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#05-30

September 15, 2005

VIA HAND DELIVERY

D.C. Zoning Commission
Suite 210
441 4th Street, N.W.
Washington, DC 20001

Re: Corrected Sheet D02 – 6000 New Hampshire Avenue - Application for Consolidated Approval of a Planned Unit Development and a Zoning Map Amendment

Dear Members of the Commission:

On behalf of the West Group Development Company LLC and The Jarvis Company, LLC (the "Applicants"), we hereby submit 21 copies of a corrected Sheet D02 of the Architectural Plans and Drawings that were submitted as Exhibit A of the application for consolidated approval of a PUD and a zoning map amendment filed on September 12, 2005. The original Sheet D02 of Exhibit A does not include the complete water quality and storm water storage volume calculations. Accordingly, the Applicants are submitting a corrected Sheet D02 that includes this information.

Thank you for your consideration of this matter.

Sincerely,

Kyrus L. Freeman

Kyrus L. Freeman

Enclosures

cc: Advisory Neighborhood Commission 4B
Ellen McCarthy, D.C. Office of Planning
Jennifer L. Steingasser, D.C. Office of Planning

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ZONING COMMISSION
CASE No. 05-30
EXHIBIT No. 6

ZONING COMMISSION
District of Columbia
CASE NO.05-30
EXHIBIT NO.6

STORM WATER RUNOFF CALCULATIONS

STORMWATER QUANTITY HYDROLOGY

Stormwater Rational Method
Q = CIA

Where:
- Q = Peak flow (cfs)
- C = Runoff Coefficient
- I = Rainfall Intensity (in/hr)
- A = Drainage Area (acres)
- T_c = Time of Concentration (min)

Total Site Pre-Development Run-Off

T_c = 19.8 min

Pre-Development Runoff Coefficient
- A_1 = 2.55 acres
- C_1 = 0.75 (Medium Density Apartment House)
- A_2 = 0.19 acres
- C_2 = 0.65 (One-Family Detached Dwelling)
- A_3 = 8.80 acres
- C_3 = 0.35 (Grass)

Weighted Runoff Coefficient C = 0.44

Pre-Development 2-Year Storm:
$Q_{pre(2Yr)}$ = CIA
- C = Runoff Coefficient
- I_2 = rainfall intensity (in/hr) - 2-Yr Frequency 20-min
- A = Area (acres)

- C = 0.44 weighted runoff coefficient
- I_{pre2} = 3.36 in/hr
- A = 11.54 acres

$Q_{pre(2Yr)}$ = **17.2 cfs** Peak Flow

Pre-Development 15-Year Storm
$Q_{pre(15Yr)}$ = CIA
- C = Runoff Coefficient
- I_{15} = rainfall intensity (in/hr) - 15-Yr Frequency 20-min
- A = Area (acres)

- C = 0.44 weighted runoff coefficient
- I_{pre15} = 4.82 in/hr
- A = 11.54 acres

$Q_{pre(15Yr)}$ = **24.7 cfs** Peak Flow

Total Site Post-Development Run-Off

T_c = 5 min

Post-Development Runoff Coefficient
- A_1 = 2.81 acres
- C_1 = 1.00 (Roads and Parking Lot Pavement)
- A_2 = 8.73 acres
- C_2 = 0.75 (Medium Density Apartment House)

Weighted Runoff Coefficient C = 0.81

Post-Development 2-Year Storm
$Q_{post(2Yr)}$ = CIA
- C = Runoff Coefficient
- I_5 = rainfall intensity (in/hr) - 2-Yr Frequency 5-min
- A = Area (acres)

- C = 0.81 weighted runoff coefficient
- I_{post5} = 5.29 in/hr
- A = 11.54 acres

$Q_{post(2Yr)}$ = **49.4 cfs** Peak Flow

Post-Development 15-Year Storm
$Q_{post(15Yr)}$ = CIA
- C = Runoff Coefficient
- I_{15} = rainfall intensity (in/hr) - 15-Yr Frequency 5-min
- A = Area (acres)

- C = 0.81 weighted runoff coefficient
- I_{post15} = 7.56 in/hr
- A = 11.54 acres

$Q_{post(15Yr)}$ = **70.7 cfs** Peak Flow

WATER QUALITY CALCULATIONS

WATER QUALITY

Water Quality Volume
V_{wq} = (R x I_a) / 12

Where:
- V_{wq} = Water Quality Volume (cubic feet)
- R = Runoff Depth (inches)
- I_a = Impervious Area (square feet)
- 12 = Conversion Factor

Sand Filter Area
A_F = 50 + (I_a - 0.1ac) x (167 sqft/ac)

Where:
- A_F = Surface Area of filter layer (second chamber) (square feet)
- I_a = Impervious Area (acres)

First Flush Volume
V_F = V_{wq} - (F x T x A_F)

Where:
- V_F = Storage Volume needed to hold first flush runoff (cubic feet)
- V_{wq} = Water Quality Volume (cubic feet)
- F = Infiltration Rate for sand (feet/hour)
- T = Filtering Time (hours)
- A_F = Surface Area of Filter Layer (second chamber)

Total Site Runoff Depth
- 0.5 inches = Parking lots, city streets, highspeed roads
- 0.3 inches = Rooftops, sidewalks, pedestrian plaza areas

- A_1 = 2.81 acres
- R_1 = 0.50 (Parking lots, city streets, highspeed roads)
- A_2 = 8.73 acres
- R_2 = 0.30 (Rooftops, sidewalks, pedestrian plaza areas)

Weighted Runoff Depth R = 0.35 inches

Total Site Water Quality Volume
V_{wq} = (R x I_a) / 12

Weighted R = 0.35 inches
I_a = 502,683 square feet

V_{wq} = **14,007 cubic feet**

Total Site Sand Filter Area
A_F = 50 + (I_a - 0.1ac) x (167 sqft/ac)

I_a = 11.54 acres

A_F = 1,900.5 square feet

Use:
A_F = 2,000 square feet

Total First Flush Volume
V_F = V_{wq} - (F x T x A_F)

- F = 1.18 feet/hour
- T = 1.0 hour
- A_F = 2,000 square feet

V_F = **12,247 cubic feet**

Roof Downspout Filtration System (typical)
Runoff Depth:
- 0.5 inches = Parking lots, city streets, highspeed roads
- 0.3 inches = Rooftops, sidewalks, pedestrian plaza areas

Typical Townhome Area (including driveway)
Area = 918 square feet

- A = 0.021 acres
- R = 0.30 inches (Rooftops, sidewalks, pedestrian plaza areas)

Townhome Water Quality Volume
V_{wq} = (R x I_a) / 12

- R = 0.30 inches
- I_a = 918 square feet

V_{wq} = **23.0 cubic feet**

Townhome Sand Filter Area
A_F = 50 + (I_a - 0.1ac) x (167 sqft/ac)

- I_a = 0.021 acres
- A_F = 36.8 square feet

Use:
A_F = 40 square feet

RDF Stone Reservoir Size
V = V_w x (1+n)
A = V/d
V_s = A x (d_s + 0.25) x n
V_{sr} = V - V_s
d_{sr} = V_{sr} / A

Where:
- V = Total RDF Volume (cubic feet)
- V_w = Water Quality Volume (cubic feet)
- A = Total RDF Surface Volume (square feet)
- d = Total Depth of system (less than or equal to 5) (feet)
- V_s = Volume of Sand Filter Bed (cubic feet)
- d_s = Depth of Sand Filter Bed (feet)
- 0.25 = Depth of Pea Gravel Layer (feet)
- n = Porosity
- V_{sr} = Volume of Stone Reservoir (cubic feet)
- d_{sr} = Depth of Stone Reservoir (feet)

- V_w = 23.0 cubic feet
- n = 0.30
- V = 29.8 cubic feet
- d = 5.0 feet
- A = 6.0 square feet
- d_s = 1.0 foot
- V_s = 2.2 cubic feet
- V_{sr} = 27.6 cubic feet
- d_{sr} = 4.6 feet

STORM WATER STORAGE VOLUME CALCULATIONS

STORMWATER QUANTITY CONTROL

NRCS TR55 Hydrology Method
Where:
- V_s = Storage Volume
- Q_o = Peak Outflow Discharge
- V_r = Runoff Volume
- Q_i = Peak Inflow Discharge

Pre-Development Run-Off
2-Year Storm
Q_{pi} = 17.2 cfs

15-Year Storm
Q_{pi} = 24.7 cfs

Post-Development Run-Off
2-Year Storm
Q_{pi} = 49.4 cfs

15-Year Storm
Q_{pi} = 70.7 cfs

Determine q_o/q_i
2-Year Storm
q_o/q_i = 0.35

15-Year Storm
q_o/q_i = 0.35

Determine V_s/V_r (from Figure 6.1 TR55)
V_s/V_r = 0.35

Post-Development Curve Number
A_1 = 2.81 acres
CN_1 = 98 (Roads and Parking Lot Pavement)

A_2 = 8.73 acres
CN_2 = 90 (Medium Density Apartment House, assuming type C soils)

Weighted Curve Number CN = 92

Determine Rainfall P
(From Table A.2 DDH Storm Water Management Guidebook)
Rainfall, P_{2-Yr} (24-hour) = 2.17 in
Rainfall, P_{15-Yr} (24-hour) = 6.79 in

Determine Runoff Q
Q = (P-0.25)^2/(P+0.85)

Where:
- Q = Runoff (in)
- P = Rainfall (in)
- S = Potential Maximum Retention after Runoff Begins (in)

S = (1000/CN) - 10

S = 0.86

Runoff Q_{2-Yr} = 1.26 in
Runoff Q_{15-Yr} = 5.64 in

Determine Runoff Volume Vr
V_r = 53.33Q(A_m)

Where:
- V_r = Runoff Volume (acre-ft)
- Q = Runoff (in)
- A_m = Drainage Area (sq mi)
- 53.33 = Conversion factor from (in-sq mi) to (acre-ft)

$V_{r(2-Yr)}$ = 1.33 acre-ft
$V_{r(15-Yr)}$ = 5.62 acre-ft

Determine Storage Volume Vs
V_s = V_r x (V_s/V_r)

Where:
- V_s = Storage Volume (ac-ft)
- V_r = Runoff Volume (ac-ft)

$V_{s(2-Yr)}$ = 0.47 ac-ft
$V_{s(15-Yr)}$ = **1.97 ac-ft**

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Zoning Table

Zoning Lot	Unit	Bldg Dimensions		Veritcal Height From FFE	Top of Building Elevation	Curb Front Elev	Building Height (By defn)	Rear Midpoint Grade Elev	Fronts Public Street ?	Setbacks								Lot Occupancy		Lot / Building Data			FAR		Parking			
										Required				Provided											Required		Provided	
		Width ft	Depth ft							Front	Side (L)	Side (R)	Rear	Front	Side (L)	Side (R)	Rear	Maximum Allowable	Provided	Lot Area	Building Area	Gross Square Footage	Maximum Allowable	Provided	Onsite	Pvt Street	Onsite	Pvt Street
A	TH	108	41	30.25	276.25	236	40.25	244	Y	0	10.06	10.06	20	0.00	30.00	32.00	49.50	40%	27.2%	16,281	4,428	13,284	1.0	0.82	6	0	12	5
B	TH	41	18	30.25	278.25	248	30.25	247	N	20	8.00	8.00	20	20.00	10.00	0.00	20.00	40%	24.9%	2,958	738	2,214	1.0	0.75	1	0	1	0
C	TH	41	18	30.25	276.25	244	32.25	249	Y	0	8.06	8.06	20	6.00	0.00	0.00	14.33	40%	47.0%	1,571	738	2,214	1.0	1.41	1	0	1	0
D	TH	72	41	30.25	278.25	238.4	39.85	247	Y	0	9.96	9.96	20	4.00	0.00	14.95	15.50	40%	50.9%	5,802	2,952	8,856	1.0	1.53	4	0	4	0
E	TH	41	133	30.25	273.25	233.9	39.35	238	Y	0	9.84	9.84	20	0.00	32.00	30.00	27.00	40%	31.3%	16,479	5,166	15,498	1.0	0.94	7	0	14	7
F	TH	108	41	30.25	269.25	238.4	30.85	238	N	20	8.00	8.00	20	31.00	0.00	10.00	20.00	40%	41.1%	10,774	4,428	13,284	1.0	1.23	6	0	6	2
G	TH	72	41	30.25	263.25	231.6	31.65	233	Y	0	8.00	8.00	20	4.00	9.00	0.00	22.50	40%	54.0%	5,468	2,952	8,856	1.0	1.62	4	0	8	0
H	TH	54	41	30.25	266.25	232.8	33.45	235	Y	0	8.36	8.36	20	4.00	10.00	0.00	22.50	40%	51.3%	4,320	2,214	6,642	1.0	1.54	3	0	6	0
I	TH	72	41	30.25	280.25	248.8	31.45	249	N	20	8.00	8.00	20	32.00	22.90	19.00	25.78	40%	25.2%	11,730	2,952	8,856	1.0	0.75	4	0	8	2
J	TH	41	72	30.25	283.25	253	30.25	252	Y	0	8.00	8.00	20	0.00	24.00	24.04	20.44	40%	35.9%	8,231	2,952	8,856	1.0	1.08	4	0	4	0
K	TH	72	41	30.25	277.25	247.8	29.45	241	N	20	8.00	8.00	20	32.00	13.70	27.02	30.00	40%	25.4%	11,608	2,952	8,856	1.0	0.76	4	0	8	4
L	TH	54	41	30.25	267.25	236.3	30.95	238	N	20	8.00	8.00	20	31.00	12.98	0.00	20.00	40%	35.1%	6,301	2,214	6,642	1.0	1.05	3	0	6	2
M	TH	72	41	30.25	269.25	237.3	31.95	239	N	20	8.00	8.00	20	31.00	27.02	0.00	30.00	40%	29.2%	10,098	2,952	8,856	1.0	0.88	4	0	8	5
N	TH	72	41	30.25	266.25	235.3	30.95	230	N	20	8.00	8.00	20	31.00	0.00	0.00	33.55	40%	29.4%	10,028	2,952	8,856	1.0	0.88	4	0	4	2
P	TH	54	41	30.25	264.25	231.7	32.55	231	N	20	8.14	8.14	20	31.00	0.00	31.00	24.00	40%	27.1%	8,160	2,214	6,642	1.0	0.81	3	0	3	3
Q	TH	54	41	30.25	259.25	227.9	31.35	228	N	20	8.00	8.00	20	31.00	0.00	8.00	21.31	40%	38.1%	5,814	2,214	6,642	1.0	1.14	3	0	3	2
R	SF	36	52	35	255	218.8	36.2	225	Y	0	8.00	8.00	20	8.00	5.50	26.31	41.24	40%	20.0%	7,646	1,527	3,274	1.0	0.43	1	0	2	0
S	SF	36	52	35	257	220	37	225	Y	0	8.00	8.00	20	8.00	5.50	4.00	20.52	40%	40.1%	3,811	1,527	3,274	1.0	0.86	1	0	2	0
T	SF	36	52	35	258	222	36	226	Y	0	8.00	8.00	20	8.00	5.50	4.00	20.52	40%	40.1%	3,811	1,527	3,274	1.0	0.86	1	0	2	0
U	SF	36	52	35	260	223.1	36.9	228	Y	0	8.00	8.00	20	8.00	5.50	4.00	20.52	40%	40.1%	3,811	1,527	3,274	1.0	0.86	1	0	2	0
V	SF	36	52	35	261	225.5	35.5	229	Y	0	8.00	8.00	20	8.00	5.50	4.00	20.52	40%	40.1%	3,811	1,527	3,274	1.0	0.86	1	0	2	0
W	SF	36	52	35	263	226.5	36.5	230	Y	0	8.00	8.00	20	8.00	5.50	4.00	72.45	40%	24.4%	6,269	1,527	3,274	1.0	0.52	1	0	2	0
X	SF	36	52	35	265	228.1	36.9	231	Y	0	0.00	8.00	20	8.00	5.86	4.00	30.65	40%	29.9%	5,100	1,527	3,274	1.0	0.64	1	0	2	0
Y	TH	126	41	30.25	273.25	235	38.25	237	N	20	9.56	9.56	20	21.00	27.00	26.37	34.39	40%	31.2%	16,533	5,166	15,498	1.0	0.94	7	0	14	9
Z	TH	72	41	30.25	276.25	241.1	35.15	236	N	20	8.79	8.79	20	56.10	27.00	0.00	30.00	40%	21.3%	13,857	2,952	8,856	1.0	0.64	4	0	8	5
AA	TH	54	41	30.25	279.25	246.4	32.85	244	N	20	8.21	8.21	20	25.63	0.00	26.00	52.97	40%	23.1%	9,568	2,214	6,642	1.0	0.69	3	0	6	2
AB	TH	90	41	30.25	259.25	228.3	30.95	225	N	20	8.00	8.00	20	31.05	8.58	26.01	15.06	40%	33.7%	10,962	3,690	11,070	1.0	1.01	5	0	5	4
AC	TH	90	41	30.25	260.25	229.5	30.75	225	N	20	8.00	8.00	20	31.00	10.00	0.00	59.33	40%	28.1%	13,133	3,690	11,070	1.0	0.84	5	0	10	3
AD	TH	167	41	30.25	265.25	229.8	35.45	231	N	20	8.86	8.86	20	31.00	0.00	27.00	36.20	40%	31.6%	21,041	6,642	19,926	1.0	0.95	9	0	18	7
AE	SF	36	52	35	249	211.4	37.6	220	Y	0	8.00	8.00	20	8.00	6.00	14.95	27.29	40%	29.7%	5,134	1,527	3,274	1.0	0.64	1	0	2	6
AF	SF	36	52	35	251	212.8	38.2	222	Y	0	8.00	8.00	20	8.00	7.04	4.00	27.29	40%	35.8%	4,266	1,527	3,274	1.0	0.77	1	0	2	0
AG	SF	36	52	35	253	214	39	224	Y	0	8.00	8.00	20	8.00	35.54	4.00	15.95	40%	25.6%	5,966	1,527	3,274	1.0	0.55	1	0	2	0
AH	TH	144	41	30.25	280.25	245.6	34.65	250	N	20	8.66	8.66	20	32.50	0.00	0.00	40.45	40%	32.9%	17,933	5,904	17,712	1.0	0.99	8	0	12	5
AI	SF	36	52	35	287	252	35	251	Y	0	8.00	8.00	20	4.00	27.01	4.00	23.02	40%	27.9%	5,470	1,527	3,274	1.0	0.60	1	0	2	0
AJ	SF	36	52	35	288	252.8	35.2	251	Y	0	8.00	8.00	20	4.00	8.85	4.00	22.76	40%	38.0%	4,022	1,527	3,274	1.0	0.81	1	0	2	0
AK	SF	36	52	35	289	253.4	35.6	251	Y	0	8.00	8.00	20	4.00	6.67	9.00	32.13	40%	32.4%	4,715	1,527	3,274	1.0	0.69	1	0	2	0
AL	SF	36	52	35	290	253.8	36.2	251	Y	0	8.00	8.00	20	4.00	9.95	30.60	32.13	40%	23.2%	6,588	1,527	3,274	1.0	0.50	1	0	2	0
AM	SF	36	52	35	288	252	36	250	Y	0	8.00	8.00	20	4.00	19.05	27.00	40.06	40%	18.0%	8,466	1,527	3,274	1.0	0.39	1	0	2	0
AN	SF	36	52	35	284	247.3	36.7	249	N	20	8.00	8.00	20	39.00	17.00	5.00	35.64	40%	21.7%	7,030	1,527	3,274	1.0	0.47	1	0	2	1
AO	SF	36	52	35	282	244.4	37.6	246	N	20	8.00	8.00	20	39.00	5.00	5.00	35.64	40%	27.4%	5,571	1,527	3,274	1.0	0.59	1	0	2	2
AP	SF	36	52	35	279	241.4	37.6	243	N	20	8.00	8.00	20	39.00	5.00	5.00	35.64	40%	27.4%	5,571	1,527	3,274	1.0	0.59	1	0	2	2
AQ	SF	36	52	35	276	238.4	37.6	250	N	20	8.00	8.00	20	39.00	5.00	5.00	35.64	40%	27.4%	5,571	1,527	3,274	1.0	0.59	1	0	2	2
AR	SF	36	52	35	273	235.3	37.7	237	N	20	8.00	8.00	20	39.00	5.00	5.00	35.64	40%	27.4%	5,571	1,527	3,274	1.0	0.59	1	0	2	2
AS	SF	36	52	35	270	232.5	37.5	234	N	20	8.00	8.00	20	39.00	5.00	5.00	35.64	40%	27.4%	5,571	1,527	3,274	1.0	0.59	1	0	2	2
AT	SF	36	52	35	267	229.7	37.3	231	N	20	8.00	8.00	20	39.00	5.00	5.00	35.64	40%	27.4%	5,571	1,527	3,274	1.0	0.59	1	0	2	2
AU	SF	36	52	35	264	226.9	37.1	228	N	20	8.00	8.00	20	39.00	5.00	5.00	35.64	40%	27.2%	5,611	1,527	3,274	1.0	0.58	1	0	2	1
AV	SF	36	52	35	261	224.2	36.8	225	N	20	8.00	8.00	20	39.00	5.00	10.00	35.64	40%	24.7%	6,193	1,527	3,274	1.0	0.53	1	0	2	1
AW	SF	36	52	35	243	202	41	214	Y	0	8.00	8.00	20	8.00	15.61	10.75	34.01	40%	25.3%	6,035	1,527	3,274	1.0	0.54	1	0	2	0
AX	SF	36	52	35	241	200.5	40.5	212	Y	0	8.00	8.00	20	8.00	10.63	10.63	32.56	40%	27.8%	5,497	1,527	3,274	1.0	0.60	1	0	2	0
AY	SF	36	52	35	237	200	37	208	Y	0	8.00	0.00	20	8.00	11.47	6.28	43.44	40%	26.6%	5,750	1,527	3,274	1.0	0.57	1	0	2	0
AZ	TH	162	41	30.25	265.25	232.5	32.75	235	Y	0	0.00	8.19	20	15.00	4.06	15.00	35.00	40%	39.5%	16,819	6,642	19,926	1.0	1.18	9	0	18	0
BA	CO	123.3	54.1	32.83	287.24	250	37.24	250	Y	0	9.31	0.00	20	40.44	14.29	47.3	42.81	40%	25.3%	22,930	5,800	17,400	1.0	0.76	12	0	8	5
BB	CO	128.8	238.4	43.92	306.75	254	52.75	240	Y	0	13.19	13.19	20	0.00	19.90	18.8	58.42	40%	37.8%	49,214	18,616	66,250	1.0	1.35	49	0	31	0
BC	OS								N/A	0	0.00	0.00	0					40%	0.0%	14,516	0	0	1.0	0.00	0	0	0	0
BD	OS								N/A	0	0.00	0.00	0					40%	0.0%	11,936	0	0	1.0	0.00	0	0	0	6

Total Lots: 55

Total Livable Units 199
Open Space 2

Townhomes	111	% Type	Condo	61	% Type	Single Family	27	% Type
Type I	32	29%	1 BR	14	23%	Type I	18	67%
Type II	27	24%	1 BR / Den	7	11%	Type II	9	33%
Type IIIA	18	16%	2BR	25	41%			
Type IIIB	20	18%	2 BR / Den	8	13%			
Type IV	11	10%	3 BR	6	10%			
Type V	3	3%	Eff	1	2%			

OVERALL SITE SUMMARY							
TOTAL LOT OCC	TOTAL LOT AREA	TOTAL BUILDING AREA	TOTAL GROSS SQ FT	FLOOR AREA RATIO PROVIDED	ON-SITE PARKING REQUIRED	PARKING PROVIDED	ADDITIONAL PARKING PROVIDED *
29.4%	502,493	147,563	417,802	0.83	199	280	101

* Additional Parking Spaces on the private streets are provided for the convenience of the community and are not evaluated against the required parking. As such, spaces on private streets may not meet the size requirements per code.

Kimley-Horn and Associates, Inc.

10/21/2005 11:12 AM

6000 New Hampshire Avenue
Initial PUD Submission:
September 12, 2005

Lot Tabulation
Sheet T01