RIO GRANDE ENGINEERING OF NEW MEXICO, LLC

September 17, 2013

Mr. Greg Olson, PE
Senior Engineer
Hydrology
City of Albuquerque

RE: Grading and Drainage Plan
Beehive homes (L232-D022)

Dear Mr. Olson:

The purpose of this letter is to accompany the enclosed grading plan for the referenced project. This plan has been modified to address your comments dated August 29, 2013. The following is a summary of your comments with the annotation as to how the plans were modified to address the comments.

1. The abutting four hills channel:
   a. Proposed connection must be done under SO19. Add SO19 notes, and details for construction
      We have added the SO19 general notes and the details of the channel penetration
   b. Plans must require contractor to call storm maintenance for inspections.
      We have added the SO19 general notes including inspection requirements and contact information.
   c. Raise connection to 3' above channel bottom
      We have raised channel penetration
   d. Utilize channel record drawings to detail penetration.
      We have utilized the record drawings and included excerpts into the plan.
   e. Plans must call for contractor to locate existing rebar to minimize the rebar cuts
      We have added the detail and note to reflect the contractor to visually see the rebar prior to cutting, this will reduce amount of cuts. We have meet regarding detail and the plans reflect suggested detailing of the penetration.

2. Drainage report discusses retaining first .44", yet plan shows releasing all flows
   We had submitted in correct outfall elevation and have corrected
   a. Storm drain pipe shall connect directly to channel
      We have modified piping such the flow from the upland and majority of site drains directly to the channel.
   b. Pond will be resized to accommodate flow for undeveloped east side and rear roof areas.
      We have reconfigured the pond to account for the flows from east side of lot the ponding is sized to contain the 100-year 6 hours volume and the inlet will release volumes in excess to the storm drain pipe and discharge to the channel.
   c. Raise grate on inlet to allow for retention.
      We have raised the inlet to provide adequate volume for the first .44 inches and the 100-year 6-hour volume of the contributing basin
   d. Pond spill way shall correspond to existing flow path to south.
      We have adjusted the spillway location.
   e. Show how retention pond will be accessed.
      The pond will have clear access from the north; the slope is 3:1 and will be able to be accessed from the site from the undeveloped area

3. Clarify how site "rough grading" is intended to be completed
   The entire site will be graded at one time. We have specified pad elevations, the future homes are to be built with crawl space, and will be dug out at time of phase construction.

4. Label the building numbers and phasing
   We have labeled the phasing and building numbers

5. What is purpose of wall on south side, eliminate the no mans land. Is south swale plated as well
   We adjusted the retaining wall and removed screen wall. The swale is to be cobble per detail and callout

6. Drafting issues need to be corrected:

   a. Legend symbologies need to not obscure details and more differentiable
      We have attempted to clean up hatch patterns such they are clear and not obscuring the site detail.
   b. Proposed contours are not legible.
      We have eliminated the text box around elevations to make more legible.
   c. Clarify the limits of paving and add sidewalks/concrete.
      We have added concrete pattern for sidewalks and concrete, the pavement pattern makes the plan too difficult to read
   d. What are limits for cobble swale, same pattern used.
      All swales shown will be cobble

7. Add flow arrows and offsite design Q's. Show how they enter the site
   We have added the flows and provided clear path for upland flows to enter the site.

8. Show where roof flows leave the structure
   The roofs are pitched and leave roof as sheet flow.

9. Clarify inlet details on southern end. How will flows enter the inlet
   We have added the curb to force water into inlet

10. Add sidewalk culverts so concentrated flow does not go over sidewalks
    We have added.

11. Adjust swale at NW corner of western building pad
    We have corrected.

12. Clarify grades around parking areas, typical sidewalk grades, etc. Add flow arrows
    We have note stating all grades flow line unless other wise noted. The traffic control plan calls out and shows details of sidewalks. A reduced copy has been attached

13. Show SAS manhole and account for
    We have shown manhole and addressed raising to 6" above finished grade

14. Details, sheet 2:
    A. Better define cobble swale
       We have clarified the swale is to have 6" cobbles, 1' deep
    B. Correct section A-A
       We have corrected this section
    C. Adjust section B-B
       We have modified section to account for changes to wall
    D. Revise Emergency spillway detail per previous comments
       We have adjusted
    E. Provide more detail on channel penetration
    F. We have added more detail to better describe how penetration shall be constructed

Due to size of lot, a SWPPP has been prepared and submitted under separate cover. Should you have any questions regarding this re-submittal, please do not hesitate to call me.

Sincerely,

David Soule, PE
Rio Grande Engineering
505.321.9099

Weighted E Method

BEEHIVE HOMES

Proposed Developed Basins

Basin	Area (sf)	Area (acres)	Treatment A		Treatment B		Treatment C		Treatment D		100-Year, 6-hr.			10-day
			%	(acres)	%	(acres)	%	(acres)	%	(acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Volume (ac-ft)
UPLAND A	32339	0.742	0%	0	10.0%	0.074	5.0%	0.03712	85%	0.631	2.425	0.150	3.67	0.234
UPLAND B	32047	0.736	0%	0	10.0%	0.074	5.0%	0.03678	85%	0.625	2.425	0.149	3.64	0.232
UPLAND C	21936	0.504	0%	0	10.0%	0.050	5.0%	0.02518	85%	0.428	2.425	0.102	2.49	0.159
D	8521	0.196	0%	0	20.0%	0.039	30.0%	0.05868	50%	0.098	1.974	0.032	0.85	0.045
E	21011	0.482	0%	0	0.0%	0.000	10.0%	0.04823	90%	0.434	2.522	0.101	2.46	0.159
F	39986	0.918	0%	0	65.0%	0.597	35.0%	0.32128	85%	0.780	3.457	0.264	7.04	0.368
G	10259.00	0.236	0%	0	20.0%	0.047	20.0%	0.0471	60%	0.141	2.092	0.041	1.06	0.060
H	75099.00	1.724	0%	0	50.0%	0.862	30.0%	0.51721	20%	0.345	1.506	0.216	6.26	0.262
Harvest amount	154876.00	3.555										5678.787	27.45	

Equations:

Weighted E = Ea*Aa + Eb*Ab + Ec*Ac + Ed*Ad / (Total Area)

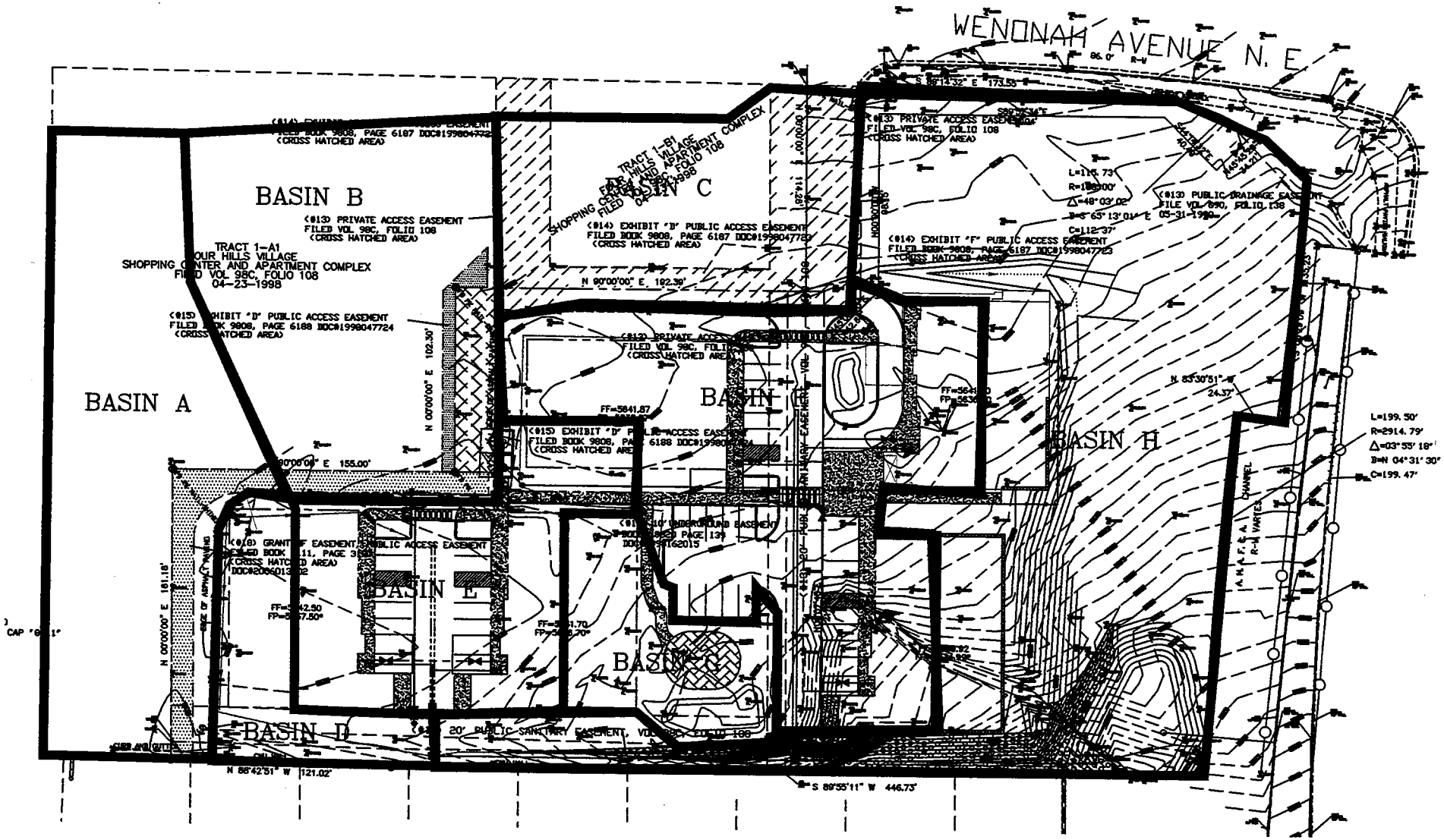
Volume = Weighted D * Total Area

Flow = Qa * Aa + Qb * Ab + Qc * Ac + Qd * Ad

Where for 100-year, 6-hour storm (zone 4)

Ea= 0.8	Qa= 2.2
Eb= 1.08	Qb= 2.92
Ec= 1.46	Qc= 3.73
Ed= 2.64	Qd= 5.25

DISCHARGE TO SE CORNER	27.45	CFS
EXISTING DISCHARGE	20.89	CFS
INCREASE	6.56	


WENONAH AVENUE N. E.
BASIN A
BASIN B
BASIN C
BASIN D
BASIN E
BASIN F
BASIN G
BASIN H
TRACT 1-A1
SHOPPING CENTER AND APARTMENT COMPLEX
FILED VOL 98C, FOLIO 108
04-23-1998
(#13) PRIVATE ACCESS EASEMENT
FILED VOL 98C, FOLIO 108
(CROSS HATCHED AREA)
(#14) EXHIBIT "D" PUBLIC ACCESS EASEMENT
FILED BOOK 9808, PAGE 6187 DOC#1998047723
(CROSS HATCHED AREA)
(#15) EXHIBIT "D" PUBLIC ACCESS EASEMENT
FILED BOOK 9808, PAGE 6188 DOC#1998047724
(CROSS HATCHED AREA)
(#16) GRANT OF EASEMENT PUBLIC ACCESS EASEMENT
(CROSS HATCHED AREA)
(#13) PUBLIC DRAINAGE EASEMENT
FILE VOL 890, FOLIO 138
05-31-1980
(#14) EXHIBIT "F" PUBLIC ACCESS EASEMENT
FILED BOOK 9808, PAGE 6187 DOC#1998047723
(CROSS HATCHED AREA)
20' PUBLIC SANITARY EASEMENT, VOL 89Y FOLIO 198
A.M.F.C.D. CHANNEL
R-W VARIES
N 90°00'00" E 192.39'
N 00°00'00" E 102.30'
N 90°00'00" E 155.00'
N 00°00'00" E 181.18'
N 56°42'51" W 121.02'
S 89°55'11" W 446.73'
N 83°30'51" W 24.37'
L=199.50'
R=2914.79'
Δ=03°55'18"
B=N 04°31'30"
C=199.47'
L=116.73'
R=135.00'
Δ=48°03'02"
B=S 65°13'01" E
C=113.27'
FF=5841.87
FF=5842.50
FP=5837.50
FF=5841.70
FP=5836.70
FF=5843.92
FP=5838.92
CAP "6911"