

Kimley-Horn

MATHENY CREEK BASIN - MASTER PLAN

Hydrologic/Hydraulic
Modelling Supplement

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MATHENY CREEK BASIN - MASTER PLAN

**Hydrologic/Hydraulic
Modelling Supplement**

Prepared for:
Sarasota County Stormwater Environmental Utility

Prepared by:
Kimley-Horn and Associates, Inc.
Consulting Engineers and Surveyors
7202 Beneva Road
Sarasota FL 34238

**Project No. 6739.05
January 1995**

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1.0 INTRODUCTION

On July 27, 1993, Sarasota County contracted Kimley-Horn and Associates, Inc. to prepare a Basin Master Plan for Matheny Creek pursuant to Purchase Order No. 307672.

On January 21, 1994, Kimley-Horn and Associates, Inc. submitted three (3) copies of the draft interim report and one (1) copy of the supporting appendices for the Matheny Creek Basin Master Plan to the Sarasota County Stormwater Environmental Utility for review.

On May 27, 1994, Kimley-Horn and Associates, Inc. submitted a copy of the working draft final report for the Matheny Creek Basin Master Plan to the Sarasota County Stormwater Environmental Utility. This submittal addressed review comments received from the SEU relative to the 1/21/94 submittal.

On August 26, 1994, a copy of a second working draft final report for the Matheny Creek Basin Master Plan was submitted to SEU by Kimley-Horn and Associates, Inc.

On September 23, 1994, five (5) copies of a final draft of the Matheny Creek Basin Master Plan were submitted to SEU by Kimley-Horn and Associates, Inc.

On November 28, 1994, three (3) copies of the Matheny Creek Basin Master Plan - Final Report were submitted to SEU by Kimley Horn and Associates, Inc.

On January 31, 1995, five (5) copies of a revised Matheny Creek Basin Master Plan - Final Report were submitted to SEU by Kimley-Horn and Associates Inc. Revisions made to the Matheny Creek Basin Master Plan - Final Report were to address comments provided by the SEU.

As part of their review of the Matheny Creek Basin Master Plan - Final Report, SEU requested that additional discussion of the hydrologic/hydraulic modelling efforts be provided.

2.0 PURPOSE

The purpose of this supplement to the Matheny Creek Basin Master Plan is to provide additional discussion of the hydrologic/hydraulic modelling efforts.

3.0 METHODOLOGY AND MODELLING OVERVIEW

Section 4.2.1 of the *Matheny Creek Basin Master Plan - Final Report* provides an overview of the hydrologic and hydraulic methodology and modelling. In summary, the SCS unit hydrograph method was used for the hydrologic modelling. Parameters used for the hydrologic modelling are consistent with prescribed guidelines and based upon engineering judgement and experience. They are believed to be appropriate for unrouted hydrograph generation in flat, urban, coastal areas such as Matheny Creek. However, in recognition that peak flow rates, as well as water surface elevations in such areas may be a function of time-dependant tailwater conditions, physical limitations of the local topography to convey flows, volumetric considerations, and flood routing, a hydrodynamic computer model was considered essential to the accurate prediction of hydraulic conditions in Matheny Creek.

One such hydrodynamic computer model is the EXTRAN block of the Storm Water Management Model, developed by the Environmental Protection Agency. A modified version of EXTRAN has been developed by Hillsborough County which will interface with the SCS unit hydrograph program. However, attempts to obtain this model in a timely fashion were not successful. Therefore, the Advanced Interconnected Pond Routing program, developed by Pete Singhoffen, was selected for its ability to interface directly with the SCS unit hydrograph method and consider hydrodynamic routing. Relevant correspondence relative to coordination of the modelling efforts is provided in APPENDIX A.

The computer modeling performed in association with the 1724 acre Matheny Creek Basin Master Plan considered 164 subbasins, 190 nodes, 101 weirs, 90 culverts, 27 drop structures and 61 ditch segments. Subbasins were delineated using one-foot contour aerial maps and engineering construction plans. Node storage was estimated using one-foot contour aerial maps. Weir, culvert, drop structures and ditch segment data were based upon surveyed and or engineering construction plans. This level of modelling detail substantially exceeds that performed in association of all previous studies of the Matheny Creek drainage basin, including that performed for the latest Sarasota County Flood Insurance Study. As such, water surface elevations indicated by the Matheny Creek Basin Master Plan are expected to be more accurate than those generated by all previous studies. Copies of the survey field notes used for the modelling and a listing of all engineering plans reviewed and assimilated into the modelling are provided in APPENDICES B and C, respectively.

4.0 MODEL VERIFICATION

Based upon the research conducted in association with the Matheny Creek Basin Master Plan, no stream stage or flow gauge data exist within the Matheny Creek drainage basin. In fact, the only relevant hydraulic information available are a few random surveyed high water marks and photographs taken in the basin during the June 1992 storm. This information, as available, is reflected in TABLES 4.2.1.2.a through 4.2.1.2.h, and identified graphically on EXHIBITS 4.2.1.2.a through 4.2.1.2.h of the Final Report. By way of comparison, TABLES 4.2.1.2.a through 4.2.1.2.h indicate that the surveyed high water marks generally correspond to flood elevations simulated by the model for the 100-year design storm. However, one notable discrepancy which exists at water level control structure MC-2 (just downstream of Beneva Road) may be reconciled by reports of cross basin contributions from the headwater of the Clark Lakes branch of Phillippi Creek. This also seems plausible based upon surveyed high water marks in the Clark Lakes branch and personal observations of flooding during this period in the Clark Lakes area.

With respect to hydrologic data, our research indicated that a single rainfall gauge is located in the vicinity of the easterly headwaters of the Matheny Creek basin. This rainfall gauge is operated by the Palmer Ranch and was in operation in June of 1992. Data obtained from the Palmer Ranch from this gauge indicated that 18.31 inches of rainfall occurred between June 23, 1992 and June 26, 1992 at this location. Copies of the surveyed high water marks from the June 1992 flood, as well as the rainfall data obtained from the Palmer Ranch, are provided in APPENDIX D.

To further verify the accuracy of the computer model used for the Matheny Creek Basin Master Plan, Kimley-Horn and Associates, Inc. attempted to correlate the simulated model results using the rainfall information obtained from the Palmer Ranch with actual flow measurements available from the USGS for two other urban coastal watersheds in Sarasota County. The flow measurements obtained from the USGS reflect the June 1992 flood at locations in Walker Creek (Whittaker Bayou Basin) and Clower Creek. Walker Creek reportedly contains 2939 acres of mixed urban land use and is located approximately six miles north of Matheny Creek. Clower Creek contains 227 acres of primarily commercial and high density residential and is located approximately two miles south of Matheny Creek. The peak discharge measured by the USGS for the June 1992 events at Walker Creek and Clower Creek were 960 cfs and 227 cfs, respectively. The simulated peak discharge for the June 1992 storm from Matheny Creek was 770 cfs. TABLE 1 compares contributing areas and peak discharges for the June 1992 flood. FIGURE 1 compares the simulated flood hydrograph for Matheny Creek with the observed flood hydrograph for Walker Creek.

Similarly FIGURE 2 compares the simulated Matheny Creek flood hydrograph with that observed at Clower Creek. As expected, the peak discharge for Matheny Creek falls between those observed at Walker Creek and Clower Creek.

In addition, unit discharges for each of these basins were computed by dividing the peak discharge for the June 1992 flood by the contributing area. The resulting unit peak discharges are presented in TABLE 1. FIGURE 3 compares the unit discharge hydrographs for Walker Creek and Matheny Creek. FIGURE 4 compares the unit discharge hydrographs for Clower Creek and Matheny Creek. As expected for urban basins, the unit discharge is inversely proportional to the contributing area. Also as expected, the unit discharge for Matheny Creek is greater than that from Walker Creek but less than that for Clower Creek.

Finally, as indicated in TABLE 2, the simulated runoff volume for Matheny Creek is generally consistent with the storm specific curve numbers corresponding to the volumes measured by the USGS at all other sites in Sarasota County except for Clower Creek. It should be noted that rainfall was not measured by the USGS at the Clower Creek site. The rainfall taken from the Palmer Ranch gauge was considered in computing the storm specific curve number for Clower Creek.

A further verification of the Matheny Creek Basin Master Plan model was conducted with respect to flood levels. The computer modeling and methodology used for the Matheny Creek Basin Master Plan is identical to that used by Kimley-Horn and Associates, Inc. for the neighboring Catfish Creek drainage basin. Following the June 1992 storm, high water marks were obtained throughout the Catfish Creek main at essentially all node locations. Flood levels were then computed using the SCS Unit Hydrograph and Advanced Interconnected Pond Routing programs using the rainfall data obtained from the Palmer Ranch. The simulated and observed flood levels in the Catfish Creek main during the June 1992 storm are presented in TABLE 3 and indicate that application of the modelling and methodologies to the neighboring Catfish Creek basin yielded a good correlation between observed and simulated flood levels.

Finally, a comparison was made of design discharge from all previous authoritative studies of the Matheny Creek drainage basin with those developed in association with the Matheny Creek Basin Master Plan. The results of this comparison are provided in TABLE 4 and indicate that the design discharges computed in association with the Matheny Creek Basin Master Plan are significantly greater than those estimated by all previous authoritative studies, except the 1967 Matheny Creek Flood Control Study. However, since the level of

detail used to set up the model for the Matheny Creek Basin Master Plan is substantially greater than all previous authoritative studies; and since the modelling results appear to yield reasonable results when compared to surveyed high water marks, photographs of flood prone areas, and observations from other basins, it is concluded that the modelling results for the Matheny Creek Basin Master Plan are more accurate than all previous authoritative studies.

JUNE 1992 - Unit Discharge Comparison

	Contributing Area (Acres)	June 1992 Discharge (cfs)	Unit Discharge (cfs per acre)
Clower Creek	227	227 ¹	1.00
Matheny Creek	1727	770 ²	0.45
Walker Creek	2939	960 ¹	0.33

¹ Measured

² Simulated

TABLE 1

VOLUME SUMMARY FROM JUNE 1992 FLOOD

	AREA (in acres)	RUNOFF (in inches)	RAINFALL (in inches)	CN
Walker	2,939	7.54	15.23	50.0
Clower	227	17.20	18.31	91.2
South	9,740	6.56	16.51	40.7
Forked	2,099	6.95	12.83	57.9
Gottfried	1,065	8.64	15.15	56.2
Ainger	1,336	7.24	13.96	54.1
	2,040	4.74	13.96	40.6
Matheny(Sim.)	1,723	9.83	18.31	48.7

673905.J17(MAT-RPT)

TABLE 2

**Comparison of Observed and Simulated High Water Elevations
in Catfish Creek Main for June 1992 Flood**

NODE	LOCATION	High Water Elevations (NGVD)	
		Observed	Simulated
CCM-18	U.S. 41	6.8	6.83
CCM-22		8.6	8.50
CCM-23		9.7	9.99
CCM-24		10.0	10.25
CCM-25		10.9	10.87
CCM-27	Central Sarasota Parkway	12.3	11.84
CCM-28	Weir No. 1	12.3	13.03
CCM-31		12.9	13.20
CCM-32		13.1	13.31
CCM-33	McIntosh Road	15.9	15.70
CCM-34			15.76
CCM-36		16.0	15.81
CCM-37	Weir No. 2		15.99
CCM-38		16.0	16.00
CCM-39	Deer Creek Ent.		16.08
CCM-40		16.3	16.11
CCM-41		16.3	16.12
CCM-44	McIntosh Road		16.18
CCM-49		16.4	16.25
CCM-50	Weir No. 3		16.37
CCM-51		16.6	16.50
CCM-52	Prestancia Boulevard	16.8	16.63
CCM-53	McIntosh Road		16.66
CCM-54			16.81
CCM-56		16.9	16.84
CCM-57	Weir No. 4		16.95
CCM-58		17.0	16.98
CCM-59	Weir No. 5		17.14
CCM-60		17.3	17.19
CCM-61	Sawyer Road	17.4	17.32
CCM-62		17.4	17.38
CCM-63		17.7	17.47

TABLE 3

**COMPARISON OF DESIGN DISCHARGE RATES FOR
THE MATHENY CREEK BASIN**

Date	Authoritative Study	Study Area (acres)	Design Discharge (cfs)	Frequency	Unit Discharge (cfc/acre)
1967	Matheny Creek Flood Control Study	1,640 770 ¹	1,150 780 ¹	25-year 25-year	0.70 1.01 ¹
1973	Floodplain Information Sarasota County FL	1,728	400	100-year	0.23
1987	Sarasota County Stormwater Master Plan	1,500	607	25-year	0.40
1992	Unincorporated Sarasota County Flood Insurance Study	1,670	650	100-year	0.39
1994	Matheny Creek Basin Master Plan	1,724 862 ¹	1,389 1,697 764 ¹ 825 ¹	25-year 100-year 25-year 100-year	0.81 0.98 0.89 ¹ 0.96 ¹

¹ Denham Acres Lateral Basin

TABLE 4

JUNE 1992 FLOOD

FLOOD HYDROGRAPH COMPARISON

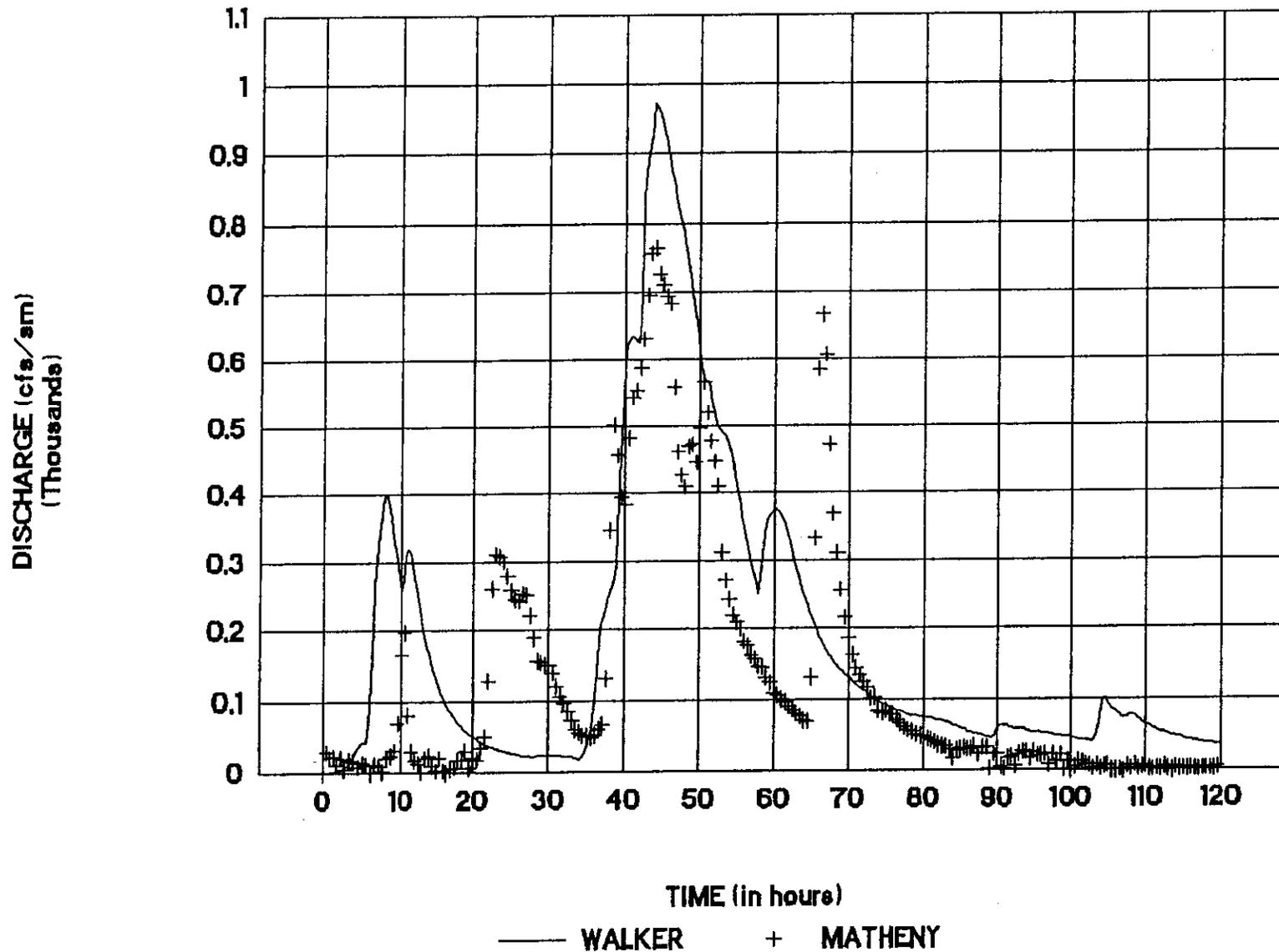


FIGURE 1

JUNE 1992 FLOOD

FLOOD HYDROGRAPH COMPARISON

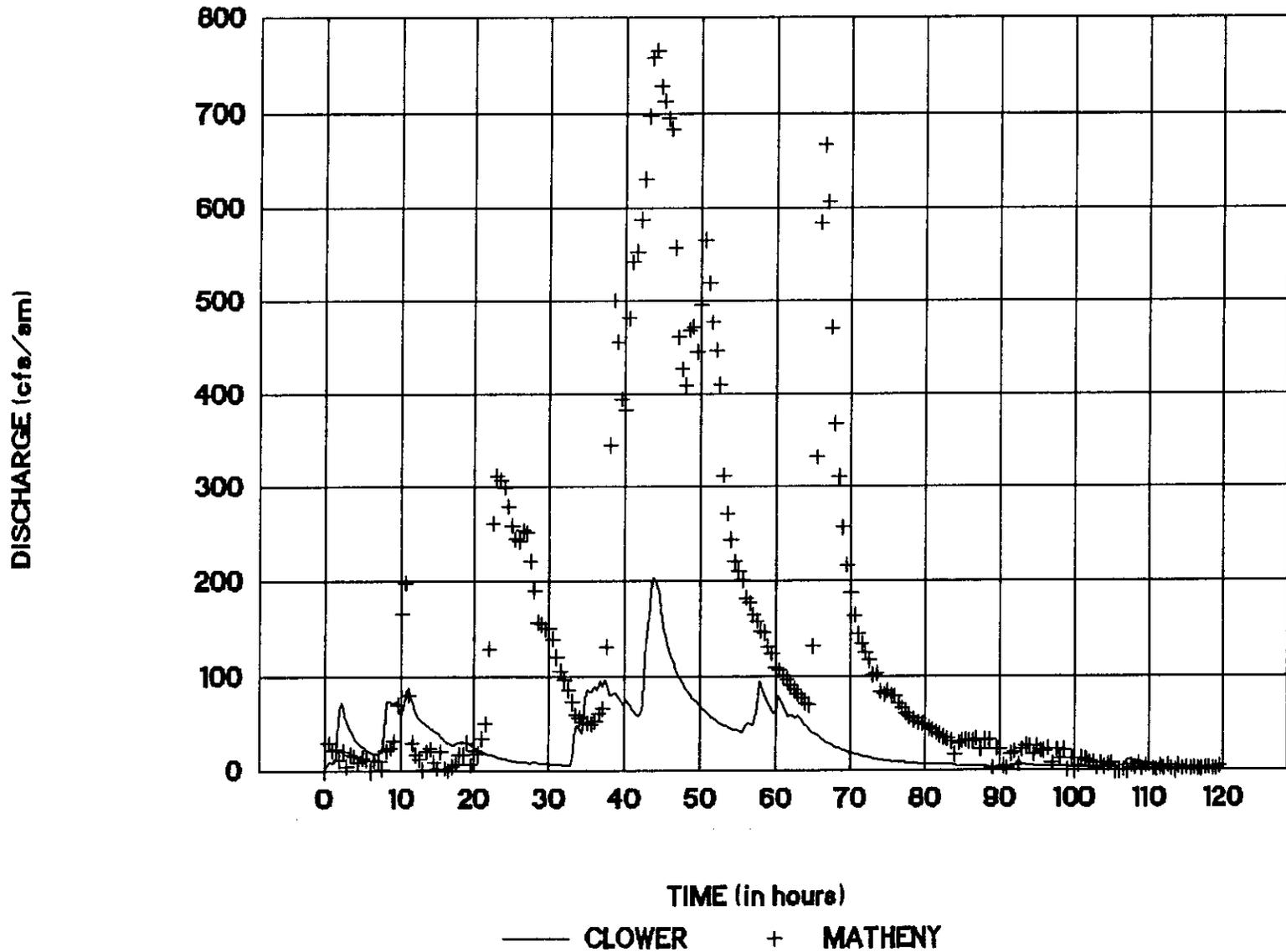


FIGURE 2

JUNE 1992 FLOOD

UNIT DISCHARGE COMPARISON

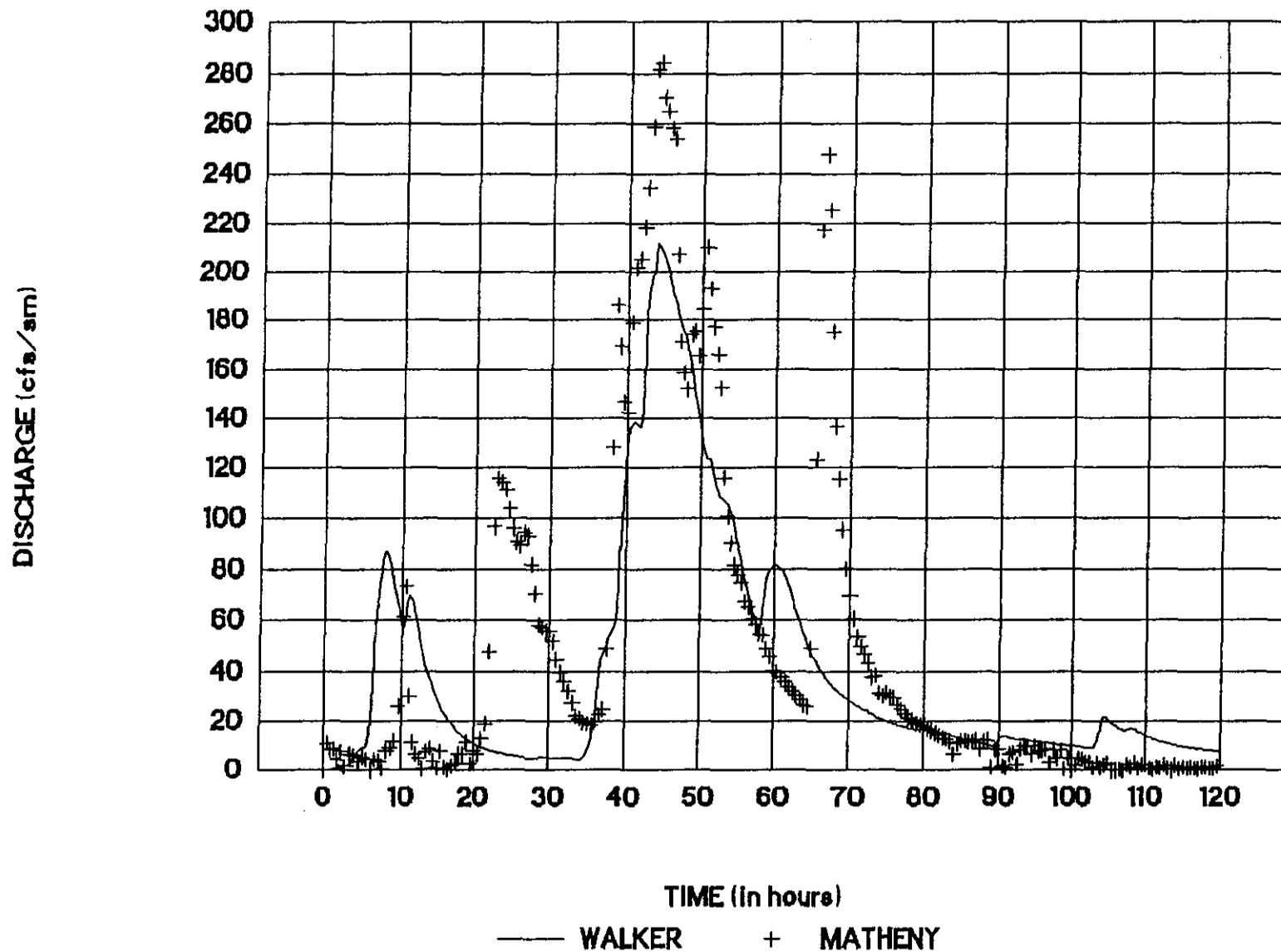


FIGURE 3

JUNE 1992 FLOOD

UNIT DISCHARGE COMPARISON

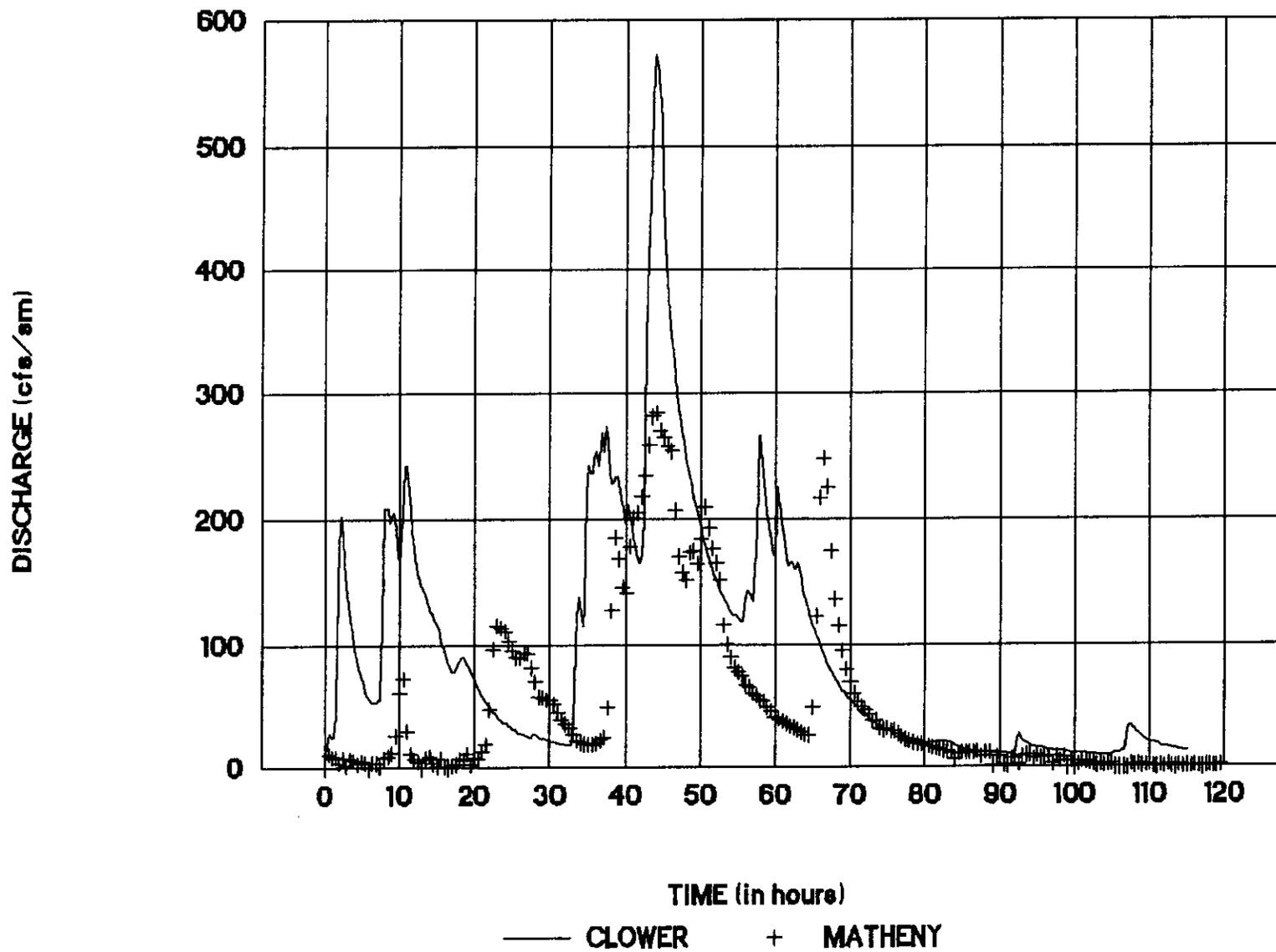
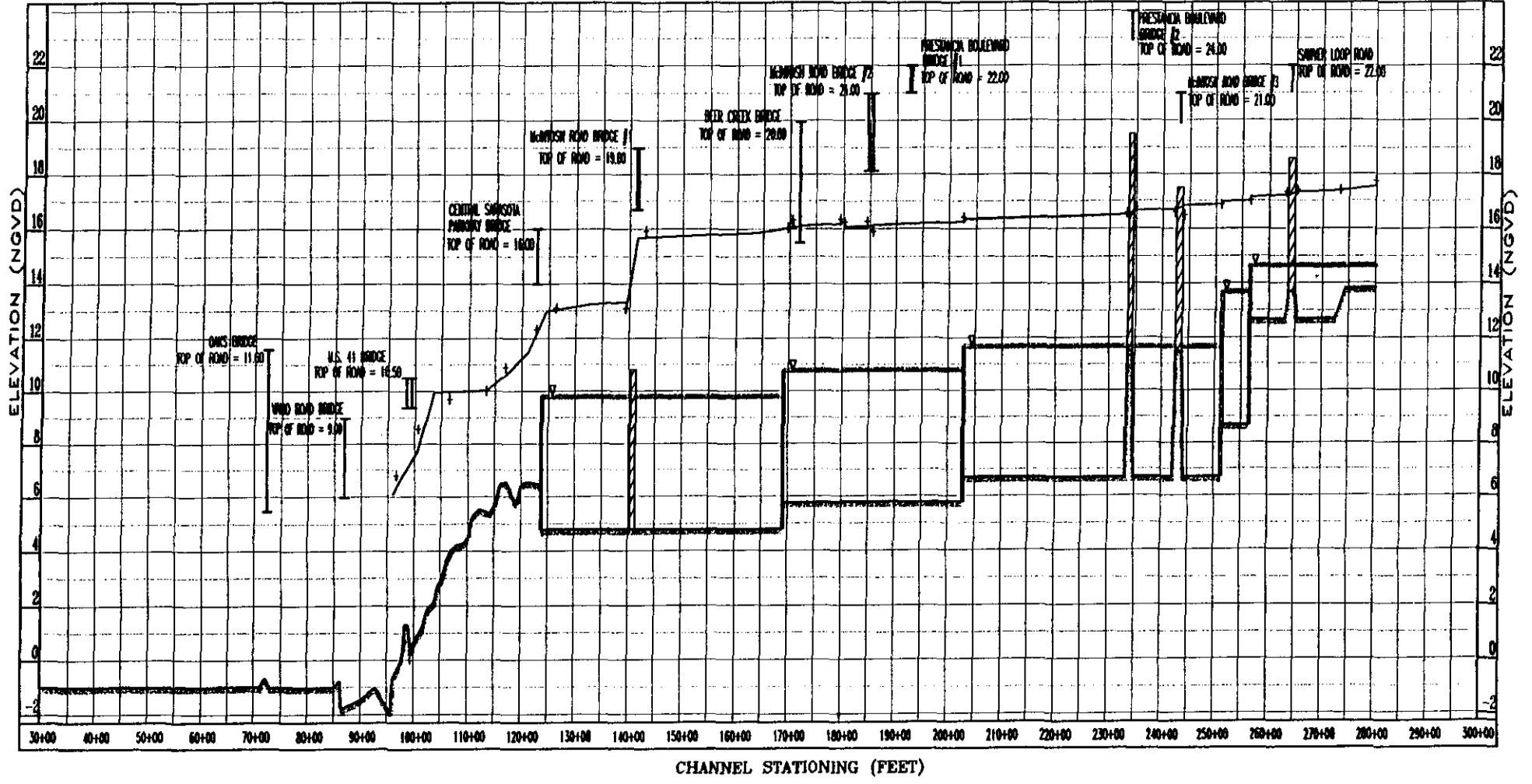


FIGURE 4

COMPARISON OF OBSERVED AND SIMULATED HIGH WATER IN CATFISH CREEK FOR JUNE 1992 FLOOD



LEGEND

- FLOOD ELEVATION INFORMATION**
- OBSERVED STORM EVENT PROFILE
 - SIMULATED STORM EVENT PROFILE
 - CONTROL WATER LEVEL
 - ~ STREAM BED
 - I BRIDGE
 - ▨ CULVERT
 - CHECK DAM / WEIR

**CATFISH CREEK MAIN DRAINAGEWAY
SURFACE WATER FLOOD PROFILES
STA. 30+00 TO STA. 280+00**

FIGURE 5

Kimley-Horn

Kimley-Horn and Associates, Inc.
ENGINEERING, PLANNING, AND ENVIRONMENTAL CONSULTANTS

7202 Beneva Road South, Sarasota, Florida 34238 813-922-8187 Fax 813-922-2351

April 19, 1993

Mr. Tim Polk, P.E.
Florida Department of Transportation
P. O. Box 1249
Bartow, Florida 33830

Re: Clark Road Improvements from U.S. 41 to Sawyer Road and
U.S.41 plans from Clark Road to Beneva Road

Our Ref: 64.09

Dear Mr. Polk:

We will be conducting a basin master plan study of the Matheny Creek watershed on behalf of Sarasota County. As such, we wish to request plans for the above referenced State roads, specifically as they relate to drainage.

Please do not hesitate to give me a call if you have any questions regarding this matter.

Very truly yours,

KIMLEY-HORN AND ASSOCIATES, INC.

Stephen M. Suau

Stephen M. Suau, P.E.

SMS:pjg(#15)

cc: Thomas A. Shoopman, P.E.



SARASOTA COUNTY GOVERNMENT
SARASOTA, FLORIDA

0009.40/644
SMS

Transportation Department
Stormwater Environmental Utility

1301 Cattlemen Road, Bldg. A
Sarasota, Florida 34232
Telephone (813) 378-6030
FAX (813) 378-6130

April 28, 1993

Mr. Tim Polk, P.E.
Project Manager
Florida Department of Transportation
District One
Post Office Box 1249
Bartow, Florida 33830

Re: Clark Road Improvements - U.S. 41 to Sawyer Road
F.A. Proj. No. F-140-1(4)

Dear Mr. Polk:

Please provide us with a copy of the roadway improvement plans for the Clark Road Improvements from U.S. 41 to Sawyer Road and the storm drainage calculations for the roadway stormwater management systems and for cross drainage structures.

We are requesting the information for coordination in our preparation of basin master plan for Matheny Creek currently being initiated. If you have any questions or need additional information, please call Tom Shoopman at (813) 378-6030.

Sincerely,

Thomas A. Shoopman, P.E.
Planning Engineer
Stormwater Environmental Utility

c: John C. Goodknight, Director, Transportation Department
J.P. Marchand, Manager, Stormwater Environmental Utility
Stephen M Suau, P.E., Kimley-Horn and Associates, Inc.

RECEIVED MAY 3 1993

Kimley-Horn

Kimley-Horn and Associates, Inc.
ENGINEERING, PLANNING, AND ENVIRONMENTAL CONSULTANTS

7202 Beneva Road South, Sarasota, Florida 34238 813-922-8187 Fax 813-922-2351

August 3, 1993

William Merkel, P.E.
Soil Conservation Service
P. O. Box 6567
Fort Worth, Texas 76115

Re: Matheny Creek - Basin Master Plan

Our Ref: 6739.05

Dear Mr. Merkel:

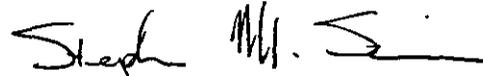
Our firm has been authorized by the Sarasota Board of County Commissioners to prepare a basin master plan for the Matheny Creek watershed located in Sarasota County, Florida. Our scope includes coordination with various authoritative agencies such as the Soil Conservation Service (SCS).

As part of this plan we will need to perform detailed hydrologic/hydraulic analyses. Recognizing the extensive work regarding hydrologic parameter estimation which you have been involved in, we would request any insights or recommendations which the SCS could provide with respect to this region of Florida.

Should you have any questions regarding this request, please do not hesitate to give me a call.

Very truly yours,

KIMLEY-HORN AND ASSOCIATES, INC.



Stephen M. Suau, P.E.

SMS:pjg(#17)

cc: Pat Collins, Sarasota County

RECORD OF TELEPHONE CONVERSATION

DISCUSSION WITH: JEFF VOMANKA, SOUTHWEST FLORIDA WATER
MANAGEMENT DISTRICT (SWFWMD)

DISCUSSION BY: STEPHEN M. SUAU, KHA

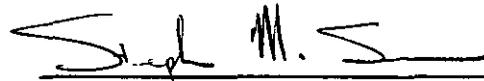
DATE: AUGUST 27, 1993

SUBJECT: MATHENY CREEK, BASIN MASTER PLAN -
HYDROLOGIC/HYDRAULIC METHODOLOGY - 6739.05

Called Mr. Vomanka who is with the Engineering Research Division of SWFWMD in Brooksville. Mr. Vomanka has been reviewing hydrologic information collected by the District for the purpose of better defining runoff characteristics from watersheds within Southwest Florida.

To this end Mr. Vomanka is deriving unit hydrographs from direct runoff hydrographs by dividing the DRH ordinate by the peak discharge. The excess rainfall hydrograph (and the rainfall distribution and volume) are not considered in this procedure. However, Mr. Vomanka believes that the distribution of rainfall is not an important variable to watersheds which the District is studying. Mr. Vomanka is then determining peak rate factors using the ratio of the rising and receding limbs under the 'unit runoff hydrograph'. It is Mr. Vomanka's objective to develop guidelines for peak rate factors within the District and possibly generate a methodology to determine watershed peak rate factors from continuous stage recorders. Unfortunately, none of the study watersheds being reviewed by the District are located in Sarasota County. The closest study site is the Manatee River in Manatee County.

With respect to recommendations regarding the modeling of the Matheny Creek Basin Master Plan, Mr. Vomanka indicated that the use of a peak rate factor of 256 for the residentially developed study area seemed appropriate.



Stephen M. Suau, P.E.

SMS:pjg(#18)

Kimley-Horn

Kimley-Horn and Associates, Inc.
ENGINEERING, PLANNING, AND ENVIRONMENTAL CONSULTANTS

2702 Beneva Road South, Sarasota, Florida 34238 813-922-8187 Fax 813-922-2351

August 30, 1993

Mr. William Veon, P.E.
Hillsborough County
Planning & Development Management Department
P. O. Box 1110
Tampa, Florida 33601

Re: Matheny Creek, Basin Master Plan

Our Ref: 6739.05

Dear Mr. Veon:

As you may recall, our office obtained a copy of the HEC-1 and EXTRAN computer models developed by Hillsborough County to perform an analysis of Faulkenberg Road within the context of the Delaney Creek watershed. The version of HEC-1 utilized contained a default SCS dimensionless unit hydrograph with a peak rate factor of 323.

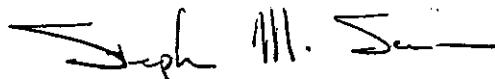
I had occasion to speak with John Trommer with the local U.S.G.S. office last week and he indicated that you have developed a version of HEC-1 with a SCS dimensionless unit hydrograph with a peak rate factor of 256. As I believe that this would be more appropriate for a basin master plan which we are conducting for Sarasota County, I wish to request a copy of this latest version of HEC-1 and have enclosed a blank formatted disk.

I have also enclosed a copy of a paper by C.J. Neidrauer who has developed a simple equation to compute General Dimensionless Curvilinear Unit Hydrographs which you might find useful in allowing a user specified dimensionless unit by hydrograph for specific basins or subbasins within a watershed.

Should you have any questions, please do not hesitate to give me a call.

Very truly yours,

KIMLEY-HORN AND ASSOCIATES, INC.



Stephen M. Suau, P.E.

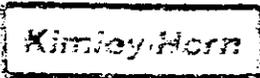
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Enclosures

cc: Pat Collins, Sarasota County

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7202 Beneva Road South, Sarasota, Florida 34238 813-922-8187 Fax 813-922-2351

November 17, 1993

Pat Collins, P.E.
Sarasota County Stormwater Environmental Utility
1301 Cattlemen Road
Sarasota, Florida 34232

Re: Matheny Creek - Basin Master Plan

Our Ref: 6739.05

Dear Mr. Collins:

Based upon our research and delineation of the Matheny Creek drainage basin, an obvious discrepancy has come to light. Specifically, the basin area as delineated and inventoried in Section 12 of the Sarasota Bay-Framework for Action of 3,800 acres is significantly larger than our research or findings would indicate. Our efforts to date indicate that the drainage area for this basin is closer to 1,700 acres. Areas determined by previous authoritative studies of Matheny Creek are summarized below:

BASIN AREA (acres)	DATE	SOURCE
1. 1,341	May 1959	FDOT
2. 1,640	Sept. 1961	SWN
3. 1,640	July 1967	SWN
4. 1,728	June 1973	ACOE
5. 1,500	March 1987	CDM
6. 1,670	Sept. 1992	FIS
7. 1,732	1993	CDM - NPDES Permit
8. 1,722	Nov. 1993	KHA

- FDOT - Florida Department of Transportation
- SWN - Smalley, Wellford & Nalven, Inc.
- ACOE - Army Corps of Engineers
- CDM - Camp Dresser & McKee
- FIS - Flood Insurance Study
- KHA - Kimley-Horn and Associates, Inc.

Pat Collins, P.E.
Sarasota County Stormwater Environmental Utility
November 17, 1993
Page Two

We believe that it is important to reconcile this discrepancy for future reference in that certain wastewater plants located in the area of dispute have been identified by the National Estuary Program for Sarasota Bay (NEP) as primary sources of water quality problems.

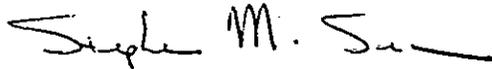
Our reconciliation is founded upon the conclusion that the NEP delineation of Matheny Creek actually includes the Elligraw Bayou basin, the Clower Creek basin, the Holiday Bayou basin, and a significant portion of the headwaters of the Catfish Creek basin. We can be particularly confident with our conclusion with respect to the Catfish Creek delineation given our intimate familiarity with that basin.

These findings have been shared with representatives of both the Sarasota County Stormwater Environmental Utility and the Southwest Florida Water Management District knowledgeable in drainage ridge lines in this area. There is a consensus that the actual basin delineation and drainage area of Matheny Creek is consistent with that identified as part of the Basin Master Plan of ±1700 acres. Therefore, this discrepancy is considered reconciled.

Should you have any questions regarding this matter, please do not hesitate to give me a call.

Very truly yours,

KIMLEY-HORN AND ASSOCIATES, INC.

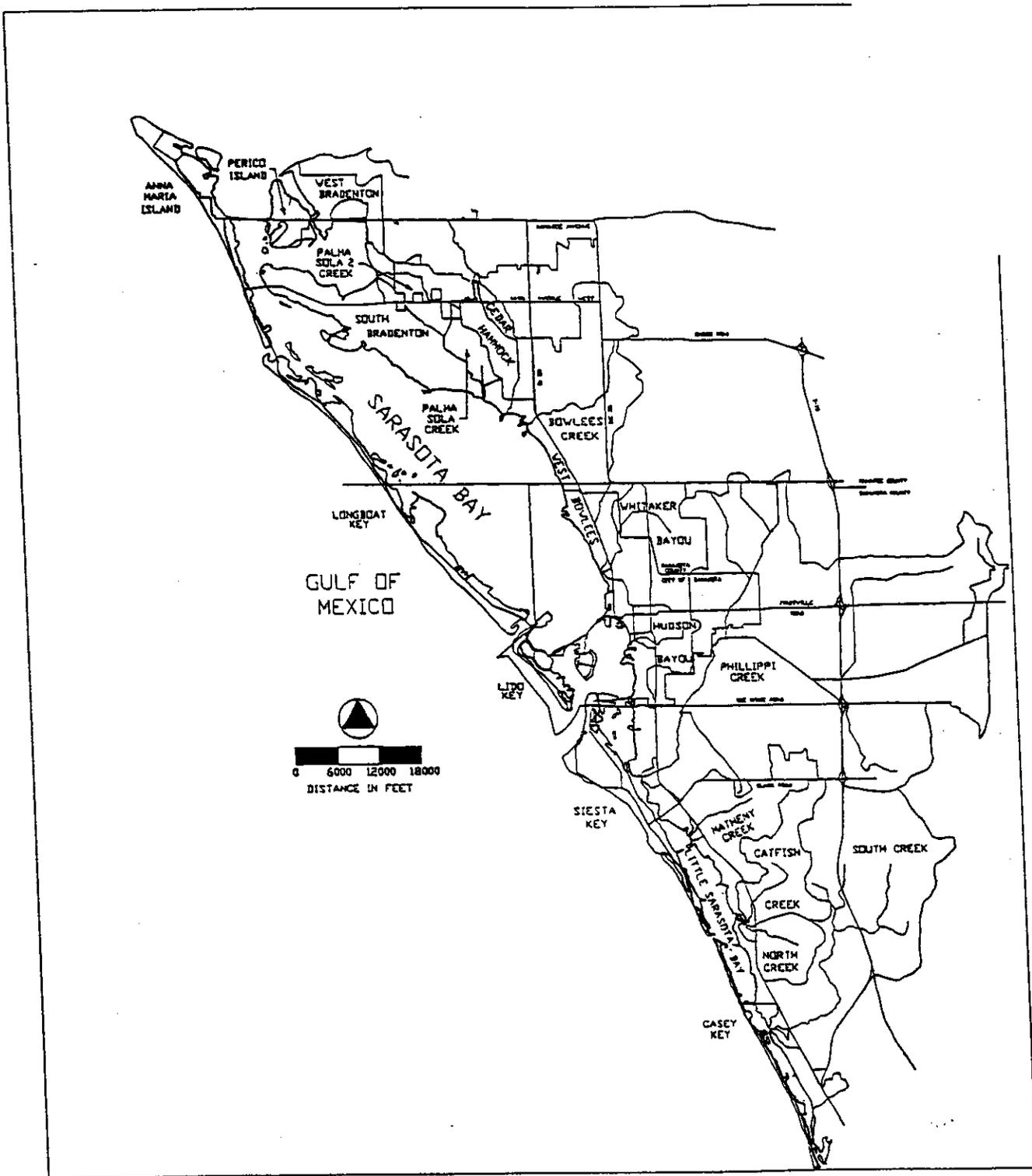


Stephen M. Suau, P.E.

SMS:pjg(#19)

Enclosures

cc: Himat Solanki, P.E., w/enc.
Thomas A. Shoopman, P.E., w/enc.



development accounts for 70 percent of the total urban land use, primarily divided among medium- and high-density single-family- and multi-family-building land uses. Most of the open or undeveloped land, located in the far eastern part of the city, consists of golf courses and parks that will not be developed for other uses in the future. As a group, the barrier islands have 66

percent of their land area in urban development and 34 percent open or undeveloped. Most open or undeveloped areas are located on Longboat Key and Perico Island, where open/recreation land use predominates. Siesta Key and Anna Maria Island are predominantly urbanized, with 94 percent of the urban area residential.

Figure 1. Sarasota Bay NEP Study Area.

Watershed	Drainage Area (acres)	Jurisdiction
Philippi Creek	36,417	City of Sarasota Sarasota County Manatee County
Hudson Bayou	1,595	City of Sarasota
Bowlees Creek	6,489	City of Sarasota Sarasota County Manatee County
West Bowlees	1,559	City of Sarasota Sarasota County Manatee County
Whitaker Bayou	5,015	City of Sarasota Sarasota County
Direct to Bay	4,241	City of Sarasota Sarasota County
Matheny Creek	3,800	Sarasota County
Catfish Creek	3,360	Sarasota County
North Creek	1,920	Sarasota County
South Creek	12,995	Sarasota County
Palma Sola Creek	900	Manatee County
Palma Sola 2	1,120	Manatee County
West Bradenton	4,395	Manatee County
South Bradenton	4,635	Manatee County
Cedar Hammock	1,930	Manatee County
Siesta Key	1,385	Barrier Islands
Anna Maria Island	919	Barrier Islands
Parico Island	860	Barrier Islands
Longboat Key	1,697	Barrier Islands
Other Islands	900	Barrier Islands

Table 1. Watersheds in Sarasota Bay NEP Study Area.

Future Land Use

Three land-use scenarios were developed: (five-year future, 20-year and buildout future), two of which are discussed. The five-year scenario was based on the Developments of Regional Impact (DRI) data provided by Sarasota and Manatee counties. The Comprehensive Plans for both counties and the barrier-island communities were used to develop the buildout scenario. Both scenarios excluded the City of Sarasota, because the city is currently approaching buildout and future development will be limited.

In the five-year scenario, all projected development will be in Sarasota County, where an estimated 1,686 acres of open or undeveloped land are expected to be developed. Overall, 248 acres of open/recreational, 1,350 acres of rangeland/woodland and 88 acres of citrus will be developed to create 1,319 acres of medium-density single-family residential, 120 acres of industrial, 20 acres of institutional and 227 acres of commercial area.

In the buildout scenario, almost 31,000 acres of open or undeveloped land within the two counties are projected to be converted to urban land uses. Of the 31,000 acres, about

85 percent will be developed for residential uses and 15 percent will be converted to commercial or industrial use.

Soil Characteristics

According to Soils Conservation Service (SCS) soil surveys for Manatee and Sarasota counties, the soils in the study area are generally classified as B/D, indicating that they tend to be poorly drained in unimproved areas and moderately drained where drainage improvements have been implemented.

Water-Quality Characteristics

Based on reports from the Florida Dept. of Environmental Regulation (FDER), Sarasota Bay is generally characterized as having "fair" water quality; its tributaries are characterized as having "poor" to "fair" water quality. Tributaries with "fair" water-quality ratings include Phillippi, Matheny and Catfish creeks; Whitaker Bayou has a "poor" water-quality rating. In most cases, the poor to fair ratings are due to elevated nutrient levels, which are generally attributed to urban runoff and discharge from wastewater-treatment plants.

TELEPHONE CONVERSATION

DATE: JANUARY 20, 1994
TO: MARK FARRELL/DAVE MOORE
BY: STEPHEN M. SUAU
TOPIC: MATHENY CREEK BASIN MASTER PLAN - WQLOS
PROJECT: 6739.05

Spoke with Dave ^{Moore} ~~Farrell~~ who returned my call to Mark Farrell regarding any insight that the District could provide regarding the direction which the State may be taking with respect to water quality. Mr. Farrell indicated that I contact the Sarasota Bay Program to get their recommended pollutant load reduction goals (PLRG). According to Mr. Farrell, the Sarasota Bay Program was using a nutrient PLRG of 19% to 22%. Mr. Farrell also indicated that Tom Harrison with the District was developing new design criteria based upon the receiving waterbody.



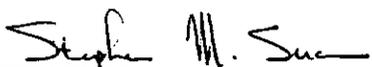
Stephen M. Suau, P.E.

SMS:pjg(#21)-2

TELEPHONE CONVERSATION

DATE: JANUARY 20, 1994
TO: ERIC LIVINGSTON, FDEP
BY: STEPHEN M. SUAU
TOPIC: WATER QUALITY LEVELS OF SERVICE
PROJECT: 6739.05

- Eric indicated the State would look to the Sarasota Bay Program to establish Pollutant Load Reduction Goals.
- If not established by the Sarasota Bay Program, SWFWMD is required to develop Pollutant Load Reduction goals by watershed.
- In the latter case, the establishment of pollutant load reduction goals could be several years away. In the interim, Eric recommended developing structural and especially non-structural measures aimed at improving water quality. "Do the best you can" type approach.
- Talked briefly about maintenance of stormwater management facilities. From studies he had seen, Eric indicated that sediments should be removed from stormwater ponds on the average of every 15 years and that vegetation, especially cattails may need to be harvested every year.



Stephen M. Suau, P.E.

SMS:pjg(#21)



March 24, 1994

Mr. Pat Collins
Sarasota County Stormwater Management Division
1301 Cattlemen Road
Sarasota, FL 34232

Dear Mr. Collins,

Thank you for allowing me to review the report on Matheny Creek prepared by Kimley-Horn. In general, the reports appear to be quite comprehensive. Their information on sediment contaminant levels indicates higher levels of metals in Matheny Creek than was indicated by Lowrey (1992). However, it appears, based on conversations with the consultants, that sampling sites for Lowrey's study were further downstream, where oysters could be found and analyzed as well (Dixon, 1992). It is no surprise that metal contaminant levels would be elevated in areas higher up in the watershed. Based on Dixon's report on shellfish, Matheny Creek was not chosen by the SBNEP as a "priority" watershed for stormwater retrofit. The present study indicates retrofits might be appropriate in areas of the creek higher up than we studied.

Table 1.3.2 lists pollutant removal efficiencies to be expected with various BMP coverage scenarios. What pollutant(s) are considered? Apparently not TDS. As is shown in Table 4.2.2.2.d, removal efficiencies vary widely, depending upon which pollutant is considered. If lead is considered, removal efficiencies from BMP's range from 32 percent (Martin, 1988) to over 90 percent (Harper, 1988). Rushton & Kehoe indicated concentrations of lead and zinc can be reduced an average of 93 and 65 percent, respectively, with BMP use. The values given for these parameters in Table 4.2.2.2.d appear appropriate.

For nutrients, removal efficiencies for BMP's are much lower when one considers loads of total nitrogen. Nitrate and nitrite reductions should not be considered, as BMP's often transform inorganic nitrogen to organic nitrogen, with the result that inorganic nitrogen concentrations can be reduced by over 50 percent, while organic nitrogen concentrations average 20 percent reduction, with some BMP's actually showing increased concentrations at BMP outfalls (Tomasko et al., 1993). Further, Tomasko et al. (1993) showed the average total nitrogen load reduction for BMP's was just under 50 percent, with a range (n = 6) of 20 percent to 90 percent load reduction.

Again, what "pollutant" is being considered in Table 1.3.2?

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On page 33, reference is made to how septic tank pollutant loads (presumably nitrogen) were modeled. Even when referring to Table 4.2.2.2.b, it is not clear how septic tank loads were determined. It appears that only failed septic tanks were assumed to load nitrogen to nearby surface waters (p. 33). This is not accurate. As summarized in SBNEP's Framework for Action, as well as the SBNEP's Comprehensive Conservation and Management Plan, even properly functioning septic tanks can load nitrogen through groundwater contamination by nutrients. The University of Florida's Institute of Food and Agricultural Sciences has summarized the various problems associated with septic tanks (IFAS, 1985). Perhaps the consultants should familiarize themselves with this paper, as well as how the SBNEP approach to estimating septic loads, which has been nationally peer-reviewed, was designed.

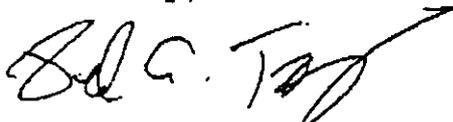
The question of accurately assessing septic tank and package plant nitrogen loads is critical. First off, the pollutant load reductions referred to in various tables and throughout the text need to be better defined. What pollutant?

Second, if wastewater nitrogen loads are inadequately calculated, as appears to be the case in this report, then stormwater loads will become proportionately larger. Thus, the benefits of stormwater retrofits in terms of total pollutant load reductions would be exaggerated.

I don't believe that any of the flaws in this study are beyond repair, but they are critical. As currently written, I do not have much confidence in the "pollutant" load reduction scenarios, unless they refer exclusively to TSS and/or metals. The load reductions estimated for parameters such as BOD and TKN are probably overestimated, as wastewater loads are most definitely underestimated.

Please call me if you wish further explanation about my comments.

Sincerely,



David A. Tomasko, Ph.D.

Papers cited:

- Dixon, L.K. 1992. Bivalved shellfish of Sarasota Bay. Sarasota Bay National Estuary Program 1992 Framework for Action.
- Harper, H.H. 1988. Effects of stormwater management systems on groundwater quality. Florida Dept. of Environmental Regulation. Project WM 190. Tallahassee, FL.
- IFAS. 1985. On-site sewage disposal: Nitrogen behavior. Notes in Soil Science. Institute of Food and Agricultural Sciences, University of Florida.
- Lowrey, S. 1992. Water and sediment quality in Sarasota Bay. Sarasota Bay National Estuary Program 1992 Framework for Action.
- Martin, E.H. 1988. Effectiveness of an urban run-off detention pond-wetland system. J. of Environmental Engineering 114(4): 810-827.
- Rushton, B., Kehoe, M. 1993. Significant conclusions documented from stormwater research. Stormwater Research Program, southwest Florida Water Management District.
- Tomasko, D.A., Alderson, D.M., Smith, H. 1993. A watershed strategy for reducing toxin and nutrient loadings from stormwater runoff in Sarasota Bay, Florida. Pp. 73-78. In: C. Dye and B. Rushton (eds.). Proceedings of the 3'rd Biennial Stormwater Research Conference. Southwest Florida Water Management District. Brooksville, FL.

Kimley-Horn

Kimley-Horn and Associates, Inc.
ENGINEERING, PLANNING, AND ENVIRONMENTAL CONSULTANTS

7202 Beneva Road South, Sarasota, Florida 34238 813-922-8187 Fax 813-922-2351

March 28, 1994

Mr. Pat Collins, P.E.
Sarasota County Stormwater Management Division
1301 Cattlemen Road
Sarasota, Florida 34232

Re: Matheny Creek - Basin Master Plan

Our ref: 6739.05

Dear Mr. Collins:

As requested, we have reviewed Mr. Tomasko's letter of March 24, 1994 to you and provide the following responses:

1. In general, the concerns raised by Mr. Tomasko do not stem from the surface water and sediment sampling performed in the field but from the pollutant loading model. It is our understanding that this model was developed by CDM for the SBNEP and Sarasota County's NPDES permit. Any questions or concerns Mr. Tomasko has regarding this model should therefore be directed to its author.
2. Subsequent to conducting the pollutant loading analysis, CCI identified a deficiency to the CDM model as noted in our letter of March 15, 1994. Specifically, the septic tank subroutine in the CDM model is apparently not operational. Therefore, the pollutant loading analysis results reviewed by Mr. Tomasko only reflect loadings from stormwater.
3. As indicated on page 7 of the report, Table 1.3.2 summarizes the range of removal efficiencies (excluding TDS) for each primary basin in the Matheny Creek watershed. Specific removal efficiencies for each parameter by basin are provided in Table 5.2.2.b of the report.

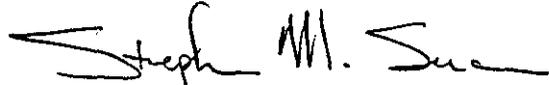
Mr. Pat Collins, P.E.
Sarasota County Stormwater Management Division
March 28, 1994
Page Two

In conclusion, it should be made clear to Mr. Tomasko that neither KHA nor CCI authored the pollutant loading model. We do not accept responsibility for its logic, only its application to the Matheny Creek watershed. However, it is somewhat disconcerting that Mr. Tomasko appears to be questioning the accuracy of the same model used by SBNEP to conduct the pollutant loading analysis published in their *Framework for Action* document.

We would welcome the opportunity to meet with you and Mr. Tomasko, if there is a consensus that further discussions would be helpful.

Very truly yours,

KIMLEY-HORN AND ASSOCIATES, INC.



Stephen M. Suau, P. E.

SMS:clc(#1)

cc: Nenad Iranican

Kimley-Horn

Kimley-Horn and Associates, Inc.
ENGINEERING, PLANNING, AND ENVIRONMENTAL CONSULTANTS

7202 Beneva Road South, Sarasota, Florida 34238 813-922-8187 Fax 813-922-2351

June 9, 1994

Mr. Tim Polk, P.E.
Florida Department of Transportation
P. O. Box 1249
Bartow, Florida 33830

Re: Matheny Creek - Basin Master Plan

Our Ref: 6739.05

Dear Mr. Polk:

This letter and attached information are provided on behalf of our client, Sarasota County, and as a follow-up to our discussions on June 2, 1994 regarding drainage structure S-1227B for State Project No. 17070-3525 (State Road 72/Clark Road) located in Sarasota County between U.S. 41 and Swift Road.

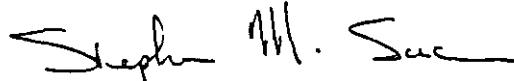
Structure S-1227B is intended to accept off-site runoff from a ditch which drains Sunnyside Lake located north of Clark Road. The drainage calculations on file at the Venice office of the Southwest Florida Water Management District indicate a ditch invert of 14.82 NGVD at this location. However, the storm sewer calculations on file at SWFWMD indicate that Structure S-1227B is to have a slot invert at elevation 16.60 NGVD. A topography survey of the Sunnyside Lake outfall ditch (copy enclosed) reveals that the ditch invert is 14.2 NGVD.

You may wish to revisit the slot invert elevation for Structure S-1227B. On behalf our client it is our recommendation that this slot invert be set so as not to elevate upstream water stages. From the available information, it would seem appropriate to set the slot at elevation 14.5 NGVD and perform some minor maintenance work to the upstream ditch so that it functions as originally intended.

Should you have any questions regarding this matter, please do not hesitate to give me a call.

Very truly yours,

KIMLEY-HORN AND ASSOCIATES, INC.



Stephen M. Suau, P. E.

SMS:pjg(#24)
Enclosure
cc: Pat Collins

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Phoenix • Raleigh • Sarasota • Stuart • Tampa • Vero Beach • Virginia Beach • West Palm Beach

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July 5, 1994

~~6739.06~~
SMS

6739.05

Mr. Tim Polk
District Drainage Engineer
Florida Department of Transportation
District 1
801 North Broadway
Post Office Box 1249
Bartow, Florida 33830-1249

Re: Clark Road (S.R. 72) - from U.S. 41 to Sawyer Road
State Project No. 17070-3525
WPI No. 1119224
FAP No. ACSU-140-1(4)
Sarasota County
Kimley-Horn Ref. No. 6739.05
DSA CM No. 87014-U2

Subject: Slot Elevation of Drainage Structure S-1227B

Dear Mr. Polk:

On June 29, 1994 DSA received a letter from you which was written by Mr. Stephen Suau, of Kimley-Horn, on behalf of Sarasota County. The letter requested that you have the slot invert in drainage structure S-1227B lowered from elevation 16.6 to elevation 14.5, based on data on file at Sarasota County.

Mr. Suau included with his letter a drawing showing the original design plans for an outfall ditch from Sunnyside Lake which drains to the future S-1227B drainage structure along Clark Road. The ditch has an invert elevation of 14.5 which is the basis for requesting a change to the slot elevation. The lake's only outfall control feature is the ditch from the lake. The ditch from the lake joins the ditch along Clark Road. Water elevations in the ditch are controlled by two 24-inch pipes near station 66+35 which pass water from the roadway ditch on the north side of Clark Road to the south side of Clark Road. The ditch on the south side of Clark Road flows through various driveway sidedrain pipes to a major north-south ditch at station 50+50. DSA's storm sewer design maintained or improved hydraulic gradeline conditions along this drainage system.

RECEIVED JUL 1 1 1994

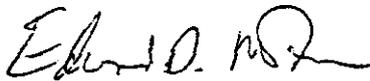
Mr. Tim Polk
July 5, 1994
Page Two

To maintain positive outflow from Sunnyside Lake, DSA agrees that the slot elevation in drainage structure S-1227B should be lowered from elevation 16.6 to elevation 14.5. DSA's research of this issue concluded that the ditch profile shown on the cross section must be the top of bank and not the invert of the ditch. To lower the slot, S-1227B must be changed to a Special Modified Type "C" Inlet with a "J" bottom rather than a Standard Modified Type "C" Inlet with a "J" bottom. Also, the grade difference between the ditch invert and the sidewalk will require a gravity wall on both sides of the inlet. The handrail associated with the Special Modified Type "C" Inlet must be extended along the gravity wall section. Enclosed are photocopies of the drainage structure sheet and the plan sheet which show the changes.

The hydraulic grade line for the 3-year event is at elevation 15.88 at S-1227B so water from the Clark Road drainage system now has the capability of flowing into Sunnyside Lake with the new slot elevation because the slot was at elevation 16.6. In the original DSA design for S-1227B, flow into the lake could not occur. However, based on the data provided by Kimley-Horn, flow from the Clark Road roadside ditch must commingle with the water from Sunnyside Lake under present day conditions. Therefore, conditions present before and after the construction of Clark Road should remain the same with the revised slot elevation.

Sincerely,

DSA GROUP, INC.

A handwritten signature in dark ink, appearing to read "Edward D. McGuire".

Edward D. McGuire, P.E.
Project Manager

EDM/swe

Enclosure: Copies of Drainage Structure Sheet and Plan Sheet

cc: Mr. Barry Wilson, PBS&J Construction, Sarasota
Mr. Stephen M. Suau, Kimley-Horn
202 Beneva Road South, Sarasota, Florida, 34238

R:\87014\WP\LE4704TP.EDM



Kimley-Horn
and Associates, Inc.

Engineering
Planning
and
Environmental
Consultants

■
7202 Beneva Road South
Sarasota, Florida
34238

December 12, 1994

Mr. Himat T. Solanki, P.E.
Southwest Florida Water Management District
111 Corporation Way
Venice, Florida 34292

Re: Matheny Creek Basin Master Plan
Our Ref: 6739.05

Dear Mr. Solanki:

Pursuant to our meeting of December 5, 1994 and on behalf of our client, Sarasota County, we formally submit the following documents for your preliminary review:

1. Matheny Creek - Basin Master Plan, Final Report (2 copies)
2. Matheny Creek - Basin Master Plan, Technical Appendices (1 copy)

It is our intent to utilize the information contained within these documents as the basis for a subsequent Conceptual Permit. We will plan on scheduling a pre-application meeting some time in late January and would welcome any constructive comments which the District may have at that time.

Very truly yours,

KIMLEY-HORN AND ASSOCIATES, INC.

Stephen M. Suau, P. E.

SMS:pjg(#29)

Enclosures

cc: Pat Collins, P.E., Sarasota County Stormwater Division
Paul O'Neal, P.E., SWFWMD-Brooksville

■
TEL 813 922 8187
FAX 813 922 2351

6739.05

**STREAMLINE**
TECHNOLOGIES

MEMORANDUM

November 23, 1994

To: adICPR Users

From: Peter J. Singhofen, P.E. *(Signature)*

Re: Status of FEMA Approval of adICPR

We have received dozens of phone calls over the past few months concerning FEMA's recent objection to the use of adICPR for LOMA's and LOMR's. Although FEMA has accepted adICPR in the past, their recent objection is based on subparagraph 65.6(a)(6)(iii) of the National Flood Insurance Program regulations. I want to emphasize that FEMA's objection is not based on any technical flaws or deficiencies in the program. Subparagraph 65.6(a)(6)(iii) states:

"For programs not generally available from a Federal agency, the source code and user's manuals must be sent to FEMA free of charge, with fully documented permission from the owner that FEMA may release the code and user's manuals to such impacted parties."

This section, if complied with in its literal sense, would completely void our rights under the "Trade Secret Protection Act" and eventually put us out of business. This has obviously been of great concern to us and we would not comply with it as initially interpreted by FEMA.

However, understanding our clients' need for approval from FEMA, we have developed an agreement with FEMA (at a significant expense to us in legal fees and time) whereby our rights are protected and the intent of their rule is satisfied. I won't go into details of the agreement, but it is now in place and we are in a position to move forward with a formal review of adICPR by FEMA.

I am scheduled to spend two days in Washington, D.C. to review the program in detail with FEMA's staff and FEMA's technical contractor Dewberry and Davis on December 8th and 9th. FEMA then has up to 120 days to review and comment on the program. We are then afforded an opportunity to modify the program if necessary and resubmit it. Although we are very optimistic about final acceptance of the program, there are no guarantees. It is also my understanding that FEMA is anxious to complete the review and that it may not take the entire 120 days.

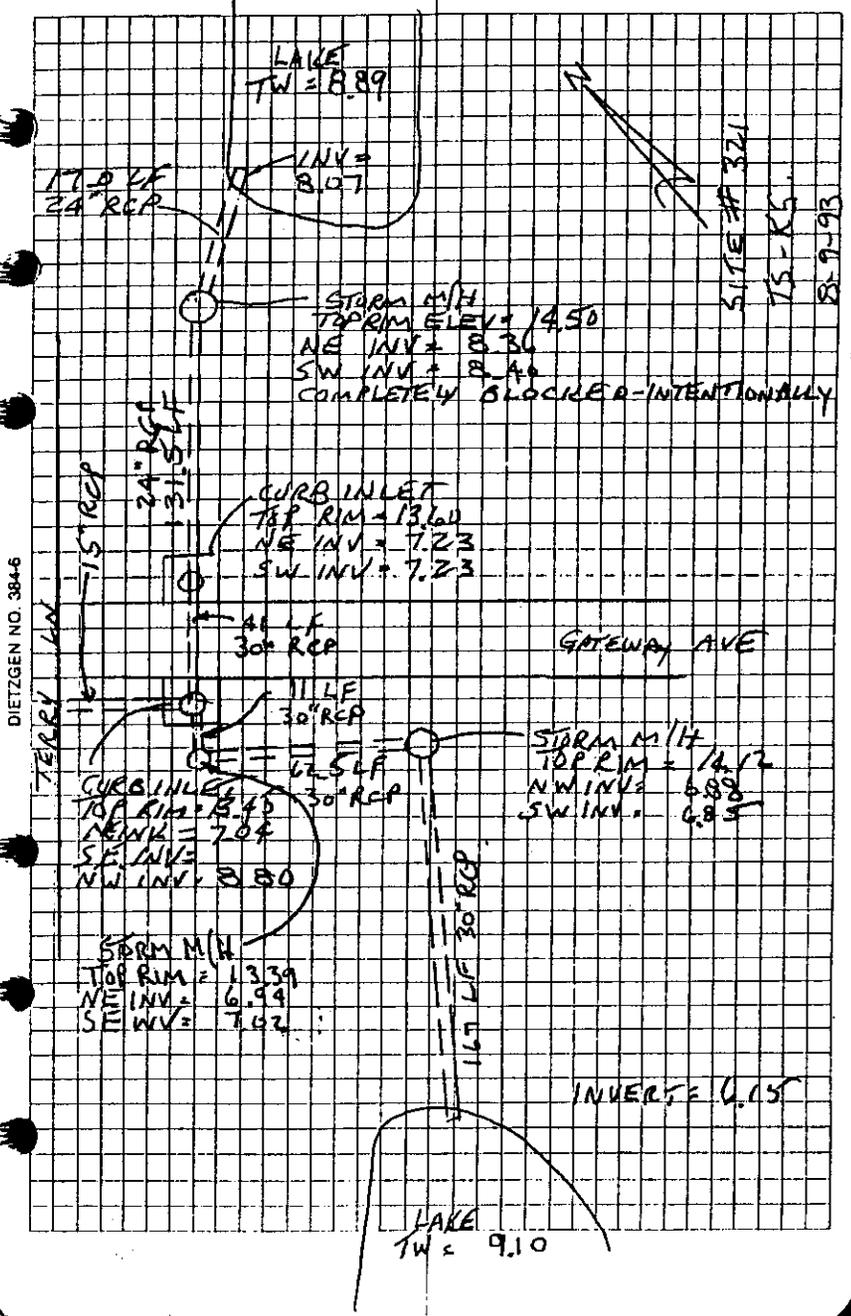
FEMA's review will be of the upcoming release of version 2.0 of adICPR. We have enhanced the model significantly and have incorporated features (bridges, super-critical flow regimes, etc.) we feel will help expedite the review. We will keep everybody informed as the review progresses.

①

PROJECT #93-266
ELEVATIONS OF METHENY
CREEK BASIN

FOR: KIMLEN - HORN

T. SNYDER
K. GINDERSBERGER
8-9-93



DIETZGEN NO. 384-6

17.0 LF
24" RCP

LAKE
TW = 8.89

INV =
8.07

STORM M/H
TOP RIM ELEV = 14.50

NE INV = 8.30
SW INV = 8.40

COMPLETELY BLOCKED - INTENTIONALLY

CURB INLET

TOP RIM = 13.60
NE INV = 7.23
SW INV = 7.23

41 LF
30" RCP

GATEWAY AVE

11 LF
30" RCP

62.5 LF
30" RCP

CURB INLET
TOP RIM = 8.40
NE INV = 7.04
SW INV = 8.80

STORM M/H
TOP RIM = 14.12
NW INV = 6.88
SW INV = 6.85

STORM M/H
TOP RIM = 13.39
NE INV = 6.99
SW INV = 7.42

117 LF
30" RCP

INVERT = 0.15

LAKE
TW = 9.10

SITE # 321
15-K5
8-9-93

E SWIFT RD

175' E

STORM INLET
TOP GRATE 17.25
INV. S = 10.27
INV. W = 10.24

27" CMP

30" CMP

19.10

E SR 72

TOP GRATE 17.15
STORM INLET

15" CMP

INV. E = 10.19
INV. W = 10.19
INV. N = 12.54

ASPHALT

DIETZGEN NO. 384-6

DIETZGEN NO. 384-5

30" CMP

80.1

INVERT 10.24

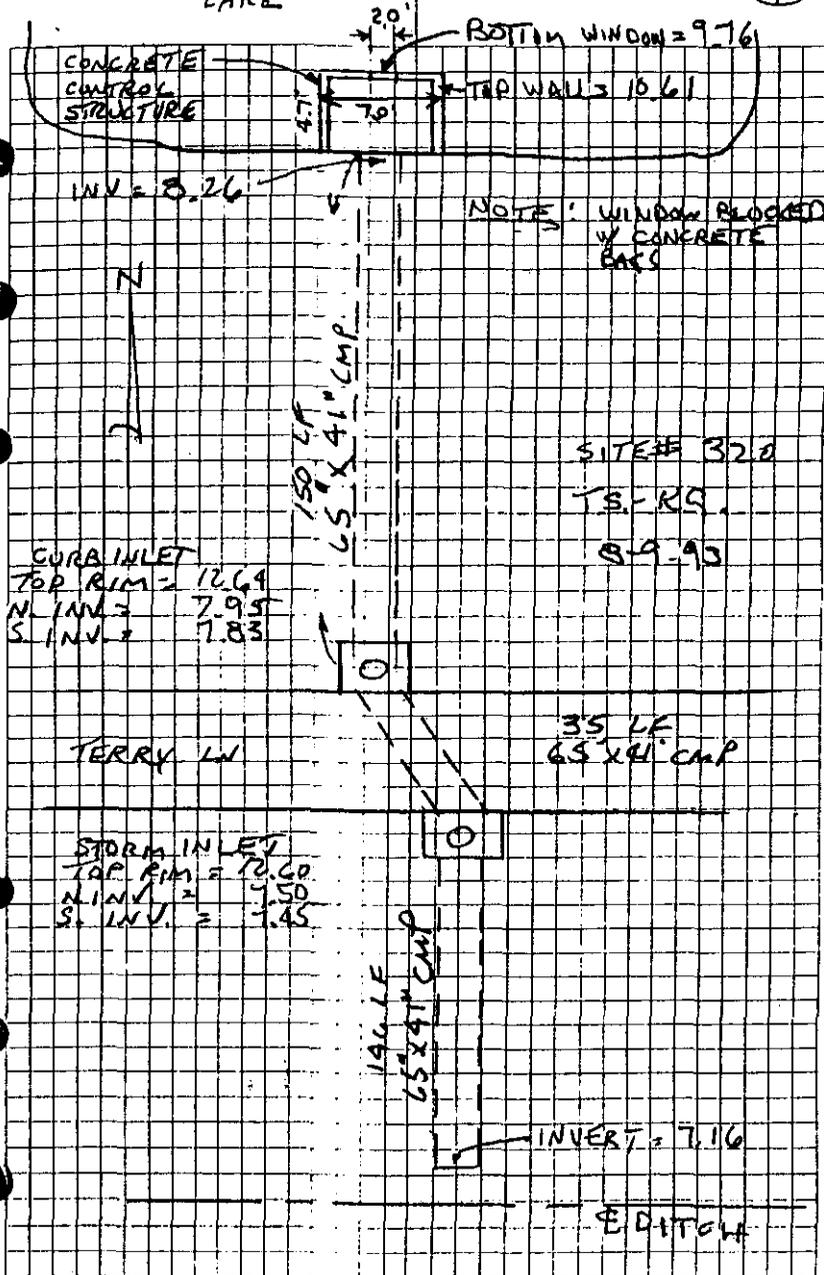
SITE # 662

TS-162

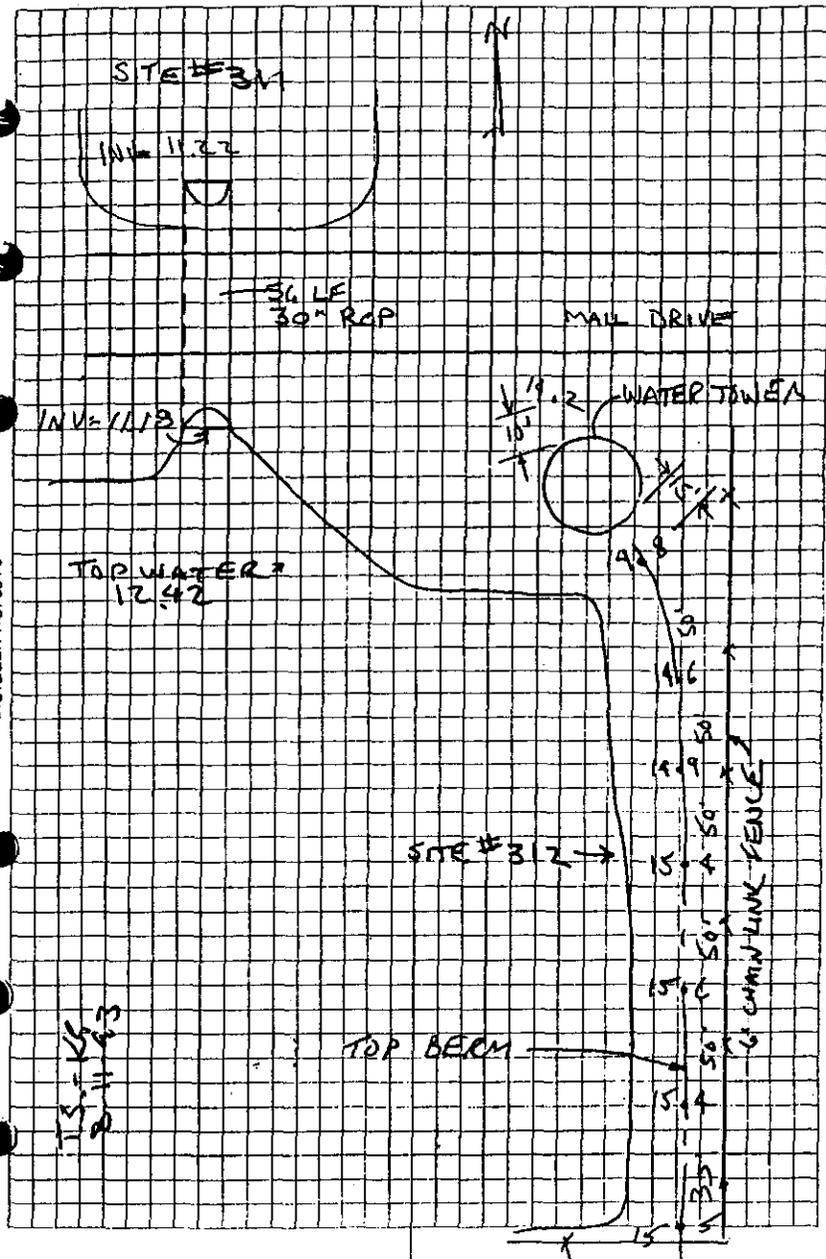
8-9-93

LAKE

④



6



DIETZEN NO. 3846

SITE # 311

INV. 11.22

36 LF
30" RCP

MAIL DRIVE

INV. 11.13

19.2 WATER TOWER

TOP WATER
12.42

SITE # 312

CHAIN LINK FENCE

TOP BERM

15.15
8.11 23

10.5

19.2

10.5

10.5

10.5

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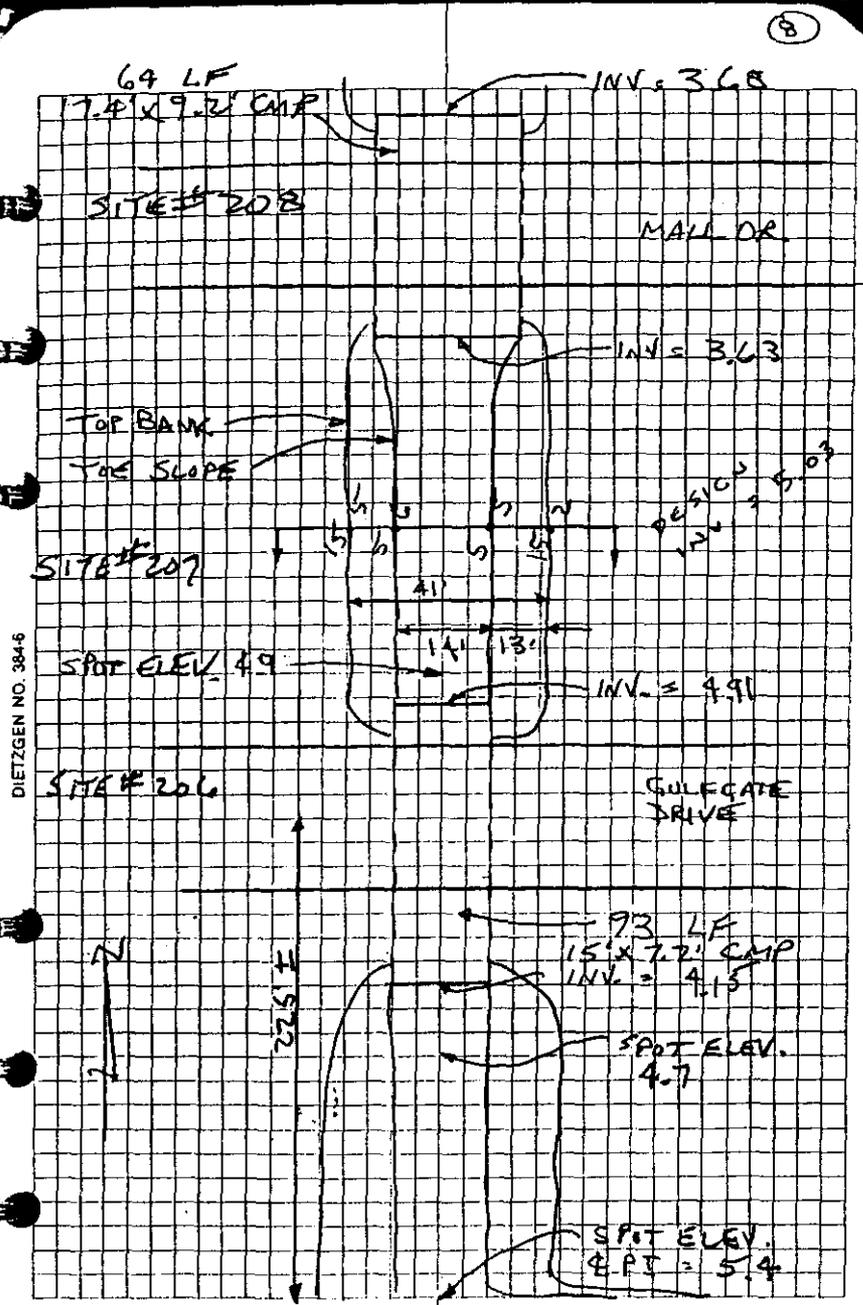
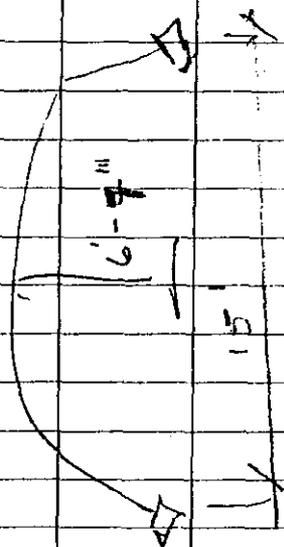
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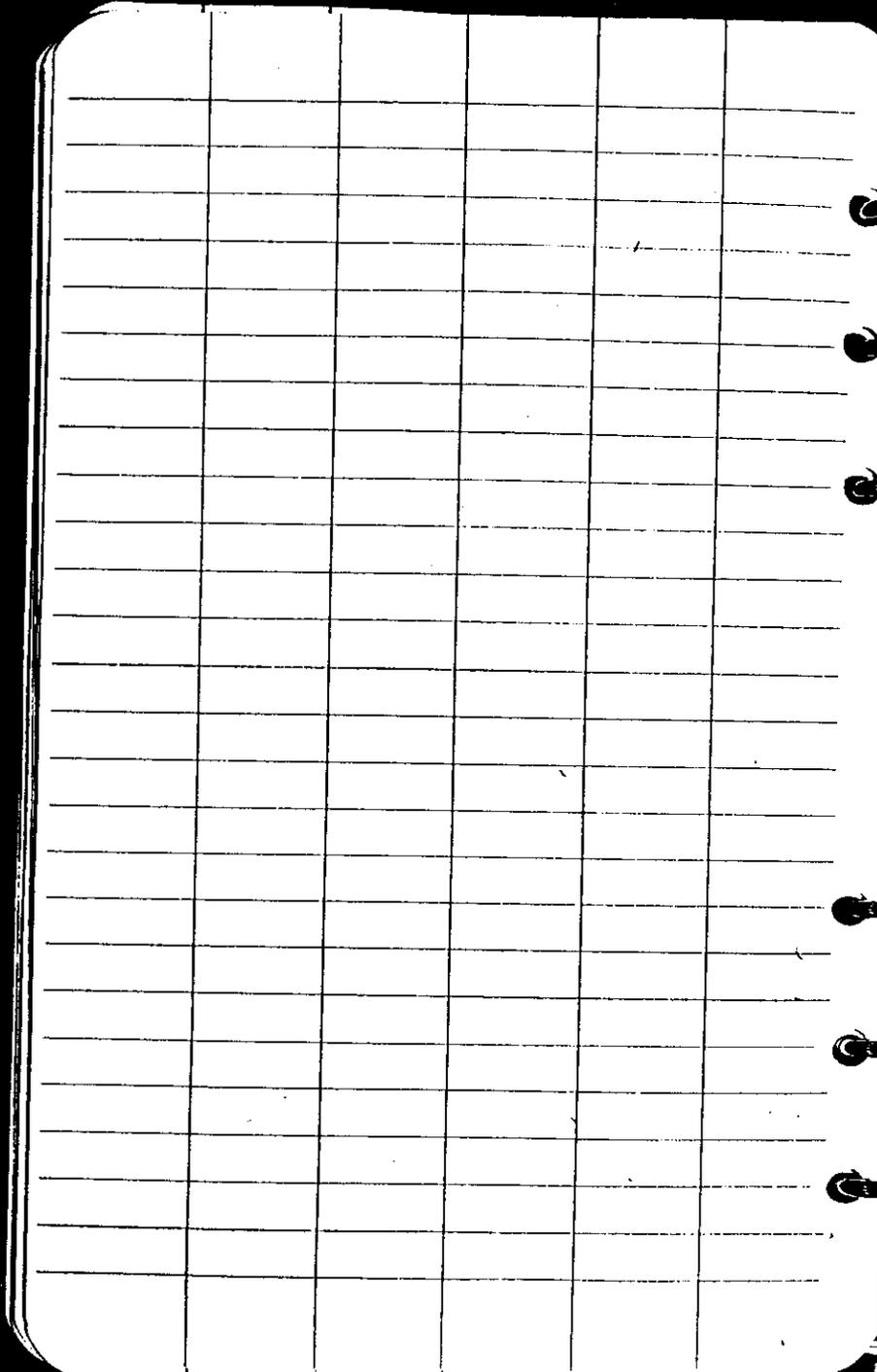
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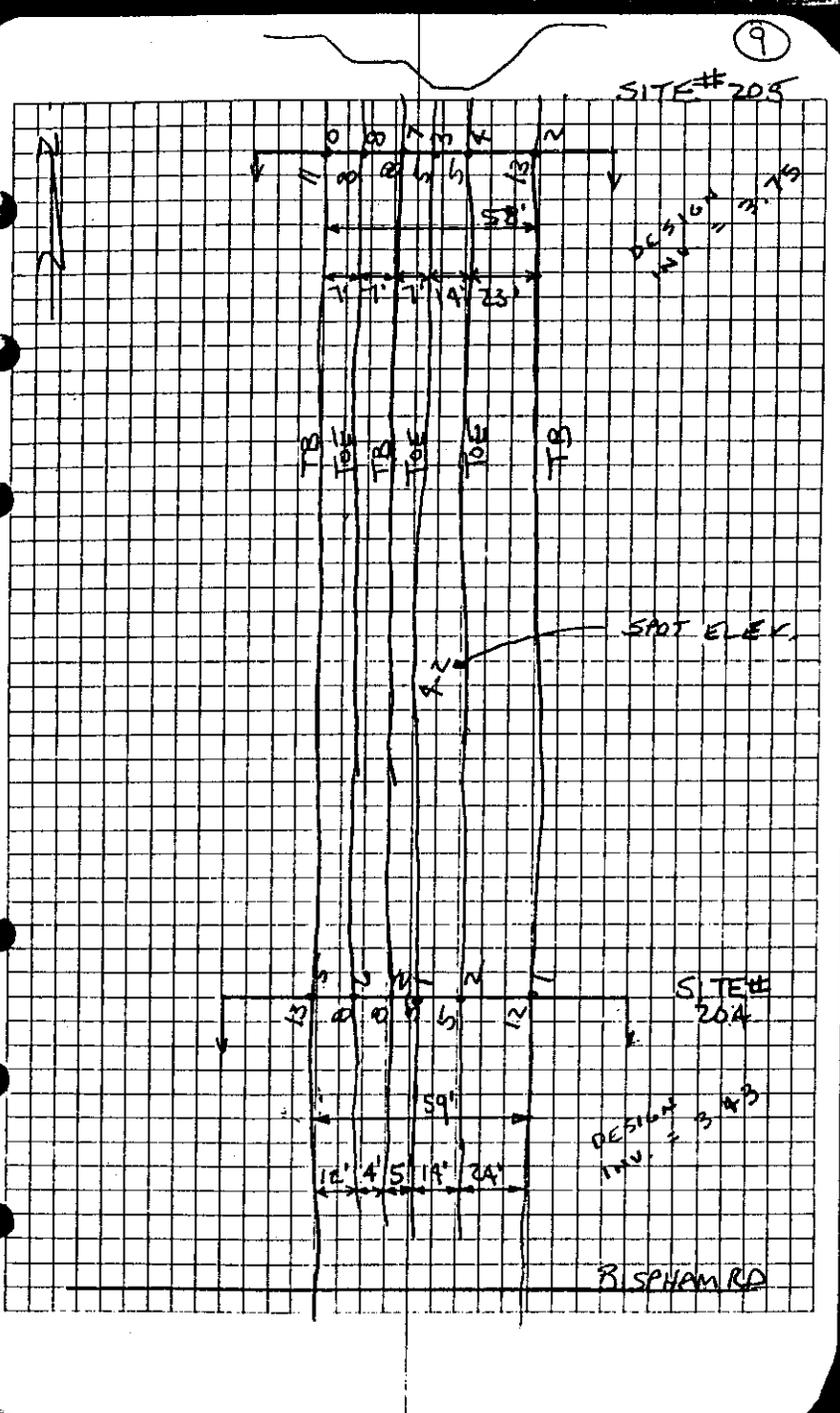
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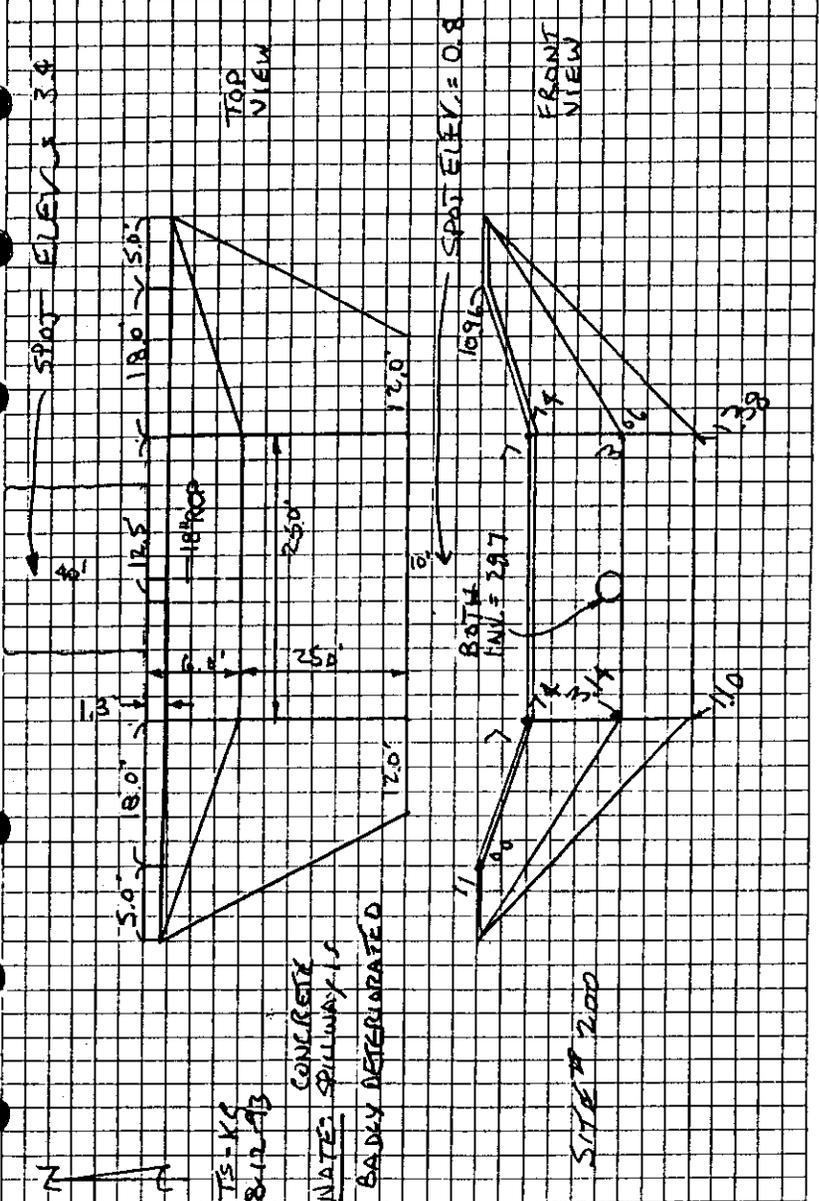




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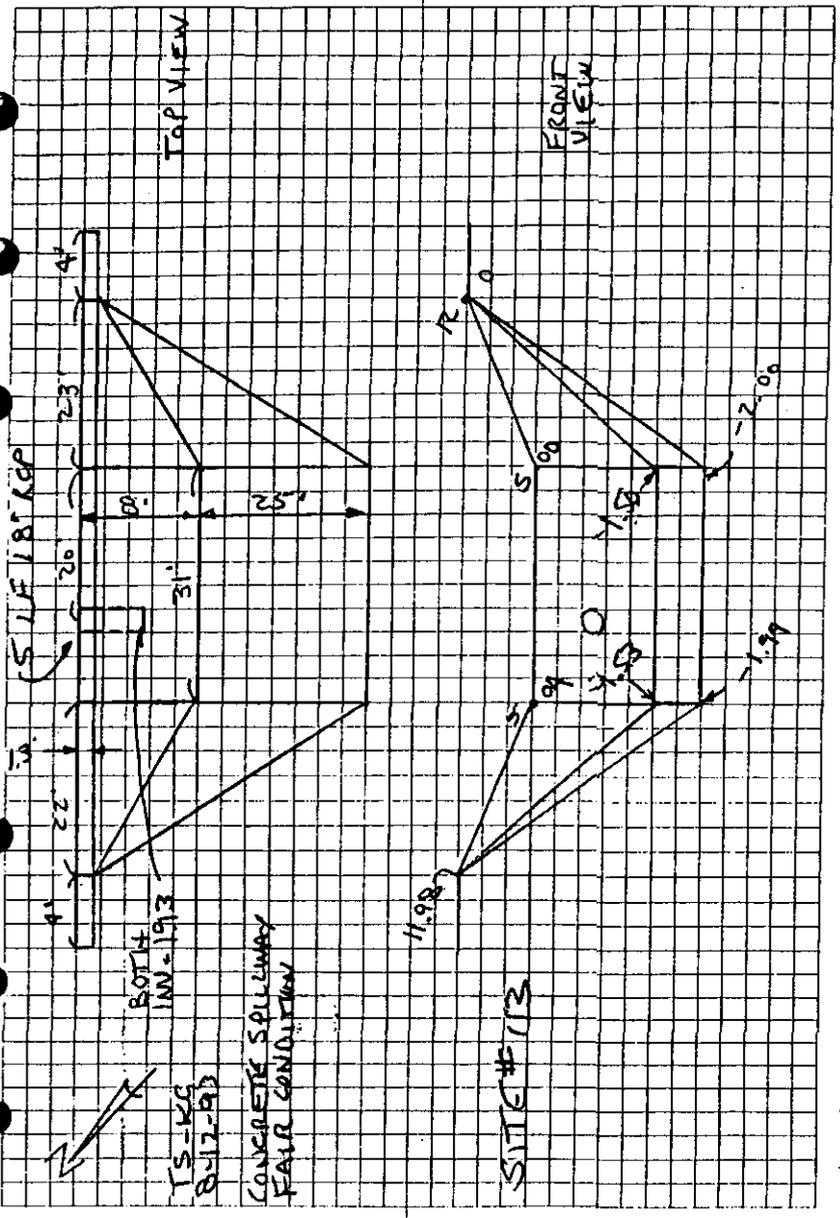


DIETZGEN NO. 3846



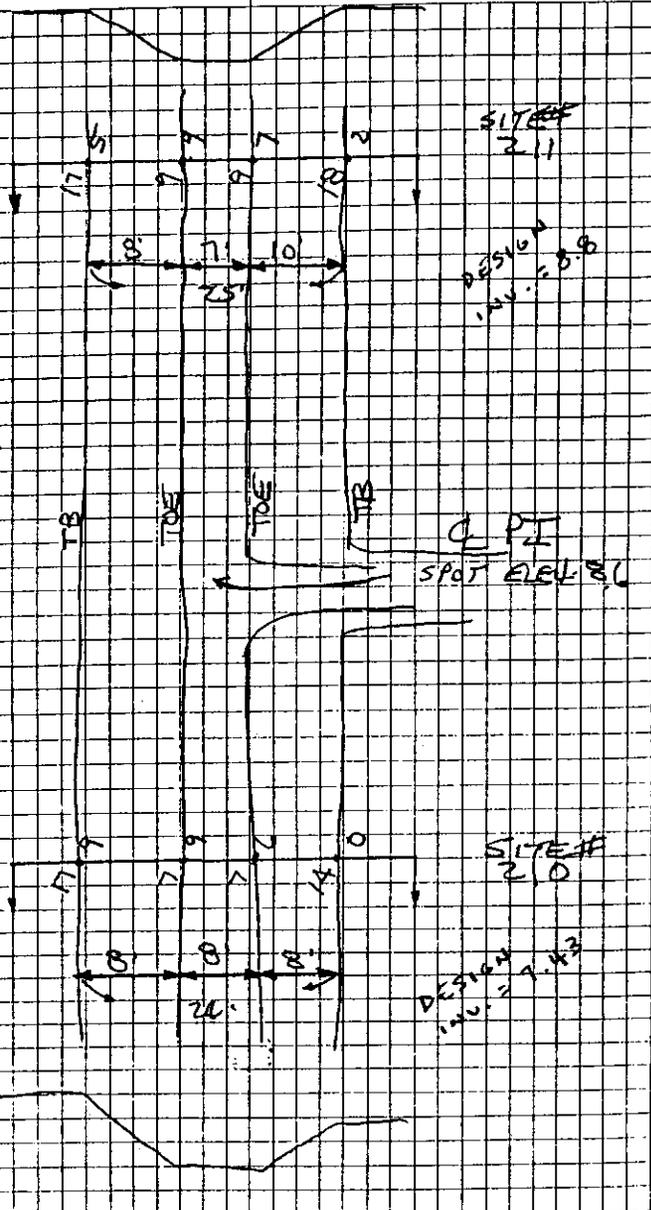
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DIETZEN NO. 384-6



DIETZGEN NO. 384-B

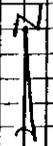
NOTE: RESIDENT Q ZION VALLEY FORCE S2
INDICATED FLOOD LEVEL OF JUNE 97
TO BE AT 14.05



Q PI
SPOT ELEV. 8.1

SITE #
2.10

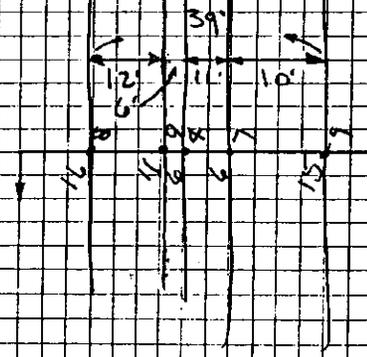
DESIGN
INU. = 7.0-3



W-15
B-1293

SPT ELEV. IS
6.8

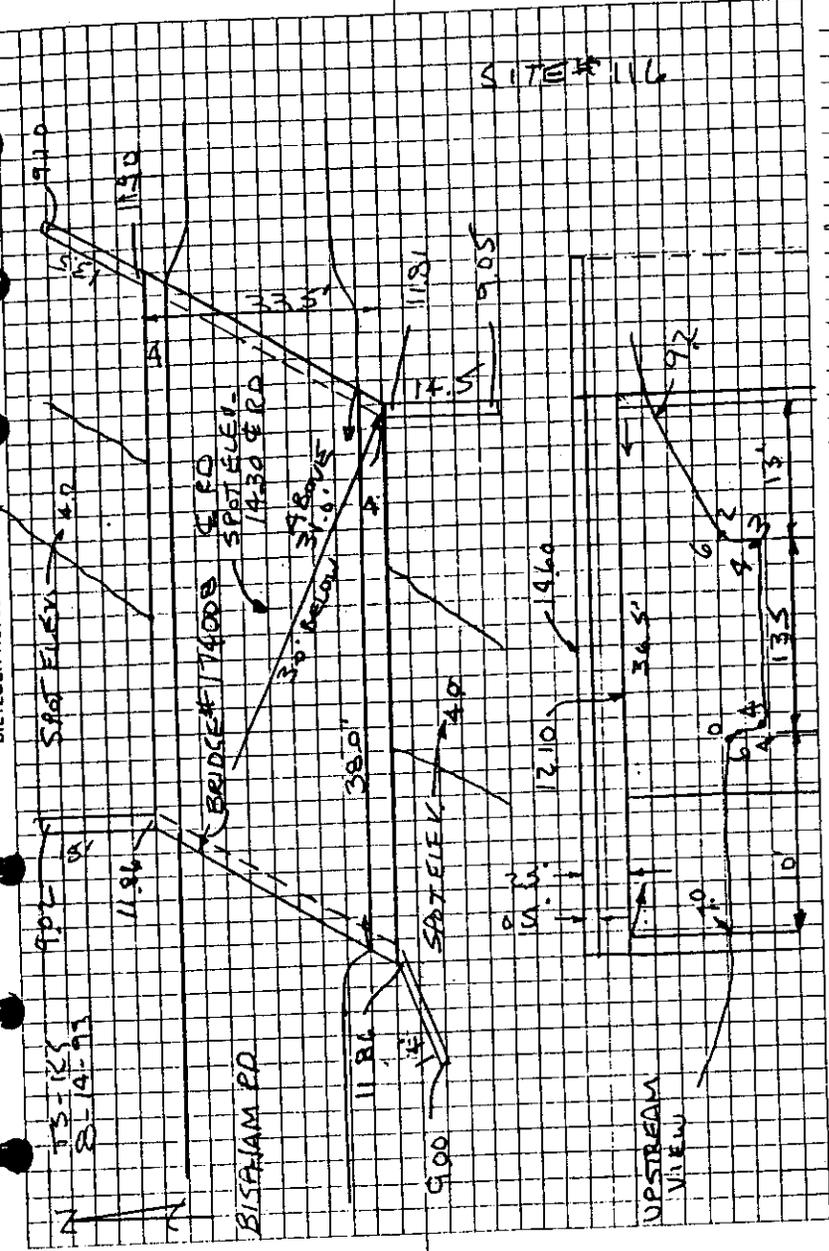
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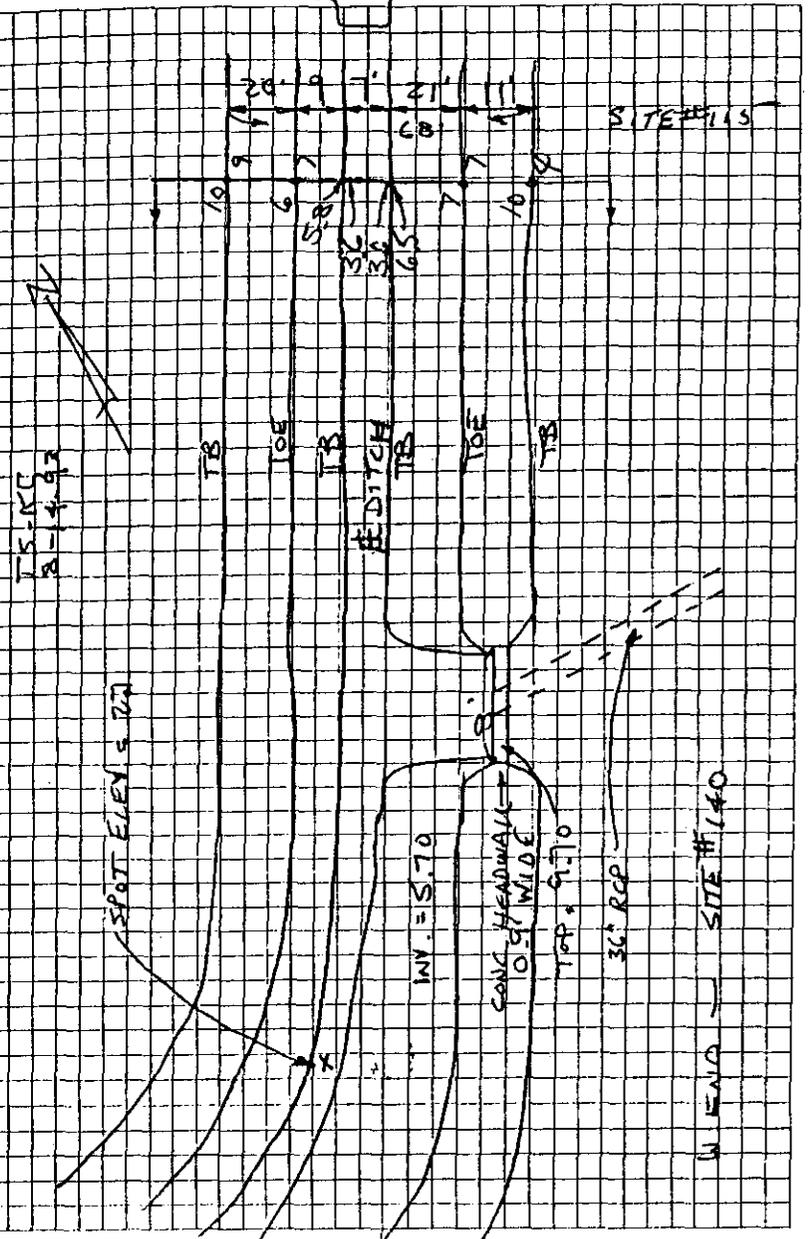
AS
NOTED
DESIGN
1/16/63

SITE # 116

DIETZGEN NO. 3846

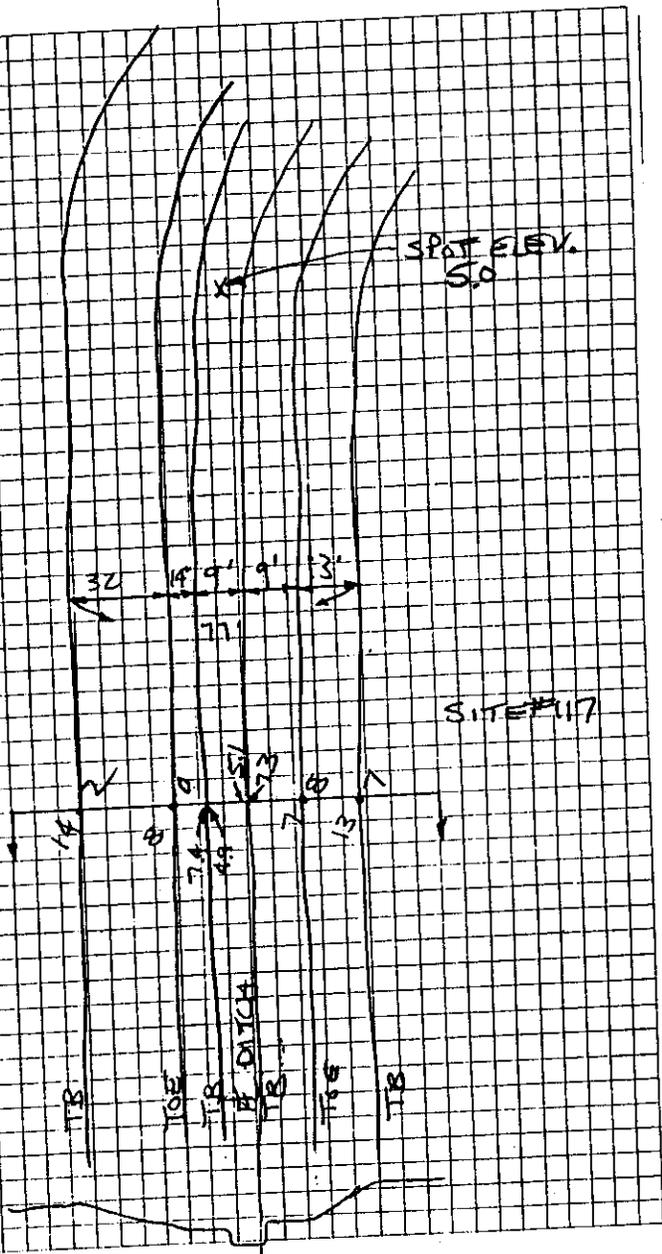


DIETZGEN NO. 384-6

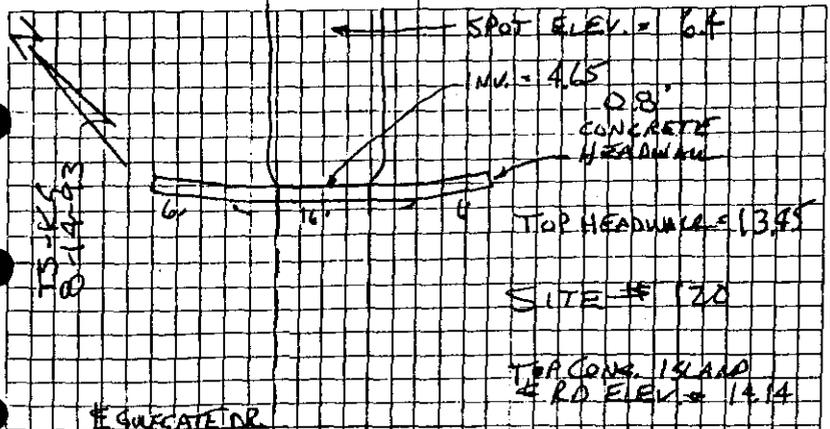


DIETZGEN NO. 384-6

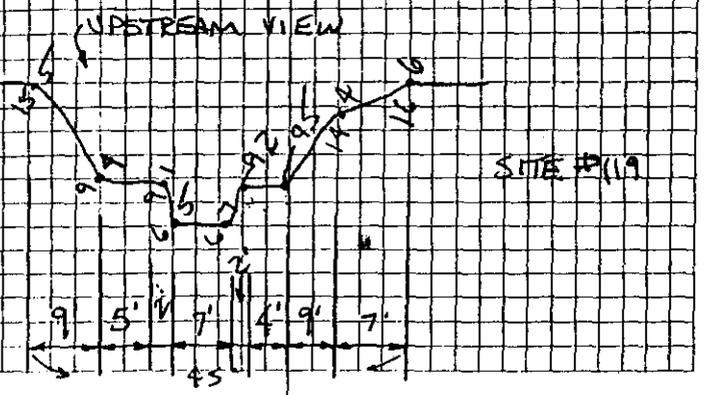
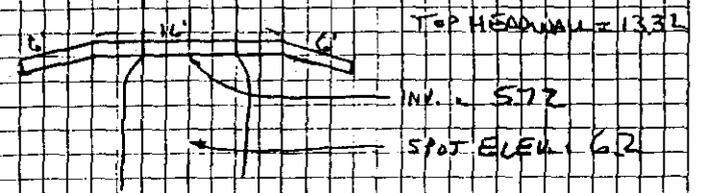
TS-KS
8-14-53



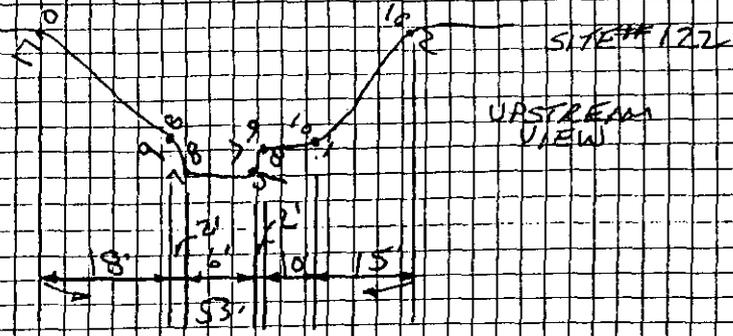
(21)



NOTE: PIPE DIMENSION
 NOT UNIFORM - SWLY 15'
 MEASURES 6" I.D. -
 REMAINDER MEASURES 7"



DIETZEN NO. 3846



SITE # 122

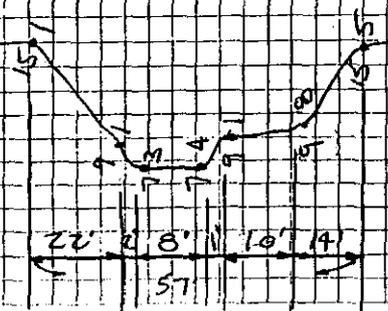
UPSTREAM VIEW

WISKEY
7.9

HARLAN WASTEWATER
MANAGEMENT
PLANT BY RESIDENT
2637 & RISHMAN

SPOT ELEV.
BETWEEN
21 + 133

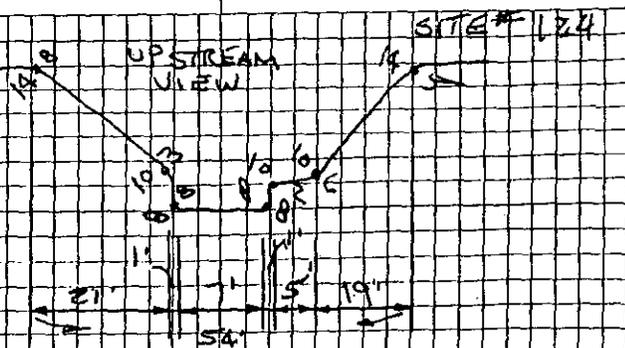
DIETZEN NO. 3846



SITE # 122

UPSTREAM VIEW

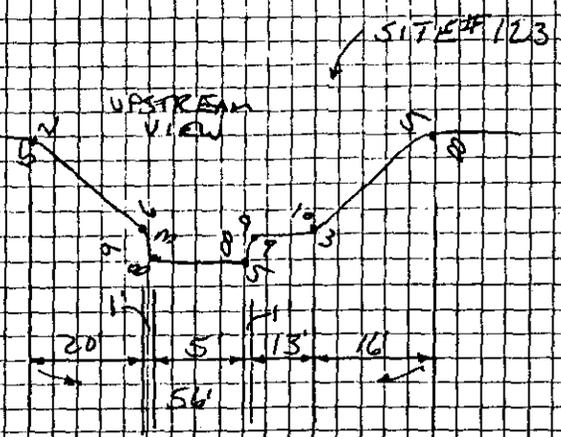
TSL-KP
8-16-93



TS-KS
8-16-93

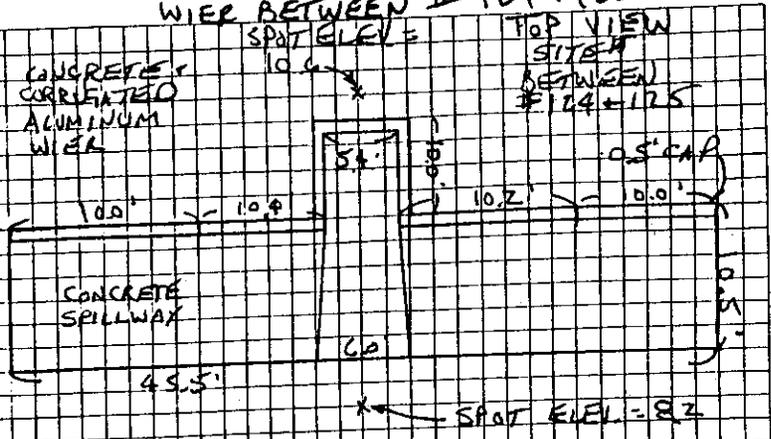
3.3
SPOT ELEV
BETWEEN
#123 + 124

DIETZGEN NO. 3846



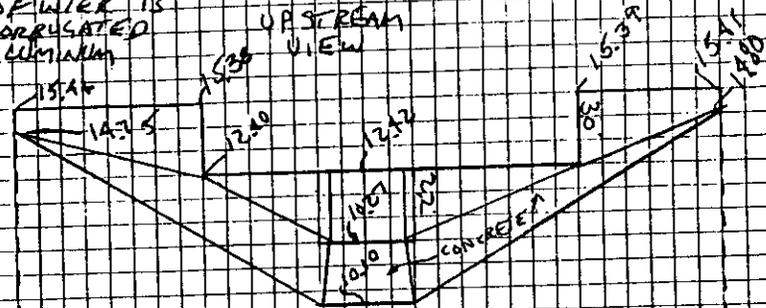
1.7
SPOT ELEV
BETWEEN
#122 + 123
E.P. DATUMS

WIER BETWEEN II 124 + 125



DIETZEN NO. 384-6

VERTICAL PORTION OF WIER IS CORRUGATED ALUMINUM

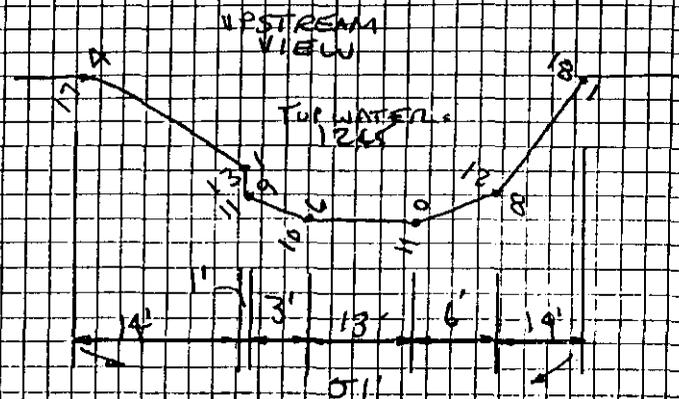


T.S. - K.S.
8-10-93

25

TS-KC
8-12-93

12.6
SITE # 126



NOTE: HIGH WATER MARK, JUNE 1992
FLOOD POINTED OUT BY RESIDENT
- 6-6-92 - RABBIT
ELEV 3.77 - 1.8

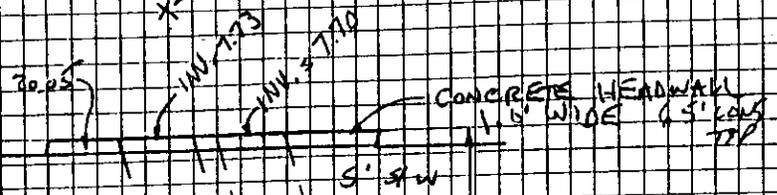
ADDRESS: 100 E. OF WIER
STATION ON R.D. 1

26

SITE ELEV. 127

TOP WATER = 127.3

SPOT ELEV. 100



BRIDGE 174.060

BENEVA RD N.

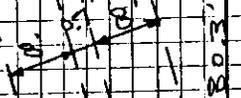
ISLAND

DIETZGEN NO. 384-6

90 LF
2 CONCRETE
BOX CULVERTS
8' X 8' EACH

BENEVA RD S.

5' SW



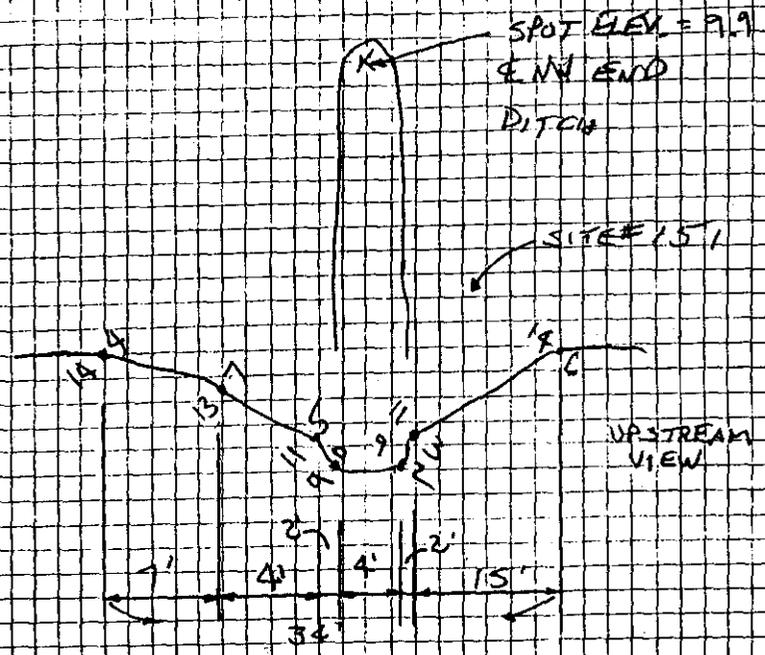
INV. 7.83

INV. 7.58

SPOT ELEV. 107



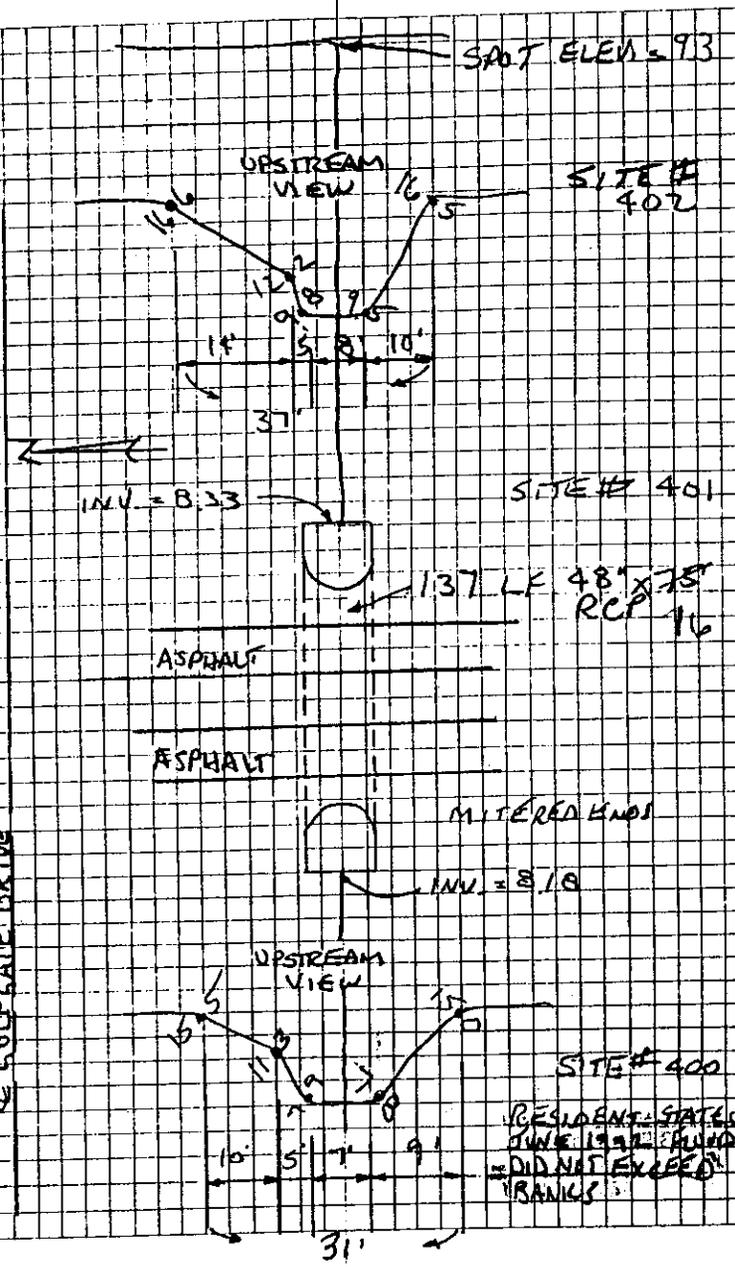
DIETZEN NO. 384-6



39 LF 48" CAP

RECAPTA DA
 4/20/1965





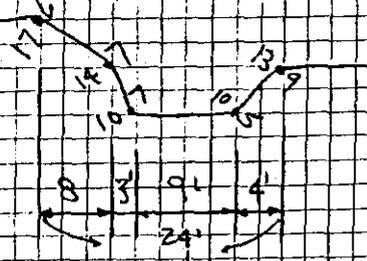
DIETZGEN NO. 384-6

PS-K-6
0-16-83

4.7

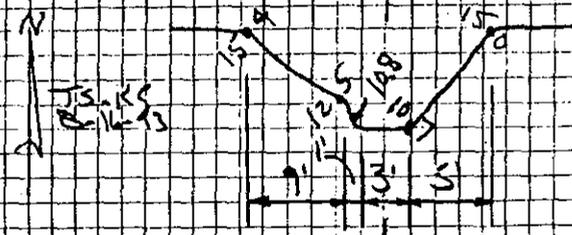
TOP STANDARD WATER 11/49

SITE # 405



DIETZEN NO. 384-6

SITE # 404

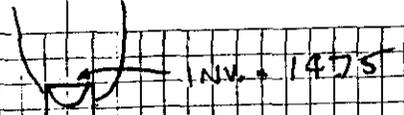


SITE # 403

E COLLEGE DR

← 109 LF 44" x 12" CMA

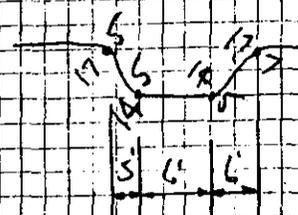
← INV. = 9.55



SITE# 412

ELOCKWOOD RIDGE

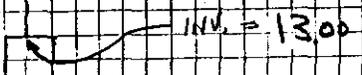
59 LF 18" x 30" RCP



SITE# 411

DIETZGEN NO. 384-6

Z
TS-KC
8-18-98

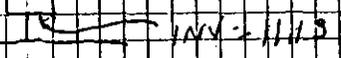


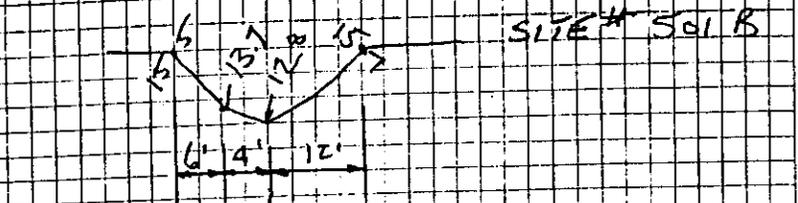
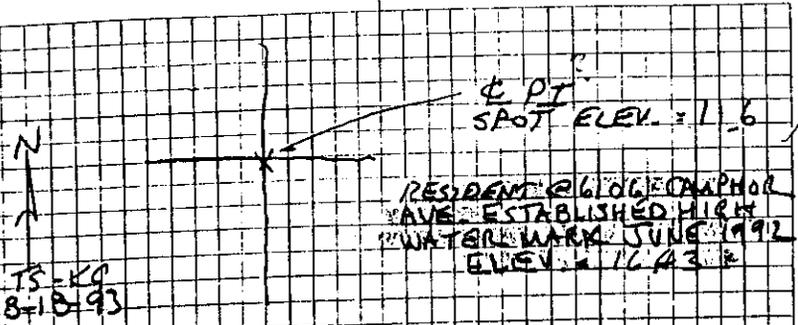
15" DIA. INLET
TOP GRATE = 14.65
E = 11.98

59 LF
28 LF

15" DIA. INLET
TOP GRATE = 14.18
E = 11.46

SITE# 410
69 LF 18" x 24" CAP





DIETZEN NO. 3846

TOP GRATE = 15.37
 INV. N = 13.55
 INV. S = 13.55
 INV. W = 13.55

11" x 18" C&D
 TYR

SITE # 408

E VALLEY FORGE
 SF

TOP GRATE = 15.41
 INV. N = 13.67
 INV. S = 13.67
 INV. W = 13.67

10 LF 14" x 22" RCP
 INV. = 13.60

2' x 2' INLET

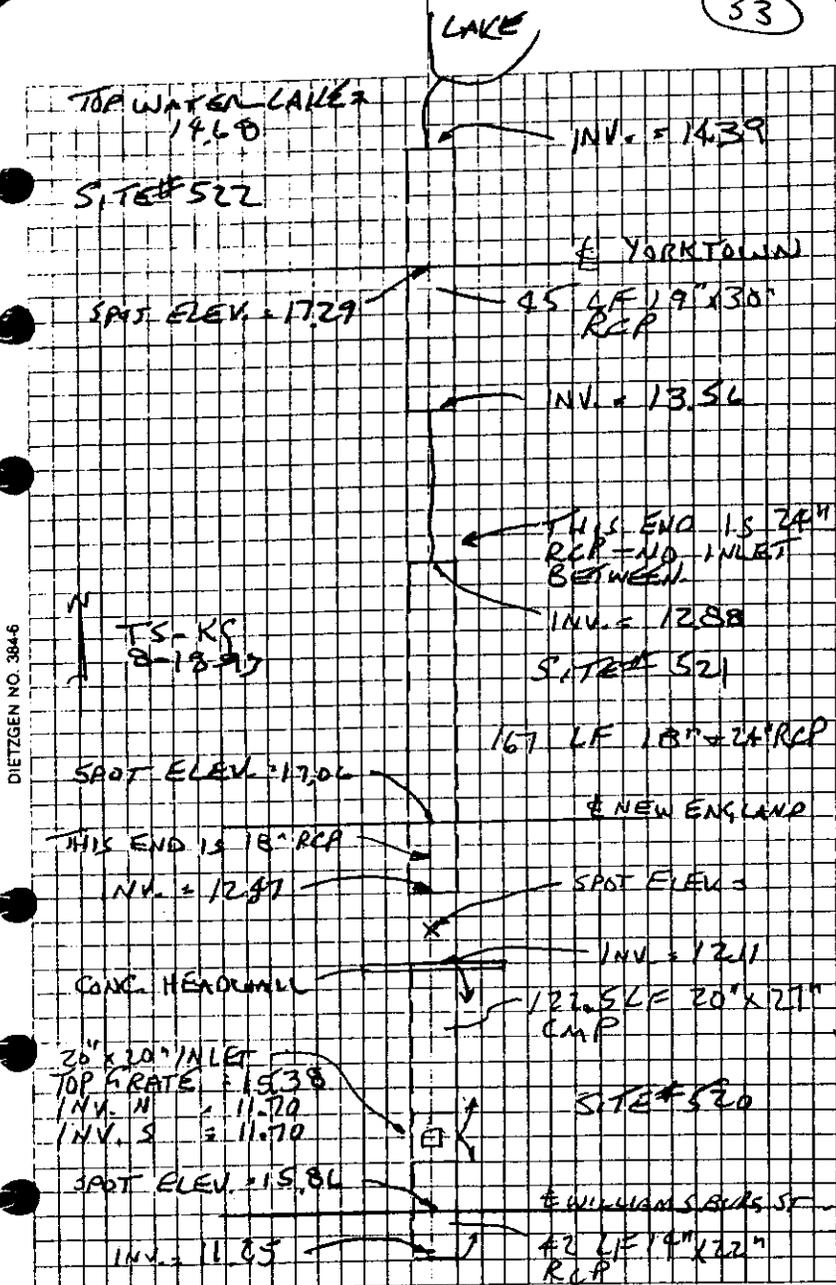
36 LF 14" x 22" RCP

ERD ELEV. = 15.36

2' x 2' INLET

10 LF 14" x 22" RCP

INV. = 13.67



THIS HAS THIS
MISSING ELEVATION FILLED

IN.

33

TOP WATER LAKE
14.60

LAKE

INV. = 14.39

SITE # 522

YORKTOWN

SPOT ELEV. = 17.29

45 LF 19" x 30" RCP

INV. = 13.56

THIS END IS 24" RCP - NO INLET BETWEEN

INV. = 12.88

SITE # 521

TS-RS
2-13-97

167 LF 18" x 24" RCP

SPOT ELEV. = 17.06

NEW ENGLAND

THIS END IS 18" RCP

INV. = 12.47

SPOT ELEV. = 14.3

INV. = 12.11

CONC. HEADWALL

127.5 LF 20" x 24" CMP

25" x 20" INLET
TOP GRATE = 15.38
INV. N = 11.70
INV. S = 11.70

SITE # 520

SPOT ELEV. = 15.86

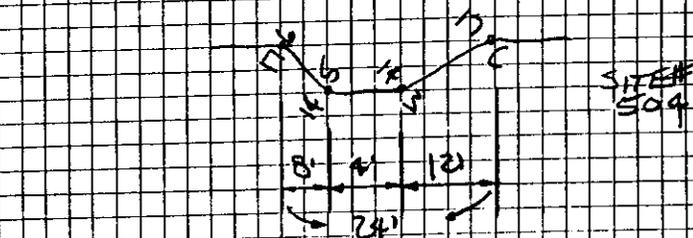
WILLIAMSBURG ST

INV. = 11.85

40 LF 14" x 22" RCP

DIETZGEN NO. 3846

DIETZGEN NO. 384-6



SITE # 504

T.S. - K.S.
8-19-23



EMURDOCK AVE

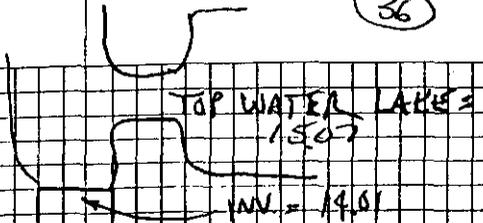
SPOT ELEV. 16.37

SITE # 503

INV. = 1340
INV. = 1346

36

TS-K5
8-11-93



SITE # 505

DIETZGEN NO. 3846

121 LF
38" x 20" CMP

28" x 43" CMP

INV. = 14.70

INV. = 14.40

INV. = 14.40

CONCRETE STORM
INLET
M.H. RIM ELEV. = 18.58

CONC. SPILLWAY
78" L x 0.15"
WINDOW = 17.56

INV. = 14.35

LOCKWOOD
BRIDGE RD.

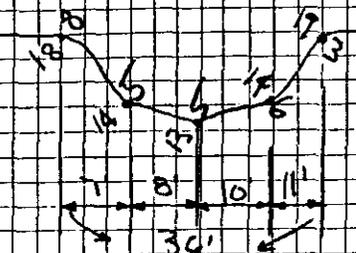
SPOT ELEV. = 18.75

37 LF 19" x 24"
CMP

INV. = 14.24
INV. = 14.37

37

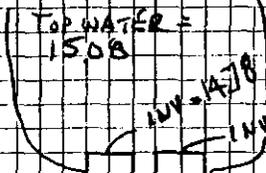
DIETZEN NO. 3846



SITE #
507



SITE # 506

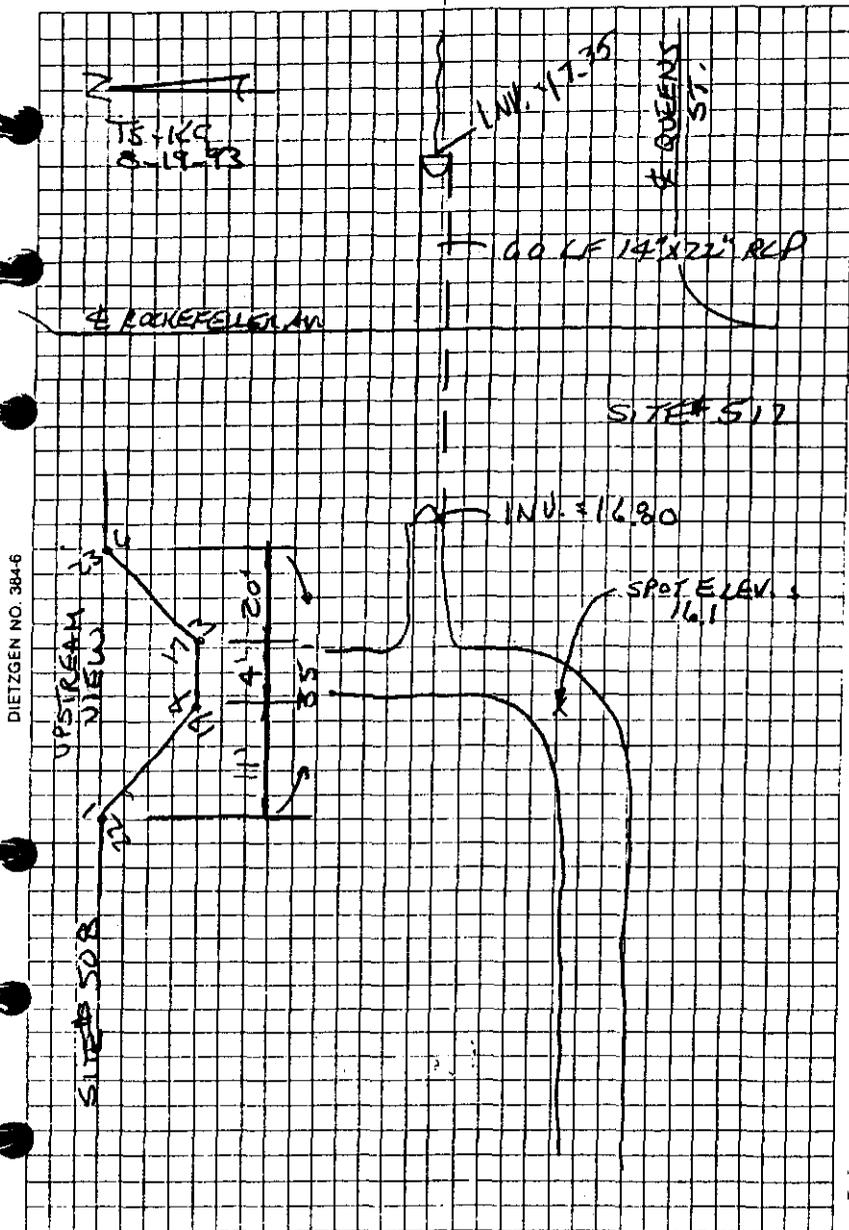


44 LF
14" X 22" RCP

E NELSON AV.

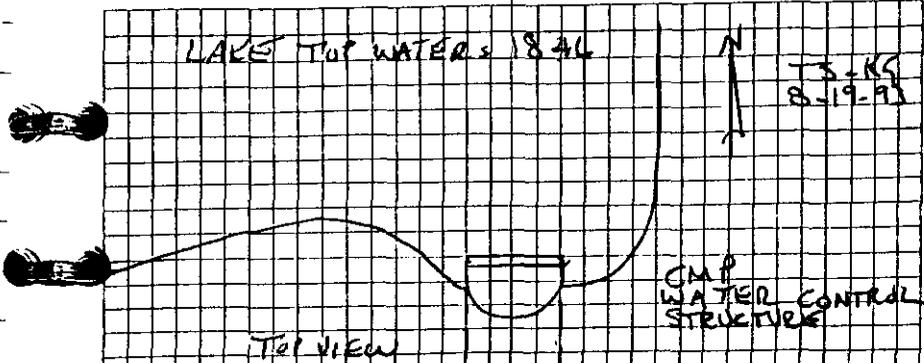
SPOT ELEV.

INV = 14.90
INV = 14.53



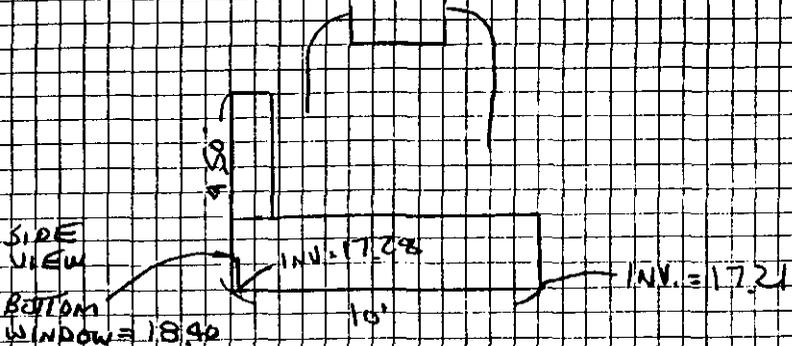
LAKE TOP WATER = 18.46

T.S. KS
8-19-93

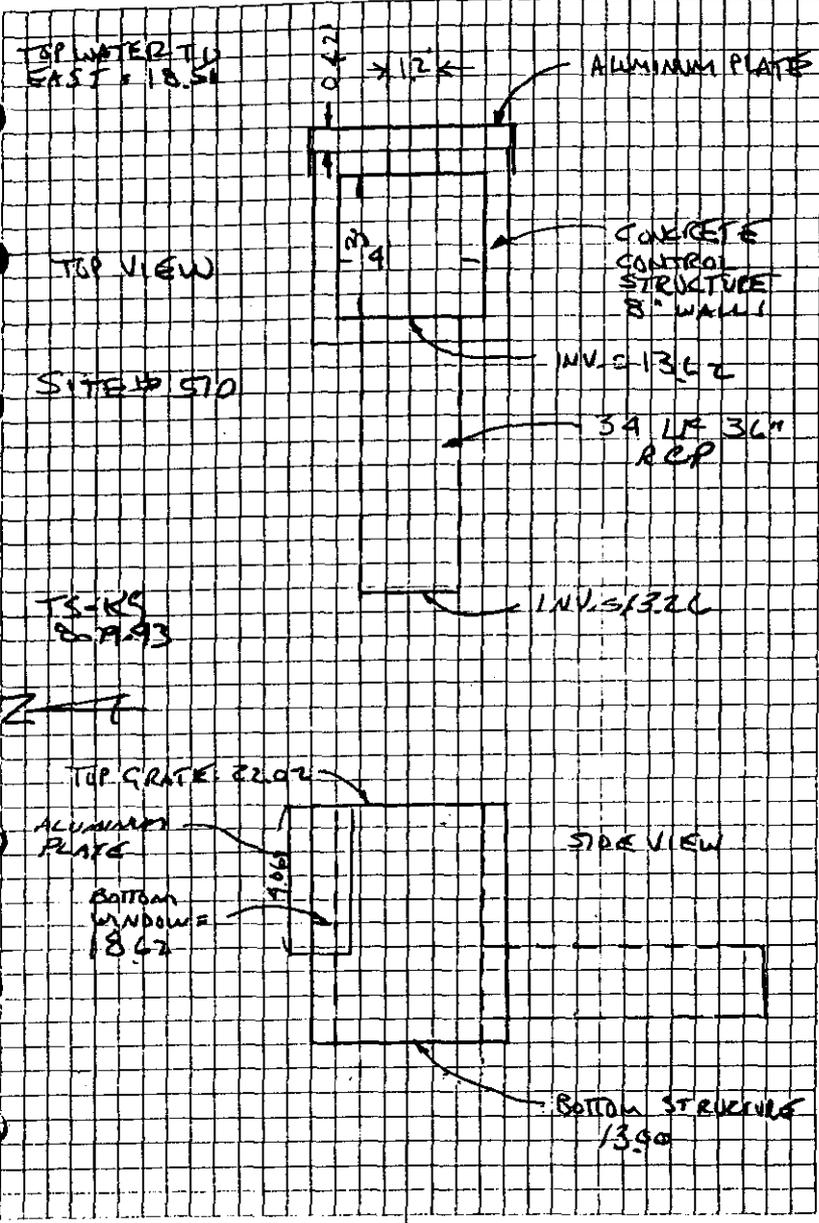


10 LF 30" CMP

DIETZGEN NO. 3846



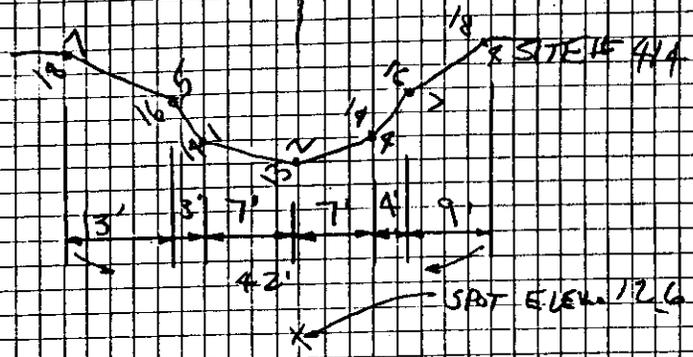
SITE # 509



18 KS
2-19-93

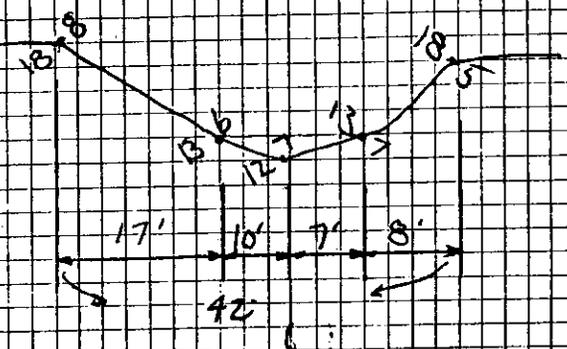
SPOT ELEV = 11.9

HIGH WATER ELEV
JUNE 1992 = 12.7



SPOT ELEV = 12.6

SITE # 413

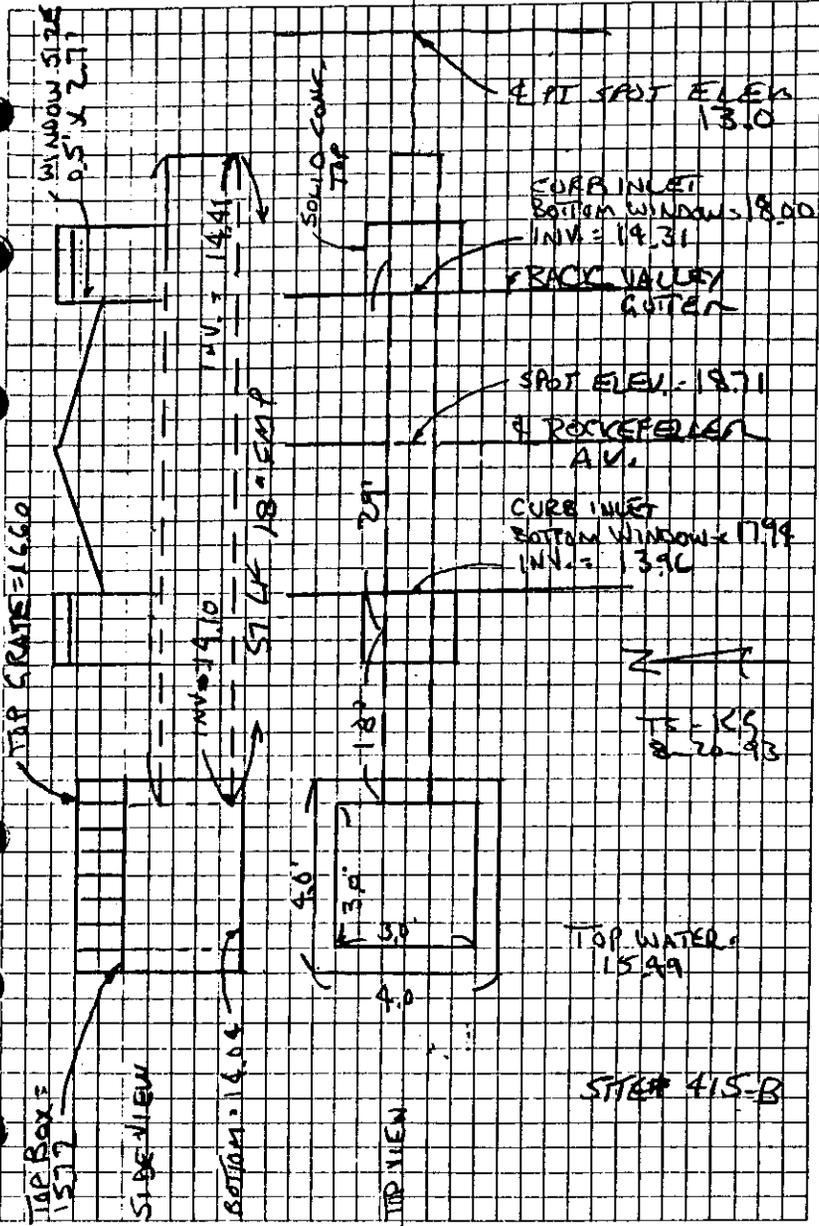


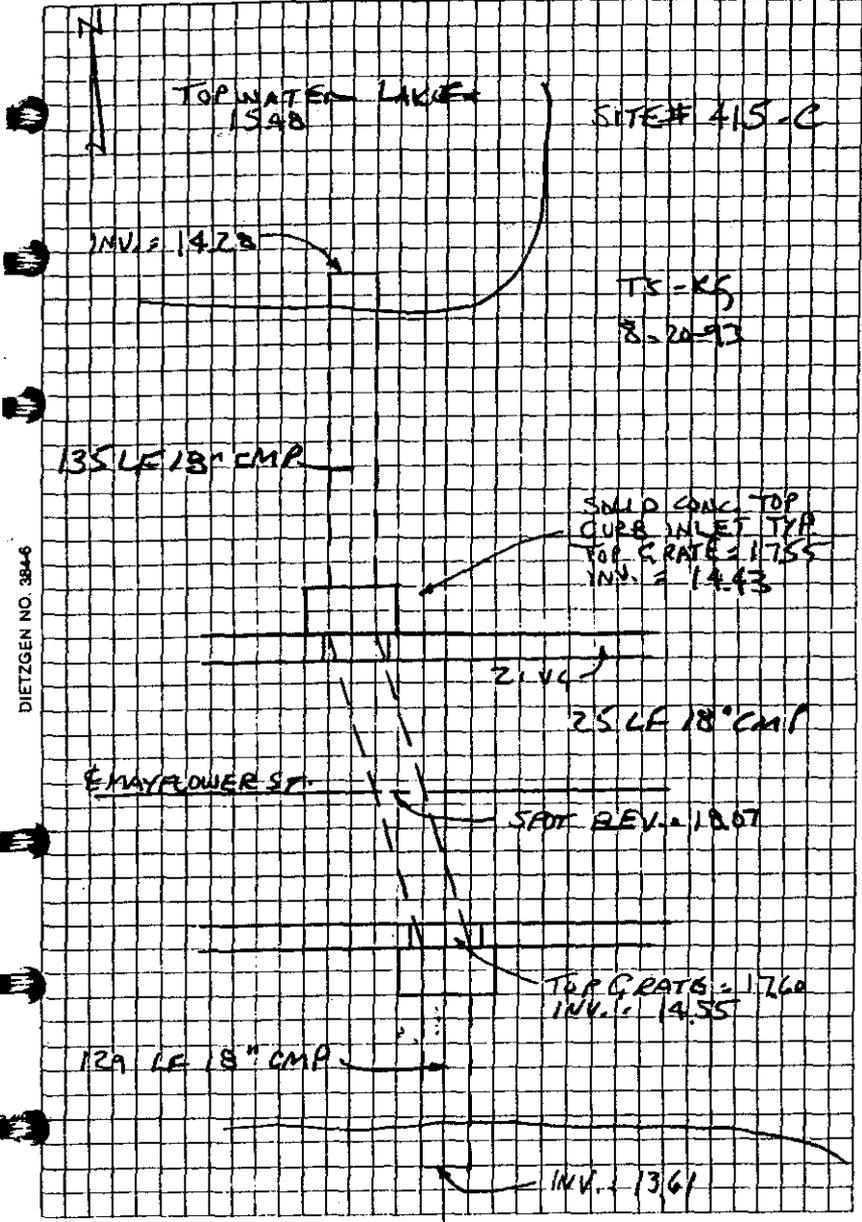
SPOT ELEV @ P1
12.7

415-A

DIETZGEN NO. 3846

DIETZEN NO. 3846





DIETZGEN NO. 3846

46

TOP WATER = 13.00
 INV. = 10.85

3.5' 24" CMP

142 LF 24" CMP

CURB WINDOW = 0.5' x 40'

CURB INLET
 M/H RIM = 16.48
 BOTTOM WINDOW = 15.62
 INV. E = 10.83
 INV. W = 10.93

EKENMOOSE

SPOT ELEV. = 16.13

33 LF 24" CMP

CURB INLET
 BOTTOM WINDOW = 15.45
 INV. E = 10.80
 INV. W = 10.76
 M/H RIM = 16.28

286 LF 24" CMP

TS-KS
 S. 20513

SITE # 162

DIETZEN NO. 3846

E ROWLINE SPV

SPOT ELEV. = 17.30

STORM M/H
 RIM ELEV. = 8.73
 INV. E = 10.83
 INV. W = 10.83

174 LF 24" CMP

CONC HEADWALL

35 LF 24" CMP

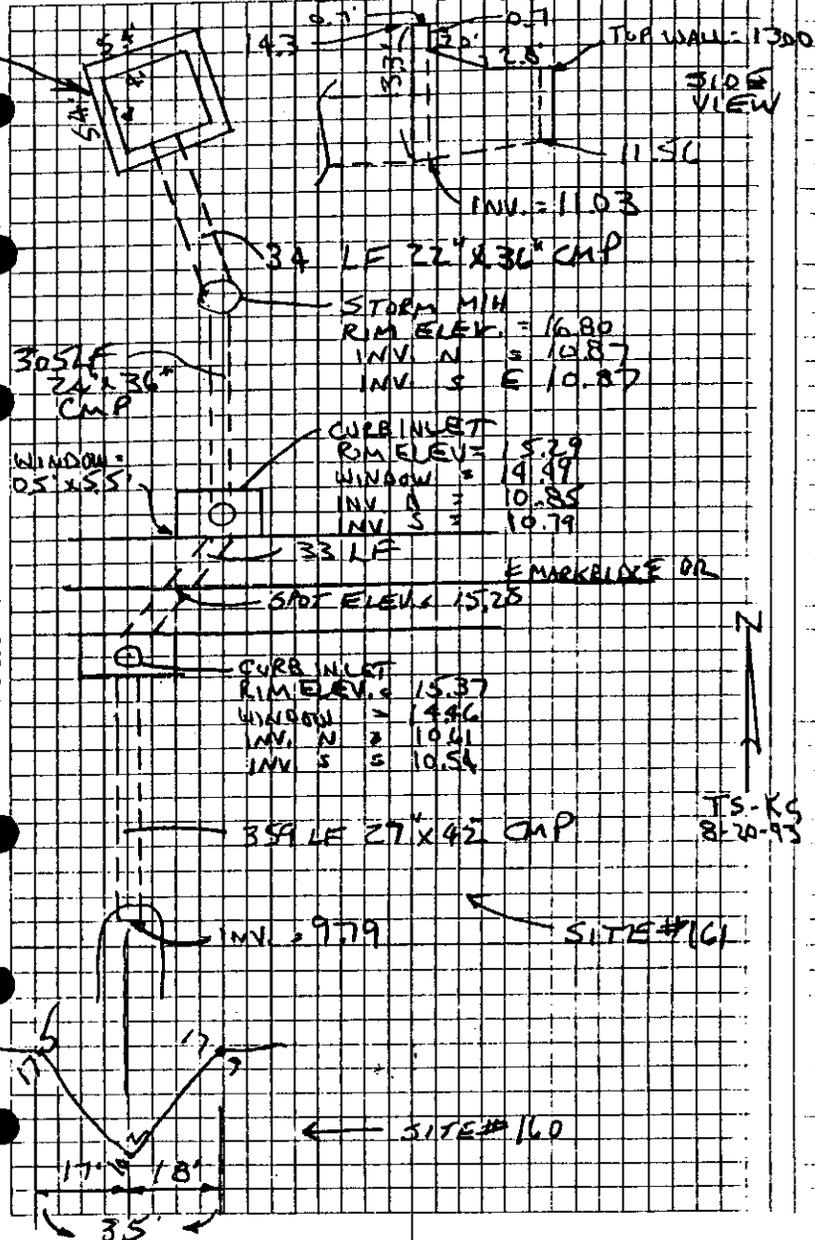
INV. = 9.43

TOP WATER = 12.90

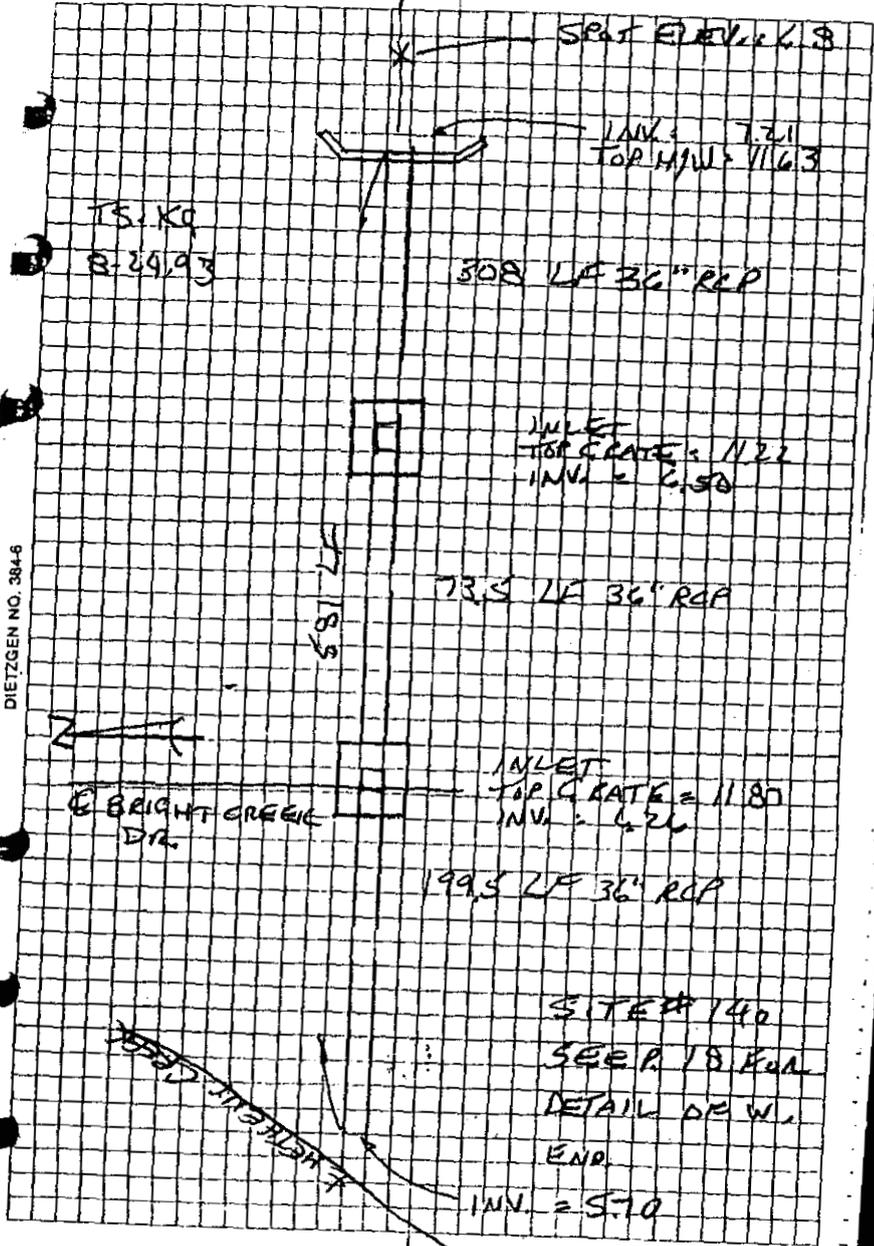
BLOCKED BY
SCREEN

(47)

CONCRETE CONTROL STRUCTURE



48



DIETZGEN NO. 3846

TS. KG
B-29,93

SPAT ELEV. 6.8

INLET
TOP CRATE = 11.22
INV. = 6.50

308 LF 36" RCP

581 LF

73.5 LF 36" RCP

BRIGHT CREEK
DR.

INLET
TOP CRATE = 11.80
INV. = 6.26

199.5 LF 36" RCP

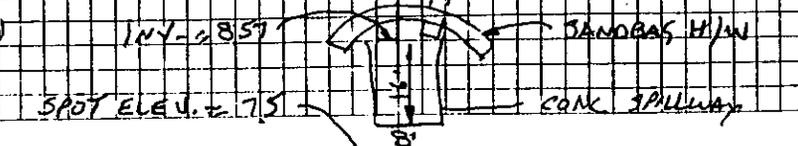
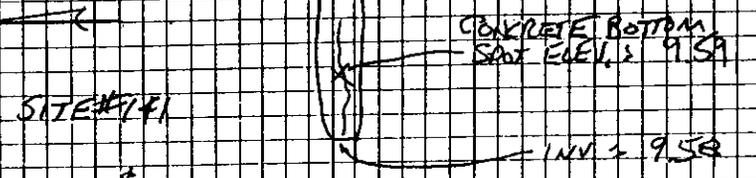
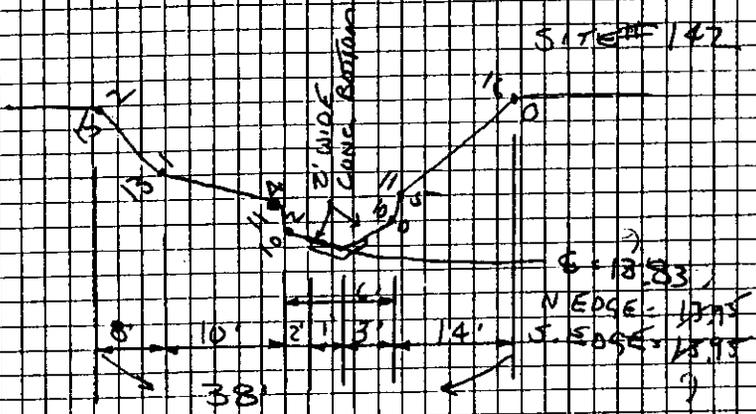
SITE # 140
SEE P. 18 FOR
DETAIL DR W.
END

INV. = 5.70

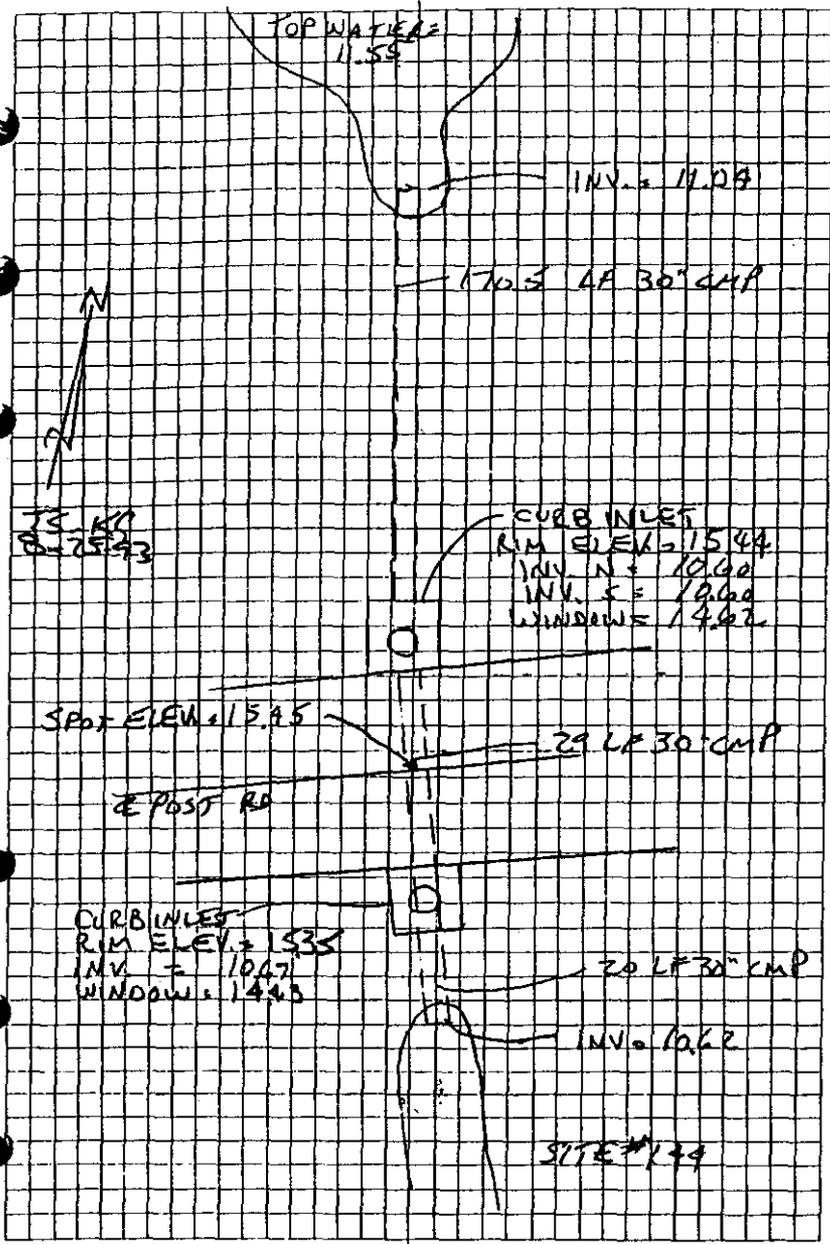
BRIDGE

15. KS
8.24.73

DIETZGEN NO. 3846



(51)



DIETZEN NO. 3846

Z

3-46
8-25-93

INV. - 13.18

-6.55 LE 14' X 23' RCP

CASE 57

SPOT ELEV. 15.37

INV. - 13.49

SITE # 105

53

SITE # 146

NOTE: N END PIPE ONLY

12" VERTICAL x 18" HORIZ

INV. = 12.29

N
N

142 LF 15" CMP

SAND BAR
HEADWALL

T5-K5
8-25-93

CURB INLET
RIM ELEV. = 15.52
INV. N : 12.18
INV. S : 12.38
WINDOW 1A6B

SPOT ELEV. = 15.60

POST RD

154 LF 18" CMP

DIETZEN NO. 3846

~~STREET~~

NOTE: W END CMP

1/2 BLOCKED BY SAND - SPOT ELEV. = 12.27

CURB INLET
RIM ELEV. = 15.32
INV. NE : 12.38
INV. SW : 12.41
INV. N : 12.43
WINDOW 1B3

SPOT ELEV. = 15.19

CURB INLET
RIM ELEV. = 15.36
INV. N : 12.16
WINDOW 1A6B

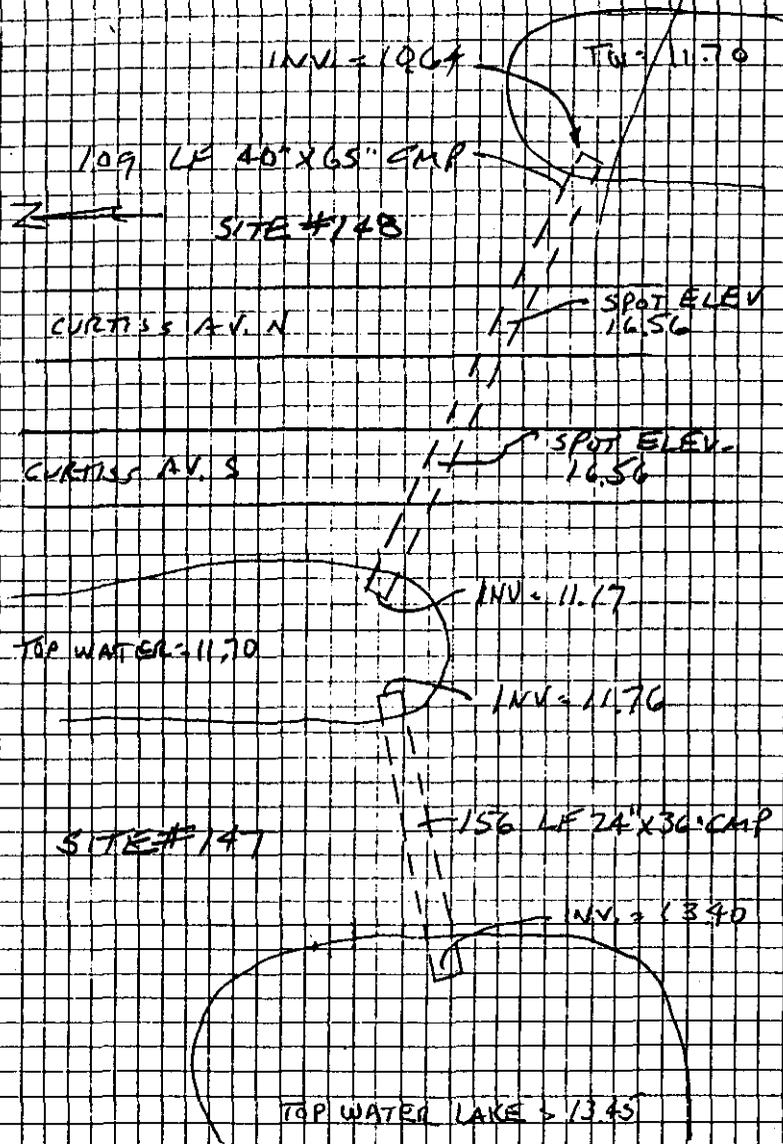
136 LF 24" x 17" CMP

INV. = 11.90

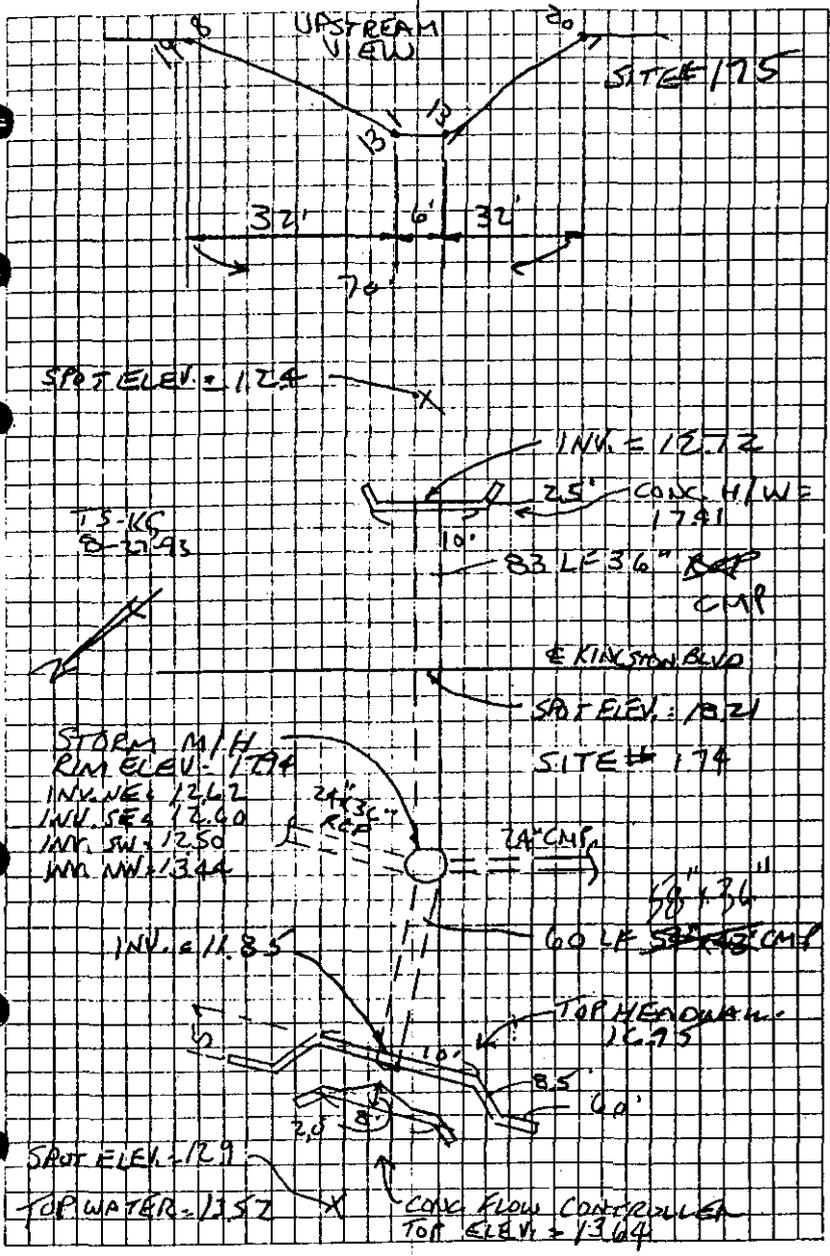
BOUNDARY DRIVE

(54)

T.S. - R.S.
8-25-93



DIETZEN NO. 384-6



DIETZGEN NO. 3846

56

13-KS
8-21-93

SITE # 176

LAKE TW = 14.89

DIETZGEN NO 3846

25'

1.1'

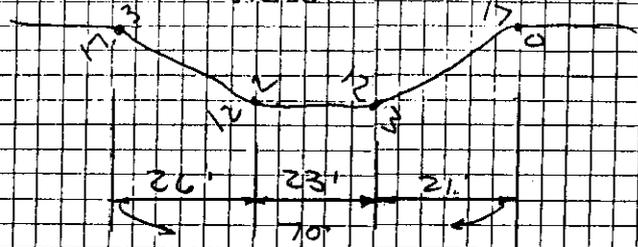
CONCRETE W/EN
TOP ELEV. = 14.87

SPOT ELEV. 13.8

(5)

SITE # 173

UPSTREAM
VIEW



DIETZGEN NO. 384-6

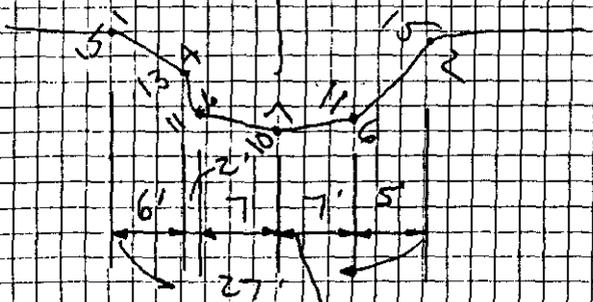
SPT ELEV. 104
TOP WATER = 1252

SITE # 130

SITE # 128

SPOT ELEV. 10.3

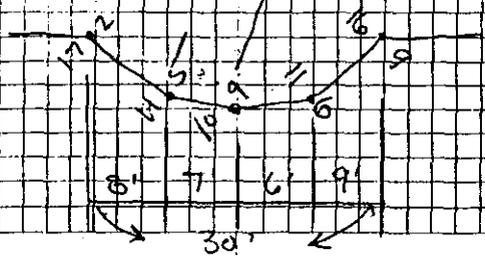
SITE # 131
~~138~~



SITE # 13

8-21-93

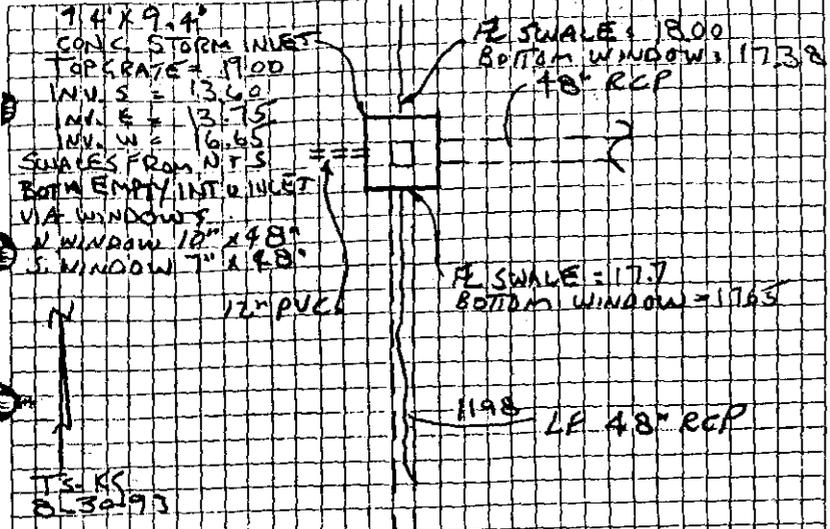
SITE # 130
~~139~~



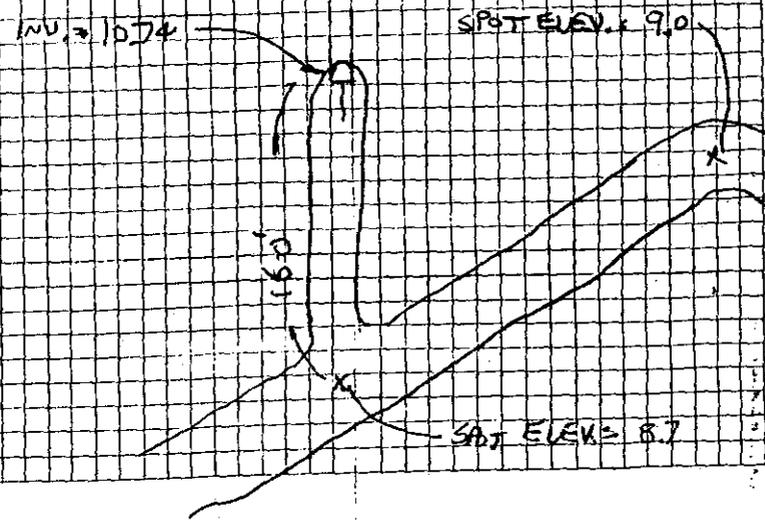
DIETZEN NO. 3846

60

SITE 190



DIETZEN NO. 3846



(67)



TRICK
8-30-73

X SPOT ELEV. 21.4

R/R

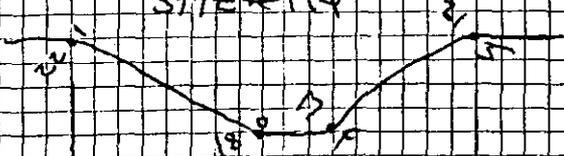
SITE # 195



X SPOT ELEV. 18.5

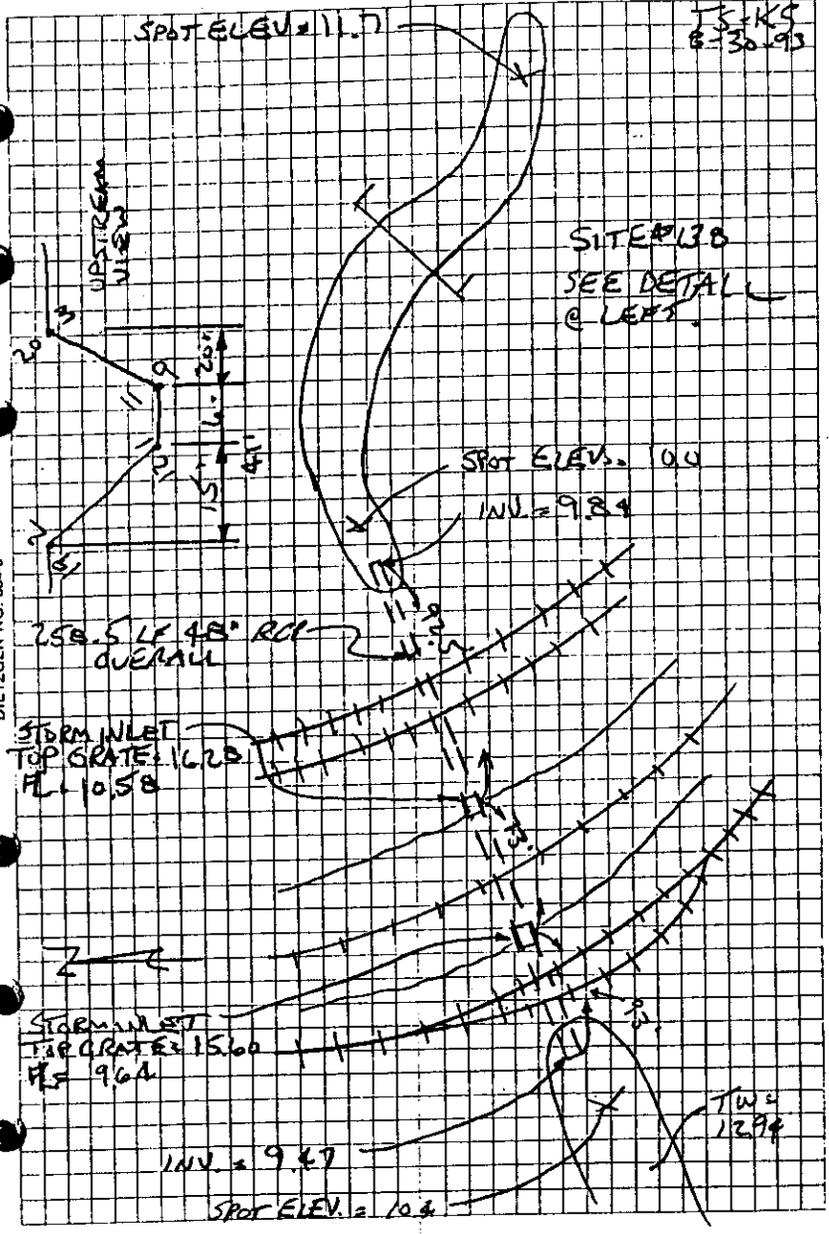
DIETZEN NO. 3846

SITE # 194



SPOT ELEV. = 11.7

TK-KS
8-30-93



SITE #138
SEE DETAIL @ LEFT

SPOT ELEV. = 10.0
INV. = 9.84

2.5% S. LF 48' RCJ
OVERALL

STORM INLET
TOP GRATE = 10.28
FL = 10.58

STORM INLET
TOP GRATE = 15.00
FL = 9.64

INV. = 9.47
SPOT ELEV. = 10.3

TW = 12'0"

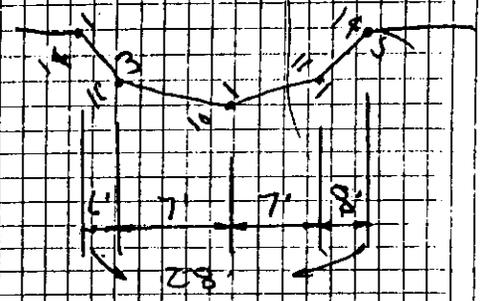
DIETZGEN NO. 384-6

64

TRK 9
2.

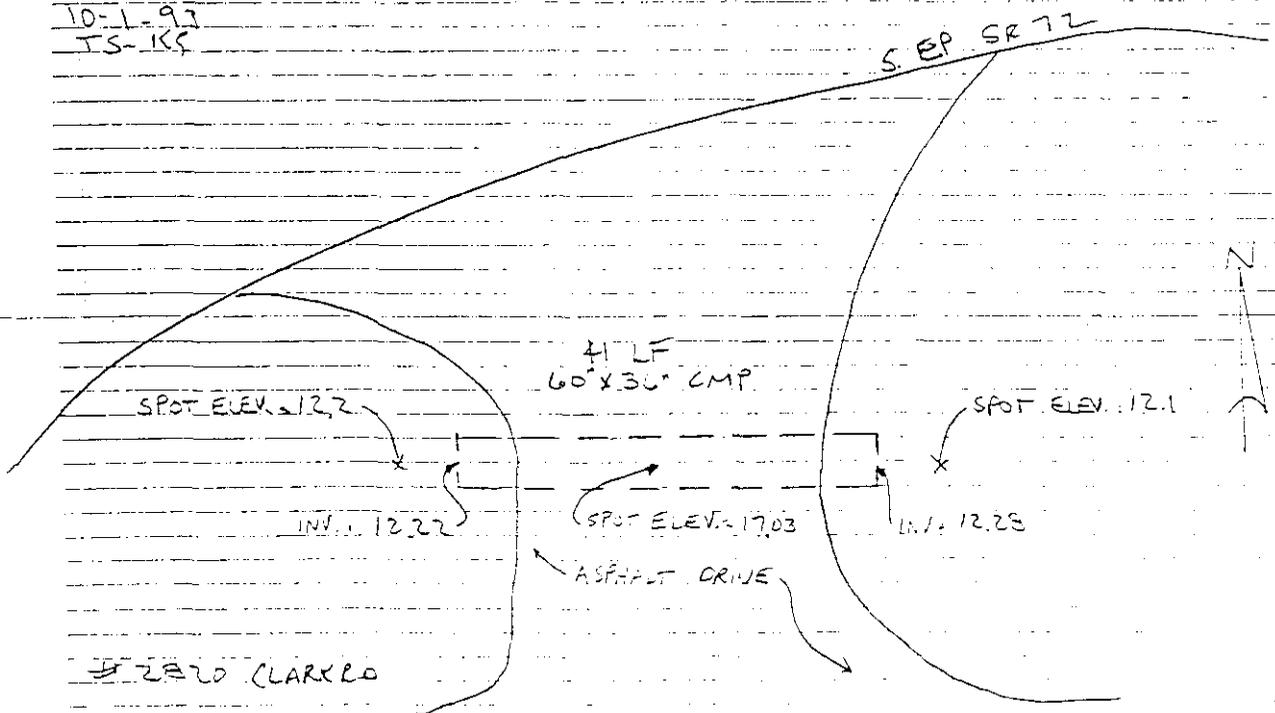
SITE 132 ✓

UPSTREAM VIEW

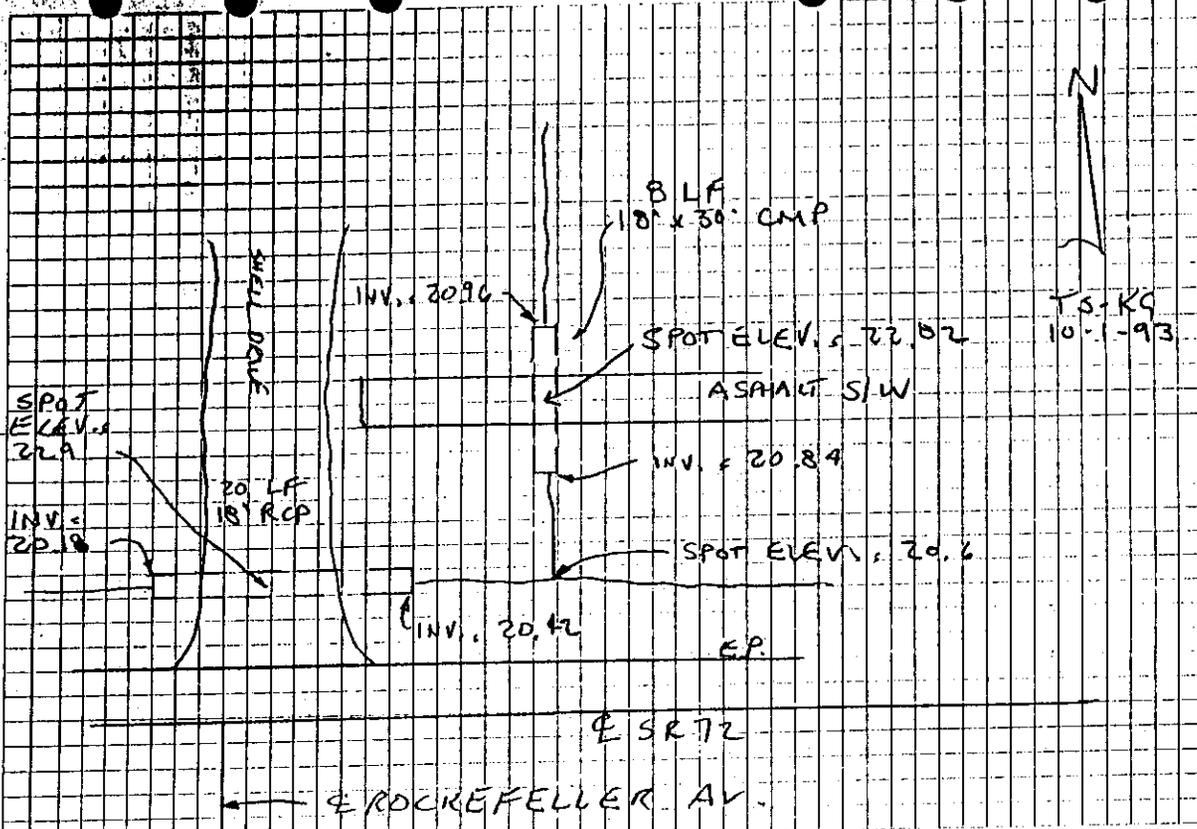


DIETZEN NO. 384-6

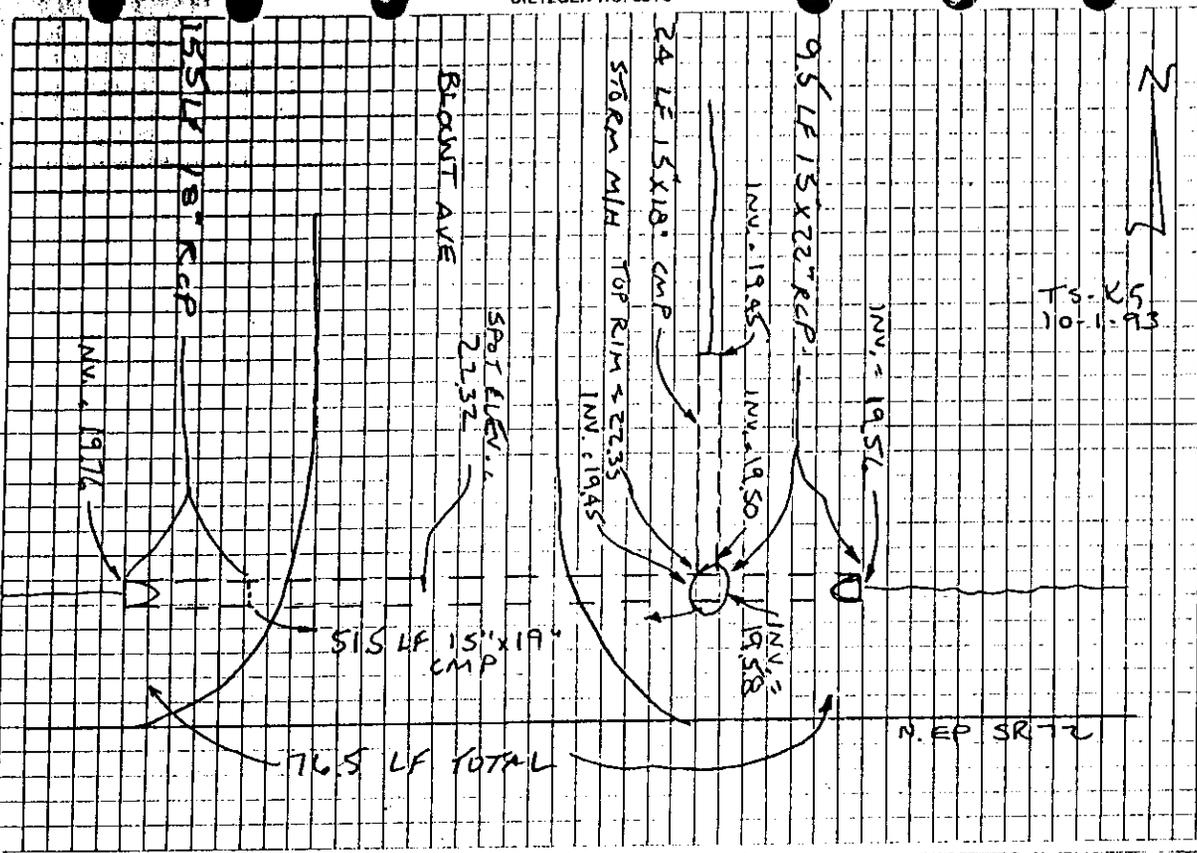
10-1-93
TS-185



DIETZGEN NO. 3846



(79)



DEVELOPMENT PLANS

Residential Developments

1. Ashton Lakes
2. Beneva Oaks
3. Beneva Oaks II
4. Beneva Place
5. Buccaneer Plaza
6. Colonial Terrace
7. Coral Lake Condo
8. Denham Acres, Unit No. 1
9. Golden Acres
10. Golden Acres, First and Second Additions
11. Golden Lakes, Second Addition
12. Gulf Gate, Units 4 through 15
13. Gulf Gate Church
14. Gulf Gate East, Units 1 through 5
15. Gulf Gate Garden Manor East Condominium
16. Gulf Gate Glens
17. Gulf Gate Manor, Units 1 through 3
18. Gulf Gate School
19. Gulf Gate West
20. Gulf Gate Woods, Units 1 through 3
21. Los Lagos
22. Mohawk Gardens
23. Palm Lakes
24. Phillippi Gardens (Units 5, 6, 15 & 16)
25. Pine Park Centre
26. Shadow Lakes
27. Siesta Heights
28. Siesta Heights Manor
29. St. Thomas Moore Catholic Church
30. Summerside Condominium
31. Sun Haven, Units 2 and Unit 5
32. Sun Oak
33. Sunnyside Lake
34. Swifton Villas Condominium
35. Tregate Manor
36. Village in the Pines
37. Woodside Village East
38. Woodside Oaks Condominium
39. Woodside South
40. Woodside Terrace
41. Villa Gardens

Commercial Developments

1. Beneva Village Shops
2. Gulf Gate Mall
3. Palmer Park of Commerce (Future)
4. Publix Warehouse
5. Stickney Pointe Office Center
6. Winn Dixie Warehouse

7. Outback Steakhouse
8. Robb & Stucky Furniture Store
9. Merchants Pointe Shopping Center

Major Roadway Corridors

1. U.S. 41 (from Stickney Pointe to Pinehurst Street)
2. Beneva Road (from Clark Road to Gulf Gate Drive)
3. Lockwood Ridge (from Ashton Road to Markridge Road)
4. Clark Road (from U.S. 41 to McIntosh Road)
5. Swift Road (from Clark Road to Ashton Road)

Kimley-HornKimley-Horn and Associates, Inc.
ENGINEERS • PLANNERS • SURVEYORS

7202 Beneva Road South Sarasota, Florida 34238 813-922-8187 Facsimile 813-922-2351

July 20, 1992

Mr. Pat Collins
Stormwater Management
Sarasota County
1301 Cattlemen Road
Sarasota, Florida 34232

Re: Rainfall Data for June 1992 Storm

Our Ref 6679.05

Dear Mr. Collins:

As you requested, I have enclosed rainfall information taken from Palmer Ranch gauge no. 1. This data has also been reduced into 1-hour rainfall totals between June 23rd and June 26th (distribution enclosed). Daily and maximum 24-hour, 48-hour and 72-hour totals are also summarized below:

DATE	TOTAL RAINFALL
June 23, 1992	2.44"
June 24, 1992	2.80"
June 25, 1992	9.47"
June 26, 1992	3.60"
	<u>18.31"</u>

DURATION (MODAHR)	MAXIMUM PRECIPITATION
24-hours (062508 through 062607)	9.58"
48-hours (062415 through 062614)	13.28"
72-hours (062316) through (062615)	17.98"

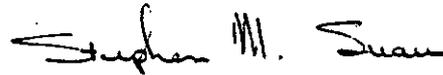
The total rainfall from 062314 through 062616 (75-hours) contained 18.08".

Mr. Pat Collins
Stormwater Management
Sarasota County
July 20, 1992
Page Two

A location map for this rainfall gauge is also enclosed. I will forward information from the two other Palmer Ranch rainfall gauges when available.

Very truly yours,

KIMLEY-HORN AND ASSOCIATES, INC.



Stephen M. Suau, P.E.

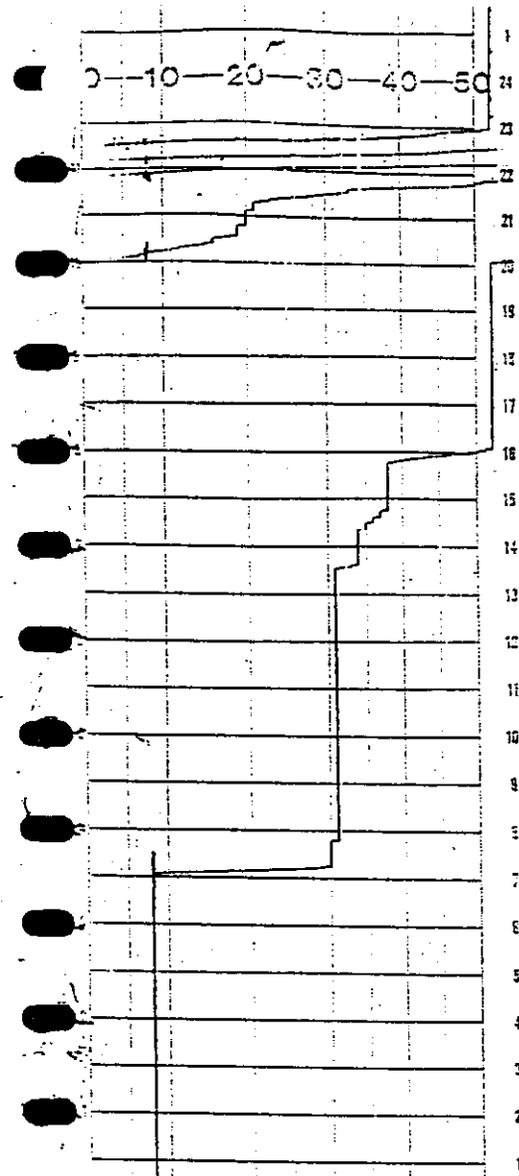
SMS:pjg(#9)

Enclosures

cc: Thomas A. Shoopman, P.E.
J. P. Marchand, P.E.
John Tommer, w/enclosures
James Paulmann

1-HOUR RAINFALL TOTALS JUNE 23 - 26, 1992

HOUR	23RD	24TH	25TH	26TH
0				
1	0.00	0.00	0.00	0.10
2	0.00	0.00	0.12	0.12
3	0.00	0.12	0.01	0.00
4	0.00	0.17	0.00	0.02
5	0.00	1.24	0.00	0.00
6	0.00	0.04	0.00	0.00
7	0.00	0.04	0.00	0.00
8	0.23	0.60	0.57	0.11
9	0.00	0.02	0.23	0.10
10	0.00	0.04	1.01	0.60
11	0.00	0.09	0.91	1.30
12	0.00	0.10	0.54	0.35
13	0.00	0.03	0.28	0.80
14	0.03	0.00	0.43	0.00
15	0.04	0.07	0.15	0.07
16	0.11	0.18	0.21	0.03
17	0.03	0.05	0.05	0.00
18	0.00	0.01	0.86	0.00
19	0.00	0.00	1.75	0.00
20	0.00	0.00	1.89	0.00
21	0.17	0.00	0.42	0.00
22	0.50	0.00	0.03	0.00
23	1.33	0.00	0.00	0.00
24	<u>0.00</u>	<u>0.00</u>	<u>0.01</u>	<u>0.00</u>
	2.44"	2.80"	9.47"	3.60"



NOTES

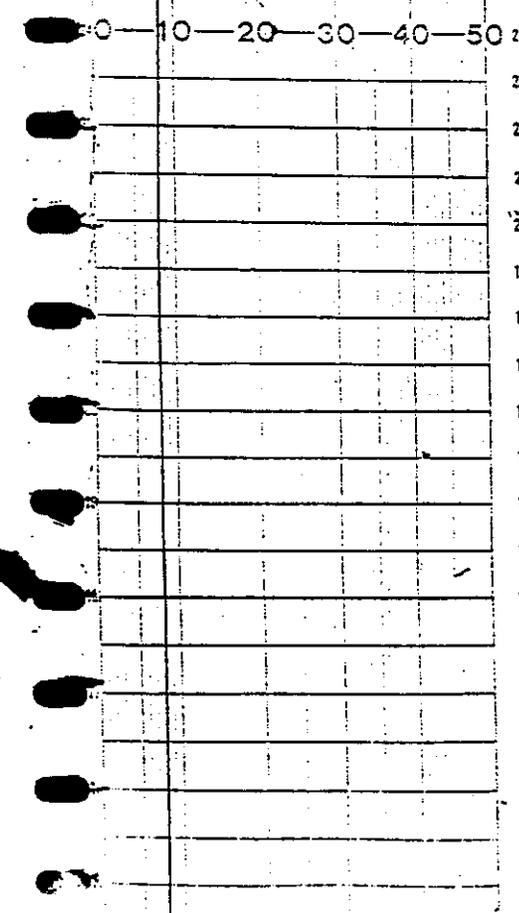
477 H

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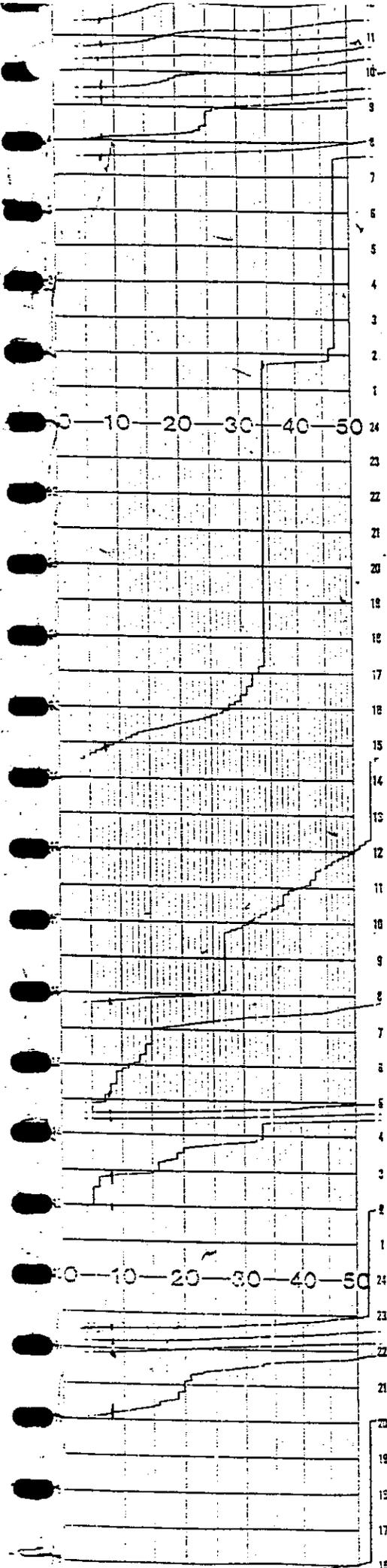
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(B)

June 25, 1962



NOTES



HT HT 9'S
 HT HT 9'S

NOTES

June 24, 1962

HT HT

~~HT HT~~

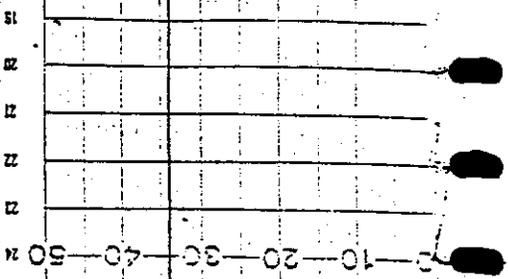
HT HT

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2"

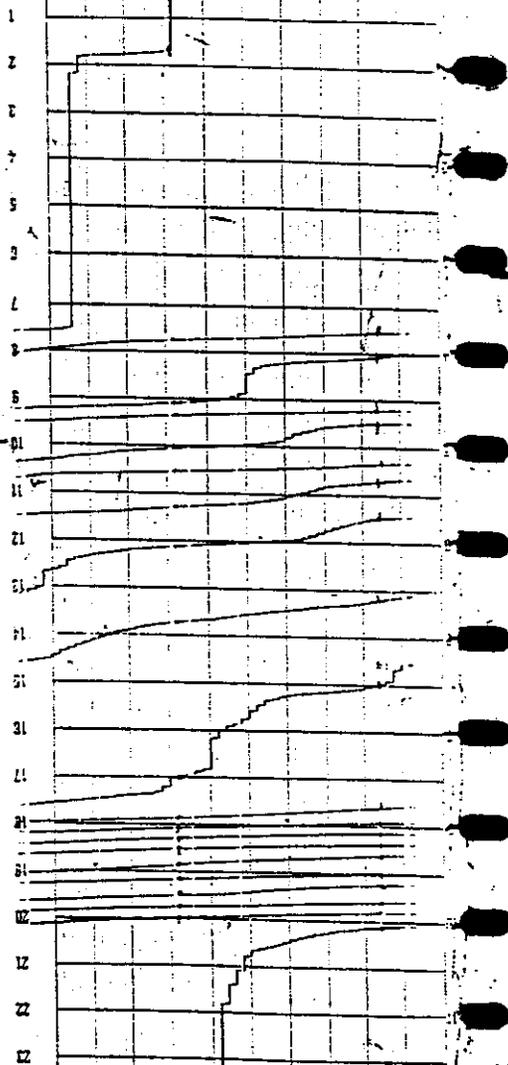
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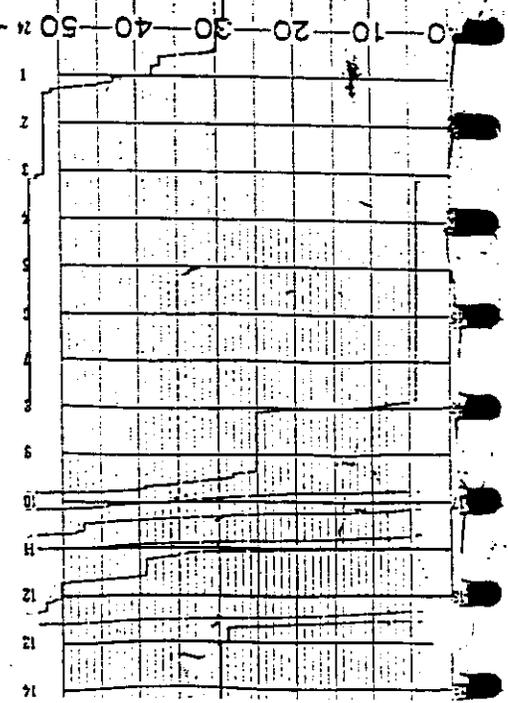


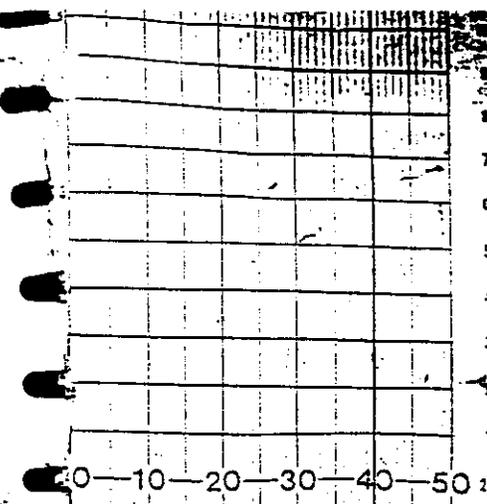
~~20~~
 LHT LHT LHT LHT
 LHT LHT LHT LHT
 June 25, 1962
 25

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LHT 11
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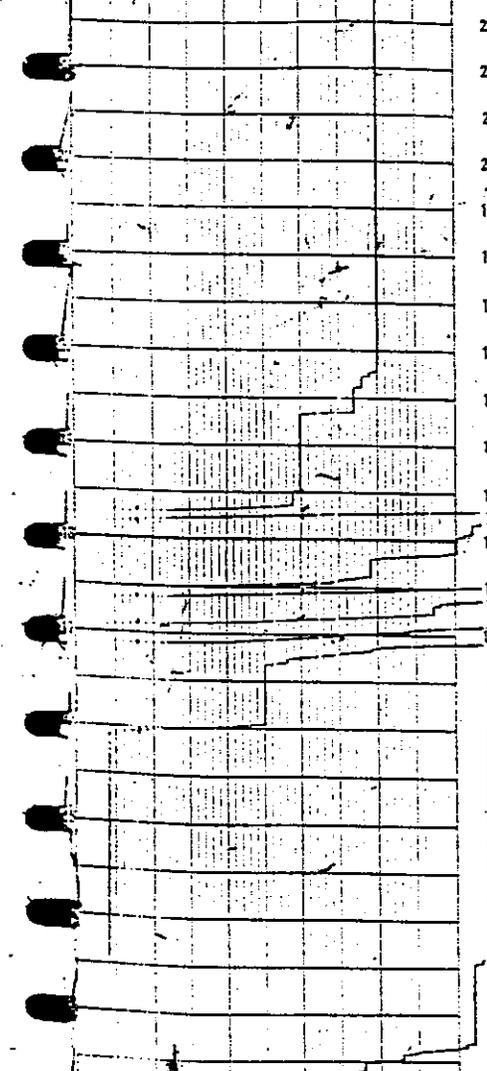
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MA

LIT 11

June 26, 1952



NOTES

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