

4-069-0296A



APPLICATION

1719

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT

P.O. Box 1429
Palatka, Florida 32178-1429

016489

DATE Jan. 24, 19 94

RECEIVED FROM Cross-Tie Ranch L.P.

THE SUM OF Cross-Tie Ranch Phase II DOLLARS \$ 2500.⁰⁰

FOR app # 4-069-0296A

AMOUNT OF ACCOUNT 2500

AMOUNT PAID..... 2500 - Thank You!

BALANCE DUE.....\$ 0

CASH CHECK M.O. CREDIT CARD

By Lillian Aguerre

MANAGEMENT AND STORAGE OF SURFACE WATERS INDIVIDUAL
APPLICATION ASSIGNMENT SHEET

Office: ORLANDO

Reviewer: COOK EUNICE

Date Received: 1/24/94

Date Processed: 1/24/94

Application Number: 4-069-0296A

Related Application Number: _____

Owner: ESTATE OF HERBERT MAYER/CROSS-TIE RANCH L.P.

Applicant: ESTATE OF HERBERT MAYER/CROSS-TIE RANCH L.P.

Consultant/Engineer: FARNER, BARLEY & ASSOCAITES, INC.

Project Name: CROSS-TIE RANCH PHASE II

THE FOLLOWING INFORMATION IS NEEDED TO ADMINISTRATIVELY COMPLETE THIS APPLICATION:

___ Signatures

___ Authorization from Owner for Agent

___ Individual/Firm Preparing Specifications

___ Name in which Permit is to be Issued

___ Entity Responsible for Maintenance Statement ^{AN 26 1994}

___ Bound Reports (No. Received: 4)

___ Plans (No. Received: 4)

___ Calculations (No. Received: 4)

___ Notice of Receipt of Application

___ Adequate Map Coordinates

___ Fee: 2500.00 Receipt Number: 16489

RECEIVED

PERMIT DATA SERVICES
Palatka

Comments: REC'D NOTICE

Application is adminstratively complete? YES LO _____

Application Number: 4-069-0296A

Project Name: CROSS-TIE RANCH PHASE II

Date Received: 1/24/94

Reviewer: COOK EUNICE

Request for Additional Information must be mailed by: 2/21/94

Regulatory Meeting Date if determined technically/administratively complete: 4/12/94

Basin Criteria: Upper Ocklawaha Wekiva Lower
 Wekiva Protection Area Sensitive Karst Area

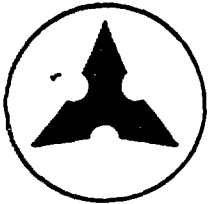
Comments: _____

Date RAI letter sent: _____

Date Application Complete: _____

Schedule for _____ Regulatory Meeting (Approval/Denial)

** NOTE: PLEASE RETURN TO THE DATA MANAGEMENT SUPERVISOR UPON SCHEDULING BOARD ACTION.



FARNER BARLEY

AND ASSOCIATES, INC.

ENGINEERS ▲ SURVEYORS ▲ PLANNERS

350 North Sinclair Avenue

Tavares, Florida 32778

Phone: (904) 343-8481

TO: ST. JOHNS RIVER WATER MANAGEMENT DISTRICT

ADDRESS: 618 East South Street

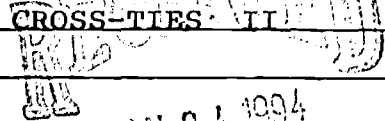
CITY: Orlando, Fl 32801

STATE:

DATE: 1/21/94 JOB NO.: 921088.001

ATTN: Permitting Section

RE: CROSS-TIES II



JAN 21 1994
2/069-0296A

WE ARE SENDING YOU ATTACHED UNDER SEPARATE COVER VIA RECORDS THE FOLLOWING:

- PLANS
- PRINTS
- DRAWINGS
- MAPS\PHOTOS
- OTHER
- LETTER
- PERMIT APPLICATION
- REPORT
- BIDS
- SHOP DRAWINGS
- SPECIFICATIONS
- CHANGE ORDER
- INFORMATION

NO.	COPIES	DATE	DESCRIPTION
1	4		40C-4 Application
2	5		Notice and Receipt Forms
3	4		Stormwater Calculations
4	1		Check in the amount of \$2,500.00
5	4		Construction Drawings

THESE ARE BEING TRANSMITTED AS INDICATED BELOW:

- AS REQUESTED
- FOR APPROVAL
- OTHER
- FOR YOUR USE
- PER DISCUSSION
- FOR REVIEW AND COMMENT
- RETURNED AFTER LOAN

COMMENTS:

COPIES TO: P 357 608 275

SIGNED: Thomas J. McCann
Thomas J. McCann, P.E.

Effective Date _____ MANAGEMENT AND STORAGE OF SURFACE WATERS
INDIVIDUAL PERMIT APPLICATION
CHAPTER 40C-4, CHAPTER 40C-41, F.A.C.

RECEIVED

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
DEPARTMENT OF RESOURCE MANAGEMENT
DIVISION OF RECORDS
P.O. BOX 1429
PALATKA, FLORIDA 32178-1429

NUMBER 4-009-0296A
FEE RECEIVED 42000.00
ASSIGNED REVIEWER ORLANDO
PROJECTED DATE OF ISSUANCE _____

Please type or print with BLACK ball point pen. Read ALL instructions on the back of this sheet before completing application. Complete necessary data sheets attached.

APPLICATION IS FOR: _____ ALTERATION _____ OPERATION _____ MAINTENANCE
RE-ISSUANCE _____ REMOVAL _____ ABANDONMENT _____ CONSTRUCTION (APPLICATION TO CONSTRUCT OR ALTER IS ALSO CONSIDERED AS APPLICATION TO OPERATE.)
MODIFICATION _____

OWNER

Name of Owner: Estate of Herbert Mayer/Cross-Tie Ranch L.P.
Address: 518 Pleasant Street
City: Northampton County: Fairfield
State: Ma Zip Code: 01060 Telephone No.: (413) 586-3465

APPLICANT/ENTITY TO RECEIVE PERMIT

Name of Applicant: Same as above
Address: _____
City: _____ County: _____
State: _____ Zip Code: _____ Telephone No.: _____

CONSULTANT OR ENGINEER OR SCS DISTRICT CONSERVATIONIST

Name of Firm: FARNER, BARLEY & ASSOCIATES, INC.
Name of Firm Contact: Thomas J. McCann, P.E.
Address: 350 North Sinclair Avenue
City: Tavares County: Lake
State: Florida Zip Code: 32778 Telephone No.: (904) 343-8481

ATTORNEY OF RECORD

Name of Firm: N/A
Name of Firm Contact: _____
Address: _____
City: _____ County: _____
State: _____ Zip Code: _____ Telephone No.: _____

PROJECT INFORMATION

Name of Project: Cross-Tie Ranch Phase II
U.S.G.S. Topo Quad Map: Sorrento
County: Lake Project Acreage: 100.0 Total Acreage Owned: 690
Section: 5, 8 Township: 19 Range: 28
Description of Project: 40 lot single-family subdivision with less than 10% impervious area

Description of Proposed Surface Water Works:
Roadside swale collection and conveyance to existing retention areas.

Water Course/Water Body Most Affected: None
Date Construction is Proposed to Commence/End: Upon receipt of permit
If Application is for Alteration of Existing Permit,
Give Permit Number: _____
(Include Information Required on Attached Sheets)

OTHER

Name and Address of Proposed Operation/Maintenance Entity: homeowner's Association
Have You Had A Pre-Application Conference With District Staff?
Yes _____ No Date: _____/_____/_____ With Whom? _____
Has a Conservation Plan Been Approved by the Local SWCD? N/A
Has Stormwater Permit or Exemption Been Granted? _____ If So, Give No.: _____

Have any Wetland Resource/Dredge and Fill Permits, Authorizations, or Exemptions Been Granted? If so, Give Nos. and Agencies:
** Issuance of Permit Does Not Preclude Responsibility of Applicant to Obtain All Necessary Federal, State, Local Permits **

In compliance with the provisions of Chapter 373, Florida Statutes, 1973, and applicable rules and regulations of St. Johns River Water Management District, application is hereby made for a permit as identified above, and in accordance with support data and incidental information filed with this application and made a part thereof.

Mr. Herbert Mayer, Jr.

Applicant's Name (please print)

Applicant's Signature

Date

Herbert Mayer, Jr. 9/14/93
President SunSound Audio, Inc., General Partner
If person other than applicant has completed this form, that person certifies by his signature below that he is acting as an authorized agent of the applicant and his signature will be certification that he is in fact the authorized agent.

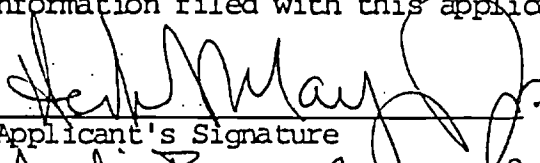
Agent's Name (please print)

Agent's Signature

Date

Have any Wetland Resource/Dredge and Fill Permits, Authorizations, or Exemptions Been Granted? If so, Give Nos. and Agencies:
 ** Issuance of Permit Does Not Preclude Responsibility of Applicant to Obtain All Necessary Federal, State, Local Permits **

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Applicant's Name (please print)	Applicant's Signature	Date

President Sun Sound Audio, Inc. General Partner
 If person other than applicant has completed this form, that person certifies by his signature below that he is acting as an authorized agent of the applicant and his signature will be certification that he is in fact the authorized agent.

Agent's Name (please print)	Agent's Signature	Date

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT

NOTICE OF RECEIPT OF APPLICATION

Pursuant to Section 373.413, Florida Statutes, and Chapter 40C-4, Florida Administrative Code, the applicant is required to provide the following information for the purpose of public notice. Failure to provide all information will result in an incomplete application. This information is in addition to that required in other portions of the application form.

Five copies of this form and all attachments must be submitted.

This section will be completed by the District.

RECEIVED

JAN 24 1994

RECORDS ORLANDO

Application Number: 4-069-0296A

Date of hearing, if any : 4-12-94

Earliest possible date for agency action: 2-21-94

Date to be posted: 1-31-94 Date to be removed: 2-14-94

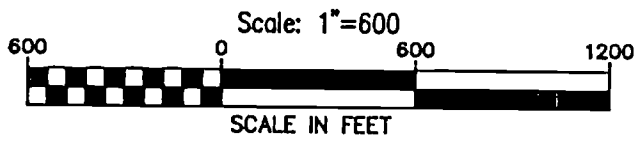
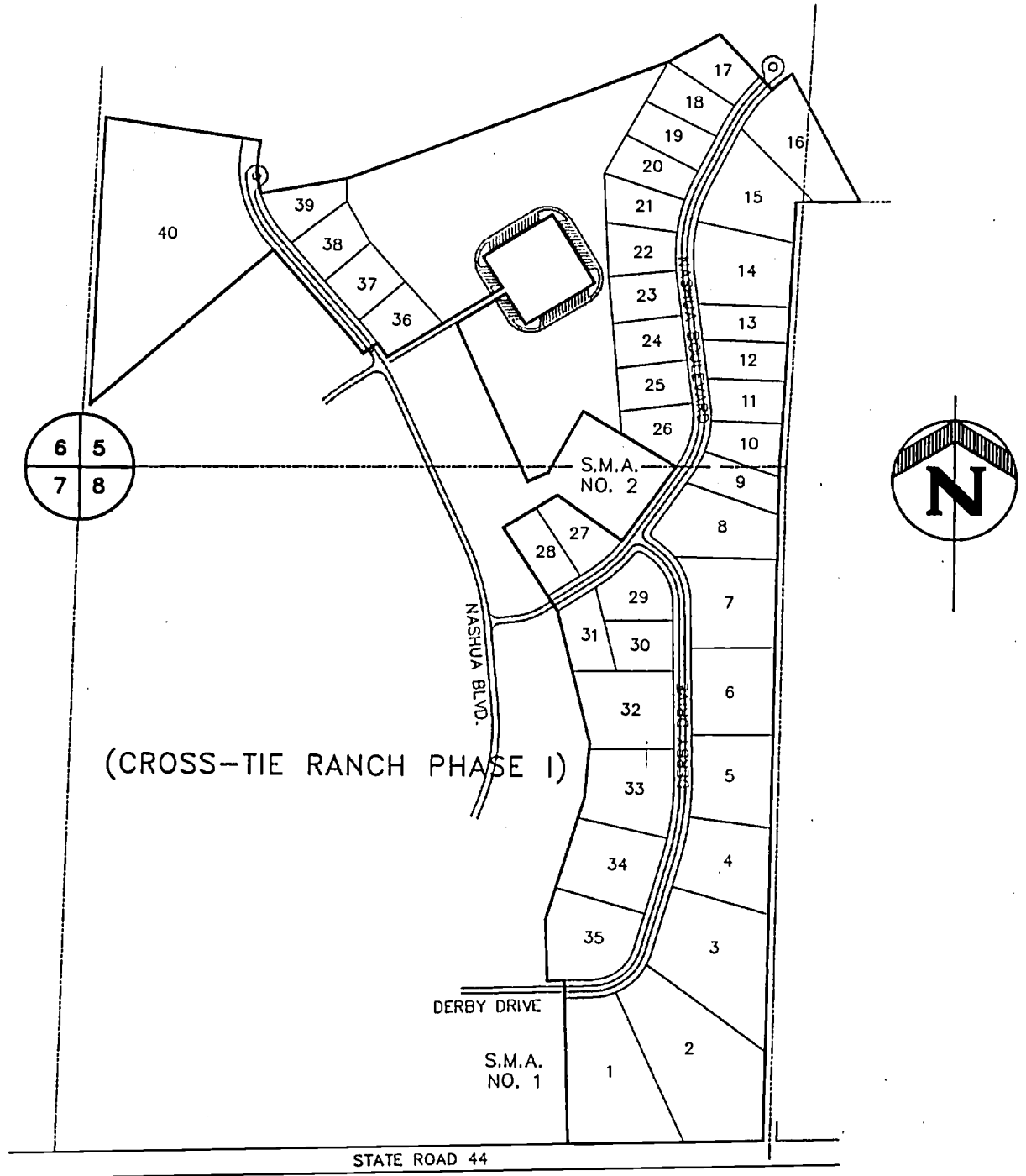
Written objections must be filed by: FEBRUARY 14, 1994

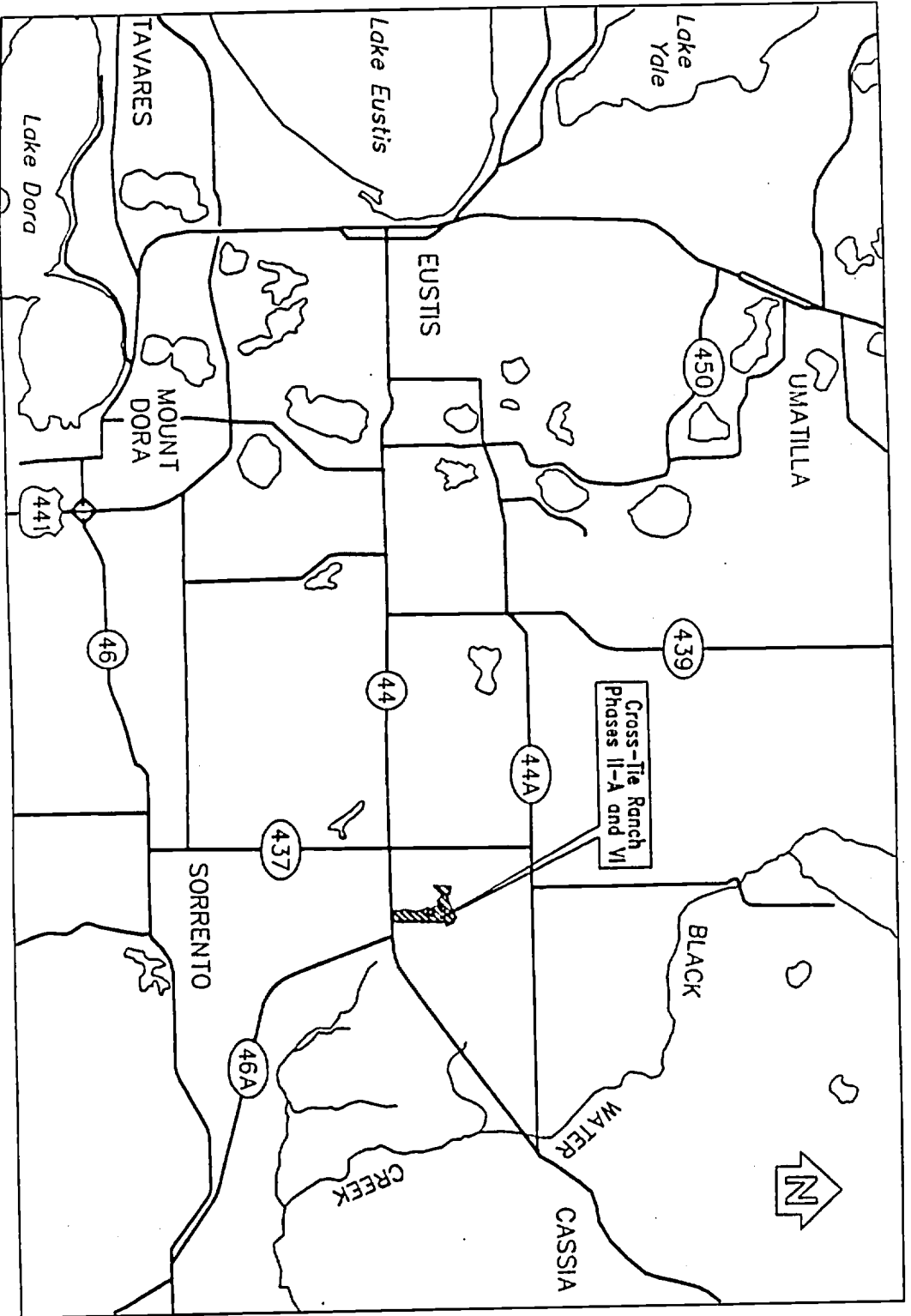
1. Attach a location map, showing the boundary of the proposed activity and its relationship to any other portions of the project. Map size must be no larger than 11" by 17" referenced to Section, Township, and Range. Map scale must be 1" = 2000' (plot on USGS quad maps). Attach multiple sheets, if necessary.
2. Attach a depiction (plan) of the work, works, dams, impoundments, stormwater management systems, or other regulated facilities proposed to be constructed under the permit. Depiction size must be no larger than 11" by 17". Depiction scale should be sufficient to show location and type of works (at least 1" = 2000', (plot on USGS quad). Attach multiple sheets, if necessary.
3. Specify acreage of wetlands, if any, that are proposed to be disturbed, filled, excavated, or otherwise impacted by the proposed surface water management system: None
4. Provide a brief statement describing any wetland mitigation proposed to be undertaken (attach additional sheets if necessary):
None
5. Provide the names of all streams, lakes, wetlands, or other watercourses that are proposed to be impounded, diverted, drained, discharged into (either directly or indirectly), or otherwise impacted by the proposed activity:
None, on-site retention
6. Indicate the source of any water to be contained on site: Direct Run-Off:
the volume of water to be contained on site: 25 (acre-feet):
the use to be made of the water and any other limitation thereon:
Retention with recharge and percolation to shallow aquifer

Persons interested in the above described application should contact the St. Johns River Water Management District at P. O. Box 1429, Palatka, Florida 32178-1429, or in person at its office on State Highway 100 West, Palatka, Florida, 904/328-8321. Written objections to the application may be made no later than the date specified above. Written objections should identify the objector by name and address, and fully describe the nature of the objection to the application. All timely filed written objections will be presented to the Board for consideration prior to the Board taking action on the application. Filing a written objection does not entitle one to a Chapter 120, Florida Statutes, administrative hearing. Only those persons whose substantial interests are affected by the application and who file a petition meeting the District's requirements after receipt of notice of intended action or final action may obtain an administrative hearing (see section 40C-1.511, F.A.C.). The requirements relating to timing and content of such petitions are set forth in Chapter 40C-1, F.A.C., Parts I and V.

DEPICTION MAP OF CROSS-TIE RANCH PHASE II

SECTIONS 5 AND 8, TOWNSHIP 19 SOUTH, RANGE 28 EAST
LAKE COUNTY, FLORIDA





VICINITY MAP

INDEX

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

STORMWATER MANAGEMENT CALCULATIONS

FOR

Cross-Tie Phase 2

Lake County, Florida

Thomas McCann, P.E.
Farner, Barley & Assoc.
Tavares, Florida

January 1994

Thomas McCann
1/21/94

PROJECT DESCRIPTION

The proposed 100-acre project addition is to be developed for a low density subdivision of 40 single-family lots together with common recreation areas. There is to be no regrading of the lot areas or the central common area. The only significant earthwork which is necessary for infrastructure construction is that for grading of roadways. The direct stormwater runoff from the streets will be collected in roadside swales and conveyed to a retention area for percolation into the shallow groundwater table.

SYSTEM DESIGN & PERFORMANCE CRITERIA

The total runoff calculated for each respective basin will be routed into the retention basin without exfiltration loss in the conveyance swales. From that simple storage level it will be demonstrated shown that the facility will completely recover in less than 14 days. Additionally, for the purpose of setting minimum building levels, a 24-hour 100-year storm will be stored in the basin 1 and 3 retention areas.

The above approach is very conservative in that no percolation or exfiltration losses are considered to occur from the swale system or in the retention areas during the storm period. The particularly good site soils and groundwater conditions would, in fact, insure that little or no runoff would accumulate beyond impervious areas.

HYDROLOGIC DATA

Overall Assumptions:

- All "A" type soils with a CN=39 for grassed pervious areas.
- Retention area bottoms are considered as DCIA only after runoff occurs. Otherwise, there is no DCIA.
- Developed impervious areas will be figured as NDCIA and a composite CN will be calculated using 4,000 ft.² per lot for house and drive and 22 ft. wide pavement for roadways.

Postdevelopment Parameters:

Land use - Indirectly connected impervious areas - **CN95**
Pervious and grassed areas - **CN39**

Time of concentration, use $T_c = 30$ minutes as a minimum. (Note that this is not a significant parameter with total retention and routing periods in days.)

For runoff coefficients to compute 40C-42 water quality volumes, the FDOT Drainage Manual, Table 5-5 will be used:

Grassed areas - C = 0.20

and

Impervious areas - C = 0.95

Basin Calculations:

Basin B-1:

Area = **83.3 ac.** (inc. offsite from SR44)

26 lots X 4000 ft.² = 104,000 ft.² imp.

7650 ft. roadway X 22 ft. = 166,300 ft.²

Total imper. area = **6.25 ac.**

CN = 39(77.1) + 95(6.25) = **43.2** w/ 1.93 ac. ret. area = **2.3% DCIA**

Basin B-2:

Area = **73.7 ac.**

32 lots X 4000 ft.² = 128,000 ft.² imp.

5070 ft. roadway X 22 ft. = 111,600 ft.²

Total imper. area = **5.50 ac.**

CN = 39(68.2) + 95(5.5) = **43.2** w/ 1.35 ac. ret. area = **1.8% DCIA**

Basin B-0:

Area = **23.5 ac.**

10 lots X 4000 ft.² = 40,000 ft.² imp.

Total imper. area = **0.92 ac.**

CN = 39(22.6) + 95(.92) = **41.2** w/NO DCIA

Runoff Coef: 0.20(22.6) + 0.95(.92) = **0.23**

Basin B-4:

Area = **9.1 ac.**

1 lots X 4000 ft.² = 4,000 ft.² imp.

Total imper. area = **0.1 ac.**

CN = 39(9.0) + 95(0.1) = **39.6 w/ NO DCIA**

Runoff Coef: 0.20(9.0) + 0.95(.1) = **0.21**

Basin B-5:

Area = **1.9 ac.**

1 lots X 4000 ft.² = 4,000 ft.² imp.

250 ft. roadway X 22 ft. = 5,500 ft.²

Total imper. area = **0.22 ac.**

CN = 39(1.68) + 95(0.22) = **45.5 w/ NO DCIA**

Runoff Coef: 0.20(1.68) + 0.95(0.22) = **0.29**

Basin B-6:

Area = **4.1 ac.**

2 lots X 4000 ft.² = 8,000 ft.² imp.

Total imper. area = **0.18 ac.**

CN = 39(3.9) + 95(0.18) = **41.4 w/NO DCIA.**

Runoff Coef: 0.20(3.9) + 0.95(0.18) = **0.23**

STORM ROUTING

With the above parameters the 25-yr 24-hr. storm event of a total rainfall depth of 8.40" and a 100-yr. storm event of 10.50" (USWB Pub. TP-4) is distributed according to the following tables:

Retention Basins 24-hour, 25-year Storms:

Basin	Area	CN	DCIA (%)	S (in)	24-Hr. RO (a-f)	24-Hr. RO (ft. ³)	1" RunOff (ft. ³)
1	83.3	43.2	2.3	13.15	13.56	590,616	302,379
2	73.7	43.2	1.8	13.15	11.74	511,313	267,531

Rear Swale Management Areas:

24-hr Events-

40C42 Criteria-

Basin	Area	CN	DCIA (%)	S (in)	24-Hr RO (a-f)	Existing 24 hr. Case RO	Δ RO 24-hr	R.O. Coef.	40C-42 Vol.(af)
0	14.5	42.6	0	13.47	2.05	1.61	0.45	0.23	0.28
4	9.1	41.2	0	14.27	1.18	1.01	0.17	0.21	0.16
5	1.9	39.6	0	15.25	0.22	0.21	0.01	0.29	0.05
6	4.1	45.5	0	11.98	0.69	0.45	0.23	0.23	0.08

For the rear lot areas the net increase in runoff is so slight that the water quality volumes will in most cases be greater than the 25-yr. net difference in runoff. The above table enumerates both cases.

Basin	Area	CN	DCIA (%)	S (in)	24-Hr. RO (a-f)	Retention Stage (ft)
1	83.3	43.2	2.3	13.15	22.13	65:20
2	73.7	43.2	1.8	13.15	19.26	70:20

24-hour, 100-year Storms:

Swale Volumes:

Basin	Length (ft)	Avg. Slope (%)	Reduction Factor	Vol. (ft.3)	Vol. (af)	Req'd Vol. from above
0	3000	1.00	0.50	42,000	0.96	0.45
4	500	0.60	0.30	9,800	0.22	0.17
5	150	0	0	4,200	0.10	0.05
6	1200	1.00	0.50	16,800	0.39	0.23

The above swale volumes area based upon the geometry which yields a 28 ft.² cross section. This is further reduced depending on the slope.

**Retention Area Capacity
R-1:**

El.(ft)	Pond Area(ft ²)	Pond ΔVol.(ft ³)	Pond ΣVol.(ft. ³)	Pond ΣVol.(a-f)	Routing Results
58.0	105265	0		0	40C-42 Vol. @ ⇐ el. 60.6 24-hr vol. @ ⇐ el. 62.9
59.0	112104	108,685	108,685	2.495	
60.0	118940	115,522	224,207	5.147	
61.0	125780	122,360	346,567	7.956	
62.0	132620	129,200	475,767	10.922	
63.0	139460	136,040	611,807	14.045	
64.0	146298	142,879	754,686	17.325	
65.0	197850	172,074	926,760	21.276	
66.0	238560	218,205	1,144,965	26.285	
67.0	277360	257,960	1,402,925	32.207	

R-2:

El.(ft)	Pond Area(ft ²)	Pond ΔVol.(ft ³)	Pond ΣVol.(ft. ³)	Pond ΣVol.(a-f)	Routing Results
60.0	59275	0	0	0	40C-42 Vol. @ ⇐ el. 63.8 24-hr vol. @ ⇐ el. 66.9
61.0	63405	61340	61340	1.408	
62.0	67540	65473	126813	2.911	
63.0	71672	69606	196419	4.509	
64.0	75805	73739	270157	6.202	
65.0	80039	77922	348079	7.991	
66.0	84373	82206	430285	9.878	
67.0	88808	86591	516876	11.866	
68.0	93343	91076	607951	13.957	
69.0	97979	95661	703612	16.153	
70.0	102716	100348	803960	18.456	

Additional criteria for Lake Co. requires the retention of 4.0" of runoff from all connected impervious areas. As there is really no such area we will use the roadway pavement as follows:

Basin	Pavement Area(ac.)	4" Vol. (a-f)	Pond Area (ac)	4" Vol. Depth
1	6.25	2.08	2.42	0.86'
2	5.5	1.83	1.36	1.34'

Soils & Groundwater Modeling

Hand auger borings and percolation tests were conducted at three locations in the retention areas on the site. The percolation tests will be the basis for the permeability values and groundwater table estimates used in the modeling. Only in the lowest boring, B-1, was groundwater encountered. At a depth of 12 ft. from the surface level of el. 60.0 ft. the groundwater level would be at el. 48.0 ft. Allowing some undulation with the topography, and considering that the borings were taken at a seasonal high time, the groundwater level across the site could be considered as el. 50.0, two feet higher.

SCS generalized data for these Astatula sands give typical values as greater than 20"/hr. One half of this value (20 ft/day) will be used for a retention areas drawdown estimates even though the real field values are greater by orders of magnitude.

As a conservative design, total retention is staged without any losses from the swales or the retention areas is first provided. In the following groundwater analysis the recovery of the retention volumes is shown with a three-dimensional model.

A version of USGS's groundwater program, MODFLOW, will be used to demonstrate the retention area drawdown and recovery routing. The initial runoff will fill the unsaturated volume between the pond bottom and the groundwater table, el. 50.0 ft. The next stage is for the saturated flow in a horizontal sense through the sides to the surrounding groundwater table as a dynamic mounding.

The relatively small volumes for 40C-42 requirements are also routed through the ponds. It should be obvious that with the percolative capacity of the retention areas designed for much larger storms that recovery of these runoff amounts will be a matter of minutes.

All the groundwater results are included in the appendix.

APPENDIX

PONDS - Version 2.00
Copyright 1993

Written By Devo Seereeram, Ph.D.
And Robert D. Casper

Licensed Solely For Use By:
Farner, Barley & Associates, Inc.

Retention Pond Recovery Analysis

I. Job Information

Job Name: **Cross-Tie R1 24-hr. storm**
Engineer: tjm
Date: 1/17/94

II. Input Data

Equivalent Pond Length, [L] (ft):	375.00
Equivalent Pond Width, [W] (ft):	375.00
Pond Bottom Elevation, [PB] (ft above datum):	58.00
Porosity Of Material Within Pond, [p] (%):	100.00
Base Of Aquifer Elevation, [B] (ft above datum):	40.00
Water Table Elevation, [WT] (ft above datum):	50.00
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day)	20.00
Fillable Porosity of Aquifer, [n] (%):	25.00
Vertical Unsaturated Infiltration, [Iv] (ft/day):	20.00
Runoff Volume, [V] (cubic feet)	590616.00
Percent Recovery Of Runoff Volume, [PV] (%)	100.00

III. Results

UNSATURATED FLOW

Recovery Time From Unsaturated Flow, [T1] (days): 0.1000
Recovered Volume From Unsaturated Flow, [V1] (ft³): 281250.00

SATURATED FLOW

Recovery Time From Saturated Flow, [T2] (days): 5.2116
Recovered Volume From Saturated Flow, [V2] (ft³): 309366.00
Maximum Radius Of Influence, [R] (ft): 167.21
Maximum Driving Head, [Hmax] (ft): 10.200
Minimum Driving Head, [Hmin] (ft): 8.000

TOTAL

Total Recovery Time, [T] (days): 5.3116
Total Recovered Volume, [V] (ft³): 590616.00

I. Job Information

Job Name: **Cross-Tie R1 40C-42**

Engineer: tjm

Date: 1/17/94

II. Input Data

Equivalent Pond Length, [L] (ft): 375.00
Equivalent Pond Width, [W] (ft): 375.00
Pond Bottom Elevation, [PB] (ft above datum): 58.00
Porosity Of Material Within Pond, [p] (%): 100.00

Base Of Aquifer Elevation, [B] (ft above datum): 40.00
Water Table Elevation, [WT] (ft above datum): 50.00
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day) 20.00
Fillable Porosity of Aquifer, [n] (%): 25.00
Vertical Unsaturated Infiltration, [Iv] (ft/day): 20.00

Runoff Volume, [V] (cubic feet)	302379.00
Percent Recovery Of Runoff Volume, [PV] (%)	100.00

III. Results

UNSATURATED FLOW

Recovery Time From Unsaturated Flow, [T1] (days):	0.1000
Recovered Volume From Unsaturated Flow, [V1] (ft ³):	281250.00

SATURATED FLOW

Recovery Time From Saturated Flow, [T2] (days):	0.0335
Recovered Volume From Saturated Flow, [V2] (ft ³):	21129.00
Maximum Radius Of Influence, [R] (ft):	13.82
Maximum Driving Head, [Hmax] (ft):	8.150
Minimum Driving Head, [Hmin] (ft):	8.000

TOTAL

Total Recovery Time, [T] (days):	0.1335
Total Recovered Volume, [V] (ft ³):	302379.00

Retention Pond Recovery Analysis

I. Job Information

Job Name: **Cross-Tie R2 24-hr storm**
Engineer: **tjm**
Date: **1/17/94**

II. Input Data

Equivalent Pond Length, [L] (ft):	300.00
Equivalent Pond Width, [W] (ft):	300.00
Pond Bottom Elevation, [PB] (ft above datum):	60.00
Porosity Of Material Within Pond, [p] (%):	100.00
Base Of Aquifer Elevation, [B] (ft above datum):	40.00
Water Table Elevation, [WT] (ft above datum):	50.00
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day)	20.00
Fillable Porosity of Aquifer, [n] (%):	25.00
Vertical Unsaturated Infiltration, [Iv] (ft/day):	20.00
Runoff Volume, [V] (cubic feet)	511313.00
Percent Recovery Of Runoff Volume, [PV] (%)	100.00

III. Results

UNSATURATED FLOW

Recovery Time From Unsaturated Flow, [T1] (days): 0.1250
Recovered Volume From Unsaturated Flow, [V1] (ft³): 225000.00

SATURATED FLOW

Recovery Time From Saturated Flow, [T2] (days):	3.8180
Recovered Volume From Saturated Flow, [V2] (ft ³):	286313.00
Maximum Radius Of Influence, [R] (ft):	151.05
Maximum Driving Head, [Hmax] (ft):	13.181
Minimum Driving Head, [Hmin] (ft):	10.000

TOTAL

Total Recovery Time, [T] (days):	3.9430
Total Recovered Volume, [V] (ft³):	511313.00

Retention Pond Recovery Analysis

I. Job Information

Job Name: Cross-Tie R2 40C-42

Engineer: tjm

Date: 1/17/94

II. Input Data

Equivalent Pond Length, [L] (ft):	300.00
Equivalent Pond Width, [W] (ft):	300.00
Pond Bottom Elevation, [PB] (ft above datum):	60.00
Porosity Of Material Within Pond, [p] (%):	100.00

Base Of Aquifer Elevation, [B] (ft above datum):	40.00
Water Table Elevation, [WT] (ft above datum):	50.00
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day)	20.00
Fillable Porosity of Aquifer, [n] (%):	25.00
Vertical Unsaturated Infiltration, [Iv] (ft/day):	20.00

Runoff Volume, [V] (cubic feet)	267530.00
Percent Recovery Of Runoff Volume, [PV] (%)	100.00

III. Results

UNSATURATED FLOW

Recovery Time From Unsaturated Flow, [T1] (days): 0.1250
Recovered Volume From Unsaturated Flow, [V1] (ft³): 225000.00

SATURATED FLOW

Recovery Time From Saturated Flow, [T2] (days): 0.1171
Recovered Volume From Saturated Flow, [V2] (ft³): 42530.00
Maximum Radius Of Influence, [R] (ft): 27.07
Maximum Driving Head, [Hmax] (ft): 10.473
Minimum Driving Head, [Hmin] (ft): 10.000

TOTAL

Total Recovery Time, [T] (days): 0.2421
Total Recovered Volume, [V] (ft³): 267530.00

I. Job Information

Job Name: **XT2 Swales**

Engineer: **tjm**

Date: **1/18/94**

II. Input Data

Equivalent Pond Length, [L] (ft):	100.00
Equivalent Pond Width, [W] (ft):	14.00
Pond Bottom Elevation, [PB] (ft above datum):	80.00
Porosity Of Material Within Pond, [p] (%):	100.00
Base Of Aquifer Elevation, [B] (ft above datum):	40.00
Water Table Elevation, [WT] (ft above datum):	50.00
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day)	20.00
Fillable Porosity of Aquifer, [n] (%):	25.00
Vertical Unsaturated Infiltration, [Iv] (ft/day):	20.00
Runoff Volume, [V] (cubic feet)	2800.00
Percent Recovery Of Runoff Volume, [PV] (%)	100.00

III. Results

UNSATURATED FLOW

Recovery Time From Unsaturated Flow, [T1] (days):	0.1000
Recovered Volume From Unsaturated Flow, [V1] (ft ³):	2800.00

SATURATED FLOW

Recovery Time From Saturated Flow, [T2] (days):	0.0000
Recovered Volume From Saturated Flow, [V2] (ft ³):	0.00
Maximum Radius Of Influence, [R] (ft):	0.00
Maximum Driving Head, [Hmax] (ft):	0.000
Minimum Driving Head, [Hmin] (ft):	0.000

TOTAL

Total Recovery Time, [T] (days):

0.1000

Total Recovered Volume, [V] (ft³):

2800.00

SOIL AUGER BORINGS CROSS-TIE RANCH

