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11	DETAILS		

GENERAL NOTES

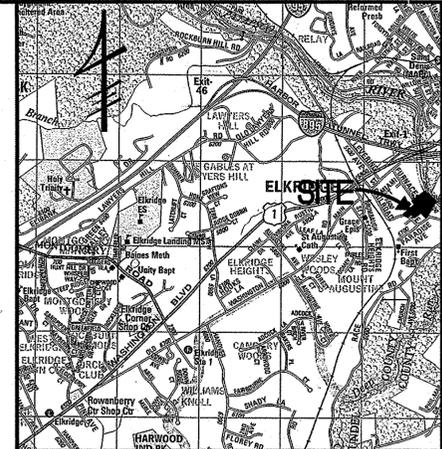
- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL, VOLUME IV IE, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION.
- THE PLANS CONTAIN A SUGGESTED SEQUENCE OF CONSTRUCTION. THE CONTRACTOR MAY CHOOSE AN ALTERNATE SEQUENCE SUBJECT TO APPROVAL BY THE ENGINEER AND HOWARD SOIL CONSERVATION DISTRICT.
- THE LOCATIONS OF THE UTILITIES SHOWN IS APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE EXISTENCE, LOCATION AND DEPTH OF ANY UTILITIES AND SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO BEGINNING WORK.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE ENGINEERING OFFICE, PHOENIX ENGINEERING, INC. AT (410) 229-1150 IN THE EVENT OF ANY DISCREPANCIES IN THE PLANS OR IN THE RELATIONSHIP OF FINISHED GRADES TO EXISTING GRADES, PRIOR TO BEGINNING ANY WORK.
- THE CONTRACTOR SHALL NOTE THAT IN THE CASE OF DISCREPANCY BETWEEN THE SCALED AND FIGURED DIMENSIONS SHOWN ON THESE PLANS, THE FIGURED DIMENSIONS SHALL GOVERN.
- IT SHALL BE DISTINCTLY UNDERSTOOD THAT FAILURE TO MENTION SPECIFICALLY WORK WHICH WOULD NORMALLY BE REQUIRED TO COMPLETE THE PROJECT SHALL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO PERFORM SUCH WORK.
- CONTRACTOR TO NOTIFY THE FOLLOWING UTILITIES OR AGENCIES AT LEAST FIVE (5) DAYS BEFORE STARTING WORK ON THESE DRAWINGS:
 *MISS UTILITY (800) 257-7777
 BALTIMORE GAS & ELECTRIC COMPANY (410) 685-0123
 VERIZON TELEPHONE (800) 978-7532
 AT&T CABLE LOCATION DIVISION (410) 539-9990
 HOWARD COUNTY BUREAU OF UTILITIES (410) 393-4974
 HOWARD COUNTY CONSTRUCTION INSPECTION SURVEY DIVISION (24 HOURS NOTICE PRIOR TO COMMENCEMENT OF WORK) (410) 393-3648
- THIS PROJECT COMPLIES WITH THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE FOR FOREST CONSERVATION WITH A FOREST CONSERVATION SURETY AMOUNT FOR THE 0.67 AC TOTAL FCE OBLIGATION WILL BE AS FOLLOWS:
 A) AFFORESTATION (0.22 AC): 5,983 SF X \$0.50/SF = \$4,792
 B) CREDITED RETENTION (0.06 AC): 2,614 SF X \$0.20/SF = \$523
 C) SELECTIVE CLEARING & SUPPLEMENTAL PLANTING (0.39 AC): 16,998 SF X \$0.40/SF = \$6,796
 HOWEVER, RECEIVING CREDIT FOR SELECTIVE CLEARING AND SUPPLEMENTAL PLANTING WITHIN THIS AREA GOES TOWARDS THE REFORESTATION/AFFORESTATION OBLIGATION.
- THE CONTRACTOR SHALL OBTAIN THE NECESSARY PERMITS FOR CONSTRUCTION.
- TOPO TAKEN FROM FIELD RUN SURVEY PERFORMED BY MARKS AND ASSOCIATES DATED DECEMBER 2007.
- ALL HORIZONTAL CONTROLS ARE BASED ON MARYLAND STATE GRID COORDINATES.
- ANY DAMAGE CAUSED BY THE CONTRACTOR TO THE COUNTY RIGHT-OF-WAY, EXISTING PAVEMENT, CURBS AND OUTGERS AND UTILITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE IN ACCORDANCE WITH THE HOWARD COUNTY STANDARDS AND SPECIFICATIONS.
- THIS PROPERTY IS ZONED CAC-CL1 IN ACCORDANCE WITH THE COMPREHENSIVE ZONING PLAN DATED FEBRUARY 2, 2004 AND THE COMPREHENSIVE LITE ZONING REGULATION AMENDMENTS EFFECTIVE JULY 26, 2006.
- THIS PLAN IS SUBJECT TO THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS, PER COUNCIL BILL 45-2003, AND THE ZONING REGULATIONS AMENDED BY COUNCIL BILL 75-2003. DEVELOPMENT OR CONSTRUCTION ON THIS PROPERTY MUST COMPLY WITH SETBACK AND BUFFER REGULATIONS IN EFFECT AT THE TIME OF SUBMISSION OF THE SITE DEVELOPMENT PLAN, WAIVER PETITION APPLICATION OR BUILDING/GRADING PERMIT APPLICATION.
- NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING OR NEW STRUCTURES SHALL BE PERMITTED WITHIN THE WETLANDS, STREAM, BUFFERS OR 100 YEAR FLOODPLAIN, AND FOREST CONSERVATION EASEMENTS, EXCEPT AS NOTED ON THE FOREST CONSERVATION PLAN AND FOR THE GRADING, CLEARING AND CONSTRUCTION DISTURBANCE LOCATED WITHIN THE 7' STREAM BUFFER AND 100 YEAR FLOODPLAIN FOR THE STORMWATER MANAGEMENT OUTFALL PIPE AND RIP RAP CHANNEL WHICH WAS DETERMINED ESSENTIAL OR NECESSARY BY SCD AND DEP IN ACCORDANCE WITH SECTION 16.116(e) OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS.
- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT 410-313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
- TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNALINGS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
- EXISTING WATER AND SEWER OF FURNACE AVENUE ARE PUBLIC, IN THE PATAPSCO DRAINAGE AREA AND WERE BUILT UNDER CONTRACT 22A, W1088-30325, AND 44-1126. ON SITE WATER AND SEWER IS BEING PROVIDED UNDER CONTRACT NO. 14-4881-D.
- EXISTING UTILITIES ARE BASED ON FIELD RUN TOPO SUPPLEMENTED BY AS-BUILT CONSTRUCTION PLANS.
- A FLOODPLAIN STUDY FOR THIS PROJECT IS INCLUDED WITH THIS SUBMISSION.
- THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL, LANDSCAPE SURETY IN THE AMOUNT OF \$45,740 WILL BE SUBMITTED WITH THE DEVELOPMENT AGREEMENT. THE SURETY IS BASED ON 112 SHADE TREES AT \$300 PER TREE, 7 EVERGREEN TREES AT \$150 PER TREE, 426 ORNAMENTAL TREES AT \$150 PER TREE, 165 SHRUBS AT \$30 PER SHRUB, 434 LF OF PRIVACY FENCES AT \$10/LF, AND 75 LF OF SITE WALL AT \$20/LF. A SURETY OF \$45,530 WAS POSTED BY THE OWNER UNDER THE ORIGINAL SDP APPROVAL. THE REMAINDER OF THE LANDSCAPE SURETY WILL BE POSTED WITH THE GRADING PERMIT.
- THE PROPERTY IS LISTED IN THE HOWARD COUNTY HISTORIC SITES INVENTORY AS HO-518 AND HO-784. THE PLANS WERE REVIEWED BY THE HISTORIC DISTRICT COMMISSION ON JUNE 5, 2008.
- THERE WILL BE NO BUSINESS VEHICLES PARKED ON SITE OVERNIGHT.
- ALL FIVE OF THE EXISTING HOUSES INCLUDING THE TWO REMAINING HISTORIC HOUSES IDENTIFIED AS HO-518 AND TWO COMMERCIAL STRUCTURES LOCATED WITHIN PARCELS A AND B WILL BE REMOVED OR RELOCATED UNDER THE PROCESSING OF SDP-08-109.
- THERE ARE NO BURIAL OR CEMETERY SITES LOCATED ON THE SUBJECT PROPERTY.
- THIS SITE IS LOCATED WITHIN THE BWI AIRPORT ZONING DISTRICT. THE MAA HAS REVIEWED THE AIRPORT ZONING PERMIT AND ON SEPTEMBER 2, 2008 APPROVED THIS PROJECT. THIS SITE IS NOT EXPECTED TO PRESENT HAZARDS TO THE AIRSPACE SURROUNDING BWI.

RIVERWATCH

PARCELS A & B

1ST ELECTION DISTRICT

HOWARD COUNTY, MARYLAND



VICINITY MAP
SCALE: 1"=2000'

BM# 0024 NAD83 Elevation: 26.93'
 Description: Brass disc, located at the intersection of southbound US Rt. 1 and the off ramp from I-895, 600' + east of Levinger Avenue, 81.75' NE of BGE Pole #229974
 Northing: 665065.4512
 Easting: 1395212.1044

BM# 0055 NAD83 Elevation: 68.812'
 Description: Brass disc located in a concrete wingwall 9.3' east of the intersection of US RT 1 and the B&O Railroad tracks
 Northing: 664363.703
 Easting: 1394202.3634

SITE DATA ANALYSIS CHART

TOTAL GROSS AREA OF SITE = 4.818 AC. OR 209,821 SQ. FT.
 TOTAL AREA OF THIS SUBMISSION = 4.818 AC. OR 209,821 SQ. FT.
 TOTAL NET AREA = 3.982 AC.
 PARCEL "A" = 1.004 AC, PARCEL "B" = 3.484 AC.
 AREA OF 100 YEAR FLOODPLAIN 0.450 AC.
 AREA OF 25% SLOPES (OUTSIDE OF FLOODPLAIN) 0.406 AC.
 AREA OF RW DEDICATION = 0.330 AC.

ZONING: CAC-CL1
 DENSITY BASED ON 25 UNITS PER NET TRACT AREA

EXISTING USE: INDUSTRIAL
 PROPOSED USE = MIXED USE WITH RESIDENTIAL (84 D.U.), COMMERCIAL/OFFICE
 TOTAL NUMBER OF RESIDENTIAL UNITS ALLOWED @ 25/NET AREA = 99 D.U.
 TOTAL NUMBER OF RESIDENTIAL UNITS PROPOSED = 84 D.U.
 TOTAL NUMBER OF MIHU REQUIRED @ 15% = 13 D.U.
 TOTAL NUMBER OF MIHU PROPOSED = 42 D.U.

ALL UNITS WILL BE "FOR RENT"
 THE SOIL TYPES SHOWN ON THESE PLANS ARE AS SHOWN IN THE "HOWARD COUNTY SOILS SURVEY", AND ARE OF THE "ELSBORO" CLASSIFICATION TYPE "B" SOILS.

THERE ARE WETLANDS AND FLOODPLAINS AS SHOWN ON THIS SITE.
 ALL EXISTING VEGETATION ON SITE IS IN THE FORM OF LAWN WITH SPARSE TREE STANDS.
 TOTAL AREA OF 100 YEAR FLOODPLAIN EASEMENT = 0.43 AC.
 OPEN SPACE (GREEN AREA) TO REMAIN ON SITE = 1.05 AC
 TOTAL AREA TO BE DISTURBED = 185,395 SF OR 4.26 AC.
 OPEN SPACE AND AMENITY AREA REQUIRED @ 10% OF THE NET SITE AREA = 17,346 S.F.
 OPEN SPACE AND AMENITY AREA PROVIDED @ 19.2% = 35,218 S.F.

TOTAL IMPERVIOUS AREA = 127,616 SF OR 2.93 AC
 BUILDING COVERAGE AREA = 42,162 SF AND 24.3% OF SITE

PARKING SPACE DISTRIBUTION CHART:

PARKING REQUIRED:	SPACES
RESIDENTIAL - 84 APT UNITS	168 SPACES
2.0 SPACES PER APARTMENT D.U.	168 SPACES
0.3 SPACES PER APARTMENT D.U. FOR VISITOR/ OVERFLOW PER DESIGN MANUAL	26 SPACES
8,400 S.F. OFFICE/PERSONAL SERVICES @ 331,000 S.F. (REDUCED TO 100 S.F. PER RESIDENTIAL UNIT)	28 SPACES
*SEE GENERAL NOTE #35.6	
TOTAL SPACES BEFORE ADJUSTMENT	222 SPACES
PARKING REQUIRED AFTER ADJUSTMENT: (SEE CHART, THIS SHEET)	197 SPACES

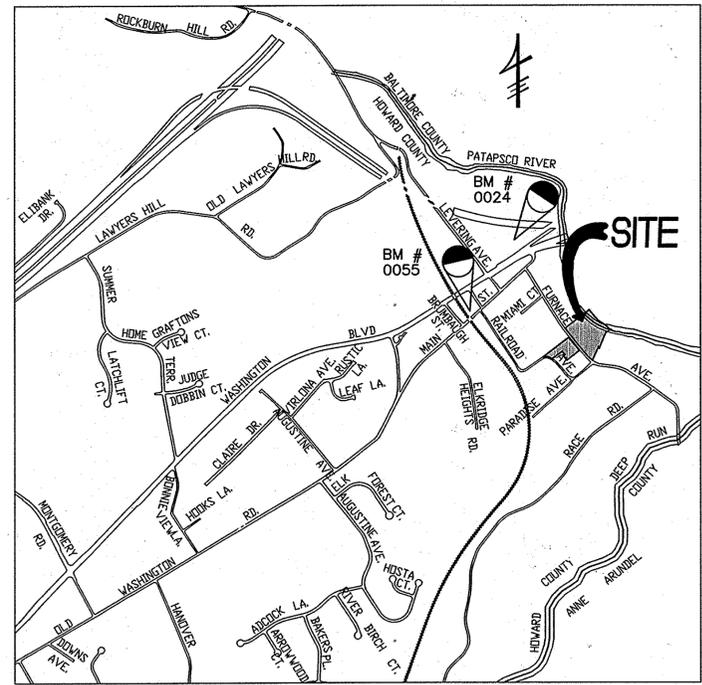
PARKING PROVIDED:

HANDICAP SPACES:	SPACES
REGULAR 8'X18' W/ AISLE =	0
VAN ACCESSIBLE 8'X18' W/ AISLE =	1
REGULAR ON SITE COMMON SPACES (9'X18') =	48
ON-SITE PARALLEL SPACES =	9
GARAGE SPACES (NOT INCLUDING HANDICAP)	80
TOTAL =	21

THE PROPERTY MANAGEMENT COMPANY THAT MANAGES THE PROPERTY WILL NEED TO MONITOR AND REGULATE THE PARKING SITUATION ON THE PROPERTY. PARKING SPACES WILL NEED TO BE ASSIGNED TO SPECIFIC RESIDENCE TYPES AND USES. SIGNAGE OR SPACE NUMBERING WILL NEED TO BE PROVIDED TO REGULATE PARKING. THE MANAGEMENT COMPANY SHALL ADDRESS ANY PARKING DEFICIENCIES THAT MAY RISE IN THE FUTURE.

LEGEND

- EX. CONTOUR
- PROP. CONTOUR
- SPOT ELEVATION
- PROPERTY LINE
- TREE LINE
- EX WATER
- PROP WATER
- EX SEWER
- PROP SEWER
- EX SD
- PROP SD
- DUMPSTER PAD
- EXISTING FIRE HYDRANT
- ENTRANCE/EXIT DOOR
- EXISTING TREES TO REMAIN
- PROP FOREST CONSERVATION ESMT.
- TRANSFORMER PAD
- PRIVATELY MAINTAINED LIGHTING
- PUBLICLY MAINTAINED LIGHTING
- PROP FIRE HYDRANT
- PROP SIDEWALK
- EXIST. POWER POLE
- 100 YR. FLOODPLAIN
- TRAFFIC CONTROL SIGNS



LOCATION MAP
SCALE: 1" = 1000'

- WP-14-069 WAS APPROVED ON 1-31-14 AND WILL BE VALID FOR ONE YEAR OR AS LONG AS THIS SITE PLAN REDLINE REMAINS IN ACTIVE PROCESSING, ALLOWING FOR PARKING TO EXTEND OUTSIDE THE 200 FOOT MINIMUM DISTANCE FROM THE MAIN ENTRANCE TO AN APARTMENT BUILDING OR THE MIDPOINT OF A GROUP OF SINGLE FAMILY ATTACHED UNITS, AS ALLOWED BY SECTION 16.120(d) OF THE HOWARD COUNTY LAND DEVELOPMENT REGULATIONS.
- IF A WALL IS DISCOVERED DURING THE GRADING PROCESS, IT WILL NEED TO BE PROPERLY ABANDONED BY A LICENSED WELL DRILLER AND DOCUMENTATION FORWARDED TO THE HEALTH DEPARTMENT.
- THE PHASING OF RESIDENTIAL AND COMMERCIAL CONSTRUCTION SHALL BE PROPORTIONAL IN ACCORDANCE WITH SECTION 127.5.E.3.d OF THE ZONING REGULATIONS. NO MORE THAN 50% OF THE RESIDENTIAL UNITS SHALL BE CONSTRUCTED PRIOR TO COMMENCING THE PROPORTIONAL AMOUNT OF COMMERCIAL CONSTRUCTION ON SITE.
- THE PROPERTY MANAGEMENT COMPANY THAT MANAGES THE PROPERTY WILL NEED TO MONITOR AND REGULATE THE PARKING SITUATION ON THE PROPERTY. PARKING SPACES WILL NEED TO BE ASSIGNED TO SPECIFIC RESIDENCE TYPES AND USES. SIGNAGE OR SPACE NUMBERING WILL NEED TO BE PROVIDED TO REGULATE PARKING. THE MANAGEMENT COMPANY SHALL ADDRESS ANY PARKING DEFICIENCIES THAT MAY RISE IN THE FUTURE.
- IN ACCORDANCE WITH ZONING SECTION 133, EACH GARAGE WITHIN A SFA UNIT SHALL BE USED FOR THE PARKING OF A MOTOR VEHICLE. THE TANDEN SPACES IN LINE WITH THEIR RESPECTIVE UNITS' GARAGES ARE FOR THAT INDIVIDUAL RESIDENCES UNIT AND WILL BE MARKED AS SUCH.
- A DAP MEETING WAS HELD FOR THIS PROJECT ON 12-11-2013 AND 5-14-2014.
- A VARIANCE PETITION TO SECTION 127.5.D.4.5.1a. FOR SIDEWALK, PARKING, AND BUILDING TO BE WITHIN THE 30' STRUCTURE AND USE SETBACK FROM AN R12 ZONING DISTRICT ON THE SOUTH SIDE OF FURNACE AVENUE (BUILDING PARCEL A), CASE NUMBER BA-14-088V, WAS APPROVED ON 6-30-2014.
- DEPZ APPROVED TWO STRIPED ACCESS AISLES OF ADJOINING HANDICAP PARKING SPACES WITHIN THE 10' SURFACE PARKING SETBACK AT THE MAIN ENTRANCE OF THE NORTH SITE AREA. THE USE OF THIS STRIPED PAVEMENT IS FOR PEDESTRIAN USE ONLY. VEHICULAR USE OF THESE STRIPED ACCESS AREAS WILL BE CITED AS A ZONING VIOLATION.

SHARED PARKING ADJUSTMENT

USE	# Spaces Req'd	WEEKDAY	WEEKEND	NIGHT
Residential	194.00	156.00	117.00	194.00
Comm-Office	28.00	23.00	28.00	3.00
		80%	100%	100%
		100%	100%	10%
		100%	10%	5%
		100%	10%	5%
		179.00	145.00	145.00
		197.00	197.00	196.00
		after shared parking adjustment		

ADDRESS CHART

STREET ADDRESS: 5701-5712 CARROLL LN, 5601-5606 COLE DR, 5651-5676 FURNACE AVE, 5702-5704 KIRBY DR, 5701-5703 - RAILROAD AVE.

PERMIT INFORMATION CHART

SUBDIVISION NAME	SECTION/AREA	PARCEL
RIVERWATCH	N/A	PARCELS A & B

PLAN NO.'s: 20665 & 20666
 DATE: 5/21/14
 WATER CODE: N/A
 SEWER CODE: N/A



7-25-2014
 Date

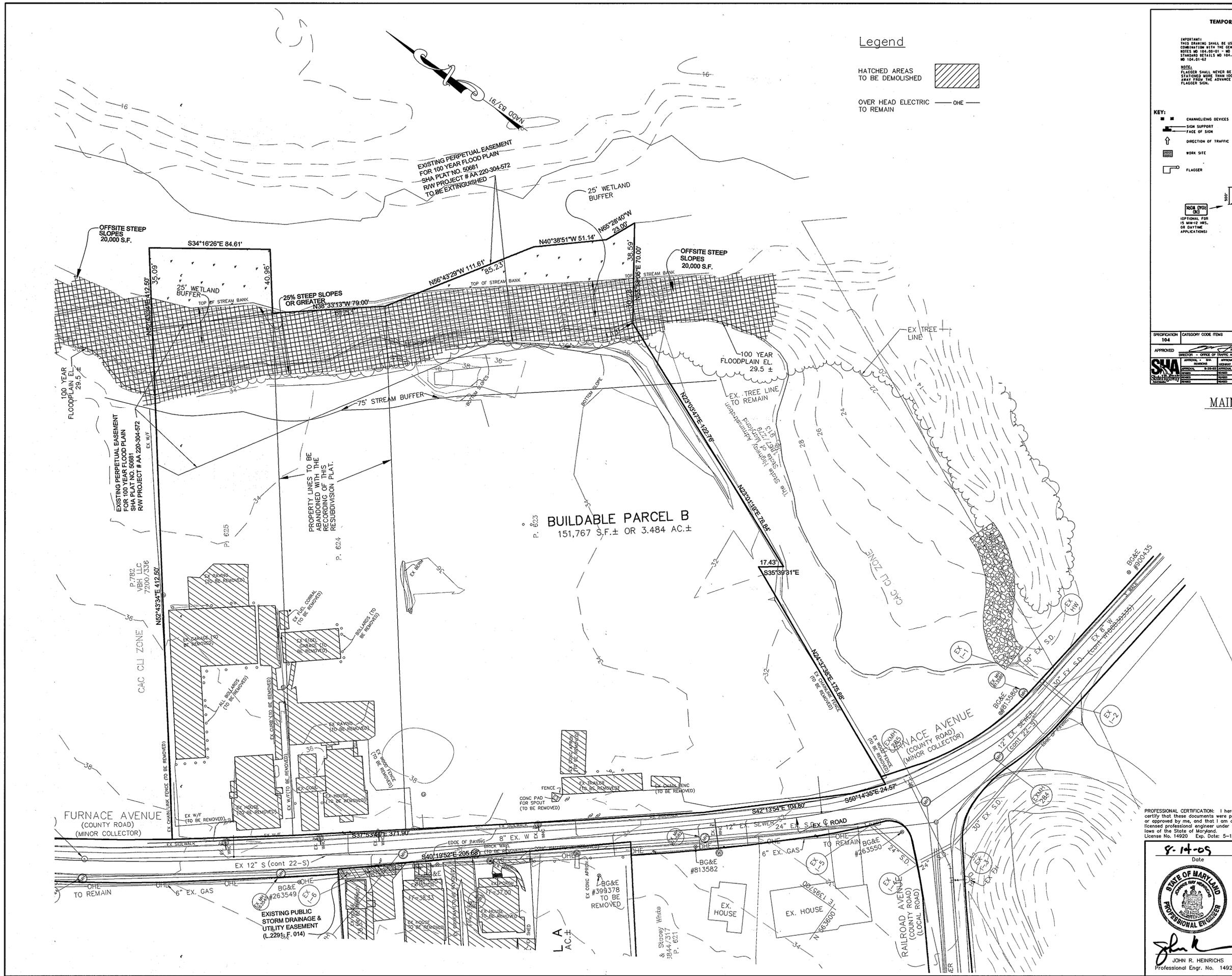
COVER SHEET

AREA: ELKRIDGE
 PARCELS: 420, 421, 422, 623, 624, 625, 620
 CENSUS TRACT 6012.01 TAX MAP: 38
 1ST ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND

PREPARED BY: PHOENIX ENGINEERING, INC. CONSULTING ENGINEERS
 1420 JOH AVENUE, SUITE A
 BALTIMORE, MARYLAND 21227
 (410) 247-8833 FAX 247-6397

DATE: 7-25-2014

Des By: R.J.W. Scale: AS SHOWN Proj No: 07-041
 Date: JULY, 2014 Drawing: 001.dwg
 Ck By: J.R.H. SDP: 08-109 1 OF 22



Legend

- HATCHED AREAS TO BE DEMOLISHED
- OVER HEAD ELECTRIC TO REMAIN

TEMPORARY TRAFFIC CONTROL TYPICAL APPLICATION

IMPORTANT: THIS DRAWING SHALL BE USED IN COMBINATION WITH THE GENERAL NOTES NO. 104-01-01 - NO. 104-01-18 AND STANDARD DETAILS NO. 104-01-01 - NO. 104-01-02.

NOTE: FLAGGER SHALL NEVER BE STATIONED MORE THAN 100' AWAY FROM THE ADVANCE FLAGGER SIGN.

KEY:

- CHANNELIZING DEVICES
- SOIL SUPPORT
- FACE OF SIGN
- DIRECTION OF TRAFFIC
- WORK SITE
- FLAGGER
- OPTIONAL FOR 15 MPH-17 MPH, OR DAYTIME APPLICATIONS
- OPTIONAL FOR 15 MPH-17 MPH, OR DAYTIME APPLICATIONS
- OPTIONAL FOR 15 MPH-17 MPH, OR DAYTIME APPLICATIONS
- OPTIONAL FOR 15 MPH-17 MPH, OR DAYTIME APPLICATIONS
- OPTIONAL FOR 15 MPH-17 MPH, OR DAYTIME APPLICATIONS
- OPTIONAL FOR 15 MPH-17 MPH, OR DAYTIME APPLICATIONS

PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 14920 Exp. Date: 5-12-10

STATE OF MARYLAND
PROFESSIONAL ENGINEER

John R. Heinrichs
Professional Engr. No. 14920

Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES
FLAGGING OPERATION-2-LANE, 2-WAY
EQUIVALENT 40 MPH
STANDARD NO. MD 104.02-10

MAINTENANCE OF TRAFFIC
NOT TO SCALE

APPROVED: FOR PUBLIC WATER AND PUBLIC SEWERAGE SYSTEMS

COUNTY HEALTH OFFICER
HOWARD COUNTY HEALTH DEPARTMENT

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION *9/17/09*

CHIEF, DIVISION OF LAND DEVELOPMENT *10/20/09*

DIRECTOR *10/22/09*

Date	No	Revision Description

DEVELOPER:
NKC PROPERTIES, LLC
12183 TRIADAPLHIA ROAD
ELLCOTT CITY, MD 21042
410-796-7676

OWNER:
THOMAS PALACOROLLA
12183 TRIADAPLHIA ROAD
ELLCOTT CITY, MD 21042
410-796-7676

PROJECT:
RIVERWATCH
BUILDABLE PARCELS 'A' & 'B'
A RESUBDIVISION OF SHINNAMON
SUBDIVISION LOTS 1 THRU 7 AND PARCELS
420, 421, 422, 620, 623, 624 AND 625
ELKRIDGE, MD 21046
HOWARD COUNTY, MARYLAND

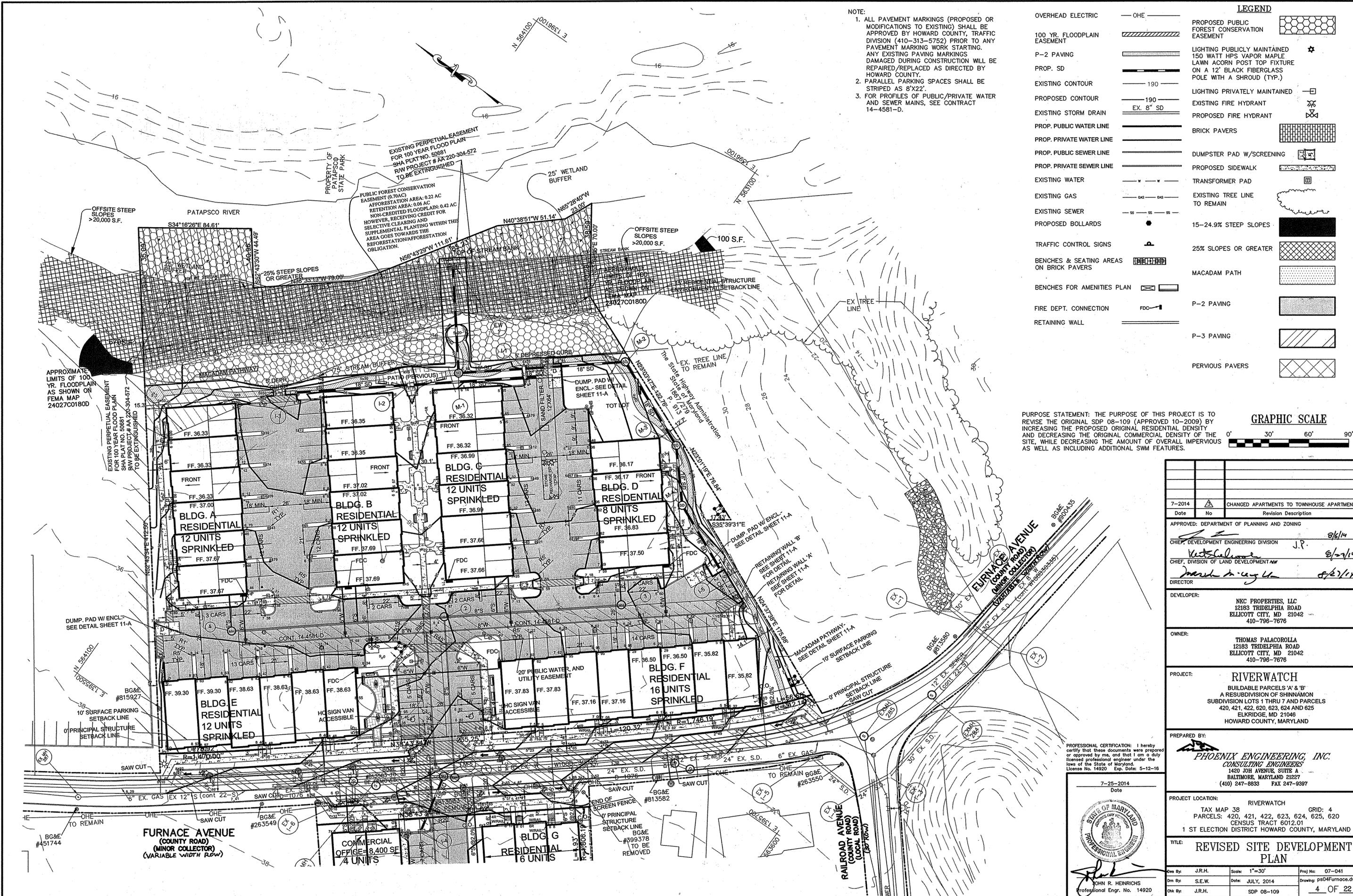
PREPARED BY:
PHOENIX ENGINEERING, INC.
CONSULTING ENGINEERS
1420 JOH AVE. SUITE A
BALTIMORE, MARYLAND 21227
(410) 247-8833 FAX 247-9397

PROJECT LOCATION:
RIVERWATCH
TAX MAP 38 GRID: 4
PARCELS: 420, 421, 422, 623, 624, 625, 620
CENSUS TRACT 6012.01
1 ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE:
EXISTING CONDITIONS & DEMOLITION PLAN

Des By: J.R.H. Scale: 1"=30' Proj No: 07-041
Dra By: S.E.W. Date: DECEMBER, 2008 Drawing: demo01.dwg
Chk By: J.R.H. SDP 08-109 2 OF 22

SDP 08-109



NOTE:
 1. ALL PAVEMENT MARKINGS (PROPOSED OR MODIFICATIONS TO EXISTING) SHALL BE APPROVED BY HOWARD COUNTY, TRAFFIC DIVISION (410-313-5752) PRIOR TO ANY PAVEMENT MARKING WORK STARTING. ANY EXISTING PAVING MARKINGS DAMAGED DURING CONSTRUCTION WILL BE REPAIRED/REPLACED AS DIRECTED BY HOWARD COUNTY.
 2. PARALLEL PARKING SPACES SHALL BE STRIPED AS 8'X22'.
 3. FOR PROFILES OF PUBLIC/PRIVATE WATER AND SEWER MAINS, SEE CONTRACT 14-4581-D.

LEGEND	
OVERHEAD ELECTRIC	OHE
100 YR. FLOODPLAIN EASEMENT	[Symbol]
P-2 PAVING	[Symbol]
PROP. SD	[Symbol]
EXISTING CONTOUR	190
PROPOSED CONTOUR	190
EXISTING STORM DRAIN	EX. 8" SD
PROP. PUBLIC WATER LINE	[Symbol]
PROP. PRIVATE WATER LINE	[Symbol]
PROP. PUBLIC SEWER LINE	[Symbol]
PROP. PRIVATE SEWER LINE	[Symbol]
EXISTING WATER	[Symbol]
EXISTING GAS	[Symbol]
EXISTING SEWER	[Symbol]
PROPOSED BOLLARDS	[Symbol]
TRAFFIC CONTROL SIGNS	[Symbol]
BENCHES & SEATING AREAS ON BRICK PAVERS	[Symbol]
BENCHES FOR AMENITIES PLAN	[Symbol]
FIRE DEPT. CONNECTION	FDC
RETAINING WALL	[Symbol]
PROPOSED PUBLIC FOREST CONSERVATION EASEMENT	[Symbol]
LIGHTING PUBLICLY MAINTAINED 150 WATT HPS VAPOR MAPLE LAWN ACORN POST TOP FIXTURE ON A 12" BLACK FIBERGLASS POLE WITH A SHROUD (TYP.)	[Symbol]
LIGHTING PRIVATELY MAINTAINED	[Symbol]
EXISTING FIRE HYDRANT	[Symbol]
PROPOSED FIRE HYDRANT	[Symbol]
BRICK PAVERS	[Symbol]
DUMPSTER PAD W/SCREENING	[Symbol]
PROPOSED SIDEWALK	[Symbol]
TRANSFORMER PAD	[Symbol]
EXISTING TREE LINE TO REMAIN	[Symbol]
15-24.9% STEEP SLOPES	[Symbol]
25% SLOPES OR GREATER	[Symbol]
MACADAM PATH	[Symbol]
P-2 PAVING	[Symbol]
P-3 PAVING	[Symbol]
PERVIOUS PAVERS	[Symbol]

PURPOSE STATEMENT: THE PURPOSE OF THIS PROJECT IS TO REVISE THE ORIGINAL SDP 08-109 (APPROVED 10-2009) BY INCREASING THE PROPOSED ORIGINAL RESIDENTIAL DENSITY AND DECREASING THE ORIGINAL COMMERCIAL DENSITY OF THE SITE, WHILE DECREASING THE AMOUNT OF OVERALL IMPERVIOUS AS WELL AS INCLUDING ADDITIONAL SWM FEATURES.

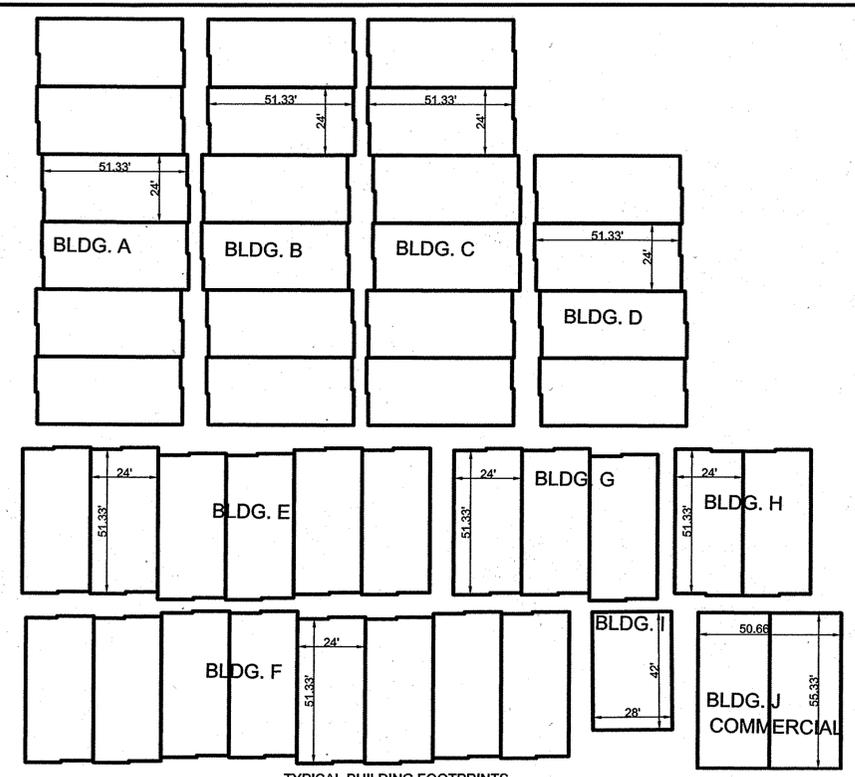
GRAPHIC SCALE
 0' 30' 60' 90'

7-2014	CHANGED APARTMENTS TO TOWNHOUSE APARTMENTS
Date	Revision Description
APPROVED: DEPARTMENT OF PLANNING AND ZONING	
CHIEF, DEVELOPMENT ENGINEERING DIVISION	8/6/14
CHIEF, DIVISION OF LAND DEVELOPMENT	8/27/14
DIRECTOR	8/27/14
DEVELOPER:	NKC PROPERTIES, LLC 12183 TRIDELPHIA ROAD ELLCOTT CITY, MD 21042 410-796-7878
OWNER:	THOMAS PALACOROLLA 12183 TRIDELPHIA ROAD ELLCOTT CITY, MD 21042 410-796-7878
PROJECT:	RIVERWATCH BUILDABLE PARCELS 'A' & 'B' A RESUBDIVISION OF SHINNAMON SUBDIVISION LOTS 1 THRU 7 AND PARCELS 420, 421, 422, 620, 623, 624 AND 625 ELKRIDGE, MD 21046 HOWARD COUNTY, MARYLAND
PREPARED BY:	PHOENIX ENGINEERING, INC. CONSULTING ENGINEERS 1420 JOH AVENUE, SUITE A BALTIMORE, MARYLAND 21227 (410) 247-8833 FAX 247-8897
PROJECT LOCATION:	RIVERWATCH TAX MAP 38 GRID: 4 PARCELS: 420, 421, 422, 623, 624, 625, 620 CENSUS TRACT 6012.01 1 ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND
TITLE:	REVISED SITE DEVELOPMENT PLAN
Des By:	J.R.H. Scale: 1"=30'
Drn By:	S.E.W. Date: JULY, 2014
Chk By:	J.R.H. SDP 08-109
Proj No:	07-041
Drawing:	p804Furnace.dwg
Page:	4 OF 22

PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 14920 Exp. Date: 5-12-16

7-25-2014 Date

JOHN R. HEINRICHS
Professional Engr. No. 14920

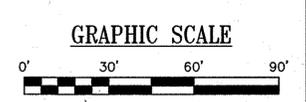
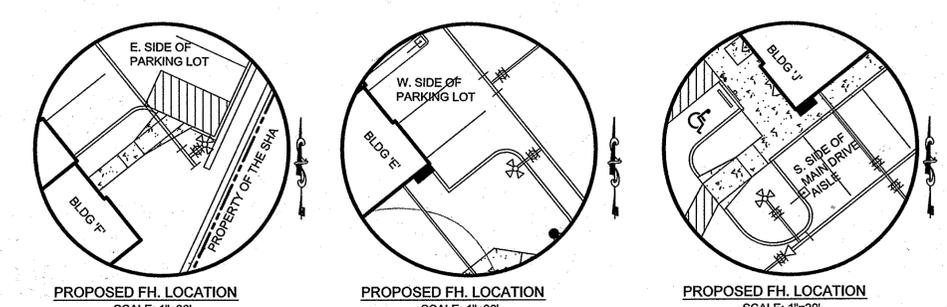


LEGEND

OVERHEAD ELECTRIC	— OHE —	PROPOSED PUBLIC FOREST CONSERVATION EASEMENT		MACADAM PATH	
100 YR. FLOODPLAIN EASEMENT		LIGHTING PUBLICLY MAINTAINED 150 WATT HPS VAPOR MAPLE LAWN ACORN POST TOP FIXTURE ON A 12" BLACK FIBERGLASS POLE WITH A SHROUD (TYP.)		BENCHES & SEATING AREAS ON BRICK PAVERS	
P-2 PAVING		LIGHTING PRIVATELY MAINTAINED EXISTING FIRE HYDRANT		FIRE DEPT. CONNECTION	
PROP. SD		PROPOSED FIRE HYDRANT			
EXISTING CONTOUR	— 190 —	BRICK PAVERS			
PROPOSED CONTOUR	— 190 —	DUMPSTER PAD W/SCREENING			
EXISTING STORM DRAIN	EX. 8" SD	PROPOSED SIDEWALK			
PROP. PUBLIC WATER LINE		TRANSFORMER PAD			
PROP. PRIVATE WATER LINE		EXISTING TREE LINE TO REMAIN			
PROP. PUBLIC SEWER LINE		15-24.9% STEEP SLOPES			
PROP. PRIVATE SEWER LINE		25% SLOPES OR GREATER			
EXISTING WATER	— W —	P-3 PAVING			
EXISTING GAS	— GAS —	PERVIOUS PAVERS			
EXISTING SEWER	— S —				
PROPOSED BOLLARDS	•				
TRAFFIC CONTROL SIGNS					
BENCHES FOR AMENITIES PLAN					
P-2 PAVING					
RETAINING WALL					

NOTE:

- ALL PAVEMENT MARKINGS (PROPOSED OR MODIFICATIONS TO EXISTING) SHALL BE APPROVED BY HOWARD COUNTY, TRAFFIC DIVISION (410-313-5752) PRIOR TO ANY PAVEMENT MARKING WORK STARTING. ANY EXISTING PAVING MARKINGS DAMAGED DURING CONSTRUCTION WILL BE REPAIRED/REPLACED AS DIRECTED BY HOWARD COUNTY.
- PARALLEL PARKING SPACES SHALL BE STRIPED AS 8'X22'. SEE DETAIL ON SHEET 11
- ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE POST (14 GAUGE) INSERTED INTO A 2-1/2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE SLEEVE (12 GAUGE) - 3' LONG. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.
- FOR PROFILES OF PUBLIC/PRIVATE WATER AND SEWER MAINS, SEE CONTRACT 14-4581-D.



PURPOSE STATEMENT: THE PURPOSE OF THIS PROJECT IS TO REVISE THE ORIGINAL SDP 08-109 (APPROVED 10-2009) BY INCREASING THE PROPOSED ORIGINAL RESIDENTIAL DENSITY AND DECREASING THE ORIGINAL COMMERCIAL DENSITY OF THE SITE, WHILE DECREASING THE AMOUNT OF OVERALL IMPERVIOUS AS WELL AS INCLUDING ADDITIONAL SWM FEATURES.

PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 14920 Exp. Date: 5-12-16

7-25-2014 Date

JOHN R. HEINRICHS
Professional Engr. No. 14920

7-2014	△	CHANGED APARTMENTS TO TOWNHOUSE APARTMENTS
Date	No	Revision Description
APPROVED: DEPARTMENT OF PLANNING AND ZONING		
CHIEF, DEVELOPMENT ENGINEERING DIVISION <i>J.R.</i> 8/6/14		
CHIEF, DIVISION OF LAND DEVELOPMENT <i>W. St. Lawrence</i> 8/20/14		
DIRECTOR <i>Paul A. Uggler</i> 8/27/14		
DEVELOPER: NKC PROPERTIES, LLC 12183 TRIDELPHIA ROAD ELLICOTT CITY, MD 21042 410-796-7876		
OWNER: THOMAS PALACOROLLA 12183 TRIDELPHIA ROAD ELLICOTT CITY, MD 21042 410-796-7876		
PROJECT: RIVERWATCH BUILDABLE PARCELS 'A' & 'B' A RESUBDIVISION OF SHINNAMON SUBDIVISION LOTS 1 THRU 7 AND PARCELS 420, 421, 422, 623, 624, 625 AND 626 ELK RIDGE, MD 21046 HOWARD COUNTY, MARYLAND		
PREPARED BY: PHOENIX ENGINEERING, INC. CONSULTING ENGINEERS 1420 JOH AVENUE, SUITE A BALTIMORE, MARYLAND 21227 (410) 247-8833 FAX 247-9397		
PROJECT LOCATION: RIVERWATCH GRID: 4 TAX MAP 38 PARCELS: 420, 421, 422, 623, 624, 625, 626 CENSUS TRACT 6012.01 1 ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND		
TITLE: REVISED SITE DEVELOPMENT PLAN		
Des By: J.R.H.	Scale: 1"=30'	Proj No: 07-041
Drn By: S.E.W.	Date: JULY, 2014	Drawing: ps04Furnace.dwg
Chk By: J.R.H.	SDP 08-109	5 OF 22



BUILDING D FRONT ELEVATION

SCALE: 1/8"=1'



BUILDING A, B, C & E FRONT ELEVATION

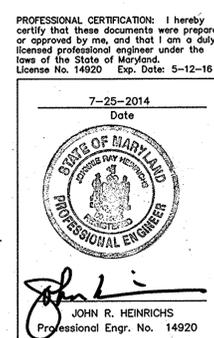
SCALE: 1/8"=1'



BUILDING F FRONT ELEVATION

SCALE: 1/8"=1'

7-2014	7-2014	CHANGED APARTMENTS TO TOWNHOUSE APARTMENTS
Date	No	Revision Description
APPROVED: DEPARTMENT OF PLANNING AND ZONING		
CHIEF, DEVELOPMENT ENGINEERING DIVISION		8/6/14
CHIEF, DIVISION OF LAND DEVELOPMENT		8/27/14
DIRECTOR		8/27/14
DEVELOPER:		
NKC PROPERTIES, LLC 12183 TRIDELPHIA ROAD ELLCOTT CITY, MD 21042 410-796-7876		
OWNER:		
THOMAS PALACOROLLA 12183 TRIDELPHIA ROAD ELLCOTT CITY, MD 21042 410-796-7876		
PROJECT:		
RIVERWATCH BUILDABLE PARCELS 'A' & 'B' A RESUBDIVISION OF SHINNAMON SUBDIVISION LOTS 1 THRU 7 AND PARCELS 420, 421, 422, 620, 623, 624 AND 625 ELKRIDGE, MD 21046 HOWARD COUNTY, MARYLAND		
PREPARED BY:		
PHOENIX ENGINEERING, INC. CONSULTING ENGINEERS 1420 JOH AVENUE, SUITE A BALTIMORE, MARYLAND 21227 (410) 247-8833 FAX 247-9397		
PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 14920 Exp. Date: 5-12-16		
7-25-2014 Date		
PROJECT LOCATION:		
RIVERWATCH TAX MAP 38 GRID: 4 PARCELS: 420, 421, 422, 623, 624, 625, 620 CENSUS TRACT 6012.01 1 ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND		
TITLE:		
ELEVATIONS		
Des By:	J.R.H.	Scale: AS SHOWN
Drn By:	S.E.W.	Date: JULY, 2014
Chk By:	J.R.H.	SDP 08-109
Proj No:	07-041	Drawing: ps04Furnace.dwg
		5-A OF 22





BUILDING I FRONT ELEVATION
SCALE: 1/8"=1'



BUILDING H FRONT ELEVATION
SCALE: 1/8"=1'

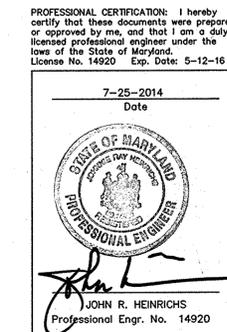


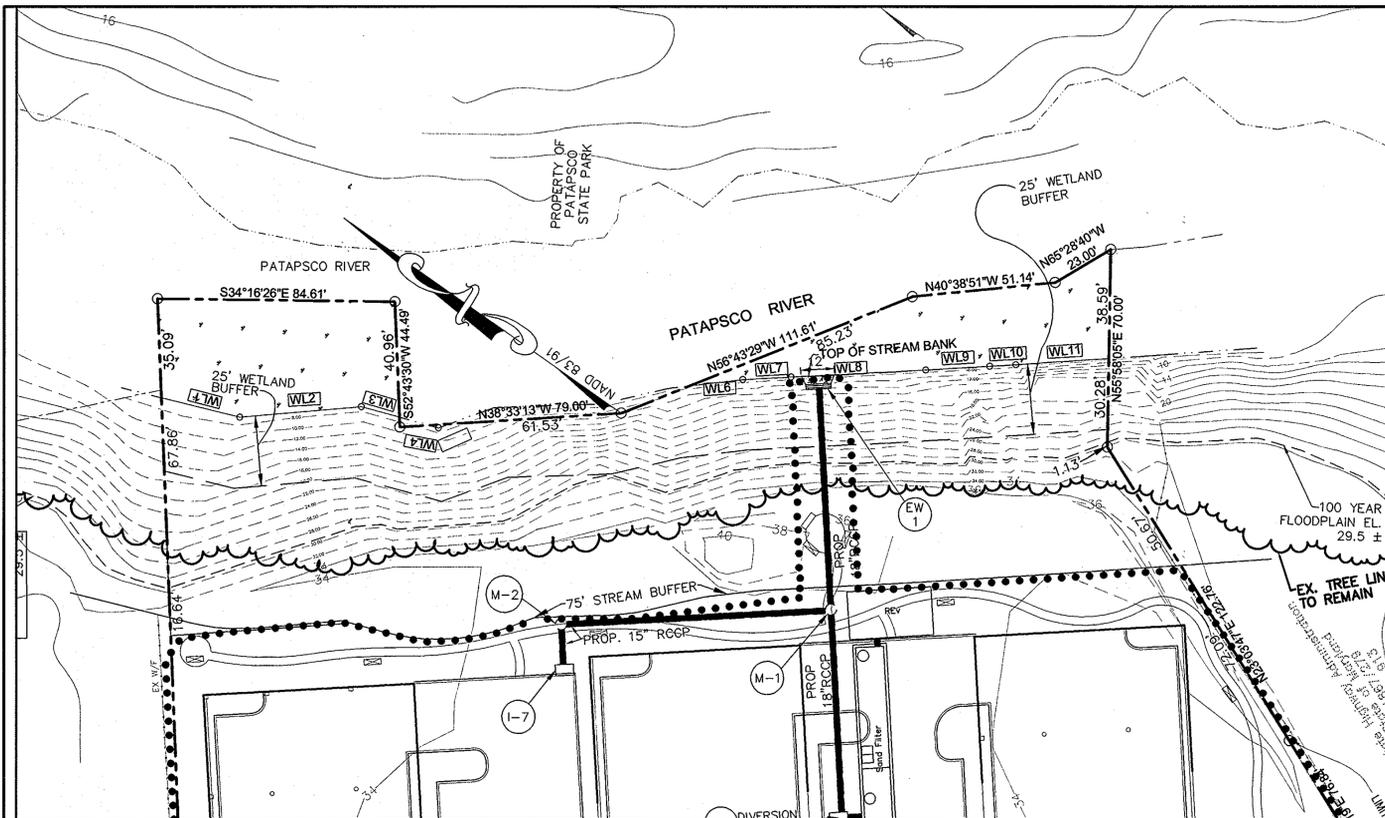
BUILDING J FRONT ELEVATION
SCALE: 1/8"=1'



BUILDING G FRONT ELEVATION
SCALE: 1/8"=1'

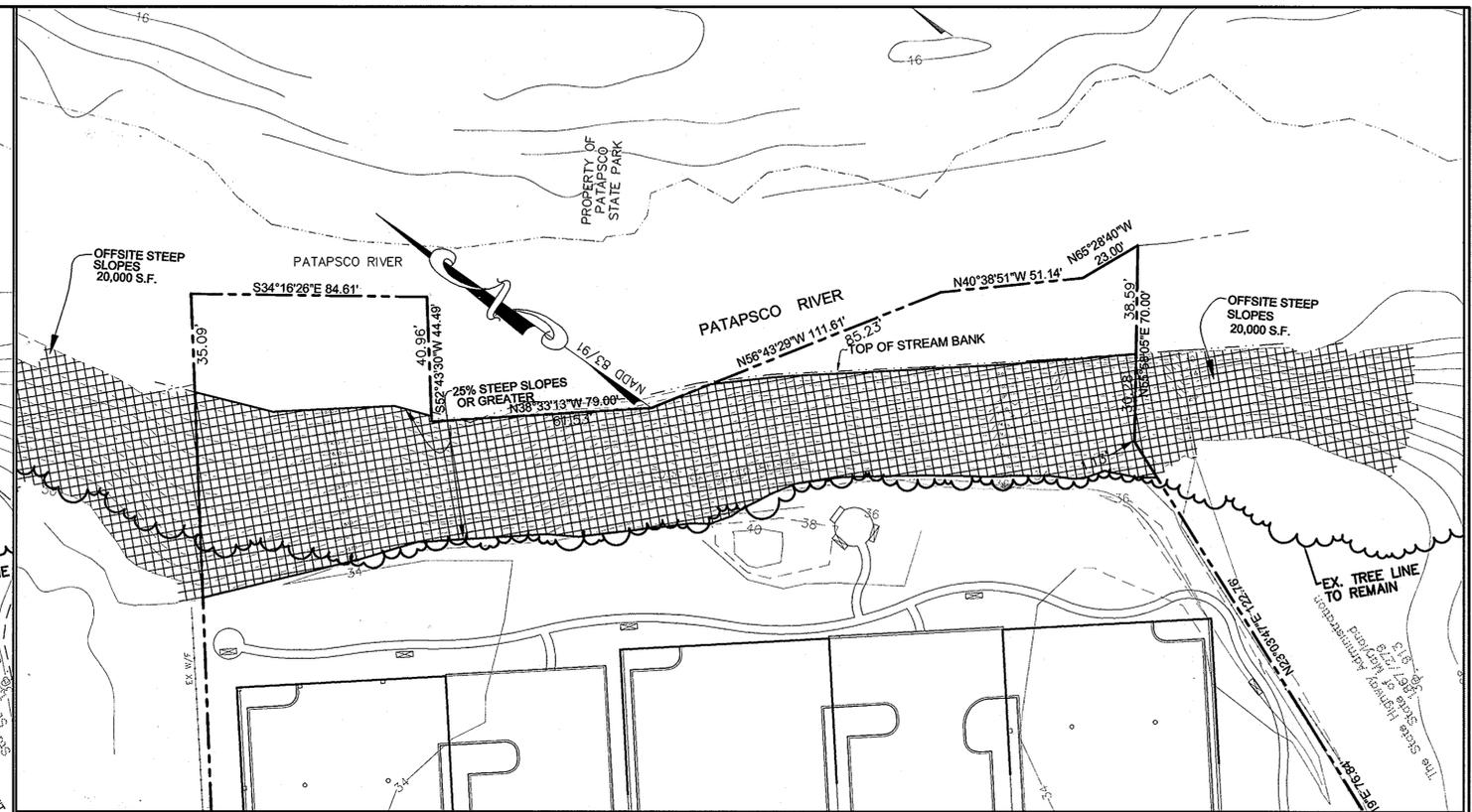
7-2014	CHANGED APARTMENTS TO TOWNHOUSE APARTMENTS	
Date	No Revision Description	
APPROVED: DEPARTMENT OF PLANNING AND ZONING		
CHIEF, DEVELOPMENT ENGINEERING DIVISION	J.P. 8/6/14	
CHIEF, DIVISION OF LAND DEVELOPMENT	8/27/14	
DIRECTOR	8/27/14	
DEVELOPER: NKC PROPERTIES, LLC 12183 TRIDELPHIA ROAD ELLCOTT CITY, MD 21042 410-796-7876		
OWNER: THOMAS PALACOROLLA 12183 TRIDELPHIA ROAD ELLCOTT CITY, MD 21042 410-796-7876		
PROJECT: RIVERWATCH BUILDABLE PARCELS 'A' & 'B' A RESUBDIVISION OF SHINNAMON SUBDIVISION LOTS 1 THRU 7 AND PARCELS 420, 421, 422, 620, 623, 624 AND 625 ELKRIDGE, MD 21046 HOWARD COUNTY, MARYLAND		
PREPARED BY: PHOENIX ENGINEERING, INC. CONSULTING ENGINEERS 1420 30th AVENUE, SUITE A BALTIMORE, MARYLAND 21227 (410) 247-8833 FAX 247-9397		
PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 14920 Exp. Date: 5-12-16		
7-25-2014	Date	
PROJECT LOCATION: RIVERWATCH TAX MAP 38 GRID: 4 PARCELS: 420, 421, 422, 623, 624, 625, 620 CENSUS TRACT 6012.01 1 ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND		
TITLE: ELEVATIONS		
Des By: J.R.H.	Scale: AS SHOWN	Proj No: 07-041
Drn By: S.E.W.	Date: JULY, 2014	Drawing: ps04Furnace.dwg
Chk By: J.R.H.	SDP 08-109	5-B OF 22





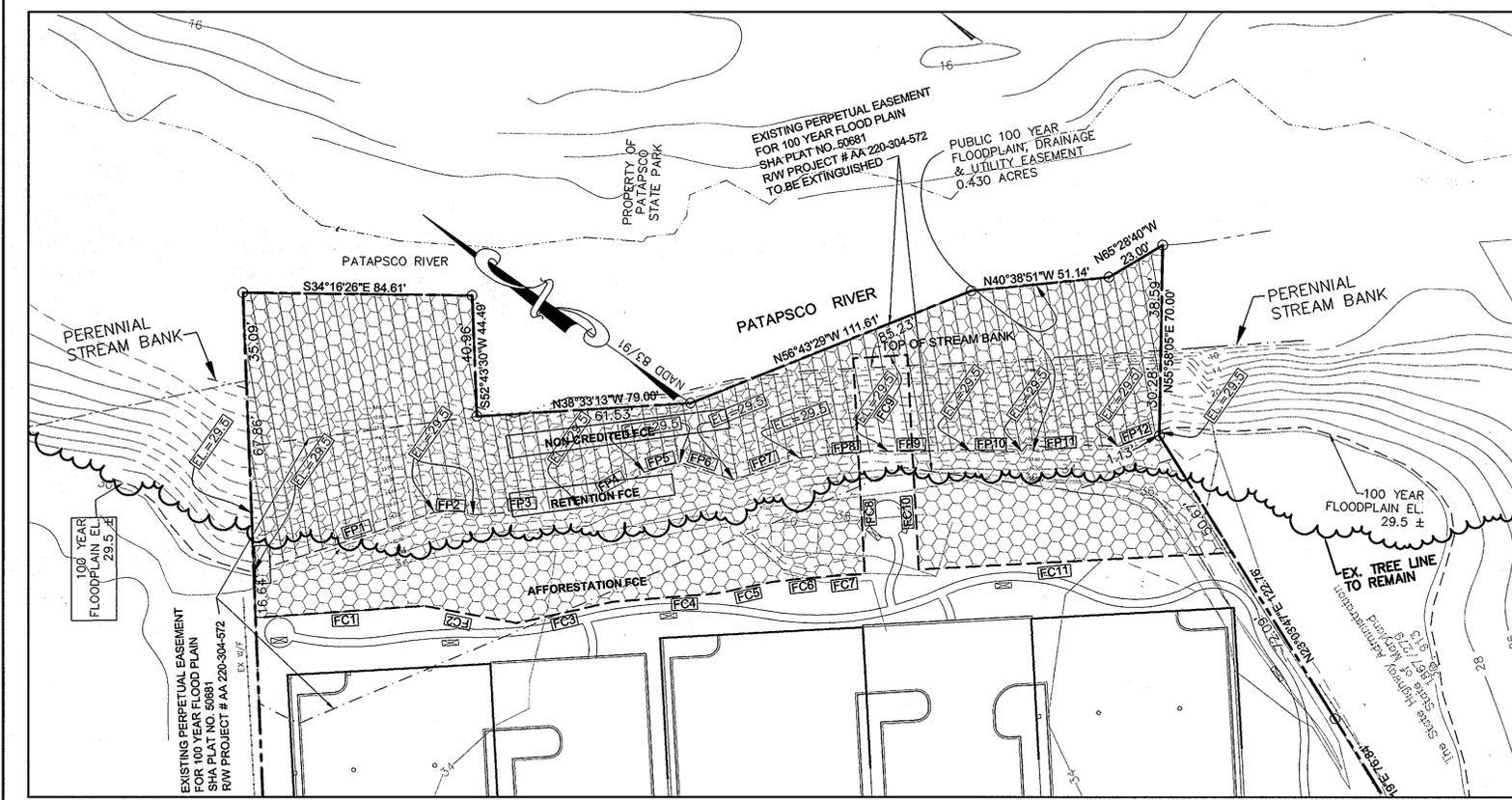
WETLANDS AND WETLANDS BUFFER

SCALE: 1"=30'



PLAN OF 15 TO 24.9% STEEP SLOPES AND 25% STEEP SLOPES OR GREATER

SCALE: 1"=30'



FOREST CONSERVATION EASEMENT AND FLOODPLAIN EASEMENT

SCALE: 1"=30'

LINE TABLE FOR FLOODPLAIN ESM'T.

LINE	BEARING	DISTANCE
FP1	S33°45'25"E	10.40'
FP2	S52°39'16"E	30.16'
FP3	S35°07'41"E	32.95'
FP4	S38°23'20"E	49.95'
FP5	S65°02'39"E	17.10'
FP6	S45°01'47"E	25.88'
FP7	S27°13'34"E	24.91'
FP8	S48°32'46"E	27.06'
FP9	S33°15'40"E	46.24'
FP10	S21°48'59"E	9.64'
FP11	S38°04'54"E	51.32'
FP12	S51°11'01"E	14.43'

LINE TABLE FOR FOREST CONSERVATION EASEMENT

LINE	BEARING	DISTANCE
FC1	S38°58'14"E	62.38'
FC2	S24°29'31"E	34.79'
FC3	S47°27'54"E	38.38'
FC4	S39°30'58"E	38.45'
FC5	S48°58'24"E	21.03'
FC6	S40°28'11"E	22.59'
FC7	S38°10'31"E	11.53'
FC8	N51°55'46"E	79.45'
FC9	S38°53'38"E	29.00'
FC10	S51°55'45"W	78.99'
FC11	S38°03'18"E	115.67'

LINE TABLE FOR WETLANDS

LINE	BEARING	DISTANCE
WL1	N20°59'56"W	28.77'
WL2	N39°56'01"W	43.52'
WL3	N19°40'55"W	14.06'
WL4	N19°40'55"W	3.46'
WL5	N65°04'29"W	3.94'
WL6	S41°37'52"E	18.85'
WL7	S37°49'50"E	17.28'
WL8	S37°58'27"E	48.03'
WL9	S38°22'04"E	22.90'
WL10	S38°22'04"E	9.27'
WL11	S38°53'13"E	33.24'

LEGEND

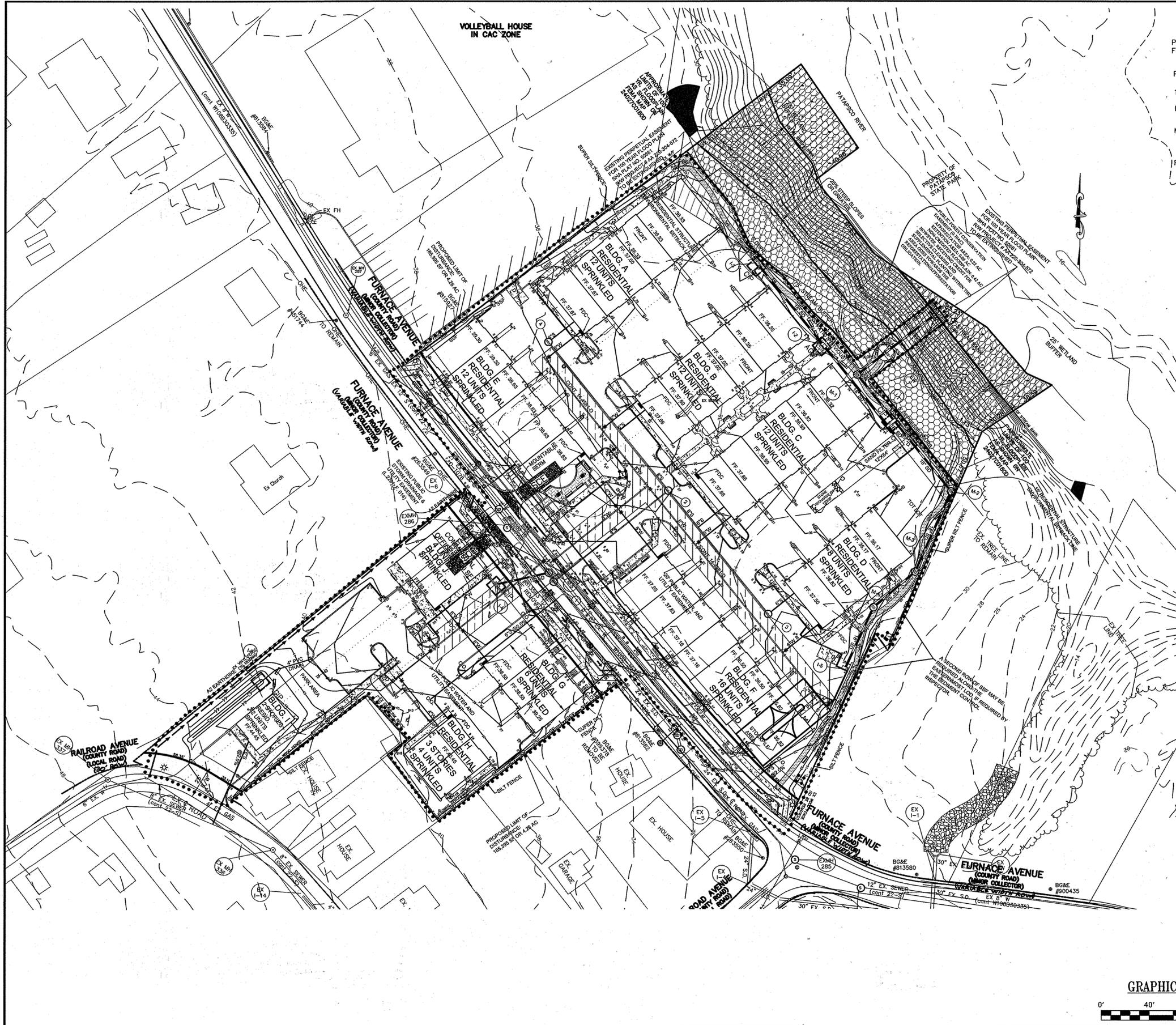
- 100 YR. FLOODPLAIN EASEMENT
- 25% OR GREATER STEEP SLOPES 15,463 S.F. ON SITE AND GREATER THAN 20,000 S.F. OF SITE
- FOREST CONSERVATION EASEMENT
- WETLAND EASEMENT
- EXISTING TREE LINE TO REMAIN
- 15% TO 24.9% STEEP SLOPES 0 S.F. ON SITE AND 770 S.F. OFF SITE

Date	No	Revision	Description
			APPROVED: FOR PUBLIC WATER AND PUBLIC SEWERAGE SYSTEMS
<p>COUNTY HEALTH OFFICER HOWARD COUNTY HEALTH DEPARTMENT</p> <p>APPROVED: DEPARTMENT OF PLANNING AND ZONING CHIEF, DEVELOPMENT ENGINEERING DIVISION <i>[Signature]</i> 9/17/09</p> <p><i>[Signature]</i> 10/29/09 CHIEF, DIVISION OF LAND DEVELOPMENT</p> <p><i>[Signature]</i> 10/29/09 DIRECTOR</p>			
DEVELOPER:			
<p>NKC PROPERTIES, LLC 12183 TRIDELPHIA ROAD ELLCOTT CITY, MD 21042 410-796-7676</p>			
OWNER:			
<p>THOMAS PALACOROLLA 12183 TRIDELPHIA ROAD ELLCOTT CITY, MD 21042 410-796-7676</p>			
PROJECT:			
<p>RIVERWATCH BUILDABLE PARCELS 'A' & 'B' A RESUBDIVISION OF SHINNAMON SUBDIVISION LOTS 1 THRU 7 AND PARCELS 420, 421, 422, 620, 623, 624 AND 625 ELKRIDGE, MD 21046 HOWARD COUNTY, MARYLAND</p>			
PREPARED BY:			
<p><i>[Signature]</i> PHOENIX ENGINEERING, INC. CONSULTING ENGINEERS 1420 JOH AVENUE, SUITE A BALTIMORE, MARYLAND 21227 (410) 247-8833 FAX 247-9397</p>			
PROJECT LOCATION:			
<p>RIVERWATCH TAX MAP 38 GRID: 4 PARCELS: 420, 421, 422, 623, 624, 625, 620 CENSUS TRACT 6012.01 1 ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND</p>			
TITLE:			
<p>EASEMENT PLAN</p>			
Des By:	J.R.H.	Scale:	1"=30'
Des By:	S.E.W.	Date:	DECEMBER, 2008
Des By:	J.R.H.	SDP	08-109
Proj No:	07-041	Drawing:	esmt01.dwg
Sheet:	6	Of:	22

PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 14920 Exp. Date: 5-12-10

5-14-09
Date

[Signature]
JOHN R. HEINRICHS
Professional Engr. No. 14920



LEGEND

- PROPOSED PUBLIC FOREST CONSERVATION: [Hatched pattern]
- PROPOSED SIDEWALK: [Dotted pattern]
- 100 YR. FLOODPLAIN: [Diagonal hatching]
- PROPOSED CONTOUR: [Solid line]
- MACADAM PATH: [Cross-hatched pattern]
- PERVIOUS PAVERS: [Grid pattern]
- LIMIT OF DISTURBANCE: [Dashed line]
- SILT FENCE: [Line with 'SF' markers]
- SUPER SILT FENCE: [Line with 'SSF' markers]
- INLET PROTECTION: [Structure symbol]
- HEAVY DUTY STABILIZED CONSTRUCTION ENTRANCE W/MOUNTABLE BERM: [Structure symbol]
- 15-24.9% STEEP SLOPES: [Solid black area]
- 25% SLOPES OR GREATER: [Cross-hatched area]

THE PROPOSED LOD RUNS ALONG THE PROPERTY LINES AND NOT INTO NEIGHBORING PROPERTIES. THE LOD LINE IS SHOWN AWAY FROM THE PROPERTY LINE FOR GRAPHIC CLARITY AND DISPLAY PURPOSES ONLY.

Date	No	Revision Description
7-2014	1	CHANGED APARTMENTS TO TOWNHOUSE APARTMENTS

ENGINEER'S CERTIFICATE
 I/WE CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD COUNTY SOIL CONSERVATION DISTRICT.
 John R. Heinrichs, P.E. #14920 7/25/14
 PHOENIX ENGINEERING, INC.

DEVELOPER'S CERTIFICATE
 I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT.
 Thomas Palacorolla 7-25-14
 DEVELOPER: THOMAS PALACOROLLA

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
 John K. Klatt 7/31/14
 HOWARD S.C.D.

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 Chief, Development Engineering Division J.P. 8/6/14
 Chief, Division of Land Development R.W. 9/27/14
 Director J. 7/27/14

DEVELOPER:
 NKC PROPERTIES, LLC
 12183 TRIADDELPHIA ROAD
 ELLICOTT CITY, MD 21042
 410-796-7676

OWNER:
 THOMAS PALACOROLLA
 12183 TRIADDELPHIA ROAD
 ELLICOTT CITY, MD 21042
 410-796-7676

PROJECT:
 RIVERWATCH
 BUILDABLE PARCELS 'A' & 'B'
 A RESUBDIVISION OF SHINNAMON
 SUBDIVISION LOTS 1 THRU 7 AND PARCELS
 420, 421, 422, 620, 623, 624 AND 625
 ELKRIDGE, MD 21046
 HOWARD COUNTY, MARYLAND

PREPARED BY:
 PHOENIX ENGINEERING, INC.
 CONSULTING ENGINEERS
 1420 JOH AVENUE, SUITE A
 BALTIMORE, MARYLAND 21227
 (410) 247-8833 FAX 247-8397

AREA: ELKRIDGE
 PARCELS: 420, 421, 422, 623, 624, 625, 620
 CENSUS TRACT 8012.01 TAX MAP: 38 GRID 4
 1ST ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND

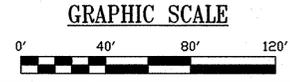
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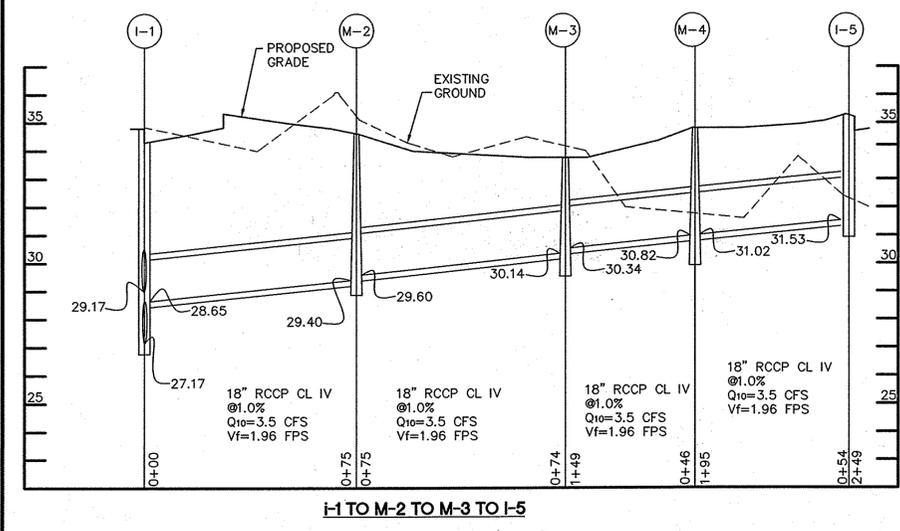
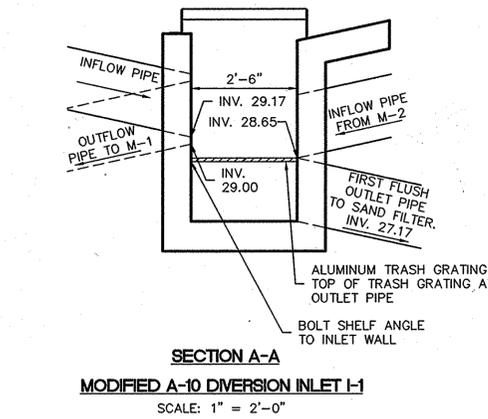
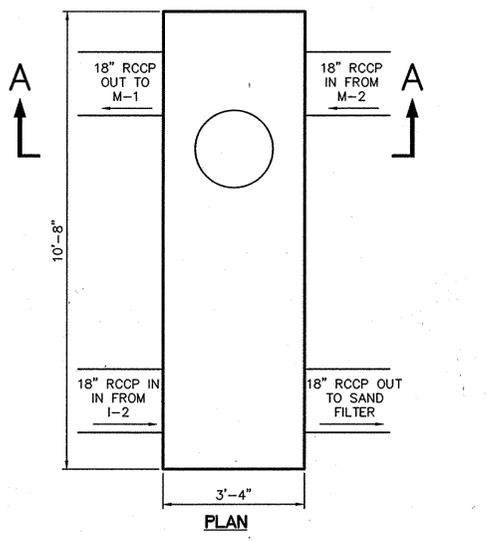
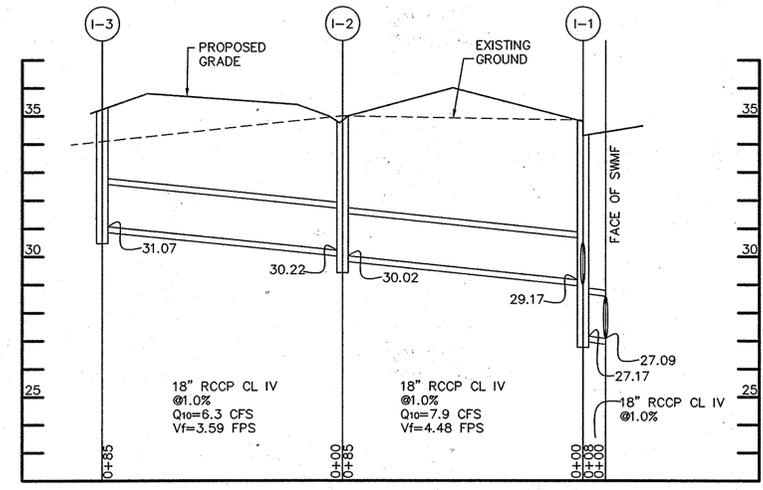
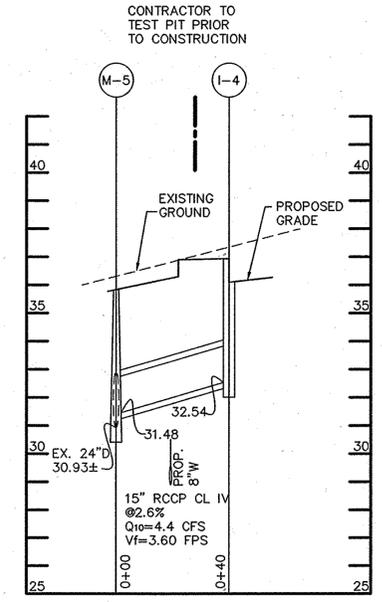
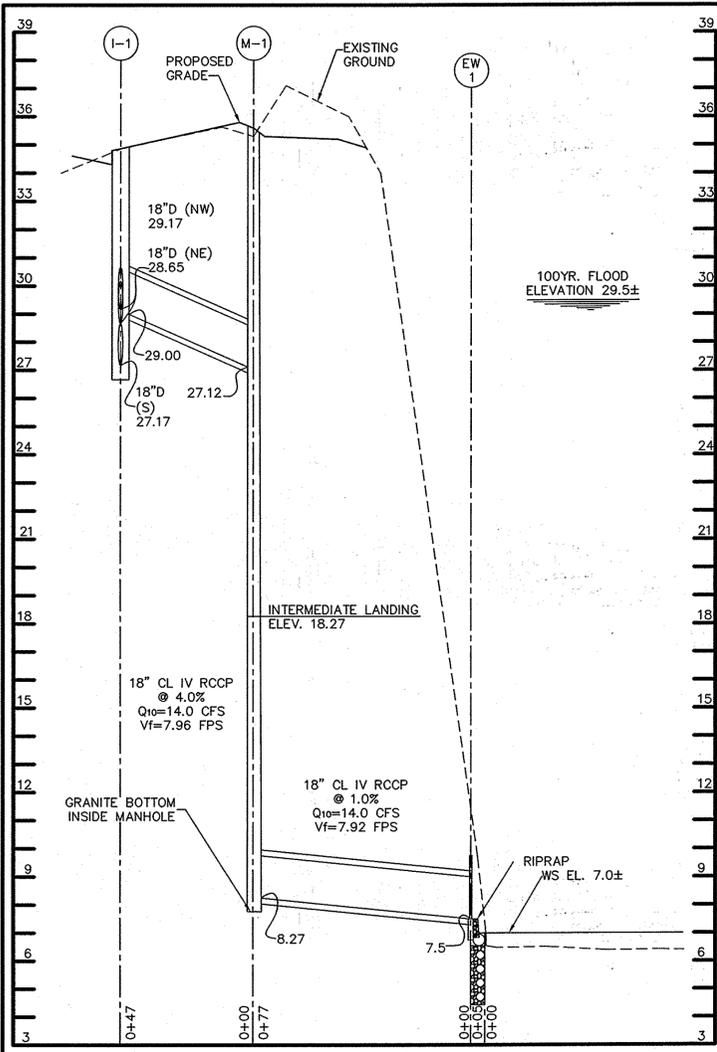
Des By: R.J.W.	Scale: 1"=40'	Proj No: 07-041
Drn By: S.E.W.	Date: JULY, 2014	Drawing: ES01.dwg
chk By: J.R.H.	SDP: 08-109	7 OF 22

PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 14920 Exp. Date: 5-12-16

7-25-2014
Date

John R. Heinrichs
Professional Engr. No. 14920





Date	No	Revision Description
7-2014		CHANGED APARTMENTS TO TOWNHOUSE APARTMENTS

ENGINEER'S CERTIFICATE
I, JOHN R. HEINRICHS, P.E. #14920, PHOENIX ENGINEERING, INC., CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD COUNTY SOIL CONSERVATION DISTRICT.

7/25/14
DATE

DEVELOPER'S CERTIFICATE
I, THOMAS PALACOROLLA, CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD COUNTY SOIL CONSERVATION DISTRICT.

7-25-14
DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DEVELOPMENT ENGINEERING DIVISION 8/6/14
CHIEF, DIVISION OF LAND DEVELOPMENT 8/27/14
DIRECTOR 8/27/14

DEVELOPER: NKC PROPERTIES, LLC
12183 TRIADDELPHIA ROAD
ELICOTT CITY, MD 21042
410-796-7676

OWNER: THOMAS PALACOROLLA
12183 TRIADDELPHIA ROAD
ELICOTT CITY, MD 21042
410-796-7676

PROJECT: RIVERWATCH
BUILDABLE PARCELS 'A' & 'B'
A RESUBDIVISION OF SHINNAMON
SUBDIVISION LOTS 1 THRU 7 AND PARCELS
420, 421, 422, 620, 623, 624 AND 625
ELKRIDGE, MD 21046
HOWARD COUNTY, MARYLAND

PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 14920 Exp. Date: 5-12-16

7-25-2014
Date

STATE OF MARYLAND
PROFESSIONAL ENGINEER

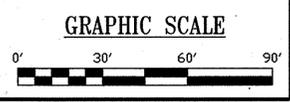
7-25-2014
Date

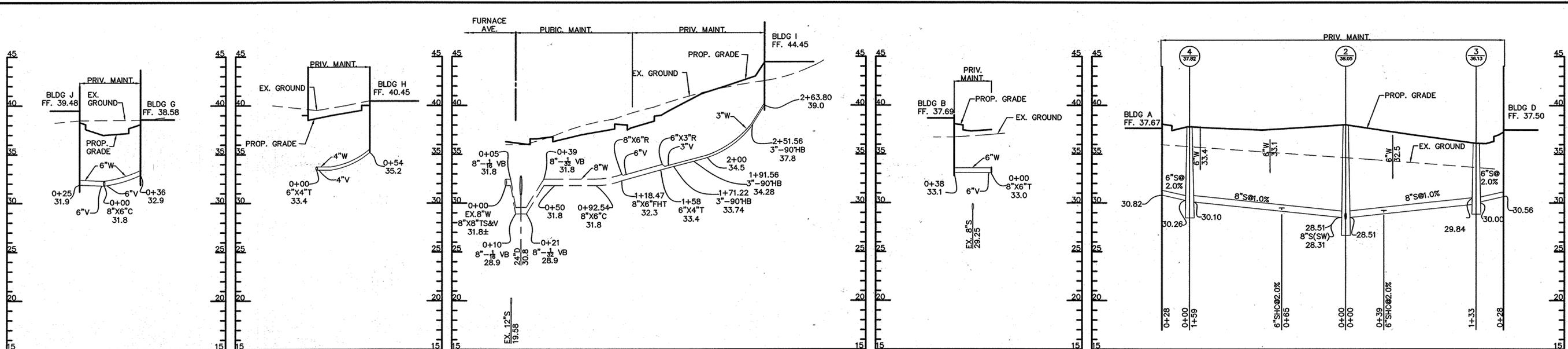
JOHN R. HEINRICHS
Professional Engr. No. 14920

PROJECT LOCATION: RIVERWATCH
TAX MAP 38 PARCELS: 420, 421, 422, 623, 624, 625, 620
GRID: 4
CENSUS TRACT 6012.01
1 ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: PROPOSED STORM DRAIN PROFILES & DETAILS

Prepared By: K.M.W. Scale: H:1"=30' V:1"=3'
Date: JULY, 2014
Project No: 07-041
Drawing: pp01 Furnace
8 OF 22





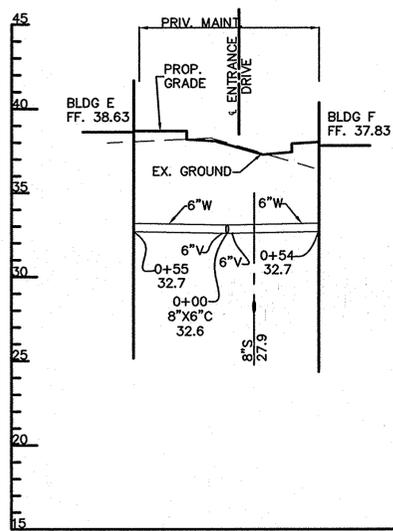
6" WHC @ BLDGS G&H

4" WHC @ BLDG H

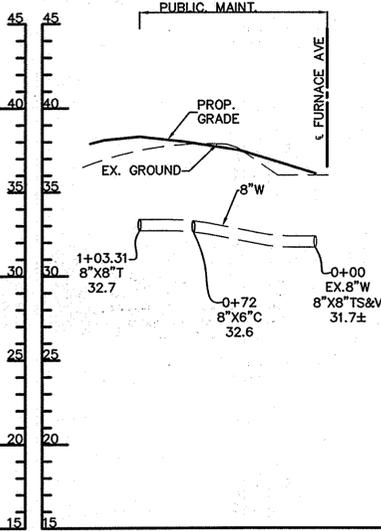
WHC @ BLDG I

6" WHC @ BLDG B

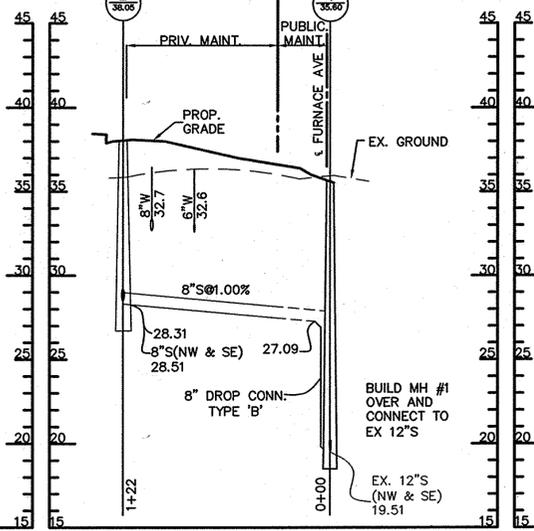
8" SEWER @ BLDGS A&D



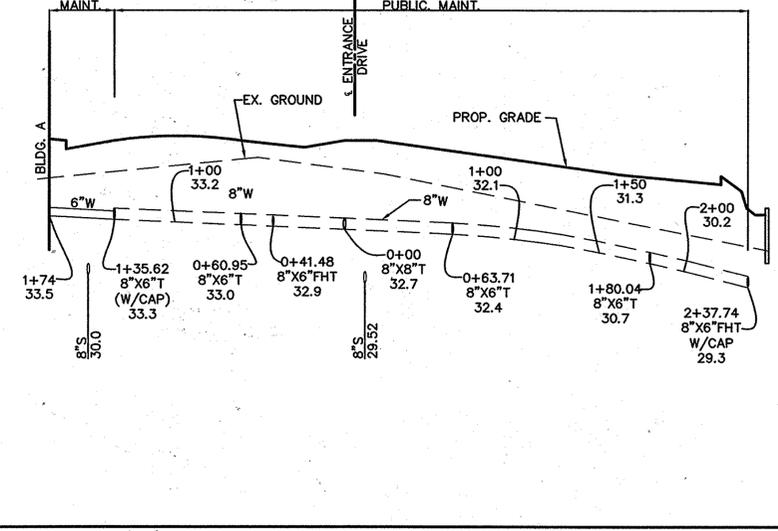
6" WHC @ BLDGS E&F



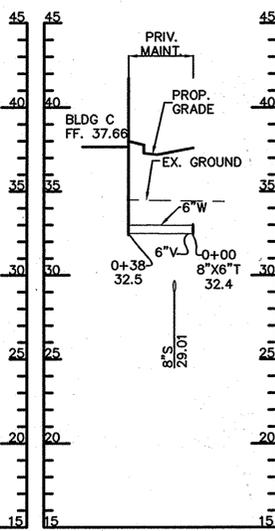
8" W IN FURNACE AVENUE



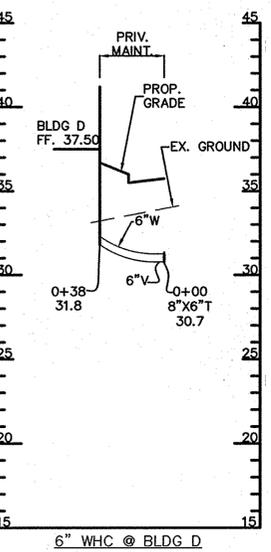
8" SEWER IN FURNACE AVENUE



8" WATER @ BLDGS A,B,C,&D



6" WHC @ BLDG C



6" WHC @ BLDG D

ALL PIPELINES SHALL HAVE SHALL 'C' TRENCH BEDDING UNLESS OTHERWISE NOTED ON PLANS

Date	No	Revision Description
7-2014	1	CHANGED APARTMENTS TO TOWNHOUSE APARTMENTS

ENGINEER'S CERTIFICATE

I/WE CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD COUNTY SOIL CONSERVATION DISTRICT.

John R. Heinrichs, P.E. #14920
PHOENIX ENGINEERING, INC. DATE: 7/25/14

DEVELOPER'S CERTIFICATE

I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE-INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT.

Thomas Palacorolla 7-25-14
DEVELOPER: THOMAS PALACOROLLA DATE:

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division J.P. 8/6/14
Chief, Division of Land Development W.W. 8/27/14
Director David L. Long, Jr. 8/27/14

DEVELOPER: NKC PROPERTIES, LLC
12183 TRIADDELPHIA ROAD
ELLICOTT CITY, MD 21042
410-796-7676

OWNER: THOMAS PALACOROLLA
12183 TRIADDELPHIA ROAD
ELLICOTT CITY, MD 21042
410-796-7676

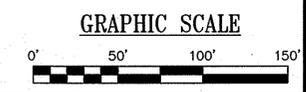
PROJECT: RIVERWATCH
BUILDABLE PARCELS 'A' & 'B'
A RESUBDIVISION OF SHINNAMON
SUBDIVISION LOTS 1 THRU 7 AND
PARCELS 420, 421, 422, 620, 623,
624 AND 625
ELKBRIDGE, MD 21046
HOWARD COUNTY, MARYLAND

PREPARED BY:
PHOENIX ENGINEERING, INC.
CONSULTING ENGINEERS
1420 JOH AVENUE, SUITE A
BALTIMORE, MARYLAND 21227
(410) 247-8633 FAX 247-9397

PROJECT LOCATION: RIVERWATCH
TAX MAP 38 GRID: 4
PARCELS: 420, 421, 422, 623, 624, 625, 620
CENSUS TRACT 6012.01
1 ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: PROPOSED WATER AND SEWER PROFILES

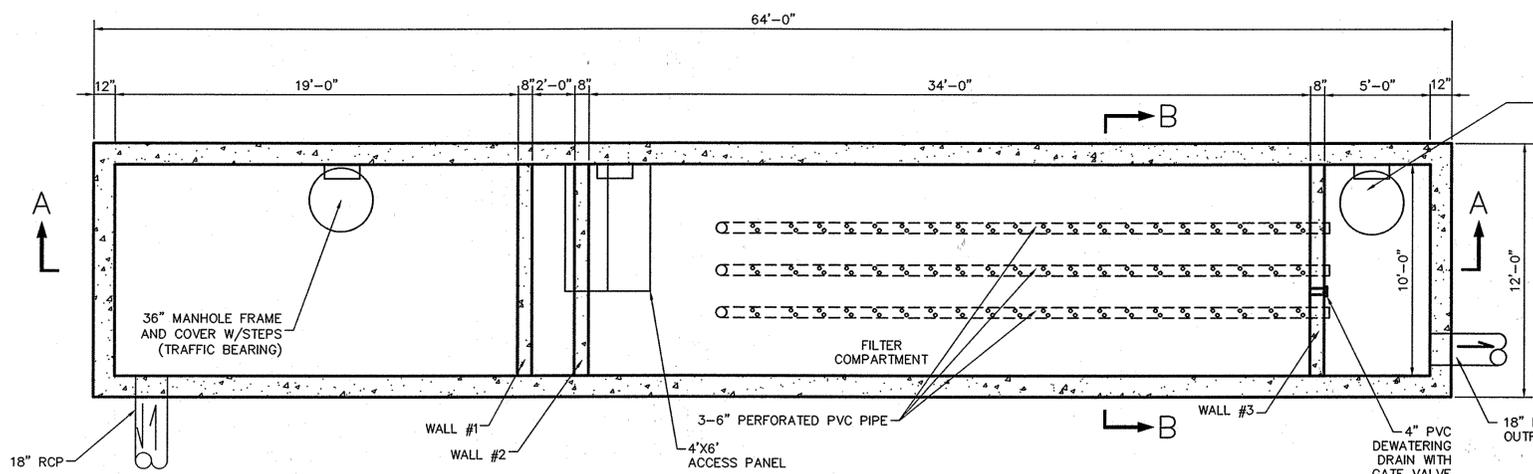
Des By: R.J.W. Scale: H:1=50' Proj No: 07-041
Dn By: S.E.P. Date: JULY, 2014 Drawing: pp01 Furnace
Chk By: J.R.H. SDP 08-109 8-A OF 22



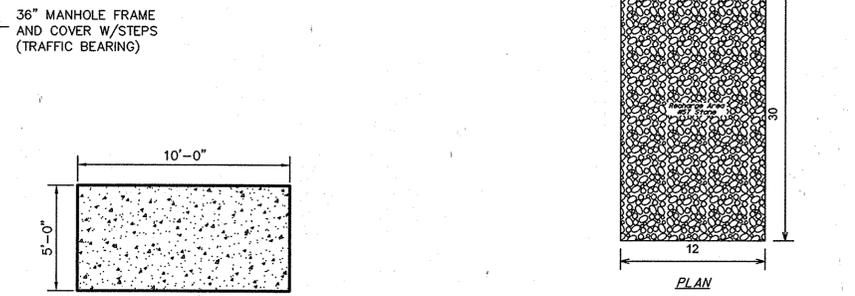
PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 14920 Exp. Date: 5-12-16

7-25-2014
Date

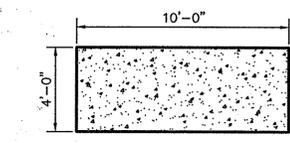
JOHN R. HEINRICHS
Professional Engr. No. 14920



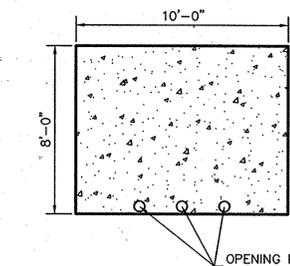
PLAN



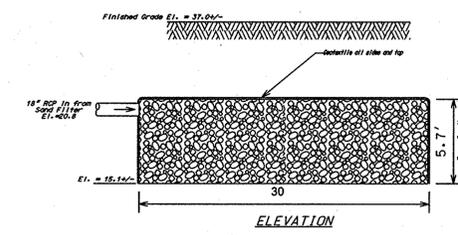
WALL #1



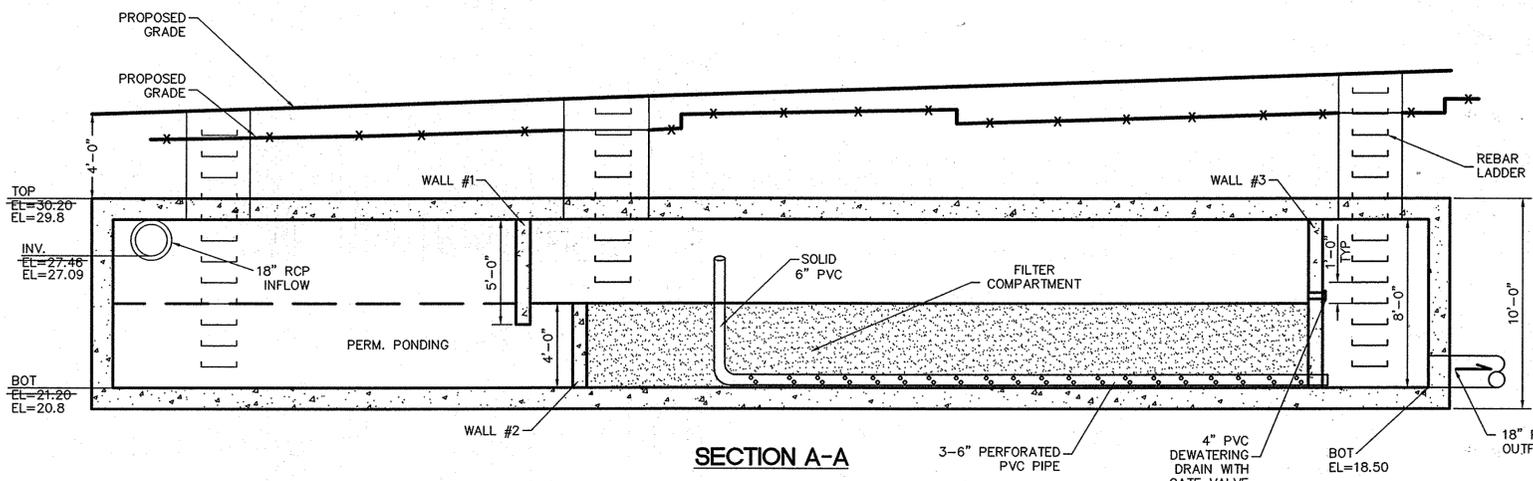
WALL #2



WALL #3



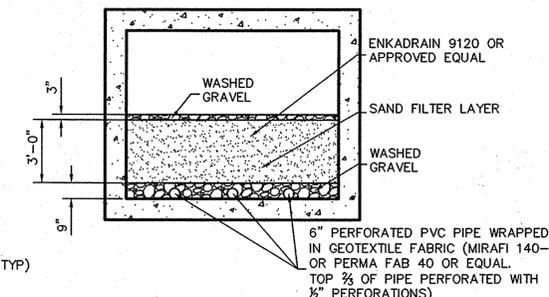
Recharge Volume Detail
NOT TO SCALE



SECTION A-A

STORMWATER MANAGEMENT QUALITY STRUCTURE

SCALE: 1/4" = 1'-0"



SECTION B-B

NOTES:

1. THIS ITEM SHALL BE CAST IN PLACE. REFER TO STRUCTURAL PLANS FOR SAND FILTER STRUCTURAL DESIGN. WALL AND SLAB THICKNESS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL PLANS.
2. SEE SITE PLAN AND PLUMBING PLANS FOR INFLOW AND OUTFLOW ORIENTATION.
3. CONTRACTOR SHALL COORDINATE LOCATIONS OF MANHOLE OPENINGS WITH ARCHITECTURAL, STRUCTURAL AND M.E.P. PLANS TO ENSURE NO CONFLICTS EXIST.
4. SEE STRUCTURAL/ARCHITECTURAL PLANS FOR WALL THICKNESS, DIMENSIONS AND REINFORCEMENT.

MAINTENANCE REQUIREMENTS

THE SFWQ STRUCTURE IS DESIGNED TO MINIMIZE MAINTENANCE. HOWEVER IT IS SUBJECT TO CLOGGING BY SEDIMENT, OIL, GREASE, GRIT AND OTHER DEBRIS. ACTUAL PERFORMANCE AND SERVICE LIFE OF THE STRUCTURE IS NOT AVAILABLE AT THIS TIME. NEVERTHELESS IT IS STILL VERY IMPORTANT TO PROVIDE A GENERAL STANDARD MAINTENANCE GUIDELINES IN ORDER TO MAINTAIN ADEQUATE STRUCTURE OPERATION.

THE MAINTENANCE OF THE SYSTEM INCLUDES:

THE WATER LEVEL IN THE FILTER CHAMBER SHOULD BE MONITORED BY THE OWNER ON A QUARTERLY BASIS AND AFTER EVERY LARGE STORM FOR THE FIRST YEAR AFTER COMPLETION OF CONSTRUCTION. A LOG OF THE RESULTS SHOULD BE MAINTAINED, INDICATING THE RATE OF DEWATERING AFTER EACH STORM AND THE WATER DEPTH FOR EACH OBSERVATION. ONCE THE REGULATORY STORMWATER INSPECTOR INDICATES THAT SATISFACTORY PERFORMANCE OF THE STRUCTURE HAS BEEN DEMONSTRATED, THE MONITORING SCHEDULE MAY BE REDUCED TO AN ANNUAL BASIS.

AS WITH OTHER PRETREATMENT STRUCTURES, THE FIRST CHAMBER MUST BE PUMPED OUT SEMI-ANNUALLY. IF THE CHAMBER CONTAINS AN OIL SKIM, IT SHOULD BE REMOVED BY A FIRM SPECIALIZING IN OIL RECOVERY AND RECYCLING. THE REMAINING MATERIAL MAY THEN BE REMOVED BY A VACUUM PUMP TRUCK AND DISPOSED OF IN AN APPROVED LANDFILL. AFTER EACH CLEANING, REFILL THE FIRST CHAMBER TO A DEPTH OF THREE FEET WITH CLEAN WATER TO REESTABLISH THE WATER SEAL.

AFTER APPROXIMATELY THREE TO FIVE YEARS, THE UPPER LAYER OF THE FILTER CAN BE EXPECTED TO BECOME CLOGGED WITH FINE SILT. WHEN THE DRAW DOWN TIME FOR THE FILTER EXCEEDS 72 HOURS, THE UPPER LAYER OF GRAVEL, GEOTEXTILE FABRIC MUST BE REMOVED AND REPLACED WITH NEW, CLEAN MATERIALS CONFORMING TO THE GENERAL SPECIFICATIONS.

NOTES FOR STORMWATER MANAGEMENT QUALITY STRUCTURE

1. STRUCTURE WALLS SHALL BE REINFORCED CONCRETE.
2. ALL CONCRETE SHALL BE CLASS A3 WITH A MINIMUM 4000 psi AT 28 DAYS.
3. ALL BRICK SHALL MEET THE REQUIREMENTS OF ASTM DESIGNATION C-32-73 GRADE MS.
4. MORTAR SHALL CONFORM TO ASTM SPECIFICATION C-270 TYPE M OR S.
5. REINFORCING STEEL SHALL CONFORM TO ASTM A615 GRADE 60. ALL SPLICES SHALL BE LAPPED A MINIMUM OF 24 BAR DIAMETERS. MINIMUM COVER FOR ALL REINFORCING STEEL SHALL BE 2 INCHES.
6. PROVIDE WATERTIGHT CONNECTIONS BETWEEN PIPES AND STRUCTURE WALLS WITH NON-SHRINK GROUT.
7. THE STRUCTURE MAY BE EITHER CAST-IN-PLACE OR PRECAST. PRECAST STRUCTURES REQUIRE ADVANCE APPROVAL.

NOTE:

THIS ITEM MAY BE PRECAST OR CAST-IN-PLACE. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ALL SAND FILTER DESIGNS PREPARED AND SEALED BY A REGISTERED STRUCTURAL OR GEOTECHNICAL ENGINEER.

Date	No	Revision Description
7-2014		CHANGED APARTMENTS TO TOWNHOUSE APARTMENTS

ENGINEER'S CERTIFICATE

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John R. Heinrichs, P.E. #14920 7/25/14 DATE

DEVELOPER'S CERTIFICATE

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Thomas Palacorolla 7-25-14 DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION J.P. 8/6/14

CHIEF, DIVISION OF LAND DEVELOPMENT MW 8/27/14

DIRECTOR Frank A. Long 8/22/14

DEVELOPER:

NKC PROPERTIES, LLC
12183 TRIADAPLHIA ROAD
ELLCOTT CITY, MD 21042
410-796-7878

OWNER:

THOMAS PALACOROLLA
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PROJECT:

RIVERWATCH
BUILDABLE PARCELS 'A' & 'B'
A RESUBDIVISION OF SHINNAMON
SUBDIVISION LOTS 1 THRU 7 AND PARCELS
420, 421, 422, 623, 624 AND 625
ELKRIDGE, MD 21046
HOWARD COUNTY, MARYLAND

PREPARED BY:

PHOENIX ENGINEERING, INC.
CONSULTING ENGINEERS
1420 JOH AVENUE, SUITE A
BALTIMORE, MARYLAND 21227
(410) 247-8833 FAX 247-9397

PROJECT LOCATION:

TAX MAP 38 RIVERWATCH GRID: 4
PARCELS: 420, 421, 422, 623, 624, 625, 620
CENSUS TRACT 6012.01
1 ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE:

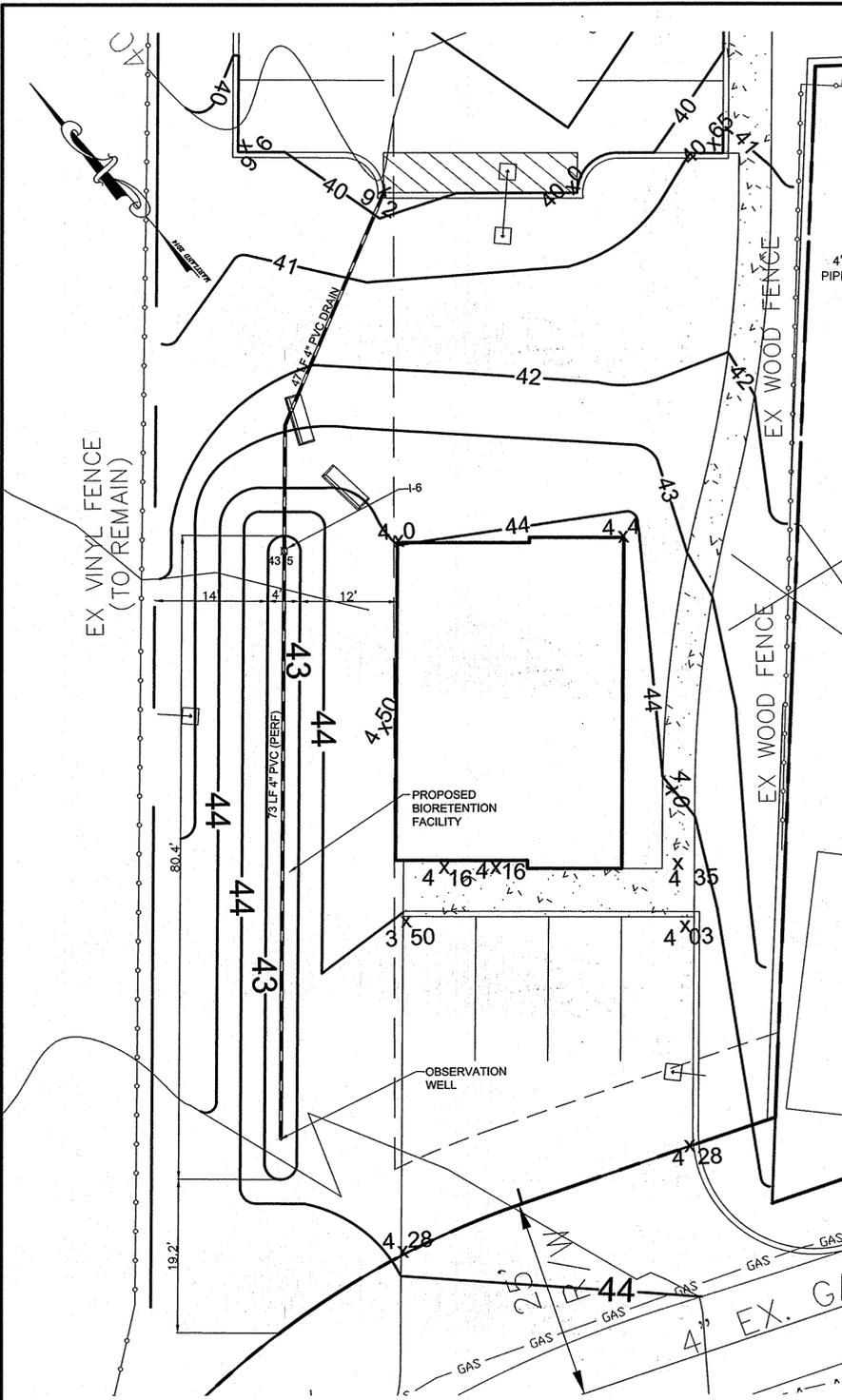
STORM WATER MANAGEMENT
PLAN & DETAILS

Des By: J.R.H.	Scale: AS SHOWN	Proj No: 07-041
Drn By: C.M.F.	Date: JULY, 2014	Drawing: sw01furnace
Chk By: J.R.H.	SDP 08-109	9 OF 22

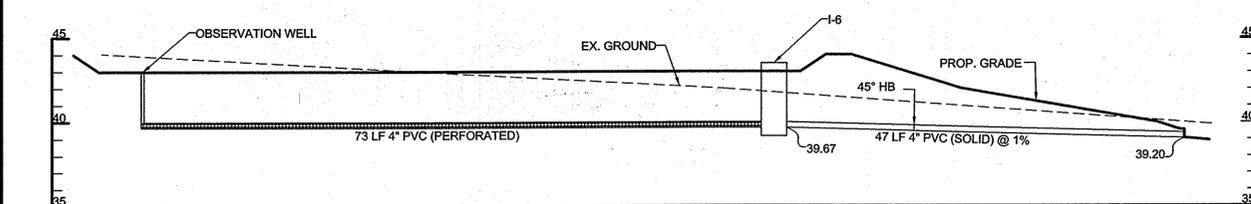
PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 14920 Exp. Date: 5-12-16

7-25-2014 Date

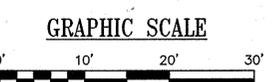
John R. Heinrichs
Professional Engr. No. 14920



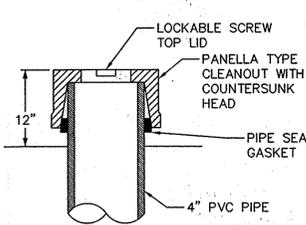
RAIN GARDEN PLAN
SCALE: 1"=10'



BIORETENTION SECTION
SCALE: 1/4"=1'-0"

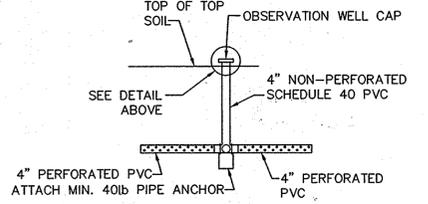


BIORETENTION DETAIL
NOT TO SCALE



SCREW TOP CAP
NOT TO SCALE

NOTE:
THE TUBE SHALL HAVE A FACTORY ATTACHED CAST IRON OR HIGH IMPACT PLASTIC COLLAR WITH RIBS TO PREVENT ROTATION WHEN REMOVING SCREW TOP LID. THE SCREW TOP LID SHALL BE CAST IRON OR HIGH IMPACT PLASTIC THAT WILL WITHSTAND ULTRA-VIOLET RAYS.



OBSERVATION WELL DETAIL
NOT TO SCALE

B.4.C Specifications for Micro-Bioretentation, Rain Gardens, Landscape Infiltration & Infiltration Basins

- Material Specifications**
The allowable materials to be used in these practices are detailed in Table B.4.1.
- Filtering Media or Planting Soil**
The soil shall be a uniform mix, free of stones, stumps, roots or other similar objects larger than two inches. No other materials or substances shall be mixed or dumped within the micro-bioretentation practices that may be harmful to plant growth, or prove a hindrance to the planting or maintenance operations. The planting soil shall be free of Bermuda grass, Quackgrass, Johnson grass, or other noxious weeds as specified under COMAR 15.08.01.05.
The planting soil shall be tested and shall meet the following criteria:
 - Soil Component - Loamy Sand or Sandy Loam (USDA Soil Textural Classification)
 - Organic Content - Minimum 10% by dry weight (ASTM D 2974). In general, this can be met with a mixture of loamy sand (60%-65%) and compost (35% to 40%) or sandy loam (30%), coarse sand (30%), and compost (40%).
 - Clay Content - Media shall have a clay content of less than 5%.
 - pH Range - Should be between 5.5 - 7.0. Amendments (e.g., lime, iron sulfate plus sulfur) may be mixed into the soil to increase or decrease pH.
 There shall be at least one soil test per project. Each test shall consist of both the standard soil test for pH, and additional tests of organic matter, and soluble salts. A textural analysis is required from the site stockpiled topsoil. If topsoil is imported, then a texture analysis shall be performed for each location where the topsoil was excavated.
- Compaction**
It is very important to minimize compaction of both the base of bio-retention practices and the required backfill. When possible, use excavation holes to remove original soil. If practices are

Supp. 1 B.4.4

Appendix B.4. Construction Specifications for Environmental Site Design Practices

- excavated using a loader, the contractor should use wide track or marsh track equipment, or light equipment with turf type tires. Use of equipment with narrow tracks or narrow tires, rubber tires with large lugs, or high-pressure tires will cause excessive compaction resulting in reduced infiltration rates and is not acceptable. Compaction will significantly contribute to design failure.
- Compaction can be alleviated at the base of the bio-retention facility by using a primary tilling operation such as a chisel plow, ripper, or subsoiler. These tilling operations are to restructure the soil profile through the 12 inch compaction zone. Substitute methods must be approved by the engineer. Rototillers typically do not till deep enough to reduce the effects of compaction from heavy equipment.
- Rototill 2 to 3 inches of sand into the base of the bio-retention facility before backfilling the optional sand layer. Pump any ponded water before preparing (rototilling) base.
- When backfilling the topsoil over the sand layer, first place 3 to 4 inches of topsoil over the sand, then rototill the sand/topsoil to create a gradation zone. Backfill the remainder of the topsoil to final grade.
- When backfilling the bio-retention facility, place soil in lifts 12" to 18". Do not use heavy equipment within the bio-retention basin. Heavy equipment can be used around the perimeter of the basin to supply soils and sand. Grade bio-retention materials with light equipment such as a compact loader or a dozer/loader with marsh tracks.
- Plant Material**
Recommended plant material for micro-bioretentation practices can be found in Appendix A, Section A.2.3.
 - Plant Installation**
Stop is a better organic material source, is less likely to float, and should be placed in the invert and other low areas. Mulch should be placed in surrounding to a uniform thickness of 2" to 3". Shredded or chipped hardwood mulch is the only accepted mulch. Fine mulch and wood chips will float and move to the perimeter of the bio-retention area during a storm event and are not acceptable. Shredded mulch must be well aged (6 to 12 months) for acceptance.
Rootstock of the plant material shall be kept moist during transport and on-site storage. The plant root ball should be planted so 1/8" of the ball is above final grade surface. The diameter of the planting pit shall be at least six inches larger than the diameter of the planting ball. Set and maintain the plant straight during the entire planting process. Thoroughly water ground bed cover after installation.

Supp. 1 B.4.5

Appendix B.4. Construction Specifications for Environmental Site Design Practices

Material	Specification	Size	Notes
Plantings	See Appendix A, Table A.4	n/a	Plantings are site-specific
Planting soil [2" to 4" deep]	loamy sand (60-65%) & compost (35-40%) or sandy loam (30%), coarse sand (30%), and compost (40%)	n/a	USDA soil types loamy sand or sandy loam; clay content < 5%
Organic content	Min. 10% by dry weight (ASTM D 2974)	n/a	
Gravel diaphragms	stainless hardware poly gravel ASTM D-448	NO. 8 OR NO. 9 (1/8" TO 3/8")	aged 6 months, minimum, no pipe or wood chips
Curtain drain	conventional stone, washed cobble	stone: 2" to 5"	
Geotextile	n/a	n/a	PE Type 1 nonwoven
Gravel (underdrains and infiltration basins)	AASHTO M-43	NO. 57 OR NO. 6 (3/8" TO 3/4")	
Underdrain piping	F 755, Type PS 28 or AASHTO M-272	4" to 6" rigid schedule 40 PVC or HDPE	slotted or perforated pipe, 3/8" perft. @ 6" on center, 4 holes per row; minimum of 3" of gravel core pipe; not necessary underdrain pipes. Perforated pipe shall be wrapped with 1/4-inch galvanized hardware cloth
Poured in place concrete (if required)	MSHA Mix No. 3, F, = 3500 psi @ 28 days, normal weight, air-entrained, reinforcing to meet ASTM-641-60	n/a	in-site testing of poured-in-place concrete required. 28 day strength and slump test; all concrete design (cure-in-place or pre-cast) not using previously approved design or local standards requires design drawings sealed and approved by a professional engineer licensed in the State of Maryland - design to include meeting ACI Code 308.2R, vertical loading (10-16 or 20), allowable horizontal loading (based on soil pressure), and analysis of potential cracking.
Sand	AASHTO M-6 or ASTM C-33	0.075" to 0.04"	Send substitutions such as Diabase and Gneiss (AASHTO) if it is not acceptable. No sodium sulfonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

Supp. 1 B.4.7

Inspection Item	Frequency of Inspection	Inspection Requirements	Remedial Action
Diverting Basin	Seasonally and after a major storm	Facility must divert water within 48 hours of rainfall. Noticeable odors, stained water on the filter surface, or at the outlet, or the presence of algae or aquatic vegetation are indicators of anaerobic conditions, and indicate diverting of the facility.	The top three inches of soil should be removed and replaced with soil material as per plan specifications. Follow up inspections must confirm adequate diverting. If the facility does not function as intended after the entire filter and underdrain system may need maintenance. MDE approval may be necessary.
Mulch Layer	Check mulch for adequate cover, sediment accumulation, or discoloration.	Replace and remove old mulch and excess sediment. Provide adequate mulch cover according to approved design.	
Vegetative Surfaces	Monthly	Remove plant competition with approved plant. Check for invasive species or weeds. Check for dead or dying vegetation.	Remove and replace plants in accordance with approved landscaping plan. Re-grading may be required when concentrated flow causes rills or gully through the facility.
Vegetative Cover and Erosion	Check for evidence of erosion, runoff channeling, or bare spots.	Revised or re-plant in accordance with approved landscaping plan. Re-grading may be required when concentrated flow causes rills or gully through the facility.	
Debris and Trash Cleanout	Monthly	Check that the facility is clean of trash and debris. Rills, ruts, and contributing areas around the facility must be checked.	Trash and debris must be disposed of in an acceptable manner according to current regulations.
Structural Components	Annually	Check for evidence of structural deterioration, spalling, or cracking. Inlet and outlet structures must be in good condition.	Repair to good condition according to specifications on the approved plans.

* Field conditions may require a modification to the original approval in order to achieve the intended design function. Contact MDE's Sediment and Stormwater Management Plan Review Division at 410-537-3563 for review and approval of proposed modifications.

Outlet	Seasonally and after a major storm	Check for evidence of erosion, rills, or gully.	Stabilize all eroded areas and grade to provide stable conveyance.
Pre-treatment Forebays	Seasonally and after a major storm	Riprap outlet must be maintained in good functional condition.	Repair according to approved plan.
Sediment Accumulation	Check for sediment accumulation in the forebay.	When the forebay depth is less than half the proposed design, sediment must be removed and the forebay restored according to the approved design.	
Sand Layer	Check sand for staining and sediment accumulation.	Replace first three inches of sand layer with sand materials per plan specifications.	
Gravel Diaphragms	Check gravel diaphragm for sediment accumulation and evidence of erosion.	Stabilize or replace gravel according to plan specifications.	
Grass Channel Conveyance Systems	Seasonally and after a major storm	Check for erosion, flow blockages, and stable.	Stabilize and grade according to approved plan.
Overall Function of the Facility	Annually	Check that flow splines are functioning as designed and that bypass is operating as designed.	Construction must be in accordance with approved plans.

* Field conditions may require a modification to the original approval in order to achieve the intended design function. Contact MDE's Sediment and Stormwater Management Plan Review Division at 410-537-3563 for review and approval of proposed modifications.

Appendix B.4. Construction Specifications for Environmental Site Design Practices

- Trees shall be braced using 2" by 2" stakes only as necessary and for the first growing season only. Stakes are to be equally spaced on the outside of the tree ball.
- Grasses and legume seed should be drilled into the soil to a depth of at least one inch. Grass and legume plugs shall be planted following the non-grass ground cover planting specifications.
- The topsoil specifications provide enough organic material to adequately supply nutrients from natural cycling. The primary function of the bio-retention structure is to improve water quality. Adding fertilizers, or at a minimum, impedes this goal. Only add fertilizer if wood chips or mulch are used to amend the soil. Rototill urea fertilizer at a rate of 2 pounds per 1000 square feet.
- Underdrains**
Underdrains should meet the following criteria:
 - Pipe: Should be 4" to 6" diameter, slotted or perforated rigid plastic pipe (ASTM F 755, Type PS 28, or AASHTO-M-278) in a gravel layer. The perforated material is slotted, 4" rigid pipe (e.g., PVC or HDPE).
 - Perforations - If perforated pipe is used, perforations should be 3/8" diameter located 6" on center with a minimum of four holes per row. Pipe shall be wrapped with 1/4" (No. 4 or 4x4) galvanized hardware cloth.
 - Gravel - The gravel layer (No. 57 stone preferred) shall be at least 3" thick above and below the underdrain.
 - The main collector pipe shall be at a minimum 0.5% slope.
 - A rigid, non-perforated observation well must be provided (one every 1,000 square feet) to provide a clean-out port and monitor performance of the filter.
 - A 4" layer of pea gravel (1/4" to 3/8" stone) shall be located between the filter media and underdrain to prevent migration of fines into the underdrain. This layer may be considered part of the filter bed when bed thickness exceeds 24".
 - The main collector pipe for underdrain systems shall be constructed at a minimum slope of 0.5%. Observation wells and/or clean-out pipes must be provided (one minimum per every 1000 square feet of surface area).
 - Miscellaneous**
These practices may not be constructed until all contributing drainage area has been stabilized.

Supp. 1 B.4.6

Date	No.	Revision Description
7-2014	1	CHANGED APARTMENTS TO TOWNHOUSE APARTMENTS

ENGINEER'S CERTIFICATE
I, JOHN R. HEINRICHS, P.E. #14920, PHOENIX ENGINEERING, INC. certify that this plan for erosion and sediment control represents a PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD COUNTY SOIL CONSERVATION DISTRICT.
7/25/14

DEVELOPER'S CERTIFICATE
I, THOMAS PALACOROLLA, certify that all development and construction will be done ACCORDING TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD COUNTY CONSERVATION DISTRICT.
7-25-14

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DEVELOPMENT ENGINEERING DIVISION 8/6/14
CHIEF, DIVISION OF LAND DEVELOPMENT 8/27/14
DIRECTOR 8/21/14

DEVELOPER:
NKC PROPERTIES, LLC
12183 TRIADAPLHIA ROAD
ELICOTT CITY, MD 21042
410-796-7876

OWNER:
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PROJECT:
RIVERWATCH
A RESUBDIVISION OF SHINAMON
SUBDIVISION LOTS 1 THRU 7 AND PARCELS
420, 421, 422, 620, 623, 624 AND 625
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HOWARD COUNTY, MARYLAND

PREPARED BY:
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CONSULTING ENGINEERS
1420 JOH AVENUE, SUITE A
BALTIMORE, MARYLAND 21227
(410) 247-8833 FAX 247-8937

PROJECT LOCATION:
RIVERWATCH
TAX MAP 38 GRID: 4
PARCELS: 420, 421, 422, 623, 624, 625, 620
CENSUS TRACT 6012.01
1 ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE:
BIORETENTION
PLAN & DETAILS

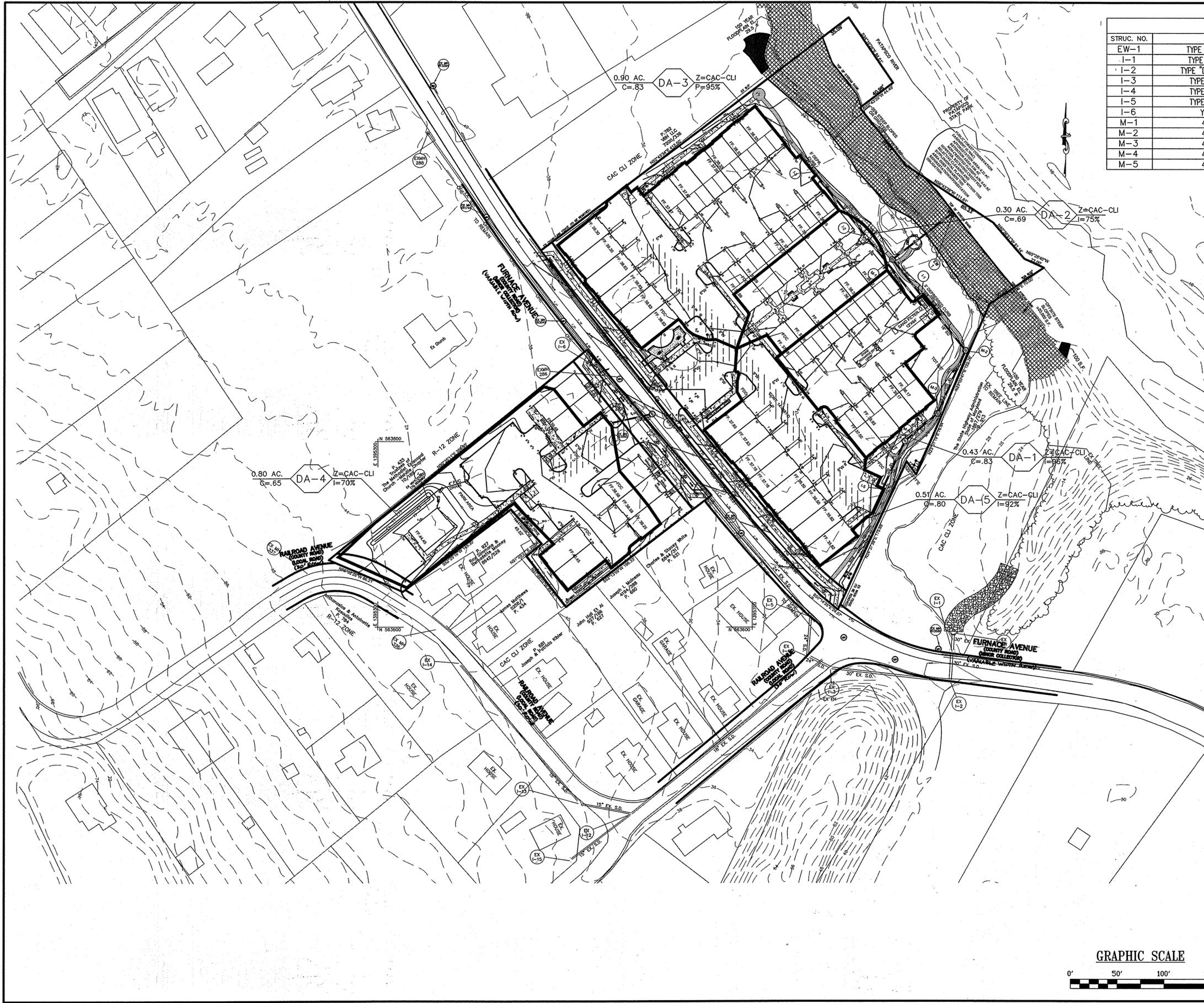
Des By: K.M.W. Scale: AS SHOWN Proj No: 07-041
Dwn By: S.E.P. Date: JULY, 2014 Drawing: SW01turnoc
Ck By: J.R.H. SDP 08-109 9-A OF 22

PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 14920 Exp. Date: 5-12-16

7-25-2014 Date

STATE OF MARYLAND PROFESSIONAL ENGINEER

JOHN R. HEINRICHS Professional Engr. No. 14920



STRUCTURE SCHEDULE						
STRUC. NO.	TYPE	INV. IN	INV. OUT	THROAT ELEV.	STD. NO.	REMARKS
EW-1	TYPE "C" HEADWALL	-	7.50	-	SD 5.21	
I-1	TYPE "A-10" INLET	30.22	27.17	35.30	SD 4.03/4.04	
I-2	TYPE "DOUBLE S" INLET	30.22	30.02	TOP 34.00	SD 4.23	RETICULAR GRATE SD.4.93
I-3	TYPE "A-5" INLET	-	31.07	34.60	SD 4.02	
I-4	TYPE "A-5" INLET	-	32.54	36.10	SD 4.02	
I-5	TYPE "A-5" INLET	-	31.53	35.30	SD 4.02	
I-6	YARD INLET	39.67	39.67	43.50	SD 4.14	
M-1	4' DIA. MH	27.12	8.27	RIM 36.00	G 5.12/G5.16	W/1 INTERMEDIATE LANDING @ 31.12
M-2	4' DIA. MH	29.60	29.40	RIM 34.00	G 5.12	
M-3	4' DIA. MH	30.34	30.14	RIM 33.76	G 5.12	
M-4	4' DIA. MH	31.02	30.82	RIM 34.60	G 5.12	
M-5	4' DIA. MH	31.48	30.93	RIM 35.84	G 5.12	

PIPE SCHEDULE				
FROM STRUCTURE	TO STRUCTURE	LENGTH	SIZE	TYPE
EW-1	M-1	77 LF	18"	CL IV R.C.C.P.
M-1	I-1	47 LF	18"	CL IV R.C.C.P.
SWMF	I-1	8 LF	18"	CL IV R.C.C.P.
I-1	I-2	85 LF	18"	CL IV R.C.C.P.
I-2	I-3	85 LF	18"	CL IV R.C.C.P.
M-5	I-4	40 LF	15"	CL IV R.C.C.P.
I-1	M-2	75 LF	18"	CL IV R.C.C.P.
M-2	M-3	74 LF	18"	CL IV R.C.C.P.
M-3	M-4	46 LF	18"	CL IV R.C.C.P.
M-4	I-5	54 LF	18"	CL IV R.C.C.P.
I-6	CURB CUT	47 LF	4"	SOLID P.V.C.

LEGEND

- 15-24.9% STEEP SLOPES [Solid black box]
- 25% SLOPES OR GREATER [Cross-hatched box]

7-2014	1	CHANGED APARTMENTS TO TOWNHOUSE APARTMENTS
Date	No	Revision Description
APPROVED: DEPARTMENT OF PLANNING AND ZONING		
CHIEF, DEVELOPMENT ENGINEERING DIVISION		J.P. 8/6/14 DATE
CHIEF, DIVISION OF LAND DEVELOPMENT		M.H. 8/27/14 DATE
DIRECTOR		M.H. 8/23/14 DATE

DEVELOPER: NKC PROPERTIES, LLC
12183 TRIADDELPHIA ROAD
ELLCOTT CITY, MD 21042
410-796-7676

OWNER: THOMAS PALACOROLLA
12183 TRIADDELPHIA ROAD
ELLCOTT CITY, MD 21042
410-796-7676

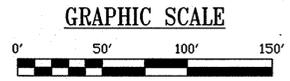
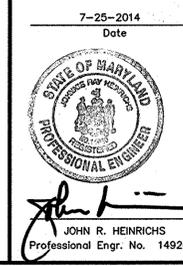
PROJECT: RIVERWATCH
BUILDABLE PARCELS 'A' & 'B'
A RESUBDIVISION OF SHINNAMON
SUBDIVISION LOTS 1 THRU 7 AND PARCELS
420, 421, 422, 620, 623, 624 AND 625
ELKRIDGE, MD 21046
HOWARD COUNTY, MARYLAND

PREPARED BY: PHOENIX ENGINEERING, INC.
CONSULTING ENGINEERS
1420 JOH AVENUE, SUITE A
BALTIMORE, MARYLAND 21227
(410) 247-8833 FAX 247-8397

AREA: ELKRIDGE
PARCELS: 420, 421, 422, 623, 624, 625, 620
CENSUS TRACT 6012.01 TAX MAP: 38 GRID 4
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: PROPOSED DRAINAGE AREA MAP
Des By: R.J.W. Scale: 1"=50' Proj No: 07-041
Dm By: S.E.W. Date: JULY, 2014 Drawing: d005 Furnace.dwg
Ck By: J.R.H. SDP: 08-109 10 OF 22

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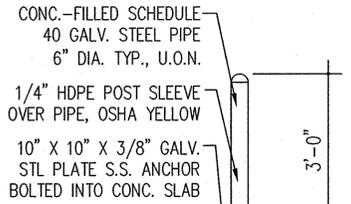
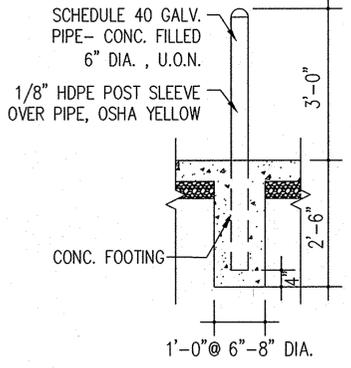
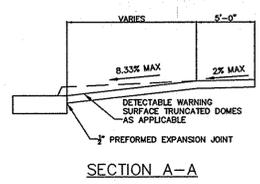


PLATE BOLLARD- NTS
ALTERNATIVE OPTION

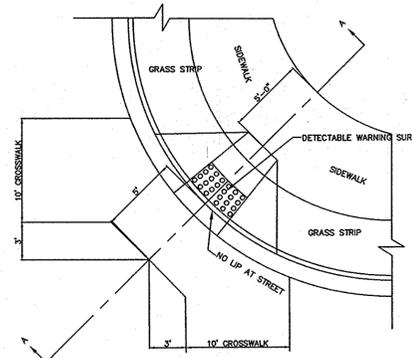


NOTE: ALL PIPE SECTION SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION

TYPICAL BOLLARD- NTS
STANDARD OPTION

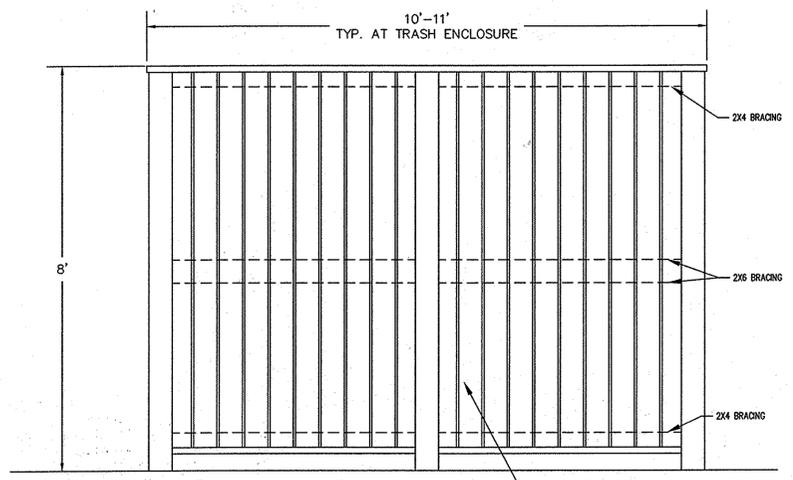


SECTION A-A

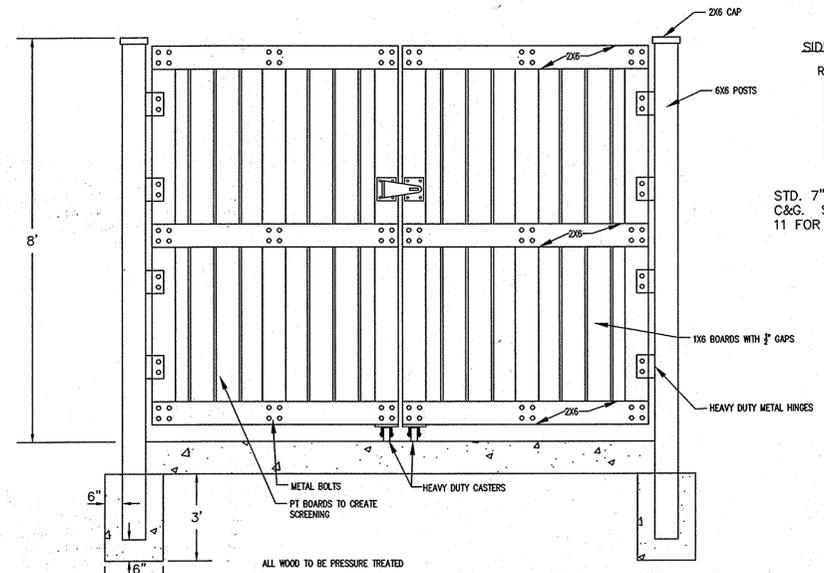


NOTE:
1. ALL RAMP SHALL HAVE DETECTABLE WARNING SURFACES. SEE DETAIL R-407
2. GRASS AREA ADJACENT TO SIDEWALK SHALL BE SLOPED TO MEET GRADE

TYPE 'B' SIDEWALK RAMP
NOT TO SCALE

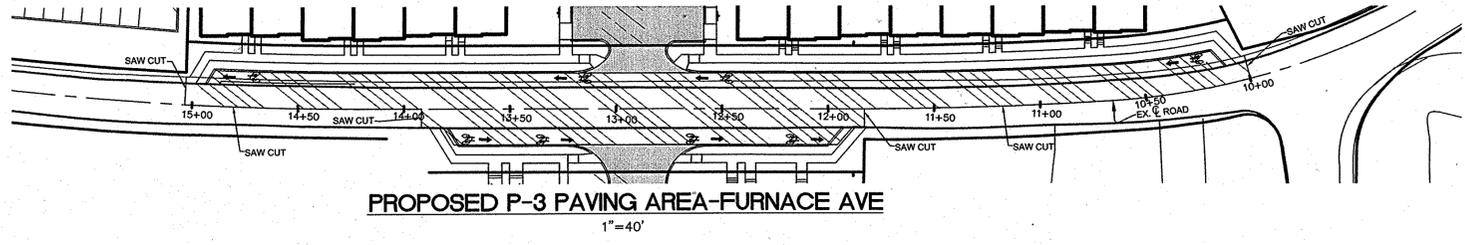


SCREEN FENCE AND TRASH ENCLOSURE ELEVATION
NOT TO SCALE

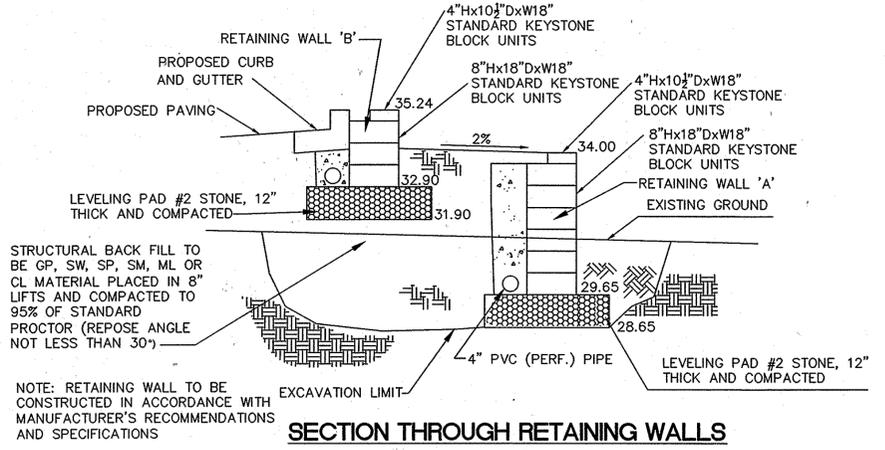


GATE ENCLOSURE ELEVATION
NOT TO SCALE

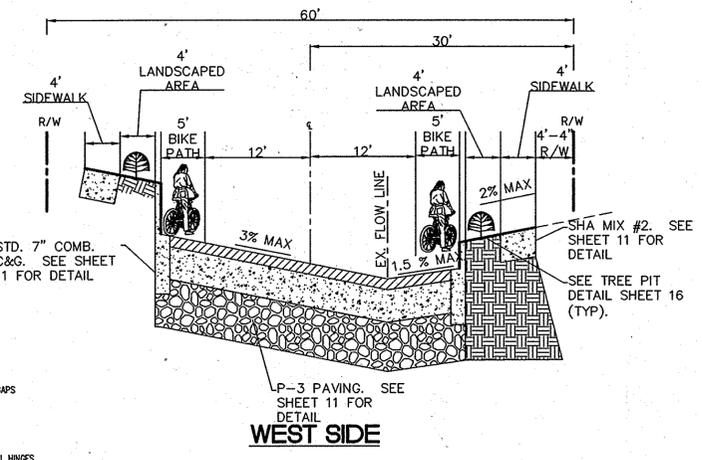
LEGEND



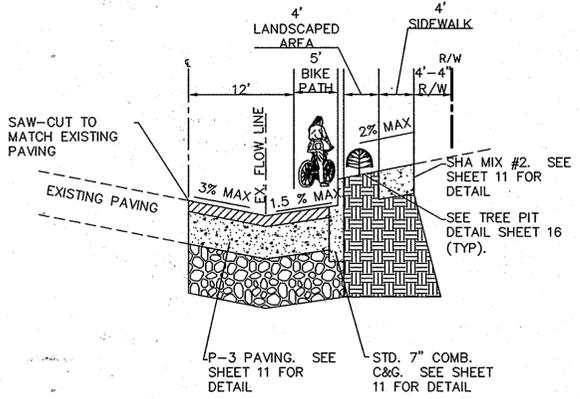
PROPOSED P-3 PAVING AREA-FURNACE AVE
1"=40'



SECTION THROUGH RETAINING WALLS 'A' AND 'B'
SCALE: NOT TO SCALE



WEST SIDE

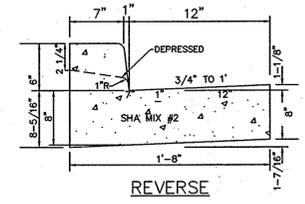


EAST SIDE

TYP. SECTION-FURNACE AVENUE
SCALE: NO SCALE

RETAINING WALL 'A'				
TOP OF WALL/BOTTOM OF WALL				
STATION	TOP OF WALL EL.	BOTTOM OF WALL EL.	NORTH	EAST
0+00	30.32	30.42	563875.80	1395815.81
0+00.75	31.00	30.40		
0+01.50	31.33	30.39		
0+08.25	32.00	30.25		
0+13.50	32.67	30.15		
0+20.25	33.33	30.02		
0+24	34.00	30.05		
0+96	34.00	33.03		
1+04.25	33.33	32.31		
1+12.50	32.67	31.58		
1+16.25	32.00	31.58	563782.16	1395884.57
1+17	31.67	30.58		

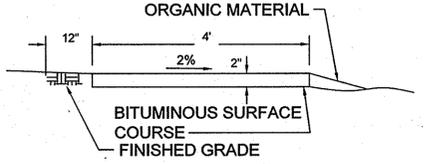
RETAINING WALL 'B'				
TOP OF WALL/BOTTOM OF WALL				
STATION	TOP OF WALL EL.	BOTTOM OF WALL EL.	NORTH	EAST
0+00	33.57	30.56	563714.71	1395827.71
0+00.75	33.90	33.57		
0+02.25	34.24	33.60		
0+03	34.57	34.09		
0+04.50	34.91	33.63		
0+05.25	35.25	33.64		
0+39.75	33.64	33.98		
0+40.50	33.91	33.98		
1+42	34.58	33.99	563753.79	1395845.62
1+42.75	34.24	34.00		



REVERSE

STANDARD 6" COMBINATION CURB AND GUTTER
NOT TO SCALE

+ON SITE-PRIVATELY MAINTAINED AREAS ONLY

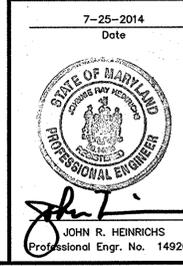


MACADAM PATHWAY DETAIL
NO SCALE

FURNACE AVENUE DATA

STA.	POINT	NORTHING	EASTING
10+00	POB/PC	563612.7920	1395785.6606
	CP	563888.4469	1395988.3334
10+50	POC	563645.2431	1395747.6806
10+65.69	PT/PC	563656.5327	1395736.7829
11+00	POC	563681.9792	1395713.7734
11+50	POC	563719.8499	1395681.1292
	CP	563979.4096	1396039.6988
11+82.93	SAW CUT	563745.2923	1395660.2132
11+88.08	PT	563749.3029	1395656.9875
12+00	€ RD	563758.5995	1395649.5326
12+50	€ RD	563797.6067	1395618.2527
13+00	€ RD	563836.6140	1395586.9728
13+50	€ RD	563875.6213	1395555.6929
13+91.77	SAW CUT	563908.1688	1395529.5930
14+00	€ RD	563914.6285	1395524.4130
14+23.33	PC	563932.8343	1395509.8138
14+50	POC	563953.7830	1395493.3188
	CP	563977.4431	1395491.5583
15+00	POC	563993.5759	1395463.5942
15+03.44	POC/END OF WORK	563996.6391	1395461.3901

PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 14920 Exp. Date: 5-12-16



APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION *J.R.* 8/6/14 DATE

CHIEF, DIVISION OF LAND DEVELOPMENT *Mark K. Lyell* 8/27/14 DATE

DIRECTOR *Mark K. Lyell* 8/27/14 DATE

Date	No	Revision Description
7-2014	3	CHANGED APARTMENTS TO TOWNHOUSE APARTMENTS

DEVELOPER: NKC PROPERTIES, LLC
12183 TRIADDELPHIA ROAD
ELLCOTT CITY, MD 21042
410-796-7876

OWNER: THOMAS PALACOROLLA
12183 TRIADDELPHIA ROAD
ELLCOTT CITY, MD 21042
410-796-7876

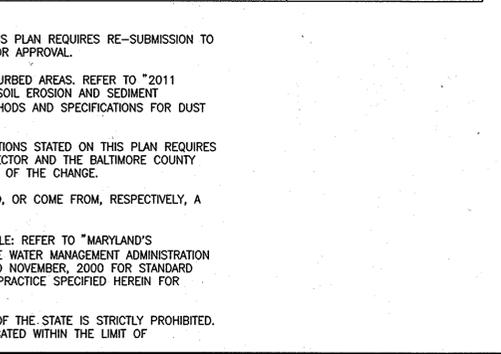
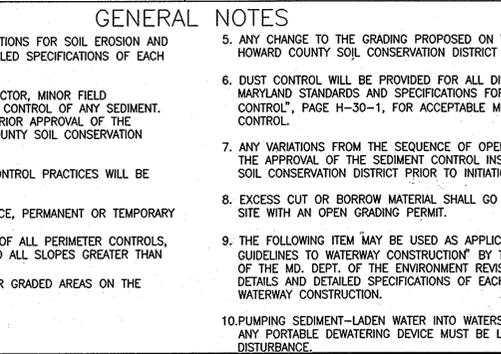
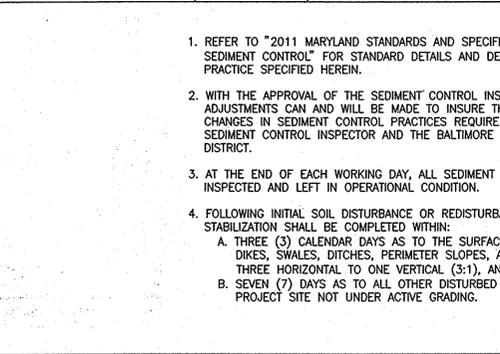
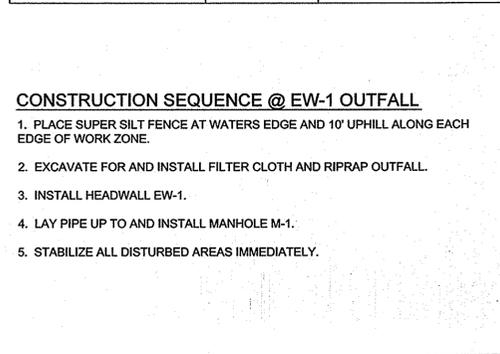
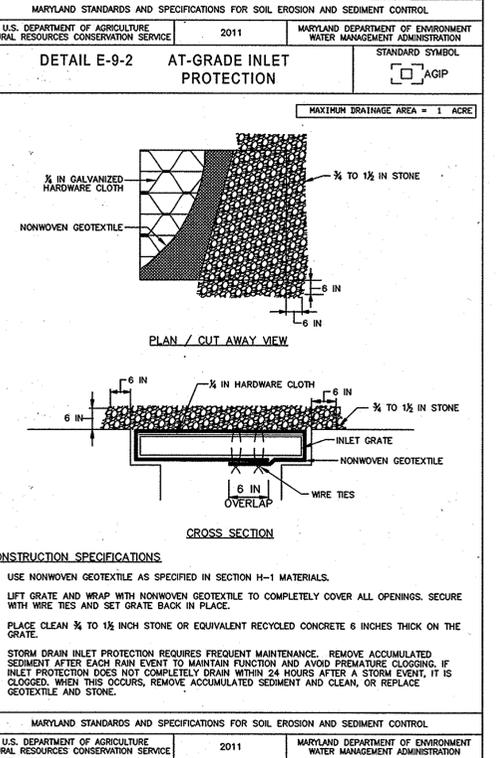
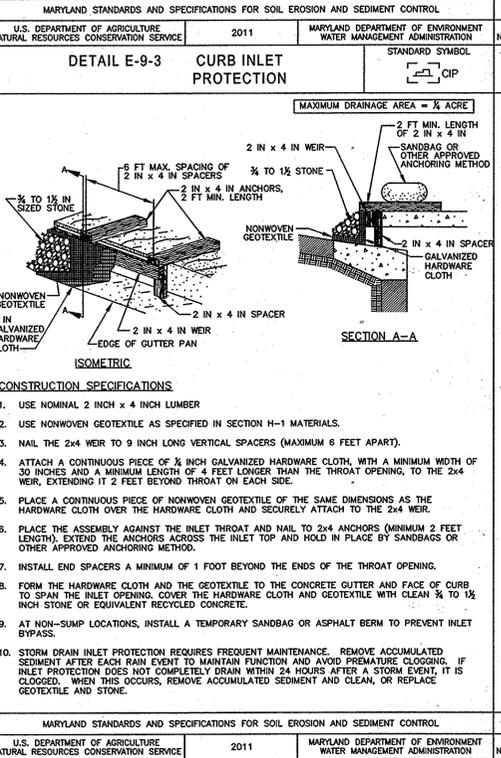
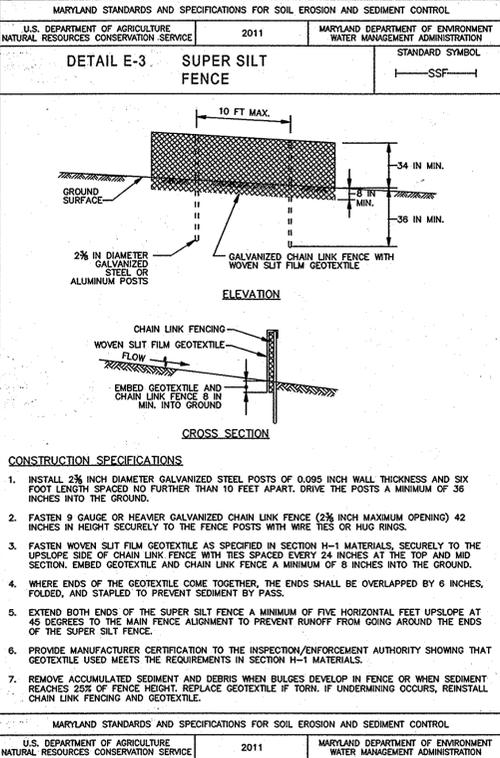
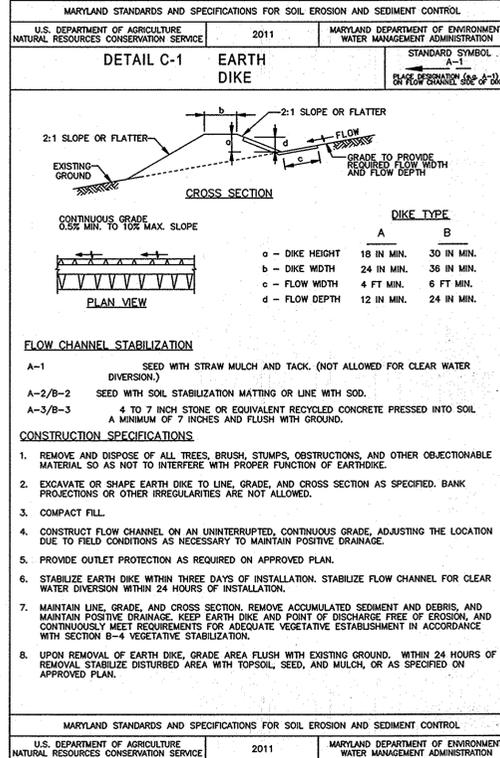
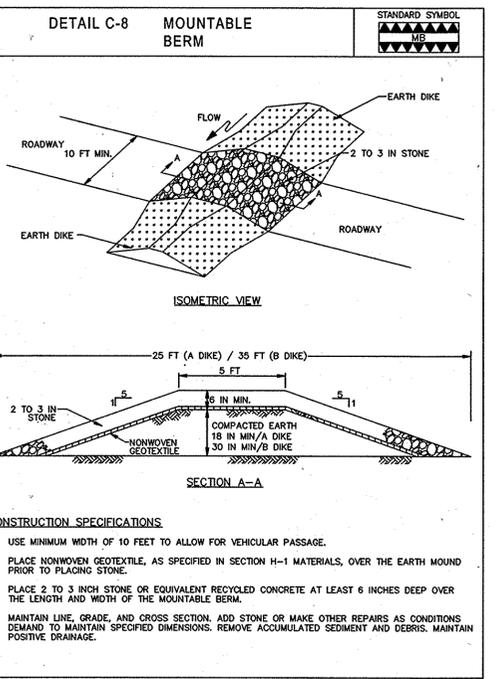
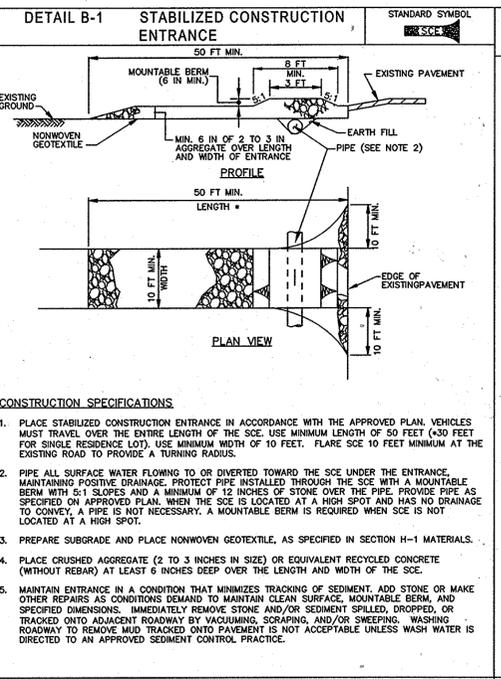
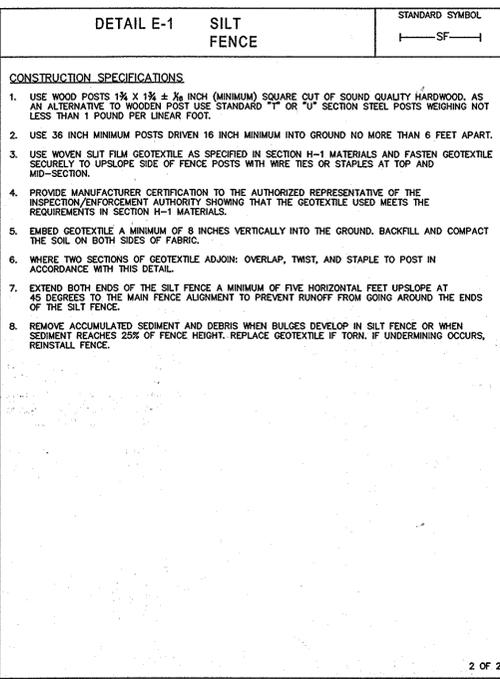
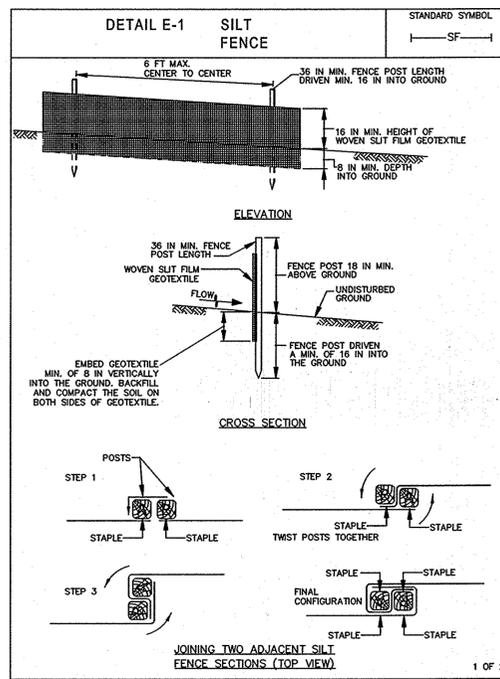
PROJECT: RIVERWATCH
BUILDABLE PARCELS 'A' & 'B'
A RESUBDIVISION OF SHINNAMON
SUBDIVISION LOTS 1 THRU 7 AND PARCELS
420, 421, 422, 620, 623, 624 AND 625
ELKRIDGE, MD 21046
HOWARD COUNTY, MARYLAND

PREPARED BY: PHOENIX ENGINEERING, INC.
CONSULTING ENGINEERS
1420 JOH AVENUE, SUITE A
BALTIMORE, MARYLAND 21227
(410) 247-8833 FAX 247-9397

AREA: ELKRIDGE
PARCELS: 420, 421, 422, 623, 624, 625, 620
CENSUS TRACT 6012.01 TAX MAP: 38 GRID 4
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: DETAILS

Des By: R.J.W.	Scale: AS SHOWN	Proj No: 07-041
Drn By: S.E.W.	Date: JULY, 2014	Drawing: 0602.dwg
Chk By: J.R.H.	SDP: 08-109	11-A OF 22



SEQUENCE OF CONSTRUCTION

(DAY 1)	DAY 1	OBTAIN A GRADING PERMIT
(2 DAYS)	DAY 2-3	CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE WITH A MOUNTABLE BERM (SCE).
(6 DAYS)	DAY 4-10	CLEAR AND GRUB AREA FOR, AND INSTALL REMAINING SEDIMENT CONTROL DEVICES.
(10 DAYS)	DAY 11-20	ROUGH GRADE SITE AND STABILIZE AS PER TEMPORARY SEEDING NOTES.
(30 DAYS)	DAY 21-51	CONSTRUCT ALL UTILITIES IE: WATER, SEWER, STORM DRAINS, AND SWM FACILITY. INSTALL INLET PROTECTION AROUND INLETS I-1, I-2, I-3, I-4, I-5 AND I-6 IMMEDIATELY UPON COMPLETION.
(100 DAYS)	DAY 52-152	CONSTRUCT BUILDINGS AND STABILIZE AROUND EACH BUILDING AS SOON AS POSSIBLE AND INSTALL CURB AND PAVING.
(22 DAYS)	DAY 153-175	FINE GRADE SITE AND SEED DISTURBED AREAS IN ACCORDANCE WITH PERMANENT SEEDING NOTES.
(15 DAYS)	DAY 175-190	WHEN ALL DISTURBED AREAS HAVE BEEN STABILIZED AND UPON APPROVAL OF THE SEDIMENT CONTROL INSPECTOR, REMOVE ALL SEDIMENT CONTROL DEVICES.

APPROVED FOR PUBLIC WATER AND PUBLIC SEWERAGE SYSTEMS

COUNTY HEALTH OFFICER _____ DATE _____

ENGINEER'S CERTIFICATE

"I/WE CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD COUNTY SOIL CONSERVATION DISTRICT."

ENGINEER: JOHN R. HEINRICHS, P.E. #14920 DATE 7/25/14
PHOENIX ENGINEERING, INC.

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT."

THOMAS PALACOROLLA 7-25-14 DATE
DEVELOPER: THOMAS PALACOROLLA

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD COUNTY SOIL CONSERVATION DISTRICT

John R. Heinrichs 7/31/14 DATE
HOWARD S.C.D.

PROVIDED: DEPARTMENT OF PLANNING AND ZONING

8/6/14
CHIEF, DEVELOPMENT ENGINEERING DIVISION JR.

8/27/14
CHIEF, DIVISION OF LAND DEVELOPMENT MM

8/27/14
DIRECTOR

Date	No	Revision Description
7-2014	1	CHANGED APARTMENTS TO TOWNHOUSE APARTMENTS

DEVELOPER:

NKC PROPERTIES, LLC
12185 TRIADDELPHIA ROAD
ELLCOTT CITY, MD 21042
410-796-7676

OWNER:

THOMAS PALACOROLLA
12185 TRIADDELPHIA ROAD
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PROJECT:

RIVERWATCH
BUILDABLE PARCELS 'A' & 'B'
A RESUBDIVISION OF SHINNAMON
SUBDIVISION LOTS 1 THRU 7 AND PARCELS
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PREPARED BY:

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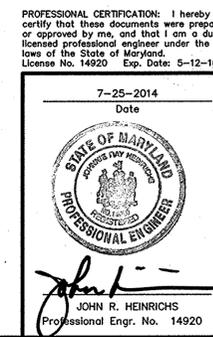
AREA: ELKRIDGE

PARCELS: 420, 421, 422, 623, 624, 625, 620
CENSUS TRACT 601.01 TAX MAP: 38 GRID 4
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: SEDIMENT CONTROL NOTES & DETAILS

Des By: R.J.W.	Scale: AS SHOWN	Proj No: 07-041
Drn By: S.E.W.	Date: JULY, 2014	Drawing: de01.dwg
Chk By: J.R.H.	SOP: 08-109	12 OF 22

SDP 08-109



B-4 STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION

Definition: Using vegetation as cover to protect exposed soil from erosion.

Purpose: To promote the establishment of vegetation on exposed soil.

Conditions Where Practice Applies: On all disturbed areas not stabilized by other methods. This specification is divided into sections on incremental stabilization; soil preparation, soil amendments and topsoiling; seeding and mulching; temporary stabilization; and permanent stabilization.

Effects on Water Quality and Quantity: Stabilization practices are used to promote the establishment of vegetation on exposed soil. When soil is stabilized with vegetation, the soil is less likely to erode and more likely to allow infiltration of rainfall, thereby reducing sediment loads and runoff to downstream areas.

Planting vegetation in disturbed areas will have an effect on the water budget, especially on volumes and rates of runoff, infiltration, evaporation, transpiration, percolation, and groundwater recharge. Over time, vegetation will increase organic matter content and improve the water holding capacity of the soil and subsequent plant growth.

Vegetation will help reduce the movement of sediment, nutrients, and other chemicals carried by runoff to receiving waters. Plants will also help protect groundwater supplies by assimilating those substances present within the root zone.

Sediment control practices must remain in place during grading, seedbed preparation, seeding, mulching, and vegetative establishment.

Adequate Vegetative Establishment: Inspect seeded areas for vegetative establishment and make necessary repairs, replacements, and reseeding within the planting season.

- 1. Adequate vegetative stabilization requires 95 percent groundcover.
2. If an area has less than 40 percent groundcover, restabilize following the original recommendations for lime, fertilizer, seedbed preparation, and seeding.
3. If an area has between 40 and 94 percent groundcover, over-seed and fertilize using half of the rates originally specified.
4. Maintenance fertilizer rates for permanent seeding are shown in Table B.6.

B-4 STANDARDS AND SPECIFICATIONS FOR INCREMENTAL STABILIZATION

Definition: Establishment of vegetative cover on cut and fill slopes.

Purpose: To provide timely vegetative cover on cut and fill slopes as work progresses.

Conditions Where Practice Applies: Any cut or fill slope greater than 15 feet in height. This practice also applies to stockpiles.

Criteria:

A. Incremental Stabilization - Cut Slopes

- 1. Excavate and stabilize cut slopes in increments not to exceed 15 feet in height. Prepare seedbed and apply seed and mulch on all cut slopes as the work progresses.
2. Construction sequence example (Refer to Figure B.1):
a. Construct and stabilize all temporary swales or dikes that will be used to convey runoff around the excavation.
b. Perform Phase 1 excavation, prepare seedbed, and stabilize.
c. Perform Phase 2 excavation, prepare seedbed, and stabilize. Overseed Phase 1 areas as necessary.
d. Perform final phase excavation, prepare seedbed, and stabilize. Overseed previously seeded areas as necessary.

Note: Once excavation has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.

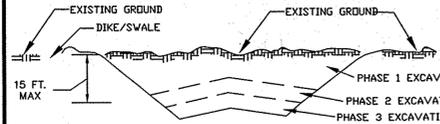


FIGURE B.1 INCREMENTAL STABILIZATION - CUT

B. Incremental Stabilization - Fill Slopes

- 1. Construct and stabilize fill slopes in increments not to exceed 15 feet in height. Prepare seedbed and apply seed and mulch on all slopes as the work progresses.
2. Stabilize slopes immediately when the vertical height of a lift reaches 15 feet, or when the grading operation ceases as prescribed in the plans.
3. At the end of each day, install temporary water conveyance practice(s), as necessary, to intercept surface runoff and convey it down the slope in a non-erosive manner.
4. Construction sequence example (Refer to Figure B.2):
a. Construct and stabilize all temporary swales or dikes that will be used to divert runoff around the fill. Construct silt fence on low side of fill unless other methods shown on the plans address this area.
b. At the end of each day, install temporary water conveyance practice(s), as necessary, to intercept surface runoff and convey it down the slope in a non-erosive manner.
c. Place Phase 1 fill, prepare seedbed, and stabilize.
d. Place Phase 2 fill, prepare seedbed, and stabilize.
e. Place final phase fill, prepare seedbed, and stabilize. Overseed previously seeded areas as necessary.

Note: Once the placement of fill has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.

B-4-2 STANDARDS AND SPECIFICATIONS FOR SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

Definition: The process of preparing the soils to sustain adequate vegetative stabilization.

Purpose: To provide a suitable soil medium for vegetative growth.

Conditions Where Practice Applies: Where vegetative stabilization is to be established.

Criteria:

A. Soil Preparation

- 1. Temporary Stabilization
a. Seedbed preparation consists of loosening soil to a depth of 3 to 5 inches by means of suitable agricultural or construction equipment, such as disc harrows or chisel plows or rippers mounted on construction equipment. After the soil is loosened, it must not be rolled or dragged smooth but left in the roughened condition. Slopes 3:1 or flatter are to be tracked with ridges running parallel to the contour of the slope.
b. Apply fertilizer and lime as prescribed on the plans.
c. Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disking or other suitable means.

Permanent Stabilization

- a. A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:
i. Soil pH between 6.0 and 7.0.
ii. Soluble salts less than 500 parts per million (ppm).
iii. Soil contains less than 40 percent clay but enough fine grained material (greater than 30 percent silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception: if loess will be planted, then a sandy soil (less than 30 percent silt plus clay) would be acceptable.
iv. Soil contains 1.5 percent minimum organic matter by weight.
v. Soil contains sufficient pore space to permit adequate root penetration.
b. Application of amendments or topsoil is required if on-site soils do not meet the above conditions.
c. Graded areas must be maintained in a true and even grade, as specified on the approved plan, then scarified or otherwise loosened to a depth of 3 to 5 inches.
d. Apply soil amendments as specified on the approved plan or as indicated by the results of a soil test.
e. Mix soil amendments into the top 3 to 5 inches of soil by disking or other suitable means. Rake lawn areas to smooth the surface, remove large objects like stones and branches, and ready the area for seed application. Loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface where site conditions will not permit normal seedbed preparation.
f. Track slopes 3:1 or flatter with tracked equipment leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. Leave the top 1 to 3 inches of soil loose and friable. Seedbed loosening may be unnecessary on newly disturbed areas.

B. Topsoiling

- 1. Topsoiling is placed over prepared subsoil prior to establishment of permanent vegetation. The purpose is to provide a suitable soil medium for vegetative growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.
2. Topsoil salvaged from an existing site may be used provided it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-NRCS.
3. Topsoiling is limited to areas having 2:1 or flatter slopes where:
a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.
c. The original soil to be vegetated contains material toxic to plant growth.
d. The soil is so acidic that treatment with limestone is not feasible.
4. Areas having slopes steeper than 2:1 require special consideration and design.
5. Topsoil Specifications: Soil to be used as topsoil must meet the following criteria:
a. Topsoil must be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Topsoil must not be a mixture of contrasting textured subsoils and must contain less than 5 percent by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1/2 inches in diameter.
b. Topsoil must be free of noxious plants or plant parts such as Bermuda grass, Johnson grass, Johnson grass, nut sedge, poison ivy, thistle, or others as specified.
c. Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.

6. Topsoil Application

- a. Erosion and sediment control practices must be maintained when applying topsoil.
b. Uniformly distribute topsoil in a 5 to 8 inch layer and lightly compact to a minimum thickness of 4 inches. Spreading is to be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations must be corrected in order to prevent the formation of depressions or water pockets.
c. Topsoil must not be placed if the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.

C. Soil Amendments (Fertilizer and Lime Specifications)

- 1. Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas of 5 acres or more. Soil analysis may be performed by a recognized private or commercial laboratory. Soil samples taken for engineering purposes may also be used for chemical analyses.
2. Fertilizers must be uniform in composition, free flowing and suitable for accurate application by appropriate equipment. Manure may be substituted for fertilizer with prior approval from the appropriate approval authority. Fertilizers must all be delivered to the site fully labeled according to the applicable laws and must bear the name, trade name or trademark and warranty of the producer.
3. Lime materials must be ground limestone (hydrated or burnt lime may be substituted except when hydrosedding) which contains at least 50 percent total oxides (calcium oxide plus magnesium oxide). Limestone must be ground to such fineness that at least 50 percent will pass through a #100 mesh sieve and 98 to 100 percent will pass through a #20 mesh sieve.
4. Lime and fertilizer are to be evenly distributed and incorporated into the top 3 to 5 inches of soil by disking or other suitable means.
5. Where the subsoil is either highly acidic or composed of heavy clays, spread ground limestone at the rate of 4 to 8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil.

B-4-3 STANDARDS AND SPECIFICATIONS FOR SEEDING AND MULCHING

Definition: The application of seed and mulch to establish vegetative cover.

Purpose: To protect disturbed soils from erosion during and at the end of construction.

Conditions Where Practice Applies: To the surface of all perimeter controls, slopes, and any disturbed area not under active grading.

Criteria:

A. Seeding

- 1. Specifications
a. All seed must meet the requirements of the Maryland State Seed Law. All seed must be subject to re-testing by a recognized seed laboratory. All seed used must have been tested within the 6 months immediately preceding the date of sowing such material on any project. Refer to Table B.4 regarding the quality of seed. Seed tests must be available upon request to the inspector to verify type of seed and seeding rate.
b. Mulch alone may be applied between the fall and spring seeding dates only if the ground is frozen. The appropriate seeding mixture must be applied when the ground thaws.
c. Inoculants: The inoculant for treating legume seed in the seed mixtures must be a pure culture of nitrogen fixing bacteria prepared specifically for the species. Inoculants must not be used later than the date indicated on the container. Add fresh inoculants as directed on the package. Use four times the recommended rate when hydrosedding. Note: It is very important to keep inoculant as cool as possible until use. Temperatures above 75 to 80 degrees Fahrenheit can weaken bacteria and make the inoculant less effective.
d. Sod or seed must not be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phytotoxic materials.

2. Application

- a. Dry Seeding: This includes use of conventional drop or broadcast spreaders
i. Incorporate seed into the subsoil at the rates prescribed on Temporary Seeding Table B.1, Permanent Seeding Table B.3, or site-specific seeding summaries.
ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction. Roll the seeded area with a weighted roller to provide good seed to soil contact.
b. Drill or Cultipacker Seeding: Mechanized seeders that apply and cover seed with soil.
i. Cultipacker seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of soil covering. Seedbed must be firm after planting.
ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction.
c. Hydrosedding: Apply seed uniformly with hydroseder (slurry includes seed and fertilizer).
i. If fertilizer is being applied at the time of seeding, the application rates should not exceed the following: nitrogen, 100 pounds per acre total of soluble nitrogen; P205 (phosphorous), 200 pounds per acre; K20 (potassium), 200 pounds per acre.
ii. Lime: Use only ground agricultural limestone (up to 3 tons per acre may be applied by hydrosedding). Normally, not more than 2 tons are applied by hydrosedding at any one time. Do not use burnt or hydrated lime when hydrosedding.
iii. Mix seed and fertilizer on site and seed immediately and without interruption.
iv. When hydrosedding do not incorporate seed into the soil.

B. Mulching

- 1. Mulch Materials (in order of preference)
a. Straw consisting of thoroughly threshed wheat, rye, oat, or barley and reasonably bright in color. Straw is to be free of noxious weed seeds as specified in the Maryland Seed Law and not musty, moldy, coked, decayed, or excessively dusty. Note: Use only sterile straw mulch in areas where one species of grass is desired.
b. Wood Cellulose Fiber Mulch (WCFM) consisting of specially prepared wood cellulose processed into a uniform fibrous physical state.
i. WCFM is to be dyed green or contain a green dye in the package that will provide an appropriate color to facilitate visual inspection of the uniformly spread slurry.
ii. WCFM, including dye, must contain no germination or growth inhibiting factors.
iii. WCFM materials are to be manufactured and processed in such a manner that the wood cellulose fiber mulch will remain in uniform suspension in water under agitation and will blend with seed, fertilizer and other additives to form a homogeneous slurry. The mulch material must form a blotter-like ground cover, an application, having moisture absorption and percolation properties and must cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.
iv. WCFM material must not contain elements or compounds of concentration levels that will be phytotoxic.
v. WCFM must conform to the following physical requirements: fiber length of approximately 10 millimeters, diameter approximately 1 millimeter, pH range of 4.0 to 8.5, ash content of 1.6 percent maximum and water holding capacity of 90 percent minimum.

2. Application

- a. Apply mulch to all seeded areas immediately after seeding.
b. When straw mulch is used, spread it over all seeded areas at the rate of 2 tons per acre to a uniform loose depth of 1 to 2 inches. Apply mulch to achieve a uniform distribution and depth so that the soil surface is not exposed. When using a mulch anchoring tool, increase the application rate to 2.5 tons per acre.
c. Wood cellulose fiber used as mulch must be applied at a net dry weight of 1500 pounds per acre. Mix the wood cellulose fiber with water to obtain a mixture with a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.

3. Anchoring

- a. Perform mulch anchoring immediately following application of mulch to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon the size of the area and erosion hazard:
i. A mulch anchoring tool is a tractor drawn implement designed to punch and anchor mulch into the soil surface a minimum of 2 inches. This practice is most effective on large areas, but is limited to flatter slopes where equipment can operate safely. If used on sloping land, this practice should follow the contour.
ii. Wood cellulose fiber may be used for anchoring straw. Apply the fiber binder at a net dry weight of 750 pounds per acre. Mix the wood cellulose fiber with water at a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
iii. Synthetic binders such as Acrylic DLR (Agra-Tack), DCA-70, Petroset, Terra Tax II, Terra Tack AF or other approved equal may be used. Follow application rates as specified by the manufacturer. Application of liquid binders needs to be heavier at the edges where wind catches mulch, such as in valleys and on crests of banks. Use of asphalt binders is strictly prohibited.
iv. Lightweight plastic netting may be stapled over the mulch according to manufacturer recommendations. Netting is usually available in rolls 4 to 15 feet wide and 300 to 3,000 feet long.

B-4-4 STANDARDS AND SPECIFICATIONS FOR TEMPORARY STABILIZATION

Definition: To stabilize disturbed soils with vegetation for up to 6 months

Purpose: To use fast growing vegetation that provides cover on disturbed soils.

Conditions Where Practice Applies: Exposed soils where ground cover is needed for a period of 6 months or less. For longer duration of time, permanent stabilization practices are required.

Criteria:

- 1. Select one or more of the species or seed mixtures listed in Table B.1 for the appropriate Plant Hardiness Zone (from Figure B.3), and enter them in the Temporary Seeding Summary below along with application rates, seeding dates and seeding depths. If this Summary is not put on the plan and completed, then Table B.1 plus fertilizer and lime rates must be put on the plan.
2. For sites having soil tests performed, use and show the recommended rates by the testing agency. Soil tests are not required for Temporary Seeding.
3. When stabilization is required outside of a seeding season, apply seed and mulch or straw mulch alone as prescribed in Section B-4-3-A.1.b and maintain until the next seeding season.

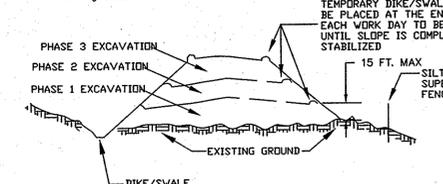


FIGURE B.2 INCREMENTAL STABILIZATION - FILL

B-4-5 STANDARDS AND SPECIFICATIONS FOR PERMANENT STABILIZATION

Definition: To stabilize disturbed soils with permanent vegetation

Purpose: To use long-lived perennial grasses and legumes to establish permanent ground cover on disturbed soils.

Conditions Where Practice Applies: Exposed soils where ground cover is needed for 6 months or more.

Criteria:

A. Seed Mixtures

1. General Use

- a. Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant Hardiness Zone (from Figure B.3) and based on the site condition or purpose found on Table B.2. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The Summary is to be placed on the plan.
b. Additional planting specifications for exceptional sites such as shorelines, stream banks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-NRCS Technical Field Office Guide, Section 342 - Critical Area Planting.
c. For sites having disturbed area over 5 acres, use and show the rates recommended by the soil testing agency.
d. For areas receiving low maintenance, apply urea form fertilizer (46-0-0) at 3 1/2 pounds per 1000 square feet (150 pounds per acre) at the time of seeding in addition to the soil amendments shown in the Permanent Seeding Summary.

2. Turfgrass Mixtures

- a. Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance.
b. Select one or more of the species or mixtures listed below based on the site conditions or purpose. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The summary is to be placed on the plan.
i. Kentucky Bluegrass: Full Sun Mixture: For use in areas that receive intensive management. Irrigation required in the areas of central Maryland and Eastern Shore. Recommended Certified Kentucky Bluegrass Cultivars Seeding Rate: 1.5 to 2.0 pounds per 1000 square feet. Choose a minimum of three Kentucky bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
ii. Kentucky Bluegrass/Perennial Rye: Full Sun Mixture: For use in full sun areas where rapid establishment is necessary and when turf will receive medium to intensive management. Certified Perennial Ryegrass Cultivars/Certified Kentucky Bluegrass Seeding Rate: 2 pounds mixture per 1000 square feet. Choose a minimum of three Kentucky bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
iii. Tall Fescue/Kentucky Bluegrass: Full Sun Mixture: For use in drought prone areas and/or for areas receiving low to medium management in full sun to medium shade. Recommended mixture includes: Certified Tall Fescue Cultivars 95 to 100 percent, Certified Kentucky Bluegrass Cultivars 0 to 5 percent. Seeding Rate: 5 to 8 pounds per 1000 square feet. One or more cultivars may be blended.
iv. Kentucky Bluegrass/Fine Fescue: Shade Mixture: For use in areas with shade in Bluegrass lawns. For establishment in high quality, intensively managed turf area. Mixture includes: Certified Kentucky Bluegrass Cultivars 30 to 40 percent and Certified Fine Fescue and 60 to 70 percent. Seeding Rate: 1 1/2 to 3 pounds per 1000 square feet.

Notes: Select turfgrass varieties from those listed in the most current University of Maryland Publication, Agronomy Memo #77, "Turfgrass Cultivar Recommendations for Maryland"

Choose certified material. Certified material is the best guarantee of cultivar purity. The certification program of the Maryland Department of Agriculture, Turf and Seed Section, provides a reliable means of consumer protection and assures a pure genetic line

TEMPORARY SEEDING SUMMARY

Table with columns for NO., SPECIES, APPLICATION RATE (LB/AC), SEEDING DATES, SEEDING DEPTHS, FERTILIZER RATE (10-20-20), and LIME RATE.

TABLE B.1: TEMPORARY SEEDING FOR SITE STABILIZATION

Table with columns for PLANT SPECIES, SEEDING RATES (LB/AC, LBS/1000 FT^2), SEEDING DEPTH (INCHES), and RECOMMENDED SEEDING DATES BY PLANT HARDINESS ZONE (5b AND 6a, 6b, 7a AND 7b).

Table with columns for PLANT SPECIES, SEEDING RATES, SEEDING DEPTH, and RECOMMENDED SEEDING DATES BY PLANT HARDINESS ZONE.

Seeding rates listed above are for temporary seedings, when planted alone. When planted as a nurse crop with permanent seed mixtures, use 1/3 of the seeding rate listed above for nurse crops, and when...
Seeding rates listed above are for temporary seedings, when planted alone. When planted as a nurse crop with permanent seed mixtures, use 1/3 of the seeding rate listed above for nurse crops, and when...
Seeding rates listed above are for temporary seedings, when planted alone. When planted as a nurse crop with permanent seed mixtures, use 1/3 of the seeding rate listed above for nurse crops, and when...

B-4-6 STANDARDS AND SPECIFICATIONS FOR STOCKPILE AREA

Definition: A mound or pile of soil protected by appropriately designed erosion and sediment control measures.

Purpose: To provide a designated location for the temporary storage of soil that controls the potential for erosion, sedimentation, and changes to drainage patterns.

Conditions Where Practice Applies: Stockpile areas are utilized when it is necessary to segregate and store soil for later use.

- 1. The stockpile location and all related sediment control practices must be clearly indicated on the erosion and sediment control plan.
2. The footprint of the stockpile must be sized to accommodate the anticipated volume of material and based on a site slope ratio no steeper than 2:1. Benching must be provided in accordance with Section B-3 Land Grading.
3. Runoff from the stockpile area must drain to a suitable sediment control practice.
4. Access the stockpile area from the up-slope side.
5. Clear water runoff into the stockpile area must be minimized by use of a diversion device such as an earth dike, temporary swale or diversion fence. Provisions must be made for discharging concentrated flow in a non-erosive manner.
6. Where runoff concentrates along the toe of the stockpile fill, an appropriate erosion/sediment control practice must be used to intercept the discharge.
7. Stockpiles must be stabilized in accordance with the 3/7 day stabilization requirement as well as Standard B-4-1 Incremental Stabilization and Standard B-4-4 Temporary Stabilization.
8. If the stockpile is located on an impervious surface, a liner should be provided below the stockpile to facilitate cleanup. Stockpiles containing contaminated material must be covered with impermeable sheeting.

The stockpile area must continuously meet the requirements for Adequate Vegetative Establishment in accordance with Section B-4-5 Vegetative Stabilization. Site slopes must be maintained at no steeper than a 2:1 ratio. The stockpile area must be kept free of erosion. If the vertical height of a stockpile exceeds 20 feet for 2:1 slopes, 30 feet for 3:1 slopes, or 40 feet for 4:1 slopes, benching must be provided in accordance with Section B-3 Land Grading.

APPROVED: FOR PUBLIC WATER AND PUBLIC SEWERAGE SYSTEMS

COUNTY HEALTH OFFICER DATE
HOWARD COUNTY HEALTH DEPARTMENT

ENGINEER'S CERTIFICATE
I/WE CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD COUNTY SOIL CONSERVATION DISTRICT.

ENGINEER: JOHN R. HEINRICHS, P.E. #14920 DATE 7/25/14
PHOENIX ENGINEERING, INC.

DEVELOPER'S CERTIFICATE
I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD COUNTY SOIL CONSERVATION DISTRICT.

DEVELOPER: THOMAS PALACOROLLA 7-25-14

APPROVED: DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

CHIEF, DEVELOPMENT ENGINEERING DIVISION 8/6/14

CHIEF, DIVISION OF LAND DEVELOPMENT 8/27/14

DIRECTOR 8/22/14

7-2014 CHANGED APARTMENTS TO TOWNHOUSE APARTMENTS

DEVELOPER: NKC PROPERTIES, LLC
12183 TRIADLEPHIA ROAD
ELICOTT CITY, MD 21042
410-796-7676

OWNER: THOMAS PALACOROLLA
12183 TRIADLEPHIA ROAD
ELICOTT CITY, MD 21042
410-796-7676

PROJECT: RIVERWATCH
BUILDABLE PARCELS 'A' & 'B'
A RESUBDIVISION OF SHINNAMON
SUBDIVISION LOTS 1 THRU 7 AND PARCELS
420, 421, 422, 620, 623, 624 AND 625
HOWARD COUNTY, MARYLAND

PREPARED BY: PHOENIX ENGINEERING, INC.
CONSULTING ENGINEERS
1420 JOH AVENUE, SUITE A
BALTIMORE, MARYLAND 21227
(410) 247-8833 FAX 247-9397

AREA: ELKRIDGE
PARCELS: 420, 421, 422, 623, 624, 625, 620
CENSUS TRACT 6012.01 TAX MAP: 38 GRID 4
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: SEDIMENT CONTROL NOTES

Des By: R.J.W. Scale: AS SHOWN Proj No: 07-041
Dwn By: S.E.W. Date: JULY, 2014 Drawing: de01.dwg
Chk By: J.R.H. SPP: 08-109 12-A OF 22

PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 14920 Exp. Date: 5-12-16



JOHN R. HEINRICHS
Professional Engr. No. 14920

PERMANENT SEEDING SUMMARY

NO.	SPECIES	HARDINESS ZONE: 7A SEED MIXTURE: ROADSIDES		FERTILIZER RATE (10-20-20)			LIME RATE	
		APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS	N	P2O5		K2O
3	RETOP	1	2/15-5/31	1/4- 1/2 INCH	45 LB/AC (1.0 LB/1000SF)	90 LB/AC (2 LB/1000SF)	90 LB/AC (2 LB/1000SF)	2 TONS/AC (90 LB/1000SF)
3	COMMON LESPEDEZA	10	2/15-5/31	1/4- 1/2 INCH				
3	CANADIAN WILD RYE	3	2/15-5/31	1/4- 1/2 INCH				
3	DEERTONGUE	20	2/15-5/31	1/4- 1/2 INCH				
6	TALL FESCUE	40	2/15-4/30 8/15-10-31	1/4- 1/2 INCH				
6	WHITE CLOVER	5	8/15-10/31 2-15-4-30	1/4- 1/2 INCH				
6	PERENNIAL RYE	25	8/15-10/31 2-15-4-30	1/4- 1/2 INCH				

* FOR THE PERIOD OF 5/1-8/14 SEE NOTE 1 UNDER TEMP. SEEDING TABLE B-1 FOR USE OF NURSE CROPS.

NOTE: AN ANNUAL RYE SEEDING MIX APPROVED BY BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION & SUSTAINABILITY (EPS) MUST BE USED TO STABILIZE THE AREA DISTURBED WITHIN THE EXISTING FOREST SO THAT THE AREA MAY REVERT BACK TO A NATURAL UNDERSTORY.

TABLE B.2: RECOMMENDED PERMANENT SEEDING MIXTURES BY SITE CONDITION OR PURPOSE

SITE CONDITION OR PURPOSE OF THE PLANTING	RECOMMENDED MIX (SEE TABLE B.3)											
	1	2	3	4	5	6	7	8	9	10	11	12
STEEP SLOPES, ROADSIDES	R	R	R	R	R	R	R	R	R	R	R	R
SAND AND GRAVEL PITS, SANITARY LANDFILLS	R	R	R	R	R	R	R	R	R	R	R	R
SALT-DAMAGED AREAS	A											R
MINE SPOIL, DREDGED MATERIAL, AND SPOIL BANKS	A	R	A	A								
UTILITY RIGHTS-OF-WAY	R	R	R	R	R	R	R	R	R	R	R	R
DIKES AND DAMS	A	A	R	A	R	R	A	R	R	R	R	R
BERMS AND LOW EMBANKMENTS (NOT ON PONDS)	R	R	R	R	R	R	R	R	R	R	R	R
PONDS AND CHANNEL BANKS, STREAMBANKS	R	R	R	R	R	R	R	R	R	R	R	R
GRASSED WATERWAYS, DIVERSIONS, TERRACES, SPILLWAYS	A		A	R	A	R	A	R	R	R	R	R
BOTTOM OF DRAINAGE CHANNELS, SWALES, DETENTION BASINS	R	R	R	R	R	R	R	R	R	R	R	R
FIELD BORDERS, FILTER STRIPS, CONTOUR BUFFER STRIPS	R	R	R	R	R	R	R	R	R	R	R	R
WASTEWATER TREATMENT STRIPS AND AREAS										R	A	
HEAVY USE AREAS (GRASS LOAFING PADDocks FOR LIVESTOCK)										R		
ATHLETIC FIELDS, RESIDENTIAL AND COMMERCIAL LAWNS										A	R	R
RECREATION AREAS										R	R	R

R= RECOMMENDED MIX FOR THIS SITE CONDITION OR PURPOSE
A=ALTERNATIVE MIX, DEPENDING ON SITE CONDITIONS

NOTES:

1/ Seeding Rates: Seeding rates for the warm-season grasses are in pounds of Pure Live Seed (PLS). Actual planting rates must be adjusted to reflect percent seed germination and purity, as tested. Adjustments are usually not needed for the cool-season grasses, legumes, or wildflowers. All legume seeds must be inoculated before planting with the appropriate Rhizobium bacteria. When feasible, hard-seeded legumes should be scarified to improve germination.

2/ Soil Drainage Class (refer to the county soil survey for further information):
E- Excessively Drained; W- Well Drained; MW- Moderately Well Drained; SP- Somewhat Poorly Drained; P- Poorly Drained.

3/ Maintenance Level:

A- Intensive mowing (every 2-4 days), fertilization, lime, insect and weed control, and watering (examples: high maintenance lawns and athletic fields).
B- Frequent mowing (every 4-7 days), occasional fertilization, lime, pest control, and watering (examples: residential, school, and commercial lawns).
C- Periodic mowing (every 7-14 days), occasional fertilization and lime (examples: residential lawns, parks).
D- Infrequent or no mowing, fertilization, or lime after the first year of establishment (examples: wildlife areas, roadsides, steep banks).

4/ Turf-type cultivars of tall fescue and Kentucky bluegrass must be selected based on recommendations of the University of Maryland Cooperative Extension Service, Agronomy Minor 77. Recommendations are as follows:

A. Kentucky Bluegrass-

1. The following Kentucky bluegrass cultivars are suitable for general use, and are also noted for shade tolerance:

America	Country	Quinton Leap
Ascot	Liberty	Shenandoah
Brilliant	Moonlight	SR 2000
Champagne	Regade	Utiqwe
Compact	Princeton 105	

2. The following Kentucky bluegrass cultivars are suitable for general use, and are also noted for tolerance of low maintenance conditions:

Barfuss	Haga	Masoply
Caliber	Livington	Washington
Eagleton	Merit Freedom	Midnight

B. Tall Fescue - The following turf-type cultivars are suitable for general use:

Alamo II	Bullring	Debutante	Good-Ea	Micro DD	Rebel 3D*	Scorpio	Titan 2
Apache II	Chapel Hill	Destiny	Grade	Millettan	Rebel III*	Shenandoah	Tombhawk*
Avant*	Chelula II*	Duke	Guardian	Olympic Gold	Rebel Jr.	Shenandoah II	Trailblazer II*
Avion	Chisok	Dexter*	Heritage	Ozco	Rebel Sentry	Southern Choice*	Twilight II
Bandana	Cochise II	Eldorado*	Horning 5	Pile	Red Coat	SR 8200	Virtus*
Barfuss	Comstock	Empress	Jaguar III	Pile B*	Regiment*	SR 8300	Washington
Barrington	Coyote	Falcons II*	Lancer	Plateland	Rebirth*	Stetson	Wolfpack
Bossan*	Crowdier*	Falcons Petal*	Leprechaun	Pyramid	Reogade	Tarbel	WPEZE
Bossan II	Crowdier II	Genesis	Masterpiece	Rebel 2000	Reserve	TF6	Wyatt

Tall fescue cultivar names that are followed by an asterisk (*) have low endophyte levels (20% or lower, based on seed analysis). To avoid livestock health problems due to endophyte toxicity, use low-endophyte cultivars for critical areas where livestock may be allowed to graze (e.g., heavy use grass loafing paddocks). Please note that endophyte levels in plantings can vary between varieties, between fields of the same variety, and with the time of year. For areas where livestock will not have access, cultivars with higher endophyte levels are desirable because they tend to be more drought tolerant and more resistant to disease and insect damage.

TABLE B.3: SELECTED LIST OF PERMANENT HERBACEOUS SEEDING MIXTURE

MIX	RECOMMENDED CULTIVAR	SEEDING RATE ^{1/}		SOIL DRAINAGE CLASS ^{2/}	MAX HEIGHT (INCH)	MAINT. LEVEL ^{3/}	REMARKS
		LB/AC	1000 FT ²				
WARM-SEASON/COOL SEASON GRASS MIXES							
1. SELECT ONE WARM-SEASON GRASS: Switch Grass (<i>Panicum virgatum</i>) OR Coastal Panic Grass (<i>Panicum amarum</i> var. <i>amarulum</i>) AND ADD: Creeping Red Fescue (<i>Festuca rubra</i> var. <i>rubra</i>) PLUS ONE OF THE FOLLOWING LEGUMES: Partridge Pea (<i>Chamaecrista fasciculata</i>) Bush Clover (<i>Lespedeza capitata</i>) Wild Indigo (<i>Baptisia tinctoria</i>)	Blackwell, Carriage, Cave-in-Rock, or Shelter	10	0.23				All species are native to Maryland. Plant this mix with a regular grass drill.
	Atlantic	10	0.23				Coastal panicgrass is best adapted to Zones 7a and 7b.
	Dawson, Pennlaw, Flyer, Fortess, Ruby, or Salem	15	0.34	E-P	4-7	C-D	Creeping red fescue is a cool-season grass that will provide erosion protection while the warm-season grasses (switchgrass or coastal panicgrass) is becoming established.
	Common	4	0.09				Switchgrass, coastal panicgrass, the "Dawson" variety of creeping red fescue, and partridge pea are moderately salt-tolerant. Do not use bush clover or wild indigo on wet sites.
	Common	2	0.05				
2. Big Bluestem (<i>Andropogon gerardii</i>) Indiangrass (<i>Sorghastrum nutans</i>) Little Bluestem (<i>Schizachyrium scoparium</i>) Creeping Red Fescue (<i>Festuca rubra</i> var. <i>rubra</i>) PLUS ONE OF THE FOLLOWING LEGUMES: Partridge Pea (<i>Chamaecrista fasciculata</i>) Bush Clover (<i>Lespedeza capitata</i>) Wild Indigo (<i>Baptisia tinctoria</i>) Stony Tick-Trefoil (<i>Desmodium canadense</i>)	Niagara or Roentree	6	0.14				All species are native to Maryland.
	Rumsey	6	0.14				The indiagrass and bluestems have fluffy seeds. Plant with a specialized native seed drill.
	Aldous or Blaze	4	0.09				Creeping red fescue is a cool-season grass that will provide erosion protection while the warm-season grasses are becoming established.
	Dawson, Pennlaw, Flyer, Fortess, Ruby, or Salem	15	0.34	E-MW	6-8	C-D	
	Common	4	0.09				
3. SELECT THREE GRASSES: Deertongue (<i>Dichanthelium clandestinum</i>) Sheep Fescue (<i>Festuca ovina</i>) OR Canada Wild Rye (<i>Elymus canadensis</i>) Redtop (<i>Agrostis gigantea</i>) PLUS ONE OF THE FOLLOWING LEGUMES: Common Lespedeza (<i>Lespedeza striata</i>) Korean Lespedeza (<i>Lespedeza stipulacea</i>)	Tioga	20	0.46				Excellent for excessively droughty, low pH (acidic) soils.
	Common or Bighorn	20	0.46				Sheep fescue, Canada wild rye, and reitop are cool-season grasses that will provide erosion protection while the warm-season grass (deertongue) is becoming established.
	Common	3	0.07	E-MW	4-6	C-D	
	Common	1	0.02				
	Common	10	0.23				Common lespedeza (Kobe variety) is more tolerant of low acidity and high manganese concentrations than Korean lespedeza. These lespedezas are reseeding annuals.
4. Deertongue (<i>Dichanthelium clandestinum</i>) Creeping Red Fescue (<i>Festuca rubra</i> var. <i>rubra</i>) OR Canada Wild Rye (<i>Elymus canadensis</i>)	Tioga	15	0.34				
	Dawson, Pennlaw, Flyer, Fortess, Ruby, or Salem Common	20	0.46	W-P	2-3	C-D	Use Virginia wild rye on moist, shady sites.
	Common	5	0.11				Use Canada wild rye on droughty sites.
	Common	5	0.11				
	Common	10	0.23				
COOL SEASON GRASS MIXES							
5. SELECT TWO GRASSES: Creeping Red Fescue (<i>Festuca rubra</i> var. <i>rubra</i>) OR Hard Fescue (<i>Festuca trachyphylla</i>) Perennial Ryegrass (<i>Lolium perenne</i>) OR Redtop (<i>Agrostis gigantea</i>) AND ADD THE FOLLOWING LEGUME: Flatpea (<i>Lathyrus sylvatica</i>)	Dawson, Pennlaw, Flyer, Fortess, Ruby, or Salem	20	0.46				Use creeping red fescue in heavy shade and on moist sites.
	Atila or Aurora	20	0.46				
	Blazer (II), Pennfine	10	0.23	E-SP	2-3	B-D	Perennial ryegrass and reitop will establish more rapidly than either fescue. Redtop tolerates wet sites better than ryegrass.
	Streaker	1	0.02				Flatpea will suppress woody vegetation. It should be planted in the spring, or as a dormant seeding in late fall or winter. It must be incorporated into the soil or covered with mulch. It may not be winter-hardy if planted late summer-fall. Caution: Flatpea can spread aggressively, and can be toxic to livestock.
	Lathro	15	0.34				
6. Tall Fescue (<i>Lolium arundinaceum</i>) formerly <i>Festuca arundinacea</i>) Perennial Ryegrass (<i>Lolium perenne</i>) PLUS ONE OF THE FOLLOWING LEGUMES: Birdsfoot Trefoil (<i>Lotus corniculatus</i>) White Clover (<i>Trifolium repens</i>)	Recommended MD turf-types ^{4/}	40	0.93				
	Blazer (II), Pennfine	25	0.57	W-SP	2-3	C-D	Birdsfoot trefoil is suitable for use only in Zones 5b and 6a.
	Empire, Viking, Norcen, Leo	8	0.18				
	Common	5	0.11				
	Common	15	0.34				
7. Creeping Red Fescue (<i>Festuca rubra</i> var. <i>rubra</i>) Kentucky Bluegrass (<i>Poa pratensis</i>)	Dawson, Pennlaw, Flyer, Fortess, Ruby, or Salem Recommended MD turf-types	60	1.38	W-MD	2-3	C-D	This mix has good shade tolerance.
	Common	15	0.34				
	Common	100	2.3	E-SP	2-3	A-D	Tall fescue produces a dense turf if frequently mowed, but tends to be clumpy if mowed only occasionally. For best results, recommended using a blend of 3 cultivars.
	Common	100	2.3				Use low-endophyte cultivars in areas where livestock may graze.
	Common	60	1.38				
9. SELECT ONE SPECIES OF FESCUE: Tall Fescue (<i>Lolium arundinaceum</i>) (formerly <i>Festuca arundinacea</i>) OR Hard Fescue (<i>Festuca trachyphylla</i>) AND ADD: Kentucky Bluegrass (<i>Poa pratensis</i>) Perennial Ryegrass (<i>Lolium perenne</i>)	Recommended MD turf-types ^{4/}	60	1.38				Good for highly managed athletic fields.
	Atila or Aurora	40	0.92	W-SP	2-3	A-B	Tall fescue is more suitable for compacted, high use areas and on moist sites.
	Recommended MD turf-types ^{4/}	40	0.92				Hard fescue produces finer-textured turf with more shade tolerance.
	Blazer (II), Pennfine	20	0.46				Use tall fescue instead of hard fescue for wastewater treatment strips and areas.
	Common	20	0.46				For best results, recommend using a blend of 3 cultivars each for tall fescue and Kentucky bluegrass.
10. Orchardgrass (<i>Dactylis glomerata</i>) Creeping Red Fescue (<i>Festuca rubra</i> var. <i>rubra</i>) Redtop (<i>Agrostis gigantea</i>) Alsike Clover (<i>Trifolium hybridum</i>) White Clover (<i>Trifolium repens</i>)	Any	25	0.57				Low maintenance mix that is easy to establish.
	Dawson, Pennlaw, Flyer, Fortess, Ruby, or Salem Streaker	10	0.23				
	Common	1	0.02	W-SP	2-3	C-D	Alsike clover can be toxic to horses.
	Common	3	0.07				Omit the clovers if using this mix for wastewater treatment strips and areas.
	Common	3	0.07				
11. Creeping Red Fescue (<i>Festuca rubra</i> var. <i>rubra</i>) Chewings Fescue (<i>Festuca rubra</i> ssp. <i>commutata</i>) Kentucky Bluegrass (<i>Poa pratensis</i>) OPTIONAL ADDITION Rough Bluegrass (<i>Poa trivialis</i>)	Dawson, Pennlaw, Flyer, Fortess, Ruby, or Salem Common	30	0.69				
	Recommended MD turf-types ^{4/}	30	0.69	E-MW	2-3	B-D	
	Common	20	0.46				
	Common	15	0.34				Add rough bluegrass in moist, shady conditions.
	Common	25	0.57				
12. Creeping Red Fescue (<i>Festuca rubra</i> var. <i>rubra</i>) Hard Fescue (<i>Festuca trachyphylla</i>) Sheep Fescue (<i>Festuca ovina</i>) PLUS WILDFLOWER MIX: Black-eyed Susan (<i>Rudbeckia hirta</i>) Lance-leaved Coreopsis (<i>Coreopsis lanceolata</i>) Purple Coneflower (<i>Echinacea purpurea</i>) Partridge Pea (<i>Chamaecrista fasciculata</i>) OR ADD CLOVER MIX: White Clover (<i>Trifolium repens</i>) Red Clover (<i>Trifolium pratense</i>)	Dawson, Pennlaw, Flyer, Fortess, Ruby, or Salem Atila or Aurora	25	0.57				Attractive mix of fine fescues and wildflowers for low maintenance conditions. Once well-established, the grasses may tend to outcompete the wildflowers.
	Common or Bighorn	25	0.57				
	Common	25	0.57				
	Common	2	0.05				Wildflowers are best established by broadcasting and cultipacking on a prepared seedbed. Drilling can be also used, but care must be taken so that seeds are not drilled too deep.
	Common	2	0.05	E-MW	2-3	C-D	Hydroseeding is not recommended for this mix if wildflowers are used. (They have very small seeds.)
13. Aklali Saltgrass (<i>Puccinellia distans</i>) Creeping Red Fescue (<i>Festuca rubra</i> var. <i>rubra</i>) Fowl Meadowgrass (<i>Poa polystris</i>) OPTIONAL ADDITION Creeping Bentgrass (<i>Agrostis stolonifera</i>)	Falls or Salty	20	0.46				This is the recommended mix for saline sites. Saltgrass will persist only under saline conditions.
	Dawson	15	0.34	W-P	2-3	B-D	For best results, only use the "Dawson" variety of creeping red fescue. It is a salt-tolerant variety.
	Common	2	0.05				Add bentgrass for wetter conditions.
	Common	2	0.05				
	Common	2	0.05				

PLANT HARDINESS ZONE: 7A

APPROVED: FOR PUBLIC WATER AND PUBLIC SEWERAGE SYSTEMS

COUNTY HEALTH OFFICER: _____ DATE: _____
HOWARD COUNTY HEALTH DEPARTMENT

ENGINEER'S CERTIFICATE

"I/WE CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD COUNTY SOIL CONSERVATION DISTRICT."

John R. Heinrichs 7/25/14
ENGINEER: JOHN R. HEINRICHS, P.E. #14920 DATE: 7/25/14
PHOENIX ENGINEERING, INC.

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD COUNTY SOIL CONSERVATION DISTRICT."

Thomas Palacorolla 7-25-14
DEVELOPER: THOMAS PALACOROLLA DATE: 7-25-14

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD COUNTY SOIL CONSERVATION DISTRICT

John R. Heinrichs 7/31/14
HOWARD S.C.D. DATE: 7/31/14

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION 8/6/14
Vet Schulz 8/21/14
CHIEF, DIVISION OF LAND DEVELOPMENT
DIRECTOR 8/27/14

7-2014	CHANGED APARTMENTS TO TOWNHOUSE APARTMENTS
Date	No Revision Description

DEVELOPER:

NKC PROPERTIES, LLC
12183 TRIADDELPHIA ROAD
ELLCOTT CITY, MD 21042
410-796-7676

OWNER:

THOMAS PALACOROLLA
12183 TRIADDELPHIA ROAD
ELLCOTT CITY, MD 21042
410-796-7676

PROJECT:

RIVERWATCH
BUILDABLE PARCELS 'A' & 'B'
A RESUBDIVISION OF SHINNAMON
SUBDIVISION LOTS 1 THRU 7 AND PARCELS
420, 421, 422, 620, 623, 624 AND 625
ELKRIDGE, MD 21046
HOWARD COUNTY, MARYLAND

PREPARED BY:

PHOENIX ENGINEERING, INC.
CONSULTING ENGINEERS
1420 JOH AVENUE, SUITE A
BALTIMORE, MARYLAND 21227
(410) 247-8833 FAX 247-9397

AREA:

ELKRIDGE
PARCELS: 420, 421, 422, 623, 624, 625, 620
CENSUS TRACT 6012.01 TAX MAP: 38 GRID 4
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE:

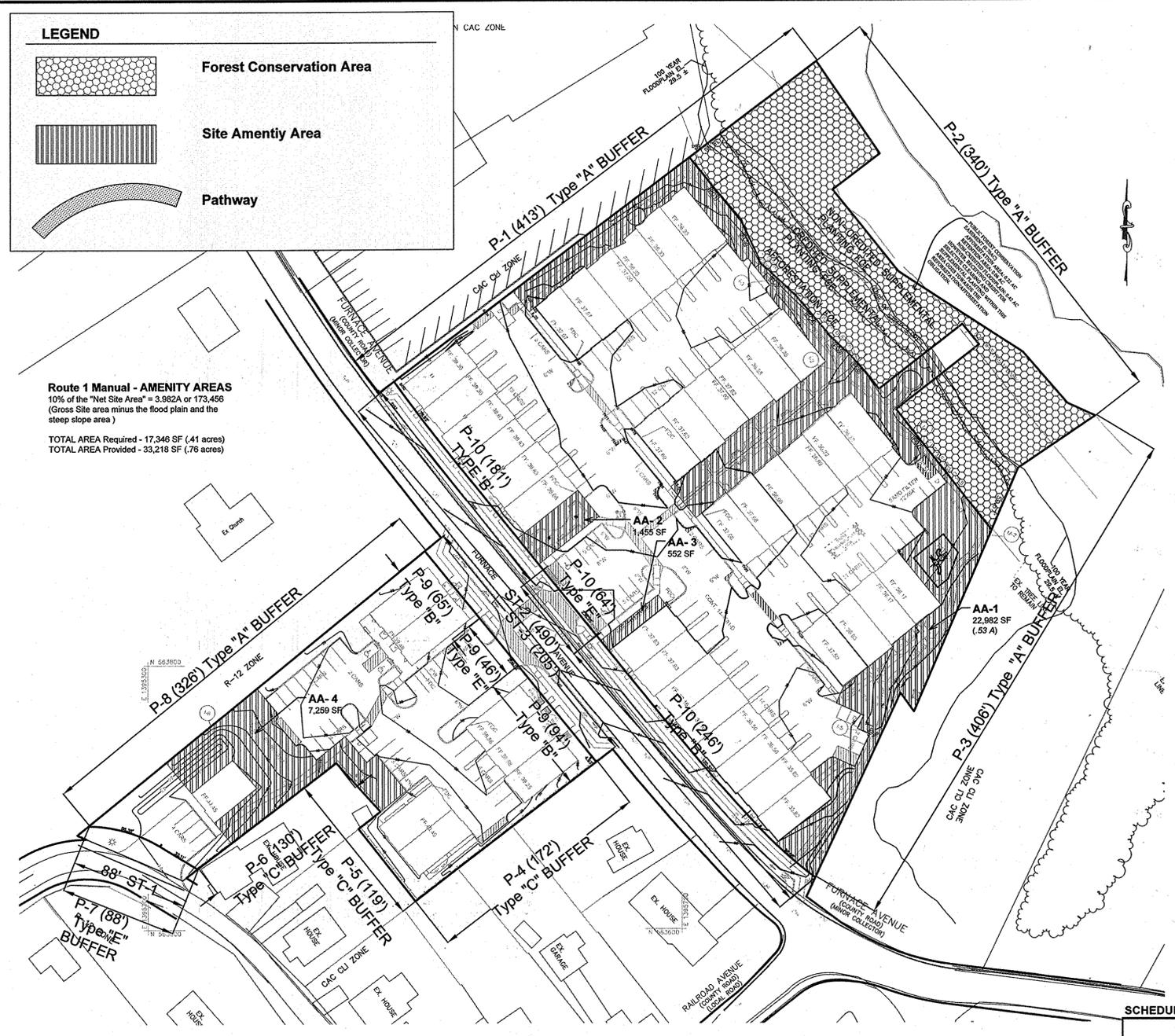
SEDIMENT CONTROL NOTES

Des By:	R.J.W.	Scale:	AS SHOWN	Proj No:	07-041
Drn By:	S.E.W.	Date:	JULY, 2014	Drawn:	de01.dwg
Chk By:	J.R.H.	SP:	08-109		12-B OF 22

SDP 08-109

PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 14920 Exp. Date: 5-12-16

7-25-2014
Date
STATE OF MARYLAND
PROFESSIONAL ENGINEER
John R. Heinrichs
Professional Engr. No. 14920



LEGEND

- Forest Conservation Area
- Site Amenity Area
- Pathway

Route 1 Manual - AMENITY AREAS
 10% of the "Net Site Area" = 3,892A or 173,456
 (Gross Site area minus the flood plain and the steep slope area)
 TOTAL AREA Required - 17,346 SF (41 acres)
 TOTAL AREA Provided - 33,216 SF (76 acres)

SCHEDULE "A" Perimeter Landscape Buffers

Perimeter ID	Landscape Type	Linear Feet of Roadway Frontage/Perimeter	Credit for Existing Vegetation	Credit for Wall, Fence or Berm	Remaining Perimeter Length	Number of Plants Required			Number of Plants Provided			Buffer Requirements	Notes/Comments	
						Shade Trees	Evergreen Trees	Shrubs	Shade Trees	Evergreen Trees	Other (2:1 sub.)			
P-1	Type "A"	413	95	0	318	5	0	0	3	0	4	0	1 shade tree/60 Linear Feet	Credit for Existing Forests and Afforestation Plantings
P-2	Type "A"	340	340	0	0	0	0	0	0	0	0	0	1 shade tree/60 Linear Feet	Credit for Existing Forests (340')
P-3	Type "A"	406	80	0	326	5	0	0	5	0	0	0	1 shade tree/60 Linear Feet	
P-4	Type "C"	172	0	172	0	0	0	0	0	0	0	0	1 shade tree/40 Linear Feet 1 Evergreen Tree/20 Linear Feet	Credit for Proposed Screening Fence (172')
P-5	Type "C"	119	0	119	0	0	0	0	0	0	0	0	1 shade tree/40 Linear Feet 1 Evergreen Tree/20 Linear Feet	Credit for Proposed Screening Fence (119')
P-6	Type "C"	130	0	130	0	0	0	0	0	0	0	0	1 shade tree/40 Linear Feet 1 Evergreen Tree/20 Linear Feet	Credit for Proposed Screening Fence (130')
P-7	Type "B"	88	0	0	88	1	2	0	1	3	0	0	1 shade tree/60 Linear Feet 1 Evergreen Tree/40 Linear Feet	Note existing ornamental fence along this Property Perimeter
P-8	Type "A"	326	0	0	326	6	0	0	12	0	0	0	1 shade tree/60 Linear Feet	Alternative Compliance - CAC Zone and Streetscape per Rt-1 Manual. Trees Relocated to P-10, IL and PL
P-9	Type "B"	159	0	0	159	3	4	0	2	0	0	0	1 shade tree/50 Linear Feet 1 Evergreen Tree/40 Linear Feet	Credit for Proposed Site Walls
P-9	Type "E"	46	0	15	31	1	0	8	1	0	0	4	1 shade tree/40 Linear Feet 1 Shrub/4 Linear Feet	Alternative Compliance - CAC Zone and Streetscape per Rt-1 Manual. Trees Relocated to P-10, IL and PL
P-10	Type "B"	427	0	0	427	9	11	0	11	0	0	10	1 shade tree/50 Linear Feet 1 Evergreen Tree/40 Linear Feet	Credit for Proposed Site Walls
P-10	Type "E"	64	0	30	34	1	0	8	2	0	0	8	1 shade tree/40 Linear Feet 1 Shrub/4 Linear Feet	
TOTALS:						31	17	16	37	3	4	22		

PLANT LIST

Quan	Key	Botanical Name	Common Name	Size	Remarks and Typical Spacing
SHADE TREES					
18	LP	Platanus acerifolia 'Bloodgood'	Bloodgood London Planetree	2.5" cal	Spaced as shown on the Plan
32	HL	Gleditsia tricanthos inermis 'Shademaster'	Shademaster Honeylocust	2.5" cal	Spaced as shown on the Plan
1	HL-I	Gleditsia tricanthos inermis 'Imperial'	Imperial Honeylocust	2.5" cal	Spaced as shown on the Plan
16	RB	Betula nigra 'Duraheat'	Duraheat River Birch	2.5" cal	Spaced as shown on the Plan
45	CO	Quercus palustris 'Green Pillar'	Green Pillar Columnar Oak	2.5" cal	Spaced as shown on the Plan
ORNAMENTAL (SMALL) TREES					
3	AMC	Amelanchier grandiflora 'Autumn Brilliance'	Autumn Brilliance Serviceberry	8'-10' ht	Spaced as shown on the Plan
4	AG	Acer griseum	Paperbark Maple	1.5 - 2" cal	SINGLE STEM Spaced as shown on the Plan
19	CM	Lagerstroemia indica 'Natchez'	Natchez Crape Myrtle (white)	8'-10' ht	Spaced as shown on the Plan
EVERGREEN TREES					
3	GGA	Thuja plicata 'Green Giant'	Green Giant Arborvitae	8' ht	Spaced as shown on the Plan
SHRUBS					
165	SHRUBS	Euonymus kiautschowicus 'Manhattan'	Manhattan Euonymus	2.5" ht	Spaced as shown on the Plan

NOTE: Additional small-scale ground level landscaping (i.e. shrubs groundcover/flowers) to be installed by Contractor

Street Tree Schedule

Perimeter ID	Street Name	Length of Street	Street Tree Requirements	Shade Trees Required	Shade Trees Provided	Notes
ST-1	Railroad Ave.	87'	Med to Large Tree Min 40' OC	2	2	
ST-2	Furnace Ave.	490'	Med to Large Tree Min 40' OC	12	12	
ST-3	Furnace Ave.	205'	Small to Med. Tree Min 30' CO	7	7	Within BGE "Green Zone" - Small Trees Required
TOTALS:				21	21	

SCHEDULE B - Internal Parking Lot Landscape

Condition	Required Parking Spaces	Adjustments to Parking Counts	Number of Spaces	Parking Island Requirements	Parking Islands Required	Shade Trees Required	Shade Trees Provided	Notes
Proposed Residential Parking Spaces	194	157	37	1 Island/ 10 Spaces	4	4	8	Number of proposed spaces do not include 80 proposed (residential) parking spaces located in garages and the 77 proposed (residential) parking spaces located outside garages (157)
Proposed Non-Residential Parking Spaces	28	0	28	1 Island/ 20 Spaces	2	2	4	
TOTAL:				222	94	65	12	

SCHEDULE C - Residential Development Internal Landscaping

Number of Apartment Dwelling Units	84
Number of PU Required (1:DU SFA; 1:3 DU APTS)	28 Plant Units
Number of Trees Provided	42 - 42 PU 22 - 11 PU 143 - 14.3 PU 67.3 PU TOTAL

NOTE: Additional "Internal Landscaping" provided as an Alternative Compliance to offset the buffer requirements that were not consistent with the design intent.

Perimeter Buffer and Amenity Area ID Plan

Scale 1" = 50'-0"

LANDSCAPE PLAN GENERAL NOTES
 The owner, tenants and/or their agents shall be responsible for maintenance of the required landscaping including plant materials, berms, fences and walls. All plant materials shall be maintained in good growing condition, and when necessary replaced with new materials to insure continued compliance with applicable regulations. All other landscaping shall be permanently maintained in good condition and when necessary, repaired or replaced.
 At the time of plant installation, all shrubs and trees listed and approved on the Landscape Plan, shall comply with the proper height requirements in accordance with the Howard County Landscape Manual. In addition, no substitutions or relocations of the required plantings may be made without prior review and approval from the Department of Planning and Zoning. Any deviation from the Approved Landscape Plan may result in denial or delay in the release of the landscape surety until such time as all required materials are planted and/or revisions are made to the applicable plans.
 This plan has been prepared in accordance with Section 16.124 of the Howard County Code and the Landscape Manual. Landscape surety in the amount of \$45,530.00 will be submitted with the DPW, Owners Agreement (See adjacent Landscape Surety Calculations).

LANDSCAPE SURETY CALCULATIONS

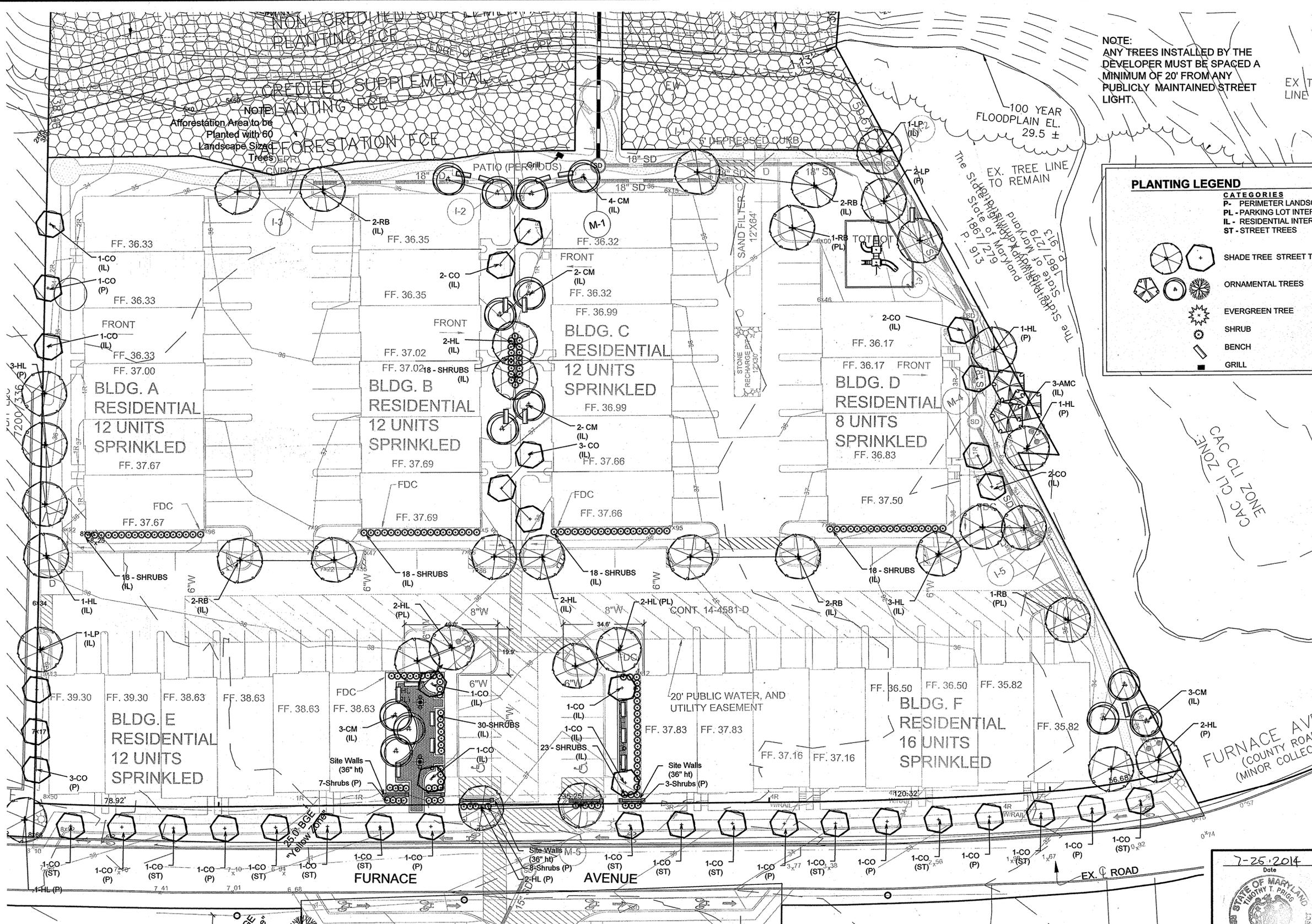
Schedule A			
Shade Trees	37 x	\$300.00 =	\$11,100.00
Evergreen/Other Trees	7 x	\$150.00 =	\$1,050.00
Shrubs	22 x	\$30.00 =	\$660.00
Fence	434 x	\$10.00 =	\$4,340.00
Site Wall	75 x	\$20.00 =	\$1,500.00
TOTAL Schedule A			
\$18,650.00			
Schedule B			
Shade Trees	12 x	\$300.00 =	\$3,600.00
TOTAL Schedule B			
\$3,600.00			
Street Tree Schedule			
Shade Trees	21 x	\$300.00 =	\$6,300.00
TOTAL Street Tree Schedule			
\$6,300.00			
Schedule C			
Shade Trees	42 x	\$300.00 =	\$12,600.00
Ornamental Trees	22 x	\$150.00 =	\$3,300.00
Shrubs	143 x	\$30.00 =	\$4,290.00
TOTAL Schedule C			
\$20,190.00			
TOTAL Landscape Surety for Project:			
\$48,740.00			

Developers/Builders Certificate

I/We certify that the landscape shown on this plan will be done according to the plan, Section 16.124 of the Howard County Code and the Howard County Landscape Manual. I/We further certify that upon completion a Letter of Landscape Installation, accompanied by an executed one year guarantee of plant materials, will be submitted to the Department of Planning and Zoning.

Jeffery Kirby 7-25-14
 JEFFERY KIRBY DATE

7-2014	3	CHANGED APARTMENTS TO TOWNHOUSE APARTMENTS
Date	No	Revision Description
APPROVED: DEPARTMENT OF PLANNING AND ZONING		
<i>[Signature]</i>		8/6/14 DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION		J.R. 8/27/14 DATE
<i>[Signature]</i>		8/23/14 DATE
CHIEF, DIVISION OF LAND DEVELOPMENT		
DIRECTOR		
DEVELOPER:		
NKC PROPERTIES, LLC 12183 TRIADPHIA ROAD ELLCOTT CITY, MD 21042 410-796-7676		
OWNER:		
THOMAS PALACOROLLA 12183 TRIADPHIA ROAD ELLCOTT CITY, MD 21042 410-796-7676		
PROJECT:		
RIVERWATCH BUILDABLE PARCELS 'A' & 'B' A RESUBDIVISION OF SHINNAMON SUBDIVISION LOTS 1 THRU 7 AND PARCELS 420, 421, 422, 620, 623, 624 AND 625 ELKRIDGE, MD 21046 HOWARD COUNTY, MARYLAND		
PREPARED BY:		
<i>[Signature]</i> PHOENIX ENGINEERING, INC. CONSULTING ENGINEERS 1420 JOH AVENUE, SUITE A BALTIMORE, MARYLAND 21227 (410) 247-8833 FAX 247-9397		
AREA:		
PARCELS: 420, 421, 422, 623, 624, 625, 620 CENSUS TRACT 6012.01 TAX MAP: 38 GRID 4 1ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND		
TITLE:		
LANDSCAPING PLAN		
Des By: R.J.W.	Scale: AS NOTED	Proj No: 07-041
Des By: S.E.W.	Date: DEC. 11, 2008	Drawing: LP01.dwg
Des By: J.R.H.	SDP: 08-109	13 OF 22



NOTE:
ANY TREES INSTALLED BY THE DEVELOPER MUST BE SPACED A MINIMUM OF 20' FROM ANY PUBLICLY MAINTAINED STREET LIGHT.

PLANTING LEGEND

CATEGORIES
 P - PERIMETER LANDSCAPE BUFFERS (SCHEDULE "A")
 PL - PARKING LOT INTERNAL LANDSCAPING (SCHEDULE "B")
 IL - RESIDENTIAL INTERNAL LANDSCAPING (SCHEDULE "C")
 ST - STREET TREES

SHADE TREE STREET TREE
 ORNAMENTAL TREES
 EVERGREEN TREE
 SHRUB
 BENCH
 GRILL

7-2014	3	CHANGED APARTMENTS TO TOWNHOUSE APARTMENTS
Date	No	Revision Description
APPROVED: DEPARTMENT OF PLANNING AND ZONING		
CHIEF, DEVELOPMENT ENGINEERING DIVISION		8/6/14 DATE
CHIEF, DIVISION OF LAND DEVELOPMENT		8/27/14 DATE
DIRECTOR		8/22/14 DATE

DEVELOPER:
NKC PROPERTIES, LLC
12183 TRIADDELPHIA ROAD
ELLCOTT CITY, MD 21042
410-796-7676

OWNER:
THOMAS PALACOROLLA
12183 TRIADDELPHIA ROAD
ELLCOTT CITY, MD 21042
410-796-7676

PROJECT:
RIVERWATCH
BUILDABLE PARCELS 'A' & 'B'
A RESUBDIVISION OF SHINNAMON
SUBDIVISION LOTS 1 THRU 7 AND PARCELS
420, 421, 422, 620, 623, 624 AND 625
ELKRIDGE, MD 21046
HOWARD COUNTY, MARYLAND

PREPARED BY:
PHOENIX ENGINEERING, INC.
CONSULTING ENGINEERS
1420 JOH AVENUE, SUITE A
BALTIMORE, MARYLAND 21227
(410) 247-8833 FAX 247-9397

AREA:
ELKRIDGE
PARCELS: 420, 421, 422, 623, 624, 625, 620
CENSUS TRACT 6012.01 TAX MAP: 38 GRID 4
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE:
LANDSCAPING PLAN

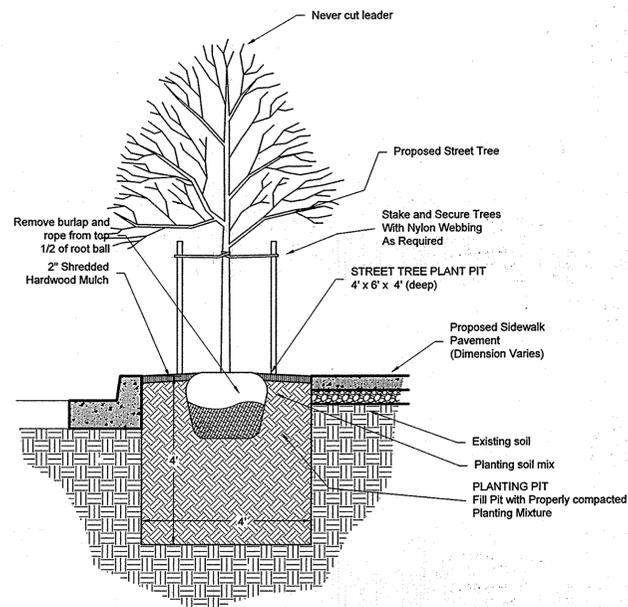
Des By: TTP	Scale: AS NOTED	Proj No: 07-041
Drn By: TTP	Date: DEC. 11, 2008	Drawing: LP01.dwg
Chk By: J.R.H	SDP: 08-109	15 OF 22

7-25-2014 Date

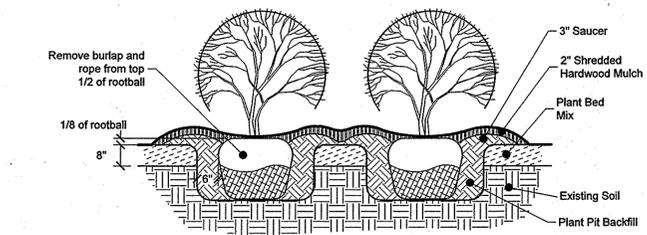
Timothy T. Prigg
RLA No. 1000

Landscape Plan ~ North Side of Furnace Ave

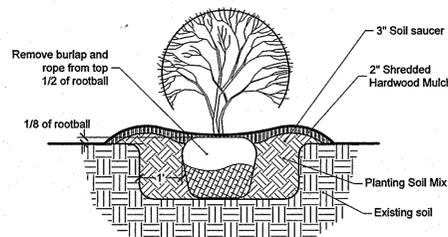
Scale 1"= 20'-0"



① Street Tree Planting
Scale 1/2" = 1'-0"

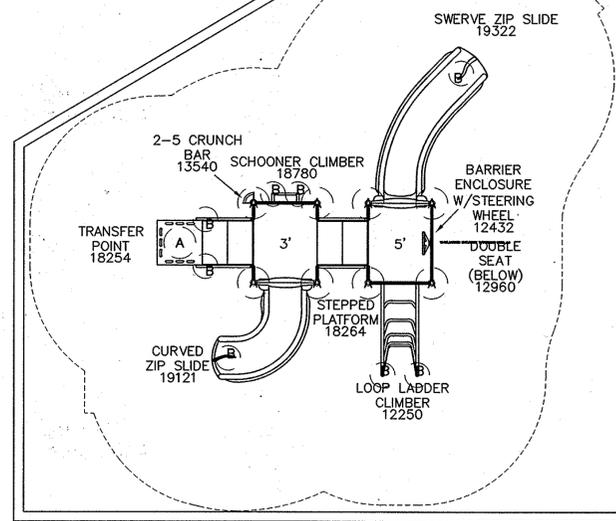


③ Shrub Bed Planting
Scale 1/2" = 1'-0"



④ Shrub Planting
Scale 1/2" = 1'-0"

GAME TIME
19616 - CATALINA
(OR APPROVED ALTERNATIVE)

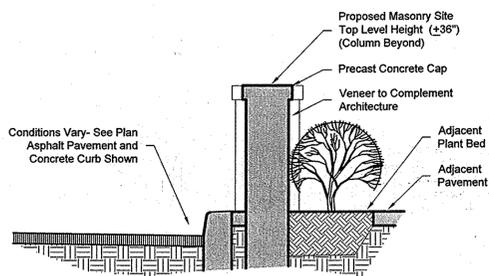


FOOTINGS TABLE			
TYPE	DIAMETER/SIDE	DEPTH	QTY.
A	1'-6" [45.72cm]	2'-6" [76.20cm]	9
B	1'-2" [35.56cm]	2'-6" [76.20cm]	8

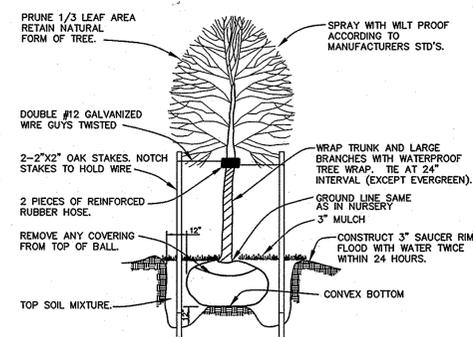
NOTE: SIMILAR DESIGNS MAY BE USED ONLY AFTER RECEIVING ENGINEER'S APPROVAL

NOTE: ON NON-LETTERED HOLES, TO ENSURE CONCRETE REQUIREMENTS PLEASE REFER TO EACH COMPONENTS INSTALLATION SHEETS.

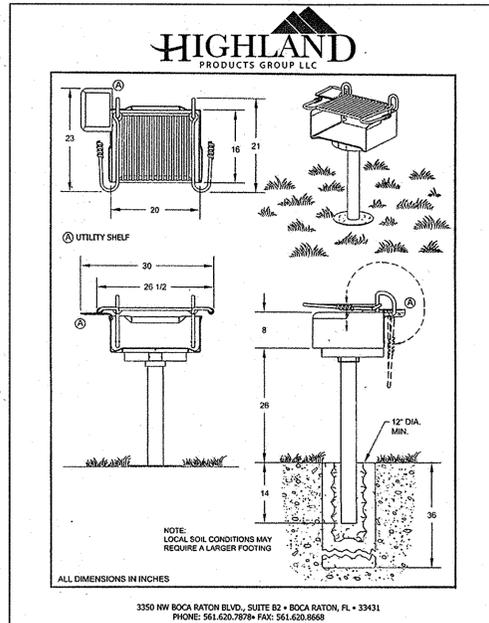
⑦ Proposed "Tot-Lot" Structure
Scale 1/4" = 1'-0"



② Site Wall Parking Screening Section
Scale 1/2" = 1'-0"



⑤ Tree Planting
Not to Scale



⑥ Amenity Area Furnishings
Not to Scale

NOTE: SIMILAR DESIGNS MAY BE USED ONLY AFTER RECEIVING ENGINEER'S APPROVAL

7-2014	3	CHANGED APARTMENTS TO TOWNHOUSE APARTMENTS
Date	No	Revision Description
APPROVED: DEPARTMENT OF PLANNING AND ZONING		
CHIEF, DEVELOPMENT ENGINEERING DIVISION		8/6/14 DATE
CHIEF, DIVISION OF LAND DEVELOPMENT		8/27/14 DATE
DIRECTOR		8/23/14 DATE
DEVELOPER:		
NKC PROPERTIES, LLC 12183 TRIADDELPHIA ROAD ELLCOTT CITY, MD 21042 410-796-7676		
OWNER:		
THOMAS PALACOROLLA 12183 TRIADDELPHIA ROAD ELLCOTT CITY, MD 21042 410-796-7676		
PROJECT:		
RIVERWATCH BUILDABLE PARCELS 'A' & 'B' A RESUBDIVISION OF SHINNAMON SUBDIVISION LOTS 1 THRU 7 AND PARCELS 420, 421, 422, 620, 623, 624 AND 625 ELKRIDGE, MD 21046 HOWARD COUNTY, MARYLAND		
PREPARED BY:		
PHOENIX ENGINEERING, INC. CONSULTING ENGINEERS 1420 JOH AVENUE, SUITE A BALTIMORE, MARYLAND 21227 (410) 247-8833 FAX 247-9397		
AREA:		
ELKRIDGE PARCELS: 420, 421, 422, 623, 624, 625, 620 CENSUS TRACT 6012.01 TAX MAP: 38 GRID 4 1ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND		
TITLE:		
LANDSCAPING DETAILS		
Des By: TTP	Scale: AS NOTED	Proj No: 07-041
Drn By: TTP	Date: DEC. 11, 2008	Drawing: LP01.dwg
Chk By: J.R.H	SDP: 08-109	16 OF 22

7-25-2014
Date

Timothy T. Prigg
RLA No. 1000



Plant Community Analysis in Net Tract Area									
Key	Community	Area (Ac)	Soil Types	Forest Cover By Soil Type	Woodland Suitability	Existing Vegetation	Diameter Range	Age	General Conditions
F-1	Forest	0.07	Cs, EnA	Oak-Maple	4,30	Invasive*	1-16"	<20	Poor*
F-2	Forest(Floodplain)	0.43	Cs, EnA	Oak-Maple	4,30	Invasive*	1-16"	<20	Poor*
L-1	Non Agricultural	2.77	EnA	Oak-Maple	30	Paved	NA	NA	NA
L-2	Non Agricultural	1.54	EnA, EnB2, C1C3	Oak-Maple	17,30	Lawn	NA	NA	NA

*See FSD Notes. Forest Condition is poor due to invasive species

Specimen Trees				Soils			
ID No.	Species	Diameter	Condition	Future Status	Symbol	Name	Characteristics
ST-1	Silver Maple	37"	Good	Remove	EnA	Elsinboro loam 0-3% slope	hard gravely sandy loam
ST-2	Norway Maple	34"	Good	Remove	EnB2	Elsinboro loam 3-8% slope	hard gravely sandy loam
ST-3	Silver Maple	34"	Good	Remove			
ST-4	Silver Maple	35"	Good	Remove			
ST-5	Black Locust	32"	Good	Remove			

Source: USDA Howard County Soil Survey

FOREST STAND DELINEATION NARRATIVE:
 THE SITE IS 4.82 ACRES, OF WHICH 0.43 ACRES IS WITHIN THE FLOOD PLAIN OF THE PATAPSCO RIVER. CURRENT LAND USE IS MPD MIXED USE AND IS WITHIN THE CAC-CL1 R1 REVITALIZATION. THE SURROUNDING AREA INCLUDES MIXED-USE COMMERCIAL AND RESIDENTIAL DEVELOPMENT AS WELL AS OPEN SPACE ALONG THE PATAPSCO RIVER. THE PATAPSCO STATE PARK IS ADJACENT TO THE SITE, ACROSS THE RIVER TO THE NORTH.

THE FIELD DATA FOR THIS FSD WAS COLLECTED ON MAY 8, 2008. ALL TREES WERE IN FULL FOLIAGE TO PROVIDE FIELD ESTIMATES OF CANOPY COVER, TREE CONDITION AND SPECIES IDENTIFICATION. BECAUSE OF THE SMALL SITE AREA (4.82 ACRES), A COMPLETE INVENTORY OF ALL INDIVIDUAL LANDSCAPE TREES AND FOREST AREA CHARACTERISTICS WAS RECORDED.

SOILS ON THIS SITE ARE PREDOMINATELY ELSINBORO LOAM. THERE ARE NO SIGNIFICANT SOIL CHARACTERISTICS OR LIMITATIONS ON THE SITE. WOODLAND SUITABILITY IS GOOD IN MOST AREAS AS INDICATED BY A SITE INDEX FOR OAK OF 75-84 (REFERENCE: USDA HOWARD COUNTY SOIL SURVEY).

THE SITE HAS ONE FOREST STAND IN THE PATAPSCO RIVER FLOODPLAIN (F-2) AND ADJACENT STEEP SLOPE (F-1). FOREST SOILS IN UNDISTURBED AREAS ARE GOOD OAK SITE INDEX (75-84). THE FOREST STAND IS AN OPEN CANOPY (<2% CANOPY CLOSURE) MIX OF INVASIVE AND EARLY SUCCESSION TREE SPECIES. OVERSTORY TREE SPECIES INCLUDE: NORWAY MAPLE, ALANTHUS, RED MAPLE, SYCAMORE, BLACK LOCUST AND BOX ELDER. AN UNDERSTORY STRUCTURE IS ABSENT. DIAMETER SIZE CLASS IS 1-12 INCHES AND BASAL AREA IS <20 SQ FT/ACRE. NATURAL TREE REGENERATION AND GROUND COVER IS DOMINATED BY INVASIVE AND NON-NATIVE SPECIES INCLUDING NORWAY MAPLE, ALANTHUS, ENGLISH IVY, POISON IVY AND HONEY SUCKLE. THE OVERALL STRUCTURE AND COMPOSITION OF THIS FOREST STAND IS POOR.

WILDLIFE HABITAT VALUE FOR SMALL MAMMALS AND BIRDS WITHIN THIS EARLY SUCCESSION FOREST STAND IS GOOD DUE TO THE OPEN CANOPY AND ADJACENT RIVER CORRIDOR AND PARK LAND. NO WILDLIFE WERE OBSERVED. WILDLIFE HABITAT IS LIMITED BY EXISTING ADJACENT DEVELOPMENT AND MAJOR HIGHWAYS.

THERE ARE 5 TREES ON THE SITE THAT MEET THE 30" DIAMETER SPECIMEN TREE DEFINITION. NO TREES ARE SIGNIFICANT IN TERMS OF SPECIES, QUALITY, OR AS A STATE CHAMPION CANDIDATE.

- FSD NOTES:**
1. THERE ARE EXISTING BUILDINGS, PAVED AREAS AND OTHER IMPROVEMENTS ON THE SITE.
 2. CURRENT LAND USE CATEGORY IS MPD MIXED USE.
 3. EXISTING LAND USES ON THE SITE ARE COMMERCIAL AND RESIDENTIAL.
 4. ADJACENT LAND USES INCLUDE COMMERCIAL AND RESIDENTIAL DEVELOPMENT AND OPEN SPACE.
 5. THE SITE IS IN THE LOWER PATAPSCO RIVER WATERSHED.
 6. THE SITE INCLUDES 0.43 AC WITHIN THE FLOODPLAIN OF THE PATAPSCO RIVER.
 7. STEEP SLOPES (>25%) ARE PRESENT ALONG THE NORTH SIDE OF THE SITE.
 8. NO GEOLOGICAL FORMATIONS ARE PRESENT ON THE SITE.
 9. NO HISTORICAL OR CULTURAL FEATURES WERE OBSERVED ON THE SITE.
 10. NO RARE, THREATENED, OR ENDANGERED PLANT SPECIES WERE OBSERVED ON THE SITE. DNR VERIFICATION RECEIVED 5/29/08.
 11. NO CRITICAL WILDLIFE HABITATS WERE OBSERVED ON THE SITE.
 12. NO INTERMITTENT OR PERENNIAL STREAMS ARE ON THE SITE OUTSIDE OF THE PATAPSCO RIVER FLOODPLAIN.
 13. NO TIDAL OR NON-TIDAL WETLANDS ARE ON THE SITE OUTSIDE OF THE PATAPSCO RIVER FLOODPLAIN.

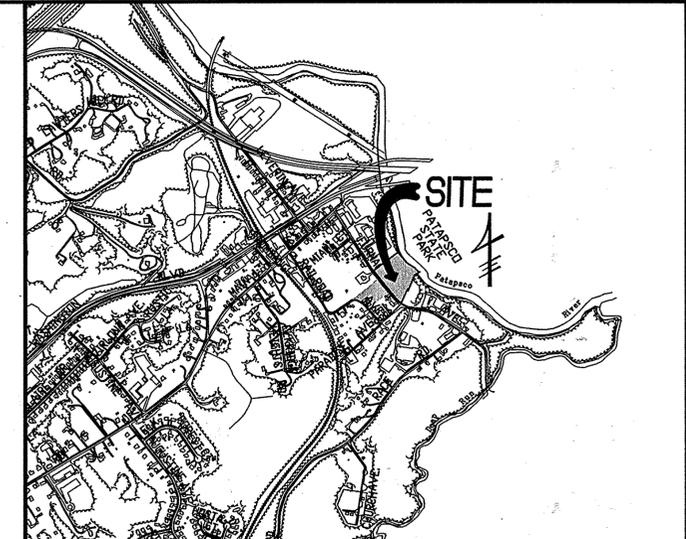
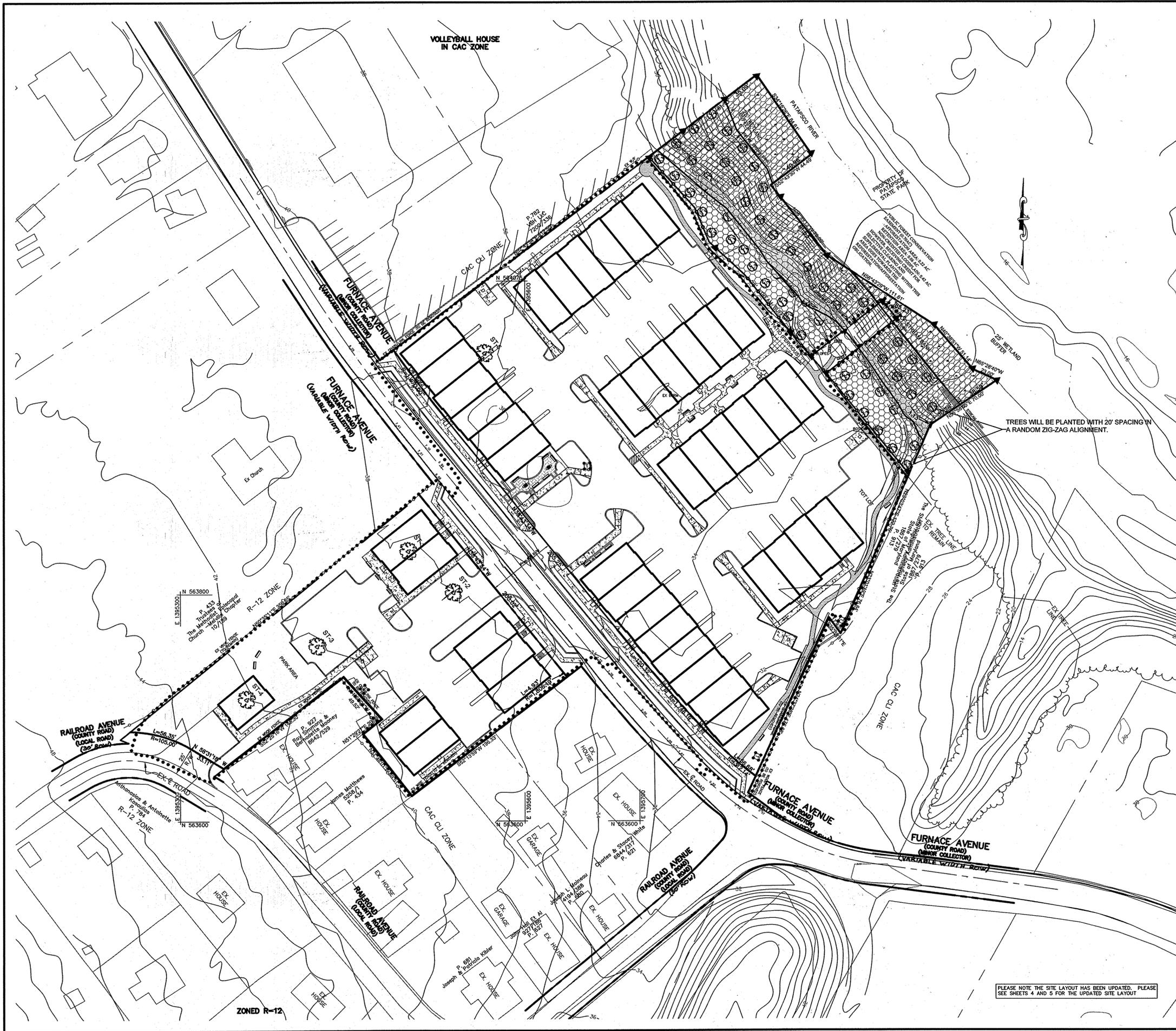
LEGEND

- FOREST EDGE
- EnA SOIL
- EnB2 SOIL
- F-1 FLOODPLAIN BOUNDARY
- F-1 PLANT COMMUNITY TYPE
- ST-1 SPECIMEN TREE
- STEEL SLOPES (GREATER THAN 25%)

PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional forester under the laws of the State of Maryland.
 License No. 155 Exp. Date: 5-12-10

Date: 5/1/09
 JAMES H. HIMEL
 Professional Forester No. 155

Date	No	Revision Description
APPROVED: DEPARTMENT OF PLANNING AND ZONING		
		<i>John J. ...</i> 9/17/09
		CHIEF, DEVELOPMENT ENGINEERING DIVISION
		<i>Cinda ...</i> 10/20/09
		CHIEF, DIVISION OF LAND DEVELOPMENT
		<i>Mark ...</i> 10/22/09
		DIRECTOR
DEVELOPER:		
NKC, LLC 12183 TRIDELPHIA ROAD ELLCOTT CITY, MD 21042 410-796-7676		
OWNER:		
THOMAS PALACOROLLA 12183 TRIDELPHIA ROAD ELLCOTT CITY, MD 21042 410-796-7676		
PROJECT:		
RIVERWATCH BUILDABLE PARCELS 'A' & 'B' A RESUBDIVISION OF SHINNARON SUBDIVISION LOTS 1 THRU 7 AND PARCELS 420, 421, 422, 620, 623, 624 AND 625 ELKRIDGE, MD 21046 HOWARD COUNTY, MARYLAND		
PREPARED BY:		
PHOENIX ENGINEERING, INC. CONSULTING ENGINEERS 1420 JOH AVENUE, SUITE A BALTIMORE, MARYLAND 21227 (410) 247-8833 FAX 247-9397		
PROJECT LOCATION:		
RIVERWATCH GRID: 4 PARCELS: 420, 421, 422, 623, 624, 625, 620 CENSUS TRACT 6012.01 1 ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND		
TITLE:		
FOREST STAND DELINEATION		
Des By:	J.R.H.	Scale: 1"=40'
Drawn By:	S.E.W.	Date: DECEMBER, 2008
Proj No:		07-041
Checked By:	J.R.H.	SDP 08-109
		17 OF 22



VICINITY MAP
SCALE: 1"=1000'

- LEGEND**
- CREDITED FOREST RETENTION AREA (0.06 AC.)
 - FOREST EDGE
 - FLOODPLAIN BOUNDARY
 - LIMIT OF DISTURBANCE
 - FOREST CONSERVATION EASEMENT
 - 100 YEAR FLOODPLAIN EASEMENT
 - 2 1/2" MIN. CAL. TREE PLANTING LOCATIONS
 - TREE PROTECTION ORANGE MESH FENCE
 - FOREST RETENTION SIGNS
 - ST-1
 - SPECIMEN TREE

7-2014		CHANGED APARTMENTS TO TOWNHOUSE APARTMENTS
Date	No	Revision Description
APPROVED: DEPARTMENT OF PLANNING AND ZONING		
CHIEF, DEVELOPMENT ENGINEERING DIVISION		8/6/14
CHIEF, DIVISION OF LAND DEVELOPMENT		8/27/14
DIRECTOR		8/27/14

PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 14920 Exp. Date: 5-12-16

7-25-2014
Date

JOHN R. HEINRICHS
Professional Engr. No. 14920

PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional forester under the laws of the State of Maryland. License No. 155 Exp. Date: 5-12-10

5/1/09
Date

JAMES H. HIMEL
Professional Forester No. 155

DEVELOPER:
NKC, LLC
12183 TRIDELPHIA ROAD
ELLCOTT CITY, MD 21042
410-796-7876

OWNER:
THOMAS PALACOROLLA
12183 TRIDELPHIA ROAD
ELLCOTT CITY, MD 21042
410-796-7876

PROJECT: **RIVERWATCH**
BUILDABLE PARCELS 'A' & 'B'
A RESUBDIVISION OF SHINNAMON
SUBDIVISION LOTS 1 THRU 7 AND PARCELS
420, 421, 422, 620, 623, 624 AND 625
ELKRIDGE, MD 21046
HOWARD COUNTY, MARYLAND

PREPARED BY:
PHOENIX ENGINEERING, INC.
CONSULTING ENGINEERS
1420 JOH AVENUE, SUITE A
BALTIMORE, MARYLAND 21221
(410) 247-8833 FAX 247-9397

PROJECT LOCATION: RIVERWATCH
TAX MAP 38 GRID: 4
PARCELS: 420, 421, 422, 623, 624, 625, 620
CENSUS TRACT 6012.01
1 ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: **FOREST CONSERVATION PLAN AND PLANTING DIAGRAM**

Des By: J.R.H.	Scale: 1"=40'	Proj No: 07-041
Drn By: S.E.W.	Date: JULY, 2014	Drawing: FC01.dwg
chk By: J.R.H.	SDP 08-109	18 OF 22

Forest Conservation Plan Narrative:

The objective of the proposed Forest Conservation Plan is to provide on-site planting and selective clearing & supplemental planting to enhance and protect the adjacent 100 year flood plain and stream buffer area along the north edge of this property. This plan will also enhance forest cover on the steep slopes in this area, remove invasive plant species and enlarge the forest corridor for wildlife movement along the Patuxent River and the adjacent Patuxent River State Park.

This is a unique project using Selective Clearing & Supplemental Planting within a credited forest retention area and non-credited forest retention area within a flood plain to enhance a forested stream buffer and satisfy the forest conservation obligation of the proposed project.

The total Forest Conservation Obligation is 0.67 Acres. A Public Forest Conservation Easement (FCE) area of 0.70 Acres will be established on-site. This FCE consists of the following three areas:

- 1) Afforestation Area minus SWM outfall: 0.24 - 0.02 = 0.22Ac
- 2) Forest Retention Area minus SWM outfall: 0.07 - 0.01 = 0.06Ac
- 3) Non-credited floodplain area minus SWM outfall: 0.43 - 0.01 = 0.42Ac

The total Reforestation/Afforestation requirement for this site is 0.61 Acres. A total of 61 2" caliper trees will be planted on site to meet this requirement. This Plan includes the following planting areas:

- 1) Afforestation (0.22Ac)
- 2) Retention with Selective Clearing and Supplemental Planting (0.06 Ac)
- 3) Selective Clearing & Supplemental Planting inside the floodplain (0.42 Ac)

The trees planted on this site will include at least 5 different species that may include: Red Maple, Sycamore, Swamp White Oak, River Birch, Tulip Poplar, Red Bud, Dogwood, Pin oak, Sweet gum, Black gum and American holly or other available tree species indigenous to the area. Site preparation work in the existing forest stand to receive supplemental planting will include felling or girdling of invasive trees (Ailanthus and Norway maple) and removal of invasive plant species (English ivy, Poison ivy) and other nuisance vegetation.

Forest Conservation Easement:

1. A Forest Conservation Easement (FCE) of 0.70 Acres is proposed for this site to satisfy the total forest conservation obligation of 0.67 Acres. The proposed FCE includes the application of selective clearing and supplemental planting within a credited forest retention area and non-credited forest retention area within a flood plain. The FCE will consist of the following three areas:

- a) Afforestation: 0.22Ac
- b) Retention: 0.06 Ac
- c) Non-credited floodplain: 0.42 Ac

2. The Forest Conservation Easement has been established to fulfill the requirements of Section 16.1200 of the Howard County Code and the Forest Conservation Act. No clearing, grading, or construction is permitted within the Forest Conservation Easement. However, forest management practices as defined in the Deed of Forest Conservation Easement are allowed.

3. Owner reserves unto itself, its successors and assigns, all easements shown on this plan for forest conservation (designated as "Forest Conservation Easement Area"), located in and on the property. Any conveyances of the aforesaid property shall be subject to the easement herein reserved, whether or not expressly stated in the deed conveying said property.

4. Owner shall execute and deliver a deed of easement to Howard County with a metes and bounds description of the Forest Conservation Easement Area and these metes and bounds shall be included in the record plat. Upon completion of the owner's obligations under the forest conservation installation and maintenance agreement executed by the owner and the County, and the release of owner's surety posted with said agreement, the County shall accept the easements and record the deed of easement in the Land Records of Howard County.

5. The DPW Real Estate Services (RES) Division will prepare a Deed of Forest Conservation Easement which will be recorded by RES after the recording of the Final Subdivision Plat for this project. RES will also prepare the Forest Conservation Installation and Maintenance Agreement which must be executed prior to signature approval of the SDP. If you have any questions about these documents, please contact RES at (410) 313-2330.

FCP Surety Requirements:

1. A Forest Conservation Agreement including surety for the Afforestation, Retention, and Selective Clearing & Supplemental Planting required. Forest Conservation Agreement forms may be obtained from the Howard County Real Estates Services Division.

2. Forest Conservation surety amount for the 0.67 Acre Total Forest Conservation Obligation will be as follows:

- a) Afforestation (0.22Ac): 9,383 sq ft x \$0.50 / sq ft = \$4,792
- b) Retention (0.06Ac): 2,614 sq ft x \$0.20 / sq ft = \$523
- c) Selective Clearing & Supplemental Planting (0.39Ac): 16,988 sq ft x 0.40 / sq ft = \$6,796

TOTAL FCP SURETY AMOUNT: \$12,111.

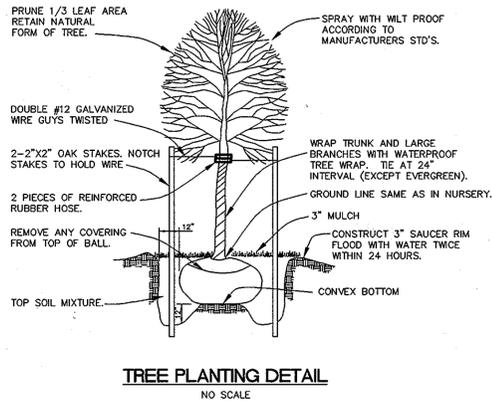
FOREST CONSERVATION WORKSHEET (Version 1.0)	Acres
A. Total Area of Tract	4.82
B. Deductions 100 year Floodplain, Critical Area	0.43
C. Area to remain in agricultural production	0.00
D. Net Tract Area	4.39
Land Use Category: MPD	
E. Afforestation Threshold: 15% x D	0.66
F. Conservation Threshold: 15% x D	0.66
EXISTING FOREST COVER	
G. Existing Forest Cover within net tract area	0.07
H. Forest Area above Afforestation Threshold: H-H-F	0.00
I. Forest Area above Conservation Threshold: J-H-G	0.00
BREAK EVEN POINT	
J. Forest retention Above Threshold with no mitigation	0.00
K. Clearing permitted without mitigation	0.00
PROPOSED FOREST CLEARING	
L. Total Area of Forest to be Cleared	0.01
M. Total Area of Forest to be Retained	0.06
PLANTING REQUIREMENTS	
N. Reforestation for clearing above conservation threshold	0.00
P. Reforestation for clearing below conservation threshold	0.02
Q. Credit for retention above conservation threshold	0.00
R. Total reforestation required	0.02
S. Total afforestation required	0.59
T. Total Reforestation & Afforestation Required	0.61

PROPOSED PUBLIC FOREST CONSERVATION EASEMENT	
TOTAL FOREST CONSERVATION OBLIGATION	0.67 AC
AFFORESTATION AREA	0.22 AC
RETENTION AREA (OUTSIDE FLOODPLAIN)*	0.06 AC
RETENTION AREA (INSIDE FLOODPLAIN)*	0.42 AC
TOTAL PROPOSED EASEMENT AREA	0.70 AC
* Selective Clearing & Supplemental Planting Areas	

FCP PLANTING REQUIREMENT	
Total Planting Requirement from FCP Worksheet	0.61 Ac
On-site FCE Area available for planting	0.70 Ac
2" cal Deciduous Trees @ 100 per Ac X 0.61 Ac	61 Trees
Number of Trees to be planted in FCE	61 Trees

Plant List for FCP Afforestation and Supplemental Planting			
Name	Genus	Size	Spacing
Red Maple	Acer	2" cal	20' x 20'
River Birch	Betula	2" cal	20' x 20'
Sycamore	Platanus	2" cal	20' x 20'
Swamp white oak	Quercus	2" cal	20' x 20'
Pin oak	Quercus	2" cal	20' x 20'
Tulip poplar	Liriodendron	2" cal	20' x 20'
Red bud	Cercis	2" cal	20' x 20'
Dogwood	Cornus	2" cal	20' x 20'
Sweet gum	Liquidambar	2" cal	20' x 20'
Black gum	Nyssa	2" cal	20' x 20'
American holly	Ilex	2" cal	20' x 20'
Black walnut	Juglans	2" cal	20' x 20'
Mockernut hickory	Carya	2" cal	20' x 20'
American beech	Fagus	2" cal	20' x 20'

Note: Planting to use at least 5 of the above tree types.
Each tree type to be no more than 20% of total planting.



Planting Plan:

1. This Forest Conservation Plan will provide 61 2" caliper trees of at least 5 tree species from the included Plant List.
2. Trees will be planted with 20' spacing in a random zig-zag alignment.
3. Planting of 2" B&B trees will be in accordance with the planting detail included on this plan.
4. All trees will be mulched with wood chips to at least a 3R diameter and 5in depth.
5. All tree planting will be supervised by a Licensed Forester or certified Arborist who will be fully responsible for implementing the requirements of the approved FCP including planting techniques, species, and maintenance needs, or requests for modifications of previously approved planting requirements.
6. When all planting is complete, the Forester or Arborist will convey to Howard County Department of Planning and Zoning, certification that all plantings have been installed as required by the FCP.

Afforestation Site Specifications:

1. Afforestation site preparation prior to planting will include soil augmentation specified by the project forester/arborist.
2. Invasive plants will be removed from planting site prior to afforestation planting.

Selective Clearing & Supplemental Planting Site Specifications:

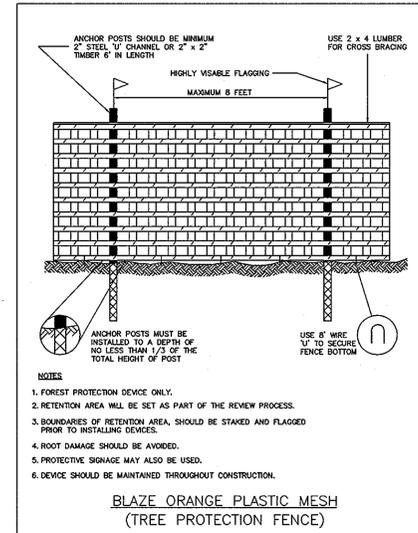
1. Supplemental planting site preparation will include selective clearing of existing and future invasive Ailanthus, Norway Maple trees as well as of other nuisance plants including English and Poison Ivy vines.
2. No tree stumps are to be removed, but may be treated to avoid stump sprouting.
3. Selective clearing must not disturb the remaining trees and beneficial understorey areas tagged by a forester or arborist.
4. Supplemental Planting tree species will be chosen from the Plant List included on this Plan with consideration given to steep slope and floodplain soil conditions.

Tree Protection Plan:

1. Orange mesh fence will be installed along the LOD prior to any site grading.
2. Forest Retention signs as specified on the detail included on this plan will be erected on metal posts 4 ft above the ground at 50 to 100 foot intervals along the Limit of Disturbance and around the entire perimeter and corners of the FCE.
3. The Forester or Arborist will inspect the LOD prior to site grading to insure that the Critical Root Zones (CRZ) of individual trees adjacent to the LOD are adequately protected.
4. The Forester or Arborist will supervise all construction and post construction activities to insure that all existing trees are adequately protected and planted trees are correctly planted and maintained for the first 2 growing seasons.
5. After construction is complete, the Forester or Arborist will convey to Howard County Department of Planning and Zoning, certification that all forest retention areas have been preserved and all protection measures required for the post-construction period have been put in place.

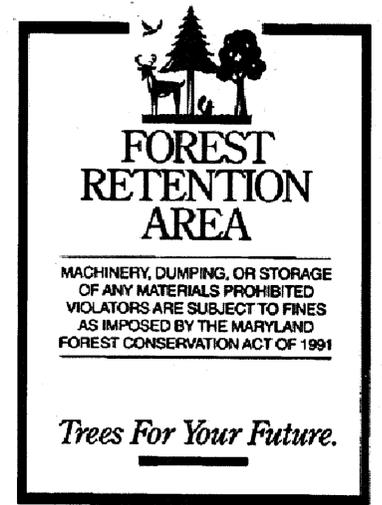
Sequence of Planting and Tree Protection:

1. Prior to site grading, orange mesh fence and Forest Retention signs will be installed along the LOD in accordance with the construction details included on this plan and the general construction plan for the site.
2. The project Forester or Arborist will inspect the LOD and provide field adjustments to the Tree Protection Plan to protect the Critical Root Zone (CRZ) of trees adjacent to the LOD that were not apparent during the development of this FCP.
3. Prior to site grading, the Howard County DPZ will be notified to inspect and verify the LOD and Tree Protection fencing and signage.
4. After site construction is complete Tree Protection fencing will be removed. Forest Retention signage will remain in place along the entire perimeter of the FCE in accordance with this plan.
5. During the post-construction landscaping of the site, Afforestation and Supplemental Planting will be completed in accordance with the planting details included on this plan.
6. Post construction management will include routine inspection and maintenance of Retention Signs, and tree watering and replacement if unhealthy or dead.
7. Inspection of the planting site after 2 years to confirm compliance with Howard County tree survival requirements and to identify any additional site maintenance requirements.



- NOTES:
1. FOREST PROTECTION DEVICE ONLY.
 2. RETENTION AREA WILL BE SET AS PART OF THE REVIEW PROCESS.
 3. BOUNDARIES OF RETENTION AREA, SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLING DEVICES.
 4. ROOT DAMAGE SHOULD BE AVOIDED.
 5. PROTECTIVE SIGNAGE MAY ALSO BE USED.
 6. DEVICE SHOULD BE MAINTAINED THROUGHOUT CONSTRUCTION.

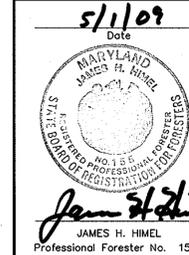
BLAZE ORANGE PLASTIC MESH
(TREE PROTECTION FENCE)

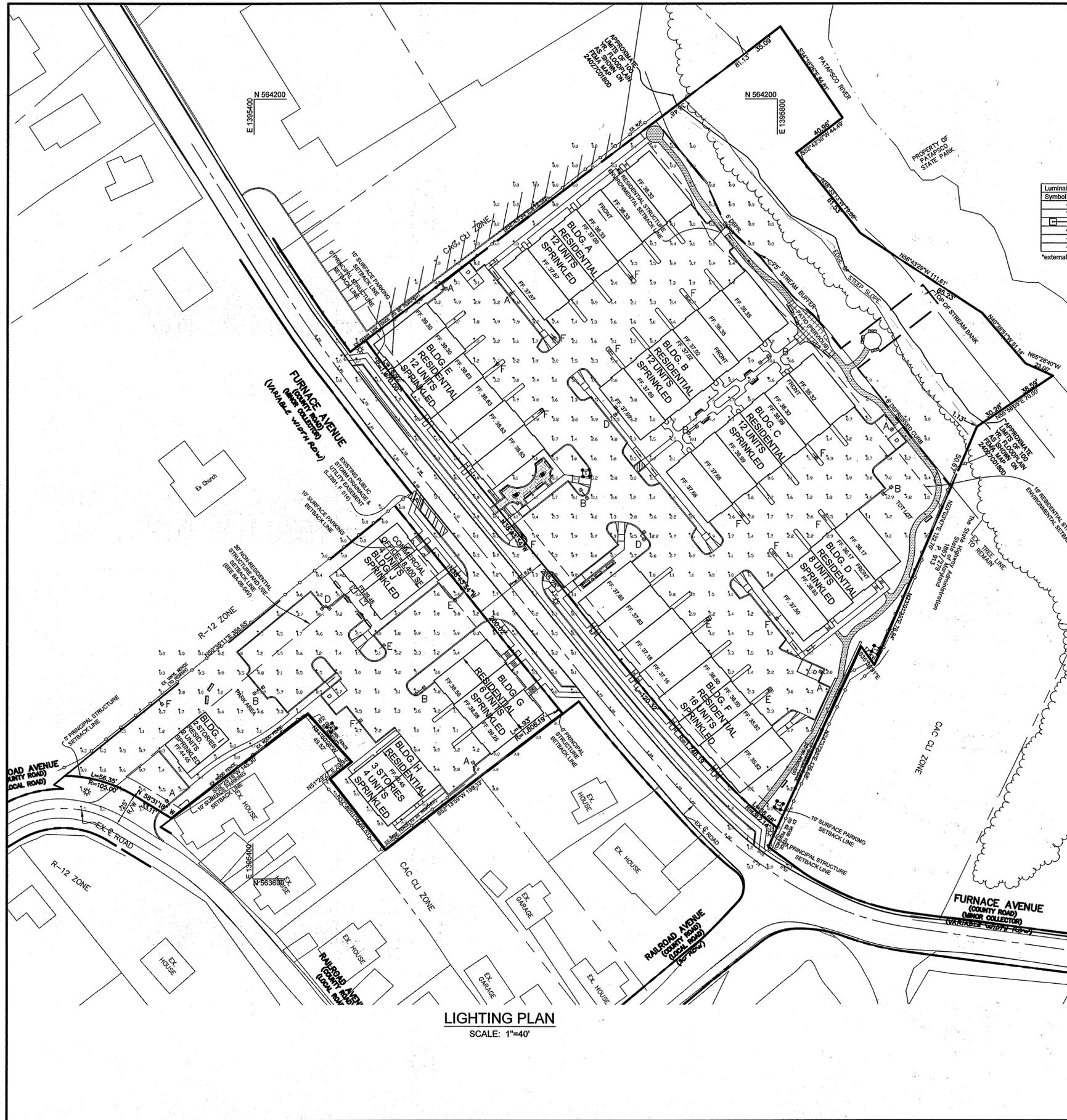


SIZE: 11" X 15"
MATERIAL: HDPE PLASTIC (.050G)
COLOR: GREEN ON WHITE BACKGROUND

Date	No	Revision Description
		APPROVED: DEPARTMENT OF PLANNING AND ZONING
		CHIEF, DEVELOPMENT ENGINEERING DIVISION
		CHIEF, DIVISION OF LAND DEVELOPMENT
		DIRECTOR
DEVELOPER:		
NKC, LLC 12183 TRIDELPHIA ROAD ELICOTT CITY, MD 21042 410-796-7676		
OWNER:		
THOMAS PALACOROLLA 12183 TRIDELPHIA ROAD ELICOTT CITY, MD 21042 410-796-7676		
PROJECT:		
RIVERWATCH BUILDABLE PARCELS 'A' & 'B' A RESUBDIVISION OF SHINNAMON SUBDIVISION LOTS 1 THRU 7 AND PARCELS 420, 421, 422, 620, 623, 624 AND 625 ELKBRIDGE, MD 21046 HOWARD COUNTY, MARYLAND		
PREPARED BY:		
PHOENIX ENGINEERING, INC. CONSULTING ENGINEERS 1420 JOH AVENUE, SUITE A BALTIMORE, MARYLAND 21227 (410) 247-8833 FAX 247-9397		
PROJECT LOCATION:		
RIVERWATCH TAX MAP 38 GRID: 4 PARCELS: 420, 421, 422, 623, 624, 625, 620 CENSUS TRACT 6012.01 1 ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND		
TITLE:		
FOREST CONSERVATION DETAILS		
Des By:	J.R.H.	Scale: AS SHOWN
Proj No:		07-041
Des By:	S.E.W.	Date: JULY, 2008
Drawing:		FCO2.dwg
Ok By:	J.R.H.	SDP 08-109
		19 OF 22

PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional forester under the laws of the State of Maryland.
License No. 155 Exp. Date: 5-12-10





LIGHTING PLAN
SCALE: 1"=40'

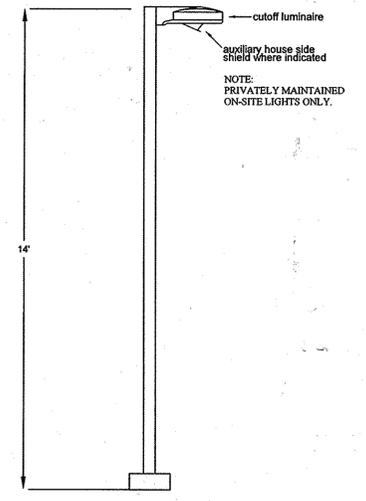
- NOTES:
1. ALL EXTERIOR LIGHT FIXTURES SHALL BE ORIENTED TO DIRECT LIGHT INWARDS AND DOWNWARDS ON-SITE AWAY FROM ALL ADJOINING RESIDENTIAL USE PROPERTIES AND PUBLIC ROADS AND BE IN COMPLIANCE WITH THE LIGHT TRESPASS REQUIREMENTS IN ACCORDANCE WITH SECTION 134 OF THE HOWARD COUNTY ZONING REGULATIONS.
 2. PROPERTY OWNER WILL BE RESPONSIBLE FOR PEDESTRIAN STREET LIGHT MAINTENANCE.
 3. STREET LIGHT PLACEMENT AND TYPE OF FIXTURE AND POLE SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL, VOLUME III (1995) AND AS MODIFIED BY "GUIDELINES FOR STREET LIGHTS IN RESIDENTIAL DEVELOPMENTS (JUNE 1993)". A MINIMUM SPACING OF 20 FEET SHALL BE MAINTAINED BETWEEN ANY STREETLIGHT AND ANY TREE.
 4. ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE POST (14 GAUGE) INSERTED INTO A 2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE SLEEVE (12 GAUGE)- 3' LONG. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.
 5. THERE ARE 6 STREET LIGHTS TO BE PUBLICLY MAINTAINED 150 WATT HPS VAPOR MAPLE LAWN ACORN POST TOP FIXTURE ON A 12" BLACK FIBERGLASS POLL WITH A SHROUD TYP, AND ARE SHOWN AS THIS

Symbol	Qty	Label	Arrangement	Description	LLF	Lumens/Lamp	Arr. Lum. Lumens	Arr. Watts
	6	A	SINGLE	PTHS-F1-175-MH-F-HSS-14"MH	0.720	12800	6182	291
	4	B	ACORN 150HPS	SINGLE	0.700	16000	11065	195
	6	B	D-180	PTHS-S-175-MH-F-14"MH	0.720	12800	17052	370
	3	D	2 @ 90 DEGREES	PTHS-F1-175-MH-F-HSS-14"MH	0.720	12800	18758	582
	4	E	SINGLE	PTHS-S-175-MH-F-14"MH	0.720	12800	8831	185
	14	F	SINGLE	PTHS-S-175-MH-F-HSS-14"MH	0.720	12800	6632	185

*external house side shield to meet light trespass requirements

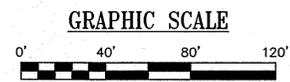
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
CalcPts	Illuminance	Fc	1.97	14.2	0.0	N.A.	N.A.

Maintained Footcandle levels at grade.

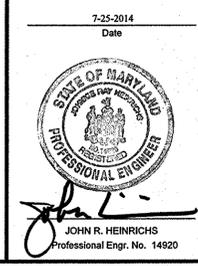


LEGEND

- LIGHTING PUBLICLY MAINTAINED 150 WATT HPS VAPOR MAPLE LAWN ACORN POST TOP FIXTURE ON A 12" BLACK FIBERGLASS POLE WITH A SHROUD (TYP.)
- TRANSFORMER PAD
- PRIVATELY MAINTAINED LIGHTING SEE DETAIL-THIS SHEET



PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 14920 Exp. Date: 5-12-16



APPROVED: FOR PUBLIC WATER AND PUBLIC SEWERAGE SYSTEMS

~~HOWARD COUNTY HEALTH DEPARTMENT~~ DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION *[Signature]* 8/6/14 DATE

CHIEF, DIVISION OF LAND DEVELOPMENT *[Signature]* 8/27/14 DATE

DIRECTOR *[Signature]* 8/27/14 DATE

Date	No	Revision Description
7-2014		CHANGED APARTMENTS TO TOWNHOUSE APARTMENTS

DEVELOPER:

NKC PROPERTIES, LLC,
12183 TRIADDELPHIA ROAD
ELLCOTT CITY, MD 21042
410-796-7676

OWNER:

THOMAS PALACOROLLA
12183 TRIADDELPHIA ROAD
ELLCOTT CITY, MD 21042
410-796-7676

PROJECT:

RIVERWATCH
BUILDABLE PARCELS 'A' & 'B'
A RESUBDIVISION OF SHINNAMON
SUBDIVISION LOTS 1 THRU 7 AND PARCELS
420, 421, 422, 620, 623, 624 AND 625
ELKRIDGE, MD 21046
HOWARD COUNTY, MARYLAND

PREPARED BY:

PHOENIX ENGINEERING, INC.
CONSULTING ENGINEERS
1420 JOHN AVENUE, SUITE A
BALTIMORE, MARYLAND 21227
(410) 247-8833 FAX 247-9397

AREA: ELKRIDGE

PARCELS: 420, 421, 422, 623, 624, 625, 620
CENSUS TRACT 6012.01 TAX MAP: 38 GRID 4
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: **LIGHTING PLAN**

Des By: R.J.W.	Scale: 1"=40'	Proj No: 07-041
Drn By: S.E.W.	Date: JULY, 2014	Drawing: L101Furnace.dwg
Chk By: J.R.H.	SDP: 08-109	20 OF 22

SDP 08-109

MAA VEGETATIVE ESTABLISHMENT DETAILS AND SPECIFICATIONS FOR PROJECTS WITHIN 4 MILES OF THE BWI AIRPORT July 1, 2004

References to ITEM #s noted below are found in Maryland Aviation Administration's manual entitled Specifications for Performing Landscaping Activities for the Maryland Aviation Administration dated May 2001

SOIL TESTS

- Following initial soil disturbances or re-disturbance, permanent or temporary stabilization shall be completed within seven calendar days for the surface of all perimeter controls, dikes, swales, ditches, perimeter slopes, and all slopes greater than 3 horizontal to 1 vertical (3:1) and fourteen days for all other disturbed or graded areas on the project site.
- Occurrence of acid sulfate soils (grayish black color) will require covering with a minimum of 12 inches of clean soil with 6 inches minimum capping of top soil. No stockpiling of material is allowed. If needed, soil tests should be done before and after a 6-week incubation period to allow oxidation of sulfates.
- The minimum soil conditions required for permanent vegetative establishment are:
 - Soil pH shall be between 6.0 and 7.0.
 - Soluble salts shall be less than 500 parts per million (ppm).
 - The soil shall contain less than 40% clay but beyond fine grained material (> 30% silt plus clay) to provide the capacity to hold a moderate amount of moisture.
 - Soil shall contain 1.5% minimum organic matter by weight.
 - Soil must contain sufficient pore space to permit adequate root penetration.
 - If these conditions cannot be met by soils on site, adding topsoil is required in accordance ITEM 901 or amendments made as

SEEDING

ITEM 903 SEEDING

DESCRIPTION

903-1.1 GENERAL. This item provides specifications for seeding of areas as designated on plans or as directed by the MAA Engineer. The species, mixtures, and methods of application provided in this item have been designed to reduce the attractiveness of airport grounds to wildlife. Only MAA-approved species, mixtures, and rates of application provided in this item may be used to establish vegetation. All activities associated with seeding including soil preparation, seed application, fertilization, and maintenance shall also conform to these approved standards.

MATERIALS

903-2.1 SEED. All seed shall comply with the Maryland Seed Law (Agricultural Article of the Annotated Code of Maryland). Only MAA-approved species, mixtures, and rates of application provided in this item may be used to establish vegetation. Seed will be sampled and tested by an inspector from the Turf and Seed Section, Maryland Department of Agriculture (MDA), Annapolis, Maryland. All lawn and turf seed and mixtures shall be free from the following state-listed restricted noxious weeds:

- corn cockle (*Agrostemma githago*),
- bentgrass (*Agrostis spp.*),
- redtop (*Agrostis gigantea*),
- wild onion (*Allium canadense*),
- wild garlic (*Allium vineale*),
- bindweed (*Cuscuta spp.*),
- dodder (*Cuscuta spp.*),
- Bermuda grass (*Cynodon dactylon*),
- ochardgrass (*Dactylis glomerata*),
- tall fescue (*Festuca arundinacea*),
- meadow fescue (*Festuca pratensis*),
- velvetgrass (*Holcus lanatus*),
- annual bluegrass (*Poa annua*),
- rough bluegrass (*Poa trivialis*),
- timothy (*Phleum pratense*), and
- Johnson grass (*Sorghum halepense*).

Restricted noxious-weed seed may not exceed 0.5 percent by weight of any seed mixture. In addition, all seeds sold in Maryland shall be free from the following listed prohibited

¹ These species may be included as a labeled component of a mixture when each is present in excess of five percent of the mixture by weight.

noxious weeds: balloonvine (*Cardiospermum halicacabum*), quackgrass (*Elytrigia repens*), sicklepod (*Senna obtusifolia*), sorghum (*Sorghum spp.*), Canada thistle (*Cirsium arvense*), plumeless thistle (*Carduus spp.* includes musk thistle and curled thistle), and serrated tussock (*Nassella trichotoma*).

903-2.1.1 APPROVED SPECIES. The following table contains species that are approved by MAA for use in seed mixtures. Purity requirements and germination requirements are also provided.

MAA SEED MIXTURES	APPROVED PLANT SPECIES		
	Purity ¹ Not Less than %	Minimum % Germination ²	Pure Live Seed Factor
Certified Turf-Type Tall Fescue (<i>Festuca arundinacea</i>)	98	90	1.13
Certified Kentucky Bluegrass (<i>Poa pratensis</i>)	90	80	1.39
Hard Fescue (<i>Festuca longifolia</i>)	98	90	1.13
Cheatings Red Fescue (<i>Festuca rubra commutata</i>)	98	90	1.13
Annual Ryegrass (<i>Lolium multiflorum</i>)	95	85	1.24
Perennial Ryegrass (<i>Lolium perenne</i>)	90	80	1.39
Fowl Meadow Grass (<i>Poa polystrcha</i>)	90	80	1.39
Little Bluestem (<i>Andropogon scoparius</i>)	62	94	1.71

903-2.1.2 PURITY. All seed shall be free of all state-designated noxious weeds listed in Paragraph 2.1.1 and conform to MAA specifications. To ensure compliance, MAA requires sampling and testing of seed by the Turf and Seed Section, Maryland Department of Agriculture (MDA). The Contractor shall furnish the MAA Engineer with duplicate signed copies of a statement by the Turf and Seed Section certifying that each lot of seed has been laboratory tested within six months of date of delivery. This statement shall include the following information:

- name and address of laboratory,
- date of test,
- lot number,
- the results of tests as to name, percentages of purity and of germination,
- percentage of weed content for the seed furnished,
- and, in the case of a mixture, the proportions of each kind of seed.

Seed shall be furnished in standard containers with the seed name, lot number, net weight, percentages of purity, germination rate and hard seed, and percentage of maximum weed seed content clearly marked. All seed containers shall be tagged with a MDA supervised mix program seed tag.

903-2.1.3 MIXTURES AND APPLICATION RATES. Only seed mixtures and application rates described in this item may be used unless otherwise approved by the MAA Engineer. Seed mixtures shall meet criteria detailed in Paragraph 903-2.1.2. Seed mixtures have been formulated to minimize the attractiveness of areas to wildlife of common landscape scenarios. The appropriate seed mixture for application will be designated based on environmental conditions and may vary from site to site. All planting rates listed are in pounds of Pure Live Seed (PLS) per acre.

Seed mixtures, application scenarios, and rates for permanent cool-season grasses are as follows:

- Seed Mixture No. 1 - relatively flat areas (grade less than 4:1) subject to normal conditions and regular mowing (Application rate = 234 lbs PLS/acre);
- Seed Mixture No. 2 - sloped areas (grade greater than 4:1) not subject to regular mowing (Application rate = 115 lbs PLS/acre); and
- Seed Mixture No. 3 - wetlands and their associated buffer zones (Application rate = 131 lbs PLS/acre).

Seed Mixture No. 1: Relatively flat areas regularly mowed and exposed to normal conditions (Application rate = 234 lbs PLS/acre)

Seed	Rate of Application (lbs of PLS/acre)
85% Certified Turf-Type Tall Fescue	192
10% Certified Kentucky Bluegrass	28
5% Perennial Ryegrass	14

Seed Mixture No. 2: Sloped areas not subject to regular mowing (Application rate = 115 lbs PLS/acre)

Seed	Rate of Application (lbs of PLS/acre)
75% Hard Fescue	85
20% Cheatings Fescue	23
5% Kentucky Bluegrass	7

Supplemental Seed Redtop 3

Seed Mixture No. 3 - Wetland areas and their associated buffer zones (Application rate = 131 lbs PLS/acre)

Seed	Rate of Application (lbs of PLS/acre)
60% Fowl Meadow Grass	83
30% Cheatings Fescue	34
10% Perennial Ryegrass	14

Supplemental Seed Redtop 3

903-2.1.4 SEEDING SEASONS. Application of seed and seed mixtures shall occur within a specified seeding season unless otherwise approved by the MAA Engineer. No seed or seed mixtures are to be applied on frozen ground or when the temperature is at or below 35 degrees Fahrenheit (7.2 degrees Centigrade). Under these conditions, a layer of mulch should be applied in accordance with Item 905. Mulching, to stabilize the site, and permanent seeding should occur in the subsequent seeding season. Seed application may occur during the seeding season dates listed below. Seeding performed after October 20 should be a temporary cover of annual ryegrass and followed by overseeding of the appropriate seed mixture during the spring seeding season.

SEEDING SEASONS	
Permanent Cool-Season Grasses	March 1 to April 20 and August 1 to October 20, inclusive
Temporary Cover of Annual Rye/Redtop	March 1 to April 30 and August 1 to November 30, inclusive
Temporary Cover of Warm-Season Grasses (Little Bluestem only)	May 1 to July 31, inclusive. Rate of application should be 13.6 lbs PLS per acre.

Seeding seasons are based on typical years and can be subject to variation, which may be modified by the MAA Engineer based on seasonal trends.

If the time required to complete any of the operations necessary under this item, within the specified planting season or any authorized extensions thereof, extends beyond the Contract period, then such time will be charged against the Contract time, and liquidated damages will be enforced with respect to this portion of work.

903-2.2 LIME. Lime shall consist of ground limestone and contain at least 85 percent total carbonates. Lime shall be ground to a fineness so that at least 90 percent will pass through a No. 20 mesh sieve and 50 percent will pass through a No. 100 mesh sieve. Dolomitic lime or a high magnesium lime shall contain at least 10 percent magnesium oxide. Lime shall be applied by approved methods detailed in Section 903-3.3 of this item. The rate of application will be based on soils of test.

903-2.3 FERTILIZER. Fertilizer shall be standard commercial fertilizer (supplied separately or in mixtures) and meet the requirements of applicable state and federal laws (O-F-241) as well as standards of the Association of Official Agricultural Chemists. Nitrogen-Phosphorus-Potassium (N-P-K) concentrations shall be determined from analysis of soil samples (Approved fertilizer rate: 21 pounds of 10-10-10 per 1,000 square feet). Methods of fertilizer application shall conform to standards described in Section 903-3.3 of this item. Fertilizer shall be furnished in standard containers that are clearly labeled with name, weight, and guaranteed analysis of the contents (percentage of total nitrogen, available phosphoric acid, and water-soluble potash). Mixed fertilizers shall not contain any hydrated lime or cyanamide compounds. Fertilizers failing to meet the specified analysis may be approved by the MAA Engineer, providing sufficient materials are applied to conform with the specified nutrients per unit of measure without additional cost to MAA.

The fertilizers may be supplied in the following forms:

- A granular or pellet form suitable for application by blower equipment.

The rate of application will be based on results of soil tests performed by the University of Maryland Soil Testing Laboratory. By law, persons applying fertilizer to State-owned land shall follow the recommendations of the University of Maryland as set forth in the "Plant Nutrient Recommendations Based on Soil Tests for Turf Maintenance" and the "Plant Nutrient Recommendations Based on Soil Tests for Sod Production" (see Appendix B). Application of the fertilizer shall be in a manner that is consistent with the recommendations of the University of Maryland Cooperative Extension.

CONSTRUCTION METHODS AND EQUIPMENT

903-3.1 GENERAL. This section provides approved methods for the application of and includes standards for seedbed preparation, methods of application, and equipment to be used during the process. Lime and fertilizer shall be applied to seeded areas before the seed is spread. The mixture of seed will be determined for sites based on environmental conditions as described in Paragraph 903-2.1.3.

903-3.2 ADVANCE PREPARATION. Areas designated for seeding shall be properly prepared in advance of seed application. The area shall be tilled and graded prior to application of lime and fertilizer, and the surface area shall be cleared of any stones larger than 1 inch in diameter, sticks, stumps, and other debris that might interfere with sowing of seed, growth of grasses, or subsequent maintenance of grass-covered areas. Damage caused by erosion or other forces that occur after the completion of grading shall be repaired prior to the application of fertilizer and lime. The Contractor will repair such damage, which may include filling gullies, smoothing irregularities, and repairing other incidental damage before beginning the application of fertilizer and ground limestone.

If an area to be seeded is sparsely sodded, weedy, barren and unworked, or packed and hard, all grass and weeds shall first be cut or otherwise satisfactorily disposed of, and the soil then scarified or otherwise loosened to a depth not less than 5 inches (125 mm). Clods shall be broken and the top 3 inches (75 mm) of soil shall be worked into a satisfactory condition by disking or by use of cultipackers, rollers, drags, harrows, or other appropriate means.

An area to be seeded shall be considered a satisfactory seedbed (without requiring additional treatment) if it has recently been thoroughly loosened and worked to a depth of not less than 5 inches; the top 3 inches of soil is loose, friable, and is reasonably free from large clods, rocks, large roots, or other undesirable matter; appropriate amounts of fertilizer and lime have been added; and, if it has been shaped to the required grade immediately prior to seeding. For slope areas steeper than 3:1 (three horizontal to one vertical), the subsoil shall be loose to a depth of 1 inch.

After completion of tilling and grading, lime and fertilizer shall be applied within 48 hours according to the specified rate (Paragraphs 903-2.2 and 2.3) and methods

(Paragraphs 903-3.3.1 and 903-3.3.2) approved by MAA. The seeding mixture shall be applied within 48 hours after application of lime and fertilizer. To firm the seeded areas, cultipacking shall occur immediately after seeding.

903-3.3 METHODS OF APPLICATION. Lime, fertilizer, and seed mixtures shall be applied by either the dry or wet application methods that have been approved by MAA and are detailed below.

903-3.3.1 DRY APPLICATION METHOD

a. Liming. If soil test results indicate that lime is needed, the following procedures will be used: following advance preparation of the seedbed, lime shall be applied prior to the application of any fertilizer or seed and only on seedbeds that have been prepared as described in paragraph 903-3.2. The lime shall be uniformly spread and worked into the top 2 inches of soil, after which the seedbed shall be properly graded again.

b. Fertilizing. Following advance preparations (and liming if necessary), fertilizer shall be spread uniformly at the specified rate to provide no less than the minimum quantity stated in Paragraph 903-2.3.

c. Seeding. Seed mixtures shall be sown immediately after fertilization of the seedbed. The fertilizer and seed shall be lightly raked to a depth of 1 inch for newly graded and disturbed areas.

d. Rolling. After the seed has been properly covered, the seedbed shall be immediately compacted using a cultipacker or an approved lawnmower.

903-3.3.2 WET APPLICATION METHOD/HYDROSEEDING

a. General. The Contractor may elect to apply seed and fertilizer as per Paragraphs c and d of this section in the form of an aqueous mixture by spraying over the previously prepared seedbed using methods and equipment approved by MAA. The rates of application shall be as specified in Paragraphs 903-2.1 through 903-2.3.

b. Spraying Equipment. The spraying equipment shall have a container or water tank equipped with a liquid level gauge capable of reading increments of 50 gallons or less over the entire range of the tank capacity. The liquid level gauge shall be mounted so as to be visible to the nozzle operator at all times. The container or tank shall also be equipped with a mechanical power-driven agitator capable of keeping all the solids in the mixture in complete suspension at all times until used.

The spraying equipment shall also include a pressure pump capable of delivering 100 gallons per minute at a pressure of 100 pounds per square inch. The pressure pump assembly shall be configured to allow the mixture to flow through the tank when not being sprayed from the nozzle. All pump passages and pipelines shall be capable of providing clearance for 5/8-inch solids. The power unit for the pump and agitator shall have controls mounted so as to be accessible to the nozzle operator. A pressure gauge shall be connected to and mounted immediately behind the nozzle.

The nozzle pipe shall be mounted on an elevated supporting stand in such a manner that it can be rotated through 360 degrees horizontally and inclined vertically from at least 20 degrees below to at least 60 degrees above the horizontal. There shall be a quick-acting, three-way control valve connecting the recirculating line to the nozzle pipe and mounted so that the nozzle operator can control and regulate the amount of flow of mixture to be supplied so that mixtures may be properly sprayed over a distance varying from 20 feet to 100 feet. One shall be a close-range ribbon nozzle, one a medium-range ribbon nozzle, and one a long-range jet nozzle. For ease of removal and cleaning, all nozzles shall be connected to the nozzle pipe by means of quick-release couplings. In order to reach areas inaccessible to the regular equipment, an extension hose at least 50 feet in length shall be provided to which the nozzles may be connected.

c. Mixtures. Lime shall be applied separately in the quantity specified, prior to the fertilizing and seeding operations. Lime should be added to and mixed with water at a concentration not to exceed 220 pounds of lime for every 100 gallons of water. After lime has been applied, the tank should be emptied and rinsed with fresh water. Seed and fertilizer shall be mixed together in the relative proportions specified, but the resulting concentration should not exceed 220 pounds of mixture per 100 gallons of water and should be applied within 30 minutes to prevent fertilizer burn of the seeds.

All water used shall be obtained from fresh water sources and shall be free from injurious chemicals and other toxic substances harmful to plant life. Brackish water shall not be used at any time. The Contractor shall identify all sources of water to the MAA Engineer at least two weeks prior to use. The Engineer may take samples of the water at the source or from the tank at any time and have a laboratory test the samples for chemical and saline content. The Contractor shall not use any water from any source that is disapproved by the Engineer following such tests.

All mixtures shall be constantly agitated from the time they are mixed until they are finally applied to the seedbed. All such mixtures shall be used within 30 minutes from the time they were mixed or they shall be wasted and disposed of at a location acceptable to the Engineer.

d. Spraying. Lime shall be sprayed upon previously prepared seedbeds on which the lime, if required, shall have been worked in already. The mixtures shall be applied using a high-pressure spray which shall always be directed upward into the air so that the mixtures will fall to the ground in a uniform spray. Nozzles or sprays shall never be directed toward the ground in such a manner that might produce erosion or runoff. Particular care shall be exercised to ensure that the application is made uniformly, at the prescribed rate, and to guard against misses and overlapped areas. Predetermined quantities of the mixture shall be used in accordance with specifications to cover specified sections of known areas. To check the rate and uniformity of application, the applicator will observe the degree of wetting of the ground or distribute test sheets of paper or pans over the area at intervals and observe the quantity of material deposited thereon.

On surfaces that are to be mulched as indicated by the plans or designated by the MAA Engineer, seed and fertilizer applied by the spray method need not be raked into the soil or rolled. However, on surfaces on which mulch is not to be used, the raking and rolling operations will be required after the soil has dried.

903-3.4 MAINTENANCE OF SEEDED AREAS. The contractor shall protect seeded areas against traffic or other use by warning signs or barricades, as approved by the Engineer. Surfaces gullied or otherwise damaged following seeding shall be repaired by regrading and reseeding as directed. The Contractor shall mow, water as directed, and otherwise maintain seeded areas in a satisfactory condition until final inspection and acceptance of the work.

When either the dry or wet application method outlined above is used for work performed out of season, the Contractor will be required to establish a good stand of grass of uniform color and density to the satisfaction of the Engineer. If at the time when the contract has been otherwise completed it is not possible to make an adequate determination of the color, density, and uniformity of such stand of grass, payment for the unaccepted portions of the areas seeded out of season will be withheld until such time as these requirements have been met.

MULCHING

Mulch shall be applied to all seeded areas immediately after seeding. During the time periods when seeding is not permitted, mulch shall be applied immediately after grading.

Mulch shall be applied as per ITEM 905.

TEMPORARY SEEDING

Lime: 100 pounds of dolomitic limestone per 1,000 square feet.

Fertilizer: 15 pounds of 10-10-10 per 1,000 square feet.

Seed: Per ITEM 903

Mulch: Mulch shall be applied as per ITEM 905.

FILL

No fills may be placed on frozen ground. All fill to be placed in approximately horizontal layers, each layer having a loose thickness of not more than 8 inches. All fill in roadways and parking areas is to be classified Type 2 as per Anne Arundel County Code - Article 21, Section 2-308, and compacted to 90% density; compaction to be determined by ASTM D-1557-66T (Modified Proctor). Any fill within the building area is to be compacted to a minimum of 95% density as determined by methods previously mentioned. Fills for pond embankments shall be compacted as per MD-378 Construction Specifications. All other fills shall be compacted sufficiently so as to be stable and prevent erosion and slippage.

SODDING

Installation of sod should follow permanent seeding dates. Seedbed preparation for sod shall be as noted above. Lime and fertilizer per permanent seeding specifications and lightly irrigate soil prior to laying sod. Sod is to be laid on the contour with all ends tightly abutting. Joints are to be staggered between rows. Water and roll or tamp sod to insure positive root contact with the soil. All slopes steeper than 3:1, as shown, are to be permanently sodded or protected with an approved erosion control netting. Additional watering for establishment may be required. Sod is not to be installed on frozen ground. Sod shall not be transplanted when moisture content (dry or wet) and/or extreme temperature may adversely affect its survival. In the absence of adequate rainfall, irrigation should be performed to ensure establishment of sod.

Install sod as per ITEM 904.

PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 14920 Exp. Date: 5-12-12

8-14-05 Date



JOHN R. HEINRICHS
Professional Engr. No. 14920

APPROVED FOR PUBLIC WATER AND PUBLIC SEWERAGE SYSTEMS

COUNTY HEALTH OFFICER: HOWARD COUNTY HEALTH DEPARTMENT DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION J.P. 9/17/09

CHIEF, DIVISION OF LAND DEVELOPMENT DATE 11/20/09

DIRECTOR DATE 11/20/09

Date	No	Revision	Description

DEVELOPER: NKC PROPERTIES, LLC
12183 TRIADELPHIA ROAD
ELICOTT CITY, MD 21042
410-796-7676

OWNER: THOMAS PALACOROLLA
12183 TRIADELPHIA ROAD
ELICOTT CITY, MD 21042
410-796-7676

PROJECT: RIVERWATCH
BUILDABLE PARCELS 'A' & 'B'
A RESUBDIVISION OF SHINNAMON
SUBDIVISION LOTS 1 THRU 7 AND PARCELS
420, 421, 422, 620, 623, 624 AND 625
ELKRIDGE, MD 21046
HOWARD COUNTY, MARYLAND

PREPARED BY: PHOENIX ENGINEERING, INC.
CONSULTING ENGINEERS
1420 JOH AVENUE, SUITE A
BALTIMORE, MARYLAND 21227
(410) 247-6853 FAX 247-9397

AREA: ELKRIDGE
PARCELS: 420, 421, 422, 623, 624, 625, 620
CENSUS TRACT 6012.01 TAX MAP: 38 GRID 4
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: MARYLAND AVIATION ADMINISTRATION SPECIFICATIONS

Des By: R.J.W. Scale: AS SHOWN Proj No: 07-041
Dwn By: S.E.W. Date: DECEMBER, 2008 Drawing: MAA Spec.dwg
Chk By: J.R.H. SPP: 08-109 21 OF 22

