DRAINAGE REPORT FOR WHISTLER SUBDIVISION TRACT B-9 AT SEVEN BAR NORTH

JUNE 30, 1998

Prepared for:

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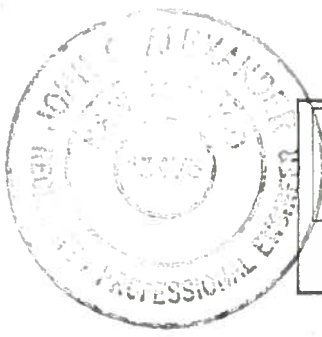

John C. Alexander, P.E. Date 7-9-98

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I. INTRODUCTION

This report summarizes the revisions made to a previously submitted and approved Drainage Report. The previous report, "Revised Drainage Report for Tracts B-7, B-8, and B-9 Subdivision at Seven Bar North," dated June 1995 is in City A-13/D-7 file. These revisions are an increased lot count in Tract B-9 only from 64 lots in the June 1995 report to 100 lots in this revised report. Streets have remained essentially identical in layout between the two reports. We have included pertinent maps and plans from the 1995 report for your convenience and comparison.

II. PURPOSE

The purpose of this report is to obtain approval for the revised preliminary and final plat, grading plan, building permit, and work order for Tract B-9. Development of Tract B-9 will occur in two phases, to be called "Whistler at Seven Bar North, Units I and II."

The preliminary plat and grading plan is anticipated to be heard at DRB on August 4th, 1998. For clarity's and reduced paperwork's sake, we have not attempted to revise and resubmit the bulky previous report, but instead are submitting this report as an "addendum" that provides new calculations and materials only in areas where drainage conditions have changed.

III. HYDROLOGIC/HYDRAULIC COMPARISON BETWEEN REPORTS

All information pertaining to "Tract B-9" in the June 1995 report remains essentially unchanged except for lot density. It has changed from 3.40 to 5.32 dwelling units per acre. An analysis of impervious area was performed to compare the actual difference of the two fully developed conditions. The results show a negligible increase of only 0.6 cfs over the entire site in the 100-year, 6-hour storm event. Accordingly, there is no need to revise the vast majority of the storm drain/street drainage system calculations of the previous report. The results of the analysis are in the Appendix in a spreadsheet format.

As previously mentioned, we have enclosed plans and plats from the June 1995 and May 1998 reports in the Appendix for comparison and reference. The developed storm drainage system proposed and approved in the June 1995 report has not changed. The horizontal and vertical alignments of the residential streets have not changed except for the deletion of the connection road between Tracts B-9 and B-8. Essentially, we have moved lot lines and added thirty-six lots to the site. Due to the revised lot configuration, the majority of the pads have changed elevation only +/- one foot. We still incorporate split level pads and backyard ponds at some lots. Calculations for the backyard ponds are included in Appendix B.

IV. PROPOSED PHASING

The phasing of construction has no significant impact on the hydrologic calculations. An overall grading plan as well as Units I & II phased grading plans have been enclosed as Plates 3, 4 and 5 at the rear of this report. Please refer to Plate 4, Proposed Subdivision Site Grading and Drainage Plan, Unit I, (July 1998). Phase One will include rough grading of the Unit II site and the installation of the infrastructure and paving of Unit I. A temporary desilting pond will be constructed at each of the paving terminus. The rough grading of Unit II will insure its flows will be directed to these ponds, and onto the proposed roadways.

Please refer to Plate 5 proposed Subdivision Site Grading, Unit II (July 1998). Tie slopes will be kept to a 3:1 maximum. Runoff from the northern boundary tie slope, north of Westside Boulevard's median curb, is confined within the Westside Boulevard right-of-way and conveyed via earthen channels to an existing beehive covered manhole to the west, and the eastward flow to the temporary paved west bound driving lane. The runoff from the high point on Westside Boulevard's asphalt is conveyed east and west by the south curb and gutter. Westward flow is directed to an existing pair of inlets built with COA Project number 5752.83, located just east of the Westside Boulevard and Seven Bar Loop Road intersection. Eastward flow is directed to an existing battery of inlets, built with COA Project number 3725, near the intersection of Westside Boulevard and Sierrita Road.

V. CONCLUSION

In conclusion, the increase in lot density and revised pad elevations has a negligible impact on the hydrological and hydraulic calculations on the previously approved drainage plan. Therefore, we recommend that this revised plan be approved for revised preliminary and final plat, grading plan, building permit and work order for Tract B-9.

HYDROLOGIC DATA-SEVEN BAR NORTH TRACT 9
JUNE, 1995

PEAK DISCHARGE, CFS/ACRE				
EVENT	A	B	C	D
100-YR (1)	1.29	2.03	2.87	4.37
10-YR (2)	0.24	0.76	1.49	2.89
3	0.44	0.67	0.99	1.97
4	0	0.22	0.44	1.24
2	0.24	0.76	1.49	2.89

FULLY DEVELOPED CONDITIONS:

SUMMARY OF HYDROLOGIC DATA										RATIONAL METHOD		
			% LAND TREATMENT									
BASIN ID	AREA AC	AREA SQ.MI.	A	B	C	D	TIME TO PEAK	10-YR DISCHARGE CFS/AC	Q(10YR) CFS	COMPOSITE C	I (IN/HR)	Q(100YR) (CFS)
9A	3.016	0.0047	3.0	21.2	21.2	54.6	0.1333	2.06	6.2	0.74	4.70	10.4
9B	1.930	0.0030	3.3	18.8	18.8	59.1	0.1333	2.14	4.1	0.75	4.70	6.8
9C	4.660	0.0073	3.3	20.4	20.4	55.9	0.1333	2.08	9.7	0.74	4.70	16.2
9D	1.277	0.0020	3.6	18.0	18.0	60.3	0.1333	2.16	2.8	0.76	4.70	4.6
9E	2.683	0.0042	3.4	19.2	19.2	58.3	0.1333	2.12	5.7	0.75	4.70	9.5
9F	2.467	0.0039	3.7	17.3	17.3	61.7	0.1333	2.18	5.4	0.76	4.70	8.9
9G	1.533	0.0024	3.0	24.6	24.6	47.9	0.1333	1.94	3.0	0.71	4.70	5.1
SUMS	*17.6*											*61.5*

Total

HYDROLOGIC DATA-SEVEN BAR NORTH TRACT 9
JUNE, 1995

IMPERVIOUS AREA CALCULATIONS

	LOT WIDTH	(IN FEET)	50	55	60	65	70	75	80
	PAD WIDTH		40	45	50	55	60	65	70
	PAD DEPTH		65	65	65	65	65	65	65
	DRIVEWAY	(20'x20')	400	400	400	400	400	400	400
(INCLUDED W/ ROAD)	WALKWAY	(4' WIDE)	200	220	240	260	280	300	320
(NOT INCLUDED W/ BACKYARD PONDING)	PATIO	(10'x10')	100	100	100	100	100	100	100
	TOTAL IMPERVIOUS		3300 sq.ft/lot	3645 sq.ft/lot	3990 sq.ft/lot	4335 sq.ft/lot	4680 sq.ft/lot	5025 sq.ft/lot	5370 sq.ft/lot

ROADWAY CALCULATIONS

ROADWAY	TYPE 1	TYPE 2	TYPE 3	TYPE 4	CUL 1
F-F WIDTH	28	51	26	0	
SIDEWALK	4	4	4	0	0
RADIUS					40
	36 sq.ft/ft	59 sq.ft/ft	34 sq.ft/ft	0 sq.ft/ft	5027 sq.ft

CALCULATIONS

BASIN ID	AREA TYPE D AC	PERCENT TYPE D	TOTAL NUMBER OF LOTS PER BASIN 50'	55'	60'	65'	70'	75'	80'
9A	1.65	54.6	0	0	0	1	4	4	1
9B	1.14	59.1	0	0	0	0	4	1	2
9C	2.61	55.9	0	0	0	2	6	8	1
9D	0.77	60.3	0	0	0	1	3	0	1
9E	1.56	58.3	0	0	0	3	4	1	2
9F	1.52	61.7	0	0	0	5	2	2	1
9G	0.73	47.9	0	0	0	3	1	0	1
			0	0	0	15	24	16	9

TOTAL LOTS: 64

TOTAL LENGTH OF ROADWAY PER BASIN TYPE 1	TYPE 2	TYPE 3	TYPE 4	NUMBER OF CUL-DE-SACS PER BASIN
577	0	0	0	0.49
423	0	0	0	0.00
711	0	0	0	1.12
273	0	0	0	0.00
413	75	0	0	0.26
410	0	0	0	1.00
0	0	114	0	1.00

Data used to calculate Q_{100} 1995

HYDROLOGIC DATA-SEVEN BAR NORTH TRACT 9
APRIL, 1998

PEAK DISCHARGE, CFS/ACRE				
EVENT	A	B	C	D
100-YR (1)	1.29	2.03	2.87	4.37
10-YR (2)	0.24	0.76	1.49	2.89
3	0.44	0.67	0.99	1.97
4	0	0.22	0.44	1.24
2	0.24	0.76	1.49	2.89

FULLY DEVELOPED CONDITIONS:

SUMMARY OF HYDROLOGIC DATA — **RATIONAL METHOD**

BASIN ID	AREA AC	AREA SQ.MI.	% LAND TREATMENT A	B	C	D	TIME TO PEAK	10-YR DISCHARGE CFS/AC	Q(10YR) CFS	COMPOSITE C	I (IN/HR)	Q(100YR) (CFS)
9A	3.016	0.0047	4.6	20.0	20.0	55.4	0.1333	2.06	6.2	0.74	4.70	10.4
9B	1.930	0.0030	5.7	14.5	14.5	65.2	0.1333	2.23	4.3	0.77	4.70	7.0
9C	4.660	0.0073	5.3	17.7	17.7	59.3	0.1333	2.12	9.9	0.75	4.70	16.4
9D	1.277	0.0020	5.0	17.9	17.9	59.2	0.1333	2.13	2.7	0.75	4.70	4.5
9E	2.683	0.0042	5.1	17.4	17.4	60.0	0.1333	2.14	5.7	0.75	4.70	9.5
9F	2.467	0.0039	6.0	13.2	13.2	67.6	0.1333	2.26	5.6	0.78	4.70	9.1
9G	1.533	0.0024	4.8	21.2	21.2	52.9	0.1333	2.02	3.1	0.72	4.70	5.2
SUMS	***17.6***											***62.1***

Total

HYDROLOGIC DATA-SEVEN BAR NORTH TRACT 9
APRIL, 1998

IMPERVIOUS AREA CALCULATIONS

	LOT WIDTH	(IN FEET)	50	55	60	65	70	75	80
	PAD WIDTH		40	45	50	55	60	65	70
	PAD DEPTH		65	65	65	65	65	65	65
	DRIVEWAY	(20'x20')	400	400	400	400	400	400	400
(INCLUDED W/ ROAD)	WALKWAY	(4' WIDE)	200	220	240	260	280	300	320
(NOT INCLUDED W/ BACKYARD PONDING)	PATIO	(10'x10')	100	100	100	100	100	100	100
	TOTAL IMPERVIOUS		3300 sq.ft/lot	3645 sq.ft/lot	3990 sq.ft/lot	4335 sq.ft/lot	4680 sq.ft/lot	5025 sq.ft/lot	5370 sq.ft/lot

ROADWAY CALCULATIONS

ROADWAY	TYPE 1	TYPE 2	TYPE 3	TYPE 4	CUL 1
F-F WIDTH	28	51	26	0	
SIDEWALK	4	4	4	0	0
RADIUS					40
	36 sq.ft/ft	59 sq.ft/ft	34 sq.ft/ft	0 sq.ft/ft	5027 sq.ft

LOT CALCULATIONS

BASIN ID	AREA TYPE D AC	PERCENT TYPE D	TOTAL NUMBER OF LOTS PER BASIN 50'	55'	60'	65'	70'	75'	80'
9A	1.67	55.4	15	0	0	0	0	0	0
9B	1.26	65.2	12	0	0	0	0	0	0
9C	2.76	59.3	27	0	0	0	0	0	0
9D	0.76	59.2	7	0	0	0	0	0	0
9E	1.61	60.0	15	0	0	0	0	0	0
9F	1.67	67.6	16	0	0	0	0	0	0
9G	0.81	52.9	8	0	0	0	0	0	0
			100	0	0	0	0	0	0

TOTAL LOTS: 100

TOTAL LENGTH OF ROADWAY PER BASIN TYPE 1	TYPE 2	TYPE 3	TYPE 4	NUMBER OF CUL-DE-SACS PER BASIN
577	0	0	0	0.49
423	0	0	0	0.00
711	0	0	0	1.12
273	0	0	0	0.00
413	75	0	0	0.26
410	0	0	0	1.00
0	0	114	0	1.00

Data used to calculate Q100 1998

WHISTLER AT SEVEN BAR NORTH
BACKYARD POND DESIGN
APRIL, 1998

BACKYARD PONDS

ASSUMING: (50% treatment "B" and 50% treatment "C") X (Backyard Area) + (100 sf X Treatment "D")
for 10 day, 100 year volumes

$$V(10) = \frac{V(360) + Ad*(P(10) - P(360)}{12 \text{ in/ft}}$$

Wher E is the weighted excess percipitation
A is the area in each treatment type

eq. a-7 DPM

E for treatment "B" and "C" portions:

$$E = \frac{EaAa+EbAb+EcAc+EdAd}{Aa+Ab+Ac+Ad}$$

eq. a-5 DPM

Given:
Ea = n/a
Eb = 0.67
Ec = 0.99
Ed = 1.97

P10 = 3.67
P360 = 2.20

$$E = \frac{[.67+.99]}{2*(12)} = 0.069 \text{ ft}$$

(converts inches to feet)

$$V(10) = \frac{[(X \text{ BACKYARD AREA } -100 \text{ sf}) \times E] + 100 \text{ sf}* [(1.97) + (3.67-2.20)]/12]}{2*(12)}$$

eq. a-9 DPM

WHISTER AT SEVEN BAR NORTH:

LOT # UNIT B-9	BACKYARD AREA (SQ. FT.)	REQUIRED V (100) (CU. FT.)	POND DIMENSION (FT.) *(AVG. WIDTHS)*			D	POND VOLUME (CU. FT.)	C	I	Q(100) cfs
			L	W1	W2					
8	1280	117	32	9	6	0.5	120	0.52	4.7	0.07
9	2002	167	27	14	11	0.5	169	0.52	4.7	0.11
59	2500	201	35	13	10	0.5	201	0.52	4.7	0.14
84	5150	384	31	23	19.4	0.6	394	0.52	4.7	0.29
85	1400	125	20	14	11	0.5	125	0.52	4.7	0.08
86	1567	137	21	15	12	0.5	142	0.52	4.7	0.09
87	1640	142	21	15	12	0.5	142	0.52	4.7	0.09
88	1649	142	21	15	12	0.5	142	0.52	4.7	0.09
89	1562	136	21	15	12	0.5	142	0.52	4.7	0.09
90	1552	136	21	15	12	0.5	142	0.52	4.7	0.09
91	1595	139	21	15	12	0.5	142	0.52	4.7	0.09
92	1638	142	21	15	12	0.5	142	0.52	4.7	0.09
93	1615	140	21	15	12	0.5	142	0.52	4.7	0.09
94	1660	143	22	15	12	0.5	149	0.52	4.7	0.09
95	5391	401	42	18	14.4	0.6	408	0.52	4.7	0.30
96	3945	301	24	23	19.4	0.6	305	0.52	4.7	0.22

TOTAL = 2.03

checked by J.A. 6-29-98