HYDROLOGY G21/D2 5 PLANS

G 21/D 2

5 PLANS

WILSON & COMPANY
ENGINEERS & ARCHITECTS

505 262-2116

Office Location... 1921 SAN PEDRO N.E. ■ ALBUQUERQUE, NEW MEXICO 87110

Mailing Address... P.O. BOX 3905 ■ ALBUQUERQUE, NEW MEXICO 87190

ENGINEERS
ARCHITECTS
PLANNERS

An Equal Opportunity Employer

January 22, 1981

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

Re: Candelight III Apartments
Candelaria & Jane Place NE
WCEA File: 8C-510

Dear Mr. Aguirre:

The required storage volume required for the Candelight III project is 40,720 cu.ft. and the storage provided is 40,820 cu.ft. based on the as-constructed elevations we obtained in the field, and the retention ponds are located in such a manner as to be functional.

I do not believe the location of the retention ponds will cause a problem for the building foundations if the owner pumps the ponds after a major storm as he states in the attached letter to Mr. Conegliano.

Also the owner states he will inform any future owners of the project of the obligation to pump the retention ponds after any major run-off occurance.

Based upon the above information I certify the above project complies with the drainage requirements of the City of Albuquerque.

Very truly yours,
WILSON & COMPANY

Robert F. Sykes, P.E.

APPROVED FOR DRAINAGE
1-23-81
DATE
SIGNATURE
TITLE
ADVISE DRAINAGE INSPECTOR FOR WHEN GRADING IS REQUIRED
P.O issued

xc: Cauwels & Davis
Bruno Conegliano

Attachment

-sp

CAUWELS DAVIS
ASSOCIATES
MANAGEMENT COMPANY

Jan. 7, 1981

Mr. Bruno Conegliano
Assistant City Engineer-Hydrology
City of Albuquerque
P. O. Box 1293
Albuquerque, New Mexico 87103

RE: Candelight III Apartments-Sunridge Village Apartments
3100 Jane Place N.E.
Albuquerque, New Mexico
PROPOSED DRAINAGE PLAN

Dear Mr. Conegliano,

During or after a rain storm we will be responsible for the pumping of water from the detention ponds that are located at various areas around the project. We are the owners and managers of this project. We have purchased a pump and have this on the job site at all times. In the event that this project be sold we would inform the future owners of their obligation to maintain proper drainage on the site for the reasons listed below.

The reasons for doing so:

1. Protect structural integrity of foundations
2. Eliminate possible health nuisance - i.e. breeding ponds
3. Protect the grass and landscaped areas around the ponds for it they are underwater, the plant material would die within a short time.

If you have any further questions, please advise.

Sincerely,

Rick Davis, general partner

RED:bh

Affiliate of h. a. simpson and associates development company

1116 PENNSYLVANIA N. E.
ALBUQUERQUE, NEW MEXICO 87110
TELEPHONE (505) 266-5711

WILSON & COMPANY
ENGINEERS & ARCHITECTS

505 262-2116

ENGINEERS
ARCHITECTS
PLANNERS

Office Location... 1321 SAN PEDRO N.E. ■ ALBUQUERQUE, NEW MEXICO 87110

An Equal Opportunity Employer

Mailing Address... P.O. BOX 3305 ■ ALBUQUERQUE, NEW MEXICO 87190

January 6, 1981

Mr. Bruno Conegliano
Assistant City Engineer Hydrology
City of Albuquerque
P. O. Box 1293
Albuquerque, NM 87103

Re: Final Drainage Report
Candelight III Apartments
NE Corner Candelaira Blvd. &
Jane Place NE
WCEA File: 80-510

Dear Mr. Conegliano:

Attached is a print of the "As Built" elevations and calculations for the Candelight III Apartments. From the previous reports it was determined the undeveloped run-off using 100 year, 6 hr. rainfall of 2.6 inches, is 48,670 cu.ft. Thus the required detention volume is 40,720 cu.ft. From the contours of the as built improvements the retained storage volume provided is 40,820 cu.ft. I believe the 40,820 cu.ft. is a conservative number for there are many depressed landscaped areas not considered, plus there will be a certain amount of detention provided by the tennis courts and at the southwest corner of the parking lot.

The off site drainage from the shopping area to the east is intercepted by a curb or retaining wall constructed along the east property line and the flow is diverted to Candelaria Blvd. or Jane Place.

Please give me a call if you have any additional questions.

Very truly yours,
WILSON & COMPANY

Robert F. Sykes, P.E.

Attachments

-sp

WILSON & COMPANY
ENGINEERS & ARCHITECTS

505 262-2116

ENGINEERS
ARCHITECTS
PLANNERS

Office Location... 1921 SAN PEDRO N.E. ■ ALBUQUERQUE, NEW MEXICO 87110

An Equal Opportunity Employer

Mailing Address... P.O. BOX 3305 ■ ALBUQUERQUE, NEW MEXICO 87190

RECEIVED
DEC 11 1980
CITY ENGINEER

December 10, 1980

Mr. Richard S. Heller
City Engineer
City of Albuquerque
P. O. Box 1293
Albuquerque, NM 87103

Re: Candelight III Apartments
WCEA File: 80-510

Dear Mr. Heller:

We received your letter dated 26 November today which was postmarked 8 December 1980. We will be glad to furnish the information necessary to show the plan is in substantial compliance with plan approved when the building permit was orginally issued for the project.

We will have this information submitted to your office no later than the 10 January 1981.

Very truly yours,
WILSON & COMPANY

Robert F. Sykes, P.E.

-sp

RSH BSA ADM
HRO DAC SUR
CDS COUN
DES SEC
INSP FILE
HYDRO RETURN

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

November 26, 1980

Mr. Bob Sykes
Wilson & Company Engineers
1321 San Pedro N.E.
Albuquerque, New Mexico 87110

RE: CANDLELIGHT III APARTMENTS

Dear Bob:

The drainage and grading for the Candlelight III Apartments has been reviewed by members of staff and found to be not in conformance with the plan approved when the building permit was originally issued for the project.

The certificate of occupancy for this structure cannot be granted until a revised drainage report consistent with the existing grading in the field is submitted and approved by the City Engineers Office. Should this not be submitted within thirty days, this matter will be transmitted to the City Attorney for his further action in this matter.

Should you have any further questions regarding this, please feel free to contact me or Bruno Conegliano at your earliest convenience.

Very truly yours,

Richard S. Heller
City Engineer

RSH/tsl

CAUWELS DAVIS
ASSOCIATES
MANAGEMENT COMPANY

Nov. 14, 1980

Mr. Bruno Conegliano
Assistant City Engineer-Hydrology
City of Albuquerque
P. O. Box 1293
Albuquerque, New Mexico 87103

RE: Candelight III Apartments - Sunridge Apartments
3100 Jane Place N.E.
Albuquerque, New Mexico
PROPOSED DRAINAGE PLAN

Dear Mr. Canegliano,

During or after a rain storm we will be responsible for the pumping of water from the detention ponds that are located at various areas around the project. We are the owners and managers of this project. We have purchased a pump and have this on the job site at all times.

The reasons for doing so:

1. Protect structural integrity of foundations
2. Eliminate possible health nuisance-i.e. breeding ponds
3. Protect the grass and lanscaped areas around the ponds for if they are under water, the plant material would die within a short time.

If you have any further questions, please advise.

Sincerely,

Rick Davis, general partner

RED:bh

Affiliate of h. a. simpson and associates development company

1116 PENNSYLVANIA N. E.
ALBUQUERQUE, NEW MEXICO 87110
TELEPHONE (505) 266-5711

WILSON & COMPANY
ENGINEERS & ARCHITECTS

505 262-2116

Office Location... 1821 SAN PEDRO N.E. ■ ALBUQUERQUE, NEW MEXICO 87110

Mailing Address... P.O. BOX 3805 ■ ALBUQUERQUE, NEW MEXICO 87190

ENGINEERS
ARCHITECTS
PLANNERS

An Equal Opportunity Employer

November 7, 1980

Mr. Bruno Conegliano
Assistant City Engineer - Hydrology
City of Albuquerque
P. O. Box 1293
Albuquerque, NM 87103

Re: Candelight III Apartments
At Northeast Corner Candelaria & Jane Place NE
Revisions to Revised Drainage Report
WCEA File: 80-510

Dear Mr. Conegliano:

Attached are additional calculations for the runoff to the drainage ponds. All the ponds are positioned to receive 100 year runoff which equals or exceeds the capacity of the ponds; except for ponds in Area 2.

The effective ponding volume is 46,480 cu. ft. The ponding volume required is 40,716 cu. ft.

The owners have completed the project and have invested a great deal of money in landscaping. They are reluctant to dig up their landscaping to install drain pipes at this time, but they do plan to pump the retention ponds whenever they contain a significant amount of water that might be detrimental to their landscaping. They will not allow the water to stand long enough to saturate the soils near the foundations.

Attached are our calculations and a layout plan.

Please give me a call if you have any questions.

Very truly yours,
WILSON & COMPANY

Robert F. Sykes, P.E.

Attachments

-sp

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE

REF. NO._____

G-21-02

TO: Richard Leonard

FROM: Bruno Conegliano

SUBJECT: Candlelight III Apartments Revised Drainage Report

Date: July 22, 1980

Enclosed please find a copy of the Candlelight III Apartments Revised Drainage Report received on July 22, 1980.

Thank you.

bc:lf

Enc.

WILSON & COMPANY
ENGINEERS & ARCHITECTS

505 262-2116

ENGINEERS
ARCHITECTS
PLANNERS

Office Location... 1821 SAN PEDRO N.E. ■ ALBUQUERQUE, NEW MEXICO 87110

An Equal Opportunity Employer ■

Mailing Address... P.O. BOX 3305 ■ ALBUQUERQUE, NEW MEXICO 87190

July 21, 1980

Mr. Bruno Conegliano
Assistant City Engineer - Hydrology
City of Albuquerque
P. O. Box 1293
Albuquerque, NM 87103

Re: Candelight III Apartments
NE Candelaria & Jane Place NE
Revised DRainage Report

Dear Mr. Conegliano:

Attached are revised calculations and site plan for the apartment complex at the northeast corner of Candelaria Rd. and Jane Place NE.

The proposed ponds on the original report have been revised. Those ponds shown with solid contour lines are constructed and have been drawn from field survey information. The ponds with dashed lines are proposed and have not been constructed.

The revised drainage report has been prepared with the approval from Mr. Wilbur D. Stites of Stites and Chakrabarti, Inc., Denver, CO.

The proposed retention ponds will have adequate storage to retain the difference between undeveloped and developed runoff. The offsite drainage will pass thru the project via the parking lots.

Please give me a call if you have any questions.

Very truly yours,
WILSON & COMPANY

Robert F. Sykes, P.E.

Attachments

-sp

xc: Cauwels-Davis
Fred Aquirre - City of Albuquerque

Bruna

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

July 24, 1979

G 21-D2

Mr. Wilbur D. Stites
Stites & Chakrabarti, Inc.
8000 East Girard Ave., Suite 306
Denver, Colorado 80231

Re: Candelight III Apartments

Dear Mr. Stites:

The additional information provided was sufficient to approve the drainage plan as revised.

Very truly yours,

Richard S. Heller
City Engineer

RSH/fs

MUNICIPAL DEVELOPMENT DEPARTMENT

Richard S. Heller, P.E., City Engineer ENGINEERING DIVISION Telephone (505) 766-7441

STITES AND CHAKRABARTI INC.

CIVIL AND STRUCTURAL ENGINEERING
LAND SURVEYING

Wilbur D. Stites, P.E. & L.S.
Saurin Chakrabarti, P.E.

8000 East Girard Avenue - Suite 306 Denver, Colorado 80231 (303) 751-1237

July 12, 1979

RECEIVED
JUL 13 1979
CITY ENGINEER

Mr. Bruno Conegliano
Assistant City Engineer-Hydrology
P. O. Box 1293
Albuquerque, New Mexico 87103

Re: Grading Plans
Candlelight III Apartments
Albuquerque, New Mexico

Dear Bruno:

We are submitting three copies of Grading Plan for referenced project. We have drawn the plans at 1" = 20' in accordance with your letter of June 5, 1979.

We have shown interior retention ponds on the Plan and indicated the retention volume of each pond. We arrived at the volumes by use of a planimeter to determine the surface area of each contour and then calculated the volume between the 2'-0" contours. This is a normally acceptable method for calculating volumes and we are including a copy of our calculations.

We conducted a field inspection of the Sandia Plaza Shopping Center. In accordance with our conversation with the remodelling Contractor at the site, the roof drains are connected to storm sewers. We could not locate any discharge areas from the roof and assume their statement is correct.

It also appears that most of the drainage from the shopping center will flow South from the shopping center and discharge into Candalaria Blvd. Some sheet flow will occur from the westerly portion of the shopping center. We have indicated a detail on our plans for curb openings and certainly would not block any flow pattern from the shopping center. The drainage through the project is sufficient to accomodate any offsite flows.

We did not include the storm sewer in the central area of the project as grading the site would not allow the storm sewer to discharge into the large detention pond during periods of heavy rainfall.

To expedite obtaining a building permit for the Owner, Mr. Robert E. Davis, we will certainly assume responsibility for any design, and, if any additional requirements not incorporated on these plans are necessary, the Owner has assured us he will cooperate. We will also provide a verification of the final detention volumes and other drainage features at your request to ensure the Contractor has complied with the design intent.

We would appreciate your earliest possible review of this project.

Very truly yours,

Bud Stites

Wilbur D. Stites
New Mexico P. E. No. 5900

WDS:mf
enclosures

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

MAYOR
David Rusk

June 5, 1979

Mr. Wilbur D. Stites
Stites and Chakrabarti, Inc.
8000 East Girard Ave. - Suite 306
Denver, Colorado 80231

Ref: Candlelight III Apartments

Dear Mr. Stites:

I have received and reviewed the drainage report and revised site grading plan submitted with your letter dated May 11, 1979 and my comments are as follows:

The overall scheme of drainage appears in keeping with the requirements of the AMAFCA Resolution 72-2. I will, therefore, approve the site development plan. There are, nevertheless, a number of concerns that will have to be addressed at the time of submission of the construction plans. While the plan submitted is satisfactory to show the overall concept, its scale is too small to be used for accurate construction, ease of verification and inspection. It is a normal City requirement that the site grading plan be prepared on a scale no smaller than 1"=10ft; given the size of this project, the City may accept plans on a scale 1"=20ft. provided that sufficient details can be shown in a clear manner.

For instance, on page 7 of the drainage report, it is shown that all the landscaped areas along Jane Place and Candelaria Rd. will be used as discharge containment areas and detention ponds. From the City's point of view, this approach is highly desirable; it is very effective to use these small areas for the detention and infilteration of the runoff from the parking bays.

As you know, discharge over the sidewalk and over the curb is not allowed, therefore, drains must be installed through the curb to allow the detention areas to drain into the gutter. These details cannot effectively be shown on a small scale plan such as the one forwarded with your letter. The ponding areas cannot be freehanded but must be dimensioned so that the ponding volumes can be unequivocably computed and the grading can be performed correctly in accordance with the intention of the designer. It is also essential that each drainage area contributing to each pond (including the indication of the roof drainage) be defined on the site plan so that the balance between the runoff and the pond volumes can be verified.

Since the ponding volume required is for the difference between the undeveloped and the developed flows, the undeveloped flow must be carried safely through the development and discharged onto public facilities. Attention must also be paid to how the runoff will be conveyed to the ponds without causing local erosion of the rundowns or swales. This erosion would in short order seal the ponds' bottom and render these facilities ineffective. The drawing on page 7 of the drainage report mentioned earlier shows that a small storm sewer will be strategically located to collect the runoff from the core of the development and discharge said runoff into the large detention area next to tennis courts; construction details for this facility must also be supplied.

Since it is desirable that no water be retained for a period greater than 24 hours, a small diameter outfall pipe needs to be supplied, to allow the emptying of the large pond after the storm and still provide the required time of detention.

A final item pertains to the offsite flow; a field inspection has revealed that a significant amount of water, more than what is indicated in the report, discharges onto this site from the Sandia Plaza Shopping Center. Since no topographic information of the adjacent development is supplied, nor details for the retaining wall shown are included, I must request that the offsite flow be identified, collected, and disposed of onto the public street with a drain through the curb. I am sure that ll these requirements will be incorporated in the construction drawings so that expeditious review and approval will be possible.

Very truly yours,

Bruno Conegliano
Assistant City Engineer-Hydrology

BC/ms

cc - Richard Heller, City Engineer
Richard Leonard, AMAFCA
Drainage File

Wilbur D. Stites, P.E. & L.S.
Saurin Chakrabarti, P.E.

Stites and Chakrabarti, Inc.

CIVIL AND STRUCTURAL ENGINEERING
LAND SURVEYING

8000 East Girard Avenue - Suite 306 Denver, Colorado 80231 (303) 751-1237

May 11, 1979

RECEIVED
MAY 15 1979
CITY ENGINEERS

Mr. Bruno Conegliano
Engineering Office
Asst. City Engineer
Public Works Department
P. O. Box 1293
Albuquerque, New Mexico 87103

Re: Drainage - Candlelight III Apartments
Candelaria Blvd. N.E. & Jane Place N.E.

Dear Bruno:

We are enclosing two copies of our revised grading plan.

The landscaped areas have been terraced to pond runoff from these areas. Incorporating the terracing in the landscaped areas together with the detention areas previously shown will significantly reduce runoff from the site.

If you have any questions or require additional comments, please contact our office.

Very truly yours,

Wilbur D. Stites

WDS:mf
enclosures

THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT

COMP. R.F. Sykes
CK.
DATE 5 Jan 1981

WILSON & COMPANY ENGINEERS ARCHITECTS

LOC Alb. FILE 80-510
PROJ. Candlelight III SHEET 1
SUBJ Drainage OF 2

VOLUME COMPLETED PONDS

Pond #1 Bet. Bldg 3 & 4

Area Elev 15.1 = 0 ft²
Area Elev 16.0 = 960 ft²
Area Elev 16.4 = 1440 ft²

$V_{15.1-16} = (1/3)(.9)(960)$ = 280 ft³
$V_{16-16.4} = (1/3)(.4)[960 + 1440 + (960 \cdot 1440)^{1/2}]$ = 477
Σ = 757 ft³

Pond #2 Bet Bldgs 3, 4 & 5

Area Elev 13.5 = 0 ft²
Area Elev 14.0 = 928 ft²
Area Elev 15.0 = 808 ft²
Area Elev 15.6 = 1296 ft²

$V_{13.5-14} = (1/3)(.5)(928)$ = 55 ft³
$V_{14-15} = (1/3)(1)[328 + 808 + (928 \cdot 808)^{1/2}]$ = 550 ft³
$V_{15-15.6} = (1/3)(.6)[808 + 1296 + (808 \cdot 1296)^{1/2}]$ = 625
Σ 1230 ft³

Pond #3 Bet Bldgs 2, 3, 5 & 7

Area Elev 10.5 = 0 ft²
Elev 11.0 = 52 ft²
Elev 12.0 = 280 ft²
Elev 13.0 = 768 ft²
Elev 14.0 = 1376 ft²

$V_{10.5-11} = (1/3)(.5)(52)$ = 9 ft³
$V_{11-12} = (1/3)(1)[52 + 280 + (52 \cdot 280)^{1/2}]$ = 151 ft³
$V_{12-13} = (1/3)(1)[280 + 768 + (280 \cdot 768)^{1/2}]$ = 504 ft³
$V_{13-14} = (1/3)(1)[768 + 1376 + (768 \cdot 1376)^{1/2}]$ = 1057 ft³
Σ = 1721 ft³

Pond #4 Bet Bldgs 7 & 8

Area Elev 09.0 = 0 ft²
Elev 10.0 = 840 ft²
Elev 11.0 = 2248 ft²
Elev 11.3 = 2928 ft²

$V_{9-10} = (1/3)(1)(840)$ = 280 ft³
$V_{10-11} = (1/3)(1)[840 + 2248 + (840 \cdot 2248)^{1/2}]$ = 1487 ft³
$V_{11-11.3} = (1/3)(.3)[2248 + 2928 + (2248 \cdot 2928)^{1/2}]$ = 774 ft³
Σ = 2541 ft³

Pond #5 Bet Bldgs 13 & 14

Area Elev 02.2 = 0 ft²
03.0 = 464
04.0 = 1360
05.0 = 2216
05.2 = 2832

$V_{2.2-3.0} = (1/3)(.8)(464)$ = 124 ft³
$V_{3-4} = (1/3)(1)[464 + 1360 + (464 \cdot 1360)^{1/2}]$ = 873 ft³
$V_{4-5} = (1/3)(1)[1360 + 2216 + (1360 \cdot 2216)^{1/2}]$ = 1771 ft³
$V_{5-5.2} = (1/3)(.2)[2216 + 2832 + (2216 \cdot 2832)^{1/2}]$ = 504 ft³
Σ = 3272 ft³

Pond #6 Bet Bldg 9 & 10

Area Elev. 01.6 = 0 ft²
Elev 02.0 = 352
Elev 03.0 832
Elev 03.4 1168

$V_{1.6-02} = (1/3)(.4)(352)$ = 47 ft³
$V_{2-3} = (1/3)(1)[352 + 832 + (352 \cdot 832)^{1/2}]$ = 575
$V_{3-3.4} = (1/3)(.4)[832 + 1168 + (832 \cdot 1168)^{1/2}]$ = 398
Σ = 1020 ft³

THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT

COMP. R.E. Sykes
CK.
DATE 5 Jan 19

WILSON & COMPANY ENGINEERS ARCHITECTS

LOC. A16 FILE 80-510
PROJ. Condelight III SHEET 2
SUBJ. Drainage OF 2

Pond #7 Bet Bldgs 15, 16 & 20

Area Elev 98.2 • 0
Elev 99.0 • 1307 ft²
Elev 100.0 • 2160 ft²
Elev 101.0 • 3167 ft²
Elev 101.3 • 4099 ft²

$V_{98.2-99} = (1/3)(.8)(1307)$ = 349 ft³
$V_{99-100} = (1/3)(1)[1307 + 2160 + (1307 \cdot 2160)^{1/2}]$ = 1716
$V_{100-101} = (1/3)(1)[2160 + 3167 + (2160 \cdot 3167)^{1/2}]$ = 2638
$V_{101-101.3} = (1/3)(.3)[3167 + 4099 + (3167 \cdot 4099)^{1/2}]$ = 1084
Σ = 5787 ft³

Pond #8 Bet Bldgs 17, 18, & 20

Area Elev 93.8 • 0
Elev 94.0 • 1607 ft²
Elev 95.0 1067 ft²
Elev 96.0 • 1605 ft²
Elev 96.5 1998 ft²

$V_{93.8-94} = (1/3)(.2)(160)$ = 11 ft³
$V_{94-95} = (1/3)(1)[160 + 1067 + (160 \times 1067)^{1/2}]$ = 547
$V_{95-96} = (1/3)(1)[1067 + 1605 + (1067 \times 1605)^{1/2}]$ = 1327
$V_{96-96.5} = (1/3)(.5)(1605 + 1998 + (1605 \times 1998)^{1/2})$ = 899
Σ = 2784 ft³

Pond #9 North of Tennis Courts.

Area Elev. 02.9 • 0
Elev 04.0 • 1616
Elev 05.0 • 3216
Elev 06.0 • 4688
Elev 06.3 • 5536

$V_{02.9-04.0} = (1/3)(1.1)(1616)$ = 593 ft³
$V_{04-05} = (1/3)(1)[1616 + 3216 + (1616 \cdot 3216)^{1/2}]$ = 2371
$V_{05-06} = (1/3)(1)[3216 + 4688 + (3216 \cdot 4688)^{1/2}]$ = 3929 ft³
$V_{06-06.3} = (1/3)(.3)[4688 + 5536 + (4688 \cdot 5536)^{1/2}]$ = 1532
8425

Pond #10 South of Tennis Courts

Permanent Water Elev = 98.0

Area Elev 98.0 • 3656 ft²
Elev 100.1 • 6709 ft²

$V_{98-100} = (1/3)(2.1)(3656 + 6709 + (3656 \cdot 6709)^{1/2})$ = 10,722

Storage depressed Landscaping = $4 \times 20' \times 8' \times 20 \times 3/2$ = 2560 ft³

TOTAL VOLUME STORAGE

Pond 1	757
Pond 2	1230
Pond 3	1721
Pond 4	2501
Pond 5	9272
Pond 6	1020
Pond 7	5787
Pond 8	2784
Pond 9	8425
Pond 10	10722
Depressed Land	2560
Σ =	40,819 ft³

STITES and CHAKRABARTI, INC

Job Title Candlelight III. By ____ Date ____ Job No. 52-54
Subject DETENTION POND VOL. Checked ____ Sheet 1 of 3

$V = \frac{1}{3}(A + B + \sqrt{A \times B})$

POND #	SURFACE AREA				
#1 S.W. of TENNIS Courts	Contour 602 616 7/2 = 3083.5 ÷ 2 = 1541 7.5	Contour 600 413 2/2 = 2066 x 5 = 10330	Contour 598 273 8/2 = 1369 x 5 = 6845	Contour 597 217 5/2 108 7.5 x 5 5437.5	602-600 $V = \frac{1}{3}(15417.5 + 10300 + \sqrt{15417.5 \times 10300})$ = 25578 600-598 $V = \frac{1}{3}(10330 + 6845 + \sqrt{10330 \times 6845})$ = 17055 598-597 $V = \frac{1}{3}(6845 + 5437.5 + \sqrt{6845 \times 5437.5})$ = 6127 TOTAL 48760
#2 N.E. BLDG #19	606 773/2 = 386.5 x 5 = 1932.5	604 319/2 = 159.5 x 5 = 797.5			606-604 $V = \frac{1}{3}(1932.5 + 797.5 + \sqrt{1932.5 \times 797.5})$ = 2647
#3 N.E. BLDG #18	598 1122/2 = 561 x 5 = 2805	596 248/2 = 124 x 5 = 620			598-596 $V = \frac{1}{3}(2805 + 620 + \sqrt{2805 \times 620})$ = 3162
#4 NE BLDG #20	600 599/2 = 299.5 x 5 = 1497.5	598 91/2 = 45.5 x 5 = 227.5			600-598 $V = \frac{1}{3}(1497.5 + 227.5 + \sqrt{1497.5 \times 227.5})$ = 1539
#5 North of swimming pool	604 257/5 = 128.5 x 5 = 642.5	602 36/2 = 18 x 5 = 90			604-602 $V = \frac{1}{3}(642.5 + 90 + \sqrt{642.5 \times 90})$ = 648
#6 North BLDG #18	598 325/2 = 162.5 x 5 = 812.5	596 8/2 4 x 5 20	Ponds 2,3,4,5,6 TOTAL = 8635		598-596 $V = \frac{1}{3}(812.5 + 20 + \sqrt{812.5 \times 20})$ = 639 TOTAL 57395

STITES and CHAKRABARTI, INC

Job Title _____ By _____ Date _____ Job No. 82-54
Subject _____ Checked _____ Sheet 2 of 3

	SURFACE AREA Contour	Contour	Contour	Contour	
#7 NORTH BLDG #8	612 925/2 = 462.5 x 5 = 2312.5	610 104/2 = 52 x 5 = 260			612-610 $V = \frac{2}{3}(2312.5 + 260 + \sqrt{2312.5 \times 260})$ = 2231
#8 WEST BLDG #10	610 516/2 = 258 x 5 = 1290	608 121/2 = 60.5 x 5 = 302.5			610-608 $V = \frac{2}{3}(1290 + 302.5 + \sqrt{1290 \times 302.5})$ = 1478
#9 NORTH BLDG #9	608 668/2 = 334 x 5 = 1670	606 16/2 = 8 x 5 = 40			608-606 $V = \frac{2}{3}(1670 + 40 + \sqrt{1670 \times 40})$ = 1312
#11 NORTH BLDG #4 SHARE	620 493/2 = 246.5 x 5 = 1232.5	618 52/2 = 26 x 5 = 130			620-618 $V = \frac{2}{3}(1232.5 + 130 + \sqrt{1232.5 \times 130})$ = 1175
#10 NORTH BLDG #13 SHARE	606 1464/2 = 732 x 5 = 3660	604 409/2 = 204.5 x 5 = 1022.5			606-604 $V = \frac{2}{3}(3660 + 1022.5 + \sqrt{3660 \times 1022.5})$ = 4411
#12 WEST BLDG #4	620 483/2 241.5 x 5 1207.5	618 17/2 8.5 x 5 42.5			620-618 $V = \frac{2}{3}(1207.5 + 42.5 + \sqrt{1207.5 \times 42.5})$ = 984
#13 NORTH BLDG #5	618 332/2 = 166 x 5 = 830	616 30/2 = 15 x 5 = 75			618-616 $V = \frac{2}{3}(830 + 75 + \sqrt{830 \times 75})$ = 769 TOTAL 12360

STITES and CHAKRABARTI, INC

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POND #	SURFACE AREA				$V = \frac{1}{3}(A+B+\sqrt{A \times B})$
#14 WEST BLDG #5	Contour 614 1260/2 =630 x 5 =3150	Contour 612 451/2 =225.5 x 5 =1127.5	Contour	Contour	614 - 612 $V = \frac{2}{3}(3150+1127.5+\sqrt{3150 \times 1127.5})$ = 4108
#15 SOUTH BLDG #5	616 412/2 =206 x 5 =1030	614 33/2 =16.5 x 5 =82.5			616 - 614 $V = \frac{2}{3}(1030+82.5+\sqrt{1030 \times 82.5})$ = 936
#16 WEST BLDG #2	610 303/2 =151.5 x 5 =757.5	608 26/2 =13 x 5 =65			610 - 608 $V = \frac{3}{4}(757.5+65+\sqrt{757.5 \times 65})$ = 696
					TOTAL 5740
					TOTAL 2-16 (26699)