HYDROLOGY

H12/D5
2 PLANS

H12/D5

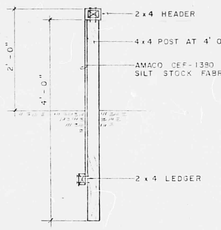
2 PLANS

CONSTRUCTION NOTES:

1. Before beginning construction, the Contractor shall check and verify pertinent figures shown here on and all applicable field measurements. Should any conflict, error or discrepancy be discovered, the Contractor shall notify the Engineer at once to resolve the problem. It is recommended that the contractor meet with the Eaginner for a pre-design conference to determine the scope of work and critical areas involved.

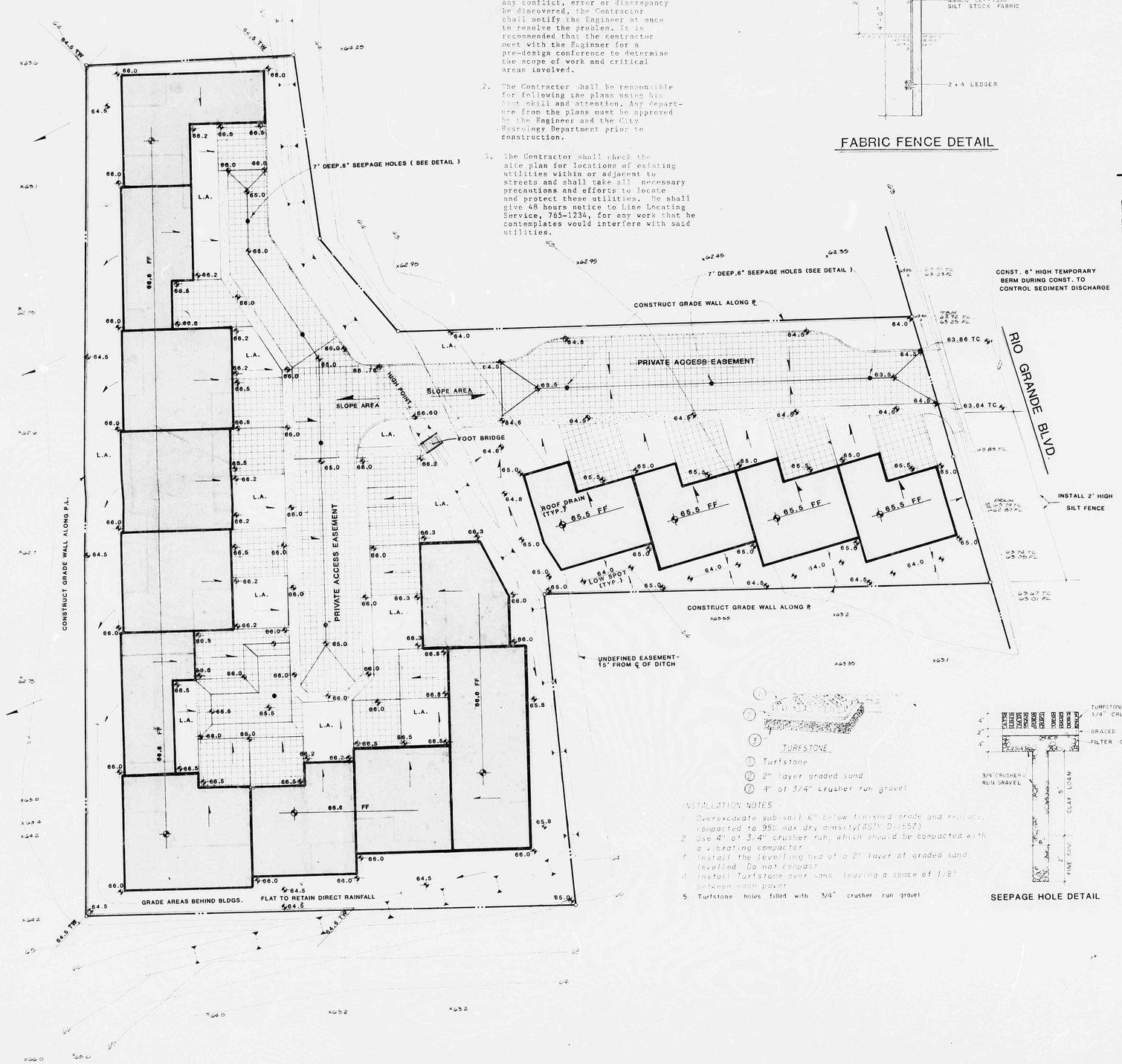
2. The Contractor shall be responsible for following the plans using his best skill and attention. Any departure from the plans must be approved by the Engineer and the City Hydrology Department prior to construction.

3. The Contractor shall check the site plan for locations of existing utilities within or adjacent to streets and shall take all necessary precautions and efforts to locate and protect these utilities. He shall give 48 hours notice to Line Locating Service, 765-1234, for any work that he contemplates would interfere with said utilities.



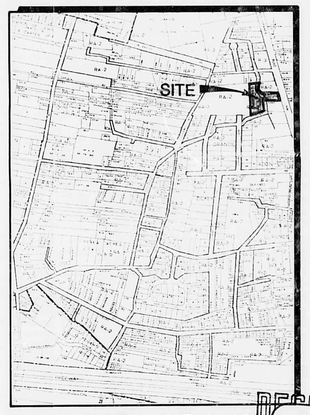
FABRIC FENCE DETAIL

1" = 20'



LEGEND

- SIDEWALK, CURB & GUTTER (EXISTING, PROPOSED)
- PROPOSED TURF PAVERS
- BUILDING (EXISTING, PROPOSED)
- PROPERTY LINE
- X12.7 — EXISTING SPOT ELEVATION
- 10 — EXISTING CONTOUR
- 12.5 — PROPOSED SPOT ELEVATION
- 10 — PROPOSED CONTOUR
- SURFACE FLOW DIRECTION (EXISTING, PROPOSED)
- L.A. — LANDSCAPED AREA



VICINITY MAP H-12

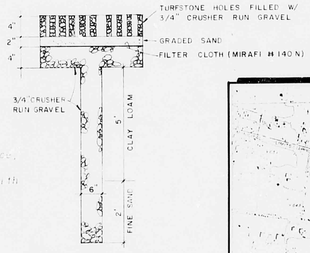
RECEIVED JAN 23 1985 HYDROLOGY SECTION

TURFSTONE

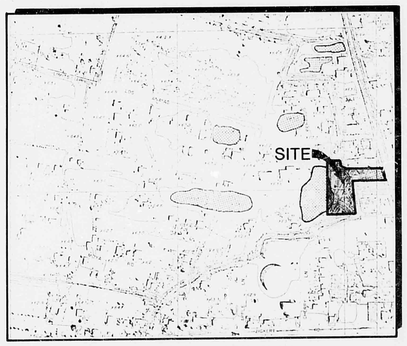
1. Turfstone
2. 2" layer graded sand
3. 4" of 3/4" crusher run gravel

INSTALLATION NOTES -

1. Overexcavate sub-soil 6" below finished grade and replace, compacted to 95% max dry density (ASTM D-1557)
2. Use 4" of 3/4" crusher run, which should be compacted with a vibrating compactor
3. Install the levelling bed of a 2" layer of graded sand, levelled. Do not compact
4. Install Turfstone over sand, leaving a space of 1/8" between each paver
5. Turfstone holes filled with 3/4" crusher run gravel



SEEPAGE HOLE DETAIL



FLOOD HAZARD MAP

C.T.S. INC. ENGINEERING
1100 ALVARADO N.E. SUITE A
ALBUQUERQUE, NEW MEXICO 87110
(505) 266 - 3444

REVISIONS	DATE
DESIGNED CWJ	1-84
DRAWN CC	1-84
CHECKED CWJ	1-84

DRAINAGE / GRADING PLAN
PAWIDOL SUBDIVISION

SHEET 1 OF 1

NOTES

SCOPE:

The proposed improvements, comprised of 15 single story townhouses and associated walks, driveways, landscaping and utilities, is located off Rio Grande Blvd. N.W., several hundred feet south of Los Anayas Road. Because of the lack of capacity on Rio Grande and its storm sewer and because of the difficulties in draining water across the MRGCD ditch, the developer has elected to pond all on-site runoff within private access roadways. Roadways and driveways will be covered with "Turfstone", an open block which allows infiltration into the soil. Percolation tests by Albuquerque Testing Labs indicate that a permeable sand layer exists 6'-7' below ground level. Several 6"-diameter, 7'-deep gravel-filled holes will be constructed from the "Turfstone" pond into this sand layer to enhance infiltration.

The present site is undeveloped except for an old wooden shack which will be torn down. The site is presently undeveloped and is divided into two parts by the Durango Ditch. The front portion of the site is lower than Rio Grande Blvd. and does not drain to a public Right of Way. The rear portion of the site is very flat and is self ponding in that there is a small berm along the west PL.

The intent of this plan is to show:

a) Grading relationships between the existing ground elevations and proposed finished elevations in order to facilitate positive drainage to designated discharge points.

b) The extent of proposed site improvements, including buildings, walks and pavement.

c) The flow rate/volume of rainfall runoff across or around these improvements and methods of handling these flows to meet City requirements for drainage management.

d) The relationship of onsite improvements with existing neighboring property to insure an orderly transition between proposed and surrounding grades.

GENERAL NOTES:

LEGAL:
Tracts 53 A2, 53 B1, and northerly 10 ft. of tract 53 B2, MRGCD Map No. 35, Albuquerque, New Mexico, Bernalillo County, New Mexico.

SURVEYOR:
Wayne Johnson, L.S..

B.M.:
City of Albuquerque B.M. F-H13R, Elevation 4964.08.

T.B.M.:
NE corner of site, lot line projection @ T.C. Elevation 4,963.92.

SOILS:
Gila Clay loam (Ge) moderately well drained with infiltration capacity of 0.6-2.0 in/hr. (Hydrologic Group B).

FLOOD HAZARD:
The extreme western portion of the site supposedly lies within a 100-year flood hazard area (Albuquerque MDP, Map H-12). Field inspection by CTS on July 29, 1984, indicates that the flood hazard area does not actually extend onto the site because of a 0.5' berm that runs along the chainlink fence on the west side. The flood hazard area is very shallow (0.2' to 0.4').

OFF-SITE DRAINAGE:
Site is not affected by off-site drainage.

EROSION CONTROL:
Site will be developed in two phases. Phase 1 (east area) will have a 2' high filter fabric "silt fence" installed along east property line and a 6"-high berm across street at intersection with Rio Grande Boulevard. This will ensure that eroded sediments will not leave site. Phase 2 (west area) will be developed later. All flow and sediment will be contained on-site by existing topography and proposed grades. No flow or sediment can reach Rio Grande Boulevard or Phase 1 area from Phase 2.

CALCULATIONS:
Based on a pre-design meeting with City of Albuquerque Hydrology, on July 2,1984, the following criteria was established.

a. Free discharge if downstream capacity is available; if not ponding on site. (Subsequent analysis showed that connection to the storm sewer could not be made conveniently and that street and storm sewer did not have hydraulic capacity.)

Calculations are based on the City of Albuquerque D.P.M. Manual, Vol. II for the 100 year-6 hour storm, using the Rational Formula to compare the existing and proposed runoff rates.

RATIONAL METHOD- Q = CIA

Area of site: 73,616 sq.ft.= 1.69 Ac. Excluding back yard areas which will be self infiltrating, site will have 1.26 ac. draining to "Turfstone" ponds.

Run-off Coefficient:

Existing site:

East Area (0.5 Ac)
A imp. = 0 Ac
% imp. = 0 %
"C" = 0.34 (DPM 22.2 C-1)

West Area (1.19 Ac)
A imp. = 0 Ac
% imp. = 0 %
"C" = 0.34 (DPM 22.2 C-1)

Developed Site:

East Area (0.5 Ac)
A imp. = 0.17 Ac
% imp. = 34 %
"C" = 0.50 (DPM 22.2 C-1)
(Use "C" = 0.55 to account for "Turfstone" clogging.)

West Area (1.19 Ac)
A imp. = 0.50 Ac.
% imp. = 42 %
"C" = 0.54 (DPM 22.2 C-1)
(Use "C" = 0.6 to account for Turfstone clogging)

Rainfall Intensity:

$I = P_6 (6.84)\ Tc^{-0.51} = 4.65"$ per hour
where $P_6 = 2.2"$(DPM 22.2 D-1)
Tc = 10 minutes

Existing Condition:
East Area

Q100 = (0.34)(4.65)(0.5)
= 0.8cfs

V100 = (0.8)(5 Tc)(60 sec/in)/2
= 1200 cu. ft

West Area

Q100 = (0.34)(4.65)(1.19)
= 1.9 cfs
V100 = (1.9)(50)(60)/2
= 2850 cu. ft.

Total East and West

Q100 = 2.7 cfs
V100 = 4050 cu. ft.

Developed Condition:
East Area

Q100 = (0.55)(4.65)(0.5)
= 1.3cfs

V100 = (1.3)(50)(60)/2
= 1950 cu. ft.

West Area

Q100 = (0.6)(4.65)(1.19)
= 3.3cfs
V100 = (3.3)(50)(60)/2
= 4950 cu. ft.

Total East and West

Q100 = 4.6 cfs
V100 = 6,900 cu. ft.

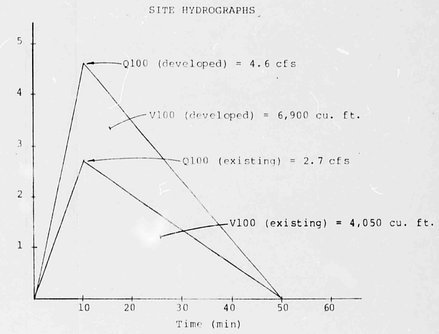
SUMMARY:

ΔQ100 = (4.6) - (2.7) = 1.9 cfs (increase)
ΔV100 = 6900 - 4050 = 2,850 cu. ft. (increase)

POND VOLUME CALCULATIONS

The entire 6,900 cu. ft. (V100) will not flow to the "Turfstone" ponds since 0.1 Ac. (east side) and 0.4 Ac. (west side) will be in isolated backyard or landscaped areas. V100 for the 0.1 Ac. area on the west side = CIA x 50 x 60/2 = 240 cu. ft.; on the east side, V100 for the 0.34 Ac. area = 810 cu. ft. Subtracting these volumes from the total developed V100 results in a ponding requirement for the east side of 1,710 cu. ft. and 4,140 cu. ft. for the west side.

By planimeter and assuming a mean depth of 0.5', the east pond has a storage capacity of 2,600 cu. ft. at elevation = 64.5'.
The west pond has a volume of 5,200 cu. ft. at elevation = 66.0'.



PERCOLATION TESTS

ATL ENGINEERING SERVICES

Albuquerque Testing Laboratory, Inc.
532 Jefferson N.E. (87108)
P. O. Box 4101 (87106)
Albuquerque, New Mexico
(505) 268-4537

August 15, 1984

Mr. Steve Aiken
P. O. Box 36137
Station D
Albuquerque, New Mexico 87176

Re: ATL Engineering Services Lab No. 2-04374-84. Field Percolation Tests, Rio Grande Blvd., South of Los Anayas.

Dear Mr. Aiken:

The results of the referenced tests are herewith submitted. Included are a description of the procedures utilized and results of Partical Size Analysis performed on representative soil samples.

If you have any questions or if we can be of further assistance to you, please call us.

Respectfully submitted:

ATL ENGINEERING SERVICES
Nicholas T. Korecki
Nicholas T. Korecki, P.E.

Reviewed by:
Robert K. Lloyd
Robert K. Lloyd, P.E.
Head, Geotechnical Section

NTK/ss

Lab No. 2-04374-84
Page 2

PERCOLATION TEST NO. 1

INTRODUCTION

The percolation test was performed on August 2, 1984 at approximately 35 feet East of the West property line at the approximate Center of the site. The test was run at a depth of three (3) feet beneath the existing ground surface in a 3-1/2"± diameter hole. The lower two foot portion of the hole was filled with one inch gravel. The top foot contained a 3 inch diameter pipe in which the water level was monitored and measured. The hole was allowed to saturate with water prior to running the test.

TEST RESULTS

Time Interval (minutes)	Initial Water Level in Hole (inches)	Drop in Water Level (inches)
0-10	36	5-3/4
10-20	30-1/4	5-1/4
20-30	27	3
30-40	36	5-3/4
40-50	30-1/4	5-1/4
50-60	36	5-1/2

Percolation rate during the last ten (10) minutes = 1.8 minutes per inch. The rate varies according to the water level.

GRADATION TEST (Percent)
Auger Cuttings 0' - 3'

G	CS	MS	FS	S/C
1	0	2	30	67

Unified Soils Classification: CLAY, brown, sandy (CL)

Lab No. 2-04374-84
Page 3

PERCOLATION TEST NO. 2

INTRODUCTION

The percolation test was performed on August 9, 1984, 15' West of Test No. 1, at a depth of 10 feet beneath the existing ground's surface, in a 6-1/2"± diameter hole. The bottom 9 foot portion of the hole was filled with one inch gravel. The upper one foot section contained a 4 inch diameter pipe surrounded by one inch gravel.

Because of the rapid percolation rate in the clean sand the time was recorded during which the water level dropped 12 inches from the ground's surface. A total of twenty measurements were made over a period of 90 minutes. Prior to running the test, 20 gallons of water were poured into the hole in order to saturate the soils.

TEST RESULTS

Trial	Time*	Trial	Time*
1	45	11	205
2	74	12	230
3	76	13	250
4	90	14	240
5	115	15	235
6	130	16	255
7	142	17	240
8	150	18	265
9	165	19	280
10	195	20	285

*Time in seconds for water level to drop 12 inches

Average Percolation rate for the last 10 trials: 0.34 minutes per inch.

GRADATION TEST (Percent)
Auger Cuttings 8' - 10'

G	CS	MS	FS	S/C
1	0	26	69	3

Unified Soils Classification: SAND, brown, fine to medium grained (SP).

Lab No. 2-04374-84
Page 4

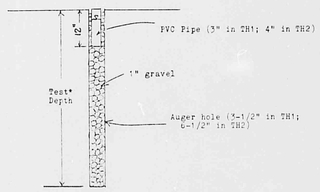
DRILLER'S LOG

Boring Location: 25' East of West Property Line at the approximate Center of the site.

Depth	Visual Description
0' - 7'	CLAY, light brown, sandy, fine grained
7' - 15'	SAND, brown, fine to medium grained

No water encountered

SKETCH OF TEST PROCEDURE



*3' in TH1; 10' in TH2

RECEIVED
JAN 23 1985
HYDROLOGY SECTION

W.G. Nelson 1-23-85

DRAINAGE PLAN

CTS, INC.
ENGINEERING
1100 ALVARADO N.E. SUITE A
ALBUQUERQUE, NEW MEXICO 87110
(505) 266-3444

REVISIONS	DATE

DESIGNED WGH 1-21-85
DRAWN KW 1-22-85
CHECKED CW 1-23-85

DRAINAGE / GRADING PLAN
PAWIDOL SUBDIVISION

SHEET 2 OF 2