E21 / D22

MOUNTAIN RUN

APARTMENTS

5 PLANS

BOHANNAN-HUSTON INC.

4125 CARLISLE BLVD., N.E. ALBUQUERQUE, NEW MEXICO 87107 505 881-2000
6713 VISCOUNT BLVD., EL PASO, TEXAS 79925 915 778-4491
330 GARFIELD, SANTA FE, NEW MEXICO 87501 505 988-7671

June 30, 1983

Mr. Dwayne Sheppard
Acting City Engineer
City of Albuquerque
P. O. Box 1293
Albuquerque, NM 87103

Re: SAD 210 – Harper Road Criteria

Dear Dwayne:

The purpose of this letter is to outline our concerns with regard to drainage management along Harper Road from Layton Avenue to Wyoming Boulevard. As the consultant for all property owners fronting the south side of Harper Road in this reach, we are attempting to suggest a solution that is cost effective and meets criteria outlined in the Drainage Ordinance. It is hoped that this letter will clearly identify issues we feel must be addressed prior to proceeding with final plans and assessments within the district.

Sections 7C and 7E of the ordinance establish the governing criteria for flows in Harper Road. More specifically, Section 7C states that the ***10-year design storm runoff shall not exceed a depth of 0.5 feet in any arterial and shall flow such that one twelve-foot driving lane in each direction is free of flowing or standing water.*** Likewise, Section 7E states that ***arterial and collector streets shall be protected from damages to the pavement surface and from the safety hazards created by surface flow of nuisance waters across them.*** Section 7C relates to flow capacity in Harper Road, while Section 7E pertains to nuisance runoff crossing Layton Avenue in a westerly direction to Harper Road.

Mr. Brian Burnett, of this office, has reviewed the SAD 210 Drainage Report prepared by Wilson & Company. He concurs with the report's finding that, based on the nuisance flow and one-lane dry criteria (flowline runoff depth of approximately 0.35 feet), a 24" storm sewer line is required along Harper Road from Layton Avenue to Red Sky Street. It should be pointed out that an 18" storm sewer would adequately convey the anticipated flow rates, however, the DPM states that the minimum line size shall be 24".

PRINCIPALS
JERRY R. BOHANNAN, P. E. & L. S.
LARRY W. HUSTON
DONALD T. CREMANS, P. E.
C. J. (SKIP) MEAD, P. E.
MICHIAL M. EMERY, P. E.

ASSOCIATES
ANDRES ARAGON VIAMONTE, P. E.
JACK EICHORN
ROBERT H. GREENLEE, P. E.
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DARRELL L. WADE, P. E.
PATRICK L. STIEHR, P. E.
DAVID M. Y. MILLIKAN, P. E.

The last paragraph points to a potential contradiction in terms of the classification of arterials and collectors and their associated flow requirements. During the DPM Task Force sessions in which Section 7 was discussed, it was always my understanding that the term "arterial street" implied a six-lane facility. In other words, if the 0.5 foot depth requirement was met, there would be one lane dry in each direction for the six-lane case. We now have a situation in which Harper Road (classified as an arterial) will only be four lanes in the ultimate condition. As the ordinance now reads, one lane must be dry regardless of whether the arterial section will be four lanes or six lanes. Again, let me stress that whenever this section was explained, the arterial section was assumed to be six lanes, and the 0.5 foot depth criteria would yield similar flow capacity results for both arterial and collector streets.

Mr. Burnett has prepared a table indicating the flow capacity in Harper Road utilizing the criteria that the flow line runoff depth shall not exceed 0.5 feet. Supporting information and assumptions are listed below:

1. Layton Avenue

   a. Street criteria is met for this collector street.

   b. Runoff from Area H1 (as indicated in the SAD 210 report) will drain entirely to the south half of Harper Road.

2. Harper Road

   To determine the surface flow rates impacting Harper Road, runoff values from the SAD 210 report, for both the 10- and 100-year storms, were computed for specific reaches on a cfs/ft. of street basis. In other words, there is a specific flow quantity impacting each foot of road surface in both the north and south halves of the street. Summarizing:

   <u>Station 68+00 to 54+500</u>

   a. South half: $Q_{10} = 0.0029$ cfs/ft. of st.
      $Q_{100} = 0.0045$ cfs/ft. of st.

   b. North half: $Q_{10} = 0.0074$ cfs/ft. of st.
      $Q_{100} = 0.0112$ cfs/ft. of st.

Station 54+50 to 45+00

a. South half: Q_{10} = 0.00702 cfs/ft. of st.
Q_{100} = 0.0107 cfs/ft. of st.

b. North half: Q_{10} = 0.0138 cfs/ft. of st.
Q_{100} = 0.0211 cfs/ft. of st.

Figures in the accompanying table indicate that the street capacity in Harper Road is first exceeded along the south half at Station 49+50, which is about 450 feet east of the Red Sky Street/Harper Road intersection. Also enclosed are roadway cross-sections indicating flow depths for both the one-lane dry and 0.5 foot flow line runoff depth criteria. It is interesting to note that even in the 0.5 foot case, approximately 6.5 feet of the inside lane is "dry," and the maximum runoff depth in the remainder of this twelve-foot lane is minimal.

Section 7E of the ordinance also presents some interesting ramifications in terms of the use of storm sewer in arterial and collector streets. If one were to "relax" the one-lane dry criteria, approximately 2,300 feet of 24" storm sewer along Harper Road would be required to prevent the nuisance runoff from crossing Layton Avenue. In conversations with Bob Sykes, we discussed the possibility of simply collecting the trickle flows and daylighting the pipe in the curb line on Harper Road west of Layton Avenue. I realize that this particular approach has never been designed, and that it represents some difficult features from a hydraulic and traffic standpoint. Another solution is to incorporate the discharge of trickle flows into the landscaping and drainage scheme for the area within the Tanoan Country Club that is encompassed by Area H1. To alleviate the need for the long collection system, we would definitely pursue this alternative.

Let me take this opportunity to point out that the Academy is willing to grant easements at Red Sky Street and possibly at Barstow Street for the conveyance of storm water runoff. This will negate the need to have a continuous system along Harper Road. The details of this proposal are currently being coordinated with Bob Sykes.

Dwayne, as I stated earlier, we are working diligently to provide a workable solution in the spirit of criteria outlined in the Drainage Ordinance. Bohannan–Huston, Inc. will continue to pursue solutions which comply with the intent of existing policies and procedures. We do, however, feel that an in-depth look should be

made to assess the impacts of items in the ordinance, such as Sections 7C and 7E, on both the private and public sector. In short, for this particular assessment district, is it in the best interests of both the City and affected property owners to provide a solution which strictly adheres to criteria outlined in those sections of the ordinance?

Your thoughtful review of this letter is greatly appreciated. Please contact Mr. Brian Burnett or me if you have any questions, or if you would like to arrange a meeting to discuss these issues.

Sincerely yours,

Michial M. Emery

Michial M. Emery, P.E.
Vice President

cc: Mr. Bob Sykes
Mr. Jim Kirkpatrick
Mr. Gerald Farley
Mr. Joe Fritz

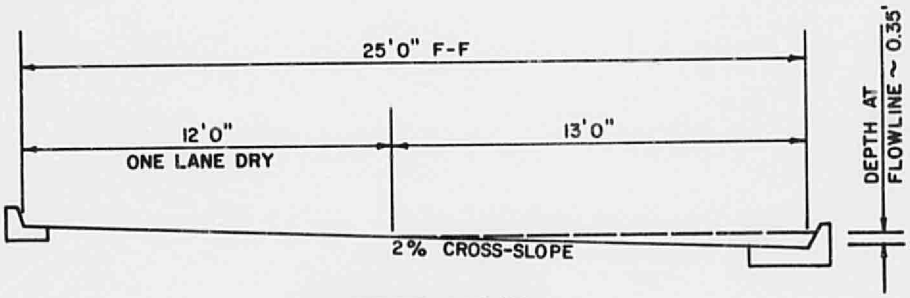
Enclosure

BB/dlh
Job No. 3 941 7
2 074 3

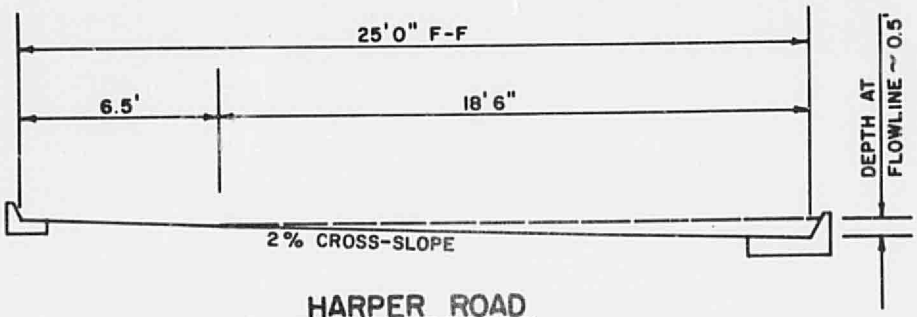
FLOW RATE CAPACITY IN HARPER ROAD
ASSUMING A FLOW LINE RUNOFF DEPTH OF 0.5 FEET

			Street Capacity Flow Rates*				Developed Condition Flow Rates			
			10-Yr.		100-Yr.		10-Yr.		100-Yr.	
Station	Distance	Slope	South One-Half	North One-Half	South One-Half	North One-Half	South One-Half	North One-Half	South One-Half	North One-Half
68+00							16.8 cfs	-0- cfs	25.6 cfs	-0- cfs
	300 ft.	0.0128	16 cfs	16 cfs	80 cfs	80 cfs				
65+00							17.7 cfs	2.2 cfs	27.0 cfs	3.4 cfs
	400 ft.	0.0248	23 cfs	23 cfs	98 cfs	98 cfs				
61+00							18.9 cfs	5.2 cfs	28.8 cfs	7.9 cfs
	650 ft.	0.0424	28 cfs	28 cfs	85 cfs	85 cfs				
54+50							20.8 cfs	10.0 cfs	31.7 cfs	15.2 cfs
	150 ft.	0.0424	28 cfs	28 cfs	85 cfs	85 cfs				
53+00							21.9 cfs	12.1 cfs	33.3 cfs	18.4 cfs
	350 ft.	0.0260	23 cfs	23 cfs	98 cfs	98 cfs				
49+50							24.2 cfs	16.9 cfs	37.0 cfs	25.8 cfs
	225 ft.	0.0253	23 cfs	23 cfs	98 cfs	98 cfs				
47+25							26.0 cfs	20.0 cfs	39.4 cfs	30.5 cfs
	225 ft.	0.0324	25 cfs	25 cfs	92 cfs	92 cfs				
45+00							27.6 cfs	23.0 cfs	41.8 cfs	35.2 cfs

*From Plate 22.3 D-3 (DPM)



HARPER ROAD
ONE LANE DRY CRITERIA



HARPER ROAD
0.5' WATER DEPTH AT FLOWLINE

SCALE: 1" = 40'

NOTE: CROSS-SECTIONS TAKEN FROM PRELIMINARY PLANS FOR SAD 210

JOB No. 39417

INFORMATION SHEET

PROJECT TITLE Mountain Run Apartments TYPE OF SUBMITTAL Preliminary

ZONE ATLAS PAGE NO. E-21, ~~F-21~~ CITY ADDRESS

LEGAL DESCRIPTION 15.85 Acre site of Tracts I & H, Academy Place Subdivision

ENGINEERING FIRM Bohannan–Huston, Inc. CONTACT Dave Millikan

ADDRESS 4125 Carlisle Blvd., NE PHONE 881-2000

OWNER Glenn Gronnerud CONTACT

ADDRESS 5 Post Oak Park, Suite 1300 PHONE 713-960-0050

ARCHITECT N/A CONTACT

ADDRESS PHONE

SURVEYOR Bohannan–Huston, Inc. CONTACT Dwain Weaver

ADDRESS 4125 Carlisle Blvd., NE PHONE 881-2000

CONTRACTOR N/A CONTACT

ADDRESS PHONE

DATE SUBMITTED 8-19-83

BY Keith R. Jones

RECEIVED AUG 19 1983 ENGINEERING

9/27/83 ~~A~~

Review Mountain Run - Grading & Drainage Plan

1. Flow across Eubank was questioned in the pre-design conference.

2. Question still remains as to how the flow is to get across Eubank since the total discharge will be 130 cfs under developed conditions.

3. The head on the weir section was computed to be 1.35 ft. as it spreads out down stream the depth is still going to be roughly one half this. The flow will be perpendicular to the flow of traffic on Eubank and this depth will increase against a vehicle. Therefore it is felt by this department that this condition will create a hazard and nuisance to the vehicular and walking public on the west side of Eubank.

4. It is suggested that the outlet proposed be given more thought and analysis. Possibly a storm drain system in conjunction with the development to the west of Eubank and south of Layton may be feasible and beneficial to both. It is

planned at this time for the channel for the Bear Crk south of Layton Ave to be lined.

5. Another alternative may be to discharge through the park on the north side of Layton Ave. However the discharge would have to be controlled such as not to create an erosive condition in the park or to significantly impact the flooding conditions upstream from Layton Ave.

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

September 28, 1983

Mr. Dave Millikan
Bohannan-Huston, Inc.
4125 Carlisle Blvd. N.E.
Albuquerque, N.M. 87107

RE: DRAINAGE AND GRADING PLAN FOR MOUNTAIN RUN APARTMENTS (E21-D22)

Dear Mr. Millikan:

I have reviewed the drainage and grading plan for the subject project site and the following are my comments:

1. In a pre-design conference with Mr. Fred Aguirre of this department, it was noted that concern existed about the discharge across Eubank Blvd., this condition has not changed. As per your report, the developed condition runoff for the entire site will be about 130 cfs and concentrated at one location, i.e., the southwest corner of the property.

2. The depth of the discharge for this plan ($\approx$79 cfs) across Eubank Blvd. will be at least one half the head on the weir section on the north bound lanes and perpendicular to the traffic. The depth against a vehicle will increase. Therefore, it is felt by this department that this condition will create a hazard and nuisance to the vehicular and walking public on the east side of Eubank Blvd. and it is recommended that another alternative be investigated.

3. Layton Avenue at the intersection with Bear Tributary is currently a low-water crossing and any increase in flow to that situation is not recommended. The channel downstream from this crossing is in the design phase for lining. However, the crossing itself is not included at this time.

4. According to the right-of-way shown in your cross-section for Layton Avenue, this street falls under the designation of an Arterial street. The drainage ordinance, Section 7C specifies that one twelve (12.0) foot lane in each direction is free of flowing water. This criteria needs to be investigated.

5. Additional comments for the plan:

   A. Existing contours do not extend beyond property line as per DPM.

B. Street elevations should have both T.C. and F.L.

C. No easements are indicated.

D. Some of the finished floor elevations are lower than the surrounding ground elevations, maybe some spot elevations would clarify.

6. The development of the inflow/outflow,storage/discharge hydrographs for the ponding area should be provided. This analysis could possibly indicate a lower discharge rate than what is shown. The routing and combining of hydrographs for each area may produce a little different result.

7. Will the development of the Commercial Site and the Restaurant Site add to this plan or will they be treated separately?

8. Would like to see an Erosion Control Plan.

Should you have any questions or comments regarding this review, please feel free to contact me.

Sincerely yours,

Billy J. Goolsby P.E.

Billy J. Goolsby, P.E.
Civil Engineer/Hydrology

BJG/tsl

BOHANNAN-HUSTON INC.
4125 CARLISLE BLVD., N.E. ALBUQUERQUE, NEW MEXICO 87107 505 881 2000

ENGINEERS PLANNERS PHOTOGRAMMETRISTS

October 4, 1983

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Mr. Billy J. Goolsby, P.E.
Civil Engineer/Hydrology
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: Drainage and Grading Plan for Mountain Run Apartments (E21--D22)

Dear Billy:

Please consider this letter as an amendment to the Mountain Run Apartments Drainage and Grading Plan. The purpose of this plan is to define the required drainage improvements and demonstrate the feasibility of the proposed improvements. A detailed grading plan at a scale of 1"=30' will be prepared for construction. For this reason the grading plan was not prepared with all of the details required for construction. The detailed grading plan will be submitted to you for review and approval before construction begins.

A review of the "Drainage Ordinance" and the Development Process Manual indicates that flows within the streets must be designed in accordance with the folowing criteria:

a. Manning's roughness coefficient is 0.017.
b. Flow depths in the event of the 100-year design discharge may not exceed 0.2 feet above curb height or 0.87 feet at any location.
c. Flow depths in the event of the 10-year design discharge may not exceed 0.5 feet in any collector or arterial street. One lane free of flowing or standing water in each traffic direction must be preserved on arterial streets.
d. The product of depth times velocity shall not exceed 6.5 in any location in any street in the event of a 10-year design storm (with velocity calculated as the average velocity measured in feet per second and depth measured at the gutter flowline in feet.)
e. **The discharge of nuisance waters to public streets shall be discouraged.**

With this criteria in mind, our responses to your comments are as follows:

1. In our report, it indicates that in the undeveloped state, all of the runoff from Tracts I and H is discharged at the southwest corner of the site. When developed, as shown in our report, only runoff from the apartment site and possibly the restaurant site will occur at the southwest corner. Runoff from the commercial site will be discharged at the southwest corner of the commercial site, not the aprtment site. Therefore, the maximum discharge at any one point to Eubank is approximately 79 cfs.

Combining the flow rates from this report, and the shopping center report results in the following flow rates.

Apartment site + restaurant site	78.6 cfs
South end of commercial site	23.5 cfs
North end of commercial site	25.4 cfs
Bank site	5.0 cfs
Total	132.5 cfs

The total flows discharged to Eubank are not concentrated at one location, but at four separate locations. Of these flows, the 78.6 cfs does not have to flow along the curbline in Eubank. It is discharged in such a location that it may flow directly across Eubank to Layton Avenue. Therefore the maximum flow rate which must be conveyed in the east half of Eubank is 53.9 cfs. This is well within the capacity of the street.

2. Since no criteria is given concerning flows entering a street from the side, the following assumption was made. The flows entering at one location are very similar to flows entering at a side street. The only criteria for flows entering at a side street are as listed above. Upon review of this criteria, it is our interpretation that the flows entering from the side may not exceed a depth of 0.5 feet or have a depth times velocity in excess of 6.5 due to a 10-year design discharge.

   We are enclosing sketches of the proposed outlet to Eubank. The flows enter Eubank in compliance with these criteria. Since the discharge rate of 78.6 cfs does not have to change directions and flow to the south in Eubank, the formula given in your letter for computing depth of flow at this point in Eubank does not appear applicable. What formula?

   Since the manner in which these flows are introduced into Eubank meet the criteria for a side street, we feel that it is satisfactory.

3. The additional flows leaving this site due to development will not affect the peak flow rate in the Bear Tributary Arroyo at its crossing of Layton Avenue. Therefore, whether or not the crossing is in place or not, should not affect the allowable discharge from this site.

4. A review of the long range major street plan does indicate that Layton Avenue is designated as a minor arterial. A significant amount of discussion occurred along with review of the S.A.D. No. 210 drawings concerning criteria which states that one lane in each direction must be free of flowing water. Our understanding of the outcome of those discussions was that for six-lane arterials that criteria was satisfactory. However, for arterials which only consist of four lanes,

the 0.5 foot depth criteria is more applicable. The 0.5 foot depth criteria is equivalent on a four-lane road to the one lane in each direction free of flowing water criteria for six-lane roads, if the depression within the gutter is excluded. We have calculated the allowable flow rate in Layton to comply with this criteria (64.6 cfs). The estimated 10-year developed discharge from the basins (which contribute to Layton Avenue under present conditions) is 121.0 cfs (see enclosed computations). Therefore, in order to meet the 10-year criteria, some ponding must be provide on each site. As indicated in our report, ponding is not required to meet the 100-year criteria.

We have revised the grading at the southwest corner of the site to provide the required amount of ponding. The peak discharge from the apartment site during a 10-year storm will be 28 cfs. This peak discharge rate requires a ponding volume of 0.40 acre-feet.

We have enclosed hydrographs, computations, and diagrams indicating the proposed outlet configuration. The drainage solution outlined in these enclosures meets all of the applicable 10-year and 100-year criteria contained in the "Drainage Ordinance" and the DCM.

5.a. Spot elevations are shown at all property corners on the outside of the existing block wall around the east and south sides of the site. Since the property on the outside of the wall is under separate ownership, is relatively inaccessible, and is not likely to change, spot elevations should be adequate.

b. All curb within City rights-of-way is 8" high. All curb within the site is 6" high. Locations where there is depressed curb or unusual conditions will be shown in more detail on the final grading plan.

c. There are no drainage easements proposed within this site.

d. Additional information will be provided on the final grading plan. In no cases will the finished floor elevation be beneath the adjacent finished ground elevation.

6. The drainage solution proposed in the original report did not propose any detention. Therefore, hydrographs were not necessary. Hydrographs are provided for the revised solution outlined in this report.

7. The drainage report for the commercial site was submitted to your office on September 1,1983. The restaurant site will be submitted as a separate report. The bank site at the corner of Eubank and Juan Tabo will also be submitted as a separate report. Each of these reports should be approved as a separate document.

8. Additional notes will be provided on the final grading plan which outline the information provided in the end of the original report. It is our belief that this meets the requirements of an erosion control plan.

If you have any additional comments or questions, please contact Dave Millikan or me.

Sincerely yours,

David M. Millikan

for Michial M. Emery, P.E.
Vice President

Enclosures

cc: Mr. Glenn Gronnerud

DMYM/bim
Job No. 3 154 3

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

October 14, 1983

Mr. Dave Milliken
Bohannan-Huston, Inc.
4125 Carlisle Blvd. N.E.
Albuquerque, N.M. 87107

RE: DRAINAGE & GRADING PLAN FOR MOUNTAIN RUN APARTMENTS (E21-D22)

Mr. Fred Aguirre and I have been deliberating on this plan, and as previously stated in my letter dated September 28, 1983, our concern is still the treatment and impact of the proposed discharge into and through the intersection of Eubank Blvd. and Layton Avenue.

It is recommended that additional analysis regarding the flows in this area be performed. Maybe a reservoir routing analysis through this area, to determine the actual depth of flow in Eubank, is appropriate. Also, this discharge condition will have to be reviewed by Traffic.

Upon further inspection of the plan it was noted that the detention pond is designed only to process the 10 year flows and does not provide any emergency spillway for higher frequency flows. Discharge over a public right-of-way is not acceptable if the spillway is at the sidewalk culvert.

The maximum discharge through the two twelve outlet pipes into the expansion box is only about 10 cfs. Also, the dimensioning on the curb opening inlet detail on the drawing is incorrect.

Should you have any questions regarding these comments, please contact myself or Fred.

Yours truly,

Billy J. Goolsby P.E.

Billy J. Goolsby, P.E.
Civil Engineer/Hydrology

BJG/tsl

BOHANNAN-HUSTON INC.

4125 CARLISLE BLVD., N.E. ALBUQUERQUE, NEW MEXICO 87107 505 881-2000
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October 18, 1983

Mr. Billy Goolsby
Civil Engineer/Hydrology
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: Drainage and Grading Plans for Mountain Run Apartments (E21-D22) and Mountain Run Shopping Center (E21-D23) – Your Letter of October 6, 1983 and October 14, 1983

Dear Billy:

This letter provides further justification for the proposed discharge rates from the above-referenced sites. Please refer to items outlined in Mr. Dave Millikan's letter of October 4, 1983 for additional background information.

To reiterate, we feel that the following criteria and guidelines are the governing framework for determining flowrate values in the area adjacent to the Eubank Boulevard–Layton Avenue intersection:

1. The 10-year design storm runoff shall not exceed a depth of 0.5 feet in any arterial street (Drainage Ordinance Section 7C).

2. The 10-year design storm runoff shall flow such that one twelve foot driving lane in each direction is free of flowing or standing water in any ***6-lane arterial street.*** For any ***4-lane arterial street*** the one-lane dry criteria does not apply and that the 10-year design storm criteria shall govern. (Depth not to exceed 0.5 feet)

3. Arterial and collector streets shall be protected from damages to the pavement surface and from the safety hazards created by surface flow of nuisance waters across them (Drainage Ordinance Section 7E).

4. The crossing of the Bear Tributary Arroyo at Layton Avenue has adequate hydraulic capacity.

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Assumption No. 2 above is a by-product of lengthy discussions during the review of SAD 210 (See attached letter). It is the consensus of staff who wrote the document and outside consultants providing technical input during the process, that the ordinance language was intended to apply to 6-lane arterial streets. It was not intended to include 4-lane facilities classified as arterial streets. With this being the case, runoff not exceeding 0.5 feet is the governing criteria in Layton Avenue.

PRINCIPALS
JERRY R. BOHANNAN, P.E. & L.S.
LARRY W. HUSTON
MICHAEL M. EMERY, P.E.

As you know, the crossing of the arroyo at Layton Avenue does not meet criteria outlined in Section 8 of the ordinance under existing conditions. To comply with Section 12G, minimum discharge rates from sites discharging to the arroyo between Layton Avenue and Tramway Boulevard would be required until a permanent all-weather crossing is constructed by the City. Assumption No. 4 above is valid, therefore, based on previous criteria established for developments impacting the arroyo, an example being Quail [illegible] Apartments.

We feel that Dave's letter adequately addresses a) that the 10-year one lane dry criteria is met in Eubank Boulevard, b) that the depth in Layton Boulevard does not exceed 0.5 feet in the 10-year storm, c) a developed watershed condition such that a "first come, first serve" approach has been avoided, and d) that nuisance runoff will be controlled in the pond.

To supplement the October 4, 1983 analysis, as-built grades at the intersection of Eubank Boulevard and Layton Avenue have been obtained to analyze flow conditions in terms of capacity, depth, and velocity times depth. The attached calculations indicate that the flow depth in the intersection does not exceed 0.4 feet during both the 10- and 100-year runoff events. This simplified analysis assumes that water will sheet flow across the intersection, thus utilizing the maximum capacity of the intersection which intersection acts as a very shallow channel section for flows crossing this point. A more complex routing or water surface profile approach to analyze flow conditions is difficult, time consuming, and would yield results that we believe would be no more conclusive or reproduceable than the values provided on the attached sheets.

We have discussed with Mr. Bob Fosnaugh, City Traffic Engineer, the fact that flows will sheet flow across the sidewalk during events greater than the 10-year storm. It is his opinion that this situation is better than say a solution which utilizes a standard drive pad as an emergency spillway. This type of solution would not only require that some means be provided to prevent vehicular access but would not solve the problem of inundation of the walking surface during larger storms. We also feel that solutions of this type simply complicate design with no added benefits. It is our strong opinion that preventing excess runoff from adversely impacting adjacent property owners is a much more important issue than discharge across the sidewalk. As indicated on the plans, the design of the site and pond will insure that runoff will be directed towards Eubank Boulevard.

The situation at Eubank Boulevard and Layton Avenue is unique in terms of establishing drainage criteria for development adjacent to the intersection. We feel, however, that our analysis is sound and based on published criteria and guidelines. It goes without saying that the best solution from both a traffic and drainage standpoint is to redesign the reach of Eubank Boulevard between Layton Avenue and Juan Tabo Boulevard. Until this is done, though, the City and adjacent developments must live with existing conditions.

We are most appreciative of your prompt attention to this matter in past submittals. Due to the closeness of Thursday's EPC hearing, we are again asking that you consider the above items in an expeditious manner. We will be glad to meet with you to discuss this letter at your convenience. Please call Brian Burnett or me if you have any questions.

Sincerely yours,

Michial M. Emery

Michial M. Emery, P.E.
Vice President

cc: Mr. Glenn Gronnerud
Mr. Bob Spooner

BGB/blm
Job No. 31543
31860

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

FILE COPY

November 1, 1983

Mr. Brian Burnett
Bohannan-Huston, Inc.
4125 Carlisle Boulevard NE
Albuquerque, NM 87107

REF: DRAINAGE & GRADING PLAN FOR MOUNTAIN RUN APARTMENTS (E21-D22)

Dear Mr. Burnett:

This letter is a follow-up and recap of our meeting on October 31, 1983.

The above referenced plan is within the criteria of the flood ordinance with the exceptions of:

1. The pond overflow will have to be directed under the sidewalk.

2. Our feeling is that the rate of discharge is detrimental to public safety.

The definition of public safety with respect to this specific site is a controversial matter; therefore, the approval of this plan is contingent upon the approval by the Traffic Section and the redesign of the overflow from the pond.

If you have any questions or comments regarding this matter, please contact me or Fred Aguirre at 766-7644.

If approval from Traffic is acquired, an approval letter from this section will be forthcoming.

Yours truly,

Billy J. Goolsby

Billy J. Goolsby, PE
Civil Engineer/Hydrology

BJG:mrk

BOHANNAN-HUSTON INC.
4125 CARLISLE BLVD., N.E. ALBUQUERQUE, NEW MEXICO 87107 505 881-2000
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330 GARFIELD, SANTA FE, NEW MEXICO 87501 505 988-7671

November 14, 1983

Mr. Fred Aquirre
Assistant City Engineer/Hydrology
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: Mountain Run Apartment Drainage Report (E21 - D22) and
Shopping Center Drainage Report (E21 - D23)

Dear Fred:

On Monday, November 7, 1983, Dwayne Shepard, Bob Fosnaugh, Dave Harmon, Billy Goolsby, and you met with Dave Millikan to discuss the method of discharging storm water runoff into Eubank Boulevard adjacent to the above-referenced sites.

At that meeting it was agreed that discharge will be allowed to Eubank as stated in the reports if the following conditions are met:

a) Discharge from the 10-year storm and the 100-year storm shall be conveyed beneath the sidewalk.

b) The maximum depth of flow for runoff entering Eubank Boulevard is 0.3 feet.

c) The velocity times depth of flows entering the street shall not exceed 6.5.

We are in the process of finalizing the construction drawings and the grading plans. On the apartment site, we propose the 10-year flows to be discharged to the street through four curb outlets, as shown in my letter dated October 18, 1983. This results in a flowrate of 7 cfs per outlet. We estimate that the depth of flow will be 0.25' at a velocity of 6.1 fps. Sidewalk culverts will be constructed beneath the sidewalks to convey the additional flows due to a 100-year storm. The criteria stated in a) and b) above will be met for these additional flows.

PRINCIPALS
JERRY R. BOHANNAN, P.E. & L.S.
LARRY W. HUSTON
MICHAL M. EMERY, P.E.

Discharges from the shopping center site will be released from the shopping center site in compliance with items a), b), and c) above.

We appreciate your cooperation in resolving this matter. If you have any comments or questions, please call Dave Millikan or me.

Sincerely yours,

Michial M. Emery, P.E.
Vice President

cc: Mr. Glen Gronnerud
Mr. Bob Spooner
Mr. Dwayne Sheppard
Mr. Bob Fosnaugh
Mr. Dave Harmon
Mr. Billy Goolsby

DMYM/rs
Job Nos. 3 154 3, 3 186 0

COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

November 21, 1983

Mr. Dave Millikan
Bohannan-Huston, Inc.
4125 Carlisle Boulevard NE
Albuquerque, NM 87107

REF: MOUNTAIN RUN APARTMENTS DRAINAGE REPORT (E21-D22)

Dear Mr. Millikan:

The plan set, dated November 11, 1983, for the above referenced site is approved.

If I can be of further assistance, please contact me at 766-7644.

Yours truly,

Billy J. Goolsby

Billy J. Goolsby, PE
Civil Engineer/Hydrology

BJG:mrk

INFORMATION SHEET

PROJECT TITLE Mountain Run Apts TYPE OF SUBMITTAL Certification

ZONE ATLAS PAGE NO. F-F21 CITY ADDRESS -

LEGAL DESCRIPTION Sections 28 and 33 in Albuq. Tracts H-1 & I-1 Academy Place

ENGINEERING FIRM Bohannan-Huston CONTACT Brian Burnett

ADDRESS 4125 Carlisle NE PHONE 881-2000

OWNER Campbell & Co. CONTACT Dave Millikan

ADDRESS 5 Post Oak Park 13th Floor Houston, TX 77027 PHONE (713) 960-0050

ARCHITECT - CONTACT

ADDRESS PHONE

SURVEYOR Southwest Surveying CONTACT Dan

ADDRESS 215 Marble N.W. PHONE 247-4444

CONTRACTOR - CONTACT

ADDRESS PHONE

PRE-DESIGN MEETING:

___ YES
X NO
___ COPY OF CONFERENCE RECAP SHEET PROVIDED

PLEASE CHECK TYPE OF APPROVAL EXPECTED WITH THIS SUBMITTAL:

___ SKETCH PLAT APPROVAL
___ PRELIMINARY PLAT APPROVAL
___ SITE DEVELOPMENT PLAN APPROVAL
___ FINAL PLAT APPROVAL
___ BUILDING PERMIT APPROVAL
X CERTIFICATE OF OCCUPANCY APPROVAL
___ ROUGH GRADING PERMIT APPROVAL
___ GRADING/PAVING PERMIT APPROVAL
___ OTHER _____ (SPECIFY)

Approved Certification for Phase I

DATE SUBMITTED: Nov. 19 1982

BY: Brian D Burnett

RECEIVED
NOV 19 1984
HYDROLOGY SECTION

BOHANNAN–HUSTON INC.

4125 Carlisle Blvd. NE Albuquerque, New Mexico 87107
(505) 881-2000

Transmittal

To: City Hydrology

- ☐ Parcel Post
- ☐ First Class
- ☐ Express Mail
- ☐ Bus
- ☐ Messenger
- ☐ UPS
- ☐ Air Freight
- ☐ _____

Attention: Bernie Montoya

Date: 11/19/84 Our job number: 42302

Your job number:

Job: Mountain Run Certification

We are enclosing:	For:

Comments:

RECEIVED NOV 19 1984 HYDROLOGY SECTION

By: Steve Burrell thank you

Rec'd by: Connie Lopez Date: 11-19-84

☐ Please Return Signed Yellow Copy

2/1/84

2182

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

DESIGN HYDROLOGY SECTION
123 Central NW, Albuquerque, NM 87102
(505) 766-7644

November 28, 1984

Mr. Brian Burnett
Bohannan-Huston Inc.
4125 Carlisle Boulevard NE
Albuquerque, NM 87501

REF: MOUNTAIN RUN APARTMENT DRAINAGE REPORT CERTIFICATION PHASE I (E21-D22)

Dear Brian:

Based on the information provided on your November 19, 1984 submittal, certification for the above referenced drainage plan is acceptable.

If you have any questions, please feel free to contact me at 766-7644.

Sincerely yours,

Bernie J. Montoya

Bernie J. Montoya
Engineering Assistant, C.E.

BJM:mrk

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

October 29, 1984

Dawn Development Corporation
15301 Dallas Parkway, Suite 850
Dallas, Texas 75248

Gentlemen:

This is to certify that the City of Albuquerque hereby accepts Project 84-37 as being completed according to construction specifications and accepts same. The project is more particularly described as follows:

Sewer, Water and Paving of Eubank Blvd. from Station 0+00 (Juan Tabo Blvd.) to Station 13+35 Juan Tabo Blvd. from Station 0+00 (Eubank Blvd.) to Station 11+50 for the Mountain Run Shopping Center, Mountatin Run Subdivision. Project No. 2001, W.O. No. 2001.

Sincerely,

C. D. Sheppard, P.E.

C. Dwayne Sheppard, P.E.
City Engineer

CDS/fs
cc: KNC, Inc.
Bill McNamara, Assistant City Engineer/Field
Joe Martin, Director/Transportation
George Paul, Street Maint. Engineer
Jim Gill, Director/Water Resources
Joe Vallez, Water Line Maint. Supt.
Dean Wall, Liquid Waste, Line Maint. Engineer
Walter Nickerson, Chief Engineer, Water Resources
Josie Gutierrez, New Meter Sales Clerk, Water Resources
Claudia Gallegos, Standby Charges Clerk, Water Resources
Inez Barela, CIP Office
Denise Wilcox, Administrative Assistant/City Engineer
Greg Olson, Assistant City Engineer/Design
File

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NOV 19 1984
HYDROLOGY SECTION

BOHANNAN-HUSTON INC.

4125 CARLISLE BLVD., N.E. ALBUQUERQUE, NEW MEXICO 87107 505 881-2000
UNIVERSITY PLAZA, 330 GARFIELD SUITE 104 SANTA FE, N. M. 87509 505 988-7671
6713 VISCOUNT BLVD. EL PASO, TEXAS 79925 915 778-4491

November 19, 1984

Mr. Bernie Montoya
Civil Engineer/ Hydrology
City of Albuquerque
Post Office Box 1293
Albuquerque, NM 87103

Re: Engineer Certification - Mountain Run Apartments

Dear Bernie:

Enclosed are two copies of the certification for the referenced project. Please note that portions of the pond constructed in the public right-of-way under City Project #2001 have been approved by the City (see enclosed letter).

An acceptable amount of spot elevations have been provided to confirm compliance with the approved drainage report. If the information is satisfactory, we would request that Certificates of Occupancy be released for the units contained within Phase 1. I would also like to ask that 30-day, temporary Certificates of Occupancy be issued if the review of the certification is going to take more than several days.

If you have any questions, please do not hesitate to call.

Truly yours,

Brian G. Burnett, P.E.
Division Manager

Enclosures

cc: Mr. Dave Millikan

BGB/mls
Job No. 4 230 2

RECEIVED
NOV 19 1984
HYDROLOGY SECTION

PRINCIPALS
JERRY R. BOHANNAN, P.E. & L.S.
LARRY W. HUSTON
MICHIAL M. EMERY, P.E.

E21-D22

INFORMATION SHEET

PROJECT TITLE MOUNTAIN RUN APTS TYPE OF SUBMITTAL CERTIFICATION

ZONE ATLAS PAGE NO. E21 CITY ADDRESS

LEGAL DESCRIPTION

ENGINEERING FIRM Bohannan-Huston CONTACT Brian Burnett

ADDRESS 4125 Carlisle, NE PHONE 881-2000

OWNER CHC CONTACT Mike Chatton

ADDRESS PHONE 823-5987 (Pager)

ARCHITECT CONTACT

ADDRESS PHONE

SURVEYOR CONTACT

ADDRESS PHONE

CONTRACTOR CONTACT

ADDRESS PHONE

PRE-DESIGN MEETING:

___ YES
___ NO
___ COPY OF CONFERENCE RECAP SHEET PROVIDED

DRAINAGE LOG NUMBER E21-D22

PLEASE CHECK TYPE OF APPROVAL EXPECTED WITH THIS SUBMITTAL:

___ SKETCH PLAT APPROVAL
___ PRELIMINARY PLAT APPROVAL
___ SITE DEVELOPMENT PLAN APPROVAL
___ FINAL PLAT APPROVAL
X BUILDING PERMIT APPROVAL
___ CERTIFICATE OF OCCUPANCY APPROVAL
___ ROUGH GRADING PERMIT APPROVAL
___ GRADING/PAVING PERMIT APPROVAL
___ OTHER _____ (SPECIFY)

RECEIVED
MAR 05 1985
HYDROLOGY SECTION

DATE SUBMITTED: 3/5/85

BY: BB

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

DESIGN HYDROLOGY SECTION
123 Central NW, Albuquerque, NM 87102
(505) 766-7644

March 5, 1985

Brian Burnett
Bohannan-Huston, Inc.
4125 Carlisle Blvd., NE
Albuquerque, New Mexico 87107

RE: MOUNTAIN RUN APARTMENT DRAINAGE REPORT CERTIFICATION
PHASE II (E-21/D22)

Dear Brian:

Based on the information provided on your March 5, 1985 submittal, certification for the referenced drainage plan is acceptable.

If you have any questions or comments, please call me at 766-7644.

Cordially,

Bernie J. Montoya

Bernie J. Montoya, C.E.
Engineering Assistant

BJM/bsj

BOHANNAN-HUSTON INC.

4125 CARLISLE BLVD., N.E. ALBUQUERQUE, NEW MEXICO 87107 505 881-2000
UNIVERSITY PLAZA, 330 GARFIELD SUITE 104 SANTA FE, N.M. 87509 505 988-7671
6713 VISCOUNT BLVD. EL PASO, TEXAS 79925 915 778-4491

October 14, 1985

RECEIVED
OCT 14 1985
HYDROLOGY SECTION

Mr. Bernie Montoya
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: Mountain Run Apartments - Temporary Certificates of Occupancy (E21-D22)

Dear Bernie:

In accordance with our conversation of last week, I am requesting your approval of release of temporary certificates of occupancy for Phase III of the subject apartment site. Enclosed is a phasing plan indicating the phase limits of the project. Phases I and II have been approved already. As you can see, this Phase can "stand on its own" with respect to drainage.

We will provide as-built drawings and engineer's certification for this phase prior to your release of permanent C.O.'s. If you have any questions, please call me.

Sincerely,

James Topmiller

James Topmiller, P.E.
Project Engineer

cc: Mr. Larry Fay

BGB/mls
Job No. 4 230 1

PRINCIPALS
JERRY R. BOHANNAN, P.E. & L.S.
LARRY W. HUSTON
MICHIAL M. EMERY, P.E.

-BARBARA JUAREZ-

DRAINAGE INFORMATION SHEET

PROJECT TITLE: MOUNTAIN RUN APARTMENTS ZONE ATLAS/DRNG. FILE #: E21-D22

LEGAL DESCRIPTION:

CITY ADDRESS:

ENGINEERING FIRM: BOHANNAN-HUSTON CONTACT: JAMES TOPMILLER

ADDRESS: 4125 CARLISLE NE PHONE: 881-2000

OWNER: CONTACT:

ADDRESS: PHONE:

ARCHITECT: CONTACT:

ADDRESS: PHONE:

SURVEYOR: CONTACT:

ADDRESS: PHONE:

CONTRACTOR: CONTACT:

ADDRESS: PHONE:

RECEIVED OCT 14 1985 HYDROLOGY SECTION

PRE-DESIGN MEETING:

___ YES

X NO

___ COPY OF CONFERENCE RECAP SHEET PROVIDED

DRB NO.

EPC NO.

PROJ. NO.

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT

___ DRAINAGE PLAN

___ CONCEPTUAL GRADING & DRAINAGE PLAN

___ GRADING PLAN

___ EROSION CONTROL PLAN

___ ENGINEER'S CERTIFICATION

✓ ~~PLASTIC PLAN~~

CHECK TYPE OF APPROVAL SOUGHT:

___ SKETCH PLAT APPROVAL

___ PRELIMINARY PLAT APPROVAL

___ SITE DEVELOPMENT PLAN APPROVAL

___ FINAL PLAT APPROVAL

___ BUILDING PERMIT APPROVAL

___ FOUNDATION PERMIT APPROVAL

✓ CERTIFICATE OF OCCUPANCY APPROVAL (TEMP.)

___ ROUGH GRADING PERMIT APPROVAL

___ GRADING/PAVING PERMIT APPROVAL

___ OTHER _____ (SPECIFY)

DATE SUBMITTED: 10/14/85

BY: JAMES TOPMILLER

— BARBARA JUAREZ —

BOHANNAN-HUSTON INC.
4125 Carlisle Blvd NE Albuquerque NM 87107
(505) 881-2000

RECEIVED
OCT 14 1985
HYDROLOGY SECTION

Transmittal

To: CITY HYDROLOGY
2ND & CENTRAL
2ND FLOOR

- [ ] Parcel post
- [x] Messenger
- [ ] First Class
- [ ] UPS
- [ ] Express Mail
- [ ] Air Freight
- [ ] Bus
- [ ] _____

Attention: BERNIE MONTOYA

Date: 10/14/85

Our job number: 42301

Your job number: _____

Job: MOUNTAIN RUN PH. III CERTIFICATION

We are enclosing:	For:

Comments: _____

By: JAMES TOPMILLER

thank you

Rec'd by: _____

Date: 10/14/85

☐ Please Return Signed Yellow Copy

1/23/85

PHASE III

RECEIVED
OCT 14 1985
HYDROLOGY SECTION

BUILDINGS	UNITS
9	901-904 921-924
10	1001-1004 1021-1024
11	1101-1104 1121-1124
12	1201-1204 1221-1224
5	501-504 521-524 531-534
6	601-604 621-624
7	701-704 721-724
8	801-804 821-824

RECEIVED
OCT 14 1985
HYDROLOGY SECTION

BUILDINGS	UNITS
24	2401 - 2408
	2421 - 2428
	2431 - 2438
25	2501 - 2504
	2521 - 2528
	2531 - 2538
28	2801 - 2808
	2821 - 2828
	2838 - 2831
29	2901 - 2908
	2921 - 2928
	2931 - 2938
37	Athletic Center

BOHANNAN-HUSTON INC.

4125 CARLISLE BLVD., N.E. ALBUQUERQUE, NEW MEXICO 87107 505 881-2000
UNIVERSITY PLAZA, 330 GARFIELD SUITE 104 SANTA FE, N.M. 87509 505 988-7671
6713 VISCOUNT BLVD. EL PASO, TEXAS 79925 915 778-4491

November 7, 1985

RECEIVED
NOV 12 1985
HYDROLOGY SECTION

Mr. Bernie Montoya
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: Mountain Run Apartments - Phase III - Permanent Certificates of Occupancy

Dear Bernie:

Enclosed is a record drawing of as-built elevations and drainage features for Phase 3 and a phasing plan indicating the phase limits of the project. The apartment complex is located east of Eubank, south of Juan Tabo. The drawing also includes engineering certification that the completed project phase is in substantial compliance with the approved drainage plan.

By this certification, the owner is requesting permanent certification of occupancy for Phases 3 of the project. This completes the required drainage certification for the site. If I can answer any questions, please call.

Sincerely,

James Topmiller

James Topmiller, P.E.
Project Engineer

Enclosure

cc: Mr. Larry Fay

JT/mls
Job No. 4 230 1

PRINCIPALS
JERRY R. BOHANNAN, P.E. & L.S.
LARRY W. HUSTON
MICHIAL M. EMERY, P.E.

DRAINAGE INFORMATION SHEET

PROJECT TITLE: MOUNTAIN RUN APARTMENTS ZONE ATLAS/DRNG. FILE #: E,F.21

LEGAL DESCRIPTION:

CITY ADDRESS:

ENGINEERING FIRM: BOHANNAN-HUSTON CONTACT: JAMES TOPMILLER

ADDRESS: 4125 CARLISLE NE PHONE: 881-2000

OWNER: CD DEVELOPMENT CONTACT: LARRY FAY

ADDRESS: PHONE: 292-8862

ARCHITECT: CONTACT:

ADDRESS: PHONE:

SURVEYOR: SOUTHWEST SURVEYING CONTACT:

ADDRESS: PHONE:

CONTRACTOR: CONTACT:

ADDRESS: PHONE:

RECEIVED NOV 12 1985 HYDROLOGY SECTION

REF. E21-D22

PRE-DESIGN MEETING:

___ YES

X NO

___ COPY OF CONFERENCE RECAP SHEET PROVIDED

DRB NO.

EPC NO.

PROJ. NO.

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT

___ DRAINAGE PLAN

___ CONCEPTUAL GRADING & DRAINAGE PLAN

___ GRADING PLAN

___ EROSION CONTROL PLAN

X ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

___ SKETCH PLAT APPROVAL

___ PRELIMINARY PLAT APPROVAL

___ SITE DEVELOPMENT PLAN APPROVAL

___ FINAL PLAT APPROVAL

___ BUILDING PERMIT APPROVAL

___ FOUNDATION PERMIT APPROVAL

X CERTIFICATE OF OCCUPANCY APPROVAL

___ ROUGH GRADING PERMIT APPROVAL

___ GRADING/PAVING PERMIT APPROVAL

___ OTHER _____ (SPECIFY)

DATE SUBMITTED: 11/12/85

BY: James Topmiller

PHASE III

BUILDINGS	UNITS
9	901-904 921-924
10	1001-1004 1021-1024
11	1101-1104 1121-1124
12	1201-1204 1221-1224
5	501-504 521-524 531-534
6	601-604 621-624
7	701-704 721-724
8	801-804 821-824

RECEIVED
NOV 12 1985
HYDROLOGY SECTION

BUILDINGS	UNITS
24	2401 - 2408
	2421 - 2428
	2431 - 2438
25	2501 - 2504
	2521 - 2528
	2531 - 2538
28	2801 - 2808
	2821 - 2828
	2838 - 2831
29	2901 - 2908
	2921 - 2928
	2931 - 2938
37	Athletic Center

RECEIVED
NOV 1 1985
HYDROLOGY SECTION

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

DESIGN HYDROLOGY SECTION
123 Central NW, Albuquerque, NM 87102
(505) 766-7644

November 14, 1985

James Topmiiler
Bohannan-Huston, Inc.
4125 Carlisle Blvd., NE
Albuquerque, New Mexico 87107

RE: CERTIFICATION FOR MOUNTAIN RUN APARTMENTS PHASE III
RECEIVED NOVEMBER 12, 1985 (E21/D22)

Dear James:

Based on the information provided on your submittal dated November 6, 1985, certification for the referenced drainage plan is acceptable. Please be advised that upon Phase IV submittal, I will need a copy of the acceptance letter from the City Engineer's office in reference to the Eubank Blvd. improvements.

If I can be of further assistance, please call me at 766-7644.

Cordially,

Berrie J. Montoya

Berrie J. Montoya, C.E.
Engineering Assistant
Design Hydrology Section

BJM/bsj

BOHANNAN-HUSTON INC.

4125 CARLISLE BLVD., N.E. ALBUQUERQUE, NEW MEXICO 87107 505 881-2000
UNIVERSITY PLAZA, 330 GARFIELD SUITE 104 SANTA FE, N.M. 87501 505 988-7671
6713 VISCOUNT BLVD. EL PASO, TEXAS 79925 915 778-4491

November 26, 1985

Mr. Bernie Montoya
City of Albuquerque
Post Office Box 1293
Albuquerque, NM 87103

Re: Mountain Run Apartments - Phase IV Drainage Certification

Dear Bernie:

Enclosed is a record drawing of as-built elevations and drainage features for Phase IV and a phasing plan indicating the phase limits of the project. The drawing also includes engineering certification that the completed project phase is in substantial compliance with the approved drainage plan.

By this certification, the owner is requesting permanent Certificates of Occupancy for Phase IV of the project. This completes the required drainage certification for the site.

As requested, a copy of the Acceptance letter from the City Engineer's office in reference to the Eubank Boulevard Improvements is enclosed.

If I can answer any questions, please call.

Sincerely,

James Topmiller

James Topmiller, P.E.
Project Engineer

Enclosures

cc: Mr. Larry Faye

TG/mls
Job No. 4 230 1

RECEIVED
NOV 27 1985
HYDROLOGY SECTION

PRINCIPALS
LARRY W. HUSTON
MICHIAL M. EMERY, P.E.

ATTENTION: BARBARA JUAREZ

DRAINAGE INFORMATION SHEET

PROJECT TITLE: MOUNTAIN RUN APARTMENTS ZONE ATLAS/DRNG. FILE #: E-21/D22

LEGAL DESCRIPTION: JUAN TABO & EUBANK

CITY ADDRESS:

ENGINEERING FIRM: BOHANNAN-HUSTON CONTACT: JAMES TOPMILLER

ADDRESS: 4125 CARLISLE NE PHONE: 884-7543

OWNER: CD DEVELOPMENT CONTACT: LARRY FAY

ADDRESS: PHONE: 292-8862

ARCHITECT: CONTACT:

ADDRESS: PHONE:

SURVEYOR: SOUTHWEST SURVEYING CONTACT: DAN GRANEY

ADDRESS: PHONE: 247-4444

CONTRACTOR: CONTACT:

ADDRESS: PHONE:

PRE-DESIGN MEETING:

___ YES

X NO

___ COPY OF CONFERENCE RECAP SHEET PROVIDED

DRB NO.

EPC NO.

PROJ. NO.

RECEIVED NOV 27 1985 HYDROLOGY SECTION

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT

___ DRAINAGE PLAN

___ CONCEPTUAL GRADING & DRAINAGE PLAN

___ GRADING PLAN

___ EROSION CONTROL PLAN

X ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

___ SKETCH PLAT APPROVAL

___ PRELIMINARY PLAT APPROVAL

___ SITE DEVELOPMENT PLAN APPROVAL

___ FINAL PLAT APPROVAL

X BUILDING PERMIT APPROVAL

___ FOUNDATION PERMIT APPROVAL

___ CERTIFICATE OF OCCUPANCY APPROVAL

___ ROUGH GRADING PERMIT APPROVAL

___ GRADING/PAVING PERMIT APPROVAL

___ OTHER _____ (SPECIFY)

DATE SUBMITTED: 11/27/85

BY: JamesTopmiller

BOHANNAN-HUSTON INC.
4125 Carlisle Blvd NE Albuquerque NM 87107
(505) 881-2000

Transmittal

To: CITY HYDROLOGY
2ND & CENTRAL
2ND FLOOR

- [ ] Parcel post
- [x] Messenger
- [ ] First Class
- [ ] UPS
- [ ] Express Mail
- [ ] Air Freight
- [ ] Bus
- [ ] _____

Attention: BARBARA JUAREZ

Date: 11/27/85

Our job number: 42301

Your job number:

Job: MOUNTAIN RUN APTS. - PH. IV CERTIFICATION

We are enclosing:	For:
1 transmittal letter	your review
1 asbuilt elev. plan	" "
1 info sheet	" "
1 building list	" "

Comments:

RECEIVED
NOV 27 1985
HYDROLOGY SECTION

By: James Topmiller

thank you

Rec'd by: Carla A Martinez

Date:

- [ ] Please Return Signed Yellow Copy

1/23/85

MOUNTAIN RUN APARTMENTS
PHASE II
LIST OF BUILDINGS & UNITS

Bldg. 19 – all units
Bldg. 20 – all units
Bldg. 18 – all units
Bldg. 17 – all units
Bldg. 21 – all units
Bldg. 22 – all units
Bldg. 23 – all units
Bldg. 27 – all units
Bldg. 26 – all units
Bldg. 16 – all units

Bldg. 15 – all units
Bldg. 14 – all units
Bldg. 13 – all units

RECEIVED
NOV 27 1985
HYDROLOGY SECTION

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

DESIGN HYDROLOGY SECTION
123 Central NW, Albuquerque, NM 87102
(505) 766-7644

December 4. 1985

James Topmiller
Bohannan-Huston, Inc.
4125 Carlisle Blvd., NE
Albuquerque, New Mexico 87107

RE: CERTIFICATION FOR PHASE III ON MOUNTAIN RUN APARTMENTS
ENGINEER'S STAMP DATED NOVEMBER 27, 1985 (E-21/D22)

Dear James:

Based on the information provided on your November 27, 1985 submittal, certification for the referenced drainage plan is acceptable.

I would also like to take this opportunity to commend you on the format that you have used for your certification submittals, the composite format that you have used, has eliminated much paper work, thick files and confusion encountered in looking up as-built information.

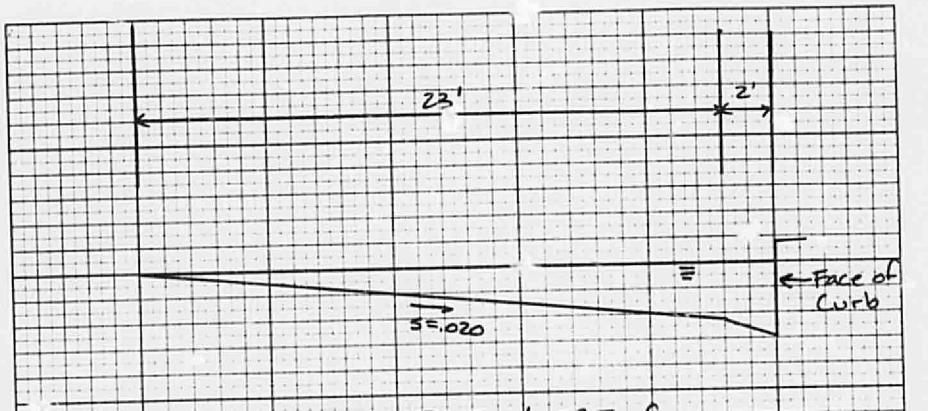
If I can be of further assistance, please feel free to call me at 766-7644.

Cordially,

Bernie J. Montoya

Bernie J. Montoya, C.E.
Engineering Assistant

BJM/bsj



$A = .125 + 1.17 + 5.29 = 6.585$ sf

$P = 2.004 + 23.005 + .585 = 25.594$

$R = .2573$

$Q = \frac{1.486}{n} A R^{2/3} S^{1/2}$

$Q = \frac{1.486}{.017} (6.585)(.2573)^{2/3}(.0192)^{1/2}$

$Q = 32.3$ cfs / half street

$2Q = 64.6$ cfs / full street

RECEIVED
OCT 06 1983
ENGINEERING

PROJECT NAME Mountain Run Apts. SHEET ____ OF ____
PROJECT NO. 31543 BY Dmym DATE 10-4-83
SUBJECT Layton Ave 10-yr Capacity CH'D ____ DATE ____

2 2 0 6

Flows Impacting Layton Ave. Vs 10-yr Capacity of Layton Ave.

Undeveloped land bounded by Layton, Eubank & Bear Tributary Arroyo

Area = 9.9 ac assume "c" = 0.82

Assume T_c = 10 min

I_{100} = 5.3

I_{10} = (.657)(5.3) = 3.48

Q_{10} = (0.82)(3.48)(9.90) = 28.25 cfs

Eubank R/W

Area = 1.65 ac assume "c" = 1.00

Assume T_c = 10 min

I_{10} = 3.48

Q_{10} = (1.0)(3.48)(1.65) = 5.74 cfs

Future Shopping Center

From Report

Q_{10} = 32.3 cfs

Developed Apartment site

Q_{10} = 51.9 cfs

Future Bank Site

Area = 1.0 ac

I_{10} = 3.48

assume "c" = 0.82

Q = (0.82)(3.48)(1.0) = 2.85 cfs Total = 121.0 cfs

PROJECT NAME Mountain Run Apts SHEET 1 OF 2

PROJECT NO. 31543 BY Dmyn DATE 10-4-83

SUBJECT Flows Impacting Layton Ave. CH'D DATE

Allowable Discharges (10-yr Storm)

Undeveloped land Bounded by Layton, Eubank & Bear Tributary Arroyo

$$28.25 \times \frac{64.6}{121.0} = 15.1 \text{ cfs}$$

Future Shopping Center

$$32.3 \times \frac{64.6}{121.0} = 17.2 \text{ cfs}$$

Developed Apartment Site

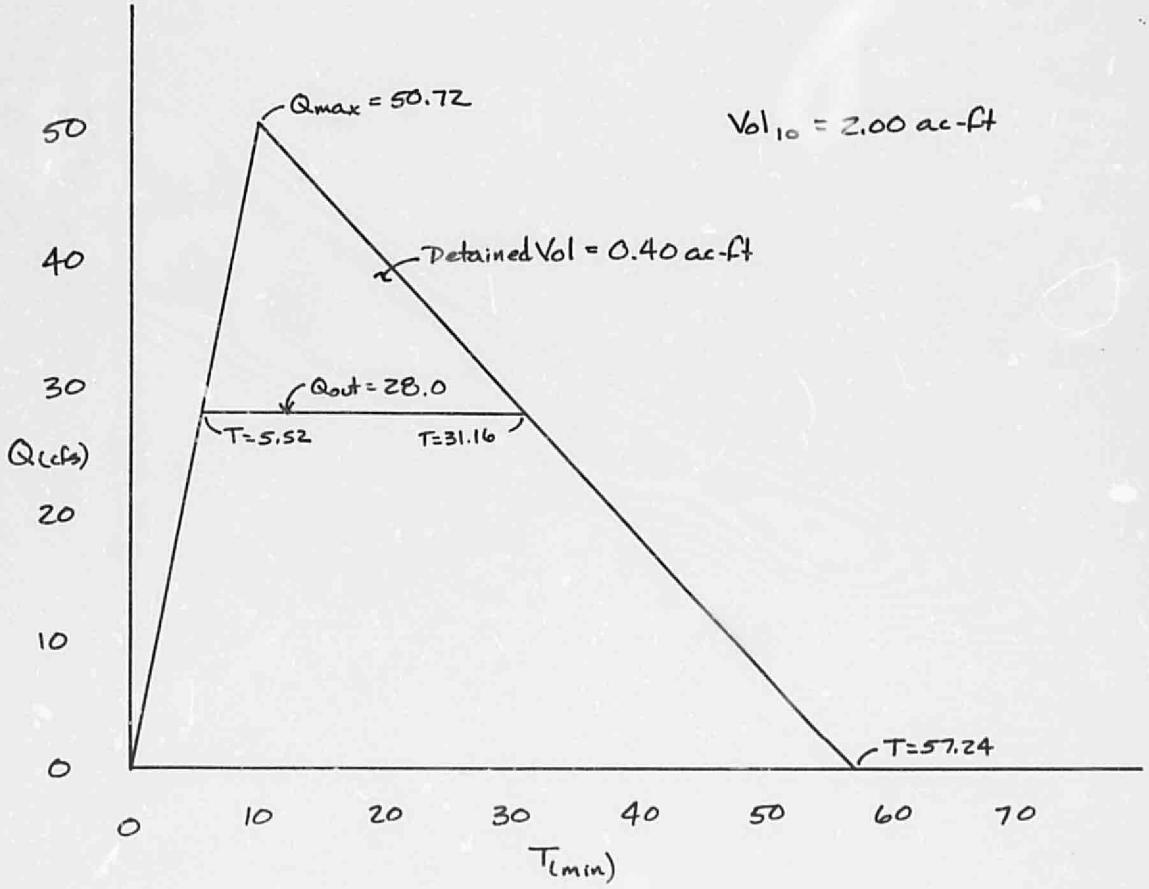
$$51.9 \times \frac{64.6}{121.0} = 27.7 \text{ cfs}$$

Future Bank Site

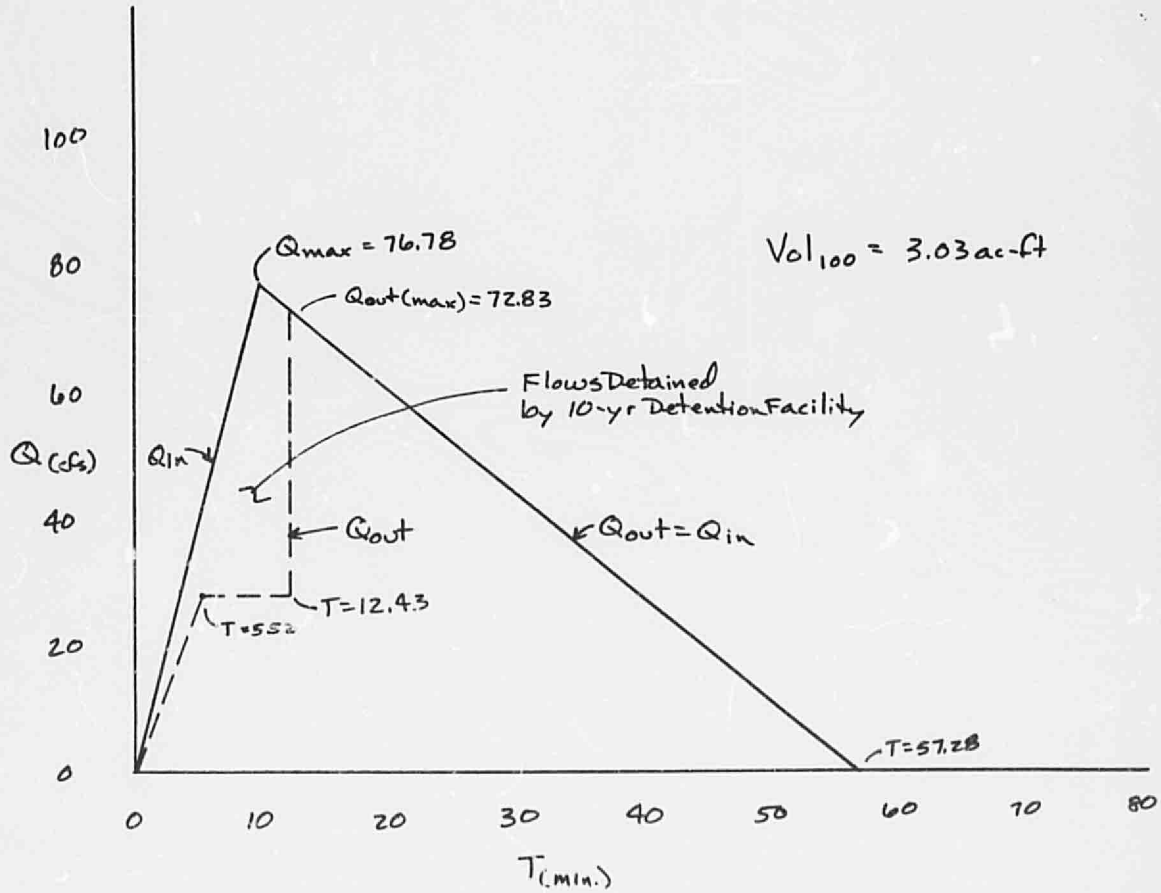
$$2.85 \times \frac{64.6}{121.0} = 1.5 \text{ cfs}$$

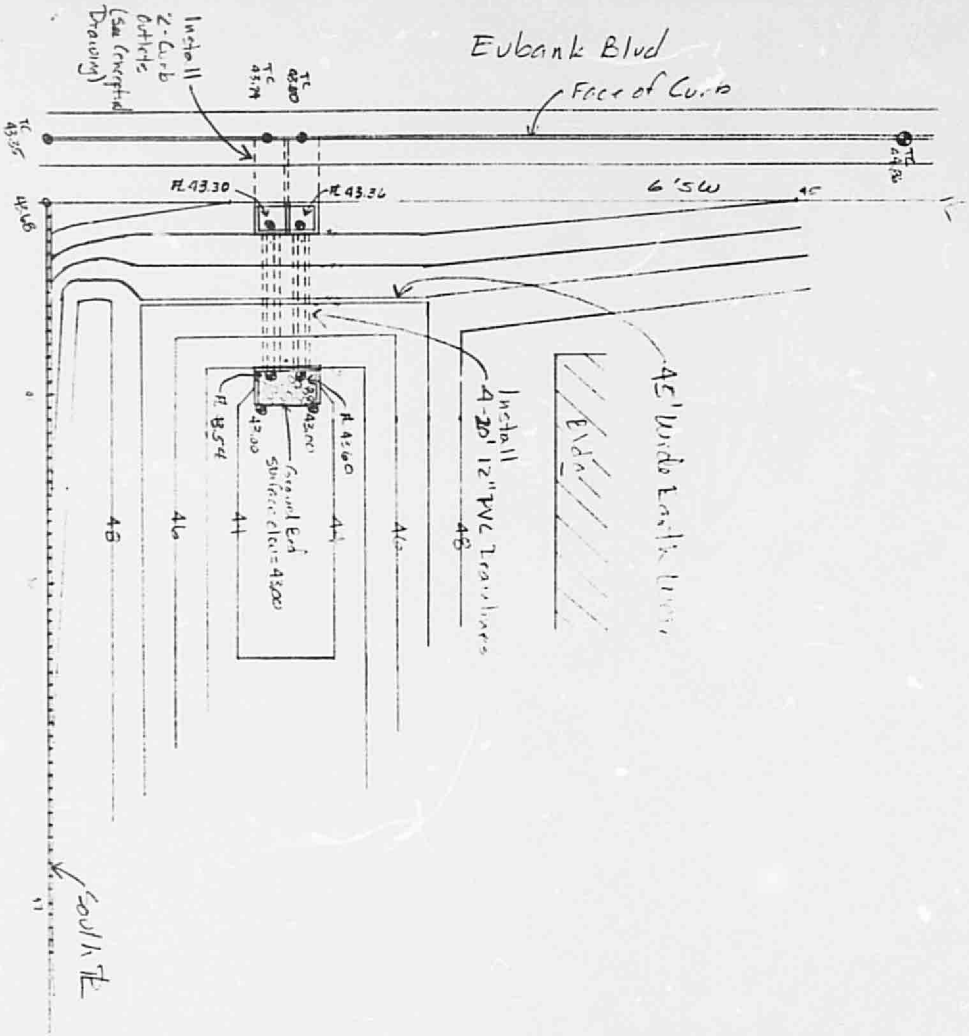
PROJECT NAME Mountain Run Apts SHEET 2 OF 2
PROJECT NO. 31543 BY Dmyn DATE 10-4-83
SUBJECT Flows Impacting Layton Ave CH'D DATE

PROJECT NAME Mtn Run Apartments
PROJECT NO. 3154.3
SUBJECT 10-yr storm hydrograph
BY Bmyn
DATE 10-3-03

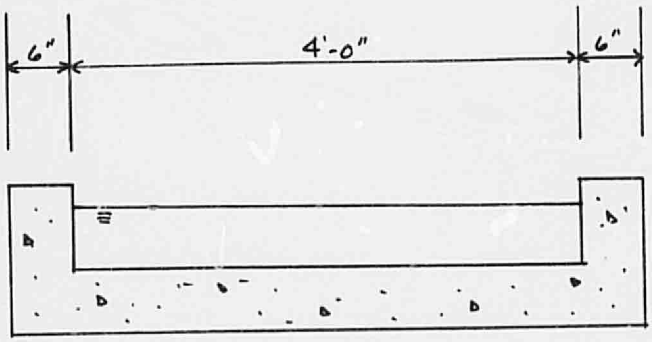


PROJECT NAME Mountain Run Apts
PROJECT NO. 31573
SUBJECT 100-yr storm hydrograph
BY Bmyn
DATE 10-4-83





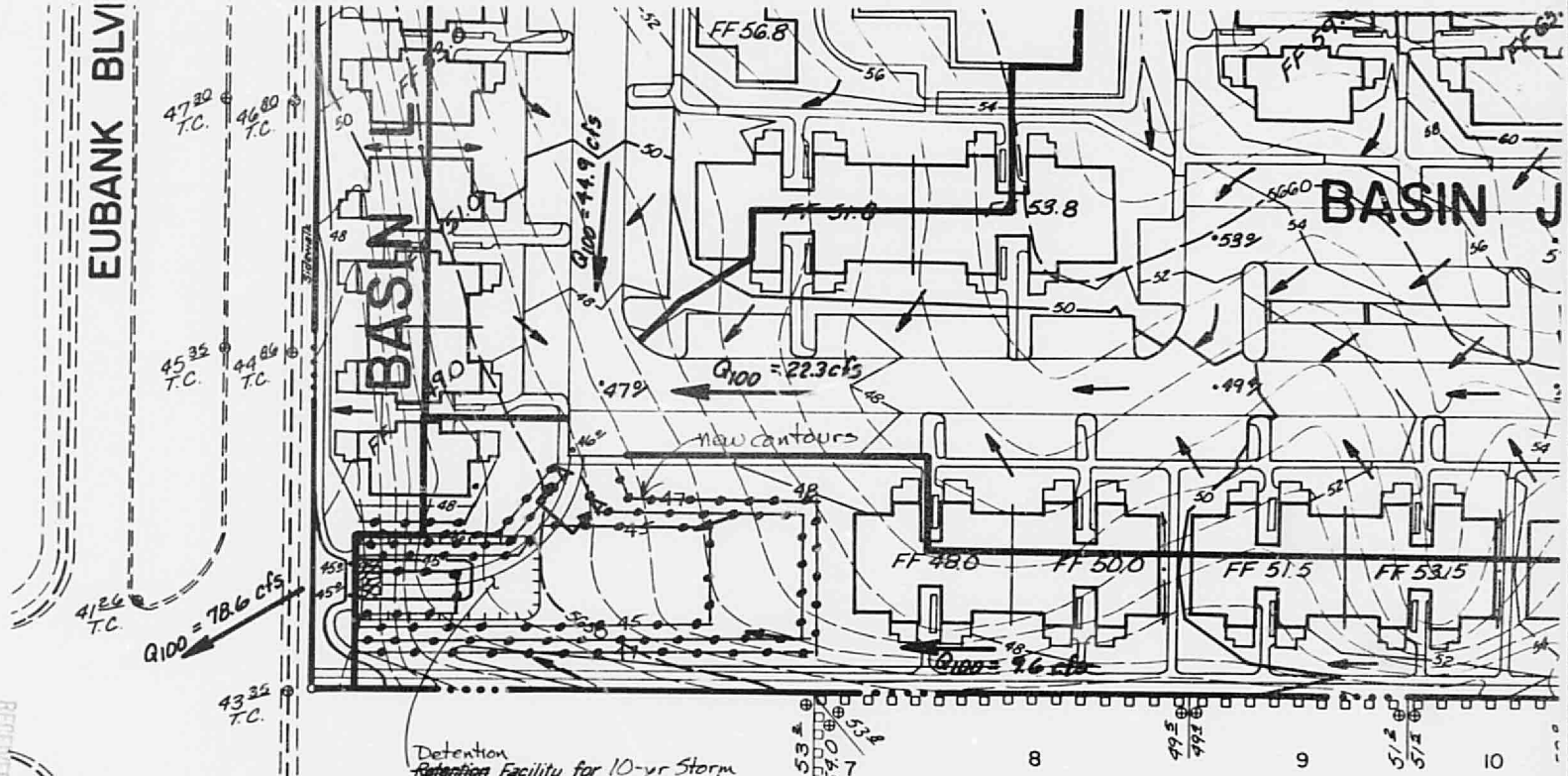
PROJECT NAME Mountain Run Apts
PROJECT NO. 31543
SUBJECT Pond Outlet Detail
SHEET
BY
DATE 10-4-83
CHK'D
DATE



Qmax = 14.0 cfs/each
n = .013
s = .0150
Depth of flow = 0.48'
Velocity = 7.07 fps
Vel. x Depth (10 yr) = 3.39 < 6.5 ok.

PROJECT TITLE Mountain Run Apts
PROJECT NO. 31543
SUBJECT 10-yr Vel. x Depth Calculations

Dmyn 10-4-83



Weir Overflow elevation = 47.0
Maximum Pond Volume = 0.41 ac-ft.
Maximum Sideslopes = 5:1
Weir will be irrigated - maintained turf

Elevation	Area	Storage Volume
43.0	0	> 204 cf
44.0	680 sf	> 2662 cf
45.0	4644 sf	> 6212 cf
46.0	7779 sf	> 8945 cf
47.0	10112 sf	18023 cf = 0.41 ac-ft

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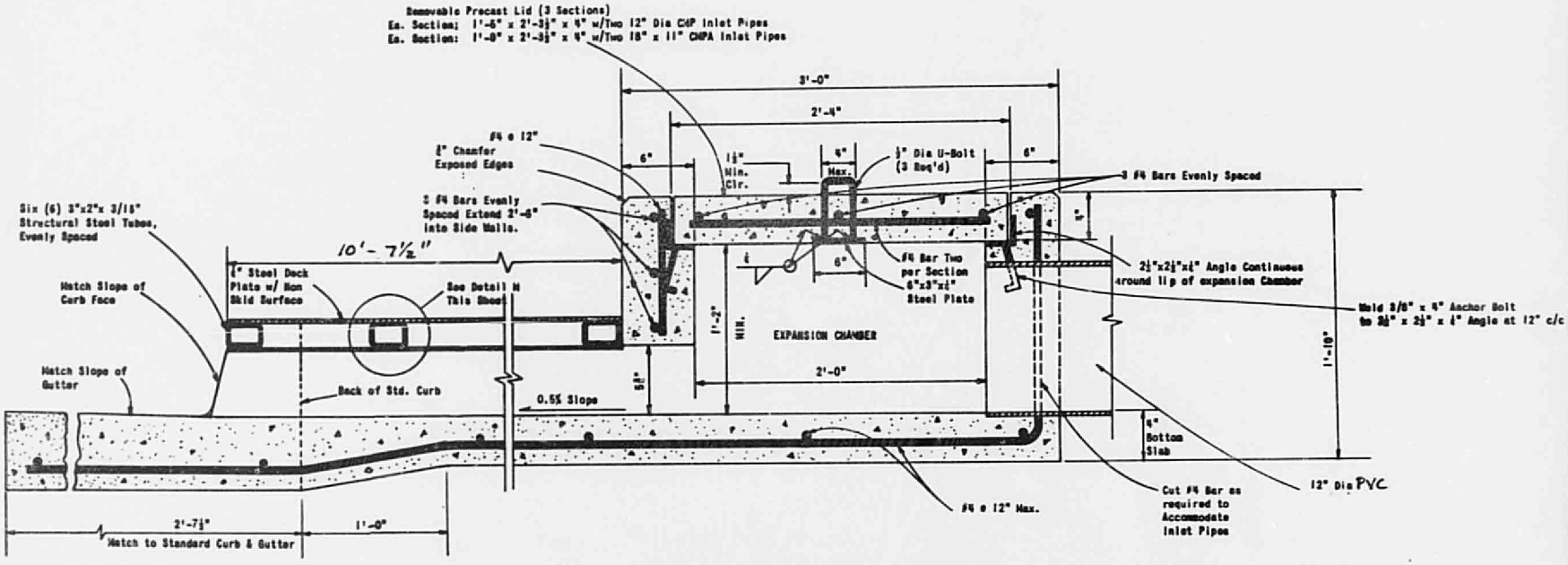
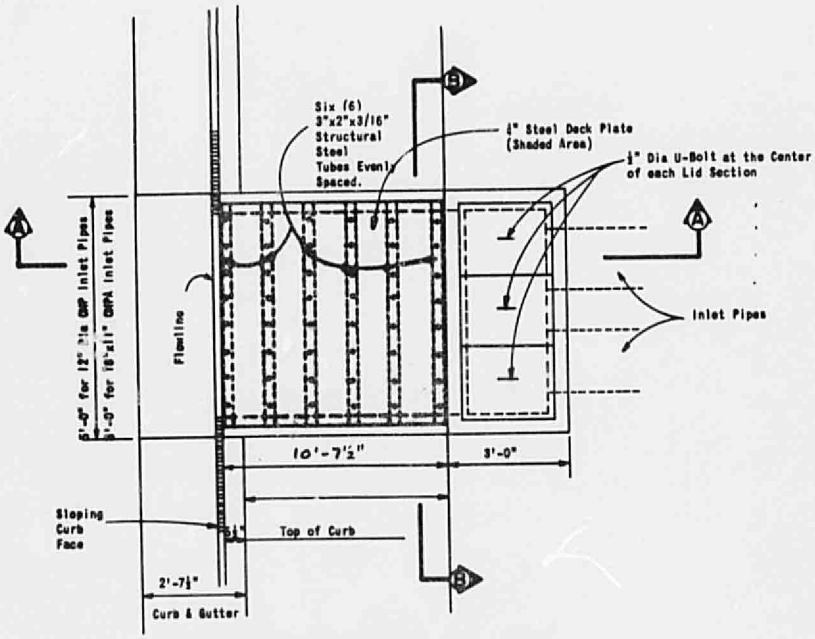


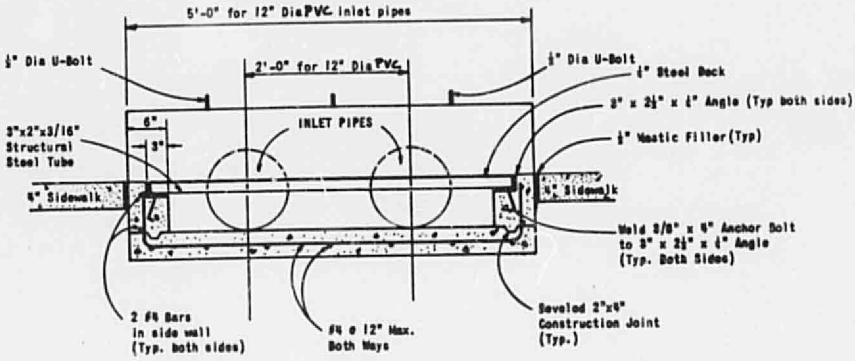
SECTION A-A

NO SCALE



CURB OUTLET PLAN VIEW

NO SCALE



SECTION B-B

NO SCALE

PROJECT NAME: Mountain Run Apts.

PROJECT NO. 31543

SUBJECT: Intersection Analysis

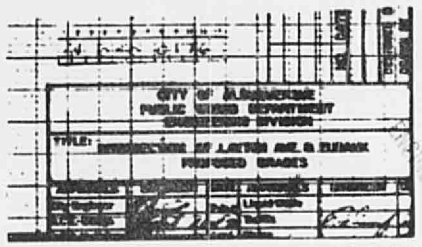
BGB

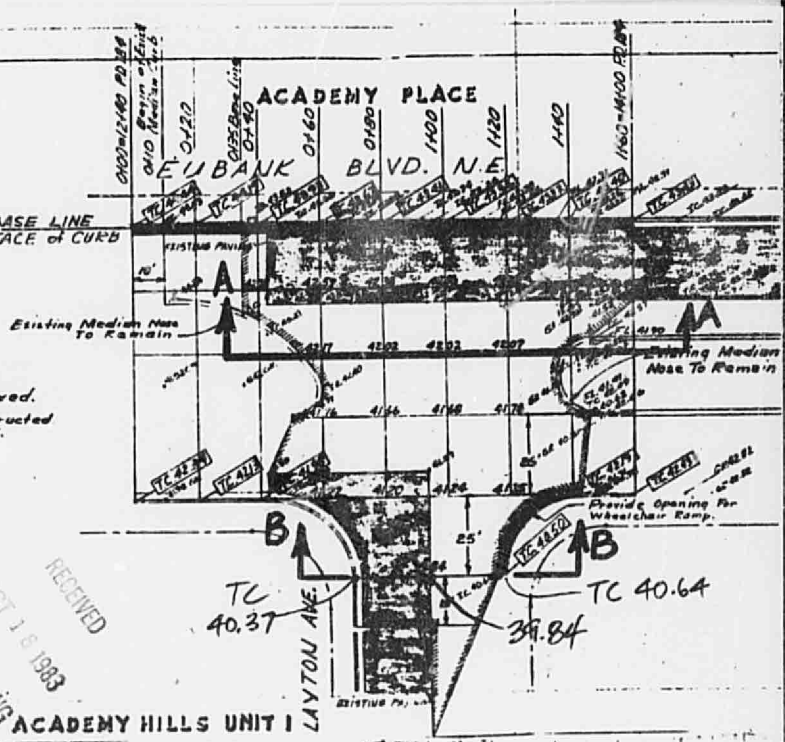
10.18.83

Scale: 1" = 20' Horiz.
1" = 2' Vert.

LEGEND

- Existing Flow Line Elevation.
- Existing Ground Elevation.
- Existing Top of Curb Elevation.
- 41.25 Proposed Finished Elevation 41.25 @ 20 Ft Grid Unless otherwise Shown.
- Limit of Proposed Paving
- Existing Paving Within the Limits to be Removed.
- Existing Curb to be Removed & Reconstructed Outer Lip of Gutter to be Depressed.
- TC 44.44 Proposed Top of Curb Elevation.





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OCT 18 1983
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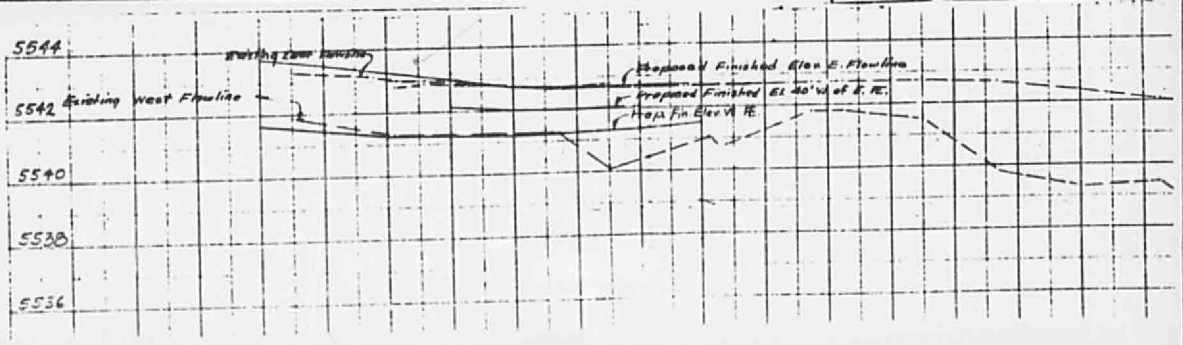
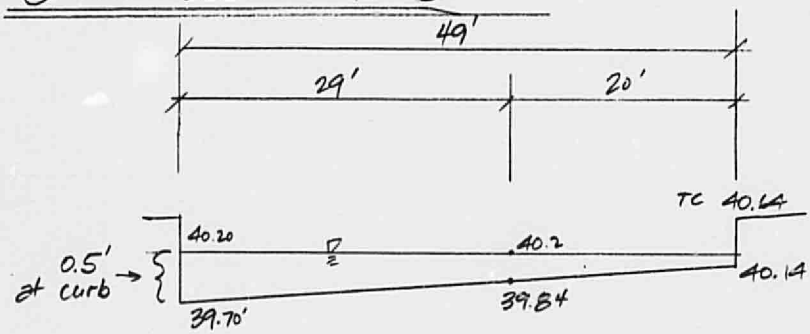


Cross-Section B-B



Look @ 10-year Case - 0.5' at curb

Area $= (1/2)(0.5)\,49 = 12.25$ ft

Perimetter $\cong 49'$

Slope ~ 0.056 (Obtained from as-built drawings of intersection

$$\text{Capacity} = \frac{1.49}{.017}\left(12.25\right)\left(\frac{12.25}{49}\right)^{2/3}\left(.056\right)^{1/2}$$

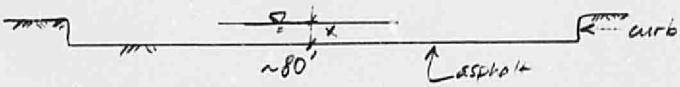
$$= 100.92 > 61.1$$

$$V \times d = 8.24 \times .5 = 4.1 < 6.5 \text{ ok}$$

PROJECT NAME Mountain Run Apts
PROJECT NO. 31543
SUBJECT Intersection Analysis
BGB 10-18-83

Cross-Section A-A

x = water depth



- Assume flat bottom -
- Area = 80x
- Wetted Perimeter = 80 + 2x
- Slope ~ 0.0175 (computed from as-built intersection grades)
- Q_{10} = 61.1 cfs (from Sheet 2/2 - Oct. 4, 1983 letter)
- Q_{100} = 184.2 cfs (from Sheet 1/2 - Oct 4, 1983 letter)
- Use Manning's Equation:

$$Q = \frac{1.49}{.017}\underbrace{(A)}_{[80x]}\left(\frac{A}{P}\right)^{2/3}\left[\frac{80x}{80+2x}\right]^{2/3}(S)^{1/2}$$

Substituting in Q values for 10- & 100 year

$F(x)_{10} = 5.27$

$F(x)_{100} = 15.89$

Solving for x:

$x_{10} \cong 0.20' = 2.40'' < 6''$

$x_{100} \cong 0.38' = 4.6'' < 6''$

$(V \times d)_{10} = .76$ $(V \times d)_{100} = 2.3$ (both acceptable)

PROJECT: Mountain Run Apts.
PROJECT #: 31543
SUBJECT: Intersection Analysis

BGB 10.18.83

BOHANNAN-HUSTON INC.

4125 Carlisle Blvd. Albuquerque, New Mexico 87107
(505) 881-2000 NE

To: City Engr. 4th Floor

E21-023
E21-023

Attention: Billy Goolsby
Fred Aguirre

- ☐ Parcel Post
- ☐ Messenger
- ☐ First Class
- ☐ UPS
- ☐ Air Mail
- ☐ RR Express
- ☐ Special Delivery
- ☐ Air Freight
- ☐ Bus

Transmittal

Date: 10/18/83 Our job number: 31543
Your job number:
Job: Mountain View Apts

We are enclosing:	For:
____ Prints	____ Your Use
____ Sepias	____ Your Approval
____ Tracings	____ Your Records
____ Specs	____ Review & Comments
____ Studies Report	____ Revisions
____ Xerox	____ Response to Your Request
____ Plan Sets	

RECEIVED OCT 1 1983 ENGINEERING

Comments:

By: [signature] thank you

Rec'd by: Date:

AGREEMENT

THIS AGREEMENT dated this 16th day of July, 1980, is entered into between the CITY OF ALBUQUERQUE, a minicipal corporation (the "City"), the TANOAN COMMUNITY ASSOCIATION, a New Mexico non-profit corporation (the "Community Association") and AFFILIATED MORTGAGE & DEVELOPMENT COMPANY, a New Mexico corporation ("AMDeC").

WHEREAS, Tanoan, a planned community development within the City of Albuquerque, has been Master Planned and the Environmental Planning Commission has adopted the Tanoan Master Plan as part of the Comprehensive Plan of the City by approval of the Academy-Tramway-Eubank Sector Development Plan,

WHEREAS, the Environmental Planning Commission has given subdivision approval to Village Greens, Fairway Estates and the Masters subdivisions (the "Approved Subdivisions") within the Sector Development and AMDeC intends to develop additional subdivisions within the Sector Development,

WHEREAS, the Sector Development Plan provides that the Tanoan Community shall have community streets owned and maintained by the Community Association, with easements for water and sewer lines, and the Approved Subdivisions have such community streets,

WHEREAS, the parties are desirous of defining and clarifying the responsibilities, obligations and liabilities of the parties with respect to the community streets and the municipal utilities within the Approved Subdivisions and any future subdivisions within the Tanoan Communities which are approved by the Environmental Planning Commission for community streets, and

WHEREAS, AMDeC is the developer of the Tanoan Communities and will own the community streets until such time as they are conveyed to the Community Association.

NOW, THEREFORE, it is agreed:

1. This Agreement shall govern the community-owned streets in the Approved Subdivisions and in any future subdivisions within the Tanoan Communities which are approved by the Environmental Planning Commission for community streets (herein the "Subdivisions").

2. The City is the owner of all water meters and distribution and service lines, sanitary sewer lines (except for lateral sewer lines and connections), storm sewer lines, and other appurtenances of those systems located within existing easements dedicated to public use within the Subdivisions (the City Systems).

3. The Community Association or AMDeC is the owner of the community streets, sidewalks, curb and gutter, landscaping and the irrigation water system which are located within the community street right-of-way (the Association Systems).

4. The City shall exercise complete dominion and control over the City Systems, to the exclusion of the Community Association and shall be solely responsible for the operation, repair and maintenance of the City Systems.

5. The Community Association or AMDeC shall exercise complete dominion and control over the Association Systems, to the exclusion of the City, and shall be solely responsible for the operation, repair and maintenance of the Association Systems.

6. Where the City, in fulfilling its performance obligations under the Agreement, damages the Association Systems, without negligence on the part of the City, the City shall bear no obligation to the Community Association for repair and restoration of those Association Systems, and will be held harmless for damages to the Community Association due to waterline breaks or sewer backups. HOWEVER, the City shall have the obligation to:

A. barricade potentially dangerous conditions as a result of the repair work, and

B. immediately notify the Community Association of such damage to their system.

7. Where the Community Association or AMDeC damages the City Systems either with or without negligence, they shall be liable to the City for repair of that system, to the extent that the City's negligence does not contribute to the damage to the City System. The Community Association or AMDeC shall:

A. grant complete access to its facilities at all times,

B. pay the City the cost of repair of the City Systems,

C. prohibit the placement of obstructions in the public easements that could increase the cost and difficulty to the City for operation, maintenance, and repair of the City Systems over those of standard public right-of-way costs, and

D. pay for any barricades at work sites after City has completed repair on City Systems.

8. In the event the Community Association is dissolved, or is unwilling or unable to comply with the terms of this Agreement and AMDeC does not assume the obligations under this Agreement, master meters shall be installed and the operation and maintenance requirements of the Tanoan Community water and sewer systems shall become the responsibility of the property owners within the Subdivisions unless the utility easements are dedicated and accepted as public rights-of-way.

9. This Agreement shall be binding upon AMDeC for only those obligations or claims relating to an Association System of which

AMDeC is the owner and has not conveyed to the Community Association.

CITY OF ALBUQUERQUE

By _____
Acting CAO

ATTEST

_____
CITY ATTORNEY

_____
SECRETARY

TANOAN COMMUNITY ASSOCIATION, INC.

By _____
President

AFFILIATED MORTGAGE & DEVELOPMENT COMPANY

By _____
Exec. V.P.

BOHANNAN-HUSTON INC.

MOUNTAIN RUN
APARTMENTS
DRAINAGE AND GRADING
PLAN

AUGUST, 1983

DRAINAGE AND GRADING PLAN
FOR
MOUNTAIN RUN APARTMENTS

AUGUST, 1983

PREPARED FOR

CAMPBELL & COMPANY
5 POST OAK PARK, SUITE 1300
HOUSTON, TEXAS 77027

PREPARED BY

BOHANNAN–HUSTON, INC.
4125 CARLISLE BOULEVARD, N.E.
ALBUQUERQUE, NEW MEXICO 87107
505/881-2000

DAVID M. Y. MILLIKAN
NEW MEXICO
7547
8-19-83
REGISTERED PROFESSIONAL ENGINEER

David M. Y. Millikan

DAVID M. Y. MILLIKAN, P.E.
N.M.P.E. NO. 7547

TABLE OF CONTENTS

	Page
INTRODUCTION	1
SITE LOCATION AND DESCRIPTION	1
METHOD OF ANALYSIS	1
EXISTING DRAINAGE CONDITIONS	2
DEVELOPED DRAINAGE CONDITIONS	2
EROSION CONTROL PLAN	3

FIGURES

Figure 1 – Vicinity Map
Figure 2 – Soils Map
Figure 3 – Flood Hazard Boundary Map

APPENDIX

PLATES

Plates 1 and 2 – Grading and Drainage Plan

INTRODUCTION

The Mountain Run Apartment complex will contain 472 housing units in 31 building "clusters". The complex is to be constructed on a 15.85 acre site of presently undeveloped land.

The purpose of this report is to describe existing drainage conditions on and adjacent to the site, and to present a grading and drainage plan which provides a workable means for treating all flows impacting or generated on the site.

SITE LOCATION AND DESCRIPTION

The Mountain Run site is located on a portion of Tracts I and H of the Academy Place Subdivision in the City of Albuquerque, New Mexico. Tracts I and H are located at the southeast corner of Eubank and Juan Tabo Blvds. In addition to the Mountain Run Apartment Complex, an 11.73 acre commercial business site and a 2.30 acre restaurant site will also be located on Tracts I and H. Figure 1 is a vicinity map of the area.

The site slopes at approximately 4% from the east to the west. Soils on the site are classified as Embudo–Tijeras association (Etc). This soil type is described as level to moderately sloping, well drained loamy and gravelly soils. It is classified as hydrologic soil type "B" by the U.S. Soil Conservation Service. Figure 2 is a copy of the soils map for the area.

METHOD OF ANALYSIS

All methods of analysis and computations are done in accordance with Chapter 22 of the City of Albuquerque's Development Process Manual (DPM). Allowable discharge rates and volumes were determined in accordance with the "Drainage Ordinance".

For existing condition calculations, a runoff coefficient of .34 is used (type "B" soil, 0% impervious). A runoff coefficient of .82 is used assuming the site to be 86% impervious when developed.

Rainfall intensity calculations are based on a 6 hr. rainfall volume of 2.5 in., (as obtained from Plate 22.2 D–1 of the DPM). For existing 10-year and 100-year rainfall intensity calculations, a time of concentration of 25.0 min. is used. For all developed condition calculations, rainfall intensity is found assuming the time of concentration to be 10.0 min. Time of concentration calculations are included in the Appendix.

The Rational Formula has been applied to determine 10-year and 100-year peak flow rates and runoff volumes.

EXISTING DRAINAGE CONDITIONS

The only flows which impact the site are generated on the remainder of Tracts I & H. The Flood Hazard Boundary Map (Figure 3) indicates that flows in Juan Tabo and Eubank are contained within the street right-of-way.

Under present conditions, all of Tracts I & H including the Mountain Run Site drain to the southwest corner of the Mountain Run Apartment site. Therefore, flow rate and runoff volume values have been computed for all of Tracts I & H. The portion attributable to the Mountain Run Apartment site can be found by proportioning its area to the remainder of the 29.88 acre tract. The 10-year peak flow rate for the Mountain Run site is 12.0 cfs. The 100-year peak flow rate is 18.2 cfs. The 10-year and 100-year runoff volumes are 0.737 ac.-ft. and 1.124 ac.-ft., respectively. Computations are included in the Appendix.

DEVELOPED DRAINAGE CONDITIONS

All flows impacting the site will be generated on the Mountain Run Apartment site or the restaurant site. Runoff from the commercial site will discharge directly to Eubank without crossing this site. Internal street capacities are sufficient to allow discharge from the adjacent restaurant site to be conveyed through the site.

Runoff from this site is discharged to Eubank Blvd. The flows are then discharged from Eubank Blvd. to Layton Avenue. From this point the flows are conveyed in Layton Avenue to the Bear Tributary Arroyo. Page 4 of the Appendix shows calculations determining the capacity of Layton Ave. It has been assumed that all basins which drain to Layton Avenue under present conditions will drain to Layton Avenue under developed conditions. The boundaries of this basin are shown on Figure 3. The capacity of Layton just upstream of the Bear Tributary Arroyo was calculated as 260 cfs. Assuming the entire basin contributing to Layton is developed with a runoff coefficient of 0.82 results in a peak flow rate in Layton of 181 cfs. (41.4 ac.) This is less than the capacity of Layton, therefore, uncontrolled discharge from the site is allowable.

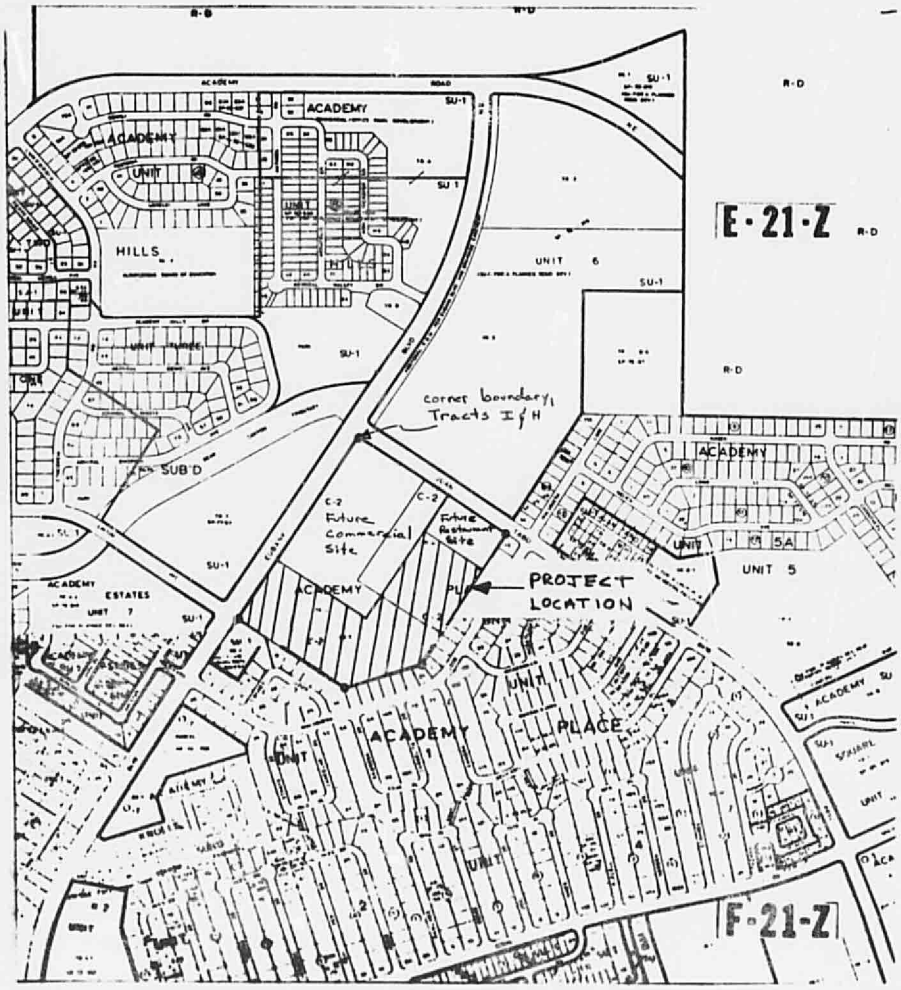
All runoff from the site will be discharged to Eubank at the southwest corner of the site. A small retention facility will be constructed at this corner of the site to prevent nuisance flows from entering Eubank. This is in accordance with the "Drainage Ordinance". Flows which exceed the capacity of the small retention facility will be discharged over a turfed weir at the end of the facility. They will be conveyed across Eubank Blvd. and routed down Layton Avenue to the Bear Tributary Arroyo. Based on a 100-year storm, a peak flow rate of approximately 79 cfs will be discharged from the site.

The Drainage and Grading Plan (Plates 1 and 2) indicate the drainage basins, flow directions and flow quantities (100-year storm) corresponding to the developed grading of the site. Pages 2 and 3 of the Appendix show individual basin flow rates and runoff volume values. Curb openings will be used in parking area islands in Basins B and J. These openings will be 2 ft. in width. Flows generated within Basins E and F will be collected by a curb opening inlet,routed through an 18" concrete pipe and discharged through an expansion box into Basin J. All flows, excluding those from Basin L, are conveyed through the small retention facility. Flows from Basin L will be discharged directly onto Eubank Blvd. Nuisance flows from Basin L should be minimal, since the only impervious areas in this area are the roofs of the buildings adjacent to Eubank.

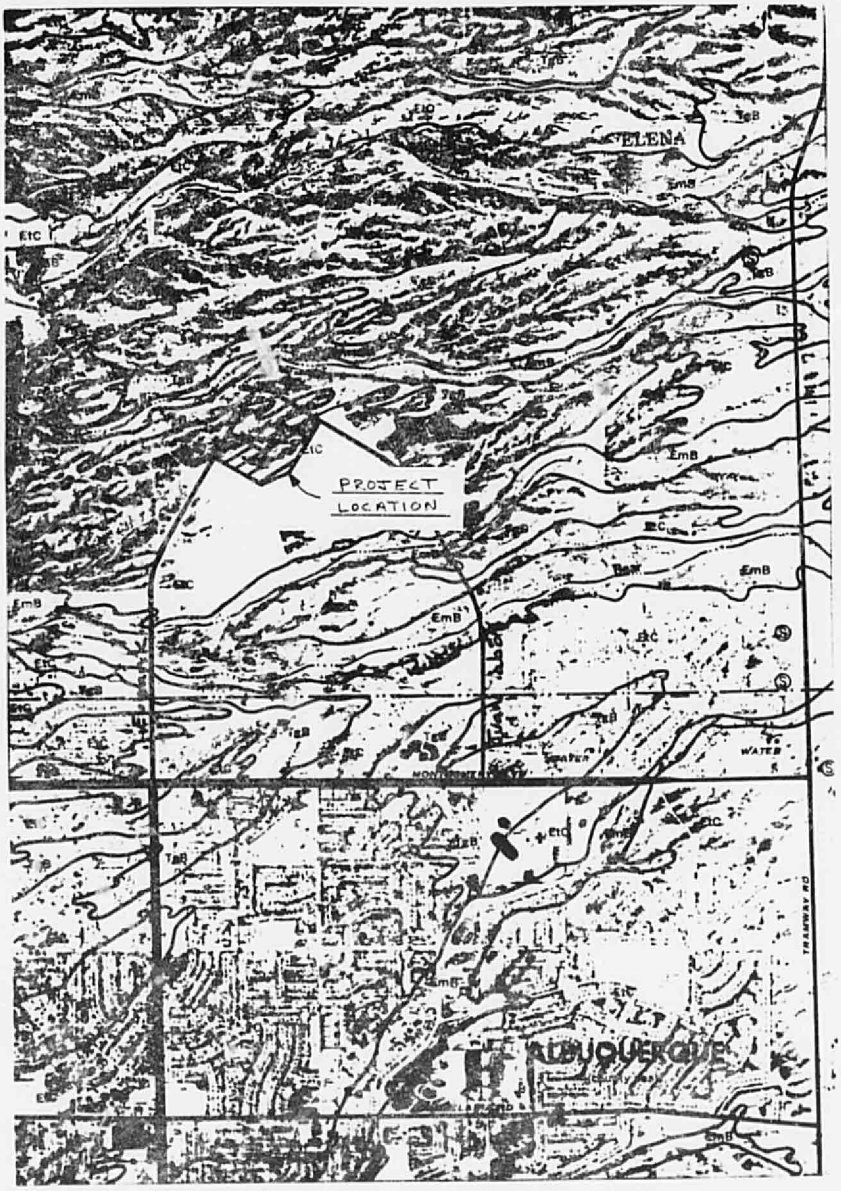
EROSION CONTROL PLAN

Slopes on the site at locations where there are concentrated flows are mild (1%–5%). During the construction phase, erosion in these areas should be minimal. Upon completion of the paving and landscaping no erosion should occur in these areas. Slopes in landscaped areas are 3:1 or flatter. No concentrated flows are directed over these slopes. Therefore, erosion upon completion of the project should not occur in these areas.

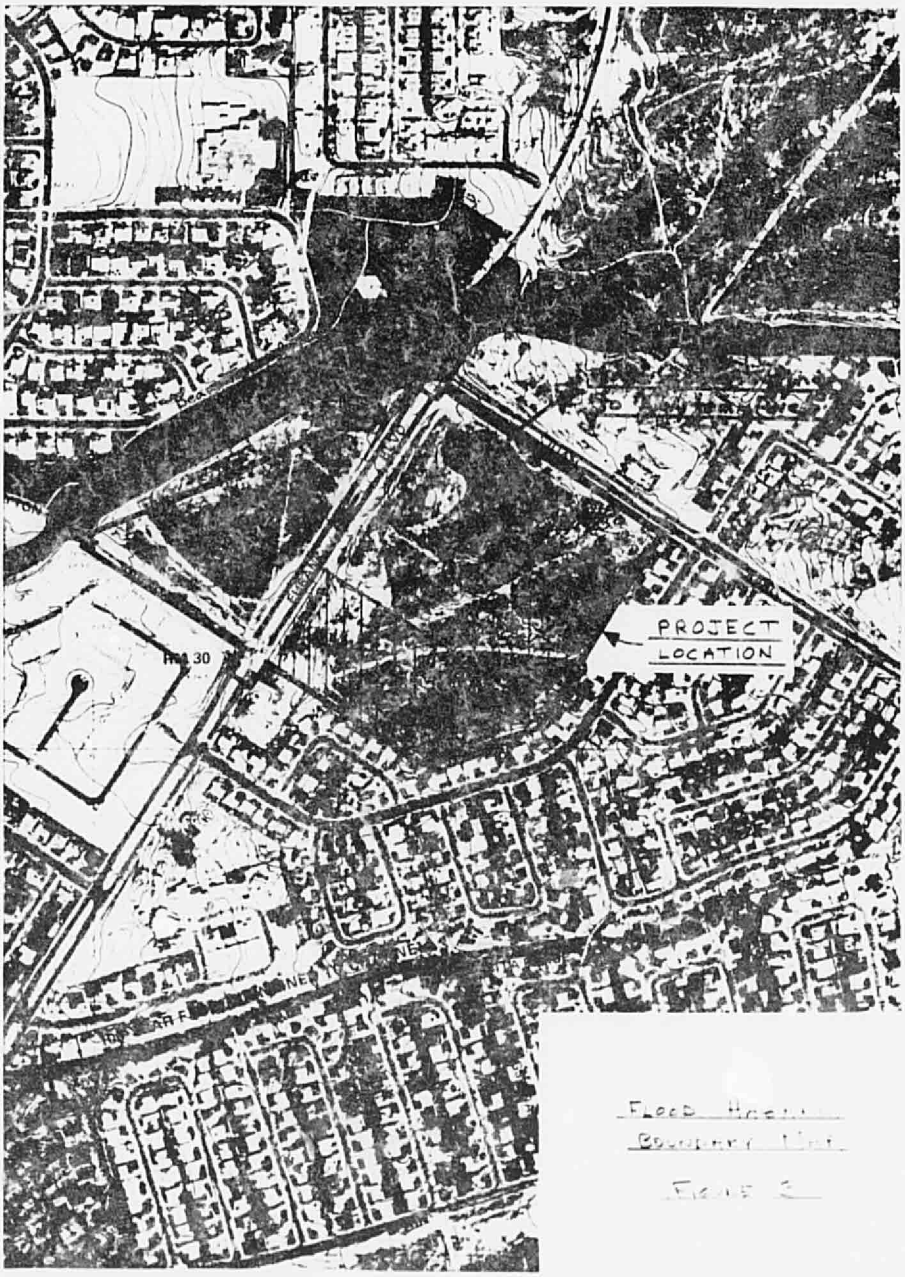
All runoff from the site (except Basin L) is being routed through the small retention facility in the southwest corner. Therefore, any erosion that occurs on the site during construction should be prevented from leaving the site.



VICINITY MAP
FIGURE 1



SOILS MAP
FIGURE 2



Flood Hazard
Boundary Map

Figure 2

APPENDIX

TRACTS I + H, EXISTING DRAINAGE CONDITIONS

assume 0% imper. (c = .34 , "B" soil)
6-hr, 100-yr rainfall = 2.5"

Tracts I + H (total area):

$s = .033$ $V = 1.1$ ft/s $T_c = \frac{1650}{1.1(60)} = 25.0$ min
$A = 29.88$ ac

$I/6 = 1.35$ in/hr

$I_{10} = (2.5 \times .657)(1.35) = 2.2$ in/hr

$I_{100} = (2.5)(1.35) = 3.4$ in/hr

$Q_{10} = (.34)(2.2)(29.88) = 22.6$ cfs

$Q_{100} = (.34)(3.4)(29.88) = 34.3$ cfs

$V_{10} = (.34)(2.5 \times .657)(29.88)/12 = 1.39$ ac-ft

$V_{100} = (.34)(2.5)(29.88)/12 = 2.12$ ac-ft

Proportioning by area:

apartment site $= \frac{15.85}{29.88} \times 100 = 53\%$

future shopping center $= \frac{11.73}{29.88} \times 100 = 39\%$

future restaurant $= \frac{2.30}{29.88} \times 100 = 8\%$

∴

	restaurant	shp. center	apart. site
Q_{10} (cfs)	1.8	8.8	12.0
Q_{100} (cfs)	2.8	13.4	18.2
V_{10} (ac-ft)	.111	.542	.737
V_{100} (ac-ft)	.170	.827	1.124

PROJECT NAME Mtn. Run Apts. SHEET 1 OF 8
PROJECT NO. 31543 BY JS DATE 8/15/03
SUBJECT Existing Drainage Calcs. CH'D _____ DATE _____

BASIN DISCHARGE FLOWRATES AND RUNOFF VOLUMES

Analyzing a typical section of the site:

$A_{total} = .494$ ac

$A_{imper} = .250$ ac

$\therefore \frac{.250}{.494} = .51$ or 51% impervious

Analyzing Basin A for instance:

$A_{total} = 1.76$ ac

$A_{street} = 1.25$ ac (100% imper.), $A_{other} = .51$ ac (51% imper.)

$\therefore \frac{.51}{1.76}(.51) + \frac{1.25}{1.76}(100) = .86$ or 86% imper.

Use 86% imper. for developed condition

note- per DPM Plate 22.2 C-1, runoff coeffecient $C = .82$ for 86% imper., type "B" soil. Also, 6hr rainfall, 100yr frequency = 2.5 in

Sample Calc.

Basin A: $S = .015$ $\therefore V = 3.3$ ft/s (Plate 22.2 E-2)
$A = 1.70$ ac

$T_c = \frac{L}{V(60)} = \frac{950}{3.3(60)} = 4.8$ min → assume 10.0 min (use 10.0 min for all basin calcs)

$I/6 = 2.11$ in/hr (Plate 22.2 D-2)

$I_{10} = (2.11)(2.5 \times .657) = 3.5$ in/hr $\quad I_{100} = 2.11(2.5) = 5.3$ in/hr

$Q_{10} = CI_{10}A = (.82)(3.5)(1.83) = 5.25$ cfs $\quad Q_{100} = CI_{100}A = (.82)(5.3)(1.83) = 7.95$ cfs

$V_{10} = (.82)(2.5 \times .657)(1.83)/12 = 0.21$ ac-ft $\quad V_{100} = (.82)(2.5)(1.83)/12 = 0.31$ ac-ft

PROJECT NAME Mtn. Run Apts. SHEET 2 OF 8
PROJECT NO. 31513 BY JJ DATE 8/15/83
SUBJECT Developed Drainage Calcs. CH'D DATE

SUMMARY OF BASIN FLOWRATES AND RUNOFF VOLUMES

Basin	A (ac)	Q_{10} (cfs)	Q_{100} (cfs)	V_{10} (ac-ft)	V_{100} (ac-ft)
Restaurant site	2.40	6.89	10.43	0.27	0.41
A	1.83	5.25	7.95	0.21	0.31
B	2.18	6.26	9.47	0.24	0.37
C	1.03	2.96	4.48	0.12	0.18
D	0.93	2.67	4.04	0.10	0.16
E	1.77	5.02	7.61	0.20	0.30
F	0.88	2.53	3.82	0.10	0.15
G	2.20	6.31	9.56	0.25	0.38
H	0.85	2.44	3.69	0.10	0.15
J	2.49	7.15	10.82	0.28	0.43
K	1.13	3.24	4.91	0.13	0.19
L	0.42	1.21	1.83	0.47	0.07
			78.61		

note - All basins contribute to retention facility at southwest corner of site except for Basin L. Total Q_{100} = 76.78 cfs at facility.

PROJECT NAME Mtn. Run Apts. SHEET 3 OF 8
PROJECT NO. 31543 BY KJ DATE 8/15/83
SUBJECT Developed Drainage Calcs. CH'D _____ DATE _____

PROJECT NAME Mtn. Run Apts. SHEET 4 OF 8

PROJECT NO. 31513 BY [illegible] DATE 7/28/83

SUBJECT Capacity of Layton Ave. CH'D DMM DATE 7/28/83

CAPACITY OF LAYTON AVE.

$$Q = \frac{1.486}{n} A R^{2/3} S^{1/2}$$

$n = .017$, $S = .0192$

$A_1 = \frac{1}{2}(.2)\left(\frac{.2}{\tan\theta}\right) = .780$

$A_2 = 30(.87 - .60) = 8.10$

$A_3 = \frac{1}{2}(.60)(30) = 9.00$

$17.88\ ft^2 \times 2 = 35.76\ ft^2 = A$

wetted perimeter

$P = [7.80 + .67 + 30.0]\,2$

$P = 76.94\ ft$

$\therefore R = A/P$

$R = \frac{35.76}{76.94} = .465$

$Q = \frac{1.486}{.017}(35.76)(.465)^{2/3}(.0192)^{1/2}$

$Q = 260\ cfs$

total street capacity

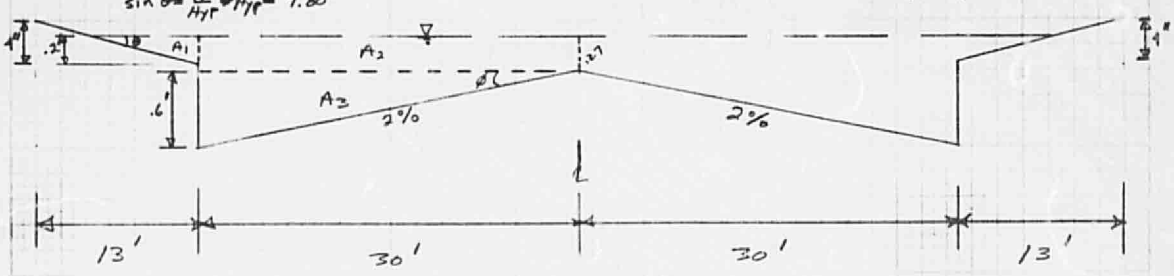
$\tan\alpha = \frac{.3333}{13}$

$\alpha = 1.4687 = \theta$

$\sin\theta = \frac{.2}{Hyp} \Rightarrow Hyp = 7.80'$

$\tan\phi = \frac{.6}{30} \Rightarrow \phi = 1.146$

$\sin\phi = \frac{.6}{Hyp} \Rightarrow Hyp \simeq 30.0'$



86' R/W

FLOWS IMPACTING LAYTON AVE. VS. CAPACITY OF LAYTON AVE.

Undevel. land bounded by Layton, Eubank and Bear Trib. -

$s = \frac{72.0 - 24.0}{1300} = .037$, $V = 1.2$

$T_c = \frac{1300}{1.2(60)} = 18.1$ $I/6 = 1.65$

$I_{100} = 2.5(1.65) = 4.1$ $Q_{100_{UD}} = (.34)(4.1)(9.90) = \underline{13.8 \text{ cfs}}$

assume developed: $c = 0.82$, $T_c = 10.0$ min $Q_{100_D} = (.82)(5.3)(9.90) = \underline{\underline{43.0 \text{ cfs}}}$

On Eubank -

$s = \frac{78.5 - 42.7}{1200} = .030$ $V = 4.6$

$T_c = \cancel{4.35} \rightarrow 10.0$ $I/6 = 2.11$

$I_{100} = 2.5(2.11) = 5.3$ $Q_{100} = (.10)(5.3)(1.653) = \underline{\underline{8.8 \text{ cfs}}}$

Future Shopping Center -

$Q_{100_{UD}} = \underline{13.4 \text{ cfs}}$ (see pg. 1 of Appendix)

assume developed: $c = 0.82$, $T_c = 10.0$ min

$Q_{100_D} = (.82)(5.3)(11.73) = \underline{\underline{51.0 \text{ cfs}}}$

Developed site -

$Q_{100_D} = \underline{\underline{78.61 \text{ cfs}}}$

$\therefore Q_{100(total)}$ when developed $= 181.4 < 260$ cfs ✓

therefore adequate capacity in Layton for uncontrolled discharge from all contributing basins.

PROJECT NAME Mtn. Run Apts. SHEET 5 OF 8
PROJECT NO. 31543 BY [illegible] DATE 8/15/03
SUBJECT Flows Impacting Layton Ave CH'D DATE

Size SD pipe to carry flows Basins E+F to J

$$\overset{11.4}{Q} = \overset{.6}{C}A\sqrt{2gh} \quad \underline{\text{or}} \quad h = \frac{1}{2g}\left(\frac{Q}{CA}\right)^2$$

available slope of hydr. g.l. (℄ minus top of pipe at outlet) -

$$S = \frac{60.5' - 56.5'}{130} = .031$$

cap. of 18" pipe flowing full is ≃ 19.0 cfs (from design manual) so OK.

$$A = \pi r^2 = \pi\left[\frac{18}{2(12)}\right]^2 = 1.77\,ft^2$$

$$h = \frac{1}{2g}\left[\frac{11.4}{.6(1.77)}\right]^2 = 1.79\text{ ft}$$ (center of pipe to ℄ of inlet)

add .5 ft additional clearance plus 1/2 pipe dia.

$$1.79 + 0.50 + 0.75 = \cancel{3.04'} \; 3.0'$$ (min. elev. diff. between inlet grade elev. + invert of pipe)

inlet ℄ elev. 60.5' minus 3.04' = 57.5'

$$\frac{57.5' - 55.0'}{130'} = .019$$ (18" pipe at 1.9% has cap. of ≃ 15 cfs)

Size curb opening inlet

$$\underset{11.4}{Q} = \underset{3.0}{C} L H^{3/2} \quad \underline{\text{or}} \quad L = \frac{Q}{CH^{3/2}}$$

try H = 6"

$$L = \frac{11.4}{(3.0)(.5)^{3/2}} = 10.7'$$

try H = 8"

$$L = \frac{11.4}{(3.0)(.67)^{3/2}} = \cancel{6.9'} \rightarrow \text{use } 7.0'$$

∴ use 8" high curb opening – extend 8" high curb 5' out from each side of inlet.

10.5 cfs

PROJECT NAME Mtn. Run Apts. SHEET 6 OF 8
PROJECT NO. 31543 BY KJ DATE 8/16/83
SUBJECT Storm Drain Design CH'D _____ DATE _____

STORM DRAIN OUTLET DESIGN
(Expansion Box)

Normal depth of outlet:

try 6' width @ 2% slope -

$$Q = \frac{1.486}{n} A R^{2/3} S^{1/2}$$

$D = .32' = 3.89''$ (ht. of outlet = 4.00")

Near pressure flow, check orifice eqn.:

$$Q = cA\sqrt{2gh} \Rightarrow h = \frac{1}{2g}\left(\frac{Q}{cA}\right)^2 = \frac{1}{2g}\left(\frac{11.4}{.6(1.77)}\right)^2 = 1.31' = 15.78''$$

Add 2" for 1/2 depth of opening (17.78")

Top of pipe = 1'6" = 18"

Therefore, OK as flow in pipe is not under pressure flow.

Use 6' wide, 4" deep outlet at 2% slope.

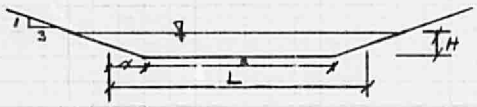
PROJECT NAME Mtn. Run Apts.	SHEET 7	OF 8	
PROJECT NO.	BY DMYM	DATE 8/16/83	
SUBJECT SD Outlet Sizing	CH'D KJ	DATE 8/16/83	

Retention Facility Weir Design

$Q = CLH^{3/2}$

Let $B = 15'$ w/ 3:1 side slopes, $C = 3.0$

$Q = 63.0$ cfs (contributions from all basins but K)



$B = L - 2x$, $H = 2/3\, x$

$x = 3/2\, H$

$\therefore \quad B = L - 3/2\, H$

$L = 3/2\, H + 15$

$Q = CLH^{3/2}$

$Q/C = (3/2\, H + 15)(H^{3/2}) = 3/2\, H^{5/2} + 15\, H^{3/2} = \frac{78.6}{3.0} = 26.2$

$H = 1.35'$ ✓

Construct 3:1 side sloped turfed weir w/ 15' bottom width

PROJECT NAME Mtn. Run Apts. SHEET 8 OF 8

PROJECT NO. 31543 BY KJ DATE 8/16/83

SUBJECT Retention Facility Weir Design CH'D _____ DATE _____

BOHANNAN–HUSTON INC.

4125 Carlisle Blvd. Albuquerque, New Mexico 87107

(505) 881–2000 NE

To: City Hydrology
4th floor
City Hall

Attention: Fred Aguirre

- ☐ Parcel Post
- ☑ Messenger
- ☐ First Class
- ☐ UPS
- ☐ Air Mail
- ☐ RR Express
- ☐ Special Delivery
- ☐ Air Freight
- ☐ Bus

Transmittal

Date: 8/19/83 Our job number: 31543

Your job number:

Job: Mtn Run – Grading + Drainage Plan

We are enclosing:	For:
___ Prints	___ Your Use
___ Sepias	✓ Your Approval
___ Tracings	___ Your Records
___ Specs	___ Review & Comments
✓ Studies Report	___ Revisions
___ Xerox	___ Response to Your Request
___ Plan Sets	___

RECEIVED
AUG 19 1983
ENGINEERING

Comments:

By: Keith Rynes thank you

Rec'd by: Thomas J Lucero Date: