

APPLICATION

1719

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT

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

0 018762

DATE Dec. 8, 1995

RECEIVED FROM Fanner, Bailey & Associates, Inc.

THE SUM OF Emp Ridge PUD Phase III DOLLARS \$ 500.00

FOR app# 4-069-0326A-ERP

AMOUNT OF ACCOUNT \$ 500.-

AMOUNT PAID.....\$ 500.- Thank You!

BALANCE DUE.....\$ ✓

CASH CHECK M.O. CREDIT CARD

BY Lillian Ogueda

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT

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

0 018761

DATE Dec 8, 19 95

RECEIVED FROM Land Holding Adult Orlando

THE SUM OF Emp Ridge, P.O. Phase 111 DOLLARS \$ 2500.00

FOR app # 4-069-0326A-ERP

AMOUNT OF ACCOUNT \$2500.

AMOUNT PAID..... \$2500.

BALANCE DUE..... \$

CASH CHECK M.O. CREDIT CARD

Thank You!

BY Jillian Ogundo

Large Plans in Vaught?

MANAGEMENT AND STORAGE OF SURFACE WATERS INDIVIDUAL
APPLICATION ASSIGNMENT SHEET

Office: ORLANDO Reviewer: ABOODI EUNICE

Date Received: 12/ 8/95 Date Processed: 12/11/95

Application Number: 4-069-0326A-ERP

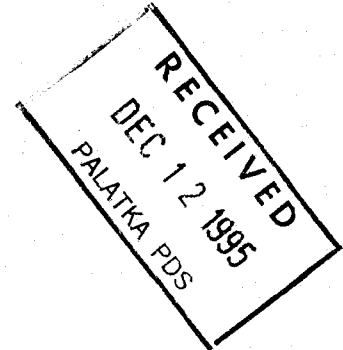
Related Application Number: _____

Owner: CLERMONT GROVES, INC. ET. AL

Applicant: LERNAR ACTIVE ADULT COMMUNITIES

Consultant/Engineer: FARNER BARLEY & ASSOCIATES, INC.

Project Name: KINGS RIDGE, P.U.D., PHASE III



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
- ___ Bound Reports (No. Received: 5)
- ___ Plans (No. Received: 5)
- ___ Calculations (No. Received: 5)
- ___ Notice of Receipt of Application
- ___ Adequate Map Coordinates
- ___ Fee: 2500.00 Receipt Number: 18761

Comments: ADD'L FEE REC'D \$500. REC# 0018762; REC'D NOTICE

Application is administratively complete? YES LO

RAI must be mailed by: 1/ 5/96 Regulatory Meeting: 2/13/96

FOR AGENCY USE ONLY

ACOE Application # _____ SJR Application # _____
 Date Application Received _____ Date Application Received _____
 Proposed Project Lat. _____ Fee Received \$ _____
 Proposed Project Long. _____ Fee Receipt # _____
 Date Received _____ Project Use Codes _____
 Assigned Reviewers _____ Reviewer# 's _____

SECTION A

Are any of the activities described in this application proposed to occur in, on, or over wetlands or other surface waters? ___ yes **XX** no

A. Type of Environmental Resource Permit Requested (check at least one)

- _____ Noticed General - include information requested in Section B.
- _____ Standard General (Single Family Dwelling) - include information requested in Sections C and D.
- _____ Standard General (all other projects) - include information requested in Sections C and E.
- XXX** Individual (Single Family Dwelling) - include information requested in Sections C and D.
- _____ Individual (all other projects) - include information requested in Sections C and E.
- _____ Conceptual - include information requested in Sections C and E.
- _____ Mitigation Bank Permit (construction) - include information requested in Sections C and F.

(If the proposed mitigation bank involves the construction of a surface water management system requiring another permit defined above, check the appropriate box and submit the information requested by the applicable section.)

- _____ Mitigation Bank (conceptual) - include information requested in Sections C and F.
- _____ Standard General Stormwater - include information requested in Sections C and H
- XXX** Individual Stormwater - include information requested in Sections C and H

B. Type of activity for which you are applying (check at least one)

- _____ Construction and operation of a new system including dredging or filling in, on or over wetlands and other surface waters.
- _____ Alteration and operation of an existing system which was not previously permitted by a WMD or DEP.
- _____ Modification of a system previously permitted by a WMD or DEP. Provide previous permit numbers: _____

- ___ Alteration and operation of a system ___ Extension of permit duration
- ___ Abandonment of a system **XXX** Construction and operation of additional phases of a system
- ___ Removal of a system

C. Are you requesting authorization to use State Owned Submerged Lands? ___ yes **XXX** no

(If yes, include the information requested in Section G.)

D. For activities in, on or over wetlands or other surface waters, check type of federal dredge and fill permit requested:

- ___ Individual ___ Programmatic General
- ___ General ___ Nationwide

E. Are you claiming to qualify for an exemption? ___ yes **XXX** no

If yes provide rule number if known _____

RECEIVED

JAN 03 1996
4-069-0326 A-erp

RECORDS
09/11/96

OWNER(S) OF LAND	ENTITY TO RECEIVE PERMIT (IF OTHER THAN OWNER)
NAME CLERMONT GROVES, INC. ET AL	NAME LENNAR ACTIVE ADULT COMMUNITIES
ADDRESS POST OFFICE BOX 770338	ADDRESS 1110 DOUGLAS AVENUE, SUITE 2040
CITY, STATE, ZIP WINTER GARDEN, FLORIDA 34777	CITY, STATE, ZIP ALTAMONTE SPRINGS, FLORIDA 32714
COMPANY AND TITLE	COMPANY AND TITLE ATTENTION: MARSHALL AMES, REGIONAL PRESIDENT
TELEPHONE (407) 656-2291 FAX ()	TELEPHONE (407) 682-9291 FAX ()
AGENT AUTHORIZED TO SECURE PERMIT (IF AN AGENT IS USED)	CONSULTANT (IF DIFFERENT FROM AGENT)
NAME	NAME ROBERT E. FARNER, P.E. #31950
COMPANY AND TITLE	COMPANY AND TITLE FARNER BARLEY & ASSOCIATES, INC.
ADDRESS	ADDRESS 350 NORTH SINCLAIR AVENUE
CITY, STATE, ZIP	CITY, STATE, ZIP TAVARES, FLORIDA 32778
TELEPHONE () FAX ()	TELEPHONE (352) 343-8481 FAX (352) 343-8495
<p>Name of project, including phase if applicable <u>KINGS RIDGE PUD PHASE III</u></p> <p>Is this application for part of a multi-phase project? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no</p> <p>Total applicant-owned area contiguous to the project <u>968.44</u> ac</p> <p>Total project area for which a permit is sought <u>299.27</u> ac</p> <p>Impervious area for which a permit is sought <u>22.3</u> ac</p> <p>What is the total area (metric equivalent for federally funded projects) of work in, on, or over wetlands or other surface waters?</p> <p><u>0</u> acres <u> </u> square feet <u> </u> hectares <u> </u> square meters</p> <p>If a docking facility, the number of proposed new slips <u>N/A</u></p> <p>Project location (use additional sheets, if needed)</p> <p>County(ies) <u>LAKE</u></p> <p>Section(s) <u>3, 4, 9 & 10</u> Township(s) <u>23S</u> Range(s) <u>26E</u></p> <p>Section(s) <u> </u> Township(s) <u> </u> Range(s) <u> </u></p> <p>Land Grant name, if applicable <u>N/A</u></p> <p>Tax Parcel Identification Number <u>1412269, 1412285, 1412072 & 1462193</u></p> <p>Street address, road, or other location <u>US HIGHWAY 27/441 AND HARTWOOD MARSH ROAD</u></p> <p>City, Zip Code if applicable <u>N/A</u></p>	

Describe, in general terms, the proposed project, system or activity.

RESIDENTIAL SUBDIVISION WITH A TOTAL OF 145 LOTS, ROADWAY EXTENSIONS, 11 HOLES OF GOLF FOR A FUTURE 18 HOLE GOLF COURSE, GOLF COURSE MAINTENANCE FACILITY MASS GRADING OF PROJECT, AND RELATED DRAINAGE FACILITIES.

If there have been any pre-application meetings, including at the project site, with regulatory staff, please list the date(s), location(s), and names of key staff and project representatives.

ALEX ABOODI 9/21/95 (ORLANDO FIELD OFFICE)

Please identify by number any MSSW/Wetland Resource/ERP/ACOE permits pending, issued or denied for projects at the location and any related enforcement actions.

Agency	Date	No. \ Type of Application	Action Taken (Pending/Issued/Denied)
<u>SJRWMD</u>	<u>6/28/95</u>	<u>42-069-1062N</u>	<u>ISSUED</u>
<u>SJRWMD</u>	<u>10/11/95</u>	<u>40-069-0196</u>	<u>ISSUED</u>

Note: The following information is required for projects proposed to occur in, on or over wetlands or other surface waters that need a federal dredge and fill permit and/or authorization to use state owned submerged lands. Please provide the names, addresses and zip codes of property owners whose property directly adjoins the project (excluding applicant). Please attach a plan view showing the owner's names and adjoining property lines. Attach additional sheets if necessary.

1. _____
2. _____
3. _____
4. _____

By signing and submitting this application form, I am applying, or I am applying on behalf of the applicant, for the permit and any proprietary authorizations identified above, according to the supporting data and other incidental information filed with this application. I am familiar with the information contained in this application, and represent that such information is true complete and accurate. I understand this is an application and not a permit, and work prior to approval is a violation. I understand that this application and any permit issued or proprietary authorization issued pursuant thereto, does not relieve me of any obligation for obtaining any other required federal, state, water management district or local permit prior to commencement of construction. I agree, or I agree on behalf of my corporation, to operate and maintain the permitted system unless the permitting agency authorizes transfer of the permit to a responsible operation entity. I understand that knowingly making any false statement or representation in this application is a violation of Section 373.430, F.S., and 18 U.S.C. Section 1001.

LENNAR ACTIVE ADULT COMMUNITIES

Typed/Printed Name of Applicant (If no Agent is used) or Agent (If one is so authorized below)

Marshall Ames
Signature of Applicant/Agent

Date

MARSHALL AMES, REGIONAL PRESIDENT, LENNAR HOMES, INC.

(Corporate Title if applicable)

AN AGENT MAY SIGN ABOVE ONLY IF THE APPLICANT COMPLETES THE FOLLOWING:

I hereby designate and authorize the agent listed above to act on my behalf, or on behalf of my corporation, as the agent in the processing of this application for the permit and/or proprietary authorization indicated above; and to furnish, on request, supplemental information in support of the application. In addition, I designate and authorize the above-listed agent to bind me, or my corporation, to perform any requirement which may be necessary to procure the permit or authorization indicated above. I understand that knowingly making any false statement or representation in this application is a violation of Section 373.430, F.S., and 18 U.S.C. Section 1001.

Typed/Printed Name of Applicant

Signature of Applicant

Date

(Corporate Title if applicable)

Please note: The applicant's original signature (not a copy) is required above.

PERSON AUTHORIZING ACCESS TO THE PROPERTY MUST COMPLETE THE FOLLOWING:

I either own the property described in this application or I have legal authority to allow access to the property, and I consent, after receiving prior notification, to any site visit on the property by agents or personnel from the Department of Environmental Protection, the Water Management District and the U.S. Army Corps of Engineers necessary for the review and inspection of the proposed project specified in this application. I authorize these agents or personnel to enter the property as many times as may be necessary to make such review and inspection. Further, I agree to provide entry to the project site for such agents or personnel to monitor permitted work if a permit is granted.

Clermont Groves, Inc., Et Al

Typed/Printed Name

[Signature]
Signature

12/19/95
Date

President

(Corporate Title if applicable)

SECTION D
INFORMATION FOR STANDARD GENERAL OR INDIVIDUAL
ENVIRONMENTAL RESOURCE PERMITS FOR PROJECTS RELATED TO A
SINGLE FAMILY DWELLING UNIT

Complete this Section only if your project does not qualify for an exemption or noticed general permit. The information requested below is for projects related to an individual, single family dwelling unit, duplex or quadraplex which is not part of a larger common plan of development proposed by the applicant. Please contact the local office of the DEP or WMD if you are unsure whether your project would fit this description.

PLEASE SUBMIT ALL INFORMATION ON 8 1/2" by 11" PAPER

A. SITE INFORMATION

1. Directions: Provide written directions to the property.
2. Location of work: Indicate how the project will be marked on-site. For example, the center line of the road is flagged, a string running between stakes identifies the bulkhead location, etc.

B. DRAWINGS

Drawings should be of sufficient detail to clearly show the existing conditions of the site, and the extent, type, and location of the proposed activities. The drawings should clearly show wetlands or other surface waters temporarily or permanently impacted. Any wetland areas proposed to be created, enhanced, restored, preserved, or which will remain undisturbed should be clearly identified and labeled. The following drawings are required:

1. PLAN VIEW (TOP VIEW)

This shows the work as viewed from above. A survey of the project site is very useful as a starting point for preparing plan views of the project. Include the following:

- a. Applicant name, property lines, north arrow and graphic scale or dimensions of proposed work on each drawing sheet.
- b. Representative land elevations (spot elevations or contour lines) referred to National Geodetic Vertical Datum (NGVD), as is used on the U.S.G.S. contour maps.
- c. The limits of wetlands, surface waters and open waters in the vicinity of the proposed work. Describe how the wetland limits were determined. If there has ever been a jurisdictional declamatory statement, a formal wetland determination, a formal determination, validated informal determination, or revalidated jurisdictional determination, provide identifying number.
- d. All proposed work, including dredging, filling, or structures. Where possible, differentiate between work in open water, marshes, swamps, tidal flats or uplands.
- e. Show selected water depths in and adjacent to the project site. For dock projects provide water depths at all mooring areas. Water depths should be determined at approximate mean low water (MLW) or seasonal low water. Include the average tidal range (the difference between mean high water (MHW) elevation and MLW elevation) if the project is in a tidal waterbody.

- f. Label all existing structures, such as docks, bulkheads, riprap, or buildings in wetlands or other surface waters at or adjacent to the proposed activity.
- g. If dredging or dewatering is involved, show the location of proposed spoil or dewatering sites. Include any levees, control structures or other methods for retaining or detaining return water. Also include locations of discharge sites where appropriate. **Note: a consumptive or water use permit may be required for dewatering.**
- h. For piling supported structures over wetlands or other surface waters, show the entire structure and indicate the location of any aquatic vegetation in the vicinity of the proposed structure.
- i. Show distance between the most waterward point of the proposed facility and the nearest edge of any navigation channel, where appropriate. If the project is on a waterway that has a federally maintained channel, a survey may be required to establish the distance from the waterward points of the structure to the near edge of the federal channel. Also indicate the width of the waterway.
- j. Clearly show the locations of all corresponding cross-sectional or profile views on the plan view drawings.

2. CROSS-SECTIONAL AND PROFILE VIEWS

The cross-sectional view should show a "cut-away" end or middle view of the project, while the profile view should show a side view as if cut length-wise. All drawings should include:

- a. Applicant name and graphic horizontal and vertical scales or dimensions of proposed work on each drawing sheet.
- b. Show approximate mean or seasonal (high and low) water line elevations referenced to NGVD.

C. PROJECT DETAILS

Provide a detailed description of the proposed project, including the following:

1. The type of activity that is proposed, how the activity will be conducted, and construction techniques and sequencing including equipment to be used, and methods for moving the equipment to and from the site. For projects that involve any dredging or excavation, describe the method of excavation, the type of material to be excavated, and the disposal location for the excavated material. Please state whether spoil is to be placed (either temporarily or permanently) in a wetland or other surface water. Indicate the time period that any temporary work will be in place.
2. The acreage of excavation and fill and differentiating between temporary and permanent work.
3. Methods for controlling turbidity (muddy water caused by erosion or work in the water).
4. Methods for stabilizing any slopes that will be created or disturbed during construction, including times expected to elapse before stabilization is performed. Describe both temporary and permanent stabilization methods such as staked hay bales, temporary grass seed, and permanent sod.

5. If pilings or a seawall are to be installed, state whether pilings and seawall slabs are to be installed by jetting or driving.
6. For fill projects, describe the source and type of fill material to be used. For activities that involve the installation of riprap, describe the source, type and size of the rocks, concrete, or other material to be used for the riprap, and how these materials are to be placed. State whether the rocks will be underlain with filter cloth.

D. SPECIAL BASIN INFORMATION

1. Wekiva River Basin-For projects within the Wekiva River Basin (basin boundary defined in chapter 40C-41, F.A.C) provide design analysis to demonstrate compliance with Wekiva River Basin criteria, including:
 - a. Pre- and post-development recharge from the project area;
 - b. Location and volume of encroachment within the 100-year floodplain, and plan for compensating storage;
 - c. Detailed erosion and sediment control plan when the project is within the Water Quality Protection Zone or if the project exceeds 120 acres;
 - d. Estimated pre- and post-development ground water table levels when any part of the project is located within the Water Quantity Protection Zone;
 - e. Delineation and assessment of the Riparian Habitat Protection Zone; and
 - f. Submittal of the Local Government Notification form when any part of the system/project is within the Wekiva River Protection Area.
2. Econlockhatchee River Basin-For projects within the Econlockhatchee River Basin (basin boundary defined in chapter 40C-41, F.A.C.) provide design analysis to demonstrate compliance with Econlockhatchee River Basin criteria, including:
 - a. Pre- and post-development runoff hydrograph for the mean annual and 25-year design storm;
 - b. Location and volume of encroachment within the 100-year floodplain, and plan for compensating storage;
 - c. Systems which serve a drainage area in excess of 10 acres must satisfy the Stormwater Management Standard; and
 - d. Delineation and assessment of the Riparian Habitat Protection Zone and impacts.
3. Upper St. Johns River Hydrologic Basin and Ocklawaha River Hydrologic Basin-For projects located within the Upper St. Johns River Hydrologic Basin and Ocklawaha River Hydrologic Basin (basin boundaries defined in chapter 40C-41, F.A.C.), provide:
 - a. Pre- and post-development runoff hydrograph analysis for the 10-year and 25-year design storm; and
 - b. For systems using pump discharges, provide pre- and post-development total runoff volume for the 96-hour storm duration.

SECTION H
INFORMATION FOR ENVIRONMENTAL RESOURCE STORMWATER PERMITS

Provide the information requested below if the proposed project requires an environmental resource stormwater permit.

I. General Permit Category: Projects which meet one of the following performance criteria qualify for a general permit. If applicable, indicate the appropriate general permit category below:

a) Systems which discharge into a stormwater management system which is permitted pursuant to Paragraphs 40C-42.024(2)(b), (c), or (d), F.A.C., or Subsection 40C-42.024(3), F.A.C., or which was previously approved pursuant to a noticed exemption under Section 17-25.030, F.A.C., where the appropriate treatment criteria specified in this chapter and applied to the permitted or exempt system are not exceeded by the discharge: or.

b) Systems which meet the applicable design and performance standards of Section 40C-42.025, F.A.C., and which comply with any or more of the following:

1. dry detention systems within project areas less than 5 acres in size, and which serve a drainage area less than 5 acres in size and which meet the criteria of Subsection 40C-42.026(1), F.A.C.:

2. retention systems which meet the criteria of Subsection 40C-42.026(2), F.A.C.:

3. underdrain systems which meet the criteria of Subsection 40C-42.026(3), F.A.C.:

4. underground exfiltration trench systems which meet the criteria of Subsection 40C-42.026(4), F.A.C.:

5. wet detention systems which meet the criteria of Subsection 40C-42.026(5), F.A.C.: or

6. swale systems which meet the criteria of Subsection 40C-42.026(6), F.A.C.: or.

c) Systems that include a combination of management practices including but not limited to retention basins, swales, pervious pavement, landscape or natural retention storage that will provide for the percolation of the runoff from a three-year one-hour design storm: or.

d) Modification or reconstruction by a city, county, state agency, or special district with drainage responsibility of an existing stormwater management system which is not intended to increase the original design capacity, and which will not increase pollution loading, or change points of discharge in a manner that would adversely affect the designated uses of waters of the State: or.

e) Paving of existing public dirt roads if all of the following are met:

1. the road will not serve new development:

2. additional traffic lanes are not added to the road:

3. the traffic load is not expected to significantly increase:

4. the drainage system serving the road is not significantly altered:

5. erosion and sediment control measures are utilized to prevent turbidity during construction:
and,

6. the project does not require a wetland resource management (dredge and fill) permit pursuant to Chapter 17-312, F.A.C.

Individual Permit Categories: If applicable, indicate the appropriate permit category below.

- a) Wetlands stormwater management systems which meet the design and performance criteria in Sections 40C-42.025 and 40C-42.0265, F.A.C.; or,
- b) Systems which employ a treatment methodology or device other than those described in Subsections 40C-42.024(2) or (3), F.A.C.; or,
- c) Systems which do not meet the applicable design criteria of Sections 40C-42.025, 40C-42.026, or 40C-42.0265, F.A.C.

Required Technical Information

All applicable technical information must be submitted with the completed application form. Failure to provide all required information will result in a delay in application processing and permit issuance.

A. General site conditions

- 1. Recent aerial photo of project site (no photocopies) - 1" to 400' scale maximum;
- 2. Map(s) or applicable construction plan(s) (no larger than 24" X 36") showing:
 - a. General location of project shown on USGS quad map(s), including points of discharge;
 - b. Project area boundary;
 - c. Pre-development (existing) topography;
 - d. Pre-development drainage patterns including points of discharge for existing site drainage and drainage basin boundaries;
 - e. Off-site drainage area and flow patterns across project site;
 - f. Location of existing drainage right-of-way or easements on-site;
 - g. Location of private and public water supply wells on-site; and
 - h. All wetlands on the site;
- 3. SCS soils map and report and/or soil boring data for treatment facility locations (borings should be a minimum 6 ft. depth below ground surface and 5 ft. below proposed treatment facility bottom);
- 4. Water table data
 - a. Date, location, and water table level of actual measurements (if collected) with the estimated depth of antecedent rainfall (nearest NOAA rainfall station or other rain gage) during the previous one month period; and
 - b. Estimated normal dry and wet season water table elevation (provide source or method of estimate).

B. Post-development project conditions

1. Describe or document the legal outfall for point discharges of treated stormwater to adjacent property;
2. Identify and describe all on-site and off-site stormwater management systems which discharge into or receive discharge from the proposed project;
3. Provide the design tailwater elevation(s) at all points of discharge (include source or method of estimate);
4. Include the following on construction drawings for the project site:
 - a. Project land use and land cover;
 - b. Proposed construction, including erosion and sediment control plan for each phase (show specifications for erosion/sediment control measures on plans);
 - c. Vegetative cover plan for all on-site and off-site earth surfaces disturbed by construction;
 - d. Legal reservations for access to the treatment system for maintenance and operation by future maintenance entities for subdivided projects;
 - e. Provide locations for the following on construction plans:
 - (1) Drainage divide and area (in acres) served by each hydraulically separate stormwater treatment system;
 - (2) Septic tank or other proposed on-site wastewater treatment facility; and
 - (3) Wells and surface water withdrawals;
 - f. Provide plans, elevations and/or profiles, and details for the following:
 - (1) Roadway and parking pavements;
 - (2) Floor slabs, walkways and other paved surfaces;
 - (3) Earthwork grades for pervious landscaped areas; and
 - (4) All stormwater treatment and drainage facilities.
 - (5). Show the following details for stormwater treatment systems construction plans:
 - a. All treatment systems:
 - (1) Show the elevation of normal wet season water table, design normal water elevation, and elevations for storage of the treatment volume;
 - (2) Details of oil and grease control mechanism, if required;
 - (3) Details of the outlet and overflow control structure; and

(4) Details of treatment drawdown outlets. Show the design tailwater elevations on the outlet details: and

(5) The minimum erosion and sediment control measures to be implemented during construction and all permanent control measures in post-development conditions:

b. Retention/detention facilities (including swales designed for retention/detention treatment only):

(1) Plan contours and/or cross section details showing bottom contours and elevations, all design dimensions, side slopes, and top of bank elevations; and

(2) Grassing or planting of all treatment system earth surfaces:

c. Exfiltration trench:

(1) Trench dimensions and elevations:

(2) Pipe diameter, material, length, slope, perforation specification:

(3) Trench rock material with fillable porosity and filter fabric protection:

(4) Overflow elevation for trenches with outfall:

(5) Inlet and outlet structure details including sediment sumps; and

(6) Design and location of observation well(s):

d. Underdrain and filter systems:

(1) Pipe length, slope, diameter, and minimum and maximum inverts:

(2) Maintenance access (such as at-grade cleanouts) for the filter pipe:

(3) Permeability of filter media for filtration systems:

(4) Permeability of soils for underdrain systems:

(5) Filter media gradation (uniformity coefficient and effective grain size) for filtration systems:

(6) Underdrain or filter detail at a uniform horizontal and vertical scale no greater than 1 inch 5 feet (to scale, not typical):

(7) Permeable, protective and stable surface cover (at the surface slope) for the filter surface (such as gravel); and

(8) Filter fabric protection as applicable for perforated pipes, coarse aggregate sections, and round the filter section:

e. Wet detention systems:

(1) Littoral zone location and depths: and

(2) Elevation contours of pond bottom;

f. Wetland stormwater management systems:

(1) Delineation of wetland areas utilized for stormwater treatment;

g. Karst Sensitive Areas

(1) Geologic borings and geologic sections through the retention basin area. A geologic boring should be performed at the point of maximum excavation within the basin;

(2) Location and description of limestone outcrops and any karst features, i.e., sinkholes or solution pipes which exist at the project site; and

(3) Inventory of existing wells within a 1000 foot radius of the stormwater basin;

6. Design analysis/calculations (minimum required):

a. Provide the rational method runoff coefficient (c), drainage area, and impervious area (percentage of total drainage area) for each treatment system;

b. Calculate treatment volume required for each separate system (based on information in 5.a. above);

c. Provide stage-storage tabulations to demonstrate that required treatment storage is available in the treatment system below the overflow elevation;

d. Demonstrate 72 hour drawdown for retention, filtration, underdrain, or exfiltration trench systems based on natural soil conditions and/or specified filter media (with safety factor of 2 for filtration, underdrain, and exfiltration). Calculations must consider normal wet season water table and tailwater conditions to demonstrate recovery;

e. Demonstrate that the function of the proposed treatment systems does not adversely affect the treatment performance of all other stormwater management systems which serve or are served by the proposed project;

f. Demonstrate no more than half the treatment volume is discharged within 48 to 60 hours following a storm event for wet detention and wetland stormwater management systems;

g. Design analysis for sizing wet detention permanent pool volume;

h. Describe any additional management practices such as pretreatment, which will be used to enhance the water quality of the stormwater discharge; and

i. Peak discharge and conveyance calculations (if appropriate) for pre-development and post-development conditions as follows:

(1) Runoff characteristics, including area, runoff curve number or runoff coefficient, SCS hydrologic soil group, and time of concentration for each drainage hydrologic unit;

(2) Design storms used including duration, frequency, and time distribution;

- (3) Runoff hydrograph(s) for each drainage basin for all required design storm events;
- (4) State-storage computations for any storage area, such as a detention area or channel storage, used in storage routing;
- (5) Stage-discharge computations for any storage areas at a selected control point, such as structure control or natural restriction;
- (6) Flood routings through on-site conveyance and storage areas;
- (7) Water surface profiles and elevations in the primary surface water management system for the required design storm event(s); and
- (8) Runoff peak rates and volumes discharged from the system for the design storm event(s);

7. Operation and maintenance

- a. Describe the overall maintenance and operation schedule for the proposed stormwater treatment system;
- b. If the proposed operation and maintenance entity is not a property owners association, provide proof of the existence of an entity or the future acceptance of the system by an entity, pursuant to Paragraphs 40C-42.027, (1)(a)-(d), F.A.C., which will operate and maintain the system;
- c. If a property owners association is the proposed operation and maintenance entity, provide articles of incorporation for this association and the declaration, restrictive covenants, deed restrictions or other operational documents that assign responsibility for the operation and maintenance of the system, pursuant to 40C-42.027(4), F.A.C.; and
- d. Provide information to ensure the continued adequate access to stormwater treatment systems for maintenance purposes;

8. Alternative stormwater treatment (individual permit)

If equivalent treatment is to be provided, it is the applicant's responsibility to demonstrate that the stormwater management system, as designed, will meet or exceed the requirements set forth in the rule. Describe the subject stormwater discharge system. Discuss how the design is intended to achieve a treatment level equivalent to the design and performance criteria in Subparagraph 40C-42.024(2)(b)2. or Subsection 40C-42.024(4), F.A.C. Provide design analysis and calculations necessary to demonstrate that equivalent treatment will be achieved.

9. Wekiva River Basin (if applicable)

Submit the Local Government Notification form when any part of the system/project is within the Wekiva River Protection Area.

Note: If professional engineering, geology, or landscape architecture is required by Florida Statute for the design of the proposed stormwater management system, construction plans and calculations must be signed and sealed by an appropriate professional registered in the State of Florida.

SECTION C
ENVIRONMENTAL RESOURCE PERMIT NOTICE OF RECEIPT OF APPLICATION

This information is required in addition to that required in other sections of the application. Please submit five copies of this notice of receipt of application and all attachments. Please submit all information on 8 1/2" x 11" paper.

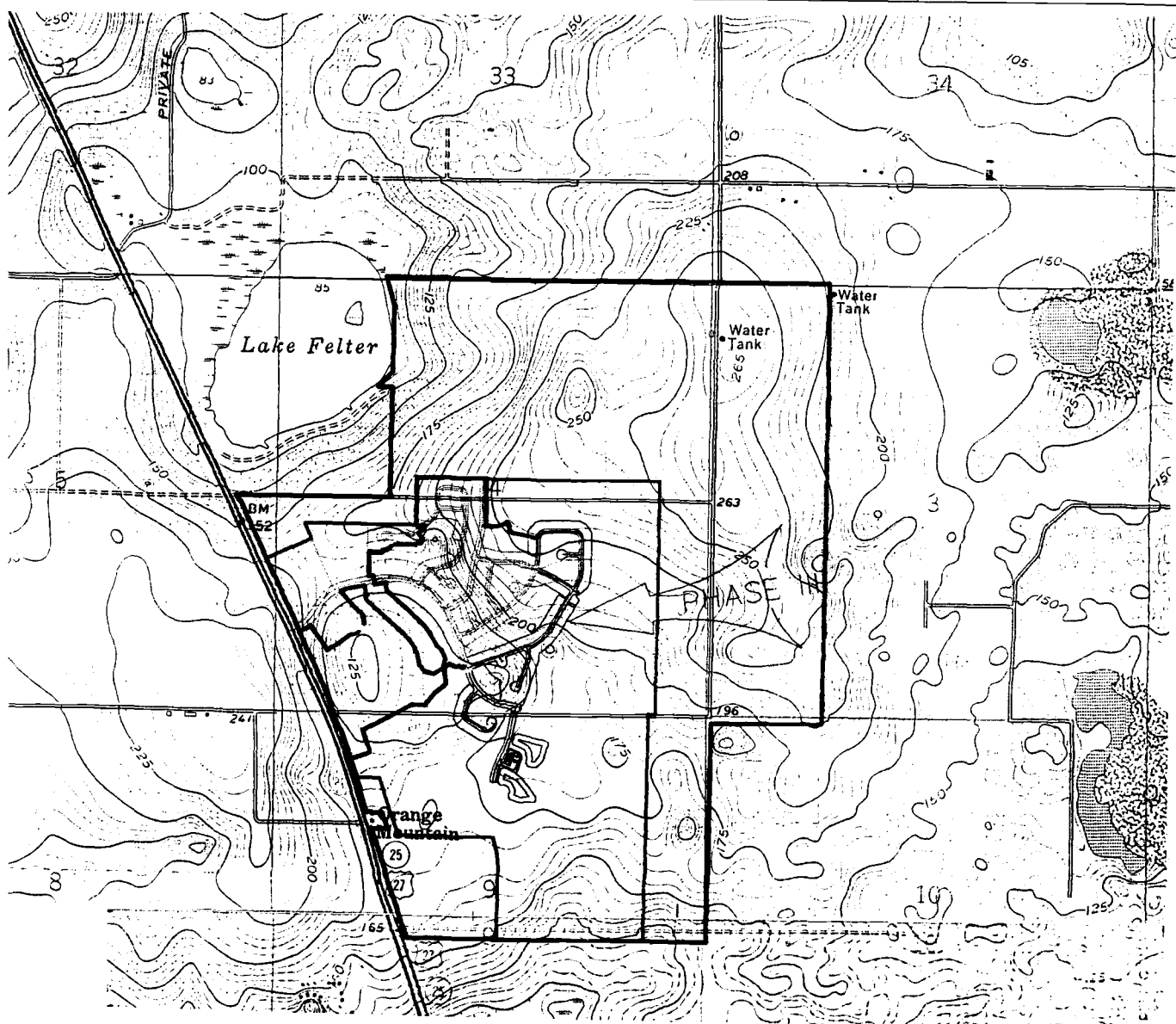
Project Name: Kings Ridge Phase III County: Lake
Owner: Clermont Groves, Inc.
Applicant: Lennar Active Adult Communities
Applicant's Address: 1110 Douglas Avenue; Suite 2040
Altamonte Springs, Florida 32714

1. Indicate the project boundaries on a USGS quadrangle map reduced or enlarged as necessary to legibly show the entire project. If not apparent from the quad map, attach a location map showing a north arrow and a graphic scale; Section(s), Township(s), and Range(s); and sufficient detail to allow a person unfamiliar with the site to find it.
2. Provide the names of all wetlands, or other surface waters that would be dredged, filled, impounded, diverted, drained, or would receive discharge (either directly or indirectly) or otherwise be impacted by the proposed activity, and specify if they are in an Outstanding Florida Water or Aquatic Preserve:
None
3. Attach a depiction (plan and section views), which clearly shows the works or other facilities proposed to be constructed. Use a scale sufficient to show the location and type of works. Use multiple sheets, if necessary.
4. Briefly describe the proposed project (such as "construct a deck with boatshelter", "replace two existing culverts", "construct surface water management system to serve 150 acre residential development"):
Construct a surface water management system to serve a 145 lot residential development, 11 holes of golf, golf course maintenance facility and mass grading
5. Specify the acreage of wetlands or other surface waters, if any, that are proposed to be disturbed, filled, excavated, or otherwise impacted by the proposed activity:
None
6. Provide a brief statement describing any proposed mitigation for impacts to wetlands and other surface waters (attach additional sheets if necessary):
N/A

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DEC 18 1994
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ORLANDO

Kings Ridge PUD Phase III

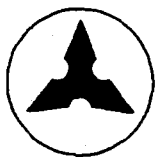
FOR AGENCY USE ONLY	
Application Name:	
Application Number:	<u>4-064</u>
Office where the application can be inspected:	<u>Orlando</u>
Date to be posted:	<u>12-13-94</u>
Date to be removed:	<u>12-27-94</u>



SCALE 1" = 2000'

SECTION 4 & 9
 TOWNSHIP 23 S
 RANGE 26 E

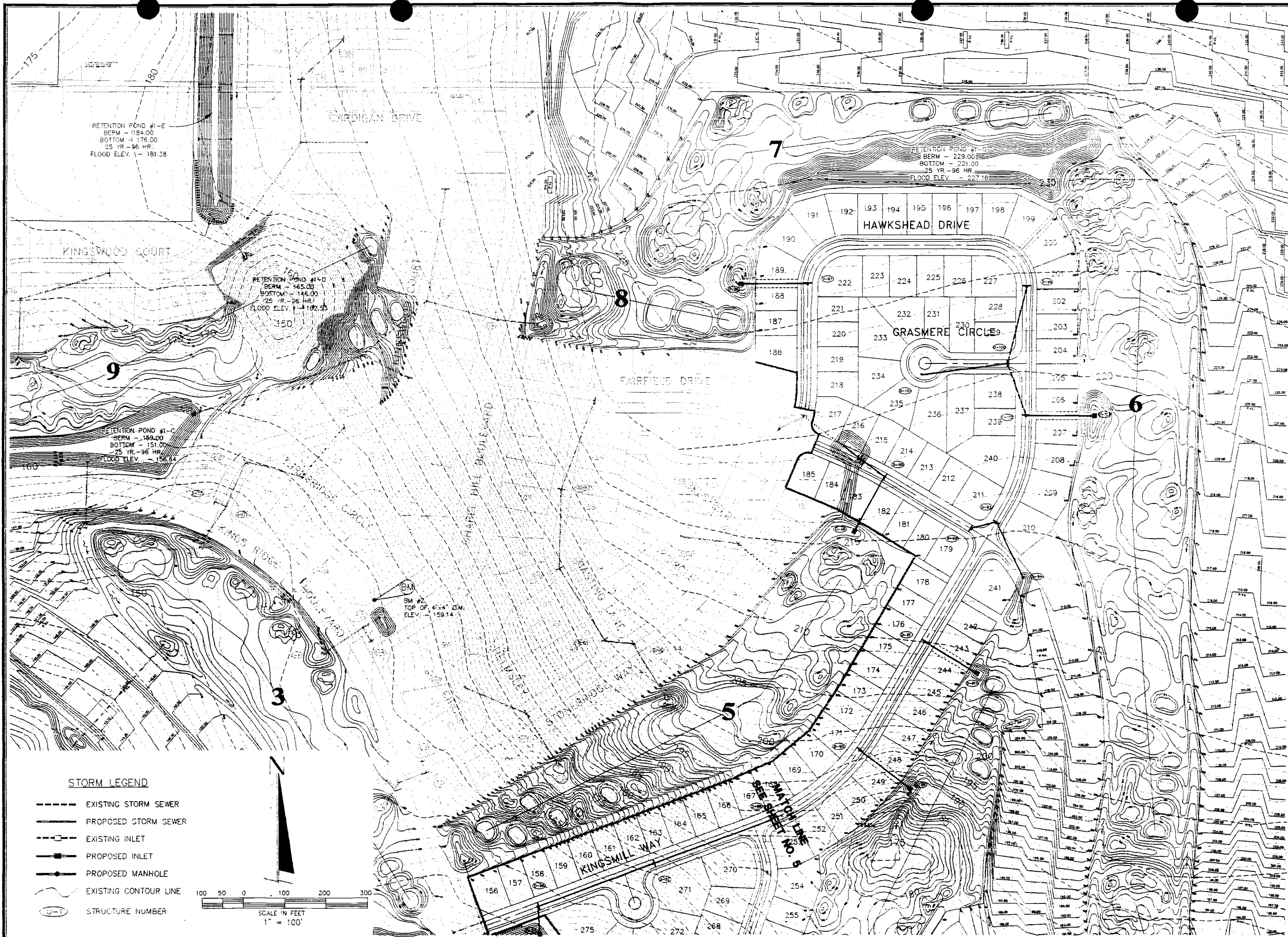
CLERMONT-EAST
 LAKE LOUISA



**FARNER
 BARLEY**
 AND ASSOCIATES, INC.

- ▲ ENGINEERS
- ▲ SURVEYORS
- ▲ PLANNERS

350 North Sinclair Avenue O Tavares, Florida 32778 O (904) 343-8481



RETENTION POND #1-E
 BERM - 184.00
 BOTTOM - 176.00
 25 YR - 96 HR.
 FLOOD ELEV. - 181.38

RETENTION POND #1-D
 BERM - 165.00
 BOTTOM - 146.00
 25 YR - 96 HR.
 FLOOD ELEV. - 162.53

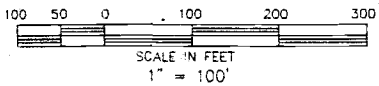
RETENTION POND #1-C
 BERM - 159.00
 BOTTOM - 151.00
 25 YR - 96 HR.
 FLOOD ELEV. - 156.64

RETENTION POND #1-F
 BERM - 229.00
 BOTTOM - 221.00
 25 YR - 96 HR.
 FLOOD ELEV. - 227.16

BM #2
 TOP OF 4" DIA. C.M.
 ELEV. - 159.14

STORM LEGEND

- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- - - EXISTING INLET
- - - PROPOSED INLET
- PROPOSED MANHOLE
- ~ EXISTING CONTOUR LINE
- (U-1) STRUCTURE NUMBER



REVISIONS	DATE

ENGINEERS
 SURVEYORS
 PLANNERS

**FARNER
 BARLEY**
 AND ASSOCIATES, INC.

350 North Sinclair Avenue O Favares, Florida 32778 C (904) 343-8481

**KINGS RIDGE P.U.D. PHASE III
 STORM DRAINAGE
 MASTER PLAN**

DATE 9-1-95
 JOB NO. 941716.009
 DWG. NO. P3STORM1
 F.B. PG
 DRAWN BY DLB
 CHKD BY

SHT. 4 OF 34



4

2

RETENTION POND
CLAY CORE DETAIL

RETENTION POND
500 POND SIDE SLOPE
& SEED & MULCH BOTTOM

VARE'S
(500) BERM
(500)

EXIST. GRADE

2" WIDE CLAY CORE COMPACTED
@ 98% DENSITY IN THE LOCATIONS
AS SHOWN ON SHEETS 4 & 5.

CONST. CLAY CORE
(SEE DETAIL THIS SHEET)

CONST. TYPE "J" BOTTOM
ALT. B #10-76
GRATE - 173.50
INV. - 176.00

CONSTRUCT PAVED END SECTION #0-72
F.D.O.T. INDEX #270
* FIELDSTONE SPLASH PAD
INVERT 122.50

STORM LEGEND

- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- EXISTING INLET
- PROPOSED INLET
- PROPOSED MANHOLE
- EXISTING CONTOUR LINE
- (B-1) STRUCTURE NUMBER

RETENTION POND #1-1
BERM - 147.00
BOTTOM - 139.00
25 YR - 96 HR.
FLOOD ELEV. - 146.74

RETENTION POND #1-1
BERM - 150.00
BOTTOM - 142.00
25 YR - 96 HR.
FLOOD ELEV. - 149.33

RETENTION POND #1-10A
BERM - 178.00
BOTTOM - 170.00
25 YR - 96 HR.
FLOOD ELEV. - 175.14

RETENTION POND #1-1
BERM - 180.00
BOTTOM - 168.00
D.L.W. - 176.00
25 YR - 96 HR.
FLOOD ELEV. - 176.73

RETENTION POND #1-1
BERM - 180.00
BOTTOM - 168.00
D.L.W. - 176.00
25 YR - 96 HR.
FLOOD ELEV. - 176.73

RETENTION POND #1-1
BERM - 184.00
BOTTOM - 178.00
25 YR - 96 HR.
FLOOD ELEV. - 183.24

RETENTION POND #1-1
BERM - 190.00
BOTTOM - 182.00
25 YR - 96 HR.
FLOOD ELEV. - 187.61

CONST. TYPE "J" BOTTOM
ALT. B #0-116
GRATE - 182.00
INV. - 175.50

CONST. 37.50 L.F. OF
42" R.C.P. @ 1.18%

CONST. 166.29 L.F. OF
42" R.C.P. @ 1.18%

CONST. TYPE "E" INLET #0-119
GRATE - 180.00
INV. - 171.84

CONST. 242.74 L.F. OF
42" R.C.P. @ 1.18%

CONST. TYPE "J" BOTTOM #0-117
REDUCER SLAB FOR FUTURE
TYPE "J-6" INLET
GRATE - 183.00
INV. - 174.24

CONST. TYPE "J" BOTTOM #0-118
REDUCER SLAB FOR FUTURE
TYPE "J-6" INLET
GRATE - 183.00
INV. - 175.80

CONSTRUCT PAVED END SECTION #0-72
F.D.O.T. INDEX #270
* FIELDSTONE SPLASH PAD
INVERT 122.50

REMOVE EXIST. PAVED ROAD
FROM THIS POINT TO THE
WEST END OF ROAD.

**KINGS RIDGE P.U.D. PHASE III
STORM DRAINAGE
MASTER PLAN**

DATE 9-1-95
JOB NO. 941218.009
DWG. NO. P33STORM2
F.B. PG.
DRAWN BY DLB
CHKD BY

SHT 5 OF 34

ENGINEERS
SURVEYORS
PLANNERS

**FARNER
BARBLEY
AND ASSOCIATES, INC.**

350 North Star Avenue O. Tallahassee, Florida 32378 O (904) 343-8481

REVISIONS
DATE



PHASE 3
PHASE 2

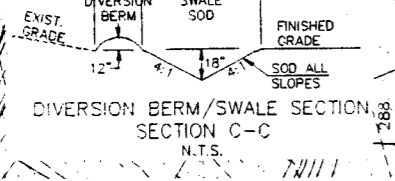
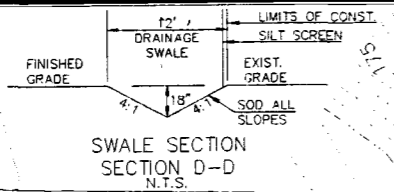
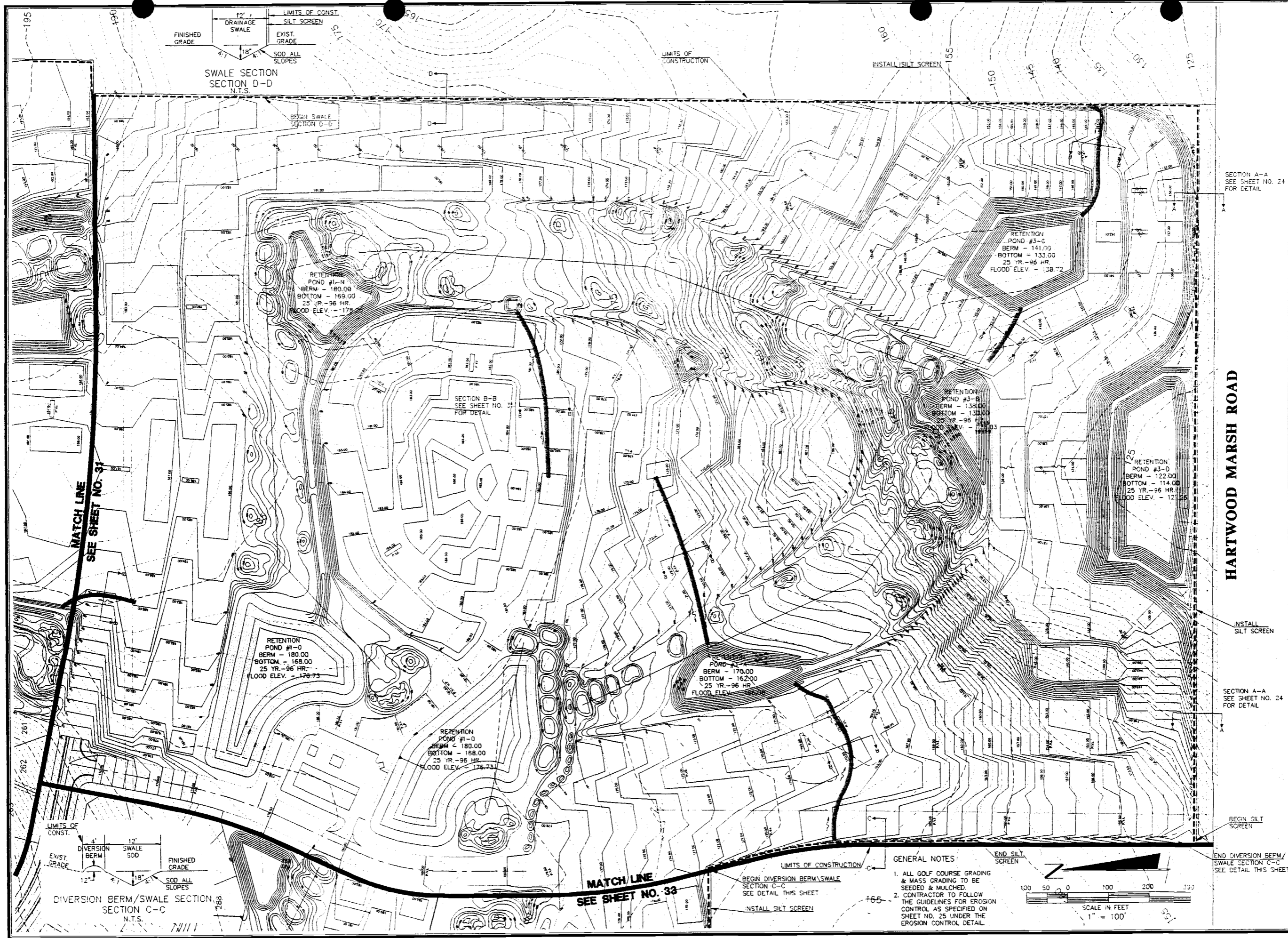
SCALE IN FEET
0 50 100

GENERAL NOTES
 1. ALL GOLF COURSE GRADING & MASS GRADING TO BE SEED & MULCHED.
 2. CONTRACTOR TO FOLLOW THE GUIDELINES FOR EROSION CONTROL AS SPECIFIED ON SHEET NO. 25 UNDER THE EROSION CONTROL DETAIL.

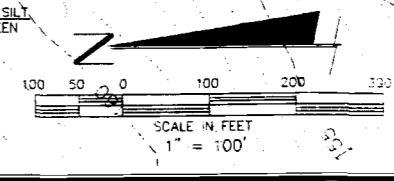
DATE	10-5-95
JOB NO.	941216.009
DWG. NO.	P3GR4
F.B.	PG.
DRAWN BY	DLB
CHKD BY	
SHT.	31 OF 34

KINGS RIDGE P.U.D. PHASE III
MASS GRADING PLAN

FARNER BARLEY AND ASSOCIATES, INC.
 ENGINEERS SURVEYORS PLANNERS
 350 North Sinclair Avenue O. Toivonen, Florida 32778 O (904) 343-8481



- GENERAL NOTES:
1. ALL GOLF COURSE GRADING & MASS GRADING TO BE SEED & MULCHED.
 2. CONTRACTOR TO FOLLOW THE GUIDELINES FOR EROSION CONTROL AS SPECIFIED ON SHEET NO. 25 UNDER THE EROSION CONTROL DETAIL.



SECTION A-A
SEE SHEET NO. 24
FOR DETAIL

HARTWOOD MARSH ROAD

INSTALL SILT SCREEN

SECTION A-A
SEE SHEET NO. 24
FOR DETAIL

BEGIN SILT SCREEN

END DIVERSION BERM/
SWALE SECTION C-C
SEE DETAIL THIS SHEET

REVISIONS

NO.	DATE	DESCRIPTION

ENGINEERS
SURVEYORS
PLANNERS

FARNER BARBLEY AND ASSOCIATES, INC.

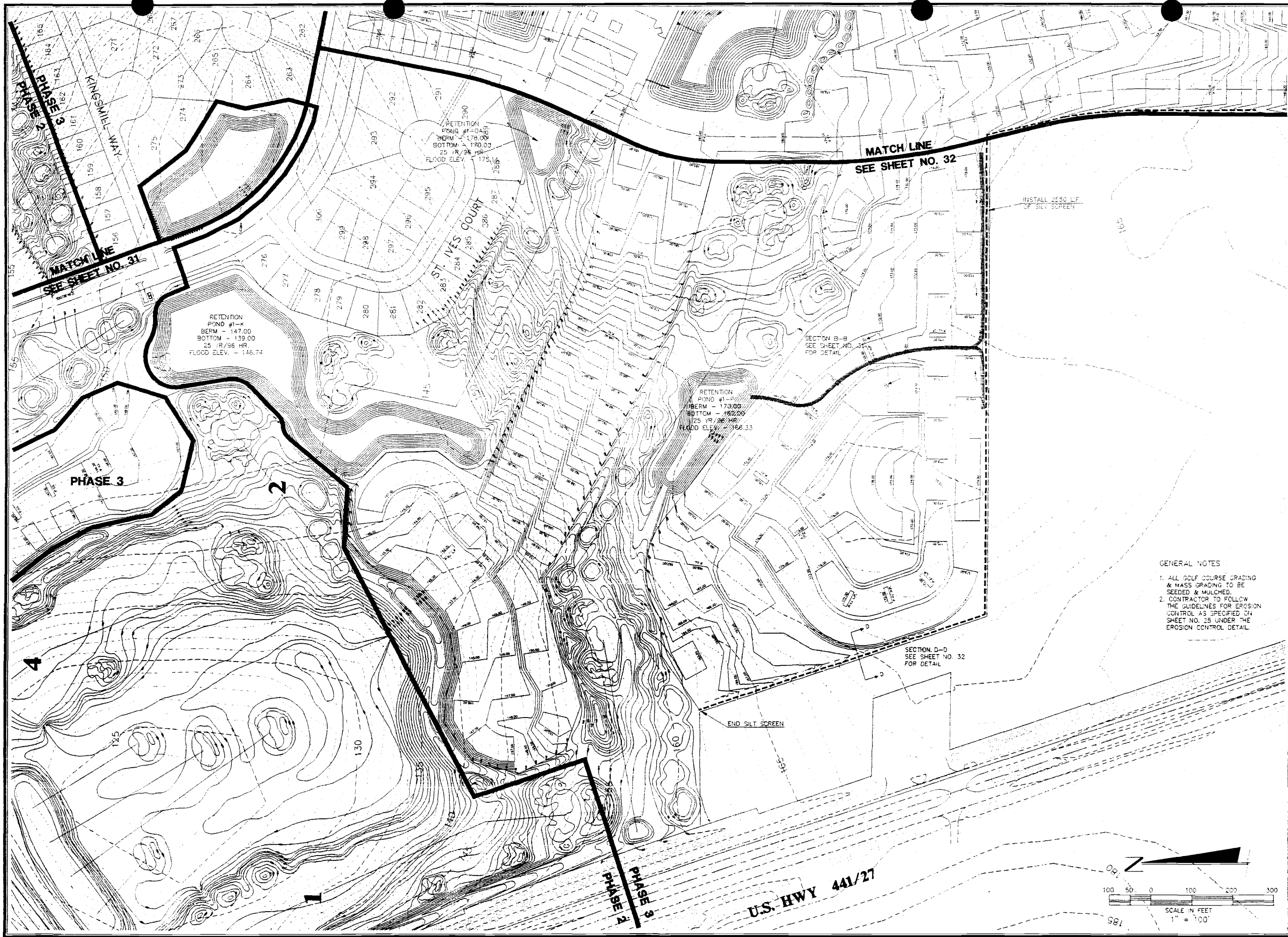
350 North Sinclair Avenue • Tallahassee, Florida 32378 • (904) 343-8481

KINGS RIDGE P.U.D. PHASE III

MASS GRADING PLAN

DATE 10-5-95
JOB NO. 941216.009
DWG. NO. P3GR5
F.B. PG.
DRAWN BY DLB
CHKD BY

SHT. 32 OF 34



REVISIONS

ENGINEERS
SURVEYORS
PLANNERS

**FARNER
BARBER
AND ASSOCIATES, INC.**

550 North Shiloh Avenue • Tallahassee, Florida 32378 • (904) 343-6461

KINGS RIDGE P.U.D. PHASE III

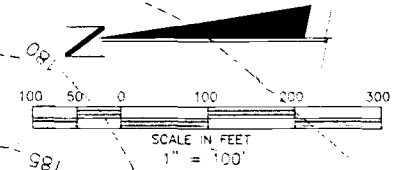
MASS GRADING PLAN

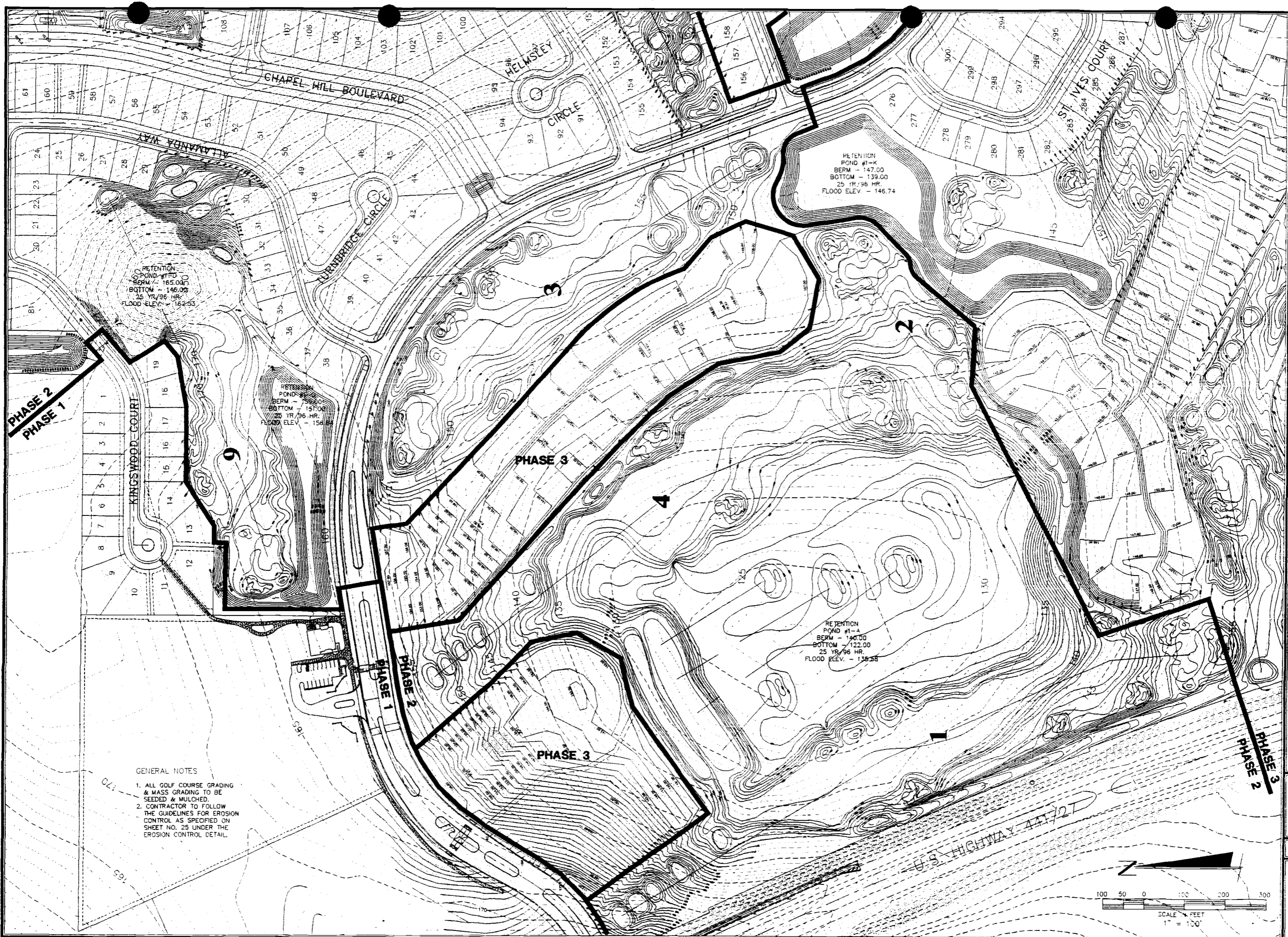
DATE 10-5-95
JOB NO. 941216.009
DWG. NO. P3GR6
F.B. PG.
DRAWN BY DLB
CHKD BY

SHT. 33 OF 34

GENERAL NOTES

- ALL GOLF COURSE GRADING & MASS GRADING TO BE SEEDED & MULCHED.
- CONTRACTOR TO FOLLOW THE GUIDELINES FOR EROSION CONTROL AS SPECIFIED ON SHEET NO. 25 UNDER THE EROSION CONTROL DETAIL.





GENERAL NOTES

1. ALL GOLF COURSE GRADING & MASS GRADING TO BE SEEDED & MULCHED.
2. CONTRACTOR TO FOLLOW THE GUIDELINES FOR EROSION CONTROL AS SPECIFIED ON SHEET NO. 25 UNDER THE EROSION CONTROL DETAIL.

RETENTION POND #1-K
 BERM - 147.00
 BOTTOM - 139.00
 25 YR/96 HR.
 FLOOD ELEV. - 146.74

RETENTION POND #1-A
 BERM - 156.00
 BOTTOM - 157.00
 25 YR/96 HR.
 FLOOD ELEV. - 156.84

RETENTION POND #2
 BERM - 140.00
 BOTTOM - 122.00
 25 YR/96 HR.
 FLOOD ELEV. - 138.28

REVISIONS	DATE

ENGINEERS
 SURVEYORS
 PLANNERS

FARNER BARLEY
 AND ASSOCIATES, INC.

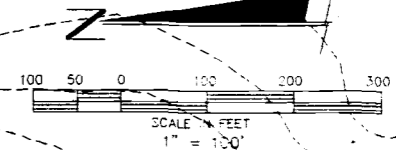
350 North Starke Avenue • Tallahassee, Florida 32378 • (904) 343-8481

KINGS RIDGE P.U.D. PHASE III

MASS GRADING PLAN

DATE 10-5-95
 JOB NO. 941218.009
 DWG. NO. P3GR7
 F.B. PG.
 DRAWN BY DLB
 CHKD BY

SHT 74 OF 34



**ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
MANAGEMENT AND STORAGE OF SURFACE WATERS (MSSW) PERMIT APPLICATION
CHAPTERS 40C-4, 40C-40, 40C-41, 40C-42, F.A.C.**

(including stormwater management systems but excluding agricultural surface water management systems)

No construction (including land clearing) on the project shall begin until the appropriate permit is obtained. Failure to comply will result in the District pursuing enforcement action in accordance with section 373.129, Florida Statutes. Issuance of a District permit does not preclude the responsibility of the applicant to obtain all other necessary federal, state, and/or local permits.

GENERAL INSTRUCTIONS: Please type or print. The following information must be provided with each permit application: a) 5 copies of the completed Notice of Application; b) the appropriate permit application fee (see the supplemental sheets for fees depending on application type); and c) 3 copies of the application form and all information listed on the appropriate supplemental sheet(s). Please submit the application to the appropriate District office as shown below:

Project Location (County)	District Office
Alachua, Flagler, Marion, Putnam	District Headquarters, P.O. Box 1429, Palatka, FL 32178-1429 (904) 329-4500
Baker, Bradford, Clay, Duval, Nassau, St. Johns	Jacksonville Field Office, 775 Baymeadows Way, Suite 102, Jacksonville, FL 32256 (904) 730-6270
Lake, Orange, Polk, Seminole, Volusia	Orlando Field Office, 618 E. South Street, Orlando, FL 32801 (407) 897-4300
Brevard, Indian River, Okeechobee, Osceola	Melbourne Field Office, 305 East Drive, Melbourne, FL 32904 (407) 984-4940

Permit applications for agricultural surface water management systems must use the appropriate forms 40C-1.181(9),(10), or (11).

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PERMIT TYPE AND ACTIVITY

Indicate the type of permit for which you are applying by checking only one of the following and include supporting information as required on the Indicated supplemental sheets:

- Individual MSSW permit (40C-4) -- include information requested on supplemental sheets A and B
- General MSSW permit (40C-40) -- include information requested on supplemental sheets A and B
- General Isolated wetland MSSW permit (40C-40) -- include information requested on supplemental sheets A and C
- Conceptual MSSW approval (40C-4) -- include information requested on supplemental sheet D
- Stormwater management system permit (40C-42) -- include information requested on supplemental sheet A

For District Use Only **Project Use Codes:** _____

Application Number: 4-069-0326A-ERP Fee Received: _____

Date Received: _____ Assigned Reviewers: _____ Reviewer numbers: _____

Indicate the type of activity for which you are applying by checking one of the following:

- Construction and operation of a new system
 Alteration and operation of an existing system not previously permitted by the District
 Modification of a system previously permitted by the District (check one of the boxes below):
 Alteration and operation of an existing system previously permitted by the District
 Construction and operation of additional phases of a system previously permitted by the District

List all previously issued District surface water permit numbers: _____

_____ Removal of a system

_____ Abandonment of a system

_____ Re-application for a permit that has expired; please provide the latest permit number: _____

_____ Extension of a permit prior to expiration; please provide the latest permit number: _____

OWNER

Name of Owner: Clermont Groves, Inc., Et. Al

Address: Post Office Box 770338

City: Winter Garden

State: FL Zip Code: 34777 Telephone No: (407) 656-2291

APPLICANT/ENTITY TO RECEIVE PERMIT

Name of Applicant: Lennar Active Adult Communities

Attention: Marshall Ames

Address: 1110 Douglas Avenue

City: Altamonte Springs

State: FL Zip Code: 32714 Telephone No: (904) 682-9291

AGENT, CONSULTING FIRM, SCS ENGINEER (if any)

Name of Firm: Farner Barley & Associates, Inc.

Name of Firm Contact: Robert E. Farner

Agent For: _____

Address: 350 North Sinclair Avenue

City: Tavares

State: FL Zip Code: 32778 Telephone No: (904) 343-8481

ATTORNEY OF RECORD (if any)

Name of Firm: N/A

Name of Firm Contact: _____

Attorney For: _____

Address: _____

City: _____

State: _____ Zip Code: _____ Telephone No: _____

OPERATION AND MAINTENANCE ENTITY (entity proposed to operate and maintain the system after construction is complete and the permit becomes an operation permit)

Name of Entity #1: Kings Ridge Homeowners Association
Name of Entity #1 Contact: Marshall Ames
Address: 1110 Douglas Avenue
City: Altamonte Springs
State: FL Zip Code: 32714 Telephone No: (904) 682-9291
Part of System to be Operated and Maintained by Entity #1: Stormwater System
Name of Entity #2 (If applicable): _____
Name of Entity #2 Contact: _____
Address: _____
City: _____
State: _____ Zip Code: _____ Telephone No: _____
Part of System to be Operated and Maintained by Entity #2: _____

PROJECT INFORMATION

Name of Project: Kings Ridge, P.U.D., Phase III
Street Address: US Highway 27/441 and Hartwood Marsh Road
County: Lake
Section/Township/Range: Section 3, 4, 9 & 10, Township 23 S, Range 26 E
U.S.G.S. Topographic Quad Map: Clermont East
Project Acreage: 299.27 Ac.
Total Acreage Owned: 968.44 acres
Project Description: Residential subdivision with a total of 145 lots, roadway extensions, 11 holes of golf for a future 18 hole golf course, golf course maintenance facility, mass grading of project, related drainage facilities.

Description of Proposed Surface Water Management System: Storm sewer collection system discharging to retention areas.

Water Course/Water Body Most Affected: None (landlocked drainage basin)
Class of Water Body: N/A
Date Construction is Proposed to Commence/End: Commence upon receipt of permit
Other Permits Issued or Pending for Proposed Activities:
DEP Water and sewer distribution & collection
SJRWMD Phase I Permit Number 42-069-1062N
COE None

Have you had a preapplication conference with District Staff? Yes XXX No _____
Date: 9/21/95 With Whom? Alex Aboodi
Have any District staff previously visited the site? Yes _____ No XXX
Date(s): _____ For What Purpose? _____
With whom? _____

CERTIFICATION

By submitting this application form, I am applying, or I am applying on behalf of the applicant, for the permit identified above according to the supporting data and other incidental information filed with this application. I understand I may have to provide any additional information/data that may be necessary to complete this application. I am familiar with the information contained in this application, and to the best of my knowledge and belief, such information is true, complete and accurate. I understand that knowingly making any false statement or representation in this application is a violation of Chapters 373 and 837, F.S.

Lennar Active Adult Communities
Type/Printed Name of Applicant or Agent

M. Ames
Signature of Applicant or Agent

10-11-95
Date

Marshall Ames, Regional President, Lennar Homes, Inc.
(Corporate Title If applicable)

AN AGENT MAY SIGN ABOVE IF THE APPLICANT COMPLETES THE FOLLOWING:

I hereby designate and authorize the agent listed above to act on my behalf, or on behalf of my corporation, as my agent in the processing of this application for a permit indicated above and to furnish, on request, supplemental information in support of the application. In addition, I designate and authorize the above listed agent to bind me, or my corporation, to perform any requirement which may be necessary to procure the permit indicated above. I am familiar with the information contained in this application, and to the best of my knowledge and belief, such information is true, complete and accurate. I understand that knowingly making any false statement or representation in this application is a violation of Chapters 373 and 837, F.S.

Typed/Printed Name of Applicant

Signature of Applicant

Date

(Corporate Title If applicable)

PERSON AUTHORIZING ACCESS TO THE PROPERTY MUST COMPLETE THE FOLLOWING:

I certify to the St. Johns River Water Management District that I either own the property described in this application or I have legal authority to allow access to the property, and that I consent to any necessary site visits being made on the property. I authorize representatives and personnel from the District to enter the property as many times as may be necessary to make these site visits. I agree to indemnify and defend the District for all liability that may occur from accessing the property including, but not limited to, actions for trespass.

Clermont Groves, Inc. Et. Al
Typed/Printed Name

Rex V. McPherson, II
Signature

10/11/95
Date

Rex V. McPherson, II, President

(Corporate Title If applicable)

OPERATION AND MAINTENANCE:

I agree, or I agree on behalf of my corporation, to operate and maintain the permitted system in compliance with the provisions of Chapters 40C-1, 40C-4, and 40C-42, F.A.C. Responsibility for maintenance and operation may be transferred to another entity acceptable to the District upon written notice by the District that the requirements of Chapter 40C-1, F.A.C., have been met, and that the entity proposed to assume responsibility for maintenance and operation in compliance with Chapters 40C-1, 40C-4, and 40C-42, F.A.C., has accepted the permit and agrees to operate and maintain the permitted system.

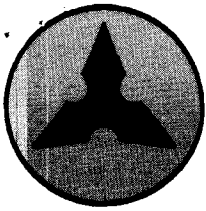
Lennar Active Adult Communities
Typed/Printed Name of Applicant

M. Ames
Signature of Applicant

10-11-95
Date

Marshall Ames, Regional President, Lennar Homes, Inc.
(Corporate Title if applicable)

Form Number 40C-1.181(2) Effective Date: 2/27/94



FARNER BARLEY

ENGINEERS ▲ SURVEYORS ▲ PLANNERS

VIA HAND DELIVERY AND ASSOCIATES, INC.

December 8, 1995
Mr. Alex Aboodi, Engineer
St. Johns River Water Management District
618 East South Street
Orlando, Florida 32801

RE: KINGS RIDGE PHASE III SUBMITTAL (FBA #941216.009)

Dear Mr. Aboodi:

Please find enclosed the following with regards to the above-referenced submittal:

1. Five (5) Permit Applications.
2. Five (5) sets of construction drawings.
3. Five (5) Notice and Receipt Forms.
4. Five (5) sets of Stormwater Calculations.
5. Five (5) sets of Declaration and Covenants and Restrictions and Articles of Incorporation.
6. Check in the amount of \$2,500.00 and one check in the amount of \$500.00, totalling \$3,000.00.
7. Five (5) copies of the Pesticide Management Plan.

Should you have any questions with regards to this matter, please feel free to contact our office.

Sincerely,

FARNER, BARLEY & ASSOCIATES, INC.

Troy W. Locklin

FARNER, BARLEY & ASSOCIATES, INC.

Robert E. Farner P.E.
President

TWL/REF/km
Enclosures

RECEIVED

DEC 08 1995
4-069-0326A-EXF
RECORDS
ORLANDO

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
MANAGEMENT AND STORAGE OF SURFACE WATERS PERMIT APPLICATION

Supplemental Sheet A: Stormwater Management System

GENERAL INSTRUCTIONS: Three copies of both page 1 of this form and the required technical information listed on pages 2-4 must be provided with all applications for stormwater management systems and for individual and general MSSW permits. The appropriate fee, as shown in Section 40C-1.603, F.A.C., must be provided with each stormwater management system permit application.

Project Name: Kings Ridge P. U. D., Phase III

County: Lake

General Permit Category: Projects which meet one of the following performance criteria qualify for a general permit. If applicable, indicate the appropriate general permit category below:

- a) Systems which discharge into a stormwater management system which is permitted pursuant to Paragraphs 40C-42.024(2)(b), (c), or (d), F.A.C., or Subsection 40C-42.024(3), F.A.C., or which was previously approved pursuant to a noticad exemption under Section 17-25.030, F.A.C., where the appropriate treatment criteria specified in this chapter and applied to the permitted or exempt system are not exceeded by the discharge; or,
- b) Systems which meet the applicable design and performance standards of Section 40C-42.025, F.A.C., and which comply with any or more of the following:
1. filtration systems which serve projects less than 10 acres in size and which meet the criteria of Subsection 40C-42.026(1), F.A.C.;
 2. retention systems which meet the criteria of Subsection 40C-42.026(2), F.A.C.;
 3. underdrain systems which meet the criteria of Subsection 40C-42.026(3), F.A.C.;
 4. underground exfiltration trench systems which meet the criteria of Subsection 40C-42.026(4), F.A.C.;
 5. wet detention systems which meet the criteria of Subsection 40C-42.026(5), F.A.C.; or
 6. swale systems which meet the criteria of Subsection 40C-42.026(6), F.A.C.; or,
- c) Systems that include a combination of management practices including but not limited to retention basins, swales, pervious pavement, landscape or natural retention storage that will provide for the percolation of the runoff from a three-year one-hour design storm; or,
- d) Modification or reconstruction by a city, county, state agency, or special district with drainage responsibility of an existing stormwater management system which is not intended to increase the original design capacity, and which will not increase pollution loading, or change points of discharge in a manner that would adversely affect the designated uses of waters of the State; or,
- e) Paving of existing public dirt roads if all of the following are met:
1. the road will not serve new development;
 2. additional traffic lanes are not added to the road;
 3. the traffic load is not expected to significantly increase;
 4. the drainage system serving the road is not significantly altered;
 5. erosion and sediment control measures are utilized to prevent turbidity during construction; and,
 6. the project does not require a wetland resource management (dredge and fill) permit pursuant to Chapter 17-312, F.A.C.

Individual Permit Categories: If applicable, indicate the appropriate permit category below.

- _____ a) Wetlands stormwater management systems which meet the design and performance criteria in Sections 40C-42.025 and 40C-42.0265, F.A.C.; or,
- _____ b) Systems which employ a treatment methodology or device other than those described in Subsections 40C-42.024(2) or (3), F.A.C.; or,
- _____ c) Systems which do not meet the applicable design criteria of Sections 40C-42.025, 40C-42.026, or 40C-42.0265, F.A.C.

Will there be any dredge or fill activity in waters of the State: _____ yes XX no

If yes, please be advised that unless exempt, dredging or filling in waters of the State requires a Wetland Resource Management (dredge and fill) permit (Chapter 17-312, F.A.C.). If a wetland resource management permit is required, contact the District for application forms and materials. If the construction of the stormwater management system requires dredge or fill in waters of the State, all requirements of Chapters 40C-42 and 17-25, F.A.C. will be reviewed as part of the wetland resource management permit application. In that case, you must provide all information on this application form as a part of a wetland resource management permit application.

NOTE: IF PROFESSIONAL ENGINEERING, GEOLOGY, OR LANDSCAPE ARCHITECTURE IS REQUIRED BY FLORIDA STATUTE FOR THE DESIGN OF THE PROPOSED STORMWATER MANAGEMENT SYSTEM, CONSTRUCTION PLANS AND CALCULATIONS MUST BE SIGNED AND SEALED BY AN APPROPRIATE PROFESSIONAL REGISTERED IN THE STATE OF FLORIDA.

Required Technical Information

All applicable technical information must be submitted with the completed application form. Failure to provide all required information will result in a delay in application processing and permit issuance.

A. General site conditions

1. Recent aerial photo of project site (no photocopies) - 1" to 400' scale maximum;
2. Map(s) or applicable construction plan(s) (no larger than 24" X 36") showing:
 - a. General location of project shown on USGS quad map(s), including points of discharge;
 - b. Project area boundary;
 - c. Pre-development (existing) topography;
 - d. Pre-development drainage patterns including points of discharge for existing site drainage and drainage basin boundaries;
 - e. Off-site drainage area and flow patterns across project site;
 - f. Location of existing drainage right-of-way or easements on-site;
 - g. Location of private and public water supply wells on-site; and
 - h. All wetlands on the site;
3. SCS soils map and report and/or soil boring data for treatment facility locations (borings should be a minimum 6 ft. depth below ground surface and 5 ft. below proposed treatment facility bottom);
4. Water table data

- a. Date, location, and water table level of actual measurements (if collected) with the estimated depth of antecedent rainfall (nearest NOAA rainfall station or other rain gage) during the previous one month period; and
- b. Estimated normal dry and wet season water table elevation (provide source or method of estimate).

B. Post-development project site conditions

1. Describe or document the legal outfall for point discharges of treated stormwater to adjacent property;
2. Identify and describe all on-site and off-site stormwater management systems which discharge into or receive discharge from the proposed project;
3. Provide the design tailwater elevation(s) at all points of discharge (include source or method of estimate);
4. Include the following on construction drawings for the project site:
 - a. Project land use and land cover;
 - b. Proposed construction, including erosion and sediment control plan for each phase (show specifications for erosion/sediment control measures on plans);
 - c. Vegetative cover plan for all on-site and off-site earth surfaces disturbed by construction;
 - d. Legal reservations for access to the treatment system for maintenance and operation by future maintenance entities for subdivided projects;
- e. Provide locations for the following on construction plans:
 - (1) Drainage divide and area (in acres) served by each hydraulically separate stormwater treatment system;
 - (2) Septic tank or other proposed on-site wastewater treatment facility; and
 - (3) Wells and surface water withdrawals;
- f. Provide plans, elevations and/or profiles, and details for the following:
 - (1) Roadway and parking pavements;
 - (2) Floor slabs, walkways and other paved surfaces;
 - (3) Earthwork grades for pervious landscaped areas; and
 - (4) All stormwater treatment and drainage facilities,
5. Show the following details for stormwater treatment systems construction plans:
 - a. All treatment systems:
 - (1) Show the elevation of normal wet season water table, design normal water elevation, and elevations for storage of the treatment volume;
 - (2) Details of oil and grease control mechanism, if required;
 - (3) Details of the outlet and overflow control structure; and
 - (4) Details of treatment drawdown outlets. Show the design tailwater elevations on the outlet details; and
 - (5) The minimum erosion and sediment control measures to be implemented during construction and all permanent control measures in post-development conditions;

b. Retention/detention facilities (including swales designed for retention/detention treatment only):

- (1) Plan contours and/or cross section details showing bottom contours and elevations, all design dimensions, side slopes, and top of bank elevations; and
- (2) Grassing or planting of all treatment system earth surfaces;

c. Exfiltration trench:

- (1) Trench dimensions and elevations;
- (2) Pipe diameter, material, length, slope, perforation specification;
- (3) Trench rock material with fillable porosity and filter fabric protection;
- (4) Overflow elevation for trenches with outfall;
- (5) Inlet and outlet structure details including sediment sumps; and
- (6) Design and location of observation well(s);

d. Underdrain and filter systems:

- (1) Pipe length, slope, diameter, and minimum and maximum inverts;
- (2) Maintenance access (such as at-grade cleanouts) for the filter pipe;
- (3) Permeability of filter media for filtration systems;
- (4) Permeability of soils for underdrain systems;
- (5) Filter media gradation (uniformity coefficient and effective grain size) for filtration systems;
- (6) Underdrain or filter detail at a uniform horizontal and vertical scale no greater than 1 inch - 5 feet (to scale, not typical);
- (7) Permeable, protective and stable surface cover (at the surface slope) for the filter surface (such as gravel); and
- (8) Filter fabric protection as applicable for perforated pipes, coarse aggregate sections, and round the filter section;

e. Wet detention systems:

- (1) Littoral zone location and depths; and
- (2) Elevation contours of pond bottom;

f. Wetland stormwater management systems:

- (1) Delineation of wetland areas utilized for stormwater treatment;

g. Karst Sensitive Areas

- (1) Geologic borings and geologic sections through the retention basin area. A geologic boring should be performed at the point of maximum excavation within the basin;
- (2) Location and description of limestone outcrops and any karst features, i.e., sinkholes or solution pipes which exist at the project site; and

(3) Inventory of existing wells within a 1000 foot radius of the stormwater basin

6. Design analysis/calculations (minimum required):

- a. Provide the rational method runoff coefficient (c), drainage area, and impervious area (percentage of total drainage area) for each treatment system;
- b. Calculate treatment volume required for each separate system (based on information in 5.a. above);
- c. Provide stage-storage tabulations to demonstrate that required treatment storage is available in the treatment system below the overflow elevation;
- d. Demonstrate 72 hour drawdown for retention, filtration, underdrain, or exfiltration trench systems based on natural soil conditions and/or specified filter media (with safety factor of 2 for filtration, underdrain, and exfiltration). Calculations must consider normal wet season water table and tailwater conditions to demonstrate recovery;
- e. Demonstrate that the function of the proposed treatment systems does not adversely affect the treatment performance of all other stormwater management systems which serve or are served by the proposed project;
- f. Demonstrate no more than half the treatment volume is discharged within 48 to 60 hours following a storm event for wet detention and wetland stormwater management systems;
- g. Design analysis for sizing wet detention permanent pool volume;
- h. Describe any additional management practices such as pretreatment, which will be used to enhance the water quality of the stormwater discharge; and
- i. Peak discharge and conveyance calculations (if appropriate) for pre-development and post-development conditions as follows:
 - (1) Runoff characteristics, including area, runoff curve number or runoff coefficient, SCS hydrologic soil group, and time of concentration for each drainage hydrologic unit;
 - (2) Design storms used including duration, frequency, and time distribution;
 - (3) Runoff hydrograph(s) for each drainage basin for all required design storm events;
 - (4) Stage-storage computations for any storage area, such as a detention area or channel storage, used in storage routing;
 - (5) Stage-discharge computations for any storage areas at a selected control point, such as structure control or natural restriction;
 - (6) Flood routings through on-site conveyance and storage areas;
 - (7) Water surface profiles and elevations in the primary surface water management system for the required design storm event(s); and
 - (8) Runoff peak rates and volumes discharged from the system for the design storm event(s);

7. Operation and maintenance

- a. Describe the overall maintenance and operation schedule for the proposed stormwater treatment system;
- b. If the proposed operation and maintenance entity is not a property owners association, provide proof of the existence of an entity or the future acceptance of the system by an entity, pursuant to Paragraphs 40C-42.027, (1)(a)-(d), F.A.C., which will operate and maintain the system;

c. If a property owners association is the proposed operation and maintenance entity, provide articles of incorporation for this association and the declaration, restrictive covenants, or restrictions or other operational documents that assign responsibility for the operation and maintenance of the system, pursuant to 40C-42.027(4), F.A.C.; and

d. Provide information to ensure the continued adequate access to stormwater treatment systems for maintenance purposes;

8. Alternative stormwater treatment (individual permit)

If equivalent treatment is to be provided, it is the applicant's responsibility to demonstrate that the stormwater management system, as designed, will meet or exceed the requirements set forth in the rule. Describe the subject stormwater discharge system. Discuss how the design is intended to achieve a treatment level equivalent to the design and performance criteria in Subparagraph 40C-42.024(2)(b)2. or Subsection 40C-42.024(4), F.A.C. Provide design analysis and calculations necessary to demonstrate that equivalent treatment will be achieved.

9. Wekiva River Basin (if applicable)

Submit the Local Government Notification form when any part of the system/project is within the Wekiva River Protection Area.

Form Number 40C-1.181(2) Effective Date: 2/27/94

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
MANAGEMENT AND STORAGE OF SURFACE WATERS PERMIT APPLICATION

Supplemental Sheet B: Individual/General MSSW Permits

GENERAL INSTRUCTIONS: Three copies of the required technical information listed below must be provided with all applications for individual and general MSSW permits. The appropriate fee, as shown in Section 40C-1.603, F.A.C., must be provided with each MSSW permit application.

A. Pre-development site information including:

1. A general location map (USGS 7 1/2' Quadrangle) delineating the project area and nearby highways and water bodies;
2. A map, or maps of the same scale, of the project area and vicinity (at a scale no smaller than one inch equals 400' and on a sheet(s) no larger than 24' x 36') delineating:
 - a. Project area boundary;
 - b. Existing land use and land cover (acreage and percentages);
 - c. Existing topography, drainage patterns and basin boundaries within the project area;
 - d. The area of any lands outside the project area contributing runoff to the project area;
 - e. Rights-of-way and easements for the existing drainage system, if any;
 - f. Soil types used to determine hydrologic soil group;
 - g. Normal and seasonal high water table elevations;
 - h. 10-year and 100-year flood elevation and floodplain boundary of any lake, stream or other watercourse located on or adjacent to the site;
 - i. Wetlands delineated on a land cover map at the same scale as the site plan;
 - j. Limits of waters of the State; and
 - k. Wetlands as delineated by any binding jurisdictional determinations or formal wetland determinations (include copies of agency letters); and
3. A recent aerial photograph at the same scale as the site plan, with project boundaries delineated on the photograph.

B. A description of the on-site wetlands, including:

1. The acreage of wetlands existing on the site;
2. A discussion of the proposed alterations or disturbances to the wetland areas;
3. A discussion of the wetlands that will be preserved in their natural or existing state;
4. A discussion of the methods used and results of any surveys for threatened or endangered species conducted on the site; and
5. Any proposed wetland mitigation plans and details.

C. Post-development site information including construction plans and specifications (on sheets no larger than 24' x 36") for the system delineating:

1. Proposed land use and land cover (acreages and percentages);
2. Proposed construction schedule, including sequence of any major phases;
3. Construction plans for paving, grading and drainage;

4. Post-development drainage boundaries showing the direction of flows, taking into account any off-site runoff being routed through or around the system;
5. Location of all water bodies with details of size, side slopes, and depths;
6. Location and details of all water control structures, control elevations of the control structures, and any seasonal water level regulation schedules;
7. Location and elevations of all proposed roads and building;
8. Location, size, and design capacity of the internal water management facilities;
9. Pump specifications and operating curves for range of possible operating conditions (if used in system);
10. Rights-of-way and easements for the system, including all on-site and off-site areas to be reserved for water management purposes;
11. Receiving waters or surface water management into which runoff from the developed site will be discharged;
12. Any temporary construction which might affect the surface water management system prior to completion of the system;
13. The minimum erosion and sediment control measures to be implemented during each phase of construction and all permanent control measures to be implemented in post-development conditions; and
14. Proposed maintenance practices and schedules.

D. Design Analysis including:

1. Pre-development and post-development drainage calculations as follows:
 - a. Runoff characteristics, including: area, runoff curve number or runoff coefficient, SCS hydrologic soil group and time of concentration for each drainage hydrologic unit;
 - b. Water table elevations (normal and seasonal high) including aerial extent and magnitude of any proposed water table drawdown;
 - c. Receiving water elevations (normal, wet season, design storm);
 - d. Design storms used including duration, frequency, and time distribution;
 - e. Runoff hydrograph(s) for each drainage basin for all required design storm event;
 - f. Stage-storage computations for any storage area, such as a reservoir, detention area or channel storage, used in storage routing;
 - g. Stage-discharge computations for any storage areas at a selected control point, such as structure control or natural restriction;
 - h. Flood routings through on-site conveyance and storage areas;
 - i. Water surface profiles and elevations in the primary surface water management system for the required design storm event(s); and
 - j. Runoff peak rates and volumes discharged from the system for the design storm event(s);
2. Engineering analysis of floodplain storage and conveyance (if applicable), including:
 - a. Hydraulic calculations for all proposed traversing works;
 - b. Backwater water surface profiles showing upstream impact of traversing works;
 - c. Location and volume of encroachment within 10-year floodplain; and
 - d. Plan for compensating floodplain storage, if necessary;
3. Provide a description of the engineering methodology, assumptions and references, and a copy of all such computations, engineering plans, and specifications used to analyze the system. If a computer program is used for the analysis, provide the name and a description of the program.
4. For projects within the Wekiva River Basin (basin boundary defined in chapter 40C-41, F.A.C) design analysis to demonstrate compliance with Wekiva River Basin criteria, including:

- a. Pre- and post-development discharge from the project area;
 - b. Location and volume of encroachment within the 100-year floodplain, and plan for compensating storage;
 - c. Detailed erosion and sediment control plan when the project is within the Water Quality Protection Zone or if the project exceeds 120 acres;
 - d. Estimated pre- and post-development ground water table levels when any part of the project is located within the Water Quantity Protection Zone;
 - e. Delineation and assessment of the Riparian Habitat Protection Zone; and
 - f. Submittal of the Local Government Notification form when any part of the system/project is within the Wekiva River Protection Area.
5. For projects within the Econlockhatchee River Basin (basin boundary defined in chapter 40C-41, F.A.C.) design analysis to demonstrate compliance with Econlockhatchee River Basin criteria, including:
 - a. Pre- and post-development runoff hydrograph for the mean annual and 25-year design storm;
 - b. Location and volume of encroachment within the 100-year floodplain, and plan for compensating storage;
 - c. Systems which serve a drainage area in excess of 10 acres must satisfy the Stormwater Management Standard; and
 - d. Delineation and assessment of the Riparian Habitat Protection Zone and impacts.
 6. For projects located within the Upper St. Johns River Hydrologic Basin and Cokiawaha River Hydrologic Basin (basin boundaries defined in chapter 40C-41, F.A.C.), provide:
 - a. Pre- and post-development runoff hydrograph analysis for the 10-year and 25-year design storm; and
 - b. For systems using pump discharges, provide pre- and post-development total runoff volume for the 96-hour storm duration.
- E. For stormwater management systems, construction plans and calculations to demonstrate compliance with the requirements for stormwater management systems in Chapter 40C-42, F.A.C. unless exempt or previously permitted. Provide all applicable technical information as listed on Supplemental Sheet A of the District's Management and Storage of Surface Waters permit application form.
- F. Submit the permittee's proposal of an entity to be responsible for operation and maintenance of the permitted system, and a draft document enumerating enforceable affirmative obligations on the entity to properly operate and maintain the system for its expected life. If the proposed operation and maintenance entity is not a property owners association, provide proof of the existence of an entity, or the future acceptance of the system by an entity, pursuant to Paragraphs 40C-42.027(1)(a)-(d), F.A.C., which will operate and maintain the system. If a property owners association is the proposed operation and maintenance entity, provide copies of the articles of incorporation for the association and copies of the declaration, restrictive covenants, deed restrictions, or other operational documents that assign responsibility for the operation and maintenance of the system, pursuant to Paragraph 40C-42.027(4), F.A.C. Provide information to ensure the continued adequate access to the system for maintenance purposes. Prior to lot or unit sales, or construction, whichever occurs first, the approved document must be recorded, if appropriate. Failure to submit the appropriate final document will result in the permittee remaining personally liable for carrying out maintenance and operation of the permitted system.
- G. Water Use
1. Will the surface water system be used for water supply, including landscape irrigation, recreation, etc.?
 2. Are there proposed groundwater withdrawals which will discharge into surface waters? If so, from what hydrogeologic zone?

Form Number 40C-1.181(2) Effective Date: 2/27/94

*A Pesticide Management Plan
for the
King's Ridge P.U.D. Site*

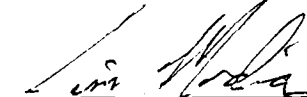
October 8, 1995

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DEC 08 1995
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RECORDS
ORLANDO

Submitted to:

St. Johns River Water Management District
Orlando Field Office
618 East South Street
Orlando, FL 32801

Submitted By:



James V. Modica
President

Modica & Associates

310 Almond St.
Clermont, FL 34711
(904) 394-2000

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1.0 INTRODUCTION

The Kings Ridge P.U.D. consists of a 956 acres residential development that includes a 18 hole golf course. The project is located in Sections 3, 4 and 9, Township 23 South, Range 26 East in Lake County (Figure 1). The project is bordered to the west by U.S. Highway 27 and to the south by Hartwood Marsh Road.

The subject property is primarily comprised of three upland communities. These communities are citrus grove, coniferous plantation and unimproved pasture. A wetland community, associated with the shore of Lake Felter, is also present on the site. The vegetative communities were surveyed by vehicular and pedestrian transects. The cover types that exist on the project site are illustrated in Figure 2.

The following Integrated Pest Management Plan has been prepared for the proposed Kings Ridge P.U.D.s as required by the St. Johns River Water Management District (SJRWMD). It is in compliance with the SJRWMD Management and Storage of Surface Water (MSSW) permit.

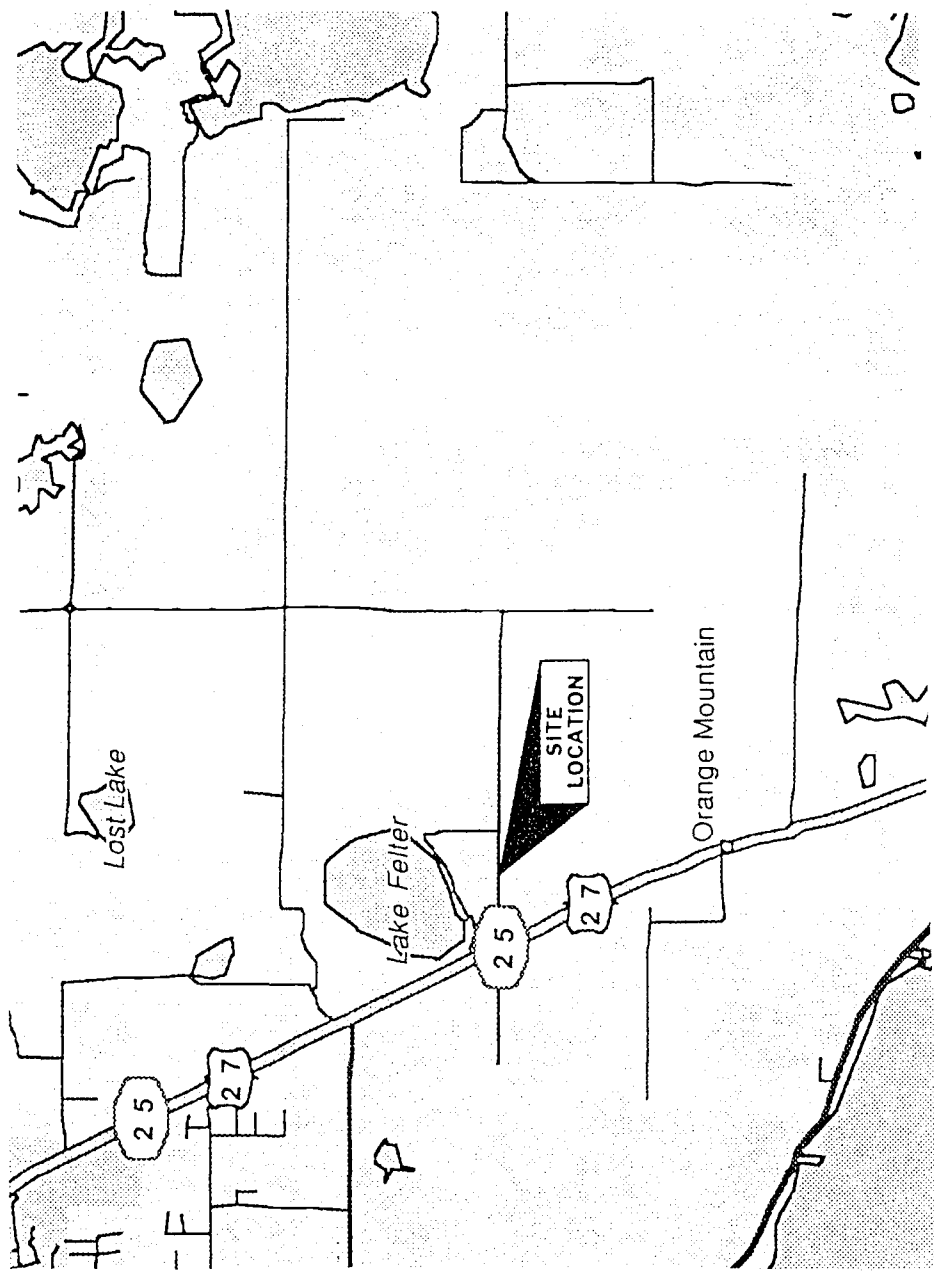
The Integrated Pest Management Plan will describe the combined use of Physical, Cultural, Biological, and Chemical management practices in the development and maintenance of the Kings Ridge P.U.D.s' Golf Course. If the Physical development and the Cultural and Biological practices are managed properly, the need for Pesticides is greatly reduced.

Tolerances must be set at the Golf Course by the superintendent, possibly with inputs from the board of directors, for the amount of injury level or the size of the pest population that is going to cause economic and aesthetic damage beyond acceptance. This can determine the extent of the management practices. Once the Cultural and Biological management practices are not enough to keep the pest populations below or at the tolerance levels, Chemical management will be required. The types of pesticides needed to correct the problem will be selected and the safest one of these will be chosen for application.

Along with the Physical, Cultural, Biological and Chemical Management practices there must be records to follow the pest populations and the management practices' effectiveness. A regular and rigorous monitoring program is the cornerstone to an effective Integrated pest Management Plan. This paper will discuss each of these aspects.

Because the Management of Hazardous Chemicals on the site is a major concern, two sections will discuss the Management and Control, and the Regulatory Framework.

The Goal of the Integrated Pest Management Plan is to maintain pest populations below levels that cause economic and aesthetic damage with minimized dependency

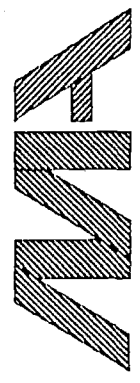


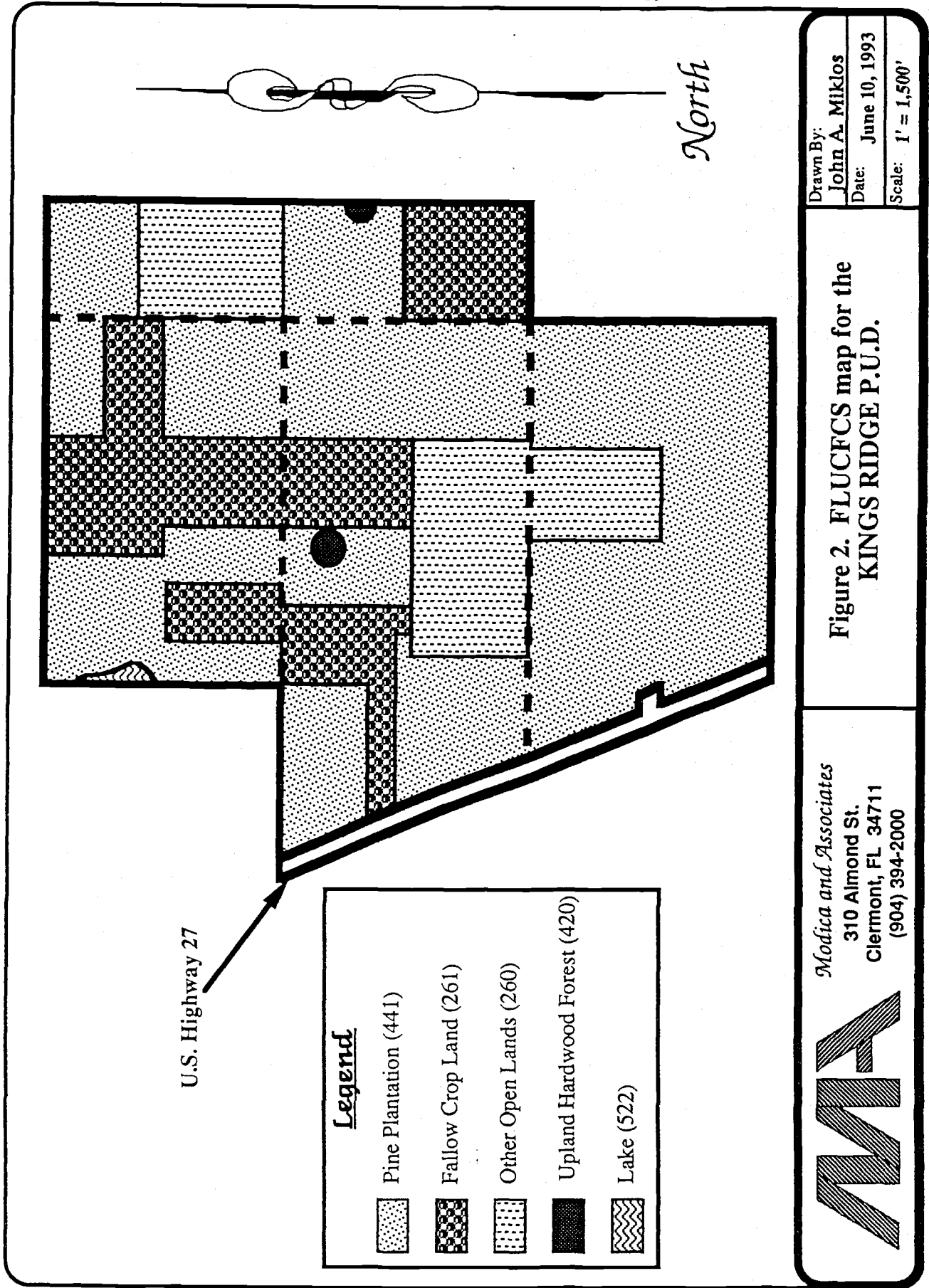
North

Drawn By:	John A. Miklos
Date:	June 10, 1993
Scale:	N.T.S.

Figure 1. Location map for the KINGS RIDGE P.U.D.






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 Clermont, FL 34711
 (904) 394-2000

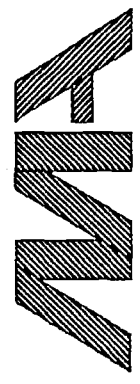




U.S. Highway 27

Legend

-  Pine Plantation (441)
-  Fallow Crop Land (261)
-  Other Open Lands (260)
-  Upland Hardwood Forest (420)
-  Lake (522)



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 310 Almond St.
 Clermont, FL 34711
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**Figure 2. FLUCFCS map for the
 KINGS RIDGE P.U.D.**

Drawn By: **John A. Miklos**
 Date: **June 10, 1993**
 Scale: **1' = 1,500'**

on chemicals.

2. TURF MANAGEMENT PRACTICES

There are four types of practices to be incorporated in an Integrated Pest Management Plan; Physical, Cultural, Biological, and Chemical. Physical practices deal with the development of the golf course which will effect all of the other practices. If cultural and biological practices are managed properly, the need for Chemical practices is greatly reduced. The timing and sequence of these practices can have a great effect on the quality of the turf.

2.1 PHYSICAL

Five soil types exist on the Kings Ridge P.U.D. project site. These types include Astatula sand, dark surface (0 to 5% slopes), Astatula sand, dark surface (5 to 12% slopes), Astatula sand, dark surface (12 to 40% slopes), Lake sand (5 to 12% slopes) and Lake sand (12 to 22% slopes). Astatula sand, dark surface (0 to 5% slopes) is the dominant soil type on this site. Astatula sand, dark surface (5 to 12% slopes) and Astatula sand, dark surface (12 to 40% slopes) occur quite frequently, however Lake sand (5 to 12% slopes) and Lake sand (12 to 22% slopes) can only be found in two small areas along the western property boundary. Figure 3 illustrates the soils map for the Kings Ridge P.U.D.

These sand soils are low in organic matter and therefore are likely to be highly permeable which means high leaching potential. With high permeability and low organic matter comes low partitioning coefficient. The PC value is determined by the ration of pesticide concentration in the absorbed state versus that in the solution state. Therefore, it becomes more crucial to have a shorter half-life pesticide. With less pesticides absorbed and more in the solution state, the smaller the PC value, and the more likely to leach.

The golf course will be built primarily from fill obtained from pond and lake construction. Because of all the sand at the site drainage should not be a problem. Depending on the topography some greens may require a drain field which used pipe, gravel, DOT sand and peat moss. Peat is used initially to slow the percolation rate and act as the organic thatch layer, until a natural layer develops.

The ground water levels are in excess of 10 feet across the site except in the area immediately adjacent to Lake Felter..

2.2 Cultural

Cultural practices enhance the turf. When the turf is healthy there is less opportunity for insects, weeds, and disease to become a problem. Cultural activities include; fertilization, maintaining proper soil pH levels, irrigation, thatch control, top dressing, vertical cutting aerofication, and mowing. Each of these are interdependent on each

other and their resulting effects on insect, weeds, disease, and nematodes.

2.2.1 Fertilization: Soil tests and leaf analysis should be made on an annual or biannual basis to establish the needs of the soil. In knowing these needs, proper fertilizer levels can be applied. Nitrogen is usually applied on a more regular basis and iron is usually applied when a visual deficiency appears. A properly fertilized soil will promote healthy turf growth. A healthy turf will choke out weed growth, lessen disease susceptibility, and resist and recuperate faster from wear. Different grasses require different treatments. Bermudagrass varieties will be the established turf at Kings Ridge P.U.D.s. The greens and tees are the most intensely managed areas on a golf course because they have specific turf requirements and the most traffic. This intense management includes more frequent applications of fertilizer. Fairways and roughs are not intensely managed and are fertilized less frequent. Roughs are fertilized at a minimum rate once established. The effluent system at Kings Ridge P.U.D.s will add nutrients on a regular basis and therefore may reduce the need for applying as much fertilizer.

2.2.2 pH: For Bermudagrass the pH should be between 6.0 and 7.0. Amendments can be made according to the soil test results. Effluent usually tends to be basic in reaction and therefore may require more frequent analysis.

2.2.3. Irrigation: Weather stations can monitor weather trends which will have an effect on soil moisture. Tensiometers may also be used to detect soil moisture. If the soil moisture is not at its desired level then irrigation is required. In general, the soil should be moistened to the full depth of the root zone with each irrigation.

As far as the insects and disease are concerned, keeping the soil moist during the summer will reduce chinchbug numbers. By irrigating before dawn, the water will dry leaving no free water on the leaf surface and therefore breaking the disease cycle. Most diseases require five or more hours of leaf wetness to germinate and begin their cycle. Greens and tees are always irrigated. At Kings Ridge P.U.D.s, effluent will be mixed with water for irrigation and therefore the fairways and roughs will also be irrigated to create a greater volume use and dispose of more effluent.

2.2.4. Thatch Control: Thatch is the organic layer of dead and living roots, stems and shoots that develop between the zone of green vegetation and the soil surface. The right amount of thatch will add resiliency and improve tolerance to wear and make soils less prone to soil compaction. If thatch exceeds 0.3 inch in thickness, it increases: disease and insect activity, potential hydrophobic restrictions in water penetration, puffiness, foot printing, slower putting, and proneness to mower scalping. Thatch can be prevented by 1) light frequent lime applications under acidic conditions, 2) aerofication and matting (top dressing), 3) light frequent vertical cutting, 4) frequent close mowing, and 5) light frequent nitrogen applications.

2.2.5 Top Dressing: Top dressing is a technique in which a desired soil medium such as sand is spread over the turf evenly and is physically worked in by matting, raking or

irrigation. Top dressing is the most effective practice for biologically controlling thatch. It also corrects irregularities in the surface, provides a firm tight fine textured turf, and controls grain formation. Top dressing needs to be performed periodically. Tees require more material than greens because they are subject to more damage. Fairways are not usually top dressed in their entirety, although spot top dressing may be used. Top dressing is not practiced in the roughs. Aerification coring brings soil to the top that can be reincorporated and therefore serves the same purpose.

2.2.6 Vertical Cutting: Vertical cutting involves a mechanical device with vertically rotating blades that cut into the face of the turf. Thatch can be prevented or controlled by different levels of vertical cutting. Light vertical cutting on a regular basis can prevent thatch build up. Deep vertical cutting can remove excessive thatch. Vertical cutting also controls the grain. In this case it is more like coming the grass blades. It should slightly rough up the turf surface without gauging. Light and deep vertical cutting is differentiated by the spacing between the blades and the depth at which they are set. All vertical cutting should be performed when the turf is actively growing. Debris from vertical cutting should be picked up and removed. Vertical cutting over freshly aerified soil will cut up the cores enabling them to be incorporated back into the turf.

2.2.7 Aerification: Aerification is a means of working the soil without destroying the turf. Soil compaction results when particles in the soil are pressed together so tight that it results in: restricted root growth; lack of water infiltration; increased runoff; loss of resiliency; decline in turf grass health, vigor and density. Small particle soil and excessive moisture with traffic are the major causes of compaction. The best prevention is in the building of the course, by creating a sandy root zone and designing for proper drainage. Other preventative measures are to avoid excessive irrigation and select proper golf cart pathways. Depending on the soil type there will always be a certain amount of compaction. Therefore the corrective measure of aerification should be used on a regular basis. Aerification not only corrects compaction but assists in thatch control and alleviates soil layering. Soil layering is defined as stratification within the soil profile which may affect the conductivity and retention of water, soil aeration, and rooting.

One practice of aerification is coring. This process removes cores of soil about 3 to 4 inches deep. These cores can be removed or vertically cut to chop and matted to blend back into the turf. If a soil needs more sand the core should be removed and the area top dressed with sand. At Kings Ridge P.U.D.s, the cores will usually be incorporated because the soils are of proper texture. Any grass remnants or trash will be removed after the soil from the core has incorporated.

Another aerification practice is slicing. This is used less frequently than coring. The depth is about 3 to 4 inches. No soil is brought to the surface and therefore slicing has less surface disruptions. Top dressing is frequently applied.

The third aerification method is spiking. Spiking enables compaction correction in an

area that is highly used and can not be disrupted by coring and slicing, because it only punches to a depth of 0.5 to 1 inch. Spiking is used to sever rhizomes and stolons which stimulates new shoot and root growth. It also can allow water penetration through thatch, mat and / or surface crust.

Greens usually receive aerofication treatments two to three times per year. Tees, fairways and roughs usually receive one. Aerofications need to occur when the turf is growing.

2.2.8 Mowing: Mowing is probably the most intensively used tool on the golf course. There are many considerations when mowing that affect turf; height, frequency, pattern, operation and clippings removal. All of these aspects will be discussed.

Height: The turf leaf number is determined by cutting height, fertility and irrigation. The closer the turf is cut, the higher the number of leaf blades. Turf stiffness is achieved by irrigation and potassium not necessarily the height of the turf. Therefore extremely close cutting will not add stiffness but will weaken the turf. Close cutting also reduces root growth and carbohydrate reserves which weakens the turf. Weakened turf is susceptible to weeds, diseases, insects, and will recuperate from injury slower. Mower blades that are worn or thick will cut lower, so check for wear and replace with the same thickness of blade.

The recommended mowing height for Bermudagrass varieties is as follows: greens .19 to .31 inches, tees .3 to .6 inches, fairways .5 to 1 inch (not irrigated may be mowed at a higher height), primary roughs 1.5 to 4 inches or 1.5 to 2 inches if irrigated, secondary roughs may not be mowed. Weed populations can be reduced by raising the cutting height to encourage grasses to shade out weeds.

Frequency: Frequent mowing result in increased shoot density and finer leaf texture. Mowing should be done when the turf is not wet. This will minimize compaction and prevent accumulation and clumping of clippings. Mowing should be skipped one day after top dressing, fertilizing or aerofication. During the growing season, mowing frequently will increase. Bermudagrass greens should be mowed daily. Skipping the seventh day will improve vigor. Tees should be mowed two to three times per week. Fairways two to three times per week if irrigated, if not weekly to biweekly. Roughs are mowed on a seven to fourteen day interval, if irrigated on a five to ten day interval.

Pattern: Altering directions achieves a couple of goals; it enhances upright growth, it reduces compaction from tires operating in the same path, and it provides a more attractive visual pattern. Greens should be mowed with an around the clock procedure in four directions. Start one day from the 12 o'clock to the 6 position, the next day 3 to 9, next 4:30 to 10:30, and finally 1:30 to 7:30. The cycle is then repeated after the four directions are complete. Tees are usually mowed in two perpendicular directions, with mowers alternating directions on the perpendiculars to minimize grain development. Fairways are usually mowed longitudinally with mowers alternating direction on the longitude. At lease once a month the fairway should be cross mowed with its direction

being altered each time. The roughs are generally mowed in random single directions. Contouring with the landscape will blend the terrain and add interest.

Operation: Operators should pay close attention to procedures and equipment. Straight lines, minimum overlap, check for foreign objects, and uniform speeds recommended by the equipment's manual are vital to turf management and equipment maintenance. Equipment should be checked for regular maintenance such as worn parts, motor oil and grease fittings. It should also be checked for fuel, oil, grease and hydraulic fluid leaks and accumulation. If these substances were to drop on the turf they can cause a dead spot. Speed should be reduced for turns and make the turns in wide arcs. This will keep the rollers from bruising or tearing the turf. Rollers should also be kept clear of soil and cutting accumulations because they can cause turf damage. Along with mowing are repairs required to the turf before mowing over the area. Greens must have ball marks repaired. Tees must have divots replaced and marks filled. While inspecting for these it may also be a good time to incorporate the monitoring program which is discussed later. Also look for foreign objects. When mowing fairways and roughs, always look ahead for foreign objects for the safety of the turf, equipment and the operator.

Clippings Removal: Clippings are removed when high intensity cultural practices are used, which includes very close mowing. This helps to keep the playing area obstruction free and helps to control thatch and/or puffiness which will cause scalping. Greens are intensely managed and require clipping removal. Tees are slightly less intensely managed and clipping removal is preferred. Fairways generally always their clipping returned, therefore a proper mowing frequency must be maintained so clippings are not objectionable from an appearance or playing standpoint. Roughs almost always have their clippings returned.

2.2.9 Winter Overseeding: Winter Overseeding is seeding cool season turfgrasses onto warm season turfgrasses at or near their start of winter dormancy. Warm season turfgrasses have a temperature optimum of 80 to 95 degrees F. Cool season turfgrasses have a temperature optimum of 60 to 75 degrees F. Properly maintained warm season turfgrasses will survive winter dormancy and overseeding better than turf which is not well maintained. Four to six weeks before overseeding, have excessive thatch removed by vertical cutting and /or top dressing. Aerification and any fertilization should also be complete. The actual time of overseeding depends on the regional location and the temperature differences. Overseeding should be done late enough in the year so that the Bermuda grass growth has slowed by the declining fall temperatures but still early enough so that temperatures are still warm for germination of the overseeding seed. At Kings Ridge P.U.D.s, the greens, tees and fairways will be overseeded with a rye variety and Bentgrass. The goal is a uniform surface transition with no adverse effects on ball roll.

The basic steps in winter overseeding include:

1. Vertical cutting in several directions and removal of plant debris. This will open

the bermudagrass stand and allow the seed to reach the soil surface which makes for better germination and reduces lateral movement of seed by wind and water erosion. Fairways may not receive all of this soil preparation.

2. Apply preventative fungicide to the crucial areas such as greens and possibly tees to control seedling diseases caused by Pythium and Rhizoctonia. Seed can be purchased that has been treated with a fungicide.
3. Apply seed uniformly at the proper rate. Plan on completing seeding, matting and top dressing as soon as possible, preferably nine holes per day. Half of the seed should be applied in one direction and the other half in another direction to insure uniform coverage. At Kings Ridge P.U.D.s, the winter grasses most likely used will be Bentgrass for the greens and ryegrass for the tees and fairways.
4. Matting will work the seeds into the turf. This is usually limited to the greens.
5. A light top dressing is applied after overseeding on the greens. Sometimes it is used on the tees and less often on the fairways.
6. A light irrigation is required to give the necessary moisture for germination. Too much water may cause lateral movement of the seed with the water.

After overseeding the seed bed must be kept moist. Excess water, compacted soil, and /or poorly drained soils and high humidity will encourage seedling diseases. Compaction, poor drainage, and excessive irrigation are factors that can be eliminated to decrease the opportunities for disease to develop. If a seedling disease does occur, a fungicide application may be necessary. Another practice after overseeding that will help the seedlings is to raise the cutting height to allow initial establishment. Fertilization after overseeding should be withheld until seedlings are well established. Tees and cups should be moved frequently during overseeding establishment to minimize injury and thinning.

In the spring when Bermudagrass is coming out of dormancy the ryegrass may persist and become competitive which impairs bermudagrass survival. To reduce the ryegrass perform a series of light vertical cuttings while the ryegrass is still actively growing and just before the spring Bermudagrass greenup.

2.3 Biological

Biological management involves the use and encouragement of disease and insect resistant varieties of grasses, native vegetation, natural enemies, propagation of pest diseases and parasites, and the release of sterile pests.

2.3.1 Plant Selection: In the development of a golf course, grasses are selected that are suited for the environment. Native trees and ornamentals should also be selected. Native vegetation means the plants naturally exist in that environment and therefore

are more resistant to the pests of that environment than introduced plants would be. They are accustomed to the climate and will not stress in that environment's normal weather conditions. Resistant varieties which have been bred to resist attacks by insect and disease should be selected. An example of a resistant variety is the endophyte bearing Ryegrass. These selections can eliminate a lot of problems from the beginning.

2.3.2 Biological Control Agents: The pests that we want to rid a golf course of have their own natural enemies. Birds such as purple martins and bluebirds are natural enemies to mosquitoes, flies and gnats. The big eyed bug Geacoris spp. as well as a beneficial fungi Bavaria spp. prey on the chinch bug. There is a pythium fungi that antagonizes the pythium species that causes turf diseases. There are nematodes; uruguayan neoaplectanid and Heterorhabditis heliothdis, that control white grubs, masked chafers, mole crickets and cutworms populations. These biological control agents are a great help but they may not give the control level needed on low tolerance level greens and tees. They are also susceptible to the pesticides used on the pests. If pesticides are used in areas with a higher tolerance level, use the minimal rate of a pesticide that is as pest specific as possible instead of broad spectrum formulations. This will help to protect the beneficials so they can act as a pest management practice. Some of these biological controls will have to be introduced, others will need the habitat to be improved to invite them. Research and development is in process to make this practice even more viable.

2.3.3. Release of Sterile Pests: Some sterile pests species are commercially available. The purpose is to release them on the site, where they join in the life cycle of the fertile pest. When breeding occurs between sterile and fertile pests there will not be any fertile eggs produced and reduced populations can result.

2.3.4 Biological Beneficials: Biological Beneficials are different from biological control agent in that they are not an enemy to any of the pests, but they are advantageous and necessary for vigorous and productive plant growth. These include the worms and fungi that help breakdown and decompose thatch; or bees that pollinate ornamentals, fruit and vegetable. To encourage the worms and fungi; the pH should be between 6.0 to 7.0, the soil should be aerated to increase oxygen, and the soil must be kept moist but not excessively wet. For the bees, find any apiarist within two miles and develop a working relationship with them. Apiarists need to know 42 hours ahead of the scheduled spraying. Also, formulations can be chosen that are less toxic to bees.

2.4 Chemicals

The proper use and selection of pesticides is crucial. This section is devoted to making clear all points of the process.

2.4.1 Pesticide Selection: The SJRWMD MSSW Permit requires the following regarding the selection of pesticides:

Prior to pesticide use the permittee must submit an Integrated Pest Management Plan for district staff approval. The selection of pesticides must be based first on the labeling and applicability. Once the pesticides that will treat the pest have been determined the safest of the group depending upon short half-lives (1 to 10 weeks), a low n-octanol/water partitioning coefficient, and suitability to site specific soil and ground water pH. The use of organochlorides usually have longer half-lives and should not be used.

Clifton Ezell and Clifton Golf Design Group has been contracted by Kings Ridge P.U.D.s as an Environmental Consultant and is developing the Integrated Pest Management Plan.

A list of pesticides was taken from the Florida Turfgrass Association Recommendations for 1988. Tables 2.1,2.2,2.3 and 2.4 are the initial pesticide lists organized by Insecticides, Herbicide, Fungicides and Nematicide respectively with information on the applications such as prevention/correction and target pests of the pesticides. Tables 2.5, 2.6, 2.7, 2.8, also organized by Insecticides, Herbicides, Fungicides, and Nematicides respectively, supply information the chemical properties of the pesticides including common trade names, common chemical names, Organochlorides, Kow Average, Half-life, Solubility, Koc/PC, LD50 Oral and Restricted Use Pesticide. Clifton Ezell and Clifton Golf Design Group does not endorse these projects, these names were acquired from the Florida Turfgrass Association. Appendix A lists the Chemical Manufacturers for the chemicals suggested.

Once a pest has been identified to require a pesticides for correction, a selection must be made from the suggest list. A compound should be selected that will provide specific control for the target pest instead of a broad spectrum. This will help to maintain the beneficial biologicals. An appropriate form of pesticide must be selected such as wettable powder (WP), emulsifiable concentrates (EC), flowables (F), dust (D), bait (B), granular (G), dry flowable (DF) or gas fumigants. This selection depends on the equipment available, effectiveness of formulation, phytotoxicity to the turf, and safety. Formulations of the same project have different qualities. Dry flowables have less dust emitting during mixing that wettable powders. Ultralow volume formulations are much more hazardous than other liquids. EC generally have shorter "killing spans" than the wettable powders; and granular is less of a threat to some creatures such as bees.

The applicator may want to combine several pesticides, fertilizer and/or adjutants. If so, consult the label for suggestions and computabilities.

2.4.1.1 Organochloride:An Organchloride has chlorinated hydrocarbon as its' active, functional component. Organochlorides have long-half lives and are therefore not approved by the SJRWMD.

2.4.1.2 N-Octanol/Water Partitioning Coefficient: The N-octanol/water

partitioning coefficient (KOW) is a useful parameter for assessing the environmental behavior of a pesticide compound based on its physical and chemical properties. Using the physical and chemical properties of water solubility, molecular weight, and melting point, scientists developed figures that can predict pesticide behavior regarding : soil absorption, biological uptake, lipophilic storage, and biomagnification. These three figures (where they apply) will be averaged and their average will appear in Tables 2.5, 2.6, 2.7,2.8. The SJRWMD requires pesticides with a log KOW of less than 5.

2.4.1.3 Pesticide Half-Life: The persistence of a pesticide in the environment is a function of its' physical and chemical properties. Half-Life measures the time it takes for a compound to degrade by its own chemical reactions. In general, compounds that are highly volatile and unstable will have shorter half-lives and are thus less persistent. Some organochlorides have half-lives of ten years or more. Organophosphates are less persistent and have shorter half-lives. The SJRWMD requires 1 to 10 weeks half-life. If the actual days of persistence are not available the stability will be considered.

2.3.1.4 Solubility and Sorption: When a chemical enters the soil some will go into solution and some will absorb to the soil particles especially organic matter. The chemical in solution is likely to run off or leach before it has time to degrade. The absorbed chemical can only be carried off with the soil particle by erosion. The partitioning coefficient quantifies pesticide absorption on the soil. The partitioning coefficient quantifies pesticide absorption on the soil. The partitioning coefficient value is determined by the ratio of pesticide concentration in the absorbed state versus that in the solution state. Thus the smaller the partitioning coefficient (PC) value, the more likely the pesticide is to leach and to require more careful management.

With the PC and soil type (amount of organic matter) we can determine the changes of loss due to runoff and leaching. K is the index for the given soil and pesticide.

$$K = (PC) (\%OM) (0.0058)$$

2.4.1.5. LD50: the LD50 is the lethal dose of a pesticide required for a 50% loss in the test population. All LD50 figures in this plan are for the oral doses. This information is given for general knowledge and will not effect the rating of the chemical. These figures can be found on the MSDS sheets and on some labels.

2.4.1.6. Conclusion: The pesticides will be ranked according to the Organochloride status, KOW, Half-life and partitioning Coefficient (PC, KOC). The data for the chemical properties was compiled from several sources refer to Appendix B. Information is not available on some of these chemicals at this time and the chemical will be penalized for this in the rating system. Table 2.9 is the Chemical Rating Results.

Organochlorides will receive a score of 5. If the chemical is not an Organochloride it receives a score of 1 and any chemicals without data receive a score of 2. The organochlorides were left in the rating system because of the conflicting data; although they are supposed to have long half-lives, information revealed most half-lives within SJRWMD specifications of 1 to 10 weeks. By giving a high score to the organ chlorides most should be at the bottom of the rating scale.

KOWS with an average of less than 5 receive a score of 1. Half-lives over 71 days and over receive a 3 and any without data receive a 2.

Half-Lives under 10 weeks of 70 days receive a score of 1. Half-lives over 71 days and over receives a 3 and any with data receive a 2.

PC, KOC are preferred to be high, therefore if a PC is under 5000, the chemical receives a 3. If a PC is between 5001 and 9999 or it is without data, it receives a 2 and if it is over 10000, it receives a 1.

2.4.2 Safe Fill, Mix and Apply: When a pesticide must be mixed in a tank with water (as opposed to dry spread from a tub) it should be done immediately before the material is applied. Mixing is a crucial time because the pesticide is in its most concentrated form. Therefore, follow all safety precautions on the labels. Applicators should always wear personal protective gear which includes: rubber gloves, goggles or face shields, respirators, protective clothing (tyvex suites) and rubber boots. If a spill is made on the clothing or person, wash off immediately and dispose of clothing article in the proper fashion or wash properly. If the spill or leak is on the ground, it should be cleaned immediately. Showers and eye wash facilities should be within easy access.

Filling the tank with water is an important first step. A stand pipe is the fastest and safest method of filling. never leave a filling tank unattended, it may over flow and cause a toxic puddle.

Compatibilities should be checked before mixing. Physical incompatibilities may result in lumping or precipitation. Chemical incompatibilities may result in reduced effectiveness, increased toxicity to the applicator, or phytotoxicity to the turf grass. Spray adjutants (e.g. wetting agents, emulsifiers, foaming agents, stickers) should be used in accordance with label recommendations.

When adding chemicals to the tank do not stand directly over the tank or look into it as they usually splash and emit dust. Always measure out chemicals below eye level, rinse measuring cups and put the rinse water in the tank. Only fill and mix exactly the amount needed.

Application begins with thorough mixing of materials in the tank. The equipment should be calibrated and properly operating. Applications will not be made on windy days or before rain. There is no smoking, drinking, or eating during this process. Protective gear is worn for filling, mixing, applying and cleaning equipment. When all

of this is finished, protective gear will be disposed or cleaned and stored properly. The applicator will wash thoroughly with soap and water. Clothes that have been exposed should be washed and stored separately.

2.4.3. Applications: Pesticides will be used when insect, disease, weeds or nematodes have reached their threshold levels. There are times when pre-emergent applications must be used for effective control. These will be held to a minimum. For the most part, spot applications can correct a problem. Greens and tees have the lowest tolerance levels which means chemical applications may be necessary more often in these areas. There is a total of 3.91 acres of low tolerance level turf. Applications will be made by individuals who have a Certified Restricted Use pesticide Applicators License. Applications will be made according to the labels. The applicator must read and understand all information on the label before handling is attempted. Label directions may include proper time or conditions for applications to be made such as time of day, temperature range, pH of water /solution, or use of adjutants. Labels sometimes suggest rates of travel in applying and may state compatibilities with other chemicals. Labels always specify proper rates; using the lower range of these recommended rates will insure effective pest control and safety to humans and the environment.

2.4.4 Equipment Cleaning: All pesticides should be applied leaving an empty tank. If all has been done to properly use the pesticides, the tank and equipment can be rinsed at the pesticide evaporation degradation facility wash down pad. This process requires personal protective gear, which should still be on from the previous spray activities. The entire spray system of the tank should be flushed with water, by actually running water through the system. Some labels may specify a cleaning materials such ammonia for 2, 4-D. Nozzles, filters and hoses should be checked for wear or clogging. Equipment should be stored in a dry, protected area.

2.4.5 Disposal of Containers: Most containers are to be triple rinsed, punctured and disposed of according to the label. Some containers may require other methods of disposal so always check the label directions. Containers should be rinsed before spray so the rinsate can be put in the spray tank, otherwise it should go through the evaporation/degradation system.

2.4.6. Pesticide Record Keeping: Records must be kept of all pesticide applications. Besides meeting government requirements, proper records help establish proof of proper use. They help in finding the cause of an error an facilitate a comparison of results from different pesticides. The information needed in records include:

1. Date and time of application
2. Names of the people involved with filing and mixing
3. Name of the person actually applying the pesticide
4. Specific turf area or ornamental involved
5. Target pest
6. Equipment used

7. Pesticide used (trade name, chemical name, formulation, active ingredient and Lot #)
8. Total formulation added to tank or hopper (oz of material)
9. Amount of mixture used (gallons in tank)
10. Amount or numbers treated (acres or tree, etc.)

2.5. **Establishing Tolerances:** Tolerances for insects, fungi, nematodes, and weeds must be set according to the amount of aesthetic or economic damage allowable on tees, greens, fairways, or roughs. The tolerance or injury level is the size of the pest population that is going to cause damage beyond acceptance. The goal is to keep pests from reaching the tolerance levels with cultural and biological management. Tolerance levels for the most part are subjective. There are exact numbers that can be applied such as 15 to 30 chinch bugs per square foot, but most of these figures remain to be established. The superintendent will establish the tolerances according to his or her experience with the area and the course, and the demands of the golf course directors.

2.6. **Monitoring Reports and Records:** A program will be set up to sample and monitor pest and natural enemy populations. Monitoring is to be done on a regular basis. When a problem is noticed it should be immediately recorded. Subsequent information such as treatment, reaction and status may also be recorded. This gives a record of the pests diagnosis, progression, and the effects of the treatment. As mentioned before, pesticide applications are recorded and these records will supplement each other. Monitoring should also include soil samples with a check for nematodes levels. The soil sample will establish nutrient levels, pH, and percent organic material. These records will identify problems that can be solved with cultural practices such as fertilization, top dressing, irrigation, aeration, mowing or vertical cutting. Monitoring may include a weather station to watch and record weather trends.

3. MANAGEMENT AND CONTROL OF HAZARDOUS MATERIALS ON SITE

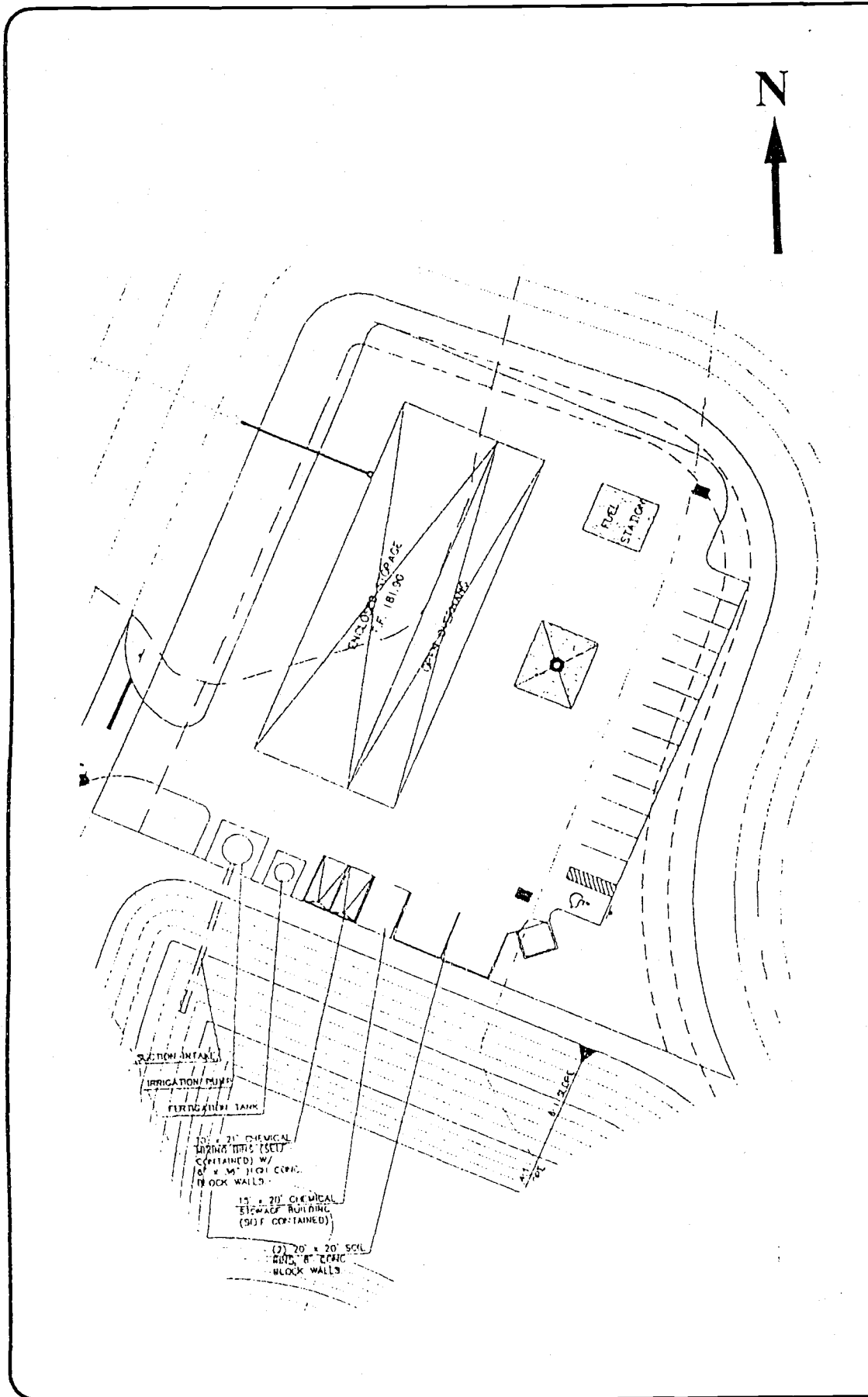
The hazardous materials dealt with in this section include pesticides and fertilizers. The Evaporation/Degradation System will deal with the pesticide waste materials. The golf course maintenance facility and the associated chemical and fertilizer storage facilities are depicted on Figure 3. The following section will describe the techniques for the proper storage of pesticides and fertilizers.

3.1 Evaporation/Degradation Systems

The Kings Ridge P.U.D. Development will have an evaporation/Degradation system for Pesticide Equipment Rinse Water. This system allows an outlet for tank rinse water and container rinsate (which is a hazardous waste) without having to be reused as a diluent in later spray operations or reapplied as a pesticide to labeled sites. A permit is required to construct and operate this system, which is allowed under the Florida Administrative Code Chapter 17-28.822.

3.1.1. Evaporation/Degradation Unit: The evaporation/degradation unit is where the rinse water is deposited for the evaporation and degradation processes. It consists of a tank with a safety retainment system and a roof. The process of evaporation/degradation takes place naturally. The liquid from the tank evaporates with the wind and heat. The remaining pesticides are broken down into less toxic compounds by the soil microorganisms and sunlight. The tank is made of nonearthen materials, in this case fiberglass and concrete. The dimensions of the tank will depend on the amount of rinse water expected to be generated. The tank must meet the Code of Federal Regulations 260.10 definition and is expected to last ten to twenty years depending on the quality of materials used in building. The soil matrix in the tank consists of soil and gravel. The best soil to use is top soil, preferably sandy, that had pesticides applied to it for a couple of years, because that means the microorganisms in it are already adapted to degradation of the pesticides commonly used. Both soil and gravel can be obtained locally. Two tank configurations are allowed, under ground or above ground, at Kings Ridge P.U.D., the tank will be above ground. The tank must withstand the stresses caused by the weight of the matrix mixture and the rinse water. The elevated tank will allow for visual inspection of leaks. A berm will surround the tank area that is high enough to prevent rainfall runoff from entering the area or for the tank water volume from overflowing in case of a rupture. An impermeable membrane will line the containment areas and berms. An alarm with a collection pipe and sump will be placed in this retention area so that in case of an overflow, the liquid is collected and an alarm signaled. Weeds around the tank must be kept trimmed and objects should not be allowed to accumulate around the tank. The tank should be 75 feet from the closest building to insure ventilation for evaporation. The tank must have a roof sufficient to prevent rainfall inputs into the tank. It must also be translucent to let the sunlight hit the matrix surface for degradation. There should be a chain link fence with a lock to discourage unauthorized access. In dismantling, the soil matrix is considered hazardous waste and therefore must be disposed of at a certified hazardous waste disposal contractor. Figure 3.1 is a diagram of the above ground unit similar to the at Kings Ridge P.U.D..

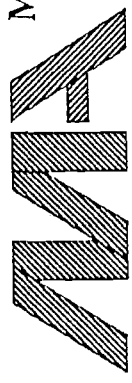
3.1.2. Wash Down Pad: The equipment is rinsed on this pad where it is collected to be pumped to the evaporation/degradation unit. The rinsate from triple rinsed containers



Drawn By: RCH
 Date: 10/06/95
 Scale: 1 in. = 30 feet

Figure 3. Site plan for the Golf Course Maintenance Facility at the Kings Ridge P.U.D. Phase III project site.

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may also be put in the wash pad collection. The wash pad will have a sump pump to get the rinse water to the above ground tank. The roof should be sufficient to prevent rainfall inputs. Figure 3.2 is a diagram of the wash pad.

3.1.3. Operation: Personnel involved in operating the tank must read the IFAS publication Bulletin 242 section on routine operation and maintenance. There are three important points to be noted; 1) the tank should never be filled to within one inch of the top edge of the tank wall. 2) Any leaks from the tank, piping, or sump pump should be reported to management immediately. 3) The sump at the wash pad should always be pumped dry at the end of the day. Personnel should check for leaks weekly. If there is a leak or a tank rupture, contact the local DER immediately. The containment system around the tank will keep the hazardous materials from reaching the ground water, but a clean up would be necessary.

3.2 Chemical Storage Facility: pesticides should be stored in a separate facility which is cool, dry, well lighted, ventilated, fireproof and can be locked. Warning signs should be clearly visible. A drainage system should collect runoff. The site should not be in an area likely to flood; absorptive material should be available in case of a spill or leak. There should be emergency shower and eye wash stations readily available at the storage facility. A smoke detector and a fire extinguisher are suggested. Fertilizers and pesticides should be stored in separate building. Figure 3.3 is an example of a pesticide storage facility prepared by the Florida Cooperative Extension Service.

4. REGULATORY FRAMEWORK FOR HAZARDOUS MATERIALS ON SITE

There are a couple of laws that must be compiled within Florida as a Grower. A Golf Course Superintendent is considered a grower because he or she is producing an end product for the consumer-turf.

There are four laws that deal with Worker and Community Right-To-Know and one that deals with Underground Storage Tanks. The four that deal with Right-To-Know are as follows:

1. The Florida Worker and Community Right-To-Know
2. The Emergency Planning and Community Right-To-Know Act. Also known as SARA TITLE III
3. THE OSHA Hazardous Communication Standard.
4. The Florida Hazardous Materials Emergency Response and Community Right-To-Know Act

All of these laws overlap somewhat. Depending on the amount of pesticides used and stored or the number of full time employees, Kings Ridge P.U.D. may be exempt from some of these, at this time.

The regulations on the registration, construction and monitoring of fuel storage tanks

will be discussed. Kings Ridge P.U.D. will most likely have under ground tanks so the discussion will concentrate on Underground Storage Tanks (UST).

4.1 Florida Worker and Community Right-To-Know: This is a state law under the Florida Administrative Code, Rules of the Department of Labor and Employment Safety, passed in 1985. It has its own list called the Florida Substance List, Chapter 442, Florida Statutes. Facilities can be exempt if they have less than 12 full time or 24 seasonal employees. This law insures that employees know what chemicals they are working with and their hazards.

First a Right-To-Know poster must be obtained and posted, informing employees of their rights. Next, an inventory must be taken and compared to the Florida Substance List. Retain a list of the chemicals that match the list, although it would be prudent to keep a list of all substances on the property. This list must be available to the employees.

Material Safety Data Sheets (MSDS) must be obtained for all chemicals on the inventory list. These can be obtained from the retailer or the manufacturer. MSDS must be maintained for 30 years and be available to an employee upon request within five working days. Employees have a right to refuse work under specified circumstances with a listed toxic substance if not provided a copy of the MSDS for that substance within the five working days. Employees have the right to protection against discharge, discipline or discrimination for having exercised any of these rights.

Instruction must be provided to employees within their first 30 days of employment, and at least annually after that. Instruction should include: The adverse health effects of each listed toxic substances, which they work with; how to use the substance safely; and what to do in case of an emergency. The employer must advise employees of their right to obtain further information from the Toxic Substance Information Center.

For the Community's Right-To-Know, the employer/owner must notify the local fire department of the locations and names of each listed toxic substance present in the workplace.

4.2 SARA TITLE III, Emergency Planning and Community Right-To-Know: This is a Federal Statute passed in 1986. The Super fund Amendments and Reauthorization Act (SARA TITLE III) revises and expands the earlier comprehensive environmental response compensation and liability act of 1980. (CERCLA) establishes the Emergency Planning and Community Right-To-Know. SARA TITLE III includes four major sections:

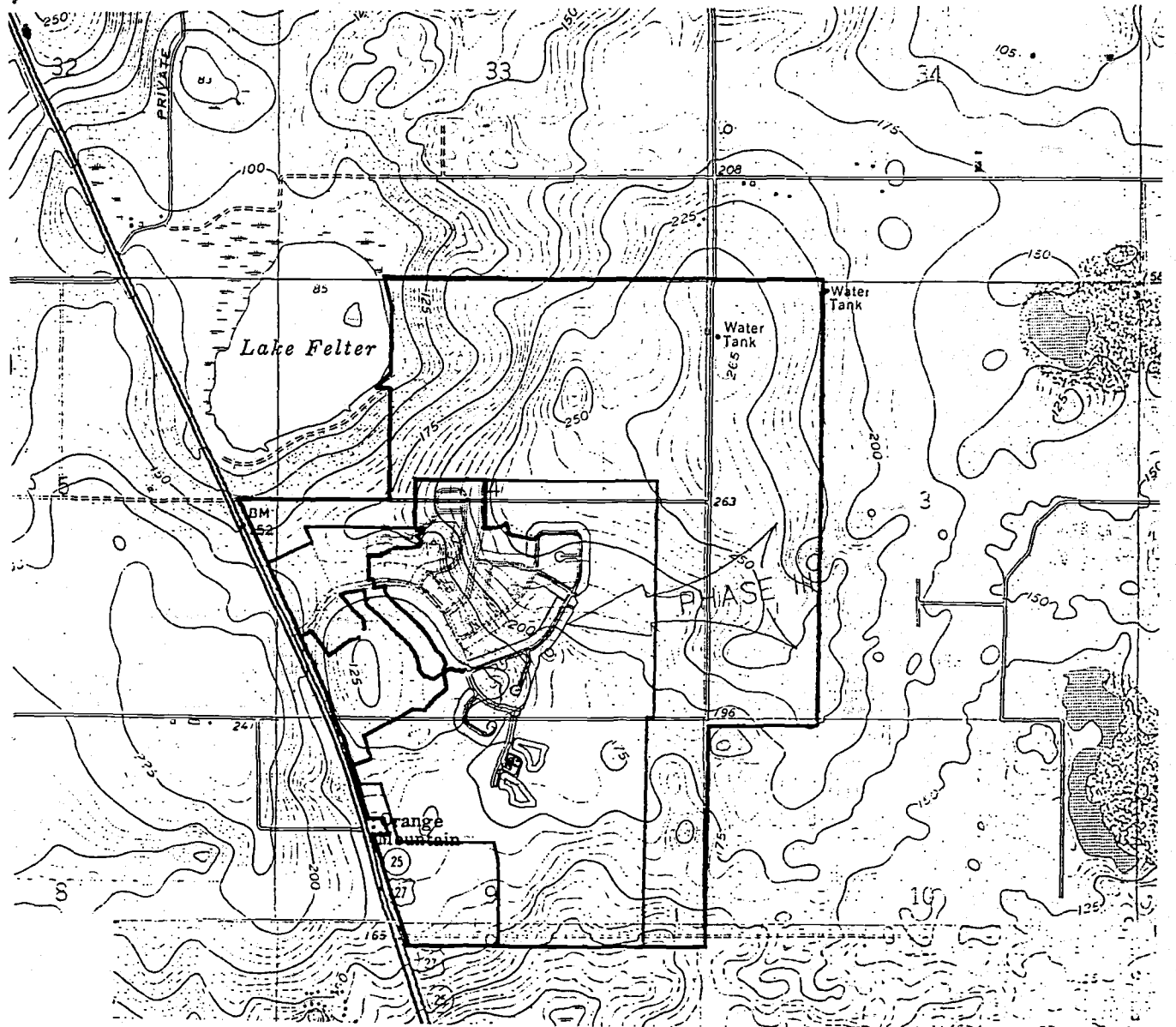
1. Emergency Planning, Section 301-303
2. Emergency Notification, Section 304
3. Community Right-To-Know and Reporting Requirements, Section 311-MSDS and 312-Hazardous Chemical Inventory.
4. Toxic Chemical Release Reporting and Emissions Inventory, Section 313.

There are different reporting and/or notification requirements for each of these sections. There are also exemptions for each requirement and some of these requirements will not apply to Kings Ridge P.U.D. at this time.

4.2.1. Emergency Planning, Section 302: Section 302 requires that if you have a substance on EPA's Extremely Hazardous Substance List (EHS or 302 on the consolidated hazardous materials list) in excess of its Threshold Planning Quantity (TPQ) you must notify the State Emergency Response Commission (SERC) and the local emergency planning committees (LEPC) of its locations and name. A facility has 60 days to make this notification after acquiring an Extremely Hazardous Substance (EHS) over the Threshold Planning Quantity (TPQ). This is one time notification with a one time filing fee of \$50.00 per facility. There is also no annual fee. Up until June 30, 1990, the annual fee will be based on the factors directly related to chemical toxicity and volatility, quantity, and potential hazard to the community.

4.2.2. Emergency Planning, Section 303: Any facility subject to 302 must send the name and phone number of a contact person, or facility representative, to the SERC and LEPC. The contact person will provide LEPC with the necessary information to develop emergency response plans. Figure 4.1 is a sample reporting letter to be sent to the SERC and the LEPC in response to sections 302 and 303. Figure 4.2 is a map describing the LEPC district for there to report, and the SERC address is 2740 Center view Drive, Tallahassee, Florida 32399-2149.

4.2.3. Emergency Notification, Section 304: Section 304 requires notification for off site spills that will result in exposure to people off site. This section of SARA TITLE III, provides that accidental non-routine releases (spray applications are routine) of EHS exceeding the Reportable Quantity (RQ) are immediately reported to the SERC and the LEPC.



4-069-0326A-ERP



SCALE 1" = 2000'

SECTION 4 & 9
TOWNSHIP 23 S
RANGE 26 E

CLERMONT-EAST
LAKE LOUISA



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