Appendix E

FLORIDA DEPARTMENT OF TRANSPORTATION CULVERT ANALYSIS SUMMARY REPORT

Chris Smith
EN-HH

Florida Department of Transportation

JEB BUSH
GOVERNOR

THOMAS F. BARRY, JR.
SECRETARY

District Six Environmental Management Office
1000 N.W. 111 Avenue, Room 6101
Miami, Florida 33172

August 13, 1999

Richard E. Bonner, P.E.
Deputy District Engineer for Project Management
Department of the Army
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Re: **Condition of Culverts under U.S. 41 / S.R. 90 / Tamiami Trail**

Dear Mr. Bonner:

Enclosed please find a report on the condition of the culverts under U.S. 41 / S.R. 90 / Tamiami Trail from Station 708 + 10.28 (M.P. 13.871, west of Krome Avenue) to Station 1299 + 46.28 in Miami-Dade County. As a follow-up to our February 15, 1999 correspondence to you, this field assessment and report were prepared by our consultant in response to your earlier request to assess the condition and need for maintenance of the existing culverts under Tamiami Trail in Miami-Dade County. The results of this assessment were previously relayed in my telephone discussion with Ms. Cheryl Ulrich, P.E., of your office on June 3, 1999. The enclosed report is forwarded for your files and provides additional details regarding the present condition of all culverts in this area.

In summary, there are 55 steel-reinforced concrete pipe culverts between the above referenced stations. These culverts are placed in groups (typically three) within a single head wall structure on either side of the roadway (please see report for photograph of typical culvert structure). A visual inspection of each culvert on both sides of the roadway revealed that all of the culverts were between 50% and 100% full of water . No culverts were observed with obstructions from substantial sediment, debris, or vegetation build-up inside of, or immediately adjacent to, the pipe openings. A southern flow of water was observed at each location with rates varying from slow to rapid. Based on the consultant's observations, it appears that at present, the primary determining factor for flow rate through the culverts is the water level. Rapid flow rates coincide with dredged waterways south of the culverts and restricted flow rates are associated with shallow water wetlands outside of the Department's right-of-way. There is some minor

maintenance needed on the southern side of the roadway at culverts #1, 2 and #3 (head wall structure #S-2), where it is recommended that a dense mat of water hyacinth be removed to improve flow. There is also an abandoned 55-gallon drum located on the south side of the roadway at culvert #55 (head wall structure #S-23). While this drum is not impeding flow, it should be removed and properly disposed of. Both the vegetation and the drum are outside the Department's right-of-way. They appear to be within Everglades National Park property, although this was not confirmed.

Based on the above findings, no maintenance of the culverts is needed at this time.
As mentioned previously, the Department is proceeding with plans to install two stadia adjacent to the canal, which will allow our maintenance personnel to regularly monitor water levels next to Tamiami Trail in this area.

We hope this information is helpful. If there are any questions regarding this report please call me at (305) 470-5220.

Sincerely,

Barbara B. Culhane, A.I.C.P.
District Environmental Administrator

cc: Richard Ring, ENP
Gary Evink, FDOT Central Office
Ron Steiner, FDOT Maintenance
Mike Ciscar, FDOT Environmental Mgmt
Marjorie Bixby, FDOT Environmental Mgmt.

TAMIAMI TRAIL CULVERT SURVEY REPORT
S.R. 90/U.S. 41/TAMIAMI TRAIL

FROM STATION 708+10.28 (M.P. 13.871, WEST OF KROME AVENUE)

TO STATION 1299+46.28

IN MIAMI-DADE COUNTY

FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT SIX

MAY, 1999

INTRODUCTION

The objective of this report is to provide a summary of our recent inspections of cross culverts under S.R. 90/U.S. 41/Tamiami Trail. There are a total of fifty-five (55) pipe culverts under Tamiami Trail with 37 headwall structures (north and south of the roadway) at nineteen (19) locations. They are located in an eleven (11) mile section of Tamiami Trail west of S.R. 997/S.W. 177 Ave/Krome Avenue. The typical structure is a group of three steel-reinforced concrete pipes in a north-south orientation (under the road) between two concrete headwalls that are orientated parallel to the road. Sample plan details of the culverts and structures are included with this report (see Attachment 1).

METHODOLOGY

The field inspections were conducted on February 23 and 24, 1999, by two biologists from Consulting Engineering & Science, Inc. Two goals of the inspections were characterizing any obstructions to the effective operation of the culverts and marking the culvert locations for any warranted FDOT maintenance crew activities. Potential obstructions due to wetland vegetation or sedimentary buildup in front of the pipes on either side of the roadway were investigated. We also noted the shape and approximate diameter of the pipes, as well as their general hydrologic operating conditions. Each location was marked by painting the structure number on the headwall and on the asphalt beneath the guardrail on both the north and south road shoulders. In addition, a numbered wooden stake flagged with pink survey tape was placed in front of the headwalls. Representative photographs and a table summarizing our findings are enclosed (see Attachments 2 and 3, respectively).

RESULTS

The overall condition of the culverts is good and no structural problems were observed. No culverts were observed with obstructions from substantial sediment, debris, or vegetation build-up inside of, or immediately adjacent to, the pipe openings. A southern flow of water was observed at each location, with rates varying from slow (noticeable by drifting periphyton) to rapid (with visibly turbulent water). Water was observed discharging mainly into shallow expanses of water surrounded by densely vegetated wetlands adjacent to the southern roadway shoulder (within Everglades National Park). However, several culverts discharged into dredged channels or sloughs (utilized as airboat docks and navigation channels at tourist establishments) which were relatively clear of vegetation and exhibited rapid flow rates.

The slow flow rates were observed at culvert locations that initially discharged to deep (3 to 4 foot depths) dredged water areas in front of southern headwalls. These dredged areas appeared to extend between 15 and 30 feet south of the discharge structures (based upon visual observations at several locations where vegetation did not obscure the view). However, the area then generally transitions at a steep slope to shallow-water (approximately 1 foot), densely vegetated wetlands to the south of Tamiami Trail.

Yellow cow lilies (Nuphar sp.) are the predominant emergent vegetative cover in front of the culverts. They occur in sparse (5 to 30 percent of surface water area) to moderate (30 to 70 percent) coverages. Other native, non-invasive aquatic vegetation present in front of the culverts included: bladderworts (Utricularia sp.), tape-grass (Vallisneria americana), and Illinois pondweed (Potamogeton illinoensis). Invasive exotic species present in front of the culverts included: water hyacinth (Eichhornia crassipes), fanworts (Cabomba sp.), and Hydrilla (Hydrilla verticillata). Only Culverts No. 1, 2, & 3 on the southside of the roadway (Structure No. S-2) had openings obstructed by a dense mat of vegetation (water hyacinth). However, based on construction plans, the FDOT right-of-way ends at the headwall at this location.

DISCUSSION

Based on our observations, it appears that the determining factor for flow rate through the culverts is hydrologic and not due to vegetation, debris, or sediment build-up. Rapid flow rates coincide with dredged waterways south of the culverts and restricted flow rates are associated with shallow water wetlands outside of FDOT right-of-way.

The mat of water hyacinth in front of Culverts 1, 2, & 3 (Structure No. S-2), located at the southern toe-of-slope near the western limits of the survey (M.P. 13.871) should be removed in order to improve flow at these culverts. This vegetation is outside of the FDOT right-of-way. It appears to be within Everglades National Park right-of-way, however this has not been confirmed. In addition, Culvert No. 35 (Structure No. S-23) has a 55-gallon drum which should be removed from the water in front of the pipe opening. This drum is outside of the FDOT right-of-way. Culvert No. 40 (Structure No. S-26) had cattails sucked into the pipe at this location but they did not appear to restrict water flow.