

Bound Reports

1720

**STORMWATER CALCULATIONS
KINGS RIDGE NORTH CLUBHOUSE & SPA
FBA # 941216.118**

**FARNER, BARLEY & ASSOCIATES INC,
350 N. SINCLAIR AVENUE
TAVARES, FLORIDA 32778**

BY: _____

DUANE K. BOOTH, P.E.

DATE APR 09 2001

19411-13
RECEIVED

APR 0 2001

PDS
ORLANDO
SJR WMD

Kings Ridge North Clubhouse & Spa

Stormwater Summary

The Kings Ridge North Clubhouse consist of 3.36 Acres and is located in Section 4, Township 23S, and Range 26E of the Kings Ridge North Subdivision. This area of 3.36 acres (2.22 Ac. impervious) is part of Basin 16 of which was previously permitted by SJRWMD (4-069-0326M9-ERP). The area proposed will consist of clubhouse, pool & spa, paved driveways & parking, and a stormwater conveyance system that will tie into the existing drainage system for basin 16. In the existing condition basin 16 is 91.22% complete. In the proposed condition basin 16 will be 100% complete. The overall CN designed under permit 4-069-0326M9-ERP for this basin is 56.

CN at 91.22% build out:	Pervious area	= 29.70 Ac.
	Impervious area	= 8.60 Ac.
	CN	= 52

CN at 100% build out:	Pervious area	= 27.48 Ac.
	Impervious area	= 10.82 Ac.
	CN	= 56

As it shows, the CN at 100% build out is less than or equal to the approved CN by SJRWMD.

POST DEVELOPMENT BASIN SUMMARY TABLE

<i>BASIN</i>	<i>AREA (AC.)</i>	<i>PERCENT IMPERVIOUS</i>	<i>PERCENT PERVIOUS</i>	<i>CN</i>
1	25.24	30	70	57
2	9.55	14	86	47
3	13.36	24	76	53
4	24.75	36	64	60
5	56.47	34	66	59
6	15.89	23	77	53
7	5.73	18	82	50
10	29.08	28	72	56
11	10.30	37	63	61
12	19.15	27	73	55
13	3.77	35	65	60
14	5.40	40	60	63
15	10.83	23	77	53
16	38.30	28	72	56

BASIN 16 PREVIOUSLY PERMITTED BY SJRWMD, PERMIT # 4-069-0326M9-ERP

STORM RUNOFF WORKSHEET

PROJECT # 94216.077 PROJECT: KINGS RIDGE NORTH DATE: 11/17/99

PRE-DEVELOPMENT
 POST-DEVELOPMENT

BASIN NO. <u>B16</u>		TOTAL AREA <u>38.30 ac.</u>			STORM: <u>25</u> YEAR <u>96</u> HOUR		
SOIL	GROUP	LAND USE	AREA Pervious (acres)	AREA Imperv. (acres)	CN	AREA (%)	PRODUCT CN x AREA
	<u>A</u>	<u>GREEN GRASS (GOOD)</u>	<u>27.48</u>		<u>39</u>	<u>72</u>	<u>2808</u>
		<u>68 x 3500 = 238,000</u>					
		<u>22 x 4250 = 93,500</u>					
		<u>STREET / CLUB = 139,734</u>					
		<u>471,234</u>		<u>10.82</u>	<u>98</u>	<u>28</u>	<u>2744</u>
TOTALS						<u>100</u>	<u>5552</u>

RAINFALL (P) = 11.2 in. RUNOFF R = _____ in. _____ ac.ft. _____ cu.ft.

PRODUCT COVERAGE = \overline{CN} = 56

BASIN NO. _____		TOTAL AREA _____			STORM: _____ YEAR _____ HOUR		
SOIL	GROUP	LAND USE	AREA Pervious (acres)	AREA Imperv. (acres)	CN	AREA (%)	PRODUCT CN x AREA
TOTALS							

RAINFALL (P) = _____ in. RUNOFF R = _____ in. _____ ac.ft. _____ cu.ft.

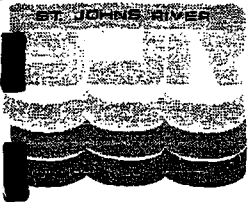
PRODUCT COVERAGE = \overline{CN} = _____

BASIN NO. _____		TOTAL AREA _____			STORM: _____ YEAR _____ HOUR		
SOIL	GROUP	LAND USE	AREA Pervious (acres)	AREA Imperv. (acres)	CN	AREA (%)	PRODUCT CN x AREA
TOTALS							

RAINFALL (P) = _____ in. RUNOFF R = _____ in. _____ ac.ft. _____ cu.ft.

PRODUCT COVERAGE = \overline{CN} = _____

$S = \frac{1000}{CN} - 10$
 $R = \frac{(P - 0.25)^2}{(P + 0.85)}$
 R = runoff (in.)
 P = rainfall (in.)



**WATER
MANAGEMENT
DISTRICT**

POST OFFICE BOX 1429

TELEPHONE 904-329-4500
TDD 904-329-4450
FAX (Executive) 329-4125 (Legal) 329-4485

PALATKA, FLORIDA 32178-1429

1-800-451-7106
TDD SUNCOM 860-4450
(Permitting) 329-4315
SUNCOM 904-860-4500
(Administration/Finance) 329-4508

SERVICE CENTERS

618 E. South Street
Orlando, Florida 32801
407-897-4300
1-877-228-1658
FAX 407-897-4354
TDD 407-897-5960

7775 Baymeadows Way
Suite 102
Jacksonville, Florida 32256
904-730-6270
1-800-852-1563
FAX 904-730-6267
TDD 904-448-7900

PERMITTING:
305 East Drive
Melbourne, Florida 32904
407-884-4940
1-800-295-3264
FAX 407-722-5357
TDD 407-722-5368

OPERATIONS:
2133 N. Wickham Road
Melbourne, Florida 32935-8109
407-752-3100
TDD 407-752-3102

April 11, 2000

Lennar Land Partners
ATTN: Robert Ahrens
7600 Nob Hill
Tamarac, FL 33321

SUBJECT: Management and Storage of Surface Waters Individual
Permit Number 4-069-0326M9-ERP

Dear Sir:

Enclosed is your permit as authorized by the Governing Board of the St. Johns River Water Management District on April 11, 2000.

This permit is a legal document and should be kept with your other important documents. The attached MSSW/Stormwater As-Built Certification Form should be filled in and returned to the Palatka office within thirty days after the work is completed. By so doing, you will enable us to schedule a prompt inspection of the permitted activity.

In addition to the MSSW/Stormwater As-Built Certification Form, your permit also contains conditions which require submittal of additional information. All information submitted as compliance to permit conditions must be submitted to the Palatka office address.

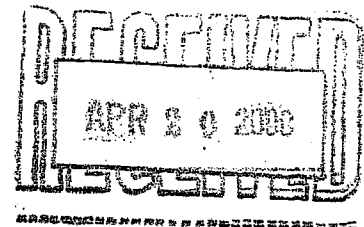
Permit issuance does not relieve you from the responsibility of obtaining permits from any federal, state and/or local agencies asserting concurrent jurisdiction for this work.

In the event you sell your property, the permit will be transferred to the new owner, if we are notified by you within thirty days of the sale. Please assist us in this matter so as to maintain a valid permit for the new property owner.

Thank you for your cooperation and if this office can be of any further assistance to you, please do not hesitate to contact us.

Sincerely,

Quen Johnson, Data Control Technician
Permit Data Services Division



Enclosures: Permit with EN form(s), if applicable

cc: District Permit File

Farner Barley & Associates Inc.

ATTN: Duane K. Booth, PE, 350 North Sinclair Avenue, Tavares, FL, 32778

William Kerr, CHAIRMAN
MELBOURNE BEACH

Ometrias D. Long, VICE CHAIRMAN
APOPKA

Jeff K. Jennings, SECRETARY
MAITLAND

Duane Ottenstroer, TREASURER
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Otis Mason
ST. AUGUSTINE

Clay Albright
EAST LAKE WEIR

Reid Hughes
DAYTONA BEACH

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
Post Office Box 1429
Palatka, Florida 32178-1429

PERMIT NO. 4-069-0326M9-ERP,

DATE ISSUED April 11, 2000

A PERMIT AUTHORIZING:

This permit is for the construction of a surface water management system consisting of mass grading for a future golf course residential community, including construction of two lined wet retention ponds, and nine dry retention ponds in 228.80 acres of area known as Kings Ridge North.

LOCATION: Section(s) 4, Township 23 South, Range 26 East

COUNTY: Lake

ISSUED TO:
(owner)

Lennar Land Partners
7600 Nob Hill
Tamarac, FL 33321

Permittee agrees to hold and save the St. Johns River Water Management District and its successors harmless from any and all damages, claims, or liabilities which may arise from permit issuance. Said application, including all plans and specifications attached thereto, is by reference made a part hereof.

This permit does not convey to permittee any property rights nor any rights or privileges other than those specified herein, nor relieve the permittee from complying with any law, regulation or requirement affecting the rights of other bodies or agencies. All structures and works installed by permittee hereunder shall remain the property of the permittee.

This Permit may be revoked, modified or transferred at any time pursuant to the appropriate provisions of Chapter 373, Florida Statutes:

PERMIT IS CONDITIONED UPON:

See conditions on attached "Exhibit A", dated April 11, 2000

AUTHORIZED BY: St. Johns River Water Management District

Department of Resource Management Governing Board

By: 

(DIRECTOR)
JEFF ELLEDGE

By: 

(ASSISTANT SECRETARY)
HENRY DEAN

"EXHIBIT A"

Lennar Land Partners

April 11, 2000

4-069-0326M9-ERP

1. All activities shall be implemented as set forth in the plans, specifications and performance criteria as approved by this permit. Any deviation from the permitted activities and the conditions for undertaking that activity shall constitute a violation of this permit.
2. This permit or a copy thereof, complete with all conditions, attachments, exhibits, and modifications, shall be kept at the work site of the permitted activity. The complete permit shall be available for review at the work site upon request by District staff. The permittee shall require the contractor to review the complete permit prior to commencement of the activity authorized by this permit.
3. Activities approved by this permit shall be conducted in a manner, which do not cause violations of state water quality standards.
4. Prior to and during construction, the permittee shall implement and maintain all erosion and sediment control measures (best management practices) required to retain sediment on-site and to prevent violations of state water quality standards. All practices must be in accordance with the guidelines and specifications in Chapter 6 of the Florida Land Development Manual: A Guide to Sound Land and Water Management (Florida Department of Environmental Regulation 1988), which are incorporated by reference, unless a project specific erosion and sediment control plan is approved as part of the permit, in which case the practices must be in accordance with the plan. If site specific conditions require additional measures during any phase of construction or operation to prevent erosion or control sediment, beyond those specified in the erosion and sediment control plan, the permittee shall implement additional best management practices as necessary, in accordance with the specifications in Chapter 6 of the Florida Land Development Manual: A Guide To Sound Land and Water Management (Florida Department of Environmental Regulation 1988). The permittee shall correct any erosion or shoaling that causes adverse impacts to the water resources.
5. Stabilization measures shall be initiated for erosion and sediment control on disturbed areas as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 7 days after the construction activity in that portion of the site has temporarily or permanently ceased.
6. At least 48 hours prior to commencement of activity authorized by this permit, the permittee shall submit to the District a Construction Commencement Notice Form No. 40C-4.900(3) indicating the actual start date and the expected completion date.
7. When the duration of construction will exceed one year, the permittee shall submit construction status reports to the District on an annual basis utilizing an annual Status Report Form No. 40C-4.900(4). These forms shall be submitted during June of each year.

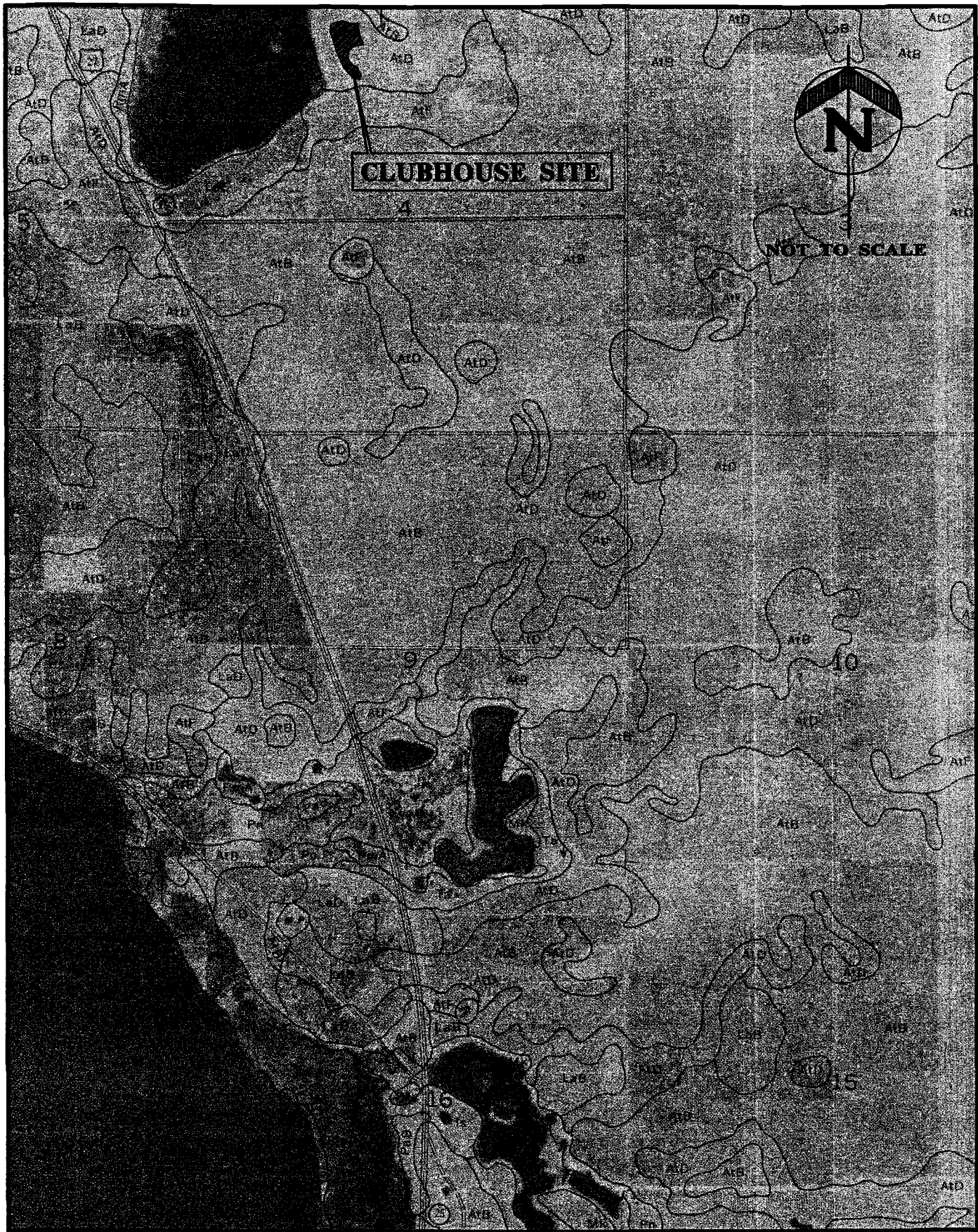
8. For those systems which will be operated or maintained by an entity which will require an easement or deed restriction in order to provide that entity with the authority necessary to operate or maintain the system, such easement or deed restriction, together with any other final operation or maintenance documents as are required by Subsections 7.1.1 through 7.1.4 of the Applicant's Handbook: Management and Storage of Surface Waters, must be submitted to the District for approval. Documents meeting the requirements set forth in these Subsections of the Applicants Handbook will be approved. Deed restrictions, easements and other operation and maintenance documents which require recordation either with the Secretary of State or the Clerk of the Circuit Court must be so recorded prior to lot or unit sales within the project served by the system, or upon completion of construction of the system, whichever occurs first. For those systems which are proposed to be maintained by county or municipal entities, final operation and maintenance documents must be received by the District when maintenance operation of the system is accepted by the local governmental entity. Failure to submit the appropriate final documents referenced in this paragraph will result in the permittee remaining liable for carrying out maintenance and operation of the permitted system.
9. Each phase or independent portion of the permitted system must be completed in accordance with the permitted plans and permit conditions prior to the initiation of the permitted use of site infrastructure located within the area served by that portion or phase of the system. Each phase or independent portion of the system must be completed in accordance with the permitted plans and permit conditions prior to transfer of responsibility for operation and maintenance of that phase or portion of the system to a local government.
10. Within 30 days after completion of construction of the permitted system, or independent portion of the system, the certification by a registered professional engineer or other appropriate individual as authorized by law, utilizing As-Built Certification Form 40C-1.81(13) or 40C-1.181(14) supplied with this permit. When the completed system differs substantially from the permitted plans, any substantial deviations shall be noted and explained and two copies of as-built drawings submitted to the District. Submittal of the completed form shall serve to notify the District that the system is ready for inspection. Statement of completion and certification shall be based on the on-site observation of construction (conducted by the registered professional engineer, or other appropriate individual as authorized by law, or under his/her direct supervision) or review of as-built drawings for the purpose of determining if the work was completed in compliance with approved plans and specifications. As-built drawings shall be the permitted drawings revised to reflect any changes made during construction. Both the original and any revised specifications must be clearly shown. The plans must be clearly labeled as "as-built" or "record" drawing. All surveyed dimensions and elevations shall be certified by a registered surveyor. The following information, at a minimum, shall be certified on the as-built drawings:
 - A. Dimensions and elevations of all discharge structures including all weirs, slots, gates, pumps, pipes, and oil and grease skimmers;
 - B. Locations, dimensions, and elevations of all filter, exfiltration, or underdrain systems including cleanouts, pipes, connections to control structures, and points of discharge to the receiving waters;

- C. Dimensions, elevations, contours, or cross-sections of all treatment storage areas sufficient to determine stage-storage relationships of the storage area and the permanent pool depth and volume below the control elevation for normally wet systems, when appropriate;
 - D. Dimensions, elevations, contours, final grades, or cross-sections of the system to determine flow directors and conveyance of runoff to the treatment system;
 - E. Dimensions, elevations, contours, final grades, or cross-sections of all conveyance systems utilized to convey off-site runoff around the system;
 - F. Existing water elevations(s) and the date determined; and
 - G. Elevation and location of benchmark(s) for the survey.
11. The operation phase of this permit shall not become effective until the permittee has complied with the requirements of general condition no. 9 above, the District determines the system to be in compliance with the permitted plans, and the entity approved by the District in accordance with Subsections 7.1.1. through 7.1.4 of the Applicants Handbook: Management and Storage of Surface Waters, accepts responsibility for operation and maintenance of the system. The permit may not be transferred to such an approved operation and maintenance entity until the operation phase of the permit become effective. Following inspection and approval of the permitted system by the District, the permittee shall request transfer of the permit to the responsible approved operation and maintenance entity, if different from the permittee. Until the permit is transferred pursuant to Section 7.1 of the Applicants Handbook: Management and Storage of Surface Waters, the permittee shall be liable for compliance with the terms of the permit.
12. Should any other regulatory agency require changes to the permitted system, the permittee shall provide written notification to the District of the changes prior to implementation so that a determination can be made whether a permit modification is required.
13. This permit does not eliminate the necessity to obtain any required federal, state, local and special district authorizations prior to the start of any activity approved by this permit. This permit does not convey to the permittee or create in the permittee any property right, or any interest in real property, nor does it authorize any entrance upon or activities on property which is not owned or controlled by the permittee, or convey any rights or privileges other than those specified in the permit and Chapter 40C-4 or Chapter 40C-40, F.A.C.
14. The permittee shall hold and save the District harmless from any and all damages, claims, or liabilities which may arise by reason of the activities authorized by the permit or any use of the permitted system.

15. Any delineation of the extent of a wetland or other surface water submitted as part of the permit application, including plans or other supporting documentation, shall not be considered specifically approved unless a specific condition of this permit or a formal determination under Section 373.421(2), F.S., provides otherwise.
16. The permittee shall notify the District in writing within 30 days of any sale, conveyance, or other transfer or ownership or control of the permitted system or the real property at which the permitted system is located. All transfers of ownership or transfers of a permit are subject to the requirements of Section 40C-1.612, F.A.C. The permittee transferring the permit shall remain liable for any corrective actions that may be required as a result of any permit violations prior to the sale conveyance or other transfer.
17. Upon reasonable notice to the permittee, District authorized staff with proper identification shall have permission to enter, inspect, sample and test the system to insure conformity with the plans and specifications approved by the permit.
18. If historical or archeological artifacts are discovered at any time on the project site, the permittee shall immediately notify the District.
19. The permittee shall immediately notify the District in writing of any previously submitted information that is later discovered to be inaccurate.
20. This permit for construction will expire five years from the date of issuance.
21. At a minimum, all retention and detention storage areas must be excavated to rough grade prior to building construction or placement of impervious surface within the area to be served by those facilities. To prevent reduction in storage volume and percolation rates, all accumulated sediment must be removed from the storage area prior to final grading and stabilization.
22. All wetland areas or water bodies that are outside the specific limits of construction authorized by this permit must be protected from erosion, siltation, scouring or excess turbidity, and dewatering.
23. Prior to construction, the permittee must clearly designate the limits of construction on-site. The permittee must advise the contractor that any work outside the limits of construction, including clearing, may be a violation of this permit.
24. Within 90 days of permit issuance, the Permittee must obtain District approval of a site specific, integrated Pesticides Management Plan. The management plan must specify the usage of non-chemical or cultural means as the primary defense against nuisance and/or destructive pests. These non-chemical measures should include practices such as: the planting and maintenance of native vegetation where possible; the use of pest and/or disease tolerant vegetation; the proper selection and application of fertilizer; proper supplemental watering; the use of mulch for weed control, and proper maintenance practices including mowing frequency, mowing height, mechanical dethatching, removal of dying or dead vegetation, etc. The plan must also include information on the following: A. Insecticides, nematicides, fungicides or herbicides to be used; B. Method(s) of application; C. Time

frames for use and application; and D. For the pesticides that will be used, specification of: - Half-lives - N-Octanol/water partition coefficient (Kow) - Lethal dose coefficient (LD50) - Solubility Any pesticides selected must exhibit a short half-life (<10 weeks), a low n-octanol/water coefficient (<5.0), and be suitable for use with local soils and groundwater pH conditions. The use of organochlorides and other pesticides either listed by EPA as canceled or suspended, or otherwise prohibited by state or federal law is not allowed.


25. The permittee must adhere to the fertilizer recommendations set forth in the manual for commercial turf grass management by the University of Florida compiled by the Florida Turf-Grass Association. The nutrient loading attributable to the application of effluent shall be considered a source of fertilizer for the golf course and additional non-effluent fertilizer sources shall be utilized only as a supplement.
26. The operation and maintenance entity shall submit inspection reports to the District two years after the operation phase permit becomes effective and every two years thereafter on District form EN-46. The inspection form must be signed and sealed by an appropriate registered professional.
27. The proposed surface water management system must be constructed as per the plans received by the District on January 24, 2000.
28. This permit does not authorize construction of any impervious surface, or any other work not shown on the plans referenced above.
29. The permittee may obtain a Standard General Environmental Resource Permit (ERP) for future phases of the King Ridge North when the phase is consistent with this permit and does not exceed the thresholds pursuant to 40C-40.302(2), F.A.C. If a phase exceeds the thresholds pursuant to 40C-40.302 (2), F.A.C. or if a phase is inconsistent with this permit, the permittee must obtain a modification to this permit.
30. The operation and maintenance entity must maintain the retention pond in the surface water management system as per the maintenance plan developed by the design professional.
31. Contained within the as-built report, the permittee must submit a soil analysis of the base of retention ponds verifying that the design permeability rates are provided for each phase of the construction. If the design permeability rates cannot be verified, the permittee must obtain a modification of this permit demonstrating that the design criteria and objectives of Chapter 40C-4, F.A.C. are met.
32. The operation and maintenance entity shall submit inspection reports to the District one year after the operation phase permit becomes effective and every year thereafter on District form EN-46 for each phase of the construction. The inspection form must be signed and sealed by an appropriate registered professional, and must include the results of permeability tests of the base of the retention ponds verifying that the design permeabilities are met. After three consecutive inspection reports confirm the design permeabilities for a phase of the construction, the entity will no longer be required to submit permeability test results and the inspection report requirement shall be amended to every two years for the said phase. If the design permeability rates cannot be verified, the permittee must obtain a modification to the permit demonstrating that the design criteria of Chapter 40C-4 F.A.C. are met.



CLUBHOUSE SITE



NOT TO SCALE


FARNER BARLEY
 AND ASSOCIATES, INC.
300 North Street Avenue O, Tequesta, Florida 33778 ☎ (202) 343-8401

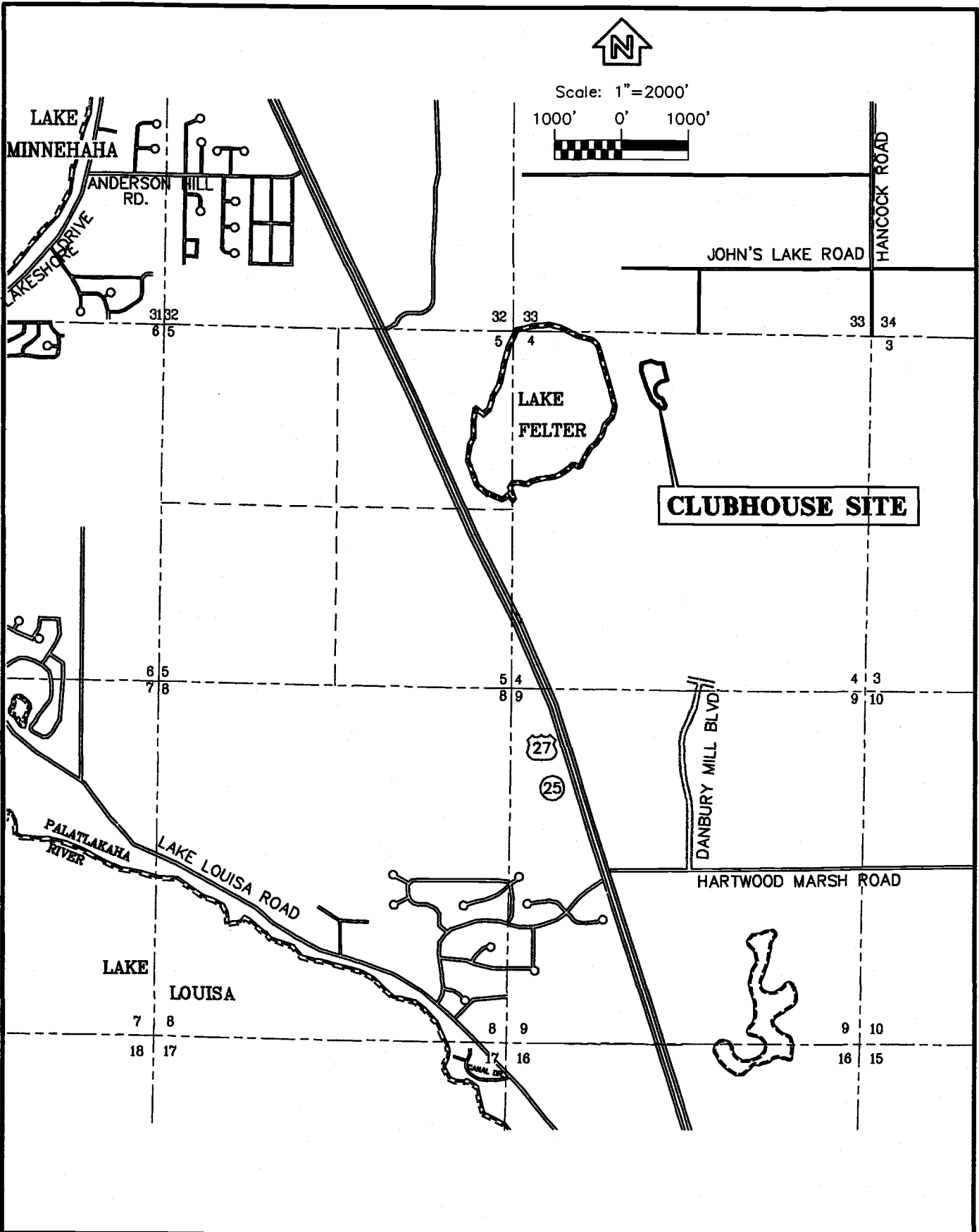
- ▲ ENGINEERS
- ▲ SURVEYORS
- ▲ PLANNERS

CLUBHOUSE
AT KINGS RIDGE

SOILS MAP



DATE: MAR. 2001
JOB NO. 941216.118

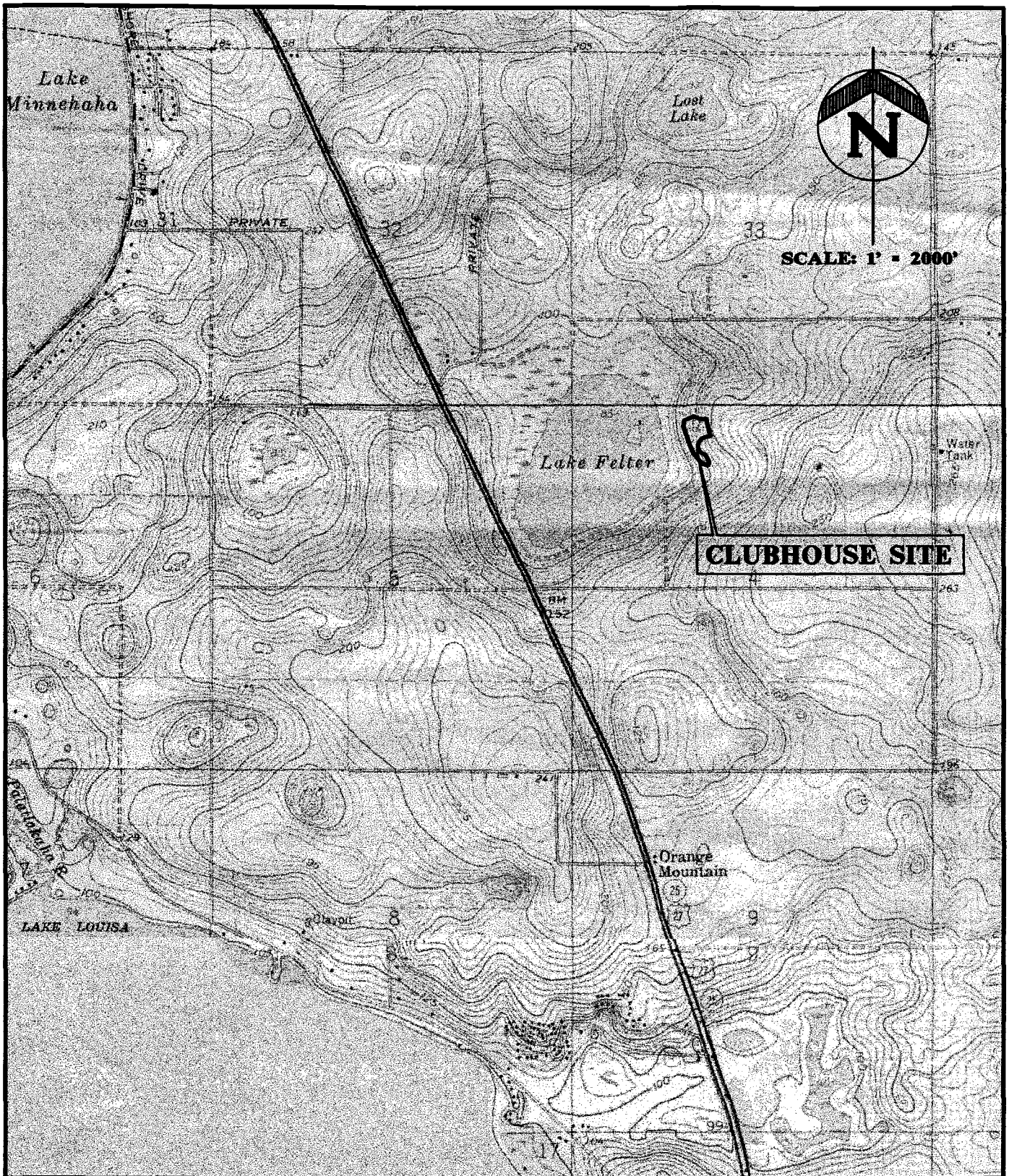


FARNER BARLEY
 AND ASSOCIATES, INC.
 300 North Sholar Avenue O. Tallahassee, Florida 32378 O (904) 343-6448

- ▲ ENGINEERS
- ▲ SURVEYORS
- ▲ PLANNERS

**CLUBHOUSE
 AT KINGS RIDGE
 LOCATION MAP**

DATE: MAR. 2001	
JOB NO. 94223.116	



**CLERMONT EAST QUADRANGLE FLORIDA
LAKE LOUISA EAST QUADRANGLE FLORIDA**



**FARNER
BARLEY**
AND ASSOCIATES, INC.

▲ ENGINEERS
▲ SURVEYORS
▲ PLANNERS

300 North Shook Avenue O Tourney, Florida 32776 © (202) 343-8481

**CLUBHOUSE
AT KINGS RIDGE**

USGS MAP

DATE: MAR, 2001

JOB NO. 942216.118

PROJECT: KING'S RIDGE NORTH CLUBHOUSE

PROJECT NO.: 941216.118

DATE: 3/15/01

RAINFALL EVENT: 10 YEAR -24 HOUR ZONE: 7

NO. D101

LAND USE	PORTION	C	PRODUCT
PERVIOUS	0	0.20	0
IMPERVIOUS			
0.21 ac	1.00	0.95	0.95
AREA: 0.21 Acres	C = 0.95		

NO. D102

LAND USE	PORTION	C	PRODUCT
PERVIOUS	0.58	0.20	0.12
IMPERVIOUS			
0.08 ac	0.42	0.95	0.40
AREA: 0.19 Acres	C = 0.52		

$Q=CIA=0.95 \times 7.3 \times 0.21 = 1.46 \text{ CFS}$

$Q=CIA=0.52 \times 7.3 \times 0.19 = 0.72 \text{ CFS}$

NO. D103

LAND USE	PORTION	C	PRODUCT
PERVIOUS	0	0.20	0
IMPERVIOUS			
0.43 ac	1.00	0.95	0.95
AREA: 0.43 Acres	C = 0.95		

NO. D104

LAND USE	PORTION	C	PRODUCT
PERVIOUS	0.34	0.20	0.07
IMPERVIOUS			
0.23 ac	0.66	0.95	0.63
AREA: 0.35 Acres	C = 0.70		

$Q=CIA=0.95 \times 7.3 \times 0.43 = 2.98 \text{ CFS}$

$Q=CIA=0.70 \times 7.3 \times 0.35 = 1.79 \text{ CFS}$

NO. D105

LAND USE	PORTION	C	PRODUCT
PERVIOUS	0	0.20	0
IMPERVIOUS			
0.32 ac	1.00	0.95	0.95
AREA: 0.32 Acres	C = 0.95		

NO. D106

LAND USE	PORTION	C	PRODUCT
PERVIOUS	0.47	0.20	0.09
IMPERVIOUS			
0.35 ac	0.53	0.95	0.50
AREA: 0.66 Acres	C = 0.59		

$Q=CIA=0.95 \times 7.3 \times 0.32 = 2.22 \text{ CFS}$

$Q=CIA=0.59 \times 7.3 \times 0.66 = 2.84 \text{ CFS}$

NO. D107

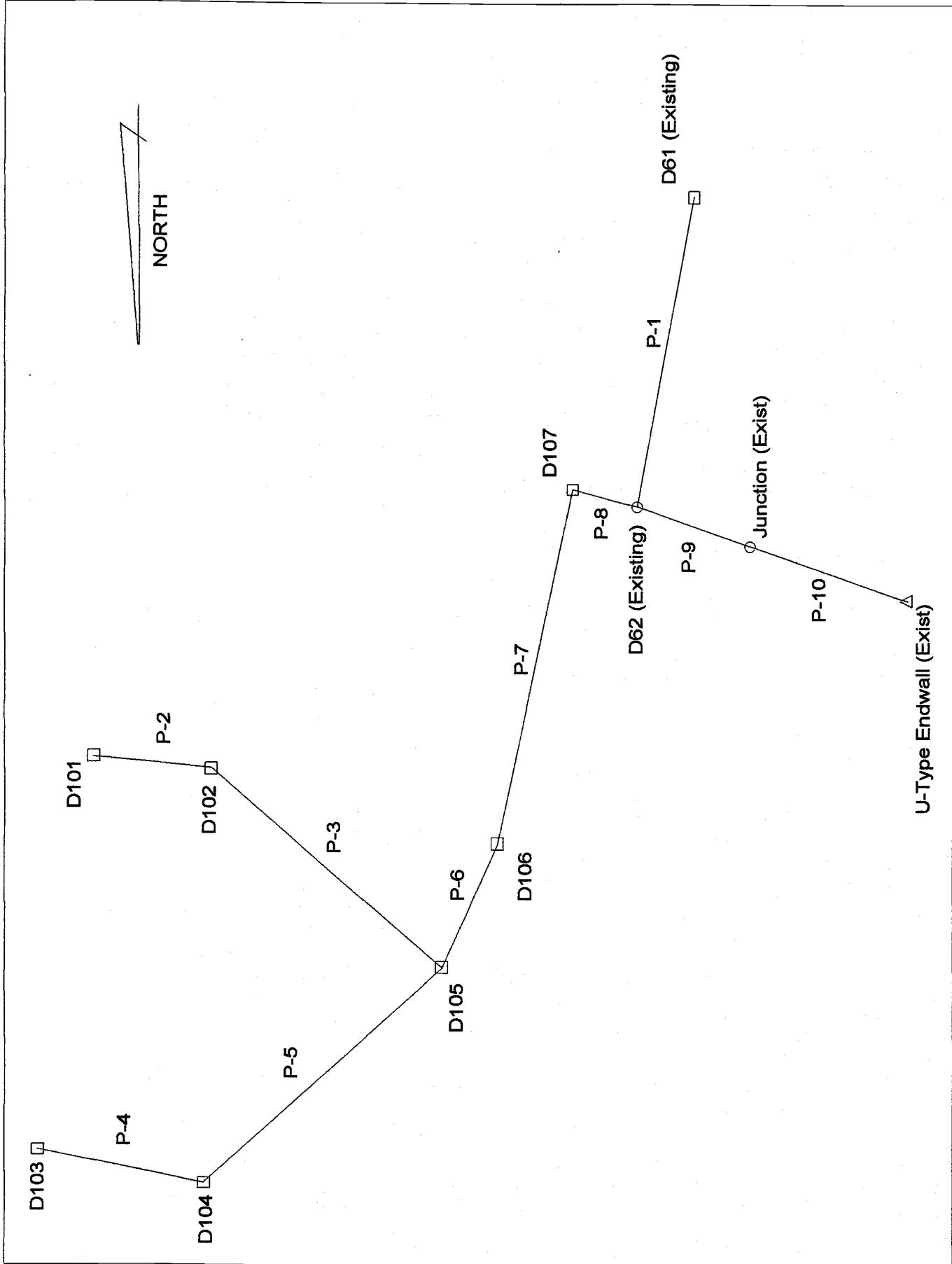
LAND USE	PORTION	C	PRODUCT
PERVIOUS	0.71	0.20	0.14
IMPERVIOUS			
0.47 ac	0.29	0.95	0.28
AREA: 1.60 Acres	C = 0.42		

NO.

LAND USE	PORTION	C	PRODUCT
PERVIOUS			
IMPERVIOUS			
AREA: _____ Acres	C = _____		

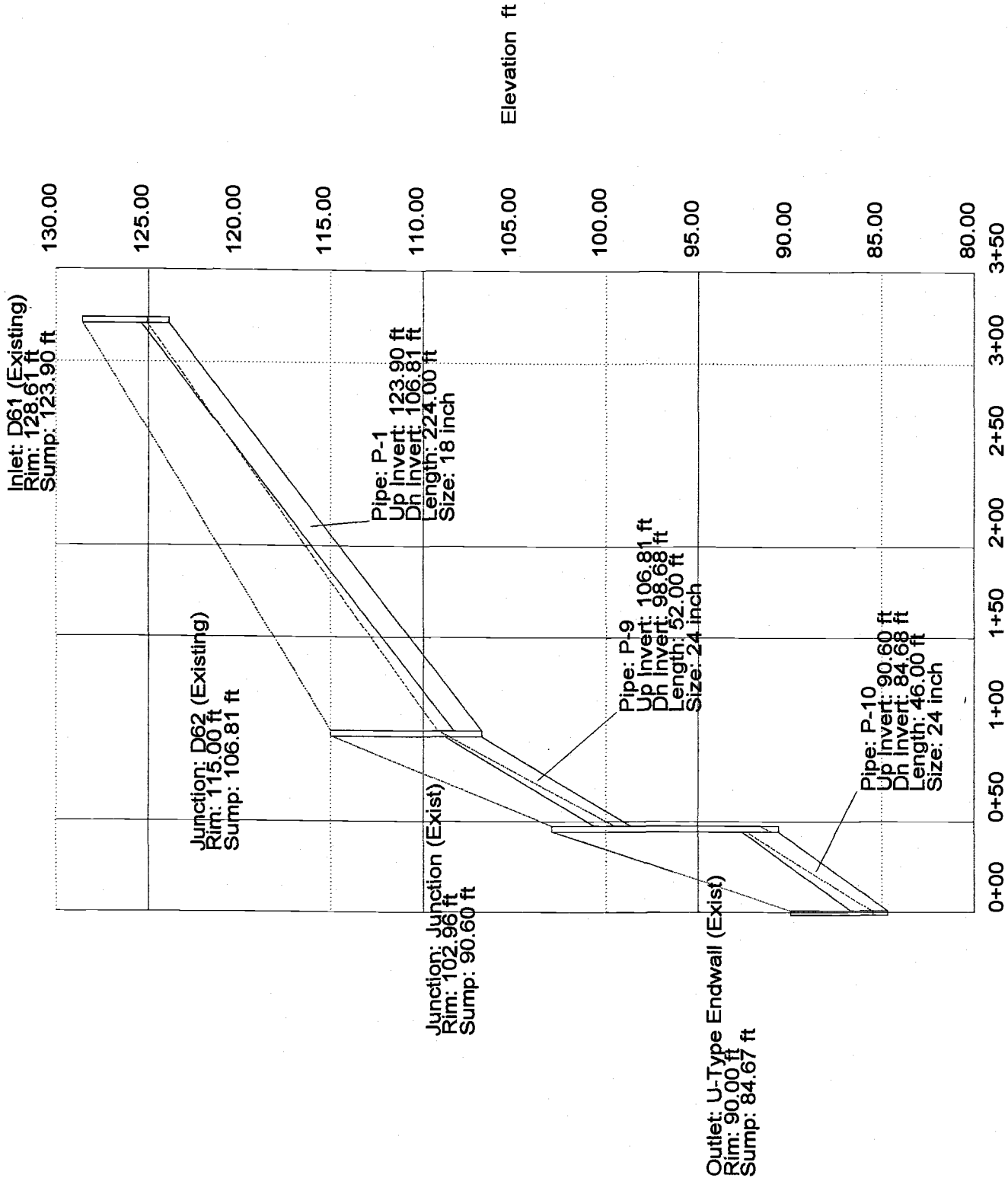
$Q=CIA=0.42 \times 7.3 \times 1.60 = 4.91 \text{ CFS}$

$Q=CIA= \quad \times \quad \times \quad = \quad \text{CFS}$



NORTH

U-Type Endwall (Exist)



Inlet: D61 (Existing)
 Rim: 128.61 ft
 Sump: 123.90 ft

Junction: D62 (Existing)
 Rim: 115.00 ft
 Sump: 106.81 ft

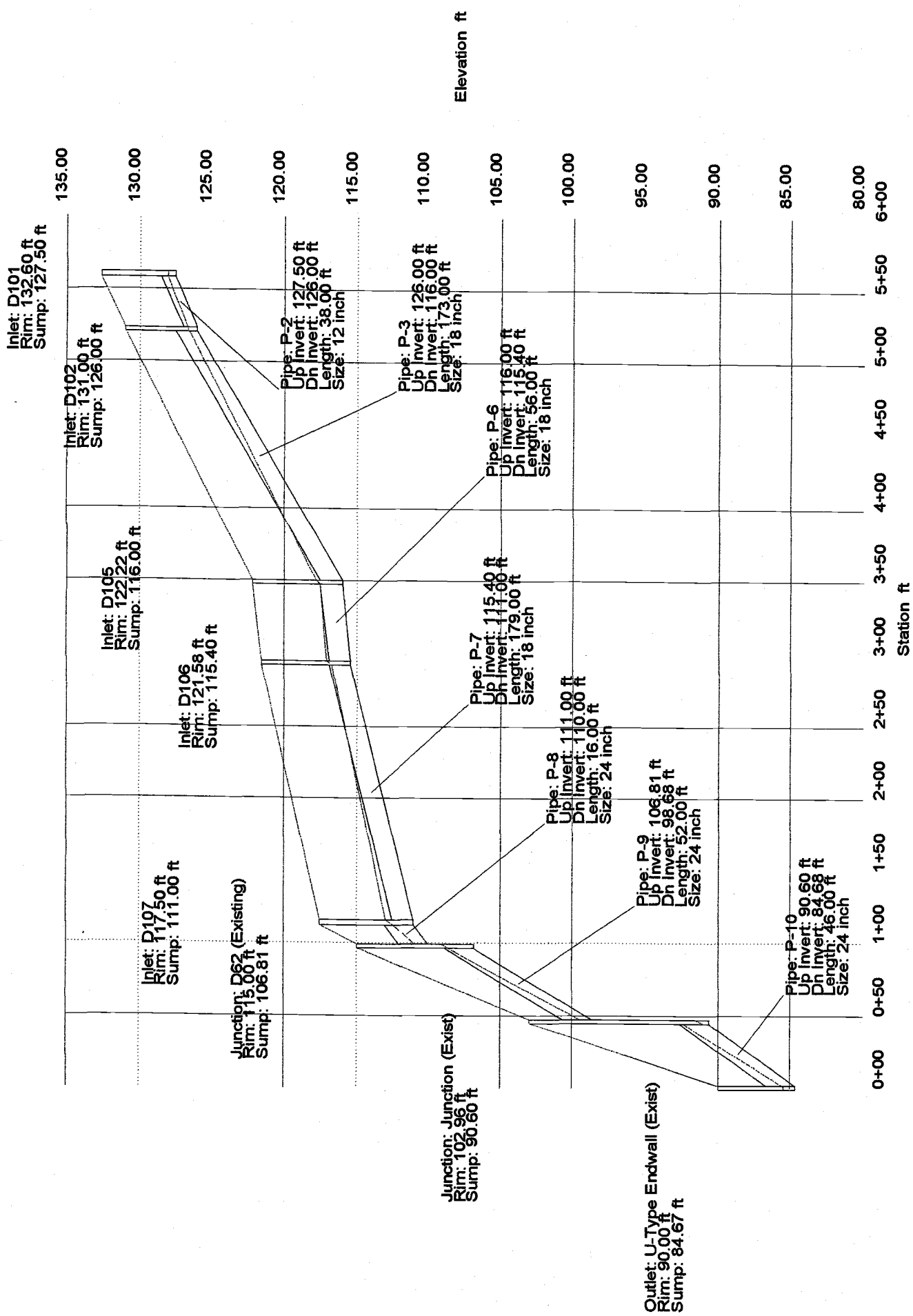
Junction: Junction (Exist)
 Rim: 102.96 ft
 Sump: 90.60 ft

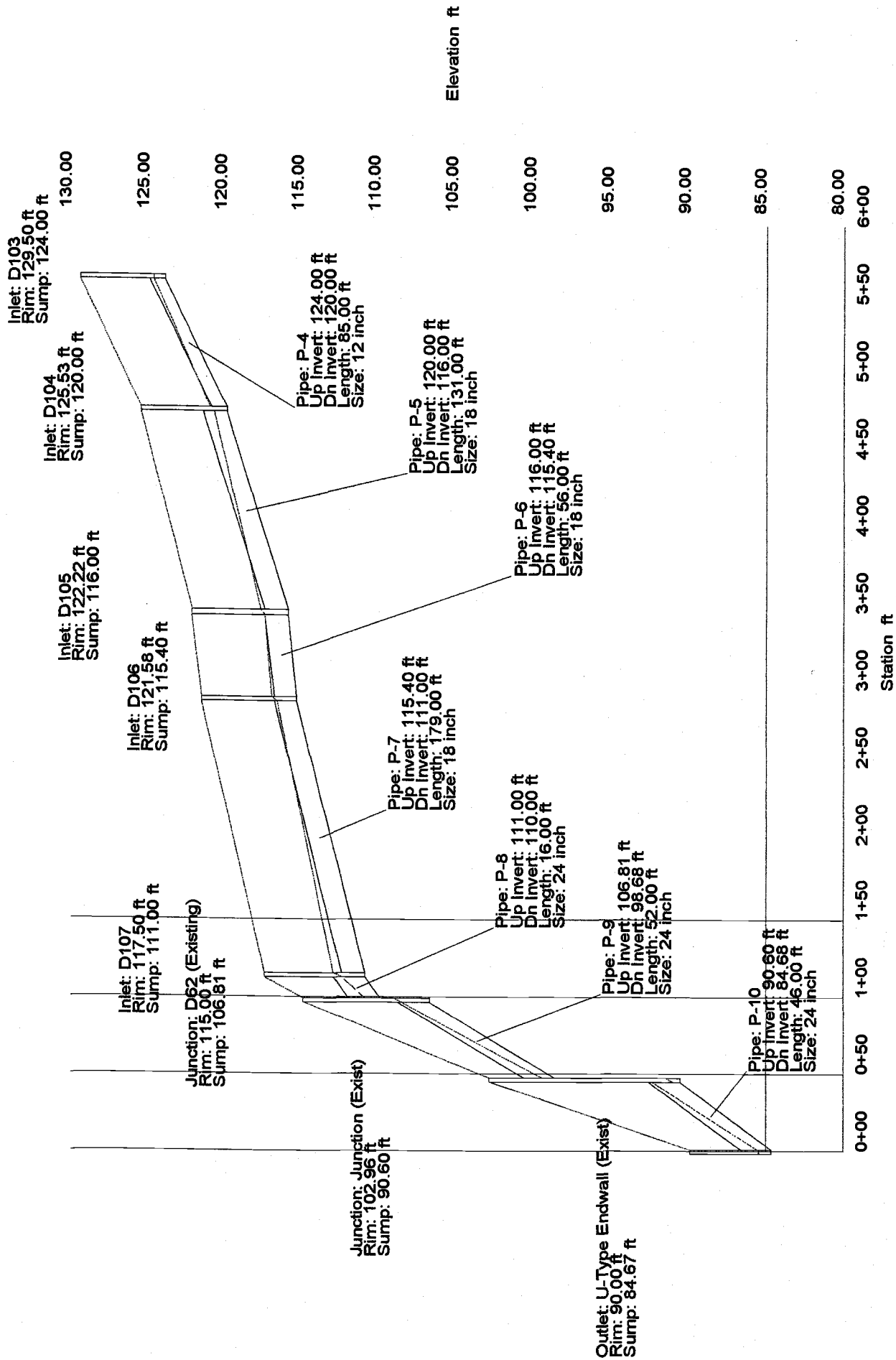
Outlet: U-Type Endwall (Exist)
 Rim: 90.00 ft
 Sump: 84.67 ft

Pipe: P-1
 Up Invert: 123.90 ft
 Dn Invert: 106.81 ft
 Length: 224.00 ft
 Size: 18 inch

Pipe: P-9
 Up Invert: 106.81 ft
 Dn Invert: 98.68 ft
 Length: 52.00 ft
 Size: 24 inch

Pipe: P-10
 Up Invert: 90.60 ft
 Dn Invert: 84.68 ft
 Length: 46.00 ft
 Size: 24 inch





Combined Pipe/Node Report

Pipe	Upstream Node	Downstream Node	Length (ft)	Inlet Area (acres)	Inlet C	Inlet CA (acres)	Total CA (acres)	Inlet Discharge (cfs)	Section Size	Capacity (cfs)	Average Velocity (ft/s)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Constructed Slope (ft/ft)	Inlet TC (min)	Upstream Ground Elevation (ft)	Upstream HGL (ft)
P-4	D103	D104	85.00	0.43	0.95	0.41	0.41	3.01	12 inch	9.13	4.31	124.00	120.00	0.047059	10.00	129.50	124.74
P-5	D104	D105	131.00	0.35	0.70	0.24	0.65	1.80	18 inch	18.35	3.69	120.00	116.00	0.030534	10.00	125.53	120.84
P-2	D101	D102	38.00	0.21	0.95	0.20	0.20	1.47	12 inch	8.37	3.09	127.50	126.00	0.039474	10.00	132.60	128.01
P-3	D102	D105	173.00	0.19	0.52	0.10	0.30	0.73	18 inch	25.25	2.44	126.00	116.00	0.057803	10.00	131.00	126.56
P-6	D105	D106	56.00	0.32	0.95	0.30	1.26	2.24	18 inch	10.87	5.03	116.00	115.40	0.010714	10.00	122.22	117.49
P-7	D106	D107	179.00	0.66	0.59	0.39	1.65	2.87	18 inch	16.47	6.84	115.40	111.00	0.024581	10.00	121.58	116.70
P-8	D107	D62 (Existing)	16.00	1.60	0.42	0.67	2.32	4.94	24 inch	56.55	8.85	111.00	110.00	0.062500	10.00	117.50	112.45
P-1	D61 (Existing)	D62 (Existing)	224.00	1.98	0.61	1.21	1.21	8.89	18 inch	29.01	5.56	123.90	106.81	0.076295	10.00	128.61	125.05
P-9	D62 (Existing)	Junction (Exist)	52.00	N/A	N/A	N/A	3.53	N/A	24 inch	89.45	13.72	106.81	98.68	0.156346	N/A	115.00	108.56
P-10	Junction (Exist)	U-Type Endwall (Exis)	46.00	N/A	N/A	N/A	3.53	N/A	24 inch	81.15	12.87	90.60	84.68	0.128696	N/A	102.96	92.35

Rainfall Table

Return Periods

Durations	10 year
10 min	7.30
15 min	6.30
20 min	5.70
25 min	5.20
30 min	4.80
35 min	4.50

Rainfall Intensities are in (in/hr)