AMENDMENT NO. 1

to Pine Creek Drainage Basin Planning Study

as approved by City Council 12/18/88, &
as approved by El Paso County
Commissioner 8/25/88

July 17, 1992
Revised July 29, 1992

Project No. 20-276

OBERING, WURTH & ASSOCIATES

Consulting Civil Engineers
Professional Land Surveyors

1015 Elkhorn Drive
Colorado Springs, Colorado 80907
Phone: (719) 531-6200
Fax: (719) 531-6206
July 1992  
Amendment No. 1 to Pine Creek  
Drainage Basin Planning Study  
Approved by City Council 12/18/88,  
Approved by El Paso County  
Commissioner 8/25/88  
Project No. 20-276  

ENGINEER'S STATEMENT  
The attached amendment to the approved Drainage Basin Planning Study was prepared under my direction and supervision and is correct to the best of my knowledge and belief. Said amendment has been prepared to the criteria established by the City for drainage reports and said amendment does not change adopted policy, approved concepts or engineering requirements of the Basin Master Plan. I accept responsibility for any liability caused by the negligent acts, errors, or omissions on my part in preparing this report.

Roland G. Obering, P.E. & P.L.S. Colorado 13226  

DEVELOPER'S STATEMENT  
The developer has read and will comply with all the requirements specified in this drainage report and plan.

Vintage Communities, Inc.  

Development Manager  

1110 N. Union Blvd.  
Colorado Springs, Co. 80906  

CITY OF COLORADO SPRINGS  
Filed in accordance with Section 15-3-906 of the Code of the City of Colorado Springs, 1980, as amended.

Conditions:
July 17, 1992
Revised July 29, 1992

City of Colorado Springs
Department of Planning & Development
Engineering Division
30 S. Nevada Avenue
P.O. Box 1575, Mail Code 435
Colorado Springs, CO 80901

Attn: Mr. Gary Haynes
City Engineer

Re: AMENDMENT NO. 1 to Pine Creek Drainage Basin Planning Study as approved by City Council 12/18/88, as approved by El Paso County Commissioner 8/25/88

Project No. 20-276

Gentlemen:

This letter summarizes several design issues with respect to the Pine Creek Drainage Basin Planning Study (DBPS) specifically as they relate to the approved study and impact or are affected by the design of the Briargate Parkway Embankment for Detention Facility No. 1. This letter accompanies design plans for the embankment that illustrate storage configuration, water surface elevations, outlet structure and other elements of the facility. The letter is intended to take the form of an administrative amendment to the approved Drainage Basin Planning Study (DBPS). This is a technical amendment only, there are no changes to the DBPS in adopted policy, approved Concepts, or engineering requirements above Design Point 6 or below Design Point 9. The contents of this amendment will not affect approval or jurisdictional agencies, other than the City of Colorado Springs.

The study has been amended in two areas above Detention Facility No. 1 but the discharge will be at or less than the rate indicated in the study. The Developer of the Briargate project is in the process of preparing a new Land Use Master Plan for portions of the project lying within the Pine Creek basin. As a result of this replanning there will be a significant reduction in densities over much of the project. This will have a direct impact on Basin hydrology and hydraulics. Upon completion of the replanning, the basin will likely require an additional restudy in order to quantify impacts. Since this process
of replanning is a relatively lengthy one and the need to proceed with the Briargate Embankment is imminent, this amendment letter process is being pursued.

The amendment to the basin study relates to the functioning of the Briargate Embankment facility (Detention Facility No. 1). The master plan identified a required release rate as part of the overall basin stormwater management scheme. Final design of the facility has revealed that it would be extremely difficult to accommodate this release rate and provide adequate storage volume for several reasons, primarily topographic, geologic, and the existing grade on State Highway 83. These factors combined with the clogging factor and freeboard requirements necessitate the addition of a second upstream detention facility. Safety criteria, overflow, and discharge remain as indicated in the approved study.

The planned new detention facility located some 1.2 miles upstream near the confluence of the North and South forks of Pine Creek would reduce the design flow reaching Detention Facility No. 1 and allow the final design of the embankment to be accomplished within the constraints of the previously mentioned factors. The location of this facility has been considered based on 1"=100', 2' C.I. topographic mapping and it appears the required volume can be achieved by grading on the golf course driving range without creating a jurisdictional facility. This amendment to the Master Plan can be summarized as an adjustment of Detention Facility No. 1 based on final design considerations and the addition of a second Detention Facility (1A) to create a more manageable flow entering at the embankment facility.

Included in this amendment to the basin study is the re-routing of several subbasins in the Business Campus area and in the Penrose Area. This re-routing is occurring as a part of the Briargate Business Campus Filing No. 10 Drainage Report & Plan. The re-routing consists of having the "Temporary Re-Route 48" RCP" in the Business Campus be a permanent pipe routing for both the 10 year the 100 year overflow system. This routing had been assumed to follow the existing utility corridor in the approved Master Plan. Approximately 210 acres of the basin are proposed to be permanently diverted into the storage area above the Embankment. In addition, a portion of the Penrose area lying East of Chapel Hills Drive consisting of about 113 acres is proposed to be permanently routed to Pine Creek at Chapel Hills rather than along the Briargate Parkway alignment as indicated in the approved Master Plan.
The re-routing of these two systems impacts the lower basin hydraulics to some extent by requiring some additional storage volume in the lower Detention Facility No. 1. This additional volume requirement has been accommodated by increasing the volume of the new Detention Facility No. 1A. The net result, as previously indicated, is in adjustment to upstream facilities and subbasins but no impact to systems or flows below Facility No. 1, (Design Point No. 9).

A copy of a portion of the Basin Map for the Pine Creek DBPS accompanies this submittal. The new Detention Facility No. 1A has been shown in an approximate location. The revised subbasin boundaries are also shown along with the re-routed underground systems. Other elements of the original Basin Map remain unchanged on the plan although they will be affected by this amendment. It is proposed that the Pine Creek DBPS be updated when the replanning of the Basin is complete and this will include the amendments contained in this letter.

Hydrology and new hydraulic computations have been completed for this amendment. This consists of HEC-1 computer modeling results for the entire Basin. We also have re-modeled Detention Facility No. 1 using Haestad Methods Pond Pac software for the new pond configuration. A preliminary grading plan for Facility No. 1A has also been prepared based on the required volume necessary to assure that both facilities working together will attenuate stormwater flows to the previously incised release rate from Facility No. 1. This support information is attached to this letter. Results of the new modeling for inflow/outflow, storage volume and staging elevations are summarized in the following table and on the partial Basin Plan.

<table>
<thead>
<tr>
<th>FACILITY</th>
<th>$Q_{in}$ INFLOW (CFS)</th>
<th>$Q_{out}$ OUTFLOW (CFS)</th>
<th>STORAGE (Ac. Ft.)</th>
</tr>
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<tbody>
<tr>
<td>No. 1 (Approved)</td>
<td>3269</td>
<td>2028</td>
<td>81</td>
</tr>
<tr>
<td>No. 2 (Amended)</td>
<td>2710</td>
<td>2028 (Max)</td>
<td>76</td>
</tr>
<tr>
<td>No. 1A (Amended)</td>
<td>2727</td>
<td>1323</td>
<td>69</td>
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</table>

This amendment letter is intended to provide revised information relative to the Briargate Embankment Detention Facility No. 1 so the facility can be designed and approved in a configuration that varies from the approved DBPS. This is proposed to be
accomplished by addition of a second detention facility in a location upstream that will compensate for final design considerations for the Embankment facility and proposed upstream basin re-routing. All other aspects of the previously approved DBPS remain unchanged. There will be no impact to the ultimate downstream release. The outlet facility is proposed to be restricted during the first stage of construction to reduce discharge to historic in accordance with conditions of approval of the Master Plan.

On behalf of the Developer, Vintage Companies, we are requesting acceptance of this amendment to the DBPS so final design of the Embankment facility may be completed and approval received. Since Vintage controls the land associated with all elements of this amendment and a formal revision to the DBPS will follow the Land Planning revisions, this is a logical approach to allow the Embankment project to proceed.

If there are any questions regarding this request, please contact the undersigned.

Very truly yours,

OBERING, WURTH & ASSOCIATES

Roland G. Obering, P.E. & P.L.S.

RGO/p

Attachment:
Basin Map - Partial
Statements
Hydrologic Computations
Revised Basin Map - Partial

cc:    Vintage Companies
       Attn: Mr. Mike DeGrant

0C0N0:06-076.717
<table>
<thead>
<tr>
<th>POINT</th>
<th>HISTORIC</th>
<th>DEVELOPED</th>
<th>COMMENTS</th>
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<tr>
<td></td>
<td></td>
<td>WITH DETENTION</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>256</td>
<td>1011</td>
<td>in=944, out=289, Pond No. 2 at Powers Boulevard (North Fork)</td>
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<tr>
<td>2A</td>
<td>177</td>
<td>672</td>
<td>in=672, out=266, Pond No. 3 at Street No. 3 (South Fork)</td>
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<td>2B</td>
<td>322</td>
<td>1402</td>
<td>in=865, out=671, Pond No. 4 at Powers Blvd. (South Fork)</td>
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<td></td>
<td></td>
<td>- - -</td>
<td>in=691, out=509, Pond No. 5</td>
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<td>3</td>
<td>476</td>
<td>2274</td>
<td>1049, Union Boulevard/Briargate Parkway (South Fork)</td>
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<td>4</td>
<td>364</td>
<td>1446</td>
<td>683, Street #10 (North Fork)</td>
</tr>
<tr>
<td>5</td>
<td>563</td>
<td>2681</td>
<td>1251, Street #10 (South Fork)</td>
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<td>*6</td>
<td>1336</td>
<td>5197</td>
<td>2462, Street #14 (North &amp; South Forks)</td>
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<td>*7</td>
<td>1364</td>
<td>5510</td>
<td>1330, At Green #10</td>
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<td>*8</td>
<td>1426</td>
<td>6298</td>
<td>1797, Chapel Hills Drive</td>
</tr>
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<td>*9</td>
<td>1515</td>
<td>7162</td>
<td>in=2710, out=2028 (max) at Briargate Parkway</td>
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<td>10</td>
<td>1118</td>
<td>5571</td>
<td>2062, Pond No. 1 Outflow @ Hwy. 83</td>
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<td>11</td>
<td>61</td>
<td>693</td>
<td>542, Business Campus Outfall at Highway 83</td>
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<td>12</td>
<td>1210</td>
<td>6212</td>
<td>2536, Combination of 10 &amp; 11 at Air Force Academy Property</td>
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<tr>
<td>13</td>
<td>1262</td>
<td>6067</td>
<td>2542, Academy Blvd. Crossing</td>
</tr>
<tr>
<td>14</td>
<td>--</td>
<td>5866</td>
<td>2559, Pine Creek at the Chapel Hills Mall Outfall (Not Including Chapel Hills Mall Outfall)</td>
</tr>
<tr>
<td>15</td>
<td>--</td>
<td>9518</td>
<td>6095, Pine Creek - North Cottonwood Junction</td>
</tr>
<tr>
<td>16</td>
<td>--</td>
<td>--</td>
<td>6689, Junction with Monument Creek</td>
</tr>
</tbody>
</table>

SUMMARY OF HYDROLOGIC COMPUTATIONS (HEC 1 COMPUTER RUNS)
PINE CREEK DRAINAGE BASIN

EXHIBIT D TABULATION OF ACCUMULATIVE FLOWS (24 HOUR)

*Changed per Amendment No. 1, July 1992

SHEET 2 of 2


Obering, Wurth & Associates
Consulting Civil Engineers
Registered Land Surveyors
1015 Elton Drive
Colorado Springs, Colorado 80907
Phone (303) 531-6200

AMENDMENT NO. 1
HYDROLOGY
SUB-BASIN SCHEMATIC
STUDY AREA

*Q300 OUTFLOW AT POINT 12 IS REQUIRED TO BE AT OR BELOW HISTORIC UNTIL DOWNSTREAM IMPROVEMENTS ARE IN PLACE. THIS NEEDS TO BE DONE BY TEMPORARY DIVERSION AND/OR DETENTION

FIGURE III
SHEET 3 of 3
JULY 1992