HYDROLOGY G11/D24 TWO PLANS

G11-D24

2 PLANS

INFORMATION SHEET

PROJECT TITLE ATRISCO APARTMENTS TYPE OF SUBMITTAL DRAINAGE PLAN

ZONE ATLAS PAGE NO. G-11 CITY ADDRESS

LEGAL DESCRIPTION

ENGINEERING FIRM BOHANNAN-HUSTON, INC. CONTACT DAN GROCHOWSKI

ADDRESS 4125 CARLISLE BLVD. NE PHONE 505-881-2000

OWNER NATIONAL REALTY CONSULTANTS CONTACT DAVID BOLTON

ADDRESS 1713 BROADMOOR, STE 204 BRYAN, TEXAS 77802 PHONE 409-775-5252

ARCHITECT HOFFMAN ARCHITECTS CONTACT DAVID HOFFMAN

ADDRESS 1722 BROADMOOR, STE 222 BRYAN, TEXAS 77802 PHONE 409-775-5060

SURVEYOR CONTACT

ADDRESS PHONE

CONTRACTOR CONTACT

ADDRESS PHONE

MAY 0 2008 HYDROLOGY SECTION

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
X BUILDING PERMIT APPROVAL
___ CERTIFICATE OF OCCUPANCY APPROVAL
___ ROUGH GRADING PERMIT APPROVAL
___ GRADING/PAVING PERMIT APPROVAL
___ OTHER _____ (SPECIFY)

DATE SUBMITTED: 5/9/84

BY: Dan Grochowski

ENGINEERS PLANNERS PHOTOGRAMMETRISTS

BOHANNAN-HUSTON INC.

4125 CARLISLE BLVD., N.E. ALBUQUERQUE, NEW MEXICO 87107 505 881-2000
8713 VISCOUNT BLVD., EL PASO, TEXAS 79925 915 778-4491
330 GARFIELD, SANTA FE, NEW MEXICO 87501 505 988-7871

May 9, 1984

Mr. Fred J. Aguirre
Civil Engineer/Hydrology
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: Atrisco Apartments Drainage Report

Dear Fred:

Enclosed is one copy of the drainage management plan for the referenced site which is located at the northwest corner of the intersection of Atrisco Drive NW and Sequoia Road NW. Please include in your schedule for review and comment.

If you have any questions, please feel free to contact James Topmiller or me.

Sincerely yours,

Brian G. Burnett, P.E.
Project Manager

Enclosure

cc: Mr. David Bolton
Mr. David Hoffman
Mr. Gene Walton

JT/mw
Job No. 4 114 4

MAY 09 1984
HYDROLOGY SECTION

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

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

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

June 10, 1984

Mr. Dan Gorchowski
Bohannan-Huston, Inc.
4125 Carlisle Blvd. NE
Albuquerque, New Mexico 87107

RE: DRAINAGE REPORT FOR ATRISCO APARTMENTS SEQUOIA RD. @ ATRISCO DR. (G11-D24) RECEIVED MAY 9, 1984.

Dear Dan,

I have reviewed the above referenced report and it is approved in concept.

Coordination in the construction of the stormsewer will be required. Also, approved street grades and paving of the north half of Sequoia Rd. are required.

Financial guarantees will be required for the stormsewer extention or it may be included in a work order for the street improvements.

Discharge to Atrisco Rd. R/W will have to be provided with a plan to insure against erosion.

Should you have any questions or comments, please contact me at 766-7644.

Yours truly,

Billy J. Goolsby

Billy J. Goolsby, PE
City/County Flood Plain Admin.

BJG/cl

ENGINEERS PLANNERS PHOTOGRAMMETRISTS

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

July 31, 1984

Billy J. Goolsby, P.E.
City/County Flood Plain Administrator
Design Hydrology Section
123 Central NW
Albuquerque, NM 87102

Re: Response to Comments on Atrisco Apartments Drainage Report

Dear Billy:

This letter is in response to your comments of June 10, 1984 concerning the referenced project.

Comment #1

Response: The required coordination is occurring. The storm sewer will be constructed following completion of the public sewer in Sequoia Road. The storm sewer will be maintained by the owner.

Street grades and paving are being approved under City Project #2181 for the north half of Sequoia Road.

Comment #2

Response: The storm sewer is being included in a Work Order under Project #2181.

Comment #3

Response: Erosion along Atrisco Road will be eliminated or minimized by grass landscaping on all sloped areas adjacent to Atrisco Road. Velocities were checked in the swale between Buildings 4 and 5 and were found to be under a half foot per second (please see enclosed calculation sheet). Other non-swale and non-channelized areas will have sheet flow runoff where, by Plate 22.2 B-1 of the DPM, velocities increase to just under 1.5 feet per second. This, also, is an acceptable velocity in grassed areas.

RECEIVED
AUG 0 1 1984
HYDROLOGY SECTION

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

Enclosed is a copy of the approved final grading plan for your files. If we can address any more concerns, please call James Topmiller or me.

Sincerely yours,

Brian G. Burnett, P.E.
Project Manager

Enclosures

cc: Mr. David R. Bolton
Mr. David Hoffman
Gene Walton, Esq.

JT/mws
Job No. 4 171 0

RECEIVED B.H. JUN 13 1984

cc Bolton
Hoffman
Walton
Fritz
MME ✓
BB ✓ JT ✓
File # 41144

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

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

June 10, 1984

Mr. Dan Gorchowski
Bohannan-Huston, Inc.
4125 Carlisle Blvd. NE
Albuquerque, New Mexico 87107

RE: DRAINAGE REPORT FOR ATRISCO APARTMENTS SEQUOIA RD. @ ATRISCO DR. (G11-D24) RECEIVED MAY 9, 1984.

Dear Dan,

I have reviewed the above referenced report and it is approved in concept.

Coordination in the construction of the stormsewer will be required. Also, approved street grades and paving of the north half of Sequoia Rd. are required.

Financial guarantees will be required for the stormsewer extention or it may be included in a work order for the street improvements.

Discharge to Atrisco Rd. R/W will have to be provided with a plan to insure against erosion.

Should you have any questions or comments, please contact me at 766-7644.

Yours truly,

Billy J. Goolsby

Billy J. Goolsby, PE
City/County Flood Plain Admin.

BJG/cl

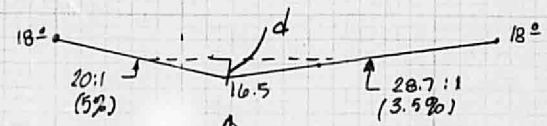
S = 0.0111 @ swale btn. Bldgs. 4 & 5

Drainage area = 0.23 acres

Q (by Rational) =

T_c = 10 min.
Area = 0.23 ac.
S = 0.0111
0% impervious, C = 0.17
2.2 inches (volume)
intensity = 4.34 in/hr.

100 year Q = 0.170 cfs



$A = \frac{1}{2} d^2 20 + \frac{1}{2} d^2 29$

$= 24.5 d^2$

$P \approx 49'$

n = 0.025

Using Manning's equation

substitute

$Q = \frac{1.49}{n} (r_h)^{.6666} (S)^{0.5} A$

by trial & error, $d \approx 2''$

velocity ≈ 0.25 fps (by Mannings)

PROJECT NAME ATRISLO APTS. SHEET ____ OF ____
PROJECT NO. DRAINAGE REPORT BY JIMMY DATE 7/30/84
SUBJECT ____ CH'D ____ DATE ____

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

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

August 14, 1984

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

REF: DRAINAGE REPORT FOR ATRISCO APARTMENTS (G11-D24) RECEIVED AUGUST 1, 1984

Dear Brian:

The above referenced plan, received August 1, 1984, is approved.

Please attach a copy of this approved plan to the construction set prior to issuance of the building permit.

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

Sincerely yours,

Billy J. Goodsby

Billy J. Goodsby, PE
Civil Engineer/Hydrology

BJG:mrk

G-11 D24

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

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

September 20, 1984

Mr. James Topmiller
Bohannan-Huston, Inc.
4125 Carlisle Blvd., N.E.
Albuquerque, New Mexico 87107

RE: SEQUOIA ROAD AND ATRISCO DRIVE INTERSECTION DRAINAGE ANALYSIS (G11-D24)

Dear James:

The above referenced submittal is in compliance with the request of Mr. Fred Aguirre, from this office, in conjunction with the approvals and sign-offs for the Atrisco Apartments development.

I have reviewed the above referenced material and hereby give approval.

Should you have any questions or comments, please contact me at 766-7644.

Sincerely yours,

Billy J. Goolsby

Billy J. Goolsby
Civil Engineer/Hydrology

BJG/bm

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

MAYOR
Harry E. Kinney

CHIEF
ADMINISTRATIVE OFFICER
Frank A. Kleinhenz

RECEIVED
JAN 04 1985
CITY ENGINEER

FILE w/ REPORT

January 3, 1985

CERTIFIED MAIL

G11-D24

Mr. Frank Sherman, Program Manager
Westland Constructors, Inc.
3501 Atrisco Road, NW
Albuquerque, New Mexico 87120

RE: EROSION CONTROL, 3501 ATRISCO, NW

Dear Mr. Sherman:

My letter of December 20 made careful reference to applicable erosion control requirements. Your assertion that there has been no erosion from the site is not corroborated by my observations dating from September 14, 1984.

Soil has been eroded from the site on the south end; it has been deposited on Sequoia, and dust has been deposited along the ROW of Atrisco Road. Curb and gutter work on these streets will not affect the source of the eroded material, namely your site.

I have contacted you twice previously - once verbally and once by letter - regarding the need for erosion control on the site. This letter marks my third and last attempt to achieve compliance and to avoid the necessity of formal enforcement action. Provision for the installation of snow fencing was part of the approved dust control plan. Control of water erosion is required under the Drainage Ordinance (Ord. 7-9), Section 7-9-12 (I) 2, 3 and 4 (copy attached). You have the option of complying with these requirements or being subject to further enforcement action.

I have requested the assistance of Mr. Fred Aquirre (Assistant City Engineer - Hydrology) in resolving the drainage/erosion issue. You may wish to review the drainage plan, as I have asked Mr. Aquirre to do. Once you have done so, you may wish to meet with us. If so, please advise. I would suggest an early response if we are to resolve this matter before the next violation occurs.

Sincerely,

Larry T. Caudill

Larry T. Caudill, Supervisor
Compliance Section
Environmental Health and Energy
Department
(505) 766-7433

LTC/cjg
Attachment
cc: Charles Brideau, Assistant City Attorney
Fred Aquirre, Assistant City Engineer
Atrisco Joint Venture
Westland Construtors
Compliance File
File

Drainage reports are required for subdivisions containing more than ten (10) lots or constituting five (5) acres or more, platting or construction within a designated flood hazard area and for any platting or development adjacent to a major arroyo.

4. Erosion Control Plan: An erosion control plan is usually incorporated into the drainage plan or drainage report. Erosion control plans address all phases of each project from initial grading through and including final occupancy. Phased projects require special attention. All construction projects, both public and private, within the jurisdiction of this ordinance unless specifically excluded require an approved erosion control plan prior to start of constructin.

J. Drainage control considerations specifically address safety, convenience and economics for both private property and public facilities.

K. The Albuquerque 100-year design storm is the 100-year 6-hour storm as defined by the National Oceanic Atmospheric Administration (NOAA) and by the storm distributions for time and areas as developd by the City Engineer. The 100-year storm has a 1% probability of occurring in any year. Watersheds with times of concentration greater than six (6) hours will require the use of the 100-year 24-hour storm volumes and distributions. Detention basins with longer thans six (6) hour evacuation times shall use a twenty-four (24) hour or longer storm volume and distribution.

Design circumstances may require larger or smaller storm volumes; Examples are emergency spillways for dams and erosion control plans respectively. The sources for rainfall data are current NOAA publications and the City Engineer. When the need for other design storms is apparent, the City Engineer will provide requirements concerning appropriate storms, frequencies and durations.

L. The City Engineer shall, within 14 to 30 calendar days after the submission to him of a request in writing for the approval of a plat, development plan, drainage submittal or exemption, approve or deny the request and mail a copy of his decision to the applicant. If the request is denied, the reasons for such denial shall be stated in writing. Appeal of such decisions is as provided in Section 15 of this ordinance.

(63-1982)

Engineer. The level of protection to be provided by temporary facilities shall be determined by considering:

1. The likelihood and consequences of a failure.

2. Length of time until permanent facilities will be in place.

3. The acceptance of maintenance responsibilities and legal liabilities.

I. Requests for approvals of development and/or platting proposals to the City Engineer shall be accompanied by drainage control, flood control and erosion control information and/or commitments. The particular nature, location and scope of the proposed development defines the degree of detail. One or more of the following levels of submittal may be required based on the following:

1. Conceptual Grading and Drainage Plan: A graphic representation of existing and proposed grading, drainage, flood control and erosion control information. The information should be of sufficient detail to determine project feasibility. The purposes of this plan are to check the compatibility of the proposed development within grading, drainage, flood hazard and erosion control constraints as dictated by on-site physical features as well as adjacent properties, streets, alleys and channels. Modifications to the Comprehensive Plan and the development of area plans, sector plans, site development plans and landscaping plans on tracts of five (5) acres or more are appropriate applications of conceptual grading and drainage plans.

2. Drainage Plan: A short detailed presentation required for approval of small, simple development approvals. Drainage plans are prepared with or on the detailed grading plan and address both on-site and off-site drainage control, flood control and erosion control issues. Drainage plans are required for building permits, site development plans and landscaping plans for developments involving less than five (5) acres.

3. Drainage Report: A drainage report is a comprehensive analysis of the drainage control, flood control and erosion control constraints on and impacts resulting from a proposed platting, development or construction project.

G11/024

JNH
HRO
GREG
JF
FEB 21 1985
TOM
CC

February 19, 1985

Mr. Bob Fosnaugh
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: Atrisco Drive/Sequoia Road Intersection - Construction Conflicts with Existing Gas Lines (Project No. 2181)

Note: The large diameter gas lines are not the local Gas Co's.

Dear Mr. Fosnaugh:

The purpose of this letter is to advise you of current and potential utility conflicts encountered during the construction stage of the referenced project. The project scope includes the installation of new curb, gutter and paving in Atrisco Drive N.W., north of the intersection, and Sequoia Road N.W., west of the intersection. However, only the west and north half respectively of each street will be installed with this project. The northwest "quarter" of the intersection will also be paved.

The current conflict involving a 4" gas line along the west side of Atrisco Drive is due to unfortunate timing between the design of this project and the installation of the now existing gas line. A delay in the project construction startup allowed the installation of the gas line in September 1984, not long after the project's design plans had been approved in August 1984 by the City. The 4" gas line was therefore not discovered until construction had begun. The gas line's existing depth, coupled with the grade cuts required by the original design plans, required the gas line to be lowered. This conflict has now been worked out by changing the design plans and a closer determination of the gas line's vertical location, but has resulted in undesirable time delays and added expense to the owner.

Potential conflicts during future construction to complete the intersection of Atrisco Road and Sequoia Road may deserve much more attention. The eastern portion of the Atrisco right-of-way contains both a 20" and a 12" gas transmission line. During previous construction of Atrisco Drive, south of Sequoia Road, substantial portions of these lines were lowered. The lines were not discovered until construction had begun. It was a dangerous situation which needs to be avoided in the future.

As you know, the design for the intersection was primarily determined by the grades and elevations of existing curb and gutter in the southeast quarter of the intersection. This design constraint will also control the design of the northeast quarter of the intersection, the area most likely to conflict with the large gas lines. Street grades

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 VISTA DEL SUN BLVD. EL PASO, TEXAS 79925 915 778-4481

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

to the north of the intersection have been established at the maximum percent allowable, but this may not completely alleviate future problems.

As I stated initially, the intent of this letter is to make you aware of existing and potential conflicts of street work in Atrisco Drive and Sequoia Road with existing gas lines. If possible, future designers in this area should be advised of the problems and potential costs involved. Although the design for the intersection is already controlled, the Gas Company should be involved with the design at an early stage. Hopefully, this approach will avert hidden costs and field designing. If additional information is desired, or you have any questions, please feel free to call James Topmiller or me at 881-2000.

Truly yours,

Brian G. Burnett, P.E.
Division Manager

cc: [redacted]
Mr. Preston Clements
Mr. Bill McNamara
Mr. David Bolton
Mr. Terry Jones
Mr. Steve Brown
Mr. Bill Vreeke

JT/mls
Job Nos. 4 235 6 - 4 171 3

(611/024)

DMJM/Adam, Hamlyn, Anderson

RECEIVED
JUL 08 1985
DH0213
HYDROLOGY SECTION

July 3, 1985

City of Albuquerque
Hydrology Department
P. O. Box 1293
Albuquerque, NM 87103

ATTN: Mr. Fred Aguirre, P. E.

RE: Ladera Golf Course - DMJM 4622-02-01 & 4622-03-02

Dear Sir:

I have reviewed the letters from the Parks Department and yourself and made an on-site inspection with Charles Burm of our office. I agree the system is not operating as designed and have prepared the following as a recommended solution to what I perceive to be the problem.

I suspect that the primary problem with the system is dirty infiltration basins. The system is sensitive to sediment and having observed the construction, I know a large amount of soil was flushed into the system. Due to this sensitivity, it is recommended that no drastic measures be taken until the apartment complex at Atrisco and Sequoia (part of the system) is completed. On completion of the complex, the entire system needs to be thoroughly cleaned. The system will need periodic cleaning to remove sediment from the infiltration basins. This periodic maintenance should be performed by the owners of each facilities, including the basin in the golf course.

I understand Mr. Guillen's frustration with the system; however, I feel there are several points in his letter that are misleading.

1. The system is not yet complete and acceptance of Project 2183 by the City occurred on March 8, 1985.

2. Grading on the golf course side was accomplished under Project 2183 and inspected by City forces. If the grading was not done to the Parks Department's satisfaction, this should have been listed on the punch list.

3. The primary purpose of Ladera Basin is to provide a storm drainage basin. I realize it is a joint use facility and praise those with the foresight to make use of our resources in this way. I ask that those in the Parks Department also <u>accept</u> joint use.

A Division of
Daniel, Mann, Johnson, & Mendenhall

Suite 280
5700 Harper Drive, N.E.
Albuquerque, New Mexico 87109
Telephone: 505/822-7955

Planning
Engineering
Systems
Economics

4. At no time was Mr. Guillen or anyone else told there would be no water escaping from the infiltration basin in the golf course. Why would we install a grate on a facility if nothing was to pass through the grate? However, the intent was that there would be no nuisance waters emitting from the basin and we will attempt to remedy that problem before we recommend the concrete swale that has been the request from the Parks Department since the beginning.

The immediate problem is a result of irrgiation of Presley Company projects and steps will be taken to mitigate this problem while the adjacent project is being completed. I will keep you informed of steps taken and results obtained as we bring the system into compliance with commitments made while obtaining approval of drainage reports from the projects.

Sincerely,

Jean J. Bordenave, P. E.

cc: Rip Orr
C. Dwayne Sheppard
Presley Homes
Parks Department

JJB/dt

DRAINAGE INFORMATION SHEET

PROJECT TITLE: ATRISCO APTS. ZONE ATLAS/DRNG. FILE #: G-11/D24

LEGAL DESCRIPTION:

CITY ADDRESS: NW COR. OF ATRISCO/SEQUOIA INTERSECTION

ENGINEERING FIRM: BOHANNAN-HUSTON CONTACT: JAMES TOPMILLER

ADDRESS: 4125 CARLISLE NE PHONE: 881-2000

OWNER: ATRISCO JOINT VENTURE CONTACT: FRANK SHERMAN

ADDRESS: PHONE: 831-3753

ARCHITECT: BOHANNAN-HUSTON CONTACT: DAVID PACHECO

ADDRESS: AS ABOVE PHONE:

SURVEYOR: BOHANNAN-HUSTON CONTACT: DWAIN WEAVER

ADDRESS: AS ABOVE PHONE:

CONTRACTOR: CONTACT:

ADDRESS: PHONE:

RECEIVED SEP 23 1985 HYDROLOGY SECTION

PRE-DESIGN MEETING:

___ YES

X NO

___ COPY OF CONFERENCE RECAP SHEET PROVIDED

DRB NO. 84 311 / 5/8/84

EPC NO. AX 80 20; Z 80 95 7/17/80

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)

REF. CITY FILE
G11-D24

DATE SUBMITTED: 9/19/85

BY: JAMES TOPMILLER

BOHANNAN-HUSTON INC.
ENGINEERS PLANNERS PHOTOGRAMMETRISTS
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

September 23, 1985

RECEIVED
SEP 23 1985
HYDROLOGY SECTION

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

Re: Pinion Trails - Phases 1 and 2 Certification (G11-D24)
(formerly Atrisco Apartments)

Dear Bernie:

Find enclosed a record drawing of as-built elevations and drainage features for Phases 1 and 2 of the Atrisco Apartments complex located near Atrisco Drive and Sequoia Road N.W. The drawing also includes engineering certification that the completed project phase is in substantial compliance with the approved drainage plan.

By this certification, the developer is requesting permanent certificates of occupancy for Phases 1 and 2 of the project. These two phases enclose Buildings 7, 8, 9, 10, 11 and the clubhouse. If I can answer any questions, please call.

Sincerely,

James Topmiller

James Topmiller, P.E.
Project Engineer

Enclosure

cc: Mr. Harold Cliver
Mr. Frank Sherman

JT/mls
Job No. 4 235 4

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

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

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

October 7, 1985

Mr. James Topmiller
Bohannan-Huston
4125 Carlisle NE
Albuquerque, NM 87107

REF: CERTIFICATION FOR ATRISCO APARTMENTS PHASE I & II (G11-D24) ENGINEER'S STAMP DATED 9/23/85

Dear James:

Based on the information provided on your September 23, 1985 submittal, certification for the above referenced drainage plan is acceptable. Please let me apologize for the delay, but as you know verification of work order acceptance from City Engineer's Field Inspection has not been received yet. At this time I will not hold back the C.O. because of the reason stated above.

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

Sincerely,

Bernie J. Montoya

Bernie J. Montoya, CE
Engineering Assistant/Hydrology

BJM:mrk

BERNIE MONTOYA

DRAINAGE INFORMATION SHEET

PROJECT TITLE: PINON TRAILS APTS. (FORMERLY ATRISCO APARTMENTS) ZONE ATLAS/DRNG. FILE #: G11-D24

LEGAL DESCRIPTION:

CITY ADDRESS: SEQUOIA RD. @ ATRISCO DRIVE

ENGINEERING FIRM: BOHANNAN-HUSTON CONTACT: JAMES TOPMILLER

ADDRESS: 4125 CAROLINA NE PHONE: 881-2000

OWNER: CONTACT:

ADDRESS: PHONE:

ARCHITECT: CONTACT:

ADDRESS: PHONE:

SURVEYOR: CONTACT:

ADDRESS: PHONE:

CONTRACTOR: CONTACT:

ADDRESS: PHONE:

RECEIVED
OCT 23 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
X ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

___ SKETCH PLAT APPROVAL
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___ 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: 10/23/85

BY: James Topmiller

BOHANNAN-HUSTON INC.
ENGINEERS PLANNERS PHOTOGRAMMETRISTS
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 23, 1985

RECEIVED
OCT 23 1985
HYDROLOGY SECTION

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

Re: Pinion Trails Apartments - Phases 3 and 4 Certification (G11-D24)
(formerly Atrisco Apartments)

Dear Bernie:

Enclosed is a record drawing of as-built elevations and drainage features for Phases 3 and 4 of the Pinon Trails Apartment complex located near Atrisco Drive and Sequoia Road N.W. 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 Phases 3 and 4 of the project. These two phases enclose Buildings 1 through 6. 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. Harold Cliver
Mr. Frank Sherman

JT/mls
Job No. 4 235 4

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

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

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

October 24, 1985

Mr. James Topmiller
Bohannan-Huston
4125 Carlisle NE
Albuquerque, NM 87107

REF: CERTIFICATION FOR PINION TRAILS APARTMENTS (FORMERLY ATRISCO APARTMENTS) PHASES III & IV (G11-D24) ENGINEER'S STAMP DATED 10/23/85

Dear James:

Based on the information provided on your October 23, 1985 submittal, certification for the above referenced drainage plan is acceptable.

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

Sincerely,

Bernie J. Montoya

Bernie J. Montoya, CE
Engineering Assistant/Hydrology

BJM:mrk

DRAINAGE REPORT
FOR
ATRISCO APARTMENTS
SEQUOIA ROAD @ ATRISCO DRIVE

May 1984

PREPARED FOR:

NATIONAL REALTY CONSULTANTS, INC.
1713 BROADMOORE, SUITE 204
BRYAN, TX 77802

PREPARED BY:

BOHANNAN–HUSTON, INC.
4125 CARLISLE BLVD. NE
ALBUQUERQUE, NM 87107

Job No. 4 114 4

Daniel J. Grochowski, P.E.
N.M.P.E. No. 8766

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EXISTING CONDITIONS	1
PROPOSED DEVELOPED CONDITIONS	2
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B. Off-Site Runoff Conveyance	2
C. Determining Downstream Capacity	2
D. On-Site Conditions	3
EROSION CONTROL	5
SITE MANAGEMENT PLAN	5

FIGURES

1 – Site Location
2 – Soils Map
3 – Flood Plain Map

APPENDIX

1 – Storm Sewer H.G.L. Calculations and Sketch
2 – On-Site Runoff/Ponding Calculations

PLATES

Drainage/Grading Plan
Undeveloped Basins Map

PURPOSE

The purpose of this report is to outline the drainage management plan for a 9.5 acre apartment site at the northwest corner of the intersection of Atrisco Drive, NW and Sequoia Road, NW. The City Drainage Ordinance and Development Process Manual will be used to establish the plan.

SITE LOCATION AND DESCRIPTION

The site is legally described as a "Portion of Lots 1, 2, Unit B, of tracts allotted from the Town of Atrisco Grant" and lies at the northwest corner of the intersection of Atrisco Drive, NW and Sequoia Road, NW. The site is bordered by the Case Ladera and Villa Ladera Apartments currently under construction on the west, and by Tucson Road on the north. Tucson Road is only platted at this time. It has not been graded and is not in use.

The site slopes unevenly to the south at approximately 0.7 percent. Covered entirely with sand dunes and native grasses, the site includes no major natural features. The soils class for the site is listed as SCS Soils Type 'A'.

Figures 1 and 2 identify the location of the site and a soils map of the area from the SCS Bernalillo County Soils Survey.

EXISTING CONDITIONS

The FEMA Floodway map (see Figure 3) shows that no existing flood plain occurs on or immediately near the site.

Under present undeveloped conditions, runoff from the site discharges by surface flow to side ditches along Sequoia Road and Atrisco Drive. Once in the ditches, runoff drains to the Atrisco-Sequoia intersection and ponds there. The ponding appears to occur mostly in the Sequoia right-of-way immediately west of Atrisco Drive. The approximate depth of the ponding may reach 0.3' before continuing its drainage path along both Sequoia and Atrisco Drive.

The site receives no off-site flows. A "ridge" near the north boundary of the site turns back any runoff generated in the Tucson Road right-of-way. Previous natural runoff from the west has been diverted by development of the adjacent tract.

Figure 3 identifies the site and its proximity to existing flood plains in the area. Plate II identifies existing undeveloped drainage basins on the site and shows that a majority of the site drains to Atrisco Drive.

Development of the adjacent tract includes the extension of a new storm sewer from the Ladera Detention Basin (Ladera Golf Course) to the west property of the tract. The proposed storm sewer includes a catch basin for street drainage but is being constructed primarily for drainage of the adjacent tract. The proposed storm sewer is indicated on Figure 3.

PROPOSED (DEVELOPED) CONDITIONS

A. Method of Analysis

Criteria outlined in Section 22.2 of the Development Process Manual (DPM) is used to computa existing and developed flow rates. Runoff from the site will be controlled per the Drainage Ordinance such that downstream capacity is not exceeded.

B. Off-Site Runoff Conveyance

The site naturally carries off-site runoff only from its west boundary. This, however, is being altered by current development of the tract west of the site. The tract's development will completely divert past natural runoff. This diversion will be complete before development of the site.

C. Determining Downstream Capacity

In accordance with the Drainage Ordinance, discharge from the site will be based on the downstream system capacity. The Ladera Detention Basin is considered to own unlimited capacity and therefore is not a controlling factor.

The proposed storm sewer to be constructed by the adjacent tract developers will be controlling. Conversations with the consulting engineer (DMJM/

Adam, Hamlyn, Anderson) for the adjacent tract indicates that the storm sewer design has only adequate capacity for the tract and that increasing line sizes would be necessary to carry additional loads. Further, the current design does not extend the storm sewer to the site and an extension of the design would be necessary.

Calculations are included in Appendix 1 indicating the necessary extension of the storm sewer and the upsizing of line sizes. Maximum capacity of the system is 28 cfs under pressure conditions when using ground surface as maximum H.G.L. A water surface elevation of 5109.0 for the Ladera Detention Basin was used to determine the system hydraulics. From this and the revised Casa Ladera/Villa Ladera drainage reports, we have:

Total storm sewer capacity	28.0 cfs
Villa Ladera/Casa Ladera discharge to storm sewer	12.6 cfs
Remaining capacity	15.4 cfs
Catch basin capacity in Sequoia Road	0.9 cfs
Allowable site discharge	14.5 cfs

Site discharge will be controlled to 14.5 cfs. In agreement with the Casa/Villa Ladera drainage reports and storm sewer design, additional discharge to the storm sewer from south of Sequoia Road has been assumed negligible or impractical. Runoff generated above the allowable discharge rate will be directed away from the storm sewer. Ponds, where used, will be provided with a minimal discharge rate (see Section D).

DMJM/Adam, Hamlyn, Anderson has submitted the proposed storm sewer design to the City for initial review. Necessary plan changes to extend the line and increase line sizes will be made before submittal for final sign-off.

D. On-Site Conditions

The apartment buildings will be flat-roofed structures. Runoff will be controlled by the use of a gutter system to a negligible discharge. This effectively reduces the peak rate leaving the site.

Peak discharge from the site will be controlled at 14.5 cfs. Runoff volume created by rates above 14.5 cfs, and not discharged to Atrisco Drive, will be ponded on-site. Using a negligible discharge from buildings, we have:

Allowable site discharge –	14.5 cfs
Discharge to storm sewer	12.3 cfs
Allowable total pond discharge rate –	2.2 cfs

Pond discharge will be cumulatively controlled to 2.2 cfs. From Appendix 2, required pond volume will be 0.040 acre-feet, or 1,764 cubic feet. This is a conservative volume figure as it ignores the small discharge rate from each pond. Ponds C and D will utilize 4" drain pipes at 0.25 cfs each discharging to the street. Pond B will discharge through a 6" pipe at 0.5 cfs to the catch basin. Notice that 1.2 cfs is still available to the site which should adequately account for the assumed negligible building discharge.

In keeping with the requirements placed on Villa/Casa Ladera Apartments, a sediment basin will be combined with the site's single inlet to the storm sewer system. Its primary function will be to collect nuisance flows from the site and prevent these flows from entering the storm sewer. The sedimentation basin is detailed on Plate I.

Basin E, as shown on Plate I, drains east to Atrisco Drive. This is necessary for the following reasons:

1. Due to the required catch basin grate elevation at the southwest corner of the site and using minimum pavement and grass slopes, Basin E was determined to be unable to discharge to the storm sewer without requiring excessive building finished floor elevations, a substantial retaining wall system along the entire east and south property lines, and additional off-site borrow requirements for fill.

2. Retaining ponds are undesirable both from a public and private viewpoint.

3. A substantial (56%) reduction in the peak discharge rate to Atrisco

Drive is achieved when comparing undeveloped (3.00 cfs) versus developed (1.31) discharge rates.

EROSION CONTROL

Erosion control is provided along the east and south boundaries of the site. This is the direction of natural runoff on the site and will most likely be the directions taken by runoff in the event of a storm during the early stages of site grading. During final grading, runoff will flow generally to the south.

Control of erosion is accomplished by a trench/berm combination providing a 2' high barrier to erosion. A detail of the trench and berm is shown on Plate I in the rear pocket.

SITE MANAGEMENT PLAN

Plate I indicates the grading plan for the site. The following key elements summarize the plan:

1. The site will be graded such that most site-generated runoff will enter the storm sewer system; the only exceptions being slopes to street grade along the east and south boundaries.

2. A single inlet grate with a sedimentation basin will be placed at the site's south boundary. The basin will be connected to the storm sewer system in Sequoia.

3. Site discharge will be controlled to 14.5 cfs by the use of ponds in the building areas. Pond discharge rates will also be controlled.

4. Runoff from the flat-roofed structures will be reduced to negligible discharge rates through the use of a gutter system.

FIGURES

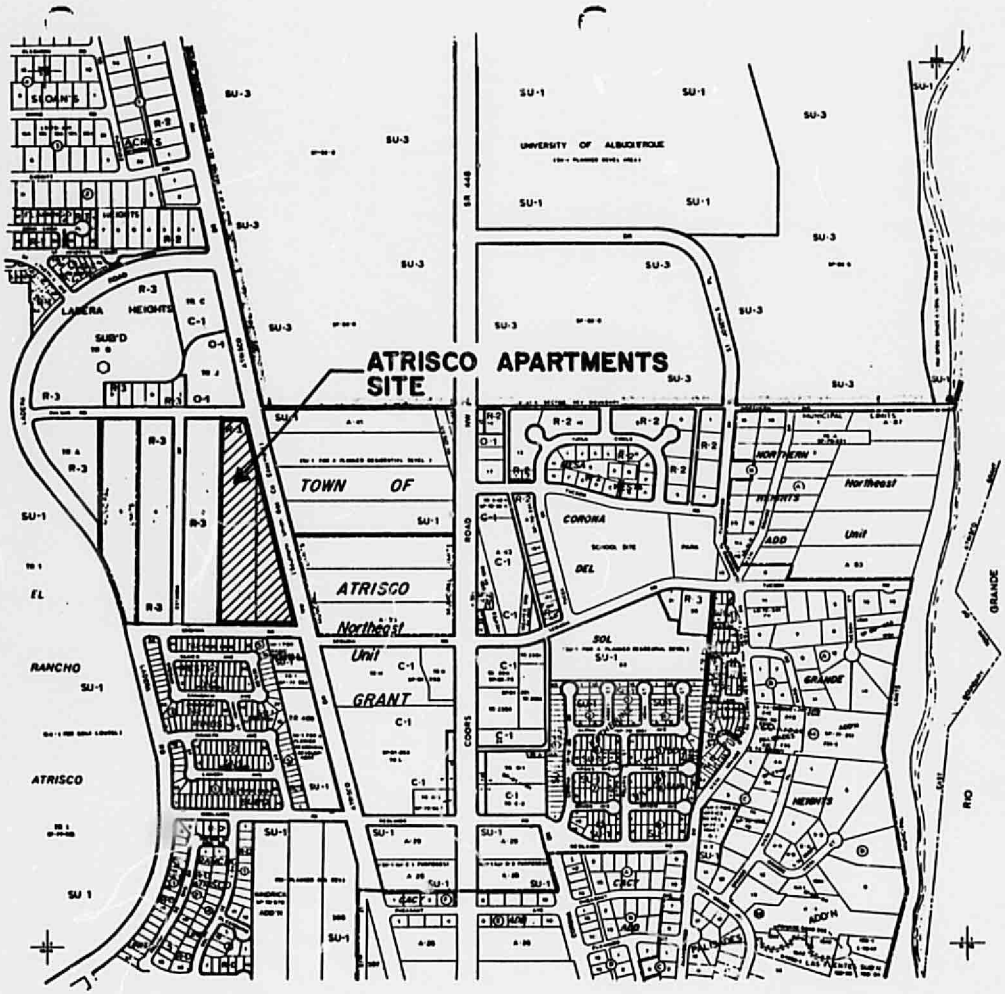


FIGURE I

G-11-Z

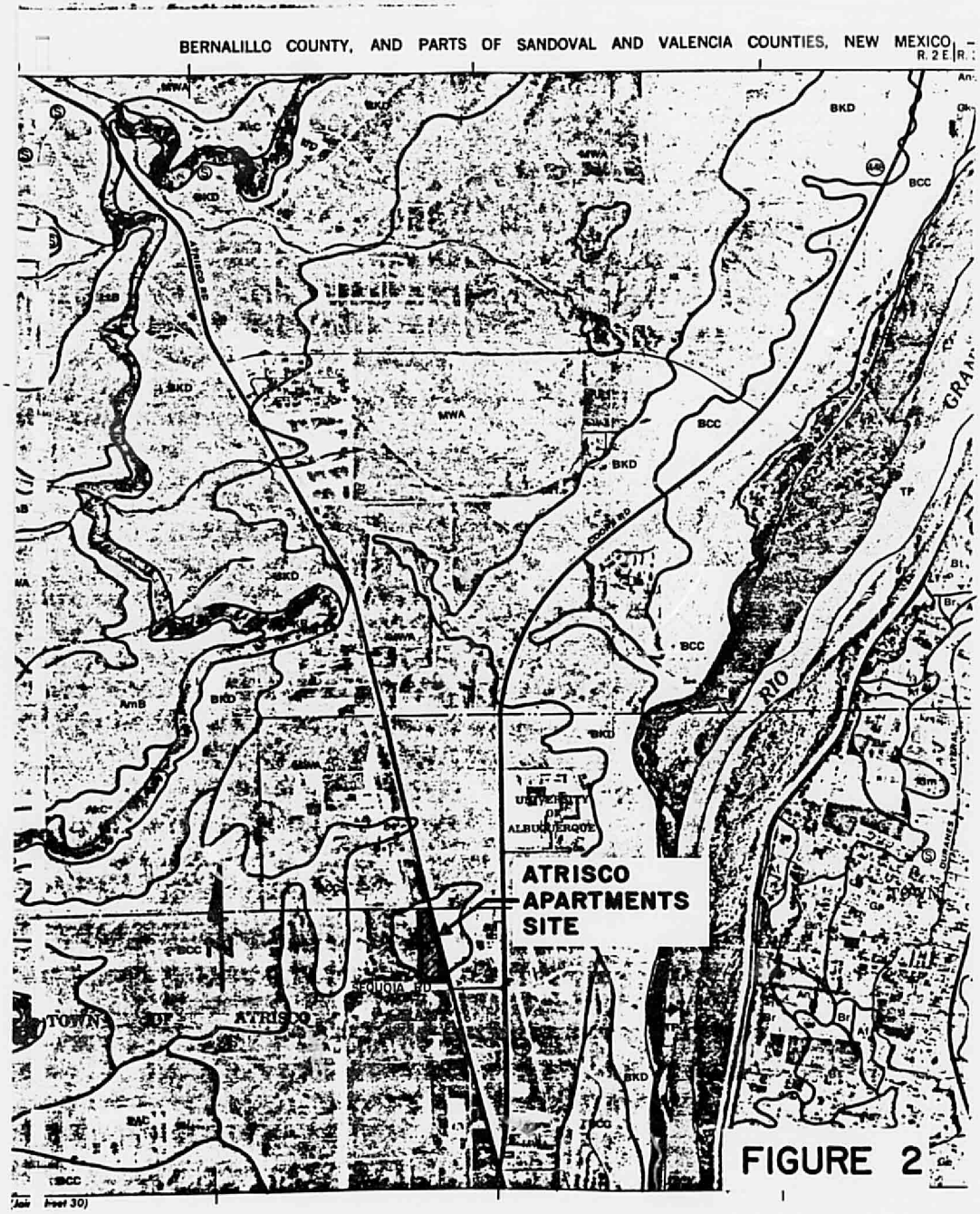

BERNALILLO COUNTY, AND PARTS OF SANDOVAL AND VALENCIA COUNTIES, NEW MEXICO
R. 2 E.
ATRISCO APARTMENTS SITE
UNIVERSITY OF ALBUQUERQUE
TOWN OF ATRISCO
SEQUOIA RD
RIO
BKD
BCC
MWA
AmB
AbC

FIGURE 2

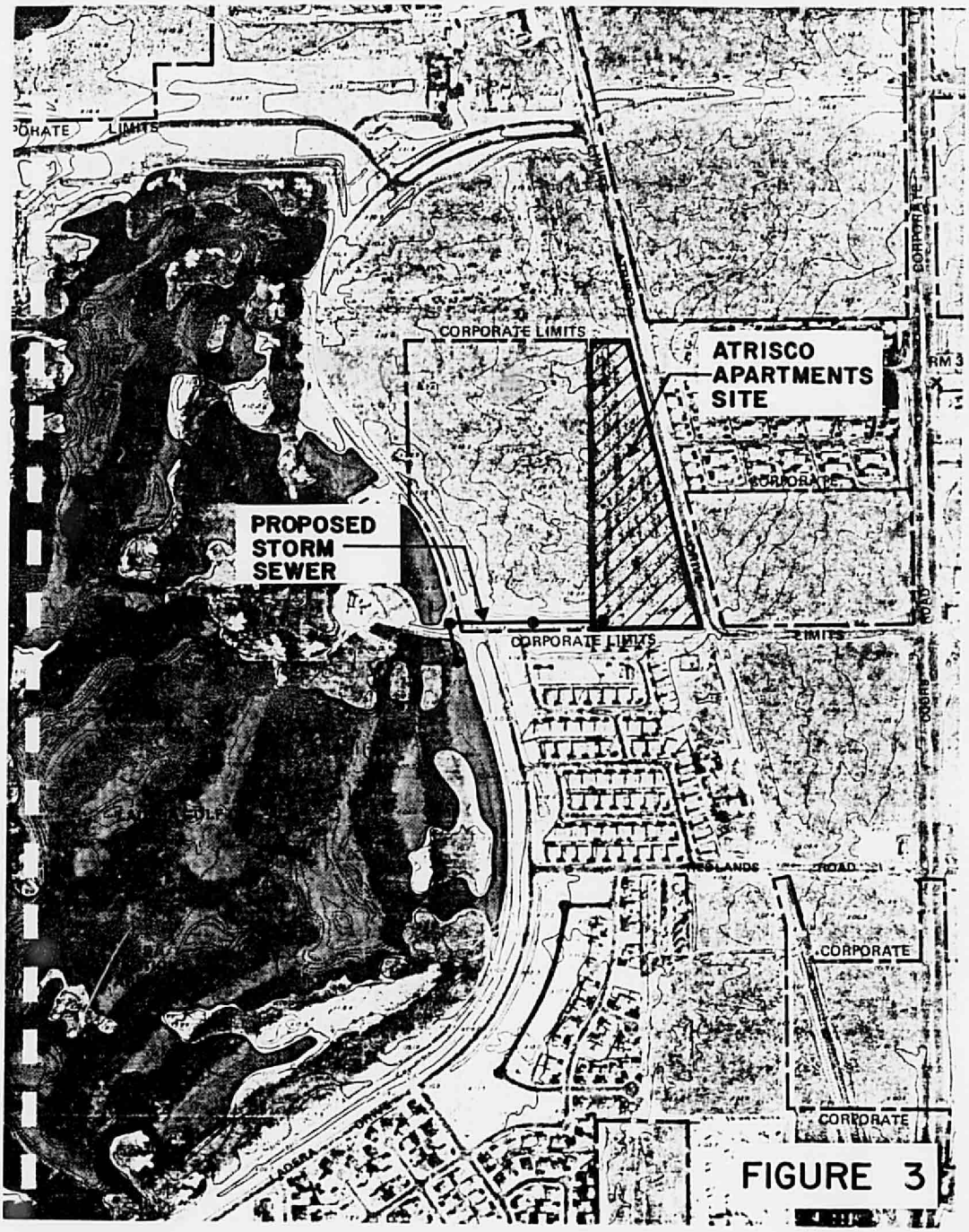

CORPORATE LIMITS
ATRISCO
APARTMENTS
SITE
PROPOSED
STORM
SEWER
CORPORATE LIMITS
CORPORATE
CORPORATE
CORPORATE

FIGURE 3

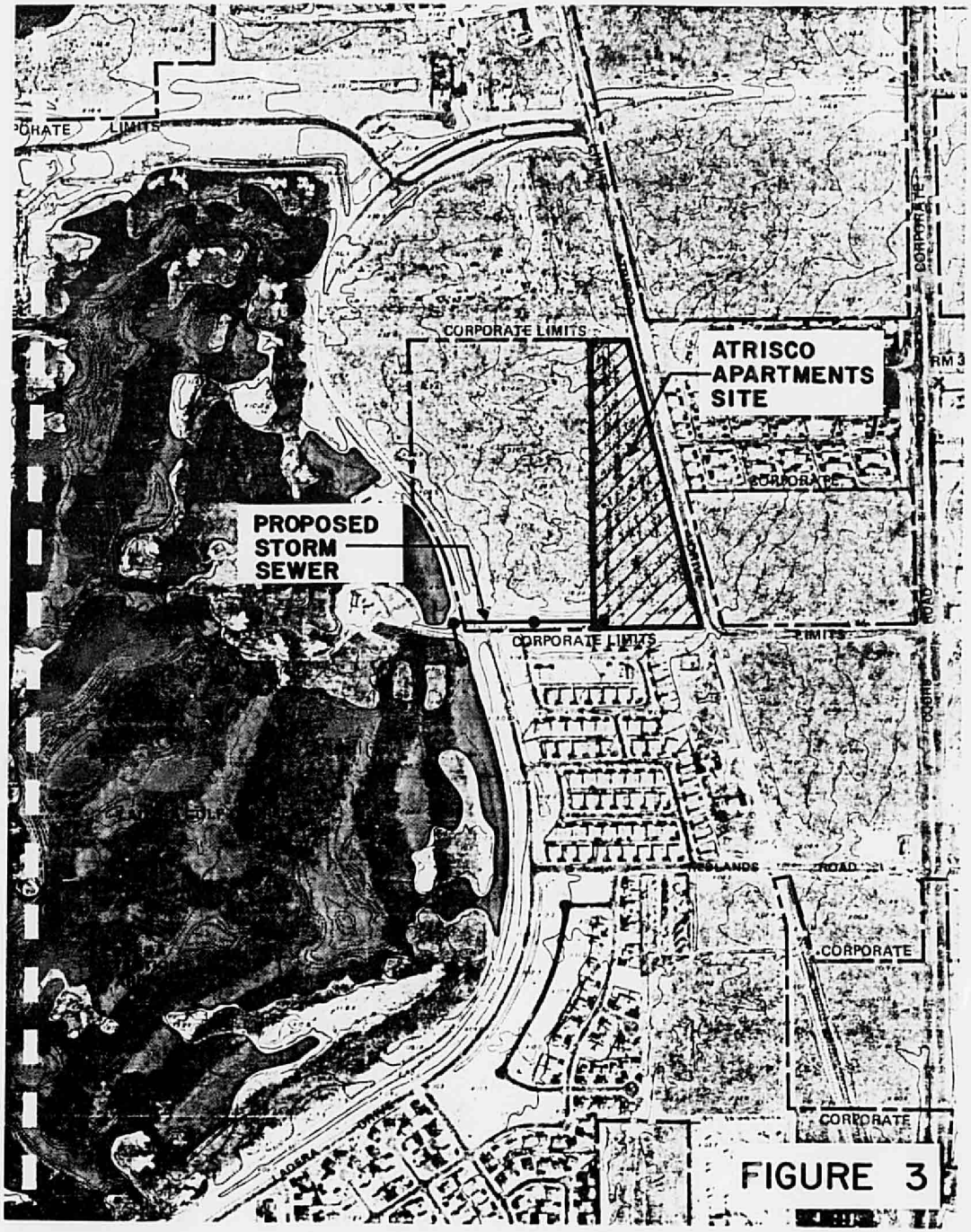

CORPORATE LIMITS
ATRISCO
APARTMENTS
SITE
PROPOSED
STORM
SEWER
CORPORATE LIMITS
CORPORATE
CORPORATE
CORPORATE

FIGURE 3

APPENDIX

APPENDIX 1

OUTLET ELEV. MEASURED IN LADERA BASIN

SUMMARY OF HYDRAULIC CALCULATIONS

CLOSED CONDUIT

PROJECT: Atrisco Apartments

LINE: Storm Sewer/Sequoia

BY: JamesT

DATE: 4.30.84

SHEET: 1 OF 1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
STATION	STRUCT	D	Q	A	V	K	S_f	L	Δ	JUNCTION D	JUNCTION θ	LOSSES h_f	h_v	h_j	h_{mb}	h_b	h_{motion}	Σ	E.G.	h_v	H.G.
5+68	Basin @ Ladera Golf Course																		9.0	—	9.0
																				.36	
		30"	23.5	4.91	4.79	409.4	.0033	300	85°			0.99	0.13		0.02			1.14			9.0
5+68	MH#1																		10.50	.36	10.14
		36"	23.5	7.06	3.32	666.2	.0012	300	85°			0.36	0.06		0.01	0.0		0.43	9.17	.17	9.0
6+68	MH#1																		9.60	.17	9.43
		30"	23.5	4.91	4.79	409.4	.0033	160				0.53						0.53			
10+28	MH#2									24"	90°			0.19				0.19	10.13	.36	9.77
																			10.32	.36	9.96
		21"	14.7	2.4	6.11	158.1	.0086	33				0.28				0.0		0.28			
10+61	MH#3									18"	90°			0.14				0.14	10.60	0.58	10.02
																			10.74	0.58	10.16
		21"	13.8	2.4	5.75	158.1	.0076	179				1.36			0.03			1.39			
12+40	MH#4									15"	65°			0.42				0.42	12.13	0.51	11.62
																			12.55	0.51	12.04
		21"	10.0	2.4	4.17	158.1	.0040	255				1.02			0.01			1.03			
14+95	MH#5																		13.58	0.27	13.31

REMARKS:

MANNING'S n: 0.013

tm again @ 36"

No good! try 36" pipe

OK (< 0.60)

(< 10.6) OK

(< 10.6) OK

(< 11.60) OK

(< 11.60) OK

(< 12.92) OK

(< 12.92) OK

NO GOOD! HGL higher than rim elev. @ catch basin onsite. go back to MH #2 and increase upstream pipe size to 24"

REV. 3-83

160

PLATE 22.8 B-5

22.8

SUMMARY OF HYDRAULIC CALCULATIONS

CLOSED CONDUIT

PROJECT: Atrisco Apartments

LINE: Storm sewer / Sequoia

BY: James T

DATE: 6/1/84

SHEET: 2 OF

1 STATION	2 STRUCT	3 D	4 Q	5 A	6 V	7 K	8 S_f	9 L	10 Δ	11 JUNCTION D	12 JUNCTION θ	13 h_f	14 h_v	15 h_j	16 h_{sub}	17 h_f	18 h_{miscl}	19 Σ	20 E.G.	21 h_v	22 H.G.
																			10.18	.36	9.77
10+28	MH#2									24"	90°			0.33				0.33			
		24"	14.7	3.14	4.68	2261	.0042	33				0.14			0.01	0.0		0.15	10.46	.34	10.12
10+61	MH#3									18"	90°			0.08				0.08	10.61	.34	10.27
		24"	13.8	3.14	4.39	2261	0.0037	179				0.67			0.01			0.68	10.69	.30	10.39
																			11.37	.30	11.07
12+40	MH#4									18"	65°			0.24				0.24			
		24"	10.0	3.14	3.18	2261	.0020	255				0.50			0.01			0.51	11.61	.12	11.49
14+95	MH#5																		12.12	.12	12.00
		18"	10.0	1.76	5.66	1042	.0039	67	30°			0.61	0.05		0.02	0.0		0.68	12.80	.49	12.31
15+62	catch basin onsite																				

(<13.0) OK

REMARKS:

MANNING'S n: _____

Try again, increasing the site flow to 14.5 cfs

REV. 3-83

160

PLATE 22.8 B-5

22.8

SUMMARY OF HYDRAULIC CALCULATIONS

CLOSED CONDUIT

PROJECT: Atrisco Apartments LINE: Storm Sewer/Sequoia

BY: James T
DATE: 5/1/84
SHEET: 3 OF 1

1 STATION	2 STRUCT	3 D	4 Q	5 A	6 V	7 K	8 S_f	9 L	10 Δ	11 JUNCTION D	12 JUNCTION θ	13 LOSSES h_f	14 h_p	15 h_j	16 h_{crit}	17 h_j	18 $h_{entrance}$	19 Σ	20 E.G.	21 h_v	22 H.G.	
																			9.25	0.25	9.0	
8+68	MH#1	36"	28.5	7.06	4.03	6662	.0018	300	85°			0.55	0.10		0.01			0.66	9.91	0.25	9.66	(> 9.60) NO GOOD!
																			9.25			
		30"	28.0	7.06	3.99	6667	.0177	300	85°			0.54	0.08		0.01			0.63	9.88	0.25	9.63	CLOSE ENOUGH
	MH#1																					
		30"	28.0	4.91	5.70	4094	.0047	160				0.75						0.75				
10+28	MH#2									24"	90°			0.53				0.53	10.63	0.50	10.13	
																			11.16	0.50	10.66	(< 10.60) OK
		30"	18.2	4.91	3.91	409.4	.0022	33				0.07			0.01			0.08				
10+61	MH#3									18"	90°			0.43				0.43	11.24	0.24	11.00	(< 11.60) OK
																			11.67	0.24	11.43	
		30"	18.3	4.91	3.72	409.4	.0020	179				0.36			0.01			0.37				
12+40	MH#4									15"	65°			0.13				0.13	12.04	0.21	11.83	
		30"	14.5	4.91	2.95	409.4	.0013	255				0.32			0.01			0.33	12.17	0.21	11.96	(< 12.92) OK
14+95	MH#5																		12.50	0.14	12.36	
		24"	14.5	3.14	4.62	226.1	.0041	67	30°			0.28	0.04					0.32				
15+62	Catch basin onsite																		12.82	0.33	12.49	(< 13.00) OK

REMARKS:

MANNING'S n: n = 0.013

NOTE: 14.5 cfs from Atrisco Apt site allowable
26" from Lidera basin to MH #1
30" from MH #1 to MH #5
24" from MH #5 to site Catch basin

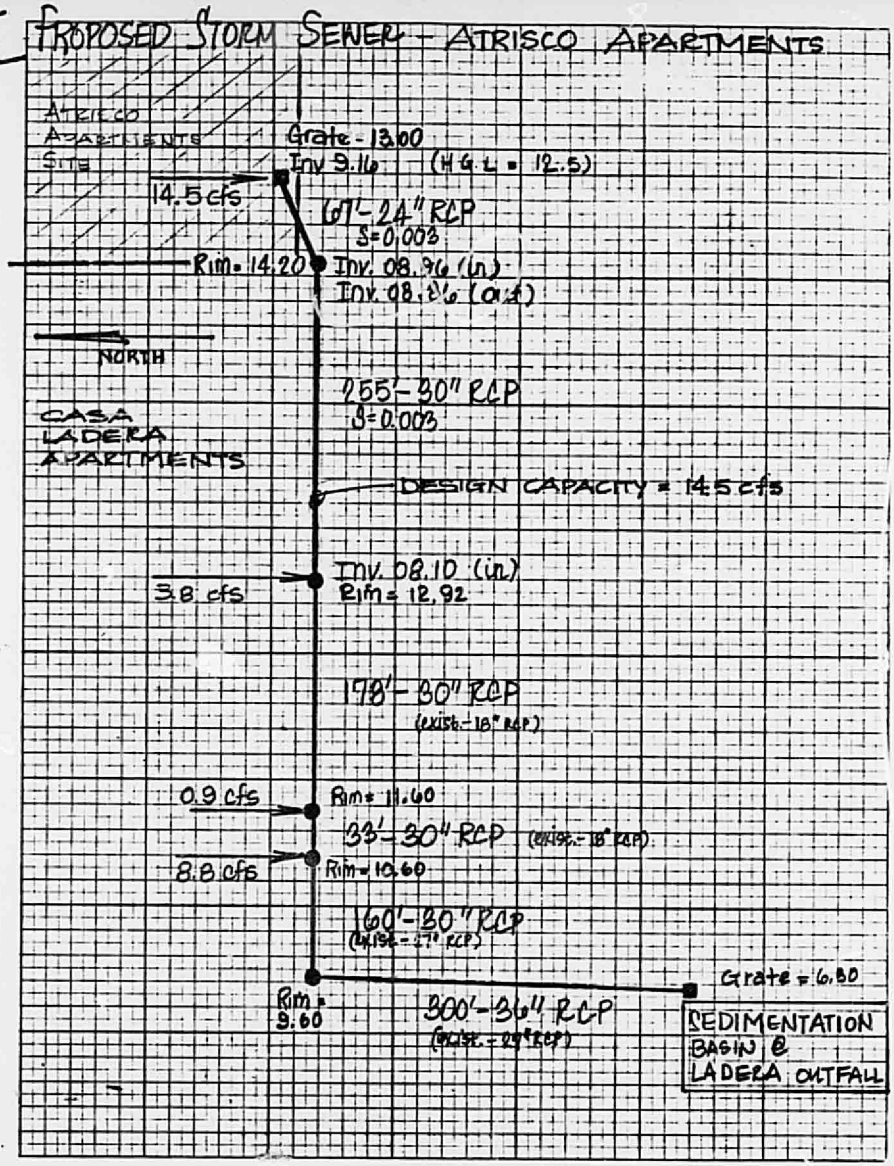
REV. 3-83

160

PLATE 22.8 8-5

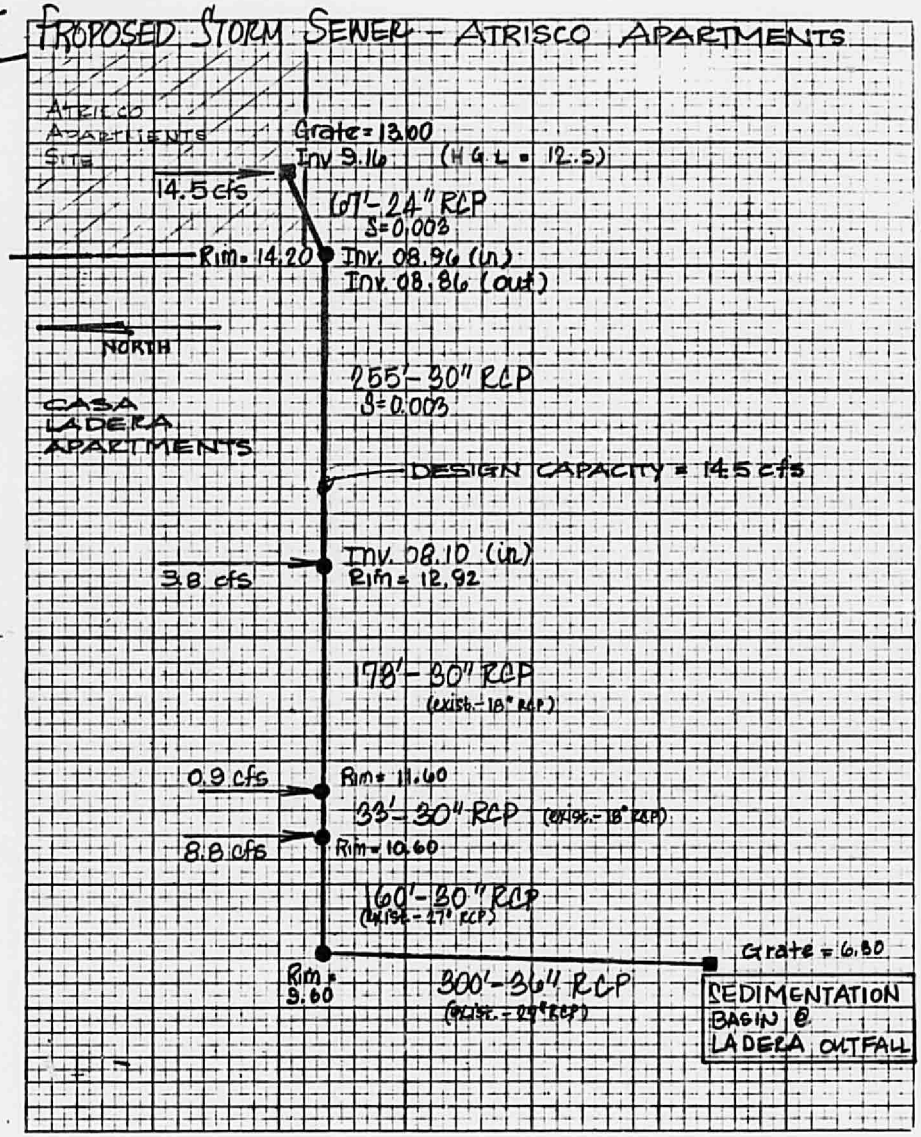
22.8

PROPOSED STORM SEWER - ATRISCO APARTMENTS



PROJECT NAME ATRISCO APARTMENTS SHEET ____ OF ____
PROJECT NO. 41144 BY JTMCGT DATE 5-1-84
SUBJECT DRAINAGE REPORT CH'D ____ DATE ____

PROPOSED STORM SEWER - ATRISCO APARTMENTS



PROJECT NAME ATRISCO APARTMENTS SHEET ____ OF ____
PROJECT NO. 41144 BY JTMCST DATE 5-1-84
SUBJECT DRAINAGE REPORT CH'D ____ DATE ____

APPENDIX 2

PROJECT NAME Atzisko Apts. SHEET 1 OF

PROJECT NO. 41144 BY James T. DATE 5-8-84

SUBJECT CH'D DATE

DETERMINING TOTAL SITE RUNOFF ONLY

UNDEVELOPED DRAINAGE

Basin	Area (ac.)	Length (ft.)	Top Elev. (ft.)	Bottom Elev. (ft.)	Slope (ft./ft.)	Time of Concentration	Soil Group	% Impervious	Runoff Coefficient, C	100 YEAR 6 Hr. Rain Volume (in.)	100 YEAR I/6 Hr Rain (in./hr.)	100 YEAR Peak Flow Rate Q (cfs)	100 YEAR Runoff Volume (ac. ft.)	10 YEAR 6 Hr. Rain Volume (in.)	10 YEAR I/6 Hr. Rain (in./hr.)	10 YEAR Peak Flow Rate Q (cfs)	10 YEAR Runoff Volume (ac. ft.)
Bldg area	1.81	controlled runoff negligible					—	100%	1.0	2.2	4.65	—	0.33	← bldg ponding			
"A" drainage to storm sewer	3.52 1.55	1250 1250	1210 210	13.0 15.0	0.0064 0.0064	20 20	A A	100% 0%	1.0 0.17	2.2 2.2	3.26 3.26	11.47 0.86 12.33	to storm sewer	1.44	2.13	7.49	
area to Antisco Rd. "E"	0.07 1.25	this line is asphalt only				10 10	A A	100% 0%	1.0 0.17	2.2 2.2	4.65 4.65 TOTAL	0.32 0.99 1.31	0.013 0.039 0.052				
area to internal ponds	1.30	controlled from ponds		runoff		10	A	0%	0.17	2.2	—	—	0.040	← 17,64.0 cu. ft.			
Ref.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

References:

1,2,3,4,5 Basin areas, lengths, top and bottom elevations and slopes from Plate ___.

6. Tc by Kirpich Formula $T_c = .0078 \frac{\text{Length}^{0.77}}{\text{Slope}^{0.385}}$ (10 minutes minimum)

7. See Soils Map Plate ___ and Text.

8. By area computation.

9. DPM Plate 22.2 C-1

10,14 DPM Plate 22.2 D-1

11,15 DPM Plate 22.2 D-2

12,16 Rational Formula $Q = CIA$

13,17 Rational Formula $V = \frac{\text{Rainfall}}{12} \times C \times A$

$T_c = \frac{L}{V} = \frac{1250'}{1.05 \text{ fps}} = 19.8$ min

Plate 22.2 B-1

PROJECT NAME ATRIS-LO APTS. SHEET 1 OF
PROJECT NO. 4144 BY DATE
SUBJECT CH'D DATE

CALCULATING POND VOLUMES ONLY

UNDEVELOPED DRAINAGE

~~Basin~~ POND	Area (ac.)	Length (Ft.)	Top Elev. (Ft.)	Bottom Elev. (Ft.)	Slope (Ft./Ft.)	Time of Concentration	Soil Group	% Impervious	Runoff Coefficient, C	100 YEAR 6 Hr. Rain Volume (in.)	100 YEAR I/6 Hr. Rain (in./hr.)	100 YEAR Peak Flow Rate Q (cfs)	100 YEAR Runoff Volume (ac. Ft.)	10 YEAR 6 Hr. Rain Volume (in.)	10 YEAR I/6 Hr. Rain (in./hr.)	10 YEAR Peak Flow Rate Q (cfs)	10 YEAR Runoff Volume (ac. Ft.)
B	0.46	—	—	—	—	10	A	0%	0.17	—	—	—	0.014	(624 cu. ft.)			
C	0.13	—	—	—	—	10	A	0%	0.17	—	—	—	0.004	(17 cu. ft.)			
D	0.71	—	—	—	—	10	A	0%	0.17	—	—	—	0.022	(963 cu. ft.)			
	1.30																
Ref.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

CALCULATING VOLUMES ONLY

References:

1,2,3,4,5 Basin areas, lengths, top and bottom elevations and slopes from Plate ___.

6. Tc by Kirpich Formula $T_c = .0078 \frac{Length^{0.77}}{Slope^{0.385}}$ (10 minutes minimum)

7. See Soils Map Plate ___ and Text.

8. By area computation.

9. DPM Plate 22.2 C-1

10,14 DPM Plate 22.2 D-1

11,15 DPM Plate 22.2 D-2

12,16 Rational Formula $Q = CIA$

13,17 Rational Formula $V = \frac{Rainfall}{12} \times C \times A$

AVAILABLE POND DISCHARGE - 2.2 cfs max.

(1) total of 3 ponds

(2) it is desirable to make the discharge line from the south pond as large as practical due to the lines required length

(3) use minimum line size = 4"

<u>PONDS C, D</u> calculate discharge of 4" drain line with 0.5' head from each

$$Q = CA\sqrt{2gh}$$

$C = 0.62$

$A = (4/12)\pi/4 = 0.087$ sq ft

$h = 0.5 - (2/12) = 0.33'$ head to center of drain

$Q = 0.62\,(0.087)\sqrt{2g(0.33)}$
$= 0.25$ cfs

remaining available Q for Pond B

2.2 cfs $- 2(0.25$ cfs$) = 1.7$ cfs

<u>POND B</u> calculate area of pipe @ $h = 0.33'$

$$A = \frac{Q}{C\sqrt{2gh}} = \frac{1.7}{0.62\sqrt{2g(0.33)}}$$

$A = 0.59$ sq ft $= \pi d^2/4$

$d = 0.8667' = 10"$ max

USE 6" PIPE TO CATCH BASIN
@ 6", $Q \cong 0.5$ cfs

PROJECT NAME ATRISCO APARTMENTS SHEET 1 OF
PROJECT NO. 41144 BY DATE
SUBJECT POND DISCHARGE CH'D DATE

1 8 0 0