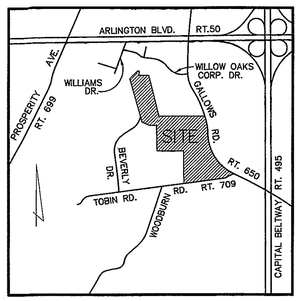
INOVA FAIRFAX HOSPITAL CAMPUS

Providence District Fairfax County, Virginia

Generalized Development Plan / Special Exception Amendment Plat
RZ 2008-PR-009 / SEA 80-P-078-15



VICINITY MAP
SCALE : 1"= 2,000'

Applicant:
INOVA Health Care Services
3300 Gallows Road
Falls Church, VA 22042

Sheet Index

1. COVER SHEET
2. EXISTING CONDITIONS PLAN
2A.INITIAL PHASE ALTERNATIVES
3. NOTES AND TABULATIONS
4. GENERALIZED DEVELOPMENT PLAN/SPECIAL EXCEPTION AMENDMENT PLAT
5. GENERALIZED DEVELOPMENT PLAN/SPECIAL EXCEPTION AMENDMENT PLAT - OPTION 1
6. GENERALIZED DEVELOPMENT PLAN/SPECIAL EXCEPTION AMENDMENT PLAT - OPTION 2
7. PEDESTRIAN CIRCULATION PLAN
8. CROSS SECTIONS / SITE FURNITURE
9. DETAIL ENLARGEMENTS
10. ROAD IMPROVEMENT PLAN
11. ROAD IMPROVEMENT PLAN
12. ROAD IMPROVEMENT PLAN
13. ROAD IMPROVEMENT PLAN
14. ROAD IMPROVEMENT PLAN
15. ROAD IMPROVEMENT PLAN
16. ROAD IMPROVEMENT PLAN
17. STORMWATER MANAGEMENT - GRADING PLAN
18. STORMWATER MANAGEMENT - LANDSCAPE PLAN
19. SWM AND OUTFALL NARRATIVES
20. SWM AND OUTFALL NARRATIVES
21. OUTFALL MAP
22. OUTFALL MAP
23. BMP AND RATING CURVES
24. HEC-1 MODELS
25. HEC-1 MODELS
26. HEC-1 MODELS

Dewberry®
Dewberry & Davis LLC
8401 ARLINGTON BLVD.
FAIRFAX, VA 22031
PHONE: 703.849.0100
FAX: 703.849.0118

SEAL

COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES CULLEITON
Lic. No. 20112
6·10·09
PROFESSIONAL ENGINEER

Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated ~~7/6/2009~~ (conditions dated 7/6/09)
Date Of (BOS) (PC) approval 7/13/2009
Sheet _____ of 27

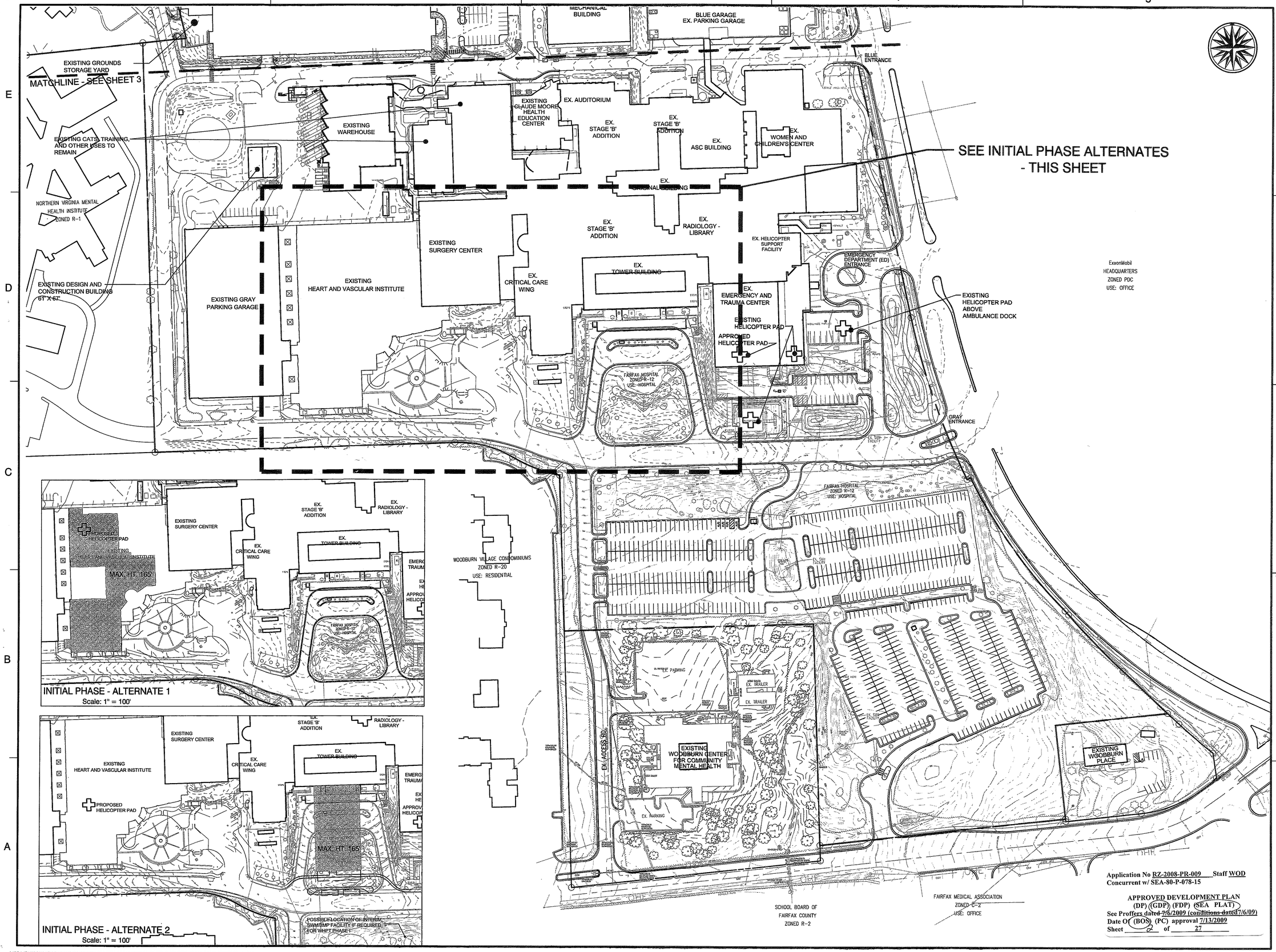
Revised June 10, 2009
Revised June 5, 2009
Revised May 20, 2009
Revised April 20, 2009
Revised March 26, 2009
Revised February 19, 2009
Revised January 23, 2009
Revised October 9, 2008
Revised August 28, 2008
Revised July 31, 2008
Rev. July 1, 2008
February 12, 2008

INOVA Fairfax Hospital Campus
Generalized Development Plan/
Special Exception Amendment
RZ 2008-PR-009
SEA 80-P-078-15

RECEIVED
Department of Planning & Zoning
RECEIVED
Department of Planning & Zoning
Zoning Evaluation Division

M-10691

RECEIVED
Department of Planning & Zoning
JUN 11 2009
Zoning Evaluation Division



Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated ~~7/6/2009 (conditions dated 7/6/09)~~
Date Of (BOS) (PC) approval 7/13/2009
Sheet 2 of 27

Q:\PROJECT\INOVA\Fairfax Hospital\Submissions\GDP\...15\Deliverables\2-EXISTING CONDITIONS.dwg, 6/10/2009 8:58:29 AM, jotna

Dewberry

Dewberry & Davis LLC
8403 ARLINGTON BLVD.
FAIRFAX, VA 22031
PHONE: 703.849.0100
FAX: 703.849.0519
www.dewberry.com

INOVA FAIRFAX HOSPITAL CAMPUS

GENERALIZED DEVELOPMENT PLAN / SPECIAL EXCEPTION AMENDMENT PLAT

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

SEAL

COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES CULLETON
Lic. No. 20112
6.10.09
PROFESSIONAL ENGINEER

KEY PLAN

SCALE
0' 80' 160'

No.	DATE	BY	Description
11	06.10.09	JMC	
10	06.05.09	JMC	
9	05.20.09	JMC	
8	04.20.09	JMC	
7	03.26.09	JMC	
6	02.19.09	JMC	
5	01.23.09	JMC	
4	10.09.08	JMC	
3	08.28.08	JMC	
2	07.31.08	ARW	
1	07.01.08	ARW	

REVISIONS

DRAWN BY JMC
APPROVED BY
CHECKED BY PGY
DATE February 12, 2008

TITLE

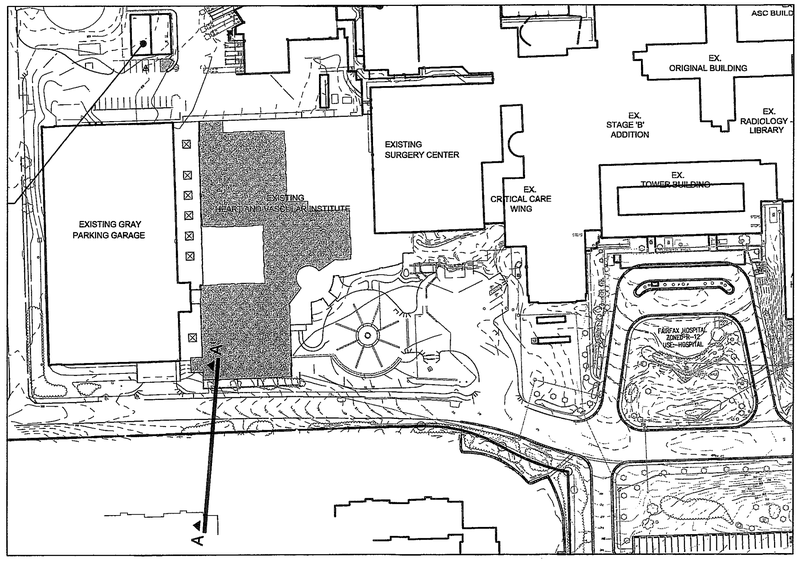
INOVA
Fairfax Hospital Campus
Development Plan
Existing Conditions Plan

PROJECT NO.

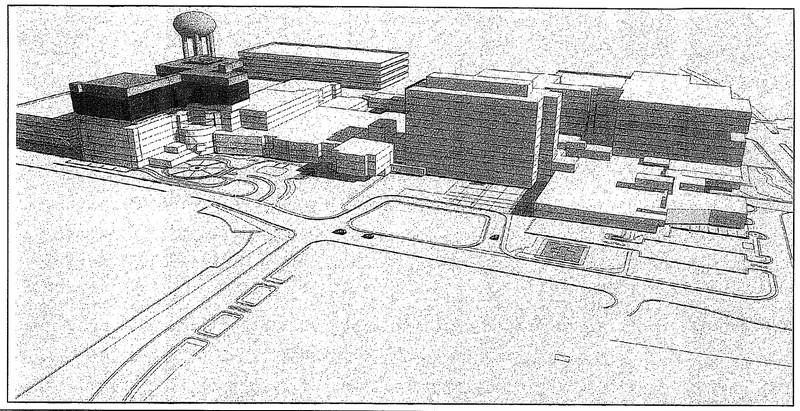
2

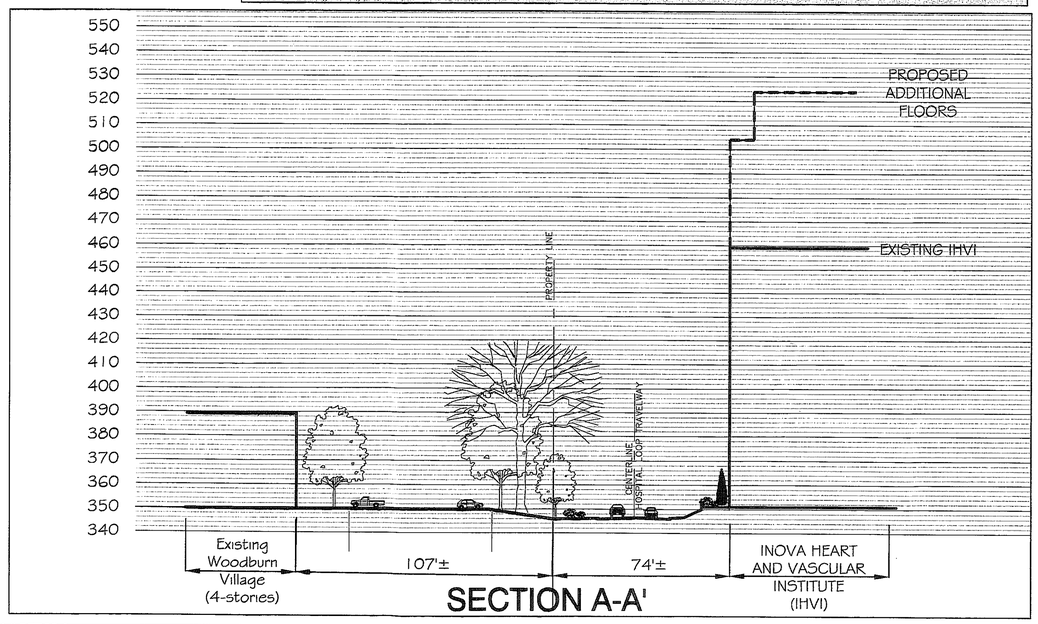
SHEET NO. 2 OF 26

M-10691

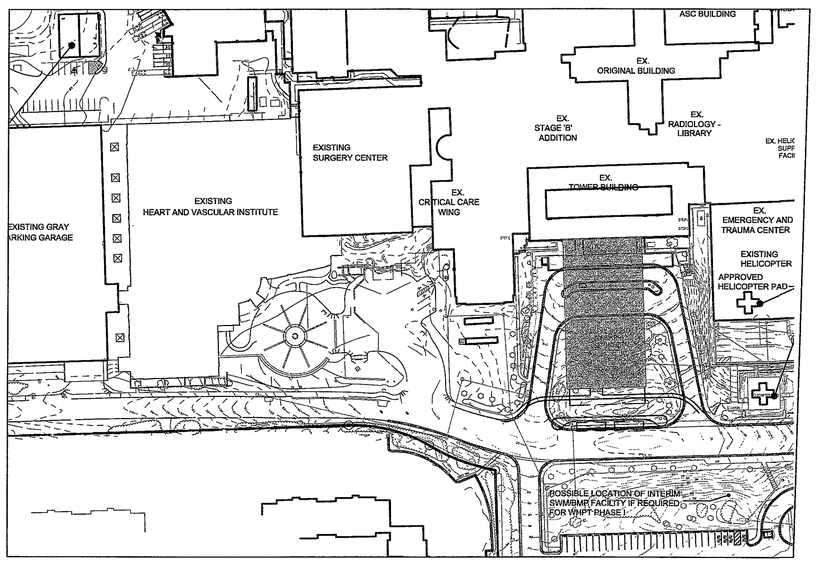


INITIAL PHASE - ALTERNATE 1

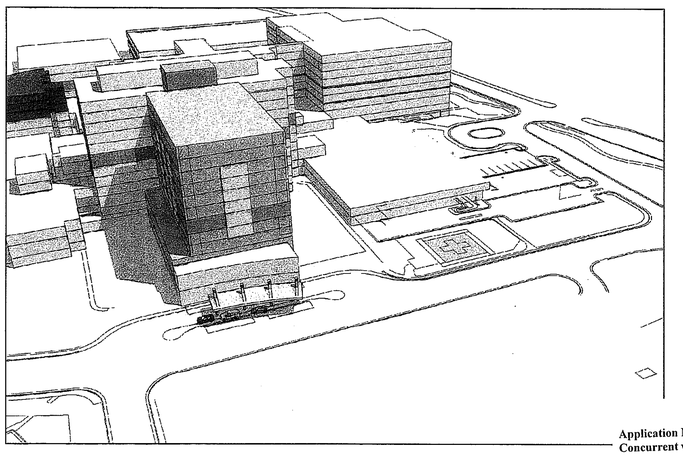




SECTION A-A'



INITIAL PHASE - ALTERNATE 2



Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated ~~7/6/2009 (conditions dated 7/6/09)~~
Date Of (BOS) (PC) approval 7/13/2009
Sheet 3 of 27

Dewberry®

Dewberry & Davis LLC
8403 ARLINGTON BLVD.
FAIRFAX, VA 22031
PHONE: 703.849.0100
FAX: 703.849.0519
www.dewberry.com

INOVA FAIRFAX HOSPITAL CAMPUS

GENERALIZED DEVELOPMENT PLAN / SPECIAL EXCEPTION AMENDMENT PLAT

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

SEAL

COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES CULLETON
Lic. No. 20112
6.10.09
PROFESSIONAL ENGINEER

KEY PLAN

SCALE

No.	DATE	BY	Description
11	06.10.09	JMC	
10	06.05.09	JMC	
9	05.20.09	JMC	
8	04.20.09	JMC	
7	03.26.09	JMC	
6	02.19.09	JMC	
5	01.23.09	JMC	
4	10.09.08	JMC	
3	08.28.08	JMC	
2	07.31.08	JMC	
1	07.01.08	ARW	

REVISIONS

DRAWN BY JMC
APPROVED BY
CHECKED BY PGY
DATE February 12, 2008

TITLE

INOVA
Fairfax Hospital Campus
Development Plan
Initial Phase

PROJECT NO.

2A

SHEET NO. 2A OF 26

M-10691

Q:\PROJECT\INOVA\Fairfax Hospital\Submissions\GDP\...15\Deliverables\2A-PHASING.dwg, 6/10/2009 11:47:11 A...

NOTES:

1. THE PROPERTY THAT IS THE SUBJECT OF THE RELATED REZONING AND SPECIAL EXCEPTION AMENDMENT (SEA) APPLICATIONS IS IDENTIFIED ON THE FAIRFAX COUNTY ZONING MAP AS 59-2 ((1)) 1A (PART), 1B, 1C, 1D AND 1E; AND 49-3 ((1)) 136C AND 136C1.

2. THE COMBINED GENERALIZED DEVELOPMENT PLAN (GDP)/SPECIAL EXCEPTION AMENDMENT (SEA) PLAT ACCOMPANIES A REZONING APPLICATION AND SEA APPLICATION THAT HAVE BEEN FILED TO AMEND THE CURRENT DEVELOPMENT PROGRAM ON THE INOVA FAIRFAX HOSPITAL CAMPUS THAT WAS APPROVED FOR SEA 80-P-078-14 BY THE BOARD OF SUPERVISORS ON DECEMBER 5, 2005. THE RELATED REZONING AND SEA APPLICATIONS HAVE BEEN FILED FOR THE FOLLOWING PURPOSES:

   A. TO REZONE THE AREA OF THE CAMPUS AND ADJOINING PROPERTY FROM THE R-1 AND R-12 DISTRICTS TO THE C-3 DISTRICT TO ENABLE AN INCREASE IN THE FLOOR AREA RATIO (FAR) ABOVE THE 0.70 THAT IS PRESCRIBED FOR THE R-12 DISTRICT.

   B. TO EXPAND THE LAND AREA OF THE CAMPUS FROM ITS ORIGINAL 58.90 ACRES TO A TOTAL OF 65.46 ACRES WHICH INCLUDES THE ADDED LAND AREAS OF THE WOODBURN MENTAL HEALTH CENTER AND THE FAIRFAX HOUSE AKA WOODBURN PLACE.

   THE OPTION 1 PROPOSED DEVELOPMENT PROGRAM FOR THE TOTAL NEW CAMPUS LAND AREA IS BASED ON THE PREMISE THAT THE EXISTING WOODBURN MENTAL HEALTH CENTER USE WILL REMAIN IN ITS CURRENT LOCATION FOR THE NEAR TERM, AND THAT ANY EXPANSION TO THIS USE WILL BE COORDINATED AND ACCOMMODATED AT A LOCATION OFF SITE.

   THE OPTION 2 DEVELOPMENT PROGRAM IS BASED ON THE PREMISE THAT THE EXISTING WOODBURN MENTAL HEALTH CENTER BUILDING WILL BE RAZED, THE USE WILL BE TEMPORARILY RELOCATED TO A NEARBY LOCATION OFFSITE, AND THAT A NEW FACILITY WOULD BE CONSTRUCTED ON THE 5.41 ACRE SITE AT A 0.8 FAR (188,500± SF GFA).

   BOTH DEVELOPMENT PROGRAMS DEPICT THE EXISTING WOODBURN PLACE BUILDING (AKA FAIRFAX HOUSE) TO REMAIN. THE OPTION 1 DEVELOPMENT PROGRAM ALLOCATES A TOTAL OF 15,000 SQUARE FEET OF GROSS FLOOR AREA (GFA) TO ACCOMMODATE FUTURE EXPANSION OF THIS USE. THE OPTION 2 DEVELOPMENT PROGRAM ASSUMES A TOTAL OF 40,075 SQUARE FEET OF GROSS FLOOR AREA WILL BE RESERVED FOR THIS USE.

   C. TO REPRESENT REVISED, UPDATED GROSS FLOOR AREA(GFA) CALCULATIONS FOR ALL THE EXISTING BUILDINGS ON THE CAMPUS IN ACCORDANCE WITH A STUDY THAT WAS PRESENTED TO THE DIRECTOR OF THE ZONING EVALUATION DIVISION, DPZ BY LETTER DATED MARCH 7, 2007.

   D. TO REPRESENT THE APPROXIMATE LOCATIONS OF FOUR (4) HELICOPTER PADS THAT ARE/WILL BE ACCESSORY TO THE HOSPITAL USE.

   E. TO SEEK APPROVAL FOR BOTH THE EXISTING AND THE PROPOSED BUILDING HEIGHTS ON THE CAMPUS THAT ARE IN EXCESS OF THE 90 FOOT MAXIMUM BUILDING HEIGHT THAT IS PRESCRIBED BY THE C-3 DISTRICT REGULATIONS IN ACCORDANCE WITH THE PROVISIONS SET FORTH IN SECT 9-607 OF THE ZONING ORDINANCE. THE BUILDING HEIGHTS FOR THE EXISTING AND PROPOSED BUILDINGS ARE PRESENTED ON THE BUILDING SCHEDULES.

   F. TO REPRESENT A PROPOSED EXPANSION TO THE CURRENTLY APPROVED DEVELOPMENT PROGRAM ON THE CAMPUS WHICH WILL CONSIST OF A NEW WOMEN'S HOSPITAL AND PATIENT TOWER THAT WILL INCLUDE AN EXPANSION TO THE NEONATAL INTENSIVE CARE UNIT (NICE).
   IN OPTION 1, THE PROPOSED WOMEN'S HOSPITAL AND PATIENT TOWER (WHPT) BUILDING WILL CONTAIN UP TO 821,661 SQUARE FEET OF GROSS FLOOR AREA IN A PROPOSED BUILDING UP TO ELEVEN (11) STORIES IN HEIGHT.

   IN THE OPTION 2 DEVELOPMENT PROGRAM, THE PROPOSED WOMEN'S HOSPITAL AND PATIENT TOWER (WHPT) WILL CONTAIN UP TO 642,686 SQUARE FEET OF GROSS FLOOR AREA IN A PROPOSED BUILDING UP TO NINE (9) STORIES IN HEIGHT.

   EVEN IF THE APPLICATION PROPERTY IS OR PROCEEDS ON AN INTERIM BASIS TO BE DEVELOPED PURSUANT TO OPTION 2, INOVA MAY CONSTRUCT THE PROPOSED WOMEN'S HOSPITAL AND PATIENT TOWER ("WHPT") UP TO THE MAXIMUM GFA AND HEIGHT OF THE WHPT AS SHOWN IN OPTION 1 WITHOUT REQUIRING A PROFFERED CONDITION AMENDMENT ("PCA") OR SPECIAL EXCEPTION AMENDMENT ("SEA") IF SUFFICIENT ADDITIONAL GFA BECOMES AVAILABLE TO SUPPORT THE DEVELOPMENT PROGRAM, THROUGH DEMOLITION OF EXISTING GFA ON THE APPLICATION PROPERTY,BY AGREEMENT WITH FAIRFAX COUNTY IN ITS PROPRIETARY CAPACITY TO UTILIZE UNUSED DENSITY ON THE WOODBURN SITE AND/OR THE WOODBURN PLACE SITE AND/OR BY WAY OF AN AMENDMENT TO THE COMPREHENSIVE PLAN.

   THE PURPOSE OF THE ABOVE PARAGRAPH IS TO ALLOW INOVA TO CONSTRUCT ONLY THE WHPT UP TO THE MAXIMUM GFA AND HEIGHT OF THE WHPT AS IT IS SHOWN ON THE GDP/SEA PLAT UNDER OPTION 1 IN THE EVENT ADDITIONAL GFA BECOMES AVAILABLE IN THE FUTURE, AND THIS IS ALLOWABLE ONLY BECAUSE THE OPTION 1 WHPT HAS BEEN APPROVED AS PART OF RZ 2008-PR-009. AS SHOWN ON THE GRAPHIC, THE OPTION 1 WHPT AND THE OPTION 2 WHPT HAVE THE SAME BUILDING FOOTPRINT, AND THIS PARAGRAPH WOULD ONLY ALLOW THE CONSTRUCTION OF ADDITIONAL FLOORS WITHIN THE OPTION 2 WHPT NOT TO EXCEED THE MAXIMUM HEIGHT LIMIT OF THE OPTION 1 WHPT (165 FEET). ANY SUCH ADDITIONAL GFA INCORPORATED INTO THE OPTION 2 WHPT WILL COUNT TOWARD THE TOTAL ALLOWABLE FAR FOR THE APPLICATION PROPERTY. A PCA AND/OR SEA SHALL BE REQUIRED TO UTILIZE ANY SUCH ADDITIONAL GFA ANYWHERE OTHER THAN IN THE WHPT.

   IT IS TO BE NOTED THAT A SECOND MECHANICAL PLANT THAT WILL SERVE THE PROPOSED EXPANSION TO THE DEVELOPMENT PROGRAM ON THE SOUTHERN PORTION OF THE CAMPUS WILL BE REQUIRED AND WILL BE LOCATED IN THE FOOTPRINT OF THE PROPOSED WHPT BUILDING.

   G. TO REPRESENT A NEW TOTAL OF PROPOSED LICENSED BEDS FOR THE HOSPITAL AT 1026. THIS REPRESENTS AN INCREASE OF 193 BEDS FROM THE CURRENTLY LICENSED APPROVED BED COUNT. (1026 - 833).

   H. TO REPRESENT PROPOSED MODIFICATIONS TO THE EXISTING TRAFFIC CIRCULATION PLAN ON THE CAMPUS. IT IS TO BE NOTED THAT SOME OF THE EXISTING ROADS ON THE CAMPUS ARE CURRENTLY RECOGNIZED IN THE STATE SYSTEM. THE APPLICANT HAS PROPOSED THAT THE ROADS BE DISCONTINUED FROM THE STATE SYSTEM AND TO MAKE ALL OF THE EXISTING AND PROPOSED ROADS ON THE CAMPUS PRIVATE TRAVELWAYS WITH PUBLIC ACCESS EASEMENTS

   I. TO REPRESENT THE APPROXIMATE LOCATION OF PROPOSED COOLING TOWERS AND GENERATORS THAT WILL BE REQUIRED TO SERVE THE BUILDING EXPANSION PROGRAM. THE COOLING TOWERS AND GENERATORS WILL BE ENCLOSED BY SCREEN WALLS WITH LOUVERS. IF A PART OF THE ENCLOSED AREA IS COVERED WITH A ROOF, AND THUS CONSIDERED GROSS FLOOR AREA, IT WOULD CONTAIN APPROXIMATELY 910 SQUARE FEET OF GROSS FLOOR AREA WHICH WILL BE DEDUCTED FROM THE TOTAL PROPOSED GROSS FLOOR AREA THAT IS REPRESENTED IN THE TABULATION.

   J. TO REPRESENT THE APPROXIMATE LOCATION OF A PROPOSED TRANSFORMER SITE THAT WILL BE REQUIRED TO SERVE THE PROPOSED BUILDING EXPANSION PROGRAM

   K. TO REPRESENT A PROPOSED NEW EMPLOYEE ENTRANCE ON THE NORTH SIDE OF BUILDING 2 WHICH IS LABELED EX. STAGE B ADDITION. IF THE COVERED ENTRANCE IS ENCLOSED, AND THUS CONSIDERED GROSS FLOOR AREA, IT WOULD CONTAIN APPROXIMATELY 550 SQUARE FEET OF GROSS FLOOR AREA WHICH WILL BE DEDUCTED FROM THE TOTAL PROPOSED GROSS FLOOR AREA THAT IS REPRESENTED IN THE TABULATION.

   L. TO DELETE THE PREVIOUSLY APPROVED, BUT NOT-YET-DEVELOPED CHILD CARE CENTER #2, (10,000± SF GFA) AND THE PREVIOUSLY APPROVED, BUT NOT-YET-DEVELOPED RESIDENT STUDENT HOUSING (99,500± SF)

   M. TO REPRESENT THE APPROXIMATE LOCATION OF A PROPOSED ADDITIONAL COOLING TOWER THAT WILL BE REQUIRED TO SERVE THE BUILDING PROGRAM ON THE NORTH SIDE OF THE CAMPUS. THE ADDITIONAL COOLING TOWER WILL BE LOCATED IN THE VICINITY OF THE EXISTING COOLING TOWERS THAT ARE LOCATED ON THE EXISTING MECHANICAL BUILDING #5 AS NOTED ON THE GRAPHIC.

3. THE BOUNDARY INFORMATION SHOWN ON THE GRAPHIC IS FROM EXISTING RECORDS.

4. THE TOPOGRAPHY SHOWN ON THE GRAPHIC IS AT A CONTOUR INTERVAL OF TWO (2) FEET FROM AN AIR SURVEY THAT HAS BEEN FIELD VERIFIED.

5. THE EXISTING BUILDING DIMENSIONS AND LOCATIONS, AND PARKING LOT LAYOUT AND INTERNAL CIRCULATION INFORMATION ARE TAKEN FROM AN AIR SURVEY AND FROM AS_BUILT SURVEY RECORDS PERFORMED BY DEWBERRY AND BY OTHERS.

6. THE PROPERTY IS SERVED BY PUBLIC WATER AND SEWER.

7. THE MINIMUM YARD REQUIREMENTS SET FORTH IN THE ZONING ORDINANCE FOR THE C-3 DISTRICT ARE AS FOLLOWS. IT IS TO BE NOTED THAT THE MINIMUM YARDS ARE APPLICABLE ONLY TO THE PERIPHERY OF THE SUBJECT PROPERTY.

   FRONT YARD: CONTROLLED BY A 25o ANGLE OF BULK PLANE, BUT NOT LESS THAN 40 FEET.

   SIDE YARD: NO REQUIREMENT

   REAR YARD: CONTROLLED BY A 20o ANGLE OF BULK PLANE, BUT NOT LESS THAN 25 FEET.

8. LANDSCAPING AND SCREENING AND TREE CANOPY HAVE BEEN/WILL BE PROVIDED IN ACCORDANCE WITH THAT REPRESENTED ON THE GRAPHICS; IN ACCORDANCE WITH THE APPLICABLE PROVISIONS OF ARTICLE 13 OF THE ZONING ORDINANCE; IN ACCORDANCE WITH CHAPTER 122, TREE CONSERVATION ORDINANCE; AND IN ACCORDANCE WITH PREVIOUSLY APPROVED DEVELOPMENT CONDITIONS. IN ITS APPROVAL OF SEA 80-P-078-14, THE BOARD MODIFIED THE TRANSITIONAL SCREENING AND WAIVED THE BARRIER REQUIREMENTS AS HAD BEEN PREVIOUSLY APPROVED WITH ITS APPROVAL OF SE 80-P-078 THROUGH SEA 80-P-078-13 IN FAVOR OF THAT SHOWN ON THE SEA PLAT. A REQUEST IS HEREBY MADE FOR A RENEWED BOARD MODIFICATION/WAIVER OF SAID REQUIREMENTS IN CONJUNCTION WITH ITS APPROVAL OF THIS SEA-15.

   THE PROPOSED TREES AND LANDSCAPING PROGRAM ALONG GALLOWS ROAD SOUTH OF THE SOUTHERNMOST ENTRANCE TO THE CAMPUS ARE IN COMPLIANCE WITH THE STREETSCAPE GUIDELINES SET FORTH IN THE MERRIFIELD SUBURBAN CENTER. IN ADDITION THE LANDSCAPE PROGRAM IS DESIGNED TO SCREEN THE PROPOSED COOLING TOWERS/GENERATORS. SAID LANDSCAPE PROGRAM WILL BE INSTALLED AS REPRESENTED ON THE GRAPHIC SUBJECT TO ANY QUALIFICATION THAT MAY BE REQUIRED BASED ON THE HELICOPTER FLIGHT PATH /APPROACH GUIDELINES.

   THERE ARE EXISTING LANDSCAPE TREES AND SHRUBS IN THE VICINITY OF THE PROPOSED IMPROVEMENTS THAT ARE THE SUBJECT OF THIS SPECIAL EXCEPTION AMENDMENT 80-P-078-15 THAT MAY OR WILL BE REMOVED DUE TO CONSTRUCTION. ALL SUCH LANDSCAPE TREES AND SHRUBS THAT WILL BE REMOVED WILL BE REPLACED WITH DESIRABLE TREES AND SHRUBS THAT ARE SUITABLE FOR THE PARTICULAR ENVIRONMENT AS APPROVED BY THE URBAN FOREST MANAGEMENT DIVISION, DPWES.

   THE INTERIOR PARKING LOT LANDSCAPING, PERIPHERAL PARKING LOT LANDSCAPING, AND TREE CANOPY CALCULATIONS THAT ARE PRESCRIBED BY THE PROVISIONS OF ARTICLE 13 OF THE ZONING ORDINANCE AND CHAPTER 122 OF THE CODE WILL BE PROVIDED WITH THE SUBMISSION OF THE SITE PLAN(S) FOR THE SUBJECT DEVELOPMENT PROGRAM.

9. IN COMPLIANCE WITH DEVELOPMENT CONDITION #17 APPROVED WITH SEA 80-P-078-8 AND DEVELOPMENT CONDITION #7 APPROVED WITH SEA 80-P-078-9, A PARKING STUDY UPDATE FOR THE FAIRFAX HOSPITAL CAMPUS WAS COMPLETED AND FILED WITH THE COUNTY ON SEPTEMBER 12, 2003. A MORE RECENT PARKING SYSTEMS STUDY UPDATE WAS FILED ON JULY 31, 2008. THAT STUDY CONCLUDED THAT THERE WILL BE A FUTURE CAMPUS DEMAND FOR 4,866 PARKING SPACES WITH THE COMPLETION OF THE PROPOSED DEVELOPMENT PROGRAM. AS NOTED IN THE TABULATION, UNDER THE OPTION 1 PROPOSED DEVELOPMENT PROGRAM, THERE WILL BE 4,724 PARKING SPACES ON THE CAMPUS.

   AS NOTED IN THE STUDY UPDATE, IF THIS SLIGHT DEFICIENCY BECOMES AN ACTUAL OPERATIONAL CHALLENGE, THERE ARE VARIOUS MANAGEMENT OPTIONS THAT INOVA COULD EMPLOY, INCLUDING VALET AND STACKED PARKING IN DESIGNATED LOCATIONS ON THE CAMPUS, OFF-SITE PARKING AND SHUTTLE BUS SERVICE, SHARED PARKING BETWEEN DESIGNATED USER GROUPS, OR A COMBINATION OF THESE STRATEGIES.

   THE HOSPITAL RESERVES THE RIGHT TO REDUCE THE NUMBER OF PARKING SPACES ON THE CAMPUS WITHOUT A PCA, AN SEA OR ADMINISTRATIVE INTERPRETATION TO ALLOW FOR MINOR ENGINEERING ISSUES SUCH AS, BUT NOT LIMITED TO, RESTRIPING PARKING LOTS, STORAGE, CONSTRUCTION EQUIPMENT/TRAILERS, STORMWATER MANAGEMENT PONDS, ETC. PROVIDED THAT AT NO TIME WILL THE TOTAL NUMBER OF PARKING SPACES BE REDUCED BELOW THAT REQUIRED BY THE PROVISIONS OF THE ZONING ORDINANCE. FURTHERMORE, IT IS TO BE UNDERSTOOD THAT THE EXISTING PARKING SPACES MAY BE REDUCED IN NUMBER TO ACCOMMODATE FUTURE EXPANSION/ADDITIONS TO THE HOSPITAL, AS MAY BE APPROVED WITH THIS OR FUTURE PCA/SEA APPLICATIONS, AS LONG AS IT CAN BE DEMONSTRATED THAT ADEQUATE PARKING IS PROVIDED.

   PARKING SPACES AND LOADING SPACES WILL BE PROVIDED ON THE CAMPUS IN ACCORDANCE WITH THE ABOVE REPRESENTATIONS AND WITH THE PROVISIONS SET FORTH IN ARTICLE 11 OF THE ZONING ORDINANCE.

10. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO GRAVES LOCATED ON THE SUBJECT PROPERTY.

11. THE EXISTING AND PROPOSED HOSPITAL AND RELATED USES ON SITE DO UTILIZE, STORE, TREAT AND DISPOSE OF HAZARDOUS AND TOXIC SUBSTANCES AS SET FORTH IN TITLE 40, CODE OF FEDERAL REGULATIONS PARTS 116.4, 302.4 AND 355; HAZARDOUS WASTE AS SET FORTH IN VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY HAZARDOUS WASTE MANAGEMENT REGULATIONS; AND/OR PETROLEUM PRODUCTS AS DEFINED IN TITLE 40, CODE OF FEDERAL REGULATIONS PART 280. TO THE BEST OF OUR KNOWLEDGE AND UNDERSTANDING, ALL SUCH SUBSTANCES THAT ARE UTILIZED, STORED AND/OR DISPOSED OF IN CONJUNCTION WITH THE HOSPITAL AND RELATED USES WILL BE IN ACCORDANCE WITH SAID REGULATIONS.

12. THE ORIGINAL HOSPITAL BUILDING WAS CONSTRUCTED IN 1958. NUMEROUS ADDITIONS AND ACCESSORY BUILDINGS HAVE BEEN CONSTRUCTED OVER THE SUBSEQUENT YEARS. WITH THE EXCEPTION OF SOME NOMINAL DEMOLITION THAT WILL OCCUR WITH THE CONTINUED EXPANSION OF THE PROPOSED DEVELOPMENT PROGRAM, ALL OF THE BUILDINGS ON THE CAMPUS WILL BE RETAINED FOR THE NEAR TERM, HOWEVER, THE APPLICANT RESERVES THE RIGHT TO DEMOLISH EXISTING STRUCTURES AT ANY TIME.

   THE WOODBURN MENTAL HEALTH CENTER BUILDING WAS BUILT IN 1973. IN BOTH OPTIONS 1 AND 2 DEVELOPMENT PROGRAMS, THE EXISTING BUILDING WILL BE RAZED. THE FAIRFAX HOUSE, AKA WOODBURN PLACE, WAS BUILT IN 1967. UNDER BOTH OPTIONAL DEVELOPMENT PROGRAMS, IT IS PROPOSED THAT THE EXISTING BUILDING WILL REMAIN AND AN ADDITION WILL BE CONSTRUCTED ON THE SITE FOR A TOTAL OF 15,000 SQUARE FEET OF GROSS FLOOR AREA UNDER THE OPTION 1 DEVELOPMENT PROGRAM OR 40,075 SQUARE FEET OF GROSS FLOOR AREA UNDER THE OPTION 2 DEVELOPMENT PROGRAM.

13. THERE IS NO FLOODPLAIN DESIGNATED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY OR UNITED STATES GEOLOGICAL SURVEY LOCATED ON THE SUBJECT PROPERTY. FAIRFAX COUNTY DOES DESIGNATE MINOR FLOODPLAIN AND RESOURCE PROTECTION AREA (RPA) IN THE NORTHERN AREA OF THE SUBJECT PROPERTY IN THE LOCATION OF THE PROPOSED SWM/BMP POND (SEE NOTE 17). A WATER QUALITY IMPACT ASSESSMENT WILL BE FILED AT SITE PLAN TO ADDRESS PROPOSED IMPROVEMENTS IN THE RPA. IN ADDITION, A FLOODPLAIN STUDY WILL BE FILED AT SITE PLAN TO ADDRESS THE PROPOSED IMPROVEMENTS IN THE MINOR FLOODPLAIN.

   IT IS TO BE NOTED THAT THE RPA REPRESENTED ON THE GRAPHIC IS THE FIELD VERIFIED RPA. IT IS BASED ON AN RPA DELINEATION STUDY BEING PREPARED AND PROCESSED UNDER SEPARATE COVER.

   OTHER THAN THE EXISTING VEGETATION, THERE ARE NO SCENIC ASSETS OR NATURAL FEATURES ON THE SUBJECT PROPERTY THAT ARE DESERVING OF PROTECTION AND PRESERVATION.

14. THERE ARE NO EXISTING UTILITY EASEMENTS HAVING A WIDTH OF TWENTY-FIVE (25) FEET OR MORE LOCATED ON THE MAIN CAMPUS PORTION OF THE SUBJECT PROPERTY. PARCEL 136C HAS AN EXISTING VIRGINIA POWER EASEMENT WITH A WIDTH OF THIRTY (30) FEET FOR AN AERIAL POWER LINE RUNNING ACROSS THE PROPERTY. OTHER THAN EXISTING MAJOR UNDERGROUND UTILITIES THAT SERVE THE CAMPUS DEVELOPMENT PROGRAM, THERE ARE NO OTHER MAJOR UNDERGROUND UTILITIES LOCATED ON THE SUBJECT PROPERTY.

   IT IS TO BE NOTED THERE ARE SEVERAL CONSERVATION EASEMENTS THAT HAVE BEEN RECORDED ON PARCEL 136C FOR THE PURPOSE OF PROVIDING AN INTERIM BEST MANAGEMENT PRACTICE (BMP) FOR THE ADJACENT DEVELOPMENT PROGRAM ON PARCEL 136C. THESE CONSERVATION EASEMENTS MAY BE VACATED WITH THE APPROVAL OF THE COUNTY WHEN IT CAN BE DEMONSTRATED THAT THE BMP REQUIREMENT IS OTHERWISE ACCOMMODATED.

   A STATEMENT CONFIRMING THE OWNERSHIP OF THE PROPERTY AND THE APPLICANT'S INTEREST IS PROVIDED SEPARATELY AS ARE THE STATEMENTS REQUIRED BY THE PROVISION SET FORTH IN PAR. 7 OF SECT. 9-011 OF THE ZONING ORDINANCE.

15. THERE IS AN EXISTING SIDEWALK ALONG GALLOWS ROAD WHICH HAS BEEN REPLACED IN PART BY A MEANDERING EIGHT (8) FOOT WIDE TRAIL/SIDEWALK. THIS IS THE ONLY TRAIL REQUIRED BY THE COMPREHENSIVE PLAN THAT IS LOCATED ON THE SUBJECT PROPERTY.

   THE EIGHT (8) FOOT WIDE TRAIL/SIDEWALK WILL BE EXTENDED ALONG THE BALANCE OF THE GALLOWS ROAD FRONTAGE IN CONJUNCTION WITH THE IMPROVEMENT OF GALLOWS ROAD BY THE APPLICANT.

16. STORMWATER 2- YEAR AND 10-YEAR DETENTION WILL BE PROVIDED IN UNDERGROUND VAULTS FOR THE WHPT AND, IN THE EVENT OF PROPOSED DEVELOPMENT OPTION 2, THE COUNTY BUILDING. THESE PROPOSED VAULT LOCATIONS ARE SHOWN ON THE GDP/SEA PLAT. A PROPOSED WILLOW OAKS SWM/BMP POND, AS ADDRESSED IN THE GDP/SEA PLAT, WILL BE DESIGNED TO PROVIDE BEST MANAGEMENT PRACTICES (BMPS) FOR THE WHPT AND COUNTY BUILDING. CONSTRUCTION OF THE PROPOSED WILLOW OAKS SWM/BMP POND IS A REQUIREMENT OF DEVELOPMENT ON THE WILLOW OAKS PROPERTY (PCA 87-P-038-04 PENDING CONCURRENTLY WITH THIS APPLICATION) AND IS NOT A REQUIREMENT OF THE APPLICATION PROPERTY. SUBJECT TO APPROVAL BY DPWES, BMPS FOR THE WHPT AND THE COUNTY BUILDING MAY BE PROVIDED IN THE WILLOW OAKS SWM/BMP POND, AND THE REQUIREMENT FOR BMPS FOR THE WHPT AND/OR THE COUNTY BUILDING MAY BE DEFERRED UNTIL SUCH TIME AS THE WILLOW OAKS SWM/BMP POND IS CONSTRUCTED. ALTERNATIVELY, AT THE APPLICANT'S OPTION, THE APPLICANT MAY ELECT TO PROVIDE AN ON-SITE SAND FILTER, OR OTHER ALLOWABLE MEASURES, TO PROVIDE BMPS FOR THE WHPT AND/OR THE COUNTY BUILDING, AS MAY BE APPROVED BY DPWES. THE PROPOSED WILLOW OAKS SWM/BMP POND WILL BE CONSTRUCTED UNDER A SEPARATE SITE PLAN IN ADVANCE OF DEVELOPMENT OF THE WILLOW OAKS PROPERTY (PCA 87-P-038-04) OR CONCURRENTLY WITH IT.

   THE APPLICANT WILL INSTALL FAIRFAX COUNTY ACCEPTED LOW IMPACT DEVELOPMENT (LID) FACILITIES, ON THE APPLICATION PROPERTY IN AT LEAST ONE OF THE POSSIBLE LOCATIONS AS REPRESENTED ON THE GRAPHIC. THE LID FACILITIES (PERVIOUS PAVEMENT OR OTHER) WILL TREAT A TOTAL OF 20,000 SQUARE FEET OF IMPERVIOUS SURFACE AND WILL HAVE A MINIMUM PHOSPHOROUS REMOVAL EFFICIENCY OF 40 PERCENT. THE LID FACILITIES WILL BE DESIGNED IN ACCORDANCE WITH THE PFM. THESE LID FACILITIES ARE INTENDED AS DEMONSTRATION FACILITIES AND WILL NOT FACTOR INTO THE REQUISITE CALCULATIONS FOR STORMWATER MANAGEMENT AND BMPS.

17. IN ACCORDANCE WITH PRIOR APPROVALS, THE FLOOR AREA RATIO (FAR) CALCULATIONS ARE BASED ON THE ORIGINAL LAND AREA OF 59.73 ACRES FOR THE CAMPUS AND THE 6.56 ACRES FOR THE ADDITIONAL LAND AREAS OF THE WOODBURN MENTAL HEALTH CENTER (5.41 ACRES) AND THE FAIRFAX HOUSE AKA WOODBURN PLACE (1.15 ACRES) FOR A TOTAL LAND AREA OF 66.29 ACRES. THE FLOOR AREA RATIO RELATED TO ALL FUTURE DEDICATIONS IS RESERVED FOR DEVELOPMENT OF THE SUBJECT PROPERTY IN ACCORDANCE WITH THE PROVISIONS SET FORTH IN PAR. 4 OF SECT. 2-308 OF THE ZONING ORDINANCE.

   IN ACCORDANCE WITH THE RECOMMENDATIONS SET FORTH IN THE COMPREHENSIVE PLAN, THE FAR FOR PARCEL 136C WILL BE LIMITED TO 0.25 WITH THE GROSS FLOOR AREA FROM THE REMAINING FLOOR AREA RATIO BETWEEN 0.25 AND 0.80 ON THE PARCEL 136C BEING TRANSFERRED TO THE MAIN CAMPUS.

18. DEVELOPMENT OF THE PREVIOUSLY APPROVED AND PROPOSED IMPROVEMENTS ON THE CAMPUS WILL CONTINUE TO OCCUR IN PHASES. IT IS TO BE UNDERSTOOD THAT THE FIRST PHASE(S) OF THE PROPOSED IMPROVEMENTS IS CURRENTLY PLANNED TO COMMENCE WITHIN THIRTY (30) MONTHS FROM THE DATE OF APPROVAL OF THE SPECIAL EXCEPTION AMENDMENT IN ACCORDANCE WITH THE PROVISION SET FORTH IN SECT. 9-015 OF THE ZONING ORDINANCE. IT IS TO BE FURTHER UNDERSTOOD THAT ALL PHASES OF THE APPROVED AND PROPOSED CONSTRUCTION MIGHT NOT COMMENCE WITHIN SAID THIRTY (30) MONTH PERIOD.

   IT IS TO BE NOTED THAT AS PART OF THE PHASING OF DEVELOPMENT, EXISTING PARKING AREAS MAY BE USED FOR CONSTRUCTION PHASING AREAS, AND ADDITIONAL INTERIM PARKING AREAS MAY BE REQUIRED WHICH MAY NOT BE LOCATED IN STRICT ACCORDANCE WITH THE FINAL DEVELOPMENT PROGRAM REPRESENTED ON THE GRAPHIC.

19. THE FOOTPRINTS OF THE BUILDINGS SHOWN ON THE GRAPHIC MAY BE INCREASED UP TO FIVE (5) PERCENT AS LONG AS THE OPEN SPACE PRESENTED IN THE TABULATION AND THE MINIMUM DISTANCES TO THE PERIPHERAL LOT LINES AS PRESENTED ON THE GRAPHIC ARE NOT DIMINISHED AND AS LONG AS THE RESULTANT PROPOSED DEVELOPMENT IS IN SUBSTANTIAL CONFORMANCE WITH THAT REPRESENTED ON THE GRAPHIC. THE SIZES AND SHAPES AND LOCATIONS OF THE PROPOSED BUILDINGS, STRUCTURES AND IMPROVEMENTS ARE PRELIMINARY AND SUBJECT TO MINOR MODIFICATION WITH FINAL ENGINEERING AND ARCHITECTURAL DESIGN IN ACCORDANCE WITH THE PROVISIONS SET FORTH IN SECTS. 9-004 AND 18-204 OF THE ZONING ORDINANCE.

   THE TOTAL GROSS FLOOR AREA AND MAXIMUM BUILDING HEIGHTS PRESENTED IN THE TABULATION ARE TO BE CONSIDERED MAXIMUMS AND THE DIMENSIONS TO THE PERIPHERAL LOT LINES PRESENTED ON THE GRAPHIC ARE TO BE DEEMED MINIMUMS WITH THE UNDERSTANDING THAT ALL DIMENSIONS SHOWN ON THE GRAPHIC AND IN THE TABULATION ARE SUBJECT TO MINOR MODIFICATION IN ACCORDANCE WITH THE PROVISIONS SET FORTH IN SECTS. 9-004 AND 18-204 OF THE ZONING ORDINANCE. THE FLOOR AREAS OF THE INDIVIDUAL BUILDINGS AS PRESENTED IN THE TABULATION MAY VARY WITH FINAL ARCHITECTURAL DESIGN; HOWEVER, THE TOTAL COMBINED GROSS FLOOR AREA AS PRESENTED IN THE TABULATION WILL NOT BE EXCEEDED.

   THE GROSS FLOOR AREAS THAT ARE REPRESENTED ARE GROSS FLOOR AREAS CALCULATED IN ACCORDANCE WITH THE DEFINITION OF GROSS FLOOR AREA AS SET FORTH IN ARTICLE 20 OF THE ZONING ORDINANCE. THE MAXIMUM BUILDING HEIGHTS THAT ARE REPRESENTED WILL BE CALCULATED IN ACCORDANCE WITH THE APPLICABLE PROVISIONS IN THE ZONING ORDINANCE. IN ADDITION, IT IS TO BE UNDERSTOOD THAT BOTH THE EXISTING AND PROPOSED BUILDINGS MAY HAVE CELLARS AS DEFINED IN ARTICLE 20.

   LASTLY, THE APPLICANT RESERVES THE RIGHT TO SHIFT GROSS FLOOR AREA THAT IS REPRESENTED ON THE TABULATION FROM ONE BUILDING TO ANOTHER WITH THE UNDERSTANDING THAT THE RESULTANT BUILDING FOOTPRINTS WILL BE IN SUBSTANTIAL CONFORMANCE WITH THE FOOTPRINTS REPRESENTED ON THE GRAPHIC AND THE MAXIMUM TOTAL GROSS FLOOR AREA REPRESENTED IN THE TABULATION WILL NOT BE EXCEEDED.

20. AS NOTED ABOVE, THE PRINCIPAL USE OF ALL OF THE BUILDINGS ON THE EXISTING HOSPITAL CAMPUS IS HOSPITAL (MEDICAL CARE FACILITY) AND RELATED ACCESSORY USES. IT IS TO BE UNDERSTOOD THAT ADDITIONAL ACCESSORY SERVICES USES AS PRESCRIBED BY THE PROVISIONS SET FORTH IN PART 2 OF ARTICLE 10 OF THE ZONING ORDINANCE MAY ALSO BE ESTABLISHED IN THE EXISTING AND PROPOSED BUILDINGS, AND THAT ADDITIONAL SPECIAL EXCEPTION AND SPECIAL PERMIT USES ALLOWED IN THE C-3 DISTRICT MAY ALSO BE ESTABLISHED SUBJECT TO APPROPRIATE APPROVALS.

   THE PRINCIPAL USE IN THE COUNTY FACILITIES IS PUBLIC USE AND RELATED ACCESSORY SERVICE USES AS DESCRIBED IN THE PROFFERS.

21. IT IS TO BE UNDERSTOOD THAT ADDITIONAL SITE FEATURES SUCH AS GAZEBOS, TRELLISES, SIGNS, FLAGPOLES, SIDEWALKS/TRAILS, LIGHT STANDARDS, PASSIVE AND ACTIVE RECREATION FACILITIES, WALLS, FENCES, AND/OR UTILITY AND MAINTENANCE STRUCTURES NOT REPRESENTED ON THE GRAPHIC MAY BE PROVIDED AS LONG AS THE RESULTANT PROPOSED DEVELOPMENT IS IN SUBSTANTIAL CONFORMANCE WITH THAT REPRESENTED ON THE GRAPHIC.

   ALL SIGNS WILL BE PROVIDED IN ACCORDANCE WITH THE PROVISIONS SET FORTH IN ARTICLE 12 OF THE ZONING ORDINANCE AND IN ACCORDANCE WITH PRIOR APPROVALS. IT IS ALSO UNDERSTOOD THAT MOBILE AND LAND BASED TELECOMMUNICATION FACILITIES MAY BE PROVIDED ON SITE IN ACCORDANCE WITH THE PROVISIONS SET FORTH IN SECT. 2-514 OF THE ZONING ORDINANCE.

22. NOTWITHSTANDING THE GDP/SEA PLAT IS PRESENTED AS ONE SET OF PLANS, THE APPLICANT RESERVES THE RIGHT TO FILE FOR ONLY SPECIAL EXCEPTION AMENDMENT(S) FROM THE BOARD OF SUPERVISORS IN THE FUTURE IN ACCORDANCE WITH SECT 9-014 OF THE ZONING ORDINANCE, WITHOUT FILING FOR AN AMENDMENT TO THE GENERALIZED DEVELOPMENT PLAN (GDP) SO LONG AS THE FLOOR AREA RATIO IS NOT INCREASED AND THERE IS NO PROPOSED CHANGE TO THE PROFFERED CONDITIONS.

   IT IS ALSO TO BE UNDERSTOOD THAT PARTIAL SPECIAL EXCEPTION AMENDMENT AND/OR GENERALIZED DEVELOPMENT PLAN AMENDMENT APPLICATIONS MAY BE FILED IN THE FUTURE IN ACCORDANCE WITH THE APPLICABLE PROVISIONS OF THE ZONING ORDINANCE.

23. THE SUBJECT PROPERTY IS LOCATED IN SUB-UNIT M1 OF THE MERRIFIELD SUBURBAN CENTER COMPONENT OF THE FAIRFAX COUNTY COMPREHENSIVE PLAN. BOTH OF THE PROPOSED ALTERNATE DEVELOPMENT PROGRAM S ARE IN ACCORDANCE WITH THE LAND USE OPTION RECOMMENDATION SET FORTH FOR SUB-UNIT M1. AS SUCH, THERE SHOULD BE NO ADVERSE EFFECTS ON ADJACENT OR NEIGHBORING PROPERTIES FROM EITHER OF THE PROPOSED DEVELOPMENT PROGRAMS.

24. TO THE BEST OF OUR KNOWLEDGE, EXCEPT AS QUALIFIED ABOVE, THE PROPOSED DEVELOPMENT OF THE SUBJECT PROPERTY CONFORMS TO ALL CURRENT APPLICABLE LAND DEVELOPMENT ORDINANCES, REGULATIONS AND ADOPTED STANDARDS.

TABULATION FOR OPTION 1 PLAN:

EXISTING ZONING	R -1 & R-12
PROPOSED ZONING	C-3
LAND AREA	65.46 AC[1]
EXISTING/PROPOSED USE	1026 BED HOSPITAL AND ACCESSORY USES (MEDICAL CARE FACILITY)
FLOOR AREA RATIO (FAR)	
PERMITTED PER COMPREHENSIVE PLAN	0.80
CURRENTLY APPROVED	0.67
PROPOSED	0.80
GROSS FLOOR AREA	
PERMITTED PER COMPREHENSIVE PLAN (0.80 FAR ON 66.29 AC)	2,310,074± SF[1]
TOTAL EXISTING	1,476,482± SF[2]
HOSPITAL	1,426,882± SF
WOODBURN MENTAL HEALTH CENTER	34,600± SF
WOODBURN PLACE + EXPANSION	15,000± SF
PROPOSED ADDITIONAL	833,592± SF
HOSPITAL – WOMEN'S CENTER	821,661± SF
CHILD CARE CENTER EXPANSION	7,311± SF
TEMPORARY ADMINISTRATIVE OFFICE FACILITY	4,620± SF
TOTAL EXISTING & PROPOSED	2,310,074± SF
EXISTING	1,476,482± SF
PROPOSED	833,592± SF
OPEN SPACE	
REQUIRED (15% OF 65.46 ACRES)	9.82AC
PROPOSED (35 % OF 65.46 ACRES)	23.22AC
PARKING SPACES REQUIRED	3,303[3]
HOSPITAL: 1026 LICENSED BEDS @ 2.9 SPACES/BED	2976
CHILD CARE CENTER: 200 CHILDREN @ 0.16 SPACES/CHILD	32
RONALD MCDONALD HOUSE: 8 UNITS @ 1 SPACE/UNIT PLUS 1 SPACE/STAFF MEMBER (7)	15
EDUCATION CENTER: 70 FACULTY/EMPLOYEES PLUS 74 STUDENTS/VISITORS @ 1 SPACE PER	144
WOODBURN MENTAL HEALTH CENTER: 3.6 SPACES/1000 SF GFA	125
WOODBURN PLACE: 1 SPACE/3 RESIDENTS (15) PLUS 1 PACE/EMPLOYEE (6)	11
PARKING SPACES EXISTING	5,085
BLUE GARAGE	587
GRAY GARAGE	1,093
EMPLOYEE GARAGE	2,246
LOT #9	182
LOT # 9A	211
LOT #10	258
EMERGENCY CENTER	28
CHILD CARE	25
RONALD MCDONALD HOUSE	14
PARCEL 136 C	280
RANDOM INTERNAL SITE	56
WOODBURN MENTAL HEALTH CENTER	94
WOODBURN PLACE	11
PARKING SPACES TO BE REMOVED WITH PROPOSED DEVELOPMENT PROGRAM	(366)
LOT #9	(98)
LOT #9A & 10	(92)
PARCEL 136 C ADJUSTMENT	(176)
ADDITIONAL PARKING SPACES PROPOSED WITH PROPOSED DEVELOPMENT PROGRAM	5
WOODBURN PLACE	5
GRAND TOTAL OF PROPOSED PARKING SPACES: 5,085 (EXISTING) – 366 (REMOVED) + 5 (PROPOSED ADDITIONAL)	4,724

1 SEE NOTE 18

2 SEE NOTE 2B AND 2C.

3 SEE NOTE 9

TABULATION FOR OPTION 2 PLAN:

EXISTING ZONING	R -1 & R-12
PROPOSED ZONING	C-3
LAND AREA	65.46 AC[1]
EXISTING/PROPOSED USES	1026 BED HOSPITAL AND ACCESSORY USES (MEDICAL CARE FACILITY) AND PUBLIC USE
FLOOR AREA RATIO (FAR)	
PERMITTED PER COMPREHENSIVE PLAN	0.80
CURRENTLY APPROVED	0.67
PROPOSED	0.80
GROSS FLOOR AREA	
PERMITTED PER COMPREHENSIVE PLAN (0.80 FAR ON 66.29 AC)	2,310,074± SF[1]
TOTAL EXISTING	1,501,557± SF[2]
HOSPITAL	1,426,882± SF
WOODBURN MENTAL HEALTH CENTER	34,600± SF
WOODBURN PLACE + EXPANSION	40,075± SF
PROPOSED DEMOLITION	
WOODBURN MENTAL HEALTH CENTER	(34,600± SF)
PROPOSED ADDITIONAL	843,117± SF
HOSPITAL–WOMEN'S CENTER	642,686± SF
MID-COUNTY COMMUNITY SERVICES CENTER	188,500± SF
CHILD CARE CENTER EXPANSION	7,311± SF
TEMPORARY ADMINISTRATIVE OFFICE FACILITY	4,620± SF
TOTAL EXISTING, DEMOLITION & PROPOSED	2,310,074± SF
EXISTING	1,476,482± SF
DEMOLITION	(34,600± SF)
PROPOSED	868,192± SF
OPEN SPACE	
REQUIRED (15% OF 65.46 ACRES)	9.82AC
PROPOSED (32 % OF 65.46 ACRES)	20.95AC
PARKING SPACES REQUIRED	3,669[3]
HOSPITAL: 1026 LICENSED BEDS @ 2.9 SPACES/BED.	2976
CHILD CARE CENTER: 200 CHILDREN @ 0.16 SPACES/CHILD	32
RONALD MCDONALD HOUSE: 8 UNITS @ 1 SPACE/UNIT PLUS 1 SPACE/STAFF MEMBER (7)	15
EDUCATION CENTER: 70 FACULTY/EMPLOYEES PLUS 74 STUDENTS/VISITORS @ 1 SPACE PER	144
EDUCATION CENTER: 70 FACULTY/EMPLOYEES PLUS 74 STUDENTS/VISITORS @ 1 SPACE PER	144
COUNTY FACILITY: 2.6 SPACES/1000 SF GFA	491
WOODBURN PLACE: 1 SPACE/3 RESIDENTS (15) PLUS 1 PACE/EMPLOYEE (6)	11
PARKING SPACES EXISTING	5,085
BLUE GARAGE	587
GRAY GARAGE	1,093
EMPLOYEE GARAGE	2,246
LOT #9	182
LOT # 9A	211
LOT #10	258
EMERGENCY CENTER	28
CHILD CARE	25
RONALD MCDONALD HOUSE	14
PARCEL 136 C	280
RANDOM INTERNAL SITE	56
WOODBURN MENTAL HEALTH CENTER	94
WOODBURN PLACE	11
PARKING SPACES TO BE REMOVED WITH PROPOSED DEVELOPMENT PROGRAM	(477)
LOT #9	(98)
LOT #9A	(76)
LOT #10	(33)
WOODBURN MENTAL HEALTH CENTER	(94)
PARCEL 136 C ADJUSTMENT	(176)
ADDITIONAL PARKING SPACES PROPOSED WITH PROPOSED DEVELOPMENT PROGRAM	905
GARAGE	900
WOODBURN PLACE	5
GRAND TOTAL OF PROPOSED PARKING SPACES: 5,085 (EXISTING) – 477 (REMOVED) + 905 (PROPOSED ADDITIONAL)	5,513

1 SEE NOTE 18
2 SEE NOTE 2B AND 2C.
3 SEE NOTE 9

Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated 7/6/2009 (conditions dated 7/6/09)
Date Of (BOS) (PC) approval 7/13/2009
Sheet 4 of 27

Dewberry®

Dewberry & Davis LLC
8403 ARLINGTON BLVD.
FAIRFAX, VA 22031
PHONE: 703.849.0100
FAX: 703.849.0519
www.dewberry.com

INOVA
FAIRFAX HOSPITAL
CAMPUS

GENERALIZED DEVELOPMENT PLAN /
SPECIAL EXCEPTION AMENDMENT PLAT

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

SEAL

COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES CULLETON
Lic. No. 20112
6-10-09
PROFESSIONAL ENGINEER

KEY PLAN

SCALE

No.	DATE	BY	Description
11	06.10.09	JMC	
10	06.05.09	JMC	
9	05.20.09	JMC	
8	04.20.09	JMC	
7	03.26.09	JMC	
6	02.19.09	JMC	
5	01.23.09	JMC	
4	10.09.08	JMC	
3	08.28.08	JMC	
2	07.31.08	JMC	
1	07.01.08	ARW	

REVISIONS

DRAWN BY JMC

APPROVED BY

CHECKED BY PGY

DATE February 12, 2008

TITLE

INOVA
Fairfax Hospital Campus
Development Plan
GDP / SEA Plat

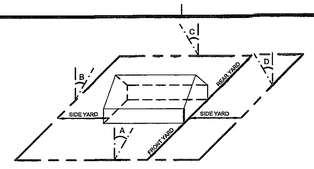
PROJECT NO.

3

SHEET NO. 3 OF 26

M-10691

CURVE TABLE						
NO.	RADIUS	DELTA	ARC	TANGENT	CHORD	BEARING
1	1832.00'	02°16'33"	72.77'	36.39'	72.76'	S13°14'28"E
2	1318.00'	14°39'01"	336.48'	168.65'	334.57'	S19°23'44"E
3	1049.44'	17°49'00"	326.33'	164.49'	325.02'	S35°35'45"E
4	1300.00'	06°55'30"	157.12'	78.66'	157.03'	S44°10'05"E
5	1201.55'	04°11'16"	87.82'	43.93'	87.80'	S49°36'26"E
6	246.48'	38°51'35"	167.17'	86.94'	163.98'	S84°15'59"W
7	290.00'	19°36'32"	99.25'	50.11'	98.77'	N69°20'06"W
8	210.00'	32°17'49"	118.37'	60.81'	116.81'	N75°40'45"W



FRONT YARD : 1 A 25' WITH A BUILDING HEIGHT OF 165', THE FRONT YARD = 77' BUT NOT LESS THAN 40'

SIDE YARD : 1 B NO REQUIREMENT

REAR YARD : 1 C 20' WITH A BUILDING HEIGHT OF 165', THE REAR YARD = 60' BUT NOT LESS THAN 20'

ANGLE OF BULK PLANE
MINIMUM REQUIRED YARD FOR BUILDING WITH 165' HEIGHT

Legend

- EXISTING BUILDING
- APPROVED BUILDING
- PROPOSED BUILDING
- EXISTING TREES AND LANDSCAPING
- PROPOSED LARGE DECIDUOUS TREE (Category III and IV Deciduous trees)
- PROPOSED EVERGREEN TREE (Category I and II Evergreen trees)
- PROPOSED EVERGREEN TREE (Category III and IV Evergreen trees)
- PROPOSED ORNAMENTAL TREE (Category I and II Deciduous trees)
- PROPOSED SHRUB / PERENNIALS
- APPROXIMATE LIMITS OF CLEARING & GRADING
- POSSIBLE L.I.D. LOCATION

* TREE COUNTED TOWARD PARKING LOT LANDSCAPING REQUIREMENT

Parking Lot Landscaping Tabulation

PARKING LOT AREA .....550,000 SF±
PARKING LOT LANDSCAPING REQUIRED (5%) .....27,500 SF±
PARKING LOT LANDSCAPING PROPOSED (5.3%) .....29,476 SF±
(58 EXISTING TREES @ AVG. 300 SF EA)
(69 PROPOSED TREES @ AVG. 175 SF EA)

Tree Canopy Tabulation

SITE AREA.....2,851,438 SF±
TREE CANOPY REQUIRED (10%).....285,044 SF±
AREA OF EXISTING TREES TO REMAIN.....305,000 SF±
TREE SAVE AREAS =248,750 SF±
APPROX. 225 INDIV. TREES X 250 SF EA. =56,250
X 1.25.....381,250 SF±
AREA OF PROPOSED LANDSCAPING.....52,050 SF±
approx 180 Cat. III & IV dec trees x 175 SF (avg).....31,000 SF
approx 170 Cat. I & II dec. trees x 65 SF (avg).....11,050 SF
approx 40 Cat. III & IV evergreen trees x 125 SF (avg)....5,000 SF
approx 75 Cat. I & II evergreen trees x 60 SF (avg).....4,500 SF

TOTAL TREE CANOPY PROVIDED (15%).....433,300 SF±

LANDSCAPE TABULATIONS

THE PARKING LOT LANDSCAPING AND TREE CANOPY TABULATIONS ARE PRELIMINARY. THE TABULATIONS ARE INTENDED TO REFLECT THE MINIMUM LANDSCAPE AND CANOPY REQUIREMENTS FOR THE PROPOSED DEVELOPMENT PROGRAM. FINAL CALCULATIONS WILL BE PROVIDED WITH THE BENEFIT OF SURVEYS AND FINAL ENGINEERING AT TIME OF SITE PLAN PREPARATION.

AT TIME OF SITE PLAN, INDIVIDUAL TREES IDENTIFIED MAY VARY AND/OR ADDITIONAL TREES MAY BE IDENTIFIED AS CONTRIBUTING TOWARDS MEETING THE LANDSCAPE REQUIREMENT AND/OR ADDITIONAL TREE COVER MAY BE CLAIMED FOR EXISTING TREES WITH LARGER CALIPER/TREE COVERAGE.

Interior Parking Lot Landscaping Graphic
Not to Scale

TABLE 12.3 TREE PRESERVATION TARGET CALCULATION

		REQUIREMENTS	RESULTS
A	PRE-DEVELOPMENT AREA OF EXISTING TREE CANOPY (FROM EXISTING VEGETATION MAP) =		16.24 AC
B	PERCENTAGE OF GROSS SITE AREA COVERED BY EXISTING TREE CANOPY =		24.8%
C	PERCENTAGE OF 10-YEAR TREE CANOPY REQUIRED FOR SITE		10% = 285,044 SF
D	PERCENTAGE OF THE 10-YEAR CANOPY REQUIREMENT THAT SHOULD BE MET THROUGH TREE PRESERVATION =		24.8% = 70,690 SF
E	PROPOSED PERCENTAGE OF CANOPY REQUIREMENT THAT WILL BE MET THROUGH TREE PRESERVATION - SEE SHEET 3 =		272,083 SF
F	HAS THE TREE PRESERVATION TARGET MINIMUM BEEN MET?		YES

PROPOSED WILLOW OAKS SWM / BMP POND (SEE SHEETS 17 AND 18 FOR DETAILS)
DEMONSTRATION PROMENADE
EXISTING BUILDING TO BE REMOVED
ENHANCED SWM/BMP FACILITY PASSIVE RECREATION AMENITY
SEE BIOSWALE DETAIL ON SHEET 17
PROPOSED 8'-10' BICYCLE / PEDESTRIAN TRAIL
TEMPORARY ADMINISTRATIVE OFFICE FACILITY
TEMPORARY CONTRACTORS' OFFICES AND EQUIPMENT SHEDS
EXISTING PARKING ATTENDANT SHED
EXISTING RONALD McDONALD HOUSE
EXISTING CHILD CARE CENTER
EXISTING GROUNDS BUILDING II AND CREDIT UNION
EXISTING GROUNDS STORAGE YARD
PROPOSED 8'-10' BICYCLE / PEDESTRIAN TRAIL
EXISTING PEDESTRIAN
PROPOSED 4'-6' TRAIL
PROPOSED COMMERCIAL DRIVE (PRIVATE)
EX. CANNONGATE ROAD (PRIVATE)
EX. MONARCH LANE
EX. BEVERLY DRIVE
STRATHMEADE SQUARE
PROSPERITY HEIGHTS
AMBERLEIGH ZONED R-20
PARCEL 136C
TREE SAVE
160± BUFFER
265.5±
88.5'
N18°45'25"W 1060.25'
S41°41'51"E 1099.27'
S33°13'19"E 33.47'
S31°01'26"W 197.28'
S88°52'00"E 27.50'
N45°50'36"W 246.96'
S84°23'59"W 229.03'
N88°09'02"E 1506.52'
EXISTING 1-STORY FUEL OIL PUMP HOUSE 11.5' x 11.5'
EXISTING OXYGEN TANKS
EXISTING ELEVATED COOLING TOWER AND PLATFORM
PROPOSED ELEVATED COOLING TOWER AND PLATFORM
TREE SAVE TO BE SUPPLEMENTED
TOWNSEND STREET
GALLOWS ROAD / ROUTE 650
EXISTING STAFF PARKING GARAGE
3 Levels Below Grade
5-7 Levels Above Grade
8-10 Levels Total
5 Levels Above Grade
7 Levels Above Grade
EX. MECHANICAL BUILDING
BLUE GARAGE
EX. PARKING GARAGE 4 LEVELS
EXISTING PEDESTRIAN BRIDGE
EXISTING MINI-PARK
EXISTING CONCR SIDEWALK WIDTH
BLUE ENTRANCE
HOSPITAL LOOP TRAVELWAY (PRIVATE)
PROPOSED EMPLOYEE ENTRANCE 1-STORY, 12' x 88'
EXISTING CLAUDE MOORE HEALTH
EX. AUDITORIUM
POND X2
MATCHLINE - SEE SHEETS 5 and 6

AREA OF TREE SAVE 148,200 SF±
AREA OF TREE SAVE 56,900 SF±
EX. TREES USED TO MEET PARKING LOT LANDSCAPING REQUIREMENTS
AREA OF TREE SAVE 17,000 SF±
AREA OF TREE SAVE 26,700 SF±
EX. TREES USED TO MEET PARKING LOT LANDSCAPING REQUIREMENTS
WOODBURN ROAD
ROUTE 700

SCALE
0' 80' 160'

No.	DATE	BY	Description
11	06.10.09	JMC	
10	06.05.09	JMC	
9	05.20.09	JMC	
8	04.20.09	JMC	
7	03.26.09	JMC	
6	02.19.09	JMC	
5	01.23.09	JMC	
4	10.09.08	JMC	
3	08.28.08	JMC	
2	07.31.08	JMC	
1	07.01.08	ARW	

REVISIONS

DRAWN BY JMC
APPROVED BY
CHECKED BY PGY
DATE February 12, 2008

TITLE
INOVA
Fairfax Hospital Campus
Development Plan
GDP / SEA Plat

PROJECT NO.

4

SHEET NO. 4 OF 26

M-10691

Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated ~~7/6/2009~~ (conditions dated 7/6/09)
Date Of (BOS) (PC) approval 7/13/2009
Sheet 5 of 27

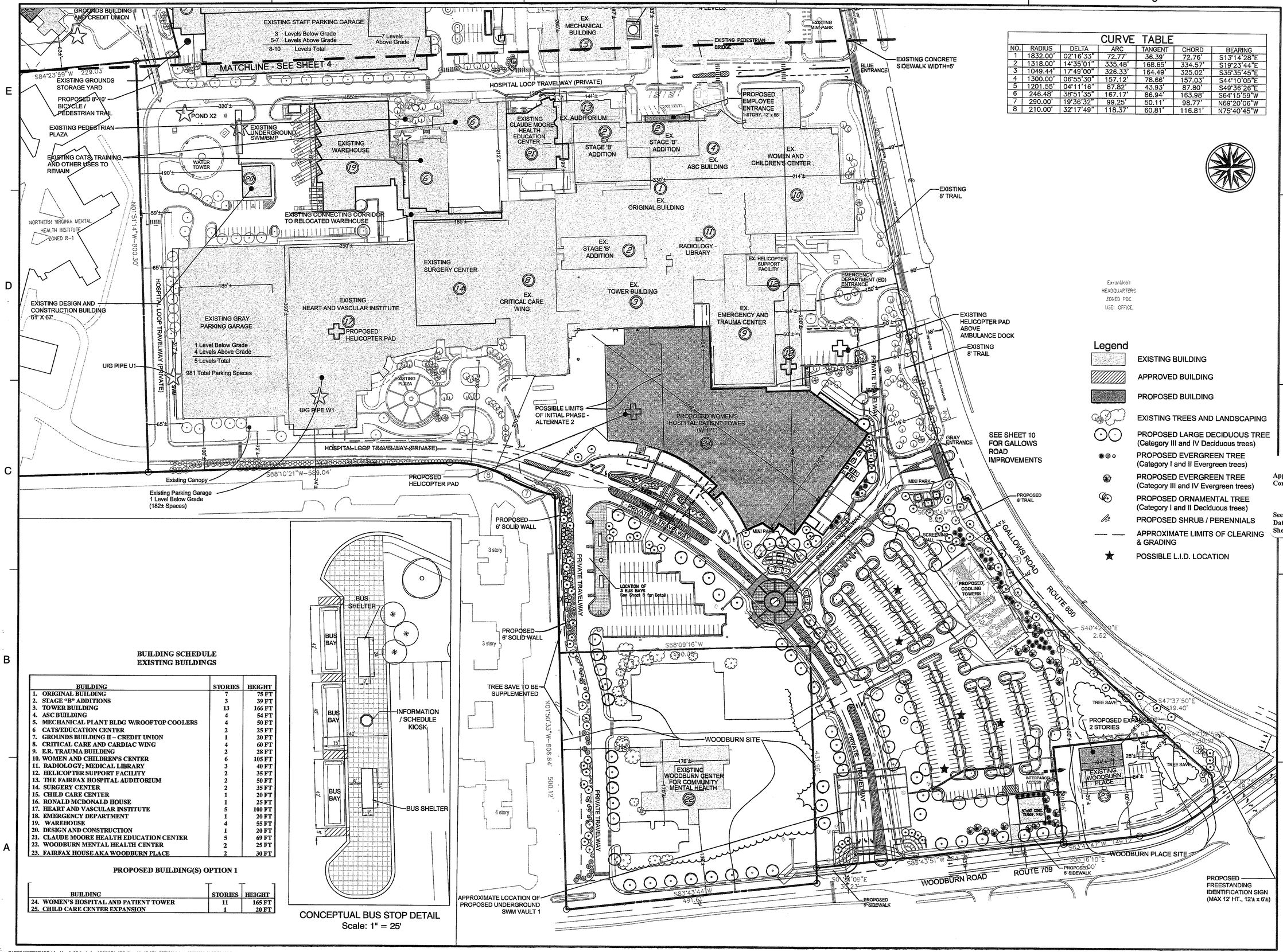
SEAL
COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES CULLETON
Lic. No. 20112
6.10.09
PROFESSIONAL ENGINEER

Dewberry®

Dewberry & Davis LLC
8403 ARLINGTON BLVD.
FAIRFAX, VA 22031
PHONE: 703.849.0100
FAX: 703.849.0518
www.dewberry.com

INOVA
FAIRFAX HOSPITAL CAMPUS
GENERALIZED DEVELOPMENT PLAN / SPECIAL EXCEPTION AMENDMENT PLAT
PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

Q:\PROJECT\INOVA\Fairfax Hospital\Submissions\GDPSEA-10\Deliverables\4-SEA.dwg, 6/10/2009 11:44:10 AM, joena



CURVE TABLE

NO.	RADIUS	DELTA	ARC	TANGENT	CHORD	BEARING
1	1832.00'	02°16'33"	72.77'	36.39'	72.76'	S13°14'28"E
2	1318.00'	14°35'01"	335.48'	168.65'	334.57'	S19°23'44"E
3	1049.44'	17°49'00"	326.33'	164.49'	325.02'	S35°35'45"E
4	1300.00'	06°55'30"	157.12'	78.66'	157.03'	S44°10'05"E
5	1201.55'	04°11'16"	87.82'	43.93'	87.80'	S49°36'26"E
6	246.48'	38°51'35"	167.17'	86.94'	163.98'	S64°15'59"W
7	290.00'	19°36'32"	99.25'	50.11'	98.77'	N69°20'06"W
8	210.00'	32°17'49"	118.37'	60.81'	116.81'	N75°40'45"W

Legend

- EXISTING BUILDING
- APPROVED BUILDING
- PROPOSED BUILDING
- EXISTING TREES AND LANDSCAPING
- PROPOSED LARGE DECIDUOUS TREE (Category III and IV Deciduous trees)
- PROPOSED EVERGREEN TREE (Category I and II Evergreen trees)
- PROPOSED EVERGREEN TREE (Category III and IV Evergreen trees)
- PROPOSED ORNAMENTAL TREE (Category I and II Deciduous trees)
- PROPOSED SHRUB / PERENNIALS
- APPROXIMATE LIMITS OF CLEARING & GRADING
- POSSIBLE L.I.D. LOCATION

BUILDING SCHEDULE
EXISTING BUILDINGS

BUILDING	STORIES	HEIGHT
1. ORIGINAL BUILDING	7	75 FT
2. STAGE "B" ADDITIONS	3	39 FT
3. TOWER BUILDING	13	166 FT
4. ASC BUILDING	4	54 FT
5. MECHANICAL PLANT BLDG W/ROOFTOP COOLERS	4	50 FT
6 CATS/EDUCATION CENTER	2	25 FT
7. GROUNDS BUILDING II – CREDIT UNION	1	20 FT
8. CRITICAL CARE AND CARDIAC WING	4	60 FT
9. E.R. TRAUMA BUILDING	2	28 FT
10. WOMEN AND CHILDREN'S CENTER	6	105 FT
11. RADIOLOGY; MEDICAL LIBRARY	3	40 FT
12. HELICOPTER SUPPORT FACILITY	2	35 FT
13. THE FAIRFAX HOSPITAL AUDITORIUM	2	50 FT
14. SURGERY CENTER	2	35 FT
15. CHILD CARE CENTER	1	20 FT
16. RONALD MCDONALD HOUSE	1	25 FT
17. HEART AND VASCULAR INSTITUTE	5	100 FT
18. EMERGENCY DEPARTMENT	1	20 FT
19. WAREHOUSE	4	55 FT
20. DESIGN AND CONSTRUCTION	1	20 FT
21. CLAUDE MOORE HEALTH EDUCATION CENTER	5	69 FT
22. WOODBURN MENTAL HEALTH CENTER	2	25 FT
23. FAIRFAX HOUSE AKA WOODBURN PLACE	2	30 FT

PROPOSED BUILDING(S) OPTION 1

BUILDING	STORIES	HEIGHT
24. WOMEN'S HOSPITAL AND PATIENT TOWER	11	165 FT
25. CHILD CARE CENTER EXPANSION	1	20 FT

CONCEPTUAL BUS STOP DETAIL
Scale: 1" = 25'

Dewberry

Dewberry & Davis LLC
8403 ARLINGTON BLVD.
FAIRFAX, VA 22031
PHONE: 703.849.0100
FAX: 703.849.0519
www.dewberry.com

INOVA FAIRFAX HOSPITAL CAMPUS

GENERALIZED DEVELOPMENT PLAN / SPECIAL EXCEPTION AMENDMENT PLAT
PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

SEAL
COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES CULLETON
Lic. No. 20112
6.10.09
PROFESSIONAL ENGINEER

Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated 7/6/2009 (conditions dated 7/6/09)
Date Of (BOS) (PC) approval 7/13/2009
Sheet 5 of 27

SCALE
0' 80' 160'

No.	DATE	BY	Description
11	06.10.09	JMC	
10	06.05.09	JMC	
9	05.20.09	JMC	
8	04.20.09	JMC	
7	03.26.09	JMC	
6	02.19.09	JMC	
5	01.23.09	JMC	
4	10.09.08	JMC	
3	08.28.08	JMC	
2	07.31.08	JMC	
1	07.01.08	ARW	

REVISIONS

DRAWN BY JMC
APPROVED BY
CHECKED BY PGY
DATE February 12, 2008

TITLE

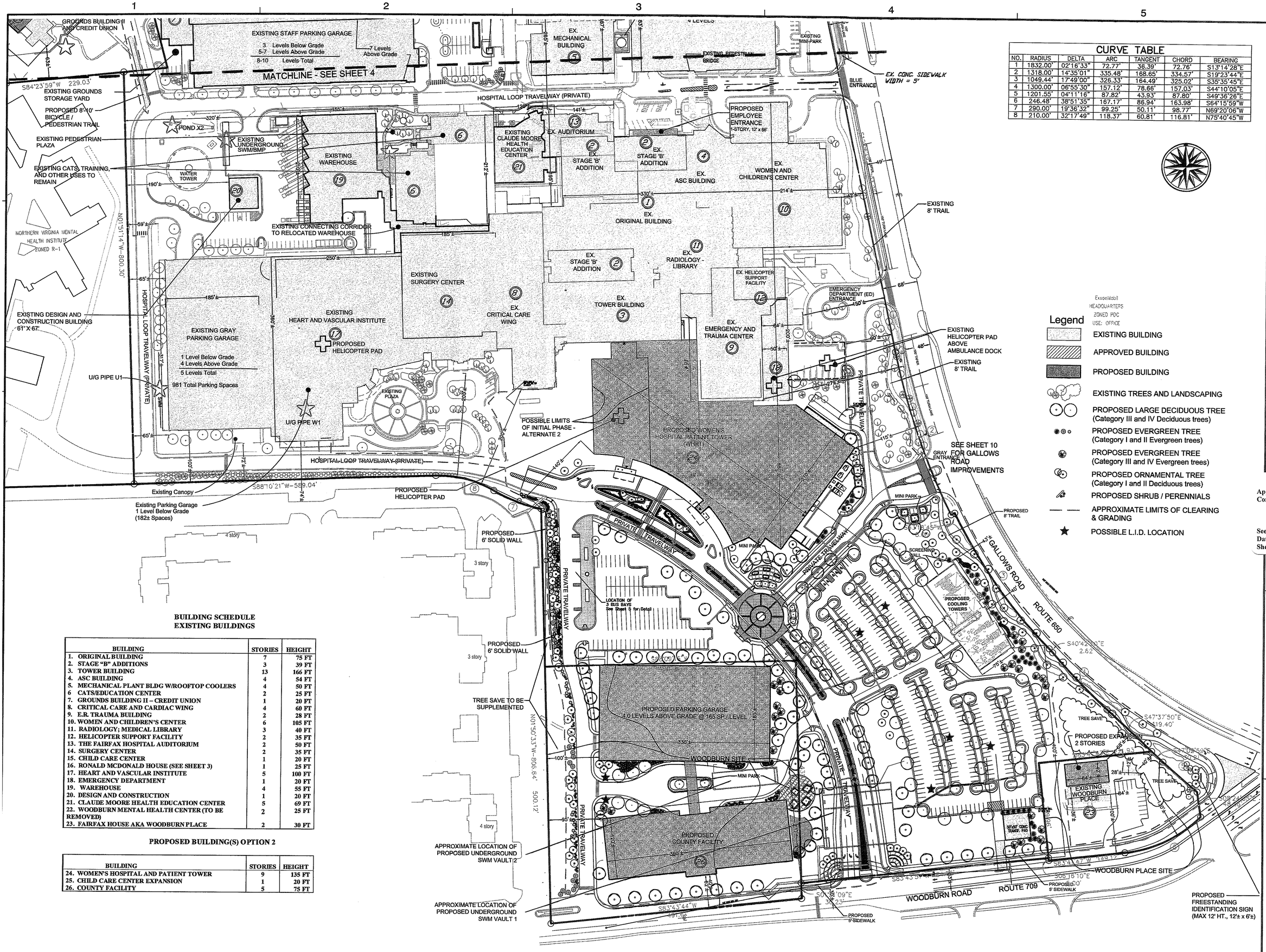
INOVA
Fairfax Hospital Campus
Development Plan
GDP / SEA Plat
Option 1

PROJECT NO.

5

SHEET NO. 5 OF 26

M-10691



CURVE TABLE

NO.	RADIUS	DELTA	ARC	TANGENT	CHORD	BEARING
1	1832.00'	02°16'33"	72.77'	36.39'	72.76'	S13°14'28"E
2	1318.00'	14°35'01"	335.48'	168.65'	334.57'	S19°23'44"E
3	1049.44'	17°49'00"	326.33'	164.49'	325.02'	S35°35'45"E
4	1300.00'	06°55'30"	157.12'	78.66'	157.03'	S44°10'05"E
5	1201.55'	04°11'16"	87.82'	43.93'	87.80'	S49°36'26"E
6	246.48'	38°51'35"	167.17'	86.94'	163.98'	S64°15'59"W
7	290.00'	19°36'32"	99.25'	50.11'	98.77'	N69°20'06"W
8	210.00'	32°17'49"	118.37'	60.81'	116.81'	N75°40'45"W

Legend

- EXISTING BUILDING
- APPROVED BUILDING
- PROPOSED BUILDING
- EXISTING TREES AND LANDSCAPING
- PROPOSED LARGE DECIDUOUS TREE (Category III and IV Deciduous trees)
- PROPOSED EVERGREEN TREE (Category I and II Evergreen trees)
- PROPOSED EVERGREEN TREE (Category III and IV Evergreen trees)
- PROPOSED ORNAMENTAL TREE (Category I and II Deciduous trees)
- PROPOSED SHRUB / PERENNIALS
- APPROXIMATE LIMITS OF CLEARING & GRADING
- POSSIBLE L.I.D. LOCATION

BUILDING SCHEDULE
EXISTING BUILDINGS

BUILDING	STORIES	HEIGHT
1. ORIGINAL BUILDING	7	75 FT
2. STAGE "B" ADDITIONS	3	39 FT
3. TOWER BUILDING	13	166 FT
4. ASC BUILDING	4	54 FT
5. MECHANICAL PLANT BLDG W/ROOFTOP COOLERS	4	50 FT
6 CATS/EDUCATION CENTER	2	25 FT
7. GROUNDS BUILDING II – CREDIT UNION	1	20 FT
8. CRITICAL CARE AND CARDIAC WING	4	60 FT
9. E.R. TRAUMA BUILDING	2	28 FT
10. WOMEN AND CHILDREN'S CENTER	6	105 FT
11. RADIOLOGY; MEDICAL LIBRARY	3	40 FT
12. HELICOPTER SUPPORT FACILITY	2	35 FT
13. THE FAIRFAX HOSPITAL AUDITORIUM	2	50 FT
14. SURGERY CENTER	2	35 FT
15. CHILD CARE CENTER	1	20 FT
16. RONALD MCDONALD HOUSE (SEE SHEET 3)	1	25 FT
17. HEART AND VASCULAR INSTITUTE	5	100 FT
18. EMERGENCY DEPARTMENT	1	20 FT
19. WAREHOUSE	4	55 FT
20. DESIGN AND CONSTRUCTION	1	20 FT
21. CLAUDE MOORE HEALTH EDUCATION CENTER	5	69 FT
22. WOODBURN MENTAL HEALTH CENTER (TO BE REMOVED)	2	25 FT
23. FAIRFAX HOUSE AKA WOODBURN PLACE	2	30 FT

PROPOSED BUILDING(S) OPTION 2

BUILDING	STORIES	HEIGHT
24. WOMEN'S HOSPITAL AND PATIENT TOWER	9	135 FT
25. CHILD CARE CENTER EXPANSION	1	20 FT
26. COUNTY FACILITY	5	75 FT

Dewberry

Dewberry & Davis LLC
8403 ARLINGTON BLVD
FAIRFAX, VA 22031
PHONE: 703.849.0100
FAX: 703.849.0519
www.dewberry.com

INOVA FAIRFAX HOSPITAL CAMPUS

GENERALIZED DEVELOPMENT PLAN / SPECIAL EXCEPTION AMENDMENT PLAT

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

SEAL

COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES CULLETON
Lic. No. 20112
6.10.09
PROFESSIONAL ENGINEER

Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated ~~7/6/2009 (conditions dated 7/6~~
Date Of (BOS) (PC) approval 7/13/2009
Sheet 6 of 27

SCALE
0' 80' 160'

No.	DATE	BY	Description
11	06.10.09	JMC	
10	06.05.09	JMC	
9	05.20.09	JMC	
8	04.20.09	JMC	
7	03.26.09	JMC	
6	02.19.09	JMC	
5	01.23.09	JMC	
4	10.09.08	JMC	
3	08.28.08	JMC	
2	07.31.08	JMC	
1	07.01.08	ARW	

REVISIONS

DRAWN BY	JMC
APPROVED BY	
CHECKED BY	PGY
DATE	February 12, 2008

TITLE

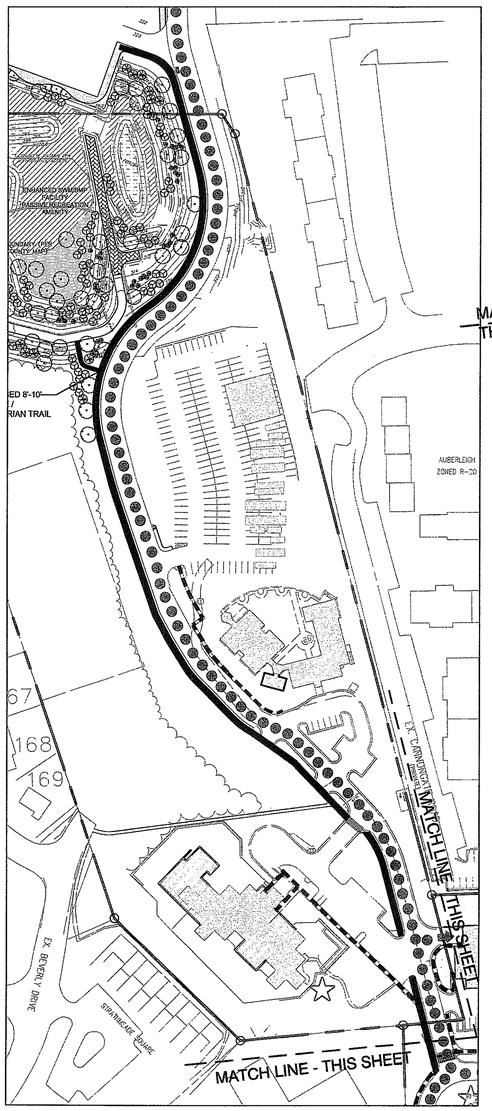
INOVA
Fairfax Hospital Campus
Development Plan
GDP / SEA Plat
Option 2

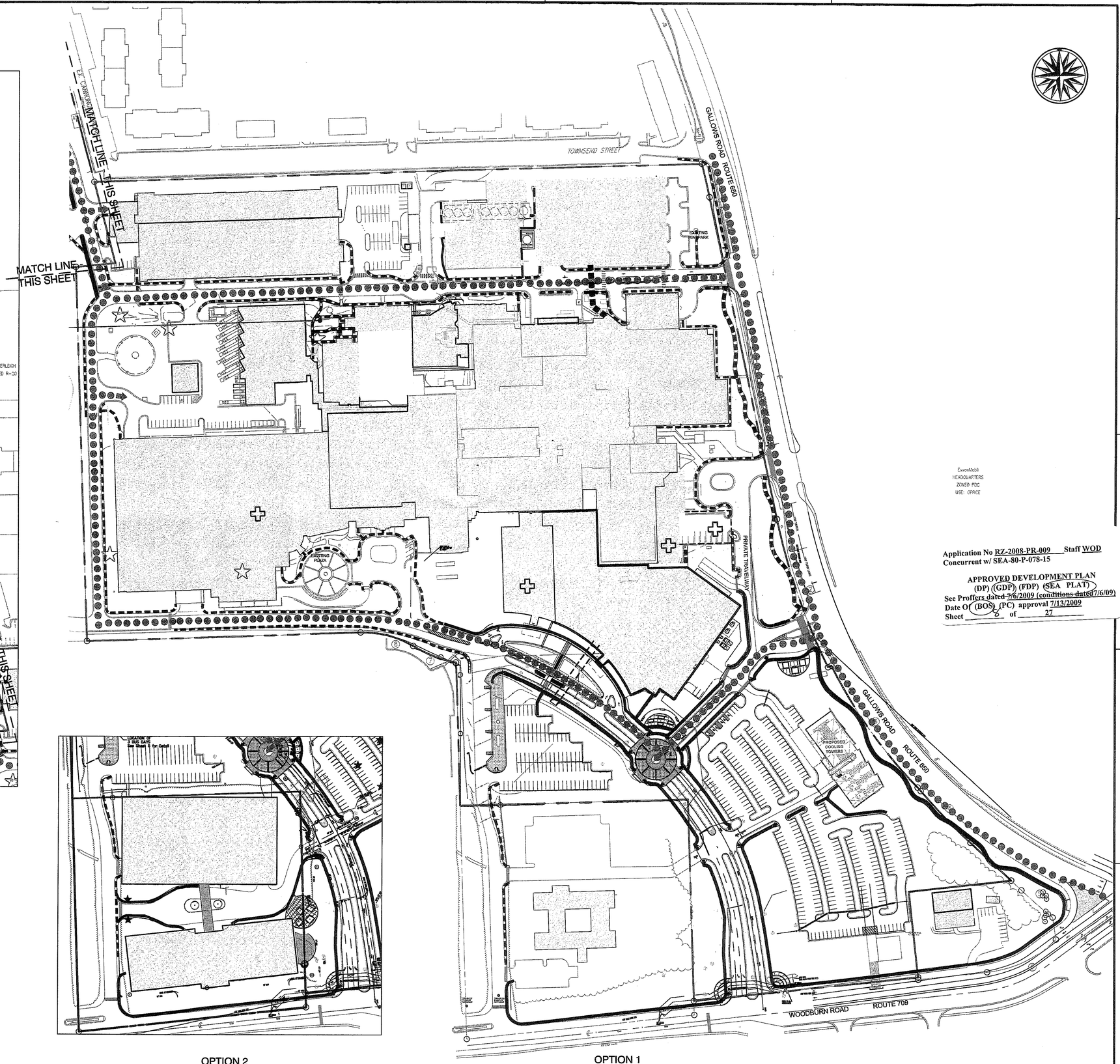
PROJECT NO.

6

SHEET NO. 6 OF 26

M-10691





OPTION 1

OPTION 2

Legend

- EXISTING SIDEWALK / TRAIL
- PROPOSED SIDEWALK / TRAIL
- PROPOSED BICYCLE CIRCULATION

Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated ~~7/6/2009 (conditions dated 7/6/09)~~
Date Of (BOS) (PC) approval 7/13/2009
Sheet 8 of 27

Dewberry

Dewberry & Davis LLC
8403 ARLINGTON BLVD.
FAIRFAX, VA 22031
PHONE: 703.849.0100
FAX: 703.849.0519
www.dewberry.com

INOVA
FAIRFAX HOSPITAL
CAMPUS

GENERALIZED DEVELOPMENT PLAN /
SPECIAL EXCEPTION AMENDMENT PLAT

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

SEAL

COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES CULLETON
Lic. No. 20112
6.10.09
PROFESSIONAL ENGINEER

KEY PLAN

SCALE
0' 80' 160'

No.	DATE	BY	Description
11	06.10.09	JMC	
10	06.05.09	JMC	
9	05.20.09	JMC	
8	04.20.09	JMC	
7	03.26.09	JMC	
6	02.19.09	JMC	
5	01.23.09	JMC	
4	10.09.08	JMC	
3	08.28.08	JMC	
2	07.31.08	JMC	
1	07.01.08	ARW	

REVISIONS

DRAWN BY JMC
APPROVED BY
CHECKED BY PGY
DATE February 12, 2008

TITLE

INOVA
Fairfax Hospital Campus
Development Plan
Pedestrian Circulation

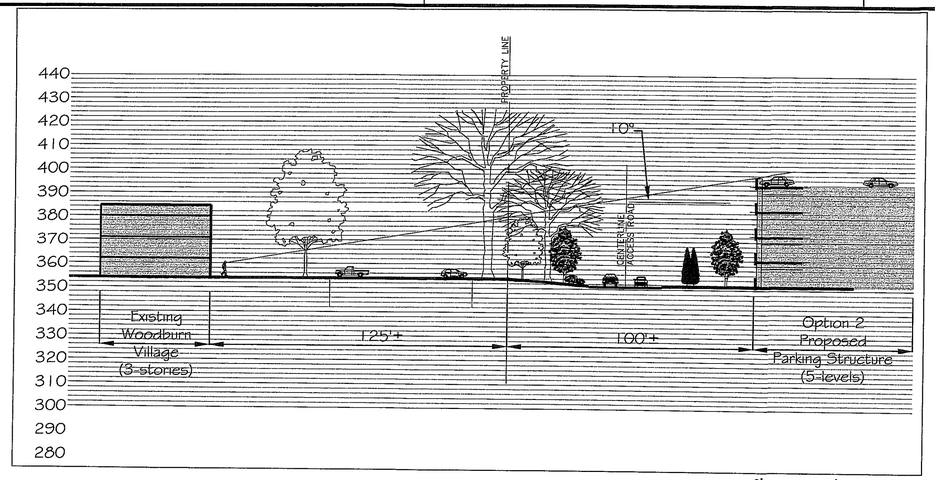
PROJECT NO.

7

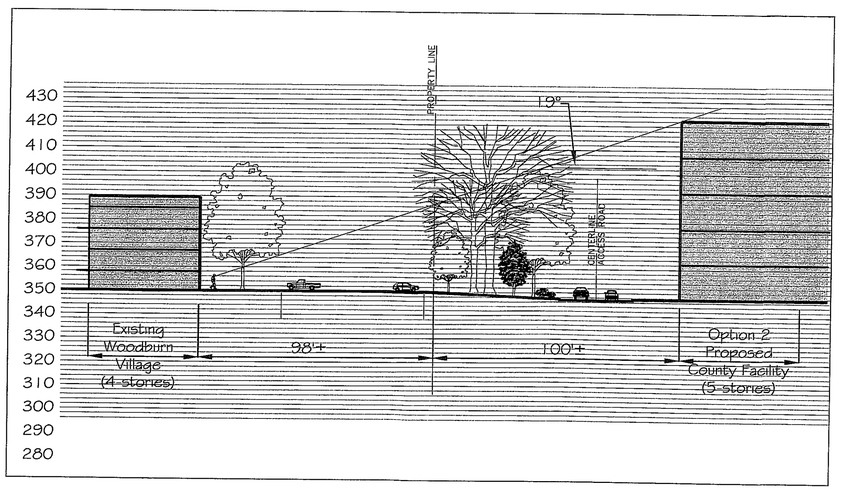
SHEET NO. 7 OF 26

M-10691

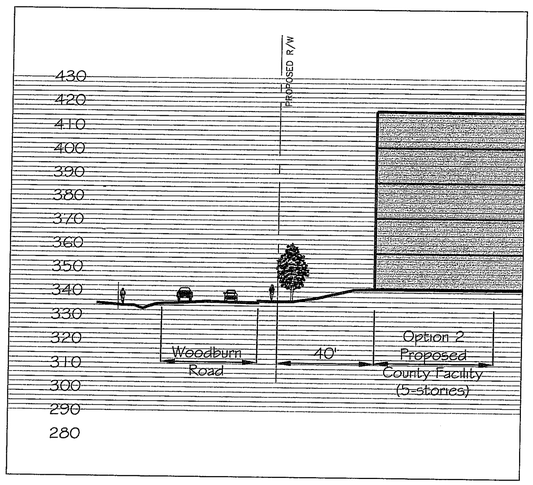
Q:\PROJECT\INOVA\Fairfax Hospital\Submissions\GDPSEA-15\Deliverables\7-PedCirculation.dwg, 6/10/2009 1:50:29 PM, joena



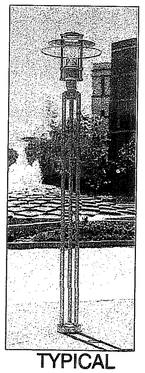
SECTION A-A'



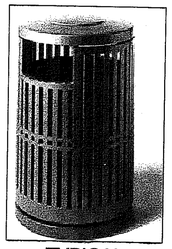
SECTION B-B'



SECTION D-D'

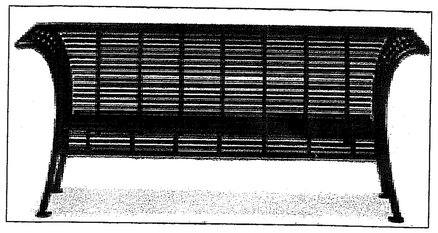


TYPICAL DECORATIVE LIGHT

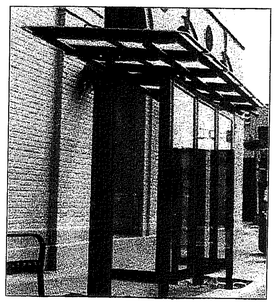


TYPICAL TRASH RECEPTACLE

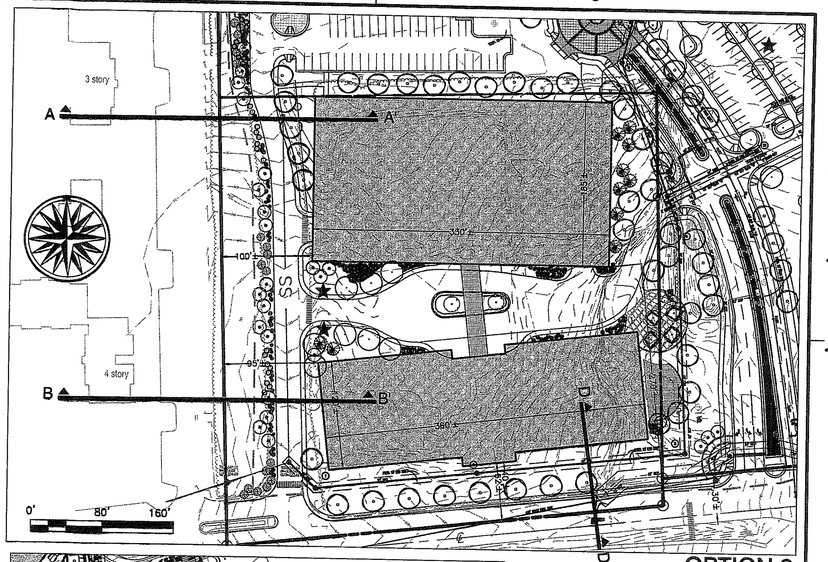
NOTE: The typical site furniture presented on this sheet are shown to illustrate the general character of the proposed facilities. They are subject to minor modification with final architectural design.



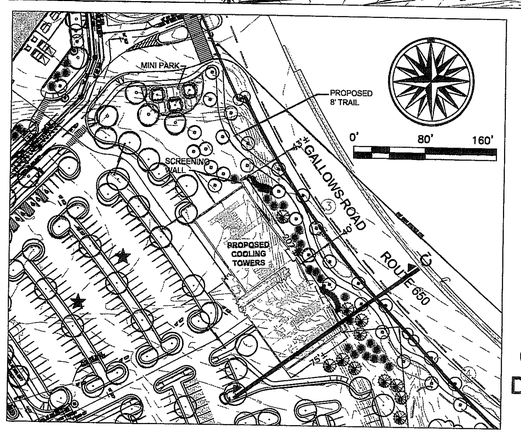
TYPICAL BENCH



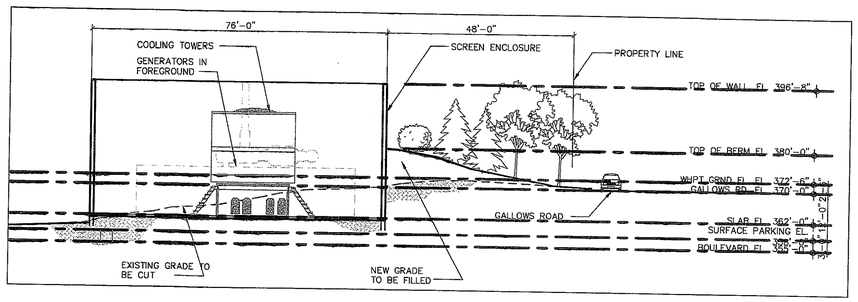
TYPICAL BUS SHELTER



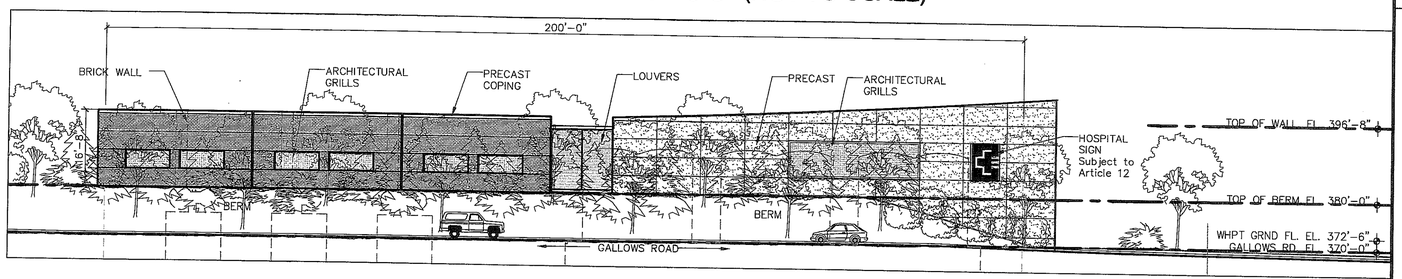
OPTION 2 DEVELOPMENT PROGRAM



OPTIONS 1 & 2 DEVELOPMENT PROGRAM



SECTION C-C' (NOT TO SCALE)



COOLING TOWERS - GALLOWS ROAD ELEVATION

Dewberry®

Dewberry & Davis LLC
8403 ARLINGTON BLVD.
FAIRFAX, VA 22031
PHONE: 703.849.0100
FAX: 703.849.0519
www.dewberry.com

INOVA
FAIRFAX HOSPITAL CAMPUS

GENERALIZED DEVELOPMENT PLAN / SPECIAL EXCEPTION AMENDMENT PLAT

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

SEAL

COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES CULLETON
Lic. No. 20112
6-10-09
PROFESSIONAL ENGINEER

KEY PLAN

Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated ~~7/6/2009~~ (conditions dated7/6/09)
Date Of (BOS) (PC) approval 7/13/2009
Sheet 4 of 27

No.	DATE	BY	Description
8	06.10.09	JMC	
7	06.05.09	JMC	
6	05.20.09	JMC	
5	04.20.09	JMC	
4	03.26.09	JMC	
3	02.19.09	JMC	
2	01.23.09	JMC	
1	10.09.08	JMC	NEW SHEET

REVISIONS

DRAWN BY JMC
APPROVED BY
CHECKED BY PGY
DATE August 4, 2008

TITLE

INOVA
Fairfax Hospital Campus
Development Plan

Cross Sections / Street Furniture

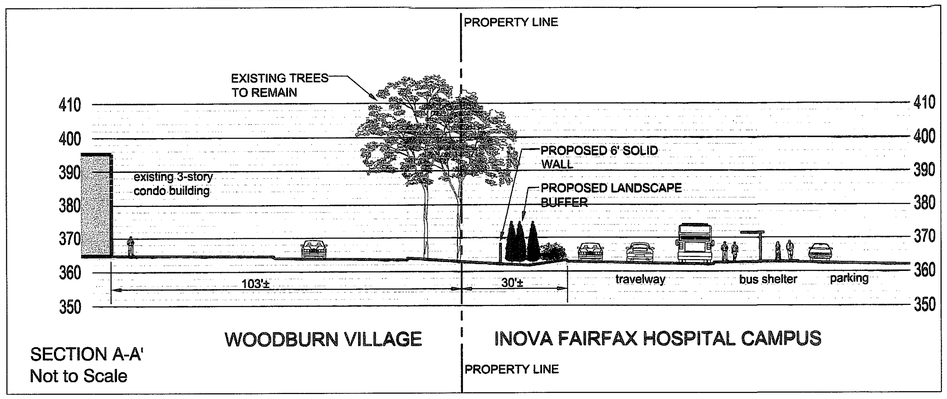
PROJECT NO.

8

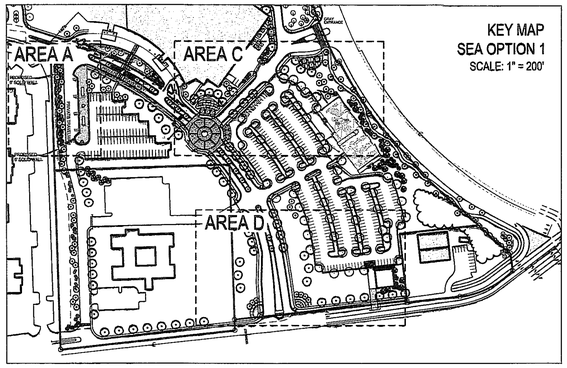
SHEET NO. 8 OF 26

M-10691

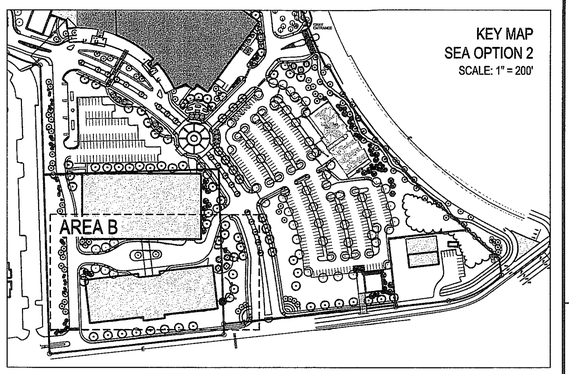
Q:\PROJECT\INOVA\Fairfax Hospital\Submissions\GDPSEA-10\Deliverables\8-Sections.dwg, 6/10/2009 1:33:30 PM, jcona



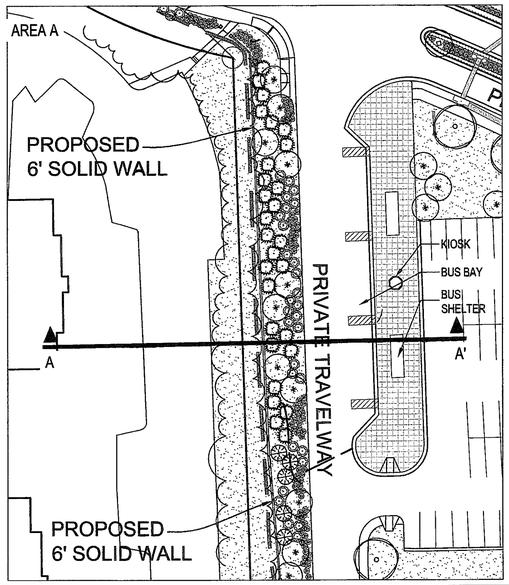
SECTION A-A'
Not to Scale



KEY MAP
SEA OPTION 1
SCALE: 1" = 200'



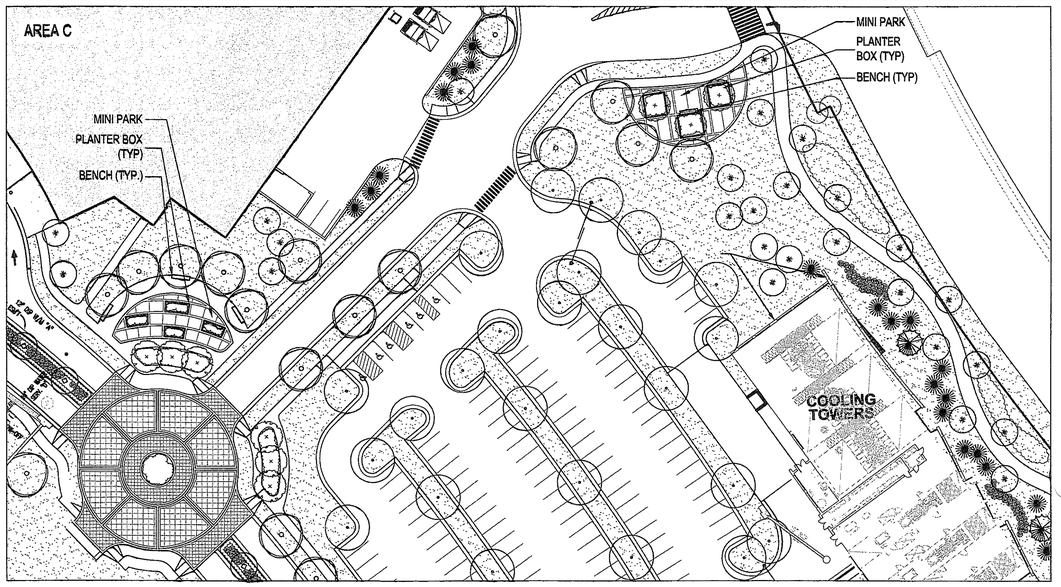
KEY MAP
SEA OPTION 2
SCALE: 1" = 200'

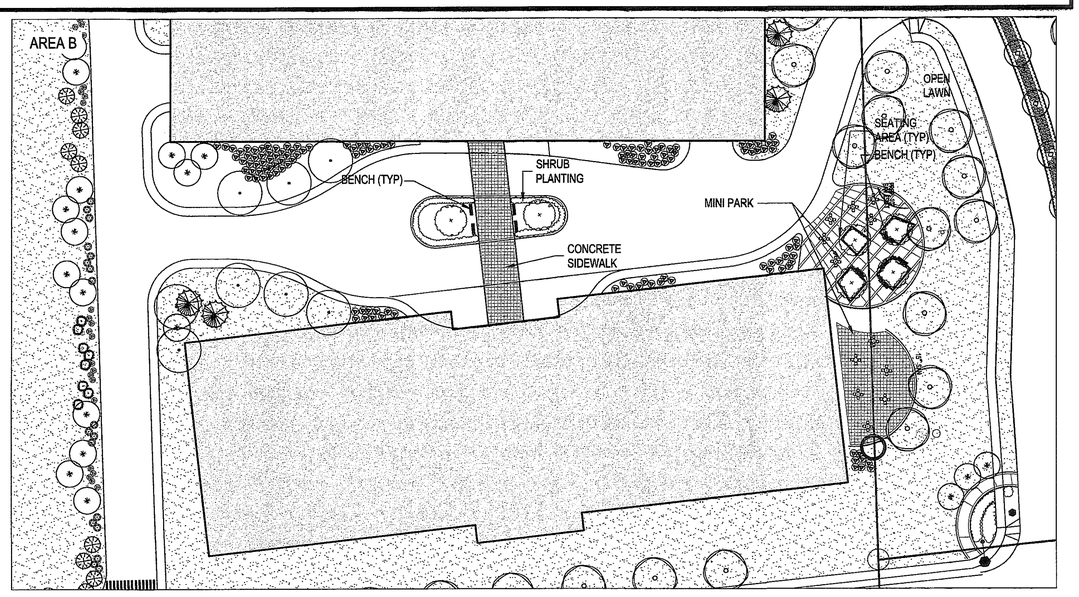


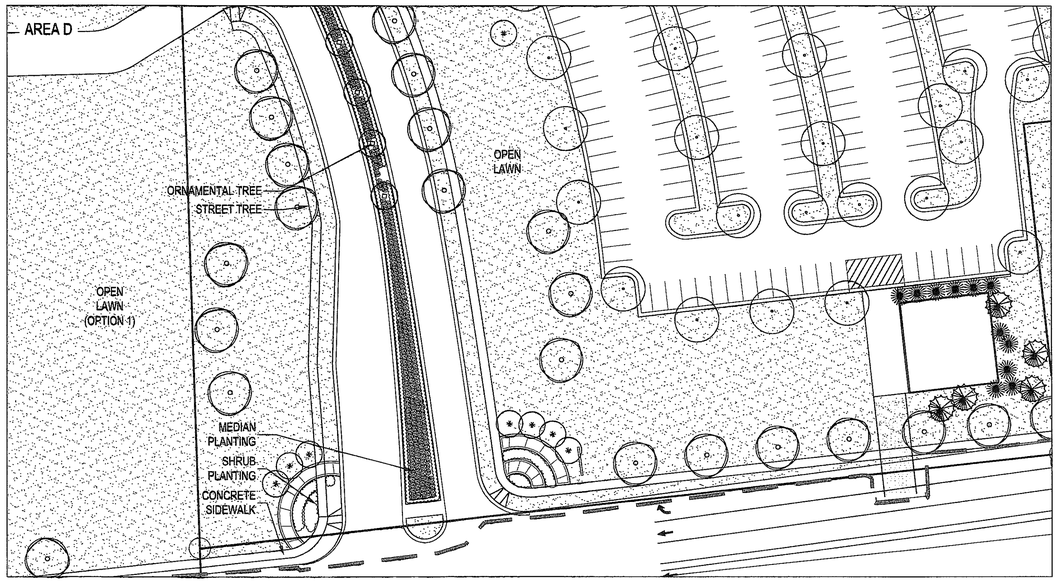
Legend

- PROPOSED LARGE DECIDUOUS TREE (Category III and IV Deciduous trees)
- PROPOSED EVERGREEN TREE (Category III and IV Evergreen trees)
- PROPOSED EVERGREEN TREE (Category I and II Evergreen trees)
- PROPOSED ORNAMENTAL TREE (Category I and II Deciduous trees)
- PROPOSED SHRUB MASS / PERENNIALS / GROUNDCOVER
- PROPOSED SITE FURNITURE
- PROPOSED LAWN/SOD
- PROPOSED SPECIAL PAVING

NOTE:
THE DETAILS PROVIDED HEREON REPRESENT THE PROPOSED HARDSCAPE AND LANDSCAPE PLANS FOR THE INDIVIDUAL OPEN SPACE AREAS. MINOR DESIGN CHANGES MAY BE MADE WITH FINAL DESIGN AND ENGINEERING.







Dewberry®

Dewberry & Davis LLC
8403 ARLINGTON BLVD.
FAIRFAX, VA 22031
PHONE: 703.849.0100
FAX: 703.849.0519
www.dewberry.com

INOVA FAIRFAX HOSPITAL CAMPUS

GENERALIZED DEVELOPMENT PLAN / SPECIAL EXCEPTION AMENDMENT PLAT

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

SEAL

COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES CULLEITON
Lic. No. 20112
6-10-09
PROFESSIONAL ENGINEER

Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated ~~7/6/2009~~ (conditions dated 7/6/09)
Date Of (BOS) (PC) approval 7/13/2009
Sheet 10 of 27

SCALE
0' 40' 80'

No.	DATE	BY	Description
11	06.10.09	JMC	
10	06.05.09	JMC	
9	05.20.09	JMC	
8	04.20.09	JMC	
7	03.26.09	JMC	
6	02.19.09	JMC	
5	01.23.09	JMC	
4	10.09.08	JMC	
3	08.28.08	JMC	
2	07.31.08	JMC	
1	07.01.08	ARW	

REVISIONS

DRAWN BY JMC
APPROVED BY
CHECKED BY PGY
DATE February 12, 2008

TITLE

INOVA
Fairfax Hospital Campus
Development Plan
Detail Enlargements

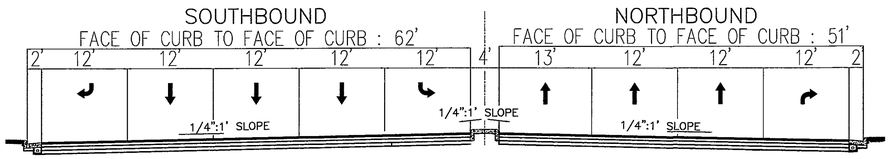
PROJECT NO.

9

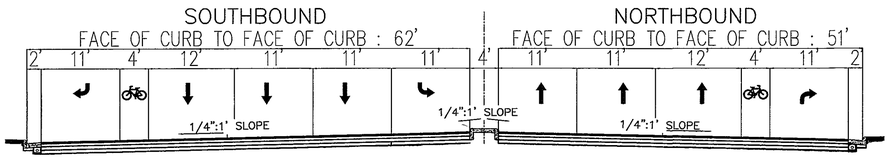
SHEET NO. 9 OF 26

M-10691

Q:\PROJECT\INOVA\Fairfax Hospital\Submissions\GDPSEA-10\Deliverables\9-DETAIL ENLARGEMENTS.dwg, 6/10/2009 1:30:29 PM, jcens



EXISTING GALLOWS RD. (RTE. 650)
TYPICAL SECTION A–A'



PROPOSED GALLOWS RD. (RTE. 650)
TYPICAL SECTION A–A'

GENERAL NOTES

SHEET 11
THE IMPROVEMENTS SHOWN ON THIS SHEET INCLUDE:

ADDITION OF THIRD SOUTHBOUND LANE FROM JUST NORTH OF WILLOW OAKS CORP. DRIVE

INTERSECTION OF WILLOW OAKS CORPORATE DRIVE AND GALLOWS ROAD, SIGNAL TIMING AND CYCLE LENGTH IMPROVEMENTS. ADDITION OF SECOND LEFT TURN LANE FROM NORTHBOUND GALLOWS TO WILLOW OAKS CORPORATE DRIVE.

INTERSECTION OF ANDERSON DRIVE AND GALLOWS ROAD, SIGNAL TIMING AND CYCLE LENGTH IMPROVEMENTS.

SHEET 12 AND 13
THE IMPROVEMENTS SHOWN ON THESE SHEETS INCLUDE:

CONTINUATION OF THIRD SOUTHBOUND LANE TO JUST SOUTH OF THE EMERGENCY DEPARTMENT ENTRANCE

INTERSECTION OF HOSPITAL BLUE ENTRANCE AND GALLOWS ROAD, SIGNAL TIMING AND CYCLE LENGTH IMPROVEMENTS ALONG WITH RE–STRIPING OF THE EASTBOUND APPROACH.

BEGIN BIKE LANE IMPROVEMENTS SOUTH OF WILLOW OAKS CORPORATE DRIVE (AS NOTED IN THE INOVA FAIRFAX HOSPITAL PROFFERS RZ 2008–PR–009)

SHEET 14
THE IMPROVEMENTS SHOWN ON THIS SHEET INCLUDE:

INTERSECTION OF WOODBURN ROAD AND FUTURE CENTER OF EXCELLENCE BOULEVARD, POSSIBLE INSTALLATION OF SIGNAL CONTROL ARM. EXTENSION OF RIGHT–TURN LANE FROM GALLOWS ROAD SOUTHBOUND ALONG THE LENGTH OF WOODBURN ROAD EASTBOUND TERMINATING AT FUTURE CENTER OF EXCELLENCE BOULEVARD.

SHEET 15
THE IMPROVEMENTS SHOWN ON THIS SHEET INCLUDE:

AT THE INTERSECTION OF WOODBURN ROAD AND GALLOWS ROAD, ADDITION OF THIRD WESTBOUND LANE FROM EXIT RAMP, (MAKING LANE USE THROUGH–LEFT–LEFT) AND SIGNAL TIMING IMPROVEMENTS. ADDITION OF SECOND THROUGH LANE ALONG WOODBURN ROAD WESTBOUND. EXTENSION OF RIGHT–TURN LANE FROM GALLOWS ROAD SOUTHBOUND ALONG THE LENGTH OF WOODBURN ROAD WESTBOUND, TERMINATING AT FUTURE CENTER OF EXCELLENCE BOULEVARD (AS SHOWN ON SHEET 14).

ADDITION OF SECOND EASTBOUND RIGHT–TURN LANE ON WOODBURN ROAD (MAKING USE LEFT–LEFT–RIGHT–RIGHT) AND SIGNAL TIMING IMPROVEMENTS. ADDITION OF SECOND LEFT–TURN LANE ALONG NORTHBOUND GALLOWS ROAD (MAKING USE THROUGH–THROUGH–LEFT–LEFT).

TERMINATION OF BIKE LANE IMPROVEMENTS ON NORTH SIDE OF WOODBURN ROAD INTERSECTION

SHEET 16
THIS SHEET IS INTENDED TO DEMONSTRATE THE ABILITY FOR THE PROPOSED RT. 495 HOT–LANE IMPROVEMENTS TO CONNECT TO THE PROPOSED GALLOWS ROAD IMPROVEMENTS. THE ALIGNMENTS SHOWN ON THIS SHEET WERE TAKEN FROM PRESENTATION GRAPHICS PROVIDED BY VDOT AND DO NOT NECESSARILY REPRESENT THE FINAL HOT–LANE IMPROVEMENT DESIGN.

NOTE:

SHEETS 10–16 WERE CREATED FOR VISUALIZING THE PROPOSED TRAFFIC IMPROVEMENTS SET FORTH IN THE PROFFERS. THE STORM SEWER SYSTEMS SHOWN WITH THE ROADWAY IMPROVEMENTS ARE APPROXIMATE AND ARE SUBJECT TO CHANGE UPON FINAL ENGINEERING. THE "EXISTING CONDITIONS" ARE SHOWN WITH TWO–FOOT CONTOURS AND WERE COMPILED THROUGH MULTIPLE SOURCES, INCLUDING FIELD SURVEYS, AIR FLOWN SURVEYS, COUNTY GIS, PROPOSED ROAD IMPROVEMENT PLANS BY OTHERS, AND DRAFTED LAYOUTS BASED ON AERIAL PHOTOGRAPHY. THESE DOCUMENTS ARE NOT FOR CONSTRUCTION PURPOSES

Dewberry

Dewberry & Davis LLC
8403 ARLINGTON BLVD.
FAIRFAX, VA 22031
PHONE: 703.849.0100
FAX: 703.849.0519
www.dewberry.com

INOVA
FAIRFAX HOSPITAL
CAMPUS

GENERALIZED DEVELOPMENT PLAN /
SPECIAL EXCEPTION AMENDMENT PLAT

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

SEAL
COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES CULLETON
Lic. No. 20112
6.10.09
PROFESSIONAL ENGINEER

Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated ~~7/6/2009 (conditions dated7/6/09)~~
Date Of (BOS) (PC) approval 7/13/2009
Sheet ____ of 27

SCALE
0' 120' 240'

No.	DATE	BY	Description
11	06.10.09	JMC	
10	06.05.09	CAP	
9	05.20.09	CAP	
8	04.20.09	JMC	
7	03.26.09	JMC	
6	02.19.09	JMC	
5	01.23.09	JMC	
4	10.09.08	JMC	
3	08.28.08	JMC	
2	07.31.08	JMC	
1	07.01.08	ARW	

REVISIONS

DRAWN BY JMC
APPROVED BY
CHECKED BY PGY
DATE February 12, 2008

TITLE
INOVA
Fairfax Hospital Campus
Development Plan
Road Improvement Plan

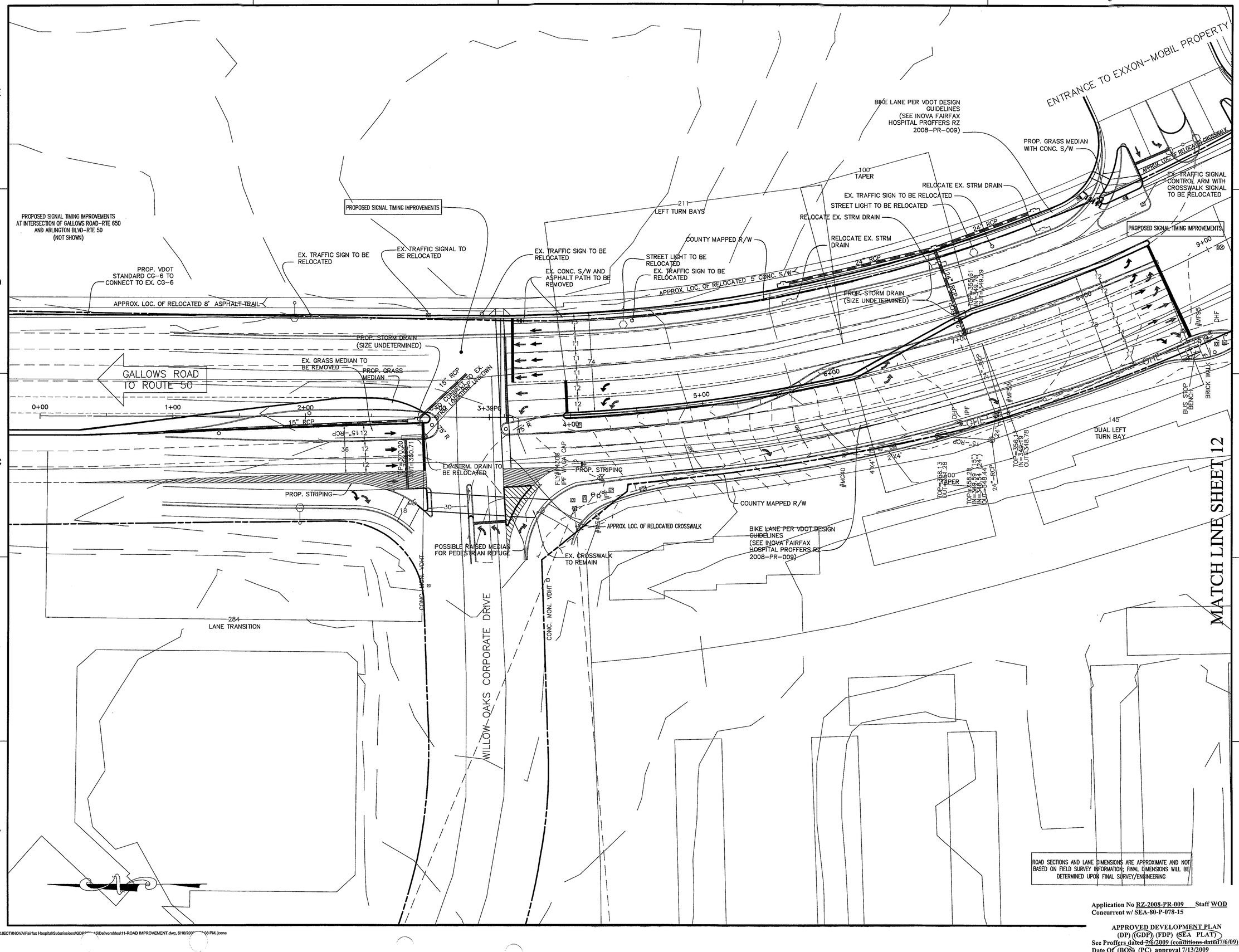
PROJECT NO.

10

SHEET NO. 10 OF 26

M-10691

Q:\PROJECT\INOVA\Fairfax Hospital\Submissions\GDP\~~4~~5\Deliverables\10-ROAD IMPROVEMENT.dwg, 6/10/2009 ~~1~~:50 PM, jcena



ROAD SECTIONS AND LANE DIMENSIONS ARE APPROXIMATE AND NOT BASED ON FIELD SURVEY INFORMATION; FINAL DIMENSIONS WILL BE DETERMINED UPON FINAL SURVEY/ENGINEERING

Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated ~~7/6/2009 (conditions dated7/6/09)~~
Date Of (BOS) (PC) approval 7/13/2009
Sheet 12 of 27

Q:\PROJECT\INOVA\Fairfax Hospital\Submissions\GDP\...\Deliverables\11-ROAD IMPROVEMENT.dwg, 6/10/2009 ...08 PM, jcena

Dewberry®

Dewberry & Davis LLC
8403 ARLINGTON BLVD.
FAIRFAX, VA 22031
PHONE: 703.849.0100
FAX: 703.849.0519
www.dewberry.com

INOVA FAIRFAX HOSPITAL CAMPUS

GENERALIZED DEVELOPMENT PLAN / SPECIAL EXCEPTION AMENDMENT PLAT

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

SEAL

COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES CULLETON
Lic. No. 20112
6-10-09
PROFESSIONAL ENGINEER

KEY PLAN

SCALE
0' 30' 60'

No.	DATE	BY	Description
11	06.10.09	JMC	
10	06.05.09	CAP	
9	05.20.09	CAP	
8	04.20.09	JMC	
7	03.26.09	JMC	
6	02.19.09	JMC	
5	01.23.09	JMC	
4	10.09.08	JMC	
3	08.28.08	JMC	
2	07.31.08	JMC	
1	07.01.08	ARW	

REVISIONS

DRAWN BY JMC
APPROVED BY
CHECKED BY PGY
DATE February 12, 2008

TITLE

INOVA
Fairfax Hospital Campus
Development Plan
Road Improvement Plan

PROJECT NO.

11

SHEET NO. 11 OF 26

M-10691

MATCH LINE SHEET 11

GALLOWS ROAD

BIKE LANE PER VDOT DESIGN GUIDELINES (SEE INOVA FAIRFAX HOSPITAL PROFFERS RZ 2008-PR-009)

END NORTHBOUND REALIGNMENT FOR ADDITIONAL SOUTHBOUND GALLOWS ROAD LANE TIE IMPROVEMENTS INTO EXISTING ROAD ALIGNMENT

APPROX. AREA OF RELOCATED. BUS STOP

144 TAPER

COUNTY MAPPED R/W

281 RIGHT TURN BAY

PROP. GRASS OR CONC. MEDIAN

STREET LIGHT TO BE RELOCATED

RELOCATE EX. STRM DRAIN INLET

PROP. GRASS MEDIAN WITH CONC. S/W

EX. TRAFFIC SIGN TO BE RELOCATED

EX. TRAFFIC SIGNAL CONTROL ARM TO BE RELOCATED

PROP. 5' CONC. S/W

CONCRETE DITCH

PROPOSED SIGNAL TIMING IMPROVEMENTS

156 LEFT TURN BAY

100 TAPER

ANDERSON DRIVE

TOWNSEND STREET

BLUE ENTRANCE

FIELD SURVEYED PROPERTY LINE

COUNTY MAPPED R/W

BIKE LANE PER VDOT DESIGN GUIDELINES (SEE INOVA FAIRFAX HOSPITAL PROFFERS RZ 2008-PR-009)

MATCH LINE SHEET 13

Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated ~~7/6/2009 (conditions dated 7/6/09)~~
Date Of (BOS) (PC) approval 7/13/2009
Sheet 13 of 27

ROAD SECTIONS AND LANE DIMENSIONS ARE APPROXIMATE AND NOT BASED ON FIELD SURVEY INFORMATION; FINAL DIMENSIONS WILL BE DETERMINED UPON FINAL SURVEY/ENGINEERING.

Dewberry

Dewberry & Davis LLC
8403 ARLINGTO
FAIRFAX, VA 22
PHONE: 703.84
FAX: 703.849.0
www.dewberry.c

INOVA
FAIRFAX HOSPITAL
CAMPUS

GENERALIZED DEVELOPMENT PLAN /
SPECIAL EXCEPTION AMENDMENT PLAT

PROVIDENCE DISTRICT

SEAL

COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES CULLETON
Lic. No. 20112
6.10.09
PROFESSIONAL ENGINEER

KEY PLAN

SCALE
0' 30' 60'

No.	DATE	BY	Description
6	06.10.09	JMC	
5	06.05.09	JMC	
4	05.20.09	CAP	
3	04.20.09	JMC	
2	03.26.09	JMC	
1	02.19.09	JMC	

REVISIONS

DRAWN BY JMC
APPROVED BY
CHECKED BY PGY
DATE February 12, 2008

TITLE
INOVA
Fairfax Hospital Campu
Development Plan
Road Improvement Plan

PROJECT NO.

12

SHEET NO. 12 OF 26

M-10691

IECT\INOVA\Fairfax Hospital\Submissions\GDPSEA-10\Deliverables\12-ROAD IMPROVEMENT.dwg, 6/10/2009 1:22:27 PM, jcena

MATCH LINE SHEET 12

MATCH LINE SHEET 14

ENTRANCE TO EXXON-MOBIL PROPERTY

GALLOWS ROAD - RTE 650

BIKE LANE PER VDOT DESIGN GUIDELINES (SEE INOVA FAIRFAX HOSPITAL PROFFERS RZ 2008-PR-009)

50 TAPER

34 LEFT TURN BAY

APPROX. LOCATION OF EX. BUS STOP / PROP. CONC. BUS PAD

285 LEFT TURN BAY

COUNTY MAPPED R/W

PROPOSED SIGNAL TIMING IMPROVEMENTS

PROP. 5' CONC. S/W

PROP. GRASS OR CONC. MEDIAN

PROP. CROSSWALK WITH COUNTDOWN SIGNAL

EX. CROSSWALK TO REMAIN

1.5'X1.5' HAND HOLE

BLUE ENTRANCE

FIELD SURVEYED PROPERTY LINE

ASPHALT

CONCRETE

EMERGENCY DEPARTMENT ENTRANCE

AMBULANCE PARKING

ENTERS PARKING STRUCTURE

JET FUEL

FENCED AREA

JET FUEL TANK

FUEL/WATER SEPARATOR TANK MH

FUEL/WATER SEPARATOR TANK MH

6" HIGH FUEL PUMPS

CONCRETE ISLAND

CONCRETE DITCH

GRAY ENTRANCE

RELOCATE EX. STRM DRAIN

TRAILER

SIGNAL CONTROL BOX

EX. CROSSWALK TO REMAIN

BIKE LANE PER VDOT DESIGN GUIDELINES (SEE INOVA FAIRFAX HOSPITAL PROFFERS RZ 2008-PR-009)

147 LEFT TURN BAY

EX. CROSSWALK TO REMAIN

ROAD SECTIONS AND LANE DIMENSIONS ARE APPROXIMATE AND NOT BASED ON FIELD SURVEY INFORMATION; FINAL DIMENSIONS WILL BE DETERMINED UPON FINAL SURVEY/ENGINEERING

Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated ~~7/6/2009 (conditions dated 7/6/09)~~
Date of (BOS) (PC) approval 7/13/2009
Sheet 14 of 27

\OJECT\INOVA\Fairfax Hospital\Submissions\GDP[illegible]\9\Deliverables\13-ROAD IMPROVEMENT.dwg, 6/10/200[illegible]9 P.M. joena

Dewberry

Dewberry & Davis LLC
8403 ARLINGTON
FAIRFAX, VA 220
PHONE: 703.849.
FAX: 703.849.051
www.dewberry.co

INOVA
FAIRFAX HOSPITAL
CAMPUS

GENERALIZED DEVELOPMENT PLAN / SPECIAL EXCEPTION AMENDMENT PLAT

PROVIDENCE DISTRICT

SEAL

COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES CULLETON
Lic. No. 20112
6.10.09
PROFESSIONAL ENGINEER

KEY PLAN

SCALE
0' 30' 60'

No.	DATE	BY	Description
6	06.10.09	JMC	
5	06.05.09	CAP	
4	05.20.09	CAP	
3	04.20.09	JMC	
2	03.26.09	JMC	
1	02.19.09	JMC	

REVISIONS

DRAWN BY JMC
APPROVED BY
CHECKED BY PGY
DATE February 12, 2008

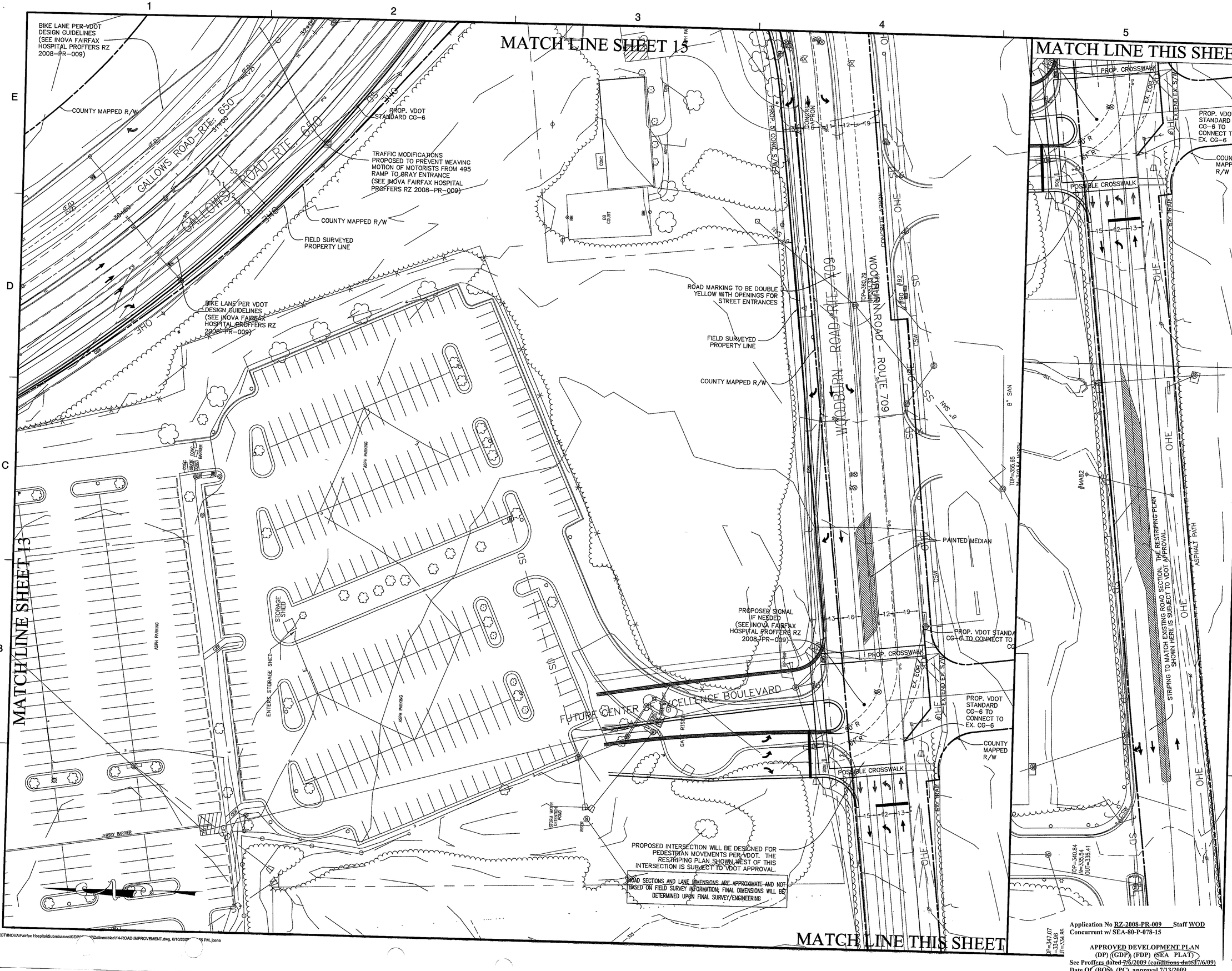
TITLE
INOVA
Fairfax Hospital Camp
Development Plan
Road Improvement Plan

PROJECT NO.

13

SHEET NO. 13 OF 2

M-10691



Q:\PROJECT\INOVA\Fairfax Hospital\Submissions\GDP\[illegible]\Deliverables\14-ROAD IMPROVEMENT.dwg, 6/10/2009 [illegible]:5 PM, joena

Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated ~~7/6/2009~~ (conditions dated 7/6/09)
Date Of (BOS) (PC) approval 7/13/2009
Sheet 15 of 27

Dewberry

Dewberry & Davis LLC
8403 ARLINGTON BLVD.
FAIRFAX, VA 22031
PHONE: 703.849.0100
FAX: 703.849.0519
www.dewberry.com

INOVA FAIRFAX HOSPITAL CAMPUS

GENERALIZED DEVELOPMENT PLAN / SPECIAL EXCEPTION AMENDMENT PLAT

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

SEAL

COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES CULLETON
Lic. No. 20112
6.10.09
PROFESSIONAL ENGINEER

KEY PLAN

SCALE
0' 30' 60'

No.	DATE	BY	Description
6	06.10.09	JMC	
5	06.05.09	JMC	
4	05.20.09	CAP	
3	04.20.09	JMC	
2	03.26.09	JMC	
1	02.19.09	JMC	

REVISIONS

DRAWN BY JMC
APPROVED BY
CHECKED BY PGY
DATE February 12, 2008

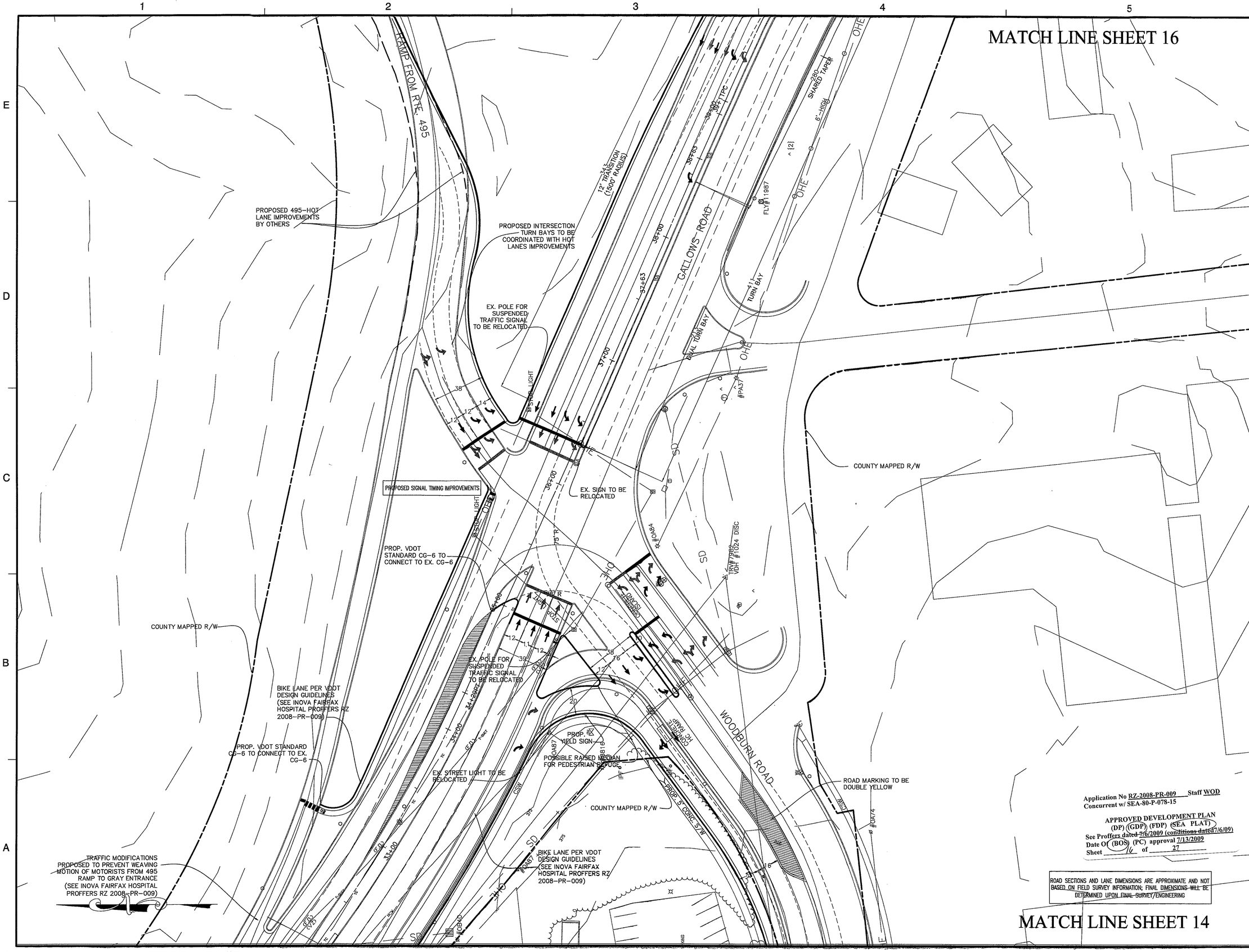
TITLE
INOVA
Fairfax Hospital Campus
Development Plan
Road Improvement Plan

PROJECT NO.

14

SHEET NO. 14 OF 26

M-10691



Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated 7/6/2009 (conditions dated 7/6/09)
Date Of (BOS) (PC) approval 7/13/2009
Sheet 16 of 27

ROAD SECTIONS AND LANE DIMENSIONS ARE APPROXIMATE AND NOT BASED ON FIELD SURVEY INFORMATION; FINAL DIMENSIONS WILL BE DETERMINED UPON FINAL SURVEY/ENGINEERING

Q:\PROJECT\INOVA\Fairfax Hospital\Submissions\GDP\...\Deliverables\15-ROAD IMPROVEMENT.dwg, 6/10/2009 ...:27 PM, joena

Dewberry

Dewberry & Davis LLC
8403 ARLINGTON BLVD.
FAIRFAX, VA 22031
PHONE: 703.849.0100
FAX: 703.849.0519
www.dewberry.com

INOVA FAIRFAX HOSPITAL CAMPUS

GENERALIZED DEVELOPMENT PLAN / SPECIAL EXCEPTION AMENDMENT PLAT

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

SEAL

COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES CULLEITON
Lic. No. 20112
6-10-09
PROFESSIONAL ENGINEER

KEY PLAN

SCALE
0' 30' 60'

No.	DATE	BY	Description
6	06.10.09	JMC	
5	06.05.09	JMC	
4	05.20.09	CAP	
3	04.20.09	JMC	
2	03.26.09	JMC	
1	02.19.09	JMC	

REVISIONS

DRAWN BY JMC
APPROVED BY
CHECKED BY PGY
DATE February 12, 2008

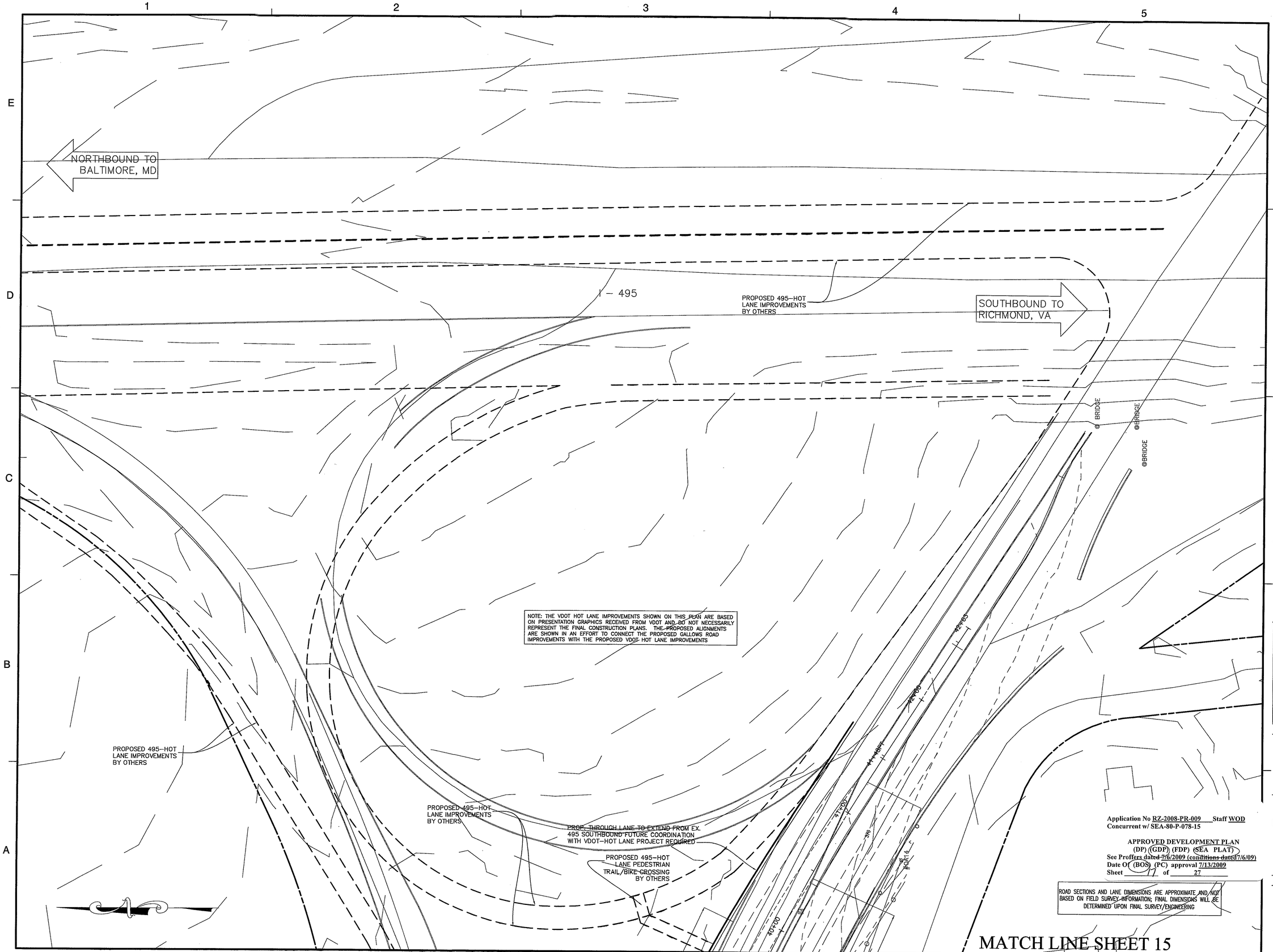
TITLE
INOVA
Fairfax Hospital Campus
Development Plan
Road Improvement Plan

PROJECT NO.

15

SHEET NO. 15 OF 26

M-10691



Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated 7/6/2009 (conditions dated 7/6/09)
Date Of (BOS) (PC) approval 7/13/2009
Sheet 17 of 27

ROAD SECTIONS AND LANE DIMENSIONS ARE APPROXIMATE AND NOT BASED ON FIELD SURVEY INFORMATION; FINAL DIMENSIONS WILL BE DETERMINED UPON FINAL SURVEY/ENGINEERING

Q:\PROJECT\INOVA\Fairfax Hospital\Submissions\GDP\...\Deliverables\16-ROAD IMPROVEMENT.dwg, 6/10/200... 23 AM, joena

Dewberry

Dewberry & Davis LLC
8403 ARLINGTON BLVD.
FAIRFAX, VA 22031
PHONE: 703.849.0100
FAX: 703.849.0519
www.dewberry.com

INOVA FAIRFAX HOSPITAL CAMPUS

GENERALIZED DEVELOPMENT PLAN / SPECIAL EXCEPTION AMENDMENT PLAT

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

SEAL

COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES CULLEITON
Lic. No. 20112
6-10-09
PROFESSIONAL ENGINEER

KEY PLAN

SCALE
0' 30' 60'

No.	DATE	BY	Description
6	06.10.09	JMC	
5	06.05.09	CAP	
4	05.20.09	CAP	
3	04.20.09	JMC	
2	03.26.09	JMC	
1	02.19.09	JMC	

REVISIONS

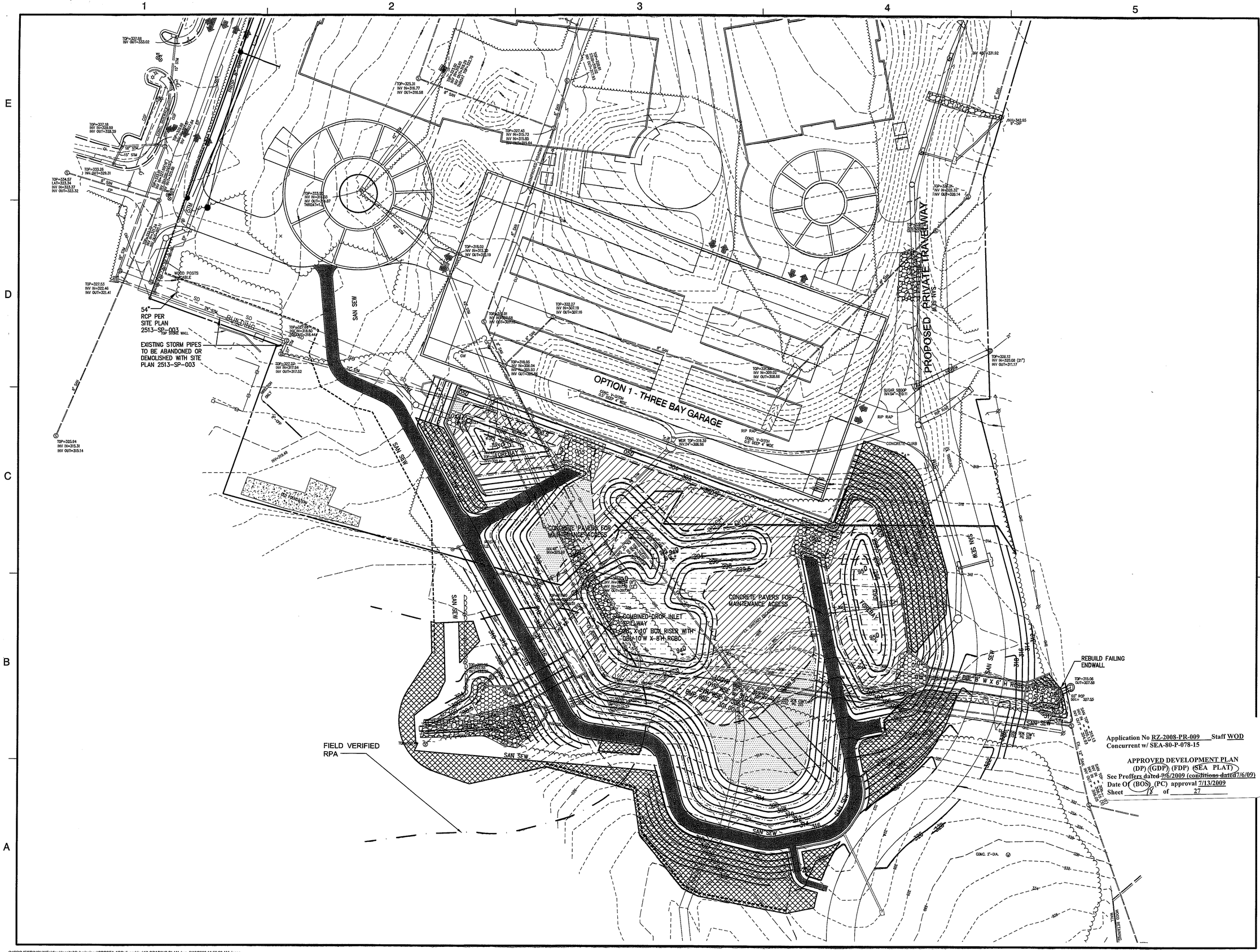
DRAWN BY JMC
APPROVED BY
CHECKED BY PGY
DATE February 12, 2008

TITLE
INOVA
Fairfax Hospital Campus
Development Plan
Road Improvement Plan

PROJECT NO.
16

SHEET NO. 16 OF 26

M-10691



Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated ~~7/6/2009 (conditions dated 7/6/09)~~
Date Of (BOS) (PC) approval 7/13/2009
Sheet 18 of 27

Q:\PROJECT\INOVA\Fairfax Hospital\Submissions\GDPSEA-19\Deliverables\17-GRADING PLAN.dwg, 6/10/2009 11:56:22 AM, joena

Dewberry

Dewberry & Davis LLC
8403 ARLINGTON BLVD.
FAIRFAX, VA 22031
PHONE: 703.849.0100
FAX: 703.849.0519
www.dewberry.com

INOVA FAIRFAX HOSPITAL CAMPUS

GENERALIZED DEVELOPMENT PLAN / SPECIAL EXCEPTION AMENDMENT PLAT

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

SEAL

COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES CULLETON
Lic. No. 20112
6.10.09
PROFESSIONAL ENGINEER

KEY PLAN

SCALE

0' 40' 80'

No.	DATE	BY	Description
11	06.10.09	JMC	
10	06.05.09	JMC	
9	05.20.09	JMC	
8	04.20.09	JMC	
7	03.26.09	JMC	
6	02.19.09	JMC	
5	01.23.09	JMC	
4	10.09.08	JMC	
3	08.28.08	JMC	
2	07.31.08	JMC	
1	07.01.08	ARW	

REVISIONS

DRAWN BY SCC
APPROVED BY PGY
CHECKED BY TCC
DATE February 12, 2008

TITLE

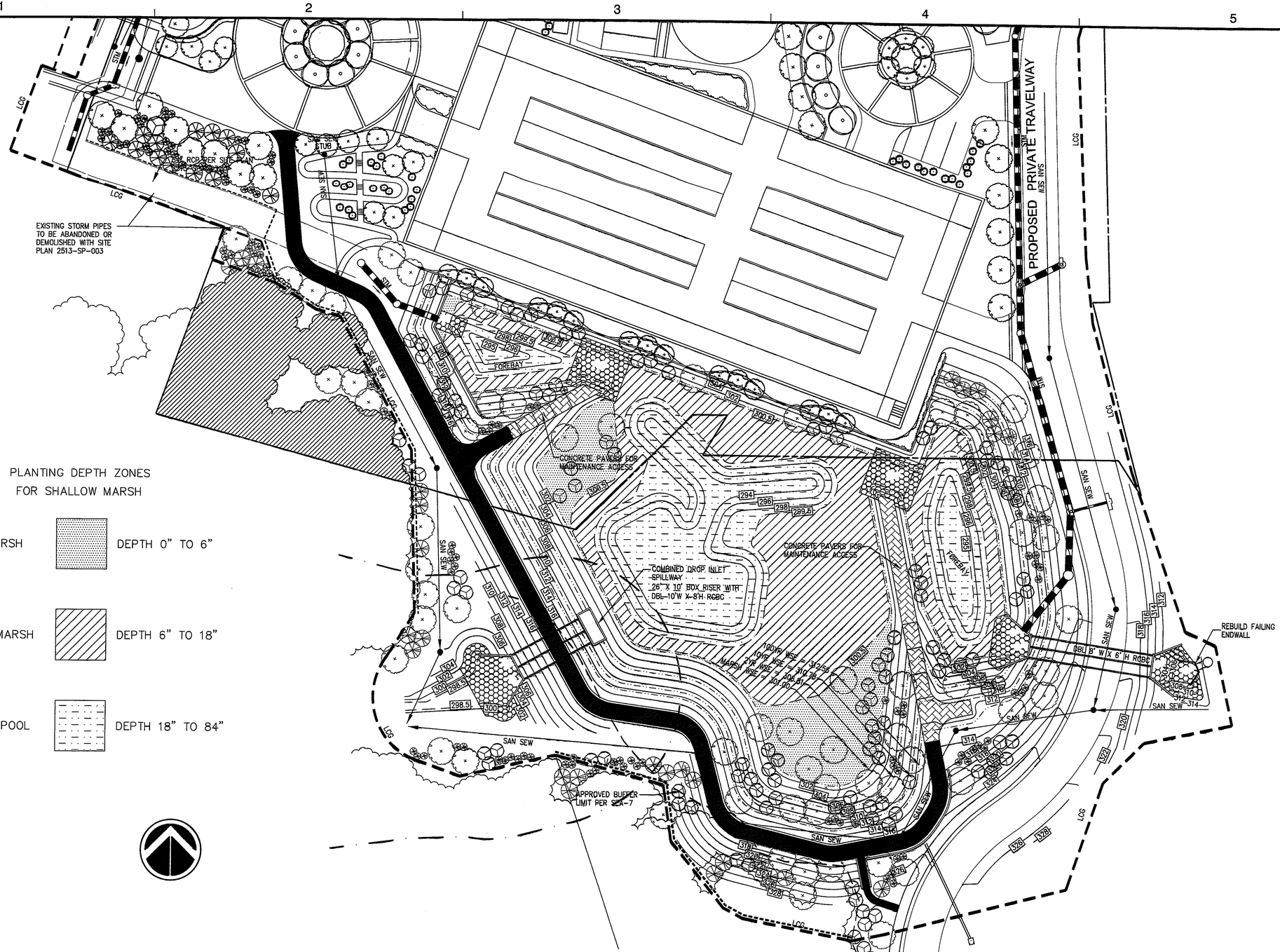
INOVA Fairfax Hospital Campus
SWM Grading Plan
GDP / SEA

PROJECT NO.

17

SHEET NO. 17 OF 26

M-10691



Legend

- PROPOSED LARGE DECIDUOUS TREE (Category III and IV Deciduous trees)
- PROPOSED EVERGREEN TREE (Category III and IV Evergreen trees)
- PROPOSED EVERGREEN TREE (Category I and II Evergreen trees)
- PROPOSED ORNAMENTAL TREE (Category I and II Deciduous trees)

Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated ~~7/6/2009~~ (conditions dated 7/6/09)
Date of (BOS) (PC) approval 7/13/2009
Sheet 19 of 27

Dewberry®

Dewberry & Davis LLC
8403 ARLINGTON BLVD.
FAIRFAX, VA 22031
PHONE: 703.849.0100
FAX: 703.849.0519
www.dewberry.com

INOVA
FAIRFAX HOSPITAL CAMPUS

GENERALIZED DEVELOPMENT PLAN / SPECIAL EXCEPTION AMENDMENT PLAT

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

SEAL

COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES CULLETON
Lic. No. 20112
PROFESSIONAL ENGINEER
6.10.09

KEY PLAN

SCALE
0' 40' 120'

No.	DATE	BY	Description
11	06.10.09	JMC	
10	06.05.09	JMC	
9	05.20.09	JMC	
8	04.20.09	JMC	
7	03.26.09	JMC	
6	02.19.09	JMC	
5	01.23.09	JMC	
4	10.09.08	JMC	
3	08.28.08	JMC	
2	07.31.08	JMC	
1	07.01.08	ARW	

REVISIONS

DRAWN BY SCC
APPROVED BY PGY
CHECKED BY TCC
DATE February 12, 2008

TITLE

INOVA
Fairfax Hospital Campus
SWM Landscape Plan
GDP / SEA

PROJECT NO.

18

SHEET NO. 18 OF 26

M-10691

Q:\PROJECT\INOVA\Fairfax Hospital\Submissions\GDPSEA-10\Deliverables\18-LA PLAN-POND.dwg, 6/10/2009 11:55:09 AM, jcena

INOVA FAIRFAX HOSPITAL STORMWATER MANAGEMENT NARRATIVE

This plan proposes the expansion of the INOVA hospital facilities and related infrastructure. SWM is required for the proposed improvements in the form of quality and quantity control. Runoff from the northern portion of the site will be conveyed to the proposed Willow Oaks SWM/BMP Pond (See Inova Willow Oaks SWM Narrative provided herein) and runoff from the southern portion of the site will be conveyed to a maximum of 2 proposed underground SWM vaults, identified as SWM Vault 1 and SWM Vault 2. As detailed in this Application, there are 2 development program options for the southern portion of the site. If Option 1 is selected, then only SWM Vault 1 is required. If Option 2 is selected, then both SWM Vaults are required as desribed below. For the purpose of SWM calculations, it is assumed that both SWM Vault 1 and SWM Vault 2 are required as described under Option 2. This is the most conservative scenario for design.

Detention and BMP

Option 1 (WHPT + Redevelopment of Existing Woodburn Place +Willow Oaks Road Improvements)

Under this option, SWM Vault 1, approximately 141' x 118' x 11', will be located beneath the proposed boulevard near the entrance to Woodburn Drive. This facility will provide detention for the WHPT and Redevelopment of Woodburn Place (21.77 acres). The road improvements to the north of the hospital drain to the proposed Willow Oaks SWM/BMP Pond where detention will be provided. BMP for Option 1 can be provided by the proposed Willow Oaks SWM/BMP Pond. This is the preferred BMP approach and a request will be made to DPWES at Site Plan to defer BMP for Option 1 improvements until the proposed Willow Oaks SWM/BMP Pond is designed and constructed. Alternately, at the Applicant's discretion, BMP could be provided in a sand filter.

Option 2 (WHPT + Redevelopment of Existing Woodburn Place + Redevelopment of Existing Woodburn Mental Health Facility

Under this option, SWM Vault 1, approximately 141' x 118' x 11', and SWM Vault 2, approximately 127' x 32' x 11' would need to be constructed. SWM Vault 1 would be located beneath the proposed boulevard near the entrance to Woodburn Drive, and SWM Vault 2 would be located on the existing Mental Health Facility property. These facilities will provide detention for the WHPT, Redevelopment of Woodburn Place, and Redevelopment of Woodburn Mental Health Facility (27.17 acres). The road improvements to the north of the hospital drain to the proposed Willow Oaks SWM/BMP Pond where detention will be provided. BMP for Option 2 can be provided by the proposed Willow Oaks SWM/BMP Pond. This is the preferred BMP approach and a request will be made to DPWES at Site Plan to defer BMP for Option 2 improvements until the proposed Willow Oaks SWM/BMP Pond is designed and constructed. Alternately, at the Applicant's discretion, BMP could be provided in a sand filter.

FLOODPLAIN

There is a regulated minor floodplain on the northern portion of the site at the proposed Willow Oaks SWM Pond (See Willow Oaks SWM Narrative provided in this Application for details on this floodplain).

There is no regulated floodplain on the southern portion of the site.

LOW IMPACT DEVELOPMENT

The Applicant shall install Fairfax County accepted Low Impact Development (LID) facilities, on the Application Property in at least one of the potential locations shown on this development plan. The LID facilities (pervious pavement or other) shall treat a combined total of 20,000 square feet of impervious surface and shall have a minimum phosphorous removal efficiency of 40 percent. The LID facilities will be designed in accordance with the PFM. These LID facilities are intended as demonstration facilities and shall not factor into the requisite calculations for stormwater management and BMPs.

PRE-DEV RUNOFF FROM SOUTHERN 27.17 SITE AREA

AREA OF SITE = 27.17 ACRES
RUNOFF COEFFICIENT = 0.30
TIME OF CONCENTRATION (TC) = 15 MIN

ULTIMATE CONDITION RUNOFF FROM SOUTHERN 27.17 SITE AREA

ULTIMATE LANDUSE	C	AREA (A) (ACRES)	PRODUCT OF C X A	WEIGHTED C	TC (MIN)
COMMERCIAL	0.85	23.58	20.04		
EX. PUBLIC ROADS	0.90	1.32	1.19		
PUBLIC ROAD IMPROVEMENTS	0.90	0.34	0.31		
OPEN SPACE	0.35	0.50	0.18		
WOODS TO REMAIN	0.20	1.43	0.29		
TOTALS =		27.17	22.01	0.81	5.0

ULTIMATE CONDITION RUNOFF TO PROPOSED UNDERGOUND FACILITIES

ULTIMATE LANDUSE	C	AREA (A) (ACRES)	PRODUCT OF C X A	TC (MIN)
COMMERCIAL TO VAULT 1	0.85	17.00	14.45	5.0
COMMERCIAL TO VAULT 2	0.85	3.80	3.23	5.0

REQUIRED RUNOFF TO DETAIN FROM ULTIMATE CONDITION SITE AREA

CONDITION	C	A	I (INCHES/HR) 2-YR	I (INCHES/HR) 10-YR	PEAK FLOW (CFS) 2-YR	PEAK FLOW (CFS) 10-YR	
ULTIMATE	0.81	27.17	5.45	7.27	120	160	
PRE-DEVELOPMENT	0.30	27.17	3.90	5.10	32	42	
					88	118	DETENTION REQUIRED
FLOW INTO SWM VAULT 1	0.85	17.00	5.45	7.27	79	105	
FLOW OUT OF SWM VAULT 1 (SEE HEC-1 MODEL)					5	5	
DETENTION PROVIDED IN SWM VAULT 1 →					74	100	
FLOW INTO SWM VAULT 2	0.85	3.80	5.45	7.27	18	23	
FLOW OUT OF SWM VAULT 2 (SEE HEC-1 MODEL)					3	4	
DETENTION PROVIDED IN SWM VAULT 1 →					15	19	
TOTAL DETENTION PROVIDED BY SWM VAULT 1 AND SWM VAULT 2 →					89	119	DETENTION PROVIDED

INOVA FAIRFAX HOSPITAL STORMWATER OUTFALL NARRATIVE

There are 2 outfall points associated with this development program. One is the outfall downstream of the proposed Willow Oaks SWM/BMP Pond and the second is the outfall downstream of Woodburn Road (See Outfall Maps provided in this Application).

WILLOW OAKS SWM/BMP POND OUTFALL

(See Inova Willow Oaks SWM Outfall Narrative provided in this Application)

WOODBURN ROAD OUTFALL

This outfall drains to an existing 48" RCP storm sewer at Woodburn Road. This 48" sewer serves as the receiving pipe for the outfall and has a drainage area of 31.3 acres. The 48" RCP storm sewer flows in a southerly direction for approximately 690 ft beneath the Fairfax County School Board property and outfalls into an existing channel. The existing channel slightly meanders in a southerly direction until it reaches the inlet of an existing 72" RCP storm sewer. Based on field observations, the channel bottom varies between 7-10 ft wide and is approximately 3 ft deep on average. The channel bottom consists mainly of large cobbles, Riprap (Class I), and gravel. The channel banks are steep (1:1 or greater) and lined by a combination of grass and exposed tree roots. The 72" RCP storm sewer is in good shape, has a clean bottom, and there is no evidence of deterioration. Just upstream of the 72" storm sewer an incoming tributary confluences with the outfall. This tributary has a drainage area of 41.0 acres and is greater than 90 % of the area of the receiving pipe. Given this, the downstream extent of review based on PFM 6-0203.2A is 150 ft downstream of this confluence. However, because the Zoning Ordinance is more conservative for determining the downstream extent of review, the downstream extent of review for this development application has been extended and anlayzed down to Accotink Creek where the drainage area is greater than 15 square miles. Downstream of the existing 72" RCP storm sewer the existing channel slightly meanders and has the same channel characteristics as the channel described upstream of the 72" RCP storm sewer with a channel bottom width varying between 10 - 15 ft wide and a depth of 3 ft on average.

Capacity and velocity computations for this outfall are summarized and provided below. A 100-year backwater elevation was determined at the inlet to the existing 72" RCP storm sewer, which is determined to be in inlet control. This backwater does not flood any buildings. Based on these computations and field observations of the outfall, it is the opinion of the engineer that; (1) adequacy of the downstream drainage system is met within the extent of review; (2) that the cross sections shown are reflective of the stream reach analyzed; and (3) that there will be no flooding of existing downstream dwellings, or buildings constructed under an approved building permit, by the 100-year storm event.

EX. CHANNEL CAPACITY/VELOCITY SUMMARY – WOODBURN ROAD OUTFALL

SECTION	SLOPE (FT/FT)	n-VALUE	WIDTH (FT)	SIDE SLOPE (V:H)	DEPTH (FT)	NORMAL DEPTH (FT)	2-YR FLOW * (CFS)	VELOCITY ACTUAL (FPS)	VELOCITY PERMISSIBLE ** (FPS)	COMMENTS
A-A	0.015	0.058	7.0	1:1	3.0	1.98	70	3.94	5.50	ADEQUATE FOR CAPACITY AND VELOCITY
B-B	0.015	0.058	10.0	1:1	3.0	2.39	136	4.59	5.50	ADEQUATE FOR CAPACITY AND VELOCITY
C-C	0.014	0.058	12.0	1:1	3.0	3.00	231	5.13	5.50	ADEQUATE FOR CAPACITY AND VELOCITY
D-D	0.014	0.058	16.0	1:1	3.0	2.98	300	5.30	5.50	ADEQUATE FOR CAPACITY AND VELOCITY

* SEE OUTFALL HEC-1 MODEL NODES "A-A", "4", "5" AND "6" FOR SECTIONS A-A, B-B, C-C, AND D-D, RESPECTIVELY
** PER TABLE 5-22 "PERMISSIBLE VELOCITIES FOR UNLINED EARTHEN CHANNELS" OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK

EX. STORM SEWER CAPACITY SUMMARY – WOODBURN ROAD OUTFALL

SEWER	SLOPE (FT/FT)	n-VALUE	DIA. (FT)	NORMAL DEPTH (FT)	10-YR FLOW * (CFS)	COMMENTS
EX 48" (1) – (2)	0.0020	0.013	4.0	2.39	43	ADEQUATE FOR CAPACITY
EX 48" (2) – (3)	0.0148	0.013	4.0	1.70	66	ADEQUATE FOR CAPACITY
EX 72" STORM	0.0100	0.013	6.0	2.71	178	ADEQUATE FOR CAPACITY

* SEE OUTFALL HEC-1 MODEL NODES "1", "2" AND "4" FOR SEWERS EX 48 STORM (1)-(2), EX 48 STORM (2)-(3) AND EX 72 STORM, RESPECTIVELY.

Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated ~~7/6/2009 (conditions dated~~7/6/09)
Date Of (BOS) (PC) approval 7/13/2009
Sheet 20 of 27

100-YR FLOODING ELEVATION AT EX 72" RCP

STRUCTURE: EX 72" STORM

DESIGN FLOWS / TAILWATER		
R.I. (YEARS)	FLOW (CFS)	TW Elev.
100-YR	302	295

CULVERT TYPE: RCP
ENT. TYPE: SQ. EDGE WITH HE.
NO. OF PIPES = 1
DIAMETER = 6
MANNING'S "N" = 0.013
Ke = 0.5
ELi = 290
ELo = 289
ELtr =
ELsh =
L = 95

CULVERT DESCRIPTION: MATERIAL-SHAPE-SIZE-ENTRANCE	TOTAL FLOW Q (CFS)	FLOW PER BARREL Q/N	INLET CONTROL HWi/D	INLET CONTROL HWi	INLET CONTROL EL(hi)	OUTLET CONTROL TW Depth	OUTLET CONTROL dc	OUTLET CONTROL (dc+D)/2	OUTLET CONTROL ho	OUTLET CONTROL Ke	OUTLET CONTROL H	OUTLET CONTROL EL(ho)	CONTROL HW ELEV.	APPROX OUTLET VEL.	COMMENTS
72" dia. RCP	302	302	1.42	8.54	298.54	6.00	4.78	5.39	6.00	0.5	3.14	298.14	298.54	10.68	I.C.

TECHNICAL FOOTNOTES :

1) HWi BASED ON POLYNOMIAL BEST-FIT EQUATIONS FROM THE FHA PUBLICATION ENTITLED CALCULATOR DESIGN SERIES #3
2) HWi MAY NOT BE ACCURATE FOR VALUES < 0.5D AND > 4.5D
3) EL(hi) = HWi + ELi (INVERT OF INLET CONTROL SECTION)
4) TW BASED ON DOWNSTREAM CONTROL OR FLOW DEPTH IN CHANNEL
5) ho = TW OR (dc+D)/2 WHICHEVER IS GREATER
6) H = (1 + Ke + (29 n^2 L) / R^1.33) V^2 / 2g
7) EL(ho) = ELo + H + ho

Dewberry®
Dewberry & Davis LLC
8403 ARLINGTON BLVD.
FAIRFAX, VA 22031
PHONE: 703.849.0100
FAX: 703.849.0519
www.dewberry.com

INOVA FAIRFAX HOSPITAL CAMPUS
GENERALIZED DEVELOPMENT PLAN / SPECIAL EXCEPTION AMENDMENT PLAT
PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

SEAL: COMMONWEALTH OF VIRGINIA — TIMOTHY CHARLES CULLETON — Lic. No. 20112 — 6-10-09 — PROFESSIONAL ENGINEER

KEY PLAN

SCALE

No.	DATE	BY	Description
11	06.10.09	JMC	
10	06.05.09	JMC	
9	05.20.09	JMC	
8	04.20.09	JMC	
7	03.26.09	JMC	
6	02.19.09	JMC	
5	01.23.09	JMC	
4	10.09.08	JMC	
3	08.28.08	JMC	
2	07.31.08	JMC	
1	07.01.08	ARW	

REVISIONS

DRAWN BY JMC
APPROVED BY
CHECKED BY PGY
DATE February 12, 2008

TITLE
INOVA
Fairfax Hospital Campus
SWM and Outfall Narratives
GDP / SEA

PROJECT NO.

19

SHEET NO. 19 OF 26
M-10691

INOVA WILLOW OAKS

STORMWATER MANAGEMENT NARRATIVE

The INOVA Willow Oaks site is located in the Accotink Creek watershed. The existing site is mostly undeveloped woods. There are two existing dry ponds on the site: Pond A and Pond B, a quasi-regional pond. This plan proposes the development of the Willow Oaks. SWM is required for the proposed improvements in the form of quality and quantity control. Runoff from the site will be conveyed to an enhanced extended detention dry pond hereinafter referred to as the Willow Oaks SWM/BMP Pond.

Existing Conditions – Pond A and Pond B

Existing Pond B is located on the site east of Williams Drive and south of Willow Oaks Corporate Center Drive. This pond was designed by Rinker-Detwiler and Associates, P.C. in 1986 (Plan #6295-SP-01-2) and is one of the first "regional" facilities constructed in the County. It was designed as a detention only dry pond and currently does not provide BMP. New development in the watershed of Pond B is currently covered for detention, but BMP must be provided by other means (i.e. sand filters, dedicated conservation easements, etc.). In comparison to today's PFM requirements for pond facilities, criteria used in designing Pond B are outdated. For example, the hydrology used to size the outlet works, emergency spillway and set the top of dam are all based on 2-hour storm durations. Under current PFM criteria this is acceptable for drainage areas less than 20 acres but Pond B has a drainage area of approximately 130.1 acres. The outlet works of Pond B consists of a riser with outlet conduit and an emergency spillway placed in the fill section of the dam, which is armored by riprap covered by approximately 1'-2' of earth.

Immediately north and adjacent to existing Pond B is Pond A. Pond A, which drains into Pond B, is also a detention only dry pond. Pond A was designed in accordance with current PFM criteria by Dewberry in 1993 (Plan # 5544-SP-04). The outlet works of Pond A consists of a combined drop inlet principle/emergency spillway including a riser and outlet conduit. Willow Oaks, Bedford Village, north end of INOVA Fairfax Hospital Campus, and some businesses along Williams Drive as well as parts of VA Route 50 all drain to existing Pond A and/or Regional Pond B.

Proposed Willow Oaks SWM/BMP Pond

As part of this development application, it is proposed that existing Pond A and Pond B be combined into one SWM/BMP facility that consists of an enhanced extended detention dry pond that meets current PFM design criteria. The proposed facility will be privately owned and maintained. The proposed facility will include sediment forebays at major inflow points and a shallow marsh area consisting of a micro pool as well as high and low marshes. The outlet works will consist of a combined drop inlet principle/emergency spillway in the form of a riser and outlet conduit. The proposed dam embankment will be approximately 18' high with less than 50 ac-ft of storage to the top of the dam and will not be State regulated. Concept grading plans of the proposed facility are provided in this application.

The proposed facility is designed to provide peak flow reduction for the 2- and 10-year storms from developed conditions to good forested conditions for the entire 130.1 acre watershed it serves. Further, the proposed facility is designed to exceed the minimum phosphorous removal requirement for the 130.1 acre watershed it serves by providing 50 % phosphorous removal efficiency - the minimum required is 40 % for this particular location in the County. As demonstrated by the phosphorous removal computations provided, the proposed facility provides enough BMP to cover the entire 130.1 acre watershed it serves (including the INOVA Willow Oaks site) plus the INOVA Fairfax Hospital site. Though the southern portion of the INOVA Fairfax Hospital site along Woodburn Road does not drain to the proposed facility, BMP credit is requested as part of the INOVA Fairfax Hospital development application in lieu of having to design, build and maintain large sand filter systems.

Willow Oaks SWM/BMP Detention Summary

	Drainage Area (acres)	Peak Flow (cfs) 2-year	10-year
Good Forested Conditions	130.1	39	173
Ultimate Conditions	130.1		
• Into proposed facility		345	636
• Out of proposed facility		34	106
Over-detention provided		5	67

Willow Oaks SWM/BMP Water-Surface Elevation Summary

	Combined PSW/ESW PSW Top	ESW Top	Dam Top	WSE	Freeboard
Marsh pool	307.00 ft	310.75 ft	316.62 ft	301.00 ft	15.62 ft
BMP pool	307.00 ft	310.75 ft	316.62 ft	304.50 ft	12.12 ft
2-year pool	307.00 ft	310.75 ft	316.62 ft	306.81 ft	9.81 ft
10-year pool	307.00 ft	310.75 ft	316.62 ft	310.78 ft	5.84 ft
100-year pool	307.00 ft	310.75 ft	316.62 ft	312.56 ft	4.06 ft
1.5 x 100-year pool (S.D.F.)	307.00 ft	310.75 ft	316.62 ft	314.60 ft	2.02 ft
2.5 x 100-year pool (F.B.H)	307.00 ft	310.75 ft	316.62 ft	316.19 ft	0.43 ft

Where: PSW = Principal Spillway ESW = Emergency Spillway WSE = Water-surface elevation

Floodplain

There is a regulated minor floodplain onsite at the proposed Willow Oaks SWM/BMP Pond. Accordingly, a Floodplain Study will be prepared and submitted at Site Plan. The proposed Willow Oaks SWM/BMP Pond will reflect a decrease in its 100-year flood elevation when compared to existing conditions and will not impact adjacent properties. This decrease is a result of increased storage and spillway capacity associated with the proposed facility. A summary of the 100-year water-surface elevations is provided as follows:

100-Year Water-Surface Elevation Summary

Existing Pond A	316.28 ft	See Existing Conditions HEC-1 Model
Existing Regional Pond B	313.69 ft	See Existing Conditions HEC-1 Model
Proposed Willow Oaks SWM/BMP Pond	312.56 ft	See Ultimate Conditions HEC-1 Model

INOVA WILLOW OAKS

STORMWATER OUTFALL NARRATIVE

Description of Existing Outfall

The Willow Oaks development has one outfall The outfall channel begins at the proposed Willow Oaks SWM/BMP pond and proceeds in a southerly direction approximately 4,500 feet where it confluences with Accotink Creek. At Accotink Creek the drainage area is approximately 15 square miles. Based on field observations, the channel is predominantly natural channel, lightly meandering, 10'-15' wide bottom width, varying 3'-4' deep, and steep side slopes (1:1) Approximately 1500' of the outfall channel located just upstream of the Highland Lane culvert crossing was improved to reflect riprap and gabions to create an engineered rectangular channel. In addition, the Highland Lane culvert was upgraded to a triple 6' x 6' box culvert as part of that project. There are no signs of erosion at either the inlet or outlet of this culvert. These channel and culvert improvements were implemented by the County as recommended in the Parsons Brinckerhoff, Quade & Douglas report entitled, "Accotink Creek Watershed Immediate Action Plan", dated April 1978. Downstream of Highland Lane, the channel is natural and ends at Accotink Creek.

Description of Outfall Adequacy Requirements

In an effort to exceed minimum PFM requirements, NRCS Hydrology was used with a 24-hour duration storm for the 2-, 10- and 100-year events. This exceeds the minimum 2-hour duration storm as given under PFM section 6-1301.5. Using NRCS Hydrology, a rainfall-runoff model was developed using HEC-1 to determine 2-, 10- and 100-year peak flows at multiple points along the site outfall. Cross section computations for permissible velocity and channel capacity assuming normal depth were performed and the Highland Road culvert was checked for capacity and freeboard. In addition, the 100-year flood elevation was determined for each cross section and the resulting 100-year floodplain was mapped. The limits of the site outfall studied, cross section locations, and developed 100-year floodplain limits are provided in this Application. Under developed conditions (i.e. proposed Willow Oaks SWM/BMP facility with fully developed watershed), the outfall analysis reflects 5 key points:

1. All representative cross sections are adequate in terms of permissible velocity for the 2-yr storm.
2. All representative cross sections are adequate in terms of channel capacity with the exception of cross section 4 that represents the existing gabion-lined channel located just upstream of Highland Road. Here the 10-year storm is determined to be out of bank while the 2-year storm is contained.
3. All representative cross sections are adequate in terms of 100-year flooding with the exception of cross section 4 that represents the existing gabion-lined channel located just upstream of Highland Road. Here the 100-year floodplain encroaches on a single home.
4. The Highland Road culvert crossing is adequate for 10-year capacity and freeboard.
5. Even if the proposed Willow Oaks SWM/BMP facility could be designed to have infinite capacity, analysis confirms that the 10-year storm would still remain out of bank as described under point 2, and the home identified under point 3 would still flood at cross section 4. The analysis shows that this condition exists because the drainage that accumulates downstream of the Willow Oaks SWM/BMP facility is sufficient enough for the 10-year storm to exceed the capacity of the gabion-lined channel and also cause 100-year flooding of the home.

Given point 5 above, it can be concluded that increasing storage capacity at the proposed Willow Oaks SWM/BMP facility will not solve the existing 10-year capacity and 100-year flooding issues at the gabion-lined channel reflected by cross section 4. For these reasons it is appropriate to apply the concept of "no adverse impact and proportional improvement". That said the channel capacity method (PFM section 6-0203.4B) and 100-year flooding method (PFM section 6-0203.5) were used to evaluate proportional improvements. The proportional improvement computations for cross section 4 are found on this sheet.

The outfall analysis demonstrates that the proposed Willow Oaks SWM/BMP facility provides the required detention to demonstrate no adverse impact and proportional improvement for channel capacity and 100-year flooding at cross section 4. For these reasons, it is our judgment that the site outfall downstream of the development site together with the proposed Willow Oaks SWM/BMP facility function as an acceptable drainage system in accordance with criteria set forth in the PFM.

A summary of the natural and manmade channel adequacy along the study reach is given in Tables 1, 2 and 3 below.

Table 1 – Channel Capacity Check (Developed Conditions)

Section	Channel n-value	Max Capacity (cfs)	Flow (cfs)	Comments
1 (natural)	0.045 [A]	662	49 (2-yr)	capacity is adequate
2 (natural)	0.045 [A]	374	98 (2-yr)	capacity is adequate
3 (natural)	0.045 [A]	226	187 (2-yr)	capacity is adequate
4 (gabions)	**0.037 [B]**	**307**	**499 (10-yr)**	**capacity not adequate [D]**
5 (natural)	0.058 [C]	246	216 (2-yr)	capacity is adequate
6 (natural)	0.058 [C]	269	216 (2-yr)	capacity is adequate

Table 2 – Channel Velocity Check (Developed Conditions)

Section	Permissible Velocity (fps)	Velocity (fps)	Comments
1 (natural)	5.5 [E]	2.8 (2-yr)	velocity is adequate
2 (natural)	5.5 [E]	3.6 (2-yr)	velocity is adequate
3 (natural)	5.5 [E]	4.0 (2-yr)	velocity is adequate
4 (gabions)	>8.0	6.2 (2-yr)	velocity is adequate
5 (natural)	5.5 [E]	4.0 (2-yr)	velocity is adequate
6 (natural)	5.5 [E]	3.7 (2-yr)	velocity is adequate

Table 3 – 100-Year Water-Surface Elevation at Outfall Sections

Section	WSEL (ft)	Section	WSEL (ft)
1	299.36	**4**	**284.92 [F] (100-year floods single home at Sec. 4)**
2	293.49	5	274.86
3	289.54	6	269.08

Where:

A : n = n1 + n2 + n3 + n4 + n5 + n6 = 0.02 + 0.010 + 0.00 + 0.01 + 0.005 + 0.00 = 0.045 (per Tables 5-16 - 5-21 of VA E&S Control Handbook)
B : n = 0.037 = weighted average of gabion sides (n=0.030) and stone bottom (n=0.045)
C : n = n1 + n2 + n3 + n4 + n5 + n6 = 0.02 + 0.010 + 0.005 + 0.01 + 0.005 + 0.0075 = 0.058 (per Tables 5-16 - 5-21 of VA E&S Control Handbook)
D : See computations for demonstration of no adverse impact and proportional improvement for channel capacity.
E : Per Table 5-22 of VA E&S Control Handbook for field verified soil type of Graded, Silt to Cobbles (nonuniformidal).
F : See computations for demonstration of no adverse impact and proportional improvement for 100-year flooding.

Opinion of Outfall Adequacy

Based on these computation and field observations of the outfall, it is the opinion of the engineer that:

1. Cross sections shown are reflective of the stream reach analyzed.
2. Adequacy of the downstream drainage system is met within the extent of review and the proposed Willow Oaks SWM/BMP facility provides the required detention to demonstrate no adverse impact and proportional improvement for 10-year channel capacity and 100-year flooding at cross section 4 where the 10-year storm is out of bank and a single home is flooded by the 100-year storm.
3. There will be no flooding of existing downstream dwellings, or buildings constructed under an approved building permit by the 100-year storm event with the exception of the home described under point 2 above.

WILLOW OAKS OUTFALL ANALYSIS FOR PROPOSED SWM/BMP POND
PROPORTIONAL IMPROVEMENT
CHANNEL CAPACITY METHOD

INADEQUATE CAPACITY SECTION 4

GIVEN:

Ad	=	Contributing drainage area of site	=	21.55 acres
Acs	=	Contributing drainage area to section	=	267.4 acres
CNd	=	Post run-off curve number for site	=	89
CNcs	=	Existing runoff curve number to section	=	83

THE CORRESPONDING PROPORTIONAL IMPROVEMENT IS CALCULATED AS:

$$Pi = \frac{Cd\ Ad}{Ccs\ Acs} \times 100$$

Johnson and Meadows (1980) had developed and equation for converting CN values to C value:

$$C = 1 - \frac{S\,[1.2 - S/(P+0.8S)]}{P}$$

where: $S = (1000/CN) - 10$

STORM EVENT	2-YR	OVERTOPPING	10-YR
P (inches)	3.20	3.30	5.20
CNd	89	89	89
Sd (inches)	1.236	1.236	1.236
Cd	0.65	0.66	0.76
CNcs	83	83	83
Scs	2.0482	2.0482	2.0482
Ccs	0.50	0.51	0.65
Ad (acres)	21.55	21.55	21.55
Acs (acres)	267.40	267.40	267.40
Existing peak flow at section (cfs)	234.00	250.00	568.00
Pi (%)	10.48	10.43	9.42
Allowable peak flow at section (cfs)	209	224	514
Provided peak flow at section (cfs)	187	202	499

WILLOW OAKS OUTFALL ANALYSIS FOR PROPOSED SWM/BMP POND
PROPORTIONAL IMPROVEMENT

100-YR FLOODING AT SECTION 4

GIVEN:

Ad	=	Contributing drainage area of site	=	21.55 acres
Acs	=	Contributing drainage area to section	=	267.4 acres
CNd	=	Post run-off curve number for site	=	89
CNcs	=	Existing runoff curve number to section	=	83

THE CORRESPONDING PROPORTIONAL IMPROVEMENT IS CALCULATED AS:

$$Pi = \frac{Cd\ Ad}{Ccs\ Acs} \times 100$$

Johnson and Meadows (1980) had developed and equation for converting CN values to C value:

$$C = 1 - \frac{S\,[1.2 - S/(P+0.8S)]}{P}$$

where: $S = (1000/CN) - 10$

STORM EVENT	100-YR
P (inches)	7.30
CNd	89
Sd (inches)	1.236
Cd	0.82
CNcs	83
Scs	2.0482
Ccs	0.73
Ad (acres)	21.55
Acs (acres)	267.40
Existing peak flow leaving pond (cfs)	594.00
Pi (%)	9.05
Allowable peak flow leaving pond (cfs)	540
Provided peak flow leaving pond (cfs)	532
Pre-dev. peak flow at section 4 (cfs)	1165
Post-dev. peak flow at section 4 (cfs)	1078

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

The following information is required to be shown or provided in all zoning applications, or a waiver request of the submission requirement with justification shall be attached. Note: Waivers will be acted upon separately. Failure to adequately address the required submission information may result in a delay in processing this application.

This information is required under the following Zoning Ordinance paragraphs:

Special Permits (9-011 2J & 2L)	Special Exceptions (9-011 2J & 2L)
Cluster Subdivision (9-615 1G & 1N)	Commercial Revitalization Districts (9-622 2A (12) & 14))
Development Plans PRC District (15-302 3 & 4L)	PRC Plan (15-303 1E & 10)
PDP P Districts (except PRC) (16-502 1F & 1Q)	Amendments (18-202 10F & 10I)

☒ 1. Plat is at a minimum scale of 1" – 50' (unless it is depicted on one sheet with a minimum scale of 1" = 100'.

☒ 2. A graphic depicting the stormwater management facility(ies) and limits of clearing and grading accommodate the stormwater management facility(ies), storm drainage pipe systems and outlet protection, pond spillways, access roads, site outfalls, energy dissipation devices, and stream stabilization measures as shown on Sheet 5.

☒ 3. Provide:

Facility Name/ Type & No.	On-site area served (acres)	Off-site area served (acres)	Drainage area (acres)	Footprint area (sf)	Storage Volume (cf)	If pond, dam height (ft)
Dry Pond (e.g. dry pond A, infil. trench, underground, vault, etc.)	19.91	110.19	130.1	206,200	1,897,800	18'
SWM Vault 1	21.77	0	17.0	16,600	183,000	NA
SWM Vault 2	5.40	0	3.8	4,100	44,700	NA
Totals	47.08	110.19	150.9	226,900	2,125,500	18'

☒ 4. Onsite drainage channels, outfalls and pipe systems are shown on Sheet 5.6. Pond inlet and outlet pipe systems are shown on Sheet 12.

☒ 5. Maintenance access (road) to stormwater management facility(ies) are shown on Sheet 5.6. Type of maintenance access road surface noted on the plat is 5.6 (e.g. asphalt, geoblock, gravel, etc.).

☒ 6. Landscaping and tree preservation shown in and near the stormwater management facility is shown on Sheet 5.6.

☒ 7. A stormwater management narrative which contains a description of how detention and best management practice requirements will be met is provided on Sheet 14.

☒ 8. A description of the existing conditions of each numbered site outfall extended downstream from the site to a point which is at least 100 times the site area or which has a drainage area of at least one square mile (640 acres) is provided on Sheet 14.

☒ 9. A description of how the outfall requirements, including contributing drainage areas of the Public Facilities Manual will be satisfied is provided on Sheet 14.

☒ 10. Existing topography with maximum contour intervals of two (2) feet and a note as to whether it is an air survey or field run is provided on Sheets 2, 3.

☒ 11. A submission waiver is requested for N/A.

☒ 12. Stormwater management is not required because N/A.

Industry Letter 05-03 dated 02/02/05

Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated ~~7/6/2009 (conditions dated 7/6/09)~~
Date Of (BOS) (PC) approval 7/13/2009
Sheet 21 of 27

NOTE:

THIS DEVELOPMENT APPLICATION REFLECT TWO (2) OUTFALLS: ONE AT WOODBURN ROAD, AND ONE AT WILLOW OAKS. THE NARRATIVES AND COMPUTATIONS GIVEN ON THIS SHEET WERE TAKEN FROM PCA 87-P-038-04 AND PROVIDED HERE FOR INFORMATION PURPOSES ONLY TO ADDRESS SWM, BMP AND OUTFALL ADEQUACY REQUIREMENTS FOR THE WILLOW OAKS OUTFALL.

Dewberry

Dewberry & Davis LLC
8403 ARLINGTON BLVD.
FAIRFAX, VA 22031
PHONE: 703.849.0100
FAX: 703.849.0519
www.dewberry.com

INOVA
FAIRFAX HOSPITAL
CAMPUS

GENERALIZED DEVELOPMENT PLAN /
SPECIAL EXCEPTION AMENDMENT PLAT

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

SEAL

COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES COLLESTON
Lic. No. 20112
6.10.09
PROFESSIONAL ENGINEER

KEY PLAN

SCALE

No.	DATE	BY	Description
11	06.10.09	JMC	
10	06.05.09	JMC	
9	05.20.09	JMC	
8	04.20.09	JMC	
7	03.26.09	JMC	
6	02.19.09	JMC	
5	01.23.09	JMC	
4	10.09.08	JMC	
3	08.28.08	JMC	NEW SHEET
2	07.31.08	JMC	
1	07.01.08	ARW	

REVISIONS

DRAWN BY JMC
APPROVED BY
CHECKED BY PGY
DATE February 12, 2008

TITLE

INOVA
Fairfax Hospital Campus
SWM and Outfall Narratives
GDP / SEA

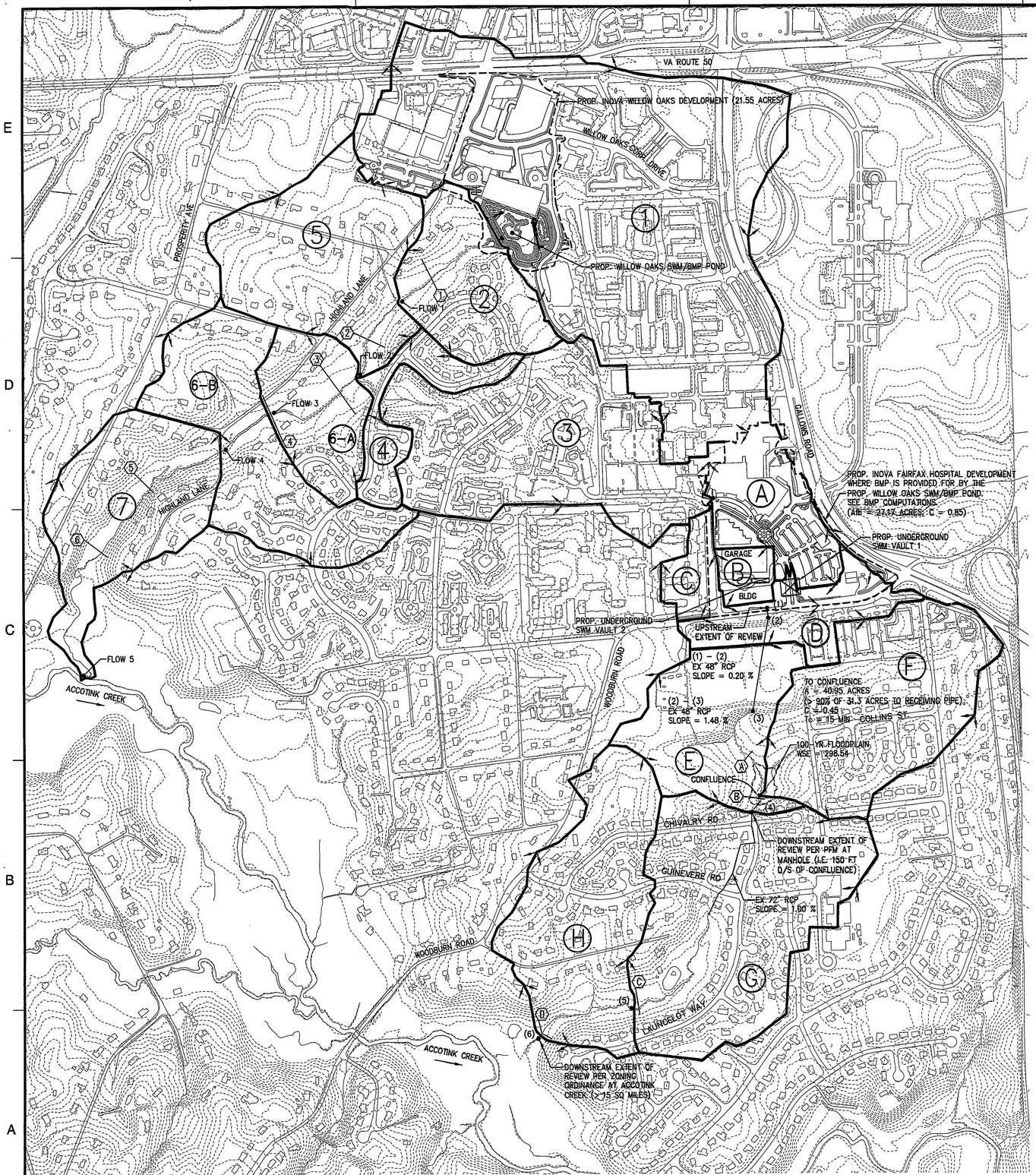
PROJECT NO.

20

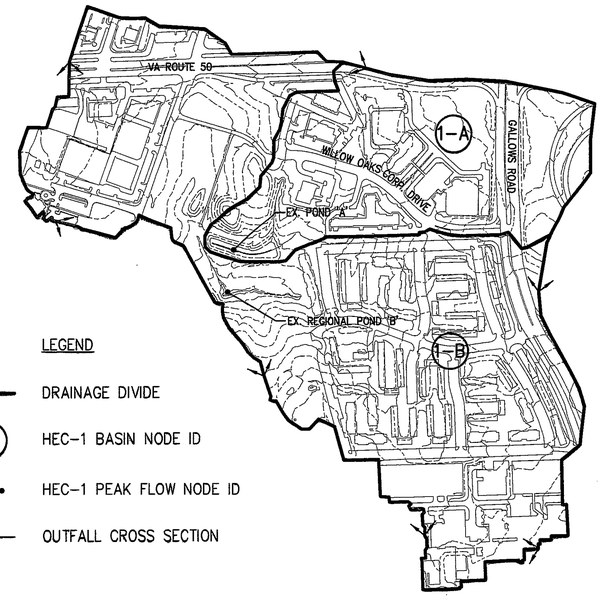
SHEET NO. 20 OF 26

M-10691

Q:\PROJECT\INOVA\Fairfax Hospital\Submissions\GDP\...\Deliverables\20-Narrative 2.dwg, 6/10/2009 11:52:36 A...



DEVELOPED CONDITIONS TO PROPOSED WILLOW OAKS SWM/BMP POND, UNDERGROUND SWM VAULTS AND OUTFALLS TO ACCOTINK CREEK
SCALE: 1" = 400'



LEGEND

- DRAINAGE DIVIDE
- HEC-1 BASIN NODE ID
- HEC-1 PEAK FLOW NODE ID
- OUTFALL CROSS SECTION

EXISTING CONDITIONS TO EXISTING REGIONAL POND 'B'
SCALE: 1" = 400'

HYDROLOGIC DATA

HEC-1 BASIN NODE ID	ACRES	RCN	Tc (min)
1-A	37.1	84	10
1-B	93.0	87	10
1 (FORESTED)	130.1	62	25
1 (DEVELOPED)	130.1	89	10
2	21.7	75	10
3	51.1	82	10
4	10.2	73	10
5	37.3	77	15
6-A	17.0	77	10
6-B	33.6	71	15
7	30.7	73	10

NRCS 24-HOUR PEAK FLOW SUMMARY ALONG WILLOW OAKS OUTFALL TO ACCOTINK CREEK

LOCATION **	2-YEAR PRE-DEV	2-YEAR POST-DEV	10-YEAR PRE-DEV	10-YEAR POST-DEV	100-YEAR PRE-DEV	100-YEAR POST-DEV
FLOW-1	96	49	278	136	689	600
FLOW-2	145	98	362	251	877	789
FLOW-3	234	187	568	499	1165	1078
FLOW-4	257	209	624	564	1255	1165
FLOW-5	263	216	628	558	1230	1145

** LOCATIONS SHOWN ON MAP THIS SHEET. ALSO REFER TO EXISTING AND ULTIMATE CONDITIONS HEC-1 MODELS PROVIDED IN THIS APPLICATION.

DEVELOPED CONDITIONS C-FACTOR TO PROP. WILLOW OAKS SWM/BMP POND

LAND USE	IMP (%)	ACRES	IMP x ACRES
COMMERCIAL	85	70.40	5984.0
OPEN SPACE	15	14.96	224.4
TOWNHOMES	70	34.57	2419.9
MAJOR ROADS	100	10.17	1017.0
		130.1	9645.3

IMP = 74 %

C = 0.05 + 0.009 (IMP) = 0.05 + 0.009 (74) = 0.72

HYDROLOGIC DATA

HEC-1 BASIN NODE ID	ACRES	C	CA	Tc (min)
A	17.0	0.85	14.45	5
B	3.8	0.85	3.23	5
C	10.5	0.60	6.30	10
D	8.8	0.55	4.84	5
E	25.5	0.30	7.65	20
F	41.0	0.45	18.45	15
G	54.4	0.45	24.48	15
I	39.0	0.45	17.55	15

Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated ~~7/6/2009 (conditions dated 7/6/09)~~
Date Of (BOS) (PC) approval 7/13/2009
Sheet 22 of 27

Dewberry

Dewberry & Davis LLC
8403 ARLINGTON BLVD.
FAIRFAX, VA 22031
PHONE: 703.849.0100
FAX: 703.849.0519
www.dewberry.com

INOVA
FAIRFAX HOSPITAL
CAMPUS

GENERALIZED DEVELOPMENT PLAN / SPECIAL EXCEPTION AMENDMENT PLAT

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

SEAL

COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES CULLETON
Lic. No. 20112
6.10.09
PROFESSIONAL ENGINEER

KEY PLAN

SCALE

AS SHOWN

No.	DATE	BY	Description
11	06.10.09	JMC	
10	06.05.09	JMC	
9	05.20.09	JMC	
8	04.20.09	JMC	
7	03.26.09	JMC	
6	02.19.09	JMC	
5	01.23.09	JMC	
4	10.09.08	JMC	
3	08.28.08	JMC	
2	07.31.08	JMC	
1	07.01.08	ARW	

REVISIONS

DRAWN BY SCC
APPROVED BY PGY
CHECKED BY TCC
DATE February 12, 2008

TITLE

INOVA
Fairfax Hospital Campus
Outfall Map
GDP / SEA

PROJECT NO.

21

SHEET NO. 21 OF 26

M-10691

Q:\PROJECT\INOVA\Fairfax HospitalSubmissions\GDPSEA-15\Deliverables\21-Outfall Map.dwg, 6/10/2009 11:51:04 AM, lcena

WILLOW OAKS OUTFALL ANALYSIS – CROSS SECTION COMPUTATION SUMMARY

Label	Discharge (ft³/s)	Channel Slope (ft/ft)	Roughness Coefficient	Normal Depth (ft)	Water Surface Elevation (ft)	Velocity (ft/s)
Cross Section 1: MAX Q	662.45	0.01000	0.045	4.18	297.83	6.72
Cross Section 1: 2YR	49.00	0.01000	0.045	1.11	294.76	2.80
Cross Section 1: 100YR	600.00	0.01000	0.087	5.71	299.36	2.64
Cross Section 2: MAX Q	373.55	0.00770	0.045	4.10	291.73	5.49
Cross Section 2: 2YR	98.00	0.00770	0.045	2.10	289.73	3.64
Cross Section 2: 100YR	789.00	0.00770	0.075	5.86	293.49	3.41
Cross Section 3: MAX Q	225.69	0.00650	0.045	3.12	287.15	4.20
Cross Section 3: 2YR	187.00	0.00650	0.045	2.85	286.88	3.98
Cross Section 3: 100YR	1078.00	0.00650	0.053	5.51	289.54	3.51
Cross Section 4: MAX Q	307.44	0.01040	0.037	3.95	282.60	7.28
Cross Section 4: 2YR	187.00	0.01040	0.038	3.01	281.66	6.21
Cross Section 4: 10YR	499.00	0.01040	0.030	5.09	283.74	5.40
Cross Section 4: 100YR	1078.00	0.01040	0.046	6.27	284.92	4.39
Cross Section 5: MAX Q	246.33	0.00800	0.058	3.50	273.01	4.22
Cross Section 5: 2YR	216.00	0.00800	0.058	3.26	272.77	4.05
Cross Section 5: 100YR	1145.00	0.00800	0.078	5.35	274.86	3.39
Cross Section 6: MAX Q	268.73	0.00800	0.058	3.35	267.12	3.98
Cross Section 6: 2YR	216.00	0.00800	0.058	3.01	266.78	3.69
Cross Section 6: 100YR	1145.00	0.00800	0.067	5.31	269.08	3.41

HY-8 Culvert Analysis Report for Highland Lane

Site Data - 3-6X6 BOX AT HIGHLAND LANE

Site Data Option: Culvert Invert Data
Inlet Station: 0.00 ft
Inlet Elevation: 274.71 ft
Outlet Station: 42.00 ft
Outlet Elevation: 274.50 ft
Number of Barrels: 3

Culvert Data Summary - 3-6X6 BOX AT HIGHLAND LANE

Barrel Shape: Concrete Box
Barrel Span: 6.00 ft
Barrel Rise: 6.00 ft
Barrel Material: Concrete
Barrel Manning's n: 0.0130
Inlet Type: Conventional
Inlet Edge Condition: 1:1 Bevel (45° flare) Wingwall
Inlet Depression: None

Roadway Data for Crossing: EX HIGHLAND LANE

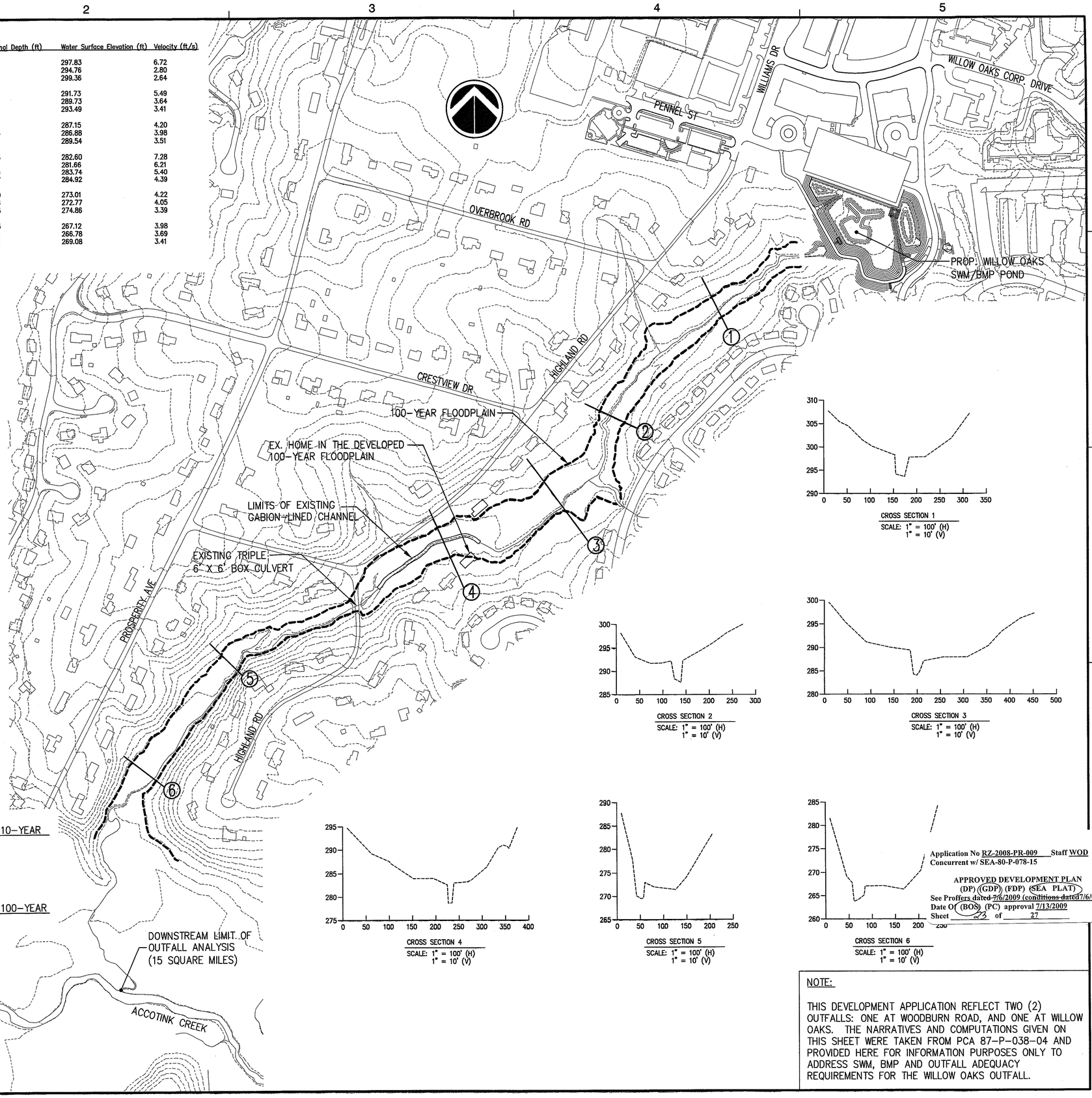
Roadway Profile Shape: Irregular Roadway Shape (coordinates)
Irregular Roadway Cross-Section:

Coord No.	Station (ft)	Elevation (ft)
1	0.00	295.61
2	7.00	294.56
3	45.00	290.31
4	84.00	286.22
5	124.00	283.64
6	164.00	282.51
7	203.00	282.78
8	240.00	283.85
9	277.00	285.06
10	287.00	285.52
11	321.00	287.63
12	357.00	290.10
13	394.00	293.12
14	429.00	296.75

Roadway Surface: Paved
Roadway Top Width: 15.00 ft

Culvert Summary Table: 3-6X6 BOX AT HIGHLAND LANE

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)	
0.00	0.00	274.71	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000	
116.50	116.50	276.60	1.624	1.893	1-S1t	0.959	1.094	1.808	1.788	3.580	3.066	
233.00	233.00	277.65	2.578	2.838	1-S1t	1.558	1.737	2.620	2.610	4.940	3.870	
349.50	349.50	278.50	3.404	3.793	1-S1t	2.081	2.276	3.251	3.241	5.973	4.409	
466.00	466.00	279.25	4.177	4.544	1-S1t	2.569	2.757	3.777	3.767	6.855	4.770	
564.00	564.00	279.83	4.790	5.121	1-S1t	2.963	3.131	4.160	4.150	7.532	4.924	10-YEAR
699.00	699.00	280.57	5.604	5.857	1-S1t	3.465	3.612	4.622	4.612	8.402	5.036	
815.50	815.50	281.18	6.301	6.454	5-S1t	3.924	4.003	4.974	4.964	9.109	5.091	
932.00	932.00	281.73	7.009	7.023	5-S1t	4.357	4.376	5.292	5.282	9.784	5.130	
1048.50	1048.50	282.45	7.745	7.571	7-M1t	4.783	4.733	5.582	5.572	10.435	5.163	
1165.00	1132.10	283.01	8.295	7.966	7-M1t	5.085	4.982	5.842	5.832	10.766	5.208	100-YEAR



CROSS SECTION 1
SCALE: 1" = 100' (H)
1" = 10' (V)

CROSS SECTION 2
SCALE: 1" = 100' (H)
1" = 10' (V)

CROSS SECTION 3
SCALE: 1" = 100' (H)
1" = 10' (V)

CROSS SECTION 4
SCALE: 1" = 100' (H)
1" = 10' (V)

CROSS SECTION 5
SCALE: 1" = 100' (H)
1" = 10' (V)

CROSS SECTION 6
SCALE: 1" = 100' (H)
1" = 10' (V)

Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated ~~7/6/2009 (conditions dated 7/6/09)~~
Date Of (BOS) (PC) approval 7/13/2009
Sheet 23 of 27

NOTE:

THIS DEVELOPMENT APPLICATION REFLECT TWO (2) OUTFALLS: ONE AT WOODBURN ROAD, AND ONE AT WILLOW OAKS. THE NARRATIVES AND COMPUTATIONS GIVEN ON THIS SHEET WERE TAKEN FROM PCA 87-P-038-04 AND PROVIDED HERE FOR INFORMATION PURPOSES ONLY TO ADDRESS SWM, BMP AND OUTFALL ADEQUACY REQUIREMENTS FOR THE WILLOW OAKS OUTFALL.

Dewberry®

Dewberry & Davis LLC
8403 ARLINGTON BLVD.
FAIRFAX, VA 22031
PHONE: 703.849.0100
FAX: 703.849.0519
www.dewberry.com

INOVA
FAIRFAX HOSPITAL
CAMPUS

GENERALIZED DEVELOPMENT PLAN / SPECIAL EXCEPTION AMENDMENT PLAT

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

SEAL

COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES CULLETON
Lic. No. 20112
6-10-09
PROFESSIONAL ENGINEER

KEY PLAN

SCALE
0' 200' 400'

No.	DATE	BY	Description
11	06.10.09	JMC	
10	06.05.09	JMC	
9	05.20.09	JMC	
8	04.20.09	JMC	
7	03.26.09	JMC	
6	02.19.09	JMC	
5	01.23.09	JMC	
4	10.09.08	JMC	
3	08.28.08	JMC	
2	07.31.08	JMC	
1	07.01.08	ARW	

REVISIONS

DRAWN BY JMC
APPROVED BY
CHECKED BY PGY
DATE February 12, 2008
TITLE

Inova
Fairfax Hospital Campus
Outfall Map - Willow Oaks
GDP / SEA

PROJECT NO.

22

SHEET NO. 22 OF 26

M-10691

Q:\PROJECT\INOVA\Fairfax Hospital\Submissions\GDP\SEA-15\Deliverables\22-Outfall Map.dwg, 6/10/2009 11:50:23 AM

Watershed Description

Part 1: List all of the Subareas and "C" Factors used in the BMP Computations

	Subarea Designation and Description (1)	"C" (2)	Acres (3)
Awo	DEVELOPED WATERSHED TO PROPOSED WILLOW OAKS SWM/BMP POND (GDPA)	0.72	130.10
Afh	UNCONTROLLED FAIRFAX HOSPITAL DEVELOPMENT (SEA)	0.85	27.17

Phosphorus Removal Calculations (Part 2 - 4)

Part 2: Compute the Weighted Average "C" Factor for the Site:

(A) Area of the site (a) 157.27 ac

	Subarea Designation and Description (1)	"C" (2)		Acres (3)		Product (4)
Awo	DEVELOPED WATERSHED TO PROPOSED WILLOW OAKS SWM/BMP POND (GDPA)	0.72	x	130.10	=	93.67
Afh	UNCONTROLLED FAIRFAX HOSPITAL DEVELOPMENT (SEA)	0.85	x	27.17	=	23.09
			(b)	Total	=	116.76

(C) Weigthed average "C" factor (b) / (a) = 0.74

Part 3: Compute the Total Phoshorus Removal for the Site

Subarea	BMP Type	Removal Eff (%)	"C"	Acres	Area Ratio	C-factor Ratio	Product (%)
Awo	SWM/BMP POND	50	0.72	130.10	0.827	0.973	40.23
Afh	NONE	0	0.85	27.17	0.173	1.149	0.00
				(a)	Total	=	40.23

Part 4: Determine Compliance with Phosphorus Removal

Select Requirement:

Water Supply Overlay District (Occoquan Watershed) = 50% (Fairfax County and Prince William County)

Chesapeake Bay Preservation Area (New Development) = 40% (Fairfax County) 50% (Prince William County)

Chesapeake Bay Preservation Area (Redevelopment) = [1-0.9x("i"pre/"i"post)]x100 = _____ %

Requirement (a) 40.00 %

If Line 3(a) 40.23 >=Line 4(a) 40.00 then Phosphorus removal requirement is satisfied

BMP Storage Calculations (Part 7 - 8)

Part 7: Compute the Weighted Average "C" Factor for the Proposed BMP Facility

	Subarea Designation and Description (1)	"C" (2)		Acres (3)		Product (4)
Awo	DEVELOPED WATERSHED TO PROPOSED WILLOW OAKS SWM/BMP POND (GDPA)	0.72	x	130.10	=	93.67
			(a)	130.10	(b)	93.67

(C) Weigthed average "C" factor (b) / (a)=(c) = 0.72

BMP Outlet Computations

Part 9: Determine the Required Orifice Size for the Proposed BMP Facility

(A) BMP storage requirement from Part 8. (a) 295978 cf

(B) Maximum head (h) at the required BMP storage from the Stage-Storage curve for the facility. (b) 3.5 ft

(C) Peak Outflow Rate (Qp) at the maximum head for a drawdown time of 48 hrs [Qp=S/(0.5x3600x48)]

0.0000116xLine 9(a) 295978 = (c) 3.4257 cfs

(D) Required Orifice Area (A) [A=Qp/(0.6x(64.4xh)$^{0.5}$]

Line 9(c) 3.4257 / [0.6x(64.4xLine 9(b) 3.5)$^{0.5}$] = (d) 0.3803 sf

(E) Diameter of a circular orifice

2.0 x (Line 9(d) 0.3803 /3.1415927)$^{0.5}$ = (e) 0.696 ft

8.352 in

USE 8.0 in

Part 8: Determine the Storage Required for the Proposed BMP Facility

C = 0.72 (weighted "C" for area draining to Pond)

Chart A6-40 value (Appendix 4-3) for BMP storage per acre:

(4375 x C) - 875 = 2275.0 cf/ac

Design 1 (48hr Drawdown)

Effective Drainage Area to Pond = 130.10 ac

Storage Volume Required = 295,978 cf

6.80 ac-ft

Storage Volume Provided = 483,952 cf - 181,863 cf = 302,089 cf

2.21 ac-ft

At Stage Elevation = 304.50 ft

WILLOW OAKS SWM/BMP POND STAGE STORAGE

	Elev. (ft)	Acres	Volume (ac-ft) Incremental	Cummulative	
	294.0	0.19	0.0000	0.0000	
	295.0	0.28	0.2350	0.2350	
	296.0	0.35	0.3150	0.5500	
	298.0	0.53	0.8800	1.4300	
	299.5	0.67	0.9000	2.3300	
	300.5	1.43	1.0500	3.3800	
(Marsh WSE)	301.0	1.75	0.7950	4.1750	181,863 cf
	302.0	1.88	1.8150	5.9900	
	304.0	2.15	4.0300	10.0200	
(BMP WSE)	304.5	2.21	1.0900	11.1100	483,952 cf
	306.0	2.33	3.4050	14.5150	
	308.0	2.49	4.8200	19.3350	
	310.0	2.6	5.0900	24.4250	
	312.0	2.77	5.3700	29.7950	
	314.0	2.95	5.7200	35.5150	
	316.0	3.12	6.0700	41.5850	
	316.5	3.16	1.5700	43.1550	

WILLOW OAKS SWM/BMP POND SPILLWAY RATING CURVE (UNCLOGGED CONDITION)

RISER ORIFICE FLOW

ORIFICE NO.	CENTROID ELEV.	AREA	C	DESCRIPTION
1	301.33	0.349	0.6	8" EXT'D DETENTION INV=301.00
2	305	4.5	0.6	4.5' X 1' ORIFICE INV=304.50
3 (top)	310.75	260	0.6	TOP OF 26' X 10' RISER

RISER WEIR FLOW

WEIR NO.	CREST ELEV.	LENGTH	C	EMER. SPILLWAY FLOW
				CREST ELEV. =
1	307	2	3	WIDTH =
2 (top)	310.75	44	3	Z =
3 (headwall)	312.5	26	3	C =

CULVERT RATING CURVE SIZE: DBL 10' X 8' RCBC

ELEV.	DISCHARGE
299	0
302.75	40
302.90	80
303.04	120
303.16	160
303.28	200
304.13	500
308.66	1500
311.48	2000
317.46	2800

ELEV.	ORIFICES Q1	Q2	Q3	WEIRS Q1	Q2	Q3	RISER FLOW	CULVERT CAPACITY	Q P.S.W. (Control)	Q E.S.W.	TOTAL FLOW	COMMENTS
301	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.3	0.0	0.0	0.0	
302	1.4	0.0	0.0	0.0	0.0	0.0	1.4	32.0	1.4	0.0	1.4	
306	3.6	21.7	0.0	0.0	0.0	0.0	25.3	913.2	25.3	0.0	25.3	
308	4.3	37.5	0.0	6.0	0.0	0.0	47.9	1354.3	47.9	0.0	47.9	
310.75	5.2	52.0	0.0	43.6	0.0	0.0	100.7	1871.0	100.7	0.0	100.7	
312	5.5	57.3	1399.7	67.1	184.5	0.0	314.4	2070.0	314.4	0.0	314.4	
314	6.0	65.0	2256.9	111.1	773.4	143.3	1098.8	2337.4	1098.8	0.0	1098.8	
316	6.4	71.9	2868.4	162.0	1587.9	510.7	2338.9	2604.8	2338.9	0.0	2338.9	
316.5	6.5	73.5	3001.9	175.7	1820.0	624.0	2699.7	2671.6	2671.6	0.0	2671.6	culvert control

EXISTING POND 'A' SPILLWAY RATING CURVE

ORIFICE FLOW

ORIFICE NO.	CENTROID ELEV.	AREA	C	DESCRIPTION
1	307.96	3.142	0.6	24" ORIFICE AT INV=306.96
2				
3 (riser top)	316	28.274	0.6	6' DIA RISER AT TOP = 316.00

WEIR FLOW

WEIR NO.	CREST ELEV.	LENGTH	C	EMER. SPILLWAY FLOW
				CREST ELEV. = 316.5
1				WIDTH = 170
2				Z =
3 (riser top)	316	18.85	3	C = 2.6

CULVERT RATING CURVE SIZE: 48" RCP

ELEV.	DISCHARGE
306.96	0
310.59	30
313.67	60
314.90	90
316.54	120
318.57	150
320.99	180
323.78	210
326.97	240

ELEV.	ORIFICES Q1	Q2	Q3	WEIRS Q1	Q2	Q3	RISER FLOW	CULVERT CAPACITY	Q P.S.W. (Control)	Q E.S.W.	TOTAL FLOW	COMMENTS
306.96	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
309	15.4	0.0	0.0	0.0	0.0	0.0	15.4	16.8	15.4	0.0	15.4	
310	21.6	0.0	0.0	0.0	0.0	0.0	21.6	25.1	21.6	0.0	21.6	
312	30.4	0.0	0.0	0.0	0.0	0.0	30.4	43.7	30.4	0.0	30.4	
314	37.2	0.0	0.0	0.0	0.0	0.0	37.2	68.0	37.2	0.0	37.2	
316	42.9	0.0	0.0	0.0	0.0	0.0	42.9	110.1	42.9	0.0	42.9	
318	47.9	0.0	192.5	0.0	0.0	159.9	207.9	141.6	141.6	812.0	953.6	culvert control

EXISTING POND 'A' STAGE STORAGE

Elev. (ft)	Acres	Volume (ac-ft) Incremental	Cummulative
306.96	0	0.0000	0.0000
308.0	0.03	0.0156	0.0156
310.0	0.46	0.4800	0.5056
312.0	0.58	1.0400	1.5456
314.0	0.69	1.2700	2.8156
316.0	0.81	1.5000	4.3156
318.0	0.81	1.6200	5.9356

EXISTING REGIONAL POND 'B' STAGE STORAGE

Elev. (ft)	Acres	Volume (ac-ft) Incremental	Cummulative
299.22	0	0.0000	0.0000
302.0	0.03	0.0417	0.0417
304.0	0.13	0.1600	0.2017
306.0	0.63	0.7600	0.9617
308.0	0.83	1.4600	2.4217
310.0	1.31	2.1400	4.5617
312.0	1.82	3.1300	7.6917
314.0	2.44	4.2600	11.9517
315.0	2.44	2.4400	14.3917

WILLOW OAKS SWM/BMP POND SPILLWAY RATING CURVE (CLOGGED CONDITION)

RISER ORIFICE FLOW

ORIFICE NO.	CENTROID ELEV.	AREA	C	DESCRIPTION
1	301.33	0	0.6	8" EXT'D DETENTION INV=301.00
2	305	0	0.6	4.5' X 1' ORIFICE INV=304.50
3 (top)	310.75	260	0.6	TOP OF 26' X 10' RISER

RISER WEIR FLOW

WEIR NO.	CREST ELEV.	LENGTH	C	EMER. SPILLWAY FLOW
				CREST ELEV. =
1	307	0	3	WIDTH =
2 (top)	310.75	44	3	Z =
3 (headwall)	312.5	26	3	C =

CULVERT RATING CURVE SIZE: DBL 10' X 8' RCBC

ELEV.	DISCHARGE
299	0
302.75	40
302.90	80
303.04	120
303.16	160
303.28	200
304.13	500
308.66	1500
311.48	2000
317.46	2800

ELEV.	ORIFICES Q1	Q2	Q3	WEIRS Q1	Q2	Q3	RISER FLOW	CULVERT CAPACITY	Q P.S.W. (Control)	Q E.S.W.	TOTAL FLOW	COMMENTS
301	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.3	0.0	0.0	0.0	
302	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32.0	0.0	0.0	0.0	
306	0.0	0.0	0.0	0.0	0.0	0.0	0.0	913.2	0.0	0.0	0.0	
308	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1354.3	0.0	0.0	0.0	
310.75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1871.0	0.0	0.0	0.0	
312	0.0	0.0	1399.7	0.0	184.5	0.0	184.5	2070.0	184.5	0.0	184.5	
314	0.0	0.0	2256.9	0.0	773.4	143.3	916.7	2337.4	916.7	0.0	916.7	
316	0.0	0.0	2868.4	0.0	1587.9	510.7	2098.6	2604.8	2098.6	0.0	2098.6	
316.5	0.0	0.0	3001.9	0.0	1820.0	624.0	2444.0	2671.6	2444.0	0.0	2444.0	

EXISTING REGIONAL POND 'B' SPILLWAY RATING CURVE

ORIFICE FLOW

ORIFICE NO.	CENTROID ELEV.	AREA	C	DESCRIPTION
1	300.47	4.909	0.6	30" ORIFICE AT INV=299.22
2				
3 (riser top)	311.02	19.635	0.6	5' DIA RISER AT TOP = 311.02

WEIR FLOW

WEIR NO.	CREST ELEV.	LENGTH	C	EMER. SPILLWAY FLOW
				CREST ELEV. = 312.6
1				WIDTH = 95
2				Z =
3 (riser top)	311.02	15.708	3	C = 2.6

CULVERT RATING CURVE SIZE: 60" RCP

ELEV.	DISCHARGE
299.22	0
303.52	100
306.67	200
311.83	300
319.05	400
328.58	500
343.49	600
372.54	700
432.86	800
552.75	900

ELEV.	ORIFICES Q1	Q2	Q3	WEIRS Q1	Q2	Q3	RISER FLOW	CULVERT CAPACITY	Q P.S.W. (Control)	Q E.S.W.	TOTAL FLOW	COMMENTS
299.22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
303	37.6	0.0	0.0	0.0	0.0	0.0	37.6	88.0	37.6	0.0	37.6	
304	44.4	0.0	0.0	0.0	0.0	0.0	44.4	115.3	44.4	0.0	44.4	
306	55.6	0.0	0.0	0.0	0.0	0.0	55.6	178.7	55.6	0.0	55.6	
308	64.9	0.0	0.0	0.0	0.0	0.0	64.9	225.8	64.9	0.0	64.9	
310	73.0	0.0	0.0	0.0	0.0	0.0	73.0	264.6	73.0	0.0	73.0	
312	80.3	0.0	93.6	0.0	0.0	45.7	126.0	302.4	126.0	0.0	126.0	
312.5	82.0	0.0	115.0	0.0	0.0	84.8	166.8	309.3	166.8	0.0	166.8	
314	86.9	0.0	163.2	0.0	0.0	242.4	250.1	330.1	250.1	453.8	703.9	riser orifice control
315	90.1	0.0	188.6	0.0	0.0	374.2	278.7	343.9	278.7	976.4	1255.1	riser orifice control

NOTE:

THIS DEVELOPMENT APPLICATION REFLECT TWO (2) OUTFALLS: ONE AT WOODBURN ROAD, AND ONE AT WILLOW OAKS. THE NARRATIVES AND COMPUTATIONS GIVEN ON THIS SHEET WERE TAKEN FROM PCA 87-P-038-04 AND PROVIDED HERE FOR INFORMATION PURPOSES ONLY TO ADDRESS SWM, BMP AND OUTFALL ADEQUACY REQUIREMENTS FOR THE WILLOW OAKS OUTFALL.

Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated ~~7/6/2009 (conditions dated 7/6/09)~~
Date Of (BOS) (PC) approval 7/13/2009
Sheet 24 of 27

Dewberry

Dewberry & Davis LLC
8403 ARLINGTON BLVD.
FAIRFAX, VA 22031
PHONE: 703.849.0100
FAX: 703.849.0519
www.dewberry.com

INOVA FAIRFAX HOSPITAL CAMPUS
GENERALIZED DEVELOPMENT PLAN / SPECIAL EXCEPTION AMENDMENT PLAT
PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

SEAL

COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES CULLETON
Lic. No. 20112
6/10/09
PROFESSIONAL ENGINEER

KEY PLAN

SCALE 0' 300' 600'

No.	DATE	BY	Description
11	06.10.09	JMC	
10	06.05.09	JMC	
9	05.20.09	JMC	
8	04.20.09	JMC	
7	03.26.09	JMC	
6	02.19.09	JMC	
5	01.23.09	JMC	
4	10.09.08	JMC	
3	08.28.08	JMC	
2	07.31.08	JMC	
1	07.01.08	ARW	

REVISIONS

DRAWN BY SCC
APPROVED BY PGY
CHECKED BY TCC
DATE February 12, 2008

TITLE

INOVA
Fairfax Hospital Campus
BMP and Rating Curves
GDP / SEA

PROJECT NO.

23

SHEET NO. 23 OF 26

M-10691

Q:\PROJECT\INOVA\Fairfax Hospital\Submissions\GDP\SEA-16\Deliverables\23-BMP.dwg, 6/10/2009 11:49:38 AM, joan

```
X     X  XXXXXXX   XXXXX        X
X     X  X        X     X      XX
X     X  X        X             X
XXXXXXX  XXXX     X     XXXXX   X
X     X  X        X             X
X     X  X        X     X       X
X     X  XXXXXXX   XXXXX       XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL   LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
1                                   HEC-1 INPUT                                        PAGE  1

 LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

   1         ID       WILLOW OAKS PROPOSED BMP/SWM POND AND OUTFALL
   2         ID       FAIRFAX COUNTY, VIRGINIA
   3         ID       SCS TYPE II, 24-HOUR RAINFALL DISTRIBUTION
   4         ID       FAIRFAX COUNTY PFM RAINFALL DEPTHS
   5         ID       EXISTING CONDITIONS DEVELOPMENT
            *DIAGRAM
   6         IT      5                 300
   7         IO      5
             *          2-YR     10-YR    100-YR  OVERTOP
   8         JR   PREC    3.2       5.2      7.3      3.3
             *

   9         KK     1-A
  10         KM  BASIN 1-A RUNOFF HYDROGRAPH TO EX POND A
  11         BA   0.058
  12         PB      1
             * SCS TypeII Rainfall Distribution Pattern
  13         IN      6
  14         PC     0.0  .00101  .00202  .00305  .00408  .00513  .00618  .00725  .00832  .00941
  15         PC  .01050  .01161  .01272  .01385  .01498  .01613  .01728  .01845  .01962  .02081
  16         PC    .022  .02321  .02442  .02565  .02688  .02813  .02938  .03065  .03192  .03321
  17         PC  .03450  .03581  .03712  .03845  .03978  .04113  .04248  .04385  .04522  .04661
  18         PC    .048  .04941  .05084  .05229  .05376  .05525  .05676  .05829  .05984  .06141
  19         PC    .063  .06461  .06624  .06789  .06956  .07125  .07296  .07469  .07644  .07821
  20         PC     .08  .08181  .08364  .08549  .08736  .08925  .09116  .09309  .09504  .09701
  21         PC    .099  .10101  .10304  .10509  .10716  .10925  .11136  .11349  .11564  .11781
  22         PC     .12  .12225  .12460  .12705  .12960  .13225    .135  .13785  .14080  .14385
  23         PC    .147   .1502  .15340   .1566   .1598    .163  .16628  .16972  .17332  .17708
  24         PC    .181  .18512  .18948  .19408  .19892    .204   .2094   .2152   .2214    .228
  25         PC    .235  .24268  .25132  .26092  .27148    .283  .30684  .35436  .43079  .56786
  26         PC    .663  .68196  .69864  .71304  .72516    .735  .74344  .75136  .75876  .76564
  27         PC    .772  .77796  .78364  .78904  .79416    .799   .8036    .808   .8122   .8162
  28         PC     .82  .82367  .82726  .83079  .83424  .83763  .84094  .84419  .84736  .85047
  29         PC  .85350  .85647  .85936  .86219  .86494  .86763  .87024  .87279  .87526  .87767
  30         PC     .88  .88229  .88455  .88679    .889  .89119  .89335  .89549   .8976  .89969
  31         PC  .90175  .90379   .9058  .90779  .90975  .91169   .9136  .91549  .91735  .91919
  32         PC    .921  .92279  .92455  .92629    .928  .92969  .93135  .93299   .9346  .93619
  33         PC  .93775  .93929   .9408  .94229  .94375  .94519   .9466  .94799  .94935  .95069
  34         PC    .952   .9533  .95459  .95588  .95716  .95844  .95971  .96098  .96224   .9635
  35         PC  .96475    .966  .96724  .96848  .96971  .97094  .97216  .97338  .97459   .9758
  36         PC    .977   .9782  .97939  .98058  .98176  .98294  .98411  .98528  .98644  .98760
  37         PC  .98875   .9899  .99104  .99218  .99331  .99444  .99556  .99668  .99779   .9989
  38         PC     1.0
  39         LS              84
  40         UD     0.1
             *

  41         KK      PA
  42         KM  ROUTE THROUGH EXISTING POND A
  43         RS       1    ELEV  306.96
  44         SA       0    0.03    0.46    0.58    0.69    0.81    0.81
  45         SE  306.96     308     310     312     314     316     318
  46         SQ       0    15.4    21.6    30.4    37.2    42.9   953.6
  47         SE  306.96     309     310     312     314     316     318
             *
1                                   HEC-1 INPUT                                        PAGE  2

 LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  48         KK     1-B
  49         KM  BASIN 1-B RUNOFF HYDROGRAPH TO EX POND B
  50         BA   0.145
  51         LS              87
  52         UD     0.1
             *

  53         KK    TO B
  54         KM  COMBINE PA HYDROGRAPH TO BASIN 1-B HYDROGRAPH
  55         HC       2
             *

  56         KK      PB
  57         KM  ROUTE "TO B" HYDROGRAPH THROUGH EXISTING REGIONAL POND B
  58         RS       1    ELEV  299.22
  59         SA       0    0.03    0.13    0.63    0.83    1.31    1.82    2.44    2.44
  60         SE  299.22     302     304     306     308     310     312     314     315
  61         SQ       0    37.6    44.4    55.6    64.9      73     126   166.8   703.9  1255.1
  62         SE  299.22     303     304     306     308     310     312   312.5     314     315
             *

  63         KK       2
  64         KM  BASIN 2 EXISTING RUNOFF HYDROGRAPH
  65         BA   0.034
  66         LS              75
  67         UD    0.10
             *

  68         KK  FLOW-1
  69         KM  COMBINE BASIN 2 HYDROGRAPH TO PB HYDROGRAPH
  70         HC       2
             *

  71         KK       5
  72         KM  BASIN 5 EXISTING RUNOFF HYDROGRAPH
  73         BA   0.058
  74         LS              77
  75         UD    0.15
             *

  76         KK  FLOW-2
  77         KM  COMBINE BASIN 5 HYDROGRAPH TO FLOW-1 HYDROGRAPH
  78         HC       2
             *

  79         KK       3
  80         KM  BASIN 3 EXISTING RUNOFF HYDROGRAPH
  81         BA    0.08
  82         LS              82
  83         UD    0.10
             *
1                                   HEC-1 INPUT                                        PAGE  3

 LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  84         KK  X-POND
  85         KM  ROUTE BASIN 3 EXISTING RUNOFF HYDROGRAPH THROUGH EX POND AT MONARCH RD
  86         RS       1    ELEV     290
  87         SA       0    0.22    0.24    0.56     1.8
  88         SE     290     292     295     300     305
  89         SQ       0     9.3    14.1    17.7   134.7   329.1   368.4  1197.7
  90         SE     290     292     294     296     298     300     302     304
             *

  91         KK       4
  92         KM  BASIN 4 EXISTING RUNOFF HYDROGRAPH
  93         BA   0.016
  94         LS              73
  95         UD    0.10
             *

  96         KK   COMB1
  97         KM  COMBINE X-POND HYDROGRAPH TO BASIN 4 HYDROGRAPH
  98         HC       2
             *

  99         KK   COMB2
 100         KM  COMBINE FLOW-2 HYDROGRAPH TO COMB1 HYDROGRAPH
 101         HC       2
             *

 102         KK    CR-1
 103         KM  CHANNEL ROUTE COMB2 HYDROGRAPH TO FLOW-3 NODE
 104         RD
 105         RC     0.1   0.045     0.1     600  0.0065
 106         RX       0     129     175     182     189     203     344     443
 107         RY  299.58  290.12  289.47  284.27  284.77  287.15  290.44  297.29
             *

 108         KK     6-A
 109         KM  BASIN 6-A EXISTING RUNOFF HYDROGRAPH
 110         BA   0.027
 111         LS              77
 112         UD     0.1
             *

 113         KK  FLOW-3
 114         KM  COMBINE BASIN 6-A HYDROGRAPH TO CR-1 HYDROGRAPH
 115         HC       2
             *

 116         KK    CR-2
 117         KM  CHANNEL ROUTE FLOW 3 HYDROGRAPH TO FLOW-4 NODE
 118         RD
 119         RC     0.1   0.045     0.1     435  0.0104
 120         RX       0     142     215     217     225     229     266  366.07
 121         RY   294.7  283.95   282.6  278.65  278.73     283  283.59  294.78
             *
1                                   HEC-1 INPUT                                        PAGE  4

 LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 122         KK     6-B
 123         KM  BASIN 6-B EXISTING RUNOFF HYDROGRAPH
 124         BA   0.053
 125         LS              71
 126         UD    0.15
             *

 127         KK  FLOW-4
 128         KM  COMBINE BASIN 6-B HYDROGRAPH TO CR-2 HYDROGRAPH
 129         HC       2
             *

 130         KK    CR-3
 131         KM  CHANNEL ROUTE FLOW-4 HYDROGRAPH TO FLOW-5 NODE
 132         RD
 133         RC     0.1  0.0575     0.1    2550   0.008
 134         RX       0      32      66      75      85      89     161   220.2
 135         RY  285.54  278.13  272.61  265.49  266.48  268.98  272.76   286.5
             *

 136         KK       7
 137         KM  BASIN 7 EXISTING RUNOFF HYDROGRAPH
 138         BA   0.048
 139         LS              73
 140         UD     0.1
             *

 141         KK  FLOW-5
 142         KM  COMBINE BASIN 7 HYDROGRAPH TO CR-3 HYDROGRAPH
 143         HC       2
             *
 144         ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
INPUT
 LINE     (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

 NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

   9        1-A
             V
             V
  41        PA
             .
             .
  48         .           1-B
             .            .
             .            .
  53       TO B............
             V
             V
  56        PB
             .
             .
  63         .            2
             .            .
             .            .
  68     FLOW-1............
             .
             .
  71         .            5
             .            .
             .            .
  76     FLOW-2............
             .
             .
  79         .            3
             .            V
             .            V
  84         .         X-POND
             .            .
             .            .
  91         .            .            4
             .            .            .
             .            .            .
  96         .          COMB1............
             .            .
             .            .
  99      COMB2............
             V
             V
 102        CR-1
             .
             .
 108         .           6-A
             .            .
             .            .
 113     FLOW-3............
             V
             V
 116        CR-2
             .
             .
 122         .           6-B
             .            .
             .            .
 127     FLOW-4............
             V
             V
 130        CR-3
             .
             .
 136         .            7
             .            .
             .            .
 141     FLOW-5............

     PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
                   FLOWS IN CUBIC FEET PER SECOND,  AREA IN SQUARE MILES
                                  TIME TO PEAK IN HOURS

                                                     RATIOS APPLIED TO PRECIPITATION
 OPERATION      STATION     AREA   PLAN             RATIO 1  RATIO 2  RATIO 3  RATIO 4
                                                      3.20     5.20     7.30     3.30

 HYDROGRAPH AT
+                   1-A      .06     1   FLOW         81.     163.     250.      85.
                                         TIME       12.00    12.00    12.00    12.00

 ROUTED TO
+                    PA      .06     1   FLOW         29.      40.     170.      29.
                                         TIME       12.25    12.25    12.08    12.25

                                   ** PEAK STAGES IN FEET **
                                     1   STAGE     311.59   314.83   316.28   311.77
                                         TIME       12.25    12.25    12.08    12.25

 HYDROGRAPH AT
+                   1-B      .14     1   FLOW        229.     436.     654.     239.
                                         TIME       12.00    12.00    12.00    12.00

 2 COMBINED AT
+                  TO B      .20     1   FLOW        253.     470.     695.     264.
                                         TIME       12.00    12.00    12.00    12.00

 ROUTED TO
+                    PB      .20     1   FLOW         77.     246.     594.      81.
                                         TIME       12.33    12.17    12.08    12.33

                                   ** PEAK STAGES IN FEET **
                                     1   STAGE     310.16   312.72   313.69   310.32
                                         TIME       12.33    12.17    12.08    12.33

 HYDROGRAPH AT
+                     2      .03     1   FLOW         30.      74.     123.      32.
                                         TIME       12.00    12.00    12.00    12.00

 2 COMBINED AT
+                FLOW-1      .24     1   FLOW         96.     278.     689.      99.
                                         TIME       12.00    12.17    12.08    12.00

 HYDROGRAPH AT
+                     5      .06     1   FLOW         50.     115.     190.      53.
                                         TIME       12.08    12.08    12.00    12.08

 2 COMBINED AT
+                FLOW-2      .29     1   FLOW        145.     362.     877.     150.
                                         TIME       12.08    12.17    12.08    12.08

 HYDROGRAPH AT
+                     3      .08     1   FLOW        102.     214.     334.     107.
                                         TIME       12.00    12.00    12.00    12.00

 ROUTED TO
+                X-POND      .08     1   FLOW         76.     187.     294.      82.
                                         TIME       12.08    12.08    12.08    12.08

                                   ** PEAK STAGES IN FEET **
                                     1   STAGE     297.00   298.54   299.64   297.10
                                         TIME       12.08    12.08    12.08    12.08

 HYDROGRAPH AT
+                     4      .02     1   FLOW         13.      32.      55.      13.
                                         TIME       12.00    12.00    12.00    12.00

 2 COMBINED AT
+                 COMB1      .10     1   FLOW         86.     213.     349.      93.
                                         TIME       12.08    12.08    12.00    12.08

 2 COMBINED AT
+                 COMB2      .39     1   FLOW        231.     545.    1213.     243.
                                         TIME       12.08    12.08    12.08    12.08

 ROUTED TO
+                  CR-1      .39     1   FLOW        212.     528.    1094.     227.
                                         TIME       12.08    12.17    12.17    12.08

 HYDROGRAPH AT
+                   6-A      .03     1   FLOW         27.      62.     102.      28.
                                         TIME       12.00    12.00    12.00    12.00

 2 COMBINED AT
+                FLOW-3      .42     1   FLOW        234.     568.    1165.     250.
                                         TIME       12.08    12.08    12.08    12.08

 ROUTED TO
+                  CR-2      .42     1   FLOW        226.     560.    1146.     241.
                                         TIME       12.17    12.17    12.17    12.08

 HYDROGRAPH AT
+                   6-B      .05     1   FLOW         32.      86.     150.      34.
                                         TIME       12.08    12.08    12.08    12.08

 2 COMBINED AT
+                FLOW-4      .47     1   FLOW        257.     624.    1255.     275.
                                         TIME       12.08    12.17    12.17    12.08

 ROUTED TO
+                  CR-3      .47     1   FLOW        251.     607.    1196.     269.
                                         TIME       12.25    12.33    12.33    12.25

 HYDROGRAPH AT
+                     7      .05     1   FLOW         38.      97.     166.      40.
                                         TIME       12.00    12.00    12.00    12.00

 2 COMBINED AT
+                FLOW-5      .52     1   FLOW        263.     628.    1230.     282.
                                         TIME       12.25    12.33    12.33    12.25
1

 *** NORMAL END OF HEC-1 ***
```

```
X     X  XXXXXXX   XXXXX        X
X     X  X        X     X      XX
X     X  X        X             X
XXXXXXX  XXXX     X     XXXXX   X
X     X  X        X             X
X     X  X        X     X       X
X     X  XXXXXXX   XXXXX       XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL   LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
1                                   HEC-1 INPUT                                        PAGE  1

 LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

   1         ID       WILLOW OAKS PROPOSED BMP/SWM POND AND OUTFALL
   2         ID       FAIRFAX COUNTY, VIRGINIA
   3         ID       SCS TYPE II, 24-HOUR RAINFALL DISTRIBUTION
   4         ID       FAIRFAX COUNTY PFM RAINFALL DEPTHS
   5         ID       2-YR AND 10-YR STORMS
   6         ID       FORESTED WATERSHED CONDITION
            *DIAGRAM
   7         IT      5                 300
   8         IO      5
             *          2-YR     10-YR
   9         JR   PREC    3.2       5.2
             *

  10         KK       1
  11         KM  BASIN 1 RUNOFF HYDROGRAPH - ASSUME 130.1 ACRE WATERSHED IS COMPLETELY FORESTED
  12         BA   0.203
  13         PB       1
             * SCS TypeII Rainfall Distribution Pattern
  14         IN       6
  15         PC     0.0  .00101  .00202  .00305  .00408  .00513  .00618  .00725  .00832  .00941
  16         PC  .01050  .01161  .01272  .01385  .01498  .01613  .01728  .01845  .01962  .02081
  17         PC    .022  .02321  .02442  .02565  .02688  .02813  .02938  .03065  .03192  .03321
  18         PC  .03450  .03581  .03712  .03845  .03978  .04113  .04248  .04385  .04522  .04661
  19         PC    .048  .04941  .05084  .05229  .05376  .05525  .05676  .05829  .05984  .06141
  20         PC    .063  .06461  .06624  .06789  .06956  .07125  .07296  .07469  .07644  .07821
  21         PC     .08  .08181  .08364  .08549  .08736  .08925  .09116  .09309  .09504  .09701
  22         PC    .099  .10101  .10304  .10509  .10716  .10925  .11136  .11349  .11564  .11781
  23         PC     .12  .12225  .12460  .12705  .12960  .13225    .135  .13785  .14080  .14385
  24         PC    .147   .1502  .15340   .1566   .1598    .163  .16628  .16972  .17332  .17708
  25         PC    .181  .18512  .18948  .19408  .19892    .204   .2094   .2152   .2214    .228
  26         PC    .235  .24268  .25132  .26092  .27148    .283  .30684  .35436  .43079  .56786
  27         PC    .663  .68196  .69864  .71304  .72516    .735  .74344  .75136  .75876  .76564
  28         PC    .772  .77796  .78364  .78904  .79416    .799   .8036    .808   .8122   .8162
  29         PC     .82  .82367  .82726  .83079  .83424  .83763  .84094  .84419  .84736  .85047
  30         PC  .85350  .85647  .85936  .86219  .86494  .86763  .87024  .87279  .87526  .87767
  31         PC     .88  .88229  .88455  .88679    .889  .89119  .89335  .89549   .8976  .89969
  32         PC  .90175  .90379   .9058  .90779  .90975  .91169   .9136  .91549  .91735  .91919
  33         PC    .921  .92279  .92455  .92629    .928  .92969  .93135  .93299   .9346  .93619
  34         PC  .93775  .93929   .9408  .94229  .94375  .94519   .9466  .94799  .94935  .95069
  35         PC    .952   .9533  .95459  .95588  .95716  .95844  .95971  .96098  .96224   .9635
  36         PC  .96475    .966  .96724  .96848  .96971  .97094  .97216  .97338  .97459   .9758
  37         PC    .977   .9782  .97939  .98058  .98176  .98294  .98411  .98528  .98644  .98760
  38         PC  .98875   .9899  .99104  .99218  .99331  .99444  .99556  .99668  .99779   .9989
  39         PC     1.0
  40         LS              62
  41         UD    0.25
             *
  42         ZZ
     PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
                   FLOWS IN CUBIC FEET PER SECOND,  AREA IN SQUARE MILES
                                  TIME TO PEAK IN HOURS

                                               RATIOS APPLIED TO PRECIPITATION
 OPERATION      STATION     AREA   PLAN        RATIO 1  RATIO 2
                                                 3.20     5.20

 HYDROGRAPH AT
+                     1      .20     1   FLOW     39.     173.
                                         TIME   12.17    12.17

 *** NORMAL END OF HEC-1 ***
```

Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated ~~7/6/2009~~ (~~conditions dated~~7/6/09)
Date Of (BOS) (PC) approval 7/13/2009
Sheet 25 of 27

Dewberry®

Dewberry & Davis LLC
8403 ARLINGTON BLVD.
FAIRFAX, VA 22031
PHONE: 703.849.0100
FAX: 703.849.0519
www.dewberry.com

INOVA
FAIRFAX HOSPITAL
CAMPUS

GENERALIZED DEVELOPMENT PLAN /
SPECIAL EXCEPTION AMENDMENT PLAT

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

SEAL
COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES CULLETON
Lic. No. 20112
6-10-09
PROFESSIONAL ENGINEER

KEY PLAN

SCALE

No.	DATE	BY	Description
11	06.10.09	JMC	
10	06.05.09	JMC	
9	05.20.09	JMC	
8	04.20.09	JMC	
7	03.26.09	JMC	
6	02.19.09	JMC	
5	01.23.09	JMC	
4	10.09.08	JMC	
3	08.28.08	JMC	
2	07.31.08	JMC	
1	07.01.08	ARW	

REVISIONS

DRAWN BY JMC
APPROVED BY
CHECKED BY PGY
DATE February 12, 2008

TITLE
INOVA
Fairfax Hospital Campus
HEC-1 Models
GDP / SEA

PROJECT NO.

24

SHEET NO. 24 OF 26

M-10691

Q:\PROJECT\INOVA\Fairfax Hospital\Submissions\GDPSEA-15\Deliverables\24-HEC-1.dwg, 6/10/2009 11:48:58 AM, jcena

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X               X
XXXXXXX  XXXX     X       XXXXX   X
X     X  X        X               X
X     X  X        X     X         X
X     X  XXXXXXX   XXXXX         XXX
```

```
THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL   LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1                                       HEC-1 INPUT                                          PAGE  1

 LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

   1         ID       WILLOW OAKS PROPOSED BMP/SWM POND AND OUTFALL
   2         ID       FAIRFAX COUNTY, VIRGINIA
   3         ID       SCS TYPE II, 24-HOUR RAINFALL DISTRIBUTION
   4         ID       FAIRFAX COUNTY PFM RAINFALL DEPTHS
   5         ID       ULTIMATE CONDITIONS DEVELOPMENT
             *DIAGRAM
   6         IT      5                  300
   7         IO      5
             *        2-YR      10-YR     100-YR      OVERTOP
   8         JR    PREC     3.2      5.2      7.3     3.3
             *

   9         KK      1
  10         KM  BASIN 1 RUNOFF HYDROGRAPH - ASSUME DEVELOPED SITE AREA IS BUILT OUT
  11         BA   0.203
  12         PB      1
             * SCS TypeII Rainfall Distribution Pattern
  13         IN      6
  14         PC     0.0  .00101  .00202  .00305  .00408  .00513  .00618  .00725  .00832  .00941
  15         PC  .01050  .01161  .01272  .01385  .01498  .01613  .01728  .01845  .01962  .02081
  16         PC    .022  .02321  .02442  .02565  .02688  .02813  .02938  .03065  .03192  .03321
  17         PC  .03450  .03581  .03712  .03845  .03978  .04113  .04248  .04385  .04522  .04661
  18         PC    .048  .04941  .05084  .05229  .05376  .05525  .05676  .05829  .05984  .06141
  19         PC    .063  .06461  .06624  .06789  .06956  .07125  .07296  .07469  .07644  .07821
  20         PC     .08  .08181  .08364  .08549  .08736  .08925  .09116  .09309  .09504  .09701
  21         PC    .099  .10101  .10304  .10509  .10716  .10925  .11136  .11349  .11564  .11781
  22         PC     .12  .12225  .12460  .12705  .12960  .13225    .135  .13785  .14080  .14385
  23         PC    .147   .1502  .15340   .1566   .1598    .163  .16628  .16972  .17332  .17708
  24         PC    .181  .18512  .18948  .19408  .19892    .204   .2094   .2152   .2214    .228
  25         PC    .235  .24268  .25132  .26092  .27148    .283  .30684  .35436  .43079  .56786
  26         PC    .663  .68196  .69864  .71304  .72516    .735  .74344  .75136  .75876  .76564
  27         PC    .772  .77796  .78364  .78904  .79416    .799   .8036    .808   .8122   .8162
  28         PC     .82  .82367  .82726  .83079  .83424  .83763  .84094  .84419  .84736  .85047
  29         PC  .85350  .85647  .85936  .86219  .86494  .86763  .87024  .87279  .87526  .87767
  30         PC     .88  .88229  .88455  .88679    .889  .89119  .89335  .89549   .8976  .89969
  31         PC  .90175  .90379   .9058  .90779  .90975  .91169   .9136  .91549  .91735  .91919
  32         PC    .921  .92279  .92455  .92629    .928  .92969  .93135  .93299   .9346  .93619
  33         PC  .93775  .93929   .9408  .94229  .94375  .94519   .9466  .94799  .94935  .95069
  34         PC    .952   .9533  .95459  .95588  .95716  .95844  .95971  .96098  .96224   .9635
  35         PC  .96475    .966  .96724  .96848  .96971  .97094  .97216  .97338  .97459   .9758
  36         PC    .977   .9782  .97939  .98058  .98176  .98294  .98411  .98528  .98644  .98760
  37         PC  .98875   .9899  .99104  .99218  .99331  .99444  .99556  .99668  .99779   .9989
  38         PC     1.0
  39         LS              89
  40         UD     0.1
             *

  41         KK    POND
  42         KM  ROUTE BASIN 1 ULTIMATE RUNOFF HYDROGRAPH THROUGH PROPOSED SWM POND
  43         RS       1    ELEV     301
  44         SA    1.75    1.88    2.15    2.33    2.49     2.6    2.77    2.95    3.12    3.16
  45         SE     301     302     304     306     308     310     312     314     316   316.5
  46         SQ       0     1.4    25.3    47.9   100.7   314.4  1098.8  2338.9  2671.6
  47         SE     301     302     306     308  310.75     312     314     316   316.5
             *
1                                       HEC-1 INPUT                                          PAGE  2

 LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  48         KK       2
  49         KM  BASIN 2 EXISTING RUNOFF HYDROGRAPH
  50         BA   0.034
  51         LS              75
  52         UD    0.10
             *

  53         KK  FLOW-1
  54         KM  COMBINE BASIN 2 HYDROGRAPH TO POND HYDROGRAPH
  55         HC       2
             *

  56         KK       5
  57         KM  BASIN 5 EXISTING RUNOFF HYDROGRAPH
  58         BA   0.058
  59         LS              77
  60         UD    0.15
             *

  61         KK  FLOW-2
  62         KM  COMBINE BASIN 5 HYDROGRAPH TO FLOW-1 HYDROGRAPH
  63         HC       2
             *

  64         KK       3
  65         KM  BASIN 3 EXISTING RUNOFF HYDROGRAPH
  66         BA    0.08
  67         LS              82
  68         UD    0.10
             *

  69         KK  X-POND
  70         KM  ROUTE BASIN 3 EXISTING RUNOFF HYDROGRAPH THROUGH EX POND AT MONARCH RD
  71         RS       1    ELEV     290
  72         SA       0    0.22    0.24    0.56     1.8
  73         SE     290     292     295     300     305
  74         SQ       0     9.3    14.1    17.7   134.7   329.1   368.4  1197.7
  75         SE     290     292     294     296     298     300     302     304
             *

  76         KK       4
  77         KM  BASIN 4 EXISTING RUNOFF HYDROGRAPH
  78         BA   0.016
  79         LS              73
  80         UD    0.10
             *

  81         KK   COMB1
  82         KM  COMBINE X-POND HYDROGRAPH TO BASIN 4 HYDROGRAPH
  83         HC       2
             *
1                                       HEC-1 INPUT                                          PAGE  3

 LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  84         KK   COMB2
  85         KM  COMBINE FLOW-2 HYDROGRAPH TO COMB1 HYDROGRAPH
  86         HC       2
             *

  87         KK    CR-1
  88         KM  CHANNEL ROUTE COMB2 HYDROGRAPH TO FLOW-3 NODE
  89         RD
  90         RC     0.1   0.045     0.1     600  0.0065
  91         RX       0     129     175     182     189     203     344     443
  92         RY  299.58  290.12  289.47  284.27  284.77  287.15  290.44  297.29
             *

  93         KK     6-A
  94         KM  BASIN 6-A EXISTING RUNOFF HYDROGRAPH
  95         BA   0.027
  96         LS              77
  97         UD     0.1
             *

  98         KK  FLOW-3
  99         KM  COMBINE BASIN 6-A HYDROGRAPH TO CR-1 HYDROGRAPH
 100         HC       2
             *

 101         KK    CR-2
 102         KM  CHANNEL ROUTE FLOW-3 HYDROGRAPH TO FLOW-4 NODE
 103         RD
 104         RC     0.1   0.045     0.1     435  0.0104
 105         RX       0     142     215     217     225     229     266  366.07
 106         RY   294.7  283.95   282.6  278.65  278.73     283  283.59  294.78
             *

 107         KK     6-B
 108         KM  BASIN 6-B EXISTING RUNOFF HYDROGRAPH
 109         BA   0.053
 110         LS              71
 111         UD    0.15
             *

 112         KK  FLOW-4
 113         KM  COMBINE BASIN 6-B HYDROGRAPH TO CR-2 HYDROGRAPH
 114         HC       2
             *

 115         KK    CR-3
 116         KM  CHANNEL ROUTE FLOW-4 HYDROGRAPH TO FLOW-5 NODE
 117         RD
 118         RC     0.1  0.0575     0.1    2550   0.008
 119         RX       0      32      66      75      85      89     161   220.2
 120         RY  285.54  278.13  272.61  265.49  266.48  268.98  272.76   286.5
             *
1                                       HEC-1 INPUT                                          PAGE  4

 LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 121         KK       7
 122         KM  BASIN 7 EXISTING RUNOFF HYDROGRAPH
 123         BA   0.048
 124         LS              73
 125         UD     0.1
             *

 126         KK  FLOW-5
 127         KM  COMBINE BASIN 7 HYDROGRAPH TO CR-3 HYDROGRAPH
 128         HC       2
             *
 129         ZZ
1
          SCHEMATIC DIAGRAM OF STREAM NETWORK
INPUT
 LINE     (V) ROUTING           (--->) DIVERSION OR PUMP FLOW

  NO.     (.) CONNECTOR         (<---) RETURN OF DIVERTED OR PUMPED FLOW

   9          1
              V
              V
  41        POND
              .
  48          .          2
              .          .
  53      FLOW-1..........
              .
  56          .          5
              .          .
  61      FLOW-2..........
              .
  64          .          3
              .          V
              .          V
  69          .       X-POND
              .          .
  76          .          .          4
              .          .          .
  81          .        COMB1.........
              .          .
  84       COMB2..........
              V
              V
  87        CR-1
              .
  93          .         6-A
              .          .
  98      FLOW-3..........
              V
              V
 101        CR-2
              .
 107          .         6-B
              .          .
 112      FLOW-4..........
              V
              V
 115        CR-3
              .
 121          .          7
              .          .
 126      FLOW-5..........
```

```
         PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
                        FLOWS IN CUBIC FEET PER SECOND,  AREA IN SQUARE MILES
                                      TIME TO PEAK IN HOURS

                                                           RATIOS APPLIED TO PRECIPITATION
OPERATION        STATION     AREA    PLAN             RATIO 1  RATIO 2  RATIO 3  RATIO 4
                                                         3.20     5.20     7.30     3.30

HYDROGRAPH AT
+                      1      .20      1    FLOW         345.     636.     939.     359.
                                            TIME        12.00    12.00    12.00    12.00

ROUTED TO
+                   POND      .20      1    FLOW          34.     106.     532.      37.
                                            TIME        12.67    12.42    12.17    12.58

                                       ** PEAK STAGES IN FEET **
                                       1    STAGE      306.81   310.78   312.56   307.02
                                            TIME        12.67    12.42    12.17    12.58

HYDROGRAPH AT
+                      2      .03      1    FLOW          30.      74.     123.      32.
                                            TIME        12.00    12.00    12.00    12.00

 2 COMBINED AT
+                 FLOW-1      .24      1    FLOW          49.     136.     600.      52.
                                            TIME        12.00    12.08    12.08    12.00

HYDROGRAPH AT
+                      5      .06      1    FLOW          50.     115.     190.      53.
                                            TIME        12.08    12.08    12.00    12.08

 2 COMBINED AT
+                 FLOW-2      .29      1    FLOW          98.     251.     789.     104.
                                            TIME        12.08    12.08    12.08    12.08

HYDROGRAPH AT
+                      3      .08      1    FLOW         102.     214.     334.     107.
                                            TIME        12.00    12.00    12.00    12.00

ROUTED TO
+                 X-POND      .08      1    FLOW          76.     187.     294.      82.
                                            TIME        12.08    12.08    12.08    12.08

                                       ** PEAK STAGES IN FEET **
                                       1    STAGE      297.00   298.54   299.64   297.10
                                            TIME        12.08    12.08    12.08    12.08

HYDROGRAPH AT
+                      4      .02      1    FLOW          13.      32.      55.      13.
                                            TIME        12.00    12.00    12.00    12.00

 2 COMBINED AT
+                  COMB1      .10      1    FLOW          86.     213.     349.      93.
                                            TIME        12.08    12.08    12.00    12.08

 2 COMBINED AT
+                  COMB2      .39      1    FLOW         184.     464.    1125.     197.
                                            TIME        12.08    12.08    12.08    12.08

ROUTED TO
+                   CR-1      .39      1    FLOW         168.     451.    1034.     179.
                                            TIME        12.17    12.08    12.17    12.08

HYDROGRAPH AT
+                    6-A      .03      1    FLOW          27.      62.     102.      28.
                                            TIME        12.00    12.00    12.00    12.00

 2 COMBINED AT
+                 FLOW-3      .42      1    FLOW         187.     499.    1078.     202.
                                            TIME        12.08    12.08    12.17    12.08

ROUTED TO
+                   CR-2      .42      1    FLOW         181.     478.    1055.     192.
                                            TIME        12.17    12.08    12.17    12.08

HYDROGRAPH AT
+                    6-B      .05      1    FLOW          32.      86.     150.      34.
                                            TIME        12.08    12.08    12.08    12.08

 2 COMBINED AT
+                 FLOW-4      .47      1    FLOW         209.     564.    1165.     226.
                                            TIME        12.08    12.08    12.17    12.08

ROUTED TO
+                   CR-3      .47      1    FLOW         204.     530.    1112.     220.
                                            TIME        12.25    12.25    12.33    12.25

HYDROGRAPH AT
+                      7      .05      1    FLOW          38.      97.     166.      40.
                                            TIME        12.00    12.00    12.00    12.00

 2 COMBINED AT
+                 FLOW-5      .52      1    FLOW         216.     558.    1145.     233.
                                            TIME        12.25    12.25    12.33    12.25

1
*** NORMAL END OF HEC-1 ***
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X               X
XXXXXXX  XXXX     X       XXXXX   X
X     X  X        X               X
X     X  X        X     X         X
X     X  XXXXXXX   XXXXX         XXX
```

```
THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL   LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1                                       HEC-1 INPUT                                          PAGE  1

 LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

   1         ID       WILLOW OAKS PROPOSED BMP/SWM POND AND OUTFALL
   2         ID       FAIRFAX COUNTY, VIRGINIA
   3         ID       SCS TYPE II, 24-HOUR RAINFALL DISTRIBUTION
   4         ID       FAIRFAX COUNTY PFM RAINFALL DEPTHS
   5         ID       ULTIMATE CONDITIONS DEVELOPMENT
   6         ID       SPILLWAY DESIGN MODEL
   7         ID       SDF = 1.5 X 100-YR; FBH = 2.5 X 100-YR
             *DIAGRAM
   8         IT      5                  300
   9         IO      5
             *          SDF     FBH
  10         JR    PREC   10.95   18.25
             *

  11         KK     ULT
  12         KM  BASIN ULTIMATE RUNOFF
  13         BA   0.203
  14         PB      1
             * SCS TypeII Rainfall Distribution Pattern
  15         IN      6
  16         PC     0.0  .00101  .00202  .00305  .00408  .00513  .00618  .00725  .00832  .00941
  17         PC  .01050  .01161  .01272  .01385  .01498  .01613  .01728  .01845  .01962  .02081
  18         PC    .022  .02321  .02442  .02565  .02688  .02813  .02938  .03065  .03192  .03321
  19         PC  .03450  .03581  .03712  .03845  .03978  .04113  .04248  .04385  .04522  .04661
  20         PC    .048  .04941  .05084  .05229  .05376  .05525  .05676  .05829  .05984  .06141
  21         PC    .063  .06461  .06624  .06789  .06956  .07125  .07296  .07469  .07644  .07821
  22         PC     .08  .08181  .08364  .08549  .08736  .08925  .09116  .09309  .09504  .09701
  23         PC    .099  .10101  .10304  .10509  .10716  .10925  .11136  .11349  .11564  .11781
  24         PC     .12  .12225  .12460  .12705  .12960  .13225    .135  .13785  .14080  .14385
  25         PC    .147   .1502  .15340   .1566   .1598    .163  .16628  .16972  .17332  .17708
  26         PC    .181  .18512  .18948  .19408  .19892    .204   .2094   .2152   .2214    .228
  27         PC    .235  .24268  .25132  .26092  .27148    .283  .30684  .35436  .43079  .56786
  28         PC    .663  .68196  .69864  .71304  .72516    .735  .74344  .75136  .75876  .76564
  29         PC    .772  .77796  .78364  .78904  .79416    .799   .8036    .808   .8122   .8162
  30         PC     .82  .82367  .82726  .83079  .83424  .83763  .84094  .84419  .84736  .85047
  31         PC  .85350  .85647  .85936  .86219  .86494  .86763  .87024  .87279  .87526  .87767
  32         PC     .88  .88229  .88455  .88679    .889  .89119  .89335  .89549   .8976  .89969
  33         PC  .90175  .90379   .9058  .90779  .90975  .91169   .9136  .91549  .91735  .91919
  34         PC    .921  .92279  .92455  .92629    .928  .92969  .93135  .93299   .9346  .93619
  35         PC  .93775  .93929   .9408  .94229  .94375  .94519   .9466  .94799  .94935  .95069
  36         PC    .952   .9533  .95459  .95588  .95716  .95844  .95971  .96098  .96224   .9635
  37         PC  .96475    .966  .96724  .96848  .96971  .97094  .97216  .97338  .97459   .9758
  38         PC    .977   .9782  .97939  .98058  .98176  .98294  .98411  .98528  .98644  .98760
  39         PC  .98875   .9899  .99104  .99218  .99331  .99444  .99556  .99668  .99779   .9989
  40         PC     1.0
  41         LS              89
  42         UD    0.10
             *
             * ASSUME PROP. RISER IS CLOGGED AND START ROUTING AT TOP OF EMERGENCY SPILLWAY
1                                       HEC-1 INPUT                                          PAGE  2

 LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  43         KK    POND
  44         KM  ROUTE BASIN ULT THROUGH PROPOSED SWM POND
  45         RS       1    ELEV  310.75
  46         SA    1.75    1.88    2.15    2.33    2.49     2.6    2.77    2.95    3.12    3.16
  47         SE     301     302     304     306     308     310     312     314     316   316.5
  48         SQ       0   184.5   916.7  2098.6    2444
  49         SE  310.75     312     314     316   316.5
             *
  50         ZZ
```

```
         PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
                        FLOWS IN CUBIC FEET PER SECOND,  AREA IN SQUARE MILES
                                      TIME TO PEAK IN HOURS

                                                           RATIOS APPLIED TO PRECIPITATION
OPERATION        STATION     AREA    PLAN             RATIO 1  RATIO 2
                                                        10.95    18.25

HYDROGRAPH AT
+                    ULT      .20      1    FLOW        1458.    2483.
                                            TIME        12.00    12.00

ROUTED TO
+                   POND      .20      1    FLOW        1273.    2231.
                                            TIME        12.08    12.00

                                       ** PEAK STAGES IN FEET **
                                       1    STAGE      314.60   316.19
                                            TIME        12.08    12.00

*** NORMAL END OF HEC-1 ***
```

Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated ~~7/6/2009 (conditions dated~~ 7/6/09)
Date Of (BOS) (PC) approval 7/13/2009
Sheet 26 of 27

Dewberry®

Dewberry & Davis LLC
8403 ARLINGTON BLVD.
FAIRFAX, VA 22031
PHONE: 703.849.0100
FAX: 703.849.0519
www.dewberry.com

INOVA
FAIRFAX HOSPITAL CAMPUS
GENERALIZED DEVELOPMENT PLAN / SPECIAL EXCEPTION AMENDMENT PLAT
PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

SEAL
COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES CULLETON
Lic. No. 20112
6-10-09
PROFESSIONAL ENGINEER

KEY PLAN

SCALE

No.	DATE	BY	Description
11	06.10.09	JMC	
10	06.05.09	JMC	
9	05.20.09	JMC	
8	04.20.09	JMC	
7	03.26.09	JMC	
6	02.19.09	JMC	
5	01.23.09	JMC	
4	10.09.08	JMC	
3	08.28.08	JMC	
2	07.31.08	JMC	
1	07.01.08	ARW	

REVISIONS

DRAWN BY JMC
APPROVED BY
CHECKED BY PGY
DATE February 12, 2008

TITLE
INOVA
Fairfax Hospital Campus
HEC-1 Models
GDP / SEA

PROJECT NO.

25

SHEET NO. 25 OF 26

M-10691

Q:\PROJECT\INOVA\Fairfax Hospital\Submissions\GDPSEA-15\Deliverables\25-HEC-1.dwg, 6/10/2009 11:48:33 AM, jce

```
X     X  XXXXXXX   XXXXX       X
X     X  X        X     X     XX
X     X  X        X            X
XXXXXXX  XXXX     X     XXXXX  X
X     X  X        X            X
X     X  X        X     X      X
X     X  XXXXXXX   XXXXX      XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL   LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
1                                     HEC-1 INPUT                                              PAGE  1

LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  1          ID        INOVA FAIRFAX HOSPITAL
  2          ID        FAIRFAX COUNTY, VIRGINIA
  3          ID        SCS TYPE II, 24-HOUR RAINFALL DISTRIBUTION
  4          ID        FAIRFAX COUNTY PFM RAINFALL DEPTHS
  5          ID        WOODBURN ROAD OUTFALL MODEL
  6          ID        2-, 10-, AND 100-YR
             *
  7          IT        5
  8          IO        5
  9          JP        3
             *
             *
             *

 10          KK        A
 11          KM   2-YEAR RUNOFF HYDROGRAPH TO PROPOSED SWM VAULT 1
 12          KO                                 22
 13          QI        0   78.75   50.72   37.57   30.06   24.85    21.1    18.5    15.9   14.45
 14          QI    12.86   11.85   10.69    9.83    8.96    8.09    7.08    6.21    5.35    4.48
 15          QI     3.61    2.75    1.73    0.87       0
 16          KP        2
 17          KM   10-YEAR RUNOFF HYDROGRAPH TO PROPOSED SWM VAULT 1
 18          QI        0  105.05   67.63      50   40.03   33.09   28.03   24.28   21.24   18.93
 19          QI    17.05   15.61   14.31   13.15   11.99   10.69    9.54    8.38    7.23    5.92
 20          QI     4.77    3.61    2.46    1.16       0
 21          KP        3
 22          KM   100-YEAR RUNOFF HYDROGRAPH TO PROPOSED SWM VAULT 1
 23          QI        0  177.74  115.06   85.44   67.55   56.54   47.87   42.09   37.39   33.96
 24          QI    30.53      28   25.65   23.48   21.31   19.33   17.16   14.99   12.82   10.66
 25          QI     8.49     6.5    4.34    2.17       0
             *

 26          KK   VAULT1
 27          KM   ROUTE HYDROGRAPHS THROUGH PROPOSED SWM VAULT 1
 28          KO                                 22
 29          RS        1    ELEV     328
 30          SV        0   1.638   1.641   3.053   3.053
 31          SE      328     335  335.01     339     341
             * 8" ORIFICE AT INV 328; 20' WEIR AT ELEV 339
 32          SL   328.33   0.349     0.6     0.5
 33          SS      339      20       3     1.5
             *

 34          KK        B
 35          KM   2-YEAR RUNOFF HYDROGRAPH TO PROPOSED SWM VAULT 2
 36          KO                                 22
 37          QI        0    17.6   11.34     8.4    6.72    5.56    4.72    4.13    3.55    3.23
 38          QI     2.87    2.65    2.39     2.2       2    1.81    1.58    1.39     1.2       1
 39          QI     0.81    0.61    0.39    0.19       0
 40          KP        2
 41          KM   10-YEAR RUNOFF HYDROGRAPH TO PROPOSED SWM VAULT 2
 42          QI        0   23.48   15.12   11.18    8.95     7.4    6.27    5.43    4.75    4.23
 43          QI     3.81    3.49     3.2    2.94    2.68    2.39    2.13    1.87    1.62    1.32
 44          QI     1.07    0.81    0.55    0.26       0
 45          KP        3
1                                     HEC-1 INPUT                                              PAGE  2

LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 46          KM   100-YEAR RUNOFF HYDROGRAPH TO PROPOSED SWM VAULT 2
 47          QI        0   39.73   25.72    19.1    15.1   12.64    10.7    9.41    8.36    7.59
 48          QI     6.82    6.26    5.73    5.25    4.76    4.32    3.84    3.35    2.87    2.38
 49          QI      1.9    1.45    0.97    0.48       0
             *

 50          KK   VAULT2
 51          KM   ROUTE HYDROGRAPHS THROUGH PROPOSED SWM VAULT 2
 52          KO                                 22
 53          RS        1    ELEV     328
 54          SA    0.083   0.083   0.083   0.083   0.083
 55          SE      328     335  335.01     339     341
             * 8" ORIFICE AT INV 328; 20' WEIR AT ELEV 339
 56          SL   328.33   0.349     0.6     0.5
 57          SS      339      20       3     1.5
             *

 58          KK        C
 59          KM   2-YEAR RUNOFF HYDROGRAPH FROM DOWNSTREAM OF 2 VALUTS TO (1)
 60          KO                                 22
 61          QI        0   16.19   28.98   21.42   14.87   11.47    9.39    7.88    6.68    5.73
 62          QI     4.91    4.35    3.78    3.47    3.15    2.84    2.52    2.21    1.89    1.58
 63          QI     1.26    0.95    0.63    0.32       0
 64          KP        2
 65          KM   10-YEAR RUNOFF HYDROGRAPH FROM DOWNSTREAM OF 2 VALUTS TO (1)
 66          QI        0   20.48    37.3   28.54   19.78   15.31   12.54   10.52    8.88    7.62
 67          QI     6.55     5.8    5.04     4.6    4.22    3.78    3.34    2.96    2.52    2.08
 68          QI      1.7    1.26    0.82    0.44       0
 69          KP        3
 70          KM   100-YEAR RUNOFF HYDROGRAPH FROM DOWNSTREAM OF 2 VALUTS TO (1)
 71          QI        0   28.98   63.79   50.95   34.97   27.56   22.52   19.14   17.09    15.2
 72          QI    14.02   13.15   12.44   11.42    10.4    9.37    8.27    7.25    6.22     5.2
 73          QI     4.17    3.15    2.05    1.02       0
             *

 74          KK        1
 75          KM   COMBINED RUNOFF HYDROGRAPHS FROM 2 VAULTS AND BASIN C
 76          HC        3
             *

 77          KK        D
 78          KM   2-YEAR RUNOFF HYDROGRAPH TO (2)
 79          KO                                 22
 80          QI        0   26.38   16.99   12.58   10.07    8.32    7.07     6.2    5.32    4.84
 81          QI     4.31    3.97    3.58    3.29       3    2.71    2.37    2.08    1.79     1.5
 82          QI     1.21    0.92    0.58    0.29       0
 83          KP        2
 84          KM   10-YEAR RUNOFF HYDROGRAPH TO (2)
 85          QI        0   35.19   22.65   16.75   13.41   11.08    9.39    8.13    7.11    6.34
 86          QI     5.71    5.23    4.79     4.4    4.02    3.58    3.19    2.81    2.42    1.98
 87          QI      1.6    1.21    0.82    0.39       0
 88          KP        3
 89          KM   100-YEAR RUNOFF HYDROGRAPH TO (2)
 90          QI        0   59.53   38.54   28.62   22.63   18.94   16.03    14.1   12.52   11.37
 91          QI    10.22    9.38    8.59    7.87    7.14    6.47    5.75    5.02     4.3    3.57
1                                     HEC-1 INPUT                                              PAGE  3

LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 92          QI     2.84    2.18    1.45    0.73       0
             *

 93          KK        2
 94          KM   COMBINED RUNOFF HYDROGRAPHS FROM 1 AND BASIN D
 95          HC        2
             *

 96          KK        E
 97          KM   2-YEAR RUNOFF HYDROGRAPH TO (4)
 98          QI        0    11.4   19.35    24.1   26.16   23.87   17.37   12.78   10.48     9.1
 99          QI     8.11    7.27    6.73     6.2    5.58    5.05    4.51     3.9    3.37    2.83
100          QI     2.22    1.68    1.15    0.54       0
101          KP        2
102          KM   10-YEAR RUNOFF HYDROGRAPH TO (4)
103          QI        0   15.15   25.78   32.13   34.88   31.82    23.1   16.98      14   12.09
104          QI    10.79    9.72    8.95    8.19     7.5    6.73    5.97     5.2    4.51    3.75
105          QI     2.98    2.22    1.53    0.77       0
106          KP        3
107          KM   100-YEAR RUNOFF HYDROGRAPH TO (4)
108          QI        0   13.67   32.13   50.97   60.44   49.25   36.15   28.97   24.38   21.32
109          QI    19.13   17.88   16.73    15.3   13.96   12.53   11.19    9.75    8.42    6.98
110          QI     5.55    4.21    2.77    1.43       0
             *

111          KK      A-A
112          KM   PROPOSED RUNOFF HYDROGRAPH TO CROSS SECTION A-A
113          HC        2
             *

114          KK        F
115          KM   2-YEAR RUNOFF HYDROGRAPH TO CONFLUENCE
116          QI        0   30.44   58.67   71.96   60.33   42.62   32.47    26.2   21.59    17.9
117          QI    14.76   12.36   10.15    9.23    8.49    7.56    6.83     5.9    5.17    4.24
118          QI     3.32    2.58    1.66    0.92       0
119          KP        2
120          KM   10-YEAR RUNOFF HYDROGRAPH TO CONFLUENCE
121          QI        0   40.59   78.23    94.1   80.44   56.83   43.17   34.87   28.78    23.8
122          QI    19.74   16.42   13.47   12.36   11.25   10.15    9.04    7.93    6.83    5.54
123          QI     4.43    3.32    2.21    1.11       0
124          KP        3
125          KM   100-YEAR RUNOFF HYDROGRAPH TO CONFLUENCE
126          QI        0   64.81  138.14  162.59  131.23   89.71   73.11   62.96   55.35   49.82
127          QI    45.66    42.2   38.75   35.52   32.29   29.06   25.83    22.6   19.37   16.14
128          QI    12.92    9.69    6.46    3.23       0
             *

129          KK        4
130          KM   PROPOSE RUNOFF HYDROGRAPH TO EXISTING 72" STM AND CROSS SECTION B-B
131          HC        2
             *
1                                     HEC-1 INPUT                                              PAGE  4

LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

132          KK        G
133          KM   2-YEAR RUNOFF HYDROGRAPH TO (5)
134          KO                                 22
135          QI        0   40.39   77.85   95.47   80.05   56.55   43.08   34.76   28.64   23.75
136          QI    19.58    16.4   13.46   12.24   11.26   10.04    9.06    7.83    6.85    5.63
137          QI     4.41    3.43     2.2    1.22       0
138          KP        2
139          KM   10-YEAR RUNOFF HYDROGRAPH TO (5)
140          QI        0   53.86   103.8  124.85  106.73    75.4   57.28   46.27   38.19   31.58
141          QI    26.19   21.79   17.87    16.4   14.93   13.46      12   10.53    9.06    7.34
142          QI     5.88    4.41    2.94    1.47       0
143          KP        3
144          KM   100-YEAR RUNOFF HYDROGRAPH TO (5)
145          QI        0   85.99  183.29  215.73  174.11  119.03      97   83.54   73.44    66.1
146          QI    60.59      56   51.41   47.12   42.84   38.56   34.27   29.99    25.7   21.42
147          QI    17.14   12.85    8.57    4.28       0
             *

148          KK        5
149          KM   COMBINED RUNOFF HYDROGRAPHS FROM 4 TO BASIN G
150          HC        2
             *

151          KK        H
152          KM   2-YEAR RUNOFF HYDROGRAPH TO (6)
153          KO                                 22
154          QI        0   28.96   55.81   68.45   57.39   40.54   30.89   24.92   20.53   17.02
155          QI    14.04   11.76    9.65    8.78    8.07     7.2    6.49    5.62    4.91    4.04
156          QI     3.16    2.46    1.58    0.88       0
157          KP        2
158          KM   10-YEAR RUNOFF HYDROGRAPH TO (6)
159          QI        0   38.61   74.41   89.51   76.52   54.05   41.07   33.17   27.38   22.64
160          QI    18.78   15.62   12.81   11.76   10.71    9.65     8.6    7.55    6.49    5.27
161          QI     4.21    3.16    2.11    1.05       0
162          KP        3
163          KM   100-YEAR RUNOFF HYDROGRAPH TO (6)
164          QI        0   61.64  131.41  154.66  124.82   85.34   69.54   59.89   52.65   47.39
165          QI    43.44   40.15   36.86   33.78   30.71   27.64   24.57    21.5   18.43   15.36
166          QI    12.29    9.21    6.14    3.07       0
             *

167          KK        6
168          KM   COMBINED RUNOFF HYDROGRAPHS FROM 5 TO BASIN H
169          HC        2
             *
170          ZZ
```

```
 PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
                FLOWS IN CUBIC FEET PER SECOND,  AREA IN SQUARE MILES
                              TIME TO PEAK IN HOURS

                                                          RATIOS APPLIED TO FLOWS
OPERATION       STATION     AREA    PLAN          RATIO 1
                                                     1.00

HYDROGRAPH AT
+                  A         .00      1   FLOW         79.
                                          TIME         .08
                                      2   FLOW        105.
                                          TIME         .08
                                      3   FLOW        178.
                                          TIME         .08

ROUTED TO
+               VAULT1       .00      1   FLOW          5.
                                          TIME        1.58
                                      2   FLOW          5.
                                          TIME        1.58
                                      3   FLOW         57.
                                          TIME         .42

                                     ** PEAK STAGES IN FEET **
                                      1   STAGE     336.19
                                          TIME        1.58
                                      2   STAGE     338.41
                                          TIME        1.67
                                      3   STAGE     339.92
                                          TIME         .83

HYDROGRAPH AT
+                  B         .00      1   FLOW         18.
                                          TIME         .08
                                      2   FLOW         23.
                                          TIME         .08
                                      3   FLOW         40.
                                          TIME         .08

ROUTED TO
+               VAULT2       .00      1   FLOW          3.
                                          TIME         .83
                                      2   FLOW          4.
                                          TIME         .92
                                      3   FLOW          5.
                                          TIME        1.08

                                     ** PEAK STAGES IN FEET **
                                      1   STAGE     331.54
                                          TIME         .83
                                      2   STAGE     332.98
                                          TIME         .92
                                      3   STAGE     337.56
                                          TIME        1.08

HYDROGRAPH AT
+                  C         .00      1   FLOW         29.
                                          TIME         .17
                                      2   FLOW         37.
                                          TIME         .17
                                      3   FLOW         64.
                                          TIME         .17

 3 COMBINED AT
+                  1         .00      1   FLOW         34.
                                          TIME         .17
                                      2   FLOW         43.
                                          TIME         .17
                                      3   FLOW         89.
                                          TIME         .42

HYDROGRAPH AT
+                  D         .00      1   FLOW         26.
                                          TIME         .08
                                      2   FLOW         35.
                                          TIME         .08
                                      3   FLOW         60.
                                          TIME         .08

 2 COMBINED AT
+                  2         .00      1   FLOW         51.
                                          TIME         .17
                                      2   FLOW         66.
                                          TIME         .17
                                      3   FLOW        110.
                                          TIME         .17

HYDROGRAPH AT
+                  E         .00      1   FLOW         26.
                                          TIME         .33
                                      2   FLOW         35.
                                          TIME         .33
                                      3   FLOW         60.
                                          TIME         .33

 2 COMBINED AT
+                A-A         .00      1   FLOW         70.
                                          TIME         .17
                                      2   FLOW         91.
                                          TIME         .17
                                      3   FLOW        157.
                                          TIME         .42

HYDROGRAPH AT
+                  F         .00      1   FLOW         72.
                                          TIME         .25
                                      2   FLOW         94.
                                          TIME         .25
                                      3   FLOW        163.
                                          TIME         .25

 2 COMBINED AT
+                  4         .00      1   FLOW        136.
                                          TIME         .25
                                      2   FLOW        178.
                                          TIME         .25
                                      3   FLOW        302.
                                          TIME         .25

HYDROGRAPH AT
+                  G         .00      1   FLOW         95.
                                          TIME         .25
                                      2   FLOW        125.
                                          TIME         .25
                                      3   FLOW        216.
                                          TIME         .25

 2 COMBINED AT
+                  5         .00      1   FLOW        231.
                                          TIME         .25
                                      2   FLOW        303.
                                          TIME         .25
                                      3   FLOW        518.
                                          TIME         .25

HYDROGRAPH AT
+                  H         .00      1   FLOW         68.
                                          TIME         .25
                                      2   FLOW         90.
                                          TIME         .25
                                      3   FLOW        155.
                                          TIME         .25

 2 COMBINED AT
+                  6         .00      1   FLOW        300.
                                          TIME         .25
                                      2   FLOW        393.
                                          TIME         .25
                                      3   FLOW        672.
                                          TIME         .25

*** NORMAL END OF HEC-1 ***
```

Application No RZ-2008-PR-009 Staff WOD
Concurrent w/ SEA-80-P-078-15

APPROVED DEVELOPMENT PLAN
(DP) (GDP) (FDP) (SEA PLAT)
See Proffers dated ~~7/6/2009~~ (~~conditions dated~~7/6/09)
Date Of (BOS) (PC) approval 7/13/2009
Sheet 27 of 27

Dewberry®

Dewberry & Davis LLC
8403 ARLINGTON BLVD.
FAIRFAX, VA 22031
PHONE: 703.849.0100
FAX: 703.849.0519
www.dewberry.com

INOVA
FAIRFAX HOSPITAL
CAMPUS

GENERALIZED DEVELOPMENT PLAN /
SPECIAL EXCEPTION AMENDMENT PLAT

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

SEAL
COMMONWEALTH OF VIRGINIA
TIMOTHY CHARLES CULLETON
Lic. No. 20112
6·10·09
PROFESSIONAL ENGINEER

KEY PLAN

SCALE

No.	DATE	BY	Description
11	06.10.09	JMC	
10	06.05.09	JMC	
9	05.20.09	JMC	
8	04.20.09	JMC	
7	03.26.09	JMC	
6	02.19.09	JMC	
5	01.23.09	JMC	
4	10.09.08	JMC	
3	08.28.08	JMC	
2	07.31.08	JMC	
1	07.01.08	ARW	

REVISIONS

DRAWN BY JMC
APPROVED BY
CHECKED BY PGY
DATE February 12, 2008

TITLE
INOVA
Fairfax Hospital Campus
HEC-1 Models

PROJECT NO.

26

SHEET NO. 26 OF 26

M-10691