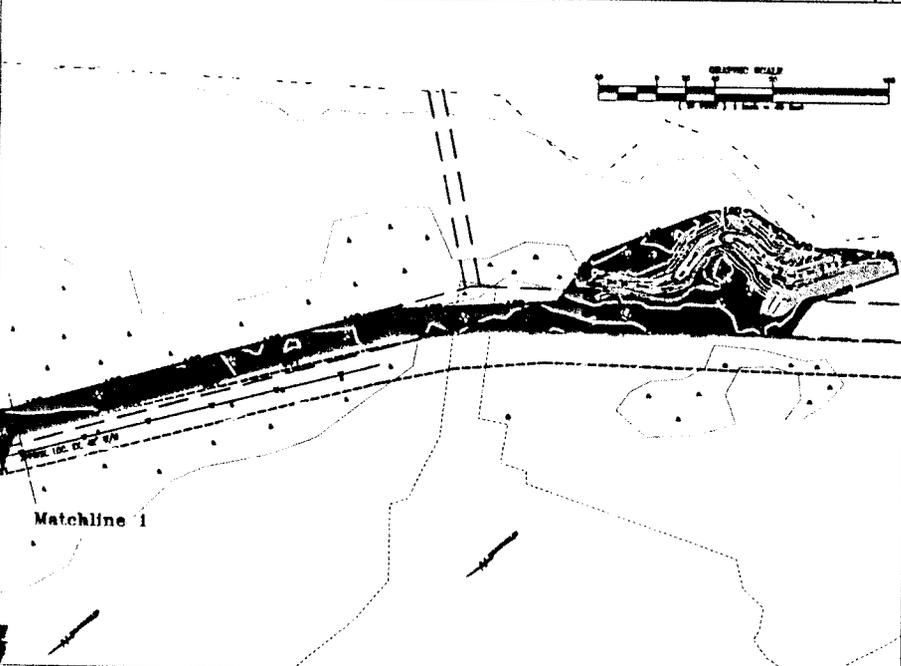
Horizontal Datum
 Vertical Datum
 Boundary and Easement
 Design Date
 Design Scale
 Project File Name



PLANTING AREAS	SYMBOL
STREAMSIDE* 0.261 SF = 0.14 AC /Alder, Salsburg, Gray Dogwood, Southern Amaranth, etc./	A, B & C
RIPARIAN FOREST* 97.642 SF = 0.22 AC /Variety of Oak, Hickory, Magnolia, White Dogwood, Gum, Hardwood, Sycamore, etc. species/	D, E & F
RIPARIAN SEED MIX ONLY 14.968 SF = 0.34 AC /Based on complete grasses, forbs, shrubs and trees/	G & H
FORESTED WETLAND 14.78 SF = 0.31 AC /Red and White, Green Ash, White, Black, Red, Black, White, Blue, Yellow, Green, Alder, American, Nuttallian, Hairy, Salsburg, etc./	I
WETLAND SEED MIX ONLY 4.766 SF = 0.11 AC /Based on complete grasses, sedges, forbs, rushes, shrubs and trees/	J

* RIPARIAN SEED MIX SHALL BE DISTRIBUTED EVENLY THROUGHOUT ALL DISTURBED AREAS IN THE AMOUNT SPECIFIED ON THE VEGETATION SCHEDULE.

LEGEND	
	EXISTING CONCRETE (SP)
	PROPOSED CONCRETE (SP)
	EXISTING CURB/RAILROAD
	EXISTING UTILITY LINE/RAILROAD
	PROPOSED STREAM CHANNEL/RAILROAD
	PROPOSED LIMITS OF CLEARING
	EXISTING / PROPOSED LIMITS OF CLEARING



REVISIONS	
1	Design
2	Check
3	Approved

Vertical Datum
Boundary and Topography
Design
Check
Approved
Date
Scale

Design Narrative

Background

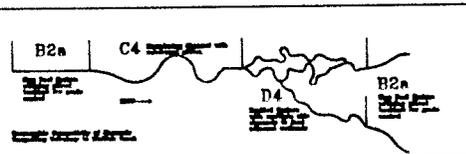
The stream restoration design philosophy for the unnamed tributary of Flatlick Branch is that of Natural Channel Design (NCD). As the name implies, the goal of NCD is to restore a degraded stream by mimicking, as much as possible, the characteristics of a stable, "natural" system. Through the use of geomorphic techniques, NCD seeks to achieve long-term stability given current as well as future flow rates.

In developing restoration design protocols applicable to the urban stream, development of a geomorphologic basis for these designs was necessary. Though regional curves that predict bankfull channels as a function of drainage area have been published, the data utilized to produce curves for the eastern United States do not account for altered hydrology in urban systems. Given the lack of available regional data for most urban systems, there was considerable uncertainty as to the applicability of published regional curve data to the unnamed tributary to Flatlick Branch.

To develop a design on similar stream restoration projects in Fairfax County that will result in environmentally sound, aesthetically pleasing streams with long-term stability, WSS undertook an analysis that included a review of prior studies and implementation of hydrologic modeling software (Riparian and Hspire) for a proposed development. Information from both of these sources was then considered in order to develop a design that incorporates certain, practicable elements of the NCD philosophy, while also taking into account significant constraints imposed by the complex urban nature of the project watershed. These constraints include limitations on the location and size of the restored channels, which, in turn, determine the type and size of the channel geomorphic features that may be used. Details of the development of the design are discussed below, prefaced by a discussion of how restoration employing elements of NCD are in compliance with state law.

Regulatory Compliance

CD is the preferred design methodology for the Virginia Department of Environmental Quality (DEQ) and the U.S. Army Corps of Engineers (COE). The 2005 state legislature enacted state law in Virginia that any stream restoration project in accordance with NCD principles is exempt from the permit requirements of Sections 15.1-10.10 of Code of Virginia, § 10.1-1400 and 10.1-1401, as well as any related local requirements. Additionally, on March 16, 2007, DEQ published its proposed Section 401 Water Quality Certification Conditions for Nationwide Nonpoint (NMP) #27 (Stream and Wetland Restoration Activities) requiring that stream stream restoration be done in accordance with NCD methodology and compared to flow rates derived from the traditional modeling techniques.



One of the central tenets of NCD is the concept of multiple stream types and the unique properties associated with various types of streams. The unnamed tributary of Flatlick Branch is composed of three different stream types, each with a specific function related to hydrologic and/or ecological function. At the upstream end of the project, a B2 stream (Shoal Pools with a small floodplain) is used to decrease the channel bed elevation over a relatively short distance. This is accomplished by using boulders placed individually at specific elevations to provide grade control. The step pools transition into a C stream type, which provides a variety of habitat as well as connectivity to the floodplain and wetland areas adjacent to the channel. At the end of the C stream is a cross vane that transitions into a level streamer. The level streamer then flows into a level D stream that runs through a wetland area. D stream types are unique hybrid systems that are flat, wide, and often very shallow; these properties slow down the flow of water through the system and, in this case, lead wetland areas that not only diversify habitat, but provide abundant vegetation to slow down flow. If the D stream type was to be converted into a single-thread channel by ditching, which would have the effect of not only concentrating flow but also deepening the channel, the wetland would likely be dewatered, and the downstream and of the project, as the stream flow is once again used to form the grade of the stream bed over a relatively short distance.

Published Data

In the process of determining a design protocol, a review of work performed by others was conducted. This includes a review and consideration of published regional curves as well as reports on urbanization and how it can result in downstream channel alteration. Specific information reviewed as part of this analysis is outlined in the following.

North Carolina Piedmont Regional Curve Data

This data includes bankfull hydraulic geometry relationships for both "urban" and "rural" streams. The streams defined as "urban" averaged 43% impervious area and those classified as "rural" contained no more than 20%. Impervious cover of up to 20% represents a wide range of land use conditions. For instance, The Chesapeake Bay Local Assistance Department (CBALAD) defines a 20% impervious cover to be 0.5 acre residential lots (houses per acre), which would be considered a rural provision for the North Carolina Piedmont Regional Curve. Land use in the project watershed also the ratio of rural consists of an average impervious cover of 66%. This is much higher than the 43% impervious area that comprises the "urban" portion of the Piedmont Regional Curve Data. The effect of this range of imperviousness is related in the Discussion section below.

Maryland Piedmont Regional Curve Data

The U.S. Fish and Wildlife Service published a report on Maryland Piedmont streams that presents regional curve information. Given that the project watershed is located in close proximity to the study area and in the same physiographic province (pediment), the MD data is considered to be the most applicable to the unnamed tributary in Flatlick Branch. Note the average impervious area of the contributing watersheds in this study is approximately 6% (and this is classified as "rural"). This is much lower than the value of imperviousness located within the project watershed.

Eastern United States Regional Curve Data

Regional curve information developed from streams in the eastern portion of the United States is presented in Water in Environmental Planning by Dunne and Leopold (1978).

Dynamics of Urban Stream Channel Entrenchment

The Center for Watershed Protection produced a report on the impact of watershed development on channel entrenchment. From this study, it is estimated that ultimate channel entrenchment can take 50-75 yrs from the time the watershed is fully developed. The project watershed is still under development, suggesting the channels have not yet reached their ultimate size (this is supported by the current condition of the channels). Based on an average impervious area in the project watershed up to the pipe outlet of about 66% and assuming no retention of stormwater in the watershed, the resulting entrenchment factor will be approximately 4.7.

Hydrologic/Hydraulic Modeling

A hydraulic model of the project watershed was developed by Ripress and Nide to assess stormwater outflow from the project watershed based on the existing flow conditions. The post-development watershed conditions used by Ripress and Nide (including off-site flows from other site areas) were used for the analysis. Flow rates developed from both the NRCS 2 and 10 yr Type II storm events were compared in results obtained from application of the enlargement factor in the MD regional curve data.

Discussion

From the analysis described above, it is clear that there are two distinct methodologies (regional curves and hydrologic modeling) available to size the channel. When considered in relation to one another along with good engineering judgment, a reasonable design methodology has been developed for use in this project. A discussion on each contributing component is provided below, along with the resulting design protocol employed for the unnamed tributary in Flatlick Branch.

Regional Curves

It is evident that use of the regional curves developed for rural MD streams would result in channels that are significantly undersized. The urban nature of the project watershed (for which contributing impervious area averages 66%) results in a significantly higher flow rate than the comparably sized watersheds represented by the curves.

In regards to the effects of urbanization, the published regional curves lack a consistent story. Rural curves (MD and NC only) do not data representing the character of the "Eastern" curve is available to evaluate the urban NC curve. Since the NC rural curve represents a wide range of development conditions with up to 20% imperviousness in watersheds, it is not surprising that it plots above the MD rural curve with an impervious area of 6%. Because of the uncertainty in the conditions of the watersheds used to develop the NC rural curve going with the significant difference between the average impervious area of the regional curve data and the project watershed, the NC regional curves are not an appropriate method to size the restored channel. The rural MD data has been determined, however, to be representative of VA development streams. Thus, comparison with reference stream data collected by WSS. Thus, the published rural MD data is applicable, yet requires adjustment in account for the effects of urbanization (i.e. increased flow rates).

Though application of the enlargement factors to the cross-sectional areas represented by the MD rural curve for each design reach in the project watershed, a modified regional curve was developed that is specific to the percentage of imperviousness within the project watershed. The cross-sectional area calculated using the enlargement factor was converted to a flowrate using the bankfull discharge relationships developed as part of the published MD data. This data was compared to the hydrologic modeling data to develop a set of design flowrates for the unnamed tributary in Flatlick Branch.

Hydrologic Modeling

The 2-yr modeled flow rates plot below the modified MD curve data. As impervious area increases, stormflow hydrographs have larger peaks for shorter durations. To account for the increase in peak flows that occurs with the increase in imperviousness due to the presence of stormwater management (SWM) facilities have been included on the site and are development, Stormwater Management (SWM) facilities have been included on the site and are stormwater treatment of the site. These SWMs include underground storage, rain gardens, green roofs and others which are designed to reduce peak flows leaving the site. These SWM facilities are included in the hydrologic modeling analysis but are unable to be included in the regional curve analysis.

Enlargement Factor

Studies have shown and experience confirms that channels entrench in response to increased runoff volumes, peak rates, and increased frequencies resulting from development of the watershed. Enlargement factors provide a measure of the potential enlargement factor based on impervious area. The enlargement factor was applied to the MD rural curve in order to replicate the NC urban curve. The NC urban curve was developed from watersheds with 43% impervious area, which requires an enlargement factor of 2.9. This factor of 4.75 was added to the MD rural curve, which compares well with the NC urban curve and establishes the validity of using the enlargement factor to account for differences in impervious area between the MD rural curve and the project watershed.

Design Protocol

Ultimate Channel Size

The ultimate size of the restored channel in the project watershed is determined by use of the hydrologic model data for the 2-yr storm provided by Ripress and Nide. Although the MD regional curve with enlargement factor is used in other urbanization restrictions completed by WSS, none of these projects included an impervious area or as many SWM facilities as are included in the project watershed. There is also a large difference between the impervious area in the upper, urbanized portion of the watershed and the lower, forested portion of the watershed. This dichotomy of land use causes flowrates to decrease moving downstream in the project watershed, according to the regional curve analysis.

In addition, the regional curve analysis does not give any consideration to stormwater management facilities, which represents a worst case scenario for the determination of flows in a developing watershed. This type of conservative approach is often desired in order to assure stability of the restored reach under changing flow conditions. However, over-sizing the unnamed tributary to Flatlick Branch could result in loss of wetland function at the downstream portion of the watershed.

Because of the uncertainty in the application of the regional curve analysis in the project along with the desire to keep the unnamed tributary hydrologically connected to the surrounding wetland area, the 2-yr hydrologic model value of 113 cfs will be used as the target flowrate used to design the bankfull channel design process, a procedure that is also desired in order to assure stability of the restored reach under changing flow conditions. However, over-sizing the unnamed tributary to Flatlick Branch could result in loss of wetland function at the downstream portion of the watershed.

Velocity over Level Spreader

To maintain stability of the untruncated wetland area, a level spreader was designed to keep velocities below the maximum allowable velocity to prevent soil erosion for the Rowland Stream soil type on the stream valley during the 2-yr design discharge of 113 cfs. Although the maximum allowable velocity for all loam soils is 3.0 fpm (obtained from Table 5.7.2 in the Virginia Erosion Prevention Design Handbook, as referenced in Section 4.1005 of the Fairfax County Public

Facilities Manual), a conservative velocity of 2.5 fpm (for sandy loam soils) was used for this analysis. According to the Fairfax County Soil Survey, sandy loam textures are common near creek banks and sandbars with Rowland Stream soils. Because sandy loam textures could be present on site, 2.5 fpm is used as the maximum permissible velocity. Velocity over the level spreader was calculated using continuity with Manning's equation. It is assumed that the full length of the level spreader is utilized for the cross-sectional area. Due to the large length of the level spreader relative to the depth, the cross-section is approximated as rectangular. Although it is expected that the wetland area will be heavily vegetated, which will slow down flow, a Manning's n of 0.035 (a typical value for unvegetated channels) is used as a conservative velocity approach. Sample calculations are shown below.

Equations for Manning's n, velocity, and discharge calculations.



The depth of flow, h, is calculated from continuity and Manning's to be 0.57 ft. The depth results in a velocity of 2.09 fpm, which is below the design permissible velocity of 2.5 fpm. In addition, the permissible velocity is for unlined earth channels. In this case, flow over the level spreader enters a densely vegetated wetland area, which provides flow resistance (reducing the velocity) and reinforcement of the soils, so the actual velocity is expected to be lower than the 2.09 fpm computed here.

Wingwalls, which have a top elevation of 1.5 ft above the level spreader, will be constructed to confine the flow to the level spreader area. The velocity analysis above provides a conservative value of velocity but most likely underestimates flow depth. To ensure the wingwalls will not be overtopped, a second continuity analysis was performed that uses a Manning's number of 0.1, which is a typical value for flow through vegetation. Sample calculations for this analysis are shown below.

Equations for Manning's n, velocity, and discharge calculations using n=0.1.

The higher Manning's value results in a water depth of 1.00 ft which is less than the 1.5 ft difference between the top elevation of the wingwalls and the elevation of the level spreader. Based on this analysis, velocities are below the permissible velocity for the given soil and meet the design flow do not top the wingwalls. The densely vegetated wetland area along the profile of the level spreader and the low velocity combine to create a stable system in line with the objective of preserving the wetland in the lower portion of the project while still conveying the design discharge.

Channel Substrate and Sediment Transport

In a stream system where there is an ample supply of sediment, the restored reach must be designed to provide adequate sediment transport. If the densely vegetated wetland area along the profile of the channel and can result in reduction and erosion of a new channel. In the project watershed, however, the vast majority of channel sediments are supplied through incision of the channel bed and subsequent erosion of the channel banks. The urban nature of the contributing watershed is such that very little sediment is contributed through overland runoff. The sediments that are supplied are also very small. Thus, providing adequate sediment transport is not a concern in the project watershed. In fact, some stabilization of the bed and banks will drastically reduce the available in-stream sediment supply, providing mobilization of the substrate material is necessary to ensure site restoration is available.

Therefore, it will be necessary to provide a minimum bed thickness at the upper portion of the unnamed tributary in Flatlick Branch to prevent the entrainment of sediment that will eventually be deposited in the wetland area located in the lower portion of the project watershed.

Sizing of the bed material is determined through analysis of the shear stresses the channel lining will experience, based on the flow depth and channel slope in each reach.

Equations for shear stress, velocity, and substrate size calculations.

Since the substrate material is sized for the maximum shear stress experienced in the deepest portion of the channel (at the distal end of the bankfull elevation in order to provide a larger factor of safety), shear stress is typically minimized using the mean flow depth. This computed substrate size is then used to assess the entire channel bottom, reorienting a significant factor of safety. In addition, shear stress computations generally represent the required force to initiate movement of loose, non-indurated particles. The substrate in the unnamed tributary in Flatlick Branch will be constructed using crushed stone (granitic and or class A) with the voids filled with a sand, gravel and loam mixture. The angularity of the crushed rock, along with the filling of the voids, will result in a very resistant armored substrate that will be capable of withstanding much greater shear stress than the computation of the required D_90 would suggest. Specific recommendations to determine the substrate size for this reach are presented in this plan set.

Overbank flooding is also considered, especially in relation to flow through the wetland area in the lower portion of the watershed. Overbank design velocities are limited to the specified allowable velocity contained in the Virginia Erosion and Sediment Control Handbook for "sandy loam (nonindurated)". This allowable velocity, 2.5 fpm, is used as a basis for sizing the pipe leading into the wetland system in the lower portion of the watershed. Coupled with the fact that the significant benefit provided by the wetland vegetation was not considered, the wetland areas will remain stable.

Reference Data

Layout of the channel pattern is governed by several factors, including the pattern of the existing stream channel, site constraints (most utilities, paths, etc.), and reference reach information. Whenever site constraints do not give a limiting, parameters of the stream pattern suggested by WSS-related reference data will be utilized.

Future Watershed Conditions

Hydrologic modeling in the project watershed considered post-development conditions, which is considered a fully developed condition. Although post-development conditions include an increase in impervious area, Best Management Practices are also indicated which reduce peak flow rates to a degree, particularly in smaller storms. In the event a redevelopment project does propose to increase the amount of impervious area in the watershed, state and county regulations are in place to require that stormwater management be provided to offset any increases in stormwater runoff. In addition, adequate runoff regulations require that the downstream receiving water be able to withstand any increase in runoff rate or volume. Thus, any redevelopment that proposes to increase stormwater runoff from the site will be required to abide by these regulations, although it is unlikely any redevelopment within the watershed will increase the amount of impervious area.

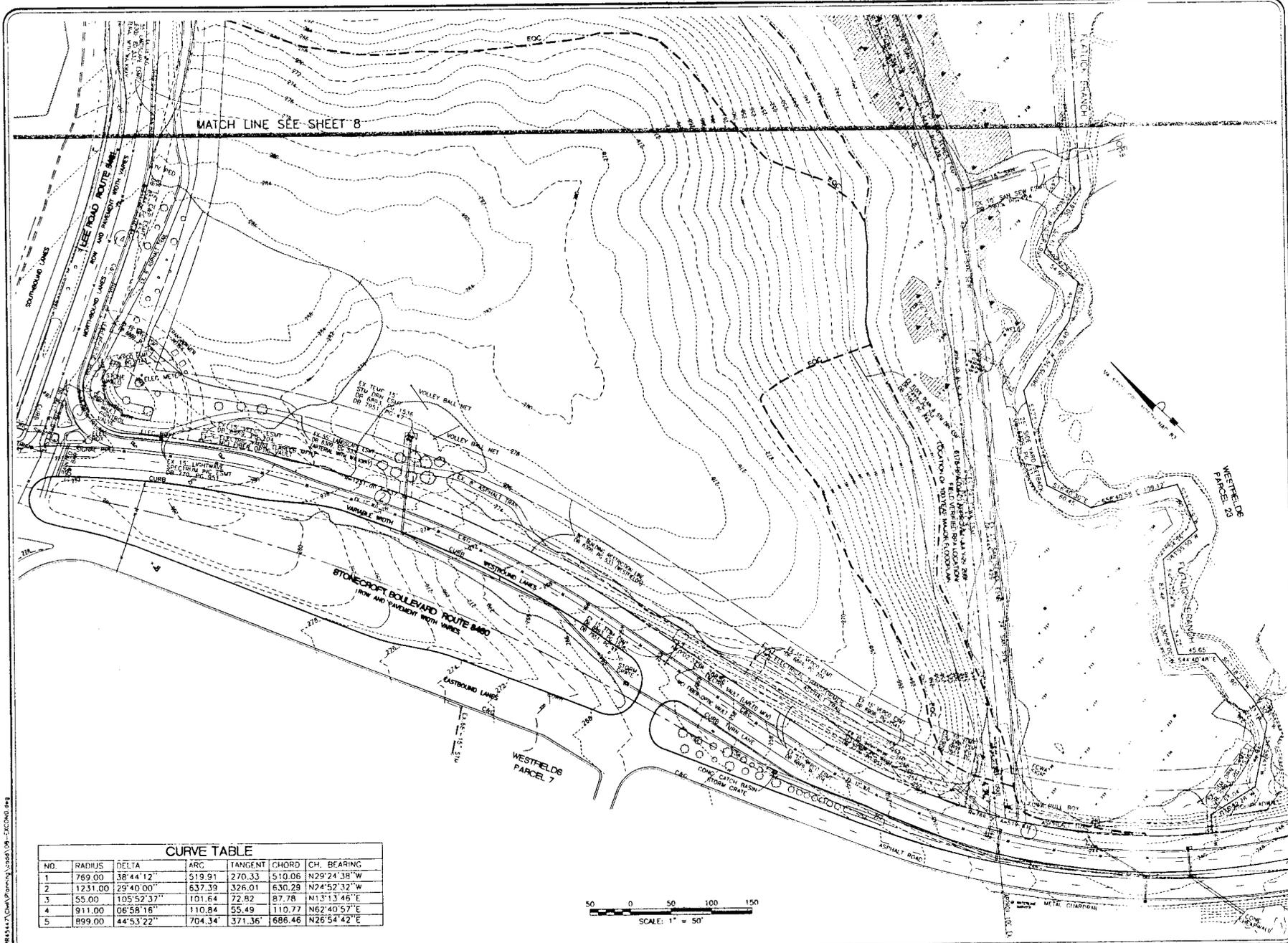
Conclusion

Natural Channel Design theories, techniques, and practices are employed as described in the plan set, and are modified as necessary to ensure long-term stability will be achieved in the project watershed. Through careful review and study of previous analyses and modeling of the watershed, a design protocol has been developed that satisfies all sources without undue reliance on any one. The design protocol employed for the unnamed tributary in Flatlick Branch provides an environmentally sound, aesthetically pleasing, and hydrologically stable stream restoration project.

List of references including Ripress & Nide, Dunne & Leopold, and other technical documents.

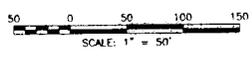
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MATCH LINE SEE SHEET 8

CURVE TABLE						
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2	1231.00	29°40'00"	637.39	326.01	630.29	N74°52'32"E
3	55.00	105°52'37"	101.64	22.82	87.78	N13°13'46"E
4	911.00	06°58'16"	110.84	55.49	110.77	N62°40'57"E
5	899.00	44°53'22"	704.34	371.36	686.46	N26°54'42"E



BURGESS & NIPLÉ
 100 P. O. BOX 1000, WESTFIELD, MASSACHUSETTS 01097-1000
 TEL: (413) 435-8800 FAX: (413) 435-8801

NO.	DATE	REVISION
1	05/17/2008	ISSUE FOR PERMIT
2	05/17/2008	REVISED PER COMMENTS
3	05/17/2008	REVISED PER COMMENTS
4	05/17/2008	REVISED PER COMMENTS
5	05/17/2008	REVISED PER COMMENTS

EXISTING CONDITIONS
AEROSPACE CORPORATION
WESTFIELDS, PARCEL 35



DATE: MAY 2008
 SCALE: 1" = 50'
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 CHECK: DMJ CHECK: JPC
 JOB NO: PR45447
 DATE: MAY 2008
 SHEET: 5 OF 5
 FILE NO: C-4702

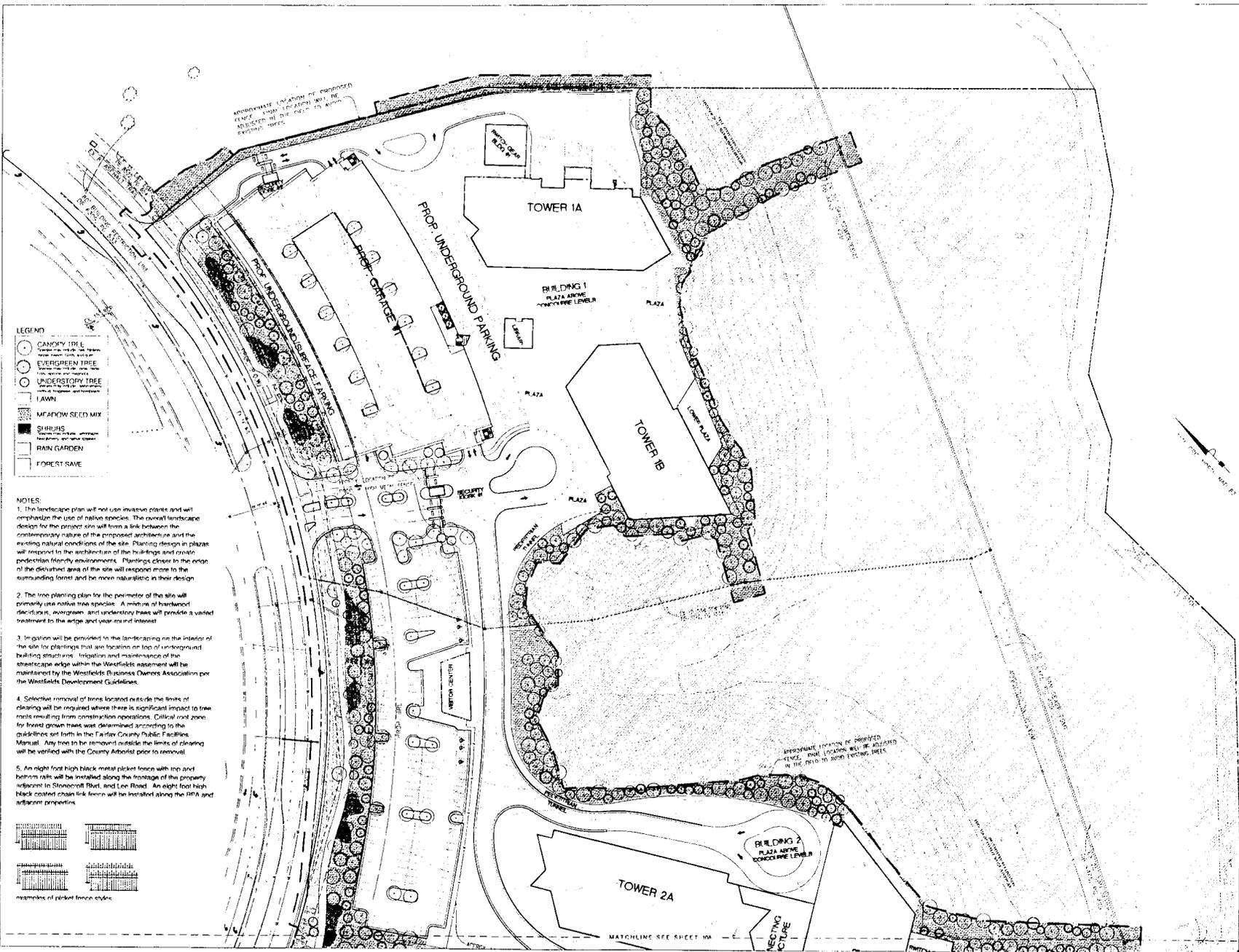
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 DATE: 05/11/2008
 DRAWN BY: [Signature]

**AEROSPACE CORPORATION
 WESTFIELDS PARCEL 35**
 SULLY DISTRICT
 FAIRFAX COUNTY, VIRGINIA



DATE	REVISION
7-1-08	REVISED PER COUNTY COMMENTS
9-10-08	REVISED PER COUNTY COMMENTS
10-3-08	REVISED PER COUNTY COMMENTS
11-4-08	REVISED PER COUNTY COMMENTS
12-1-08	REVISED PER COUNTY COMMENTS
2-12-08	REVISED PER COUNTY COMMENTS

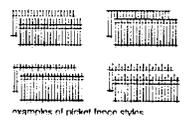
DATE	MAY, 2008
PROJECT NUMBER	W0011
SCALE	1" = 40'
TITLE	LANDSCAPE PLAN



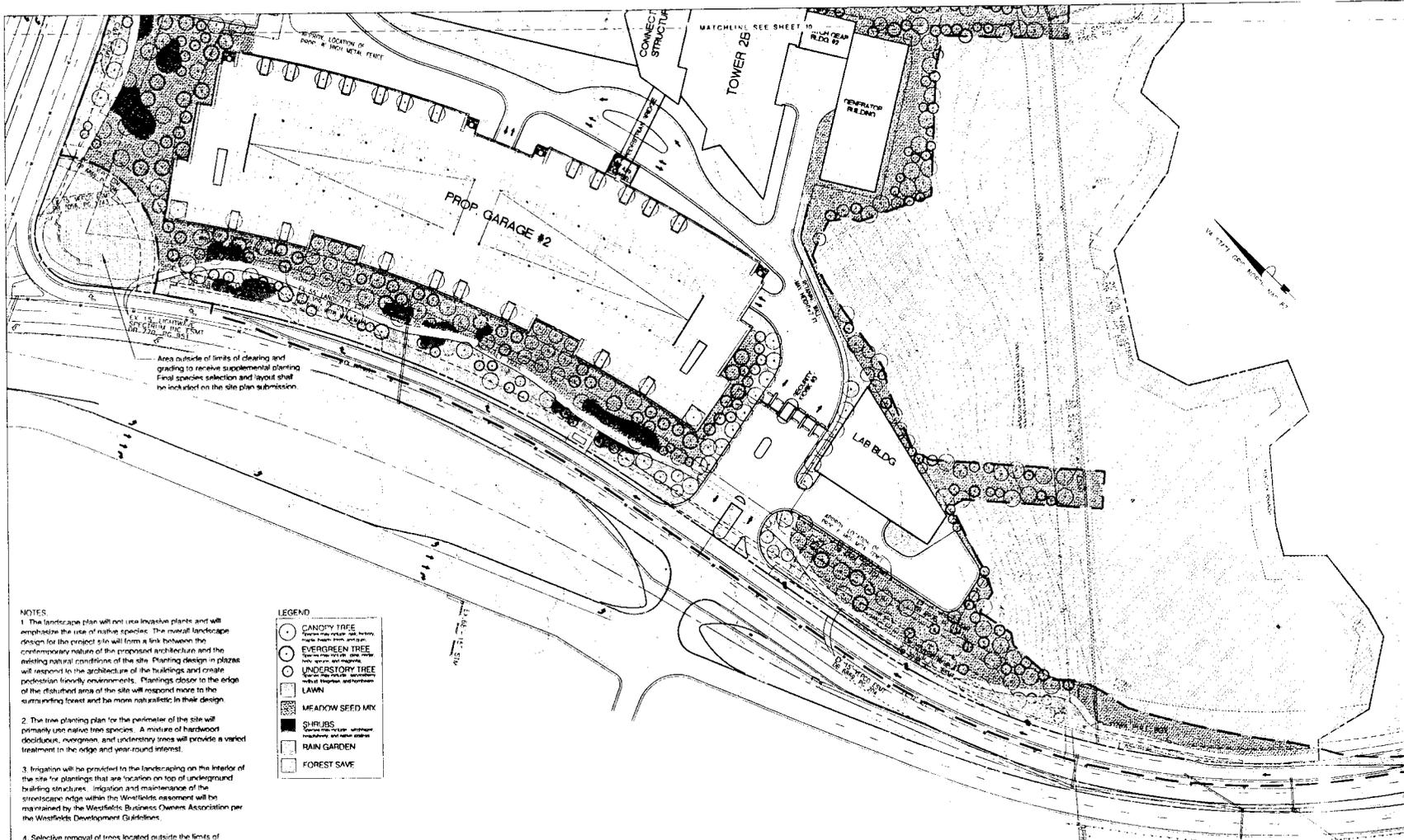
LEGEND

- CANOPY TREE
- EVERGREEN TREE
- UNDERSTORY TREE
- LAWN
- MEADOW SEED MIX
- SHRUBS
- RAIN GARDEN
- FOREST SAVE

- NOTES:**
- The landscape plan will not use invasive plants and will emphasize the use of native species. The overall landscape design for the project will form a link between the contemporary nature of the proposed architecture and the existing natural conditions of the site. Planting design in plazas will respond to the architecture of the buildings and create pedestrian friendly environments. Plantings close to the edge of the disturbed area of the site will respond more to the surrounding forest and be more naturalistic in their design.
 - The tree planting plan for the perimeter of the site will primarily use native tree species. A mixture of hardwood deciduous, evergreen, and understory trees will provide a varied treatment to the edge and year-round interest.
 - Irrigation will be provided to the landscaping on the interior of the site for plantings that are located on top of underground building structures. Irrigation and maintenance of the landscape edge within the Westfields easement will be maintained by the Westfields Business Owners Association per the Westfields Development Guidelines.
 - Selective removal of trees located outside the limits of clearing will be required where there is significant threat to tree roots resulting from construction operations. Critical root zone for forest grown trees was determined according to the guidelines set forth in the Fairfax County Public Facilities Manual. Any tree to be removed outside the limits of clearing will be verified with the County Arborist prior to removal.
 - An eight foot high black metal picket fence with top and bottom rails will be installed along the frontage of the property adjacent to Stonerock Blvd. and Lee Road. An eight foot high black coated chain link fence will be installed along the RPA and adjacent properties.



examples of picket fence styles

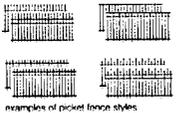


Area outside of limits of clearing and grading to receive supplemental planting. Final species selection and layout shall be included on the site plan submission.

- NOTES**
- The landscape plan will not use invasive plants and will emphasize the use of native species. The overall landscape design for the project site will form a link between the contemporary nature of the proposed architecture and the existing natural conditions of the site. Planting design in plazas will respond to the architecture of the buildings and create pedestrian friendly environments. Plantings closer to the edge of the disturbed area of the site will respond more to the surrounding forest and be more naturalistic in their design.
 - The tree planting plan for the perimeter of the site will primarily use native tree species. A mixture of hardwood deciduous, evergreen, and understory trees will provide a varied treatment in the edge and year-round interest.
 - Irrigation will be provided in the landscaping on the interior of the site for plantings that are located on top of underground building structures. Irrigation and maintenance of the streetscape edge within the Westfields assessment will be maintained by the Westfields Business Owners Association per the Westfields Development Guidelines.
 - Selective removal of trees located outside the limits of clearing will be required where there is significant impact to tree roots resulting from construction operations. Critical root zone for forest grown trees was determined according to the guidelines set forth in the Fairfax County Public Facilities Manual. Any tree to be removed outside the limits of clearing will be verified with the County Arborist prior to removal.
 - An eight foot high black metal picket fence with top and bottom rails will be installed along the frontage of the property adjacent to Stonerock Road and Lee Road. An eight foot high black coated chain link fence will be installed along the RPA and adjacent properties.

LEGEND

- CANDORY TREE
Plants like maple, ash, birch, oak, hickory, etc.
- EVERGREEN TREE
Plants like spruce, fir, pine, etc.
- UNDERSTORY TREE
Plants like holly, yew, etc.
- LAWN
- MEADOW SEED MIX
- SHRUBS
Plants like dogwood, hydrangea, etc.
- RAIN GARDEN
- FOREST SAVE



examples of picket fence styles

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2020 1/20 2021 1/20 2022 1/20 2023 1/20 2024 1/20 2025 1/20 2026 1/20 2027 1/20 2028 1/20 2029 1/20 2030 1/20

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WESTFIELDS PARCEL 35
 SULLY DISTRICT
 FAIRFAX COUNTY, VIRGINIA

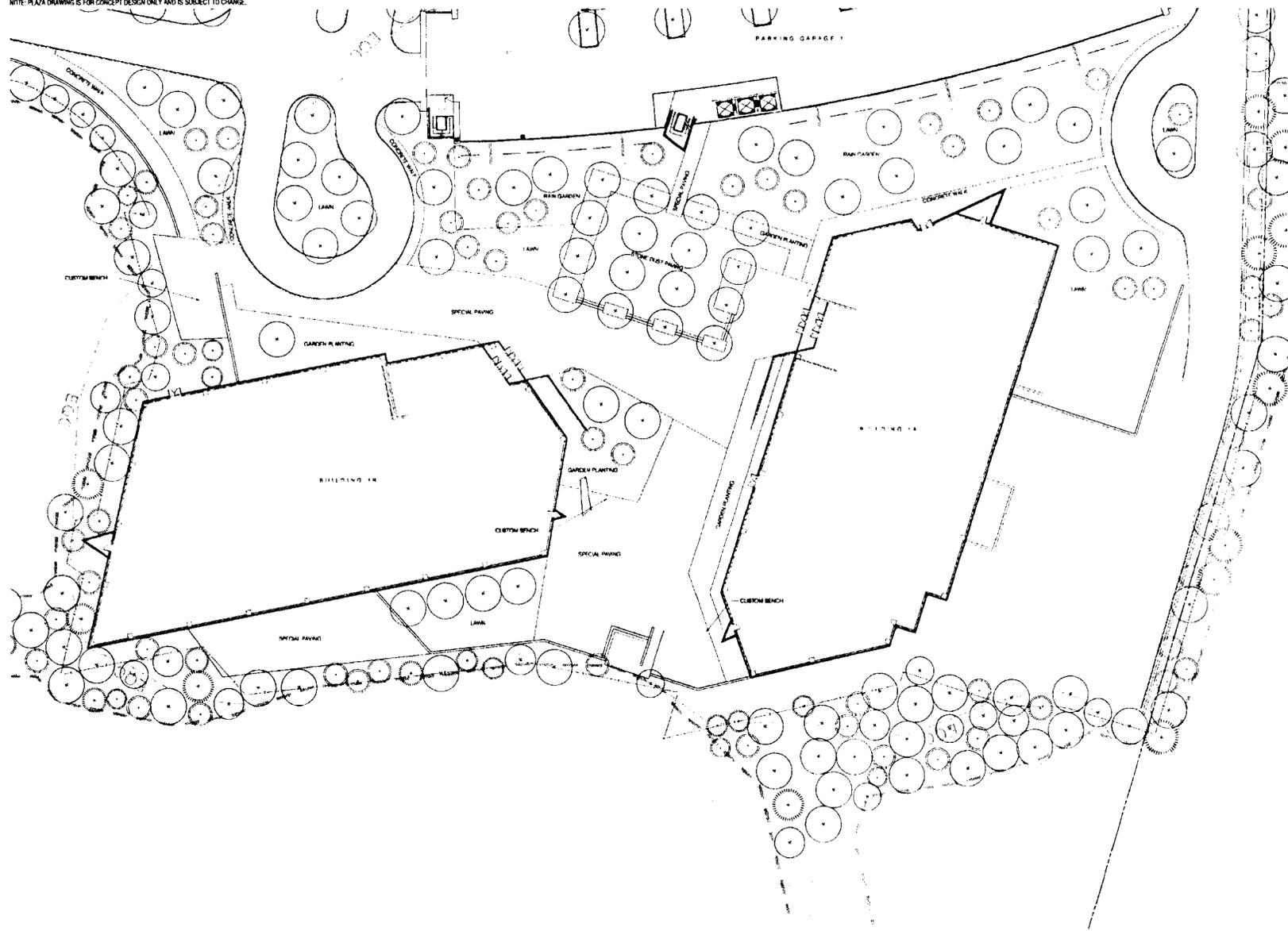


DATE	REVISION
7-1-08	REVISED PER COUNTY COMMENTS
8-10-08	REVISED PER COUNTY COMMENTS
10-9-08	REVISED PER COUNTY COMMENTS
11-18-08	REVISED PER COUNTY COMMENTS
12-1-08	REVISED PER COUNTY COMMENTS
2-17-09	REVISED PER COUNTY COMMENTS

DATE: MAY 2009
 PROJECT NAME: WEST
 SCALE: 1" = 50'
 DRAWING TITLE: LANDSCAPE PLAN

10A

NOTE: PLAZA DRAWING IS FOR CONCEPT DESIGN ONLY AND IS SUBJECT TO CHANGE.



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REVISIONS

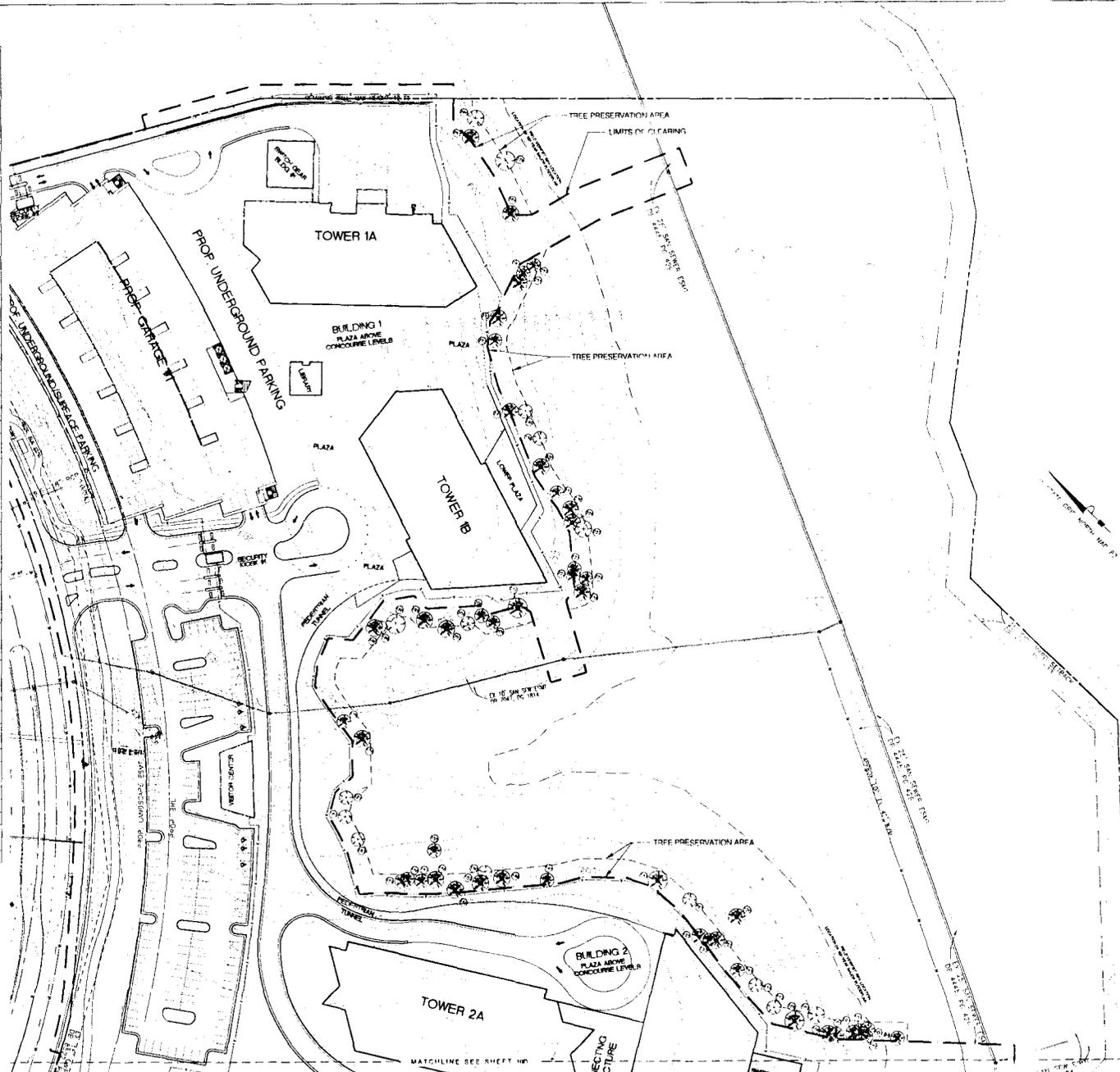
11-4-06	REVISED PER COUNTY COMMENTS
12-1-06	REVISED PER COUNTY COMMENTS
12-17-06	REVISED PER COUNTY COMMENTS

DATE: MAY, 2008
 PROJECT NUMBER: W807
 SCALE: 1" = 10'
 DRAWING TITLE: BUILDING 1 PLAZA ENLARGEMENT

10B

Tree Number	Diameter (in)	Action	Notes
98	10	remove	will sustain significant root damage
100	10	remove	will sustain significant root damage
101	12	remove	will sustain significant root damage
102	14	remove	will sustain significant root damage
103	14	remove	will sustain significant root damage
105	18	remove	will sustain significant root damage
106	16	remove	will sustain significant root damage
107	16	save	
108	24 twin	remove	will sustain significant root damage
112	10	save	
114	12	save	
115	12	remove	will sustain significant root damage
120	18	remove	dead
121	16	remove	will sustain significant root damage
123	12	remove	will sustain significant root damage
125	174	remove	will sustain significant root damage
127	10	save	
133	22	remove	will sustain significant root damage
145	17	remove	will sustain significant root damage
148	14	remove	will sustain significant root damage
150	10	save	
152	18	remove	will sustain significant root damage
153	18	remove	will sustain significant root damage
155	10	remove	dead
156	18	remove	will sustain significant root damage
157	12	remove	will sustain significant root damage
158	12	remove	will sustain significant root damage
159	10	remove	will sustain significant root damage
163	10	save	
168	10	save	
171	10	save	
176	16	remove	will sustain significant root damage
179	10	remove	will sustain significant root damage
188	22	save	
189	12	save	
190	14	remove	will sustain significant root damage
198	18	remove	will sustain significant root damage
202	18	remove	dead
204	10	save	
208	12	remove	will sustain significant root damage
209	10	remove	will sustain significant root damage
210	24 twin	remove	will sustain significant root damage
218	14	remove	will sustain significant root damage
222	12	remove	will sustain significant root damage
223	12	remove	will sustain significant root damage
224	12	remove	will sustain significant root damage
227	14	save	
229	14	remove	will sustain significant root damage
230	14	remove	will sustain significant root damage
232	12	remove	will sustain significant root damage
235	18	remove	will sustain significant root damage
238	10	save	
240	10	save	
241	16	remove	will sustain significant root damage
255	18	remove	will sustain significant root damage
257	12	remove	will sustain significant root damage
261	12	remove	will sustain significant root damage
268	16	remove	will sustain significant root damage
272	16	remove	will sustain significant root damage
273	10	remove	will sustain significant root damage
276	22	save	
280	14	save	
281	14	remove	will sustain significant root damage

LEGEND
 TREE OUTSIDE THE LIMITS OF CLEARING TO BE REMOVED

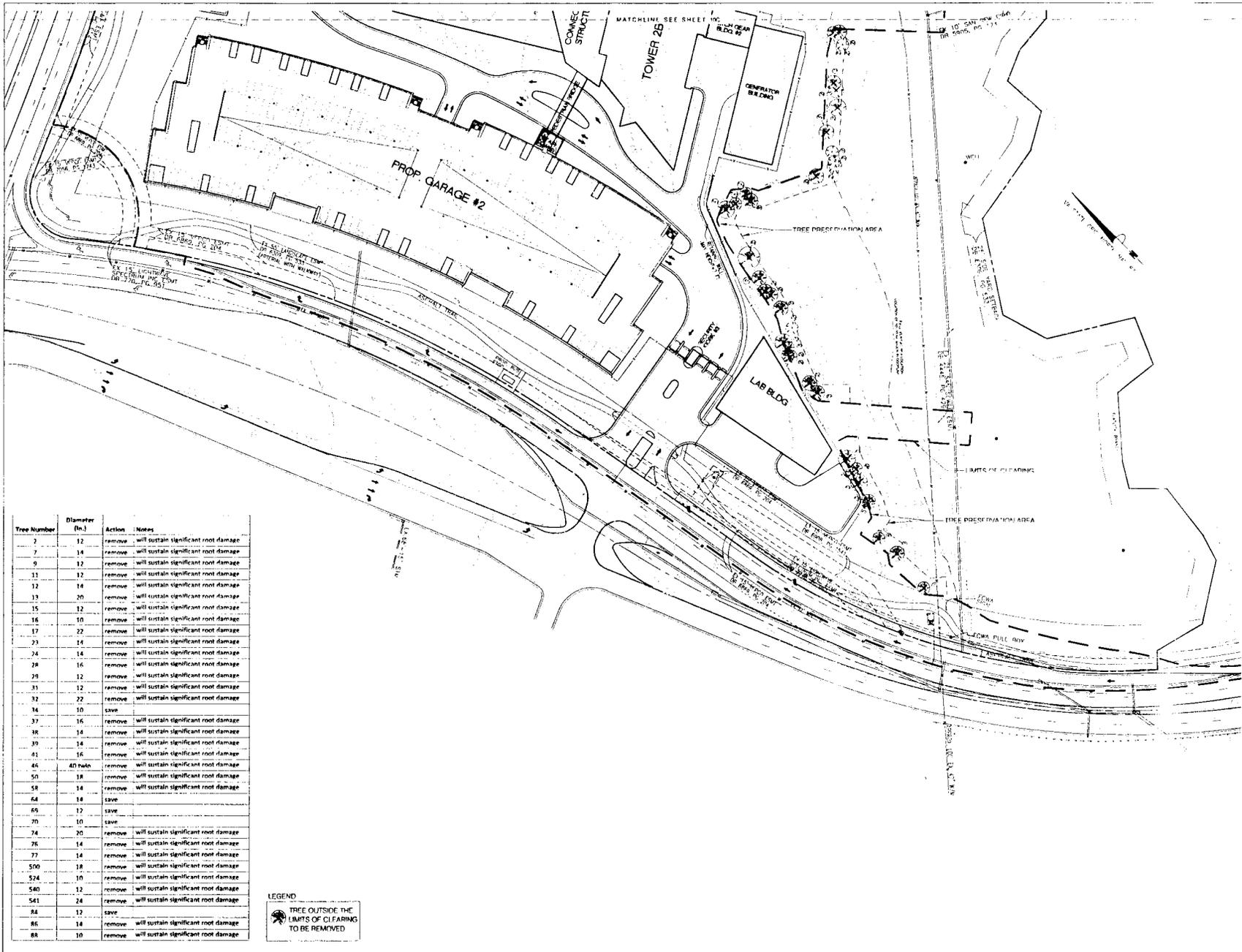


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 2841 N. STREET, SUITE 200, WASHINGTON, DC 20004
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 SULLY DISTRICT
 FAIRFAX COUNTY, VIRGINIA



DATE	12-1-08	REVISION	REVISED PER COUNTY COMMENTS
DATE	12-17-08	REVISION	REVISED PER COUNTY COMMENTS

DATE: MAY, 2008
 SHEET: W011
 SCALE: 1" = 50'
 TREE PRESERVATION PLAN



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 SULLY DISTRICT
 FAIRFAX COUNTY, VIRGINIA



REVISIONS

12-1-08	REVISED PER COUNTY COMMUNITY DEVELOPMENT
12-17-08	REVISED PER COUNTY COMMUNITY DEVELOPMENT

DATE: MAY 2008
 PROJECT NUMBER: W801
 SHEET: 11 OF 50
 TREE PRESERVATION PLAN

10D

Tree Number	Diameter (in.)	Action	Notes
3	12	remove	will sustain significant root damage
7	14	remove	will sustain significant root damage
9	12	remove	will sustain significant root damage
11	12	remove	will sustain significant root damage
12	14	remove	will sustain significant root damage
13	20	remove	will sustain significant root damage
15	12	remove	will sustain significant root damage
16	10	remove	will sustain significant root damage
17	22	remove	will sustain significant root damage
23	14	remove	will sustain significant root damage
24	14	remove	will sustain significant root damage
28	16	remove	will sustain significant root damage
29	12	remove	will sustain significant root damage
31	12	remove	will sustain significant root damage
32	22	remove	will sustain significant root damage
44	10	save	
37	16	remove	will sustain significant root damage
38	18	remove	will sustain significant root damage
39	18	remove	will sustain significant root damage
41	16	remove	will sustain significant root damage
46	40 twin	remove	will sustain significant root damage
50	18	remove	will sustain significant root damage
58	14	remove	will sustain significant root damage
64	18	save	
65	17	save	
70	10	save	
74	20	remove	will sustain significant root damage
76	18	remove	will sustain significant root damage
77	14	remove	will sustain significant root damage
500	18	remove	will sustain significant root damage
524	10	remove	will sustain significant root damage
540	12	remove	will sustain significant root damage
541	24	remove	will sustain significant root damage
84	12	save	
86	18	remove	will sustain significant root damage
88	10	remove	will sustain significant root damage

LEGEND
 TREE OUTSIDE THE LIMITS OF CLEARING TO BE REMOVED

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FAIRFAX COUNTY, VIRGINIA



REVISIONS

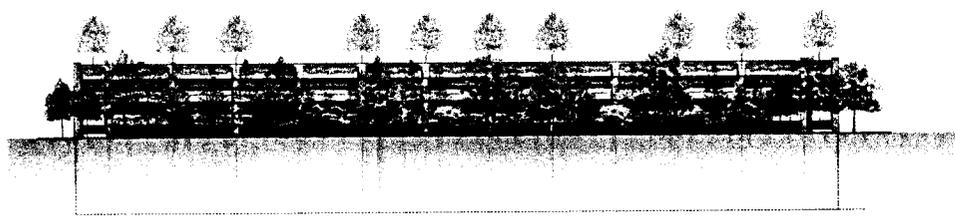
7-1-08	1	REVISED PER COUNTY COMMENTS
8-15-08		REVISED PER COUNTY COMMENTS
10-9-08		REVISED PER COUNTY COMMENTS
12-1-08		REVISED PER COUNTY COMMENTS
12-17-08		REVISED PER COUNTY COMMENTS

BY: WAP
DATE: MAY, 2008
PROJECT NUMBER: W801
SCALE: 1" = 25'

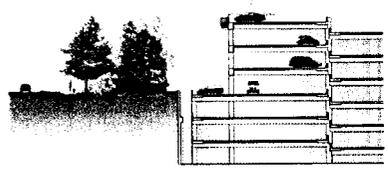
TITLE: GARAGE 1 ELEVATION & SECTION

11

SHEET NUMBER



1 GARAGE 1 ELEVATION - (note garage facade is diagrammatic and subject to change) 1/4" = 25'



2 GARAGE 1 SECTION 1/4" = 25'



3 SECTION KEY PLAN NTS

O C U L U S

3401 17th STREET, SUITE 201, FALLS CHURCH, VA 22034
P 703.888.8448 F 703.888.8448 E OCELL@OCULUSVA.COM

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WESTFIELDS PARCEL 35
SULLY DISTRICT
FAIRFAX COUNTY, VIRGINIA



REVISION NUMBER	DATE	DESCRIPTION
7-1-06		REVISED PER COUNTY COMMENTS
9-10-06		REVISED PER COUNTY COMMENTS
10-9-06		REVISED PER COUNTY COMMENTS
12-1-06		REVISED PER COUNTY COMMENTS
12-17-06		REVISED PER COUNTY COMMENTS

DATE: MAY, 2008
PROJECT NUMBER: W001
SCALE: 1" = 25'
DRAWING TITLE: GARAGE 2 ELEVATION & SECTION

11A



1 GARAGE 2 ELEVATION - (note garage facade is diagrammatic and subject to change)

1" = 25'



2 GARAGE 2 SECTION

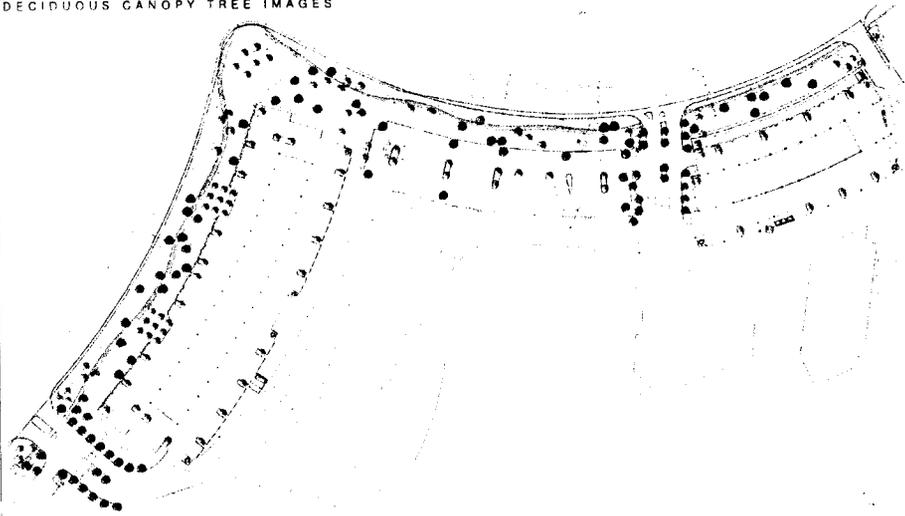
1" = 25'



3 SECTION KEY PLAN

NTR

DECIDUOUS CANOPY TREE IMAGES



O C U L U S

3410 17th STREET NW, SUITE 301, WASHINGTON DC 20009
P 202 682 5444 F 202 682 5446 E OCALLUS@OCULUSDC.COM

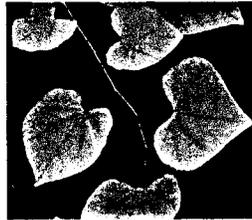
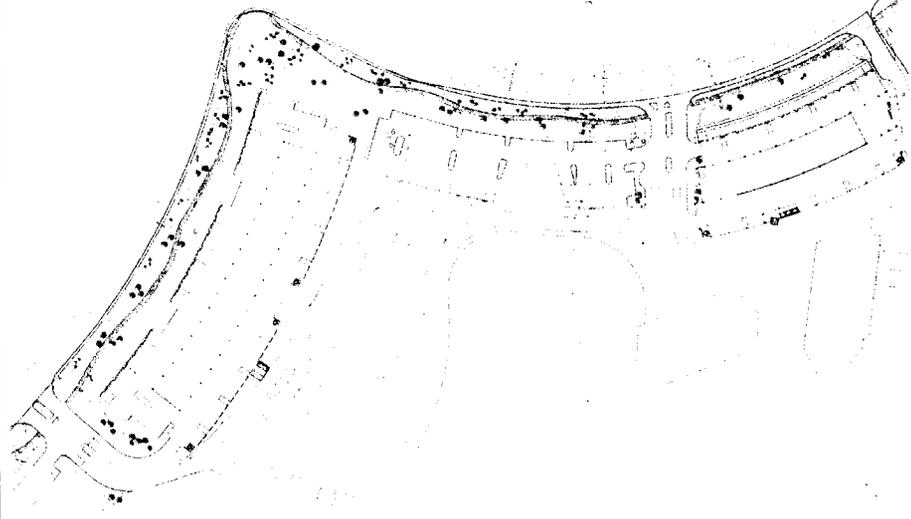
AEROSPACE CORPORATION
WESTFIELDS PARCEL 35
SULLY DISTRICT
FAIRFAX COUNTY, VIRGINIA



7-1-08	REVISED PER COUNTY COMMENTS
9-10-08	REVISED PER COUNTY COMMENTS
10-9-08	REVISED PER COUNTY COMMENTS
12-1-08	REVISED PER COUNTY COMMENTS
12-17-08	REVISED PER COUNTY COMMENTS

DATE: MAY, 2008
PROJECT NUMBER: W001
SCALE: PLANT IMAGE BOARD - DECIDUOUS CANOPY TREES ALONG STREETSCAPE SIDE

UNDERSTORY TREE IMAGES



O C U L U S

2410 HENNINGTON WAY SUITE 200 MANASSAS VA 20108
 703.760.8800 FAX 703.760.8801 E COLLEEN@OCULUSVA.COM

AEROSPACE
 CORPORATION
 WESTFIELDS PARCEL 35
 SULLY DISTRICT
 FAIRFAX COUNTY, VIRGINIA



7-1-08	REVISED PER COUNTY COMMENTS
8-16-08	REVISED PER COUNTY COMMENTS
10-9-08	REVISED PER COUNTY COMMENTS
12-1-08	REVISED PER COUNTY COMMENTS
12-17-08	REVISED PER COUNTY COMMENTS

BY: [Signature]
 DATE: MAY, 2008
 PROJECT NUMBER: W001
 SCALE: PLANT IMAGE BOARD
 UNDERSTORY TREES
 ALONG STREETS/CANYSIDE

12B

DATE: 5/14/08

FLOOR AREA TABULATIONS FOR LAND AREAS WITHIN ZONING PARCELS A AND A-2
JUNE 30, 2008

THE LAND AREAS THAT ARE WITHIN THE TWO ZONING PARCELS THAT WERE DESIGNATED AS ZONING PARCELS A AND A-2 WITHIN THE WESTFIELDS SITE (CASE NUMBER 02-19-570) ARE SUBJECT TO A ZONING PROVISION THAT LIMITS THE TOTAL ALLOWED BUILDING FLOOR AREA THAT MAY BE DEVELOPED ON THESE PARCELS. THE FOLLOWING TABLES SHOW THE FLOOR AREA ALLOCATIONS APPLICABLE TO PROVIDE AN ACCURATE ACCOUNTING OF THE FLOOR AREA PROVIDED IN COMPLIANCE WITH THE ZONING PARCELS A AND A-2. IT SHOULD BE NOTED THAT THE RECALCULATED DEVELOPMENT ON A NUMBER OF THESE PARCELS HAS BEEN ESTABLISHED THROUGH RECORDED DEEDS AND AGREEMENTS THAT LIMIT OR RESTRICT DEVELOPMENT RIGHTS.

1. CALCULATION OF GROSS ALLOWABLE FLOOR AREA, ZONING PARCELS A AND A-2

ZONING PARCEL	AREA	FAR CREDIT PER PROFFER	POTENTIAL FLOOR AREA
A	274,12591 AC (11,940,924 SQ. FT.)	0.50	5,970,482 SQ. FT.
A-2	58,96788 AC (2,596,084 SQ. FT.)	0.00	0.00 SQ. FT.
TOTALS	333,09379 AC (14,540,008 SQ. FT.)	0.41 (AVERAGE)	5,970,482 SQ. FT.

2. FLOOR AREA CHARGED AGAINST THE TOTAL POTENTIAL FLOOR AREA FOR LAND AREAS WITHIN ZONING PARCELS A AND A-2 THAT HAVE BEEN PREVIOUSLY DEVELOPED OR ARE SUBJECT TO POTENTIAL FUTURE DEVELOPMENT (INCLUDES PARCEL 35A)

PARCEL	AREA OF PARCEL WITHIN ZONING PARCEL A OR A-2 (ACRES/SQ. FT.)	FLOOR AREA CHARGED AGAINST TOTAL (GROSS/SQ. FT.)
3A	32.73 / 1,425,347	706,262 (1)
7	2.57 / 112,750	233,892 (2)
8A-1	34.89 / 1,519,984	656,308 (1)
8A-2	17.02 / 741,315	31,853 (2)
8B-1	41.08 / 1,789,595	252,855 (2)
8B-2	2.06 / 90,653	135,390 (2)
11A	0.14 / 5,823	2,387 (2)
15A	4.23 / 184,250	63,443 (2)
25A	3.58 / 155,953	34,217 (1)
27C	2.01 / 87,520	33,933 (2)
29D	1.90 / 82,764	700 (1)
29E-1	10.64 / 463,800	1,478 (2)
31A-1	8.71 / 379,260	140,472 (1)
31A-2	9.88 / 430,500	150,077 (1)
31A-3	8.35 / 377,489	85,457 (1)
31B-1	18.74 / 816,489	500,000 (1)
31B-2	6.18 / 269,110	85,000 (1)
35B	9.00 / 392,850	160,737 (1)
31	31.56 / 1,374,754	583,843 (1)
41	7.47 / 322,900	0 (1)
TOTALS	259.03 / 11,282,708	4,106,356

NOTES:
(1) FLOOR AREA CHARGED BASED ON A FLOOR AREA ALLOCATION ASSIGNED TO THE DEVELOPMENT PARCEL BY A RECORDED DEED AGREEMENT.
(2) FLOOR AREA CHARGED BASED ON THE POTENTIAL DEVELOPMENT OF THE DEVELOPMENT PARCEL TO A FLOOR AREA RATIO OF 0.41 CALCULATED ON THE AREA OF THE PARCEL WITHIN ZONING PARCELS A AND A-2.
(3) FLOOR AREA CHARGED BASED ON THE POTENTIAL DEVELOPMENT OF REMAINDER PARCEL 35A (14.81 AC.) TO A MAXIMUM FAR OF 0.50.

3. REMAINING FLOOR AREA TO BE ALLOCATED

A. GROSS BUILDING FLOOR AREA ALLOCATED TO ZONING PARCELS A AND A-2	5,970,482 GROSS SQ. FT.
B. LESS, GROSS BUILDING FLOOR AREAS PREVIOUSLY ALLOCATED AS SHOWN ABOVE	4,106,356 GROSS SQ. FT.
C. FLOOR AREA REMAINING TO BE ALLOCATED	1,864,126 GROSS SQ. FT.
4. FLOOR AREA ALLOCATION FOR PARCEL 35A	
A. FLOOR AREA REMAINING TO BE ALLOCATED	1,864,126 GROSS SQ. FT.
B. LESS, GROSS BUILDING FLOOR AREA PROPOSED ON PARCEL 35A	873,350 GROSS SQ. FT.
C. REMAINING FLOOR AREA	990,776 GROSS SQ. FT.

SPECIAL EXCEPTION AEROSPACE CORPORATION WESTFIELDS, PARCEL 35

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

The following information is required to be shown or provided in all zoning applications, or a similar report of the subdivision applicant with justification shall be submitted. Note: Values will be actual unless otherwise indicated. Values to adequately address the required information may result in a delay in processing the application.

This information is based upon the following Zoning Ordinance provisions:
Special Permit (16.11.02.1.1)
Chapter 5 Subchapter 06.110 (16.11.02.1.1)
Development Plans (16.30.02.1.1.1)
TOP 10 Percent (16.30.02.1.1.1.1)

- 1. Plot 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 facilities and lines of clearing and grading associated with the stormwater management facilities, storm drainage site systems and related practices, road shoulders, storm mains, site runoff, energy dissipation devices and stream stabilization measures as shown on Sheet 35A.

3. Stormwater

Facility Name	On-site area (acres)	Off-site area (acres)	Drainage area (acres)	Flow rate (cfs)	Storage (cu ft)	Volume (cu ft)	Peak flow (cfs)	Peak rate (gpm)
STORM FILTER #1	4.0	N/A	4.0	4.0	2,000	N/A	N/A	N/A
STORM FILTER #2	4.0	N/A	4.0	4.0	2,000	N/A	N/A	N/A
SW DETENTION SW #1	5.49	N/A	5.49	5.49	1,431	12,283	N/A	N/A
SW DETENTION SW #2	7.29	N/A	7.29	7.29	1,840	15,302	N/A	N/A
RAINF GARDEN	1.78	N/A	1.78	1.78	442	3,712	N/A	N/A
GREEN ROOF AREA	0.14	N/A	0.14	0.14	35	271	N/A	N/A
PERVIOUS PAVEMENT AREA #1	0.47	N/A	0.47	0.47	118	984	N/A	N/A
PERVIOUS PAVEMENT AREA #2	0.18	N/A	0.18	0.18	45	375	N/A	N/A
TOTALS	26.2	N/A	26.2	26.2	44,154	358,038	N/A	N/A

- 4. On-site drainage channels, outfalls and site systems are shown on Sheet 35A. Pond that will collect site runoff are shown on Sheet 35A.
- 5. Maintenance areas (road) in stormwater management facilities are shown on Sheet 35A. Time of maintenance shall not exceed 10 hours per year. (N/A - none, partial, peak, etc.)
- 6. Landscaping and tree preservation shown in and near the stormwater management facility as shown on Sheet 35A.
- 7. A stormwater management manual which contains a description of flow direction and best management practices provided to be provided on Sheet 35B.
- 8. A description of the existing conditions of each watershed site and extended drainage from the site to a point which is at least 100 feet from the site area or which has a drainage area of at least one square mile (100 acres) as provided on Sheet 35B.
- 9. A description of the flow outfall requirements, including contributing drainage areas of the Public Facilities Manual will be submitted to applicant on Sheet 35B.
- 10. A survey topography with maximum contour interval of two (2) feet and a note as to whether it is an old survey or that it is provided on Sheet 35B. NOTE ON SHEET 1.
- 11. A subdivision map is required for N/A.
- 12. Stormwater management is not required because N/A.

BMP FACILITY DESIGN CALCULATIONS:

Part 1: LIST OF SUBAREAS AND "C" FACTORS USED

SUBAREA DESIGNATION AND DESCR.	C	AREA ACRES
(1) CHALKING OPEN SPACE	0.10	12.55
(2) STORM FILTER #1	0.60	4.00
(3) STORM FILTER #2	0.60	4.00
(4) RAIN GARDEN	0.75	1.78
(5) GREEN ROOF AREA	0.41	0.14
(6) PERVIOUS PAVEMENT AREA #1	0.60	0.18
(7) PERVIOUS PAVEMENT AREA #2	0.60	0.18
(8) PERVIOUS PAVEMENT AREA #3	0.60	0.18
(9) ON-SITE UNCONTROLLED	0.55	17.07
TOTALS		40.41

Part 2: COMPUTE WEIGHTED AVERAGE "C" FACTOR FOR THE SITE

SUB AREA	C	X	ACRES	PRODUCT
(1) CHALKING OPEN SPACE	0.10	12.55	1.255	3.77
(2) STORM FILTER #1	0.60	4.00	2.400	7.20
(3) STORM FILTER #2	0.60	4.00	2.400	7.20
(4) RAIN GARDEN	0.75	1.78	1.335	4.00
(5) GREEN ROOF AREA	0.41	0.14	0.057	0.18
(6) PERVIOUS PAVEMENT AREA #1	0.60	0.18	0.108	0.32
(7) PERVIOUS PAVEMENT AREA #2	0.60	0.18	0.108	0.32
(8) PERVIOUS PAVEMENT AREA #3	0.60	0.18	0.108	0.32
(9) ON-SITE UNCONTROLLED	0.55	17.07	9.389	28.59
TOTALS		40.41	21.55	64.4

WEIGHTED AVERAGE "C" FACTOR FOR THE SITE = 21.55 / 40.4 = 0.53

Part 3: COMPUTE THE TOTAL PHOSPHORUS REMOVAL FOR THE SITE

SUB AREA	BMP TYPE	EFF. %	OFF SITE	AREA RATIO	"C" FACTOR RATIO	PHO. REMOVAL
(1) CHALKING OPEN SPACE		100	12.55	0.31	0.00	0.00
(2) STORM FILTER #1		50	4.00	0.10	0.82	1.50
(3) STORM FILTER #2		50	4.00	0.10	0.82	1.50
(4) RAIN GARDEN		15	1.78	0.04	0.75	0.53
(5) GREEN ROOF AREA		10	0.14	0.00	0.42	0.06
(6) PERVIOUS PAVEMENT AREA #1		15	0.18	0.00	0.67	0.13
(7) PERVIOUS PAVEMENT AREA #2		15	0.18	0.00	0.67	0.13
(8) PERVIOUS PAVEMENT AREA #3		15	0.18	0.00	0.67	0.13
(9) ON-SITE UNCONTROLLED		10	17.07	0.44	0.42	0.53
TOTAL SITE PHOSPHORUS REMOVAL =						50.14

Part 4: DETERMINE COMPLIANCE WITH PHOSPHORUS REMOVAL REQUIREMENT

REQUIREMENT: 50% FOR THE ENTIRE SITE
SITE PHOSPHORUS REMOVAL = 50.14 % > 50.00 %

NOTE: BMP CALCULATIONS ARE BASED ON THE NORTHERN VIRGINIA BMP HANDBOOK (COOCCOONIAN METHOD)

NOTES:

- (1) IF AN INDIANATE SECTION IS ENCOUNTERED DURING THE FINAL ENGINEERING DESIGN STAGE, A PHOTOGRAPHIC SURVEY AND NO ADVERSE IMPACT TO THE FLOWPATTERN DRAINAGE SYSTEM WILL BE SHOWN BY USING ACCEPTABLE METHODS DESCRIBED IN SECTION 6-2003.1 OF THE PDM WHICH INCLUDES THE CRITICAL SHEAR STRESS METHOD, CHANNEL CAPACITY METHOD, AND 1-YEAR DETENTION METHOD.
- (2) THE STORM WATER MANAGEMENT/FACILITIES SHOWN ON THIS PLAN ARE BASED ON PRELIMINARY EVALUATIONS AND DESIGNS, THE TYPE, LOCATION, SIZE AND ASSOCIATED COMPUTATIONS OF SWM/BMP FACILITIES LISTED ON THIS SITE MAY VARY WITH FINAL ENGINEERING DESIGN PROVIDED THAT ALL FACILITIES SHALL BE WITHIN THE LIMITS OF CLEARING PROPOSED ON THIS PLAN.

COMPUTATIONS FOR OUTFALL #1 AND #3 SHEET FLOW CONDITION

THE TIME OF CONCENTRATION T_c = 5 MIN
RANFALL INTENSITY (I₃₀) = 5.45 IN/HR
(I₁₀) = 7.27 IN/HR

OUTFALL #1 PRE-DEVELOPMENT RUNOFF

Q ₂ (75) =	8.78 CFS	C = 0.30
Q ₁₀ (75) =	8.24 CFS	

POST-DEVELOPMENT RUNOFF

Q ₂ (75) =	3.90 CFS	C = 0.41
Q ₁₀ (75) =	7.82 CFS	

OUTFALL #3 PRE-DEVELOPMENT RUNOFF

Q ₂ (75) =	3.30 CFS	C = 0.30
Q ₁₀ (75) =	4.41 CFS	

POST-DEVELOPMENT RUNOFF

Q ₂ (75) =	1.84 CFS	C = 0.41
Q ₁₀ (75) =	2.59 CFS	

STORM WATER MANAGEMENT (SWM), BEST MANAGEMENT PRACTICES (BMP)

THE PROPERTY ASSOCIATED WITH THIS SITE PLAN IS LOCATED IN THE WESTFIELDS INTERNATIONAL CORPORATE CENTER IN COLUMBIANA COUNTY, OHIO. THE WESTFIELD STORMWATER MANAGEMENT PLAN FOR THE WESTFIELD CORPORATE CENTER DEVELOPMENT PROJECT TO THE TOTAL WESTFIELD PARCEL 35A TO THE EAST AND WESTFIELD PARCEL 23 TO THE SOUTH OF THE SITE AREA FOR THE SUBJECT PROPERTY IS 40.41 ACRES. THE DEVELOPMENT OF 23.3 ACRES WILL BE OBTAINED WITH THE DEVELOPMENT. THE MAJORITY OF THE SITE CONSISTS OF UPLAND FOREST IN GOOD CONDITION. THE REMAINDER OF THE SITE CONSISTS OF UPLAND FOREST, BROWN PINE, MAINTAINED CROPLAND AND OPEN FIELDS. THE EXISTING TERRAIN GENERALLY SLOPES TOWARDS FLATKOP BRANCH.

FLATKOP BRANCH TRAVERSES THE SOUTHERN PROPERTY LINE, APPROXIMATELY 1.38 ACRES OF THE PROPERTY IS WITHIN THE 100-YEAR FLOOD PLAIN LIMIT OF FLATKOP BRANCH, WHICH IS ALSO CONSIDERED TO BE THE LIMIT OF THE RESIDUAL PROTECTIVE AREA (RPA) UP TO 21.15 ACRES OF THE PROPERTY IS CONSIDERED TO BE AN ENVIRONMENTAL QUALITY CORRIDOR (EQC). THERE IS AN EXISTING DRAINAGE CHANNEL THAT PROTECTS THE WOODS BETWEEN THE PROPERTY AND FLATKOP BRANCH THAT RECEIVES STORM WATER RUNOFF FROM THE NORTH AND WESTERN PROPERTIES FROM THE NORTH FROM THE EXISTING UN-DEVELOPED SITE DRAINING TOWARDS FLATKOP BRANCH.

THE SITE IS WITHIN THE OUR RIN WATERSHED, WHICH IS DESIGNATED AS "B" BASED ON THE OCCURRENCE THEREOF. THE PHOSPHORUS REMOVAL REQUIREMENT FOR THIS DEVELOPMENT IS 50%. WATER QUALITY IMPROVEMENT BEST MANAGEMENT PRACTICES (BMP) WILL BE PROVIDED BY THROUGH A COMBINATION OF ON-SITE OPEN SPACE AND THE USE OF UNDERGROUND MANUFACTURED BMP DEVICES, RAIN GARDEN, GREEN ROOF, AND PERVIOUS PAVEMENT (APPROPRIATE LOCATION SHOWN ON CONSTRUCTION EXISTENCE AS A WATER QUALITY MANAGEMENT AREA WHICH PROVIDES APPROXIMATELY 50% OF THE OVERALL PHOSPHORUS REMOVAL CREDIT FOR THE DEVELOPMENT. RUNOFF CREDIT ALLOCATION FOR EACH OF THE FACILITIES IS SHOWN ON THE COMPUTATIONS ON THIS SHEET. BMP CALCULATION IS BASED ON THE NORTHERN VIRGINIA BMP HANDBOOK (COOCCOONIAN METHOD). SEE BMP MAP ON SHEET 13A.

STORMWATER MANAGEMENT (SWM) WILL BE FINALLY ACCOMPLISHED USING THREE UNDERGROUND SWM FACILITIES WITH INDEPENDENT CAPACITIES. THE 2-YEAR AND 10-YEAR FLOWS WILL BE RESPONSIBLE FOR THE MAINTENANCE OF ALL SWM/BMP FACILITIES. THE PERVIOUS PAVEMENT WILL BE RESPONSIBLE FOR THE MAINTENANCE OF ALL SWM/BMP FACILITIES. WITH THE PROPOSED DEVELOPMENT, THE EXISTING DRAINAGE SYSTEM WILL BE ESSENTIALLY MAINTAINED. THE PROPOSED DRAINAGE FLOW WILL NOT BE INCREASED ABOVE THE PRE-DEVELOPMENT LEVEL. THIS PLAN COMPLIES FULLY WITH THE AMENDED CHEMERSIDE BAY PRESERVATION ORDINANCE (PRO).

ADEQUATE OUTFALL ANALYSIS

THE PRIMARY OUTFALL FOR THIS SITE IS PROVIDED BY FLATKOP BRANCH, WHICH FLOWS WESTWARD ALONG THE SOUTHERN PROPERTY LINE. A SECONDARY OUTFALL FOR THIS DEVELOPMENT IS PROVIDED BY THE EXISTING STORM SEWER SYSTEM ADJACENT TO THE EXISTING CHANNEL AT PROPOSED SITE #1.

THERE ARE FOUR OUTFALLS FOR THIS DEVELOPMENT. THREE OF THE FOUR ARE DRAINING DIRECTLY TO FLATKOP BRANCH AND ONE IS DRAINING TO THE EXISTING STORM SEWER SYSTEM IN STONECROFT BOULEVARD, AS EXHIBITED BELOW. TWO OF THE OUTFALLS (OUTFALL #1 AND OUTFALL #3) ARE SHEET FLOW CONDITION AND THE OTHER TWO OUTFALLS (OUTFALL #2 AND OUTFALL #4) ARE CONCENTRATED FLOWS.

OUTFALL #1 - LOCATED IN THE FLOOD PLAIN/AREA #1 AT THE SOUTH EAST CORNER OF THE PROPOSED DEVELOPMENT. BEAR OF TOWER 1A, OFFERS RUNOFF VIA SHEET FLOW CONDITION FROM THE LOWER SECTION OF THE DEVELOPMENT. BEARING TOWARDS FLATKOP BRANCH AND OUTFALLS TO THE PROPERTY AND TO THE FLOOD PLAIN/AREA. THE PRE-DEVELOPMENT 10-YEAR FLOW TO THIS OUTFALL IS 8.74 CFS. THE POST-DEVELOPMENT 10-YEAR FLOW TO THIS OUTFALL IS 3.90 CFS. BASED ON THE ADEQUATE OUTFALL REQUIREMENTS PERTAINING TO SHEET FLOW CONDITION, IF SHEET FLOW IS MAINTAINED IN THE POST-DEVELOPMENT CONDITION AND THE FLOW/VOLUME IS LESS THAN THE PRE-DEVELOPMENT LEVEL, ADEQUATE OUTFALL REQUIREMENT IS MET. BASED ON THE SHEET FLOW COMPUTATIONS SHOWN ON THIS SHEET, IT IS MY PROFESSIONAL OPINION THAT ADEQUATE OUTFALL FOR OUTFALL #1.

OUTFALL #2 - LOCATED AT THE END OF PROPOSED STORM STRUCTURE #1 AN EXISTING DEFINED CHANNEL THAT DRENDS THE NORTH PORTION OF THE SITE (2.00 ACRES) TOWARDS FLATKOP BRANCH. PRESENTLY, THIS CHANNEL PROTECTS THE PROPERTY FROM FLATKOP BRANCH AND ALSO PROVIDES OVERFLOW CAPACITY FOR THE FLOOD PLAIN/AREA AND OPEN FIELDS. IT IS IMPROVED THROUGH THE DEVELOPMENT BY A PROPOSED CONCRETE STORM SEWER SYSTEM AND ALSO AT THE SAME POINT WITHIN THE EXISTING NATURAL CHANNEL AT PROPOSED STRUCTURE #1. OUTFALL FLOW WILL ALSO BE COLLECTED BY A PROPOSED CONCRETE STORM SEWER SYSTEM AND RELEASED INTO UNDERGROUND SWM STRUCTURES. OUTFALL FLOWS FROM 1.38 ACRES OF THE PROPOSED DEVELOPMENT, CONNECT TO THE SAME STORM SYSTEM THAT OUTFALLS TO THE EXISTING CHANNEL AT PROPOSED SITE #1. THE EXISTING STREAM CHANNEL CONVEYS RUNOFF TO FLATKOP BRANCH.

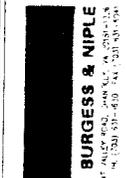
THE EXTENT OF REVIEW FOR THIS OUTFALL WILL BE BASED ON THE 6-2003.2A, WHICH STATES THAT THE EXTENT OF REVIEW SHALL BE TO A POINT THAT IS AT LEAST 100' DOWNSTREAM OF A POINT WHERE THE DRAINAGE AREA IS 360 ACRES OR GREATER. STRUCTURE #1 OUTFALLS DIRECTLY INTO THE FLOOD PLAIN LIMIT OF FLATKOP BRANCH, WHICH HAS AN AREA GREATER THAN 360 ACRES. THE PRE-DEVELOPMENT 10-YEAR FLOW TO THIS OUTFALL IS 3.30 CFS AND THE 2-YEAR VELOCITY IS 14.0 FPS. THE POST-DEVELOPMENT 10-YEAR FLOW TO THIS OUTFALL IS 1.84 CFS AND THE 2-YEAR VELOCITY IS 11.4 FPS. ADEQUATE OUTFALL REQUIREMENT TO RESTORE THE EXISTING STREAM CHANNEL. THIS WILL BE DONE AT SEPARATE CONSTRUCTION OF THE SPECIAL EXCEPTION AND SITE PLAN. ADEQUATE WETTED AND ENVIRONMENTAL CONSULTANT TO DESIGN AND CONSTRUCT THE STREAM RESTORATION PROJECT. RESTORE THE STREAM TO ADEQUATELY RECEIVE THE PRE-DEVELOPMENT FLOW FROM OUR OUTFALL AND NATURALLY CONVEY IT TO FLATKOP BRANCH IN A NON-EROSIVE LEVEL. IMPROVES THAT MAY BE USED INCLUDE PERVIOUS PAVEMENT AND OTHER FEATURES THAT INCREASES ENERGY AND REDUCE VELOCITY. THE WETTED STREAM SECTION WILL BE ANALYZED BY THE USE OF A 10-YEAR FREQUENCY STORM TO VERIFY THAT STORM WATER WILL NOT OVERFLOW CHANNEL BANKS NOR CAUSE FLOODING OF CHANNEL BED AND BANKS FROM THE 2-YEAR VELOCITY. IT IS MY PROFESSIONAL OPINION THAT THE STREAM RESTORATION PROJECT WILL PROVIDE ADEQUATE OUTFALL FOR OUTFALL #2.

OUTFALL #3 - LOCATED ADJACENT TO THE FLOOD PLAIN/AREA #1A BEAR OF TOWER 2A, RECEIVES RUNOFF VIA SHEET FLOW CONDITION FROM THE SECTION OF THE PROPERTY BEARING TOWARDS FLATKOP BRANCH AND OUTFALLS DIRECTLY TO THE FLOOD PLAIN/AREA. THE PRE-DEVELOPMENT 10-YEAR FLOW TO THIS OUTFALL IS 3.30 CFS. THE POST-DEVELOPMENT 10-YEAR FLOW TO THIS OUTFALL IS 1.84 CFS. BASED ON THE ADEQUATE OUTFALL REQUIREMENTS PERTAINING TO SHEET FLOW CONDITION, IF SHEET FLOW IS MAINTAINED IN THE POST-DEVELOPMENT CONDITION AND THE FLOW/VOLUME IS LESS THAN THE PRE-DEVELOPMENT LEVEL, ADEQUATE OUTFALL REQUIREMENT IS MET. BASED ON THE SHEET FLOW COMPUTATIONS SHOWN ON THIS SHEET, IT IS MY PROFESSIONAL OPINION THAT ADEQUATE OUTFALL FOR OUTFALL #3.

OUTFALL #4 - LOCATED AT THE SOUTHWEST CORNER OF THE DEVELOPMENT ADJACENT TO STONECROFT BOULEVARD. THIS OUTFALL IS TO THE EXISTING STORM SEWER SYSTEM ON STONECROFT BOULEVARD. THE PROPOSED UNDERGROUND SWM FACILITY FLOWS FROM FACILITY #1 OUTFALLS TO THIS SYSTEM AT EXISTING STONECROFT BOULEVARD AS THE POINT OF CONVEYANCE. THE EXISTING STORM SEWER SYSTEM AT STONECROFT BOULEVARD WAS DESIGNED TO RECEIVE FLOW FROM A PORTION OF THE SUBJECT PROPERTY.

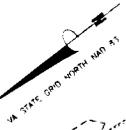
THE EXTENT OF REVIEW FOR THIS OUTFALL WILL BE BASED ON THE 6-2003.2A, WHICH STATES THAT THE EXTENT OF REVIEW SHALL BE TO A POINT THAT IS AT LEAST 100' DOWNSTREAM OF A POINT WHERE THE RECEIVING PIPE OR CHANNEL IS JOINED BY ANOTHER THAT HAS A DRAINAGE AREA THAT IS AT LEAST ONE (1) ACRE OF THE POINT OF CONVEYANCE.

THE CONTRIBUTING DRAINAGE AREA ASSOCIATED WITH THE PROPOSED DEVELOPMENT TO THE EXISTING STORM SEWER SYSTEM ON STONECROFT BOULEVARD IS 2.2 ACRES. THE POINT OF CONVEYANCE IS AN EXISTING STRUCTURE #1, WHICH IS THE POINT WHERE THE UTILITY PIPE FROM PROPOSED SWM FACILITY #1 CONNECTS TO THE EXISTING STORM SEWER SYSTEM. THE TOTAL CONTRIBUTING OUTFALL AREA ASSOCIATED WITH THE DEVELOPMENT, THEREFORE, PER FAR 6-2003.2A, THE EXTENT OF REVIEW ON THE EXISTING SYSTEM WILL BE 150' DOWNSTREAM OF POINT OF CONVEYANCE #2. BASED ON OUR PRELIMINARY ANALYSIS OF THE EXISTING STORM SEWER SYSTEM ALONG STONECROFT BOULEVARD, IT IS MY PROFESSIONAL OPINION THAT ADEQUATE OUTFALL EXIST FOR OUTFALL #4.

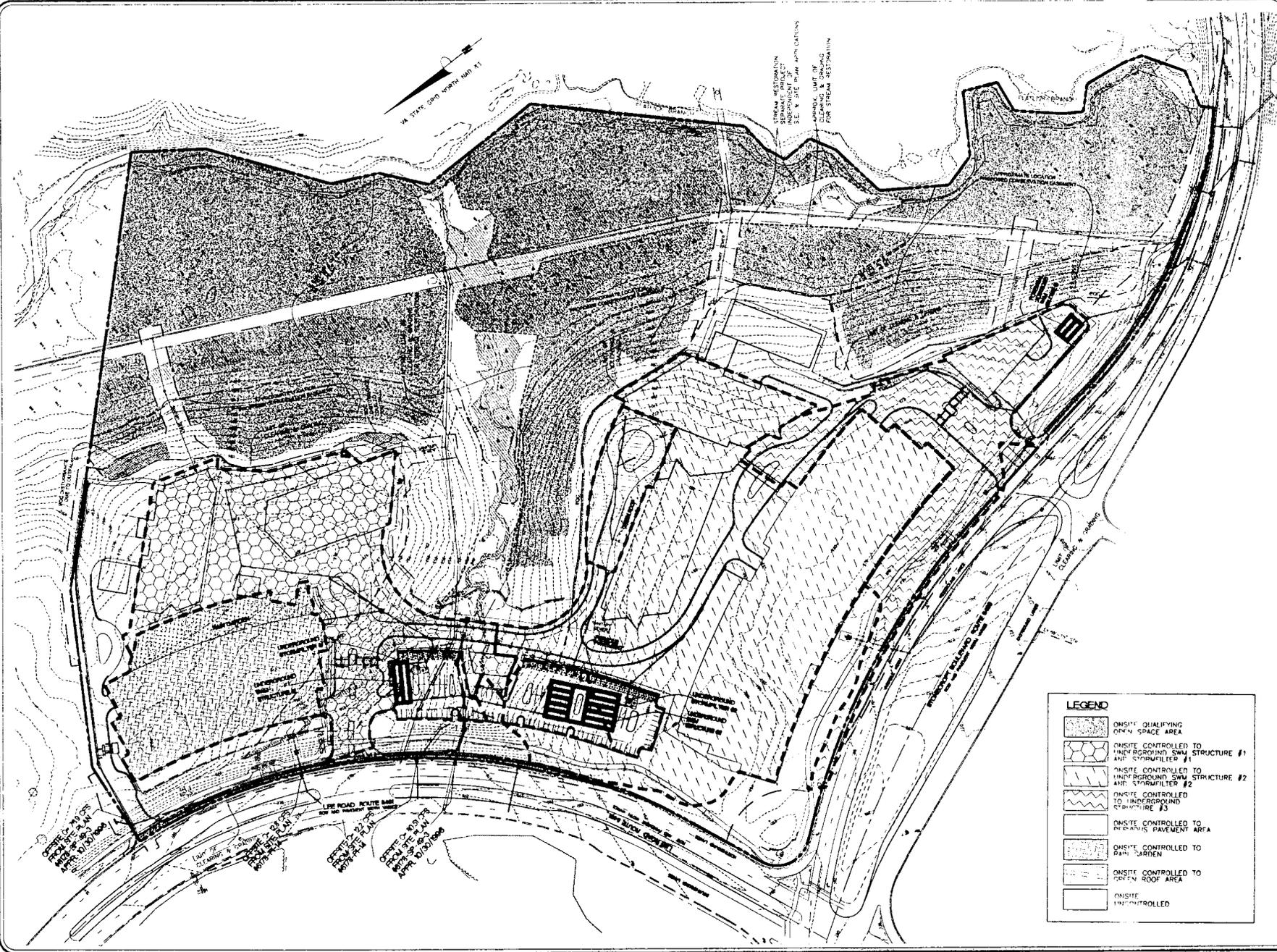


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39	06/11/08		



STORM WASTEWATER
 MANAGEMENT
 PLAN
 S.E. 1/4 SEC 10, T10N, R10E, S10E
 1/2 SECTION 10, T10N, R10E, S10E
 1/2 SECTION 10, T10N, R10E, S10E



LEGEND	
	ON-SITE QUALIFYING OPEN SPACE AREA
	ON-SITE CONTROLLED TO UNDERGROUND SWW STRUCTURE #1 AND STORMFILTER #1
	ON-SITE CONTROLLED TO UNDERGROUND SWW STRUCTURE #2 AND STORMFILTER #2
	ON-SITE CONTROLLED TO UNDERGROUND STRUCTURE #3
	ON-SITE CONTROLLED TO PERVIOUS PAVEMENT AREA
	ON-SITE CONTROLLED TO GREEN ROOF AREA
	ON-SITE UNCONTROLLED

BURGESS & NIPLE
 410 ATLANTIC AVENUE
 SUITE 200
 WESTFIELD, MA 01186
 TEL: (413) 562-4400 FAX: (413) 562-4401

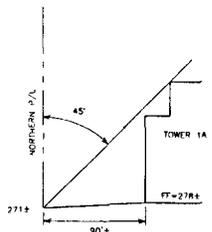
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5	08/11/2008	REVISED PER COMMENTS
6	08/11/2008	REVISED PER COMMENTS
7	08/11/2008	REVISED PER COMMENTS
8	08/11/2008	REVISED PER COMMENTS
9	08/11/2008	REVISED PER COMMENTS
10	08/11/2008	REVISED PER COMMENTS

**STORM WATER AND
 BEST MANAGEMENT PRACTICES MAP
 AEROSPACE CORPORATION
 WESTFIELDS, PARCEL 35**

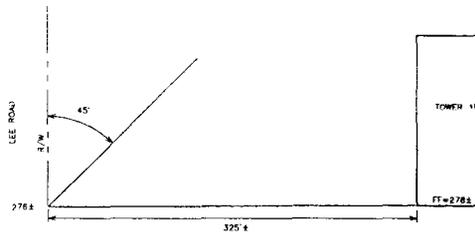


DATE	08/11/2008
SCALE	1"=70'
DESIGN	JPG
CHECK	PM
JOB NO.	0814447
P.R. NO.	47447
SHEET	14 OF 20
FILE NO.	C-4702

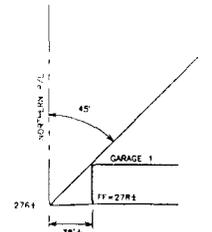
PLANNERS & CIVIL ENGINEERS, 111 STATE ST., WESTFIELD, MA 01186



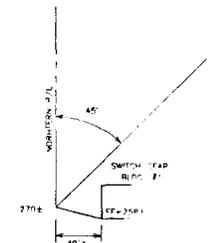
TOWER 1A
ANGLE OF BULK PLANE



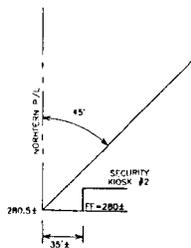
TOWER 1B
ANGLE OF BULK PLANE



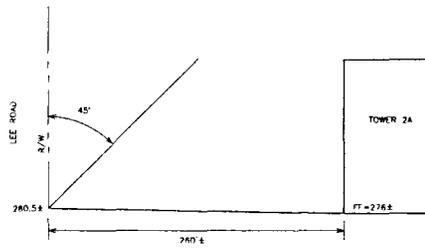
GARAGE 1
ANGLE OF BULK PLANE



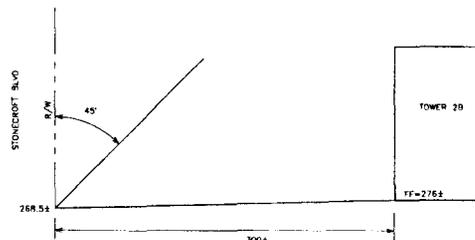
SWITCH GEAR BLDG #1
ANGLE OF BULK PLANE



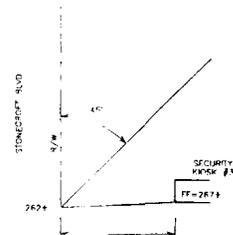
SECURITY KIOSK #2
ANGLE OF BULK PLANE



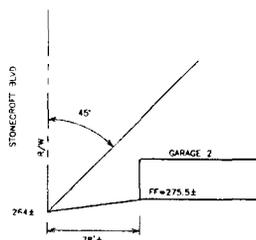
TOWER 2A
ANGLE OF BULK PLANE



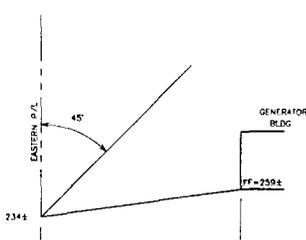
TOWER 2B
ANGLE OF BULK PLANE



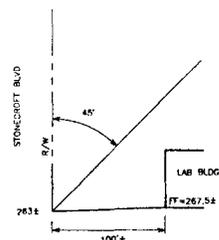
SECURITY KIOSK #3
ANGLE OF BULK PLANE



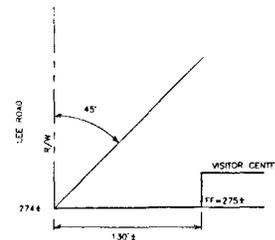
GARAGE 2
ANGLE OF BULK PLANE



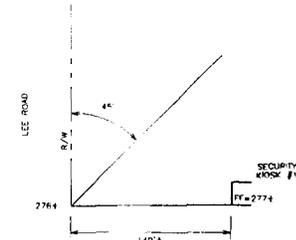
GENERATOR BUILDING
ANGLE OF BULK PLANE



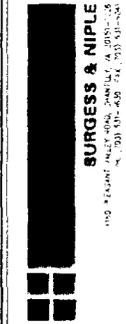
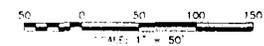
LAB BUILDING
ANGLE OF BULK PLANE



VISITOR CENTER
ANGLE OF BULK PLANE



SECURITY KIOSK #1
ANGLE OF BULK PLANE



DATE	DEC 17 1978
DESIGNER	W. J. GIBSON
CHECKER	W. J. GIBSON
PROJECT NO.	45447
SHEET NO.	7
FILE NO.	C-4702

ANGLE OF BULK PLANE DIAGRAMS
AEROSPACE CORPORATION
WESTFIELDS, PARCEL 35



DATE	MAY 29 1979
SCALE	1" = 50'
DESIGNER	JPC
CHECKER	DMT
PROJECT NO.	45447
SHEET NO.	7
FILE NO.	C-4702

Proffers
PCA 78-S-063-06
Parcel 35 of Westfields, The International Corporate Center at Dulles
For The Aerospace Corporation
March 9, 2009

Pursuant to Section 15.2-2303(A), Code of Virginia, 1950, as amended, subject to the Board of Supervisors approving a Proffered Condition Amendment for Tax Map 44-1 ((4)) 35 (the "Application Property"), the Applicant, for itself, its successors and assigns, hereby reaffirms the previous proffers applicable to the Application Property, RZ 78-S-063 and PCA 78-S-063-3, which will remain in full force and effect, except as amended as follows:

Replace Proffer #6 with the following:

- 6) Environmental Quality Corridor: The Environmental Quality Corridor ("EQC") that is associated with Flatlick Branch, as depicted on the GDP/SE Plat (as defined below), shall be preserved and maintained as permanent private major open space by the Applicant, and shall remain in its natural state, provided that certain intrusions into the EQC may occur as depicted and/or noted on the Generalized Development Plan prepared by Burgess and Niple, Oculus, Wetland Studies and Solutions, Inc., and KGD, which consists of thirty-one (31) sheets, and which is dated May 2008 (Sheets 1-6), February 2008 (Sheet 7), October 9, 2008 (Sheet 7A), November 2008 (Sheet 7B), September 2008 (Sheets 7C - 7H), May 2008 (Sheets 8 - 14), and October 9, 2008 (Sheet 15), all as revised through December 17, 2008 (the "GDP/SE Plat"). This Proffer 6 applies to areas within the EQC as depicted on the GDP/SE Plat, limits of clearing and grading, EQC intrusions, tree preservation and landscaping, and stormwater management ("SWM") outfall and stream restoration only, as depicted on the GDP/SE Plat. Pursuant to Par. 5 of Sect. 18-204, minor modifications to the GDP/SE Plat and these proffers may be permitted as determined by the Zoning Administrator. Any minor modifications to the special exception application for height only shall not require approval of a PCA or revisions to the proffered GDP/SE Plat.
- a) Conservation Easement: The conservation easement area shown on the GDP/SE Plat, shall remain as undisturbed open space with the exception of permitted trails and shall be subject to a recorded conservation easement as shown on the GDP/SE Plat running to the benefit of the Board of Supervisors, in a form approved by the County Attorney, which prohibits removal of trees except those which are dead, diseased, noxious/invasive or hazardous.
- b) Stream Restoration: The remaining tributary stream extending from the proposed outfall at the downstream limit of clearing through the EQC to Flatlick Branch shall be restored using "natural channel stream design concepts" to the maximum extent practicable as defined in § 10.1-560 of the Code of Virginia (the "Stream Restoration"). This design shall

accommodate the stream crossing at the sewer and water line easements while maintaining the wetlands in that area, shall accommodate existing and expected future off-site flows within a stable channel, and shall be reviewed in accordance with § 10.1-561. This design is generally depicted on Sheets 7A through 7H of the GDP/SE Plat, may be reviewed by the Department of Public Works and Environmental Services ("DPWES") if they choose to review it, and shall be approved by the U.S. Army Corps of Engineers ("COE") and the Virginia Department of Environmental Quality ("DEQ") prior to site plan approval. Written documentation of COE and DEQ approvals shall be provided to DPWES prior to site plan approval. Specific success criteria (the "Success Criteria"), maintenance and monitoring criteria (the "Maintenance and Monitoring Criteria"), and information regarding reports on these criteria (the "Monitoring Reports") is included on Sheet 7B of the GDP/SE Plat, and reforestation of the areas cleared for the Stream Restoration shall be as generally depicted on Sheets 7E and 7G of the GDP/SE Plat.

- c) Landscaping: Landscaping shall be generally consistent with the quality, quantity and the locations shown, respectively, on the "Landscape Plans" included as Sheets 10 and 10A, and with the "Plant Image Boards" included as Sheets 12, 12A and 12B of the GDP/SE Plat. At the time of planting the minimum size of deciduous canopy and understory trees shall be 1"-1 1/2" caliper, and the minimum height of evergreen trees shall be 8 feet. Areas that are cleared and graded for construction of stormwater sheet flow shall be replanted by the Applicant with native species more typically found at the edges of forests, such as *Acer rubrum* (Red maple), *Amelanchier arborea* (Serviceberry), *Cercis canadensis* (Redbud), *Carpinus caroliniana* (American Hornbeam), *Carya glabra* (Pignut hickory), *Cornus florida* (Dogwood), *Hamamelis virginiana* (Witchhazel), *Juniperus virginiana* (Redcedar), *Ilex opaca* (American holly), and *Quercus coccinea* (Scarlet oak), as depicted on the GDP/SE Plat, and as approved by Urban Forestry Management ("UFM"), as soon as construction activities in the sheet flow area are completed and planting conditions are appropriate, but in no instance shall this occur later than the to issuance of a Final NonRUP for any structure adjacent to a cleared area.
- d) SWM Outfall Design:
- i) SWM shall be designed to minimize the impact on the EQC and RPA by limiting the concentrated discharge to the area of the Stream Restoration, which shall be designed for this discharge. The remaining areas of runoff shall be designed to accommodate sheet flow, as appropriate and to the extent possible, as depicted on the GDP/SE Plat, as opposed to concentrating runoff into a pipe or channel system.

Specific SWM detention/BMP measures shall include a combination of structures and/or systems, including rain gardens, green roof(s), permeable pavement, storm filters, and underground detention; all of which shall be placed in otherwise already disturbed areas of the Application Property, as generally depicted on the GDP/SE Plat. Runoff from the majority of the impervious areas shall be collected and directed to one of these structures and/or systems, and then discharged into the restored tributary stream.

- ii) The Applicant shall be responsible for the maintenance of all stormwater management facilities, conveyance systems, and BMP facilities on the Application Property, including the restored stream that is utilized for adequate outfall, shall place these systems in a private drainage easement, and shall enter into an agreement for the maintenance of these stormwater management facilities and conveyance systems in perpetuity in a form acceptable to the County Attorney prior to site plan approval. The County shall have the right to periodically inspect these systems; however, any such inspectors must be cleared through security by the Applicant and shall be escorted by the Applicant at all times while on the Application Property.
- iii) If, the annual monitoring and Monitoring Reports reveals that the Stream Restoration has repeatedly failed to meet the Success Criteria, and the Stream Restoration has required significant and perpetual maintenance activities for reasons beyond control of the Applicant, then design alternatives to achieve a stable and viable stormwater conveyance system and reduce the maintenance burden may be permitted, if approved by DPWES and the Department of Planning and Zoning ("DPZ"), without the need for a PCA or SEA, provided that the alternatives do not reduce the effectiveness of the approved landscaping or open space; impact the relationship of the development to adjacent properties; or result in an increase in the amount of clearing and/or grading shown on the GDP/SE Plat.

e) Tree Preservation Plan:

- i) The Applicant shall submit a tree preservation plan at or prior to the second submission of the site plan. The limits of the tree preservation plan shall generally conform to the tree preservation area depicted on Sheets 10C and 10D of the GDP/SE Plat, which is that area up to 20 feet outside of the limits of clearing and grading shown on the GDP/SE Plat (the "Tree Preservation Area"). The tree preservation plan shall be prepared by a professional with experience in the preparation of tree preservation plans, such as a certified arborist or landscape architect, and shall be subject to the review and approval of Urban

Forest Management ("UFM"). The tree preservation plan shall consist of a tree survey that includes the location, species, size, crown spread and condition rating percentage of all trees 10 inches in diameter and greater, that are located within the Tree Preservation Area. At a minimum, the tree preservation plan shall provide for the preservation of trees within those areas shown for tree preservation on the GDP/SE Plat, with the exception of those trees shown to be removed due to anticipated impacts from construction activities; however, those trees shown to be removed shall be saved, if determined practicable, in coordination with the Urban Forester. The condition analysis ratings shall be prepared using methods outlined in the latest edition of the Guide for Plant Appraisal published by the International Society of Arboriculture. 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, shall be included in the plan.

- ii) All tree preservation activities specified above shall be accomplished in a manner that minimizes damage to vegetation to be preserved, including any woody, herbaceous or vine plant species that occurs in the lower canopy environment, and to the existing top soil and leaf litter layers that provide nourishment and protection to that vegetation. Removal of any vegetation, if any, or soil disturbance in the Tree Preservation Area, 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 UFM. The use of equipment in the Tree Preservation Area will be limited to hand-operated equipment such as chainsaw, wheel barrows, rake and shovels. Any work that requires the use of equipment, such as 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 UFM.
- iii) The Applicant shall retain the services of a certified arborist or landscape architect, and shall have the limits of clearing and grading in the Tree Preservation Area marked with continuous lines of flagging prior to the walk-through meeting with the UFM to be held prior to any clearing and grading. During the tree preservation walk-through meeting, the Applicant's certified arborist or landscape architect shall walk such limits of clearing and grading with an UFM representative to determine where adjustments to the clearing and grading limits can be made to increase the Tree Preservation Area and/or to increase the survivability of trees at the edge of the limits of grading, and such adjustment shall be implemented; provided, however, that no adjustment shall be required that would affect the location, design

and/or construction of the buildings. Trees within the Tree Preservation Area that are identified specifically by UFM in writing as dead or dying, or which are specifically identified to be removed on the Tree Preservation Plan, 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. Stumps within the Tree Preservation area should not be removed; however, 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. Any trees within the Tree Preservation Area that are removed for the reasons noted above, shall be replaced by the Applicant with native species more typically found at the edges of forests (as described in Proffer 6c and as approved and coordinated by UFM) as soon as construction activities in the area are completed and planting conditions are appropriate, prior to the issuance of a Final NonRUP for any structure adjacent to a cleared area. At the time of planting the minimum size of deciduous canopy and understory trees shall be 1"-1 1/2" caliper, and the minimum height of evergreen trees shall be 8 feet.

- iv) The Applicant shall conform strictly to the limits of clearing and grading as shown on the GDP/SE Plat, subject to exceptions specified in these proffered conditions and as necessary for the safe installation of fences, utilities and/or trails as determined by the Director of DPWES. Fences, utilities and/or trails in areas protected by the limits of clearing and grading as shown on the GDP/SE Plat, shall be located in the least disruptive manner necessary as approved by UFM. A replanting plan shall be developed and implemented, subject to approval by UFM for any areas protected by the limits of clearing and grading that must be disturbed for such fences, trails or utilities.
- v) All trees to be preserved on the tree preservation plan shall be protected by tree protection fencing. 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 shall be erected at the limits of clearing and grading adjacent to the tree preservation areas. All tree protection fencing shall be installed after the tree preservation walk-through meeting but prior to any clearing and grading activities. The installation of all tree protection fencing shall be performed under the supervision of a certified arborist and UFM, and accomplished in a manner that does not harm existing vegetation that is to be preserved. At least ten (10) days prior to the commencement of any clearing or

grading activities adjacent to the Tree Preservation Area, but subsequent to the installation of the tree protection devices, the UFM 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 UFM.

- vi) The Applicant shall root prune, as needed to comply with the tree preservation requirements of these proffers. All treatments shall be clearly identified, labeled, and detailed on the erosion and sediment control sheets of the respective public improvement/site plan submission. The details for these treatments shall be reviewed and approved by UFM, accomplished in a manner that protects affected and adjacent vegetation to be preserved, and may include, but not be limited to the following: (1) root pruning shall be done with a trencher or vibratory plow to a depth of 18 inches; (2) root pruning shall take place prior to any clearing and grading; (3) root pruning shall be conducted with the supervision of a certified arborist; and (4) a UFM representative shall be informed when all root pruning and tree protection fence installation is complete.
- vii) During any clearing or tree/vegetation removal in the areas adjacent to the Tree Preservation Area, a representative of the Applicant shall be present to monitor the process and ensure that the activities are conducted as proffered and as approved by UFM. The Applicant shall retain the services of a certified arborist or landscape architect to monitor on-site all construction and demolition work and tree preservation efforts in order to ensure conformance with all tree preservation proffers, and UFM approvals. The monitoring schedule shall be described and detailed in the Landscaping and Tree Preservation Plan, and reviewed and approved by UFM.
- viii) The Applicant shall retain a professional arborist with experience in plant appraisal, to determine the replacement value of all trees 10 inches in diameter or greater located on the Application Property that are shown to be saved on the Tree Preservation Plan. These trees shall be identified and their value shall be determined on the Tree Preservation Plan at the time of the second submission of the respective public improvement/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 UFM.

- ix) At the time of the respective public improvement/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 that die or are dying due to unauthorized construction activities. The Letter of Credit shall be equal to 50% of the replacement value of the Bonded Trees. The cash bond shall consist of 33% of the amount of the Letter of Credit. 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 UFM due to unauthorized construction activities, the Applicant shall replace such trees at its expense. The replacement trees shall be of equivalent size (or multiple trees that equal the same caliper as permitted by UFM), species and/or canopy cover as approved by UFM. In addition to this replacement obligation, the Applicant shall also make a payment equal to the value of any Bonded Tree that is dead or dying or improperly removed due to unauthorized activity. This payment shall be determined based on the Trunk Formula Method and paid to a fund established by the County for furtherance of tree preservation objectives. Upon release of the bond for structures abutting the Tree Preservation Area any amount remaining in the tree bonds required by this proffer shall be returned/released to the Applicant.
- f) Environmental/Recreational Contribution: Upon site plan approval for Building 1, the Applicant shall provide a \$350,000.00 contribution to the Sully Recreational Fund for construction of a facility in the Sully Magisterial District that provides recreational/environmental benefits to the Cub Run watershed. The specific beneficiary of the contribution shall be determined in consultation with the Sully Magisterial District Supervisor.

Add New Proffer 9G:

9) G. Transportation Improvements and Facilities:

- a) Dedication: At time of site plan approval for the Application Property, the Applicant shall dedicate in fee simple to the Board of Supervisors, right-of-way up to 60 feet from centerline along the Application Property's Lee Road frontage as shown on the GDP/SE Plat (as identified in Proffer 6). Sufficient right of way for construction of a third lane currently exists along the Application Property's Stonecroft Boulevard frontage; however, the Applicant shall dedicate in fee simple to the Board of Supervisors additional variable right-of-way between 47 and 91 feet from centerline along the Application Property's Stonecroft Boulevard frontage up to the

main entrance as shown on the GDP/SE Plat (which is the equivalent of an additional 10 feet of right of way along that frontage for construction of a right turn lane into the Application Property's Stonecroft Boulevard entrance).

b) Road and Turn Lane Construction:

- i) Prior to the issuance of the first NonRUP for Building 1 (which includes Towers 1A and 1B), the Applicant shall (a) complete construction of a third lane on Lee Road as shown on the GDP/SE Plat (which will function as right turn lanes into the Application Property's two Lee Road entrances), (b) shall complete the construction of a left turn lane into the Application Property at the existing median break on Lee Road as shown on the GDP/SE Plat, (c) shall construct a second left turn bay from Lee Road (westbound) onto Stonecroft Boulevard (southbound) as shown on the GDP/SE Plat or, if permitted by VDOT, stripe a left turn lane from Lee Road onto Stonecroft Boulevard in lieu of construction of this turn lane (which results in dual lefts), (d) and shall make appropriate signal adjustments or modifications as required by VDOT to accommodate the turn lane(s) described in Par. 9(b)(i)(c) above.
- ii) Construction of a third lane along the Applicant Property's Stonecroft Boulevard frontage shall occur as described in Proffer 9, which was accepted pursuant to the Board of Supervisor's approval of PCA 78-S-063-3, and which shall occur prior to the first NonRUP issued for the occupation of Building 2 (which includes Towers 2A and 2B). Right and left turn bays into the Application Property's Stonecroft Boulevard entrance, as shown on the GDP/SE Plat, shall be constructed by the Applicant and shall occur simultaneously with the third lane's construction. Simultaneously with the third lane's construction, the Applicant shall also extend the existing left turn lane from Stonecroft Boulevard onto Westfields Boulevard within the existing right of way by approximately 200 feet (which is approximately the maximum turn lane length that the existing median can accommodate).
- c) Traffic Signals: Concurrent with or prior to the submission of the site plan's second submission, the Applicant shall submit to VDOT warrant studies based on full build out of the Application Property for traffic signals at the Application Property's two major entrances (one on Lee Road and one on Stonecroft Boulevard). The Applicant shall design, equip, and construct each signal when warranted, if warranted prior to final bond release. If any of the signals are not warranted prior to final bond release, then the Applicant shall provide an escrow for the cost of such signal(s) in an

amount as determined by FCDOT (based upon the value of a typical VDOT traffic signal) in lieu of construction (the "Traffic Signal Escrow"). If not warranted within five (5) years after the issuance of the final NonRUP for both Buildings 1 and 2, then the Traffic Signal Escrow shall be returned to the Applicant.

d) Transportation Demand Management and Bus Shelters:

- i) The Applicant shall appoint a Transportation Coordinator (the "TC"), whose responsibility shall be to implement the TDM Strategies, with on-going coordination with FCDOT, prior to issuance of the final NonRUP for the first building. The contact information of the TC shall be provided by the Applicant to FCDOT within 30 days of such designation, and shall update the contact information within 30 days after changes occur in said designation.
- ii) The TC shall work with the Applicant to encourage telecommuting, carpooling, and to provide staggered work hours with the goal of reducing vehicular peak hour trips by 10% (the "TDM Goal"), derived from trip generation rates and/or equations applicable to 975,000 square feet of General Office use as set forth in the Institute of Transportation Engineers, Trip Generation Manual, 7th Edition Land Use Code 710 (General Office).
- iii) In order to meet the TDM Goal, the Applicant shall implement this TDM Program, which may be amended, subject to the approval of FCDOT, without the necessity of a PCA. Strategies shall include, but shall not be limited to, the following initiatives that shall be implemented by the Applicant as each phase of construction is complete:
 - (1) Participation in the Fairfax County Ride Share Program and other applicable trip reduction programs sponsored by FCDOT;
 - (2) Display materials regarding Metrorail, Metrobus, Fairfax Connector, ride-sharing, teleworking and other relevant transit options in a centralized public location within each phase of development;
 - (3) Provide information of potential carpool and vanpool options that may be available to employees. Designated carpool and vanpool parking spaces shall be provided in preferred locations within the parking garages;
 - (4) Provide relevant transit maps, information regarding ride-sharing and teleworking, and other relevant transit option information to employees through posting within a centralized common-area,

inclusion within a newsletter, or posting to a website that is accessible by the employees; and,

- (5) Provide conveniently located bicycle parking within each structured parking area. Accessible shower and locker room facilities for employee use shall be located within the fitness facility.
- iv) Monitoring: Twelve (12) months following issuance of a non-RUP for 975,000 gross square feet of development, the effectiveness of the TDM program shall be evaluated using surveys and/or traffic counts prepared by the TC in cooperation with FCDOT. The TC shall submit an Annual Report to FCDOT based upon said surveys and/or traffic counts, in order to facilitate a determination by FCDOT that the TDM Goal has, or has not, been achieved. The Applicant shall conduct such surveys and/or traffic counts annually until it is demonstrated through two (2) consecutive surveys and/or annual traffic counts that the TDM Goal has been achieved, at which time, no additional surveys and/or traffic counts shall be required.
- v) TDM Remedy: In the event that the TDM Goal has not been achieved pursuant to the aforesaid two consecutive surveys and/or traffic counts, then the Applicant shall meet with FCDOT to review the TDM Program for the purpose of identifying additional strategies and programs that may be implemented to assist in achieving the TDM Goal.
- vi) Bus Shelters: The Applicant shall provide two (2) bus shelters and appropriate access easements in the locations as generally shown on the GDP/SE Plat prior to final bond release. The bus shelters shall be the typical open type and installation shall be limited to the concrete pad, the shelter itself, a concrete connection from the shelter's concrete pad and a paved walkway, and a trash can. No bus turn outs or special lanes shall be provided by the Applicant. The bus shelters and trash cans shall be maintained by the Applicant.

Add New Proffer 17:

- 17) Architecture and Use of Buildings: The architectural design of the buildings shall be in substantial conformance with the general character of the perspectives shown on Sheet 15 of the GDP/SE Plat (as identified in Proffer 6). Buildings 1 and 2, the Lab Building and security kiosks shall be designed to create the appearance of a coordinated development through the use of complementary architectural styles, building materials and/or colors in order to create a harmonious design with complementary yet distinctive architecture. Any penthouse equipment shall be screened and screening shall

be painted and/or treated to coordinate with the majority of the associated building's façade. The structured parking garages shall be designed to blend into the screening vegetation, and shall not be designed to be a significant architectural feature. Building materials shall consist of masonry, brick, stone, pre-cast concrete, EFIS, metal or glass. Fences adjacent to Lee Road or Stonecroft Boulevard shall be made of metal, and shall be similar in style to those fences shown on Sheet 10 of the GDP/SE Plat. Fences located on the rear or side of the Application Property shall be black coated chain link.

The primary use of the towers associated with Buildings 1 and 2 shall be office and research and development. The primary use of the cellar space associated with Building 1 shall be for a conference center, dining facility, fitness facility, laboratories, information technology, and ancillary office. The primary use of the cellar space associated with Building 2 shall be for laboratories, information technology, and ancillary office.

Add New Proffer 18:

18) Low Impact Design ("LID"):

a) In order to minimize runoff from the developed areas of the Application Property, the site design shall incorporate numerous LID measures. These measures shall include rain gardens, green roofs on the plaza and Visitor's Center, permeable pavement on the visitor's parking lot, natural channel stream design concepts, and reforestation of disturbed areas within the EQC with native species as generally depicted on the GDP/SE Plat.

b) LEED Certification:

(1) Prior to the issuance of a building permit for each building (the "Submitted Building") where LEED Certification is possible, the Applicant shall provide to the Environment and Development Review Branch of DPZ ("EDRB") documentation demonstrating the registration of the building with the U.S. Green Building Council for LEED certification and a LEED Project Checklist (the "Checklist") that lists the attempted credits within the version of the U.S. Green Building Council's Leadership in Energy and Environmental Design that is applicable at the time of the Submitted Building's design. The number of attempted credits identified on the Checklist shall meet, at least, the minimum number of credits necessary to attain LEED Certification of the Submitted Building.

- (2) Prior to the issuance of the first NonRUP for the Submitted Building, the Applicant shall execute a separate agreement and post, for the Submitted Building, a "LEED Building Escrow," in the form of cash or a Letter of Credit from a financial institute acceptable to DPWES as defined in the Public Facilities Manual, in the amount of \$2.00 per gross square foot of the Submitted Building that is located above seventy-five (75) feet in height as defined by the Zoning Ordinance. (See the table below for the maximum LEED Building Escrow for each building if constructed to its maximum permitted height.) This LEED Building Escrow shall be in addition to and separate from other bond or escrow requirements and shall be released upon demonstration to EDRB of attainment of certification by the U.S. Green Building Council's Leadership in Energy and Environmental Design that is determined to be applicable to the Submitted Building.

Maximum LEED Building Escrow Amounts for Each Building			
Buildings	Use	GFA Above 75 Feet in Height	Escrow
1A	Office	71,691	\$143,382
1B	Office	154,452	\$308,904
2A	Office	115,696	\$231,392
2B	Office	117,112	\$234,224

- (3) In the event that documentation demonstrating that the Submitted Building is LEED Certified is not provided to EDRB within one (1) year of the issuance of its final NonRUP, then the Applicant shall provide documentation to EDRB demonstrating that the Applicant has applied for LEED Certification for the Submitted Building with the U.S. Green Building Council.
- (4) If, within two (2) years of issuance of the NonRUP for the Submitted Building, the Applicant provides documentation to EDRB demonstrating that LEED Certification for the Submitted Building has not been attained, but that the Submitted Building has been determined by the U.S. Green Building Council to fall within three (3) points or less of attainment of LEED Certification, then 50% of the LEED Building Escrow shall be released to the Applicant and the other 50% of the escrow shall be contributed to Fairfax County and shall be posted to a fund within the County's budget supporting implementation of environmental initiatives. However, if the Applicant provides documentation from the U.S. Green Building Council demonstrating, to the satisfaction of EDRB, that the U.S. Green Building Council completion of the review of the LEED Certification application has been delayed through no fault of the

Applicant, the Applicant's contractors or subcontractors, this proffered time-frame shall be extended for one (1) year, and no release of escrowed funds shall be made to the Applicant or the County during this year unless the Applicant provides documentation from the U.S. Green Building Council to EDRB within this time-frame regarding the completion of the review of the LEED Certification application and any appeals, if applicable during the one (1) year extension. After this one (1)-year extension, additional one (1)-year extensions shall be granted if the Applicant provides documentation from the U.S. Green Building Council at the end of the previous one (1)-year extension period demonstrating, to the satisfaction of EDRB, that U.S. Green Building Council completion of the review of the LEED Certification application has continued to be delayed through no fault of the Applicant or the Applicant's contractors or subcontractors.

- (5) If, within two (2) years of issuance of the NonRUP for the Submitted Building, the Applicant fails to provide documentation to EDRB demonstrating attainment of LEED Certification, or otherwise fails to provide documentation to EDRB that the Submitted Building has fallen short of LEED Certification by three (3) points or less as described in Par. 4 above, the entirety of the LEED Building Escrow for that Submitted Building shall be contributed to Fairfax County and shall be posted to a fund within the County's budget supporting implementation of environmental initiatives. However, if the Applicant provides documentation from the U.S. Green Building Council demonstrating, to the satisfaction of EDRB, that U.S. Green Building Council completion of the review of the LEED Certification application has been delayed through no fault of the Applicant, the Applicant's contractors or subcontractors, this proffered time-frame shall be extended for one (1) year, and no release of escrowed funds shall be made to the Applicant or to the County during this year unless the Applicant provides documentation from the U.S. Green Building Council to EDRB within this time-frame regarding the completion of the review of the LEED Certification application and any appeals, if applicable during the one (1) year extension. After this one (1)-year extension, additional one (1)-year extensions shall be granted if the Applicant provides documentation from the U.S. Green Building Council at the end of the previous one (1)-year extension period demonstrating, to the satisfaction of EDRB, that U.S. Green Building Council completion of the review of the LEED Certification application has continued to be delayed through no fault of the Applicant or the Applicant's contractors or subcontractors.

- (6) Within one (1) year of the issuance of a NonRUP for the Submitted Building, the Applicant shall provide to the Environment and Development Review Branch of DPZ a letter from a LEED®-accredited professional stating that: a LEED building maintenance reference manual (the "Manual") has been prepared for use by future building owner's and/or tenants; the Manual has been written or approved by a LEED-accredited professional; copies of the Manual shall be provided to all future building occupants; and, the Manual, at a minimum, provides the following::
- (a) A narrative description of LEED components, including a description of the environmental benefits of that component and information regarding the importance of maintenance and operation in retaining the attributes of the Submitted Building;
 - (b) Product manufacturer's manuals or other instructions, where applicable, regarding operations and maintenance needs for applicable LEED components, including operational practices that can enhance energy and water conservation;
 - (c) A maintenance staff notification process for improperly functioning equipment and/or a list of local service providers that offer regularly scheduled service and maintenance contracts to assure proper performance of LEED building-related equipment and the Submitted Building, to include, where applicable, the HVAC system, water heating equipment, water conservation features, sealants, and caulks; and,
 - (d) Contact information that the Submitted Building's occupants can use to obtain further guidance on each LEED component that is applicable to the Submitted Building.

Submission of this letter, as described above, shall satisfy this proffer.

- (7) In addition to the letter specified above, and also within one (1) year of the issuance of a NonRUP for the Submitted Building, the Applicant shall provide an electronic copy of the Manual in PDF format (or other electronic format as determined acceptable by the County) to the Environment and Development Review Branch of the Department of Planning and Zoning. This electronic version of the manual shall be edited to exclude information pertaining to security systems or maintenance of systems in classified and secure areas.

- (8) All references to the U.S. Green Building Council shall apply to similar certifying agencies that are created subsequent to approval of this PCA, provided that the alternative certifying agency is acceptable to Fairfax County and the Applicant.

Add New Proffer 19:

- 19) Stream Valley Trail: Upon site plan approval, the Applicant shall escrow \$82,000.00 (based upon \$36.08 per square yard * 2,222 square yards) with Fairfax County for a paved stream valley trail to be constructed off-site, but within the Sully Magisterial District.

Add New Proffer 20:

- 20) Signage: All signs shall conform to Article 12 of the Zoning Ordinance and shall be unified conceptually throughout the Application Property for all phases of development.

Add New Proffer 21:

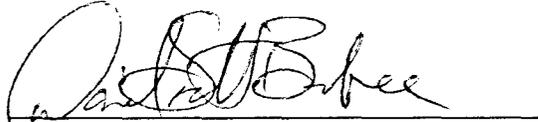
- 21) Lighting: All outdoor lighting fixtures shall be in accordance with the Performance Standards contained in Part 9 (Outdoor Lighting Standards) of Article 14 of the Zoning Ordinance, and shall be unified conceptually throughout the property for all phases of development.

[Signature on Next Sheet]

Proffers: PCA 78-S-063-06
The Aerospace Corporation
Parcel 35 Westfields

TITLE OWNER OF TAX MAP 44-1 ((4)) 35

THE AEROSPACE CORPORATION

A handwritten signature in black ink, appearing to read "Daniel S. Barbee", written over a horizontal line.

By: Daniel S. Barbee

Its: General Manager Facilities Division

[END OF SIGNATURES]

DEVELOPMENT CONDITIONS

SE 2008-SU-026

February 23, 2009

If it is the intent of the Board of Supervisors to approve SE 2008-SU-026 on Tax Map 44-1((4)) 35 at the northeastern quadrant of the intersection of Lee Road and Stonecroft Boulevard for an increase in building height from 75 feet up to a maximum of 165 feet pursuant to Sect. 9-607 of the Fairfax County Zoning Ordinance, the staff recommends that the Board condition the approval by requiring conformance with the following development conditions.

1. This Special Exception is granted for and runs with the land indicated in this application and is not transferable to other land.
2. This Special Exception is granted only for the purpose(s), structure(s) and/or use(s) indicated on the special exception amendment plat approved with the application, as qualified by these development conditions.
3. This Special Exception is subject to the provisions of Article 17, Site Plans. Any plan submitted pursuant to the special exception shall be in substantial conformance with the approved Special Exception (SE) Plat entitled "GDP/ SE Plat Aerospace Corporation, Westfields, Parcel 35", prepared by Burgess and Niple and others with all sheets revised through December 17, 2008. Minor modifications to the approved special exception may be permitted pursuant to Par. 4 of Sect. 9-004 of the Zoning Ordinance.
4. The height of the tower buildings shall not exceed a maximum height of 165 feet as shown on the GDP/ SE Plat.
5. Ancillary office shall be defined to consist of only satellite office space for tenants whose primary workspace is not located within the cellar space with a maximum of ten percent (10%) of the total cellar space devoted to such use.

The above proposed conditions are staff recommendations and do not reflect the position of the Board of Supervisors unless and until adopted by that Board.

This approval, contingent on the above noted conditions, shall not relieve the applicant from compliance with the provisions of any applicable ordinances, regulations, or adopted standards. The applicant shall be himself responsible for

obtaining the required Non-Residential Use Permit through established procedures, and this Special Exception shall not be valid until this has been accomplished.

Pursuant to Section 9-015 of the Zoning Ordinance, this special exception shall automatically expire, without notice, thirty (30) months after the date of approval unless, at a minimum, the use has been established or construction has commenced and been diligently prosecuted for one of the proposed office buildings. The Board of Supervisors may grant additional time to establish the use or to commence construction if a written request for additional time is filed with the Zoning Administrator prior to the date of expiration of the special exception. The request must specify the amount of additional time requested, the basis for the amount of time requested and an explanation of why additional time is required.



RECEIVED
Department of Planning & Zoning

JUN 04 2008

Zoning Evaluation Division

BURGESS & NIPLÉ

**METES AND BOUNDS DESCRIPTION
PARCEL 35, WESTFIELDS
SULLY DISTRICT, FAIRFAX COUNTY, VIRGINIA**

BEGINNING AT THE POINT OF INTERSECTION OF THE NORTHEASTERLY RIGHT-OF-WAY LINE OF STONECROFT BOULEVARD, ROUTE 8460 (VARIABLE WIDTH) AND THE EASTERLY RIGHT-OF-WAY LINE OF LEE ROAD, ROUTE 8461 (VARIABLE WIDTH), THENCE RUNNING WITH THE SAID EASTERLY RIGHT-OF-WAY LINE OF LEE ROAD THE FOLLOWING COURSES AND DISTANCES:

Burgess & Niple, Inc.
4160 Pleasant Valley Road
Chantilly, VA 20151
703 631.9630
Fax 703 631.6041

N66°10'05"E 152.93 FEET TO A POINT;

ALONG THE ARC OF A CURVE TO THE LEFT 911.00 FEET IN RADIUS, AN ARC DISTANCE OF 110.84 FEET, THE CHORD OF SAID ARC RUNNING N62°40'57"E 110.77 FEET TO A POINT;

N49°52'22"E 155.69 FEET TO A POINT;

ALONG THE ARC OF A CURVE TO THE LEFT 899.00 FEET IN RADIUS, AN ARC DISTANCE OF 704.34 FEET, THE CHORD OF SAID ARC RUNNING N26°54'42"E 686.46 FEET TO A POINT AT A SOUTHWESTERLY PROPERTY CORNER OF PARCEL 35B, WESTFIELDS; THENCE DEPARTING THE SAID RIGHT-OF-WAY LINE OF LEE ROAD AND RUNNING WITH THE SOUTHERLY PROPERTY LINE OF PARCEL 35B, WESTFIELDS THE FOLLOWING COURSES AND DISTANCES:

S85°31'59"E 150.00 FEET TO A POINT;

S59°52'19"E 300.84 FEET TO A POINT;

S44°46'37"E 748.68 FEET TO A POINT ON THE NORTHERLY PROPERTY LINE OF THE NOW OR FORMERLY TST WESTFIELDS LLC PROPERTY, SAID POINT LYING IN FLATLICK BRANCH; THENCE RUNNING WITH THE NORTHERLY PROPERTY LINE OF THE NOW OR FORMERLY TST WESTFIELDS, LLC PROPERTY AND FLATLICK BRANCH THE FOLLOWING COURSES AND DISTANCES:

S15°08'50"W 0.69 FEET TO A POINT;

S34°31'11"W 126.90 FEET TO A POINT;

S52°28'34"W 222.50 FEET TO A POINT;

S24°57'05"W 83.93 FEET TO A POINT;

S49°44'42"W 87.84 FEET TO A POINT;

S00°47'33"E 219.86 FEET TO A POINT;

S43°05'27"W 368.77 FEET TO A POINT;

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PARCEL 35, WESTFIELDS
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S84°26'39"W 50.61 FEET TO A POINT;

S66°15'55"W 39.75 FEET TO A POINT;

S02°42'25"E 54.99 FEET TO A POINT;

S59°56'37"W 49.43 FEET TO A POINT;

S80°05'36"W 100.40 FEET TO A POINT;

S32°51'30"W 118.32 FEET TO A POINT;

S16°40'30"E 60.45 FEET TO A POINT;

S58°40'58"E 109.12 FEET TO A POINT;

S23°10'19"W 60.77 FEET TO A POINT;

N83°55'50"W 54.96 FEET TO A POINT;

S40°47'24"W 83.48 FEET TO A POINT;

S30°58'00"W 34.25 FEET TO A POINT;

S44°40'48"E 45.65 FEET TO A POINT;

S07°18'31"W 71.90 FEET TO A POINT;

S16°30'11"W 33.18 FEET TO A POINT;

S56°58'41"W 78.42 FEET TO A POINT;

N75°32'26"W 63.04 FEET TO A POINT;

S43°12'56"W 23.25 FEET TO A POINT ON THE AFOREMENTIONED
NORTHEASTERLY RIGHT-OF-WAY LINE OF STONECROFT BOULEVARD; THENCE
RUNNING WITH THE SAID RIGHT-OF-WAY LINE OF STONECROFT BOULEVARD
THE FOLLOWING COURSES AND DISTANCES:

ALONG THE ARC OF A CURVE TO THE RIGHT 769.00 FEET IN RADIUS, AN ARC
DISTANCE OF 519.91 FEET, THE CHORD OF SAID ARC RUNNING N29°24'38"W 510.06
FEET TO A POINT;

N10°02'32"W 288.66 FEET TO A POINT;

ALONG THE ARC OF A CURVE TO THE LEFT 1231.00 FEET IN RADIUS, AN ARC
DISTANCE OF 637.39 FEET, THE CHORD OF SAID ARC RUNNING N24°52'32"W 630.29
FEET TO A POINT;

ALONG THE ARC OF A CURVE TO THE RIGHT 55.00 FEET IN RADIUS, AN ARC
DISTANCE OF 101.64 FEET, THE CHORD OF SAID ARC RUNNING N13°13'46"E 87.78
FEET TO THE POINT OF BEGINNING AND CONTAINING 40.41292 ACRES OF LAND.