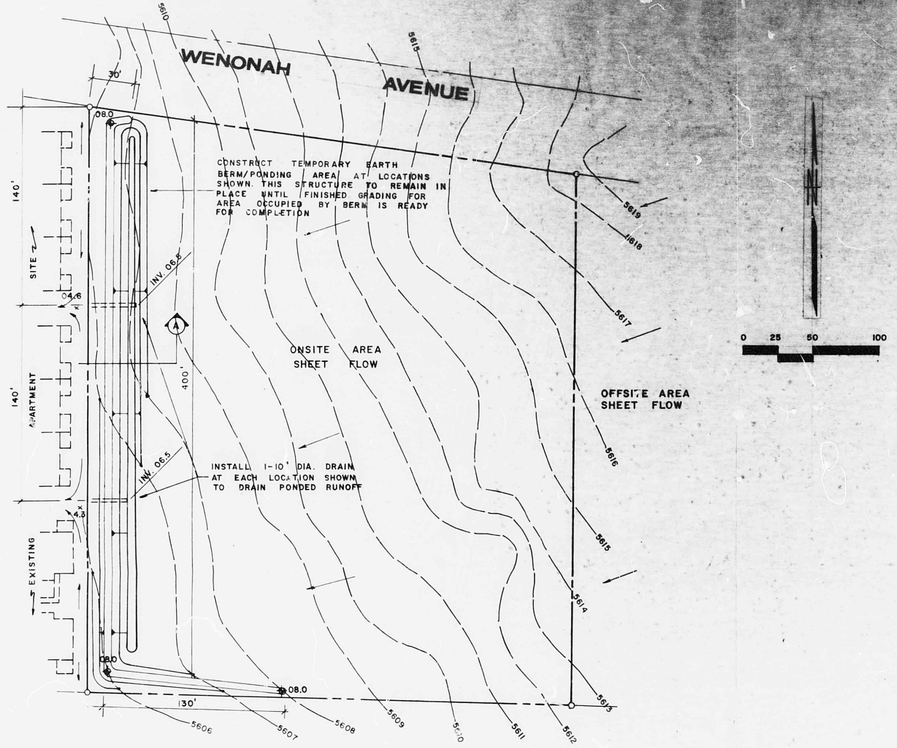
HYDROLOGY

L22/D21
FOUR PLANS

L22/D21

4 Plans







# EROSION CONTROL PLAN

SUPPLEMENT TO DRAINAGE PLAN-

# WENONAH VILLAGE

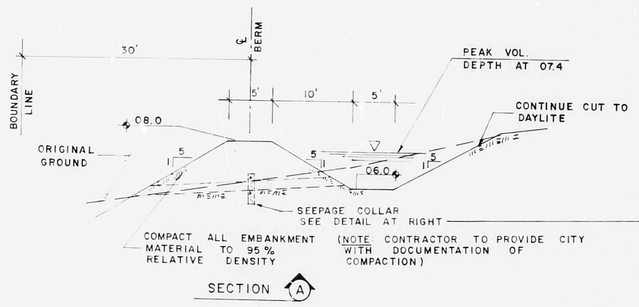
## ALBUQUERQUE, NEW MEXICO

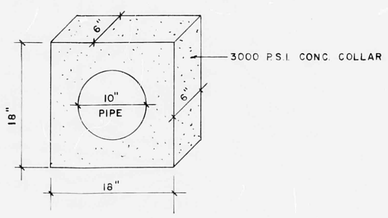
RECEIVED APR 30 1982

LEGAL: LOTS 1 & 2, BLOCK 2, FALE ADDITION, ALBUQUERQUE, N. MEX.. TO BE KNOWN AS WENONAH VILLAGE CONDOMINIUMS

NOTES:

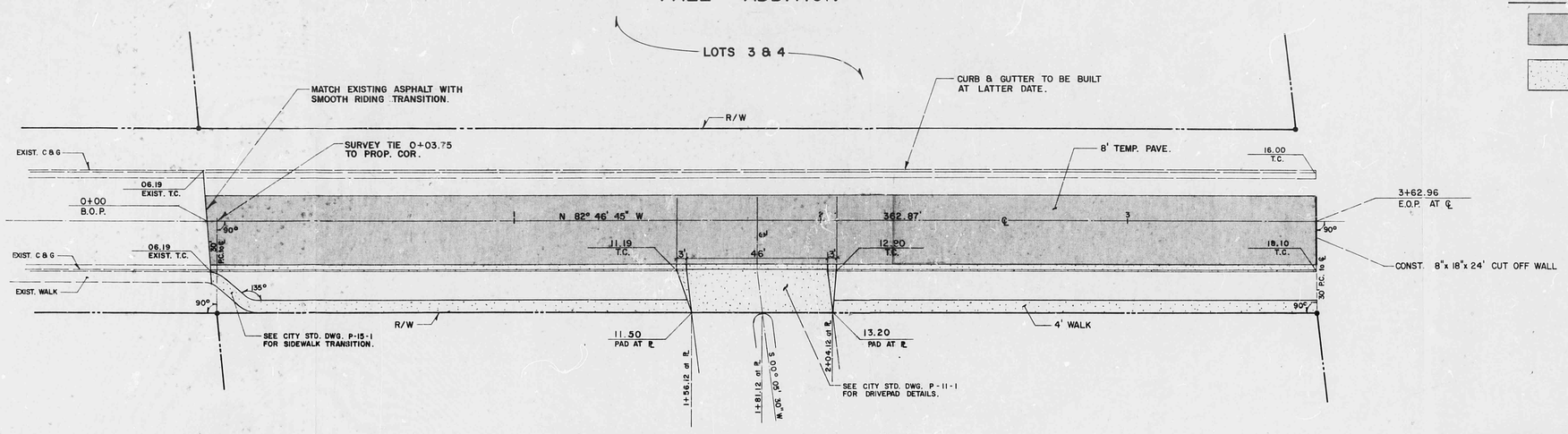
1. SITE TO BE DEVELOPED IN ONE PHASE.
2. EROSION CONTROL DESIGNED FOR 10 YR. FLOWS.
3. TEMPORARY OUTLETS TO BE ALIGNED WITH EXISTING SWALE DRAINAGE POINTS IN APARTMENT SITE TO WEST
4. OFFSITE FLOWS INTERCEPT EAST SITE BOUNDARY IN THE FORM OF SHEET FLOW. TOTAL AREA DRAINING TO SITE = 3.82 ACRES.
   $Q_{10}$ = (0.4)(2.68)(3.82) = 4 C.F.S.
   $VOL._{10}$ = (1.7/12)(0.4)(166400) = 9430 $FT.^3$
5. ONSITE FLOWS TO DRAIN TO WEST BOUNDARY. AREA = 3.3 ACRES
   $Q_{10}$ = (0.4)(2.68)(3.3 AC.) = 4 C.F.S.
   $VOL_{10}$ = (1.7/12)(0.4)(143748) = 8145 $FT^3$
6. PEAK VOL. STORED FOR ONSITE/OFFSITE FLOWS WHILE OUTFLOWING AT A Q RATE OF 8 C.F.S. FOR A TOTAL AREA OF 7.1 ACRES = 8100 $FT^3$
   PONDING DEPTH BEHIND BERMS FOR VOL. OF 8100 $FT^3$ = 1.4'
   PIPE SIZE REQUIRED TO CONTROL FLOW RATE TO 4 C.F.S. FOR EACH OUTLET = 7.5 $IN^2$. USE 1-25' LONG-10" DIA. PIPE AT EACH OUTLET




L22/D21

HORIZONTAL SCALE 1" = 20'
VERTICAL SCALE 1" = 5'




PROPOSED WENONAH VILLAGE SITE
LOTS 1 & 2

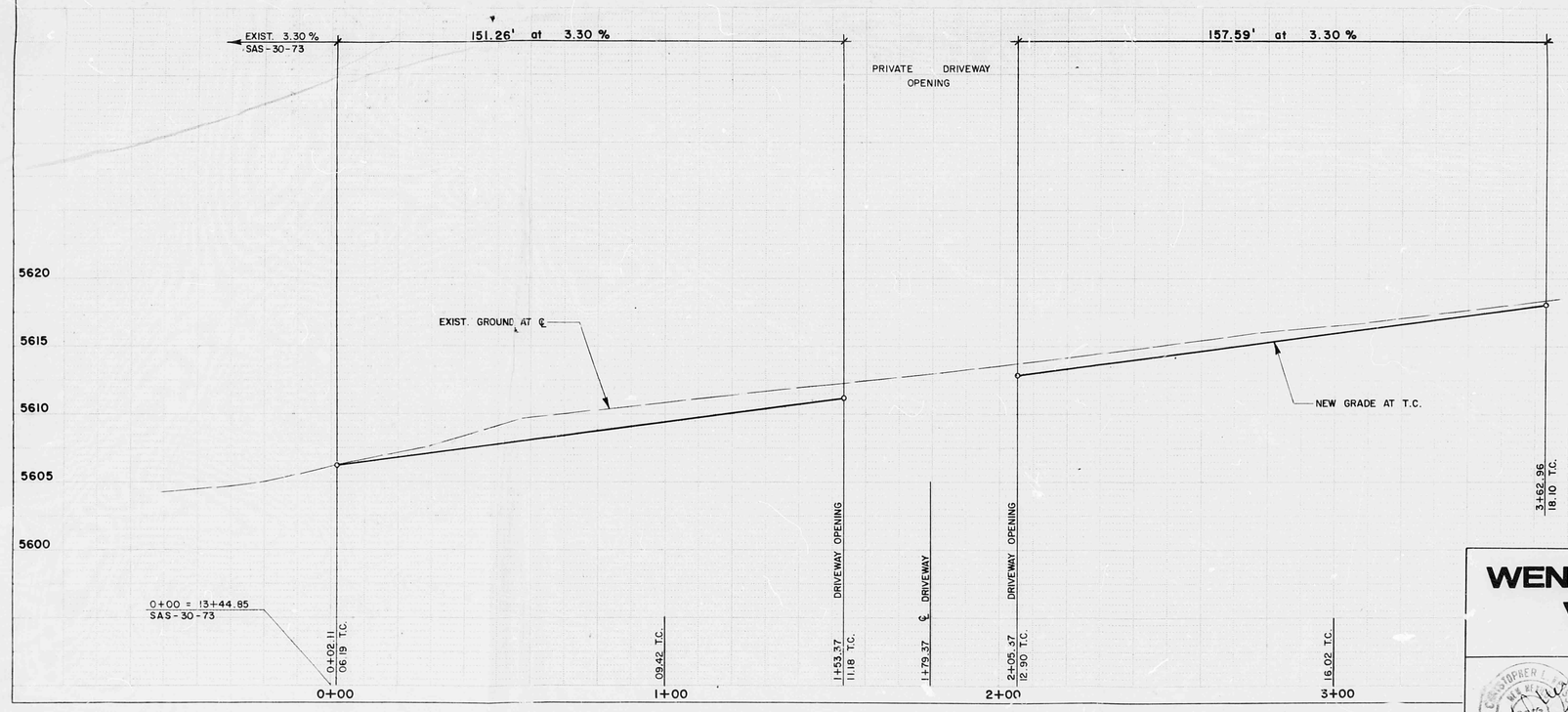
**LEGEND**

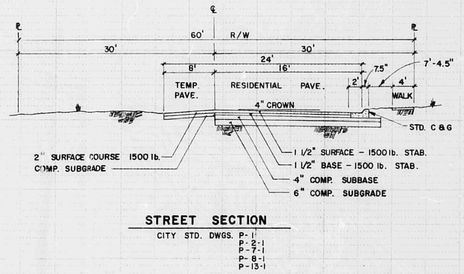
- NEW PAVEMENT
- NEW CONCRETE

**ESTIMATED QUANTITIES**

| | | |
|---|---|---|
| CURB & GUTTER | 311 | L.F. |
| WALK | 1276 | S.F. |
| DRIVE PAD | 785 | S.F. |
| SURFACE COURSE | 565 | S.Y. |
| BASE COURSE | 726 | S.Y. |
| TEMP. PAVEMENT | 323 | S.Y. |

# WENONAH AVENUE




**STREET SECTION**
CITY STD. DWGS. P-1, P-2-1, P-7-1, P-8-1, P-13-1

| AS BUILT INFORMATION | | |
|---|---|---|
| CONTRACTOR | | DATE |
| STAKED BY | | |
| INSPECTOR'S ACCEPTANCE BY | | DATE |
| FIELD INSPECTION BY | | DATE |
| DRAWINGS CORRECTED BY | | DATE |

MICRO-FILM INFORMATION
RECORDED BY DATE
NO.

**BENCH MARKS**
B.C. 2 - L22 ELEV. 5659.96
CENTRAL & TRAMWAY

**SURVEY INFORMATION**
FIELD NOTES

| NO. | BY | DATE |
|---|---|---|
| | | |

**REFERENCES**
MAP NO. L - 22
EST. NO.
WO. NO.

**REVISIONS**

| NO. | DATE | REMARKS | BY |
|---|---|---|---|
| | | | |

DESIGN
DESIGNED BY D.E.C. DATE 4 - 82
DRAWN BY D.E.C. DATE 4 - 82
CHECKED BY C.L.W. DATE 4 - 82

**WENONAH VILLAGE**

Consultants terrasol inc.

APPROVED FOR CONSTRUCTION
CITY ENGINEER DATE

CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT
ENGINEERING DIVISION

TITLE: STREET PLAN & PROFILE
WENONAH AVE.

| APPROVALS | ENGINEER | DATE | APPROVALS | ENGINEER | DATE |
|---|---|---|---|---|---|
| City Engineer | | | Liquid Waste | | |
| A.C.E. - Design | | | Traffic | | |
| A.C.E. - Hydrology | | | Water | | |

DRAWING NO. 1186
SHEET 2 OF 4

L22/D21

WENONAH VILLAGE

Runoff to South Pond: Area 1 and Southern Offsite Area

Base Data

Onsite Area = 1.59 Acres  Offsite Area = 1.53 Acres

Runoff Coefficient before development = 0.40

Runoff Coefficient after development = 0.60

Q100 Runoff = (0.49)(5.4)(3.12) = 8 cfs (Spillway design)

Q5 Runoff = (0.40)(2.43)(1.59) = 1.5 cfs (Outlet pipe design)

Local Area Precipitation = 2.6"

Total Onsite Developed Volume to be routed through pond = (2.6/12)(0.60)(1.59) = 9003 ft.$^3$

Spillway Data

Available Head = 0.2'; Minimum flow capacity = 8 cfs req'd

Minimum Spillway Breadth required = 36 ft. (Eq Q = CLH 3/2)

Actual Spillway Breadth available = 60 ft. - Actual Capacity = 13 cfs

Pipe Data

Available Head = 1.28' maximum Q discharge for head available = 1.45 cfs

Area = 28.75 in.$^2$ (Eq. Q = CAV$\sqrt{2gh}$)

Results

Peak Volume stored while outflowing Q5 of 1.45 cfs (maximum achieved for pipe size and head available) = 3695 ft.$^3$ at time interval of 30-40 minutes at a depth in pond at 1.28".

Outlet Facilities - Summary for South Pond

The pond outlet facilities will be defined by a concrete header curb and wall as shown on the grading plan. The outlet will consist of 1) a 6" diameter steel pipe sch. 40 with a flowline at elevation 5604.50 to release the entire ponded volume from the site at a controlled rate of 1.45 cfs, and 2) a 60' long spillway with its lip at elevation 5605.80. The capacity of the spillway is based on the onsite and offsite developed runoff of 8 cfs.

If the pipe remains open for the entire storm cycle, the maximum volume to be stored temporarily in the pond would equal 3695 ft.$^3$ at a high water elevation of 5605.8.

If the pipe should become plugged, ponded waters would have the potential to rise briefly to elevation 5606.00 to discharge peak flows over the spillway.

Runoff to North Pond: Area 2 and Northern Offsite Area

Base Data

Onsite Area = 1.69 Acres  Offsite Area = 2.29 Acres

Runoff Coefficient before development = 0.40

Runoff Coefficient after development = 0.60

Q100 Runoff = (0.46)(5.4)(3.98) = 10 cfs (Spillway design)

Q5 Runoff = (0.40) 2.43)(1.69) = 1.6 cfs (Outlet pipe design)

Local Area Precipitation = 2.6"

Total Onsite Developed Volume to be routed through pond = (2.6/12)(0.60)(1.69) = 9570 ft.$^3$

Spillway Data

Available Head = 0.2', minimum flow capacity = 10 cfs req'd.

Minimum Spillway Breadth required = 45 ft. (Eq Q = CLH 3/2)

Actual Spillway Breadth Available = 60 ft. - Actual capacity = 13 cfs

Pipe Data

Available Head = 1.43, maximum Q discharge for head available = 1.54 cfs

Area = 28.89 in.$^2$ (Eq. Q = CAV$\sqrt{2gh}$)

Results

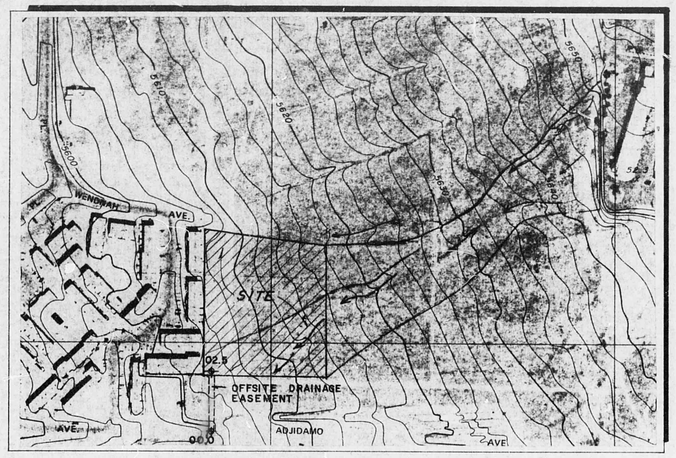
Peak Volume stored while outflowing Q5 of 1.54 cfs (maximum achieved for pipe size and head available) = 4128 ft.$^3$ at time interval of 35-40 minutes at a depth in pond at 1.43'.

Outlet Facilities - Summary for North Pond

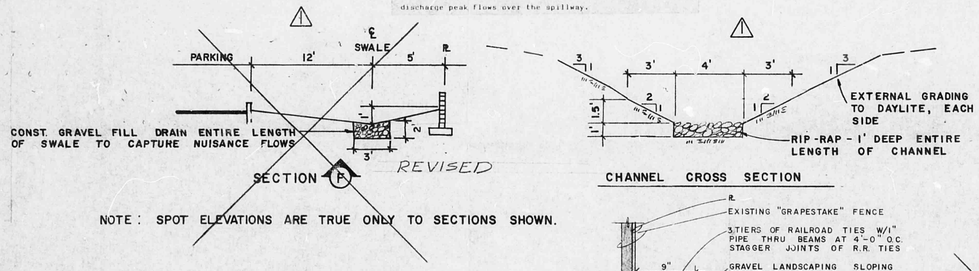
The pond outlet facilities will be defined by a concrete header curb and walk as shown on the grading plan. The outlet will consist of 1) a 6" steel pipe sch 40 with a flowline at elevation 5605.50 to release the entire ponded volume from the site at a controlled rate of 1.54 cfs, and 2) a 60' long spillway with its lip at elevation 5606.9. The capacity of the spillway is based on the site developed runoff of 10 cfs.

If the pipe remains open for the entire storm cycle, the maximum volume to be stored temporarily in the pond would equal 4128 ft.$^3$ at a high water elevation of 5606.9.

If the pipe should become plugged, ponded waters would have the potential to rise briefly to elevation 5607.1 to discharge peak flows over the spillway.

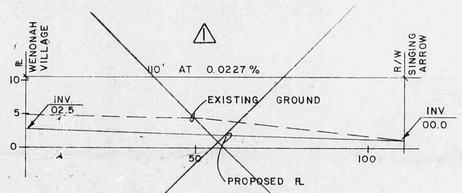



OFFSITE DRAINAGE MAP




CHANNEL CROSS SECTION

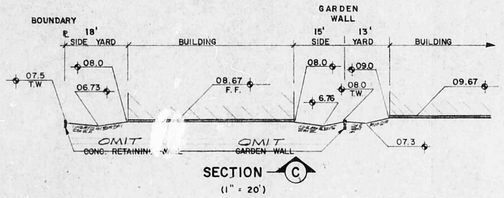
NOTE: SPOT ELEVATIONS ARE TRUE ONLY TO SECTIONS SHOWN.



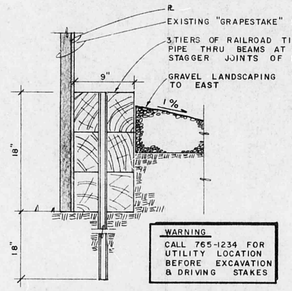

PROFILE - OFFSITE DRAINAGE CHANNEL

SEE CONSTRUCTION IN PUBLIC R.O.W. DOCUMENT

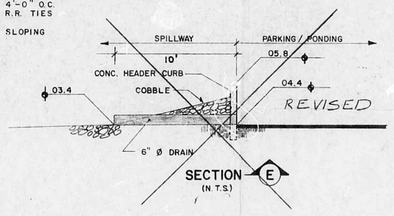
⚠ - SEE PAGE 1 FOR REVISION NOTE.



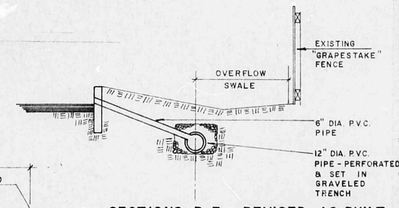

SECTION C
(1" = 20')



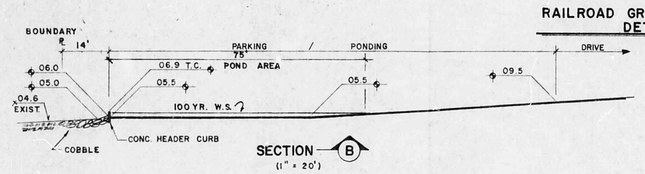

RAILROAD GRADE SEPARATION DETAIL - N.T.S.



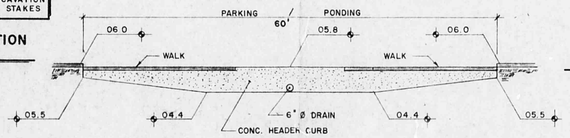

SECTION E
(N.T.S.)



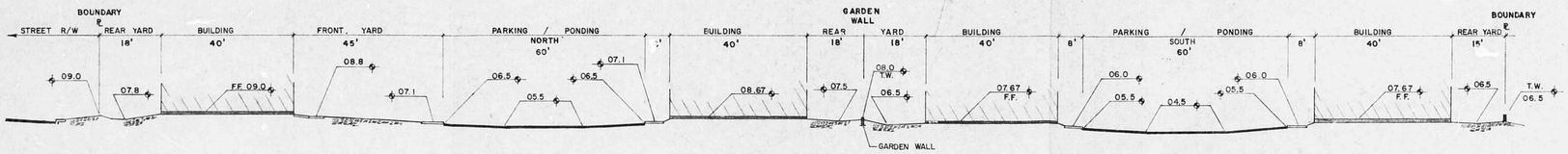

SECTIONS B-F — REVISED AS-BUILT
1" = 5'




SECTION B
(1" = 20')




SECTION D
(N.T.S.)




SECTION A
(1" = 20')

STORMWATER DETENTION POND DESIGN
SMALL DRAINAGE AREA
"NORTH"

PROGRAM PARAMETERS

| | |
|---|---|
| A2 = DRAINAGE BASIN SIZE(ACRES) | 1.69 |
| C1 = RUNOFF COEFFICIENT | .6 |
| C2 = FIRST GEOMETRIC VOLUME COEFFICIENT | 2887 |
| C3 = SECOND GEOMETRIC VOLUME COEFFICIENT | 0 |
| C4 = HEAD LOSS COEFFICIENT | .8 |
| C5 = FREQUENCY COEFFICIENT | 1.083 |
| D = DISCHARGE PIPE DIAMETER(FT) | 0.833 (6" SCH. 40) |
| J = INCREMENTAL DEPTH SIZE(FT) | .05 |
| K = NUMBER OF ROUTING TIME PERIODS | 15 |
| T = ROUTING TIME(SECS) | 300 |
| X = DEPTH OF DETENTION POND(FT) | 1.5 |
| Z = DRAIN PIPE ELEVATION-EXIT TO ENTRANCE(FT) | 0 |

PART TWO
CALCULATE ROUTING EQUATION ELEMENTS

INVERT 05.5

| T (MIN) | I2 (CFS) | S1 (CFS) | S2 (CFS) | S3 (CFS) | O1 (CFS) | O2 (CFS) |
|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 4.38 | 581 | 3 | 4 | .54 | .2 |
| 15 | 7.37 | 1067 | 13 | 15 | 1.06 | .68 |
| 20 | 9.12 | 1317 | 20 | 22 | 1.41 | 1.03 |
| 25 | 1.87 | 1554 | 22 | 25 | 1.42 | 1.2 |
| 30 | 1.87 | 1698 | 23 | 26 | 1.45 | 1.2 |
| 35 | 1.87 | 1836 | 24 | 26 | 1.45 | 1.23 |
| 40 | 1.87 | 1954 | 24 | 26 | 1.45 | 1.23 |
| 45 | .87 | 3354 | 21 | 25 | 1.42 | 1.22 |
| 50 | .87 | 3186 | 21 | 24 | 1.39 | 1.18 |
| 55 | .87 | 3262 | 20 | 23 | 1.36 | 1.17 |
| 60 | .87 | 3117 | 20 | 22 | 1.33 | 1.08 |
| 65 | .87 | 2973 | 19 | 21 | 1.27 | 1.05 |
| 70 | 0 | 2.86 | 17 | 20 | 1.27 | .979999 |
| 75 | 0 | 2.96 | 15 | 17 | 1.17 | .85 |

STORMWATER DETENTION POND DESIGN
SMALL DRAINAGE AREA
"SOUTH"

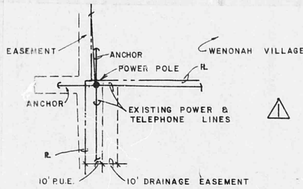
PROGRAM PARAMETERS

| | |
|---|---|
| A2 = DRAINAGE BASIN SIZE(ACRES) | 1.59 |
| C1 = RUNOFF COEFFICIENT | .6 |
| C2 = FIRST GEOMETRIC VOLUME COEFFICIENT | 2887 |
| C3 = SECOND GEOMETRIC VOLUME COEFFICIENT | 0 |
| C4 = HEAD LOSS COEFFICIENT | .8 |
| C5 = FREQUENCY COEFFICIENT | 1.083 |
| D = DISCHARGE PIPE DIAMETER(FT) | 0.833 (6" SCH. 40) |
| J = INCREMENTAL DEPTH SIZE(FT) | .05 |
| K = NUMBER OF ROUTING TIME PERIODS | 15 |
| T = ROUTING TIME(SECS) | 300 |
| X = DEPTH OF DETENTION POND(FT) | 1.5 |
| Z = DRAIN PIPE ELEVATION-EXIT TO ENTRANCE(FT) | 01 |

PART TWO
CALCULATE ROUTING EQUATION ELEMENTS

INVERT 07.5

| T (MIN) | I2 (CFS) | S1 (CFS) | S2 (CFS) | S3 (CFS) | O1 (CFS) | O2 (CFS) |
|---|---|---|---|---|---|---|
| 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 4.12 | 519 | 3 | 4 | .54 | .18 |
| 15 | 6.37 | 1063 | 14 | 15 | 1.06 | .68 |
| 20 | 7.12 | 1117 | 20 | 22 | 1.41 | 1.03 |
| 25 | 1.87 | 1554 | 22 | 25 | 1.42 | 1.2 |
| 30 | 1.87 | 1698 | 23 | 26 | 1.45 | 1.2 |
| 35 | 1.87 | 1836 | 24 | 26 | 1.45 | 1.23 |
| 40 | 1.87 | 1954 | 24 | 26 | 1.45 | 1.23 |
| 45 | .87 | 3354 | 21 | 25 | 1.42 | 1.22 |
| 50 | .87 | 3186 | 21 | 24 | 1.39 | 1.18 |
| 55 | .87 | 3262 | 20 | 23 | 1.36 | 1.17 |
| 60 | .87 | 3117 | 20 | 22 | 1.33 | 1.08 |
| 65 | .87 | 2973 | 19 | 21 | 1.27 | 1.05 |
| 70 | 0 | 2.86 | 17 | 20 | 1.27 | .979999 |
| 75 | 0 | 2.96 | 15 | 17 | 1.17 | .85 |




POWER POLE LOCATION

L22/D21


CONSULTANTS/TERRA-SOL, INC.
ALBUQUERQUE OFFICE - 1100 B ALVARADO N.E. ALBUQUERQUE, N. MEX. 87110 266-3444
SANDIA PARK OFFICE - P.O. BOX 142 SANDIA PARK, N. MEX. 87047 281-1591


| Revisions | Date |
|---|---|
| | |

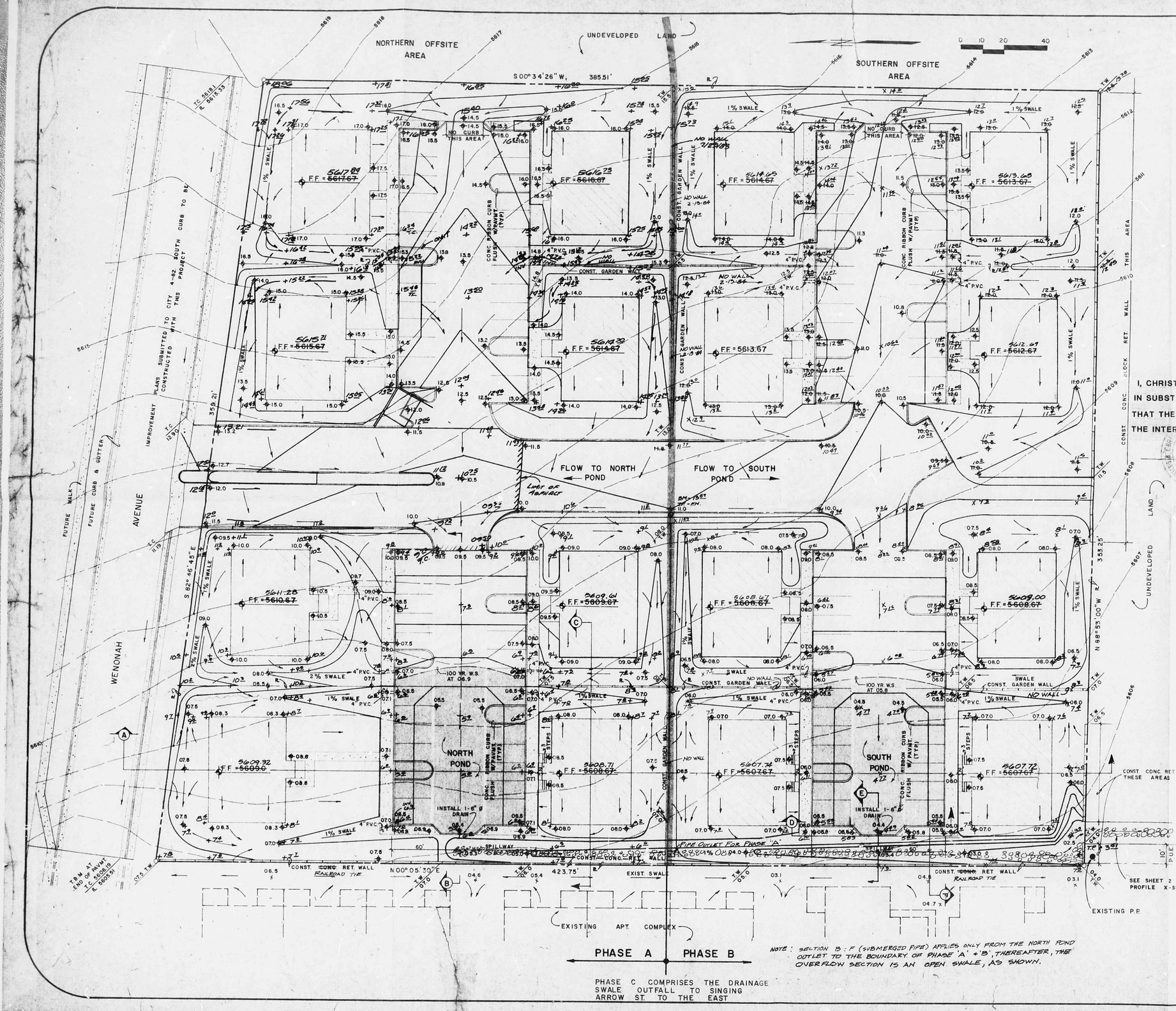
Designed C.L.W. 3-82
Drawn D.L.C. 3-82
Checked C.L.W. 4-82

# WENONAH VILLAGE

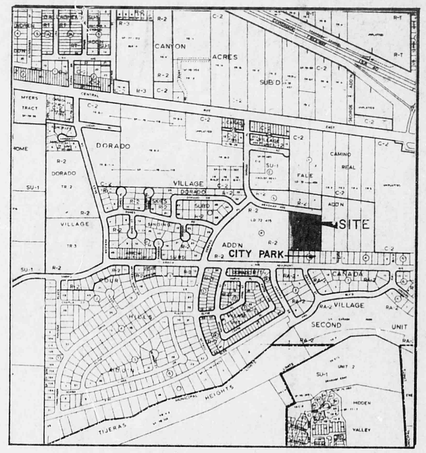
Albuquerque, New Mexico


Consultants terra-sol inc.
CIVIL/RENEWABLE ENERGY DESIGN/ENGINEERS


SHEET 2 OF 2




NOTE: SECTION B:F (SUBMERGED PIPE) APPLIES ONLY FROM THE NORTH POND OUTLET TO THE BOUNDARY OF PHASE 'A' + 'B', THEREAFTER, THE OVERFLOW SECTION IS AN OPEN SWALE, AS SHOWN.




VICINITY MAP - L-22

I, CHRISTOPHER WEISS HEREBY CERTIFY THAT THIS PLAN FOR PHASE B IS IN SUBSTANTIAL COMPLIANCE WITH THE APPROVED DRAINAGE PLAN AND THAT THE DRAINAGE SYSTEM HAS BEEN COMPLETED FOR PHASE B. THE INTERM IMPROVEMENTS OF PHASE C WILL HANDLE THE 100 YR. STORM.

3-23-84
DATE

## LEGEND

| | |
|---|---|
| 12.7 | EXISTING SPOT ELEVATION |
| 12 | EXISTING CONTOUR |
| 12.7 | PROPOSED SPOT ELEVATION |
| 12 | PROPOSED FINISHED CONTOUR |
| → | SURFACE FLOW DIRECTION |
| F.F. | FINISHED FLOOR |
| | DRAINAGE BOUNDARY |
| | POND AREA |
| x 92 | AS BUILT ELEVATIONS |

NOTES:

LEGAL: LOTS 1 & 2, BLOCK 2, FALE ADDITION, ALBUQUERQUE, N. MEX. (3.88 AC.)

SURVEYOR: WALKER SURVEY CO./DATE OF SURVEY: SEPT, 1980

B.M.: 2-L22, 5659.96, CENTRAL & TRAMWAY

T.B.M.: 5606.19, N.W. COR. SITE, PROP. LINE PROJECTED AT T.C.

ZONE: R-2 (S-81-31)

SITE NOT LOCATED IN FLOOD HAZARD AREA.

⚠ DRAINAGE PATTERN REVISIONS - 11-8-82

FLOWS FROM NORTH & SOUTH PONDS REROUTED SOUTH ALONG WESTERN BOUNDARY TO DRAINAGE EASEMENT ON CITY PARK'S LAND. SEE PAGE 2/OFFSITE MAP. ADDITIONAL REVISIONS INCLUDE OVEREXCAVATION OF SWALE FROM EACH POND OUTLET TO HOLD NUISANCE RUNOFF. - SEE PAGE 2 - DETAILS

I, ANDRE HOULE HEREBY CERTIFY THAT THIS PLAN FOR PHASE A IS IN SUBSTANTIAL COMPLIANCE WITH THE APPROVED DRAINAGE PLAN & THAT THE DRAINAGE SYSTEM HAS BEEN COMPLETED FOR PHASE A, & THE INTERM IMPROVEMENTS OF PHASE C WILL HANDLE THE 100 YR. STORM

12-7-83
N.M. 7678 DATE

CONSULTANTS: TERRA SOL INC.

| | |
|---|---|
| C.L.W. | 3-82 |
| M.W. | 3-82 |
| C.L.W. | 4-82 |

# WENONAH VILLAGE

Albuquerque, New Mexico

Consultants terra sol inc. CIVIL/ENVIRONMENTAL DESIGN ENGINEERS

L22/D21