



GENESIS GROUP, INC.

3910 US Highway 301 N., Suite 140
Tampa, Florida 33619
(813) 620-4500 • (813) 620-4980 Fax

RECEIVED

APR 4 1996

DRAINAGE DEPT.

MEMORANDUM

DATE: April 1, 1996

TO: Mike Peterson, P.E.
District Design Engineer

FROM: Reuben Ohanian, P.E.
Genesis Group, Inc.

SUBJECT: Design Variation

RE: W.P.I. No. 1110874
State Project No. 05090-1511
Glades County

Fm # 193991

This project proposes the widening of Bridge No. 050941 on SR 29 in Glades County. The structure is being widened to improve public safety and modernize the existing bridge to current FDOT Geometric Standards. Bridge No. 050941 received an efficiency rating of 86.9 with no significant deficiencies (Bridge Inspection, 05/94). An underwater inspection confirmed the same.

During the preparation of the Bridge Hydraulics Report, it became evident that the minimum 2 foot vertical clearance during the design storm is not being met at the existing bridge. Since this is a widening project and the low member elevation is not changing, the 2 foot vertical clearance will not be met by the proposed bridge either. The letter requests that a variance be granted by District One for this design requirement.

The design criteria giving in the FDOT Drainage Manual, Vol. 1, Ch. 4, states specifically

4.6.1 Vertical Clearance

Minimum vertical clearance requirements are as follows:

1. To allow debris to pass without causing damage, the clearance between the design flood stage and the low member of bridges shall be a minimum of 2 feet. This standard does not apply to culverts and bridge-culverts.

Chipley

Jacksonville
LC 000259

Sarasota
LB 000220

St. Petersburg
AA 0002343

Tallahassee
EB 0002220

Tampa

Memo to Mike Peterson, P.E.
W.P.I. No. 1110874
State Project No. 05090-1511
Page 2
April 1, 1996

The table below documents the water surface elevations computed by the hydraulic program, WSPRO, used to model the creek.

Estimate Vertical Clearances from WSPRO (in feet)			
Bridge Configuration	Low Member Elevation	Design Water Surface Elevation	Vertical Clearance (ft)
Existing Bridge	34.90	34.06	0.84
Proposed Bridge	34.90	34.10	0.80

The existing and proposed bridges both provide same amount of vertical clearance during the design storm.

Since the existing bridge is hydraulically adequate with the exception of the substandard vertical clearance, widening appears to be a viable alternative. In order to provide the required 2 foot of vertical clearance, the low member would have to be raised a minimum of 1.2 feet. Raising the low member would not be feasible without a complete bridge replacement having an approximate cost of \$180,000.00. The cost of widening the bridge is approximately \$60,000.00 or about one-third the cost of the replacement. A final recommendation on widening versus replacement will rest on a structural evaluation of the actual existing condition of the bridge which was built in 1948.

We would appreciate your approval of the design variation for a substandard vertical clearance as soon as possible so that we may continue with the project schedule as planned. Thank you for your assistance in this matter.

Sincerely,

GENESIS GROUP, INC.

EB 0002220 • AA 0002343 • LC 0000259 • LS 0005457


Reuben Ohanian, P.E.
Project Engineer

RO/dg

cc: Mike Finch, P.E., District Drainage Engineer
Arthur B. de Laski, P.E.

Chipley

Jacksonville
LC 000259

Sarasota
LB 0002220

St. Petersburg
AA 0002343

Tallahassee
EB 0002220

Tampa



RECEIVED
JUL 06 1998
DRAINAGE DEPT.

MEMORANDUM

Date: July 1, 1998

To: Bernie Masing, District Project Management Engineer

From: ^{for} Mark A. Schulz, ^{by} District Environmental Administrator

Copies: Marvin Williams - FHWA Transportation Engineer; Tom Small,
L.M. Courtney, Glenn Ivey, Walt Childs, Michael Finch, J.M. Peterson,
Andrew Phillips, Jim Wilt, Michael Enot

Subject: **Non-Major State Action**
Widen bridges
S.R. 29 at Bridge Nos. 050941, 050032, 050031, 050035
Financial Management No. 193991
Work Program Item No. 1110874
State Project No. 05090-1511
Glades County

Widen four bridges to provide for 3 meter shoulders on both sides of the bridges. Add paved shoulders to approaches.

The subject project will not use federal funds. Therefore, it has been determined that the bridge paintings are a Non-Major State Action as described in Part 1, Chapter 13 of the Project Development and Environment Manual. Also, it has been determined that this project has no known potentially significant contamination involvement.

Consequently, the project is considered to have state location and design acceptance, and no further environmental action is necessary.

If funding for this project changes to federal, please notify this office. Further environmental action **will** be necessary.

rdc

MEMORANDUM

State of Florida Department of Transportation

Date: March 18, 1996

To: J. R. Previte, Project Manager

From: /Michael D. Finch, P.E., District Drainage Engineer *MDF*

Copies To: M. K. Marshall

Subject: Bridge Hydraulics Report Concurrence
W.P.I. No. 1110874
Bridge No. 050035
State Project No. 05090-1511

I have reviewed the above Bridge Hydraulic Report dated 3/7/96. It appears that all previous comments have been addressed and that the BHR meets FDOT and FHWA criteria. Therefore, I concur with its recommendation.

Please ensure that the Structure's Department and the project file receive sufficient copies of the BHR. If there are any questions, please contact me.

The review comments are not intended to be inclusive of all errors and omissions. The consultant is responsible for the technical accuracy, project decisions, engineering judgement, and quality of the project. These comments are not intended to change the scope of work, specify direction for the project, or to be contrary to FHWA or FDOT design criteria or good engineering judgement. The intent is to identify some typical apparent inconsistencies, and to further clarify design documentation and design decisions made by the consultant.

MDF:do

MEMORANDUM

State of Florida Department of Transportation

Date: April 2, 1996
To: M. D. Finch, District Drainage Engineer, MS 1-14
From: J.R. Previte, Project Manager
Subject: W.P.I. Nos. 1110459, 1110874
State Project Nos. 04010-1507, 05090-1511
SR 31 at Bridge No. 040001 in DeSoto County
SR 29 at Bridge Nos. 050031, 32, 35, and 941 in Glades County

RECEIVED
APR 2 1996
DRAINAGE DEPT.

Transmitted:

Revised BHR and response to comments for SR 31 Br # 040001

Action to be taken:

Access Management Review	Structures Review
District Contracts Review	Construction Review
Design Services Review	Maintenance Review
► Drainage Review	Value Engineering Review
Environmental Management Review	SWAO Review
Environmental Permits Review	Utilities Review
Traffic Operations Review	Preliminary Right of Way Review
Traffic Ops. - Traffic Signals Review	Review and Comment
Traffic Ops. - Signing & Marking Review	Approval/disapproval
Traffic Ops. - Lighting Review	for Your Information
Geotechnical Review	per Your Request
Geotechnical Soil Survey	per Our Phone Conversation
Geotechnical Foundation Investigations	
Geotechnical Pond Investigations	

Date requested for return: April __, 1996

Date returned: ___ / ___ / ___

Remarks:

Response:



GENESIS GROUP, INC.

April 1, 1996

Mr. John Previte
Project Manager
State of Florida Department of Transportation
District One Office
801 North Broadway Avenue
Bartow, FL 33830

RECEIVED
APR 2 1996
DRAINAGE DEPT.

Re: S.R. 31 Crossing Prairie Creek
BHR Review Comment Responses
State Project No. 04010-1507
W.P.I. No. 1110459
Desoto County

Comments from James M. Lee, Jr. Drainage Engineer, March 20, 1996

COMMENT:

1. Show Project Number and WPI Number on Cover Sheet.

RESPONSE:

So noted and added to the cover sheet.

COMMENT:

2. On your introduction, give a short explanation of preferred alternative and other alternatives analyzed.

RESPONSE:

So noted and added an explanation of all other alternates and included a summary table of the results.

COMMENT:

3. On Page 2, Paragraph 5, should "Peach River" read "Peace River"?

RESPONSE:

Yes, so noted and corrected.

COMMENT:

4. Are pile depths known for the existing bridge? If so, please include in existing Crossing Narrative.

RESPONSE:

Yes, they are. The tip elevation is 5.0' NGVD. Added the information to the existing crossings.

COMMENT:

5. On Page 9, Paragraph 2, Bridge 04001 should say 040001.

RESPONSE:

So noted and corrected.

COMMENT:

6. The last sentence on Page 11 is confusing. Please reword to reflect type of crossing (i.e., upstream or downstream).

RESPONSE:

So noted and corrected the sentence.

COMMENT:

7. Please check all values on Table 2. Some values appear to be erroneous (i.e., velocity at existing bridge).

RESPONSE:

We have rechecked the values in the Table and made the necessary corrections. However, per the response to comments number 8 and 14, the existing bridge needs to be modeled as a composite section.

COMMENT:

8. The comparison between existing and proposed bridge on Table 2, 3 and 4 appear incorrect. You are comparing an unstricted existing bridge to a constricted proposed bridge. Please correct.

RESPONSE:

As the response to comment number 14 indicates, due to the error of "excessive pressure overflow" in the existing bridge run, we had to follow the instructions in the WSPRO manual which states that under the above conditions, the results can not be trusted and we need to model the existing bridge conditions as composite section.

COMMENT:

9. On Page 18, Paragraph 4, please explain whether the 2.6" bed elevation change is up or down.

RESPONSE:

The bed elevation change is up. See the clarification added to paragraph 4, page 18.

COMMENT:

10. Additional alternatives should be documented in report. The proposed alternative may, in fact, be the preferred bridge, but additional bridge lengths should be analyzed to justify this.

RESPONSE:

Numerous bridge lengths were analyzed; however, the results were not published in the report. A summary of these analysis are added to the revised report.

COMMENT:

11. The pictures in Appendix "A" are upside-down.

RESPONSE:

So noted and corrected.

COMMENT:

12. Please fill out Section "e" of "Other Considerations" on Phase I Scour Sheets.

RESPONSE:

So noted and completed the section.

COMMENT:

13. N values and sub-area breaks for full valley section should be the same for all alternatives.

RESPONSE:

Revised "N" values and sub-area breaks for the "existing conditions without bridge" to be the same as other alternatives.

COMMENT:

14. The bridge card is missing from input and output for the existing Bridge Analysis. This information is necessary for accurate existing condition values.

RESPONSE:

Initially the existing conditions with the bridge were analyzed using Bridge and Road Cards. The output results indicated excessive pressure overflow at the bridge. The WSPRO manual indicates when the aforementioned error appears, the results can not be relied on and a composite section needs to be modeled. That is why we revised the "existing conditions with bridge" to a composite section.

COMMENT:

15. The APPR Card should be one bridge length plus one bridge width from full valley section. Please correct on all runs.

RESPONSE:

So noted and corrected.

COMMENT:

16. Please include correspondence with all agencies (including WMD) and document what permits may be required.

RESPONSE:

So noted and added correspondence with WMD, CORE and DEP.

COMMENT:

17. The drainage basin area on the BHRS should show geographic features and areas should be in metric.

RESPONSE:

So noted and corrected.

COMMENT:

18. Include rip-rap recommendations on the BHRS.

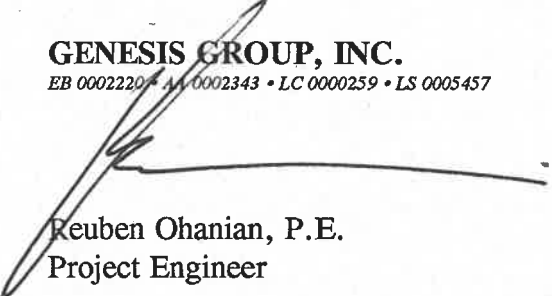
RESPONSE:

So noted and added the recommendation.

Sincerely,

GENESIS GROUP, INC.

EB 0002220 • AA 0002343 • LC 0000259 • LS 0005457



Reuben Ohanian, P.E.
Project Engineer

RO/dg

MEMORANDUM

State of Florida Department of Transportation

Date: April 22, 1996
To: J. R. Previte, Project Manager
From: Michael D. Finch, District Drainage Engineer
Copies To:
Subject: BHR Concurrence
S.R. 31 Crossing Prairie Creek
Bridge No. 040001
State Project No. 04010-1507
W.P.I. No. 1110459
Glades County

MDF

I have reviewed the above Bridge Hydraulic Report dated 04/02/96. It appears that all previous comments have been addressed and that the BHR meets FDOT and FHWA criteria. Therefore, I concur with its recommendation.

Please ensure that the Structure's Department and the project file receive sufficient copies of the BHR. If there are any questions, please contact me.

The review comments are not intended to be inclusive of all errors and omissions. The consultant is responsible for the technical accuracy, project decisions, engineering judgement, and quality of the project. These comments are not intended to change the scope of work, specify direction for the project, or to be contrary to FHWA or FDOT design criteria or good engineering judgement. The intent is to identify some typical apparent inconsistencies, and to further clarify design documentation and design decisions made by the consultant.

MDF:do

MEMORANDUM

State of Florida Department of Transportation

Date: April 23, 1996

To: M. D. Finch, District Drainage Engineer, MS 1-14

From: J.R. Previte, Project Manager

Subject: W.P.I. Nos. 1110459, 1110874
State Project Nos. 04010-1507, 05090-1511
SR 31 at Bridge No. 040001 in DeSoto County
SR 29 at Bridge Nos. 050031, 32, 35, and 941 in Glades County

DRAINAGE DEPT.
APR 23 1996
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Transmitted: Sign, sealed BHR's

- 1) Bridge # 040001
- 2) Bridge # 050941

For:

- | | |
|-----------------------------------------|---------------------------------|
| Access Management Review | Structures Review |
| District Contracts Review | Construction Review |
| Design Services Review | Maintenance Review |
| ➤ Drainage Review | Value Engineering Review |
| Environmental Management Review | SWAO Review |
| Environmental Permits Review | Utilities Review |
| Traffic Operations Review | Preliminary Right of Way Review |
| Traffic Ops. - Traffic Signals Review | Review and Comment |
| Traffic Ops. - Signing & Marking Review | Approval/disapproval |
| Traffic Ops. - Lighting Review | for Your Information |
| Geotechnical Review | per Your Request |
| Geotechnical Soil Survey | per Our Phone Conversation |
| Geotechnical Foundation Investigations | |
| Geotechnical Pond Investigations | |

Date requested for return: April, 1996

Date returned: _____ / _____ / _____

Remarks: If satisfactory, please issue letter of concurrence.

Thanks

Response:



MEMORANDUM

Date: October 27, 1997

To: M. A. Enot, Project Manager

From: Sondra Winter Ragan, Drainage Designer *SWR*

Copies: Reading File

Subject: Response to Phase IV Review Comments
S.R. 29 at Bridge Nos. 050031, 32, 35, 941 in Glades County
Consultant: Genesis Group, Inc.
W.P.I. No. 1110874
State Project No. 05090-1511
Glades County

Drainage Design has reviewed the consultant's responses to the Phase IV drainage comments, received on October 7, 1997. It appears that all comments have been adequately addressed and therefore Drainage has no further comments.

Review comments are not intended to be inclusive of all errors and omissions. The consultant is responsible for the technical accuracy, project decisions, engineering judgement, and quality of the project. Comments are not intended to change the scope of work, specify direction for the project, or to be contrary to FHWA or FDOT design criteria or good engineering judgement. The intent is to identify some apparent inconsistencies, and to further clarify design documentation and design decisions made by the consultant.

**MEMORANDUM****Date:** July 17, 1997**To:** M. A. Enot, Project Manager**From:** S. W. Ragan, Drainage Design *swr***Copies:** Reading File**Subject:** Phase IV Review

SR 29 at Bridge Nos. 050031, 32, 35, 941 in Glades County

W.P.I. No. 1110874

State Project No. 05090-1511

Glades County

Drainage has reviewed the Phase IV plans for the above project and has one comment. The approved BHRS states that the bridge deck will be drained via sheet flow. The phase IV plans propose using scuppers. Typically scuppers are not allowed on bridges less than 120 meters. Please justify this change.

The review comments are not intended to be inclusive of all errors and omissions. The consultant is responsible for the technical accuracy, project decisions, engineering judgement, and quality of the project. These comments are not intended to change the scope of work, specify direction for the project, or to be contrary to FHWA or FDOT design criteria or good engineering judgement. The intent is to identify some apparent inconsistencies, and to further clarify design documentation and design decisions made by the consultant.

Contact me at extension 2271 if there are any questions or comments.

MEMORANDUM

State of Florida Department of Transportation

Date: October 6, 1997
To: M. D. Finch, District Drainage Engineer MS 1-14
From: M. A. Enot, Project Manager
Subject: W.P.I. Nos. 1110874
State Project Nos. 05090-1511
SR 29 at Bridge Nos. 050031, 32, 35, and 941 in Glades County

RECEIVED
OCT 07 1997
DRAINAGE DEPT.

Transmitted: One (1) copy of the consultant response to your Phase IV plan comments.

For:

Access Management Review	Structures Review
District Contracts Review	Construction Review
Design Services Review	Maintenance Review
→ Drainage Review	Value Engineering Review
Environmental Management Review	SWAO Review
Environmental Permits Review	Utilities Review
Traffic Operations Review	Preliminary Right of Way Review
Traffic Ops. - Traffic Signals Review	Review and Comment
Traffic Ops. - Signing & Marking Review	Approval/disapproval
Traffic Ops. - Lighting Review	for Your Information
Geotechnical Review	per Your Request
Geotechnical Soil Survey	per Our Phone Conversation
Geotechnical Foundation Investigations	_____
Geotechnical Pond Investigations	_____

Date requested for return: October 20, 1997

Date returned: _____ / _____ / _____

Remarks:

Response:

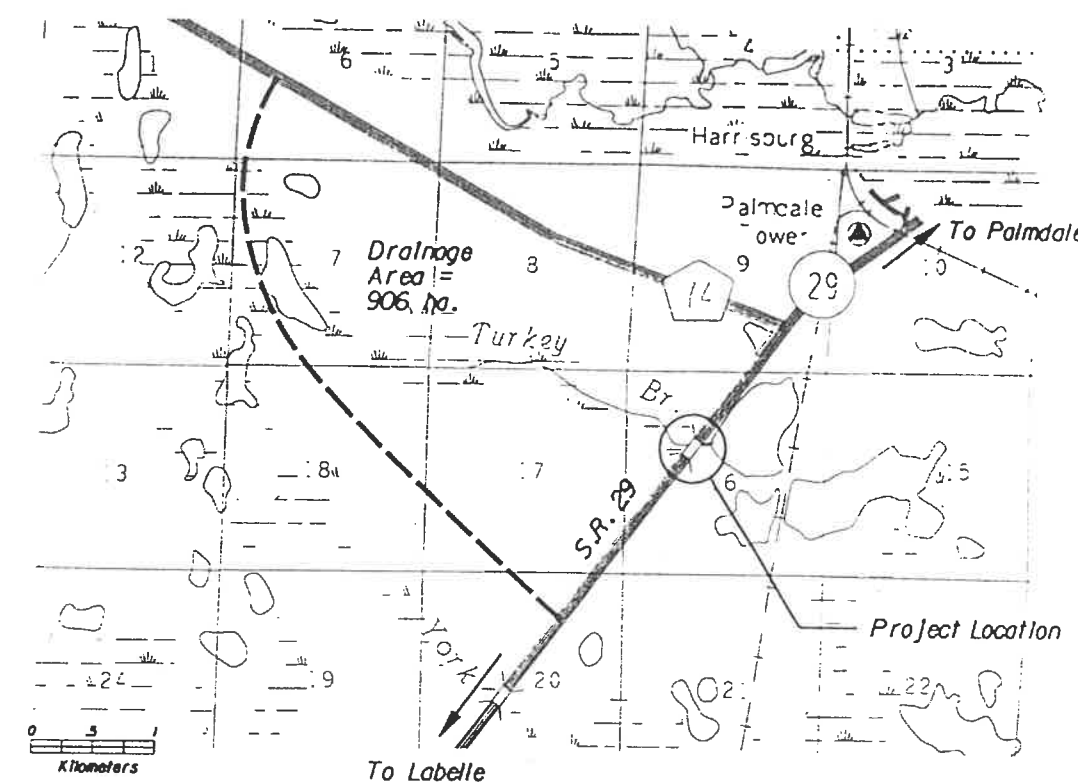
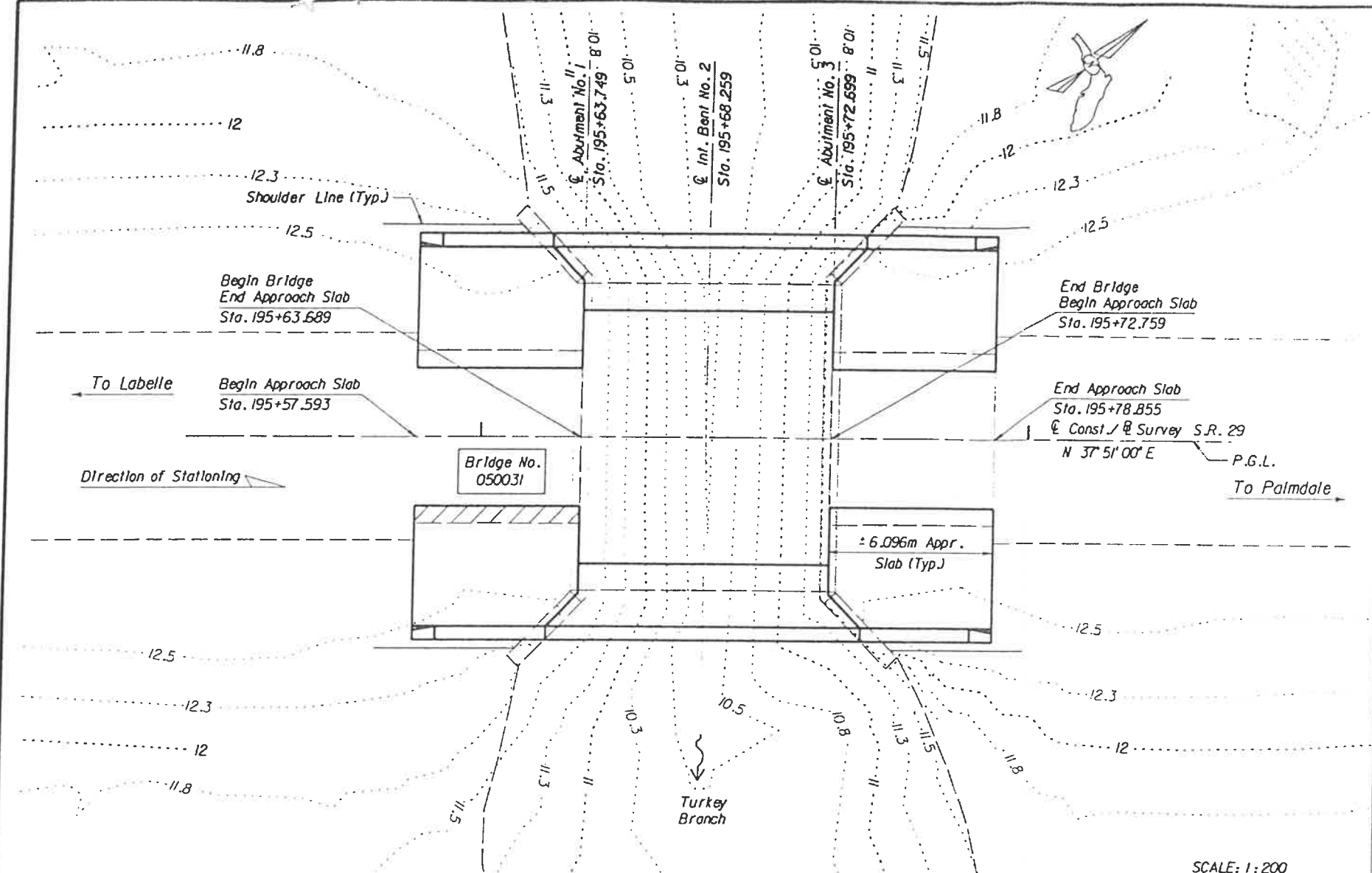
050941
032

DRAINAGE DESIGN

S.W. RAGAN

1. The approved BHRS states that the bridge deck will be drained via sheet flow. The Phase IV plans propose using scuppers. Typically scuppers are not allowed on bridges less than 120 meters. Please justify this change.

Response: We have modified the BHRS sheets to reflect "runoff will sheet flow off bridge into existing roadway drainage ditches" for Bridges 050035 & 050031.



(REFERENCE)	(1)	(2)	(3)	(4)	ASSUMED CONFIGURATION
FOUNDATION	0.305 Piles	N/A	N/A	N/A	0.305 Piles
OVERALL LENGTH	9.070				9.070
SPAN LENGTH	± 4.572				± 4.572
TYPE CONSTRUCTION	Flat Slab				Flat Slab
AREA OF OPENING @ H.W.	± 14.307				± 14.307
ROADWAY WIDTH	± 10.668				± 14.150
ELEV. LOW MEMBER	12.284				12.284

HYDRAULIC DESIGN DATA
 NOTE: The hydraulic data is shown for informational purposes only to indicate the flood discharges and water surface elevations which may be anticipated in any given year. This data was generated using highly variable factors determined by a study of the watershed. Many judgements and assumptions are required to establish these factors. The resultant hydraulic data is sensitive to changes, particularly antecedent conditions, urbanization, channelization and land use. Users of this data are cautioned against the assumption of precision which cannot be obtained.

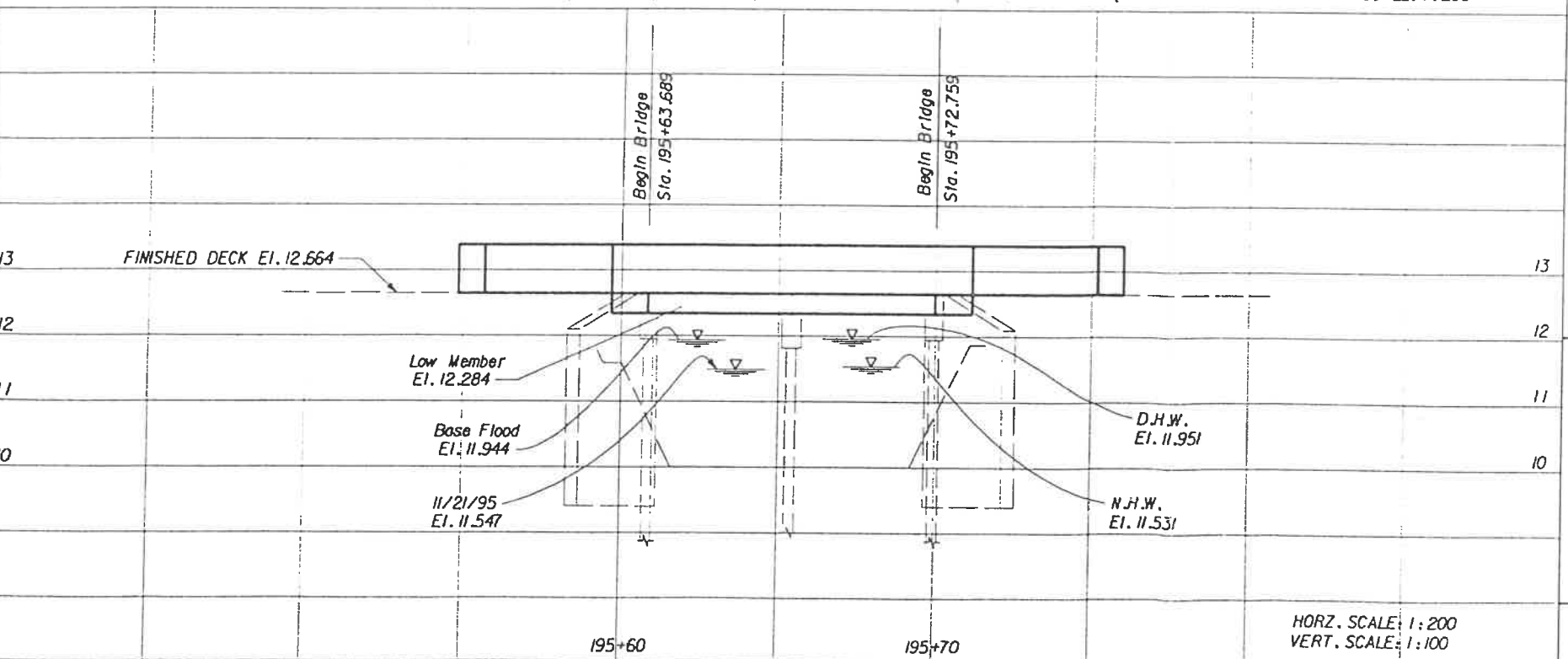
DEFINITIONS:
 Design Flood: The flood utilized to assure a desired level of hydraulic performance.
 Base Flood: The flood having a 1% chance of being exceeded in any year. (100 Year Frequency)
 Overtopping Flood: The flood which causes flow over the highway, over a watershed divide or thru emergency relief structures.
 Greatest Flood: The most severe flood which can be predicted where overtopping is not practicable.

WATER SURFACE ELEVATIONS: N.H.W. (Non-Tidal) 11.531 M.H.W. N/A M.L.W. N/A

FLOOD DATA:	MAX. EVENT OF RECORD	DESIGN FLOOD	BASE FLOOD	<input type="checkbox"/> OVERTOPPING FLOOD	<input checked="" type="checkbox"/> GREATEST FLOOD
STAGE ELEV. NGVD (M)	Unknown	11.951	11.994		12.082
DISCHARGE (CM ³ /M)	.	447	518		691
AVERAGE VELOCITY (M/S)	.	0.521	0.594		0.771
EXCEEDANCE PROB. (%)	.	2%	1%		0.2%
FREQUENCY (YR.)	.	50	100		500

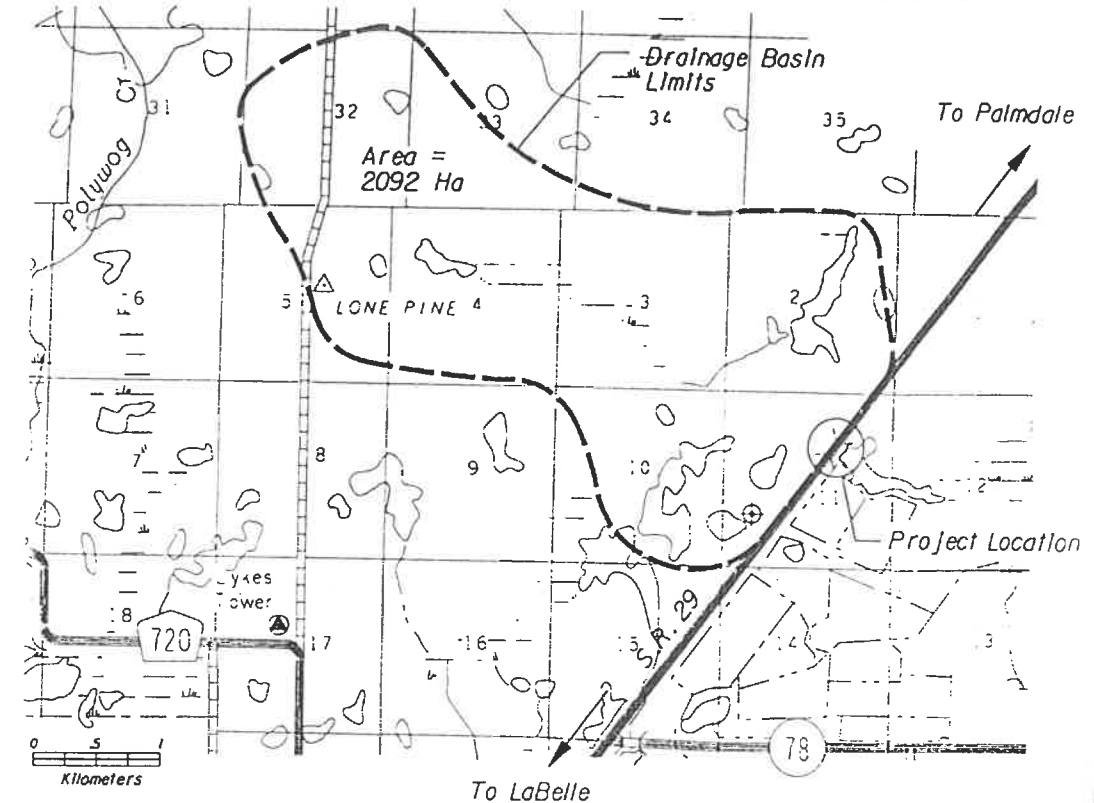
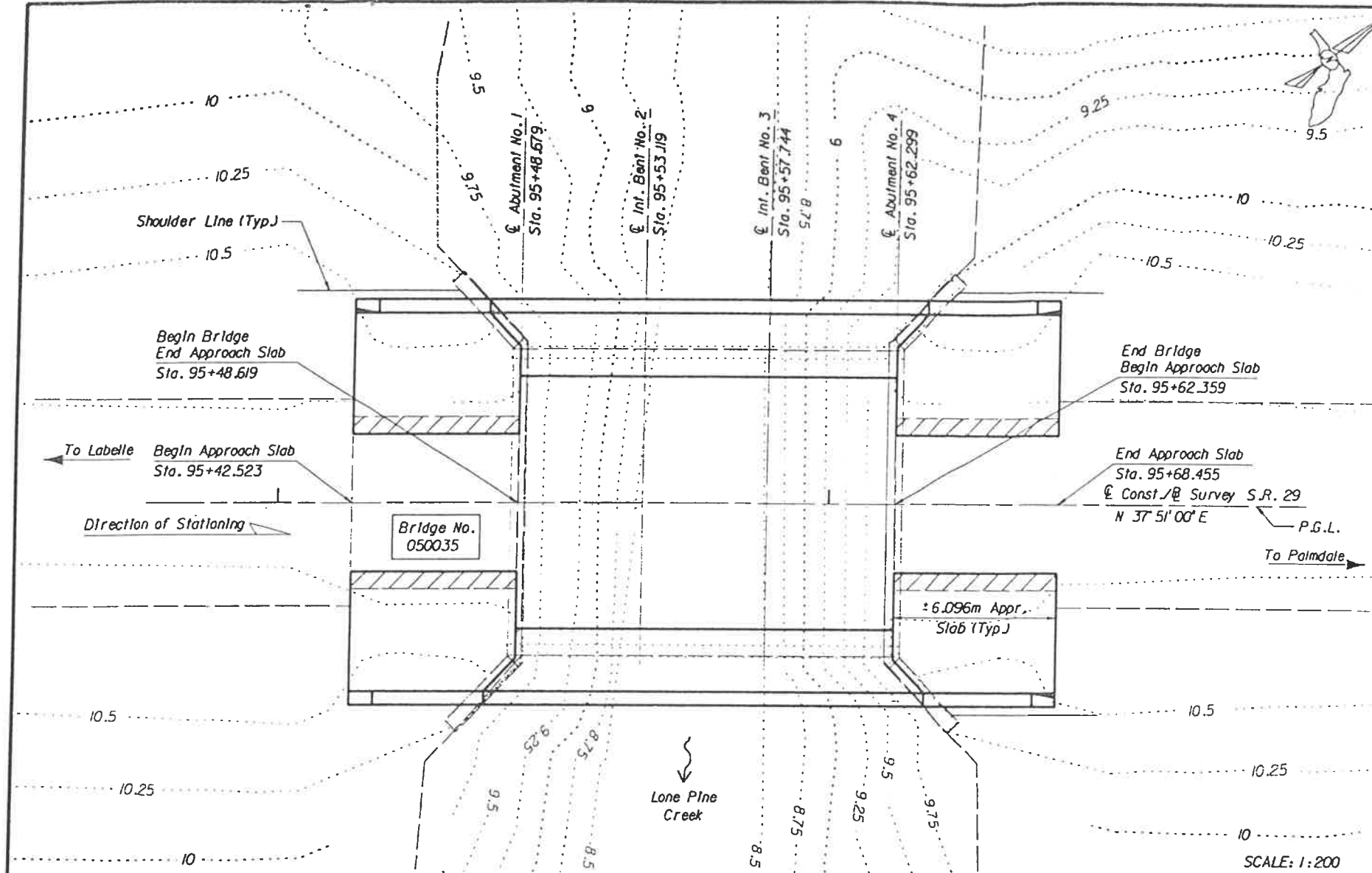
- HYDRAULIC RECOMMENDATIONS**
- BEGIN BRIDGE STATION 195+63.689 END BRIDGE STATION 195+72.759 SKEW ANGLE 0
 - CHANNEL SECTION @ STATION 195+66.199 BOTTOM WIDTH 8.534 ELEV. 10.119 SIDE SLOPE 0
 - LIMITS OF CHANNEL EXCAVATION: RT. N/A LT. N/A
 - CLEARANCE: NAVIGATION: HORIZ. N/A VERT. N/A ABOVE EL. N/A DRIFT: HORIZ. 3.962 VERT. 0.333 ABOVE EL. 11.951
 - SCOUR PREDICTION: 100 YEAR DESIGN SCOUR EL. 7.95 DEPTH = 7.12
500 YEAR SCOUR EL. 7.79 DEPTH = 9.61
 - SLOPE PROTECTION: None
 - DECK DRAINAGE: Runoff will sheet flow off bridge into existing roadway drainage ditches.
 - OTHER:

REMARKS:



DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
REVISIONS											

FILE: c:\cad\1\04\05\050031\050031.dwg
 DATE: 16 Oct 96 16:00



(REFERENCE) FOUNDATION	(1) 0.305 Piles	(2) N/A	(3) N/A	(4) N/A	ASSUMED CONFIGURATION
OVERALL LENGTH	13.740				13.740
SPAN LENGTH	± 4.572				± 4.572
TYPE CONSTRUCTION	Fret Slab				Fret Slab
AREA OF OPENING @ H.W.	± 21.924				± 21.924
ROADWAY WIDTH	± 10.668				± 10.668
ELEV. LOW MEMBER	10.375				10.375

HYDRAULIC DESIGN DATA

NOTE: The hydraulic data is shown for informational purposes only to indicate the flood discharges and water surface elevations which may be anticipated in any given year. This data was generated using highly variable factors determined by a study of the watershed. Many judgments and assumptions are required to establish these factors. The resultant hydraulic data is sensitive to changes, particularly antecedent conditions, urbanization, channelization and land use. Users of this data are cautioned against the assumption of precision which cannot be obtained.

DEFINITIONS:
 Design Flood: The flood utilized to assure a desired level of hydraulic performance.
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 Overtopping Flood: The flood which causes flow over the highway, over a watershed divide or thru emergency relief structures.
 Greatest Flood: The most severe flood which can be predicted where overtopping is not practicable.

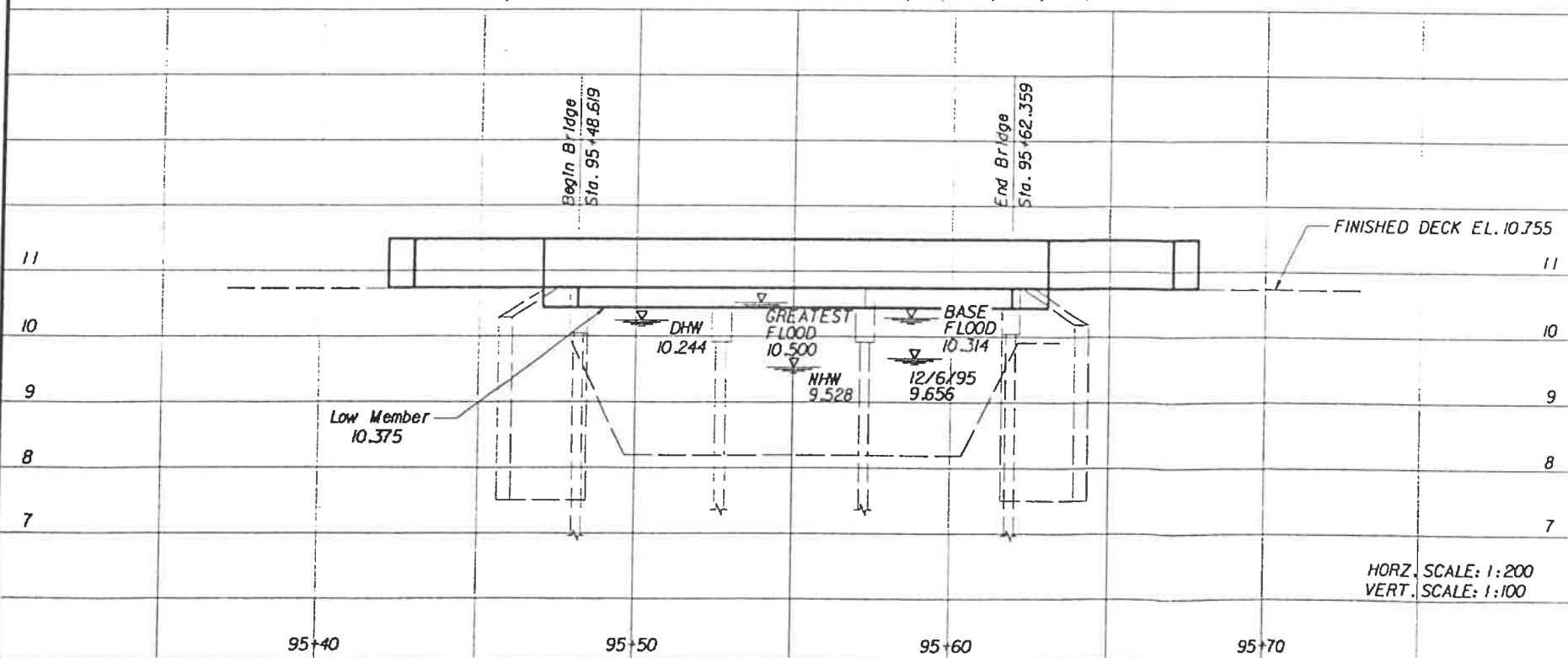
WATER SURFACE ELEVATIONS: N.H.W. (Non-Tidal) 9.528 M.H.W. N/A M.L.W. N/A

FLOOD DATA:	MAX. EVENT OF RECORD	DESIGN FLOOD	BASE FLOOD	<input type="checkbox"/> OVERTOPPING FLOOD	<input checked="" type="checkbox"/> GREATEST FLOOD
STAGE ELEV. NGVD (M)	UNKNOWN	10.244	10.314		10.452
DISCHARGE (CM ³ /M)	UNKNOWN	1016	1164		1485
AVERAGE VELOCITY (M/S)	UNKNOWN	0.783	0.875		1.070
EXCEEDANCE PROB. (%)	UNKNOWN	2%	1%		0.2%
FREQUENCY (YR.)	UNKNOWN	50	100		500

HYDRAULIC RECOMMENDATIONS

- BEGIN BRIDGE STATION 95+48.619 END BRIDGE STATION 95+62.359 SKEW ANGLE 0°
- CHANNEL SECTION @ STATION 95+55.499 BOTTOM WIDTH 13.716 ELEV. 8.230 SIDE SLOPE 0
- LIMITS OF CHANNEL EXCAVATION: RT. N/A LT. N/A
- CLEARANCE: NAVIGATION: HORIZ. N/A VERT. N/A ABOVE EL. N/A DRIFT: HORIZ. 4.166 VERT. 0.131 ABOVE EL. 10.244
- SCOUR PREDICTION: 100 YEAR DESIGN SCOUR EL. 4.298 DEPTH = 6.58
500 YEAR SCOUR EL. 3.501 DEPTH = 8.36
- SLOPE PROTECTION: NONE
- DECK DRAINAGE: RUNOFF WILL SHEET FLOW OFF BRIDGE INTO EXISTING ROADWAY DRAINAGE DITCHES.
- OTHER:

REMARKS:



DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
REVISIONS					

FILE: r:\cadd\p\05090\3511\050035\h03.dgn
 DATE: 16 Dec 96 16:00

MEMORANDUM

State of Florida Department of Transportation

Date: March 25, 1997

To: Mike Enot, Project Manager

From: ✓ James M. Lee, Jr., Asst. District Drainage Engineer

Copies To: File

Subject: Phase III Review
State Road 29
State Project No. 05010-3511
W.P.I. No. 1110875
Glades County

Drainage has reviewed the above referenced project and offers the following comment:

Please explain how the deck drainage will be handled on all of these bridges.

The review comments are not intended to be inclusive of all errors and omissions. The consultant is responsible for the technical accuracy, project decisions, engineering judgement, and quality of the project. These comments are not intended to change the scope of work, specify direction for the project, or to be contrary to FHWA or FDOT design criteria or good engineering judgement. The intent is to identify some typical apparent inconsistencies, and to further clarify design documentation and design decisions made by the consultant.

JML:do

DRAINAGE

JAMES M. LEE, JR.

1. Please explain how the deck drainage will be handled on all of these bridges.

Response: Sheet D2 of the Bridge Plans states: Runoff will sheet flow off bridge thru replacement scuppers.

Note is on all Hydraulic Sheets

*B-2
C-2
D-2
E-2*

MEMORANDUM

State of Florida Department of Transportation

Date: November 6, 1996

To: M. A. Enot, Project Manager

From: Sondra W. Ragan, Drainage *sur*

Copies: M. D. Finch

Subject: Phase II Roadway Plans
SR 29 at Bridge Nos. 050031, 32, 35, and 941
State Project No: 05090-1511
WPI No: 1110874
Glades County

Drainage has reviewed the referenced Roadway Plans as well as the consultant's responses to the Department's Phase I submittal. Both are considered acceptable and Drainage has no comments at this time.


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MEMORANDUM

State of Florida Department of Transportation

Date: July 5, 1996

To: J. R. Previte, Project Manager

From: Sondra W. Ragan, Drainage 

Copies: M. D. Finch

Subject: 30% Plans Submittal
SR 29 at Bridge Nos. 050031, 32, 35, and 941
State Project No: 05090-1511
WPI No: 1110874
Glades County

Drainage has reviewed the referenced 30% Plans Submittal package and offers the following comments:

- Bridge nos. 050031 & 050035 - an error was made in the conversion of the discharge values from m^3/min to m^3/sec ; please update the Hydraulic Design Data tables with the corrected values,
- Bridge no. 050032 - the plans reflect the discharge in 'cfs' rather than 'CM/S' as noted in the plans; please correct the values on both the Hydraulic Design Data table and on the respective BHRS, and
- Bridge no. 050941 - instead of the updated value, the discharge before the standard error adjustment was made is shown on the plans; please correct the values on both the Hydraulic Design Data table and on the respective BHRS.

The review comments are not intended to be inclusive of all errors and omissions. The consultant is responsible for the technical accuracy, project decisions, engineering judgement, and quality of the project. These comments are not intended to change the scope of work, specify direction for the project, or to be contrary to FHWA or FDOT design criteria or good engineering judgement. The intent is to identify some apparent inconsistencies, and to further clarify design documentation and design decisions made by the consultant.

RESPONSE TO COMMENTS

S.R. 29

AT BRIDGE NOS. 050031, 32, 35, AND 941 IN GLADES COUNTY

W.P.I. No. 1110874

State Project No. 05090-3511

August 13, 1996

Comments received from J. F. Mercer, dated June 28, 1996.

TRAFFIC CONTROL PLAN REVIEW

Comment:

1. The MOT scheme appears appropriate for this project; however, there were two areas of the scheme that should receive attention.
 - a. Temporary RPM's should not be specified in lieu of temporary tape or paint. Normally, this is a contractor's option. (Note: The Department has determined that the RPM's are ineffective as lane lines on some pavement during daylight hours and this option will be removed from future standards).

Response:

So noted, note has been modified.

Comment:

- b. Stage 1 and 2 typicals have temporary barrier wall encroaching on travel lanes (left side).

Response:

So noted, will modify drawing.

Comments received from Sondra W. Ragan, Drainage, to J. R. Previte, Project Manager, dated July 5, 1996.

Comment:

1. Bridge nos. 050031 & 050035 - an error was made in the conversion of the discharge values from m^3/min to m^3/sec ; please update the Hydraulic Design Data tables with the corrected values.

RESPONSE TO COMMENTS

S.R. 29

AT BRIDGE NOS. 050031, 32, 35, AND 941 IN GLADES COUNTY

W.P.I. No. 1110874

State Project No. 05090-3511

August 13, 1996

Response:

The conversion from CFS to CM/S was corrected.

Comment:

2. Bridge no. 050032 - the plans reflect the discharge in 'cfs' rather than 'CM/s' as noted in the plans; please correct the values on both the Hydraulic Design Data table and on the respective BHRS.

Response:

The flow in CM/S was provided.

Comment:

3. Bridge no. 050941 - instead of the updated value, the discharge before the standard error adjustment was made is shown on the plans; please correct the values on both the Hydraulic Design Data table and on the respective BHRS.

Response:

The correct value of discharge were put on the plans.

Comments received from Terry N. Puckett, District Geotechnical Engineer by Michael A. Enot to J. R. Previte, Project Manager, dated July 1, 1996.

Comment:

1. The Roadway Soil Survey Sheet should be included in the plan submittal package.

Response:

So noted, we will add to plans.

MEMORANDUM

State of Florida Department of Transportation

Date: May 6, 1996
To: J. R. Previte, Project Manager
From: Michael D. Finch, P.E., District Drainage Engineer *MDF*
Copies To: S. W. Ragan
Subject: Bridge Hydraulics Report Concurrence
W.P.I. No. 1110874
Bridge No. 050031
State Project No. 05090-1511

I have reviewed the above Bridge Hydraulic Report dated April 19, 1996 (Revised). It appears that all previous comments have been addressed and that the BHR meets FDOT and FHWA criteria. Therefore, I concur with its recommendation.

Please ensure that the Structure's Department and the project file receive sufficient copies of the BHR. If there are any questions, please contact me.

The review comments are not intended to be inclusive of all errors and omissions. The consultant is responsible for the technical accuracy, project decisions, engineering judgement, and quality of the project. These comments are not intended to change the scope of work, specify direction for the project, or to be contrary to FHWA or FDOT design criteria or good engineering judgement. The intent is to identify some typical apparent inconsistencies, and to further clarify design documentation and design decisions made by the consultant.

MDF/do

MEMORANDUM

State of Florida Department of Transportation

Date: April 30, 1996

To: J. R. Previte, Project Manager

From: Michael D. Finch, P.E., District Drainage Engineer *MDF*

Copies To: S. W. Ragan

Subject: Bridge Hydraulics Report Concurrence
W.P.I. No. 1110874
Bridge No. 050032
State Project No. 05090-1511

I have reviewed the above Bridge Hydraulic Report dated April 1996. It appears that all previous comments have been addressed and that the BHR meets FDOT and FHWA criteria. Therefore, I concur with its recommendation.

Please ensure that the Structure's Department and the project file receive sufficient copies of the BHR. If there are any questions, please contact me.

The review comments are not intended to be inclusive of all errors and omissions. The consultant is responsible for the technical accuracy, project decisions, engineering judgement, and quality of the project. These comments are not intended to change the scope of work, specify direction for the project, or to be contrary to FHWA or FDOT design criteria or good engineering judgement. The intent is to identify some typical apparent inconsistencies and to further clarify design documentation and design decisions made by the consultant.

MDF:do

MEMORANDUM

State of Florida Department of Transportation

Date: April 26, 1996
To: J. R. Previte, Project Manager
From: Michael D. Finch, P.E., District Drainage Engineer *MDF*
Copies To: S. W. Ragan
Subject: Bridge Hydraulics Report Concurrence
W.P.I. No. 1110874
Bridge No. 050941
State Project No. 05090-1511

I have reviewed the above Bridge Hydraulics Report dated 4/8/96. It appears that all previous comments have been addressed and that the BHR meets FDOT and FHWA criteria. Therefore, I concur with its recommendation.

Please ensure that the Structure's Department and the project file receive sufficient copies of the BHR. If there are any questions, please contact.

The review comments are not intended to be inclusive of all errors and omissions. The consultant is responsible for the technical accuracy, project decisions, engineering judgement, and quality of the project. These comments are not intended to change the scope of work, specify direction for the project, or to be contrary to FHWA or FDOT design criteria or good engineering judgement. The intent is to identify some typical apparent inconsistencies, and to further clarify design documentation and design decisions made by the consultant.

MDF:do

MEMORANDUM

State of Florida Department of Transportation

Date: April 2, 1996
To: J. R. Previte, Project Manager
From: S. W. Ragan, Drainage *SWR*
Copies To: M. D. Finch
Subject: S.R. 29 Crossing at Turkey Branch, Bridge No. 050031
BHR Review
State Project No. 05090-1511
W.P.I. No. 1110874
Glades County

Drainage has reviewed the above referenced BHR and offers the following comments:

1. There appears to be discrepancies in the cross section names on Pages 13, 14 and 15.
2. The approach cross section sub area breakpoints of the Open Channel Analysis do not match those of the Existing Bridge and Proposed Bridge Analysis.

3. The #2 NO DISCREPANCY BETWEEN Page E-1 of
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4/8/96 SWR

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to identify some
to further
gn decisions made

JRP:SWR

DISPOSITION OF COMMENTS
Preliminary Submittal

SR 29, Crossing at Turkey Branch
State Project Number: 05090-1511
WPI Number: 1110874
Bridge Number: 050031

Reviewer: S. W. Ragan, Drainage Engineer

1. C. *There appears to be discrepancies in the cross section names on Pages 13, 14 and 15.*
 - A. The cross section's names have been revised to reflect the correct sections.
2. C. *The approach cross section sub area breakpoints of the Open Channel Analysis do not match those of the Existing Bridge and Proposed Bridge Analysis.*
 - A. Neglect comment (by Sandra W. Ragan).
3. C. *The referenced figured numbers on Page E-1 of Appendix 'E' are incorrect.*
 - A. The figure numbers has been corrected.

MEMORANDUM

State of Florida Department of Transportation

Date: April 2, 1996

To: J. R. Previte, Project Manager

From: Sondra W. Ragan, Drainage *SWR*

Copies To: Mike Finch

Subject: S.R. 29 Crossing York Branch, Bridge No. 050032
BHR Review
State Project No. 05090-1511
W.P.I. No. 1110874
Glades County

Drainage has reviewed the above referenced project and offers the following comments:

1. The Project Number and WPI Number need to be on the cover page.
2. The photograph on the cover page is not a picture of Bridge No. 050032.
3. The wrong District is given on the title page.
4. The land use variables in Figure 2 are not legible.
5. Topographic information should be included on the Drainage Basin Map.
6. A statement should be made in the Hydrologic Analysis discussion that Table 1 reflects the adjusted flow values.
7. There are several instances in the Hydrologic Analysis discussion and in Appendix "B" where the wrong bridge number is given. Please correct this.
8. An incorrect appendix is referenced in Paragraph 6, Page 21.
9. Please complete the following sections of the Site Field Review Sheets: "b. Foundation"; "e. Bed material"; and parts "a" and "b" of the Typical Pier information.
10. Page 13 states that this "waterway flows all, or most, of the year", but the Site Field Review characterizes this waterway with intermittent flow. Please clarify the difference.

PAGE TWO

11. A flood flow angle of attack of 90°, as reported in the Site Field Review, seems to be extreme. Please give more information regarding this high angle of attack.
12. A lake area of 10.23% was used in the USGS Regression Equations. This lake area is not reflected in the Drainage Basin Map. Please explain how this value was obtained.
13. There are several upside down pages in Appendix "B". Please correct.
14. The approach cross section stations are incorrect on the page titled "Location of Cross Sections used in WSPRO" found in Appendix "D".
15. Please verify that similar cross sections have the same sub area breakpoints for each run of WSPRO.
16. The WSPRO Manual states that the K-Ratio "should be between 0.7 and 1.4 to ensure reliable profile computations". Several K-Ratio values are outside of this range in each of the WSPRO runs.
17. The approach velocities used in the contraction scour conditions are not reflected in the WSPRO runs. Are those values correct? Also, please note units of measurement somewhere with these results.
18. The drainage basin area should be included on the BHRS.

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SR:do



GENESIS GROUP, INC.

April 23, 1996

RECEIVED

APR 25 1996

DRAINAGE DEPT.

FDOT - District One
ATTN: J.R. Previte, Project Manager
801 North Broadway Street, M.S. 15A
Post Office Box 1249
Bartow, Florida 33830-1249

RE: S.R. 29 Crossing York Branch, Bridge No. 050032
State Project Number No. 050901511
W.P.I. No. 1110874
Glades County
Bridge Hydraulics Reports

Dear Mr. Previte:

We have reviewed the comments from Sondra W. Ragan for the referenced Bridge Hydraulics Report and have revised the document accordingly. A copy of the updated Bridge Hydraulics Report are attached for your final review and approval.

Specifically, we have made the following changes to the report:

- | | |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Page 20 | The "Estimated Scour Depths and Elevations" (Table 5) have been revised to correlate with the revised scour calculations. |
| Appendix A | The Site Review Data form for the pier description has been revised to indicate "pile bent" rather than "columns". |
| Appendix E | The summary of estimated scour, shown in tabular form on the fourth page of this appendix, has been updated to match the revised scour calculations. |



April 23, 1996
Page 2

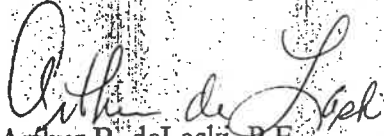
Appendix E

The scour calculations for both existing and proposed conditions for "Local Scour at Piers" have been revised. The previous submittal incorrectly evaluated scour using the upstream, rather than bridge, cross section. This oversight has been corrected.

Should further questions arise concerning this submittal, please do not hesitate to call.

Sincerely,

GENESIS GROUP, INC.



Arthur B. deLaski, P.E.
Project Manager

ABd/hln

MEMORANDUM

State of Florida Department of Transportation

Date: March 27, 1996

To: J. R. Previte, Project Manager

From: Sondra Ragan, Drainage 

Copies To: M. D. Finch

Subject: S.R. 29 Crossing Okaloacoochee River
BHR Review # 050941
State Project No. 05090-1511
W.P.I. No. 1110874
Glades County

Drainage has reviewed the above referenced BHR and offers the following comments:

1. The cover sheet needs to show the Project Number and WPI Number.
2. Okaloacoochee is misspelled on Page i.
3. This BHR recommends a full replacement instead of widening due to the vertical clearance requirement, but Page 9 states that the bridge has been hydraulically adequate in the past and three other bridges in this project (Bridge Nos. 050031, 050032, 050035) asked for variances for this requirement. Why was this bridge treated differently than the others?
4. The land use variables in Figure 2 are not legible.
5. Topographic data is needed on the Drainage Basin Map, Figure 3.
6. The bridge sites should be marked on Figures 4 and 5.
7. Please document all correspondence with permitting agencies (including WMD) and include in Appendix "G".
8. Paragraph 3, Page 9 is missing the word "meter" that follows the width of the travel lanes.
9. Please clarify the last sentence on Page 11, it is not very clear.
10. Figure 7 shows two Approach Sections. Please change the correct one to "Exit Section".

PAGE TWO

11. The title for Table 3 on Page 16 is located on Page 17. Please place the title on the same page as the table.
12. The title for the HEC 18 publication is misspelled.
13. Additional alternatives should be evaluated and documented in the report.
14. It appears that "concrete wall" was incorrectly marked on Page 2 of Appendix "A". The existing bridge's pier consists of a pile bent.
15. The flood flow angle of attack is required even if it is the same as the normal flow.
16. In the USGS calculations for flow, a lake area of 6.23% was used. This lake area is not reflected in the Drainage Basin Map. Please explain how this value was obtained.
17. The flood plain roughness coefficient computation sheet reads Desoto County instead of Glades County.
18. The figure numbers mentioned on Page 1 of Appendix "E" are incorrect.
19. Why were wing walls selected over spill-through abutments?
20. The BHRS values for span length, roadway width, and limits of channel excavation do not match those values found within the report.
21. Please mark either the overtopping or greatest flood box on the BHRS.
22. The BHRS location map should be fully in CADD and the area should be given in metric units.

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SR:do

April 9, 1996

Florida DOT District One
S.R. 29 Crossing Okaloacoochee River
BHR Review for Br# 050941
State Project No. 05090-1511
W.P.I. No. 1110874
Glades County

RECEIVED

APR 10 1996

DOT DESIGN DEPT.
BARTOW, FLA.

COMMENTS & RESPONSES

- ✓ 1. The cover sheet needs to show the Project Number and WPI Number.
RESPONSE: So noted and added.
2. Okaloacoochee is misspelled on Page i.
RESPONSE: So noted and corrected.
- ✓ 3. This BHR recommends a full replacement instead of widening due to the vertical clearance requirement, but Page 9 states that the bridge has been hydraulically adequate in the past and three other bridges in this project (Bridge Nos. 050031, 050032, 050035) asked for variances for this requirement. Why was this bridge treated differently than the others?
RESPONSE: The bridge was treated differently because of the design storm velocity at the bridge based on the original USGS flow rates. But since the USGS flow rates were revised, the design velocity at the bridge is within 2-3 fps and widening is possible.
4. The land use variables in Figure 2 are not legible.
RESPONSE: So noted and made the text legible.
- ✓ 5. Topographic data is needed on the Drainage Basin Map, Figure 3.
RESPONSE: So noted and revised.
- ✓ 6. The bridge sites should be marked on Figures 4 and 5.
RESPONSE: So noted and added the bridge location.
- ✓ 7. Please document all correspondence with permitting agencies (including WMD) and include in Appendix "G".
RESPONSE: So noted and added correspondence.

RECEIVED

APR 10 1996

DOT DESIGN DEPT.
BARTOW, FLA.

8. Paragraph 3, Page 9 is missing the word "meter" that follows the width of the travel lanes.

RESPONSE: So noted and added.

9. Please clarify the last sentence on Page 11, it is not very clear.

RESPONSE: So noted and revised the sentence.

10. Figure 7 shows two Approach Sections. Please change the correct one to "Exit Section".

RESPONSE: So noted and corrected.

11. The title for Table 3 on Page 16 is located on Page 17. Please place the title on the same page as the table.

RESPONSE: So noted and fixed.

12. The title for the HEC 18 publication is misspelled.

RESPONSE: So noted and corrected.

13. Additional alternatives should be evaluated and documented in the report.

RESPONSE: If the project is the bridge widening, no other alternatives are possible.

14. It appears that "concrete wall" was incorrectly marked on Page 2 of Appendix "A". The existing bridge's pier consists of a pile bent.

RESPONSE: So noted and corrected.

15. The flood flow angle of attack is required even if it is the same as the normal flow.

RESPONSE: So noted and added.

16. In the USGS calculations for flow, a lake area of 6.23% was used. This lake area is not reflected in the Drainage Basin Map. Please explain how this value was obtained.

RESPONSE: Per the agreement of JMI with the District, the actual storage areas can be used as Lake areas in the USGS equations. Even though the wetland areas constitute more than 30% of the basin, only 6.23% is the actual storage area.

RECEIVED

APR 10 1996

April 9, 1996
Page 3

DOT DESIGN DEPT.
BARTOW, FLA.

17. The flood plain roughness coefficient computation sheet reads DeSoto County instead of Glades County.

RESPONSE: Per the conversation of JMI with the district, actual storage areas (not wetland areas) can be considered as Lake areas. The wetlands within the basin cover more than 30% of the area, however we are only using 6.23% as Lake areas since the percentage indicates true storage area within the basin.

- ✓18. The figure numbers mentioned on Page 1 of Appendix "E" are incorrect.

RESPONSE: So noted and corrected.

- ✓19. Why were wing walls selected over spill-through abutments?

RESPONSE: Spill through abutments will further reduce the flow area at the bridge and increase the design velocity and the backwater stage.

20. The BHRS values for span length, roadway width, and limits of channel excavation do not match those values found within the report.

RESPONSE: The report is revised now to recommend widening only.

21. Please mark either the overtopping or greatest flood box on the BHRS.

RESPONSE: So noted and marked the greatest flood.

- ✓22. The BHRS location map should be fully in CADD and the area should be given in metric units.

RESPONSE: So noted and revised the map to be metric.

The review comments are not intended to be inclusive of all errors and omissions. The consultant is responsible for the technical accuracy, project decisions, engineering judgement, and quality of the project. These comments are not intended to change the scope of work, specify direction for the project, or to be contrary to FHWA or FDOT design criteria or good engineering judgement. The intent is to identify some typical apparent inconsistencies and to further clarify design documentation and design decisions made by the consultant.

MEMORANDUM

State of Florida Department of Transportation

Date: March 18, 1996
To: J. R. Previte, Project Manager
From: ~~Michael D. Finch, P.E., District Drainage Engineer~~ *MDF*
Copies To: M. K. Marshall
Subject: Bridge Hydraulics Report Concurrence
W.P.I. No. 1110874
Bridge No. 050035
State Project No. 05090-1511

I have reviewed the above Bridge Hydraulic Report dated 3/7/96. It appears that all previous comments have been addressed and that the BHR meets FDOT and FHWA criteria. Therefore, I concur with its recommendation.

Please ensure that the Structure's Department and the project file receive sufficient copies of the BHR. If there are any questions, please contact me.

The review comments are not intended to be inclusive of all errors and omissions. The consultant is responsible for the technical accuracy, project decisions, engineering judgement, and quality of the project. These comments are not intended to change the scope of work, specify direction for the project, or to be contrary to FHWA or FDOT design criteria or good engineering judgement. The intent is to identify some typical apparent inconsistencies, and to further clarify design documentation and design decisions made by the consultant.

MDF:do

MEMORANDUM

State of Florida Department of Transportation

Date: February 16, 1996
To: J. R. Previte, Project Manager
From: Michael D. Finch, District Drainage Engineer *MDF*
Copies To: Maverick Marshall
Subject: W.P.I. No. 1110874
State Project No. 05090-1511
S.R. 29, Bridge No. 050035
Reply to Response dated February 13, 1996

We find that the swamp or marsh areas, per the Bridges Report, were "Not Significant" and therefore, do not appear in the final prediction equation. As an example, the slope parameter was omitted from the Region B equations due to significance. Therefore, it is not advisable to define marsh areas as lakes to reduce the predicted discharge.

Additionally, comparisons with the Rational equation are not valid, i.e., use of the Rational Method for a large, rural marsh. Recognizing the degree of standard error of the USGS equation, it is interesting that the discharges (when the lake areas are from the quad. maps) compare well with the FHWA egn discharges vs the preferred LK = 10.23% discharges. The egn's are region specific and have adjustment factor accordingly, i.e., even with 0% lakes for Region A, the discharge is still reduced by a 3^x component.

In summary, there is insufficient justification for this deviation.

MDF:do

MEMORANDUM

State of Florida Department of Transportation

Date: February 5, 1996
To: J. R. Previte, Project Manager
From: M. Marshall, Drainage Engineer *MM*

Copies To: File

Subject: W.P.I. No. 1110874
State Project No. 05090-1511
Bridge No. 050035

1. % Lakes for the USGS Egn. should be from the USGS Quad. Maps.
2. Panel number should accompany community number for F.I.R.M. (Page 4).
3. The sentence structure of "where the stream is blocked by the roadway embankment" implies liability (Page 4).
4. Elevation changes indicated by the bridge inspection are probably not indicative of the magnitude of scour from the 100 year and 500 year event (Page 21).
5. In general, excluding pile scour, rubble rip rap with D2 filter fabric is recommended as a scour countermeasure.
6. Please check full valley n values vs photo A-5.
7. The bridge BL card xConlt. and xConrt. difference is 43' vs the bridge width of 45'.
8. For the 100 year and 500 year scour calculations, Appr is inconsistent with that shown on Page E-5.
9. Please recheck the a' and Ae values for abutment scour, with respect to the edge of water and bridge x location.

PAGE TWO

10. The correspondence notes a WSEL at the top of the pier cap, which corresponds to a 500 year event per the analysis and contradicts statements within the report that indicate the water never reaching the low member. Please clarify.

The review comments are not intended to be inclusive of all errors and omissions. The consultant is responsible for the technical accuracy, project decisions, engineering judgement, and quality of the project. These comments are not intended to change the scope of work, specify direction for the project, or to be contrary to FHWA or FDOT design criteria or good engineering judgement. The intent is to identify some typical apparent inconsistencies, and to further clarify design documentation and design decisions made by the consultant.

MKM:do

DISPOSITION OF COMMENTS
Preliminary Submittal

SR 29, Bridge Replacement at Lone Pine Creek
State Project Number: 05090-1511
WPI Number: 1110874
Bridge Number: 050035

Reviewer: M. Marshall, Drainage Engineer

1. C. *% Lakes for the USGS Eqn. should be from the USGS Quad. Maps.*
 - A. Method used to estimate flow on this project was discussed during meeting at the project site. A memorandum of this meeting is provided in Appendix G of the BHR. Lake area was re-evaluated, and the standard error was applied to the USGS regional equations.

2. C. *Panel number should accompany community number for the FIRM (Page 4).*
 - A. Panel numbers have been included.

3. C. *The sentence structure of "where the stream is blocked by the roadway embankment" implies liability (page 4).*
 - A. This statement has been removed.

4. C. *Elevation changes indicated by the bridge inspection are probably not indicative of the magnitude of scour from the 100 year and 500 year event (page 21).*
 - A. This statement has been revised.

5. C. *In general, excluding pile scour, rubble riprap with D2 filter fabric is recommended as a scour countermeasure.*
 - A. There are no maintenance berms at this bridge because there are vertical wall abutments. According to the WSPRO model of this bridge, velocities are relatively low for all storm events. To provide rubble riprap at the abutments would mean to remove a stabilized earth bed. This does not appear to be beneficial at this site.

6. C. *Please check full valley n values vs. Photo A-5.*
 - A. Reviewer has eliminated this comment per telephone conversation, Feb. 8, 1996.

7.

C. *The bridge BL card XCONLT and XCONRT difference is 43' vs. the bridge length of 45'.*

A. Current survey information shows the distance from vertical wall abutment to vertical wall abutment to be 13.1m or 43 feet. It is common that the hydraulic opening be 2-5 feet shorter than the bridge length on account of the bridge deck being supported by the end bents.
8.

C. *For the 100 year and 500 year scour calculations, A_{appr} is inconsistent with that shown on page E-5.*

A. Scour calculations have been revised.
9.

C. *Please recheck the a' and A_e values for abutment scour, with respect to the edge of water and bridge x location.*

A. Scour calculations have been revised.
10.

C. *The correspondence notes & WSEL at the top of the pier cap, which corresponds to a 500 year event per the analysis and contradicts statements within the report that indicate the water never reaching the low member. Please clarify.*

A. The statement in the correspondence is not valid as it was only a hear-say statement without any documentation. Survey measurements taken at the site indicate a WSEL 2.5 feet below the low member. This statement has been removed from the memorandum.

Phone Log

Date 2/15/96

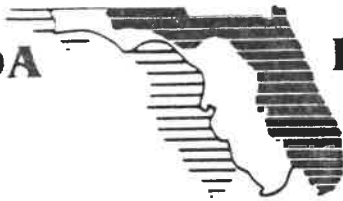
by Maverick Marshall

Spoke with: Jerry Geese of USGS District 9049429500 x 3007

Jerry agreed fully with our position on the use of the regression equations,

FLORIDA

LAWTON CHILES
GOVERNOR



DEPARTMENT OF TRANSPORTATION

BEN G. WATTS
SECRETARY

DISTRICT ONE District Drainage Office Post Office Box 1249 Bartow, Florida 33830-1249 (813) 533-8161	TELEPHONE CONVERSATION	Date: 2/2/96
		Time: 11:00 AM

CALL FOR: Kathleen Hammett P.E. RE: % Lakes for use in the
 TELEPHONE NUMBER: 813 243 5800 x 125 USGS Egn.
 REPRESENTING: USGS
 Water Resources Division
 A RETURNED CALL: YES (✓) NO ()
 PARTY AVAILABLE: YES () NO ()

DISCUSSION: I asked Kathleen if the % Lakes for use in the
 USGS Regression Egn should be taken from the Quad maps or
 can they be taken from other maps or field survey?
 She related that the % Lake Area should be from the
 Quad maps since the egn's were based on the Quad maps,
 and contains adjustment factors for the best fit regression line.

ACTION: _____

CC: _____

FLORIDA DEPARTMENT OF TRANSPORTATION
 (District Drainage Office)

BY: M Marshall

CRIT Dates
Final R/W

04 AUG 1996
05 12, 11, 96

OCTOBER 3, 1995, 10:00 PM
MAIN CONFERENCE ROOM

3 sections?
0

AGENDA

Widening or Replacement

NOTICE TO PROCEED MEETING

grid 1000' ?
Replacement - more
sections -

(29) Bridges 100 ft
1 Bids length
Short

W.P.I. No.: 1110459, 1110874
State Project No.: 04010-1507, 05090-1511
Description: Bridge Nos. 040001, 050031, 32, 33, 35, 941
County: DeSoto, Glades

1000 ft Sec
20 ft Sec

Consultant: Genesis Group, Inc.

(3)

4 meetings
Bridge
Geo
Drainage

1. Introductions

Prairie creek
Timber piles

2. Handouts

? Variance from 2' freeboard

3. Departmental Comments:

- A. Surveying
- B. Drainage
- C. Geotechnical
- D. Structures
- E. Administrative Issues

In house BDR review

- 1) Invoicing Instructions (Carl Wyrosdick)
- 2) Payout Curve
- 3) DBE Requirements (Payout Curve/Schedule, Certification forms, etc.)
- 4) Progress Reporting (Scope of Services, Section XII.E.)
- 5) Communication with Department

4. Key Submittals:

- A. Project Schedule (Scope of Services, Section XII.C.)
- B. Typical Section (Within 30 Days of NTP)
- C. Final R/W Requirements (by 10/02/96)
- D. Bridge Hydraulic Report (BHR)
- E. Bridge Development Report (Do not submit until BHR approved)
- F. Quality Control Plan (Scope of Services, Section XII.G.)
- G. Phase Submittals (Schedule of Copies Required)
- H. Response to Submittal Review Comments (Written to project manager within 30 days, copy to reviewer, separate letter for each reviewer, formatted per Department instructions)

5. Questions/Concerns/Issues

Abbreviated BDR?
29 75' R/W each side

1-14

RECEIVED

SEP 25 1995

MEMORANDUM

State of Florida Department of Transportation

DRAINAGE DEPT.

Date: September 22, 1995

To: M. J. Bizerra, Julie Mills, M. D. Finch, M. A. Kyser,
J. F. Mercer, T. N. Puckett, J. R. Wilt, Arthur B.
DeLaski, P.E.

From: John Previte, Project Manager

Copies To: W. F. Lovell, B. A. Masing

Subject: W.P.I. Nos. 1110459, 1110874
State Project Nos. 04010-1507, 05090-1511
S.R. 31 at Bridge No. 040001 in DeSoto County
S.R. 29 at Bridge Nos. 050031, 32, 33, 35 and 941
in Glades County

Please be advised that a Notice to Proceed meeting for the referenced project will be held on October 3, 1995 at 10:00 a.m. in the Main Conference Room.

A representative of your office is invited to attend this meeting to discuss your portion of the Scope of Work and respond to any pertinent questions.

Attached is a proposed Agenda for this meeting.

For further information, I may be reached at extension 2676.

JP/do
Attachment

OCTOBER 3, 1995, 10:00 PM
MAIN CONFERENCE ROOM

AGENDA

NOTICE TO PROCEED MEETING

FOR

W.P.I. No.: 1110459, 1110874
State Project No.: 04010-1507, 05090-1511
Description: Bridge Nos. 040001, 050031, 32, 33, 35, 941
County: ~~Highlands~~ **DE SOTO, FLORIDA**
Consultant: Genesis Group

1. Introductions
2. Handouts
3. Departmental Comments:
 - A. Surveying
 - B. Geotechnical
 - C. Administrative Issues
 - 1) Invoicing Instructions (Mary Lou Dietz - Ext. 2207)
 - 2) Payout Curve
 - 3) DBE Requirements (Payout Curve/Schedule, Certification forms, etc.)
 - 4) Progress Reporting (Scope of Services, Section XII.E.)
 - 5) Communication with Department
4. Key Submittals:
 - A. Project Schedule (Scope of Services, Section XII.C.)
 - B. Typical Section (Recommended within 30 Days of NTP)
 - C. Final R/W Requirements
 - D. Bridge Hydraulic Report (BHR)
 - E. Bridge Development Report (Do Not Submit until BHR approved)
 - F. Quality Control Plan (Scope of Services, Section XII.G.)
 - G. Phase Submittals (Schedule of copies required)
 - H. Response to Submittal Review Comments (Written, within 30 days, copy to Reviewer, separate letter to each reviewer, formatted per Department instructions)
5. Questions/Concerns/Issues

April 17, 1996

FDOT, District 1
801 N. Broadway Street, M.S. 15A
P.O. Box 1249
Bartow, Florida 33830-1249



Attention: J.R. Previte, Project Manager

Subject: S.R. 29 Crossing York Branch, Bridge No. 050032
State Project No. 05090-1511
W.P.I. No. 1110874
Glades County
Bridge Hydraulics Report

We have reviewed the comments from Sondra W. Ragan for the referenced Bridge Hydraulics Report and have revised the document as necessary. Two copies of the updated report are attached for your final review and approval. Specifically, we have responded to Ms. Ragan's comments as follows:

✓1. *The Project Number and WPI Number need to be on the cover page.*

We have revised the cover page to include the requested information.

✓2. *The photograph on the cover page is not a picture of Bridge No. 050032.*

The photograph on the cover has been replaced with an actual photo of Bridge No. 050032.

✓3. *The wrong District is given on the title page.*

We apologize for this oversight. The title page has been corrected.

✓4. *The land use variables in Figure 2 are not legible.*

We have increased the text size on the exhibit for improved legibility.

✓5. *Topographic information should be included on the Drainage Basin Map.*

We have revised the map to include the features noted on the USGS quadrangle map.

✓6. *A statement should be made in the Hydrologic Analysis discussion that Table 1 reflects the adjusted flow values.*

We have added a sentence to clarify this point. It should now be clear that the table contains the adjusted values.

- ✓ 7. *There are several instances in the Hydrologic Analysis discussion and Appendix "B" where the wrong bridge number is given. Please correct this.*

The reference to Bridge 050035 is actually correct. However, the phrasing was not clear. We have revised the reference to Bridge 050035 to Bridge 050032. The discussion is now both correct and clear.

- ✓ 8. *An incorrect appendix is referenced in Paragraph 6, Page 21.*

We have revised the reference to Appendix E to Appendix F.

- ✓ 9. *Please complete the following sections of the Site Field Review Sheets: "b. Foundation"; "e. Bed material; and parts "a" and "b" of the Typical Pier information.*

We have provided the data as requested. Please note that information relating to the foundation system was not collected. The existing plans contain references to the 1947 FDOT Standard Indexes. We do not have access to those documents.

- ✓ 10. *Page 13 states that this "waterway flows all, or most, of the year", but the Site Field Review characterizes this waterway with intermittent flow. Please clarify the difference.*

Based on field observation, the velocity is negligible during non-storm events. However, a review of the topographic mapping suggests that this channel would flow continuously. Therefore, we have revised the Site Field Review data to indicate perennial flow.

- ✓ 11. *A flood flow angle of 90 degrees, as reported in the Site Field Review, seems to be extreme. Please give more information regarding this high angle of attack.*

The flood angle of attack was inadvertently noted as 90 degrees. The bank is essentially parallel to the waterway, with little or no meandering. Therefore, we anticipate that the flood angle of attack will be identical to the normal flow angle of attack, or 0 degrees. The Site Field Review data has been revised accordingly.

- ✓ 12. *A lake area of 10.23 % was used in the USGS Regression Equations. This lake area is not reflected in the Drainage Basin Map. Please explain how this value was obtained.*

We inadvertently inserted the incorrect data sheet. This sheet has been replaced.

- ✓ 13. *There are several upside down pages in Appendix "B". Please correct.*

This oversight has been corrected.

- ✓14. *The approach cross sections are incorrect on the page titled " Location of Cross Sections used in WSPRO" found in Appendix "D".*

We have corrected this.

- ✓15. *Please verify that similar cross sections have the same sub area breakpoints for each run of WSPRO.*

The subarea break points have been corrected and are now consistent.

- ✓16. *The WSPRO Manual states that the K-Ratio "should be between 0.7 and 1.4 to ensure reliable profile computations". Several K-Ratio values are outside of this range in each of the WSPRO runs.*

The WSPRO model has been further calibrated to comply with this recommendation.

- ✓17. *The approach velocities used in the contraction scour conditions are not reflected in the WSPRO runs. Are those values correct? Also, please note units of measurement somewhere in these results.*

The contraction scour calculations have been revised to match the updated WSPRO results. The table now includes the correct values, as well as a reference to the units of measurement. *

- ✓18. *The drainage basin area should be included on the BHRS.*

The drainage basin map has been updated to include the area.

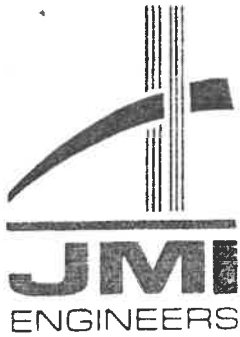
Should further questions arise concerning this submittal, please do not hesitate to call.

Sincerely,

GENESIS GROUP, INC.



Arthur B. deLaski, P.E.
Project Manager



April 10, 1996

Mr. J. R. Previte
Project Manager
Florida Department of Transportation
801 N. Broadway
Bartow, FL 33830

RE: Bridge Hydraulics Report
SR 29 at Bridge No. 050031
State Project No. 05090-1511
WPI No. 1110874

Dear Mr. Previte:

We have addressed all review comments on our Preliminary Bridge Hydraulics Report for Bridge No. 050031 which was submitted to the District on March 4, 1996. Enclosed are copies of your comments on our preliminary report and the corrected sheets for the BHR. These were requested by Sandra W. Ragan, Drainage Engineer at District One.

Please review these comments and our revised sheets for the BHR and forward them to Ms. Ragan for her review and comments. We will resolve additional comments, if any, and submit a Final Signed and Sealed BHR for Bridge No. 050031.

Should you have any questions, please contact David Snyder or myself at our Tallahassee Office.

Sincerely,
JMI Engineers, Inc.

A handwritten signature in cursive script that reads "Jerry Washington".

Jerry Washington
Drainage Designer

Enclosures

cc: David F. Snyder, JMI Engineers
Art de Laski, Genesis Group



GENESIS GROUP, INC.

March 5, 1996

Mr. John Previte, Project Manager
Florida Department of Transportation
District One
801 North Broadway
Bartow, Florida 33830

Re: SR 29 Bridge Widening: No. 050035

Dear Mr. Previte:

Enclosed are two copies of the second submittal of the BHR. We believe that we have answered all the concerns that the Department expressed as a result of the review. We have tried to incorporate all of the items discussed during our field trip last week.

If you have any questions, please get back to me. Thanks for your prompt response.

Very truly yours,

GENESIS GROUP, INC.

LC 0000259 • AA 0002343 • EB 0002220

Arthur B. de Laski, P.E.
Project Manager

ABD/dg

Enclosures (2)

F:\FDT1\005\WP.ENG\LETTERS\BHR35SUB.2

*Rec'd
3/15/96
LF*





GENESIS GROUP, INC.

February 13, 1996

Mr. John Previte, Project Manager
Florida Department of Transportation
District One
801 North Broadway
Bartow, Florida 33830

Re: SR 29 Bridge Widening: No. 050035

Dear Mr. Previte:

Enclosed is our response to Comment No. 1 for the BHR. Please review this data so that we can discuss the appropriate direction for analysis. As we discussed several times, we feel that the inclusion of the wetland storage area in the lake area best duplicates the existing site conditions. We believe that the BHR results indicate that widening is appropriate for this structure.

Please get back to me as soon as possible since we are presently in the middle of three other BHR's on S.R. 29.

Thanks for your prompt response.

Very truly yours,

GENESIS GROUP, INC.

LC 0000259 • AA 0002343 • EB 0002220

Arthur B. de Laski, P.E.
Manager of Transportation Services

ABD/dg

Enclosures (2)

F:\FDT1\005\WP.ENG\LETTERS\PREVITT.LTR



Design Documentation in Response to Comment 1

by Paula N. Coulliette
JMI Engineers, Inc.

Drainage Area

The drainage area for bridge number 050035 was carefully delineated using the USGS quadrangle map for LaBelle, Florida. The area was confirmed by a visit to the project site. A sketch of the drainage area was then sent to the Geographic Information Systems Department of Biological Research Associates. Using digitized land use and cover classification maps provided by the South Florida Water Management District, Doug J. Durbin, Ph.D., Senior Ecologist (specializing in water resources) with BRA reviewed the drainage area and made changes as he thought appropriate. The total drainage area was determined using this final delineation on the digitized map.

Regression Equations

The USGS regression equations were used to calculate the runoff from the drainage basin. Bridge 050035 is located at the southern end of Region A. Equations have not been defined for the area south of Region A.

The variables in the regression equation include drainage area (DA), lake area (LK), and slope (SL). The drainage area was determined as stated above. The slope was determined from the USGS quadrangle map. As defined in the FDOT Drainage Manual¹ and in Bridges report², the slope (SL) is the channel slope, in feet per mile, between points at 10 and 85 percent of the total channel length. The lake area (LK) is defined in the Drainage Manual as lake area, in percent of the total. Bridges defined the lake area as the surface area of lakes and ponds expressed as a percentage of the contributing drainage area.

In the development of the regression equations, Bridges also looked at variables such as Storage Area (ST) and Swamps (SW) (see attached sheet). Lake area, storage area and swamps are related by the following equation: $SW = ST - LK$. This would indicate that lake area is considered a storage area.

The drainage basin for bridge number 050035 contains both wooded and wetland areas. There are several wetland areas completely bounded. This would indicate that these areas store water, as would a lake. The actual lake area used was determined by the GIS technicians at BRA from the digitized SFWMD Land Use and Land Cover Classification Map. The area delineated is classified as wetlands. See the sections on

¹ FDOT Drainage Manual, Volume 2A, Chapter 5.8.2, Equation 5-13.

² Technique for Estimating Magnitude and Frequency of Floods on Natural-Flow Streams in Florida, Wayne C. Bridges, USGS Water Resources Investigations 82-4012.

'Wetlands' and 'Water' provided in the SFWMD Land Use and Land Cover Classification Code attached.

Based on these definitions, the following variables were used to calculate the peak runoff for this drainage basin.

- Drainage Area = 8.08 sq.mi.
- Lake Area = 10.23%
- Slope = 6.78 ft/mile

The resulting flows are as follows:

- $Q_2 = 95$ cfs
- $Q_{50} = 531$ cfs
- $Q_{100} = 654$ cfs
- $Q_{500} = 982$ cfs

Water Surface Profile Analysis

The main goal of the water surface model is to accurately replicate the existing conditions of a river or stream and correctly predict the results of greater flooding. The existing water surface elevation at bridge number 050035 at the time of survey was approximately 31.17 feet. It has been reported that during this time, the water levels were higher than normal. However, since there is no gage at this location, there is not documentation as to the normal water levels.

According to a WSPRO model of Lone Pine Creek, the 2 year water surface elevation at the bridge is 30.56 feet. This is 0.61 feet lower than that observed in late November 1995. It is possible, that due to flooding in this area during autumn 1995, the water surface elevation at this bridge is higher than "normal".

There is not a gage at this location, therefore, all records of flooding are based on historical recollection and documentation. FDOT Maintenance in LaBelle, Glades County Maintenance, and Glades County Emergency Management were all contacted regarding the flood history at this site. There was no documentation of overtopping at this location. There was also no personal recollection of flooding occurring. See memorandum of telephone conversations provided. Our WSPRO model is in accordance with these statements.

Based on the available data and engineering judgment, we feel that the originally submitted BHR accurately represents the existing and predicted storm conditions at bridge number 050035.

Comment #1

In response to comment 1, this matter was investigated thoroughly. First, the peak runoff equations were recalculated based on the lake area being taken directly from the USGS quadrangle map. The results were as follows:

Return Period	LK = 0.02	LK = 10.23
2 year	312	95
50 year	1506	531
100 year	1825	654
500 year	2709	982

Eliminating the storage area from the lake area increases the flow by over 300%. The resulting situation at the existing bridge is overtopping during the 50 year event and greater. Since this does not replicate the historical flood conditions that we have knowledge of at this site, these results were seriously questioned.

This led to a detailed search of other possible methods for determining the discharge rates at this bridge and careful examination of the hydrologic methodologies used in the analysis. FHWA equations and the Rational Method were used to calculate the runoff in this basin. The results vary significantly. The Rational Method can be used for small and intermediate urban or rural watersheds, but is best suited to urban storm drain systems. The basin for bridge number 050035 is considered large rural, hence, this is not an appropriate method for determining flow. FHWA equations are to be used for comparison purposes only (FDOT Drainage Manual, Section 5.8.2). The USGS equations are preferred for this type of situation.

The variable in question is then not the equations but the lake area variable in the USGS equations. Based on Bridges report, the lake area includes the surface area of lakes and ponds. It has been stated that this is to include the blue shaded area on the USGS quadrangle maps only, however there is no documentation of this in his report.

Conclusion

SR 29 crosses a very marshy wetland area. The topography of this general area includes many small streams, wetland storage areas, lakes and ponds. We feel that the inclusion of the wetland storage area in the lake area best duplicates the existing conditions at this site. We recommend that the results based upon these equations be used for the analysis and that, from a hydraulics standpoint, the existing bridge can be widened.



GENESIS GROUP, INC.

January 16, 1996

Mr. John Previte, Project Manager
Florida Department of Transportation
801 North Broadway
Bartow, Florida 33830

Re:

State Project #05090-1511, WPA #1110874 - SR 29 at Bridge No. 35

Dear Mr. Previte:

Enclosed are two ⁽¹⁾ BHR Reports and a disk of the WISPRO data for your review. We have submitted this report and would like a quick review so that we can get a general indication if we are on the right track for these reports. We anticipate that the SR 31 BHR will be delivered to you by February 5, 1996. The other BHR's will be delivered in March, 1996.

ATTACHED

If you have any questions regarding this material, please call me.

Very truly yours,

GENESIS GROUP, INC.

Arthur B. de Laski, P.E.
Project Manager

ABD/jp

Enc:

(F:\FDT1\005\WP.ENG\LETTERS\BHR35SUB.LTR)



MEMORANDUM

State of Florida Department of Transportation

Date: November 6, 1997
To: M.D. Finch, District Drainage Engineer, MS 1-14
From: M. A. Enot, Project Manager
Subject: W.P.I. Nos. 1110459, 1110874
State Project Nos. 04010-1507, 05090-1511
SR 31 at Bridge No. 040001 in DeSoto County
SR 29 at Bridge Nos. 050031, 32, 35, and 941 in Glades County

RECEIVED
NOV 07 1997
DRAINAGE DEPT.

Transmitted: Original Drainage Map Mylar plots (4 sheets)

For:

Access Management Review
District Contracts Review
Design Services Review
Drainage Review
Environmental Management Review
Environmental Permits Review
Traffic Operations Review
Traffic Ops. - Traffic Signals Review
Traffic Ops. - Signing & Marking Review
Traffic Ops. - Lighting Review
Geotechnical Review
Geotechnical Soil Survey
Geotechnical Foundation Investigations
Geotechnical Pond Investigations

Structures Review
Construction Review
Maintenance Review
Value Engineering Review
SWAO Review
Utilities Review
Preliminary Right of Way Review
Review and Comment
Approval/disapproval
for Your Information
per Your Request
per Our Phone Conversation

Date requested for return: N/A

Date returned: _____ / _____ / _____

Remarks:

Response:

MEMORANDUM

State of Florida Department of Transportation

Date: July 14, 1997
To: M. D. Finch, District Drainage Engineer MS 1-14
From: M. A. Enot, Project Manager
Subject: W.P.I. Nos. 1110874
State Project No, 05090-1511
SR 29 at Bridge Nos. 050031, 32, 35, and 941 in Glades County

Transmitted: 1. > One (1) copy of the consultants Phase IV plan submittal. (Roadway & Structures)

For:

Access Management Review
District Contracts Review
Design Services Review
Drainage Review
Environmental Management Review
Environmental Permits Review
Traffic Operations Review
Traffic Ops. - Traffic Signals Review
Traffic Ops. - Signing & Marking Review
Traffic Ops. - Lighting Review
Geotechnical Review
Geotechnical Soil Survey
Geotechnical Foundation Investigations
Geotechnical Pond Investigations

Structures Review
Construction Review
Maintenance Review
Value Engineering Review
SWAO Review
Utilities Review
Preliminary Right of Way Review
Review and Comment
→ Approval/disapproval
for Your Information
per Your Request
per Our Phone Conversation

RECEIVED
JUL 14 1997
DRAINAGE DEPT.

Date requested for return: August 11, 1997

Date returned: ____ / ____ / ____

Remarks:

attachments

MEMORANDUM

State of Florida Department of Transportation

Date: June 18, 1997
To: M. D. Finch, District Drainage Engineer MS 1-14
From: M. A. Enot, Project Manager
Subject: W.P.I. Nos. 1110459, 1110874
State Project No, 05090-1511
SR 29 at Bridge Nos. 050031, 32, 35, and 941 in Glades County

Transmitted: 1. > **One (1) copy of the consultants response to your Phase III (90%) Roadway Plans review comments.**

For:

Access Management Review	Structures Review
District Contracts Review	Construction Review
Design Services Review	Maintenance Review
Drainage Review	Value Engineering Review
Environmental Management Review	SWAO Review
Environmental Permits Review	Utilities Review
Traffic Operations Review	Preliminary Right of Way Review
Traffic Ops. - Traffic Signals Review	Review and Comment
Traffic Ops. - Signing & Marking Review	Approval/disapproval
Traffic Ops. - Lighting Review	for Your Information
Geotechnical Review	per Your Request
Geotechnical Soil Survey	per Our Phone Conversation
Geotechnical Foundation Investigations	_____
Geotechnical Pond Investigations	_____

Date requested for return: July 2, 1997

Date returned: _____ / _____ / _____

Remarks:

Response:

ARE SUPPERS ALLOWED TO BE PLACED ON NEW
SHORT BRIDGES?

MEMORANDUM

State of Florida Department of Transportation

Date: March 21, 1997
To: M. D. Finch, District Drainage Engineer MS 1-14
From: M. A. Enot, Project Manager MS 1-29
Subject: W.P.I. Nos. 1110874
State Project Nos. 05090-1511
SR 29 at Bridge Nos. 050031, 32, 35, and 941 in Glades County

RECEIVED
MAR 24 1997
DRAINAGE DEPT.

Transmitted: 1.> One (1) copy of the Phase III (90%) Plan Submittal (Roadway & Structures)
2.> One (1) copy of the drainage documentation.
3.> One (1) copy of the respective drainage maps for each bridge site.

For:

Access Management Review	Structures Review
District Contracts Review	Construction Review
Design Services Review	Maintenance Review
→ Drainage Review	Value Engineering Review
Environmental Management Review	SWAO Review
Environmental Permits Review	Utilities Review
Traffic Operations Review	Preliminary Right of Way Review
Traffic Ops. - Traffic Signals Review	Contamination Review
Traffic Ops. - Signing & Marking Review	Approval/disapproval
Traffic Ops. - Lighting Review	for Your Information
Geotechnical Review	per Your Request
Geotechnical Soil Survey	per Our Phone Conversation
Geotechnical Foundation Investigations	→ Review and Comment
Geotechnical Pond Investigations	

Date requested for return: **April 14, 1997**

Date returned: _____ / _____ / _____

Remarks:

Response:

MEMORANDUM

State of Florida Department of Transportation

Date: October 28, 1996
To: M. D. Finch, District Drainage Engineer MS 1-14
From: M. A. Encl. *PE* Project Manager
Subject: W.P.I. Nos. 1110874
State Project No, 05090-1511
SR 29 at Bridge Nos. 050031, 32, 35, and 941 in Glades County

RECEIVED
OCT 29 1996
DRAINAGE DEPT.

Transmitted: 1. > One (1) copy of the Phase II (60%) Roadway Plans.
2. > One (1) copy of the drainage map for each bridge site.

For:

Access Management Review	Structures Review
District Contracts Review	Construction Review
Design Services Review	Maintenance Review
→ Drainage Review	Value Engineering Review
Environmental Management Review	SWAO Review
Environmental Permits Review	Utilities Review
Traffic Operations Review	Preliminary Right of Way Review
Traffic Ops. - Traffic Signals Review	→ Review and Comment
Traffic Ops. - Signing & Marking Review	Approval/disapproval
Traffic Ops. - Lighting Review	for Your Information
Geotechnical Review	per Your Request
Geotechnical Soil Survey	per Our Phone Conversation
Geotechnical Foundation Investigations	_____
Geotechnical Pond Investigations	_____

Date requested for return: November 18, 1996

Date returned: ____ / ____ / ____

Remarks:

Response:

MEMORANDUM

State of Florida Department of Transportation

Date: August 19, 1996
To: M. D. Finch, District Drainage Engineer MS 1-14
From: J.R. Previte, Project Manager MS 1-29
Subject: W.P.I. No. 1110874
State Project No. 05090-1511
SR 29 at Bridge Nos. 050031, 32, 35, and 941
Glades County

RECEIVED
AUG 20 1996
DRAINAGE DEPT.

Plans 30%

Transmitted: **Consultant's response to Phase I review comments**

For:

Access Management Review
District Contracts Review
Design Services Review
Drainage Review
Environmental Management Review
Environmental Permits Review
Traffic Operations Review
Traffic Ops. - Traffic Signals Review
Traffic Ops. - Signing & Marking Review
Traffic Ops. - Lighting Review
Geotechnical Review
Geotechnical Soil Survey
Geotechnical Foundation Investigations
Geotechnical Pond Investigations

Structures Review
Construction Review
Maintenance Review
Value Engineering Review
SWAO Review
Utilities Review
Preliminary Right of Way Review
Review and Comment
Approval/disapproval
for Your Information
per Your Request
per Our Phone Conversation

Date requested for return:

Date returned: ____ / ____ / ____

Remarks:

Response:

MEMORANDUM

State of Florida Department of Transportation

Date: June 25, 1996
To: M.D. Finch, District Drainage Engineer, MS 1-14
From: J.R. Previte, Project Manager
Subject: W.P.I. Nos. 1110459, 1110874
State Project Nos. 04010-1507, 05090-1511
SR 31 at Bridge No. 040001 in DeSoto County
SR 29 at Bridge Nos. 050031, 32, 35, and 941 in Glades County

RECEIVED
JUN 25 1996
DRAINAGE DEPT.

Transmitted: **30% Roadway Plans for 05090-3511**

w/ DRAINAGE MAPS

For:

Access Management Review	Structures Review
District Contracts Review	Construction Review
Design Services Review	Maintenance Review
→ Drainage Review	Value Engineering Review
Environmental Management Review	SWAO Review
Environmental Permits Review	Utilities Review
Traffic Operations Review	Preliminary Right of Way Review
Traffic Ops. - Traffic Signals Review	Review and Comment
Traffic Ops. - Signing & Marking Review	Approval/disapproval
Traffic Ops. - Lighting Review	for Your Information
Geotechnical Review	per Your Request
Geotechnical Soil Survey	per Our Phone Conversation
Geotechnical Foundation Investigations	
Geotechnical Pond Investigations	

Date requested for return: July 15, 1996

Date returned: ___ / ___ / ___

Remarks:

Response:

*Drainage Divides & ground elev not shown on drainage map
Are there any existing structures w/in proj's limits? if so then they need to be added to
drainage map and plans.*

Keysheet: wrong end exception station at 168+90

Typ section: wrong begin milling station at 194+34.5

Check hydraulic design data for each bridge against B&R?

• incorrect values for discharge for Br # ~~050035, 31~~

MEMORANDUM

State of Florida Department of Transportation

Date: May 6, 1996

To: M. D. Finch, District Drainage Engineer, MS 1-14

From: J.R. Previte, Project Manager

Subject: W.P.I. Nos. 1110459, 1110874
State Project Nos. 04010-1507, 05090-1511
SR 31 at Bridge No. 040001 in DeSoto County
SR 29 at Bridge Nos. 050031, 32, 35, and 941 in Glades County

RECEIVED
MAY 06 1996
DRAINAGE DEPT.

Transmitted:

- Signed and Sealed Cover Page for BHR Bridge No. #050031

For:

Access Management Review
District Contracts Review
Design Services Review
➤ Drainage Review, concurrence
Environmental Management Review
Environmental Permits Review
Traffic Operations Review
Traffic Ops. - Traffic Signals Review
Traffic Ops. - Signing & Marking Review
Traffic Ops. - Lighting Review
Geotechnical Review
Geotechnical Soil Survey
Geotechnical Foundation Investigations
Geotechnical Pond Investigations

Structures Review
Construction Review
Maintenance Review
Value Engineering Review
SWAO Review
Utilities Review
Preliminary Right of Way Review
Review and Comment
Approval/disapproval
for Your Information
per Your Request
per Our Phone Conversation

Date requested for return: May 9, 1996

Date returned: _____ / _____ / _____

Remarks:

Response:

MEMORANDUM

State of Florida Department of Transportation

Date: April 26, 1996

To: M. D. Finch, District Drainage Engineer, MS 1-14

From: J.R. Previte, Project Manager

Subject: W.P.I. Nos. 1110459, 1110874
State Project Nos. 04010-1507, 05090-1511
SR 31 at Bridge No. 040001 in DeSoto County
SR 29 at Bridge Nos. 050031, 32, 35, and 941 in Glades County

RECEIVED

APR 26 1996

DRAINAGE DEPT.

Transmitted:

- BHR for SR 29 Turkey Branch Creek, Bridge No. # 050031
- WISPRO files on floppy disk for Bridge No. 0500941
- Signed and Sealed Page for BHR for SR 29 York Branch Bridge No. #050032

For:

Access Management Review	Structures Review
District Contracts Review	Construction Review
Design Services Review	Maintenance Review
► Drainage Review, concurrence	Value Engineering Review
Environmental Management Review	SWAO Review
Environmental Permits Review	Utilities Review
Traffic Operations Review	Preliminary Right of Way Review
Traffic Ops. - Traffic Signals Review	Review and Comment
Traffic Ops. - Signing & Marking Review	Approval/disapproval
Traffic Ops. - Lighting Review	for Your Information
Geotechnical Review	per Your Request
Geotechnical Soil Survey	per Our Phone Conversation
Geotechnical Foundation Investigations	
Geotechnical Pond Investigations	

Date requested for return: April, 1996

Date returned: ____ / ____ / ____

Remarks:

Response:

Handwritten notes:
4/26
Concurrence
Letter
Sent
dated

Handwritten note in a large oval:
Need new title page
with april date

MEMORANDUM

State of Florida Department of Transportation

Date: April 25, 1996

To: M. D. Finch, District Drainage Engineer, MS 1-14

From: J.R. Previte, Project Manager

Subject: W.P.I. Nos. 1110459, 1110874
State Project Nos. 04010-1507, 05090-1511
SR 31 at Bridge No. 040001 in DeSoto County
SR 29 at Bridge Nos. 050031, 32, 35, and 941 in Glades County

RECEIVED
APR 25 1996
DRAINAGE DEPT.

Transmitted:

Response and revised BHR according to reviewer comments for Bridge # 050032

For:

Access Management Review	Structures Review
District Contracts Review	Construction Review
Design Services Review	Maintenance Review
► Drainage Review, concurrence	Value Engineering Review
Environmental Management Review	SWAO Review
Environmental Permits Review	Utilities Review
Traffic Operations Review	Preliminary Right of Way Review
Traffic Ops. - Traffic Signals Review	Review and Comment
Traffic Ops. - Signing & Marking Review	Approval/disapproval
Traffic Ops. - Lighting Review	for Your Information
Geotechnical Review	per Your Request
Geotechnical Soil Survey	per Our Phone Conversation
Geotechnical Foundation Investigations	
Geotechnical Pond Investigations	

Date requested for return: April, 1996

Date returned: ___ / ___ / ___

Remarks:

Response:

*called out 4/25
Need seal w/ Date
received 4/26
complete 4/30*

MEMORANDUM

State of Florida Department of Transportation

Date: April 23, 1996

To: M. D. Finch, District Drainage Engineer, MS 1-14

From: J.R. Previte, Project Manager

Subject: W.P.I. Nos. 1110459, 1110874
State Project Nos. 04010-1507, 05090-1511
SR 31 at Bridge No. 040001 in DeSoto County
SR 29 at Bridge Nos. 050031, 32, 35, and 941 in Glades County

RECEIVED
APR 23 1996
DRAINAGE

Transmitted: Sign, sealed BHR's

- 1) Bridge # 040001
- 2) Bridge # 050941

For:

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none">Access Management ReviewDistrict Contracts ReviewDesign Services Review➔ Drainage ReviewEnvironmental Management ReviewEnvironmental Permits ReviewTraffic Operations ReviewTraffic Ops. - Traffic Signals ReviewTraffic Ops. - Signing & Marking ReviewTraffic Ops. - Lighting ReviewGeotechnical ReviewGeotechnical Soil SurveyGeotechnical Foundation InvestigationsGeotechnical Pond Investigations | <ul style="list-style-type: none">Structures ReviewConstruction ReviewMaintenance ReviewValue Engineering ReviewSWAO ReviewUtilities ReviewPreliminary Right of Way ReviewReview and CommentApproval/disapprovalfor Your Informationper Your Requestper Our Phone Conversation |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Date requested for return: April, 1996

Date returned: ____/____/____

Remarks: If satisfactory, please issue letter of concurrence.

Thanks

Response:

NEED WISPRO DISK
CHECK W MIKE RE DATE

called out
4/25
received
5/1

MEMORANDUM

State of Florida Department of Transportation

Date: April 18, 1996

RECEIVED

APR 18 1996

DRAINAGE DEPT.

To: M. D. Finch, District Drainage Engineer, MS 1-14
From: J.R. Previte, Project Manager
Subject: W.P.I. Nos. 1110459, 1110874
State Project Nos. 04010-1507, 05090-1511
SR 31 at Bridge No. 040001 in DeSoto County
SR 29 at Bridge Nos. 050031, 32, 35, and 941 in Glades County

Transmitted:

Genesis Group, Inc. response to comments for SR 29 Br # 050032 BHR

Action to be taken:

Access Management Review	Structures Review
District Contracts Review	Construction Review
Design Services Review	Maintenance Review
►► Drainage Review	Value Engineering Review
Environmental Management Review	SWAO Review
Environmental Permits Review	Utilities Review
Traffic Operations Review	Preliminary Right of Way Review
Traffic Ops. - Traffic Signals Review	Review and Comment
Traffic Ops. - Signing & Marking Review	Approval/disapproval
Traffic Ops. - Lighting Review	for Your Information
Geotechnical Review	per Your Request
Geotechnical Soil Survey	per Our Phone Conversation
Geotechnical Foundation Investigations	
Geotechnical Pond Investigations	

Date requested for return: April ^{May 2} 1996

Date returned: ___ / ___ / ___

Remarks:

WISPRO { Data DISAS INCLUDED

Response:

- Local Scour: Bridge section is to be used not approach.
= called Art Doloski, also spoke to
Chick Sabring in Tallahassee

MEMORANDUM

State of Florida Department of Transportation

Date: April 12, 1996
To: M. D. Finch, District Drainage Engineer, MS 1-14
From: J.R. Previte, Project Manager
Subject: W.P.I. Nos. 1110459, 1110874
State Project Nos. 04010-1507, 05090-1511
SR 31 at Bridge No. 040001 in DeSoto County
SR 29 at Bridge Nos. 050031, 32, 35, and 941 in Glades County

RECEIVED
APR 15 1996
DRAINAGE DEPT.

Transmitted:

JMI response to comments for SR 29 Br # 050031 BHR

Action to be taken:

- | | |
|-----------------------------------------|---------------------------------|
| Access Management Review | Structures Review |
| District Contracts Review | Construction Review |
| Design Services Review | Maintenance Review |
| ➔ Drainage Review | Value Engineering Review |
| Environmental Management Review | SWAO Review |
| Environmental Permits Review | Utilities Review |
| Traffic Operations Review | Preliminary Right of Way Review |
| Traffic Ops. - Traffic Signals Review | Review and Comment |
| Traffic Ops. - Signing & Marking Review | Approval/disapproval |
| Traffic Ops. - Lighting Review | for Your Information |
| Geotechnical Review | per Your Request |
| Geotechnical Soil Survey | per Our Phone Conversation |
| Geotechnical Foundation Investigations | |
| Geotechnical Pond Investigations | |

Date requested for return: April __, 1996

Date returned: ___ / ___ / ___

Remarks:

Response:

- Call and ask for a signed and sealed BHR
- Prepare concurrence letter

GENESIS 813 620 4500

ART DELASKI PAULA / RUBEN

MEMORANDUM

State of Florida Department of Transportation

Date: April 10, 1996

To: M. D. Finch, District Drainage Engineer, MS 1-14

From: J.R. Previte, Project Manager

Subject: W.P.I. Nos. 1110459, 1110874
State Project Nos. 04010-1507, 05090-1511
SR 31 at Bridge No. 040001 in DeSoto County
SR 29 at Bridge Nos. 050031, 32, 35, and 941 in Glades County

RECEIVED
APR 10 1996
DRAINAGE DEPT.

Transmitted:

Revised BHR and response to comments for SR 29 Br # 050941

Action to be taken:

Access Management Review	Structures Review
District Contracts Review	Construction Review
Design Services Review	Maintenance Review
➔ Drainage Review	Value Engineering Review
Environmental Management Review	SWAO Review
Environmental Permits Review	Utilities Review
Traffic Operations Review	Preliminary Right of Way Review
Traffic Ops. - Traffic Signals Review	Review and Comment
Traffic Ops. - Signing & Marking Review	Approval/disapproval
Traffic Ops. - Lighting Review	for Your Information
Geotechnical Review	per Your Request
Geotechnical Soil Survey	per Our Phone Conversation
Geotechnical Foundation Investigations	
Geotechnical Pond Investigations	

Date requested for return: April __, 1996

Date returned: ___ / ___ / ___

Remarks:

Response:

- Call about local Socen correction factors for shape
• Dishett submittal
✓ • Misspelled reading pi, "i"
✓ • Need signed and sealed copy.
- Prepare concurrence letter

MEMORANDUM
State of Florida Department of Transportation

Date: March 6, 1996

To: M. D. Finch, District Drainage Engineer, MS 1-14

From: J.R. Previte, Project Manager *JR*

Subject: W.P.I. Nos. 1110459, 1110874
State Project Nos. 04010-1507, 05090-1511
SR 31 at Bridge No. 040001 in DeSoto County
SR 29 at Bridge Nos. 050031, 32, 35, and 941 in Glades County

Transmitted:

Second submittal of BHR for Bridge # 050035

Action to be taken:

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none">Access Management ReviewDistrict Contracts ReviewDesign Services Review➔ Drainage ReviewEnvironmental Management ReviewEnvironmental Permits ReviewTraffic Operations ReviewTraffic Ops. - Traffic Signals ReviewTraffic Ops. - Signing & Marking ReviewTraffic Ops. - Lighting ReviewGeotechnical ReviewGeotechnical Soil SurveyGeotechnical Foundation InvestigationsGeotechnical Pond Investigations | <ul style="list-style-type: none">Structures ReviewConstruction ReviewMaintenance ReviewValue Engineering ReviewSWAO ReviewUtilities ReviewPreliminary Right of Way ReviewReview and CommentApproval/disapprovalfor Your Informationper Your Requestper Our Phone Conversation <hr/> <hr/> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Date requested for return: March __, 1996

Date returned: ___ / ___ / ___

Remarks:

Response:

MEMORANDUM

State of Florida Department of Transportation

Date: February 15, 1996

To: M. D. Finch, District Drainage Engineer MS 1-14

From: J.R. Previte, Project Manager JP

Subject: W.P.I. Nos. 1110459, 1110874
State Project Nos. 04010-1507, 05090-1511
SR 31 at Bridge No. 040001 in DeSoto County
SR 29 at Bridge Nos. 050031, 32, 35, and 941 in Glades County

RECEIVED

FEB 15 1996

DRAINAGE DEPT.

Transmitted herewith is the following:

(1) Consultant response to BHR comments, Bridge # 050035

Action to be taken:

- | | |
|--------------------------------------------|---------------------------------|
| Access Management Review | Structures Review |
| District Contracts Review | Construction Review |
| Design Services Review | Maintenance Review |
| Drainage Review ← ← ← ← ← ← ← ← ← ← | Value Engineering Review |
| Environmental Management Review | SWAO Review |
| Environmental Permits Review | Utilities Review |
| Traffic Operations Review | Preliminary Right of Way Review |
| Traffic Ops. - Traffic Signals Review | Review and Comment |
| Traffic Ops. - Signing & Marking Review | Approval/disapproval |
| Traffic Ops. - Lighting Review | for Your Information |
| Geotechnical Review | per Your Request |
| Geotechnical Soil Survey | per Our Phone Conversation |
| Geotechnical Foundation Investigations | _____ |
| Geotechnical Pond Investigations | _____ |

Date requested for return: February __, 1996

Date returned: ____ / ____ / ____

Remarks:

Response:

Attachments:

MEMORANDUM

State of Florida Department of Transportation

Date: January 17, 1996
To: M.D. Finch, District Design Engineer MS 1-14
From: J.R. Previte, Project Manager

Subject: W.P.I. Nos. 1110459, 1110874
State Project Nos. 04010-1507, 05090-1511
SR 31 at Bridge No. 040001 in DeSoto County
SR 29 at Bridge Nos. 050031, 32, 33, 35, and 941 in Glades County

RECEIVED

JAN 17 1996

DRAINAGE DEPT.

Transmitted herewith is the following:

- (1) BHR for Bridge # 050035

Action to be taken:

- | | |
|------------------------------------------------------------------|----------------------------------------------------------|
| <input type="checkbox"/> Access Management Review | <input type="checkbox"/> Structures Review |
| <input type="checkbox"/> District Contracts Review | <input type="checkbox"/> Construction Review |
| <input type="checkbox"/> Design Services Review | <input type="checkbox"/> Maintenance Review |
| <input checked="" type="checkbox"/> Drainage Review | <input type="checkbox"/> Value Engineering Review |
| <input type="checkbox"/> Environmental Management Review | <input type="checkbox"/> SWAO Review |
| <input type="checkbox"/> Environmental Permits Review | <input type="checkbox"/> Utilities Review |
| <input type="checkbox"/> Traffic Operations Review | <input type="checkbox"/> Preliminary Right of Way Review |
| <input type="checkbox"/> Traffic Ops. - Traffic Signals Review | <input type="checkbox"/> Review and Comment |
| <input type="checkbox"/> Traffic Ops. - Signing & Marking Review | <input type="checkbox"/> Approval/disapproval |
| <input type="checkbox"/> Traffic Ops. - Lighting Review | <input type="checkbox"/> for Your Information |
| <input type="checkbox"/> Geotechnical Review | <input type="checkbox"/> per Your Request |
| <input type="checkbox"/> Geotechnical Soil Survey | <input type="checkbox"/> per Our Phone Conversation |
| <input type="checkbox"/> Geotechnical Foundation Investigations | <input type="checkbox"/> _____ |
| <input type="checkbox"/> Geotechnical Pond Investigations | <input type="checkbox"/> _____ |

Date requested for return: February 9, 1996

Date returned: ____ / ____ / ____

Remarks:

Response:

Attachments:

approach with consideration
 given to normal tidal exchange
 and hurricane induced storm
 surge? N/A

Manmade/Regulated Canals
 Discharges obtained from
 regulatory agency? N/A

Is adequate justification provided
 when discharges are not developed
 as per FDOT Drainage Manual Volume
 1 procedures? _____

3. HYDRAULIC ANALYSIS

- Riverine Crossing Yes
 - WSPRO
 - Was WSPRO used? Yes
 - WSPRO error messages eliminated? _____
 - Are WSPRO results reasonable? Yes
 - Was WSPRO run for existing cond? Yes
 - Was WSPRO run for prop. cond? Yes
 - Exit & Approach Sections located
 one bridge length from the face
 of the bridge? Yes
 - Are "n" values and sub-areas
 reasonable? Yes
 - Are bridge parameters correct and
 consistent with the BHR and BHRS? Some
 - Is computer disk with WSPRO input
 data files included with submittal? Yes

- Tidal Crossing _____
 - Is hydraulic analysis based on a
 rational engineering approach with
 consideration given to normal tidal
 exchange and hurricane induced
 storm surge? N/A

- Bridge Culvert Analysis _____
 - FHWA HY-8 Program or HDS 5
 Methodology N/A

- Tailwater Determination _____
 - Effect of downstream conditions
 including structures, channel
 constrictions, channel widenings
 channel bends, etc... _____
 - From existing published data (i.e.
 FEMA Flood Insurance Study) _____
 - Historic Data _____

- Slope Conveyance Method of WSPRO (not recommended) _____
- Reasonable explanation for assumptions made in estimating tailwater _____

4. DESIGN CRITERIA

- FDOT Criteria
 - Design Storm Yes *50yr*
 - Drift Clearance VARIANCE
 - Navigation Clearance NA
- Permit Agency Criteria
 - Coast Guard N/A
 - FDEP _____
 - Water Management District _____
 - Local _____
 - Other _____

5. ALTERNATIVE STRUCTURES CONSIDERED

- Minimum structure size required to meet hydraulic standards for vertical and horizontal clearance, scour and backwater. (Should include 2 ft/sec bridge and 4 ft/sec box culvert) Yes
- For Interstate Bridges with no regulatory floodway, evaluation of the structure causing a one foot rise over the no crossing condition for the base flood. N/A
- Other sizes considering environmental, maintenance of traffic, structural, geotechnical, impacts on adjacent property, etc.... N/A
- Justification when only one bridge length or structure size is evaluated Yes
- Reasons for selecting the recommended structure and a clear explanation as to why it is the most economical structure for the site. _____
- Additional justification if the recommended structure is not the most economical Yes
- Evidence that structural alternates are feasible or reasonable options Yes

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

TECHNIQUE FOR ESTIMATING MAGNITUDE AND FREQUENCY OF FLOODS
ON NATURAL-FLOW STREAMS IN FLORIDA

By Wayne C. Bridges

U.S. GEOLOGICAL SURVEY
WATER-RESOURCES INVESTIGATIONS 82-4012

Library
North Florida Subdistrict Office
U.S. Geological Survey
Suite L-103, Woodcrest Office Park
325 John Knox Road
Tallahassee, Florida 32303

Prepared in cooperation with the
FLORIDA DEPARTMENT OF TRANSPORTATION

Tallahassee, Florida

1982



820202

To fit the log-Pearson Type III distribution to the annual maximum discharges at each gaging station, the Geological Survey computer program J-407, described by Kirby (1979), was used to perform the statistical analysis. Although program J-407 follows the guidelines of the U.S. Water Resources Council (WRC), the user is still required to use hydrologic judgment in supplying information on regional skew, historic peaks, gage-base discharge, low and high outliers, and the interpretation of the frequency distribution.

The skew coefficient determined from the station record is sensitive to extreme events; therefore, the longer the record, the more reliable the skew coefficient. It is recommended by WRC that a generalized skew be applied to station records of less than 25 years and, for station records of 25 to 100 years, a weighted-skew coefficient be used.

An effort was made to determine a better estimate of the generalized skew by plotting the station skews and drawing a skew isoline map for station records of 25 years or more. Distinct geographic and topographic patterns were not evident; therefore, the decision was made to use the WRC generalized-skew map. Values of skew can be found on the map in U.S. Water Resources Council (1977, pl. 1).

Frequency curves for 23 small-basin rainfall-runoff sites were computed using a procedure developed by Lichty and Liscum (1978) to improve the T-year (annual) flood estimates. The T-year flood estimates were computed as the weighted average of the map model estimate and the observed estimate in proportion to the accuracy of each estimate. The observed estimate is derived from the log-Pearson Type III distribution of annual peaks at the small basin site. The map model estimate is based on a long-term rainfall record that is transferred to the gaged site by means of three maps depicting the geographic variability of a coefficient, C_i , ($i = 2$ -, 25 -, and 100 -year recurrence intervals). Maps were extended (R. W. Lichty, written commun., 1979) to include peninsular Florida.

For each small basin site, the rainfall-runoff model is calibrated and the fitted parameters from the rainfall-runoff model are used in conjunction with the climatic factor, C_i , to define a frequency curve.

The procedure for estimating the map model yields an accuracy (in equivalent years of record) ranging from 7 years for the 2-year flood to 30 years for the 100-year flood.

Basin Characteristics

Described below are the basin characteristics that were tested for significance as independent variables in the regression analysis. Many of the variables were not significant and do not appear in the final prediction equations. The streamflow and basin characteristics are stored in the National Water Data Storage and Retrieval System computer file.

1. Drainage area (DA), in square miles: the area that contributes to surface runoff. Basin boundaries are delineated on U.S. Geological Survey topographic maps and the contributing area is determined by planimetering.
2. Channel slope (SL), in feet per mile: the average slope of the main channel between points 10 and 85 percent of the distance upstream from the gaging site to the basin divide.
3. Channel length (LE), in miles: the length of the main channel between the gaging station and the basin divide, as measured along the channel which drains the largest area of the basin above each junction.
4. Elevation (EL), in feet: the mean basin elevation, in feet above National Geodetic Vertical Datum of 1929 (formerly referred to as "mean sea level"), measured from topographic maps by transparent grid-sampling method (20 to 80 points sampled in each basin).
5. Storage (ST), in percent: the surface area of lakes, ponds, and swamps expressed as a percentage of the contributing drainage area.
6. Lake area (LK), in percent: the surface area of lakes and ponds expressed as a percentage of the contributing drainage area.
7. Swamps (SW), in percent: the surface area of swamps (defined as marsh and wooded marsh on topographic maps) expressed as a percentage of the contributing drainage area (SW = ST-LK).
8. Forest (FO), in percent: the area of forest expressed as a percentage of the contributing drainage area; forested area shown on topographic maps.
9. Soil (SO), in inches: the soils index represents values of potential maximum infiltration during an annual flood, under average soil moisture conditions. Values of the soils index were computed from a map provided by the Soil Conservation Service, U.S. Department of Agriculture.
10. Precipitation (PR), in inches: the mean annual precipitation determined from an isohyetal map prepared from U.S. Weather Bureau (1959, rev. 1962) precipitation records.
11. Precipitation intensity (I24,2), in inches: the maximum 24-hour precipitation expected to be exceeded on an average of once each 2 years. Values for this index were determined from a U.S. Weather Bureau (1958) publication.

S.F.W.M.D. LAND USE AND LAND COVER CLASSIFICATION CODE

LEVEL I LEVEL II LEVEL III

(U) Urban and built-up land

Urban or Built-up land consists of areas of intensive use, with much of the covered by structures. Included in this category are cities, towns, villages, s developments along highways, and such areas as those occupied by mills, shopping centers, industrial and commercial complexes, and institutions that may, in some instances, be isolated from urban areas.

As development progresses, small blocks of land of less intensive or nonconforming use may be isolated in the midst of built-up areas and will genera be included in this category. Agricultural, forest, or water areas on the fringe and built-up areas will not be included except where they are part of low-densit development.

The Urban or Built-up category takes precedence over others when the criter more than one category are met. For example, residential areas that have suffici cover to meet Forested Upland criteria will still be classified as Residential i Urban or Built-Up category.

(UR) Residential

- (URSL) Single-family, Low Density (under 2 D.U./gross acre)
- (URSM) Single-family, Medium Density (2 to 5 D.U./gross acre)
- (URSH) Single-family, High Density (over 5 D.U./gross acre)
- (URMF) Multi-family building
- (URMH) Mobile homes

(UC) Commercial and Services

- (UCPL) Parking lot
- (UCSC) Shopping center
- (UCSS) Sales and services
- (UCCE) Cultural and Entertainment
- (UCMC) Marine commercial (Marinas)
- (UCHM) Hotel-Motel

(UI) Industrial

- (UIJK) Junkyard
- (UILT) Other light industrial
- (UIHV) Other heavy industrial

(US) Institutional

- (USED) Educational
- (USMD) Medical
- (USRL) Religious
- (USMF) Military
- (USCF) Correctional

Post-It™ brand fax transmittal memo 7671 # of pages ▶ 5

To	<i>Paula Couillette</i>	From	<i>Regina Haggan</i>
Co.	<i>JMI Engineers</i>	Co.	<i>Genesis Group</i>
Dept.		Phone #	<i>813 664-4500</i>
Fax #	<i>904 385-3545</i>	Fax #	<i>813 664-0440</i>

(USGF) Governmental (other than
military or correctional)
(USSS) Social services
(Elks, Moose, Eagles)

(UT) Transportation

(UTAP) Airports
(UTAG) Small grass airports
(UTRR) Railroad yards and terminals
(UTPF) Port facilities
(UTEP) Electrical power facilities
(UTTLL) Major transmission lines
(UTHW) Major highway and rights-of-way
(UTWS) Water supply plants
(UTSP) Sewerage treatment plants
(UTSW) Solid waste disposal
(UTRS) Antenna arrays
(UTOG) Oil and gas storage

(UO) Open and others

(UORC) Recreational facilities
(UOGC) Golf courses
(UOPK) Parks
(UOCM) Cemeteries
(UORV) Recreational vehicle parks
(UOUD) Open under development
(UOUN) Open and undeveloped within
urban area

(A) Agriculture

Agricultural land may be defined as those lands which are cultivated to pro
crops and livestock. The sub-categories of Agriculture are: Cropland, Pasture
Orchards, Groves (except citrus), Vineyards, Nurseries, Ornamental Horticulture
Citrus Groves, Confined Feeding Operations, Specialty Farms and Other Agricultur

(AC) Cropland

(ACSC) Sugar cane
(ACTC) Truck crops
(ACRF) Rice fields

(AP) Pasture

(APIM) Improved pasture
(APUN) Unimproved pasture

(AM) Groves, Ornamentals, Nurseries, Tropical fruits

(AMCT) Citrus
(AMTF) Tropical fruits
(AMSF) Sod farms
(AMOR) Ornamentals

(AF) Confined feeding operations

(AFFL)	Cattle feed lots
(AFDF)	Dairy farms
(AFFF)	Fish farms
(AFHT)	Horse training and stables
(AFPY)	Poultry

(R) Rangeland

Historically, Rangeland has been defined as land where the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs, and is of being grazed. Management practices may include brush control, regulation of grazing intensity, and season of use. If revegetated to improve the forage cover, it is like native vegetation. Generally this land is not fertilized, cultivated, or irrigated.

The definition of Rangeland used in the CONSERVATION NEEDS INVENTORY by the U.S. Departments of Agriculture and Interior is used in this classification scheme and describes the natural potential (climax) plant cover as being composed principally native grasses, forbs and shrubs valuable for forage. This category includes Grassland, Shrub and Brushland, and Mixed Rangeland.

(RG) Grassland

(RS) Scrub and brushland

(RSPP)	Palmetto prairies
(RSSB)	Brushland

(F) Forested uplands

Forestland includes uplands, basically the drier areas, which have a tree crown density (crown closure of 10 percent or more), and are dominated by trees and other woody vegetation.

Lands from which trees have been removed to less than 10 percent crown closure but which have not been developed for other use, are also included in this category. For example, lands on which there are rotation cycles, involving clear-cutting and replanting, are part of the forested uplands category.

Since most naturally seeded forestlands are composed of a mixture of species, for purposes of classification a minimum of 66 2/3 percent stand dominance (by crown area measurement) of one species or species groups is necessary for inclusion in separate categories. Less than 66 2/3 percent stand dominance of one species or groups is considered to be a mixed category. It should be noted that classification is based on overstory species composition, as interpreted from aerial photography. Forested uplands are classified as follows:

(FE) Coniferous

(FEPF)	Pine flatwoods
(FESP)	Sand pine scrub
(FECF)	Commercial forest (pine)

(FO) Non-coniferous

(FOAP)	Australian pine
(FOBP)	Brazilian pepper
(FOPA)	Palms
(FOSO)	Scrub oak
(FOOK)	Oak
(FOCF)	Commercial forest

(FM) Mixed forested

(FMTW)	Temperate hardwoods
(FMCM)	Cabbage palms/Melaleuca
(FMCO)	Cabbage palms/Oaks
(FMPP)	Pine/Melaleuca
(FMPO)	Pine/Oak
(FMTH)	Tropical hammocks
(FMOF)	Old fields forested
(FMCD)	Coastal dunes
(FMPC)	Pine/Cabbage palms

(W) Wetlands

Wetlands are those areas where the water table is at, near, or above the la for a significant part of most years. The hydrologic regime is such that aquatic hydrophytic vegetation usually is established, although alluvial and tidal flats nonvegetated. Wetlands are frequently associated with topographic lows. Examples wetlands include marshes, mudflats, emergent vegetation areas, and swamps. Shall water areas with submerged aquatic vegetation are classed as Water and are not included in the Wetlands category.

Extensive parts of some river floodplains qualify as Wetlands. These do not agricultural land where seasonal wetness or short-term flooding may provide an important component of the total annual soil moisture necessary for crop product But, uncultivated wetlands yielding products such as wood, or grazed by livestock retained in the Wetlands category.

Wetlands areas drained for any purpose belong to other land use categories, whether they be Agriculture, Rangeland, or Forested. When the drainage is discontinued and such use ceases, classification reverts to Wetlands after chara vegetation is reestablished. Wetlands managed for wildlife purposes may show sho term changes in vegetation type and wetness condition as different management practices are used, but are properly classified Wetlands.

(WF) Forested fresh

(WFCM)	Cypress/Melaleuca
(WFCY)	Cypress
(WFWL)	Willow
(WFME)	Melaleuca
(WFSB)	Scrub and brushland
(WFMX)	Mixed forested

(WN) Non-forested fresh

(WNSG)	Sawgrass
(WNCT)	Cattail
(WNBR)	Bullrush
(WNWC)	Wire cordgrass
(WNAG)	Mixed aquatic grass
(WNWL)	Sloughs

(WS) Forested salt

(WSRM)	Red mangrove
--------	--------------

(WSBW) Black and White mangrove

(WM) Non-forested salt

(WX) Mixed forested and non-forested fresh

(WXPP) Pine and wet prairies

(WXCP) Cypress domes and wet prairies

(WXHM) Hardwood marsh

(H) Water

The delineation of water areas depends on the scale and resolution character of the remote-sensor photography used for interpretation. One definition of water bodies, provided by the Bureau of Census, includes all areas within the land mass of the United States that are predominantly or persistently water covered, provided if linear, they are at least 1/8 mile (660 feet or 200 meters) wide, and if extended cover at least 40 acres (16 hectares).

Defining water boundaries at Level III, minimum size has been established to be less than 10 acres. In some instances, water bodies of one acre will be plotted and identified. Water bodies or those portions of the water body having emergent vegetation are placed in the Wetland category.

(B) Barren land

Barren land has very little or no vegetation and limited ability to support general, it is an area with only soil, sand or rocks. Vegetation, if present is sparse and scrubby. However, land also may be temporarily barren due to man's activities. Generally, this land is included in other land use categories. Vast areas of agricultural land are temporarily without vegetative cover due to tillage practices. Land categories are beaches (areas exhibiting little or no evidence of human encroachment), Extractive operations, Spoil areas, and Levees.

(BB) Beaches

(BP) Extractive

(strip mines, quarries, and gravel pits)

(BS) Spoil areas

(BL) Levees

* Documentation of major codes from "LAND USE, COVER AND FORMS CLASSIFICATION SYSTEM, A TECHNICAL MANUAL", Department of Transportation, State Topographic Office Remote Sensing Center, Kuyper, Becker and Shopmyer, February 1981

TELEPHONE CONVERSATION
MEMORANDUM

DATE: 02/07/96

PROJECT NO: 9523

TIME: 09:23 AM

CALL PLACED/RECEIVED BY: Paula

FIRM CALLED: Glades Co.

TELEPHONE # (941) 946-1217

Emergency Management

SPOKE WITH: Ken Howard, Director

Subject: Flooding on SR29

I called Mr. Howard about the flooding which occurred around June 23, 1995 (per Art de Laski). He stated that the road was never completely closed during this time. There was an area where the water was over the road, however the road was still passible. A Florida Highway Patrol first noticed the water on the road and notified the EMA, who notified the Glades Co. Road Department who put up barricades and warnings for travelors.

Mr. Howard stated that this area was located about 5 miles south of the intersection of SR 29 and US 27. He said that it was not at a bridge, it was only the roadway. The water receded in about 24 hours.

Mr. Howard stated that all this information was his own personal experience. This past year was unusual due to several tropical storms, hurricanes, etc. and there were a lot of areas flooded which usually don't. In the last 7-10 years, he does not remember SR 29 ever overtopping. The EMA does not have detailed records of flooding and road closures. Since this is a state road, he recommended contacting the FDOT Maintenance.

He mentioned contacting Tommy Greenwood, Director of the Glades County Road Department for possibly more information. (941) 946-0771

Project/Proposal

cc:

File Dave Art

9523

TELEPHONE CONVERSATION
MEMORANDUM

DATE: 02/07/96

PROJECT NO: 9523

TIME: 10:19 AM

CALL PLACED/~~RECEIVED~~ BY: Paula

FIRM CALLED: Glades Co. Maintenance

TELEPHONE # (941) 946-0771

SPOKE WITH: Tommy Greenwood

Subject: Flooding on SR29

The County Maintenance Department does not have any information on this road because it is a state road. He does not have any personal recollection of flooding on SR 29 either.

He suggested calling Talbert Melton or Wally Thalen.

Project/Proposal

cc: File, Dave, Art

9523

TELEPHONE CONVERSATION
MEMORANDUM

DATE: 02/07/96

PROJECT NO: 9523

TIME: 10:29 AM

CALL PLACED/~~RECEIVED~~ BY: Paula

FIRM CALLED: FDOT Maintenance

TELEPHONE # (941) 674-4027

SPOKE WITH: Talbert Melton

Subject: Flooding on SR29

I asked Mr. Melton specifically about June 1995 when Ken Howard recalls there was a need for barricades on a portion of SR 29 where water was coming onto the roadway. He does not remember ever having to take barricades out there. He said that the water frequently comes up and will quickly runoff the roadway. At times they have gone out and driven fluorescent painted stakes at the edge of the pavement, however they have not had to drive stakes in a while.

He also spoke with field superintendent Robert Crawford who would actually gone out into the field. Mr. Crawford does not remember water over the road or bridges. He did not take barricades out during this event.

The other field superintendent, Wally Thalen, was out of the office but will call when he gets in.

Project/Proposal

cc:

File, Dave, Art

9523

TELEPHONE CONVERSATION
MEMORANDUM

DATE: 02/07/96

PROJECT NO: 9523

TIME: 11:40 AM

CALL PLACED/RECEIVED BY: Paula

FIRM CALLED: FDOT Maintenance

TELEPHONE # (941) 674-4027

SPOKE WITH: Wallace Thalen

Subject: Flooding on SR29

The area of flooding during June 1995 was at a 36" cross drain located between bridges 050033 and 050035. It is approximately 0.5 - 0.6 miles south of bridge 050033. This is the area that they have the most problems with. During June the water was up to the edge of pavement. It lacked only a few inches to overtop the road. You could not pull off the highway.

Water flows 'real good' through bridge 050035. It washes sand up on the east side of the highway. He does not remember the water level ever coming up to the bridge.

Project/Proposal

cc: File, Dave, Art

9523

**TELEPHONE CONVERSATION
MEMORANDUM**

DATE: 02/06/96

PROJECT NO: 9523

TIME: 05:04 PM

CALL PLACED/RECEIVED BY: Paula

FIRM CALLED: SFWMD

TELEPHONE # (941) 278-7396

SPOKE WITH: Clayton Miller

Subject: Deck Drainage

There is not a problem with the additional deck drainage sheet flowing off the bridge into the existing drainage ditches. They are primarily concerned with water quality. We have slowed the runoff by taking off the bridge, over the grassed shoulder and into the existing ditches. He agrees that it is not practical to provide any more treatment than this.

In regards to permitting, he advised us to look into a Noticed General Permit rather than a General Permit.

He will also be faxing the runoff equations developed by the SFWMD. However, they encourage people not to use them because the values they give are too high.

Project/Proposal

cc: File

9523

TELEPHONE CONVERSATION
MEMORANDUM

DATE: 02/06/96

PROJECT NO: 9523

TIME: 04:51 PM

CALL PLACED/RECEIVED BY: Paula

FIRM CALLED: USGS

TELEPHONE # (813) 243-5800 ext. 125

SPOKE WITH: Kathy Hammett

Subject: USGS Regression Equations and Lake Area

I called Kathy per the suggestion of Maverick Marshall. From a technical standpoint, the variables in the regression equations are drainage area (DA), slope (SL), and lake area (LK) as defined in the Technique for Estimating Magnitude and Frequency of Floods on Natural-Flow Streams in Florida by Wayne C. Bridges.

The equations were developed based on the lake area being the blue shaded area on the USGS quad. maps. How they are used varies. She has seen the lake area include other areas than the blue areas. This is a judgment call for the design engineer, the permitting or regulatory agency.

Kathy mentioned the standard error of estimates and range of possible values the USGS equations would give.

Project/Proposal

cc:

File

9523

TELEPHONE CONVERSATION
MEMORANDUM

DATE: 02/06/96

PROJECT NO: 9523

TIME: 09:43 AM

CALL PLACED/~~RECEIVED~~ BY: Paula

FIRM CALLED: SFWMD

TELEPHONE # (941) 278-7396

SPOKE WITH: Permitting Dept., Surface Waters

Subject: Runoff Equations

Specific runoff equations have been developed for areas located within the SFWMD. Information concerning the procedure for estimating sheet flow runoff in the South Florida Water Management District is found in the Management and Storage of Surface Waters (MSSW) Permit Information Manual Volume IV.

A copy of the related appendices is being sent and local equations are being faxed.

Project/Proposal

cc: File, Dave S.

9523

where:

Q_T = Peak runoff rate for return period T, in
ft³/sec

C_T = Runoff coefficient for return period T,
expressed as the dimensionless ratio of
rainfall excess to total rainfall

I_{t_c} = Average rainfall intensity, in inches/hr,
during a period of time equal to t_c for the
return period T

t_c = Time of concentration, in minutes (see
Equations 5-1, 5-2, 5-3, and 5-4)

A = Watershed drainage area, in acres, tributary
to the design point

The following procedure is recommended for using the
Rational Method:

1. Collect watershed data.
2. Calculate time of concentration using the
procedure in Section 5.3.
3. Locate the project in the appropriate precipita-
tion zone using Figure 5-1 and select the
appropriate IDF curve from Figures 5-2 through
5-12. Use the IDF curve to determine the average
rainfall intensity for the return period T and the
time of concentration (t_c) from Step 2.
4. Obtain a runoff coefficient for the return period
T, using the procedure in Section 5.6.1.
5. Compute the peak runoff rate for the return period
T, using Equation 5-12.

5.8.2 REGRESSION EQUATIONS--NATURAL CONDITIONS

Regression equations developed by the USGS (Bridges, 1982)
and USDOT, FHWA (FHWA-RD-77-158 and 159, 1977) can be used
to estimate peak runoff for natural flow conditions.

The general form for Region B is:

$$Q_T = C DA^{B_1} (LK + 0.6)^{B_2} \quad (5-14)$$

where:

Q_T = Peak runoff rate for return period T, in
ft³/sec

C = Regression constant (see Table 5-13)

DA = Drainage area, in miles²

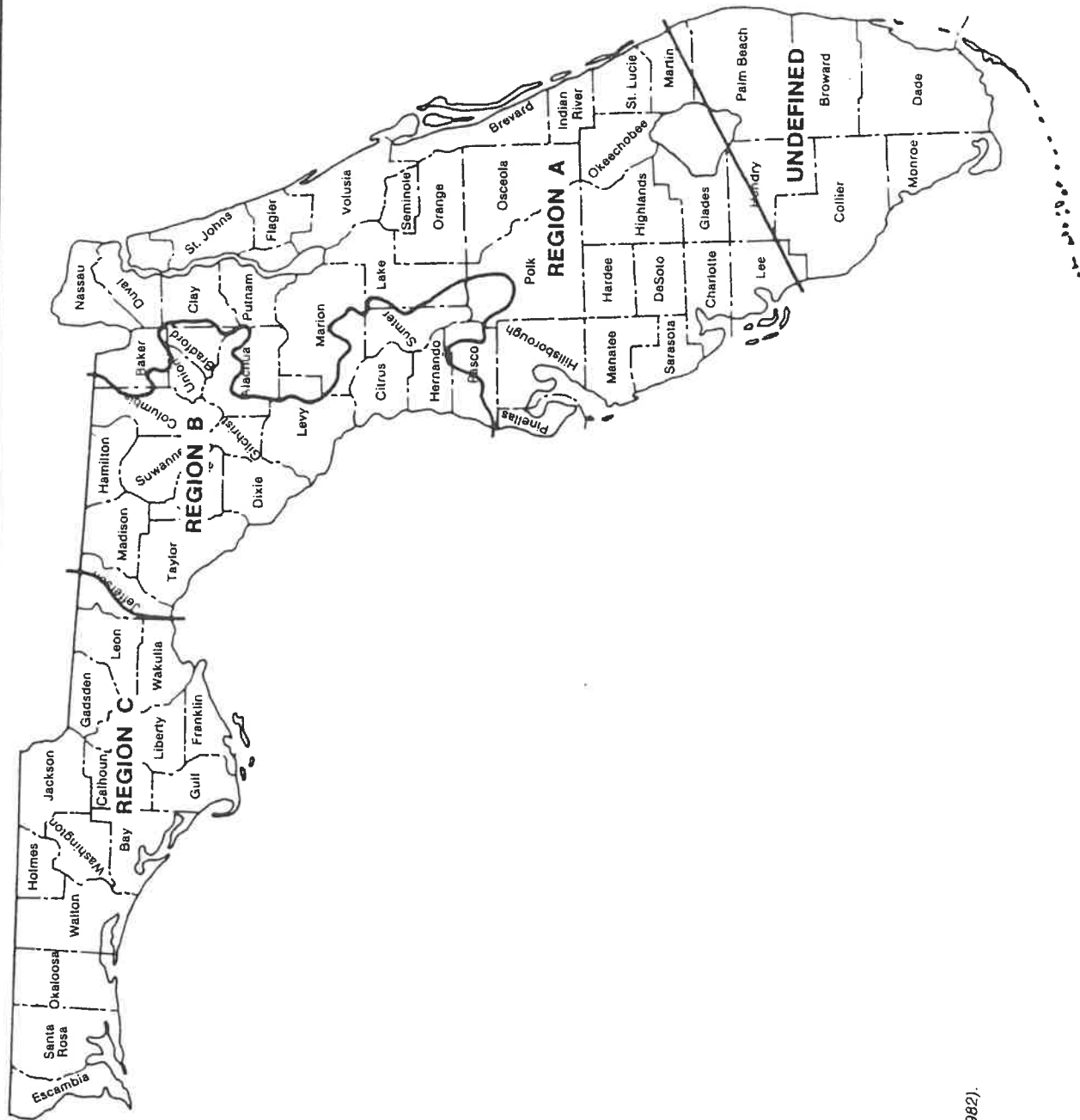
LK = Lake area, in percent of the total

B_1, B_2 = Regression exponents (see Table 5-13)

The square of the multiple regression coefficient (R^2) and the standard error, in percent, are reported for each regression equation in Tables 5-12, 5-13, and 5-14. The R^2 value provides a measure of the equation's ability to account for variation in the dependent variable. The standard error is the standard deviation of the distribution of residuals about the regression line, i.e., 68 percent of estimated values are within one standard error and 95 percent are within two standard errors.

The range of applicability for the equations is presented in each of the three tables; they are not to be used outside these ranges. It should also be noted that, in areas of karst topography, some basins may contain closed depressions and sinkholes which do not contribute to direct surface runoff. Karst areas are more likely to be found in Region B. When the drainage area is determined from 7.5-minute topographic maps, any area containing sinkholes or depressions (noncontributing area) should be subtracted from the total drainage area. All basins used in the regression analysis were adjusted, as necessary, to contributing drainage area.

The regression equations are inapplicable for basins where manmade changes have a significant effect on flood runoff. Inappropriate basins are those influenced by regulation from



Reference: Bridges (1982).

FIGURE 5-23
Regions for USGS Regression Equations for Natural Flow Conditions

Table 5-12
USGS REGRESSION EQUATIONS FOR
NATURAL FLOW CONDITIONS IN FLORIDA:
REGION A

Peak Runoff Equation	R ²	Standard Error in %
$Q_2 = 93.4 DA^{0.756} SL^{0.268} (LK + 3)^{-0.803}$	0.868	42.6
$Q_5 = 192 DA^{0.722} SL^{0.255} (LK + 3)^{-0.759}$	0.858	42.4
$Q_{10} = 274 DA^{0.708} SL^{0.248} (LK + 3)^{-0.738}$	0.843	44.2
$Q_{25} = 395 DA^{0.696} SL^{0.240} (LK + 3)^{-0.717}$	0.821	47.3
$Q_{50} = 496 DA^{0.690} SL^{0.234} (LK + 3)^{-0.705}$	0.803	50.0
$Q_{100} = 609 DA^{0.685} SL^{0.227} (LK + 3)^{-0.695}$	0.784	52.9
$Q_{200} = 779 DA^{0.674} SL^{0.205} (LK + 3)^{-0.694}$	0.763	55.8
$Q_{500} = 985 DA^{0.668} SL^{0.196} (LK + 3)^{-0.687}$	0.738	59.7

Q_T = Peak runoff rate for return period of T-years, in cfs

DA = Drainage area, in miles²

SL = Channel slope between points at 10 and 85 percent of total channel length, in ft/mile (minimum = 0.9)

LK = Lake area, in percent of total

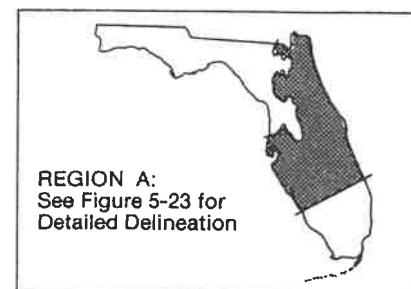
Basin Characteristic

Drainage area
Slope
Lake area

Range of Applicability

1,170 acres to 3,066 miles²
0.15 to 24.2 ft/miles
0 to 28.16 %

Reference: Bridges (1982).



Runoff

**Comparison of Storm Flow Runoff
SR 29, Bridge 050035**

Return Period	USGS, Region A ¹	USGS, Region A ²	USGS, Region A ³	FHWA, Zone 1	Rational Method
2	95	312	287	303	290
50	531	1506	1397	1258	651
100	654	1825	1694	1470	730
500	982	2709	2519	2499*	1241*

¹ LK = wetland storage area

² LK = blue lake area from quad. map

³ Wetland storage area subtracted from drainage area.

** $Q_{500} = 1.7 Q_{100}$ (HEC 18 & 20 Workbook, p.8-8, Step 8b)

RegionA - Storage Area

USGS Regression Equations

Peak Runoff Equation	CFS	CMM
$Q_2 = 93.4*(DA)^{0.756}*(SL)^{0.268}*(LK+3)^{-0.803} =$	95	162
$Q_{10} = 274*(DA)^{0.708}*(SL)^{0.248}*(LK+3)^{-0.738} =$	287	488
$Q_{50} = 496*(DA)^{0.69}*(SL)^{0.234}*(LK+3)^{-0.705} =$	531	903
$Q_{100} = 609*(DA)^{0.685}*(SL)^{0.227}*(LK+3)^{-0.695} =$	654	1111
$Q_{500} = 985*(DA)^{0.668}*(SL)^{0.196}*(LK+3)^{-0.687} =$	982	1668

- Q_t = Peak runoff rate for return period of t-years, in cfs.
 DA = Drainage area, in sq. mi. 8.08
 SL = Channel slope, in ft/mile 6.78
 LK = Lake area, in percent of total 10.23

<u>Basin Characteristics</u>	<u>Range of Applicability</u>
Drainage Area	1,170 acres to 3,066 miles ²
Slope	0.15 to 0.24 ft/miles
Lake Area	0 to 28.16%

Reference: FDOT Drainage Manual, Table 5-12

Note: LK represents wetland storage area and blue lake area from Quad. Maps.

RegionA

USGS Regression Equations

Peak Runoff Equation	CFS	CMM
$Q_2 = 93.4*(DA)^{0.756}*(SL)^{0.268}*(LK+3)^{-0.803} =$	312	530
$Q_{10} = 274*(DA)^{0.708}*(SL)^{0.248}*(LK+3)^{-0.738} =$	855	1453
$Q_{50} = 496*(DA)^{0.69}*(SL)^{0.234}*(LK+3)^{-0.705} =$	1506	2558
$Q_{100} = 609*(DA)^{0.685}*(SL)^{0.227}*(LK+3)^{-0.695} =$	1825	3101
$Q_{500} = 985*(DA)^{0.668}*(SL)^{0.196}*(LK+3)^{-0.687} =$	2709	4602

- Q_t = Peak runoff rate for return period of t-years, in cfs.
 DA = Drainage area, in sq. mi. 8.08
 SL = Channel slope, in ft/mile 6.78
 LK = Lake area, in percent of total 0.02

<u>Basin Characteristics</u>	<u>Range of Applicability</u>
Drainage Area	1,170 acres to 3,066 miles ²
Slope	0.15 to 0.24 ft/miles
Lake Area	0 to 28.16%

Reference: FDOT Drainage Manual, Table 5-12

Note: LK represents only the blue lake area from the Quad. Maps.

RegionA Reduced Area

USGS Regression Equations

Peak Runoff Equation	CFS	CMM
$Q_2 = 93.4*(DA)^{0.756}*(SL)^{0.268}*(LK+3)^{-0.803} =$	287	488
$Q_{10} = 274*(DA)^{0.708}*(SL)^{0.248}*(LK+3)^{-0.738} =$	792	1346
$Q_{50} = 496*(DA)^{0.69}*(SL)^{0.234}*(LK+3)^{-0.705} =$	1397	2374
$Q_{100} = 609*(DA)^{0.685}*(SL)^{0.227}*(LK+3)^{-0.695} =$	1694	2879
$Q_{500} = 985*(DA)^{0.668}*(SL)^{0.196}*(LK+3)^{-0.687} =$	2519	4281

Q_t = Peak runoff rate for return period of t-years, in cfs.
 DA = Drainage area, in sq. mi. 7.25 = 8.08 - 0.83
 SL = Channel slope, in ft/mile 6.78
 LK = Lake area, in percent of total 0.02

<u>Basin Characteristics</u>	<u>Range of Applicability</u>
Drainage Area	1,170 acres to 3,066 miles ²
Slope	0.15 to 0.24 ft/miles
Lake Area	0 to 28.16%

Reference: FDOT Drainage Manual, Table 5-12

Note: Wetland storage area, 529 acres, has been subtracted from the total drainage area.
 Drainage manual, 5.8.2.

Zone 1

FHWA Regression Equations

Peak Runoff Equations	CFS	CMM
$Q_{10} = 0.0214*(A^{0.44})*(R^{1.164})*(DH^{0.785})$	740	1257
$Q_2 = 0.41*Q_{10} =$	303	515
$Q_{50} = 1.46*(Q_{10}^{1.023}) =$	1258	2137
$Q_{100} = 1.64*(Q_{10}^{1.029}) =$	1470	2497

Q_t = Peak runoff rate for t-year flood, in cfs

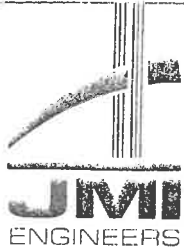
A = Drainage Area, in miles² 8.08

R = Iso-erodent factor, from Figure 17-1 400

DH = Difference in elevation from the most distance point in the watershed to the design point, in ft. 26

Limitation: Drainage Area should be less than 50 square miles.

Reference: FDOT Drainage Manual, Table 5-15



Project: Ggs-3

Page No.: 1 of 2

Designed by: _____ Date: _____

Job No.: _____

Checked by: _____ Note No.: _____

Using eq. 5-3

$$t_c = 0.0078 \frac{L^{0.77}}{S^{0.385}}$$

Reach 1: $L = 8000$

overland flow
on grass
surfaces.

$$S = \frac{61-51}{8000} = 0.00125$$

$$t_1 = 0.0078 \frac{(8000^{0.77})}{(0.00125)^{0.385}} = 103.55$$

$$t_1 = (103.55)^2 = 207.11 \text{ min}$$

Reach 2:

$L = 16,500$

$$S = \frac{51-35}{16,500} = 0.00097$$

$$t_2 = 0.0078 \frac{(16,500^{0.77})}{(0.00097)^{0.385}} = 199.39$$

$$t_c = t_1 + t_2 = 207.11 + 199.39 = 406.50 \text{ min} \\ = 6.77 \text{ hours}$$

$$i_2 = 0.56 \text{ in/hr}$$

$$i_{100} = 1.13 \text{ in/hr}$$

$$i_{50} = 1.05 \text{ in/hr}$$



Project: Eq. 5-3

Page No.: 2 of 2

Designed by: _____ Date: _____

Job No.: _____

Checked by: _____ Note No.: _____

$$C = 0.10 \quad \text{Table 5-5}$$

$$Q_2 = 0.10(0.56)(5171.2)$$

$$Q_2 = 290 \text{ cfs}$$

$$C_{50} = (1.2)(0.10) = 0.12$$

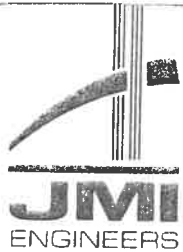
$$Q_{50} = 0.12(1.05)(5171.2)$$

$$Q_{50} = 651 \text{ cfs}$$

$$C_{100} = (0.10)(1.25) = 0.125$$

$$Q_{100} = 0.125(1.13)(5171.2)$$

$$Q_{100} = 730 \text{ cfs}$$

Project: Eq. 5-1Page No. : 1 of 2050035

Designed by : _____ Date : _____

Job No. : _____

Checked by : _____ Note No. : _____

Rational Equation = $Q = CiA$ V_i - taken from open channel WSPRO manual
(average of both Q 's)

$$C = 0.10$$

$$A = 8.08 \text{ sq. miles} = 5171.2 \text{ acres}$$

2 year

$$t_c = \frac{L_i}{60 V_i}$$

$$L_i = 24,500 \text{ feet}$$

$$V_i = 0.75 \text{ ft/sec}$$

$$t_c = \frac{24,500 \text{ ft}}{60 (0.75 \text{ ft/sec})} = 544.4 \text{ min}$$

$$9.07 \text{ hours}$$

$$i = 0.46 \text{ in/hr.}$$

50 year

$$t_c = \frac{24,500}{60 (1.00)}$$

$$V_i = 1.00 \text{ ft/sec}$$

$$t_c = 408.33 \text{ min} = 6.81 \text{ hours}$$

$$i = 1.02 \text{ in/hr.}$$

100 year

$$t_c = \frac{24,500}{60 (1.00)}$$

$$V_i = 1.00 \text{ ft/sec}$$

$$t_c = 408.33 \text{ min.} = 6.81 \text{ hours}$$

$$i = 1.12 \text{ in/hr.}$$



Project: Eq. 5-1

Page No. : 1 of 2

050035

Designed by : _____ Date : _____

Job No. : _____

Checked by : _____ Note No. : _____

$$Q_2 = C i A$$

$$Q_2 = 0.10(0.46 \text{ in/hr})(5171.2 \text{ acres})$$

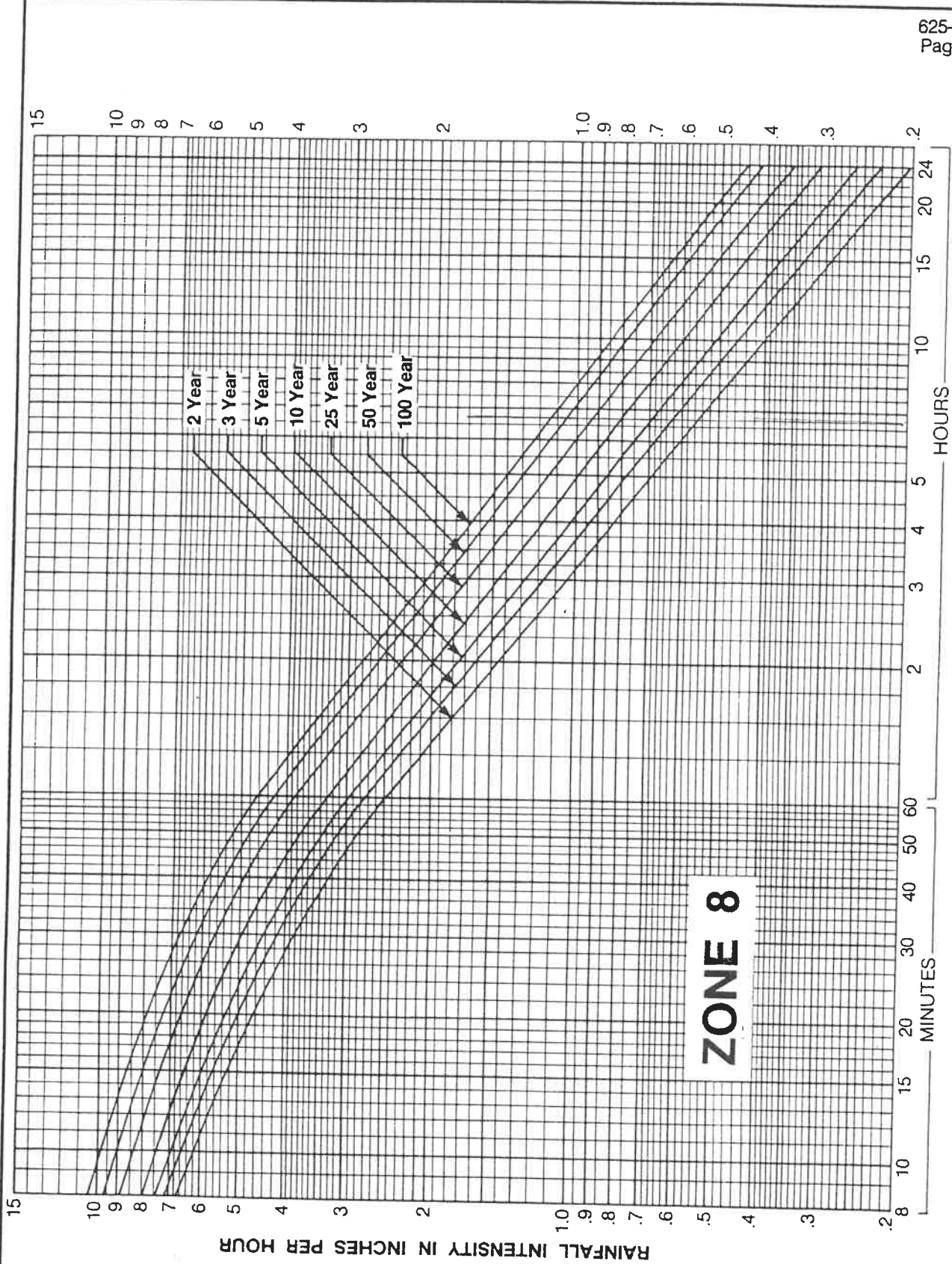
$$Q_2 = 238 \text{ cfs}$$

$$Q_{50} = 0.12(1.02 \text{ in/hr})(5171.7 \text{ acres})$$

$$Q_{50} = 633 \text{ cfs}$$

$$Q_{100} = 0.125(1.12 \text{ in/hr})(5171.2 \text{ acres})$$

$$Q_{100} = 724 \text{ cfs}$$



DURATION

FIGURE 5-9
Rainfall Intensity-Duration-Frequency Curves for Zone 8

BRIDGE HYDRAULIC REPORT REVIEW CHECKLIST
(DRAFT)

ITEM

PROVIDED

YES/NO/NA

1. PROJECT DESCRIPTION

-Existing Conditions:

- A.3 Description of roadway ^{Rural High use or? (60in on war.)} p2
- Description of channel ^{River class III waterbody} p12
- Regulated FEMA Floodway ^{NO}
- Navigable Channel-^{NO}
- Location Map p3
- Floodplain Map fig 4 p7

-Reason for Bridge Work

- Roadway widening p1
- Roadway reconstruction NA
- New Roadway construction NA
- Structural problems ^{NONE} AppC
- Other: REPLACE DUE TO VERT CLEARANCE

30fters → widen

Evidence of Field Review

- Field review notes - ^{scour field report}
- Pictures
- Observations discussed in report.
- Evidence of scour, aggradation or degradation noted
- Potential for natural change of Channel- ^{NO}
- Roadway ditches or existing drainage systems affected? ^(56 upper deck drainage)

When body goes in by changing drainage patterns

EXISTING ROADWAY DRAINAGE NOT MENTIONED IN DITCHES

Access ex USpro roadway (not bridge)

2. HYDROLOGIC ANALYSIS APPENDIX B

-Description of Drainage Basin

- Size of Drainage Area ^{3.67 sq mi} p5
- Land use (present and future) p2, 4
- Terrain (flat, hilly etc...) p3

Fig 3 p5 NO TEXT BOUNDARY
topographic info needed on dr. basin map. ie quad map info.

-Discharge Calculations

- Freshwater Flow
 - Frequency Analysis of Gaged data. N/A NO GAGE
 - Regional or Local regression equation REGION A ↔ USGS FRWA
 - Rational Equation for drainage areas <600 acres NA

~~Tidal Flow~~

Is estimate of flows based on a rational engineering

- TAILWATER DETERMINATION (CON'T)

- Slope Conveyance Method of WSPRO (not recommended) ✓
- Reasonable explanation for assumptions made in estimating tailwater N/A

4. DESIGN CRITERIA

-FDOT Criteria

- Design Storm DESIGN FLOOD = 50YR ✓ P12
- Drift Clearance VERTICLE CLEARANCE ✓ 12
- Navigation Clearance N/A

-Permit Agency Criteria PERMITS HAVE NOT BEEN APPLIED FOR YET

- Coast Guard
- FDEP
- Water Management District
- Local
- Other

Some text and correspondence

5. ALTERNATIVE STRUCTURES CONSIDERED ? (7)

-Minimum structure size required to meet hydraulic standards for vertical and horizontal clearance, scour and backwater. (Should include 2 ft/sec bridge and 4 ft/sec box culvert)

*"several bridge alternatives were considered in the analysis."
• There is no evidence of this, no economical comparison
• Nothing shows in tables.*

-For Interstate Bridges with no regulatory floodway, evaluation of the structure causing a one foot rise over the no crossing condition for the base flood.

N/A

-Other sizes considering environmental, maintenance of traffic, structural, geotechnical, impacts on adjacent property, etc....

-Justification when only one bridge length or structure size is evaluated

-Reasons for selecting the recommended structure and a clear explanation as to why it is the most economical structure for the site.

-Additional justification if the recommended structure is not the most economical

-Evidence that structural alternates are feasible or reasonable options

05090-1511
 1110874
 Br # 050941

COMMENTS

INFO

- Okalacoochee is misspelled on p 1
- ~~Table of contents placed again between pp 2 & 3~~
- Figure 2 is not legible
- Bridge sites are not located on figs 4 & 5
- APP A page 2: PIER a. Worst pier type should be Pile Bent not concrete wall.
 ← refers to interior bent.
- PIER c. Protection / countermeasures None } Both
 2) Condition Fair } ?
- No. ~~Flood~~ Flow Angle of Attack is given on page 2
- Intermittent Flow? } App 3
- No need to give surface velocity initial info. p 4
- ARE BLACK AREAS ZONE A? p 7
- A call to SWFLMD WAS NOT IN CORRESPONDENCE
 FOUND IN APP G (p 9)
 - please cost out permit, agency and documents what was requested.
- p 12 states flow is perennial but flashy; flowing most of the year, but responding to precipitation by rapid changes in stage and discharge. " clarify difference
- should fig. 3 show ^{exit} app instead of approach on downstream side? (p 15)
- Table 3 title is on following page (pp 16 & 17)
 one page is out of order

- class III water body
- replacement is proposed due to vehicle clearance during design flood.
- check drainage basin in gval maps what was used for boundaries?
- Hec20 - level 1 stream stability Analysis → MODERATE (P12) STORM FOR DESIGN FLOOD. // VELOCITY RANGE TO BE 2-3 FPS, 2' dia
- 50 YR BEST ESTIMATE
- P18 Hydraulic Analysis: WSPRO K ratios were outside of limits so x-section geometry was determined by interpolation of provided data.
- slope conveyance method
- (P19-20) P18 - excavating 4.6m on each side of channel
- Fine sand → potential scour not calculated (P21)
- No riprap at piles / bed is stabilized ^{excavation} _{includes tables}
- ONLY ONE COST ANALYSIS IS GIVEN
- existing structure appears to have been hydraulically adequate in the past.
- P21 no riprap ^{req.} due to stabilized but excavation will be needed to widen channel! → P18 BRES shows excavation.

Lynn
 America's Star

~~APP B~~

BRIDGE HYDRAULIC REPORT REVIEW CHECKLIST (DRAFT)

ITEM

PROVIDED

YES/NO/NA

1. PROJECT DESCRIPTION

-Existing Conditions:

2 in 2 way
CLASS III WATERWAY
NOT NAVIGABLE
NOT A FLOODWAY

- 4.3 Description of roadway ^{URBAN VS RURAL LANES}
- 2.2 Description of channel
- Regulated FEMA Floodway ^{DESIGNATED FLOODWAY? SHOULD STATE YES OR NO}
- 4.6.1 ^{NEED W/ CLEARANCE} Navigable Channel
- Location Map
- Floodplain Map

✓
✓ NO
✓ NO
✓
✓

-Reason for Bridge Work

- Roadway widening
- Roadway reconstruction
- New Roadway construction
- 8.1R Structural problems ^{Structural condition - Bridge Inspection Report}
- Other: _____

✓
N/A
N/A
✓
N/A

Evidence of Field Review

STABLE BED EL. 8.1R

- Field review notes ^{ie PHISAR report}
- Pictures
- Observations discussed in report. ^{from field review}
- Evidence of scour, aggradation or degradation ^{scour} noted ^{sedimentation}
- Potential for natural change of Channel ^{GEOMORPHOLOGY / STREAM STABILITY ANALYSIS USUALLY IN TEXT}
- Roadway ditches or existing drainage systems affected? ^{Deck drainage criteria? what is existing drainage? How will it be affected?}

✓
✓
✓
✓
✓
✓ p22

2. HYDROLOGIC ANALYSIS

-Description of Drainage Basin ^{Boundaries}

TOPOGRAPHIC INFO ^{ie copy of Quad map}

Size of Drainage Area

p3 Land use (present and future)

p3 Terrain (flat, hilly etc...)

✓
✓
✓

} waterway and basin description

-Discharge Calculations - USGS ^{FREQUENCY OF FLOODS ON NATURAL-FLOW STREAMS}

Freshwater Flow

ONE METRIC

- ① Frequency Analysis of Gaged data
- ② Regional or Local regression equation ^{USGS? FFWMA}
- ③ Rational Equation for drainage areas <600 acres

N/A
✓
N/A

Tidal Flow

Is estimate of flows based on a rational engineering

* COMPARE DISCHARGE BETWEEN USGS & FFWMA

- THE LARGER OF THE TWO WILL BE USED IN WSFRO

_____ N/A

approach with consideration given to normal tidal exchange and hurricane induced storm surge?

N/A

Manmade/Regulated Canals
Discharges obtained from regulatory agency?

N/A

Is adequate justification provided when discharges are not developed as per FDOT Drainage Manual Volume 1 procedures?



3. HYDRAULIC ANALYSIS

TABLE P16,17

-Riverine Crossing

WSPRO

Was WSPRO used? → MUST RECEIVE DISK

WSPRO error messages eliminated?

Are WSPRO results reasonable?

INPUT Was WSPRO run for existing cond?

INPUT Was WSPRO run for proposed cond?

INPUT Exit & Approach Sections located one bridge length from the face of the bridge?

INPUT Are "n" values and sub-areas

reasonable? AND SAME FOR EACH ALTERNATIVE SEE MANUAL FOR COEFFICIENTS

Are bridge parameters correct and consistent with the BHR and BHRS?

Is computer disk with WSPRO input data files included with submittal? → MUST HAVE

-
-
-
-
-
-
-
-

COMPARE OUTPUT
w/ TABLE

when run, bottom page tells of any pro
check velocity (over 10-12 fps is 100 mph)

lots of data

WSPRO OUTPUT

- COMPARE WSEL & VEL → BRIDGE, APP F
- ALPHA(x) SHOULD BE BELOW 2.023
- LOOK AT K - CONVEYANCE

DROPOSED OUTPUT

- STREAM TUBE OUTPUTS - ARE VELOCITIES 0
- THESE ARE USED IN LOCAL SCOUR

~~-Tidal Crossing~~

Is hydraulic analysis based on a rational engineering approach with consideration given to normal tidal exchange and hurricane induced storm surge?

N/A

-Bridge Culvert Analysis

FHWA HY-8 Program or HDS 5 Methodology

N/A

-Tailwater Determination - NOT FOUND IF SLOPE CONVEYANCE

-Effect of downstream conditions including structures, channel constrictions, channel widenings channel bends, etc...

N/A

-From existing published data (i.e. FEMA Flood Insurance Study)

N/A

-Historic Data

N/A

USE DATE FROM
STUDY OF REGULATED
FLOWWAY

- Slope Conveyance Method of WSPRO (not recommended) NEED JUSTIFICATION IF USED ✓
- Reasonable explanation for assumptions made in estimating tailwater N/A

4. DESIGN CRITERIA

50 YR BASIS OF DESIGN
 100 YR BASIC FLOOD
 500 YR GREATEST

- FDOT Criteria **P3**
- Design Storm
- Drift Clearance vehicle clearance
- Navigation Clearance

✓
VARIANCE
N/A

- Permit Agency Criteria - CORRESPONDENCE
- Coast Guard
- FDEP
- Water Management District MIN SPAN LENGTH
- Local
- Other

N/A

SOME CORRESPONDENCE

N/A

N/A

5. ALTERNATIVE STRUCTURES CONSIDERED

- Minimum structure size required to meet hydraulic standards for vertical and horizontal clearance, scour and backwater. (Should include 2 ft/sec bridge and 4 ft/sec box culvert) MIN

ONE BRIDGE

NO

- For Interstate Bridges with no regulatory floodway, evaluation of the structure causing a one foot rise over the no crossing condition for the base flood. SEE FIRM STUDY

N/A

- Other sizes considering environmental, maintenance of traffic, structural, geotechnical, impacts on adjacent property, etc....

NO

- Justification when only one bridge length or structure size is evaluated NEED TO HAVE A GOOD REASON

NO

- Reasons for selecting the recommended structure and a clear explanation as to why it is the most economical structure for the site. DETAILED LISTS WITH COSTS

NO

- Additional justification if the recommended structure is not the most economical

—

- Evidence that structural alternates are feasible or reasonable options

—

* ADD'L ALTS SHOULD BE DOCUMENTED IN RPT TO JUSTIFY THE PREFERRED BRIDGE

**BRIDGE HYDRAULIC REPORT REVIEW CHECKLIST
(DRAFT)**

ITEM

PROVIDED

YES/NO/NA

✓ 1. PROJECT DESCRIPTION

✓ Existing Conditions:

- 4.3 Description of roadway ^{URBAN VS RURAL}
- 2.2 Description of channel ^{DESIGNS - SHOW WAY}
- Regulated FEMA Floodway ^{DESIGNATED FLOODWAY? SHOULD STATE YES OR NO}
- 4.6.1.2 Navigable Channel ^{- NEED W/ CLEARANCE} N/A
- Location Map
- Floodplain Map

✓ Reason for Bridge Work

- Roadway widening
- Roadway reconstruction N/A
- New Roadway construction N/A
- 8.1R Structural problems ^{Structural condition}
- Other: N/A

✓ Evidence of Field Review

- Field review notes ^{ie ph 1 scar report}
- Pictures
- Observations discussed in report. ^{from field review}
- 8.1R Evidence of scour, aggradation ^{sedimentation} or degradation ^{scour} noted
- Potential for natural change of Channel ^{GEOMORPHOLOGY / STREAM STABILITY ANALYSIS}
- Roadway ditches or existing drainage systems affected? ^{Deck drainage criteria? what is existing drainage? how will it be affected?}

✓ 2. HYDROLOGIC ANALYSIS

✓ Description of Drainage Basin ^{boundaries}

- ^{TOPOGRAPHIC INFO ie copy of Quad map}
- Size of Drainage Area ^{App B}
- Land use (present and future) ^{p1}
- Terrain (flat, hilly etc...) ^{p4}

} waterway and basin description

✓ Discharge Calculations - USGS ^{FREQUENCY OF FLOODS ON NATURAL FLOW STREAMS}

- Freshwater Flow
- ONE METHOD {
 - ① Frequency Analysis of Gaged data N/A
 - ② Regional or Local regression equation ^{USGS? FEMA}
 - ③ Rational Equation for drainage areas <600 acres N/A

~~Tidal Flow~~

Is estimate of flows based on a rational engineering

* COMPARE DISCHARGE BETWEEN USGS & FEMA.
- THE LARGER OF THE TWO WILL BE USED IN WSPRO

approach with consideration given to normal tidal exchange and hurricane induced storm surge?

N/A

Manmade/Regulated Canals
Discharges obtained from regulatory agency?

N/A

Is adequate justification provided when discharges are not developed as per FDOT Drainage Manual Volume 1 procedures?

YES

3. HYDRAULIC ANALYSIS

-Riverine Crossing

WSPRO

Was WSPRO used? - MUST RECEIVE DISK

✓

WSPRO error messages eliminated?

✓

Are WSPRO results reasonable?

✓

INPUT Was WSPRO run for existing cond?

✓

INPUT Was WSPRO run for proposed cond?

✓

INPUT Exit & Approach Sections located one bridge length from the face of the bridge?

✓

INPUT Are "n" values and sub-areas reasonable? AND SAME FOR EACH ALTERNATIVE - SEE MANUAL FOR COEFFICIENTS

✓

Are bridge parameters correct and consistent with the BHR and BHRS?

✓

Is computer disk with WSPRO input data files included with submittal? → MUST HAVE

✓

When run, bottom page tells of any pr. check velocity, over 12.12 fps is too high

lots of a/s

WSPRO OUTPUT

- COMPARE WSEL & VEL → BRIDGE, APP F
- ALPH(X) SHOULD BE BELOW 2.023
- LOOK AT K - CONVEYANCE

PROPOSED OUTPUT

- STREAM TUBE OUTPUTS - ARE VELOCITIES C
- THESE ARE USED IN LOCAL SCOUR

-Tidal Crossing

Is hydraulic analysis based on a rational engineering approach with consideration given to normal tidal exchange and hurricane induced storm surge?

N/A

-Bridge Culvert Analysis

FHWA HY-8 Program or HDS 5 Methodology

N/A

-Tailwater Determination - NOT FOUND IF SLOPE CONVEYANCE

-Effect of downstream conditions including structures, channel constrictions, channel widenings channel bends, etc...

N/A

-From existing published data (i.e. FEMA Flood Insurance Study)

N/A

-Historic Data

N/A

USE DATE FROM STUDY OF REGULATED FLOODWAY

- Slope Conveyance Method of WSPRO (not recommended) NEED JUSTIFICATION IF USED ✓
- Reasonable explanation for assumptions made in estimating tailwater N/A

4. DESIGN CRITERIA

↳ FDOT Criteria

- Design Storm 50YR
- Drift Clearance vehicle clearance
- Navigation Clearance

✓
VARIANCE REQUESTED
N/A

-Permit Agency Criteria - correspondence

- Coast Guard
- FDEP
- Water Management District MIN SPAN LENGTH
- Local
- Other

N/A NOT APPLIED FOR YET
N/A
N/A

5. ALTERNATIVE STRUCTURES CONSIDERED

ONLY ONE ALT WAS PRESENTED

- Minimum structure size required to meet hydraulic standards for vertical and horizontal clearance, scour and backwater. (Should include 2 ft/sec bridge and 4 ft/sec box culvert) MIN

✓

- For Interstate Bridges with no regulatory floodway, evaluation of the structure causing a one foot rise over the no crossing condition for the base flood. SEE PLAN 1000

N/A

- Other sizes considering environmental, maintenance of traffic, structural, geotechnical, impacts on adjacent property, etc....

NO

- Justification when only one bridge length or structure size is evaluated

- Reasons for selecting the recommended structure and a clear explanation as to why it is the most economical structure for the site. DETAILED LISTS WITH COSTS

NO

- Additional justification if the recommended structure is not the most economical

N/A

- Evidence that structural alternates are feasible or reasonable options

N/A

* ADD'L ALTS SHOULD BE DOCUMENTED IN RPT TO JUSTIFY THE PREFERRED BRIDGE

trees (calculations and photographs provided in Appendix B). For WSPRO purposes, composite n-values have been calculated for each cross section.

Hydraulic Analysis

FHWA's Bridge Waterways Analysis Model (WSPRO) was used to create a hydraulic model of Turkey Branch at the crossing of SR 29.

Cross section data is required to describe the physical system of the stream. The location of the cross sections used in the WSPRO analysis was determined from a review of the USGS Quadrangle map, the FIRM, aerial photographs and a visit to the site. Refer to Figure 7.

The five cross sections used in the WSPRO analysis are as follows. Plots of these cross sections are provided in Appendix D.

- SURV1 - Section located approximately 30 meters (100 feet) downstream of the existing bridge.
- SURV2 - Exit Section located one bridge length, 9.14 meters (30 feet), from the downstream face of the bridge.
- SURV3 - Full Valley Section located at downstream face of bridge. This cross section does not reflect the roadway embankment.
- BRDG - Section located at the downstream face of the bridge, including all geometric information about the bridge.
- SURV4 - Approach Section located one bridge length, 9.14 meters (30 feet), from the upstream face of the bridge.
- SURV5 - Reference Section located approximately 30 meters (100 feet) upstream of existing bridge. This section has been included for backwater comparisons.

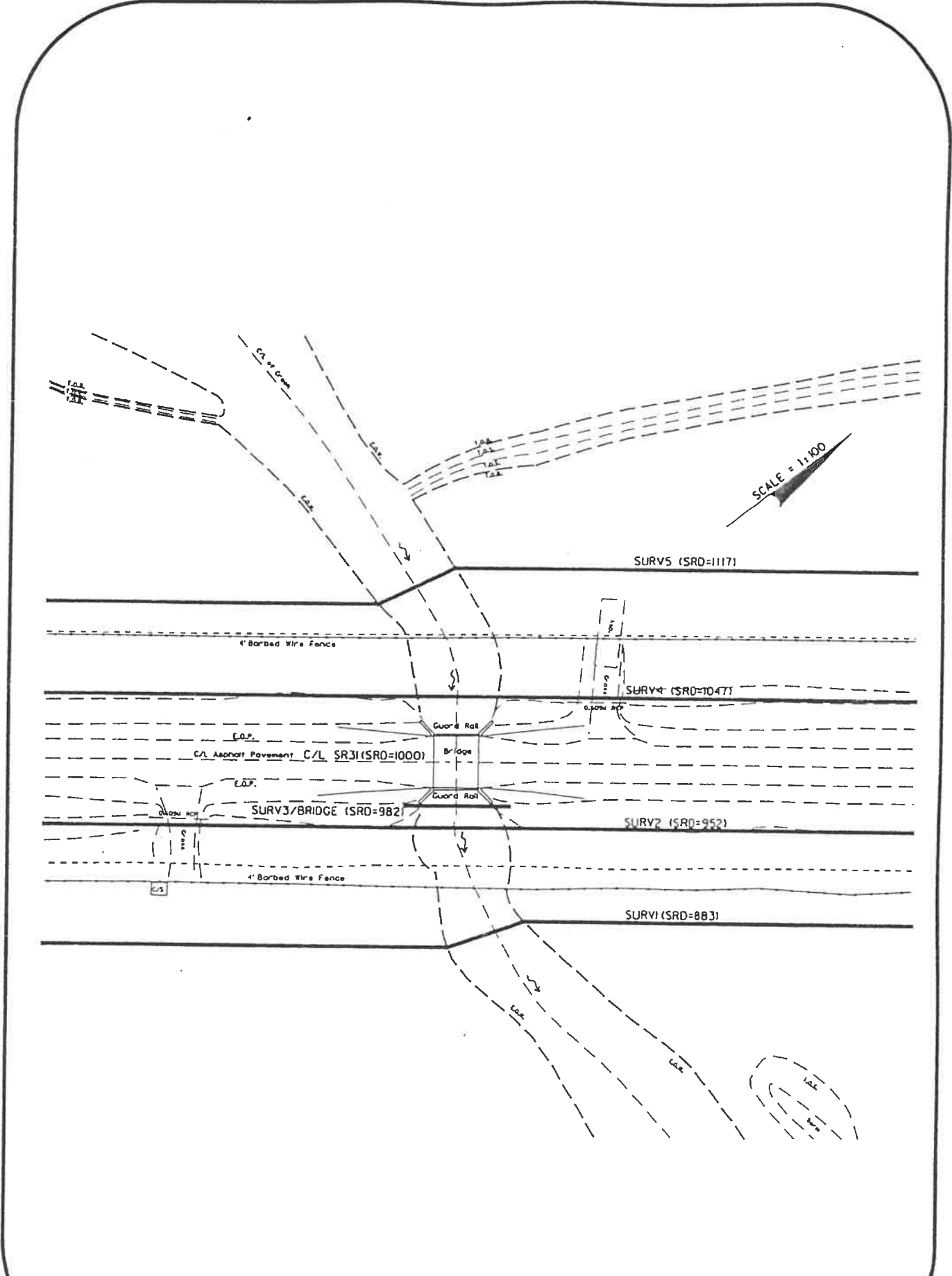


FIGURE 7
 SURVEY CROSS SECTIONS
 USED FOR WSPRO ANALYSIS

HEC - 20

Level One Stream Stability Analysis

Step 1: Define Stream Characteristics

Stream Characteristics

Turkey Branch is a small stream with an average width ranging from 10 - 15 meters (30 - 50 feet). The bed material is Okeelanta Muck (see Soil Survey Appendix B) and has a low relief valley setting. As shown in Figure 4, the Federal Emergency Management Agency's (FEMA's) Flood Insurance Rate Map (FIRM), the flood plain for this creek is very wide (>10X channel width). Natural levees are not apparent and the stream is incised. Tree cover and vegetation on the channel banks is in the range of 50-90 percent. Turkey Branch is a sinuous, equiwidth channel which is not braided or anabranching.

Step 2: Evaluate Land Use Changes

Land Use Changes

The Future Land Use Map for Glades County, Figure 2, indicates that there will not be any changes in the land use surrounding Turkey Branch.

Step 3: Assess Overall Stability

Overall Stability

Based on the interpretation of observed data and identified stream characteristics, a preliminary assessment of stream stability would indicate Turkey Branch to be stable.

Steps 4 & 5: Evaluate Lateral & Vertical Stability

Vertical and Lateral Stability

DRAINAGE

The bridges are the major drainage structures on the project. They all convey flow from the north west to the south east. The respective drainage areas are as follows:

Bridge No. 050941 crossing the Okaloacoochee River	- 951 Ha (2350 Acres)
Bridge No. 050035 crossing Lone Pine Creek	-2092 Ha (5169 Acres).
Bridge No. 050032 crossing York Branch	- 1231 Ha (3042 Acres)
Bridge No. 050031 crossing Turkey Branch	- 906 Ha (2239 Acres)

The approved Bridge Hydraulic Report, for each bridge, gives detailed information.

S.R. 29 is a two lane rural arterial roadway whose drainage is conveyed to road side ditches. The ditches slope from the limits of construction to the canal flowing under each bridge. The ditch front slope varies from 1:2 to 1:6, and the back slopes are 1:3. At the bridge approaches, where the front slope is steeper than 1:4, there is guard rail. The side drains under the two driveways at Bridge 050031 will be replaced.

Attenuation, as required by Chapter 14 - 86 of the F.A.C., will not be required because the increased impervious is insignificant when compared to the total drainage basin. The increased impervious is roadway shoulder only, there are no additional lanes being constructed.

Treatment, as required by Chapter 17 - 25 of the F.A.C., will not be required. There will be minimal additional pollution since the increased impervious is roadway shoulder, not additional lanes. An application will be submitted to South Florida Water Management District as per rule 40E - 400.443 "General Permit to the Florida Department of Transportation for Minor Bridge Activities Within Existing Rights-of-Way or Easements". The proposed bridge widening will impact less than 0.20 Ha (0.50 acre).

No National Pollutant Discharge Elimination System (NPDES) permit is required for this bridge widening project since the total work area is less than 2.02 Ha (5 acres).As per the project scope, a letter is being sent to notify the project manager with this 30 % submittal.