Goodkind & O'Dea, Inc.
Consulting Engineers and Planners

McKeel Brook Watershed Stormwater Management Plan

FINAL REPORT

Submitted to:
County of Morris
Department of Planning & Development

January 1997

Goodkind & O'Dea, Inc.
Consulting Engineers and Planners

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February 4, 1997

Mr. Ray Zabihach, P.P., Planning Director
Morris County Department of Planning & Development
Planning Board
P.O. Box 900
Morristown, NJ 07963-0900

Re: ***McKeel Brook Watershed***
Stormwater Management Plan
Rockaway Township and
Town of Dover

Dear Mr. Zabihach:

We are pleased to submit fifteen (15) copies of the Final Report for the McKeel Brook Watershed.

We would like to thank your office and Ed Bennett's office for their assistance during this project.

It has been a pleasure working with the County on this project. We are looking forward to working with the County on future projects.

Very truly yours,

Goodkind & O'Dea, Inc.

Peter Black, P.E.
Project Manager

PB:sc
Enclosures

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SECTION I

INTRODUCTION

The purpose of this report is to present the results of our hydrologic and hydraulic analyses of McKeel Brook. This includes identification of flood problem centers, inadequate stream/culvert reaches, flooding remediation alternatives studied, and recommended improvements to McKeel Brook to reduce flooding.

SECTION II

WATERSHED DESCRIPTION AND FLOODING HISTORY

McKeel Brook is the main stream located within the McKeel Brook Watershed, a drainage basin of approximately 1.4 square miles. The McKeel Brook drainage basin is shown in Figure 1. A larger scale Drainage Basin Map is included in Attachment 1. The headwaters of the Brook originate just north of Route 80, east of Mount Hope Road. The Brook flows southward through Rockaway Township before ultimately discharging into the Rockaway River in the Town of Dover. The difference in elevation from the Rockaway River to the upper limit of the watershed is approximately 340 feet.

The Dover portion of the watershed is a fully developed residential community with industrial and commercial development located along Route 46. North of the municipal boundary with Dover, Rockaway Township is characterized by medium to high density residential development and a portion of the Rockaway Townsquare Mall.

At a distance of approximately 2,100 feet upstream of the municipal boundary, a separate stream discharges into McKeel Brook. This tributary, which flows westward along Mount Pleasant Avenue and eventually southward into McKeel Brook, drains most of the eastern portion of the drainage area in Rockaway which consists of single family housing.

In addition to Clarks Pond, the watershed contains several smaller natural ponds and swamp areas which provide some storage capability for stormwater. Detention basins have been installed in recently developed sites, primarily in Rockaway Township the largest one being the McKeel Brook Basin at Fleetwood Drive and Mt. Hope Avenue.

The continuing spread of development, which began in the early 1960s, has increased peak runoff rates and volumes beyond the capacity of the already inadequate stream and culvert drainage

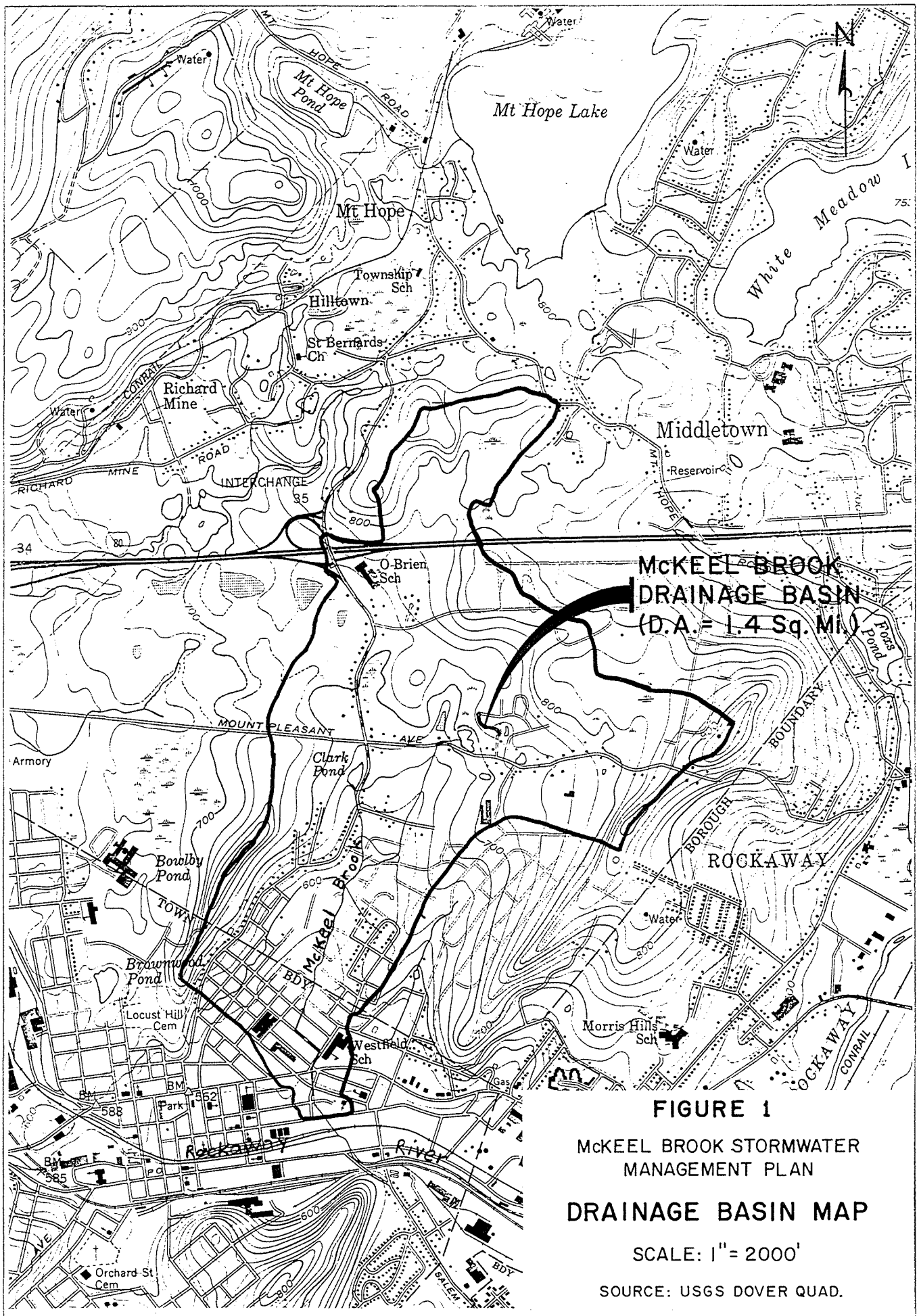

FIGURE 1

McKEEL BROOK STORMWATER MANAGEMENT PLAN

DRAINAGE BASIN MAP

SCALE: 1" = 2000'

SOURCE: USGS DOVER QUAD.

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system of McKeel Brook. In order to reduce flooding and accommodate further development, various sections of the Brook have been enlarged on enclosed with sections of pipe or box culverts. Inadequate pipe/culvert sizing and excessive development have resulted in flooding problems throughout unpiped sections of the stream, representing a continuous threat to the health and safety of those who live and work within the flood prone areas.

Based upon our knowledge of the area and discussions with local residents, frequent flooding occurs in the lower portion of the basin, i.e between Route 46 and Cooper Street. This area is characterized by dense residential development almost entirely within the Town of Dover. The stream system is composed primarily of long box culverts and several small rectangular channel segments. The stream system and adjacent floodplain in this area are relatively flat resulting in an inability to convey peak flows originating in the steeper portion of the drainage basin in Rockaway Township. Residents indicate that flooding occurs 6 to 8 times annually in the lower portion of the basin. Less frequent flooding occurs at and along McKeel Street in Rockaway Township.

SECTION III

HYDROLOGIC AND HYDRAULIC ANALYSES

For the hydrologic analysis the drainage basin was divided into numerous subbasins as identified in Figure 2, Appendix A. Flow was determined for each subbasin using the Soil Conservation Service's TR-55 method and the Army Corps of Engineers HEC-1 computer model. Existing detention basins and channel routings throughout the drainage area were modeled in the HEC-1 computer model. Using this existing conditions model, the peak flow rates for the 2, 10, 25, 50 and 100-year storms at selected nodes were calculated and are shown in Table 1. The hydrologic model and backup data are provided in Appendix A. Table 2 contains a comparison of the HEC-1 existing conditions peak discharges to the peak discharges found in a previous watershed study and the Flood Insurance Studies for both towns.

As shown in Table 2, the HEC-1 peak discharges are significantly greater than those calculated in the Flood Insurance Studies (FIS) of both municipalities. This is due to the Special Report 38 method used in both studies. This method typically underestimates discharges for fully developed watersheds, such as the McKeel Brook watershed, and is no longer accepted as a means to calculate peak discharges by the New Jersey Department of Environmental Protection. However, the HEC-1 peak discharges are very close to those calculated in the Storch study which used the Rational Method to calculate discharges.

As the McKeel Brook watershed is almost entirely developed and local ordinances already require a zero increase in peak discharges, it is unlikely that there will be any increase in peak discharges for future conditions. Therefore, the existing conditions peak discharges were used to develop reach discharges for use in the existing conditions hydraulic model.

Flows calculated in the HEC-1 model were utilized in the Army Corps of Engineers HEC-2 model to determine water surface profiles for the 2, 10, 25, 50 and 100-year storms. More specifically, the

"reach" discharges used in the hydraulic models were calculated by taking the average of the HEC-1 peak flows to obtain the reach flows as shown in Figure 4 of Appendix B. Stream cross sections were field surveyed and culvert sizes field measured. The results of the HEC-2 computer model were used to develop inundation maps to determine the extent of the floodplain. Hydraulic models are provided in Appendix B. Profiles were plotted for all storm events described above. The 10, 25, and 100-year existing and proposed floodplains were delineated on 1"=100′ scale plans. Prints of these profiles and plans are included in the attached plan sheets numbered 1 through 4 of 5 in Attachment 2.

To calibrate the hydrologic and hydraulic models, a high water mark was obtained and surveyed. This mark is located at Berry Street in Dover where frequent flooding occurs as described in the previous section. This high water mark was observed during the January 1979 flood which was estimated to be between a 40 and 100-year storm. This mark falls within 6 inches of the water surface elevation generated by the theoretical hydrologic and hydraulic models indicating that the model calibration is excellent.

TABLE 1 - PEAK DISCHARGES

EXISTING CONDITIONS

NODE	LOCATION	FLOW (CFS)				
		2	**10**	**25**	**50**	**100**
A	INFLOW TO MCKEEL BROOK DETENTION BASIN	90	225	264	328	409
B	MCKEEL BROOK DETENTION BASIN ROUTING (OUTFLOW)	34	62	67	79	114
C	INFLOW TO CONVENIENCE CENTER DETENTION BASIN	47	93	105	124	147
D	OUTFLOW FROM CONVENIENCE CENTER DETENTION BASIN	43	80	89	103	131
E	INFLOW TO CLARK POND	65	125	140	165	196
F	CONFLUENCE OF ALL MOUNT PLEASANT AVENUE TRIBUTARIES	96	254	302	386	504
G	CONFLUENCE OF MCKEEL BROOK AND MOUNT PLEASANT AVENUE TRIBUTARIES	174	436	526	655	824
H	ROCKAWAY/DOVER MUNICIPAL BOUNDARY	263	615	724	916	1154
J	MCKEEL BROOK AT CONFLUENCE WITH ROCKAWAY RIVER	359	782	902	1118	1409

TABLE 2

COMPARISON OF DISCHARGES

NODE	LOCATION	FLOW (CFS)											
		ROCKAWAY F.I.S.			DOVER F.I.S.			STORCH STUDY			G&O HEC-1		
		10	50	100	10	50	100	10	50	100	10	50	100
E	INFLOW TO CLARK POND	--	--	--	--	--	--	--	217	314	125	165	196
F	CONFLUENCE OF MOUNT PLEASANT AVENUE TRIBUTARIES	--	--	--	--	--	--	--	596	694	254	386	504
G	CONFLUENCE OF MCKEEL BROOK AND MOUNT PLEASANT AVENUE TRIBUTARIES	225	370	460	--	--	--	--	672	859	436	655	824
H	ROCKAWAY/DOVER TOWNSHIP BOUNDARY	265	440	545	--	--	--	--	794	986	615	916	1154
J	AT CONFLUENCE WITH ROCKAWAY RIVER	--	--	--	130	225	275	--	897	1107	782	1118	1409

NOTES:

1. Rockaway Flood Insurance Study dated September 18, 1986. Special Report 38 was used to develop discharges.
2. Dover Flood Insurance Study (Revised) dated July 4, 1989. Special Report 38 was used to develop discharges.
3. Storch Study Refers to "McKeel Brook Drainage Study," dated November 15, 1976, prepared by Storch Engineers. Rational method was used to develop future (year 2000) discharges.

SECTION IV

EVALUATION OF DRAINAGE BASIN

While localized flooding may appear at various locations throughout the drainage basin, this analysis will focus on the more intense flooding conditions along McKeel Brook between Clark Pond and the confluence with Rockaway River.

Based on our analyses, the flood problem centers identified are at the following locations:

(1) From the Mount Hope Avenue culvert downstream to the Oak and Titus Street intersection, where inadequate channel and culvert capacity causes runoff to flow above and outside the channel banks, flooding homes and roads in the overbanks;

(2) From the Oak and Titus Street intersection downstream to Route 46, where the stream is comprised of severely inadequate, long culverts and several small channel segments, forcing a large portion of storm runoff into the overbanks, flooding residential and commercial structures and possibly a school;

(3) From the Nelson and Belmont Street intersection downstream to the confluence with Rockaway River. Although channel and culvert capacity is inadequate for McKeel Brook watershed peak discharges, the majority of structures in this reach (residential, commercial and industrial) flood due to backwater from the Rockaway River.

The flooding limits are shown on the Inundation Maps and flood elevations are shown on the Flood Profiles attached to this Report.

The reach described in problem center (1) above is composed mostly of open channel segments and three culverts, i.e. under Mount Hope Avenue, Crestmont Drive, and McKeel Street. Although the

channel and culverts are inadequate in size and are only capable of conveying low intensity storms (approximately 1 to 2 year storms), the width of the floodplain remains relatively narrow (ranging from approximately 50 feet to 300 feet) due to the steep slope of the stream (approximately 2.6%). Flooding in this reach is limited to approximately 18 homes for the 100-year storm located along the stream banks.

Problem center (2) is an area of potentially severe flooding. As described in Section II, discussions with local residents report frequent flooding (6 to 8 times annually) within this area. South of the Dover-Rockaway municipal boundary the existing channels and culverts are inadequate to convey a 2-year storm without flooding the overbanks. The undersized culverts and channels combined with sharp culvert bends and a relatively flat channel and overbank slopes (less than 0.4%), force the water to flood into the overbanks creating a "ponding area" between Route 46 and the Oak and Titus Street intersection. Due to the flat terrain in this area, the width of the 100-year floodplain extends to approximately 800 feet.

The area described in problem center (3) at the downstream limit of McKeel Brook is also an area of potentially severe flooding. A twin 4'x8' reinforced concrete box culvert diversion has recently been installed through this reach. Any additional improvements to this reach or any upstream portions of McKeel Brook would not alleviate flooding in this reach due to backwater from the Rockaway River. The flooding from the Rockaway River is more severe than flooding due to McKeel Brook.

SECTION V
FLOOD REMEDIATION ALTERNATIVES

This section summarizes the results of alternatives which were investigated to reduce flooding along McKeel Brook, particularly between Route 46 and the Titus and Oak Street intersection. The alternatives are described in Table 3 below.

TABLE 3		
DESCRIPTION OF FLOOD REMEDIATION ALTERNATIVES		
Alternative	**Description**	**Alleviate Flooding in Problem Area #**
1	Retrofit the following existing detention basins: Convenience Center, Townsquare Office, and McKeel Brook basin.	(1)
1A	Retrofit existing detention basins as in Alternative 1 and reconstruct outlet structures to detain for 2-year storm with higher intensity storms bypassing over a spillway.	(1)
1B	Reconstruct the outlet structures of the existing basins described in Alternative 1 without regrading the basins.	(1)
2	Construction of a 5 acre detention basin at the confluence of the Mount Pleasant Avenue Tributaries.	(1)
3	Channel improvements between Clark Street and the Oak and Titus Street intersection.	(2)
4*	Extension of existing twin 4'x8' box culvert in Dover to provide a 25-year level of protection.	(2)
5*	Same as Alt. 4 to provide a 50-year level of protection.	(2)
6*	Same as Alt. 4 to provide a 100-year level of protection.	(2)
7	Extension of existing twin 4′x8′ box culvert from Berry Street to an inlet located just upstream of the Cooper Street crossing, with a culvert of same dimensions (i.e. twin 4'x8' box culvert).	(2)

*NOTE: See Table 8 for culvert sizes required to convey selected levels of protection.

Alternative 1

The existing detention basins stated were regraded to maximize storage volume for flood control. The outlet structure in the Convenience Center detention basin was reconstructed, as this basin was the only basin which could provide additional vertical "room" for flood storage. The resulting revised storage and outflow data were then input into the HEC-1 model. The results of these modifications to the existing detention basins are shown in Table 4.

Under this alternative, the peak outflow from the Convenience Center Detention Basin would be reduced by almost 26% for the 2 and 25-year storms and 34% for the 100-year storm. The peak flow at the Dover-Rockaway municipal boundary would be reduced by approximately 6% for the 2-year storm and 4% for the 25 and 100-year storms.

While providing a sizable reduction in peak flow directly downstream of the basins, retrofitting the detention basins does not significantly decrease peak flows at downstream analysis points in Dover.

TABLE 4 - ALTERNATIVE 1

DESCRIPTION: Regrade the Convenience Center, Townsquare Office, and McKeel Brook existing detention basins and reconstruct only the outlet structure in the Convenience Center basin.

NODE	LOCATION DESCRIPTION	EXISTING CONDITIONS			PROPOSED CONDITIONS			DIFFERENCE		
		FLOW (CFS)			FLOW (CFS)			FLOW (CFS)		
		2	25	100	2	25	100	2	25	100
A	INFLOW TO MCKEEL BROOK DETENTION BASIN	90	264	409	90	264	409	0	0	0
B	MCKEEL BROOK DETENTION BASIN OUTFLOW	34	67	114	28	57	80	-6	-10	-34
C	INFLOW TO CONVENIENCE CENTER DETENTION BASIN	47	105	147	44	95	133	-3	-10	-14
D	CONVENIENCE CENTER DETENTION BASIN OUTFLOW	43	89	131	32	66	86	-11	-23	-45
E	INFLOW TO CLARK POND	65	140	196	51	111	156	-14	-29	-40
G	CONFLUENCE OF MCKEEL BROOK AND MOUNT PLEASANT AVENUE TRIBUTARIES	174	526	824	159	491	775	-15	-35	-49
H	ROCKAWAY/DOVER TOWN BOUNDARY	264	723	1153	248	694	1108	-16	-29	-45
J	MCKEEL BROOK AT CONFLUENCE WITH ROCKAWAY RIVER	359	902	1409	344	874	1364	-15	-28	-45

Alternative 1A

Similar to Alternative 1, this alternative involves regrading the basins as in Alternative 1 and reconstructing all 3 outlet structures to detain for the 2-year storm. A 6-inch orifice was used in all these outlet structures and a spillway above the 2-year stage to pass higher intensity storms.

Details of the regraded basins and reconstructed outlet control structures are contained in Appendix D.

As shown in Table 5, the peak outflows from the Convenience Center Detention Basin would be reduced by approximately 95%, 58%, and 18% for the 2, 25, and 100-year storms, respectively. At the Dover-Rockaway border the peak flows decrease by 13%, 10% and 6% for the 2, 25, and 100-year storms, respectively.

As in Alternative 1, while providing a significant reduction in peak flows directly downstream of the basins for the lower intensity storms, retrofitting the basins and reconstructing the outlet structures does not significantly decrease peak flows at the downstream analysis points in Dover.

TABLE 5 - ALTERNATIVE 1A

DESCRIPTION: Regrade the three detention basins described in Alternative 1 and reconstruct all three outlet structures in order to detain the 2-year storm. Storms of higher intensity would bypass over spillways.

NODE	LOCATION DESCRIPTION	EXISTING CONDITIONS			PROPOSED CONDITIONS			DIFFERENCE		
		FLOW (CFS)			FLOW (CFS)			FLOW (CFS)		
		2	25	100	2	25	100	2	25	100
A	INFLOW TO MCKEEL BROOK DETENTION BASIN	90	264	409	90	264	409	0	0	0
B	MCKEEL BROOK DETENTION BASIN OUTFLOW	34	67	114	2	31	91	-32	-36	-23
C	INFLOW TO CONVENIENCE CENTER DETENTION BASIN	47	105	147	40	78	110	-7	-27	-37
D	CONVENIENCE CENTER DETENTION BASIN OUTFLOW	43	89	131	2	37	107	-41	-52	-24
E	INFLOW TO CLARK POND	65	140	196	40	84	119	-25	-56	-77
G	CONFLUENCE OF MCKEEL BROOK AND MOUNT PLEASANT AVENUE TRIBUTARIES	174	526	824	138	444	773	-36	-82	-51
H	ROCKAWAY/DOVER TOWN BOUNDARY	264	723	1153	229	648	1081	-35	-75	-72
J	MCKEEL BROOK AT CONFLUENCE WITH ROCKAWAY RIVER	359	902	1409	326	833	1326	-33	-69	-83

Alternative 1B

Similar to Alternatives 1 and 1A, this alternative involves reconstructing all 3 outlet structures to detain for the 2-year storm. It is assumed that the basins are not being regraded for additional volume. A 6-inch orifice was used in all these outlet structures and a spillway above the 2-year stage to pass higher intensity storms. The resulting peak flows from this alternative are shown in Table 6.

Under this alternative, the peak outflows from the Convenience Center Detention Basin would be reduced by approximately 95% and 18% for the 2 and 25-year storms, respectively. The peak outflow for the 100-year storm would increase slightly. At the Dover-Rockaway border the peak flows decrease by 13%, 9% and 3% for the 2, 25, and 100-year storms, respectively. As in Alternatives 1 and 1A, these modifications would provide a significant reduction in peak flows downstream of the basins for lower intensity storms. They do not significantly reduce peak flows at downstream analysis points in Dover.

TABLE 6 - ALTERNATIVE 1B

DESCRIPTION: Reconstruct the outlet structures for the three detention basins described in Alternatives 1 and 1A in order to detain only for 2-year storm. Storms of higher intensity would bypass over spillways.

NODE	LOCATION DESCRIPTION	EXISTING CONDITIONS			PROPOSED CONDITIONS			DIFFERENCE		
		FLOW (CFS)			FLOW (CFS)			FLOW (CFS)		
		2	25	100	2	25	100	2	25	100
A	INFLOW TO MCKEEL BROOK DETENTION BASIN	90	264	409	90	264	409	0	0	0
B	MCKEEL BROOK DETENTION BASIN OUTFLOW	34	67	114	2	53	145	-32	-14	+31
C	INFLOW TO CONVENIENCE CENTER DETENTION BASIN	47	105	147	40	78	168	-7	-27	+21
D	CONVENIENCE CENTER DETENTION BASIN OUTFLOW	43	89	131	2	65	167	-41	-24	+36
E	INFLOW TO CLARK POND	65	140	196	40	84	181	-25	-56	-15
G	CONFLUENCE OF MCKEEL BROOK AND MOUNT PLEASANT AVENUE TRIBUTARIES	174	526	824	138	460	794	-36	-66	-30
H	ROCKAWAY/DOVER TOWN BOUNDARY	264	723	1153	229	658	1115	-35	-65	-38
J	MCKEEL BROOK AT CONFLUENCE WITH ROCKAWAY RIVER	359	902	1409	326	836	1367	-33	-65	-42

Alternative 2

The proposed detention basin at the confluence of the Mount Pleasant Avenue tributaries has the following dimensions: 5 acres in area and 4 feet deep. Note: This option was previously proposed as an alternative in the "McKeel Brook Drainage Study" dated November 15, 1976. The data for the proposed basin was inserted into the HEC-1 model and the results are shown in Table 7.

Under this alternative, the peak flows at the Dover-Rockaway border would be reduced by 24%, 23% and 16% for the 2, 25, and 100-year storms, respectively. Although this alternative would provide a sizable reduction in peak flows at the border of the towns, it would not be enough to significantly reduce flooding impacts in Dover. Also, field visits to the proposed detention site revealed presence of wetlands and rock at this location, making the costs associated with construction of the basin excessive considering the minimal flood control provided. This alternative is not recommended.

TABLE 7 - ALTERNATIVE 2

DESCRIPTION: Construction of a 4 feet deep, 5 acre detention basin at the confluence of the Mount Pleasant Avenue Tributaries of McKeel Brook.

NODE	LOCATION DESCRIPTION	EXISTING CONDITIONS			PROPOSED CONDITIONS			DIFFERENCE		
		FLOW (CFS)			FLOW (CFS)			FLOW (CFS)		
		2	25	100	2	25	100	2	25	100
F	CONFLUENCE OF MT. PLEASANT AVENUE TRIBUTARIES	96	302	504	96	302	504	0	0	0
F'	PROPOSED DETENTION BASIN OUTFLOW	96	302	504	47	243	436	-49	-59	-68
G	CONFLUENCE OF MCKEEL BROOK AND MOUNT PLEASANT AVENUE TRIBUTARIES	174	526	824	105	409	678	-69	-117	-146
H	ROCKAWAY/DOVER TOWN BOUNDARY	264	723	1153	201	559	964	-63	-164	-189
J	MCKEEL BROOK AT CONFLUENCE WITH ROCKAWAY RIVER	359	902	1409	305	735	1219	-54	-167	-190

Alternative 3

Without replacing or adding any culverts, only channel improvements were considered under this alternative. The channel improvements were as follows:

- 8 foot wide rectangular channel between existing 4′x6′ box culvert under Clark Street and the Jackson Avenue culvert;

- 8 foot wide rectangular channel between the existing culverts under Jackson Avenue and Cooper Street; and

- Trapezoidal channel with 2:1 side slopes from Cooper Street culvert upstream to the Oak and Titus Street intersection.

Due to the tailwater condition that exists downstream of Clark Street, these channel improvements provide a minimal reduction in flooding. The level of protection would be less than a 1-year storm. This alternative is not recommended.

Alternatives 4 through 7

The improvements associated with Alternatives 4 through 7 involve the installation of a culvert diversion from the recently installed twin 4′x8′ concrete box culvert at Berry Street to a location approximately 140 feet upstream of Cooper Street. The existing stream would be utilized in addition to the culvert diversion. The purpose of these alternatives is to convey floodwaters directly to the Rockaway River.

Note: The recently installed twin 4′x8′ concrete box culvert (Section I and II Improvements) begins at Berry Street and continues downstream to the Rockaway River. This system was designed to convey a 100-year peak flow of 600 cfs. Special Report 38 was used to determine the 100-year peak discharge for this culvert. As stated previously, this method typically underestimates peak flows for fully developed watersheds, e.g. 100-year flow of 600 cfs developed by Special Report 38 is approximately equal to the 10-year flow calculated by the HEC-1 model for this Study. Special Report 38 is no longer accepted by the New Jersey Department of Environmental Protection. Since the culvert has already been constructed in this reach, no further improvements to this reach will be considered.

Alternatives 4, 5, and 6 involve extending the existing twin 4'x8' box culvert upstream with a culvert diversion to convey runoff resulting from a 25, 50, and 100-year storm, respectively. Table 8 contains the culvert sizes required for each alternative. Alternative 7 is simply an extension of the existing twin 4′x8′ box culvert, within the limits described above, with a culvert of the same dimensions.

Although the culvert system could be upgraded to provide protection up to a 100-year storm event, the size, cost, installation, roadway profile modifications, and right-of-way constraints (among others) associated with culverts of this size renders these options impractical. The optimum alternative is Alternative 7 which consists of extending the existing twin 4′x8′ box culvert from Berry Street to approximately 140′ upstream of the Cooper Street crossing. Instead of a twin 4′x8′ box culvert, a single cell 4′x16′ box culvert could be utilized and would convey slightly more flow

than a twin box culvert. However, it will be assumed that the typical section of the proposed culvert extension will match that of existing, i.e. a twin 4'x8' box culvert. By installing this culvert in the roadway area (Berry and Elm Streets) it would act as a diversion. The existing stream (culverts and channels) would remain as is and would convey stormwater temporarily during construction and permanently when the new box culvert is installed. Using a culvert analysis, shown in Appendix C, the capacity of the combined existing stream system and proposed twin 4' x 8' box culvert diversion would be approximately 560 cfs. Both the existing system and the new box culvert would begin together at the upstream end, located approximately 140 feet upstream of the Cooper Street crossing. Channel improvements would be limited to the area in the vicinity of the inlet. Further upstream channelization is not recommended due to the presence of wetlands and natural storage provided in this reach. Although some floodplain storage would be lost due to this improvement, the amount lost would be relatively small compared to the total stormwater runoff volumes and would not increase peak flows.

A proposed conditions HEC-1 model was prepared assuming the installation of the proposed twin 4'x8' box culvert in the downstream channel reach. This model is contained in Appendix A.

The proposed twin 4'x8' box culvert was modeled utilizing HEC-2. Similar to the existing conditions model, reach discharges were used in the HEC-2 model. The proposed conditions HEC-2 model is contained in Appendix B. A profile along the proposed culvert diversion is shown on sheet 5 of 5 in Attachment 2.

Alternative 7 would prevent flooding in the Dover reach of McKeel Brook for the 10 year flood with the exception of the area flooded by the Rockaway River.

TABLE 8

ALTERNATIVE	DESCRIPTION OF IMPROVEMENTS	ESTIMATED LEVEL OF PROTECTION
4	•TWIN 4′X13′ REINFORCED CONCRETE (R.C.) BOX CULVERT FROM SECTION II IMPROVEMENT TO ENTRANCE LOCATED 140 FT.± UPSTREAM OF COOPER STREET;	25 YEAR
5	•TWIN 5′X13′ R.C. BOX CULVERT FROM SECTION II IMPROVEMENT TO ENTRANCE LOCATED 140 FT.± UPSTREAM OF COOPER STREET;	50 YEAR
6	•TWIN 5′X16′ R.C. BOX CULVERT FROM SECTION II IMPROVEMENT TO ENTRANCE LOCATED 140 FT.± UPSTREAM OF COOPER STREET;	100 YEAR
7	•TWIN 4′X8′ R.C. BOX CULVERT, FROM SECTION II IMPROVEMENT TO ENTRANCE LOCATED 140′± UPSTREAM OF COOPER STREET;	10 YEAR

NOTES:

1. The improvements above will not reduce flooding impacts to areas located in Rockaway River floodplain.
2. Proposed culvert depths greater than four feet would require roadway profile modifications.

The flood remediation alternatives investigated in Table 3 were considered to reduce the severe flooding which occurs in the lower portion of the drainage basin at the Dover-Rockaway border in problem center (2).

Measures to minimize the less severe, localized flooding in the upper portion of the drainage basin were also considered in response to complaints from local residents. The first measure to minimize flooding was proposed by the RBA Group. See Reference No. 9. This involves the enclosure of a section of McKeel Brook between Crestmont and Mount Hope Avenues in Rockaway. The installation of this proposed culvert system would reduce flooding impacts to approximately 6 residences located adjacent to the stream but would have no impacts within the downstream portion of the drainage basin.

A second measure considered to reduce localized flooding in problem center (1) was the replacement of the McKeel Street culvert. The hydraulic analysis indicated that in addition to the replacement of the twin-pipe culvert much with a much larger (4'x16') box culvert, extensive channel improvements (approx. 200 linear feet) and roadway profile modifications would also be required. As the reported flooding at this culvert is minor, i.e. affecting 2 to 4 residences, the costs associated with these improvements are not justifiable. The total estimated cost for these improvements is in excess of $220,000.

SECTION VI

CONCLUSIONS

This section summarizes our conclusions resulting from our analyses of the McKeel Brook Drainage Basin. They are as follows:

1. Development within the McKeel Brook basin coupled with inadequate channel conveyance capacities have resulted in chronic flooding in the downstream reach of McKeel Brook principally in the Town of Dover.

2. The storage capacities of the existing ponds and man-made detention facilities, combined with their location in the upper portion of the drainage basin, renders these facilities ineffective in significantly reducing peak flow rates in the downstream problem center. However, the existing detention basins do function well at their specific sites.

   As shown in Section V, retrofitting the three large detention basins, i.e. at Convenience Center, Townsquare Office, and McKeel Brook basin, provides for additional attenuation at their specific sites and immediately downstream but do not significantly alleviate flooding along downstream reaches in Dover.

3. Flooding remediation was investigated in problem area #1. More specifically, culvert replacement under McKeel Street would require downstream channelization, possible roadway profile modifications, and their associated environmental impacts. Based on discussions with Rockaway officials, the limited number of complaints, and severity of the problem, the improvements were not justifiable.

4. The recent improvements, i.e. twin 4'x8' box culvert, have already been installed in problem area #3. Any additional improvements to this reach are not recommended since Rockaway River flooding is more severe than flooding due to McKeel Brook.

5. Regarding future conditions, it is unlikely that there will be any increase in peak discharges for the following reasons:

- The watershed is nearly fully developed;
- Current municipal ordinances require zero increase in runoff for new development; and
- As a result of this study measures will be taken to limit the peak discharges at downstream nodes to their current values for future developments.

6. As the McKeel Brook Watershed is almost entirely developed, it is too late for the implementation of non-structural measures for stormwater management, such as preservation of undeveloped areas, changes in zoning, etc. These items should have been implemented prior to or within the early stages of watershed development.

SECTION VII

RECOMMENDATIONS

Our recommendations are as follows:

1. Rockaway Township and the Town of Dover should utilize the hydrologic models developed in this Study to evaluate the effect of future development on McKeel Brook, thereby "regionalizing" the approach to stormwater management within the basin. A recommended ordinance should be adopted by both municipalities including standards for future developments such as zero increase in peak discharge for selected storm events measured at pre-defined points along the Brook to ensure that the development does not worsen downstream flooding conditions.

2. In order to reduce chronic flooding in problem area #2, i.e. the lower portion of the basin, a twin 4'x8' reinforced concrete box culvert should be installed beginning at the upstream limit of the recently constructed Section II improvements (Berry Street) and continuing upstream to approximately 150 feet north of the Cooper Street crossing. This proposed culvert should be installed under Berry and Elm Streets, thereby allowing the existing stream components to remain active and to supplement the proposed culvert upon completion of construction. The overall length of the proposed culvert is approximately 1,640 feet and the slope would be S = 0.0025 feet per foot. The capacity of the combined existing and proposed system would be approximately 560 cfs. The diversion structure would be designed to convey flood flows only. Low flows would remain in the existing open channel and culvert reaches.

3. The diversion structure described in No. 2 above requires detailed hydraulic analysis at the inlet, the junction with existing culverts, and at the bend at the intersection of Elm and Berry Streets. These detailed analyses should be performed in the design phase.

4. Since the proposed diversion would be located under roadways, sanitary sewer, water, and gas mains would require relocation. These utility relocations should be further investigated in the design phase. Local storm drainage would also require relocation/modification. This should be addressed in the design phase.

5. Although retrofitting the existing detention basins in the upper part of the watershed would not significantly reduce flooding downstream in Dover, they should be retrofitted where feasible to reduce local flooding, i.e. flooding directly downstream of the basins. Retrofitting of the existing detention basins, utilizing Alternative 1A, in the upper portion of the watershed (Rockaway Township) would significantly reduce peak flows to Clark Pond and provide some attenuation within Dover.

SECTION VIII

PRELIMINARY COST ESTIMATES

The preliminary cost estimates for each alternative are shown in Table 9.

TABLE 9		
PRELIMINARY COST ESTIMATES FOR FLOOD REMEDIATION ALTERNATIVES		
Alternative	**Description**	**Total Cost (See Notes)**
1	Retrofit the following existing detention basins: Convenience Center, Townsquare Office, and McKeel Brook basin.	$415,000
1A	Retrofit existing detention basins as in Alternative 1 and reconstruct outlet structures to detain for 2-year storm with higher intensity storms bypassing over a spillway.	$430,000
1B	Reconstruct the outlet structures of the existing basins described in Alternative 1 without regrading the basins.	$30,000
2	Construction of a 5 acre detention basin at the confluence of the Mount Pleasant Avenue Tributaries.	$385,000
3	Channel improvements between Clark Street and the Oak and Titus Street intersection.	N/A
4*	Extension of existing twin 4'x8' box culvert in Dover to provide a 25-year level of protection.	$5,000,000
5*	Same as Alt. 4 to provide a 50-year level of protection.	$5,700,000
6*	Same as Alt. 4 to provide a 100-year level of protection.	$6,250,000
7	Extension of existing twin 4′x8′ box culvert from Berry Street to an inlet located just upstream of the Cooper Street crossing, with a culvert of same dimensions (i.e. twin 4'x8' box culvert).	$3,000,000

*See Table 8 for culvert sizes required to convey the selected levels of protection.

NOTES:

1. Cost estimates for Alternatives 1, 1A, 1B, and 2 do not include permit costs and fees, or engineering costs.

2. Since Alternative 3 did not provide any benefit, no cost estimate was calculated.

3. Cost estimates for Alternatives 4, 5, 6 and 7 include only culvert installation and utility relocation costs. Property acquisition costs, permit costs and fees, engineering fees, etc. are not included.

REFERENCES

1. Federal Emergency Management Agency, Federal Insurance Administration, Flood Insurance Study, Town of Dover, Morris County, New Jersey, Washington, D.C. Revised to July 4, 1989.

2. Federal Emergency Management Agency, Federal Insurance Administration, Flood Insurance Study, Township of Rockaway, Morris County, New Jersey, Washington, D.C. September 18, 1986.

3. Geod Aerial Mapping, Inc. of Oak Ridge, New Jersey, Topographic Maps compiled from aerial photographs, Scale 1:1,200, Contour Interval 2 feet: Dover, Rockaway, New Jersey, March 1978.

4. Robinson Aerial Surveys, Inc. of Newton, New Jersey, Topographic Maps compiled from aerial photographs, Scale 1:960, Contour Interval 2 feet: Rockaway Township, New Jersey, April-May 1977.

5. McKeel Brook Improvements, Section I-Southerly U.S. Route 46 ROW to Rockaway River, Town of Dover, Morris County, New Jersey prepared by Storch Engineers, signed July 1, 1984.

6. McKeel Brook Improvements, Section II-Southerly U.S. Route 46 ROW to Southerly Berry Street ROW, Town of Dover, Morris County, New Jersey prepared by Storch Engineers, signed August 11, 1989.

7. Township of Rockaway Assessment Map prepared by Arthur De Luca of Rockaway, New Jersey, Scale 1:9,600, revised 1989.

8. Storch Engineers of Florham Park, NJ McKeel Brook Drainage Study, Morris County, New Jersey, November 15, 1976.

9. The RBA Group of Morristown, N.J., Engineering and Environmental Report for the Enclosure of a Section of Tanglewood Brook, Rockaway Township, Morris County, New Jersey, Revised June 1993.

10. Canger, Schoor, & Cassera, Inc. of Parsippany N.J., Detention Basin Computations Fleetwood at Rockaway, Rockaway Township Morris County, New Jersey, January 21, 1985.

11. Greiner Engineering Sciences, Inc. of Baltimore, Md., Rockaway Townsquare detention basin calculations dated November 12, 1974.

12. Canger, Schoor, & Cassera, Inc., Drainage Report for Towering Oaks, Lenox Road in the Township of Rockaway, Morris County, New Jersey, Revised October 13, 1986.

13. Keller & Kirkpatrick of Parsippany, N.J., Revised Stormwater Calculations for Lot 35, Block 10801, Rockaway Township, Morris County, New Jersey, November 20, 1992.

14. Keller & Kirkpatrick of Sparta, N.J., As-Built Site Plans for Office Quarters at Rockaway, Utilities Plan, Scale 1:360, Rockaway Township, Morris County, New Jersey, June 22, 1989.

15. The Chester Partnership of Mount Olive, N.J., Storm Sewer As-Built Plan, Townsquare Village, Township of Rockaway, Morris County, New Jersey, Scale 1:360, August 30, 1990.

16. Keller & Kirkpatrick, Site Plan-Lot 35 Block 10801, Sheet 1 of 3, Scale 1:600, Revised to January 4, 1993.

17. Canger, Schoor, and Cassera, Utility Plan for The Pointe at Rolling Hills, Sheet 3 of 10, Scale 1:600, Revised to September 24, 1986 and Grading Plan for The Pointe at Rolling Hills, Sheet 4 of 10, Scale 1:600, Revised to November 20, 1986.

18. Johnson Engineering Inc. of Madison, N.J., Townsquare Offices Stormwater Management Calculations, Rockaway Township, Revised to May 18, 1981.

19. Johnson Engineering, Proposed Office Building, Site Grading, Sheet SP-1, Scale 1:600, Revised to December 7, 1981 and Site Utility, Sheet SP-2, Scale 1:600, Revised to January 11, 1982.

20. Greiner Engineering Sciences, Inc., Rockaway Townsquare Mall Convenience Center Retention Pond Storage Volume Calculations dated February 22, 1978.

21. Greiner Engineering Sciences, Inc., Rockaway Townsquare Mall Convenience Center Retention Pond Construction, Sheet 2 of 7, Scale 1:240, Revised February 24, 1978.

22. M.M. Specter, P.E., L.S., Consulting Engineer of Eastchester, New York, Township of Rockaway, Morris County, New Jersey, Tanglewood Drainage Basin Study, January 1966.

23. Goodkind & O'Dea, Inc. of Rutherford, N.J., Morris County, Stormwater Management Study, Upper Rockaway River, Morris County, New Jersey.

24. The RBA Group, Stormwater Management Report for the Falcon's Crest Subdivision, Township of Rockaway, Morris County, New Jersey, May 1988.

25. The RBA Group, Preliminary Subdivision and Site Plan for Falcon's Crest, Rockaway Township, Morris County, Sheets 1 through 11 of 26, Scale 1:600, Revised to June 14, 1989.

26. Greiner Environmental Sciences, Rockaway Townsquare Drainage Computation For McKeel Brook Pond, April 1975.

27. Morris County Engineering Co. of East Hanover, N.J., Rustic Ridge Drainage Calculations for Detention Basin by Routing Method, Clark's Pond, Rockaway Township, Morris County, New Jersey, August 27, 1975.

28. The RBA Group, Delineation of Floodway and Flood Hazard Area, Rockaway River-McKeel Brook, Scale 1:2400, Contour Interval 2′ feet: Rockaway Township, Dover Town, New Jersey, Sheet D-17, December 1985.

29. The RBA Group, Delineation of Floodway and Flood Hazard Area, Rockaway River, Scale 1:2400, Contour Interval 2 feet: Rockaway Township, Randolph Township, Denville Township, New Jersey, Sheet E-18, December 1986.

30. URS Company, Inc. of Paramus, N.J., Delineation of Floodway and Flood Hazard Area, Rockaway River, Scale 1:2400, Contour Interval 2 feet: Rockaway Borough, Denville Township, New Jersey, Sheets E-17 and F-16, February 1986.

31. URS Company, Inc. Delineation of Floodway and Flood Hazard Area, Rockaway River, Scale 1:2400, Contour Interval 2 feet: Dover Town, Randolph Township, Victory Gardens Borough, Rockaway Township, New Jersey, Sheet D-18, December 1985.

32. State of New Jersey Department of Environmental Protection, Freshwater Wetlands Map, Dover SE Panel, Dover, New Jersey, Scale 1:12,000, Sheet Panel No. 27-4, undated.

33. Canger & Cassera, Inc., Rockaway Townsquare Mall Topographic Base Map, Township of Rockaway, Morris County, New Jersey, Scale 1:1,200, Contour Interval 2 feet, Sheet 1 of 2, June 5, 1991.

HYDROLOGIC CALCULATIONS
HEC-1, EXISTING & PROPOSED

APPENDIX A

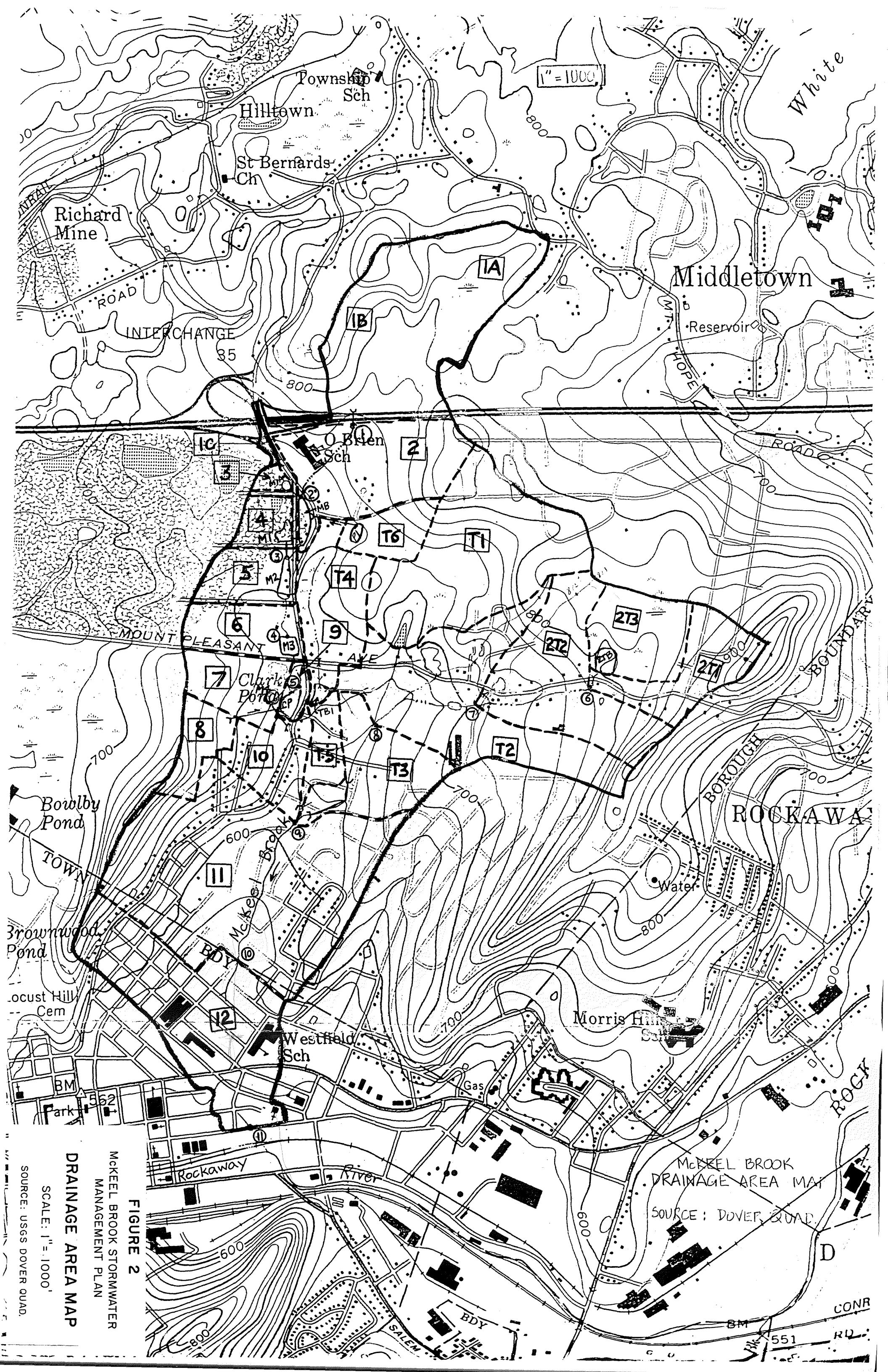

FIGURE 2

McKEEL BROOK STORMWATER MANAGEMENT PLAN

DRAINAGE AREA MAP

SCALE: 1" = 1000'

SOURCE: USGS DOVER QUAD.

GOODKIND & O'DEA INC. CONSULTING ENGINEERS

1593

JOB McKEEL BROOK NOTES BY WJH DATE 10-13-94 PAGE NO. 1 OF 2

HEC-1 NETWORK SCHEMATIC CHECK BY DATE

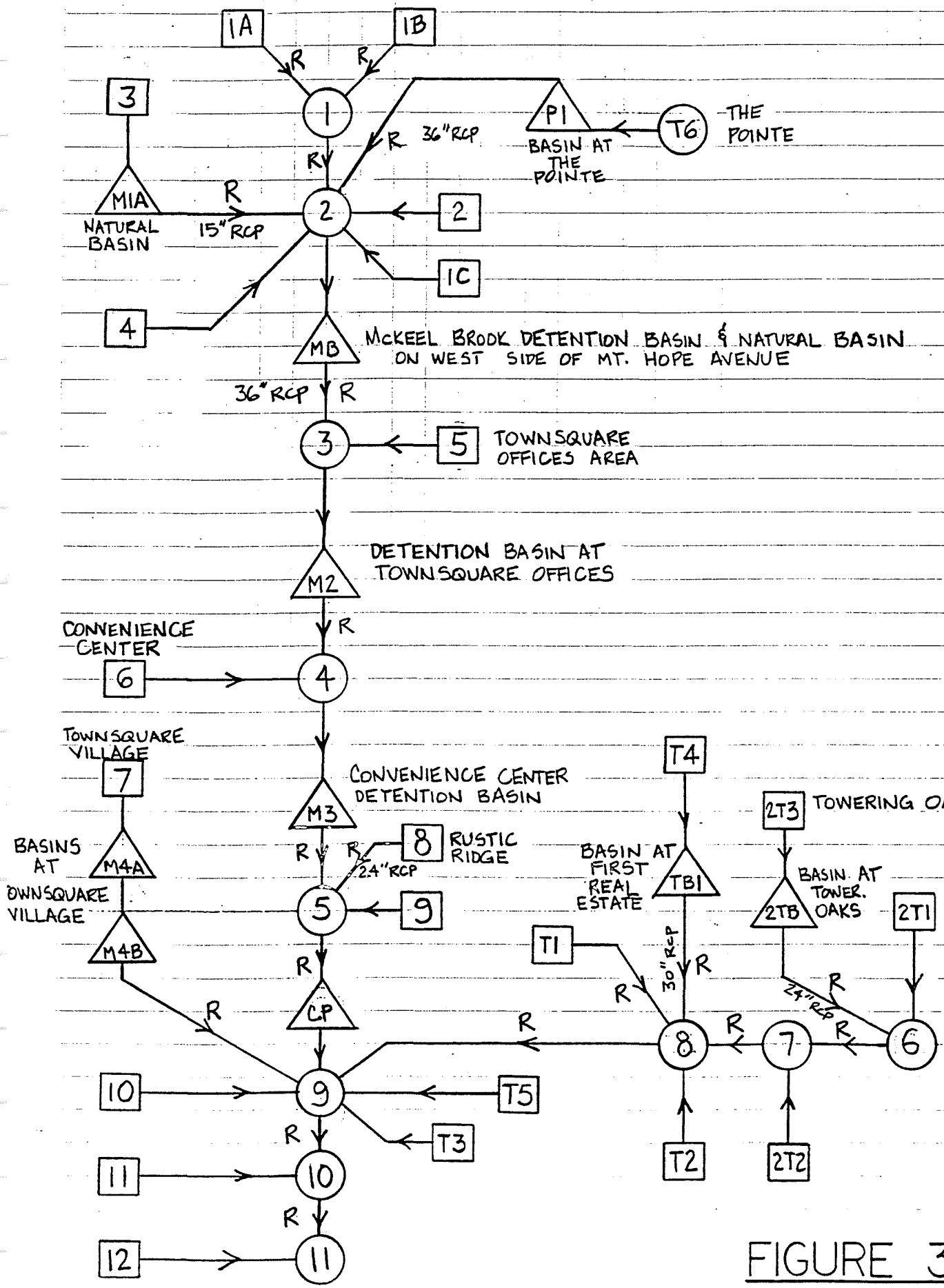

FIGURE 3

LEGEND

□	RUNOFF SUBBASIN
R	ROUTING REACH
△	EXISTING DETENTION BASINS
○	NODE (HYDROGRAPHS COMBINED)

HEC-1
EXISTING CONDITIONS

HEC1 S/N: 1343000047 HMVersion: 6.33 Data File: MCKEX2.hc1

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*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              MAY   1991              *
*           VERSION 4.0.1E             *
*                                      *
* RUN DATE  07/18/1995  TIME  09:05:51 *
*                                      *
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****************************************
*                                      *
*   U.S. ARMY CORPS OF ENGINEERS       *
*   HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET            *
*      DAVIS, CALIFORNIA 95616         *
*          (916) 756-1104              *
*                                      *
****************************************
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X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X       XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
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::::::::::::::::::::::::::::::::::::::::
:::                                  :::
:::  Full Microcomputer Implementation :::
:::                by                :::
:::       Haestad Methods, Inc.      :::
:::                                  :::
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37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

NOTE: (A) REFERS TO REFERENCED NODES IN DRAFT REPORT.

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

              *
              *DIAGRAM
  1           ID        MCKEEL BROOK STORMWATER MANAGEMENT PLAN
  2           ID        ROCKAWAY TOWNSHIP AND TOWN OF DOVER, MORRIS COUNTY, N.J.
  3           ID        PREPARED BY GOODKIND & O'DEA, 60 FERONIA WAY, RUTHERFORD, NJ  07070
  4           ID        G&O PROJECT #1593 - OCTOBER 1994              FILE: "MCKEX2.HC1"
  5           ID        SCS TYPE III, 2,10,25,50, & 100-YEAR STORMS - EXISTING CONDITIONS
  6           ID        IGNORE NATURAL BASINS UPSTREAM OF 18" AND 24" PIPES UNDER I-80
  7           IT       6       0       0     241
  8           IO       5       0
  9           JR    PREC    0.44   0.693    0.76   0.867     1.0

 10           KK   SUB1A
 11           KM               COMPUTE RUNOFF FROM SUBAREA SUB1A UPSTREAM OF I-80
 12           KO       0       1
 13           BA  0.1109
 14           PB     7.5
 15           IN      15
 16           PC      .0    .002    .005    .007    .010    .012    .015    .017    .020    .022
 17           PC    .026    .028    .031    .034    .037    .040    .043    .046    .050    .053
 18           PC    .057    .060    .064    .067    .072    .075    .080    .084    .089    .093
 19           PC    .100    .106    .115    .121     .13    .137    .148    .155    .167    .176
 20           PC    .189    .199    .216    .228    .250    .266    .298    .328    .500    .638
 21           PC    .702    .725    .751    .766    .785    .796    .811    .821    .834    .842
 22           PC    .853    .860    .870    .877    .886    .892    .900    .906    .911    .915
 23           PC    .920    .924    .929    .932    .936    .939    .944    .946    .951    .953
 24           PC    .957    .960    .963    .966    .969    .972    .975    .977    .981    .983
 25           PC    .986    .988    .991    .996    .998     1.0     1.0     1.0     1.0     1.0
 26           LS       0      70
 27           UD    0.20

 28           KK   NODE1
 29           KM               ROUTE THRU PIPE UNDER I-80
 30           KO       0       1
 31           RM       1   0.167     0.5

 32           KK   SUB1B
 33           KM               COMPUTE RUNOFF FROM SUBAREA SUB1B UPSTREAM OF I-80
 34           KO       0       1
 35           BA  0.0515
 36           LS       0      70
 37           UD    0.08

 38           KK   NODE1
 39           KM               ROUTE FLOW THRU PIPE UNDER I-80
 40           KO       0       1
 41           RM       1  0.1002     0.5

 42           KK   NODE1
 43           KM               COMBINE HYDROGRAPHS AT NODE1
 44           KO       0       1
 45           HC       2
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  46          KK   NODE2
  47          KM               ROUTE FLOW THRU CHANNEL TO BASIN MB (NODE 2)
  48          KO       0       1
  49          RM       1   0.167     0.5

  50          KK    SUB2
  51          KM               COMPUTE RUNOFF FROM SUBAREA SUB2
  52          KO       0       1
  53          BA  0.0928
  54          LS       0      70
  55          UD    0.11

  56          KK   SUBT6
  57          KM               COMPUTE RUNOFF FROM SUBAREA SUBT6 - THE POINTE
  58          KO       0       1
  59          BA  .03125
  60          LS       0      78
  61          UD    0.20

  62          KK  BASNP1
  63          KM               ROUTE FLOW THROUGH EXISTING BASIN AT THE POINTE
  64          KO       0       1
  65          RS       1    ELEV  722.46
  66          SV       0    0.01    0.09    0.32    0.68    1.21    1.89    2.47    2.77    2.96
  67          SV    3.79
  68          SE     722  722.46     724     726     728     730     732  733.33     734  734.33
  69          SE     736
  70          SQ       0       0    3.94    5.98    7.48    8.73    9.82   10.48    16.5   29.24
  71          SQ   174.7

  72          KK   NODE2
  73          KM               ROUTE FLOW THROUGH PIPE TO NODE2
  74          KO       0       1
  75          RM       1   0.167     0.5

  76          KK    SUB3
  77          KM               COMPUTE RUNOFF FROM SUBAREA SUB3
  78          KO       0       1
  79          BA  0.0022
  80          LS       0      72
  81          UD    0.27

  82          KK  BSNM1A
  83          KM               ROUTE FLOW THROUGH NATURAL BASIN
  84          KO       0       1
  85          RS       1    ELEV   713.8
  86          SA       0    0.29    0.43
  87          SE   713.8     716     717
  88          SQ       0       4       5
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 89           KK   NODE2
 90           KM              ROUTE FLOW THRU 15" DIA. CMP UNDER MT. HOPE AVE.
 91           KO       0       1
 92           RM       1   0.052     0.5

 93           KK    SUB4
 94           KM              COMPUTE RUNOFF FROM SUBAREA SUB4
 95           KO       0       1
 96           BA  0.0114
 97           LS       0      73
 98           UD    0.45

 99           KK   SUB1C
100           KM              COMPUTE RUNOFF FROM SUBAREA SUB1C
101           KO       0       1
102           BA  0.0058
103           LS       0      95
104           UD    0.05

105           KK   NODE2
106           KM              COMBINE 6 HYDROGRAPHS AT NODE2
107           KO       0       1
108           HC       6

109           KK   BSNMB
110           KM              ROUTE FLOW THRU MCKEEL BROOK BASIN (COMBINED W/BASIN M1)
111           KO       0       1
112           RS       1    ELEV   704.6
113           SA       0    1.27    2.50    3.73    4.70    5.50    6.10    6.59    7.30    8.46
114           SE   704.6     706     707     708     709     710     711     712     713     714
115           SQ       0      11      24      40      54      65      75     114     432     884

116           KK   NODE3
117           KM              ROUTE FLOWS THRU 36" DIA. RCP UNDER MT. HOPE AVE.
118           KO       0       1
119           RM       1   0.005     0.5

120           KK    SUB5
121           KM              COMPUTE RUNOFF FROM SUBAREA SUB5
122           KO       0       1
123           BA  0.0253
124           LS       0      87
125           UD    0.30

126           KK   NODE3
127           KM              COMBINE 2 HYDROGRAPHS AT NODE3
128           KO       0       1
129           HC       2
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 130          KK   BSNM2
 131          KM              ROUTE FLOW THRU EXISTING DETENTION BASIN AT TOWNSQUARE OFFICES
 132          KO       0       1
 133          RS       1    ELEV     701
 134          SV       0    0.58    1.28    2.14    3.29    4.74
 135          SE     701     702     703     704     705     706
 136          SQ       0    14.7      40      72     109     456

 137          KK   NODE4
 138          KM              ROUTE FLOW THRU PIPE AND CHANNEL TO POND M3
 139          KO       0       1
 140          RM       1   0.012     0.2

 141          KK    SUB6
 142          KM              COMPUTE RUNOFF FROM SUBAREA SUB6
 143          KO       0       1
 144          BA  0.0341
 145          LS       0      91
 146          UD    0.05

 147          KK   NODE4
 148          KM              COMBINE 2 HYDROGRAPHS AT NODE4
 149          KO       0       1
 150          HC       2

 151          KK   BSNM3
 152          KM              ROUTE FLOW THRU EXISTING DETENTION BASIN AT CONVENIENCE CENTER
 153          KO       0       1
 154          RS       1    ELEV     682
 155          SV       0   0.654   1.835   4.385   7.187  10.252
 156          SE     682     683     684     686     688     690
 157          SQ       0      17      55     123     176     283

 158          KK   NODE5
 159          KM              ROUTE FLOW THRU CHANNEL TO NODE5 (U/S END CLARK POND)
 160          KO       0       1
 161          RM       1   0.007     0.2

 162          KK    SUB8
 163          KM              COMPUTE RUNOFF FROM SUBAREA SUB8 - RUSTIC RIDGE
 164          KO       0       1
 165          BA  0.0328
 166          LS       0      90
 167          UD    0.04

 168          KK   NODE5
 169          KM              ROUTE FLOW THRU 24" DIA. PIPE TO NODE5
 170          KO       0       1
 171          RM       1   0.008     0.5
```

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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 172          KK    SUB9
 173          KM               COMPUTE RUNOFF FROM SUBAREA SUB9 - CLARK POND AREA
 174          KO       0       1
 175          BA  0.0088
 176          LS       0      70
 177          UD    0.05

 178          KK   NODE5
 179          KM               COMBINE 3 HYDROGRAPHS AT NODE 5
 180          KO       0       1
 181          HC       3

 182          KK   NODE9
 183          KM               ROUTE FLOW THRU CHANNEL TO NODE9
 184          KO       0       1
 185          RM       1   0.056     0.2

 186          KK    SUB7
 187          KM               COMPUTE RUNOFF FROM SUBAREA SUB7 - TOWNSQUARE VILLAGE
 188          KO       0       1
 189          BA  0.0328
 190          LS       0      87
 191          UD    0.15

 192          KK  BSNM4A
 193          KM               ROUTE FLOW THRU EXISTING UPPER BASIN AT TOWNSQUARE VILLAGE
 194          KO       0       1
 195          RS       1    ELEV   672.5
 196          SV       0    .025    .208    .472    .735    .999   1.262   1.526   1.789
 197          SE   672.5     673     674     675     676     677     678     679     680
 198          SQ       0     0.7     1.8     2.5     3.0     3.5    13.1      51     106

 199          KK  BSNM4B
 200          KM               ROUTE FLOW THRU EXISTING LOWER BASIN AT TOWNSQUARE VILLAGE
 201          KO       0       1
 202          RS       1    ELEV   667.5
 203          SV       0   0.019   0.203   0.504   0.818   1.148   1.492   1.845   2.200
 204          SE   667.5     668     669     670     671     672     673     674     675
 205          SQ       0     0.7     1.8     2.5     3.0     3.5     8.5      28     168

 206          KK   NODE9
 207          KM               ROUTE FLOW THRU CHANNEL TO NODE9
 208          KO       0       1
 209          RM       1   0.030     0.2

 210          KK   SUB10
 211          KM               COMPUTE RUNOFF FROM SUBAREA SUB10
 212          KO       0       1
 213          BA  0.0300
 214          LS       0      77
 215          UD    0.19
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 216          KK   SUBT3
 217          KM               COMPUTE RUNOFF FROM SUBAREA SUBT3
 218          KO       0       1
 219          BA  0.0531
 220          LS       0      75
 221          UD    0.43

 222          KK   SUBT5
 223          KM               COMPUTE RUNOFF FROM SUBAREA SUBT5
 224          KO       0       1
 225          BA  0.0114
 226          LS       0      80
 227          UD    0.12

 228          KK  SUB2T1
 229          KM               COMPUTE RUNOFF FROM SUBAREA SUB2T1
 230          KO       0       1
 231          BA  0.0484
 232          LS       0      63
 233          UD    0.26

 234          KK  SUB2T3
 235          KM               COMPUTE RUNOFF FROM SUBAREA SUB2T3 - TOWERING OAKS
 236          KO       0       1
 237          BA  0.0406
 238          LS       0      81
 239          UD    0.13

 240          KK  BSN2TB
 241          KM               ROUTE FLOW THRU EXISTING DETENTION BASIN AT TOWERING OAKS
 242          KO       0       1
 243          RS       1    ELEV   787.5
 244          SV       0   0.025   0.218   0.529   0.888   1.294   1.748   2.251   2.801   3.374
 245          SV   3.984
 246          SE   787.5     788     789     790     791     792     793     794     795     796
 247          SE     797
 248          SQ       0     1.5     7.0    10.5    13.1    15.3    17.2    18.9    20.4      27
 249          SQ      52

 250          KK   NODE6
 251          KM               ROUTE FLOW THRU 24" DIA. RCP TO NODE6
 252          KO       0       1
 253          RM       1   0.011     0.5

 254          KK   NODE6
 255          KM               COMBINE 2 HYDROGRAPHS AT NODE6
 256          KO       0       1
 257          HC       2
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 258          KK   NODE7
 259          KM               ROUTE FLOW THRU CHANNEL TO NODE7
 260          KO       0       1
 261          RM       1   0.056     0.2

 262          KK  SUB2T2
 263          KM               COMPUTE RUNOFF FROM SUBAREA SUB2T2
 264          KO       0       1
 265          BA  0.0891
 266          LS       0      65
 267          UD     0.6

 268          KK   NODE7
 269          KM               COMBINE 2 HYDROGRAPHS AT NODE7
 270          KO       0       1
 271          HC       2

 272          KK   NODE8
 273          KM               ROUTE FLOW THRU CHANNEL TO NODE8
 274          KO       0       1
 275          RM       1   0.040     0.2

 276          KK   SUBT4
 277          KM               COMPUTE RUNOFF FROM SUBAREA SUBT4
 278          KO       0       1
 279          BA  0.0516
 280          LS       0      71
 281          UD    0.98

 282          KK  BSNTB1
 283          KM               ROUTE FLOW THRU EXISTING DETENTION BASIN - FIRST REAL ESTATE
 284          KO       0       1
 285          RS       1    ELEV     655
 286          SV       0   0.106   0.450   0.853   1.316   1.840
 287          SE     655     656     657     658     659     660
 288          SQ       0     2.2     6.9      17      31      44

 289          KK   NODE8
 290          KM               ROUTE FLOW THRU PIPE TO NODE8
 291          KO       0       1
 292          RM       1   0.012     0.5

 293          KK   SUBT1
 294          KM               COMPUTE RUNOFF FROM SUBAREA SUBT1
 295          KO       0       1
 296          BA  0.1312
 297          LS       0      72
 298          UD    0.60
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 299          KK   NODE8
 300          KM              ROUTE FLOW THRU CHANNEL TO NODE8
 301          KO       0       1
 302          RM       1   0.035     0.2

 303          KK   SUBT2
 304          KM              COMPUTE RUNOFF FROM SUBAREA SUBT2
 305          KO       0       1
 306          BA  0.1219
 307          LS       0      67
 308          UD    0.52

 309          KK   NODE8
 310          KM              COMBINE 4 HYDROGRAPHS AT NODE8
 311          KO       0       1
 312          HC       4

 313          KK   NODE9
 314          KM              ROUTE FLOW THRU CHANNEL TO NODE9
 315          KO       0       1
 316          RM       1   0.030     0.2

 317          KK   NODE9
 318          KM              COMBINE 6 HYDROGRAPHS AT NODE9
 319          KO       0       1
 320          HC       6

 321          KK   RCH9A
 322          KM              ROUTE FLOW THRU CHANNEL TO RCH9B (STA. 3250 TO STA. 3020)
 323          KO       0       1
 324          RD
 325          RC    0.08   0.035    0.15     230  0.0096
 326          RX       0      15     190     210     220     230     585     610
 327          RY     580     579     578   573.2   573.2   577.2   577.2     580

 328          KK   RCH9B
 329          KM              ROUTE FLOW THRU CHANNEL TO NODE10 (STA. 3020 TO STA. 2685)
 330          KO       0       1
 331          RD
 332          RC    0.15   0.035    0.15     335   0.006
 333          RX       0     145     323     326     334     355     640     800
 334          RY     580     574   573.3   571.0   571.2     574     574     576

 335          KK   SUB11
 336          KM              COMPUTE RUNOF FROM SUBAREA SUB11
 337          KO       0       1
 338          BA  0.2203
 339          LS       0      76
 340          UD    0.31
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 341          KK  NODE10
 342          KM              COMBINE 2 HYDROGRAPHS AT NODE10
 343          KO       0      1
 344          HC       2

 345          KK  NODE11
 346          KM              ROUTE FLOW THRU CHANNEL TO NODE11
 347          KO       0      1
 348          RM       1  0.043     0.5

 349          KK   SUB12
 350          KM              COMPUTE RUNOFF FROM SUBAREA SUB12
 351          KO       0      1
 352          BA  0.1266
 353          LS       0     89
 354          UD    0.31

 355          KK  NODE11
 356          KM              COMBINE 2 HYDROGRAPHS AT NODE11
 357          KO       0      1
 358          HC       2
 359          ZZ
```

```
                 SCHEMATIC DIAGRAM OF STREAM NETWORK
INPUT
 LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

  NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

   10       SUB1A
                V
                V
   28       NODE1
                .
                .
   32           .       SUB1B
                .           V
                .           V
   38           .       NODE1
                .           .
                .           .
   42       NODE1............
                V
                V
   46       NODE2
                .
                .
   50           .        SUB2
                .           .
                .           .
   56           .           .      SUBT6
                .           .          V
                .           .          V
   62           .           .     BASNP1
                .           .          V
                .           .          V
   72           .           .      NODE2
                .           .          .
                .           .          .
   76           .           .          .       SUB3
                .           .          .          V
                .           .          .          V
   82           .           .          .     BSNM1A
                .           .          .          V
                .           .          .          V
   89           .           .          .      NODE2
                .           .          .          .
                .           .          .          .
   93           .           .          .          .       SUB4
                .           .          .          .          .
                .           .          .          .          .
   99           .           .          .          .          .      SUB1C
                .           .          .          .          .          .
                .           .          .          .          .          .
  105       NODE2.............................................................
                V
                V
  109       BSNMB
                V
                V
  116       NODE3
                .
                .
  120           .        SUB5
                .           .
                .           .
  126       NODE3............
                V
```

```
            V
130     BSNM2
            V
            V
137     NODE4
            .
            .
141         .       SUB6
            .          .
            .          .
147     NODE4............
            V
            V
151     BSNM3
            V
            V
158     NODE5
            .
            .
162         .       SUB8
            .          V
            .          V
168         .      NODE5
            .          .
            .          .
172         .          .       SUB9
            .          .          .
            .          .          .
178     NODE5......................
            V
            V
182     NODE9
            .
            .
186         .       SUB7
            .          V
            .          V
192         .     BSNM4A
            .          V
            .          V
199         .     BSNM4B
            .          V
            .          V
206         .      NODE9
            .          .
            .          .
210         .          .      SUB10
            .          .          .
            .          .          .
216         .          .          .      SUBT3
            .          .          .         .
            .          .          .         .
222         .          .          .         .      SUBT5
            .          .          .         .         .
            .          .          .         .         .
228         .          .          .         .         .     SUB2T1
            .          .          .         .         .         .
            .          .          .         .         .         .
234         .          .          .         .         .         .     SUB2T3
            .          .          .         .         .         .         V
            .          .          .         .         .         .         V
240         .          .          .         .         .         .     BSN2TB
            .          .          .         .         .         .         V
            .          .          .         .         .         .         V
250         .          .          .         .         .         .      NODE6
            .          .          .         .         .         .         .
```

```
          .         .         .         .         .         .         .
254       .         .         .         .         .      NODE6............
          .         .         .         .         .         V
          .         .         .         .         .         V
258       .         .         .         .         .      NODE7
          .         .         .         .         .         .
          .         .         .         .         .         .
262       .         .         .         .         .         .     SUB2T2
          .         .         .         .         .         .         .
          .         .         .         .         .         .         .
268       .         .         .         .         .      NODE7............
          .         .         .         .         .         V
          .         .         .         .         .         V
272       .         .         .         .         .      NODE8
          .         .         .         .         .         .
          .         .         .         .         .         .
276       .         .         .         .         .         .      SUBT4
          .         .         .         .         .         .         V
          .         .         .         .         .         .         V
282       .         .         .         .         .         .     BSNTB1
          .         .         .         .         .         .         V
          .         .         .         .         .         .         V
289       .         .         .         .         .         .      NODE8
          .         .         .         .         .         .         .
          .         .         .         .         .         .         .
293       .         .         .         .         .         .         .      SUBT1
          .         .         .         .         .         .         .         V
          .         .         .         .         .         .         .         V
299       .         .         .         .         .         .         .      NODE8
          .         .         .         .         .         .         .         .
          .         .         .         .         .         .         .         .
303       .         .         .         .         .         .         .         .      SUBT2
          .         .         .         .         .         .         .         .         .
          .         .         .         .         .         .         .         .         .
309       .         .         .         .         .      NODE8.................................
          .         .         .         .         .         V
          .         .         .         .         .         V
313       .         .         .         .         .      NODE9
          .         .         .         .         .         .
          .         .         .         .         .         .
317     NODE9.............................................................
          V
          V
321     RCH9A
          V
          V
328     RCH9B
          .
          .
335       .      SUB11
          .         .
          .         .
341     NODE10............
          V
          V
345     NODE11
          .
          .
349       .      SUB12
          .         .
          .         .
355     NODE11............
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

HEC1 S/N: 1343000047 HMVersion: 6.33 Data File: MCKEX2.hc1

```
****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              MAY   1991              *
*           VERSION 4.0.1E             *
*                                      *
*  RUN DATE  07/18/1995  TIME  09:05:51 *
*                                      *
****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
****************************************
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                    MCKEEL BROOK STORMWATER MANAGEMENT PLAN
                    ROCKAWAY TOWNSHIP AND TOWN OF DOVER, MORRIS COUNTY, N.J.
                    PREPARED BY GOODKIND & O'DEA, 60 FERONIA WAY, RUTHERFORD, NJ  07070
                    G&O PROJECT #1593 - OCTOBER 1994              FILE: "MCKEX2.HC1"
                    SCS TYPE III, 2,10,25,50, & 100-YEAR STORMS - EXISTING CONDITIONS
                    IGNORE NATURAL BASINS UPSTREAM OF 18" AND 24" PIPES UNDER I-80

  8 IO        OUTPUT CONTROL VARIABLES
                    IPRNT          5  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL         0.  HYDROGRAPH PLOT SCALE

    IT        HYDROGRAPH TIME DATA
                     NMIN          6  MINUTES IN COMPUTATION INTERVAL
                    IDATE     1    0  STARTING DATE
                    ITIME       0000  STARTING TIME
                       NQ        241  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE     2    0  ENDING DATE
                   NDTIME       0000  ENDING TIME
                    ICENT         19  CENTURY MARK

              COMPUTATION INTERVAL    0.10 HOURS
                   TOTAL TIME BASE   24.00 HOURS

        ENGLISH UNITS
            DRAINAGE AREA         SQUARE MILES
            PRECIPITATION DEPTH   INCHES
            LENGTH, ELEVATION     FEET
            FLOW                  CUBIC FEET PER SECOND
            STORAGE VOLUME        ACRE-FEET
            SURFACE AREA          ACRES
            TEMPERATURE           DEGREES FAHRENHEIT

    JP        MULTI-PLAN OPTION
                  NPLAN           1  NUMBER OF PLANS

    JR        MULTI-RATIO OPTION
                RATIOS OF PRECIPITATION
              0.44      0.69      0.76      0.87      1.00
```

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

					RATIOS APPLIED TO PRECIPITATION				
OPERATION	STATION	AREA	PLAN		RATIO 1	RATIO 2	RATIO 3	RATIO 4	RATIO 5
					0.44	0.69	0.76	0.87	1.00
HYDROGRAPH AT	SUB1A	0.11	1	FLOW	38.	102.	120.	150.	190.
				TIME	12.30	12.30	12.30	12.30	12.30
ROUTED TO	NODE1	0.11	1	FLOW	38.	100.	118.	149.	188.
				TIME	12.50	12.50	12.50	12.40	12.40
HYDROGRAPH AT	SUB1B	0.05	1	FLOW	20.	52.	61.	76.	95.
				TIME	12.20	12.20	12.20	12.20	12.10
ROUTED TO	NODE1	0.05	1	FLOW	20.	52.	61.	76.	95.
				TIME	12.30	12.30	12.30	12.30	12.20
2 COMBINED AT	NODE1	0.16	1	FLOW	55.	146.	173.	216.	272.
				TIME	12.40	12.40	12.40	12.40	12.40
ROUTED TO	NODE2	0.16	1	FLOW	54.	144.	171.	215.	272.
				TIME	12.60	12.50	12.50	12.50	12.50
HYDROGRAPH AT	SUB2	0.09	1	FLOW	35.	91.	107.	134.	169.
				TIME	12.30	12.20	12.20	12.20	12.20
HYDROGRAPH AT	SUBT6	0.03	1	FLOW	18.	38.	44.	53.	64.
				TIME	12.30	12.30	12.30	12.30	12.30
ROUTED TO	BASNP1	0.03	1	FLOW	7.	10.	10.	13.	28.
				TIME	12.80	13.00	13.10	13.00	12.70
			** PEAK STAGES IN FEET **						
			1	STAGE	727.50	731.43	732.35	733.58	734.30
				TIME	12.80	13.00	13.10	13.00	12.70
ROUTED TO	NODE2	0.03	1	FLOW	7.	10.	10.	13.	28.
				TIME	13.00	13.20	13.20	13.20	12.90
HYDROGRAPH AT	SUB3	0.00	1	FLOW	1.	2.	2.	3.	4.
				TIME	12.40	12.40	12.40	12.40	12.30
ROUTED TO	BSNM1A	0.00	1	FLOW	0.	1.	1.	2.	2.
				TIME	12.80	12.70	12.70	12.70	12.70
			** PEAK STAGES IN FEET **						
			1	STAGE	714.06	714.47	714.59	714.79	715.04
				TIME	12.80	12.70	12.70	12.70	12.70
ROUTED TO	NODE2	0.00	1	FLOW	0.	1.	1.	2.	2.
				TIME	12.80	12.80	12.80	12.80	12.80
HYDROGRAPH AT	SUB4	0.01	1	FLOW	4.	9.	11.	13.	17.
				TIME	12.60	12.60	12.60	12.50	12.50
HYDROGRAPH AT	SUB1C	0.01	1	FLOW	8.	13.	14.	16.	18.
				TIME	12.00	12.00	12.00	12.00	12.00
6 COMBINED AT	NODE2	0.31	1	FLOW	90.	225.	264.	328.	409.
				TIME	12.50	12.50	12.50	12.50	12.40

A

ROUTED TO	BSNMB	0.31	1	FLOW	34.	62.	67.	79.	114.	
				TIME	13.30	13.50	13.50	13.50	13.40	
			** PEAK STAGES IN FEET **							
			1	STAGE	707.64	709.70	710.24	711.09	712.00	
				TIME	13.30	13.50	13.50	13.50	13.40	
ROUTED TO	NODE3	0.31	1	FLOW	34.	62.	67.	79.	114.	B
				TIME	13.40	13.40	13.60	13.50	13.40	
HYDROGRAPH AT	SUB5	0.03	1	FLOW	20.	36.	40.	47.	56.	
				TIME	12.40	12.40	12.40	12.30	12.30	
2 COMBINED AT	NODE3	0.33	1	FLOW	43.	82.	91.	104.	127.	
				TIME	12.60	12.60	12.50	12.50	13.10	
ROUTED TO	BSNM2	0.33	1	FLOW	39.	73.	80.	91.	127.	
				TIME	13.20	13.00	13.00	12.90	13.20	
			** PEAK STAGES IN FEET **							
			1	STAGE	702.97	704.02	704.22	704.52	705.05	
				TIME	13.20	13.00	13.00	12.90	13.20	
ROUTED TO	NODE4	0.33	1	FLOW	39.	73.	80.	91.	127.	
				TIME	13.30	13.00	13.00	12.90	13.20	
HYDROGRAPH AT	SUB6	0.03	1	FLOW	39.	69.	77.	89.	104.	
				TIME	12.00	12.00	12.00	12.00	12.00	
2 COMBINED AT	NODE4	0.37	1	FLOW	47.	93.	105.	124.	147.	C
				TIME	12.20	12.20	12.20	12.20	12.20	
ROUTED TO	BSNM3	0.37	1	FLOW	43.	80.	89.	103.	131.	D
				TIME	13.50	13.10	13.10	13.10	13.60	
			** PEAK STAGES IN FEET **							
			1	STAGE	683.69	684.74	685.00	685.40	686.32	
				TIME	13.50	13.10	13.10	13.10	13.60	
ROUTED TO	NODE5	0.37	1	FLOW	43.	80.	89.	103.	131.	
				TIME	13.50	13.10	13.10	13.10	13.60	
HYDROGRAPH AT	SUB8	0.03	1	FLOW	36.	65.	72.	84.	99.	
				TIME	12.00	12.00	12.00	12.00	12.00	
ROUTED TO	NODE5	0.03	1	FLOW	36.	65.	72.	84.	99.	
				TIME	12.00	12.00	12.00	12.00	12.00	
HYDROGRAPH AT	SUB9	0.01	1	FLOW	4.	9.	11.	13.	17.	
				TIME	12.20	12.20	12.00	12.00	12.00	
3 COMBINED AT	NODE5	0.41	1	FLOW	65.	125.	140.	165.	196.	E
				TIME	12.20	12.20	12.20	12.20	12.20	
ROUTED TO	NODE9	0.41	1	FLOW	64.	123.	139.	163.	193.	
				TIME	12.30	12.30	12.30	12.30	12.30	
HYDROGRAPH AT	SUB7	0.03	1	FLOW	29.	53.	60.	70.	83.	
				TIME	12.20	12.20	12.20	12.20	12.20	
ROUTED TO	BSNM4A	0.03	1	FLOW	16.	50.	58.	69.	82.	
				TIME	12.60	12.30	12.30	12.20	12.20	
			** PEAK STAGES IN FEET **							
			1	STAGE	678.07	678.98	679.13	679.32	679.57	

				TIME	12.60	12.30	12.30	12.20	12.20
ROUTED TO	BSNM4B	0.03	1	FLOW	3.	24.	42.	57.	80.
				TIME	15.80	12.70	12.60	12.50	12.30
			** PEAK STAGES IN FEET **						
			1	STAGE	671.40	673.80	674.10	674.21	674.37
				TIME	16.00	12.70	12.60	12.50	12.30
ROUTED TO	NODE9	0.03	1	FLOW	3.	24.	37.	60.	85.
				TIME	15.90	12.70	12.60	12.50	12.40
HYDROGRAPH AT	SUB10	0.03	1	FLOW	16.	36.	41.	50.	61.
				TIME	12.30	12.30	12.30	12.30	12.20
HYDROGRAPH AT	SUBT3	0.05	1	FLOW	20.	47.	55.	68.	84.
				TIME	12.60	12.50	12.50	12.50	12.50
HYDROGRAPH AT	SUBT5	0.01	1	FLOW	8.	16.	18.	22.	26.
				TIME	12.20	12.20	12.10	12.10	12.10
HYDROGRAPH AT	SUB2T1	0.05	1	FLOW	9.	30.	37.	48.	62.
				TIME	12.50	12.40	12.40	12.40	12.40
HYDROGRAPH AT	SUB2T3	0.04	1	FLOW	28.	57.	65.	78.	94.
				TIME	12.20	12.20	12.20	12.20	12.10
ROUTED TO	BSN2TB	0.04	1	FLOW	13.	19.	20.	25.	43.
				TIME	12.60	12.70	12.70	12.70	12.60
			** PEAK STAGES IN FEET **						
			1	STAGE	790.90	793.89	794.64	795.73	796.63
				TIME	12.60	12.70	12.70	12.70	12.60
ROUTED TO	NODE6	0.04	1	FLOW	13.	19.	20.	25.	43.
				TIME	12.70	12.70	12.70	12.70	12.60
2 COMBINED AT	NODE6	0.09	1	FLOW	21.	48.	55.	68.	97.
				TIME	12.50	12.40	12.40	12.40	12.50
ROUTED TO	NODE7	0.09	1	FLOW	21.	47.	55.	68.	95.
				TIME	12.60	12.50	12.50	12.50	12.60
HYDROGRAPH AT	SUB2T2	0.09	1	FLOW	14.	44.	54.	70.	91.
				TIME	12.80	12.80	12.70	12.70	12.70
2 COMBINED AT	NODE7	0.18	1	FLOW	34.	87.	103.	133.	183.
				TIME	12.70	12.60	12.60	12.60	12.60
ROUTED TO	NODE8	0.18	1	FLOW	33.	87.	103.	132.	182.
				TIME	12.70	12.70	12.70	12.70	12.70
HYDROGRAPH AT	SUBT4	0.05	1	FLOW	10.	25.	30.	38.	48.
				TIME	13.20	13.10	13.10	13.10	13.10
ROUTED TO	BSNTB1	0.05	1	FLOW	7.	21.	26.	32.	40.
				TIME	13.90	13.60	13.60	13.50	13.50
			** PEAK STAGES IN FEET **						
			1	STAGE	657.01	658.32	658.62	659.10	659.73
				TIME	13.90	13.60	13.60	13.50	13.50
ROUTED TO	NODE8	0.05	1	FLOW	7.	21.	26.	32.	40.
				TIME	13.90	13.60	13.60	13.50	13.50
HYDROGRAPH AT	SUBT1	0.13	1	FLOW	35.	90.	106.	132.	165.

				TIME	12.80	12.70	12.70	12.70	12.70	
ROUTED TO	NODE8	0.13	1	FLOW	35.	89.	105.	131.	164.	
				TIME	12.80	12.80	12.80	12.70	12.70	
HYDROGRAPH AT	SUBT2	0.12	1	FLOW	24.	72.	86.	110.	142.	
				TIME	12.70	12.70	12.70	12.60	12.60	
4 COMBINED AT	NODE8	0.48	1	FLOW	96.	254.	302.	386.	504.	F
				TIME	12.80	12.70	12.70	12.70	12.70	
ROUTED TO	NODE9	0.48	1	FLOW	96.	253.	301.	384.	503.	
				TIME	12.80	12.70	12.70	12.70	12.70	
6 COMBINED AT	NODE9	1.02	1	FLOW	174.	436.	526.	655.	824.	G
				TIME	12.60	12.60	12.60	12.60	12.60	
ROUTED TO	RCH9A	1.02	1	FLOW	174.	435.	524.	655.	822.	
				TIME	12.60	12.60	12.60	12.60	12.60	
ROUTED TO	RCH9B	1.02	1	FLOW	172.	432.	516.	645.	811.	
				TIME	12.70	12.70	12.70	12.70	12.70	
HYDROGRAPH AT	SUB11	0.22	1	FLOW	99.	227.	263.	322.	395.	
				TIME	12.40	12.40	12.40	12.40	12.40	
2 COMBINED AT	NODE10	1.24	1	FLOW	263.	615.	724.	916.	1154.	H
				TIME	12.50	12.60	12.60	12.60	12.50	
ROUTED TO	NODE11	1.24	1	FLOW	264.	617.	723.	920.	1153.	
				TIME	12.60	12.60	12.60	12.60	12.60	
HYDROGRAPH AT	SUB12	0.13	1	FLOW	105.	186.	208.	243.	285.	
				TIME	12.40	12.40	12.40	12.40	12.40	
2 COMBINED AT	NODE11	1.36	1	FLOW	359.	782.	902.	1118.	1409.	J
				TIME	12.50	12.50	12.50	12.50	12.50	

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT (MIN)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	INTERPOLATED TO COMPUTATION INTERVAL DT (MIN)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)
FOR PLAN = 1 RATIO= 0.00									
RCH9A	MANE	0.68	173.97	756.61	1.06	6.00	173.52	756.00	1.06

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.5765E+02 EXCESS=0.0000E+00 OUTFLOW=0.5763E+02 BASIN STORAGE=0.3191E-01 PERCENT ERROR= 0.0

FOR PLAN = 1 RATIO= 0.00									
RCH9A	MANE	0.52	435.78	756.72	2.40	6.00	434.57	756.00	2.40

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1302E+03 EXCESS=0.0000E+00 OUTFLOW=0.1302E+03 BASIN STORAGE=0.5252E-01 PERCENT ERROR= 0.0

FOR PLAN = 1 RATIO= 0.00									
RCH9A	MANE	0.50	525.04	756.55	2.79	6.00	523.85	756.00	2.79

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1512E+03 EXCESS=0.0000E+00 OUTFLOW=0.1512E+03 BASIN STORAGE=0.5757E-01 PERCENT ERROR= 0.0

FOR PLAN = 1 RATIO= 0.00									
RCH9A	MANE	0.47	654.66	755.88	3.42	6.00	654.59	756.00	3.42

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1858E+03 EXCESS=0.0000E+00 OUTFLOW=0.1857E+03 BASIN STORAGE=0.6756E-01 PERCENT ERROR= 0.0

FOR PLAN = 1 RATIO= 0.00									
RCH9A	MANE	0.44	823.21	756.33	4.24	6.00	822.43	756.00	4.24

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2302E+03 EXCESS=0.0000E+00 OUTFLOW=0.2301E+03 BASIN STORAGE=0.7959E-01 PERCENT ERROR= 0.0

FOR PLAN = 1 RATIO= 0.00									
RCH9B	MANE	1.27	173.18	758.24	1.06	6.00	172.22	762.00	1.06

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.5762E+02 EXCESS=0.0000E+00 OUTFLOW=0.5757E+02 BASIN STORAGE=0.5484E-01 PERCENT ERROR= 0.0

FOR PLAN = 1 RATIO= 0.00									
RCH9B	MANE	1.70	432.24	763.17	2.40	6.00	431.76	762.00	2.40

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1302E+03 EXCESS=0.0000E+00 OUTFLOW=0.1301E+03 BASIN STORAGE=0.9172E-01 PERCENT ERROR= 0.0

FOR PLAN = 1 RATIO= 0.00									
RCH9B	MANE	2.94	516.23	763.23	2.78	6.00	515.81	762.00	2.78

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1512E+03 EXCESS=0.0000E+00 OUTFLOW=0.1510E+03 BASIN STORAGE=0.1022E+00 PERCENT ERROR= 0.0

```
FOR PLAN = 1  RATIO= 0.00
   RCH9B  MANE        3.40    648.64    758.47      3.42      6.00    644.93    762.00        3.42

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1858E+03 EXCESS=0.0000E+00 OUTFLOW=0.1855E+03 BASIN STORAGE=0.1213E+00 PERCENT ERROR=   0.1

FOR PLAN = 1  RATIO= 0.00
   RCH9B  MANE        4.27    816.72    760.24      4.24      6.00    811.05    762.00        4.24

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2303E+03 EXCESS=0.0000E+00 OUTFLOW=0.2300E+03 BASIN STORAGE=0.1433E+00 PERCENT ERROR=   0.1


*** NORMAL END OF HEC-1 ***
```

HEC-1
PROPOSED CONDITIONS

HEC1 S/N: 1343000047 HMVersion: 6.33 Data File: MCKPRO.hc1

```
****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              MAY   1991              *
*           VERSION 4.0.1E             *
*                                      *
* RUN DATE  08/28/1995  TIME  12:25:23 *
*                                      *
****************************************
```

```
****************************************
*                                      *
*   U.S. ARMY CORPS OF ENGINEERS       *
*   HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET            *
*      DAVIS, CALIFORNIA 95616         *
*          (916) 756-1104              *
*                                      *
****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X       XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

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::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::
:::                                    :::
:::  Full Microcomputer Implementation :::
:::                by                  :::
:::       Haestad Methods, Inc.        :::
:::                                    :::
::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

              *
              *DIAGRAM
  1           ID        MCKEEL BROOK STORMWATER MANAGEMENT PLAN
  2           ID        ROCKAWAY TOWNSHIP AND TOWN OF DOVER, MORRIS COUNTY, N.J.
  3           ID        PREPARED BY GOODKIND & O'DEA, 60 FERONIA WAY, RUTHERFORD, NJ  07070
  4           ID        G&O PROJECT #1593 - OCTOBER 1994              FILE: "MCKPRO.HC1"
  5           ID        SCS TYPE III, 2,10,25,50, & 100-YEAR STORMS - PROPOSED CONDITIONS
  6           ID        IGNORE NATURAL BASINS UPSTREAM OF 18" AND 24" PIPES UNDER I-80
  7           IT       6       0       0     241
  8           IO       5       0
  9           JR    PREC    0.44   0.693    0.76   0.867     1.0

 10           KK   SUB1A
 11           KM               COMPUTE RUNOFF FROM SUBAREA SUB1A UPSTREAM OF I-80
 12           KO       0       1
 13           BA  0.1109
 14           PB     7.5
 15           IN      15
 16           PC      .0    .002    .005    .007    .010    .012    .015    .017    .020    .022
 17           PC    .026    .028    .031    .034    .037    .040    .043    .046    .050    .053
 18           PC    .057    .060    .064    .067    .072    .075    .080    .084    .089    .093
 19           PC    .100    .106    .115    .121     .13    .137    .148    .155    .167    .176
 20           PC    .189    .199    .216    .228    .250    .266    .298    .328    .500    .638
 21           PC    .702    .725    .751    .766    .785    .796    .811    .821    .834    .842
 22           PC    .853    .860    .870    .877    .886    .892    .900    .906    .911    .915
 23           PC    .920    .924    .929    .932    .936    .939    .944    .946    .951    .953
 24           PC    .957    .960    .963    .966    .969    .972    .975    .977    .981    .983
 25           PC    .986    .988    .991    .996    .998     1.0     1.0     1.0     1.0     1.0
 26           LS       0      70
 27           UD    0.20

 28           KK   NODE1
 29           KM               ROUTE THRU PIPE UNDER I-80
 30           KO       0       1
 31           RM       1   0.167     0.5

 32           KK   SUB1B
 33           KM               COMPUTE RUNOFF FROM SUBAREA SUB1B UPSTREAM OF I-80
 34           KO       0       1
 35           BA  0.0515
 36           LS       0      70
 37           UD    0.08

 38           KK   NODE1
 39           KM               ROUTE FLOW THRU PIPE UNDER I-80
 40           KO       0       1
 41           RM       1  0.1002     0.5

 42           KK   NODE1
 43           KM               COMBINE HYDROGRAPHS AT NODE1
 44           KO       0       1
 45           HC       2
```

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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  46          KK   NODE2
  47          KM               ROUTE FLOW THRU CHANNEL TO BASIN MB (NODE 2)
  48          KO       0       1
  49          RM       1   0.167     0.5

  50          KK    SUB2
  51          KM               COMPUTE RUNOFF FROM SUBAREA SUB2
  52          KO       0       1
  53          BA  0.0928
  54          LS       0      70
  55          UD    0.11

  56          KK   SUBT6
  57          KM               COMPUTE RUNOFF FROM SUBAREA SUBT6 - THE POINTE
  58          KO       0       1
  59          BA  .03125
  60          LS       0      78
  61          UD    0.20

  62          KK  BASNP1
  63          KM               ROUTE FLOW THROUGH EXISTING BASIN AT THE POINTE
  64          KO       0       1
  65          RS       1    ELEV  722.46
  66          SV       0    0.01    0.09    0.32    0.68    1.21    1.89    2.47    2.77    2.96
  67          SV    3.79
  68          SE     722  722.46     724     726     728     730     732  733.33     734  734.33
  69          SE     736
  70          SQ       0       0    3.94    5.98    7.48    8.73    9.82   10.48    16.5   29.24
  71          SQ   174.7

  72          KK   NODE2
  73          KM               ROUTE FLOW THROUGH PIPE TO NODE2
  74          KO       0       1
  75          RM       1   0.167     0.5

  76          KK    SUB3
  77          KM               COMPUTE RUNOFF FROM SUBAREA SUB3
  78          KO       0       1
  79          BA  0.0022
  80          LS       0      72
  81          UD    0.27

  82          KK  BSNM1A
  83          KM               ROUTE FLOW THROUGH NATURAL BASIN
  84          KO       0       1
  85          RS       1    ELEV   713.8
  86          SA       0    0.29    0.43
  87          SE   713.8     716     717
  88          SQ       0       4       5
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  89          KK   NODE2
  90          KM              ROUTE FLOW THRU 15" DIA. CMP UNDER MT. HOPE AVE.
  91          KO       0       1
  92          RM       1   0.052     0.5

  93          KK    SUB4
  94          KM              COMPUTE RUNOFF FROM SUBAREA SUB4
  95          KO       0       1
  96          BA  0.0114
  97          LS       0      73
  98          UD    0.45

  99          KK   SUB1C
 100          KM              COMPUTE RUNOFF FROM SUBAREA SUB1C
 101          KO       0       1
 102          BA  0.0058
 103          LS       0      95
 104          UD    0.05

 105          KK   NODE2
 106          KM              COMBINE 6 HYDROGRAPHS AT NODE2
 107          KO       0       1
 108          HC       6

 109          KK   BSNMB
 110          KM              ROUTE FLOW THRU MCKEEL BROOK BASIN (COMBINED W/BASIN M1)
 111          KO       0       1
 112          RS       1    ELEV   704.6
 113          SA       0    1.27    2.50    3.73    4.70    5.50    6.10    6.59    7.30    8.46
 114          SE   704.6     706     707     708     709     710     711     712     713     714
 115          SQ       0      11      24      40      54      65      75     114     432     884

 116          KK   NODE3
 117          KM              ROUTE FLOWS THRU 36" DIA. RCP UNDER MT. HOPE AVE.
 118          KO       0       1
 119          RM       1   0.005     0.5

 120          KK    SUB5
 121          KM              COMPUTE RUNOFF FROM SUBAREA SUB5
 122          KO       0       1
 123          BA  0.0253
 124          LS       0      87
 125          UD    0.30

 126          KK   NODE3
 127          KM              COMBINE 2 HYDROGRAPHS AT NODE3
 128          KO       0       1
 129          HC       2
```

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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 130          KK   BSNM2
 131          KM               ROUTE FLOW THRU EXISTING DETENTION BASIN AT TOWNSQUARE OFFICES
 132          KO       0       1
 133          RS       1    ELEV     701
 134          SV       0    0.58    1.28    2.14    3.29    4.74
 135          SE     701     702     703     704     705     706
 136          SQ       0    14.7      40      72     109     456

 137          KK   NODE4
 138          KM               ROUTE FLOW THRU PIPE AND CHANNEL TO POND M3
 139          KO       0       1
 140          RM       1   0.012     0.2

 141          KK    SUB6
 142          KM               COMPUTE RUNOFF FROM SUBAREA SUB6
 143          KO       0       1
 144          BA  0.0341
 145          LS       0      91
 146          UD    0.05

 147          KK   NODE4
 148          KM               COMBINE 2 HYDROGRAPHS AT NODE4
 149          KO       0       1
 150          HC       2

 151          KK   BSNM3
 152          KM               ROUTE FLOW THRU EXISTING DETENTION BASIN AT CONVENIENCE CENTER
 153          KO       0       1
 154          RS       1    ELEV     682
 155          SV       0   0.654   1.835   4.385   7.187  10.252
 156          SE     682     683     684     686     688     690
 157          SQ       0      17      55     123     176     283

 158          KK   NODE5
 159          KM               ROUTE FLOW THRU CHANNEL TO NODE5 (U/S END CLARK POND)
 160          KO       0       1
 161          RM       1   0.007     0.2

 162          KK    SUB8
 163          KM               COMPUTE RUNOFF FROM SUBAREA SUB8 - RUSTIC RIDGE
 164          KO       0       1
 165          BA  0.0328
 166          LS       0      90
 167          UD    0.04

 168          KK   NODE5
 169          KM               ROUTE FLOW THRU 24" DIA. PIPE TO NODE5
 170          KO       0       1
 171          RM       1   0.008     0.5
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 172          KK    SUB9
 173          KM               COMPUTE RUNOFF FROM SUBAREA SUB9 - CLARK POND AREA
 174          KO       0       1
 175          BA  0.0088
 176          LS       0      70
 177          UD    0.05

 178          KK   NODE5
 179          KM               COMBINE 3 HYDROGRAPHS AT NODE 5
 180          KO       0       1
 181          HC       3

 182          KK   NODE9
 183          KM               ROUTE FLOW THRU CHANNEL TO NODE9
 184          KO       0       1
 185          RM       1   0.056     0.2

 186          KK    SUB7
 187          KM               COMPUTE RUNOFF FROM SUBAREA SUB7 - TOWNSQUARE VILLAGE
 188          KO       0       1
 189          BA  0.0328
 190          LS       0      87
 191          UD    0.15

 192          KK  BSNM4A
 193          KM               ROUTE FLOW THRU EXISTING UPPER BASIN AT TOWNSQUARE VILLAGE
 194          KO       0       1
 195          RS       1    ELEV   672.5
 196          SV       0    .025    .208    .472    .735    .999   1.262   1.526   1.789
 197          SE   672.5     673     674     675     676     677     678     679     680
 198          SQ       0     0.7     1.8     2.5     3.0     3.5    13.1      51     106

 199          KK  BSNM4B
 200          KM               ROUTE FLOW THRU EXISTING LOWER BASIN AT TOWNSQUARE VILLAGE
 201          KO       0       1
 202          RS       1    ELEV   667.5
 203          SV       0   0.019   0.203   0.504   0.818   1.148   1.492   1.845   2.200
 204          SE   667.5     668     669     670     671     672     673     674     675
 205          SQ       0     0.7     1.8     2.5     3.0     3.5     8.5      28     168

 206          KK   NODE9
 207          KM               ROUTE FLOW THRU CHANNEL TO NODE9
 208          KO       0       1
 209          RM       1   0.030     0.2

 210          KK   SUB10
 211          KM               COMPUTE RUNOFF FROM SUBAREA SUB10
 212          KO       0       1
 213          BA  0.0300
 214          LS       0      77
 215          UD    0.19
```

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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 216          KK   SUBT3
 217          KM               COMPUTE RUNOFF FROM SUBAREA SUBT3
 218          KO       0       1
 219          BA  0.0531
 220          LS       0      75
 221          UD    0.43

 222          KK   SUBT5
 223          KM               COMPUTE RUNOFF FROM SUBAREA SUBT5
 224          KO       0       1
 225          BA  0.0114
 226          LS       0      80
 227          UD    0.12

 228          KK  SUB2T1
 229          KM               COMPUTE RUNOFF FROM SUBAREA SUB2T1
 230          KO       0       1
 231          BA  0.0484
 232          LS       0      63
 233          UD    0.26

 234          KK  SUB2T3
 235          KM               COMPUTE RUNOFF FROM SUBAREA SUB2T3 - TOWERING OAKS
 236          KO       0       1
 237          BA  0.0406
 238          LS       0      81
 239          UD    0.13

 240          KK  BSN2TB
 241          KM               ROUTE FLOW THRU EXISTING DETENTION BASIN AT TOWERING OAKS
 242          KO       0       1
 243          RS       1    ELEV   787.5
 244          SV       0   0.025   0.218   0.529   0.888   1.294   1.748   2.251   2.801   3.374
 245          SV   3.984
 246          SE   787.5     788     789     790     791     792     793     794     795     796
 247          SE     797
 248          SQ       0     1.5     7.0    10.5    13.1    15.3    17.2    18.9    20.4      27
 249          SQ      52

 250          KK   NODE6
 251          KM               ROUTE FLOW THRU 24" DIA. RCP TO NODE6
 252          KO       0       1
 253          RM       1   0.011     0.5

 254          KK   NODE6
 255          KM               COMBINE 2 HYDROGRAPHS AT NODE6
 256          KO       0       1
 257          HC       2
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 258          KK   NODE7
 259          KM               ROUTE FLOW THRU CHANNEL TO NODE7
 260          KO       0       1
 261          RM       1   0.056     0.2

 262          KK  SUB2T2
 263          KM               COMPUTE RUNOFF FROM SUBAREA SUB2T2
 264          KO       0       1
 265          BA  0.0891
 266          LS       0      65
 267          UD     0.6

 268          KK   NODE7
 269          KM               COMBINE 2 HYDROGRAPHS AT NODE7
 270          KO       0       1
 271          HC       2

 272          KK   NODE8
 273          KM               ROUTE FLOW THRU CHANNEL TO NODE8
 274          KO       0       1
 275          RM       1   0.040     0.2

 276          KK   SUBT4
 277          KM               COMPUTE RUNOFF FROM SUBAREA SUBT4
 278          KO       0       1
 279          BA  0.0516
 280          LS       0      71
 281          UD    0.98

 282          KK  BSNTB1
 283          KM               ROUTE FLOW THRU EXISTING DETENTION BASIN - FIRST REAL ESTATE
 284          KO       0       1
 285          RS       1    ELEV     655
 286          SV       0   0.106   0.450   0.853   1.316   1.840
 287          SE     655     656     657     658     659     660
 288          SQ       0     2.2     6.9      17      31      44

 289          KK   NODE8
 290          KM               ROUTE FLOW THRU PIPE TO NODE8
 291          KO       0       1
 292          RM       1   0.012     0.5

 293          KK   SUBT1
 294          KM               COMPUTE RUNOFF FROM SUBAREA SUBT1
 295          KO       0       1
 296          BA  0.1312
 297          LS       0      72
 298          UD    0.60
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 299          KK   NODE8
 300          KM              ROUTE FLOW THRU CHANNEL TO NODE8
 301          KO       0       1
 302          RM       1   0.035     0.2

 303          KK   SUBT2
 304          KM              COMPUTE RUNOFF FROM SUBAREA SUBT2
 305          KO       0       1
 306          BA  0.1219
 307          LS       0      67
 308          UD    0.52

 309          KK   NODE8
 310          KM              COMBINE 4 HYDROGRAPHS AT NODE8
 311          KO       0       1
 312          HC       4

 313          KK   NODE9
 314          KM              ROUTE FLOW THRU CHANNEL TO NODE9
 315          KO       0       1
 316          RM       1   0.030     0.2

 317          KK   NODE9
 318          KM              COMBINE 6 HYDROGRAPHS AT NODE9
 319          KO       0       1
 320          HC       6

 321          KK   RCH9A
 322          KM              ROUTE FLOW THRU CHANNEL TO RCH9B (STA. 3250 TO STA. 3020)
 323          KO       0       1
 324          RD
 325          RC    0.08   0.035    0.15     230  0.0096
 326          RX       0      15     190     210     220     230     585     610
 327          RY     580     579     578   573.2   573.2   577.2   577.2     580

 328          KK   RCH9B
 329          KM              ROUTE FLOW THRU CHANNEL TO NODE10 (STA. 3020 TO STA. 2685)
 330          KO       0       1
 331          RD
 332          RC    0.15   0.035    0.15     335   0.006
 333          RX       0     145     323     326     334     355     640     800
 334          RY     580     574   573.3   571.0   571.2     574     574     576

 335          KK   SUB11
 336          KM              COMPUTE RUNOF FROM SUBAREA SUB11
 337          KO       0       1
 338          BA  0.2203
 339          LS       0      76
 340          UD    0.31
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 341          KK  NODE10
 342          KM                COMBINE 2 HYDROGRAPHS AT NODE10
 343          KO       0        1
 344          HC       2

 345          KK  NODE11
 346          KM                ROUTE FLOW THRU CHANNEL TO NODE11
 347          KO       0        1
 348          RM       1    0.125     0.5

 349          KK   SUB12
 350          KM                COMPUTE RUNOFF FROM SUBAREA SUB12
 351          KO       0        1
 352          BA  0.1266
 353          LS       0       89
 354          UD    0.31

 355          KK  NODE11
 356          KM                COMBINE 2 HYDROGRAPHS AT NODE11
 357          KO       0        1
 358          HC       2
 359          ZZ
```

```
                 SCHEMATIC DIAGRAM OF STREAM NETWORK
INPUT
 LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

  NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

   10       SUB1A
                V
                V
   28       NODE1
                .
                .
   32           .       SUB1B
                .           V
                .           V
   38           .       NODE1
                .           .
                .           .
   42       NODE1............
                V
                V
   46       NODE2
                .
                .
   50           .        SUB2
                .           .
                .           .
   56           .           .      SUBT6
                .           .          V
                .           .          V
   62           .           .     BASNP1
                .           .          V
                .           .          V
   72           .           .      NODE2
                .           .          .
                .           .          .
   76           .           .          .       SUB3
                .           .          .          V
                .           .          .          V
   82           .           .          .     BSNM1A
                .           .          .          V
                .           .          .          V
   89           .           .          .      NODE2
                .           .          .          .
                .           .          .          .
   93           .           .          .          .        SUB4
                .           .          .          .           .
                .           .          .          .           .
   99           .           .          .          .           .      SUB1C
                .           .          .          .           .           .
                .           .          .          .           .           .
  105       NODE2.............................................................
                V
                V
  109       BSNMB
                V
                V
  116       NODE3
                .
                .
  120           .        SUB5
                .           .
                .           .
  126       NODE3............
                V
```

```
                V
130        BSNM2
                V
                V
137        NODE4
                .
                .
141             .        SUB6
                .           .
                .           .
147        NODE4............
                V
                V
151        BSNM3
                V
                V
158        NODE5
                .
                .
162             .        SUB8
                .           V
                .           V
168             .       NODE5
                .           .
                .           .
172             .           .        SUB9
                .           .           .
                .           .           .
178        NODE5......................
                V
                V
182        NODE9
                .
                .
186             .        SUB7
                .           V
                .           V
192             .      BSNM4A
                .           V
                .           V
199             .      BSNM4B
                .           V
                .           V
206             .       NODE9
                .           .
                .           .
210             .           .       SUB10
                .           .           .
                .           .           .
216             .           .           .       SUBT3
                .           .           .          .
                .           .           .          .
222             .           .           .          .       SUBT5
                .           .           .          .          .
                .           .           .          .          .
228             .           .           .          .          .      SUB2T1
                .           .           .          .          .          .
                .           .           .          .          .          .
234             .           .           .          .          .          .      SUB2T3
                .           .           .          .          .          .          V
                .           .           .          .          .          .          V
240             .           .           .          .          .          .      BSN2TB
                .           .           .          .          .          .          V
                .           .           .          .          .          .          V
250             .           .           .          .          .          .       NODE6
                .           .           .          .          .          .          .
```

```
          .         .         .         .         .         .         .
254       .         .         .         .         .      NODE6............
          .         .         .         .         .         V
          .         .         .         .         .         V
258       .         .         .         .         .      NODE7
          .         .         .         .         .         .
          .         .         .         .         .         .
262       .         .         .         .         .         .     SUB2T2
          .         .         .         .         .         .         .
          .         .         .         .         .         .         .
268       .         .         .         .         .      NODE7............
          .         .         .         .         .         V
          .         .         .         .         .         V
272       .         .         .         .         .      NODE8
          .         .         .         .         .         .
          .         .         .         .         .         .
276       .         .         .         .         .         .      SUBT4
          .         .         .         .         .         .         V
          .         .         .         .         .         .         V
282       .         .         .         .         .         .     BSNTB1
          .         .         .         .         .         .         V
          .         .         .         .         .         .         V
289       .         .         .         .         .         .      NODE8
          .         .         .         .         .         .         .
          .         .         .         .         .         .         .
293       .         .         .         .         .         .         .      SUBT1
          .         .         .         .         .         .         .         V
          .         .         .         .         .         .         .         V
299       .         .         .         .         .         .         .      NODE8
          .         .         .         .         .         .         .         .
          .         .         .         .         .         .         .         .
303       .         .         .         .         .         .         .         .      SUBT2
          .         .         .         .         .         .         .         .         .
          .         .         .         .         .         .         .         .         .
309       .         .         .         .         .      NODE8.....................................
          .         .         .         .         .         V
          .         .         .         .         .         V
313       .         .         .         .         .      NODE9
          .         .         .         .         .         .
          .         .         .         .         .         .
317     NODE9.............................................................
          V
          V
321     RCH9A
          V
          V
328     RCH9B
          .
          .
335       .      SUB11
          .         .
          .         .
341     NODE10............
          V
          V
345     NODE11
          .
          .
349       .      SUB12
          .         .
          .         .
355     NODE11............
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

HEC1 S/N: 1343000047 HMVersion: 6.33 Data File: MCKPRO.hc1

```
*****************************************                    *****************************************
*                                       *                    *                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                    *   U.S. ARMY CORPS OF ENGINEERS        *
*              MAY   1991               *                    *   HYDROLOGIC ENGINEERING CENTER       *
*           VERSION 4.0.1E              *                    *         609 SECOND STREET             *
*                                       *                    *      DAVIS, CALIFORNIA 95616          *
*  RUN DATE  08/28/1995  TIME  12:25:23 *                    *          (916) 756-1104               *
*                                       *                    *                                       *
*****************************************                    *****************************************
```

MCKEEL BROOK STORMWATER MANAGEMENT PLAN
ROCKAWAY TOWNSHIP AND TOWN OF DOVER, MORRIS COUNTY, N.J.
PREPARED BY GOODKIND & O'DEA, 60 FERONIA WAY, RUTHERFORD, NJ 07070
G&O PROJECT #1593 - OCTOBER 1994 FILE: "MCKPRO.HC1"
SCS TYPE III, 2,10,25,50, & 100-YEAR STORMS - PROPOSED CONDITIONS
IGNORE NATURAL BASINS UPSTREAM OF 18" AND 24" PIPES UNDER I-80

```
  8 IO        OUTPUT CONTROL VARIABLES
                   IPRNT          5  PRINT CONTROL
                   IPLOT          0  PLOT CONTROL
                   QSCAL         0.  HYDROGRAPH PLOT SCALE

   IT         HYDROGRAPH TIME DATA
                    NMIN          6  MINUTES IN COMPUTATION INTERVAL
                   IDATE     1    0  STARTING DATE
                   ITIME       0000  STARTING TIME
                      NQ        241  NUMBER OF HYDROGRAPH ORDINATES
                  NDDATE     2    0  ENDING DATE
                  NDTIME       0000  ENDING TIME
                  ICENT          19  CENTURY MARK

               COMPUTATION INTERVAL    0.10 HOURS
                    TOTAL TIME BASE   24.00 HOURS

       ENGLISH UNITS
            DRAINAGE AREA          SQUARE MILES
            PRECIPITATION DEPTH    INCHES
            LENGTH, ELEVATION      FEET
            FLOW                   CUBIC FEET PER SECOND
            STORAGE VOLUME         ACRE-FEET
            SURFACE AREA           ACRES
            TEMPERATURE            DEGREES FAHRENHEIT

   JP         MULTI-PLAN OPTION
                   NPLAN          1  NUMBER OF PLANS

   JR         MULTI-RATIO OPTION
                 RATIOS OF PRECIPITATION
                0.44      0.69      0.76      0.87      1.00
            PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
                          FLOWS IN CUBIC FEET PER SECOND,  AREA IN SQUARE MILES
                                        TIME TO PEAK IN HOURS
```

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1	RATIO 2	RATIO 3	RATIO 4	RATIO 5
					0.44	0.69	0.76	0.87	1.00
HYDROGRAPH AT	SUB1A	0.11	1	FLOW	38.	102.	120.	150.	190.

				TIME	12.30	12.30	12.30	12.30	12.30
ROUTED TO	NODE1	0.11	1	FLOW	38.	100.	118.	149.	188.
				TIME	12.50	12.50	12.50	12.40	12.40
HYDROGRAPH AT	SUB1B	0.05	1	FLOW	20.	52.	61.	76.	95.
				TIME	12.20	12.20	12.20	12.20	12.10
ROUTED TO	NODE1	0.05	1	FLOW	20.	52.	61.	76.	95.
				TIME	12.30	12.30	12.30	12.30	12.20
2 COMBINED AT	NODE1	0.16	1	FLOW	55.	146.	173.	216.	272.
				TIME	12.40	12.40	12.40	12.40	12.40
ROUTED TO	NODE2	0.16	1	FLOW	54.	144.	171.	215.	272.
				TIME	12.60	12.50	12.50	12.50	12.50
HYDROGRAPH AT	SUB2	0.09	1	FLOW	35.	91.	107.	134.	169.
				TIME	12.30	12.20	12.20	12.20	12.20
HYDROGRAPH AT	SUBT6	0.03	1	FLOW	18.	38.	44.	53.	64.
				TIME	12.30	12.30	12.30	12.30	12.30
ROUTED TO	BASNP1	0.03	1	FLOW	7.	10.	10.	13.	28.
				TIME	12.80	13.00	13.10	13.00	12.70
			** PEAK STAGES IN FEET **						
			1	STAGE	727.50	731.43	732.35	733.58	734.30
				TIME	12.80	13.00	13.10	13.00	12.70
ROUTED TO	NODE2	0.03	1	FLOW	7.	10.	10.	13.	28.
				TIME	13.00	13.20	13.20	13.20	12.90
HYDROGRAPH AT	SUB3	0.00	1	FLOW	1.	2.	2.	3.	4.
				TIME	12.40	12.40	12.40	12.40	12.30
ROUTED TO	BSNM1A	0.00	1	FLOW	0.	1.	1.	2.	2.
				TIME	12.80	12.70	12.70	12.70	12.70
			** PEAK STAGES IN FEET **						
			1	STAGE	714.06	714.47	714.59	714.79	715.04
				TIME	12.80	12.70	12.70	12.70	12.70
ROUTED TO	NODE2	0.00	1	FLOW	0.	1.	1.	2.	2.
				TIME	12.80	12.80	12.80	12.80	12.80
HYDROGRAPH AT	SUB4	0.01	1	FLOW	4.	9.	11.	13.	17.
				TIME	12.60	12.60	12.60	12.50	12.50
HYDROGRAPH AT	SUB1C	0.01	1	FLOW	8.	13.	14.	16.	18.
				TIME	12.00	12.00	12.00	12.00	12.00
6 COMBINED AT	NODE2	0.31	1	FLOW	90.	225.	264.	328.	409.
				TIME	12.50	12.50	12.50	12.50	12.40
ROUTED TO	BSNMB	0.31	1	FLOW	34.	62.	67.	79.	114.
				TIME	13.30	13.50	13.50	13.50	13.40
			** PEAK STAGES IN FEET **						
			1	STAGE	707.64	709.70	710.24	711.09	712.00
				TIME	13.30	13.50	13.50	13.50	13.40
ROUTED TO	NODE3	0.31	1	FLOW	34.	62.	67.	79.	114.
				TIME	13.40	13.40	13.60	13.50	13.40
HYDROGRAPH AT	SUB5	0.03	1	FLOW	20.	36.	40.	47.	56.

				TIME	12.40	12.40	12.40	12.30	12.30
2 COMBINED AT	NODE3	0.33	1	FLOW	43.	82.	91.	104.	127.
				TIME	12.60	12.60	12.50	12.50	13.10
ROUTED TO	BSNM2	0.33	1	FLOW	39.	73.	80.	91.	127.
				TIME	13.20	13.00	13.00	12.90	13.20
			** PEAK STAGES IN FEET **						
			1	STAGE	702.97	704.02	704.22	704.52	705.05
				TIME	13.20	13.00	13.00	12.90	13.20
ROUTED TO	NODE4	0.33	1	FLOW	39.	73.	80.	91.	127.
				TIME	13.30	13.00	13.00	12.90	13.20
HYDROGRAPH AT	SUB6	0.03	1	FLOW	39.	69.	77.	89.	104.
				TIME	12.00	12.00	12.00	12.00	12.00
2 COMBINED AT	NODE4	0.37	1	FLOW	47.	93.	105.	124.	147.
				TIME	12.20	12.20	12.20	12.20	12.20
ROUTED TO	BSNM3	0.37	1	FLOW	43.	80.	89.	103.	131.
				TIME	13.50	13.10	13.10	13.10	13.60
			** PEAK STAGES IN FEET **						
			1	STAGE	683.69	684.74	685.00	685.40	686.32
				TIME	13.50	13.10	13.10	13.10	13.60
ROUTED TO	NODE5	0.37	1	FLOW	43.	80.	89.	103.	131.
				TIME	13.50	13.10	13.10	13.10	13.60
HYDROGRAPH AT	SUB8	0.03	1	FLOW	36.	65.	72.	84.	99.
				TIME	12.00	12.00	12.00	12.00	12.00
ROUTED TO	NODE5	0.03	1	FLOW	36.	65.	72.	84.	99.
				TIME	12.00	12.00	12.00	12.00	12.00
HYDROGRAPH AT	SUB9	0.01	1	FLOW	4.	9.	11.	13.	17.
				TIME	12.20	12.20	12.00	12.00	12.00
3 COMBINED AT	NODE5	0.41	1	FLOW	65.	125.	140.	165.	196.
				TIME	12.20	12.20	12.20	12.20	12.20
ROUTED TO	NODE9	0.41	1	FLOW	64.	123.	139.	163.	193.
				TIME	12.30	12.30	12.30	12.30	12.30
HYDROGRAPH AT	SUB7	0.03	1	FLOW	29.	53.	60.	70.	83.
				TIME	12.20	12.20	12.20	12.20	12.20
ROUTED TO	BSNM4A	0.03	1	FLOW	16.	50.	58.	69.	82.
				TIME	12.60	12.30	12.30	12.20	12.20
			** PEAK STAGES IN FEET **						
			1	STAGE	678.07	678.98	679.13	679.32	679.57
				TIME	12.60	12.30	12.30	12.20	12.20
ROUTED TO	BSNM4B	0.03	1	FLOW	3.	24.	42.	57.	80.
				TIME	15.80	12.70	12.60	12.50	12.30
			** PEAK STAGES IN FEET **						
			1	STAGE	671.40	673.80	674.10	674.21	674.37
				TIME	16.00	12.70	12.60	12.50	12.30
ROUTED TO	NODE9	0.03	1	FLOW	3.	24.	37.	60.	85.
				TIME	15.90	12.70	12.60	12.50	12.40

HYDROGRAPH AT	SUB10	0.03	1	FLOW	16.	36.	41.	50.	61.
				TIME	12.30	12.30	12.30	12.30	12.20
HYDROGRAPH AT	SUBT3	0.05	1	FLOW	20.	47.	55.	68.	84.
				TIME	12.60	12.50	12.50	12.50	12.50
HYDROGRAPH AT	SUBT5	0.01	1	FLOW	8.	16.	18.	22.	26.
				TIME	12.20	12.20	12.10	12.10	12.10
HYDROGRAPH AT	SUB2T1	0.05	1	FLOW	9.	30.	37.	48.	62.
				TIME	12.50	12.40	12.40	12.40	12.40
HYDROGRAPH AT	SUB2T3	0.04	1	FLOW	28.	57.	65.	78.	94.
				TIME	12.20	12.20	12.20	12.20	12.10
ROUTED TO	BSN2TB	0.04	1	FLOW	13.	19.	20.	25.	43.
				TIME	12.60	12.70	12.70	12.70	12.60
			** PEAK STAGES IN FEET **						
			1	STAGE	790.90	793.89	794.64	795.73	796.63
				TIME	12.60	12.70	12.70	12.70	12.60
ROUTED TO	NODE6	0.04	1	FLOW	13.	19.	20.	25.	43.
				TIME	12.70	12.70	12.70	12.70	12.60
2 COMBINED AT	NODE6	0.09	1	FLOW	21.	48.	55.	68.	97.
				TIME	12.50	12.40	12.40	12.40	12.50
ROUTED TO	NODE7	0.09	1	FLOW	21.	47.	55.	68.	95.
				TIME	12.60	12.50	12.50	12.50	12.60
HYDROGRAPH AT	SUB2T2	0.09	1	FLOW	14.	44.	54.	70.	91.
				TIME	12.80	12.80	12.70	12.70	12.70
2 COMBINED AT	NODE7	0.18	1	FLOW	34.	87.	103.	133.	183.
				TIME	12.70	12.60	12.60	12.60	12.60
ROUTED TO	NODE8	0.18	1	FLOW	33.	87.	103.	132.	182.
				TIME	12.70	12.70	12.70	12.70	12.70
HYDROGRAPH AT	SUBT4	0.05	1	FLOW	10.	25.	30.	38.	48.
				TIME	13.20	13.10	13.10	13.10	13.10
ROUTED TO	BSNTB1	0.05	1	FLOW	7.	21.	26.	32.	40.
				TIME	13.90	13.60	13.60	13.50	13.50
			** PEAK STAGES IN FEET **						
			1	STAGE	657.01	658.32	658.62	659.10	659.73
				TIME	13.90	13.60	13.60	13.50	13.50
ROUTED TO	NODE8	0.05	1	FLOW	7.	21.	26.	32.	40.
				TIME	13.90	13.60	13.60	13.50	13.50
HYDROGRAPH AT	SUBT1	0.13	1	FLOW	35.	90.	106.	132.	165.
				TIME	12.80	12.70	12.70	12.70	12.70
ROUTED TO	NODE8	0.13	1	FLOW	35.	89.	105.	131.	164.
				TIME	12.80	12.80	12.80	12.70	12.70
HYDROGRAPH AT	SUBT2	0.12	1	FLOW	24.	72.	86.	110.	142.
				TIME	12.70	12.70	12.70	12.60	12.60
4 COMBINED AT	NODE8	0.48	1	FLOW	96.	254.	302.	386.	504.
				TIME	12.80	12.70	12.70	12.70	12.70
ROUTED TO	NODE9	0.48	1	FLOW	96.	253.	301.	384.	503.

				TIME	12.80	12.70	12.70	12.70	12.70
6 COMBINED AT	NODE9	1.02	1	FLOW	174.	436.	526.	655.	824.
				TIME	12.60	12.60	12.60	12.60	12.60
ROUTED TO	RCH9A	1.02	1	FLOW	174.	435.	524.	655.	822.
				TIME	12.60	12.60	12.60	12.60	12.60
ROUTED TO	RCH9B	1.02	1	FLOW	172.	432.	516.	645.	811.
				TIME	12.70	12.70	12.70	12.70	12.70
HYDROGRAPH AT	SUB11	0.22	1	FLOW	99.	227.	263.	322.	395.
				TIME	12.40	12.40	12.40	12.40	12.40
2 COMBINED AT	NODE10	1.24	1	FLOW	263.	615.	724.	916.	1154.
				TIME	12.50	12.60	12.60	12.60	12.50
ROUTED TO	NODE11	1.24	1	FLOW	263.	616.	725.	919.	1150.
				TIME	12.70	12.70	12.70	12.70	12.70
HYDROGRAPH AT	SUB12	0.13	1	FLOW	105.	186.	208.	243.	285.
				TIME	12.40	12.40	12.40	12.40	12.40
2 COMBINED AT	NODE11	1.36	1	FLOW	349.	763.	881.	1100.	1379.
				TIME	12.60	12.60	12.60	12.60	12.60

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT (MIN)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	INTERPOLATED TO COMPUTATION INTERVAL DT (MIN)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)
FOR PLAN = 1 RATIO= 0.00									
RCH9A	MANE	0.68	173.97	756.61	1.06	6.00	173.52	756.00	1.06

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.5765E+02 EXCESS=0.0000E+00 OUTFLOW=0.5763E+02 BASIN STORAGE=0.3191E-01 PERCENT ERROR= 0.0

FOR PLAN = 1 RATIO= 0.00									
RCH9A	MANE	0.52	435.78	756.72	2.40	6.00	434.57	756.00	2.40

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1302E+03 EXCESS=0.0000E+00 OUTFLOW=0.1302E+03 BASIN STORAGE=0.5252E-01 PERCENT ERROR= 0.0

FOR PLAN = 1 RATIO= 0.00									
RCH9A	MANE	0.50	525.04	756.55	2.79	6.00	523.85	756.00	2.79

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1512E+03 EXCESS=0.0000E+00 OUTFLOW=0.1512E+03 BASIN STORAGE=0.5757E-01 PERCENT ERROR= 0.0

FOR PLAN = 1 RATIO= 0.00									
RCH9A	MANE	0.47	654.66	755.88	3.42	6.00	654.59	756.00	3.42

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1858E+03 EXCESS=0.0000E+00 OUTFLOW=0.1857E+03 BASIN STORAGE=0.6756E-01 PERCENT ERROR= 0.0

FOR PLAN = 1 RATIO= 0.00									
RCH9A	MANE	0.44	823.21	756.33	4.24	6.00	822.43	756.00	4.24

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2302E+03 EXCESS=0.0000E+00 OUTFLOW=0.2301E+03 BASIN STORAGE=0.7959E-01 PERCENT ERROR= 0.0

FOR PLAN = 1 RATIO= 0.00									
RCH9B	MANE	1.27	173.18	758.24	1.06	6.00	172.22	762.00	1.06

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.5762E+02 EXCESS=0.0000E+00 OUTFLOW=0.5757E+02 BASIN STORAGE=0.5484E-01 PERCENT ERROR= 0.0

FOR PLAN = 1 RATIO= 0.00									
RCH9B	MANE	1.70	432.24	763.17	2.40	6.00	431.76	762.00	2.40

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1302E+03 EXCESS=0.0000E+00 OUTFLOW=0.1301E+03 BASIN STORAGE=0.9172E-01 PERCENT ERROR= 0.0

FOR PLAN = 1 RATIO= 0.00									
RCH9B	MANE	2.94	516.23	763.23	2.78	6.00	515.81	762.00	2.78

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1512E+03 EXCESS=0.0000E+00 OUTFLOW=0.1510E+03 BASIN STORAGE=0.1022E+00 PERCENT ERROR= 0.0

HYDRAULIC CALCULATIONS
HEC-2, EXISTING & PROPOSED

APPENDIX B

HEC-2
EXISTING CONDITIONS

GOODKIND & O'DEA INC. CONSULTING ENGINEERS

1593

JOB McKEEL BROOK NOTES BY WJH DATE 7-17-95 PAGE NO.

REACH FLOW SCHEMATIC CHECK BY DATE

HEC-1 PEAK FLOWS AT NODE: (CFS)

HEC-2 REACH FLOWS: (CFS)

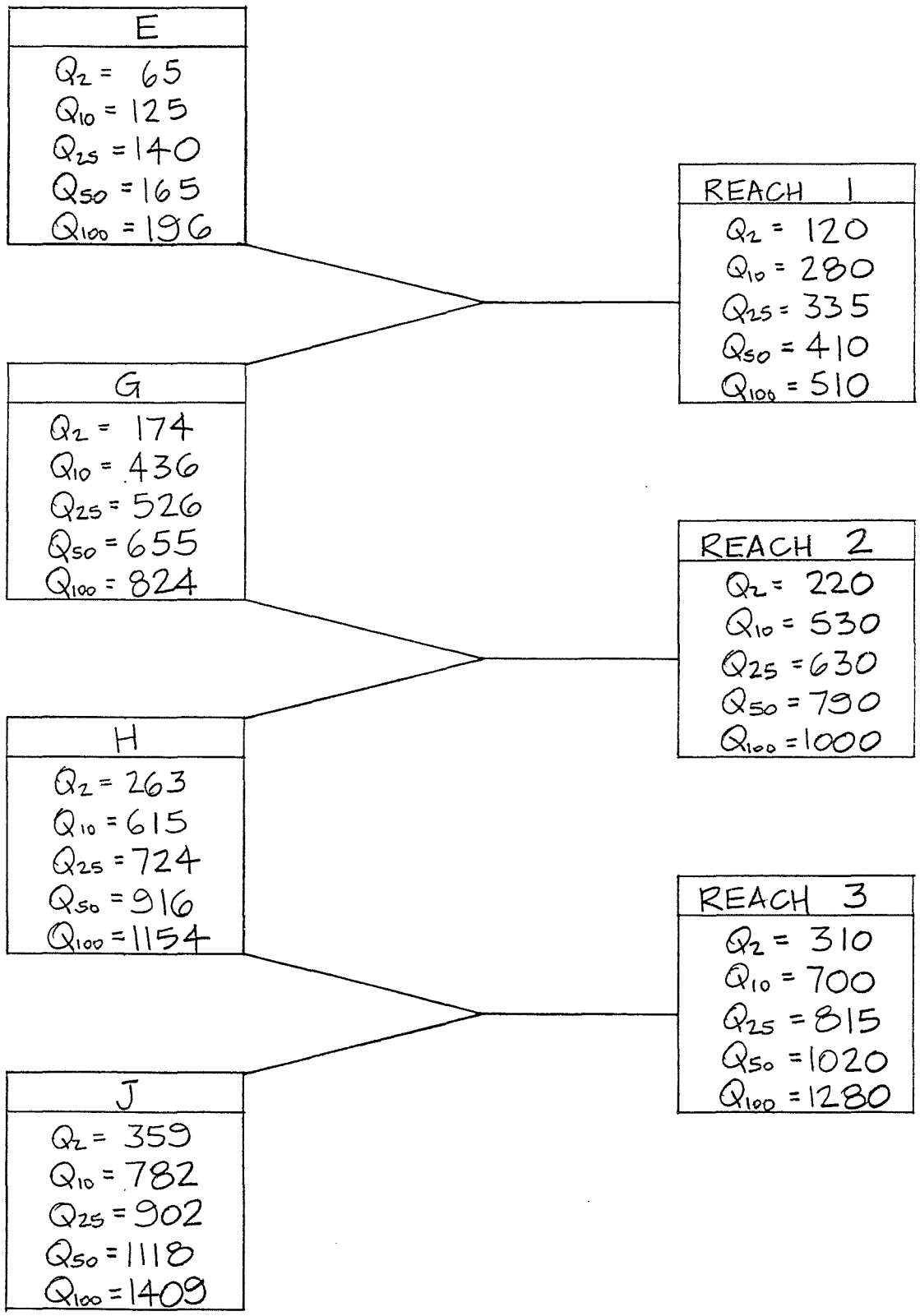

FIGURE 4

HEC2 S/N: 1363000007 HMVersion: 6.51 Data File: mckrev.hC2

```
*********************************************
*  HEC-2 WATER SURFACE PROFILES             *
*                                           *
*  Version   4.6.2;  May 1991               *
*                                           *
*  RUN DATE    24APR95    TIME    7:52:48   *
*********************************************
```

```
**************************************
*  U.S. ARMY CORPS OF ENGINEERS
*  HYDROLOGIC ENGINEERING CENTER
*  609 SECOND STREET, SUITE D
*  DAVIS, CALIFORNIA 95616-4687
*          (916) 756-1104
**************************************
```

EXISTING CONDITIONS

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X    X            X     X
X     X  X        X                      X
XXXXXXX  XXXX     X         XXXXX    XXXXX
X     X  X        X                 X
X     X  X        X    X            X
X     X  XXXXXXX   XXXXX            XXXXXXX
```

```
:::::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::::
:::                                       :::
:::   FULL MICRO-COMPUTER IMPLEMENTATION   :::
:::                                       :::
:::::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::::
```

```
============================
H A E S T A D   M E T H O D S
============================
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS RUN EXECUTED 24APR95 7:52:48

```
*************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
*************************************


T1      GOODKIND & O'DEA, INC.  60 FERONIA WAY, RUTHERFORD, NJ  07070
T2      McKEEL BROOK STORMWATER MANAGEMENT PLAN - ROCKAWAY AND DOVER, NJ
T3      EXISTING  2 YEAR STORM

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0         2         0         0         0         0         0         0    554.25         0

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      1         0        -1


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38        43         1         3        51        39        26         4        53        54
     13        14        15       100

QT        5       310       700       815      1020      1280
NC     0.06      0.06      0.03       0.3       0.5
        CROSS SECTIONS TAKEN LOOKING DOWNSTREAM
        HEC-2 BASED ON DOVER F.I.S. PREPARED BY THE RBA GROUP DATED 4/5/78
        AND UPDATED TO NOV. 1994 AS PER SURVEY BY GOODKIND & O'DEA, INC.
              CONFLUENCE WITH THE ROCKAWAY RIVER
X1     0058        10         5        44         0         0         0
X3       10                                                                  553.6     553.6
GR    553.6         0     553.6         5       549        14       549        24     548.4        26
GR    548.4        34     548.4        36     548.4        44     553.6      54.5     553.6        60

NH        4      0.06         5      0.03        26     0.015        44      0.06        60
X1     0059         0         0         0         1         1         1
BT      -11        24       549         0        24     553.6         0        26     553.6         0
BT                 26     553.6     552.4        34     553.6     552.4        34     553.6         0
BT                 36     553.6         0        36     553.6     552.4        44     553.6     552.4
BT                 44     553.6         0      54.5     553.6         0

NH        4      0.06         5      0.03        26     0.015        44      0.06        60
X1     0096        10         5        44        20        50        37
BT      -11        24       549         0        24     553.6         0        26     553.6         0
BT                 26     553.6     552.6        34     553.6     552.6        34     553.6         0
BT                 36     553.6         0        36     553.6     552.6        44     553.6     552.6
BT                 44     553.6         0        54     553.6         0
GR    553.6         0     553.6         5       549        14       549        24     548.6        26
GR    548.6        34     548.6        36     548.6        44     553.6        54     553.6        60
```

NC	0.06	0.06	0.015	0.1	0.3					
X1	0165	10	15	44	69	69	69			
BT	-14	3.5	554.7	0	15	554.7	0	15	554.7	553
BT		24	554.7	553	24	554.7	0	26	554.7	0
BT		26	554.7	552.8	34	554.7	552.8	34	554.7	0
BT		36	554.7	0	36	554.7	552.8	44	554.7	552.8
BT		44	554.7	0	56	554.7	0			
GR	554.7	0	554.7	3.5	549	15	549	24	548.8	26
GR	548.8	34	548.8	36	548.8	44	554.7	56	554.7	60
X1	0340	10	15	44	175	175	175			
BT	-14	6	554.5	0	15	554.5	0	15	554.5	554
BT		24	554.5	554	24	554.5	0	26	554.5	0
BT		26	554.5	553.3	34	554.5	553.3	34	554.5	0
BT		36	554.5	0	36	554.5	553.3	44	554.5	553.3
BT		44	554.5	0	54.5	554.5	0			
GR	554.5	0	554.5	6	550	15	550	24	549.3	26
GR	549.3	34	549.3	36	549.3	44	554.5	54.5	554.5	60
X1	0550	12	14	44	210	210	210			
BT	-18	4	555.2	0	14	555.2	0	14	555.2	552.5
BT		18	555.2	552.5	18	555.2	0	20	555.2	0
BT		20	555.2	552.5	24	555.2	552.5	24	555.2	0
BT		26	555.2	0	26	555.2	553.9	34	555.2	553.9
BT		34	555.2	0	36	555.2	0	36	555.2	553.9
BT		44	555.2	553.9	44	555.2	0	55	555.2	0
GR	555.2	0	555.2	4	550.2	14	550.2	18	550.2	20
GR	550.2	24	549.9	26	549.9	34	549.9	36	549.9	44
GR	555.2	55	555.2	60						
X1	0608	12	14	44	58	58	58			
BT	-18	7	555.5	0	14	555.5	0	14	555.5	554.3
BT		18	555.5	554.3	18	555.5	0	20	555.5	0
BT		20	555.5	554.3	24	555.5	554.3	24	555.5	0
BT		26	555.5	0	26	555.5	554	34	555.5	554
BT		34	555.5	0	36	555.5	0	36	555.5	554
BT		44	555.5	554	44	555.5	0	55	555.5	0
GR	555.5	0	555.5	7	552	14	552	18	552	20
GR	552	24	550	26	550	34	550	36	550	44
GR	555.5	55	555.5	60						
X1	0845	10	16	44	220	270	237			
BT	-14	6	559.1	0	16	559.3	0	16	559.3	558
BT		24	559.3	558	24	559.3	0	26	559.3	0
BT		26	559.3	558	34	559.3	558	34	559.3	0
BT		36	559.3	0	36	559.3	558	44	559.3	558
BT		44	559.3	0	54	559.1	0			
GR	559	0	559.1	6	554	16	554	24	554	26
GR	554	34	554	36	554	44	559.1	54	559	60

NC				0.6	0.8					
X1	0904	8	21	39	59	59	59			
BT	-10	10.5	560.3	0	21	560.3	0	21	560.3	559
BT		29	560.3	559	29	560.3	0	31	560.3	0
BT		31	560.3	559	39	560.3	559	39	560.3	0
BT		49.5	560.3	0						
GR	560.3	0	560.3	10.5	555	21	555	29	555	31
GR	555	39	560.3	49.5	560.3	60				
NC				0.1	0.3					
X1	1000	8	21	39	96	96	96			
BT	-10	10	562	0	21	562	0	21	562	560.6
BT		29	562	560.6	29	562	0	31	562	0
BT		31	562	560.6	39	562	560.6	39	562	0
BT		50	562	0						
GR	562	0	562	10	556.6	21	556.6	29	556.6	31
GR	556.6	39	562	50	562	60				
X1	1148	8	21	39	160	130	148			
BT	-10	9	564.5	0	21	564.5	0	21	564.5	562.4
BT		29	564.5	562.4	29	564.5	0	31	564.5	0
BT		31	564.5	562.4	39	564.5	562.4	39	564.5	0
BT		51.5	564.5	0						
GR	564.5	0	564.5	9	558.4	21	558.4	29	558.4	31
GR	558.4	39	564.5	51.5	564.5	60				
X1	1264	8	21	39	116	116	116			
BT	-10	9	567.5	0	21	567.5	0	21	567.5	565.4
BT		29	567.5	565.4	29	567.5	0	31	567.5	0
BT		31	567.5	565.4	39	567.5	565.4	39	567.5	0
BT		51	567.5	0						
GR	567.5	0	567.5	9	561.4	21	561.4	29	561.4	31
GR	561.4	39	567.5	51	567.5	60				
X1	1400	8	21	39	145	135	136			
BT	-10	10	568.8	0	21	568.8	0	21	568.8	567.4
BT		29	568.8	567.4	29	568.8	0	31	568.8	0
BT		31	568.8	567.4	39	568.8	567.4	39	568.8	0
BT		50	568.8	0						
GR	568.8	0	568.8	10	563.4	21	563.4	29	563.4	31
GR	563.4	39	568.8	50	568.8	60				
NC				0.6	0.8					
X1	1418	6	25	35	5	30	18			
BT	-6	15	568.8	0	25	568.8	0	25	568.8	567.4
BT		35	568.8	567.4	35	568.8	0	45	568.8	0
GR	568.8	0	568.8	15	563.9	25	563.9	35	568.8	45
GR	568.8	60								

```
X1    1480      6      25      35      68      68      68
BT      -6     15   568.8       0      25   568.8       0      25   568.8   567.5
BT             35   568.8   567.5      35   568.8       0      45   568.8       0
GR   568.8       0   568.8      15     564      25     564      35   568.8      45
GR   568.8      60

X1    1500      6      27      33       5      35      20
BT      -6     17     569       0      27     569       0      27     569     568
BT             33     569     568      33     569       0      43     569       0
GR     569       0     569      17     564      27     564      33     569      43
GR     569      60

X1    2070      6      49      55     630     620     760
BT      -6     46   572.3   572.3      49   572.5   567.1      49   572.5   571.3
BT             55   572.6   571.3      55   572.6   567.1      58   572.7   572.7
GR   572.3       0   572.3      46   567.1      49   567.1      55   572.7      58
GR   572.7     100

NC                          0.3     0.5
X1    2071       0       0       0       1       1       1
X3      10                                                   572.3   572.7

NC                     0.03
X1    2120       6     100     105      49      49      49
GR     572       0   570.3     100   567.7     100     568     105     572     105
GR     572     150

NC                     0.02
             JACKSON AVENUE
X1    2130       6     100     108      10      10      10
X3      10                                                   571.6   571.6
GR     572       0     571     100     568     100     568     108     572     108
GR     572     150

SB       0     1.5     2.5     100       8       0      27       0     568     568
X1    2180       0       0       0      50      50      50
X2                       1   571.5     573
X3      10                                                     573     573

NC                     0.03
X1    2205       9      37      43      25      25      25
GR     574       0   572.2      29   571.9      37   567.9      37   567.8      40
GR   567.8      43   572.5      43   572.1      44   572.1      57

X1    2280      10      60      65      75      75      75
GR     574       0     574      30   573.5      50   573.7      60   568.9      60
GR   568.4    62.5   568.5      65   572.5      65   572.6      75     574      80
```

```
QT      5       220     530     630     790     1000
NC                      0.02
                COOPER STREET
X1      2390    6       100     108     110     110     110
X3      10                                                      574     574
GR      574     0       574.0   100     568.6   100     568.5   108     573.6   108
GR      573.6   150

SB      0       1.7     2.5     200     8       0       36      0       568.70  568.50
X1      2440    8       104.5   112.5   50      50      50
X2                      1       573.1   574.5
X3      10                                                      574.5   574.5
GR      574     50      574     100     573.1   104.5   568.7   105     568.7   112
GR      573.8   112.5   573.8   117     574     150

NC                      0.03
X1      2450    0       0       0       10      10      10

NC      0.15    0.15    0.035   0.1     0.3
X1      2685    15      98      110     240     180     235
GR      574     0       573.2   60      573.5   70      571.6   74      571.1   77
GR      571.7   80      572.6   82      573.8   90      573.3   98      571.0   101
GR      571.1   105     571.2   109     571.8   110     572.6   120     572.6   170

X1      3020    11      115     140     290     310     335
GR      579     0       578     100     576.6   105     574.6   115     573.2   120
GR      573.0   125     573.2   130     577.2   140     578.0   160     578     240
GR      577     335

NC      0.08
X1      3250    11      70      88      230     90      230
GR      580     0       578     35      576.8   60      576.6   70      575.3   73
GR      575.2   78      575.3   83      576.8   88      576.3   98      578     220
GR      580     230

NC              0.08    0.03
X1      3515    11      35      58      250     250     265
GR      584.1   0       584.1   25      583.3   35      579.4   43      579.2   49
GR      579.8   55      585.0   58      584.9   68      586     155     588     210
GR      590     220

X1      3770    23      165     190     250     260     255
GR      588     0       588     60      590     100     590     105     615     105
GR      615     135     590     135     590.5   155     590.9   165     585.3   172
GR      585.1   178     584.1   184     588.4   190     590.6   197     592.5   200
GR      593.4   210     594     215     619     215     619     250     594     250
GR      592     270     592     315     598     360
```

```
X1    3945     27    200    221    175    175    175
GR     594      0    594     40    593     60    593     90    594     95
GR     596    125    621    125    621    155    596    155  595.8    190
GR   595.8    195  595.4    200  591.6    208  591.5    213  594.1    218
GR   596.7    221  598.5    226    600    230    600    250    625    250
GR     625    285    600    285    600    300    598    315    597    325
GR     596    355    604    390

X1    4295     21     91    111    300    400    350
GR     601      0    601     20    626     20    626     70    602     70
GR   601.4     90  600.9     91  597.8     97  597.6    104  597.7    107
GR   602.0    111  602.8    121    604    135    629    135    629    170
GR     604    170    604    190    602    205  601.8    210  601.8    240
GR     608    280

X1    4370     19    110    125    120     20     75
GR   603.5      0  603.5     35  628.5     35  628.5    100  605.1    100
GR   603.1    110  598.7    114  598.9    118  598.8    122  602.5    125
GR   603.3    135  628.3    135  628.3    160    604    160    604    175
GR     602    195  601.8    200  601.8    225    608    260

NC                 0.015    0.3    0.5
            MCKEEL STREET
X1    4405      9     95    105     35     35     35
X3      10                                          602  601.5
GR     602      0  602.3     91  601.3     94  597.7     95  598.5    105
GR   598.9    106  602.0    107  602.3    109    602    240

SB    1.25      2    2.5      0     10      2   20.6      0  598.7  597.7
X1    4480      8     95    105     75     75     75
X2                  1.0  601.3  601.8
X3      10                                          602  601.8
BT      -6      0  602.7      0    100  602.8      0    112  602.9      0
BT             140  602.7      0    200  602.3      0    240    608      0
GR     602      0    602     94  597.7     95  598.5    105  599.3    110
GR   601.6    111  602.9    113    602    240

NC                  0.03
X1    4520     15    103    125     40     40     40
GR     606      0    606     25    631     25    631     70    606     70
GR   607.1     85  605.9    103  602.5    109  600.7    110  599.8    116
GR   599.9    122  605.7    125  604.5    135    610    185    612    195

QT       5    120    280    335    410    510
NC                          0.1    0.3
X1    4630     11     80    102    110    110    110
GR   609.9      0  609.8     70  609.3     80  605.1     85  605.1     89
GR   605.2     93  609.5    102  609.8    112    610    130    612    150
GR     614    205
```

```
NC                                  0.3       0.5
X1    4695       15     107.8     112.2        80        50        65
X3      10                                                           611.8     611.8
GR     614        0       612        85     611.2       102     609.6       104     609.2     107.8
GR   608.7      108     608.4       109     608.1       110     608.4       111     608.7       112
GR   609.2    112.2     609.9     115.5     611.2       118       612       130       614       220

NC                      0.015
              CRESTMONT DRIVE
X1    4696        0         0         0         1         1         1
BT     -13       85       612       612       102       613     611.2       104     613.1     609.6
BT             107.8     613.1     609.2       108     613.1     610.4       109     613.1     611.3
BT               110     613.1     611.5       111     613.1     611.3       112     613.1     610.4
BT             112.2     613.1     609.2     115.5     613.1     609.9       118     613.0     611.2
BT               130       612       612

X1    4990       16      27.8      32.2       260       260       294
BT     -11       21     619.5     619.5        25     619.5     615.8      27.8     619.6     615.8
BT                28     619.6     616.6        29     619.6     617.7        30     619.6       618
BT                31     619.6     617.7        32     619.6     616.6      32.2     619.6     615.8
BT                35     619.6     615.8        39     619.6     619.6
GR     620        0     619.5        21     615.8        25     615.8      27.8       615        28
GR   613.8       29     613.5        30     613.8        31       615        32     615.8      32.2
GR   615.8       35     619.6        39       620        60       622        85       624       105
GR     625      160

NC                       0.03
X1    4991        0         0         0         1         1         1
X3      10                                                           619.5     619.6

X1    5025       13        29        35        34        34        34
GR     620        0     619.9        20     619.8        25     619.3        29     615.8        31
GR   615.7       34     619.7        35     619.6        40     620.6        45       620        55
GR     622       75       624        85       626       160

NC                                  0.1       0.3
X1    5135       12        74        90       120       100       110
GR     626        0     622.9        60     623.1        70     623.7        74     622.6        76
GR   621.6       80     621.6        84     624.1        90     624.3       100       626       105
GR     628      165       630       205

X1    5325       11       111       125       220       150       190
GR     637        0       636        70     635.2       100     634.4       111     632.9       113
GR   632.7      117     632.8       121     634.8       125     634.2       135       634       165
GR     636      220

NC                      0.015       0.3       0.5
              MT. HOPE AVENUE
X1    5375        7      72.8      77.2        40        60        50
X3      10                                                           638       638
GR     638        0       638        65       634      72.8       634      77.2       638        85
GR     638      140       640       145
```

SB	0	1.5	2.5	0	4.4	0	10.2	0	636.8	634.0
X1	5475	7	67.8	72.2	100	100	100			
X2			1.0	639.2	642.1					
X3	10							642	642	
BT	-9	0	642	0	66	642.1	0	67.8	642.1	0
BT		67.8	642.1	639.2	72.2	642.3	639.2	72.2	642.3	0
BT		74	642.3	0	115	642	0	155	644	0
GR	642	0	642.1	66	635.8	67.8	635.8	72.2	642.3	74
GR	642	115	644	155						
NC			0.03							
X1	5525	13	115	130	40	50	50			
GR	646	0	644	45	643.6	105	641.3	115	637.6	118
GR	637.3	119	637.0	123	637.6	128	642.3	130	643.3	140
GR	644	160	646	185	648	210				

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CCHV= 0.300 CEHV= 0.500
*SECNO 58.000
3280 CROSS SECTION 58.00 EXTENDED 0.65 FEET

CROSS SECTIONS TAKEN LOOKING DOWNSTREAM
HEC-2 BASED ON DOVER F.I.S. PREPARED BY THE RBA GROUP DATED 4/5/78
AND UPDATED TO NOV. 1994 AS PER SURVEY BY GOODKIND & O'DEA, INC.
CONFLUENCE WITH THE ROCKAWAY RIVER

58.000	5.85	554.25	0.00	554.25	554.28	0.03	0.00	0.00	553.60
310.0	0.6	290.7	18.7	3.3	195.4	37.7	0.0	0.0	548.40
0.00	0.18	1.49	0.50	0.060	0.030	0.060	0.000	548.40	0.00
0.000109	0.	0.	0.	0	0	0	0.00	60.00	60.00

1490 NH CARD USED
*SECNO 59.000
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED
3280 CROSS SECTION 59.00 EXTENDED 0.64 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.50

3370 NORMAL BRIDGE, NRD= 11 MIN ELTRD= 549.00 MAX ELLC= 552.40

59.000	5.84	554.24	0.00	0.00	554.29	0.06	0.00	0.01	553.60
310.0	1.2	305.0	3.9	3.2	160.4	10.3	0.0	0.0	548.40
0.00	0.36	1.90	0.38	0.060	0.024	0.060	0.000	548.40	0.00
0.000439	1.	1.	1.	1	0	0	-62.10	60.00	60.00

1490 NH CARD USED
*SECNO 96.000
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED
3280 CROSS SECTION 96.00 EXTENDED 0.65 FEET

3370 NORMAL BRIDGE, NRD= 11 MIN ELTRD= 549.00 MAX ELLC= 552.60

96.000	5.66	554.26	0.00	0.00	554.31	0.06	0.02	0.00	553.60
310.0	1.2	304.9	3.9	3.2	160.6	10.4	0.2	0.1	548.60
0.01	0.36	1.90	0.38	0.060	0.024	0.060	0.000	548.60	0.00
0.000437	20.	37.	50.	0	0	0	-56.00	60.00	60.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.100 CEHV= 0.300
*SECNO 165.000

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 554.70 MAX ELLC= 553.00

165.000	5.43	554.23	0.00	0.00	554.38	0.15	0.04	0.03	549.00
310.0	0.0	310.0	0.0	0.0	100.0	0.0	0.4	0.1	548.80
0.01	0.00	3.10	0.00	0.000	0.015	0.000	0.000	548.80	4.46
0.000655	69.	69.	69.	2	0	0	-112.84	50.58	55.04

*SECNO 340.000

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 554.50 MAX ELLC= 554.00

340.000	5.04	554.34	0.00	0.00	554.49	0.15	0.11	0.00	550.00
310.0	0.0	310.0	0.0	0.0	100.0	0.0	0.8	0.3	549.30
0.03	0.00	3.10	0.00	0.000	0.015	0.000	0.000	549.30	6.34
0.000655	175.	175.	175.	1	0	0	-83.21	47.82	54.16

*SECNO 550.000

3370 NORMAL BRIDGE, NRD= 18 MIN ELTRD= 555.20 MAX ELLC= 553.90

550.000	4.58	554.48	0.00	0.00	554.70	0.22	0.18	0.02	550.20
310.0	0.0	310.0	0.0	0.0	82.4	0.0	1.2	0.6	549.90
0.04	0.00	3.76	0.00	0.000	0.015	0.000	0.000	549.90	5.44
0.001232	210.	210.	210.	0	0	0	-91.70	48.06	53.50

*SECNO 608.000

3370 NORMAL BRIDGE, NRD= 18 MIN ELTRD= 555.50 MAX ELLC= 554.30

608.000	4.55	554.55	0.00	0.00	554.77	0.22	0.07	0.00	552.00
310.0	0.0	310.0	0.0	0.0	82.4	0.0	1.3	0.6	550.00
0.05	0.00	3.76	0.00	0.000	0.015	0.000	0.000	550.00	8.92
0.001232	58.	58.	58.	1	0	0	-58.79	44.15	53.08

*SECNO 845.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 559.10 MAX ELLC= 558.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

845.000	1.73	555.73	555.73	0.00	556.60	0.87	0.50	0.19	554.00
310.0	0.0	310.0	0.0	0.0	41.5	0.0	1.7	0.9	554.00
0.06	0.00	7.47	0.00	0.000	0.015	0.000	0.000	554.00	12.61
0.004422	220.	237.	270.	20	12	0	-12.78	34.78	47.39

CCHV= 0.600 CEHV= 0.800
*SECNO 904.000

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 560.30 MAX ELLC= 559.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

904.000	2.26	557.26	557.26	0.00	558.40	1.14	0.27	0.22	555.00
310.0	0.0	310.0	0.0	0.0	36.1	0.0	1.7	0.9	555.00
0.06	0.00	8.58	0.00	0.000	0.015	0.000	0.000	555.00	16.53
0.004598	59.	59.	59.	20	15	0	-14.62	26.95	43.47

CCHV= 0.100 CEHV= 0.300
*SECNO 1000.000

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 562.00 MAX ELLC= 560.60

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1000.000	2.26	558.86	558.86	0.00	560.00	1.14	0.44	0.00	556.60
310.0	0.0	310.0	0.0	0.0	36.1	0.0	1.8	1.0	556.60
0.06	0.00	8.58	0.00	0.000	0.015	0.000	0.000	556.60	16.40
0.004598	96.	96.	96.	20	15	0	-14.91	27.20	43.60

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 1148.000

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 564.50 MAX ELLC= 562.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1148.000	2.26	560.66	560.66	0.00	561.80	1.14	0.68	0.00	558.40
310.0	0.0	310.0	0.0	0.0	36.1	0.0	1.9	1.0	558.40
0.07	0.00	8.58	0.00	0.000	0.015	0.000	0.000	558.40	16.56
0.004598	160.	148.	130.	20	15	0	-14.76	27.07	43.63

*SECNO 1264.000

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 567.50 MAX ELLC= 565.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1264.000	2.26	563.66	563.66	0.00	564.80	1.14	0.53	0.00	561.40
310.0	0.0	310.0	0.0	0.0	36.1	0.0	2.0	1.1	561.40
0.07	0.00	8.58	0.00	0.000	0.015	0.000	0.000	561.40	16.56
0.004598	116.	116.	116.	20	15	0	-14.55	26.89	43.44

*SECNO 1400.000

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 568.80 MAX ELLC= 567.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1400.000	2.26	565.66	565.66	0.00	566.80	1.14	0.63	0.00	563.40
310.0	0.0	310.0	0.0	0.0	36.1	0.0	2.1	1.2	563.40
0.07	0.00	8.58	0.00	0.000	0.015	0.000	0.000	563.40	16.40
0.004598	145.	136.	135.	20	15	0	-14.91	27.20	43.60

CCHV= 0.600 CEHV= 0.800
*SECNO 1418.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE, NRD= 6 MIN ELTRD= 568.80 MAX ELLC= 567.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1418.000	3.09	566.99	566.99	0.00	568.55	1.56	0.08	0.33	563.90
310.0	0.0	310.0	0.0	0.0	30.9	0.0	2.1	1.2	563.90
0.07	0.00	10.02	0.00	0.000	0.015	0.000	0.000	563.90	18.69
0.004314	5.	18.	30.	20	18	0	-19.53	22.63	41.31

*SECNO 1480.000

3370 NORMAL BRIDGE, NRD= 6 MIN ELTRD= 568.80 MAX ELLC= 567.50

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

1480.000	3.87	567.87	567.09	0.00	569.09	1.22	0.33	0.20	564.00
310.0	0.0	310.0	0.0	0.0	35.0	0.0	2.2	1.2	564.00
0.08	0.00	8.86	0.00	0.000	0.015	0.000	0.000	564.00	16.93
0.005655	68.	68.	68.	26	18	0	-35.00	26.14	43.07

*SECNO 1500.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 568.000 EGLC= 570.591 EGC= 570.615 WSEL= 569.952

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 568.000 EGLC= 570.591 EGC= 570.596 WSEL= 567.984

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE, NRD= 6 MIN ELTRD= 569.00 MAX ELLC= 568.00

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1500.000	4.00	568.00	568.00	0.00	570.59	2.59	0.17	1.10	564.00
310.0	0.0	310.0	0.0	0.0	24.0	0.0	2.2	1.3	564.00
0.08	0.00	12.92	0.00	0.000	0.015	0.000	0.000	564.00	19.00
0.013331	5.	20.	35.	2	16	0	-32.00	22.00	41.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 2070.000
3280 CROSS SECTION 2070.00 EXTENDED 1.74 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.27

3370 NORMAL BRIDGE, NRD= 6 MIN ELTRD= 572.30 MAX ELLC= 571.30

2070.000	6.95	574.05	0.00	0.00	574.18	0.13	2.11	1.47	567.10
310.0	105.0	141.8	63.3	85.1	34.2	60.6	3.8	2.2	567.10
0.16	1.23	4.15	1.04	0.060	0.015	0.060	0.000	567.10	0.00
0.001245	630.	760.	620.	5	0	0	-23.85	100.00	100.00

CCHV= 0.300 CEHV= 0.500
*SECNO 2071.000
3280 CROSS SECTION 2071.00 EXTENDED 1.63 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.22

2071.000	6.83	573.93	0.00	0.00	574.30	0.37	0.00	0.12	567.10
310.0	48.0	232.0	30.1	87.5	41.0	63.6	3.8	2.2	567.10
0.16	0.55	5.66	0.47	0.060	0.015	0.060	0.000	567.10	0.00
0.000252	1.	1.	1.	2	0	0	0.00	100.00	100.00

*SECNO 2120.000
3280 CROSS SECTION 2120.00 EXTENDED 2.41 FEET

2120.000	6.71	574.41	0.00	0.00	574.42	0.01	0.01	0.11	570.30
310.0	213.4	39.7	57.0	326.0	32.8	108.5	4.1	2.3	572.00
0.18	0.65	1.21	0.53	0.060	0.030	0.060	0.000	567.70	0.00
0.000149	49.	49.	49.	2	0	0	0.00	150.00	150.00

*SECNO 2130.000
3280 CROSS SECTION 2130.00 EXTENDED 2.41 FEET

JACKSON AVENUE

2130.000	6.41	574.41	0.00	0.00	574.43	0.02	0.00	0.01	571.00
310.0	163.3	97.6	49.1	291.2	51.3	101.3	4.2	2.3	572.00
0.18	0.56	1.90	0.48	0.060	0.020	0.060	0.000	568.00	0.00
0.000127	10.	10.	10.	0	0	0	0.00	150.00	150.00

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.50	2.50	100.00	8.00	0.00	27.00	0.00	568.00	568.00

*SECNO 2180.000
3280 CROSS SECTION 2180.00 EXTENDED 2.42 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
577.48	574.43	0.00	275.	36.	27.	28.	571.50	573.00	100.

2180.000	6.42	574.42	0.00	0.00	574.45	0.02	0.02	0.00	571.00
310.0	163.5	97.3	49.2	292.5	51.4	101.8	4.7	2.5	572.00
0.19	0.56	1.89	0.48	0.060	0.020	0.060	0.000	568.00	0.00
0.000126	50.	50.	50.	2	0	9	0.00	150.00	150.00

*SECNO 2205.000
3280 CROSS SECTION 2205.00 EXTENDED 2.25 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.24

2205.000	6.55	574.35	0.00	0.00	574.53	0.18	0.01	0.08	571.90
310.0	84.0	171.0	55.0	54.7	39.2	31.3	4.9	2.6	572.50
0.20	1.53	4.37	1.75	0.060	0.030	0.060	0.000	567.80	0.00
0.002104	25.	25.	25.	2	0	0	0.00	57.00	57.00

*SECNO 2280.000
3280 CROSS SECTION 2280.00 EXTENDED 0.49 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.60

2280.000	6.09	574.49	0.00	0.00	574.89	0.40	0.25	0.11	573.70
310.0	55.5	186.1	68.5	38.5	29.7	25.4	5.1	2.7	572.50
0.20	1.44	6.26	2.70	0.060	0.030	0.060	0.000	568.40	0.00
0.005780	75.	75.	75.	2	0	0	0.00	80.00	80.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 2390.000
3280 CROSS SECTION 2390.00 EXTENDED 1.43 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.96

COOPER STREET

2390.000	6.53	575.03	0.00	0.00	575.10	0.07	0.12	0.10	574.00
220.0	47.0	139.3	33.6	103.0	51.8	60.1	5.5	3.0	573.60
0.22	0.46	2.69	0.56	0.060	0.020	0.060	0.000	568.50	0.00
0.000331	110.	110.	110.	2	0	0	0.00	150.00	150.00

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.70	2.50	200.00	8.00	0.00	36.00	0.00	568.70	568.50

*SECNO 2440.000
6870 D.S. ENERGY OF 575.10 IS HIGHER THAN COMPUTED ENERGY OF 575.07
3280 CROSS SECTION 2440.00 EXTENDED 0.96 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
576.02	575.30	0.00	178.	43.	36.	35.	573.10	574.50	200.

2440.000	6.26	574.96	0.00	0.00	575.10	0.14	0.00	0.00	573.10
220.0	30.9	165.4	23.7	54.4	47.7	40.3	5.7	3.1	573.80
0.22	0.57	3.47	0.59	0.060	0.020	0.060	0.000	568.70	50.00
0.000531	50.	50.	50.	2	0	6	0.00	100.00	150.00

*SECNO 2450.000
3280 CROSS SECTION 2450.00 EXTENDED 1.03 FEET

2450.000	6.33	575.03	0.00	0.00	575.12	0.09	0.01	0.02	573.10
220.0	43.9	142.7	33.4	58.4	48.3	43.0	5.7	3.1	573.80
0.22	0.75	2.95	0.78	0.060	0.030	0.060	0.000	568.70	50.00
0.000853	10.	10.	10.	2	0	0	0.00	100.00	150.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.100 CEHV= 0.300
*SECNO 2685.000
3280 CROSS SECTION 2685.00 EXTENDED 2.63 FEET

2685.000	4.23	575.23	0.00	0.00	575.26	0.03	0.13	0.01	573.30
220.0	61.3	95.3	63.4	186.6	46.1	162.0	7.1	3.8	571.80
0.28	0.33	2.07	0.39	0.150	0.035	0.150	0.000	571.00	0.00
0.000438	240.	235.	180.	2	0	0	0.00	170.00	170.00

*SECNO 3020.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.17

3020.000	2.14	575.14	575.13	0.00	575.90	0.76	0.42	0.22	574.60
220.0	0.4	219.6	0.0	0.7	31.3	0.0	8.6	4.5	577.20
0.29	0.51	7.01	0.00	0.150	0.035	0.000	0.000	573.00	112.29
0.015412	290.	335.	310.	6	8	0	0.00	22.56	134.85

*SECNO 3250.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.68

3250.000	2.34	577.54	0.00	0.00	577.82	0.28	1.87	0.05	576.60
220.0	14.3	169.0	36.6	14.1	35.1	65.2	8.9	4.8	576.80
0.31	1.01	4.81	0.56	0.080	0.035	0.150	0.000	575.20	44.55
0.005450	230.	230.	90.	4	0	0	0.00	142.54	187.09

*SECNO 3515.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3515.000	2.24	581.44	581.44	0.00	582.30	0.86	2.06	0.18	583.30
220.0	0.0	220.0	0.0	0.0	29.5	0.0	9.3	5.2	585.00
0.32	0.00	7.45	0.00	0.000	0.030	0.000	0.000	579.20	38.81
0.012201	250.	265.	250.	20	8	0	0.00	17.13	55.95

```
   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


*SECNO 3770.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  3770.000      2.72     586.82     586.82       0.00     587.68       0.86       3.16       0.00     590.90
     220.0       0.0      220.0        0.0        0.0       29.6        0.0        9.5        5.3     588.40
      0.33      0.00       7.43       0.00      0.000      0.030      0.000      0.000     584.10     170.10
  0.012627      250.       255.       260.         17         11          0       0.00      17.69     187.79


*SECNO 3945.000

3265 DIVIDED FLOW

3280 CROSS SECTION   3945.00 EXTENDED      0.01 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  3945.000      2.51     594.01     594.01       0.00     594.44       0.42       1.84       0.04     595.40
     220.0      68.2      151.8        0.0       43.8       24.5        0.0        9.7        5.6     596.70
      0.34      1.56       6.19       0.00      0.080      0.030      0.000      0.000     591.50       0.00
  0.008896      175.       175.       175.         20         11          0       0.00     110.12     217.83


*SECNO 4295.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  4295.000      2.31     599.91     599.91       0.00     600.81       0.91       3.56       0.14     600.90
     220.0       0.0      220.0        0.0        0.0       28.8        0.0       10.0        6.0     602.00
      0.35      0.00       7.63       0.00      0.000      0.030      0.000      0.000     597.60      92.92
  0.012326      300.       350.       400.         20         11          0       0.00      16.14     109.05


*SECNO 4370.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  4370.000      2.70     601.40     601.40       0.00     602.46       1.06       0.95       0.05     603.10
     220.0       0.0      220.0        0.0        0.0       26.6        0.0       10.1        6.1     602.50
      0.35      0.00       8.26       0.00      0.000      0.030      0.000      0.000     598.70     111.55
  0.012944      120.        75.        20.         20          8          0       0.00      12.56     124.11
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.300 CEHV= 0.500
*SECNO 4405.000
3280 CROSS SECTION 4405.00 EXTENDED 0.34 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 5.92

MCKEEL STREET

4405.000	4.64	602.34	600.56	0.00	602.70	0.37	0.04	0.21	597.70
220.0	3.2	210.6	6.2	21.3	42.4	30.1	10.1	6.2	598.50
0.35	0.15	4.97	0.21	0.080	0.015	0.080	0.000	597.70	0.00
0.000369	35.	35.	35.	4	8	0	0.00	240.00	240.00

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	2.00	2.50	0.00	10.00	2.00	20.60	0.00	598.70	597.70

*SECNO 4480.000

3265 DIVIDED FLOW

3280 CROSS SECTION 4480.00 EXTENDED 0.88 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.44

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
605.88	603.00	0.30	121.	99.	21.	21.	601.30	601.80	205.

4480.000	5.18	602.88	0.00	0.00	603.06	0.18	0.36	0.00	597.70
220.0	19.4	179.5	21.0	86.0	47.8	78.6	10.4	6.6	598.50
0.36	0.23	3.75	0.27	0.080	0.015	0.080	0.000	597.70	0.00
0.000179	75.	75.	75.	2	0	5	0.00	237.53	240.00

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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


*SECNO 4520.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  0.16

  4520.000      2.88    602.68      0.00      0.00    603.30      0.62      0.02      0.22    605.90
     220.0       0.0     220.0       0.0       0.0      34.7       0.0      10.5       6.7    605.70
      0.36      0.00      6.34      0.00     0.000     0.030     0.000     0.000    599.80    108.68
  0.006635       40.       40.       40.         2         0         0      0.00     14.76    123.44


CCHV=    0.100 CEHV=    0.300
*SECNO 4630.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  4630.000      1.72    606.82    606.82      0.00    607.50      0.68      0.91      0.02    609.30
     120.0       0.0     120.0       0.0       0.0      18.1       0.0      10.6       6.7    609.50
      0.37      0.00      6.63      0.00     0.000     0.030     0.000     0.000    605.10     82.95
  0.013238      110.      110.      110.        20        14         0      0.00     13.45     96.40


CCHV=    0.300 CEHV=    0.500
*SECNO 4695.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      611.80 ELREA=      611.80

  4695.000      3.20    611.30    611.30      0.00    612.72      1.43      0.81      0.37    609.20
     120.0       0.0     120.0       0.0       0.0      12.5       0.0      10.6       6.7    609.20
      0.37      0.00      9.58      0.00     0.000     0.030     0.000     0.000    608.10    107.80
  0.011762       80.       65.       50.        20        14         0      0.00      4.40    112.20


*SECNO 4696.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   611.500 EGLC=   613.270 EGC=   613.314 WSEL=   613.107
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE, NRD= 13 MIN ELTRD= 612.00 MAX ELLC= 611.50

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

CRESTMONT DRIVE

4696.000	2.95	611.05	611.05	0.00	613.09	2.04	0.01	0.31	609.20
120.0	0.0	120.0	0.0	0.0	10.5	0.0	10.6	6.7	609.20
0.37	0.00	11.47	0.00	0.000	0.015	0.000	0.000	608.10	102.19
0.011985	1.	1.	1.	3	19	0	-14.73	15.51	117.71

*SECNO 4990.000

3370 NORMAL BRIDGE, NRD= 11 MIN ELTRD= 619.50 MAX ELLC= 618.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4990.000	3.36	616.86	616.86	0.00	618.52	1.66	2.85	0.11	615.80
120.0	0.0	120.0	0.0	0.0	11.6	0.0	10.7	6.8	615.80
0.38	0.00	10.34	0.00	0.000	0.015	0.000	0.000	613.50	23.85
0.008022	260.	294.	260.	20	15	0	-7.46	12.26	36.12

*SECNO 4991.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 619.50 ELREA= 619.60

4991.000	4.54	618.04	616.98	0.00	618.80	0.76	0.01	0.27	615.80
120.0	0.0	120.0	0.0	0.0	17.1	0.0	10.7	6.8	615.80
0.38	0.00	7.00	0.00	0.000	0.030	0.000	0.000	613.50	27.80
0.005885	1.	1.	1.	21	8	0	0.00	4.40	32.20

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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


*SECNO 5025.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  5025.000      3.21     618.91     618.91       0.00     620.13       1.22       0.34       0.23     619.30
     120.0       0.0      120.0        0.0        0.0       13.5        0.0       10.7        6.8     619.70
      0.38      0.00       8.86       0.00      0.000      0.030      0.000      0.000     615.70      29.22
  0.021079       34.        34.        34.         20         12          0       0.00       5.58      34.80


CCHV=    0.100 CEHV=    0.300
*SECNO 5135.000

3265 DIVIDED FLOW


3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  5135.000      1.95     623.55     623.55       0.00     624.02       0.47       1.55       0.07     623.70
     120.0      10.8      109.2        0.0       10.2       18.9        0.0       10.7        6.9     624.10
      0.38      1.06       5.76       0.00      0.080      0.030      0.000      0.000     621.60      47.47
  0.010043      120.       110.       100.         20         14          0       0.00      39.91      88.67


*SECNO 5325.000

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  5325.000      1.85     634.55     634.55       0.00     634.94       0.39       1.70       0.01     634.40
     120.0       0.0      102.9       17.0        0.2       19.1       18.9       10.9        7.1     634.80
      0.40      0.30       5.39       0.90      0.080      0.030      0.080      0.000     632.70     108.89
  0.008127      220.       190.       150.         20         11          0       0.00      66.74     180.23


CCHV=    0.300 CEHV=    0.500
*SECNO 5375.000
```

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 638.00 ELREA= 638.00

MT. HOPE AVENUE

5375.000	2.84	636.84	636.84	0.00	638.27	1.43	0.20	0.52	634.00
120.0	0.0	120.0	0.0	0.0	12.5	0.0	10.9	7.2	634.00
0.40	0.00	9.61	0.00	0.000	0.015	0.000	0.000	634.00	72.80
0.002341	40.	50.	60.	20	14	0	0.00	4.40	77.20

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.50	2.50	0.00	4.40	0.00	10.20	0.00	636.80	634.00

*SECNO 5475.000

6070,LOW FLOW BY NORMAL BRIDGE

EGPRS= 640.062 EGLWC= 640.422 ELLC= 639.200 PCWSE= 636.838 ELTRD= 642.100

3370 NORMAL BRIDGE, NRD= 9 MIN ELTRD= 642.10 MAX ELLC= 639.20

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 642.00 ELREA= 642.00

5475.000	2.84	638.64	638.64	0.00	640.07	1.43	0.38	0.00	635.80
120.0	0.0	120.0	0.0	0.0	12.5	0.0	10.9	7.2	635.80
0.40	0.00	9.61	0.00	0.000	0.015	0.000	0.000	635.80	67.80
0.007073	100.	100.	100.	20	12	0	-1.11	4.40	72.20

*SECNO 5525.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.14

5525.000	3.43	640.43	0.00	0.00	640.60	0.17	0.14	0.38	641.30
120.0	0.0	120.0	0.0	0.0	36.7	0.0	11.0	7.2	642.30
0.40	0.00	3.27	0.00	0.000	0.030	0.000	0.000	637.00	115.71
0.001539	40.	50.	50.	4	0	0	0.00	13.50	129.20

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T1      GOODKIND & O'DEA, INC.  60 FERONIA WAY, RUTHERFORD, NJ 07070
T2      McKEEL BROOK STORMWATER MANAGEMENT PLAN - ROCKAWAY AND DOVER, NJ
T3      EXISTING 10 YEAR STORM

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0         3         0         0         0         0         0         0    554.25

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      3         0        -1
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 2

CCHV= 0.300 CEHV= 0.500
*SECNO 58.000
3280 CROSS SECTION 58.00 EXTENDED 0.65 FEET

CROSS SECTIONS TAKEN LOOKING DOWNSTREAM
HEC-2 BASED ON DOVER F.I.S. PREPARED BY THE RBA GROUP DATED 4/5/78
AND UPDATED TO NOV. 1994 AS PER SURVEY BY GOODKIND & O'DEA, INC.
CONFLUENCE WITH THE ROCKAWAY RIVER

58.000	5.85	554.25	0.00	554.25	554.42	0.17	0.00	0.00	553.60
700.0	1.3	656.5	42.2	3.3	195.4	37.7	0.0	0.0	548.40
0.00	0.40	3.36	1.12	0.060	0.030	0.060	0.000	548.40	0.00
0.000558	0.	0.	0.	0	0	0	0.00	60.00	60.00

1490 NH CARD USED
*SECNO 59.000
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED
3280 CROSS SECTION 59.00 EXTENDED 0.59 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.49

3370 NORMAL BRIDGE, NRD= 11 MIN ELTRD= 549.00 MAX ELLC= 552.40

59.000	5.79	554.19	0.00	0.00	554.48	0.29	0.00	0.06	553.60
700.0	2.3	689.9	7.8	2.9	158.2	9.4	0.0	0.0	548.40
0.00	0.78	4.36	0.82	0.060	0.024	0.060	0.000	548.40	0.00
0.002353	1.	1.	1.	2	0	0	-62.10	60.00	60.00

1490 NH CARD USED
*SECNO 96.000
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED
3280 CROSS SECTION 96.00 EXTENDED 0.69 FEET

3370 NORMAL BRIDGE, NRD= 11 MIN ELTRD= 549.00 MAX ELLC= 552.60

96.000	5.69	554.29	0.00	0.00	554.57	0.27	0.08	0.01	553.60
700.0	2.9	687.4	9.7	3.5	162.4	11.1	0.2	0.1	548.60
0.00	0.82	4.23	0.88	0.060	0.024	0.060	0.000	548.60	0.00
0.002142	20.	37.	50.	2	0	0	-56.00	60.00	60.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.100 CEHV= 0.300
*SECNO 165.000

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 554.70 MAX ELLC= 553.00

165.000	5.34	554.14	0.00	0.00	554.90	0.76	0.18	0.15	549.00
700.0	0.0	700.0	0.0	0.0	100.0	0.0	0.4	0.1	548.80
0.01	0.00	7.00	0.00	0.000	0.015	0.000	0.000	548.80	4.64
0.003342	69.	69.	69.	2	0	0	-108.28	50.21	54.85

*SECNO 340.000
3280 CROSS SECTION 340.00 EXTENDED 0.44 FEET

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 554.50 MAX ELLC= 554.00

340.000	5.63	554.93	0.00	0.00	555.50	0.57	0.59	0.02	550.00
700.0	5.3	689.0	5.7	6.6	112.7	7.0	0.8	0.4	549.30
0.01	0.81	6.12	0.81	0.060	0.015	0.060	0.000	549.30	0.00
0.003381	175.	175.	175.	2	0	0	-91.35	60.00	60.00

*SECNO 550.000
3280 CROSS SECTION 550.00 EXTENDED 0.50 FEET

3370 NORMAL BRIDGE, NRD= 18 MIN ELTRD= 555.20 MAX ELLC= 553.90

550.000	5.80	555.70	0.00	0.00	556.44	0.75	0.89	0.05	550.20
700.0	7.8	683.3	8.9	6.9	97.3	7.9	1.4	0.7	549.90
0.02	1.12	7.02	1.12	0.060	0.015	0.060	0.000	549.90	0.00
0.005438	210.	210.	210.	2	0	0	-127.45	60.00	60.00

*SECNO 608.000
3280 CROSS SECTION 608.00 EXTENDED 0.52 FEET

3370 NORMAL BRIDGE, NRD= 18 MIN ELTRD= 555.50 MAX ELLC= 554.30

608.000	6.02	556.02	0.00	0.00	556.76	0.74	0.31	0.00	552.00
700.0	8.2	682.4	9.4	7.2	97.9	8.3	1.6	0.7	550.00
0.02	1.14	6.97	1.14	0.060	0.015	0.060	0.000	550.00	0.00
0.005311	58.	58.	58.	2	0	0	-103.10	60.00	60.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 845.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 559.10 MAX ELLC= 558.00

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

845.000	2.97	556.97	556.97	0.00	558.47	1.50	1.20	0.23	554.00
700.0	0.0	700.0	0.0	0.0	71.2	0.0	2.1	1.0	554.00
0.03	0.00	9.83	0.00	0.000	0.015	0.000	0.000	554.00	10.18
0.004839	220.	237.	270.	3	16	0	-29.13	39.64	49.82

CCHV= 0.600 CEHV= 0.800
*SECNO 904.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 559.000 EGLC= 560.858 EGC= 562.062 WSEL= 560.850

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 560.30 MAX ELLC= 559.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

904.000	3.90	558.90	558.90	0.00	560.85	1.95	0.29	0.36	555.00
700.0	0.0	700.0	0.0	0.0	62.4	0.0	2.1	1.1	555.00
0.03	0.00	11.21	0.00	0.000	0.015	0.000	0.000	555.00	13.27
0.005165	59.	59.	59.	20	21	0	-37.98	33.46	46.73

CCHV= 0.100 CEHV= 0.300
*SECNO 1000.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 560.600 EGLC= 562.458 EGC= 563.762 WSEL= 562.550

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 562.00 MAX ELLC= 560.60

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1000.000	3.90	560.50	560.50	0.00	562.45	1.95	0.50	0.00	556.60
700.0	0.0	700.0	0.0	0.0	62.4	0.0	2.3	1.1	556.60
0.03	0.00	11.21	0.00	0.000	0.015	0.000	0.000	556.60	13.05
0.005165	96.	96.	96.	20	21	0	-38.83	33.90	46.95

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 1148.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 562.400 EGLC= 564.258 EGC= 566.262 WSEL= 565.044

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 564.50 MAX ELLC= 562.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1148.000	3.90	562.30	562.30	0.00	564.25	1.95	0.76	0.00	558.40
700.0	0.0	700.0	0.0	0.0	62.4	0.0	2.5	1.2	558.40
0.04	0.00	11.21	0.00	0.000	0.015	0.000	0.000	558.40	13.32
0.005165	160.	148.	130.	20	21	0	-38.40	33.68	47.00

*SECNO 1264.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 565.400 EGLC= 567.258 EGC= 569.262 WSEL= 568.044

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 567.50 MAX ELLC= 565.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1264.000	3.90	565.30	565.30	0.00	567.25	1.95	0.60	0.00	561.40
700.0	0.0	700.0	0.0	0.0	62.4	0.0	2.7	1.3	561.40
0.04	0.00	11.21	0.00	0.000	0.015	0.000	0.000	561.40	13.32
0.005165	116.	116.	116.	20	21	0	-37.77	33.36	46.68

*SECNO 1400.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 567.400 EGLC= 569.258 EGC= 570.562 WSEL= 569.350

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 568.80 MAX ELLC= 567.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1400.000	3.90	567.30	567.30	0.00	569.25	1.95	0.70	0.00	563.40
700.0	0.0	700.0	0.0	0.0	62.4	0.0	2.9	1.4	563.40
0.04	0.00	11.21	0.00	0.000	0.015	0.000	0.000	563.40	13.05
0.005165	145.	136.	135.	20	21	0	-38.84	33.90	46.95

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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


CCHV=    0.600 CEHV=    0.800
*SECNO 1418.000
3280 CROSS SECTION   1418.00 EXTENDED      1.59 FEET


3301 HV CHANGED MORE THAN HVINS


3370 NORMAL BRIDGE, NRD=   6 MIN ELTRD=   568.80 MAX ELLC=   567.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1418.000      6.49    570.39    570.39      0.00    571.46      1.07      0.10      0.53    563.90
     700.0     102.3     495.5     102.3      39.7      50.9      39.7       2.9       1.5    563.90
      0.05      2.58      9.74      2.58     0.060     0.015     0.060     0.000    563.90      0.00
  0.006317        5.       18.       30.        20         9         0    -63.00     60.00     60.00


*SECNO 1480.000
3280 CROSS SECTION   1480.00 EXTENDED      2.92 FEET


3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.82


3370 NORMAL BRIDGE, NRD=   6 MIN ELTRD=   568.80 MAX ELLC=   567.50

  1480.000      7.72    571.72      0.00      0.00    572.10      0.37      0.22      0.42    564.00
     700.0     149.9     400.1     149.9      72.9      64.2      72.9       3.2       1.6    564.00
      0.05      2.06      6.24      2.06     0.060     0.015     0.060     0.000    564.00      0.00
  0.001903       68.       68.       68.         4         0         0    -61.00     60.00     60.00


*SECNO 1500.000
3280 CROSS SECTION   1500.00 EXTENDED      2.75 FEET


3370 NORMAL BRIDGE, NRD=   6 MIN ELTRD=   569.00 MAX ELLC=   568.00
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
1500.000	7.75	571.75	0.00	0.00	572.21	0.46	0.05	0.07	564.00
700.0	195.2	309.7	195.2	74.4	40.5	74.4	3.3	1.6	564.00
0.05	2.62	7.64	2.62	0.060	0.015	0.060	0.000	564.00	0.00
0.003293	5.	20.	35.	2	0	0	-56.00	60.00	60.00

*SECNO 2070.000
3280 CROSS SECTION 2070.00 EXTENDED 2.03 FEET

3370 NORMAL BRIDGE, NRD= 6 MIN ELTRD= 572.30 MAX ELLC= 571.30

2070.000	7.22	574.32	0.00	0.00	574.78	0.46	2.57	0.00	567.10
700.0	251.2	286.9	161.9	99.0	35.9	73.4	6.2	2.7	567.10
0.09	2.54	8.00	2.21	0.060	0.015	0.060	0.000	567.10	0.00
0.004337	630.	760.	620.	3	0	0	-23.85	100.00	100.00

CCHV= 0.300 CEHV= 0.500
*SECNO 2071.000
3280 CROSS SECTION 2071.00 EXTENDED 2.10 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2071.000	7.30	574.40	574.40	0.00	575.69	1.30	0.00	0.42	567.10
700.0	130.2	481.4	88.4	110.5	43.8	84.7	6.2	2.8	567.10
0.09	1.18	11.00	1.04	0.060	0.015	0.060	0.000	567.10	0.00
0.000871	1.	1.	1.	20	5	0	0.00	100.00	100.00

*SECNO 2120.000
3280 CROSS SECTION 2120.00 EXTENDED 4.09 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.12

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
2120.000	8.38	576.08	0.00	0.00	576.10	0.02	0.02	0.38	570.30
700.0	480.8	66.1	153.1	493.5	41.2	183.8	6.8	2.9	572.00
0.10	0.97	1.61	0.83	0.060	0.030	0.060	0.000	567.70	0.00
0.000194	49.	49.	49.	2	0	0	0.00	150.00	150.00

*SECNO 2130.000
3280 CROSS SECTION 2130.00 EXTENDED 4.08 FEET

JACKSON AVENUE

2130.000	8.07	576.07	0.00	0.00	576.11	0.03	0.00	0.01	571.00
700.0	399.5	166.9	133.6	457.9	64.6	171.3	6.9	2.9	572.00
0.11	0.87	2.58	0.78	0.060	0.020	0.060	0.000	568.00	0.00
0.000172	10.	10.	10.	1	0	0	0.00	150.00	150.00

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.50	2.50	100.00	8.00	0.00	27.00	0.00	568.00	568.00

*SECNO 2180.000
3280 CROSS SECTION 2180.00 EXTENDED 4.08 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
591.73	576.11	0.00	665.	35.	27.	28.	571.50	573.00	100.
2180.000	8.08	576.08	0.00	0.00	576.11	0.03	0.01	0.00	571.00
700.0	399.5	166.8	133.6	457.9	64.6	171.3	7.7	3.1	572.00
0.12	0.87	2.58	0.78	0.060	0.020	0.060	0.000	568.00	0.00
0.000172	50.	50.	50.	2	0	10	0.00	150.00	150.00

*SECNO 2205.000
3280 CROSS SECTION 2205.00 EXTENDED 3.89 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.27

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
2205.000	8.19	575.99	0.00	0.00	576.23	0.24	0.01	0.10	571.90
700.0	294.3	267.1	138.5	115.2	49.0	54.2	8.0	3.2	572.50
0.12	2.55	5.45	2.56	0.060	0.030	0.060	0.000	567.80	0.00
0.002437	25.	25.	25.	2	0	0	0.00	57.00	57.00

*SECNO 2280.000
3280 CROSS SECTION 2280.00 EXTENDED 2.24 FEET

2280.000	7.83	576.23	0.00	0.00	576.44	0.21	0.20	0.01	573.70
700.0	341.8	206.8	151.4	143.2	38.4	51.5	8.4	3.3	572.50
0.13	2.39	5.38	2.94	0.060	0.030	0.060	0.000	568.40	0.00
0.003027	75.	75.	75.	2	0	0	0.00	80.00	80.00

*SECNO 2390.000
3280 CROSS SECTION 2390.00 EXTENDED 2.91 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.20

COOPER STREET

2390.000	8.01	576.51	0.00	0.00	576.58	0.07	0.10	0.04	574.00
530.0	214.0	204.2	111.8	251.2	63.7	122.3	9.2	3.6	573.60
0.14	0.85	3.21	0.91	0.060	0.020	0.060	0.000	568.50	0.00
0.000358	110.	110.	110.	2	0	0	0.00	150.00	150.00

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.70	2.50	200.00	8.00	0.00	36.00	0.00	568.70	568.50

*SECNO 2440.000
6870 D.S. ENERGY OF 576.58 IS HIGHER THAN COMPUTED ENERGY OF 576.52
3280 CROSS SECTION 2440.00 EXTENDED 2.41 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
582.23	576.78	0.00	506.	23.	36.	35.	573.10	574.50	200.

2440.000	7.71	576.41	0.00	0.00	576.58	0.17	0.00	0.00	573.10
530.0	152.1	269.2	108.7	133.3	59.3	94.5	9.6	3.7	573.80
0.15	1.14	4.54	1.15	0.060	0.020	0.060	0.000	568.70	50.00
0.000681	50.	50.	50.	2	0	15	0.00	100.00	150.00

*SECNO 2450.000
3280 CROSS SECTION 2450.00 EXTENDED 2.52 FEET

2450.000	7.82	576.52	0.00	0.00	576.61	0.09	0.01	0.02	573.10
530.0	186.8	210.1	133.1	139.4	60.2	98.7	9.7	3.7	573.80
0.15	1.34	3.49	1.35	0.060	0.030	0.060	0.000	568.70	50.00
0.000887	10.	10.	10.	2	0	0	0.00	100.00	150.00

CCHV= 0.100 CEHV= 0.300
*SECNO 2685.000
3280 CROSS SECTION 2685.00 EXTENDED 4.12 FEET

2685.000	5.72	576.72	0.00	0.00	576.78	0.06	0.16	0.00	573.30
530.0	182.3	194.4	153.3	332.5	63.9	251.3	12.1	4.4	571.80
0.19	0.55	3.04	0.61	0.150	0.035	0.150	0.000	571.00	0.00
0.000611	240.	235.	180.	2	0	0	0.00	170.00	170.00

*SECNO 3020.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.23

3020.000	3.50	576.50	576.39	0.00	577.62	1.12	0.52	0.32	574.60
530.0	9.4	520.6	0.0	9.1	60.7	0.0	14.6	5.1	577.20
0.20	1.03	8.57	0.00	0.150	0.035	0.000	0.000	573.00	105.48
0.011897	290.	335.	310.	6	14	0	0.00	32.78	138.26

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 3250.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.87

3250.000	3.48	578.68	0.00	0.00	578.92	0.23	1.21	0.09	576.60
530.0	77.2	288.1	164.7	56.0	55.7	209.5	15.3	5.5	576.80
0.22	1.38	5.17	0.79	0.080	0.035	0.150	0.000	575.20	23.05
0.003414	230.	230.	90.	3	0	0	0.00	200.36	223.41

*SECNO 3515.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3515.000	3.65	582.85	582.85	0.00	584.23	1.37	1.48	0.34	583.30
530.0	0.0	530.0	0.0	0.0	56.4	0.0	16.4	6.2	585.00
0.23	0.00	9.40	0.00	0.000	0.030	0.000	0.000	579.20	35.91
0.011179	250.	265.	250.	20	8	0	0.00	20.85	56.76

*SECNO 3770.000

3265 DIVIDED FLOW

3280 CROSS SECTION 3770.00 EXTENDED 0.57 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3770.000	4.47	588.57	588.57	0.00	589.41	0.84	2.14	0.05	590.90
530.0	37.5	492.5	0.0	37.7	64.7	0.0	16.8	6.5	588.40
0.24	1.00	7.61	0.02	0.080	0.030	0.080	0.000	584.10	0.00
0.006538	250.	255.	260.	20	11	0	0.00	94.10	190.55

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 3945.000

3265 DIVIDED FLOW

3280 CROSS SECTION 3945.00 EXTENDED 0.66 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3945.000	3.16	594.66	594.66	0.00	595.24	0.58	1.49	0.03	595.40
530.0	247.0	283.0	0.0	108.8	34.9	0.0	17.3	6.9	596.70
0.25	2.27	8.10	0.00	0.080	0.030	0.000	0.000	591.50	0.00
0.011565	175.	175.	175.	20	13	0	0.00	122.05	218.65

*SECNO 4295.000

3265 DIVIDED FLOW

3280 CROSS SECTION 4295.00 EXTENDED 0.48 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4295.000	3.88	601.48	601.48	0.00	602.73	1.24	3.48	0.20	600.90
530.0	10.6	519.4	0.0	10.1	57.5	0.0	18.1	7.5	602.00
0.26	1.05	9.04	0.00	0.080	0.030	0.000	0.000	597.60	0.00
0.009213	300.	350.	400.	20	11	0	0.00	43.34	110.52

*SECNO 4370.000

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4370.000	4.45	603.15	603.15	0.00	604.08	0.93	0.59	0.03	603.10
530.0	0.0	434.6	95.4	0.0	51.2	54.6	18.2	7.6	602.50
0.26	0.02	8.49	1.75	0.080	0.030	0.080	0.000	598.70	109.73
0.007694	120.	75.	20.	20	8	0	0.00	72.63	232.64

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.300 CEHV= 0.500
*SECNO 4405.000
3280 CROSS SECTION 4405.00 EXTENDED 2.01 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 5.19

MCKEEL STREET

4405.000	6.32	604.02	0.00	0.00	604.30	0.28	0.03	0.19	597.70
530.0	84.4	322.9	122.6	180.8	59.1	256.8	18.5	7.7	598.50
0.26	0.47	5.46	0.48	0.080	0.015	0.080	0.000	597.70	0.00
0.000285	35.	35.	35.	4	0	0	0.00	240.00	240.00

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 600.83 , NOT 604.02 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	2.00	2.50	0.00	10.00	2.00	20.60	0.00	598.70	597.70

*SECNO 4480.000
6870 D.S. ENERGY OF 604.30 IS HIGHER THAN COMPUTED ENERGY OF 604.05
3280 CROSS SECTION 4480.00 EXTENDED 2.02 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
624.58	606.48	0.00	505.	21.	21.	21.	601.30	601.80	212.

4480.000	6.31	604.01	0.00	0.00	604.30	0.29	0.00	0.00	597.70
530.0	95.2	324.6	110.2	193.6	59.2	231.4	19.3	8.1	598.50
0.27	0.49	5.49	0.48	0.080	0.015	0.080	0.000	597.70	0.00
0.000288	75.	75.	75.	2	0	6	0.00	240.00	240.00

*SECNO 4520.000

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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  4520.000      4.03     603.83     603.83       0.00     605.37       1.55       0.03       0.63     605.90
     530.0       0.0      530.0        0.0        0.0       53.1        0.0       19.6        8.2     605.70
      0.27      0.00       9.98       0.00      0.000      0.030      0.000      0.000     599.80     106.66
  0.011978       40.        40.        40.         20         14          0       0.00      17.37     124.03


CCHV=    0.100 CEHV=    0.300
*SECNO 4630.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  4630.000      2.79     607.89     607.89       0.00     608.92       1.03       1.31       0.05     609.30
     280.0       0.0      280.0        0.0        0.0       34.4        0.0       19.7        8.3     609.50
      0.27      0.00       8.14       0.00      0.000      0.030      0.000      0.000     605.10      81.67
  0.011891      110.       110.       110.         20         19          0       0.00      16.97      98.64


CCHV=    0.300 CEHV=    0.500
*SECNO 4695.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  4695.000      4.42     612.52     612.52       0.00     613.18       0.66       0.53       0.11     609.20
     280.0      68.7      154.4       56.9       37.3       17.9       31.7       19.8        8.4     609.20
      0.28      1.84       8.63       1.80      0.080      0.030      0.080      0.000     608.10      63.05
  0.005919       80.        65.        50.         20         14          0       0.00      90.19     153.24


*SECNO 4696.000

3370 NORMAL BRIDGE, NRD=  13 MIN ELTRD=   612.00 MAX ELLC=   611.50

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


3720 CRITICAL DEPTH ASSUMED
             CRESTMONT DRIVE
  4696.000      5.36     613.46     613.46       0.00     613.80       0.35       0.01       0.09     609.20
     280.0      92.7       99.0       88.4       63.5       12.8       61.3       19.8        8.4     609.20
      0.28      1.46       7.73       1.44      0.080      0.015      0.080      0.000     608.10      23.13
  0.008755        1.         1.         1.         20          9          0     -72.64     172.39     195.51


*SECNO 4990.000
3280 CROSS SECTION   4990.00 EXTENDED      0.95 FEET


3370 NORMAL BRIDGE, NRD=  11 MIN ELTRD=   619.50 MAX ELLC=   618.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  4990.000      7.45     620.95     620.95       0.00     621.58       0.63       1.96       0.14     615.80
     280.0      56.6      165.1       58.3       34.8       20.1       38.8       20.5        9.1     615.80
      0.29      1.63       8.20       1.50      0.080      0.015      0.080      0.000     613.50       0.00
  0.005883      260.       294.       260.         20         10          0     -45.90      71.82      71.82


*SECNO 4991.000
3280 CROSS SECTION   4991.00 EXTENDED      1.62 FEET


3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.78

  4991.000      8.12     621.62       0.00       0.00     621.73       0.11       0.00       0.15     615.80
     280.0      72.7      127.7       79.6       71.4       32.9       86.5       20.5        9.1     615.80
      0.29      1.02       3.89       0.92      0.080      0.030      0.080      0.000     613.50       0.00
  0.000763        1.         1.         1.          3          0          0       0.00      80.22      80.22


*SECNO 5025.000
3280 CROSS SECTION   5025.00 EXTENDED      1.60 FEET
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.50

5025.000	5.90	621.60	0.00	0.00	621.85	0.25	0.05	0.07	619.30
280.0	71.7	155.5	52.8	49.9	29.5	43.0	20.6	9.2	619.70
0.29	1.44	5.26	1.23	0.080	0.030	0.080	0.000	615.70	0.00
0.003084	34.	34.	34.	2	0	0	0.00	70.98	70.98

CCHV= 0.100 CEHV= 0.300
*SECNO 5135.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

5135.000	2.69	624.29	624.29	0.00	624.93	0.64	0.56	0.12	623.70
280.0	60.4	219.3	0.3	35.0	30.4	0.9	20.8	9.3	624.10
0.30	1.73	7.22	0.38	0.080	0.030	0.080	0.000	621.60	33.19
0.009736	120.	110.	100.	20	14	0	0.00	66.07	99.26

*SECNO 5325.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

5325.000	2.46	635.16	635.16	0.00	635.67	0.51	1.71	0.01	634.40
280.0	3.5	189.3	87.2	3.9	27.5	56.7	21.2	9.7	634.80
0.31	0.90	6.89	1.54	0.080	0.030	0.080	0.000	632.70	100.60
0.008596	220.	190.	150.	20	15	0	0.00	96.22	196.81

CCHV= 0.300 CEHV= 0.500
*SECNO 5375.000
3280 CROSS SECTION 5375.00 EXTENDED 0.86 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
MT. HOPE AVENUE

5375.000	4.86	638.86	638.86	0.00	639.59	0.73	0.10	0.11	634.00
280.0	51.1	181.6	47.3	78.5	21.4	70.8	21.3	9.8	634.00
0.31	0.65	8.48	0.67	0.080	0.015	0.080	0.000	634.00	0.00
0.000890	40.	50.	60.	20	14	0	0.00	142.16	142.16

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.50	2.50	0.00	4.40	0.00	10.20	0.00	636.80	634.00

*SECNO 5475.000

3301 HV CHANGED MORE THAN HVINS

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
656.42	643.49	0.00	149.	131.	10.	11.	639.20	642.10	129.

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 642.00 ELREA= 642.00

5475.000	4.99	640.79	640.79	0.00	643.32	2.52	0.13	-0.13	635.80
280.0	0.0	280.0	0.0	0.0	22.0	0.0	21.5	10.0	635.80
0.31	0.00	12.75	0.00	0.000	0.015	0.000	0.000	635.80	67.80
0.001940	100.	100.	100.	20	8	0	0.00	4.40	72.20

*SECNO 5525.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.97

5525.000	6.95	643.95	0.00	0.00	644.08	0.13	0.04	0.72	641.30
280.0	9.2	264.5	6.4	23.9	88.4	17.4	21.6	10.0	642.30
0.32	0.38	2.99	0.37	0.080	0.030	0.080	0.000	637.00	53.23
0.000502	40.	50.	50.	4	0	0	0.00	105.20	158.43

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T1      GOODKIND & O'DEA, INC.  60 FERONIA WAY, RUTHERFORD, NJ  07070
T2      McKEEL BROOK STORMWATER MANAGEMENT PLAN - ROCKAWAY AND DOVER, NJ
T3      EXISTING 25 YEAR STORM

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0        4        0        0        0        0        0        0    554.25

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

      3        0       -1
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 3

CCHV= 0.300 CEHV= 0.500
*SECNO 58.000
3280 CROSS SECTION 58.00 EXTENDED 0.65 FEET

CROSS SECTIONS TAKEN LOOKING DOWNSTREAM
HEC-2 BASED ON DOVER F.I.S. PREPARED BY THE RBA GROUP DATED 4/5/78
AND UPDATED TO NOV. 1994 AS PER SURVEY BY GOODKIND & O'DEA, INC.
CONFLUENCE WITH THE ROCKAWAY RIVER

58.000	5.85	554.25	0.00	554.25	554.47	0.22	0.00	0.00	553.60
815.0	1.5	764.4	49.1	3.3	195.4	37.7	0.0	0.0	548.40
0.00	0.47	3.91	1.30	0.060	0.030	0.060	0.000	548.40	0.00
0.000757	0.	0.	0.	0	0	0	0.00	60.00	60.00

1490 NH CARD USED
*SECNO 59.000
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED
3280 CROSS SECTION 59.00 EXTENDED 0.56 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.48

3370 NORMAL BRIDGE, NRD= 11 MIN ELTRD= 549.00 MAX ELLC= 552.40

59.000	5.76	554.16	0.00	0.00	554.56	0.40	0.00	0.09	553.60
815.0	2.5	804.0	8.5	2.8	157.3	9.0	0.0	0.0	548.40
0.00	0.90	5.11	0.94	0.060	0.024	0.060	0.000	548.40	0.00
0.003261	1.	1.	1.	2	0	0	-62.10	60.00	60.00

1490 NH CARD USED
*SECNO 96.000
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED
3280 CROSS SECTION 96.00 EXTENDED 0.72 FEET

3370 NORMAL BRIDGE, NRD= 11 MIN ELTRD= 549.00 MAX ELLC= 552.60

96.000	5.72	554.32	0.00	0.00	554.69	0.36	0.11	0.01	553.60
815.0	3.5	799.6	11.9	3.6	163.5	11.6	0.2	0.1	548.60
0.00	0.97	4.89	1.03	0.060	0.024	0.060	0.000	548.60	0.00
0.002833	20.	37.	50.	2	0	0	-56.00	60.00	60.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.100 CEHV= 0.300
*SECNO 165.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 554.70 MAX ELLC= 553.00

165.000	5.30	554.10	552.06	0.00	555.13	1.03	0.24	0.20	549.00
815.0	0.0	815.0	0.0	0.0	100.0	0.0	0.4	0.1	548.80
0.00	0.00	8.15	0.00	0.000	0.015	0.000	0.000	548.80	4.71
0.004530	69.	69.	69.	4	12	0	-106.48	50.07	54.78

*SECNO 340.000
3280 CROSS SECTION 340.00 EXTENDED 0.72 FEET

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 554.50 MAX ELLC= 554.00

340.000	5.92	555.22	0.00	0.00	555.86	0.64	0.69	0.04	550.00
815.0	12.4	789.3	13.3	10.8	120.9	11.6	0.9	0.4	549.30
0.01	1.15	6.53	1.15	0.060	0.015	0.060	0.000	549.30	0.00
0.003503	175.	175.	175.	3	0	0	-91.35	60.00	60.00

*SECNO 550.000
3280 CROSS SECTION 550.00 EXTENDED 0.80 FEET

3370 NORMAL BRIDGE, NRD= 18 MIN ELTRD= 555.20 MAX ELLC= 553.90

550.000	6.10	556.00	0.00	0.00	556.80	0.79	0.89	0.05	550.20
815.0	16.9	778.8	19.3	11.3	106.5	12.9	1.5	0.7	549.90
0.02	1.50	7.31	1.50	0.060	0.015	0.060	0.000	549.90	0.00
0.005217	210.	210.	210.	2	0	0	-127.45	60.00	60.00

*SECNO 608.000
3280 CROSS SECTION 608.00 EXTENDED 0.81 FEET

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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


3370 NORMAL BRIDGE, NRD=  18 MIN ELTRD=   555.50 MAX ELLC=   554.30

  608.000      6.31    556.31      0.00      0.00    557.10      0.79      0.30      0.00    552.00
    815.0      16.9     778.6      19.4      11.3     106.7      12.9       1.7       0.7    550.00
     0.02      1.50      7.30      1.50     0.060     0.015     0.060     0.000    550.00      0.00
 0.005197       58.       58.       58.         2         0         0   -103.10     60.00     60.00


*SECNO 845.000

3301 HV CHANGED MORE THAN HVINS


3370 NORMAL BRIDGE, NRD=  14 MIN ELTRD=   559.10 MAX ELLC=   558.00

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  845.000      3.28    557.28    557.28      0.00    558.94      1.66      1.20      0.26    554.00
    815.0       0.0     815.0       0.0       0.0      78.8       0.0       2.3       1.0    554.00
     0.03      0.00     10.34      0.00     0.000     0.015     0.000     0.000    554.00      9.56
 0.004959      220.      237.      270.         4        19         0    -34.30     40.88     50.44


CCHV=    0.600 CEHV=    0.800
*SECNO 904.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   559.000 EGLC=   561.518 EGC=   562.430 WSEL=   561.189

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   559.000 EGLC=   561.518 EGC=   561.522 WSEL=   558.984

3301 HV CHANGED MORE THAN HVINS


3370 NORMAL BRIDGE, NRD=  10 MIN ELTRD=   560.30 MAX ELLC=   559.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  904.000      4.00    559.00    559.00      0.00    561.52      2.52      0.42      0.69    555.00
    815.0       0.0     815.0       0.0       0.0      64.0       0.0       2.4       1.1    555.00
     0.03      0.00     12.73      0.00     0.000     0.015     0.000     0.000    555.00     13.08
 0.011259       59.       59.       59.        20        18         0    -39.70     33.85     46.92
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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


CCHV=    0.100 CEHV=    0.300
*SECNO 1000.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   560.600 EGLC=   563.118 EGC=   564.130 WSEL=   562.889

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   560.600 EGLC=   563.118 EGC=   563.122 WSEL=   560.584

3370 NORMAL BRIDGE, NRD=  10 MIN ELTRD=   562.00 MAX ELLC=   560.60

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1000.000      4.00    560.60    560.60      0.00    563.12      2.52      1.08      0.00    556.60
     815.0       0.0     815.0       0.0       0.0      64.0       0.0       2.5       1.1    556.60
      0.03      0.00     12.73      0.00     0.000     0.015     0.000     0.000    556.60     12.85
  0.011259       96.       96.       96.        20        18         0    -40.59     34.30     47.15


*SECNO 1148.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   562.400 EGLC=   564.918 EGC=   566.630 WSEL=   565.388

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   562.400 EGLC=   564.918 EGC=   564.922 WSEL=   562.384

3370 NORMAL BRIDGE, NRD=  10 MIN ELTRD=   564.50 MAX ELLC=   562.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1148.000      4.00    562.40    562.40      0.00    564.92      2.52      1.67      0.00    558.40
     815.0       0.0     815.0       0.0       0.0      64.0       0.0       2.7       1.3    558.40
      0.04      0.00     12.73      0.00     0.000     0.015     0.000     0.000    558.40     13.13
  0.011259      160.      148.      130.        20        18         0    -40.13     34.07     47.20


*SECNO 1264.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   565.400 EGLC=   567.918 EGC=   569.630 WSEL=   568.388

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   565.400 EGLC=   567.918 EGC=   567.922 WSEL=   565.384

3370 NORMAL BRIDGE, NRD=  10 MIN ELTRD=   567.50 MAX ELLC=   565.40
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    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1264.000      4.00     565.40     565.40       0.00     567.92       2.52       1.31       0.00     561.40
     815.0       0.0      815.0        0.0        0.0       64.0        0.0        2.9        1.3     561.40
      0.04      0.00      12.73       0.00      0.000      0.015      0.000      0.000     561.40      13.13
  0.011259      116.       116.       116.         20         18          0     -39.48      33.74      46.87


*SECNO 1400.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   567.400 EGLC=   569.918 EGC=   570.930 WSEL=   569.689

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   567.400 EGLC=   569.918 EGC=   569.922 WSEL=   567.384

3370 NORMAL BRIDGE, NRD=  10 MIN ELTRD=   568.80 MAX ELLC=   567.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1400.000      4.00     567.40     567.40       0.00     569.92       2.52       1.53       0.00     563.40
     815.0       0.0      815.0        0.0        0.0       64.0        0.0        3.1        1.5     563.40
      0.04      0.00      12.73       0.00      0.000      0.015      0.000      0.000     563.40      12.85
  0.011259      145.       136.       135.         20         18          0     -40.59      34.30      47.15


CCHV=    0.600 CEHV=    0.800
*SECNO 1418.000
3280 CROSS SECTION   1418.00 EXTENDED      1.80 FEET


3301 HV CHANGED MORE THAN HVINS


3370 NORMAL BRIDGE, NRD=   6 MIN ELTRD=   568.80 MAX ELLC=   567.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1418.000      6.70     570.60     570.60       0.00     571.79       1.19       0.16       0.80     563.90
     815.0     130.8      553.5      130.8       45.0       53.0       45.0        3.1        1.5     563.90
      0.04      2.91      10.44       2.91      0.060      0.015      0.060      0.000     563.90       0.00
  0.006885        5.        18.        30.         20         12          0     -63.00      60.00      60.00
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 1480.000
3280 CROSS SECTION 1480.00 EXTENDED 3.28 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.87

3370 NORMAL BRIDGE, NRD= 6 MIN ELTRD= 568.80 MAX ELLC= 567.50

1480.000	8.09	572.09	0.00	0.00	572.49	0.40	0.23	0.47	564.00
815.0	184.2	446.5	184.2	82.0	67.8	82.0	3.4	1.6	564.00
0.05	2.25	6.59	2.25	0.060	0.015	0.060	0.000	564.00	0.00
0.001972	68.	68.	68.	4	0	0	-61.00	60.00	60.00

*SECNO 1500.000
3280 CROSS SECTION 1500.00 EXTENDED 3.12 FEET

3370 NORMAL BRIDGE, NRD= 6 MIN ELTRD= 569.00 MAX ELLC= 568.00

1500.000	8.12	572.12	0.00	0.00	572.60	0.48	0.05	0.06	564.00
815.0	238.6	337.9	238.6	84.3	42.7	84.3	3.5	1.6	564.00
0.05	2.83	7.91	2.83	0.060	0.015	0.060	0.000	564.00	0.00
0.003283	5.	20.	35.	2	0	0	-56.00	60.00	60.00

*SECNO 2070.000
3280 CROSS SECTION 2070.00 EXTENDED 2.35 FEET

3370 NORMAL BRIDGE, NRD= 6 MIN ELTRD= 572.30 MAX ELLC= 571.30

2070.000	7.55	574.65	0.00	0.00	575.07	0.42	2.44	0.03	567.10
815.0	306.6	299.9	208.5	114.9	37.8	87.9	6.9	2.8	567.10
0.09	2.67	7.93	2.37	0.060	0.015	0.060	0.000	567.10	0.00
0.003973	630.	760.	620.	3	0	0	-23.85	100.00	100.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.300 CEHV= 0.500
*SECNO 2071.000
3280 CROSS SECTION 2071.00 EXTENDED 2.41 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2071.000	7.61	574.71	574.71	0.00	576.10	1.39	0.00	0.48	567.10
815.0	165.8	532.3	116.8	125.8	45.6	98.8	6.9	2.8	567.10
0.09	1.32	11.66	1.18	0.060	0.015	0.060	0.000	567.10	0.00
0.000926	1.	1.	1.	20	5	0	0.00	100.00	100.00

*SECNO 2120.000
3280 CROSS SECTION 2120.00 EXTENDED 4.51 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.15

2120.000	8.81	576.51	0.00	0.00	576.53	0.02	0.02	0.41	570.30
815.0	559.4	73.1	182.5	536.3	43.3	203.1	7.5	2.9	572.00
0.10	1.04	1.69	0.90	0.060	0.030	0.060	0.000	567.70	0.00
0.000200	49.	49.	49.	2	0	0	0.00	150.00	150.00

*SECNO 2130.000
3280 CROSS SECTION 2130.00 EXTENDED 4.51 FEET

JACKSON AVENUE

2130.000	8.50	576.50	0.00	0.00	576.54	0.04	0.00	0.01	571.00
815.0	470.4	185.0	159.5	500.6	68.0	189.3	7.7	2.9	572.00
0.10	0.94	2.72	0.84	0.060	0.020	0.060	0.000	568.00	0.00
0.000178	10.	10.	10.	1	0	0	0.00	150.00	150.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.50	2.50	100.00	8.00	0.00	27.00	0.00	568.00	568.00

*SECNO 2180.000
3280 CROSS SECTION 2180.00 EXTENDED 4.51 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
597.72	576.54	0.00	786.	36.	27.	28.	571.50	573.00	100.

2180.000	8.51	576.51	0.00	0.00	576.54	0.04	0.01	0.00	571.00
815.0	470.4	185.0	159.5	500.5	68.0	189.2	8.5	3.1	572.00
0.11	0.94	2.72	0.84	0.060	0.020	0.060	0.000	568.00	0.00
0.000178	50.	50.	50.	2	0	10	0.00	150.00	150.00

*SECNO 2205.000
3280 CROSS SECTION 2205.00 EXTENDED 4.31 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.27

2205.000	8.61	576.41	0.00	0.00	576.66	0.25	0.01	0.11	571.90
815.0	361.3	291.2	162.5	130.8	51.5	60.1	8.8	3.2	572.50
0.12	2.76	5.66	2.70	0.060	0.030	0.060	0.000	567.80	0.00
0.002450	25.	25.	25.	2	0	0	0.00	57.00	57.00

*SECNO 2280.000
3280 CROSS SECTION 2280.00 EXTENDED 2.68 FEET

2280.000	8.28	576.68	0.00	0.00	576.87	0.20	0.19	0.02	573.70
815.0	427.1	214.8	173.2	169.6	40.6	58.2	9.3	3.3	572.50
0.12	2.52	5.29	2.98	0.060	0.030	0.060	0.000	568.40	0.00
0.002711	75.	75.	75.	2	0	0	0.00	80.00	80.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 2390.000
3280 CROSS SECTION 2390.00 EXTENDED 3.34 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.16

COOPER STREET

2390.000	8.44	576.94	0.00	0.00	577.00	0.07	0.09	0.04	574.00
630.0	273.0	219.6	137.4	293.6	67.1	140.1	10.2	3.6	573.60
0.14	0.93	3.27	0.98	0.060	0.020	0.060	0.000	568.50	0.00
0.000348	110.	110.	110.	2	0	0	0.00	150.00	150.00

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.70	2.50	200.00	8.00	0.00	36.00	0.00	568.70	568.50

*SECNO 2440.000
6870 D.S. ENERGY OF 577.00 IS HIGHER THAN COMPUTED ENERGY OF 576.95
3280 CROSS SECTION 2440.00 EXTENDED 2.83 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
585.02	577.20	0.00	605.	24.	36.	35.	573.10	574.50	200.

2440.000	8.13	576.83	0.00	0.00	577.00	0.17	0.00	0.00	573.10
630.0	196.6	294.2	139.2	156.3	62.7	110.4	10.7	3.7	573.80
0.14	1.26	4.69	1.26	0.060	0.020	0.060	0.000	568.70	50.00
0.000676	50.	50.	50.	2	0	11	0.00	100.00	150.00

*SECNO 2450.000
3280 CROSS SECTION 2450.00 EXTENDED 2.94 FEET

2450.000	8.24	576.94	0.00	0.00	577.04	0.09	0.01	0.02	573.10
630.0	236.3	226.7	166.9	162.4	63.6	114.6	10.8	3.7	573.80
0.15	1.45	3.57	1.46	0.060	0.030	0.060	0.000	568.70	50.00
0.000862	10.	10.	10.	2	0	0	0.00	100.00	150.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.100 CEHV= 0.300
*SECNO 2685.000
3280 CROSS SECTION 2685.00 EXTENDED 4.54 FEET

2685.000	6.14	577.14	0.00	0.00	577.20	0.06	0.16	0.00	573.30
630.0	223.8	224.3	181.9	373.3	68.9	276.3	13.4	4.4	571.80
0.18	0.60	3.25	0.66	0.150	0.035	0.150	0.000	571.00	0.00
0.000632	240.	235.	180.	2	0	0	0.00	170.00	170.00

*SECNO 3020.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.24

3020.000	3.90	576.90	576.74	0.00	578.06	1.16	0.53	0.33	574.60
630.0	15.9	614.1	0.0	13.2	70.2	0.0	16.2	5.1	577.20
0.20	1.20	8.75	0.00	0.150	0.035	0.000	0.000	573.00	103.91
0.010808	290.	335.	310.	6	14	0	0.00	35.35	139.26

*SECNO 3250.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.89

3250.000	3.80	579.00	0.00	0.00	579.22	0.22	1.07	0.09	576.60
630.0	102.0	318.5	209.6	71.5	61.3	252.0	17.1	5.6	576.80
0.21	1.43	5.19	0.83	0.080	0.035	0.150	0.000	575.20	17.59
0.003027	230.	230.	90.	2	0	0	0.00	207.39	224.98

*SECNO 3515.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
3515.000	4.02	583.22	583.22	0.00	584.72	1.50	1.36	0.38	583.30
630.0	0.0	630.0	0.0	0.0	64.2	0.0	18.4	6.2	585.00
0.22	0.00	9.81	0.00	0.000	0.030	0.000	0.000	579.20	35.16
0.010982	250.	265.	250.	20	8	0	0.00	21.81	56.97

*SECNO 3770.000

3265 DIVIDED FLOW

3280 CROSS SECTION 3770.00 EXTENDED 0.81 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3770.000	4.71	588.81	588.81	0.00	589.70	0.89	2.15	0.06	590.90
630.0	68.9	560.9	0.1	55.2	70.0	0.3	18.9	6.6	588.40
0.23	1.25	8.02	0.51	0.080	0.030	0.080	0.000	584.10	0.00
0.006668	250.	255.	260.	20	8	0	0.00	99.89	191.30

*SECNO 3945.000

3265 DIVIDED FLOW

3280 CROSS SECTION 3945.00 EXTENDED 0.87 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3945.000	3.37	594.87	594.87	0.00	595.44	0.56	1.47	0.03	595.40
630.0	314.6	315.4	0.0	131.0	38.6	0.0	19.5	7.0	596.70
0.24	2.40	8.18	0.00	0.080	0.030	0.000	0.000	591.50	0.00
0.010923	175.	175.	175.	20	14	0	0.00	125.85	218.89

*SECNO 4295.000

3265 DIVIDED FLOW

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3280 CROSS SECTION 4295.00 EXTENDED 1.12 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4295.000	4.52	602.12	602.12	0.00	603.11	0.99	2.73	0.13	600.90
630.0	41.0	581.8	7.2	31.6	70.0	11.0	20.6	7.9	602.00
0.25	1.30	8.31	0.65	0.080	0.030	0.080	0.000	597.60	0.00
0.006253	300.	350.	400.	20	11	0	0.00	100.37	242.04

*SECNO 4370.000

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4370.000	4.76	603.46	603.46	0.00	604.41	0.95	0.47	0.00	603.10
630.0	0.2	490.1	139.8	0.3	55.7	73.3	20.7	8.0	602.50
0.25	0.50	8.79	1.91	0.080	0.030	0.080	0.000	598.70	108.20
0.007355	120.	75.	20.	20	8	0	0.00	80.75	234.37

CCHV= 0.300 CEHV= 0.500
*SECNO 4405.000
3280 CROSS SECTION 4405.00 EXTENDED 2.33 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 5.00

MCKEEL STREET

4405.000	6.64	604.34	0.00	0.00	604.63	0.29	0.03	0.20	597.70
630.0	111.0	358.2	160.8	211.2	62.3	300.0	21.0	8.1	598.50
0.26	0.53	5.75	0.54	0.080	0.015	0.080	0.000	597.70	0.00
0.000294	35.	35.	35.	4	0	0	0.00	240.00	240.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 601.21 , NOT 604.34 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	2.00	2.50	0.00	10.00	2.00	20.60	0.00	598.70	597.70

*SECNO 4480.000
6870 D.S. ENERGY OF 604.63 IS HIGHER THAN COMPUTED ENERGY OF 604.37
3280 CROSS SECTION 4480.00 EXTENDED 2.33 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
633.38	607.40	0.00	611.	20.	21.	21.	601.30	601.80	214.
4480.000	6.63	604.33	0.00	0.00	604.63	0.30	0.00	0.00	597.70
630.0	123.2	361.0	145.8	223.4	62.3	273.9	22.0	8.5	598.50
0.26	0.55	5.79	0.53	0.080	0.015	0.080	0.000	597.70	0.00
0.000300	75.	75.	75.	2	0	10	0.00	240.00	240.00

*SECNO 4520.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4520.000	4.45	604.25	604.25	0.00	605.93	1.68	0.04	0.69	605.90
630.0	0.0	630.0	0.0	0.0	60.6	0.0	22.3	8.6	605.70
0.26	0.00	10.39	0.00	0.000	0.030	0.000	0.000	599.80	105.91
0.011775	40.	40.	40.	20	14	0	0.00	18.34	124.25

CCHV= 0.100 CEHV= 0.300
*SECNO 4630.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

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    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  4630.000      3.09     608.18     608.18       0.00     609.30       1.12       1.29       0.06     609.30
     335.0       0.0      335.0        0.0        0.0       39.5        0.0       22.4        8.7     609.50
      0.27      0.00       8.49       0.00      0.000      0.030      0.000      0.000     605.10      81.33
  0.011641      110.       110.       110.         20         19          0       0.00      17.92      99.25


CCHV=    0.300 CEHV=    0.500
*SECNO 4695.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  4695.000      4.67     612.77     612.77       0.00     613.40       0.63       0.52       0.15     609.20
     335.0      90.9      167.8       76.3       50.2       19.0       43.7       22.5        8.8     609.20
      0.27      1.81       8.82       1.74      0.080      0.030      0.080      0.000     608.10      52.12
  0.005700       80.        65.        50.         20         11          0       0.00     112.69     164.81


*SECNO 4696.000

3370 NORMAL BRIDGE, NRD=  13 MIN ELTRD=   612.00 MAX ELLC=   611.50

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
               CRESTMONT DRIVE
  4696.000      5.45     613.55     613.55       0.00     613.93       0.38       0.01       0.07     609.20
     335.0     115.1      110.1      109.8       71.2       13.2       69.0       22.5        8.8     609.20
      0.27      1.62       8.34       1.59      0.080      0.015      0.080      0.000     608.10      19.33
  0.009795        1.         1.         1.         20         13          0     -72.64     180.20     199.53


*SECNO 4990.000
3280 CROSS SECTION   4990.00 EXTENDED      1.09 FEET


3370 NORMAL BRIDGE, NRD=  11 MIN ELTRD=   619.50 MAX ELLC=   618.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  4990.000      7.59     621.09     621.09       0.00     621.80       0.72       2.22       0.17     615.80
     335.0      72.3      186.3       76.5       38.7       20.8       44.5       23.3        9.6     615.80
      0.28      1.87       8.97       1.72      0.080      0.015      0.080      0.000     613.50       0.00
  0.006764      260.       294.       260.         20          9          0     -45.90      73.59      73.59
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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

*SECNO 4991.000
3280 CROSS SECTION   4991.00 EXTENDED      1.84 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.74

  4991.000      8.34     621.84       0.00       0.00     621.98       0.14       0.00       0.17     615.80
     335.0      89.0      145.8      100.2       77.6       33.8       97.6       23.3        9.6     615.80
      0.28      1.15       4.31       1.03      0.080      0.030      0.080      0.000     613.50       0.00
  0.000901        1.         1.         1.          3          0          0       0.00      83.03      83.03

*SECNO 5025.000
3280 CROSS SECTION   5025.00 EXTENDED      1.83 FEET

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  0.52

  5025.000      6.13     621.83       0.00       0.00     622.10       0.27       0.05       0.07     619.30
     335.0      90.9      173.1       71.0       56.7       30.9       51.7       23.5        9.6     619.70
      0.29      1.60       5.60       1.37      0.080      0.030      0.080      0.000     615.70       0.00
  0.003274       34.        34.        34.          2          0          0       0.00      73.32      73.32

CCHV=    0.100 CEHV=    0.300
*SECNO 5135.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  5135.000      2.87     624.47     624.47       0.00     625.16       0.69       0.58       0.13     623.70
     335.0      79.5      253.4        2.1       43.0       33.4        2.8       23.7        9.8     624.10
      0.29      1.85       7.59       0.75      0.080      0.030      0.080      0.000     621.60      29.53
  0.009466      120.       110.       100.         20         14          0       0.00      70.99     100.51

*SECNO 5325.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  5325.000      2.60     635.30     635.30       0.00     635.85       0.54       1.70       0.01     634.40
     335.0       6.1      215.3      113.6        5.8       29.6       67.6       24.1       10.2     634.80
      0.30      1.07       7.28       1.68      0.080      0.030      0.080      0.000     632.70      96.09
  0.008734      220.       190.       150.         20         15          0       0.00     104.78     200.87
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.300 CEHV= 0.500
*SECNO 5375.000
3280 CROSS SECTION 5375.00 EXTENDED 1.08 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
MT. HOPE AVENUE

5375.000	5.08	639.08	639.08	0.00	639.85	0.77	0.11	0.11	634.00
335.0	69.1	202.4	63.6	94.3	22.4	85.0	24.3	10.3	634.00
0.30	0.73	9.05	0.75	0.080	0.015	0.080	0.000	634.00	0.00
0.000955	40.	50.	60.	20	14	0	0.00	142.70	142.70

SPECIAL BRIDGE

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
0.00	1.50	2.50	0.00	4.40	0.00	10.20	0.00	636.80	634.00

*SECNO 5475.000
3280 CROSS SECTION 5475.00 EXTENDED 1.08 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
664.21	644.32	0.00	206.	130.	10.	11.	639.20	642.10	132.

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3710 WSEL ASSUMED BASED ON MIN DIFF
3693 PROBABLE MINIMUM SPECIFIC ENERGY

5475.000	7.28	643.08	641.43	0.00	644.06	0.98	0.07	-0.07	635.80
335.0	33.4	279.0	22.5	75.6	32.0	57.2	24.7	10.6	635.80
0.31	0.44	8.71	0.39	0.080	0.015	0.080	0.000	635.80	0.00
0.000547	100.	100.	100.	20	8	0	0.00	136.64	136.64

*SECNO 5525.000

3301 HV CHANGED MORE THAN HVINS

5525.000	7.18	644.18	0.00	0.00	644.34	0.16	0.03	0.25	641.30
335.0	16.7	307.3	11.0	40.8	92.0	24.7	24.9	10.8	642.30
0.31	0.41	3.34	0.44	0.080	0.030	0.080	0.000	637.00	40.85
0.000594	40.	50.	50.	2	0	0	0.00	121.46	162.31

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T1      GOODKIND & O'DEA, INC.  60 FERONIA WAY, RUTHERFORD, NJ  07070
T2      McKEEL BROOK STORMWATER MANAGEMENT PLAN - ROCKAWAY AND DOVER, NJ
T3      EXISTING  50 YEAR STORM

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0         5         0         0         0         0         0         0    554.25

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      4         0        -1
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 4

CCHV= 0.300 CEHV= 0.500
*SECNO 58.000
3280 CROSS SECTION 58.00 EXTENDED 0.65 FEET

CROSS SECTIONS TAKEN LOOKING DOWNSTREAM
HEC-2 BASED ON DOVER F.I.S. PREPARED BY THE RBA GROUP DATED 4/5/78
AND UPDATED TO NOV. 1994 AS PER SURVEY BY GOODKIND & O'DEA, INC.
CONFLUENCE WITH THE ROCKAWAY RIVER

58.000	5.85	554.25	0.00	554.25	554.60	0.35	0.00	0.00	553.60
1020.0	1.9	956.6	61.5	3.3	195.4	37.7	0.0	0.0	548.40
0.00	0.59	4.89	1.63	0.060	0.030	0.060	0.000	548.40	0.00
0.001185	0.	0.	0.	0	0	0	0.00	60.00	60.00

1490 NH CARD USED
*SECNO 59.000
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED
3280 CROSS SECTION 59.00 EXTENDED 0.50 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.47

3370 NORMAL BRIDGE, NRD= 11 MIN ELTRD= 549.00 MAX ELLC= 552.40

59.000	5.70	554.10	0.00	0.00	554.75	0.65	0.00	0.15	553.60
1020.0	2.7	1008.2	9.1	2.5	154.9	8.1	0.0	0.0	548.40
0.00	1.08	6.51	1.13	0.060	0.024	0.060	0.000	548.40	0.00
0.005390	1.	1.	1.	2	0	0	-62.10	60.00	60.00

1490 NH CARD USED
*SECNO 96.000
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED
3280 CROSS SECTION 96.00 EXTENDED 0.82 FEET

3370 NORMAL BRIDGE, NRD= 11 MIN ELTRD= 549.00 MAX ELLC= 552.60

96.000	5.82	554.42	0.00	0.00	554.96	0.54	0.17	0.03	553.60
1020.0	5.2	997.1	17.8	4.1	167.5	13.2	0.2	0.1	548.60
0.00	1.25	5.95	1.35	0.060	0.024	0.060	0.000	548.60	0.00
0.004067	20.	37.	50.	2	0	0	-56.00	60.00	60.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.100 CEHV= 0.300
*SECNO 165.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 554.70 MAX ELLC= 553.00

165.000	5.23	554.03	552.64	0.00	555.65	1.62	0.36	0.32	549.00
1020.0	0.0	1020.0	0.0	0.0	100.0	0.0	0.4	0.1	548.80
0.00	0.00	10.20	0.00	0.000	0.015	0.000	0.000	548.80	4.85
0.007095	69.	69.	69.	6	18	0	-103.02	49.79	54.64

*SECNO 340.000
3280 CROSS SECTION 340.00 EXTENDED 1.36 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.49

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 554.50 MAX ELLC= 554.00

340.000	6.56	555.86	0.00	0.00	556.54	0.68	0.80	0.09	550.00
1020.0	33.0	951.6	35.4	20.3	139.3	21.7	0.9	0.4	549.30
0.01	1.62	6.83	1.63	0.060	0.015	0.060	0.000	549.30	0.00
0.003177	175.	175.	175.	3	0	0	-91.35	60.00	60.00

*SECNO 550.000
3280 CROSS SECTION 550.00 EXTENDED 1.35 FEET

3370 NORMAL BRIDGE, NRD= 18 MIN ELTRD= 555.20 MAX ELLC= 553.90

550.000	6.65	556.55	0.00	0.00	557.39	0.84	0.81	0.05	550.20
1020.0	37.2	940.0	42.8	18.9	122.8	21.6	1.8	0.7	549.90
0.02	1.97	7.65	1.98	0.060	0.015	0.060	0.000	549.90	0.00
0.004732	210.	210.	210.	2	0	0	-127.45	60.00	60.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 608.000
3280 CROSS SECTION 608.00 EXTENDED 1.32 FEET

3370 NORMAL BRIDGE, NRD= 18 MIN ELTRD= 555.50 MAX ELLC= 554.30

608.000	6.82	556.82	0.00	0.00	557.68	0.86	0.28	0.01	552.00
1020.0	36.2	942.0	41.8	18.4	121.9	21.1	2.0	0.7	550.00
0.02	1.96	7.73	1.98	0.060	0.015	0.060	0.000	550.00	0.00
0.004876	58.	58.	58.	2	0	0	-103.10	60.00	60.00

*SECNO 845.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 558.000 EGLC= 559.753 EGC= 560.998 WSEL= 559.593

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 559.10 MAX ELLC= 558.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

845.000	3.89	557.89	557.89	0.00	559.74	1.85	1.16	0.30	554.00
1020.0	0.0	1020.0	0.0	0.0	93.4	0.0	2.7	1.0	554.00
0.03	0.00	10.92	0.00	0.000	0.015	0.000	0.000	554.00	8.37
0.004915	220.	237.	270.	20	21	0	-45.25	43.26	51.63

CCHV= 0.600 CEHV= 0.800
*SECNO 904.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 559.000 EGLC= 562.944 EGC= 563.007 WSEL= 561.608

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 559.000 EGLC= 562.944 EGC= 562.949 WSEL= 558.995

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 560.30 MAX ELLC= 559.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  904.000      4.00     559.00     559.00       0.00     562.94       3.94       0.50       1.67     555.00
   1020.0       0.0     1020.0       0.0        0.0       64.0        0.0        2.8        1.1     555.00
     0.03      0.00      15.94       0.00      0.000      0.015      0.000      0.000     555.00      13.08
 0.017636       59.        59.        59.         20         19          0     -39.70      33.85      46.92


CCHV=    0.100 CEHV=    0.300
*SECNO 1000.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   560.600 EGLC=   564.544 EGC=   564.707 WSEL=   563.307

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   560.600 EGLC=   564.544 EGC=   564.549 WSEL=   560.595

3370 NORMAL BRIDGE, NRD=  10 MIN ELTRD=   562.00 MAX ELLC=   560.60

 1000.000      4.09     560.69     560.60       0.00     564.64       3.94       1.69       0.00     556.60
   1020.0       0.0     1020.0       0.0        0.0       64.0        0.0        2.9        1.1     556.60
     0.03      0.00      15.94       0.00      0.000      0.015      0.000      0.000     556.60      12.66
 0.017636       96.        96.        96.          0         19          0     -43.80      34.67      47.34


*SECNO 1148.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   562.400 EGLC=   566.344 EGC=   567.208 WSEL=   565.793

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   562.400 EGLC=   566.344 EGC=   566.349 WSEL=   562.395

3370 NORMAL BRIDGE, NRD=  10 MIN ELTRD=   564.50 MAX ELLC=   562.40

 1148.000      4.90     563.30     562.40       0.00     567.25       3.94       2.61       0.00     558.40
   1020.0       0.0     1020.0       0.0        0.0       64.0        0.0        3.2        1.3     558.40
     0.03      0.00      15.94       0.00      0.000      0.015      0.000      0.000     558.40      11.35
 0.017636      160.       148.       130.          4         19          0     -72.53      37.69      49.05


*SECNO 1264.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   565.400 EGLC=   569.344 EGC=   570.208 WSEL=   568.793

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   565.400 EGLC=   569.344 EGC=   569.349 WSEL=   565.395
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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


3370 NORMAL BRIDGE, NRD=  10 MIN ELTRD=   567.50 MAX ELLC=   565.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1264.000      4.00     565.40     565.40       0.00     569.34       3.94       2.05       0.00     561.40
    1020.0       0.0     1020.0        0.0        0.0       64.0        0.0        3.3        1.4     561.40
      0.03      0.00      15.94       0.00      0.000      0.015      0.000      0.000     561.40      13.13
  0.017636      116.       116.       116.         20         19          0     -39.48      33.74      46.87


*SECNO 1400.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   567.400 EGLC=   571.344 EGC=   571.507 WSEL=   570.107

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   567.400 EGLC=   571.344 EGC=   571.349 WSEL=   567.395

3370 NORMAL BRIDGE, NRD=  10 MIN ELTRD=   568.80 MAX ELLC=   567.40

  1400.000      4.40     567.80     567.40       0.00     571.74       3.94       2.40       0.00     563.40
    1020.0       0.0     1020.0        0.0        0.0       64.0        0.0        3.5        1.5     563.40
      0.04      0.00      15.94       0.00      0.000      0.015      0.000      0.000     563.40      12.04
  0.017636      145.       136.       135.          4         19          0     -54.58      35.92      47.96


CCHV=    0.600 CEHV=    0.800
*SECNO 1418.000
3280 CROSS SECTION   1418.00 EXTENDED      2.18 FEET


3301 HV CHANGED MORE THAN HVINS


3370 NORMAL BRIDGE, NRD=   6 MIN ELTRD=   568.80 MAX ELLC=   567.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3720 CRITICAL DEPTH ASSUMED
  1418.000      7.08     570.98     570.98       0.00     572.33       1.34       0.20       1.56     563.90
    1020.0     186.3      647.4      186.3       54.6       56.8       54.6        3.6        1.5     563.90
      0.04      3.41      11.39       3.41      0.060      0.015      0.060      0.000     563.90       0.00
  0.007460        5.        18.        30.         20         12          0     -63.00      60.00      60.00
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 1480.000
3280 CROSS SECTION 1480.00 EXTENDED 3.83 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.87

3370 NORMAL BRIDGE, NRD= 6 MIN ELTRD= 568.80 MAX ELLC= 567.50

1480.000	8.63	572.63	0.00	0.00	573.10	0.47	0.25	0.53	564.00
1020.0	245.6	528.9	245.6	95.8	73.3	95.8	3.9	1.6	564.00
0.04	2.56	7.21	2.56	0.060	0.015	0.060	0.000	564.00	0.00
0.002129	68.	68.	68.	5	0	0	-61.00	60.00	60.00

*SECNO 1500.000
3280 CROSS SECTION 1500.00 EXTENDED 3.67 FEET

3370 NORMAL BRIDGE, NRD= 6 MIN ELTRD= 569.00 MAX ELLC= 568.00

1500.000	8.67	572.67	0.00	0.00	573.20	0.52	0.05	0.04	564.00
1020.0	315.2	389.7	315.2	99.2	46.0	99.2	4.0	1.6	564.00
0.04	3.18	8.46	3.18	0.060	0.015	0.060	0.000	564.00	0.00
0.003404	5.	20.	35.	2	0	0	-56.00	60.00	60.00

*SECNO 2070.000
3280 CROSS SECTION 2070.00 EXTENDED 2.90 FEET

3370 NORMAL BRIDGE, NRD= 6 MIN ELTRD= 572.30 MAX ELLC= 571.30

2070.000	8.11	575.21	0.00	0.00	575.59	0.38	2.31	0.08	567.10
1020.0	404.9	322.2	292.9	142.0	41.1	112.8	8.0	2.8	567.10
0.09	2.85	7.83	2.60	0.060	0.015	0.060	0.000	567.10	0.00
0.003464	630.	760.	620.	2	0	0	-23.85	100.00	100.00

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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


CCHV=    0.300 CEHV=    0.500
*SECNO 2071.000
3280 CROSS SECTION   2071.00 EXTENDED      2.87 FEET


3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  2071.000      8.07     575.17     575.17       0.00     576.74       1.57       0.00       0.59     567.10
    1020.0     230.0      621.2      168.8      148.6       48.4      119.7        8.0        2.8     567.10
      0.09      1.55      12.82       1.41      0.060      0.015      0.060      0.000     567.10       0.00
  0.001034        1.         1.         1.         20          5          0       0.00     100.00     100.00


*SECNO 2120.000
3280 CROSS SECTION   2120.00 EXTENDED      5.21 FEET


3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.22

  2120.000      9.50     577.20       0.00       0.00     577.23       0.02       0.02       0.46     570.30
    1020.0     699.5      85.2      235.3      606.1       46.8      234.5        8.7        2.9     572.00
      0.10      1.15      1.82       1.00      0.060      0.030      0.060      0.000     567.70       0.00
  0.000210       49.       49.        49.          2          0          0       0.00     150.00     150.00


*SECNO 2130.000
3280 CROSS SECTION   2130.00 EXTENDED      5.20 FEET

              JACKSON AVENUE
  2130.000      9.20     577.20       0.00       0.00     577.24       0.04       0.00       0.01     571.00
    1020.0     597.4      216.5      206.1      570.3       73.6      218.5        8.9        3.0     572.00
      0.10      1.05      2.94       0.94      0.060      0.020      0.060      0.000     568.00       0.00
  0.000188       10.       10.        10.          1          0          0       0.00     150.00     150.00
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.50	2.50	100.00	8.00	0.00	27.00	0.00	568.00	568.00

*SECNO 2180.000
3280 CROSS SECTION 2180.00 EXTENDED 5.20 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
610.44	577.24	0.00	984.	37.	27.	28.	571.50	573.00	100.

2180.000	9.20	577.20	0.00	0.00	577.24	0.04	0.00	0.00	571.00
1020.0	597.3	216.7	206.0	569.7	73.6	218.3	9.9	3.1	572.00
0.11	1.05	2.94	0.94	0.060	0.020	0.060	0.000	568.00	0.00
0.000188	50.	50.	50.	2	0	7	0.00	150.00	150.00

*SECNO 2205.000
3280 CROSS SECTION 2205.00 EXTENDED 4.99 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.28

2205.000	9.29	577.09	0.00	0.00	577.37	0.28	0.01	0.12	571.90
1020.0	482.1	333.4	204.5	156.0	55.6	69.7	10.2	3.2	572.50
0.11	3.09	6.00	2.94	0.060	0.030	0.060	0.000	567.80	0.00
0.002488	25.	25.	25.	2	0	0	0.00	57.00	57.00

*SECNO 2280.000
3280 CROSS SECTION 2280.00 EXTENDED 3.39 FEET

2280.000	8.99	577.39	0.00	0.00	577.58	0.19	0.18	0.03	573.70
1020.0	577.2	231.5	211.3	212.2	44.2	68.8	10.8	3.3	572.50
0.12	2.72	5.24	3.07	0.060	0.030	0.060	0.000	568.40	0.00
0.002382	75.	75.	75.	2	0	0	0.00	80.00	80.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 2390.000
3280 CROSS SECTION 2390.00 EXTENDED 4.05 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.13

COOPER STREET

2390.000	9.14	577.64	0.00	0.00	577.70	0.06	0.08	0.04	574.00
790.0	371.6	239.6	178.8	364.6	72.8	170.0	11.9	3.6	573.60
0.13	1.02	3.29	1.05	0.060	0.020	0.060	0.000	568.50	0.00
0.000316	110.	110.	110.	1	0	0	0.00	150.00	150.00

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.70	2.50	200.00	8.00	0.00	36.00	0.00	568.70	568.50

*SECNO 2440.000
6870 D.S. ENERGY OF 577.70 IS HIGHER THAN COMPUTED ENERGY OF 577.65
3280 CROSS SECTION 2440.00 EXTENDED 3.54 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
590.35	577.90	0.00	766.	25.	36.	35.	573.10	574.50	200.

2440.000	8.83	577.53	0.00	0.00	577.70	0.17	0.00	0.00	573.10
790.0	271.7	328.2	190.2	194.7	68.3	136.8	12.5	3.7	573.80
0.14	1.40	4.80	1.39	0.060	0.020	0.060	0.000	568.70	50.00
0.000632	50.	50.	50.	2	0	11	0.00	100.00	150.00

*SECNO 2450.000
3280 CROSS SECTION 2450.00 EXTENDED 3.64 FEET

2450.000	8.94	577.64	0.00	0.00	577.73	0.09	0.01	0.02	573.10
790.0	318.2	249.4	222.4	200.5	69.2	140.7	12.6	3.8	573.80
0.14	1.59	3.61	1.58	0.060	0.030	0.060	0.000	568.70	50.00
0.000788	10.	10.	10.	2	0	0	0.00	100.00	150.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.100 CEHV= 0.300
*SECNO 2685.000
3280 CROSS SECTION 2685.00 EXTENDED 5.22 FEET

2685.000	6.82	577.82	0.00	0.00	577.89	0.07	0.16	0.00	573.30
790.0	292.3	270.4	227.3	440.0	77.1	317.1	15.7	4.4	571.80
0.18	0.66	3.51	0.72	0.150	0.035	0.150	0.000	571.00	0.00
0.000633	240.	235.	180.	2	0	0	0.00	170.00	170.00

*SECNO 3020.000

3265 DIVIDED FLOW

3280 CROSS SECTION 3020.00 EXTENDED 0.60 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.28

3020.000	4.60	577.60	577.25	0.00	578.70	1.10	0.50	0.31	574.60
790.0	29.0	753.7	7.3	21.7	87.4	18.9	19.1	5.4	577.20
0.19	1.33	8.62	0.39	0.150	0.035	0.150	0.000	573.00	101.44
0.008173	290.	335.	310.	6	14	0	0.00	105.19	335.00

*SECNO 3250.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.77

3250.000	4.25	579.45	0.00	0.00	579.66	0.21	0.87	0.09	576.60
790.0	144.2	365.5	280.3	97.3	69.5	315.1	20.2	5.9	576.80
0.21	1.48	5.26	0.89	0.080	0.035	0.150	0.000	575.20	9.59
0.002621	230.	230.	90.	3	0	0	0.00	217.66	227.26

*SECNO 3515.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3515.000	4.51	583.71	583.71	0.00	585.43	1.72	1.22	0.45	583.30
790.0	0.7	789.3	0.0	1.0	75.0	0.0	21.8	6.6	585.00
0.21	0.66	10.53	0.00	0.080	0.030	0.000	0.000	579.20	29.90
0.010694	250.	265.	250.	20	8	0	0.00	27.36	57.25

*SECNO 3770.000

3265 DIVIDED FLOW

3280 CROSS SECTION 3770.00 EXTENDED 1.18 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3770.000	5.08	589.18	589.18	0.00	590.10	0.92	2.09	0.08	590.90
790.0	131.5	657.8	0.7	84.7	78.4	1.0	22.5	7.0	588.40
0.22	1.55	8.39	0.77	0.080	0.030	0.080	0.000	584.10	0.00
0.006490	250.	255.	260.	20	8	0	0.00	108.94	192.48

*SECNO 3945.000

3265 DIVIDED FLOW

3280 CROSS SECTION 3945.00 EXTENDED 1.07 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3945.000	3.57	595.07	595.07	0.00	595.71	0.65	1.52	0.03	595.40
790.0	414.8	375.2	0.0	152.4	42.1	0.0	23.2	7.5	596.70
0.23	2.72	8.91	0.00	0.080	0.030	0.000	0.000	591.50	0.00
0.012145	175.	175.	175.	20	16	0	0.00	129.41	219.12

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 4295.000

3265 DIVIDED FLOW

3280 CROSS SECTION 4295.00 EXTENDED 1.54 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4295.000	4.94	602.54	602.54	0.00	603.56	1.02	2.75	0.11	600.90
790.0	76.1	681.9	32.0	48.9	78.4	29.9	24.5	8.4	602.00
0.24	1.56	8.70	1.07	0.080	0.030	0.080	0.000	597.60	0.00
0.005885	300.	350.	400.	20	11	0	0.00	111.49	244.75

*SECNO 4370.000

3265 DIVIDED FLOW

3280 CROSS SECTION 4370.00 EXTENDED 0.41 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4370.000	5.21	603.91	603.91	0.00	604.82	0.91	0.43	0.01	603.10
790.0	13.0	561.6	215.4	15.9	62.5	103.5	24.8	8.6	602.50
0.25	0.82	8.99	2.08	0.080	0.030	0.080	0.000	598.70	0.00
0.006605	120.	75.	20.	20	8	0	0.00	125.01	236.90

CCHV= 0.300 CEHV= 0.500
*SECNO 4405.000
3280 CROSS SECTION 4405.00 EXTENDED 2.68 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 4.42

MCKEEL STREET

4405.000	6.98	604.68	0.00	0.00	605.02	0.34	0.03	0.17	597.70
790.0	151.2	420.0	218.8	244.2	65.8	346.9	25.1	8.7	598.50
0.25	0.62	6.38	0.63	0.080	0.015	0.080	0.000	597.70	0.00
0.000338	35.	35.	35.	4	0	0	0.00	240.00	240.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 601.79 , NOT 604.68 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	2.00	2.50	0.00	10.00	2.00	20.60	0.00	598.70	597.70

*SECNO 4480.000
6870 D.S. ENERGY OF 605.02 IS HIGHER THAN COMPUTED ENERGY OF 604.71
3280 CROSS SECTION 4480.00 EXTENDED 2.67 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
650.36	608.82	0.00	770.	20.	21.	21.	601.30	601.80	217.

4480.000	6.97	604.67	0.00	0.00	605.02	0.35	0.00	0.00	597.70
790.0	165.7	424.0	200.2	255.9	65.7	320.0	26.2	9.1	598.50
0.26	0.65	6.45	0.63	0.080	0.015	0.080	0.000	597.70	0.00
0.000346	75.	75.	75.	2	0	12	0.00	240.00	240.00

*SECNO 4520.000

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4520.000	5.14	604.94	604.94	0.00	606.71	1.77	0.04	0.71	605.90
790.0	0.0	788.8	1.2	0.0	73.8	1.7	26.5	9.3	605.70
0.26	0.00	10.68	0.70	0.000	0.030	0.080	0.000	599.80	104.70
0.010833	40.	40.	40.	20	16	0	0.00	27.57	138.99

CCHV= 0.100 CEHV= 0.300
*SECNO 4630.000

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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  4630.000      3.44     608.54     608.54       0.00     609.77       1.23       1.21       0.05     609.30
     410.0       0.0      410.0        0.0        0.0       46.1        0.0       26.7        9.3     609.50
      0.26      0.00       8.89       0.00      0.000      0.030      0.000      0.000     605.10      80.90
  0.011357      110.       110.       110.         20         14          0       0.00      19.10     100.00


CCHV=    0.300 CEHV=    0.500
*SECNO 4695.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  4695.000      4.98     613.08     613.08       0.00     613.65       0.57       0.49       0.20     609.20
     410.0     123.2      181.4      105.4       69.3       20.4       62.0       26.8        9.4     609.20
      0.26      1.78       8.91       1.70      0.080      0.030      0.080      0.000     608.10      39.10
  0.005305       80.        65.        50.         20         13          0       0.00     139.50     178.60


*SECNO 4696.000

3370 NORMAL BRIDGE, NRD=  13 MIN ELTRD=   612.00 MAX ELLC=   611.50

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
               CRESTMONT DRIVE
  4696.000      5.57     613.67     613.67       0.00     614.07       0.40       0.01       0.05     609.20
     410.0     147.1      122.3      140.6       82.7       13.8       80.4       26.8        9.4     609.20
      0.26      1.78       8.89       1.75      0.080      0.015      0.080      0.000     608.10      13.96
  0.010527        1.         1.         1.         20         13          0     -72.64     191.26     205.22


*SECNO 4990.000
3280 CROSS SECTION   4990.00 EXTENDED      1.34 FEET
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE, NRD= 11 MIN ELTRD= 619.50 MAX ELLC= 618.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4990.000	7.84	621.34	621.34	0.00	622.07	0.73	2.32	0.16	615.80
410.0	96.5	206.5	107.0	45.8	21.9	55.5	27.8	10.3	615.80
0.28	2.11	9.43	1.93	0.080	0.015	0.080	0.000	613.50	0.00
0.006972	260.	294.	260.	20	13	0	-45.90	76.78	76.78

*SECNO 4991.000
3280 CROSS SECTION 4991.00 EXTENDED 2.07 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.50

4991.000	8.57	622.07	0.00	0.00	622.24	0.17	0.00	0.17	615.80
410.0	110.8	170.4	128.8	83.9	34.8	109.4	27.8	10.3	615.80
0.28	1.32	4.89	1.18	0.080	0.030	0.080	0.000	613.50	0.00
0.001117	1.	1.	1.	3	0	0	0.00	85.68	85.68

*SECNO 5025.000
3280 CROSS SECTION 5025.00 EXTENDED 2.07 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.55

5025.000	6.37	622.07	0.00	0.00	622.37	0.30	0.06	0.07	619.30
410.0	116.0	198.0	96.0	63.5	32.4	61.0	27.9	10.3	619.70
0.28	1.83	6.12	1.57	0.080	0.030	0.080	0.000	615.70	0.00
0.003692	34.	34.	34.	2	0	0	0.00	75.34	75.34

CCHV= 0.100 CEHV= 0.300
*SECNO 5135.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY

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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


3720 CRITICAL DEPTH ASSUMED
  5135.000      3.11     624.71     624.71       0.00     625.45       0.73       0.61       0.13     623.70
     410.0     107.1      296.9        6.0       54.2       37.2        5.4       28.2       10.5     624.10
      0.28      1.97       7.98       1.11      0.080      0.030      0.080      0.000     621.60      24.89
  0.009051      120.       110.       100.         20         11          0       0.00      76.33     101.22


*SECNO 5325.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  5325.000      2.80     635.50     635.50       0.00     636.07       0.57       1.64       0.02     634.40
     410.0      11.3      247.1      151.6        9.4       32.3       83.1       28.7       10.9     634.80
      0.29      1.20       7.65       1.82      0.080      0.030      0.080      0.000     632.70      88.69
  0.008544      220.       190.       150.         20         12          0       0.00     117.61     206.30


CCHV=    0.300 CEHV=    0.500
*SECNO 5375.000
3280 CROSS SECTION   5375.00 EXTENDED      1.31 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
              MT. HOPE AVENUE
  5375.000      5.31     639.31     639.31       0.00     640.17       0.86       0.12       0.15     634.00
     410.0      93.4      231.0       85.6      110.7       23.4       99.8       28.9       11.1     634.00
      0.30      0.84       9.89       0.86      0.080      0.015      0.080      0.000     634.00       0.00
  0.001077       40.        50.        60.         20         17          0       0.00     143.27     143.27


SPECIAL BRIDGE

SB  XK        XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
     0.00      1.50       2.50       0.00       4.40       0.00      10.20       0.00     636.80     634.00

*SECNO 5475.000
3280 CROSS SECTION   5475.00 EXTENDED      1.37 FEET

PRESSURE AND WEIR FLOW,  Weir Submergence Based on TRAPEZOIDAL Shape
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
676.94	642.97	0.00	283.	129.	10.	11.	639.20	642.10	136.

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3720 CRITICAL DEPTH ASSUMED

5475.000	7.57	643.37	643.37	0.00	644.49	1.12	0.08	-0.08	635.80
410.0	52.4	320.3	37.3	94.8	33.3	76.2	29.4	11.4	635.80
0.30	0.55	9.62	0.49	0.080	0.015	0.080	0.000	635.80	0.00
0.000635	100.	100.	100.	20	15	0	0.00	142.31	142.31

*SECNO 5525.000

3301 HV CHANGED MORE THAN HVINS

5525.000	7.64	644.64	0.00	0.00	644.81	0.17	0.03	0.29	641.30
410.0	38.5	349.2	22.3	77.7	98.9	41.1	29.6	11.5	642.30
0.30	0.50	3.53	0.54	0.080	0.030	0.080	0.000	637.00	30.39
0.000601	40.	50.	50.	2	0	0	0.00	137.73	168.12

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T1      GOODKIND & O'DEA, INC.  60 FERONIA WAY, RUTHERFORD, NJ  07070
T2      McKEEL BROOK STORMWATER MANAGEMENT PLAN - ROCKAWAY AND DOVER, NJ
T3      EXISTING 100 YEAR STORM

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0        6        0        0        0        0        0        0    554.25

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

      5        0       -1
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 5

CCHV= 0.300 CEHV= 0.500
*SECNO 58.000
3280 CROSS SECTION 58.00 EXTENDED 0.65 FEET

CROSS SECTIONS TAKEN LOOKING DOWNSTREAM
HEC-2 BASED ON DOVER F.I.S. PREPARED BY THE RBA GROUP DATED 4/5/78
AND UPDATED TO NOV. 1994 AS PER SURVEY BY GOODKIND & O'DEA, INC.
CONFLUENCE WITH THE ROCKAWAY RIVER

58.000	5.85	554.25	0.00	554.25	554.80	0.55	0.00	0.00	553.60
1280.0	2.4	1200.5	77.1	3.3	195.4	37.7	0.0	0.0	548.40
0.00	0.74	6.14	2.05	0.060	0.030	0.060	0.000	548.40	0.00
0.001866	0.	0.	0.	0	0	0	0.00	60.00	60.00

1490 NH CARD USED
*SECNO 59.000
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED
3280 CROSS SECTION 59.00 EXTENDED 0.39 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.44

3370 NORMAL BRIDGE, NRD= 11 MIN ELTRD= 549.00 MAX ELLC= 552.40

59.000	5.58	553.98	0.00	0.00	555.08	1.10	0.00	0.27	553.60
1280.0	2.3	1269.9	7.8	1.9	150.3	6.2	0.0	0.0	548.40
0.00	1.21	8.45	1.26	0.060	0.024	0.060	0.000	548.40	0.00
0.009457	1.	1.	1.	2	0	0	-62.10	60.00	60.00

1490 NH CARD USED
*SECNO 96.000
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED
3280 CROSS SECTION 96.00 EXTENDED 1.11 FEET

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE, NRD= 11 MIN ELTRD= 549.00 MAX ELLC= 552.60

96.000	6.12	554.72	0.00	0.00	555.44	0.72	0.25	0.11	553.60
1280.0	9.2	1238.6	32.3	5.6	178.6	17.8	0.2	0.1	548.60
0.00	1.65	6.93	1.81	0.060	0.024	0.060	0.000	548.60	0.00
0.005059	20.	37.	50.	3	0	0	-56.00	60.00	60.00

CCHV= 0.100 CEHV= 0.300
*SECNO 165.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 553.000 EGLC= 555.544 EGC= 557.003 WSEL= 555.465

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.67

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 554.70 MAX ELLC= 553.00

165.000	5.14	553.94	552.77	0.00	556.49	2.54	0.50	0.55	549.00
1280.0	0.0	1280.0	0.0	0.0	100.0	0.0	0.4	0.1	548.80
0.00	0.00	12.80	0.00	0.000	0.015	0.000	0.000	548.80	5.04
0.011174	69.	69.	69.	11	19	0	-98.35	49.40	54.45

*SECNO 340.000
3280 CROSS SECTION 340.00 EXTENDED 2.33 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.14

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 554.50 MAX ELLC= 554.00

340.000	7.53	556.83	0.00	0.00	557.47	0.64	0.79	0.19	550.00
1280.0	69.4	1136.1	74.5	35.0	167.6	37.3	1.1	0.4	549.30
0.01	1.98	6.78	2.00	0.060	0.015	0.060	0.000	549.30	0.00
0.002447	175.	175.	175.	3	0	0	-91.35	60.00	60.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 550.000
3280 CROSS SECTION 550.00 EXTENDED 2.14 FEET

3370 NORMAL BRIDGE, NRD= 18 MIN ELTRD= 555.20 MAX ELLC= 553.90

550.000	7.44	557.34	0.00	0.00	558.16	0.82	0.63	0.06	550.20
1280.0	70.3	1128.9	80.8	29.9	146.5	34.2	2.2	0.7	549.90
0.02	2.35	7.71	2.36	0.060	0.015	0.060	0.000	549.90	0.00
0.003794	210.	210.	210.	3	0	0	-127.45	60.00	60.00

*SECNO 608.000
3280 CROSS SECTION 608.00 EXTENDED 2.02 FEET

3370 NORMAL BRIDGE, NRD= 18 MIN ELTRD= 555.50 MAX ELLC= 554.30

608.000	7.53	557.53	0.00	0.00	558.41	0.88	0.23	0.02	552.00
1280.0	66.5	1136.2	77.2	28.3	142.9	32.3	2.4	0.7	550.00
0.02	2.36	7.95	2.39	0.060	0.015	0.060	0.000	550.00	0.00
0.004170	58.	58.	58.	0	0	0	-103.10	60.00	60.00

*SECNO 845.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 558.000 EGLC= 560.760 EGC= 561.655 WSEL= 560.126

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 558.000 EGLC= 560.760 EGC= 560.767 WSEL= 557.984

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 559.10 MAX ELLC= 558.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

845.000	4.00	558.00	558.00	0.00	560.76	2.76	1.58	0.56	554.00
1280.0	0.0	1280.0	0.0	0.0	96.0	0.0	3.3	1.0	554.00
0.03	0.00	13.33	0.00	0.000	0.015	0.000	0.000	554.00	8.16
0.012343	220.	237.	270.	20	15	0	-47.37	43.69	51.84

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.600 CEHV= 0.800
*SECNO 904.000
3280 CROSS SECTION 904.00 EXTENDED 1.83 FEET

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 560.30 MAX ELLC= 559.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

904.000	7.13	562.13	562.13	0.00	563.65	1.52	0.54	0.74	555.00
1280.0	114.7	1050.6	114.7	38.5	97.0	38.5	3.4	1.1	555.00
0.03	2.98	10.83	2.98	0.060	0.015	0.060	0.000	555.00	0.00
0.007151	59.	59.	59.	20	9	0	-87.05	60.00	60.00

CCHV= 0.100 CEHV= 0.300
*SECNO 1000.000
3280 CROSS SECTION 1000.00 EXTENDED 1.83 FEET

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 562.00 MAX ELLC= 560.60

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1000.000	7.23	563.83	563.83	0.00	565.35	1.52	0.69	0.00	556.60
1280.0	114.7	1050.7	114.7	38.5	97.0	38.5	3.8	1.2	556.60
0.03	2.98	10.83	2.98	0.060	0.015	0.060	0.000	556.60	0.00
0.007156	96.	96.	96.	20	9	0	-92.60	60.00	60.00

*SECNO 1148.000
3280 CROSS SECTION 1148.00 EXTENDED 1.82 FEET

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 564.50 MAX ELLC= 562.40

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

 1148.000      7.92     566.32     566.32       0.00     567.85       1.53       1.06       0.00     558.40
   1280.0     114.1     1051.7      114.2       38.3       96.8       38.3        4.4        1.4     558.40
     0.04      2.98      10.87       2.98      0.060      0.015      0.060      0.000     558.40       0.00
 0.007220      160.       148.       130.         15          9          0   -120.52      60.00      60.00


*SECNO 1264.000
3280 CROSS SECTION   1264.00 EXTENDED      1.82 FEET


3370 NORMAL BRIDGE, NRD=  10 MIN ELTRD=   567.50 MAX ELLC=   565.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 1264.000      7.92     569.32     569.32       0.00     570.85       1.53       0.84       0.00     561.40
   1280.0     114.1     1051.8      114.1       38.2       96.8       38.2        4.9        1.6     561.40
     0.04      2.98      10.87       2.98      0.060      0.015      0.060      0.000     561.40       0.00
 0.007222      116.       116.       116.         20          9          0   -119.00      60.00      60.00


*SECNO 1400.000
3280 CROSS SECTION   1400.00 EXTENDED      1.83 FEET


3370 NORMAL BRIDGE, NRD=  10 MIN ELTRD=   568.80 MAX ELLC=   567.40

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 1400.000      7.23     570.63     570.63       0.00     572.15       1.52       0.98       0.00     563.40
   1280.0     114.7     1050.7      114.7       38.5       97.0       38.5        5.4        1.8     563.40
     0.04      2.98      10.83       2.98      0.060      0.015      0.060      0.000     563.40       0.00
 0.007156      145.       136.       135.          3          9          0    -92.60      60.00      60.00


CCHV=    0.600 CEHV=    0.800
*SECNO 1418.000
3280 CROSS SECTION   1418.00 EXTENDED      2.67 FEET


3370 NORMAL BRIDGE, NRD=   6 MIN ELTRD=   568.80 MAX ELLC=   567.40

7185 MINIMUM SPECIFIC ENERGY
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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


3720 CRITICAL DEPTH ASSUMED
  1418.000       7.57     571.47     571.47       0.00     572.94       1.47       0.13       0.03     563.90
    1280.0      262.4      755.1      262.4       66.8       61.7       66.8        5.5        1.8     563.90
      0.04       3.93      12.23       3.93      0.060      0.015      0.060      0.000     563.90       0.00
  0.007705         5.        18.        30.          3         12          0     -63.00      60.00      60.00


*SECNO 1480.000
3280 CROSS SECTION   1480.00 EXTENDED      4.39 FEET


3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.79


3370 NORMAL BRIDGE, NRD=   6 MIN ELTRD=   568.80 MAX ELLC=   567.50

  1480.000       9.19     573.19       0.00       0.00     573.75       0.56       0.27       0.54     564.00
    1280.0      323.0      633.9      323.0      109.7       78.9      109.7        5.9        1.9     564.00
      0.05       2.94       8.03       2.94      0.060      0.015      0.060      0.000     564.00       0.00
  0.002397        68.        68.        68.          5          0          0     -61.00      60.00      60.00


*SECNO 1500.000
3280 CROSS SECTION   1500.00 EXTENDED      4.24 FEET


3370 NORMAL BRIDGE, NRD=   6 MIN ELTRD=   569.00 MAX ELLC=   568.00

  1500.000       9.24     573.24       0.00       0.00     573.84       0.60       0.06       0.03     564.00
    1280.0      411.8      456.4      411.8      114.5       49.4      114.5        6.0        1.9     564.00
      0.05       3.60       9.23       3.60      0.060      0.015      0.060      0.000     564.00       0.00
  0.003685         5.        20.        35.          2          0          0     -56.00      60.00      60.00


*SECNO 2070.000
3280 CROSS SECTION   2070.00 EXTENDED      3.56 FEET


3370 NORMAL BRIDGE, NRD=   6 MIN ELTRD=   572.30 MAX ELLC=   571.30
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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

 2070.000      8.76     575.86       0.00       0.00     576.22       0.36       2.23       0.15     567.10
   1280.0     528.3      351.3      400.4      174.2       45.1      142.4       10.8        3.1     567.10
     0.09      3.03       7.79       2.81      0.060      0.015      0.060      0.000     567.10       0.00
 0.003033      630.       760.       620.          2          0          0     -23.85     100.00     100.00


CCHV=    0.300 CEHV=    0.500
*SECNO 2071.000
3280 CROSS SECTION   2071.00 EXTENDED      3.36 FEET


3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
 2071.000      8.56     575.66     575.66       0.00     577.47       1.82       0.00       0.73     567.10
   1280.0     312.6      730.7      236.7      172.4       51.4      141.6       10.8        3.1     567.10
     0.09      1.81      14.23       1.67      0.060      0.015      0.060      0.000     567.10       0.00
 0.001178        1.         1.         1.         20          5          0       0.00     100.00     100.00


*SECNO 2120.000
3280 CROSS SECTION   2120.00 EXTENDED      6.01 FEET


3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.31

 2120.000     10.31     578.01       0.00       0.00     578.03       0.03       0.02       0.54     570.30
   1280.0     877.1      100.1      302.8      686.5       50.8      270.7       11.5        3.2     572.00
     0.10      1.28       1.97       1.12      0.060      0.030      0.060      0.000     567.70       0.00
 0.000221       49.        49.        49.          2          0          0       0.00     150.00     150.00


*SECNO 2130.000
3280 CROSS SECTION   2130.00 EXTENDED      6.00 FEET

             JACKSON AVENUE
 2130.000     10.00     578.00       0.00       0.00     578.04       0.05       0.00       0.01     571.00
   1280.0     759.2      255.3      265.4      650.5       80.0      252.2       11.8        3.3     572.00
     0.10      1.17       3.19       1.05      0.060      0.020      0.060      0.000     568.00       0.00
 0.000198       10.        10.        10.          1          0          0       0.00     150.00     150.00
```

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.50	2.50	100.00	8.00	0.00	27.00	0.00	568.00	568.00

*SECNO 2180.000
6870 D.S. ENERGY OF 578.04 IS HIGHER THAN COMPUTED ENERGY OF 578.04
3280 CROSS SECTION 2180.00 EXTENDED 6.00 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
630.34	578.04	0.00	1247.	38.	27.	28.	571.50	573.00	100.

2180.000	10.00	578.00	0.00	0.00	578.04	0.05	0.00	0.00	571.00
1280.0	759.2	255.5	265.4	649.7	80.0	251.9	12.9	3.4	572.00
0.11	1.17	3.19	1.05	0.060	0.020	0.060	0.000	568.00	0.00
0.000198	50.	50.	50.	2	0	10	0.00	150.00	150.00

*SECNO 2205.000
3280 CROSS SECTION 2205.00 EXTENDED 5.78 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.28

2205.000	10.08	577.88	0.00	0.00	578.19	0.31	0.01	0.13	571.90
1280.0	638.0	385.3	256.7	185.1	60.3	80.7	13.3	3.5	572.50
0.11	3.45	6.39	3.18	0.060	0.030	0.060	0.000	567.80	0.00
0.002534	25.	25.	25.	2	0	0	0.00	57.00	57.00

*SECNO 2280.000
3280 CROSS SECTION 2280.00 EXTENDED 4.20 FEET

2280.000	9.80	578.20	0.00	0.00	578.40	0.20	0.17	0.03	573.70
1280.0	766.9	254.3	258.8	261.1	48.3	81.0	13.9	3.6	572.50
0.12	2.94	5.27	3.19	0.060	0.030	0.060	0.000	568.40	0.00
0.002142	75.	75.	75.	2	0	0	0.00	80.00	80.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 2390.000
3280 CROSS SECTION 2390.00 EXTENDED 4.86 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.10

COOPER STREET

2390.000	9.96	578.46	0.00	0.00	578.52	0.06	0.08	0.04	574.00
1000.0	500.4	267.6	232.1	445.8	79.3	204.1	15.3	3.9	573.60
0.14	1.12	3.38	1.14	0.060	0.020	0.060	0.000	568.50	0.00
0.000297	110.	110.	110.	0	0	0	0.00	150.00	150.00

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.70	2.50	200.00	8.00	0.00	36.00	0.00	568.70	568.50

*SECNO 2440.000
6870 D.S. ENERGY OF 578.52 IS HIGHER THAN COMPUTED ENERGY OF 578.47
3280 CROSS SECTION 2440.00 EXTENDED 4.35 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
598.82	578.72	0.00	973.	27.	36.	35.	573.10	574.50	200.

2440.000	9.65	578.35	0.00	0.00	578.52	0.17	0.00	0.00	573.10
1000.0	370.3	373.1	256.6	239.1	74.8	167.4	16.0	4.0	573.80
0.14	1.55	4.99	1.53	0.060	0.020	0.060	0.000	568.70	50.00
0.000602	50.	50.	50.	2	0	12	0.00	100.00	150.00

*SECNO 2450.000
3280 CROSS SECTION 2450.00 EXTENDED 4.45 FEET

2450.000	9.75	578.45	0.00	0.00	578.55	0.09	0.01	0.02	573.10
1000.0	425.3	280.3	294.4	244.7	75.7	171.2	16.1	4.1	573.80
0.14	1.74	3.70	1.72	0.060	0.030	0.060	0.000	568.70	50.00
0.000737	10.	10.	10.	2	0	0	0.00	100.00	150.00

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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


CCHV=    0.100 CEHV=    0.300
*SECNO 2685.000
3280 CROSS SECTION   2685.00 EXTENDED      6.01 FEET

  2685.000      7.62     578.62       0.00       0.00     578.70       0.08       0.15       0.00     573.30
    1000.0     383.0      330.4      286.5      517.5       86.6      364.6       19.8        4.7     571.80
      0.18      0.74       3.82       0.79      0.150      0.035      0.150      0.000     571.00       0.00
  0.000642      240.       235.       180.          1          0          0       0.00     170.00     170.00


*SECNO 3020.000
3280 CROSS SECTION   3020.00 EXTENDED      1.60 FEET


3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  0.38

  3020.000      5.59     578.59     578.25       0.00     579.33       0.73       0.43       0.19     574.60
    1000.0      50.8      841.1      108.1       54.7      112.6      172.9       24.3        6.4     577.20
      0.19      0.93       7.47       0.63      0.150      0.035      0.150      0.000     573.00      39.79
  0.004384      290.       335.       310.          4         17          0       0.00     295.21     335.00


*SECNO 3250.000
  3250.000      4.61     579.81       0.00       0.00     580.05       0.24       0.68       0.05     576.60
    1000.0     197.2      436.0      366.8      120.3       76.1      365.9       25.9        7.2     576.80
      0.21      1.64       5.73       1.00      0.080      0.035      0.150      0.000     575.20       3.25
  0.002766      230.       230.        90.          3          0          0       0.00     225.82     229.07


*SECNO 3515.000
3280 CROSS SECTION   3515.00 EXTENDED      0.50 FEET


3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  3515.000      5.40     584.60     584.60       0.00     586.19       1.58       1.13       0.40     583.30
    1000.0      26.6      973.4        0.0      21.6       95.1        0.0       27.8        8.0     585.00
      0.22      1.23      10.24       0.00      0.080      0.030      0.000      0.000     579.20       0.00
  0.007764      250.       265.       250.         20          8          0       0.00      57.77      57.77
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 3770.000

3265 DIVIDED FLOW

3280 CROSS SECTION 3770.00 EXTENDED 1.55 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3770.000	5.45	589.55	589.55	0.00	590.54	1.00	1.83	0.06	590.90
1000.0	216.2	781.7	2.1	116.6	86.8	2.1	28.8	8.5	588.40
0.23	1.85	9.01	1.02	0.080	0.030	0.080	0.000	584.10	0.00
0.006718	250.	255.	260.	20	5	0	0.00	117.86	193.64

*SECNO 3945.000

3265 DIVIDED FLOW

3280 CROSS SECTION 3945.00 EXTENDED 1.31 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3945.000	3.81	595.31	595.31	0.00	596.04	0.73	1.60	0.03	595.40
1000.0	550.6	449.4	0.0	179.3	46.6	0.0	29.6	9.0	596.70
0.23	3.07	9.65	0.00	0.080	0.030	0.000	0.000	591.50	0.00
0.013196	175.	175.	175.	20	18	0	0.00	133.77	219.39

*SECNO 4295.000

3265 DIVIDED FLOW

3280 CROSS SECTION 4295.00 EXTENDED 1.97 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4295.000	5.37	602.97	602.97	0.00	604.04	1.07	2.80	0.10	600.90
1000.0	121.5	802.9	75.6	66.6	87.0	54.2	31.3	10.0	602.00
0.25	1.83	9.23	1.40	0.080	0.030	0.080	0.000	597.60	0.00
0.005759	300.	350.	400.	20	11	0	0.00	122.77	247.54

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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


*SECNO 4370.000

3265 DIVIDED FLOW

3280 CROSS SECTION   4370.00 EXTENDED      0.78 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  4370.000      5.58    604.28    604.28      0.00    605.24      0.96      0.42      0.01    603.10
    1000.0      37.9     653.5     308.5      30.8      68.1     134.9      31.6      10.2    602.50
      0.25      1.23      9.60      2.29     0.080     0.030     0.080     0.000    598.70      0.00
  0.006721      120.       75.       20.        20         8         0      0.00    144.91    239.00


CCHV=    0.300 CEHV=    0.500
*SECNO 4405.000
3280 CROSS SECTION   4405.00 EXTENDED      3.04 FEET


3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  4.09

              MCKEEL STREET
  4405.000      7.34    605.04      0.00      0.00    605.44      0.41      0.04      0.17    597.70
    1000.0     204.4     500.3     295.3     277.8      69.4     394.6      32.0      10.3    598.50
      0.25      0.74      7.21      0.75     0.080     0.015     0.080     0.000    597.70      0.00
  0.000403       35.       35.       35.         4         0         0      0.00    240.00    240.00


SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS     602.48 , NOT     605.04 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     1.25      2.00      2.50      0.00     10.00      2.00     20.60      0.00    598.70    597.70

*SECNO 4480.000
6870 D.S. ENERGY OF   605.44 IS HIGHER THAN COMPUTED ENERGY OF   605.07
3280 CROSS SECTION   4480.00 EXTENDED      3.02 FEET
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
678.22	610.55	0.00	978.	22.	21.	21.	601.30	601.80	219.
4480.000	7.32	605.02	0.00	0.00	605.44	0.42	0.00	0.00	597.70
1000.0	221.8	505.5	272.7	289.2	69.2	367.3	33.2	10.8	598.50
0.26	0.77	7.30	0.74	0.080	0.015	0.080	0.000	597.70	0.00
0.000414	75.	75.	75.	2	0	13	0.00	240.00	240.00

*SECNO 4520.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4520.000	5.93	605.73	605.73	0.00	607.54	1.81	0.05	0.69	605.90
1000.0	0.0	982.6	17.4	0.0	90.2	13.1	33.6	10.9	605.70
0.26	0.00	10.89	1.33	0.000	0.030	0.080	0.000	599.80	103.31
0.009779	40.	40.	40.	20	11	0	0.00	42.84	146.15

CCHV= 0.100 CEHV= 0.300
*SECNO 4630.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4630.000	3.88	608.98	608.98	0.00	610.33	1.35	1.12	0.05	609.30
510.0	0.0	510.0	0.0	0.0	54.7	0.0	33.8	11.0	609.50
0.26	0.00	9.33	0.00	0.000	0.030	0.000	0.000	605.10	80.39
0.011040	110.	110.	110.	20	14	0	0.00	20.52	100.90

CCHV= 0.300 CEHV= 0.500
*SECNO 4695.000

3301 HV CHANGED MORE THAN HVINS

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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  4695.000      5.16     613.26     613.26       0.00     613.92       0.66       0.53       0.21     609.20
     510.0     161.2      209.4      139.4       82.3       21.2       74.6       34.0       11.1     609.20
      0.26      1.96       9.89       1.87      0.080      0.030      0.080      0.000     608.10      31.47
  0.006223       80.        65.        50.         20         11          0       0.00     155.21     186.68


*SECNO 4696.000

3370 NORMAL BRIDGE, NRD=  13 MIN ELTRD=   612.00 MAX ELLC=   611.50

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
              CRESTMONT DRIVE
  4696.000      5.67     613.77     613.77       0.00     614.25       0.48       0.01       0.05     609.20
     510.0     188.0      142.0      180.0       91.8       14.2       89.4       34.0       11.1     609.20
      0.26      2.05      10.02       2.01      0.080      0.015      0.080      0.000     608.10       9.92
  0.012846        1.         1.         1.         20         12          0     -72.64     199.58     209.50


*SECNO 4990.000
3280 CROSS SECTION   4990.00 EXTENDED      1.61 FEET


3370 NORMAL BRIDGE, NRD=  11 MIN ELTRD=   619.50 MAX ELLC=   618.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  4990.000      8.11     621.61     621.61       0.00     622.39       0.78       2.63       0.15     615.80
     510.0     127.8      233.8      148.3       53.2       23.1       67.8       35.0       11.9     615.80
      0.28      2.40      10.14       2.19      0.080      0.015      0.080      0.000     613.50       0.00
  0.007512       260.       294.       260.         20         13          0     -45.90      80.12      80.12


*SECNO 4991.000
3280 CROSS SECTION   4991.00 EXTENDED      2.35 FEET
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.34

4991.000	8.85	622.35	0.00	0.00	622.56	0.21	0.00	0.17	615.80
510.0	139.8	200.3	169.9	91.6	36.1	124.6	35.0	11.9	615.80
0.28	1.53	5.55	1.36	0.080	0.030	0.080	0.000	613.50	0.00
0.001375	1.	1.	1.	3	0	0	0.00	88.46	88.46

*SECNO 5025.000
3280 CROSS SECTION 5025.00 EXTENDED 2.36 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.58

5025.000	6.66	622.36	0.00	0.00	622.70	0.34	0.07	0.07	619.30
510.0	149.4	227.4	133.2	72.0	34.1	73.0	35.2	12.0	619.70
0.28	2.07	6.67	1.83	0.080	0.030	0.080	0.000	615.70	0.00
0.004080	34.	34.	34.	2	0	0	0.00	76.80	76.80

CCHV= 0.100 CEHV= 0.300
*SECNO 5135.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

5135.000	3.38	624.98	624.98	0.00	625.78	0.80	0.65	0.14	623.70
510.0	144.8	353.1	12.1	67.7	41.4	8.4	35.6	12.2	624.10
0.28	2.14	8.53	1.43	0.080	0.030	0.080	0.000	621.60	19.83
0.008977	120.	110.	100.	20	8	0	0.00	82.16	101.99

*SECNO 5325.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

5325.000	3.00	635.70	635.70	0.00	636.32	0.63	1.67	0.02	634.40
510.0	19.4	289.4	201.2	14.6	35.1	99.7	36.1	12.7	634.80
0.29	1.33	8.25	2.02	0.080	0.030	0.080	0.000	632.70	81.27
0.008910	220.	190.	150.	20	11	0	0.00	130.46	211.73

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.300 CEHV= 0.500
*SECNO 5375.000
3280 CROSS SECTION 5375.00 EXTENDED 1.60 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

MT. HOPE AVENUE

5375.000	5.60	639.60	639.60	0.00	640.53	0.94	0.13	0.16	634.00
510.0	128.1	264.6	117.3	131.9	24.6	119.1	36.4	12.8	634.00
0.30	0.97	10.74	0.98	0.080	0.015	0.080	0.000	634.00	0.00
0.001183	40.	50.	60.	20	14	0	0.00	143.99	143.99

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.50	2.50	0.00	4.40	0.00	10.20	0.00	636.80	634.00

*SECNO 5475.000
3280 CROSS SECTION 5475.00 EXTENDED 2.38 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
697.83	643.33	0.00	383.	128.	10.	11.	639.20	642.10	140.

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3710 WSEL ASSUMED BASED ON MIN DIFF

5475.000	8.58	644.38	0.00	0.00	645.06	0.69	0.00	0.00	635.80
510.0	103.9	317.5	88.6	163.3	37.7	155.9	37.1	13.2	635.80
0.30	0.64	8.41	0.57	0.080	0.015	0.080	0.000	635.80	0.00
0.000411	100.	100.	100.	20	0	8	0.00	155.00	155.00

*SECNO 5525.000

3301 HV CHANGED MORE THAN HVINS

5525.000	8.05	645.05	0.00	0.00	645.24	0.18	0.02	0.15	641.30
510.0	68.7	404.0	37.3	113.7	105.0	57.5	37.4	13.3	642.30
0.31	0.60	3.85	0.65	0.080	0.030	0.080	0.000	637.00	21.30
0.000659	40.	50.	50.	3	0	0	0.00	151.87	173.17

THIS RUN EXECUTED 24APR95 7:53:09

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

EXISTING 2 YEAR STORM

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	EG	DIFWSX	XLCH	VCH	TOPWID	SSTA	ENDST	QLOB	QCH	QROB
	58.000	310.00	554.25	554.28	0.00	0.00	1.49	60.00	0.00	60.00	0.58	290.74	18.6
	58.000	700.00	554.25	554.42	0.00	0.00	3.36	60.00	0.00	60.00	1.32	656.50	42.1
	58.000	815.00	554.25	554.47	0.00	0.00	3.91	60.00	0.00	60.00	1.53	764.36	49.1
	58.000	1020.00	554.25	554.60	0.00	0.00	4.89	60.00	0.00	60.00	1.92	956.62	61.4
	58.000	1280.00	554.25	554.80	0.00	0.00	6.14	60.00	0.00	60.00	2.41	1200.47	77.1
*	59.000	310.00	554.24	554.29	-0.01	1.00	1.90	60.00	0.00	60.00	1.15	304.95	3.9
*	59.000	700.00	554.19	554.48	-0.06	1.00	4.36	60.00	0.00	60.00	2.30	689.94	7.7
*	59.000	815.00	554.16	554.56	-0.09	1.00	5.11	60.00	0.00	60.00	2.53	803.95	8.5
*	59.000	1020.00	554.10	554.75	-0.15	1.00	6.51	60.00	0.00	60.00	2.72	1008.18	9.1
*	59.000	1280.00	553.98	555.08	-0.27	1.00	8.45	60.00	0.00	60.00	2.34	1269.91	7.7
	96.000	310.00	554.26	554.31	0.02	37.00	1.90	60.00	0.00	60.00	1.16	304.91	3.9
	96.000	700.00	554.29	554.57	0.11	37.00	4.23	60.00	0.00	60.00	2.86	687.41	9.7
	96.000	815.00	554.32	554.69	0.16	37.00	4.89	60.00	0.00	60.00	3.51	799.55	11.9
	96.000	1020.00	554.42	554.96	0.32	37.00	5.95	60.00	0.00	60.00	5.17	997.08	17.7
	96.000	1280.00	554.72	555.44	0.74	37.00	6.93	60.00	0.00	60.00	9.19	1238.56	32.2
	165.000	310.00	554.23	554.38	-0.03	69.00	3.10	50.58	4.46	55.04	0.00	310.00	0.0
	165.000	700.00	554.14	554.90	-0.16	69.00	7.00	50.21	4.64	54.85	0.00	700.00	0.0
	165.000	815.00	554.10	555.13	-0.22	69.00	8.15	50.07	4.71	54.78	0.00	815.00	0.0
	165.000	1020.00	554.03	555.65	-0.39	69.00	10.20	49.79	4.85	54.64	0.00	1020.00	0.0
*	165.000	1280.00	553.94	556.49	-0.78	69.00	12.80	49.40	5.04	54.45	0.00	1280.00	0.0
	340.000	310.00	554.34	554.49	0.11	175.00	3.10	47.82	6.34	54.16	0.00	310.00	0.0
	340.000	700.00	554.93	555.50	0.80	175.00	6.12	60.00	0.00	60.00	5.33	688.97	5.7
	340.000	815.00	555.22	555.86	1.12	175.00	6.53	60.00	0.00	60.00	12.41	789.32	13.2
*	340.000	1020.00	555.86	556.54	1.83	175.00	6.83	60.00	0.00	60.00	33.02	951.61	35.3
*	340.000	1280.00	556.83	557.47	2.89	175.00	6.78	60.00	0.00	60.00	69.37	1136.11	74.5

	SECNO	Q	CWSEL	EG	DIFWSX	XLCH	VCH	TOPWID	SSTA	ENDST	QLOB	QCH	QRO
	550.000	310.00	554.48	554.70	0.13	210.00	3.76	48.06	5.44	53.50	0.00	310.00	0.(
	550.000	700.00	555.70	556.44	0.76	210.00	7.02	60.00	0.00	60.00	7.78	683.30	8.9
	550.000	815.00	556.00	556.80	0.78	210.00	7.31	60.00	0.00	60.00	16.87	778.78	19.:
	550.000	1020.00	556.55	557.39	0.69	210.00	7.65	60.00	0.00	60.00	37.24	940.01	42.:
	550.000	1280.00	557.34	558.16	0.50	210.00	7.71	60.00	0.00	60.00	70.30	1128.93	80.:
	608.000	310.00	554.55	554.77	0.07	58.00	3.76	44.15	8.92	53.08	0.00	310.00	0.(
	608.000	700.00	556.02	556.76	0.33	58.00	6.97	60.00	0.00	60.00	8.21	682.37	9.4
	608.000	815.00	556.31	557.10	0.30	58.00	7.30	60.00	0.00	60.00	16.92	778.63	19.4
	608.000	1020.00	556.82	557.68	0.27	58.00	7.73	60.00	0.00	60.00	36.19	942.04	41.:
	608.000	1280.00	557.53	558.41	0.19	58.00	7.95	60.00	0.00	60.00	66.55	1136.21	77.:
*	845.000	310.00	555.73	556.60	1.18	237.00	7.47	34.78	12.61	47.39	0.00	310.00	0.(
*	845.000	700.00	556.97	558.47	0.95	237.00	9.83	39.64	10.18	49.82	0.00	700.00	0.(
*	845.000	815.00	557.28	558.94	0.98	237.00	10.34	40.88	9.56	50.44	0.00	815.00	0.(
*	845.000	1020.00	557.89	559.74	1.07	237.00	10.92	43.26	8.37	51.63	0.00	1020.00	0.(
*	845.000	1280.00	558.00	560.76	0.47	237.00	13.33	43.69	8.16	51.84	0.00	1280.00	0.(
*	904.000	310.00	557.26	558.40	1.53	59.00	8.58	26.95	16.53	43.47	0.00	310.00	0.(
*	904.000	700.00	558.90	560.85	1.94	59.00	11.21	33.46	13.27	46.73	0.00	700.00	0.(
*	904.000	815.00	559.00	561.52	1.72	59.00	12.73	33.85	13.08	46.92	0.00	815.00	0.(
*	904.000	1020.00	559.00	562.94	1.11	59.00	15.94	33.85	13.08	46.92	0.00	1020.00	0.(
*	904.000	1280.00	562.13	563.65	4.13	59.00	10.83	60.00	0.00	60.00	114.70	1050.60	114.7
*	1000.000	310.00	558.86	560.00	1.60	96.00	8.58	27.20	16.40	43.60	0.00	310.00	0.(
*	1000.000	700.00	560.50	562.45	1.60	96.00	11.21	33.90	13.05	46.95	0.00	700.00	0.(
*	1000.000	815.00	560.60	563.12	1.60	96.00	12.73	34.30	12.85	47.15	0.00	815.00	0.(
	1000.000	1020.00	560.69	564.64	1.69	96.00	15.94	34.67	12.66	47.34	0.00	1020.00	0.(
*	1000.000	1280.00	563.83	565.35	1.70	96.00	10.83	60.00	0.00	60.00	114.67	1050.66	114.6
*	1148.000	310.00	560.66	561.80	1.80	148.00	8.58	27.07	16.56	43.63	0.00	310.00	0.(
*	1148.000	700.00	562.30	564.25	1.80	148.00	11.21	33.68	13.32	47.00	0.00	700.00	0.(
*	1148.000	815.00	562.40	564.92	1.80	148.00	12.73	34.07	13.13	47.20	0.00	815.00	0.(
	1148.000	1020.00	563.30	567.25	2.61	148.00	15.94	37.69	11.35	49.05	0.00	1020.00	0.(
*	1148.000	1280.00	566.32	567.85	2.49	148.00	10.87	60.00	0.00	60.00	114.13	1051.70	114.1
*	1264.000	310.00	563.66	564.80	3.00	116.00	8.58	26.89	16.56	43.44	0.00	310.00	0.(
*	1264.000	700.00	565.30	567.25	3.00	116.00	11.21	33.36	13.32	46.68	0.00	700.00	0.(
*	1264.000	815.00	565.40	567.92	3.00	116.00	12.73	33.74	13.13	46.87	0.00	815.00	0.(
*	1264.000	1020.00	565.40	569.34	2.10	116.00	15.94	33.74	13.13	46.87	0.00	1020.00	0.(
*	1264.000	1280.00	569.32	570.85	3.00	116.00	10.87	60.00	0.00	60.00	114.12	1051.76	114.1
*	1400.000	310.00	565.66	566.80	2.00	136.00	8.58	27.20	16.40	43.60	0.00	310.00	0.(
*	1400.000	700.00	567.30	569.25	2.00	136.00	11.21	33.90	13.05	46.95	0.00	700.00	0.(
*	1400.000	815.00	567.40	569.92	2.00	136.00	12.73	34.30	12.85	47.15	0.00	815.00	0.(
	1400.000	1020.00	567.80	571.74	2.40	136.00	15.94	35.92	12.04	47.96	0.00	1020.00	0.(
*	1400.000	1280.00	570.63	572.15	1.31	136.00	10.83	60.00	0.00	60.00	114.67	1050.66	114.6

	SECNO	Q	CWSEL	EG	DIFWSX	XLCH	VCH	TOPWID	SSTA	ENDST	QLOB	QCH	QRO
*	1418.000	310.00	566.99	568.55	1.34	18.00	10.02	22.63	18.69	41.31	0.00	310.00	0.(
*	1418.000	700.00	570.39	571.46	3.09	18.00	9.74	60.00	0.00	60.00	102.27	495.46	102.2
*	1418.000	815.00	570.60	571.79	3.20	18.00	10.44	60.00	0.00	60.00	130.76	553.47	130.7
*	1418.000	1020.00	570.98	572.33	3.18	18.00	11.39	60.00	0.00	60.00	186.30	647.40	186.3
*	1418.000	1280.00	571.47	572.94	0.84	18.00	12.23	60.00	0.00	60.00	262.44	755.13	262.4
*	1480.000	310.00	567.87	569.09	0.88	68.00	8.86	26.14	16.93	43.07	0.00	310.00	0.(
*	1480.000	700.00	571.72	572.10	1.33	68.00	6.24	60.00	0.00	60.00	149.93	400.14	149.9
*	1480.000	815.00	572.09	572.49	1.49	68.00	6.59	60.00	0.00	60.00	184.23	446.54	184.2
*	1480.000	1020.00	572.63	573.10	1.65	68.00	7.21	60.00	0.00	60.00	245.55	528.89	245.5
*	1480.000	1280.00	573.19	573.75	1.72	68.00	8.03	60.00	0.00	60.00	323.05	633.90	323.(
*	1500.000	310.00	568.00	570.59	0.13	20.00	12.92	22.00	19.00	41.00	0.00	310.00	0.(
	1500.000	700.00	571.75	572.21	0.03	20.00	7.64	60.00	0.00	60.00	195.16	309.68	195.1
	1500.000	815.00	572.12	572.60	0.04	20.00	7.91	60.00	0.00	60.00	238.56	337.89	238.5
	1500.000	1020.00	572.67	573.20	0.04	20.00	8.46	60.00	0.00	60.00	315.17	389.66	315.1
	1500.000	1280.00	573.24	573.84	0.05	20.00	9.23	60.00	0.00	60.00	411.80	456.40	411.8
*	2070.000	310.00	574.05	574.18	6.05	760.00	4.15	100.00	0.00	100.00	104.96	141.75	63.2
	2070.000	700.00	574.32	574.78	2.57	760.00	8.00	100.00	0.00	100.00	251.20	286.94	161.8
	2070.000	815.00	574.65	575.07	2.53	760.00	7.93	100.00	0.00	100.00	306.64	299.86	208.4
	2070.000	1020.00	575.21	575.59	2.53	760.00	7.83	100.00	0.00	100.00	404.90	322.22	292.8
	2070.000	1280.00	575.86	576.22	2.62	760.00	7.79	100.00	0.00	100.00	528.35	351.26	400.3
*	2071.000	310.00	573.93	574.30	-0.12	1.00	5.66	100.00	0.00	100.00	47.98	231.96	30.0
*	2071.000	700.00	574.40	575.69	0.07	1.00	11.00	100.00	0.00	100.00	130.21	481.40	88.3
*	2071.000	815.00	574.71	576.10	0.06	1.00	11.66	100.00	0.00	100.00	165.83	532.34	116.8
*	2071.000	1020.00	575.17	576.74	-0.03	1.00	12.82	100.00	0.00	100.00	229.98	621.18	168.8
*	2071.000	1280.00	575.66	577.47	-0.20	1.00	14.23	100.00	0.00	100.00	312.57	730.71	236.7
	2120.000	310.00	574.41	574.42	0.48	49.00	1.21	150.00	0.00	150.00	213.38	39.66	56.9
*	2120.000	700.00	576.08	576.10	1.68	49.00	1.61	150.00	0.00	150.00	480.82	66.12	153.0
*	2120.000	815.00	576.51	576.53	1.80	49.00	1.69	150.00	0.00	150.00	559.44	73.08	182.4
*	2120.000	1020.00	577.20	577.23	2.03	49.00	1.82	150.00	0.00	150.00	699.51	85.17	235.3
*	2120.000	1280.00	578.01	578.03	2.35	49.00	1.97	150.00	0.00	150.00	877.11	100.05	302.8
	2130.000	310.00	574.41	574.43	0.00	10.00	1.90	150.00	0.00	150.00	163.33	97.62	49.0
	2130.000	700.00	576.07	576.11	-0.01	10.00	2.58	150.00	0.00	150.00	399.53	166.86	133.6
	2130.000	815.00	576.50	576.54	-0.01	10.00	2.72	150.00	0.00	150.00	470.45	185.02	159.5
	2130.000	1020.00	577.20	577.24	-0.01	10.00	2.94	150.00	0.00	150.00	597.40	216.55	206.0
	2130.000	1280.00	578.00	578.04	-0.01	10.00	3.19	150.00	0.00	150.00	759.24	255.34	265.4
	2180.000	310.00	574.42	574.45	0.02	50.00	1.89	150.00	0.00	150.00	163.49	97.34	49.1
	2180.000	700.00	576.08	576.11	0.01	50.00	2.58	150.00	0.00	150.00	399.53	166.85	133.6
	2180.000	815.00	576.51	576.54	0.01	50.00	2.72	150.00	0.00	150.00	470.43	185.04	159.5
	2180.000	1020.00	577.20	577.24	0.00	50.00	2.94	150.00	0.00	150.00	597.34	216.65	206.0
	2180.000	1280.00	578.00	578.04	0.00	50.00	3.19	150.00	0.00	150.00	759.16	255.48	265.3

	SECNO	Q	CWSEL	EG	DIFWSX	XLCH	VCH	TOPWID	SSTA	ENDST	QLOB	QCH	QROE
*	2205.000	310.00	574.35	574.53	-0.07	25.00	4.37	57.00	0.00	57.00	83.99	171.03	54.9
*	2205.000	700.00	575.99	576.23	-0.09	25.00	5.45	57.00	0.00	57.00	294.33	267.12	138.5
*	2205.000	815.00	576.41	576.66	-0.10	25.00	5.66	57.00	0.00	57.00	361.27	291.23	162.5
*	2205.000	1020.00	577.09	577.37	-0.11	25.00	6.00	57.00	0.00	57.00	482.14	333.39	204.4
*	2205.000	1280.00	577.88	578.19	-0.12	25.00	6.39	57.00	0.00	57.00	637.98	385.35	256.6
*	2280.000	310.00	574.49	574.89	0.14	75.00	6.26	80.00	0.00	80.00	55.49	186.05	68.4
	2280.000	700.00	576.23	576.44	0.25	75.00	5.38	80.00	0.00	80.00	341.85	206.79	151.3
	2280.000	815.00	576.68	576.87	0.27	75.00	5.29	80.00	0.00	80.00	427.06	214.77	173.1
	2280.000	1020.00	577.39	577.58	0.30	75.00	5.24	80.00	0.00	80.00	577.18	231.50	211.3
	2280.000	1280.00	578.20	578.40	0.33	75.00	5.27	80.00	0.00	80.00	766.91	254.27	258.8
*	2390.000	220.00	575.03	575.10	0.54	110.00	2.69	150.00	0.00	150.00	47.04	139.35	33.6
*	2390.000	530.00	576.51	576.58	0.28	110.00	3.21	150.00	0.00	150.00	213.98	204.23	111.7
*	2390.000	630.00	576.94	577.00	0.26	110.00	3.27	150.00	0.00	150.00	272.98	219.59	137.4
*	2390.000	790.00	577.64	577.70	0.25	110.00	3.29	150.00	0.00	150.00	371.56	239.64	178.8
*	2390.000	1000.00	578.46	578.52	0.25	110.00	3.38	150.00	0.00	150.00	500.35	267.56	232.0
	2440.000	220.00	574.96	575.10	-0.07	50.00	3.47	100.00	50.00	150.00	30.88	165.43	23.6
	2440.000	530.00	576.41	576.58	-0.10	50.00	4.54	100.00	50.00	150.00	152.10	269.24	108.6
	2440.000	630.00	576.83	577.00	-0.11	50.00	4.69	100.00	50.00	150.00	196.61	294.21	139.1
	2440.000	790.00	577.53	577.70	-0.10	50.00	4.80	100.00	50.00	150.00	271.67	328.17	190.1
	2440.000	1000.00	578.35	578.52	-0.11	50.00	4.99	100.00	50.00	150.00	370.26	373.11	256.6
	2450.000	220.00	575.03	575.12	0.07	10.00	2.95	100.00	50.00	150.00	43.90	142.67	33.4
	2450.000	530.00	576.52	576.61	0.11	10.00	3.49	100.00	50.00	150.00	186.84	210.05	133.1
	2450.000	630.00	576.94	577.04	0.11	10.00	3.57	100.00	50.00	150.00	236.32	226.73	166.9
	2450.000	790.00	577.64	577.73	0.11	10.00	3.61	100.00	50.00	150.00	318.18	249.44	222.3
	2450.000	1000.00	578.45	578.55	0.10	10.00	3.70	100.00	50.00	150.00	425.28	280.28	294.4
	2685.000	220.00	575.23	575.26	0.20	235.00	2.07	170.00	0.00	170.00	61.28	95.29	63.4
	2685.000	530.00	576.72	576.78	0.20	235.00	3.04	170.00	0.00	170.00	182.34	194.40	153.2
	2685.000	630.00	577.14	577.20	0.20	235.00	3.25	170.00	0.00	170.00	223.84	224.30	181.8
	2685.000	790.00	577.82	577.89	0.18	235.00	3.51	170.00	0.00	170.00	292.30	270.39	227.3
	2685.000	1000.00	578.62	578.70	0.17	235.00	3.82	170.00	0.00	170.00	383.04	330.45	286.5
*	3020.000	220.00	575.14	575.90	-0.10	335.00	7.01	22.56	112.29	134.85	0.37	219.63	0.0
*	3020.000	530.00	576.50	577.62	-0.22	335.00	8.57	32.78	105.48	138.26	9.36	520.64	0.0
*	3020.000	630.00	576.90	578.06	-0.24	335.00	8.75	35.35	103.91	139.26	15.88	614.12	0.0
*	3020.000	790.00	577.60	578.70	-0.22	335.00	8.62	105.19	101.44	335.00	28.97	753.71	7.3
*	3020.000	1000.00	578.59	579.33	-0.02	335.00	7.47	295.21	39.79	335.00	50.75	841.10	108.1
*	3250.000	220.00	577.54	577.82	2.40	230.00	4.81	142.54	44.55	187.09	14.33	169.03	36.6
*	3250.000	530.00	578.68	578.92	2.18	230.00	5.17	200.36	23.05	223.41	77.19	288.14	164.6
*	3250.000	630.00	579.00	579.22	2.10	230.00	5.19	207.39	17.59	224.98	101.96	318.47	209.5
*	3250.000	790.00	579.45	579.66	1.86	230.00	5.26	217.66	9.59	227.26	144.23	365.46	280.3
	3250.000	1000.00	579.81	580.05	1.22	230.00	5.73	225.82	3.25	229.07	197.23	435.98	366.7

	SECNO	Q	CWSEL	EG	DIFWSX	XLCH	VCH	TOPWID	SSTA	ENDST	QLOB	QCH	QROI
*	3515.000	220.00	581.44	582.30	3.90	265.00	7.45	17.13	38.81	55.95	0.00	220.00	0.(
*	3515.000	530.00	582.85	584.23	4.17	265.00	9.40	20.85	35.91	56.76	0.00	530.00	0.(
*	3515.000	630.00	583.22	584.72	4.22	265.00	9.81	21.81	35.16	56.97	0.00	630.00	0.(
*	3515.000	790.00	583.71	585.43	4.26	265.00	10.53	27.36	29.90	57.25	0.69	789.31	0.(
*	3515.000	1000.00	584.60	586.19	4.79	265.00	10.24	57.77	0.00	57.77	26.57	973.43	0.(
*	3770.000	220.00	586.82	587.68	5.38	255.00	7.43	17.69	170.10	187.79	0.00	220.00	0.(
*	3770.000	530.00	588.57	589.41	5.72	255.00	7.61	94.10	0.00	190.55	37.54	492.46	0.(
*	3770.000	630.00	588.81	589.70	5.59	255.00	8.02	99.89	0.00	191.30	68.93	560.93	0.1
*	3770.000	790.00	589.18	590.10	5.47	255.00	8.39	108.94	0.00	192.48	131.47	657.78	0.7
*	3770.000	1000.00	589.55	590.54	4.94	255.00	9.01	117.86	0.00	193.64	216.16	781.72	2.1
*	3945.000	220.00	594.01	594.44	7.20	175.00	6.19	110.12	0.00	217.83	68.17	151.83	0.(
*	3945.000	530.00	594.66	595.24	6.09	175.00	8.10	122.05	0.00	218.65	246.97	283.03	0.(
*	3945.000	630.00	594.87	595.44	6.06	175.00	8.18	125.85	0.00	218.89	314.65	315.35	0.0
*	3945.000	790.00	595.07	595.71	5.89	175.00	8.91	129.41	0.00	219.12	414.82	375.18	0.(
*	3945.000	1000.00	595.31	596.04	5.76	175.00	9.65	133.77	0.00	219.39	550.59	449.41	0.0
*	4295.000	220.00	599.91	600.81	5.90	350.00	7.63	16.14	92.92	109.05	0.00	220.00	0.0
*	4295.000	530.00	601.48	602.73	6.82	350.00	9.04	43.34	0.00	110.52	10.63	519.37	0.0
*	4295.000	630.00	602.12	603.11	7.24	350.00	8.31	100.37	0.00	242.04	40.98	581.83	7.1
*	4295.000	790.00	602.54	603.56	7.47	350.00	8.70	111.49	0.00	244.75	76.10	681.89	32.0
*	4295.000	1000.00	602.97	604.04	7.66	350.00	9.23	122.77	0.00	247.54	121.48	802.93	75.5
*	4370.000	220.00	601.40	602.46	1.49	75.00	8.26	12.56	111.55	124.11	0.00	220.00	0.0
*	4370.000	530.00	603.15	604.08	1.67	75.00	8.49	72.63	109.73	232.64	0.00	434.61	95.3
*	4370.000	630.00	603.46	604.41	1.34	75.00	8.79	80.75	108.20	234.37	0.16	490.08	139.7
*	4370.000	790.00	603.91	604.82	1.37	75.00	8.99	125.01	0.00	236.90	12.98	561.58	215.4
*	4370.000	1000.00	604.28	605.24	1.31	75.00	9.60	144.91	0.00	239.00	37.93	653.53	308.5
*	4405.000	220.00	602.34	602.70	0.94	35.00	4.97	240.00	0.00	240.00	3.16	210.61	6.2
*	4405.000	530.00	604.02	604.30	0.87	35.00	5.46	240.00	0.00	240.00	84.45	322.93	122.6
*	4405.000	630.00	604.34	604.63	0.88	35.00	5.75	240.00	0.00	240.00	111.01	358.18	160.8
*	4405.000	790.00	604.68	605.02	0.77	35.00	6.38	240.00	0.00	240.00	151.24	419.98	218.7
*	4405.000	1000.00	605.04	605.44	0.76	35.00	7.21	240.00	0.00	240.00	204.35	500.31	295.3
*	4480.000	220.00	602.88	603.06	0.55	75.00	3.75	237.53	0.00	240.00	19.44	179.55	21.0
*	4480.000	530.00	604.01	604.30	0.00	75.00	5.49	240.00	0.00	240.00	95.20	324.62	110.1
*	4480.000	630.00	604.33	604.63	-0.01	75.00	5.79	240.00	0.00	240.00	123.19	360.97	145.8
*	4480.000	790.00	604.67	605.02	-0.01	75.00	6.45	240.00	0.00	240.00	165.74	424.01	200.2
*	4480.000	1000.00	605.02	605.44	-0.01	75.00	7.30	240.00	0.00	240.00	221.80	505.53	272.6
*	4520.000	220.00	602.68	603.30	-0.20	40.00	6.34	14.76	108.68	123.44	0.00	220.00	0.0
*	4520.000	530.00	603.83	605.37	-0.19	40.00	9.98	17.37	106.66	124.03	0.00	530.00	0.0
*	4520.000	630.00	604.25	605.93	-0.08	40.00	10.39	18.34	105.91	124.25	0.00	630.00	0.0
*	4520.000	790.00	604.94	606.71	0.27	40.00	10.68	27.57	104.70	138.99	0.00	788.82	1.1
*	4520.000	1000.00	605.73	607.54	0.70	40.00	10.89	42.84	103.31	146.15	0.00	982.60	17.4

	SECNO	Q	CWSEL	EG	DIFWSX	XLCH	VCH	TOPWID	SSTA	ENDST	QLOB	QCH	QRO
*	4630.000	120.00	606.82	607.50	4.14	110.00	6.63	13.45	82.95	96.40	0.00	120.00	0.(
*	4630.000	280.00	607.89	608.92	4.07	110.00	8.14	16.97	81.67	98.64	0.00	280.00	0.(
*	4630.000	335.00	608.18	609.30	3.93	110.00	8.49	17.92	81.33	99.25	0.00	335.00	0.(
*	4630.000	410.00	608.54	609.77	3.61	110.00	8.89	19.10	80.90	100.00	0.00	410.00	0.(
*	4630.000	510.00	608.98	610.33	3.25	110.00	9.33	20.52	80.39	100.90	0.00	510.00	0.(
*	4695.000	120.00	611.30	612.72	4.47	65.00	9.58	4.40	107.80	112.20	0.00	120.00	0.(
*	4695.000	280.00	612.52	613.18	4.62	65.00	8.63	90.19	63.05	153.24	68.71	154.36	56.9
*	4695.000	335.00	612.77	613.40	4.59	65.00	8.82	112.69	52.12	164.81	90.91	167.78	76.3
*	4695.000	410.00	613.08	613.65	4.54	65.00	8.91	139.50	39.10	178.60	123.20	181.43	105.3
*	4695.000	510.00	613.26	613.92	4.28	65.00	9.89	155.21	31.47	186.68	161.20	209.37	139.4
*	4696.000	120.00	611.05	613.09	-0.25	1.00	11.47	15.51	102.19	117.71	0.00	120.00	0.(
*	4696.000	280.00	613.46	613.80	0.94	1.00	7.73	172.39	23.13	195.51	92.66	98.99	88.3
*	4696.000	335.00	613.55	613.93	0.77	1.00	8.34	180.20	19.33	199.53	115.07	110.11	109.8
*	4696.000	410.00	613.67	614.07	0.59	1.00	8.89	191.26	13.96	205.22	147.09	122.28	140.6
*	4696.000	510.00	613.77	614.25	0.51	1.00	10.02	199.58	9.92	209.50	188.00	141.99	180.(
*	4990.000	120.00	616.86	618.52	5.81	294.00	10.34	12.26	23.85	36.12	0.00	120.00	0.(
*	4990.000	280.00	620.95	621.58	7.49	294.00	8.20	71.82	0.00	71.82	56.62	165.13	58.2
*	4990.000	335.00	621.09	621.80	7.54	294.00	8.97	73.59	0.00	73.59	72.27	186.26	76.4
*	4990.000	410.00	621.34	622.07	7.67	294.00	9.43	76.78	0.00	76.78	96.51	206.46	107.0
*	4990.000	510.00	621.61	622.39	7.84	294.00	10.14	80.12	0.00	80.12	127.83	233.82	148.3
*	4991.000	120.00	618.04	618.80	1.18	1.00	7.00	4.40	27.80	32.20	0.00	120.00	0.(
*	4991.000	280.00	621.62	621.73	0.67	1.00	3.89	80.22	0.00	80.22	72.68	127.73	79.5
*	4991.000	335.00	621.84	621.98	0.76	1.00	4.31	83.03	0.00	83.03	88.97	145.85	100.1
*	4991.000	410.00	622.07	622.24	0.73	1.00	4.89	85.68	0.00	85.68	110.81	170.42	128.7
*	4991.000	510.00	622.35	622.56	0.74	1.00	5.55	88.46	0.00	88.46	139.80	200.27	169.9
*	5025.000	120.00	618.91	620.13	0.87	34.00	8.86	5.58	29.22	34.80	0.00	120.00	0.0
*	5025.000	280.00	621.60	621.85	-0.02	34.00	5.26	70.98	0.00	70.98	71.67	155.49	52.8
*	5025.000	335.00	621.83	622.10	-0.01	34.00	5.60	73.32	0.00	73.32	90.87	173.13	70.9
*	5025.000	410.00	622.07	622.37	0.00	34.00	6.12	75.34	0.00	75.34	116.00	198.03	95.9
*	5025.000	510.00	622.36	622.70	0.01	34.00	6.67	76.80	0.00	76.80	149.39	227.39	133.2
*	5135.000	120.00	623.55	624.02	4.64	110.00	5.76	39.91	47.47	88.67	10.83	109.17	0.0
*	5135.000	280.00	624.29	624.93	2.69	110.00	7.22	66.07	33.19	99.26	60.40	219.28	0.3
*	5135.000	335.00	624.47	625.16	2.64	110.00	7.59	70.99	29.53	100.51	79.54	253.36	2.1
*	5135.000	410.00	624.71	625.45	2.65	110.00	7.98	76.33	24.89	101.22	107.12	296.90	5.9
*	5135.000	510.00	624.98	625.78	2.62	110.00	8.53	82.16	19.83	101.99	144.78	353.14	12.0
*	5325.000	120.00	634.55	634.94	11.01	190.00	5.39	66.74	108.89	180.23	0.05	102.95	17.0
*	5325.000	280.00	635.16	635.67	10.87	190.00	6.89	96.22	100.60	196.81	3.54	189.30	87.1
*	5325.000	335.00	635.30	635.85	10.83	190.00	7.28	104.78	96.09	200.87	6.14	215.29	113.5
*	5325.000	410.00	635.50	636.07	10.79	190.00	7.65	117.61	88.69	206.30	11.27	247.15	151.5
*	5325.000	510.00	635.70	636.32	10.72	190.00	8.25	130.46	81.27	211.73	19.38	289.43	201.1

	SECNO	Q	CWSEL	EG	DIFWSX	XLCH	VCH	TOPWID	SSTA	ENDST	QLOB	QCH	QRO
*	5375.000	120.00	636.84	638.27	2.28	50.00	9.61	4.40	72.80	77.20	0.00	120.00	0.(
*	5375.000	280.00	638.86	639.59	3.71	50.00	8.48	142.16	0.00	142.16	51.11	181.60	47.2
*	5375.000	335.00	639.08	639.85	3.78	50.00	9.05	142.70	0.00	142.70	69.10	202.35	63.5
*	5375.000	410.00	639.31	640.17	3.81	50.00	9.89	143.27	0.00	143.27	93.38	231.01	85.(
*	5375.000	510.00	639.60	640.53	3.90	50.00	10.74	143.99	0.00	143.99	128.13	264.57	117.3
*	5475.000	120.00	638.64	640.07	1.80	100.00	9.61	4.40	67.80	72.20	0.00	120.00	0.(
*	5475.000	280.00	640.79	643.32	1.93	100.00	12.75	4.40	67.80	72.20	0.00	280.00	0.(
*	5475.000	335.00	643.08	644.06	4.00	100.00	8.71	136.64	0.00	136.64	33.43	279.03	22.5
*	5475.000	410.00	643.37	644.49	4.06	100.00	9.62	142.31	0.00	142.31	52.37	320.31	37.3
*	5475.000	510.00	644.38	645.06	4.78	100.00	8.41	155.00	0.00	155.00	103.90	317.52	88.5
*	5525.000	120.00	640.43	640.60	1.79	50.00	3.27	13.50	115.71	129.20	0.00	120.00	0.(
*	5525.000	280.00	643.95	644.08	3.15	50.00	2.99	105.20	53.23	158.43	9.15	264.49	6.3
	5525.000	335.00	644.18	644.34	1.10	50.00	3.34	121.46	40.85	162.31	16.70	307.34	10.9
	5525.000	410.00	644.64	644.81	1.28	50.00	3.53	137.73	30.39	168.12	38.47	349.22	22.3
	5525.000	510.00	645.05	645.24	0.68	50.00	3.85	151.87	21.30	173.17	68.69	403.97	37.3

EXISTING 2 YEAR STORM

SUMMARY PRINTOUT TABLE 100

	SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG
	2180.000	574.43	571.50	577.48	573.00	35.51	274.57	30.00	0.00	6.42	574.42	1.89	574.4
	2180.000	576.11	571.50	591.73	573.00	35.24	664.83	30.00	0.00	8.08	576.08	2.58	576.1
	2180.000	576.54	571.50	597.72	573.00	36.07	785.88	30.00	0.00	8.51	576.51	2.72	576.5
	2180.000	577.24	571.50	610.44	573.00	36.59	984.32	30.00	0.00	9.20	577.20	2.94	577.2
	2180.000	578.04	571.50	630.34	573.00	38.15	1246.62	30.00	0.00	10.00	578.00	3.19	578.0
	2440.000	575.30	573.10	576.02	574.50	42.51	178.01	30.00	0.00	6.26	574.96	3.47	575.1
	2440.000	576.78	573.10	582.23	574.50	22.90	506.32	30.00	0.00	7.71	576.41	4.54	576.5
	2440.000	577.20	573.10	585.02	574.50	23.86	604.80	30.00	0.00	8.13	576.83	4.69	577.0
	2440.000	577.90	573.10	590.35	574.50	25.20	765.73	30.00	0.00	8.83	577.53	4.80	577.7
	2440.000	578.72	573.10	598.82	574.50	26.82	972.98	30.00	0.00	9.65	578.35	4.99	578.5
*	4480.000	603.00	601.30	605.88	601.80	99.45	121.13	30.00	0.30	5.18	602.88	3.75	603.0
*	4480.000	606.48	601.30	624.58	601.80	21.48	504.64	30.00	0.00	6.31	604.01	5.49	604.3
*	4480.000	607.40	601.30	633.38	601.80	19.84	610.90	30.00	0.00	6.63	604.33	5.79	604.6
*	4480.000	608.82	601.30	650.36	601.80	20.26	769.79	30.00	0.00	6.97	604.67	6.45	605.0
*	4480.000	610.55	601.30	678.22	601.80	21.69	978.45	30.00	0.00	7.32	605.02	7.30	605.4
*	5475.000	640.42	639.20	640.06	642.10	120.00	0.00	59.00	0.00	2.84	638.64	9.61	640.0
*	5475.000	643.49	639.20	656.42	642.10	131.19	148.97	30.00	0.00	4.99	640.79	12.75	643.3
*	5475.000	644.32	639.20	664.21	642.10	129.96	205.65	30.00	0.00	7.28	643.08	8.71	644.0
*	5475.000	642.97	639.20	676.94	642.10	129.12	283.15	30.00	0.00	7.57	643.37	9.62	644.4
*	5475.000	643.33	639.20	697.83	642.10	127.57	382.69	30.00	0.00	8.58	644.38	8.41	645.0

SUMMARY OF ERRORS AND SPECIAL NOTES

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WARNING SECNO=     59.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     59.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     59.000  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     59.000  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     59.000  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    165.000  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    340.000  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    340.000  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=    845.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    845.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    845.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=    845.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    845.000  PROFILE=  2  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    845.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    845.000  PROFILE=  3  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    845.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    845.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    845.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=    845.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    845.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    845.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=    904.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    904.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    904.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=    904.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    904.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    904.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=    904.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    904.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    904.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=    904.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    904.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    904.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=    904.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    904.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    904.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   1000.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1000.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1000.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1000.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1000.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1000.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1000.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1000.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1000.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1000.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
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CAUTION SECNO=   1000.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1000.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   1148.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1148.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1148.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1148.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1148.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1148.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1148.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1148.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1148.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1148.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1148.000  PROFILE=  5  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=   1264.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1264.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1264.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1264.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1264.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1264.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1264.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1264.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1264.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1264.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1264.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1264.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1264.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1264.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1264.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   1400.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1400.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1400.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1400.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1400.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1400.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1400.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1400.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1400.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1400.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1400.000  PROFILE=  5  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=   1418.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1418.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1418.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1418.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1418.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1418.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1418.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1418.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1418.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1418.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1418.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
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CAUTION SECNO=   1418.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1418.000  PROFILE=  5  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=   1480.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
WARNING SECNO=   1480.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   1480.000  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   1480.000  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   1480.000  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=   1500.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1500.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

WARNING SECNO=   2070.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   2071.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO=   2071.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   2071.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   2071.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   2071.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   2071.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   2071.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   2071.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   2071.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   2071.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   2071.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   2071.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   2071.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=   2120.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   2120.000  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   2120.000  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   2120.000  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   2205.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   2205.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   2205.000  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   2205.000  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   2205.000  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   2280.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   2390.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   2390.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   2390.000  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   2390.000  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   2390.000  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   3020.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   3020.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   3020.000  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   3020.000  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   3020.000  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   3250.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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WARNING SECNO=   3250.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   3250.000  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   3250.000  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=   3515.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3515.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3515.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   3515.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3515.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3515.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   3515.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3515.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3515.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   3515.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3515.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3515.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   3515.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3515.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3515.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   3770.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3770.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3770.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3770.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3770.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   3770.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3770.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3770.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   3770.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3770.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3770.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   3770.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3770.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3770.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   3945.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3945.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3945.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   3945.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3945.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3945.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   3945.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3945.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3945.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   3945.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3945.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3945.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   3945.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3945.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3945.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   4295.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4295.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4295.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
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CAUTION SECNO=   4295.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4295.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4295.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4295.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4295.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4295.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4295.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4295.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4295.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4295.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4295.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   4370.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4370.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4370.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4370.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4370.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4370.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4370.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4370.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4370.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4370.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4370.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4370.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4370.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4370.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4370.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=   4405.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   4405.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   4405.000  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   4405.000  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   4405.000  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   4480.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO=   4480.000  PROFILE=  2  HYDRAULIC JUMP D.S.
CAUTION SECNO=   4480.000  PROFILE=  3  HYDRAULIC JUMP D.S.
CAUTION SECNO=   4480.000  PROFILE=  4  HYDRAULIC JUMP D.S.
CAUTION SECNO=   4480.000  PROFILE=  5  HYDRAULIC JUMP D.S.

WARNING SECNO=   4520.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO=   4520.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4520.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4520.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4520.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4520.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4520.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4520.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4520.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4520.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4520.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4520.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4520.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL
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CAUTION SECNO=   4630.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4630.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4630.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4630.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4630.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4630.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4630.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4630.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4630.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4630.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4630.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4630.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4630.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4630.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4630.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   4695.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4695.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4695.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4695.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4695.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4695.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4695.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4695.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4695.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4695.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4695.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4695.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4695.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4695.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4695.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   4696.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
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CAUTION SECNO=   4696.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4696.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4696.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4696.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4696.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4696.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4696.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4696.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4696.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4696.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4696.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   4990.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4990.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4990.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4990.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4990.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4990.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
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CAUTION SECNO=   4990.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4990.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4990.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4990.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4990.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4990.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4990.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4990.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4990.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   4991.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
WARNING SECNO=   4991.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   4991.000  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   4991.000  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   4991.000  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=   5025.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   5025.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   5025.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
WARNING SECNO=   5025.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   5025.000  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   5025.000  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   5025.000  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=   5135.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   5135.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   5135.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   5135.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   5135.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   5135.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   5135.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   5135.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   5135.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   5135.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   5135.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   5135.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   5135.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   5135.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   5135.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   5325.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   5325.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   5325.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   5325.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   5325.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   5325.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   5325.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   5325.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   5325.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   5325.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   5325.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   5325.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   5325.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   5325.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
```

```
CAUTION SECNO=   5325.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   5375.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   5375.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   5375.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   5375.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   5375.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   5375.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   5375.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   5375.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   5375.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   5375.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   5375.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   5375.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   5375.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   5375.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   5375.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   5475.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   5475.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   5475.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   5475.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   5475.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   5475.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   5475.000  PROFILE=  3  WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO=   5475.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   5475.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   5475.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   5475.000  PROFILE=  5  WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO=   5475.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=   5525.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   5525.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
```

HEC-2
PROPOSED CONDITIONS

GOODKIND & O'DEA INC. CONSULTING ENGINEERS

JOB McKEEL BROOK NOTES BY WJH DATE 11-7-95 PAGE NO. 1593

REACH FLOW SCHEMATIC CHECK BY DATE

HEC-1 PEAK FLOWS AT NODE : (CFS)

HEC-2 REACH FLOWS : (CFS)

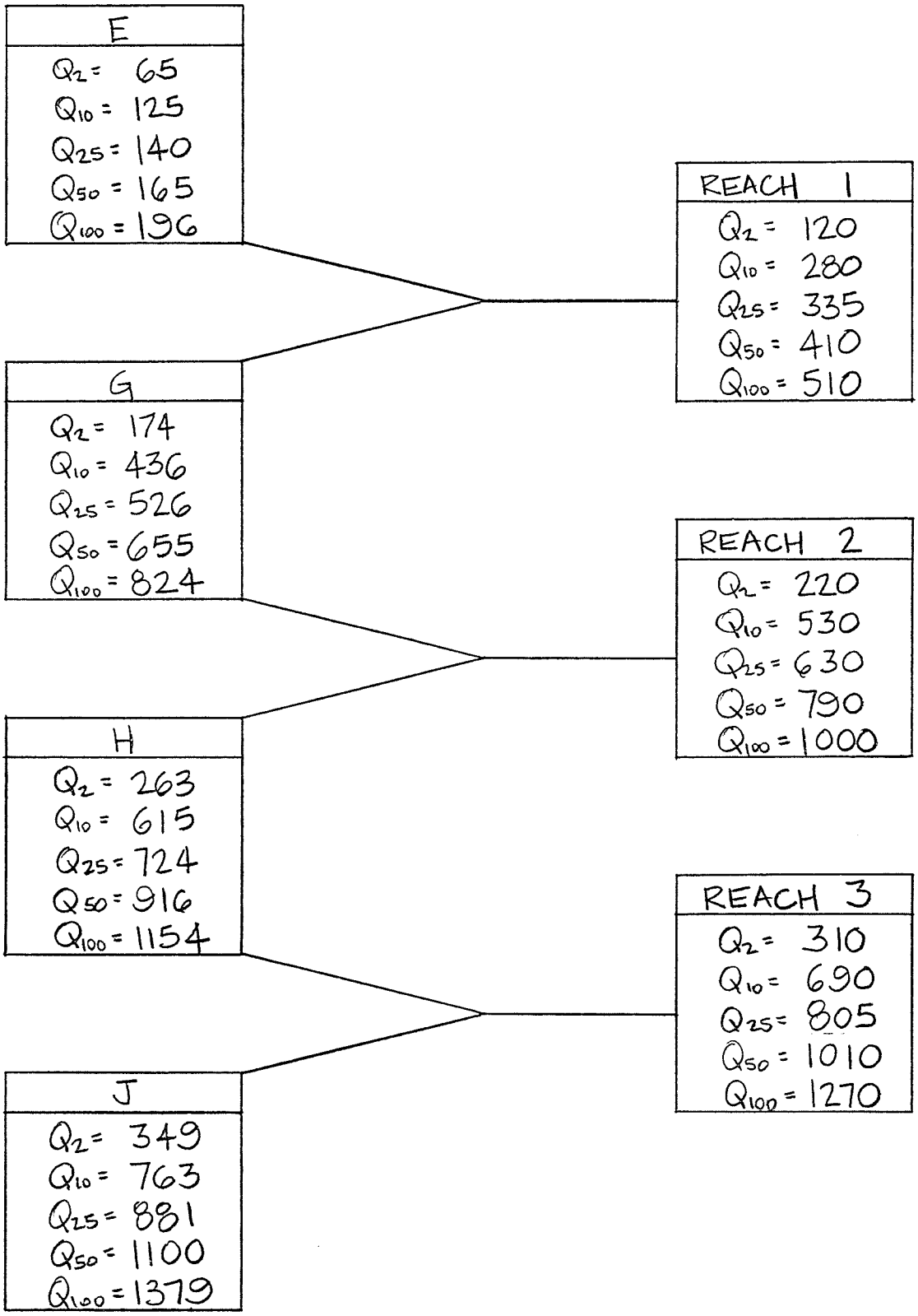

FIGURE 5

HEC2 S/N: 1363000007 HMVersion: 6.51 Data File: MCKPRO6.HC2

```
*********************************************
*  HEC-2 WATER SURFACE PROFILES             *
*                                           *
*  Version   4.6.2;  May 1991               *
*                                           *
*  RUN DATE     4DEC95    TIME    8:19:07   *
*********************************************
```

```
************************************
*  U.S. ARMY CORPS OF ENGINEERS
*  HYDROLOGIC ENGINEERING CENTER
*  609 SECOND STREET, SUITE D
*  DAVIS, CALIFORNIA 95616-4687
*          (916) 756-1104
************************************
```

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
```

```
:::::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::::
:::                                       :::
:::   FULL MICRO-COMPUTER IMPLEMENTATION   :::
:::                                       :::
:::::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::::
```

```
============================
H A E S T A D   M E T H O D S
============================
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS RUN EXECUTED 4DEC95 8:19:07

```
*************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
*************************************


T2      McKEEL BROOK STORMWATER MANAGEMENT PLAN - ROCKAWAY AND DOVER, NJ
T3      PROPOSED  2 YEAR STORM

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0         2         0         0         0         0         0         0    554.25         0

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      1         0        -1


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38        43         1         3        51        39        26         4        53        54
     13        14        15       100

QT        5       310       690       805      1010      1270
NC     0.06      0.06      0.03       0.3       0.5
        CROSS SECTIONS TAKEN LOOKING DOWNSTREAM
        HEC-2 BASED ON DOVER F.I.S. PREPARED BY THE RBA GROUP DATED 4/5/78
        AND UPDATED TO NOV. 1994 AS PER SURVEY BY GOODKIND & O'DEA, INC.

          **** THIS MODEL REPRESENTS PROPOSED CONDITIONS, i.e. INSTALLATION OF
               A TWIN 4'x 8' BOX CULVERT FROM SECTION II IMPROVEMENTS TO AN
               INLET LOCATED APPROX. 160' UPSTREAM OF COOPER STREET CROSSING.***

               CONFLUENCE WITH THE ROCKAWAY RIVER
X1     0058        10         5        44         0         0         0
X3       10                                                                  553.6     553.6
GR    553.6         0     553.6         5       549        14       549        24     548.4        26
GR    548.4        34     548.4        36     548.4        44     553.6      54.5     553.6        60

NH        4      0.06         5      0.03        26     0.015        44      0.06        60
X1     0059         0         0         0         1         1         1
BT      -11        24       549         0        24     553.6         0        26     553.6         0
BT                 26     553.6     552.4        34     553.6     552.4        34     553.6         0
BT                 36     553.6         0        36     553.6     552.4        44     553.6     552.4
BT                 44     553.6         0      54.5     553.6         0
```

NH	4	0.06	5	0.03	26	0.015	44	0.06	60	
X1	0096	10	5	44	20	50	37			
BT	-11	24	549	0	24	553.6	0	26	553.6	0
BT		26	553.6	552.6	34	553.6	552.6	34	553.6	0
BT		36	553.6	0	36	553.6	552.6	44	553.6	552.6
BT		44	553.6	0	54	553.6	0			
GR	553.6	0	553.6	5	549	14	549	24	548.6	26
GR	548.6	34	548.6	36	548.6	44	553.6	54	553.6	60
NC	0.06	0.06	0.015	0.1	0.3					
X1	0165	10	15	44	69	69	69			
BT	-14	3.5	554.7	0	15	554.7	0	15	554.7	553
BT		24	554.7	553	24	554.7	0	26	554.7	0
BT		26	554.7	552.8	34	554.7	552.8	34	554.7	0
BT		36	554.7	0	36	554.7	552.8	44	554.7	552.8
BT		44	554.7	0	56	554.7	0			
GR	554.7	0	554.7	3.5	549	15	549	24	548.8	26
GR	548.8	34	548.8	36	548.8	44	554.7	56	554.7	60
X1	0340	10	15	44	175	175	175			
BT	-14	6	554.5	0	15	554.5	0	15	554.5	554
BT		24	554.5	554	24	554.5	0	26	554.5	0
BT		26	554.5	553.3	34	554.5	553.3	34	554.5	0
BT		36	554.5	0	36	554.5	553.3	44	554.5	553.3
BT		44	554.5	0	54.5	554.5	0			
GR	554.5	0	554.5	6	550	15	550	24	549.3	26
GR	549.3	34	549.3	36	549.3	44	554.5	54.5	554.5	60
X1	0550	12	14	44	210	210	210			
BT	-18	4	555.2	0	14	555.2	0	14	555.2	552.5
BT		18	555.2	552.5	18	555.2	0	20	555.2	0
BT		20	555.2	552.5	24	555.2	552.5	24	555.2	0
BT		26	555.2	0	26	555.2	553.9	34	555.2	553.9
BT		34	555.2	0	36	555.2	0	36	555.2	553.9
BT		44	555.2	553.9	44	555.2	0	55	555.2	0
GR	555.2	0	555.2	4	550.2	14	550.2	18	550.2	20
GR	550.2	24	549.9	26	549.9	34	549.9	36	549.9	44
GR	555.2	55	555.2	60						
X1	0608	12	14	44	58	58	58			
BT	-18	7	555.5	0	14	555.5	0	14	555.5	554.3
BT		18	555.5	554.3	18	555.5	0	20	555.5	0
BT		20	555.5	554.3	24	555.5	554.3	24	555.5	0
BT		26	555.5	0	26	555.5	554	34	555.5	554
BT		34	555.5	0	36	555.5	0	36	555.5	554
BT		44	555.5	554	44	555.5	0	55	555.5	0
GR	555.5	0	555.5	7	552	14	552	18	552	20
GR	552	24	550	26	550	34	550	36	550	44
GR	555.5	55	555.5	60						

X1	0845	10	16	44	220	270	237			
BT	-14	6	559.1	0	16	559.3	0	16	559.3	558
BT		24	559.3	558	24	559.3	0	26	559.3	0
BT		26	559.3	558	34	559.3	558	34	559.3	0
BT		36	559.3	0	36	559.3	558	44	559.3	558
BT		44	559.3	0	54	559.1	0			
GR	559	0	559.1	6	554	16	554	24	554	26
GR	554	34	554	36	554	44	559.1	54	559	60
NC				0.6	0.8					
X1	0904	8	21	39	59	59	59			
BT	-10	10.5	560.3	0	21	560.3	0	21	560.3	559
BT		29	560.3	559	29	560.3	0	31	560.3	0
BT		31	560.3	559	39	560.3	559	39	560.3	0
BT		49.5	560.3	0						
GR	560.3	0	560.3	10.5	555	21	555	29	555	31
GR	555	39	560.3	49.5	560.3	60				
NC				0.1	0.3					
X1	1000	8	21	39	96	96	96			
BT	-10	10	562	0	21	562	0	21	562	560.6
BT		29	562	560.6	29	562	0	31	562	0
BT		31	562	560.6	39	562	560.6	39	562	0
BT		50	562	0						
GR	562	0	562	10	556.6	21	556.6	29	556.6	31
GR	556.6	39	562	50	562	60				
X1	1148	8	21	39	160	130	148			
BT	-10	9	564.5	0	21	564.5	0	21	564.5	562.4
BT		29	564.5	562.4	29	564.5	0	31	564.5	0
BT		31	564.5	562.4	39	564.5	562.4	39	564.5	0
BT		51.5	564.5	0						
GR	564.5	0	564.5	9	558.4	21	558.4	29	558.4	31
GR	558.4	39	564.5	51.5	564.5	60				
X1	1264	8	21	39	116	116	116			
BT	-10	9	567.5	0	21	567.5	0	21	567.5	565.4
BT		29	567.5	565.4	29	567.5	0	31	567.5	0
BT		31	567.5	565.4	39	567.5	565.4	39	567.5	0
BT		51	567.5	0						
GR	567.5	0	567.5	9	561.4	21	561.4	29	561.4	31
GR	561.4	39	567.5	51	567.5	60				
X1	1400	8	21	39	145	135	136			
BT	-10	10	568.8	0	21	568.8	0	21	568.8	567.4
BT		29	568.8	567.4	29	568.8	0	31	568.8	0
BT		31	568.8	567.4	39	568.8	567.4	39	568.8	0
BT		50	568.8	0						
GR	568.8	0	568.8	10	563.4	21	563.4	29	563.4	31
GR	563.4	39	568.8	50	568.8	60				

X1	1500	9	27	51	100	100	100			
X3	10							569	569	
BT	-14	17	569	0	27	569	0	27	569	568
BT		33	569	568	33	569	0	34	569	0
BT		34	569	567.6	42	569	567.6	42	569	0
BT		43	569	0	43	569	567.6	51	569	567.6
BT		51	569	0	70	569	0			
GR	569	0	569	17	564	27	564	33	563.6	34
GR	563.6	42	563.6	43	563.6	51	569	70		
X1	2070	10	49	73	1090	1090	1090			
X3	10							572.3	573.8	
BT	-15	46	572.3	572.3	49	572.5	567.1	49	572.5	571.3
BT		55	572.6	571.3	55	572.6	567.1	56	573.8	0
BT		56	573.8	570	64	573.8	570	64	573.8	0
BT		65	573.8	0	65	573.8	570	73	573.8	570
BT		73	573.8	0	86	573.8	0	100	573.8	0
GR	572.3	0	572.3	46	567.1	49	567.1	55	566.0	56
GR	566	64	566	65	566.0	73	572.7	86	572.7	100
NC			0.015	0.3	0.5					
		JACKSON AVENUE								
X1	2130	10	100	126	40	40	40			
X3	10							573.0	574.0	
BT	-14	0	573	0	100	573	0	100	573	571.5
BT		108	573	571.5	108	573	0	109	574	0
BT		109	574	570.1	117	574	570.1	117	574	0
BT		118	574	0	118	574	570.1	126	574	570.1
BT		126	574	0	150	574	0			
GR	572	0	571	100	568	100	568	108	566.1	109
GR	566.1	117	566.1	118	566.1	126	572	137	572	150
X1	2180	0	0	0	50	50	50			
X2							1			
X3	10							573	574	
NH	4	0.06	42	0.015	59	0.02	65	0.06	80	
X1	2280	12	42	65	100	100	100			
BT	-14	27	574.1	0	42	574.1	0	42	574.1	570.4
BT		50	574.1	570.4	50	574.1	0	51	574.1	0
BT		51	574.1	570.4	59	574.1	570.4	59	574.1	0
BT		60	574.1	0	60	574.1	572.5	65	574.1	572.5
BT		65	574.1	0	80	574.0	0			
GR	574	0	574	27	566.4	42	566.4	50	566.4	51
GR	566.4	59	573.7	60	568.4	62.5	568.5	65	572.5	65
GR	572.6	75	574	80						
QT	5	220	530	630	790	1000				
NC	0.06	0.06	0.02							

COOPER STREET

X1	2390	10	100	127	110	110	110			
X3	10							574.5	575.0	
BT	-15	0	574.5	0	100	574.5	0	100	574.5	573.1
BT		108	574.5	573.1	108	574.5	0	110	575.0	0
BT		110	575.0	570.7	118	575	570.7	118	575	0
BT		119	575	0	119	575	570.7	127	575.0	570.7
BT		127	575	0	141	575.0	0	150	575.0	0
GR	574	0	574.0	100	568.6	100	568.5	108	566.7	110
GR	566.7	118	566.7	119	566.7	127	573.6	141	573.6	150
X1	2440	12	104.5	131	50	50	50			
X3	10							574.5	575.0	
BT	-15	0	574.5	0	104.5	574.5	0	104.5	574.5	573.1
BT		112.5	574.5	573.1	112.5	574.5	0	114	575.0	0
BT		114	575.0	570.8	122	575	570.8	122	575	0
BT		123	575	0	123	575	570.8	131	575.0	570.8
BT		131	575.0	0	145	575.0	0	150	575.0	0
GR	574	50	574	100	573.1	104.5	568.7	105	568.7	112
GR	573.8	112.5	566.8	114	566.8	122	566.8	123	566.8	131
GR	574	145	574	150						
X1	2600	10	51	78	160	160	160			
X3	10							575	575	
BT	-14	39	575	0	51	575	0	51	575	573
BT		59	575	573	59	575	0	61	575	0
BT		61	575	571	69	575	571	69	575	0
BT		70	575	0	70	575	571	78	575	571
BT		78	575	0	94	575	0			
GR	575	0	575	39	569	51	569	59	567	61
GR	567	69	567	70	567	78	575	94	575	120
NC	0.15	0.15	0.035							
X1	2601	0	0	0	1	1	1			
X3	10							574	574	
NC	0.15	0.15	0.035							
X1	2685	15	98	110	240	180	235			
GR	574	0	573.2	60	573.5	70	571.6	74	571.1	77
GR	571.7	80	572.6	82	573.8	90	573.3	98	571.0	101
GR	571.1	105	571.2	109	571.8	110	572.6	120	572.6	170
NC				0.1	0.3					
X1	3020	11	115	140	290	310	335			
GR	579	0	578	100	576.6	105	574.6	115	573.2	120
GR	573.0	125	573.2	130	577.2	140	578.0	160	578	240
GR	577	335								
NC	0.08									
X1	3250	11	70	88	230	90	230			
GR	580	0	578	35	576.8	60	576.6	70	575.3	73
GR	575.2	78	575.3	83	576.8	88	576.3	98	578	220
GR	580	230								

```
NC                0.08      0.03
X1     3515        11        35        58       250       250       265
GR    584.1         0     584.1        25     583.3        35     579.4        43     579.2        49
GR    579.8        55     585.0        58     584.9        68       586       155       588       210
GR      590       220

X1     3770        23       165       190       250       260       255
GR      588         0       588        60       590       100       590       105       615       105
GR      615       135       590       135     590.5       155     590.9       165     585.3       172
GR    585.1       178     584.1       184     588.4       190     590.6       197     592.5       200
GR    593.4       210       594       215       619       215       619       250       594       250
GR      592       270       592       315       598       360

X1     3945        27       200       221       175       175       175
GR      594         0       594        40       593        60       593        90       594        95
GR      596       125       621       125       621       155       596       155     595.8       190
GR    595.8       195     595.4       200     591.6       208     591.5       213     594.1       218
GR    596.7       221     598.5       226       600       230       600       250       625       250
GR      625       285       600       285       600       300       598       315       597       325
GR      596       355       604       390

X1     4295        21        91       111       300       400       350
GR      601         0       601        20       626        20       626        70       602        70
GR    601.4        90     600.9        91     597.8        97     597.6       104     597.7       107
GR    602.0       111     602.8       121       604       135       629       135       629       170
GR      604       170       604       190       602       205     601.8       210     601.8       240
GR      608       280

X1     4370        19       110       125       120        20        75
GR    603.5         0     603.5        35     628.5        35     628.5       100     605.1       100
GR    603.1       110     598.7       114     598.9       118     598.8       122     602.5       125
GR    603.3       135     628.3       135     628.3       160       604       160       604       175
GR      602       195     601.8       200     601.8       225       608       260

NC                         0.015       0.3       0.5
                MCKEEL STREET
X1     4405         9        95       105        35        35        35
X3       10                                                                  602     601.5
GR      602         0     602.3        91     601.3        94     597.7        95     598.5       105
GR    598.9       106     602.0       107     602.3       109       602       240

SB     1.25         2       2.5         0        10         2      20.6         0     598.7     597.7
X1     4480         8        95       105        75        75        75
X2                           1.0     601.3     601.8
X3       10                                                                  602     601.8
BT       -6         0     602.7         0       100     602.8         0       112     602.9         0
BT                140     602.7         0       200     602.3         0       240       608         0
GR      602         0       602        94     597.7        95     598.5       105     599.3       110
GR    601.6       111     602.9       113       602       240
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NC                        0.03
X1    4520        15       103       125        40        40        40
GR     606         0       606        25       631        25       631        70       606        70
GR   607.1        85     605.9       103     602.5       109     600.7       110     599.8       116
GR   599.9       122     605.7       125     604.5       135       610       185       612       195

QT       5       120       280       335       410       510
NC                                  0.1       0.3
X1    4630        11        80       102       110       110       110
GR   609.9         0     609.8        70     609.3        80     605.1        85     605.1        89
GR   605.2        93     609.5       102     609.8       112       610       130       612       150
GR     614       205

NC                                  0.3       0.5
X1    4695        15     107.8     112.2        80        50        65
X3      10                                                                 611.8     611.8
GR     614         0       612        85     611.2       102     609.6       104     609.2     107.8
GR   608.7       108     608.4       109     608.1       110     608.4       111     608.7       112
GR   609.2     112.2     609.9     115.5     611.2       118       612       130       614       220

NC                        0.015
               CRESTMONT DRIVE
X1    4696         0         0         0         1         1         1
BT     -13        85       612       612       102       613     611.2       104     613.1     609.6
BT              107.8     613.1     609.2       108     613.1     610.4       109     613.1     611.3
BT                110     613.1     611.5       111     613.1     611.3       112     613.1     610.4
BT              112.2     613.1     609.2     115.5     613.1     609.9       118     613.0     611.2
BT                130       612       612

X1    4990        16      27.8      32.2       260       260       294
BT     -11        21     619.5     619.5        25     619.5     615.8      27.8     619.6     615.8
BT                 28     619.6     616.6        29     619.6     617.7        30     619.6       618
BT                 31     619.6     617.7        32     619.6     616.6      32.2     619.6     615.8
BT                 35     619.6     615.8        39     619.6     619.6
GR     620         0     619.5        21     615.8        25     615.8      27.8       615        28
GR   613.8        29     613.5        30     613.8        31       615        32     615.8      32.2
GR   615.8        35     619.6        39       620        60       622        85       624       105
GR     625       160

NC                        0.03
X1    4991         0         0         0         1         1         1
X3      10                                                                 619.5     619.6

X1    5025        13        29        35        34        34        34
GR     620         0     619.9        20     619.8        25     619.3        29     615.8        31
GR   615.7        34     619.7        35     619.6        40     620.6        45       620        55
GR     622        75       624        85       626       160
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NC                                  0.1       0.3
X1    5135       12        74        90       120       100       110
GR     626        0     622.9        60     623.1        70     623.7        74     622.6        76
GR   621.6       80     621.6        84     624.1        90     624.3       100       626       105
GR     628      165       630       205

X1    5325       11       111       125       220       150       190
GR     637        0       636        70     635.2       100     634.4       111     632.9       113
GR   632.7      117     632.8       121     634.8       125     634.2       135       634       165
GR     636      220

NC                       0.015       0.3       0.5
             MT. HOPE AVENUE
X1    5375        7      72.8      77.2        40        60        50
X3      10                                                              638       638
GR     638        0       638        65       634      72.8       634      77.2       638        85
GR     638      140       640       145

SB       0      1.5       2.5         0       4.4         0      10.2         0     636.8     634.0
X1    5475        7      67.8      72.2       100       100       100
X2                        1.0     639.2     642.1
X3      10                                                              642       642
BT      -9        0       642         0        66     642.1         0      67.8     642.1         0
BT              67.8     642.1     639.2      72.2     642.3     639.2      72.2     642.3         0
BT                74     642.3         0       115       642         0       155       644         0
GR     642        0     642.1        66     635.8      67.8     635.8      72.2     642.3        74
GR     642      115       644       155

NC                       0.03
X1    5525       13       115       130        40        50        50
GR     646        0       644        45     643.6       105     641.3       115     637.6       118
GR   637.3      119     637.0       123     637.6       128     642.3       130     643.3       140
GR     644      160       646       185       648       210
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CCHV= 0.300 CEHV= 0.500
*SECNO 58.000
3280 CROSS SECTION 58.00 EXTENDED 0.65 FEET

CROSS SECTIONS TAKEN LOOKING DOWNSTREAM
HEC-2 BASED ON DOVER F.I.S. PREPARED BY THE RBA GROUP DATED 4/5/78
AND UPDATED TO NOV. 1994 AS PER SURVEY BY GOODKIND & O'DEA, INC.

**** THIS MODEL REPRESENTS PROPOSED CONDITIONS, i.e. INSTALLATION OF
A TWIN 4'x 8' BOX CULVERT FROM SECTION II IMPROVEMENTS TO AN
INLET LOCATED APPROX. 160' UPSTREAM OF COOPER STREET CROSSING.***

CONFLUENCE WITH THE ROCKAWAY RIVER

58.000	5.85	554.25	0.00	554.25	554.28	0.03	0.00	0.00	553.60
310.0	0.6	290.7	18.7	3.3	195.4	37.7	0.0	0.0	548.40
0.00	0.18	1.49	0.50	0.060	0.030	0.060	0.000	548.40	0.00
0.000109	0.	0.	0.	0	0	0	0.00	60.00	60.00

1490 NH CARD USED
*SECNO 59.000
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED
3280 CROSS SECTION 59.00 EXTENDED 0.64 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.50

3370 NORMAL BRIDGE, NRD= 11 MIN ELTRD= 549.00 MAX ELLC= 552.40

59.000	5.84	554.24	0.00	0.00	554.29	0.06	0.00	0.01	553.60
310.0	1.2	305.0	3.9	3.2	160.4	10.3	0.0	0.0	548.40
0.00	0.36	1.90	0.38	0.060	0.024	0.060	0.000	548.40	0.00
0.000439	1.	1.	1.	1	0	0	-62.10	60.00	60.00

1490 NH CARD USED
*SECNO 96.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED
3280 CROSS SECTION 96.00 EXTENDED 0.65 FEET

3370 NORMAL BRIDGE, NRD= 11 MIN ELTRD= 549.00 MAX ELLC= 552.60

96.000	5.66	554.26	0.00	0.00	554.31	0.06	0.02	0.00	553.60
310.0	1.2	304.9	3.9	3.2	160.6	10.4	0.2	0.1	548.60
0.01	0.36	1.90	0.38	0.060	0.024	0.060	0.000	548.60	0.00
0.000437	20.	37.	50.	0	0	0	-56.00	60.00	60.00

CCHV= 0.100 CEHV= 0.300
*SECNO 165.000

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 554.70 MAX ELLC= 553.00

165.000	5.43	554.23	0.00	0.00	554.38	0.15	0.04	0.03	549.00
310.0	0.0	310.0	0.0	0.0	100.0	0.0	0.4	0.1	548.80
0.01	0.00	3.10	0.00	0.000	0.015	0.000	0.000	548.80	4.46
0.000655	69.	69.	69.	2	0	0	-112.84	50.58	55.04

*SECNO 340.000

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 554.50 MAX ELLC= 554.00

340.000	5.04	554.34	0.00	0.00	554.49	0.15	0.11	0.00	550.00
310.0	0.0	310.0	0.0	0.0	100.0	0.0	0.8	0.3	549.30
0.03	0.00	3.10	0.00	0.000	0.015	0.000	0.000	549.30	6.34
0.000655	175.	175.	175.	1	0	0	-83.21	47.82	54.16

*SECNO 550.000

3370 NORMAL BRIDGE, NRD= 18 MIN ELTRD= 555.20 MAX ELLC= 553.90

550.000	4.58	554.48	0.00	0.00	554.70	0.22	0.18	0.02	550.20
310.0	0.0	310.0	0.0	0.0	82.4	0.0	1.2	0.6	549.90
0.04	0.00	3.76	0.00	0.000	0.015	0.000	0.000	549.90	5.44
0.001232	210.	210.	210.	0	0	0	-91.70	48.06	53.50

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 608.000

3370 NORMAL BRIDGE, NRD= 18 MIN ELTRD= 555.50 MAX ELLC= 554.30

608.000	4.55	554.55	0.00	0.00	554.77	0.22	0.07	0.00	552.00
310.0	0.0	310.0	0.0	0.0	82.4	0.0	1.3	0.6	550.00
0.05	0.00	3.76	0.00	0.000	0.015	0.000	0.000	550.00	8.92
0.001232	58.	58.	58.	1	0	0	-58.79	44.15	53.08

*SECNO 845.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 559.10 MAX ELLC= 558.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

845.000	1.73	555.73	555.73	0.00	556.60	0.87	0.50	0.19	554.00
310.0	0.0	310.0	0.0	0.0	41.5	0.0	1.7	0.9	554.00
0.06	0.00	7.47	0.00	0.000	0.015	0.000	0.000	554.00	12.61
0.004422	220.	237.	270.	20	12	0	-12.78	34.78	47.39

CCHV= 0.600 CEHV= 0.800
*SECNO 904.000

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 560.30 MAX ELLC= 559.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

904.000	2.26	557.26	557.26	0.00	558.40	1.14	0.27	0.22	555.00
310.0	0.0	310.0	0.0	0.0	36.1	0.0	1.7	0.9	555.00
0.06	0.00	8.58	0.00	0.000	0.015	0.000	0.000	555.00	16.53
0.004598	59.	59.	59.	20	15	0	-14.62	26.95	43.47

CCHV= 0.100 CEHV= 0.300
*SECNO 1000.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 562.00 MAX ELLC= 560.60

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1000.000	2.26	558.86	558.86	0.00	560.00	1.14	0.44	0.00	556.60
310.0	0.0	310.0	0.0	0.0	36.1	0.0	1.8	1.0	556.60
0.06	0.00	8.58	0.00	0.000	0.015	0.000	0.000	556.60	16.40
0.004598	96.	96.	96.	20	15	0	-14.91	27.20	43.60

*SECNO 1148.000

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 564.50 MAX ELLC= 562.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1148.000	2.26	560.66	560.66	0.00	561.80	1.14	0.68	0.00	558.40
310.0	0.0	310.0	0.0	0.0	36.1	0.0	1.9	1.0	558.40
0.07	0.00	8.58	0.00	0.000	0.015	0.000	0.000	558.40	16.56
0.004598	160.	148.	130.	20	15	0	-14.76	27.07	43.63

*SECNO 1264.000

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 567.50 MAX ELLC= 565.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1264.000	2.26	563.66	563.66	0.00	564.80	1.14	0.53	0.00	561.40
310.0	0.0	310.0	0.0	0.0	36.1	0.0	2.0	1.1	561.40
0.07	0.00	8.58	0.00	0.000	0.015	0.000	0.000	561.40	16.56
0.004598	116.	116.	116.	20	15	0	-14.55	26.89	43.44

*SECNO 1400.000

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 568.80 MAX ELLC= 567.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1400.000	2.26	565.66	565.66	0.00	566.80	1.14	0.63	0.00	563.40
310.0	0.0	310.0	0.0	0.0	36.1	0.0	2.1	1.2	563.40
0.07	0.00	8.58	0.00	0.000	0.015	0.000	0.000	563.40	16.40
0.004598	145.	136.	135.	20	15	0	-14.91	27.20	43.60

*SECNO 1500.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.04

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 569.00 MAX ELLC= 568.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 569.00 ELREA= 569.00

1500.000	3.15	566.75	0.00	0.00	567.08	0.33	0.20	0.08	564.00
310.0	0.0	310.0	0.0	0.0	66.8	0.0	2.2	1.3	563.60
0.08	0.00	4.64	0.00	0.000	0.015	0.000	0.000	563.60	27.00
0.001109	100.	100.	100.	3	0	0	-23.51	24.00	51.00

*SECNO 2070.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.60

3370 NORMAL BRIDGE, NRD= 15 MIN ELTRD= 572.30 MAX ELLC= 571.30

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 572.30 ELREA= 573.80

2070.000	2.39	568.39	0.00	0.00	569.09	0.71	1.90	0.11	567.10
310.0	0.0	310.0	0.0	0.0	45.9	0.0	3.7	1.9	566.00
0.12	0.00	6.75	0.00	0.000	0.015	0.000	0.000	566.00	49.00
0.003130	1090.	1090.	1090.	3	0	0	-9.75	24.00	73.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.300 CEHV= 0.500
*SECNO 2130.000

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 573.00 MAX ELLC= 571.50

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 573.00 ELREA= 574.00

JACKSON AVENUE

2130.000	2.36	568.46	568.46	0.00	569.33	0.87	0.15	0.08	571.00
310.0	0.0	310.0	0.0	0.0	41.5	0.0	3.7	1.9	566.10
0.13	0.00	7.47	0.00	0.000	0.015	0.000	0.000	566.10	100.00
0.004506	40.	40.	40.	1	12	0	-8.97	26.00	126.00

*SECNO 2180.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.59

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 573.00 MAX ELLC= 571.50

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 573.00 ELREA= 574.00

2180.000	3.04	569.14	0.00	0.00	569.59	0.45	0.13	0.13	571.00
310.0	0.0	310.0	0.0	0.0	57.7	0.0	3.7	1.9	566.10
0.13	0.00	5.37	0.00	0.000	0.015	0.000	0.000	566.10	100.00
0.001775	50.	50.	50.	4	0	0	-13.74	26.00	126.00

1490 NH CARD USED
*SECNO 2280.000
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED

3265 DIVIDED FLOW

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 574.00 MAX ELLC= 572.50

2280.000	2.87	569.27	0.00	0.00	569.91	0.64	0.23	0.10	566.40
310.0	0.0	310.0	0.0	0.0	48.2	0.0	3.9	2.0	572.50
0.13	0.00	6.43	0.00	0.000	0.017	0.000	0.000	566.40	36.33
0.003033	100.	100.	100.	2	0	0	-11.59	25.98	65.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 2390.000

3370 NORMAL BRIDGE, NRD= 15 MIN ELTRD= 574.50 MAX ELLC= 573.10

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 574.50 ELREA= 575.00

COOPER STREET

2390.000	3.39	570.09	0.00	0.00	570.26	0.17	0.20	0.14	574.00
220.0	0.0	220.0	0.0	0.0	66.5	0.0	4.0	2.0	566.70
0.14	0.00	3.31	0.00	0.000	0.020	0.000	0.000	566.70	100.00
0.001077	110.	110.	110.	3	0	0	-20.01	27.00	127.00

*SECNO 2440.000

3265 DIVIDED FLOW

3370 NORMAL BRIDGE, NRD= 15 MIN ELTRD= 574.50 MAX ELLC= 573.10

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 574.50 ELREA= 575.00

2440.000	3.34	570.14	0.00	0.00	570.32	0.19	0.06	0.01	573.10
220.0	0.0	220.0	0.0	0.0	63.7	0.0	4.1	2.1	566.80
0.15	0.00	3.46	0.00	0.000	0.020	0.000	0.000	566.80	104.84
0.001135	50.	50.	50.	2	0	0	-15.35	25.02	131.00

*SECNO 2600.000

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 575.00 MAX ELLC= 573.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 575.00 ELREA= 575.00

2600.000	3.32	570.32	0.00	0.00	570.51	0.19	0.18	0.00	569.00
220.0	0.0	220.0	0.0	0.0	63.5	0.0	4.3	2.2	567.00
0.16	0.00	3.46	0.00	0.000	0.020	0.000	0.000	567.00	51.00
0.001168	160.	160.	160.	0	0	0	-18.92	27.00	78.00

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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


*SECNO 2601.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      574.00 ELREA=      574.00

  2601.000      3.38    570.38      0.00      0.00    570.52      0.14      0.00      0.01    569.00
     220.0       0.0     220.0       0.0       0.0      73.3       0.0       4.3       2.2    567.00
      0.16      0.00      3.00      0.00     0.000     0.035     0.000     0.000    567.00     51.00
  0.001373        1.        1.        1.         2         0         0      0.00     27.00     78.00


*SECNO 2685.000

3265 DIVIDED FLOW

3280 CROSS SECTION   2685.00 EXTENDED      0.70 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  2685.000      2.30    573.30    573.30      0.00    573.79      0.49      0.70      0.18    573.30
     220.0      25.1     153.1      41.8      19.1      22.9      46.0       4.7       2.5    571.80
      0.17      1.32      6.70      0.91     0.150     0.035     0.150     0.000    571.00     52.47
  0.011664       240.      235.      180.        20        18         0      0.00     99.13    170.00


CCHV=    0.100 CEHV=    0.300
*SECNO 3020.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.54

  3020.000      2.83    575.83      0.00      0.00    576.18      0.35      2.38      0.01    574.60
     220.0       1.9     218.1       0.0       3.8      45.6       0.0       5.2       2.9    577.20
      0.19      0.49      4.79      0.00     0.150     0.035     0.000     0.000    573.00    108.85
  0.004891       290.      335.      310.         3         0         0      0.00     27.72    136.57


*SECNO 3250.000

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  0.68

  3250.000      2.07    577.27    577.26      0.00    577.75      0.48      1.53      0.04    576.60
     220.0       9.2     183.5      27.3       8.1      30.3      41.2       5.5       3.2    576.80
      0.20      1.14      6.05      0.66     0.080     0.035     0.150     0.000    575.20     50.14
  0.010515       230.      230.       90.         2        19         0      0.00    117.69    167.83
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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


*SECNO 3515.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  3515.000      2.23     581.43     581.43       0.00     582.30       0.87       3.00       0.12     583.30
     220.0       0.0      220.0        0.0        0.0       29.4        0.0        5.8        3.6     585.00
      0.21      0.00       7.49       0.00      0.000      0.030      0.000      0.000     579.20      38.83
  0.012381      250.       265.       250.         20          8          0       0.00      17.11      55.94


*SECNO 3770.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  3770.000      2.72     586.82     586.82       0.00     587.68       0.86       3.19       0.00     590.90
     220.0       0.0      220.0        0.0        0.0       29.6        0.0        6.0        3.7     588.40
      0.22      0.00       7.43       0.00      0.000      0.030      0.000      0.000     584.10     170.10
  0.012622      250.       255.       260.         17         11          0       0.00      17.69     187.79


*SECNO 3945.000

3265 DIVIDED FLOW

3280 CROSS SECTION   3945.00 EXTENDED      0.01 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  3945.000      2.51     594.01     594.01       0.00     594.44       0.42       1.84       0.04     595.40
     220.0      68.2      151.8        0.0       43.8       24.5        0.0        6.2        3.9     596.70
      0.23      1.56       6.19       0.00      0.080      0.030      0.000      0.000     591.50       0.00
  0.008891      175.       175.       175.         20         11          0       0.00     110.12     217.83


*SECNO 4295.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  4295.000      2.31     599.91     599.91       0.00     600.81       0.91       3.56       0.15     600.90
     220.0       0.0      220.0        0.0        0.0       28.8        0.0        6.6        4.4     602.00
      0.25      0.00       7.64       0.00      0.000      0.030      0.000      0.000     597.60      92.92
  0.012342      300.       350.       400.         20         11          0       0.00      16.13     109.05
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 4370.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4370.000	2.70	601.40	601.40	0.00	602.46	1.06	0.95	0.05	603.10
220.0	0.0	220.0	0.0	0.0	26.6	0.0	6.6	4.4	602.50
0.25	0.00	8.26	0.00	0.000	0.030	0.000	0.000	598.70	111.55
0.012948	120.	75.	20.	20	8	0	0.00	12.56	124.11

CCHV= 0.300 CEHV= 0.500
*SECNO 4405.000
3280 CROSS SECTION 4405.00 EXTENDED 0.34 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 5.92

MCKEEL STREET

4405.000	4.64	602.34	600.56	0.00	602.70	0.37	0.04	0.21	597.70
220.0	3.2	210.6	6.2	21.3	42.4	30.2	6.7	4.5	598.50
0.25	0.15	4.97	0.21	0.080	0.015	0.080	0.000	597.70	0.00
0.000369	35.	35.	35.	4	8	0	0.00	240.00	240.00

SPECIAL BRIDGE

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
1.25	2.00	2.50	0.00	10.00	2.00	20.60	0.00	598.70	597.70

*SECNO 4480.000

3265 DIVIDED FLOW

3280 CROSS SECTION 4480.00 EXTENDED 0.88 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.44

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
605.88	603.00	0.30	121.	99.	21.	21.	601.30	601.80	205.
4480.000	5.18	602.88	0.00	0.00	603.06	0.18	0.36	0.00	597.70
220.0	19.4	179.5	21.0	86.0	47.8	78.6	6.9	4.9	598.50
0.26	0.23	3.75	0.27	0.080	0.015	0.080	0.000	597.70	0.00
0.000179	75.	75.	75.	2	0	5	0.00	237.53	240.00

*SECNO 4520.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.16

4520.000	2.88	602.68	0.00	0.00	603.30	0.62	0.02	0.22	605.90
220.0	0.0	220.0	0.0	0.0	34.7	0.0	7.0	5.0	605.70
0.26	0.00	6.34	0.00	0.000	0.030	0.000	0.000	599.80	108.68
0.006635	40.	40.	40.	2	0	0	0.00	14.76	123.44

CCHV= 0.100 CEHV= 0.300
*SECNO 4630.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4630.000	1.72	606.82	606.82	0.00	607.50	0.68	0.91	0.02	609.30
120.0	0.0	120.0	0.0	0.0	18.1	0.0	7.1	5.1	609.50
0.26	0.00	6.63	0.00	0.000	0.030	0.000	0.000	605.10	82.95
0.013238	110.	110.	110.	20	14	0	0.00	13.45	96.40

CCHV= 0.300 CEHV= 0.500
*SECNO 4695.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 611.80 ELREA= 611.80

4695.000	3.20	611.30	611.30	0.00	612.72	1.43	0.81	0.37	609.20
120.0	0.0	120.0	0.0	0.0	12.5	0.0	7.1	5.1	609.20
0.26	0.00	9.58	0.00	0.000	0.030	0.000	0.000	608.10	107.80
0.011762	80.	65.	50.	20	14	0	0.00	4.40	112.20

*SECNO 4696.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 611.500 EGLC= 613.270 EGC= 613.314 WSEL= 613.107

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE, NRD= 13 MIN ELTRD= 612.00 MAX ELLC= 611.50

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
CRESTMONT DRIVE

4696.000	2.95	611.05	611.05	0.00	613.09	2.04	0.01	0.31	609.20
120.0	0.0	120.0	0.0	0.0	10.5	0.0	7.1	5.1	609.20
0.26	0.00	11.47	0.00	0.000	0.015	0.000	0.000	608.10	102.19
0.011985	1.	1.	1.	3	19	0	-14.73	15.51	117.71

*SECNO 4990.000

3370 NORMAL BRIDGE, NRD= 11 MIN ELTRD= 619.50 MAX ELLC= 618.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4990.000	3.36	616.86	616.86	0.00	618.52	1.66	2.85	0.11	615.80
120.0	0.0	120.0	0.0	0.0	11.6	0.0	7.2	5.2	615.80
0.27	0.00	10.34	0.00	0.000	0.015	0.000	0.000	613.50	23.85
0.008022	260.	294.	260.	20	15	0	-7.46	12.26	36.12

*SECNO 4991.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 619.50 ELREA= 619.60

4991.000	4.54	618.04	616.98	0.00	618.80	0.76	0.01	0.27	615.80
120.0	0.0	120.0	0.0	0.0	17.1	0.0	7.2	5.2	615.80
0.27	0.00	7.00	0.00	0.000	0.030	0.000	0.000	613.50	27.80
0.005885	1.	1.	1.	21	8	0	0.00	4.40	32.20

*SECNO 5025.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

5025.000	3.21	618.91	618.91	0.00	620.13	1.22	0.34	0.23	619.30
120.0	0.0	120.0	0.0	0.0	13.5	0.0	7.2	5.2	619.70
0.27	0.00	8.86	0.00	0.000	0.030	0.000	0.000	615.70	29.22
0.021079	34.	34.	34.	20	12	0	0.00	5.58	34.80

CCHV= 0.100 CEHV= 0.300
*SECNO 5135.000

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

5135.000	1.95	623.55	623.55	0.00	624.02	0.47	1.55	0.07	623.70
120.0	10.8	109.2	0.0	10.2	18.9	0.0	7.3	5.2	624.10
0.28	1.06	5.76	0.00	0.080	0.030	0.000	0.000	621.60	47.47
0.010043	120.	110.	100.	20	14	0	0.00	39.91	88.67

*SECNO 5325.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

5325.000	1.85	634.55	634.55	0.00	634.94	0.39	1.70	0.01	634.40
120.0	0.0	102.9	17.0	0.2	19.1	18.9	7.4	5.5	634.80
0.29	0.30	5.39	0.90	0.080	0.030	0.080	0.000	632.70	108.89
0.008127	220.	190.	150.	20	11	0	0.00	66.74	180.23

CCHV= 0.300 CEHV= 0.500
*SECNO 5375.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 638.00 ELREA= 638.00

MT. HOPE AVENUE

5375.000	2.84	636.84	636.84	0.00	638.27	1.43	0.20	0.52	634.00
120.0	0.0	120.0	0.0	0.0	12.5	0.0	7.4	5.5	634.00
0.29	0.00	9.61	0.00	0.000	0.015	0.000	0.000	634.00	72.80
0.002341	40.	50.	60.	20	14	0	0.00	4.40	77.20

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.50	2.50	0.00	4.40	0.00	10.20	0.00	636.80	634.00

*SECNO 5475.000

6070,LOW FLOW BY NORMAL BRIDGE

EGPRS= 640.062 EGLWC= 640.422 ELLC= 639.200 PCWSE= 636.838 ELTRD= 642.100

3370 NORMAL BRIDGE, NRD= 9 MIN ELTRD= 642.10 MAX ELLC= 639.20

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 642.00 ELREA= 642.00

5475.000	2.84	638.64	638.64	0.00	640.07	1.43	0.38	0.00	635.80
120.0	0.0	120.0	0.0	0.0	12.5	0.0	7.5	5.5	635.80
0.30	0.00	9.61	0.00	0.000	0.015	0.000	0.000	635.80	67.80
0.007073	100.	100.	100.	20	12	0	-1.11	4.40	72.20

*SECNO 5525.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.14

5525.000	3.43	640.43	0.00	0.00	640.60	0.17	0.14	0.38	641.30
120.0	0.0	120.0	0.0	0.0	36.7	0.0	7.5	5.5	642.30
0.30	0.00	3.27	0.00	0.000	0.030	0.000	0.000	637.00	115.71
0.001539	40.	50.	50.	4	0	0	0.00	13.50	129.20

T1 GOODKIND & O'DEA, INC. 60 FERONIA WAY, RUTHERFORD, NJ 07070
T2 McKEEL BROOK STORMWATER MANAGEMENT PLAN - ROCKAWAY AND DOVER, NJ
T3 PROPOSED 10 YEAR STORM

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	3	0	0	0	0	0	0	554.25	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	3	0	-1							

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 2

CCHV= 0.300 CEHV= 0.500
*SECNO 58.000
3280 CROSS SECTION 58.00 EXTENDED 0.65 FEET

CROSS SECTIONS TAKEN LOOKING DOWNSTREAM
HEC-2 BASED ON DOVER F.I.S. PREPARED BY THE RBA GROUP DATED 4/5/78
AND UPDATED TO NOV. 1994 AS PER SURVEY BY GOODKIND & O'DEA, INC.

**** THIS MODEL REPRESENTS PROPOSED CONDITIONS, i.e. INSTALLATION OF
A TWIN 4'x 8' BOX CULVERT FROM SECTION II IMPROVEMENTS TO AN
INLET LOCATED APPROX. 160' UPSTREAM OF COOPER STREET CROSSING.***

CONFLUENCE WITH THE ROCKAWAY RIVER

58.000	5.85	554.25	0.00	554.25	554.41	0.16	0.00	0.00	553.60
690.0	1.3	647.1	41.6	3.3	195.4	37.7	0.0	0.0	548.40
0.00	0.40	3.31	1.10	0.060	0.030	0.060	0.000	548.40	0.00
0.000542	0.	0.	0.	0	0	0	0.00	60.00	60.00

1490 NH CARD USED
*SECNO 59.000
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED
3280 CROSS SECTION 59.00 EXTENDED 0.59 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.49

3370 NORMAL BRIDGE, NRD= 11 MIN ELTRD= 549.00 MAX ELLC= 552.40

59.000	5.79	554.19	0.00	0.00	554.47	0.28	0.00	0.06	553.60
690.0	2.3	680.0	7.7	3.0	158.3	9.4	0.0	0.0	548.40
0.00	0.77	4.30	0.81	0.060	0.024	0.060	0.000	548.40	0.00
0.002282	1.	1.	1.	2	0	0	-62.10	60.00	60.00

1490 NH CARD USED
*SECNO 96.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED
3280 CROSS SECTION 96.00 EXTENDED 0.69 FEET

3370 NORMAL BRIDGE, NRD= 11 MIN ELTRD= 549.00 MAX ELLC= 552.60

96.000	5.69	554.29	0.00	0.00	554.56	0.27	0.08	0.00	553.60
690.0	2.8	677.6	9.5	3.5	162.3	11.1	0.2	0.1	548.60
0.00	0.81	4.18	0.86	0.060	0.024	0.060	0.000	548.60	0.00
0.002085	20.	37.	50.	2	0	0	-56.00	60.00	60.00

CCHV= 0.100 CEHV= 0.300
*SECNO 165.000

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 554.70 MAX ELLC= 553.00

165.000	5.34	554.14	0.00	0.00	554.88	0.74	0.18	0.14	549.00
690.0	0.0	690.0	0.0	0.0	100.0	0.0	0.4	0.1	548.80
0.01	0.00	6.90	0.00	0.000	0.015	0.000	0.000	548.80	4.63
0.003247	69.	69.	69.	2	0	0	-108.43	50.23	54.86

*SECNO 340.000
3280 CROSS SECTION 340.00 EXTENDED 0.41 FEET

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 554.50 MAX ELLC= 554.00

340.000	5.61	554.91	0.00	0.00	555.47	0.56	0.58	0.02	550.00
690.0	4.9	680.0	5.2	6.2	112.0	6.6	0.8	0.4	549.30
0.01	0.78	6.07	0.78	0.060	0.015	0.060	0.000	549.30	0.00
0.003360	175.	175.	175.	2	0	0	-91.35	60.00	60.00

*SECNO 550.000
3280 CROSS SECTION 550.00 EXTENDED 0.47 FEET

3370 NORMAL BRIDGE, NRD= 18 MIN ELTRD= 555.20 MAX ELLC= 553.90

550.000	5.77	555.67	0.00	0.00	556.41	0.74	0.89	0.05	550.20
690.0	7.1	674.7	8.2	6.6	96.5	7.5	1.4	0.7	549.90
0.02	1.08	6.99	1.08	0.060	0.015	0.060	0.000	549.90	0.00
0.005449	210.	210.	210.	2	0	0	-127.45	60.00	60.00

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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


*SECNO 608.000
3280 CROSS SECTION    608.00 EXTENDED      0.49 FEET


3370 NORMAL BRIDGE, NRD=  18 MIN ELTRD=   555.50 MAX ELLC=   554.30

  608.000      6.00    556.00      0.00      0.00    556.73      0.73      0.31      0.00    552.00
    690.0       7.6     673.8       8.7       6.9      97.1       7.9       1.5       0.7    550.00
     0.02      1.10      6.94      1.10     0.060     0.015     0.060     0.000    550.00      0.00
 0.005316       58.       58.       58.         2         0         0   -103.10     60.00     60.00


*SECNO 845.000

3301 HV CHANGED MORE THAN HVINS


3370 NORMAL BRIDGE, NRD=  14 MIN ELTRD=   559.10 MAX ELLC=   558.00

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  845.000      2.94    556.94    556.94      0.00    558.42      1.49      1.20      0.23    554.00
    690.0       0.0     690.0       0.0       0.0      70.5       0.0       2.0       1.0    554.00
     0.03      0.00      9.78      0.00     0.000     0.015     0.000     0.000    554.00     10.24
 0.004826      220.      237.      270.         3        16         0    -28.70     39.53     49.76


CCHV=    0.600 CEHV=    0.800
*SECNO 904.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   559.000 EGLC=   560.805 EGC=   562.028 WSEL=   560.819

3370 NORMAL BRIDGE, NRD=  10 MIN ELTRD=   560.30 MAX ELLC=   559.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  904.000      3.90    558.90    558.90      0.00    560.80      1.90      0.29      0.33    555.00
    690.0       0.0     690.0       0.0       0.0      62.4       0.0       2.1       1.1    555.00
     0.03      0.00     11.07      0.00     0.000     0.015     0.000     0.000    555.00     13.28
 0.005039       59.       59.       59.        20        21         0    -37.88     33.44     46.72
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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


CCHV=    0.100 CEHV=    0.300
*SECNO 1000.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   560.600 EGLC=   562.405 EGC=   563.728 WSEL=   562.518

3370 NORMAL BRIDGE, NRD=  10 MIN ELTRD=   562.00 MAX ELLC=   560.60

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1000.000      3.90    560.50    560.50      0.00    562.40      1.90      0.48      0.00    556.60
     690.0       0.0     690.0       0.0       0.0      62.4       0.0       2.3       1.1    556.60
      0.03      0.00     11.07      0.00     0.000     0.015     0.000     0.000    556.60     13.06
  0.005039       96.       96.       96.        20        21         0    -38.73     33.88     46.94


*SECNO 1148.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   562.400 EGLC=   564.205 EGC=   566.228 WSEL=   565.013

3370 NORMAL BRIDGE, NRD=  10 MIN ELTRD=   564.50 MAX ELLC=   562.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1148.000      3.90    562.30    562.30      0.00    564.20      1.90      0.75      0.00    558.40
     690.0       0.0     690.0       0.0       0.0      62.4       0.0       2.5       1.2    558.40
      0.04      0.00     11.07      0.00     0.000     0.015     0.000     0.000    558.40     13.33
  0.005039      160.      148.      130.        20        21         0    -38.29     33.65     46.99


*SECNO 1264.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   565.400 EGLC=   567.205 EGC=   569.228 WSEL=   568.013

3370 NORMAL BRIDGE, NRD=  10 MIN ELTRD=   567.50 MAX ELLC=   565.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1264.000      3.90    565.30    565.30      0.00    567.20      1.90      0.58      0.00    561.40
     690.0       0.0     690.0       0.0       0.0      62.4       0.0       2.6       1.3    561.40
      0.04      0.00     11.07      0.00     0.000     0.015     0.000     0.000    561.40     13.33
  0.005039      116.      116.      116.        20        21         0    -37.67     33.33     46.67
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 1400.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 567.400 EGLC= 569.205 EGC= 570.528 WSEL= 569.318

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 568.80 MAX ELLC= 567.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1400.000	3.90	567.30	567.30	0.00	569.20	1.90	0.69	0.00	563.40
690.0	0.0	690.0	0.0	0.0	62.4	0.0	2.8	1.4	563.40
0.04	0.00	11.07	0.00	0.000	0.015	0.000	0.000	563.40	13.06
0.005039	145.	136.	135.	20	21	0	-38.73	33.88	46.94

*SECNO 1500.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 569.00 MAX ELLC= 568.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 569.00 ELREA= 569.00

1500.000	5.21	568.81	0.00	0.00	569.77	0.95	0.47	0.09	564.00
690.0	0.0	690.0	0.0	0.0	88.0	0.0	3.0	1.5	563.60
0.05	0.00	7.84	0.00	0.000	0.015	0.000	0.000	563.60	27.00
0.004442	100.	100.	100.	3	0	0	-82.25	24.00	51.00

*SECNO 2070.000
3280 CROSS SECTION 2070.00 EXTENDED 1.03 FEET

3370 NORMAL BRIDGE, NRD= 15 MIN ELTRD= 572.30 MAX ELLC= 571.30

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 572.30 ELREA= 573.80

2070.000	7.33	573.33	0.00	0.00	573.94	0.61	4.14	0.03	567.10
690.0	71.1	618.9	0.0	50.1	94.1	0.0	5.9	2.7	566.00
0.10	1.42	6.58	0.00	0.060	0.015	0.000	0.000	566.00	0.00
0.003279	1090.	1090.	1090.	3	0	0	-134.45	73.00	73.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.300 CEHV= 0.500
*SECNO 2130.000
3280 CROSS SECTION 2130.00 EXTENDED 1.44 FEET

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 573.00 MAX ELLC= 571.50

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 573.00 ELREA= 574.00

JACKSON AVENUE

2130.000	7.34	573.44	569.68	0.00	574.12	0.68	0.14	0.04	571.00
690.0	38.6	651.4	0.0	43.5	95.6	0.0	6.0	2.8	566.10
0.10	0.89	6.82	0.00	0.060	0.015	0.000	0.000	566.10	0.00
0.003897	40.	40.	40.	4	14	0	-277.23	126.00	126.00

*SECNO 2180.000
3280 CROSS SECTION 2180.00 EXTENDED 1.89 FEET

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 573.00 MAX ELLC= 571.50

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 573.00 ELREA= 574.00

2180.000	7.80	573.90	0.00	0.00	574.35	0.45	0.16	0.07	571.00
690.0	107.1	582.9	0.0	89.4	99.5	0.0	6.2	3.0	566.10
0.10	1.20	5.86	0.00	0.060	0.015	0.000	0.000	566.10	0.00
0.002753	50.	50.	50.	3	0	0	-290.22	126.00	126.00

1490 NH CARD USED
*SECNO 2280.000
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.55

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 574.00 MAX ELLC= 572.50

2280.000	7.58	573.98	570.27	0.00	575.19	1.21	0.46	0.38	566.40
690.0	0.0	690.0	0.0	0.0	78.1	0.0	6.5	3.2	572.50
0.11	0.00	8.84	0.00	0.000	0.018	0.000	0.000	566.40	27.05
0.009191	100.	100.	100.	8	15	0	-150.02	52.86	79.91

*SECNO 2390.000
3280 CROSS SECTION 2390.00 EXTENDED 2.15 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.00

3370 NORMAL BRIDGE, NRD= 15 MIN ELTRD= 574.50 MAX ELLC= 573.10

COOPER STREET

2390.000	9.06	575.76	0.00	0.00	575.87	0.11	0.35	0.33	574.00
530.0	131.5	385.7	12.8	125.3	125.2	17.3	7.0	3.4	566.70
0.12	1.05	3.08	0.74	0.060	0.020	0.060	0.000	566.70	0.00
0.001353	110.	110.	110.	3	0	0	-233.10	150.00	150.00

*SECNO 2440.000
3280 CROSS SECTION 2440.00 EXTENDED 1.81 FEET

3370 NORMAL BRIDGE, NRD= 15 MIN ELTRD= 574.50 MAX ELLC= 573.10

2440.000	9.01	575.81	0.00	0.00	575.97	0.16	0.08	0.02	573.10
530.0	85.1	431.8	13.2	71.3	122.6	15.4	7.3	3.6	566.80
0.12	1.19	3.52	0.86	0.060	0.020	0.060	0.000	566.80	50.00
0.001673	50.	50.	50.	2	0	0	-191.93	100.00	150.00

*SECNO 2600.000
3280 CROSS SECTION 2600.00 EXTENDED 1.08 FEET

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 575.00 MAX ELLC= 573.00

2600.000	9.08	576.08	0.00	0.00	576.23	0.15	0.26	0.00	569.00
530.0	55.7	428.5	45.8	55.0	125.1	45.3	8.0	4.0	567.00
0.14	1.01	3.42	1.01	0.060	0.020	0.060	0.000	567.00	0.00
0.001554	160.	160.	160.	2	0	0	-202.00	120.00	120.00

*SECNO 2601.000
3280 CROSS SECTION 2601.00 EXTENDED 1.20 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.30

2601.000	9.20	576.20	0.00	0.00	576.26	0.06	0.00	0.03	569.00
530.0	20.5	478.1	31.4	97.0	230.3	114.2	8.1	4.0	567.00
0.14	0.21	2.08	0.28	0.150	0.035	0.150	0.000	567.00	0.00
0.000143	1.	1.	1.	2	0	0	0.00	120.00	120.00

*SECNO 2685.000
3280 CROSS SECTION 2685.00 EXTENDED 3.65 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.40

2685.000	5.25	576.25	0.00	0.00	576.33	0.08	0.07	0.01	573.30
530.0	174.2	202.4	153.4	286.7	58.3	223.3	10.6	4.7	571.80
0.17	0.61	3.47	0.69	0.150	0.035	0.150	0.000	571.00	0.00
0.000899	240.	235.	180.	2	0	0	0.00	170.00	170.00

CCHV= 0.100 CEHV= 0.300
*SECNO 3020.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3020.000	3.39	576.39	576.39	0.00	577.62	1.23	0.74	0.35	574.60
530.0	8.5	521.5	0.0	8.0	58.1	0.0	12.8	5.4	577.20
0.18	1.06	8.98	0.00	0.150	0.035	0.000	0.000	573.00	106.04
0.013589	290.	335.	310.	20	14	0	0.00	31.94	137.98

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 3250.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.05

3250.000	3.52	578.72	0.00	0.00	578.94	0.22	1.22	0.10	576.60
530.0	78.2	285.7	166.1	57.6	56.3	214.1	13.5	5.8	576.80
0.20	1.36	5.07	0.78	0.080	0.035	0.150	0.000	575.20	22.46
0.003237	230.	230.	90.	2	0	0	0.00	201.13	223.58

*SECNO 3515.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3515.000	3.65	582.85	582.85	0.00	584.23	1.37	1.43	0.35	583.30
530.0	0.0	530.0	0.0	0.0	56.4	0.0	14.6	6.4	585.00
0.21	0.00	9.40	0.00	0.000	0.030	0.000	0.000	579.20	35.92
0.011185	250.	265.	250.	20	8	0	0.00	20.85	56.76

*SECNO 3770.000

3265 DIVIDED FLOW

3280 CROSS SECTION 3770.00 EXTENDED 0.57 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3770.000	4.47	588.57	588.57	0.00	589.41	0.84	2.14	0.05	590.90
530.0	37.5	492.5	0.0	37.6	64.7	0.0	15.1	6.8	588.40
0.22	1.00	7.61	0.02	0.080	0.030	0.080	0.000	584.10	0.00
0.006545	250.	255.	260.	20	11	0	0.00	94.08	190.55

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 3945.000

3265 DIVIDED FLOW

3280 CROSS SECTION 3945.00 EXTENDED 0.66 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3945.000	3.16	594.66	594.66	0.00	595.24	0.58	1.49	0.03	595.40
530.0	247.0	283.0	0.0	108.9	35.0	0.0	15.6	7.2	596.70
0.23	2.27	8.09	0.00	0.080	0.030	0.000	0.000	591.50	0.00
0.011546	175.	175.	175.	20	13	0	0.00	122.06	218.65

*SECNO 4295.000

3265 DIVIDED FLOW

3280 CROSS SECTION 4295.00 EXTENDED 0.48 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4295.000	3.88	601.48	601.48	0.00	602.73	1.24	3.47	0.20	600.90
530.0	10.6	519.4	0.0	10.1	57.5	0.0	16.4	7.8	602.00
0.24	1.05	9.04	0.00	0.080	0.030	0.000	0.000	597.60	0.00
0.009220	300.	350.	400.	20	11	0	0.00	43.32	110.52

*SECNO 4370.000

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4370.000	4.45	603.15	603.15	0.00	604.08	0.93	0.59	0.03	603.10
530.0	0.0	434.6	95.4	0.0	51.2	54.6	16.5	7.9	602.50
0.24	0.02	8.49	1.75	0.080	0.030	0.080	0.000	598.70	109.73
0.007692	120.	75.	20.	20	8	0	0.00	72.64	232.65

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.300 CEHV= 0.500
*SECNO 4405.000
3280 CROSS SECTION 4405.00 EXTENDED 2.01 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 5.19

MCKEEL STREET

4405.000	6.32	604.02	0.00	0.00	604.30	0.28	0.03	0.19	597.70
530.0	84.4	322.9	122.6	180.7	59.1	256.7	16.7	8.0	598.50
0.25	0.47	5.46	0.48	0.080	0.015	0.080	0.000	597.70	0.00
0.000285	35.	35.	35.	4	0	0	0.00	240.00	240.00

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 600.83 , NOT 604.02 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	2.00	2.50	0.00	10.00	2.00	20.60	0.00	598.70	597.70

*SECNO 4480.000
6870 D.S. ENERGY OF 604.30 IS HIGHER THAN COMPUTED ENERGY OF 604.05
3280 CROSS SECTION 4480.00 EXTENDED 2.01 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
624.58	606.48	0.00	505.	21.	21.	21.	601.30	601.80	212.

4480.000	6.31	604.01	0.00	0.00	604.30	0.29	0.00	0.00	597.70
530.0	95.2	324.6	110.2	193.6	59.1	231.4	17.6	8.4	598.50
0.25	0.49	5.49	0.48	0.080	0.015	0.080	0.000	597.70	0.00
0.000288	75.	75.	75.	2	0	6	0.00	240.00	240.00

*SECNO 4520.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4520.000	4.03	603.83	603.83	0.00	605.37	1.55	0.03	0.63	605.90
530.0	0.0	530.0	0.0	0.0	53.1	0.0	17.8	8.5	605.70
0.25	0.00	9.98	0.00	0.000	0.030	0.000	0.000	599.80	106.66
0.011978	40.	40.	40.	20	14	0	0.00	17.37	124.03

CCHV= 0.100 CEHV= 0.300
*SECNO 4630.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4630.000	2.79	607.89	607.89	0.00	608.92	1.03	1.31	0.05	609.30
280.0	0.0	280.0	0.0	0.0	34.4	0.0	17.9	8.6	609.50
0.26	0.00	8.14	0.00	0.000	0.030	0.000	0.000	605.10	81.67
0.011891	110.	110.	110.	20	19	0	0.00	16.97	98.64

CCHV= 0.300 CEHV= 0.500
*SECNO 4695.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4695.000	4.42	612.52	612.52	0.00	613.18	0.66	0.53	0.11	609.20
280.0	68.7	154.4	56.9	37.3	17.9	31.7	18.0	8.7	609.20
0.26	1.84	8.63	1.80	0.080	0.030	0.080	0.000	608.10	63.05
0.005919	80.	65.	50.	20	14	0	0.00	90.19	153.24

*SECNO 4696.000

3370 NORMAL BRIDGE, NRD= 13 MIN ELTRD= 612.00 MAX ELLC= 611.50

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3720 CRITICAL DEPTH ASSUMED

CRESTMONT DRIVE

4696.000	5.36	613.46	613.46	0.00	613.80	0.35	0.01	0.09	609.20
280.0	92.7	99.0	88.4	63.5	12.8	61.3	18.0	8.7	609.20
0.26	1.46	7.73	1.44	0.080	0.015	0.080	0.000	608.10	23.13
0.008755	1.	1.	1.	20	9	0	-72.64	172.39	195.51

*SECNO 4990.000

3280 CROSS SECTION 4990.00 EXTENDED 0.95 FEET

3370 NORMAL BRIDGE, NRD= 11 MIN ELTRD= 619.50 MAX ELLC= 618.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3693 PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

4990.000	7.45	620.95	620.95	0.00	621.58	0.63	1.96	0.14	615.80
280.0	56.6	165.1	58.3	34.8	20.1	38.8	18.7	9.4	615.80
0.27	1.63	8.20	1.50	0.080	0.015	0.080	0.000	613.50	0.00
0.005883	260.	294.	260.	20	10	0	-45.90	71.82	71.82

*SECNO 4991.000

3280 CROSS SECTION 4991.00 EXTENDED 1.62 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.78

4991.000	8.12	621.62	0.00	0.00	621.73	0.11	0.00	0.15	615.80
280.0	72.7	127.7	79.6	71.4	32.9	86.5	18.7	9.4	615.80
0.27	1.02	3.89	0.92	0.080	0.030	0.080	0.000	613.50	0.00
0.000763	1.	1.	1.	3	0	0	0.00	80.22	80.22

*SECNO 5025.000

3280 CROSS SECTION 5025.00 EXTENDED 1.60 FEET

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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  0.50

  5025.000      5.90     621.60       0.00       0.00     621.85       0.25       0.05       0.07     619.30
     280.0      71.7      155.5       52.8       49.9       29.5       43.0       18.9        9.5     619.70
      0.28      1.44       5.26       1.23      0.080      0.030      0.080      0.000     615.70       0.00
  0.003084       34.        34.        34.          2          0          0       0.00      70.98      70.98


CCHV=    0.100 CEHV=    0.300
*SECNO 5135.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  5135.000      2.69     624.29     624.29       0.00     624.93       0.64       0.56       0.12     623.70
     280.0      60.4      219.3        0.3       35.0       30.4        0.9       19.1        9.6     624.10
      0.28      1.73       7.22       0.38      0.080      0.030      0.080      0.000     621.60      33.19
  0.009736      120.       110.       100.         20         14          0       0.00      66.07      99.26


*SECNO 5325.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  5325.000      2.46     635.16     635.16       0.00     635.67       0.51       1.71       0.01     634.40
     280.0       3.5      189.3       87.2        3.9       27.5       56.7       19.4       10.0     634.80
      0.29      0.90       6.89       1.54      0.080      0.030      0.080      0.000     632.70     100.60
  0.008596      220.       190.       150.         20         15          0       0.00      96.22     196.81


CCHV=    0.300 CEHV=    0.500
*SECNO 5375.000
3280 CROSS SECTION   5375.00 EXTENDED      0.86 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
              MT. HOPE AVENUE
  5375.000      4.86     638.86     638.86       0.00     639.59       0.73       0.10       0.11     634.00
     280.0      51.1      181.6       47.3       78.5       21.4       70.8       19.6       10.1     634.00
      0.29      0.65       8.48       0.67      0.080      0.015      0.080      0.000     634.00       0.00
  0.000890       40.        50.        60.         20         14          0       0.00     142.16     142.16
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.50	2.50	0.00	4.40	0.00	10.20	0.00	636.80	634.00

*SECNO 5475.000

3301 HV CHANGED MORE THAN HVINS

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
656.42	643.49	0.00	149.	131.	10.	11.	639.20	642.10	129.

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 642.00 ELREA= 642.00

5475.000	4.99	640.79	640.79	0.00	643.32	2.52	0.13	-0.13	635.80
280.0	0.0	280.0	0.0	0.0	22.0	0.0	19.8	10.3	635.80
0.30	0.00	12.75	0.00	0.000	0.015	0.000	0.000	635.80	67.80
0.001940	100.	100.	100.	20	8	0	0.00	4.40	72.20

*SECNO 5525.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.97

5525.000	6.95	643.95	0.00	0.00	644.08	0.13	0.04	0.72	641.30
280.0	9.2	264.5	6.4	23.9	88.4	17.4	19.9	10.3	642.30
0.30	0.38	2.99	0.37	0.080	0.030	0.080	0.000	637.00	53.23
0.000502	40.	50.	50.	4	0	0	0.00	105.20	158.43

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T1      GOODKIND & O'DEA, INC.  60 FERONIA WAY, RUTHERFORD, NJ  07070
T2      McKEEL BROOK STORMWATER MANAGEMENT PLAN - ROCKAWAY AND DOVER, NJ
T3      PROPOSED   25 YEAR STORM

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0         4         0         0         0         0         0         0    554.25

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      3         0        -1
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 3

CCHV= 0.300 CEHV= 0.500
*SECNO 58.000
3280 CROSS SECTION 58.00 EXTENDED 0.65 FEET

CROSS SECTIONS TAKEN LOOKING DOWNSTREAM
HEC-2 BASED ON DOVER F.I.S. PREPARED BY THE RBA GROUP DATED 4/5/78
AND UPDATED TO NOV. 1994 AS PER SURVEY BY GOODKIND & O'DEA, INC.

**** THIS MODEL REPRESENTS PROPOSED CONDITIONS, i.e. INSTALLATION OF
A TWIN 4'x 8' BOX CULVERT FROM SECTION II IMPROVEMENTS TO AN
INLET LOCATED APPROX. 160' UPSTREAM OF COOPER STREET CROSSING.***

CONFLUENCE WITH THE ROCKAWAY RIVER

58.000	5.85	554.25	0.00	554.25	554.47	0.22	0.00	0.00	553.60
805.0	1.5	755.0	48.5	3.3	195.4	37.7	0.0	0.0	548.40
0.00	0.47	3.86	1.29	0.060	0.030	0.060	0.000	548.40	0.00
0.000738	0.	0.	0.	0	0	0	0.00	60.00	60.00

1490 NH CARD USED
*SECNO 59.000
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED
3280 CROSS SECTION 59.00 EXTENDED 0.57 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.48

3370 NORMAL BRIDGE, NRD= 11 MIN ELTRD= 549.00 MAX ELLC= 552.40

59.000	5.77	554.17	0.00	0.00	554.56	0.39	0.00	0.09	553.60
805.0	2.5	794.0	8.5	2.8	157.4	9.1	0.0	0.0	548.40
0.00	0.89	5.05	0.93	0.060	0.024	0.060	0.000	548.40	0.00
0.003174	1.	1.	1.	2	0	0	-62.10	60.00	60.00

1490 NH CARD USED
*SECNO 96.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED
3280 CROSS SECTION 96.00 EXTENDED 0.72 FEET

3370 NORMAL BRIDGE, NRD= 11 MIN ELTRD= 549.00 MAX ELLC= 552.60

96.000	5.72	554.32	0.00	0.00	554.68	0.36	0.11	0.01	553.60
805.0	3.4	789.8	11.7	3.6	163.4	11.5	0.2	0.1	548.60
0.00	0.96	4.83	1.02	0.060	0.024	0.060	0.000	548.60	0.00
0.002771	20.	37.	50.	2	0	0	-56.00	60.00	60.00

CCHV= 0.100 CEHV= 0.300
*SECNO 165.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 554.70 MAX ELLC= 553.00

165.000	5.30	554.10	552.04	0.00	555.11	1.01	0.24	0.19	549.00
805.0	0.0	805.0	0.0	0.0	100.0	0.0	0.4	0.1	548.80
0.00	0.00	8.05	0.00	0.000	0.015	0.000	0.000	548.80	4.70
0.004419	69.	69.	69.	4	15	0	-106.64	50.08	54.79

*SECNO 340.000
3280 CROSS SECTION 340.00 EXTENDED 0.69 FEET

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 554.50 MAX ELLC= 554.00

340.000	5.90	555.20	0.00	0.00	555.83	0.64	0.69	0.04	550.00
805.0	11.7	780.9	12.5	10.4	120.2	11.1	0.9	0.4	549.30
0.01	1.12	6.50	1.12	0.060	0.015	0.060	0.000	549.30	0.00
0.003505	175.	175.	175.	3	0	0	-91.35	60.00	60.00

*SECNO 550.000
3280 CROSS SECTION 550.00 EXTENDED 0.78 FEET

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE, NRD= 18 MIN ELTRD= 555.20 MAX ELLC= 553.90

550.000	6.08	555.98	0.00	0.00	556.77	0.79	0.89	0.05	550.20
805.0	16.0	770.6	18.4	10.9	105.8	12.5	1.5	0.7	549.90
0.02	1.47	7.29	1.47	0.060	0.015	0.060	0.000	549.90	0.00
0.005236	210.	210.	210.	2	0	0	-127.45	60.00	60.00

*SECNO 608.000
3280 CROSS SECTION 608.00 EXTENDED 0.78 FEET

3370 NORMAL BRIDGE, NRD= 18 MIN ELTRD= 555.50 MAX ELLC= 554.30

608.000	6.28	556.28	0.00	0.00	557.07	0.79	0.30	0.00	552.00
805.0	16.1	770.4	18.5	11.0	105.9	12.5	1.7	0.7	550.00
0.02	1.47	7.27	1.48	0.060	0.015	0.060	0.000	550.00	0.00
0.005208	58.	58.	58.	2	0	0	-103.10	60.00	60.00

*SECNO 845.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 559.10 MAX ELLC= 558.00

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

845.000	3.26	557.26	557.26	0.00	558.90	1.65	1.20	0.26	554.00
805.0	0.0	805.0	0.0	0.0	78.2	0.0	2.3	1.0	554.00
0.03	0.00	10.30	0.00	0.000	0.015	0.000	0.000	554.00	9.61
0.004954	220.	237.	270.	4	12	0	-33.82	40.77	50.39

CCHV= 0.600 CEHV= 0.800
*SECNO 904.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 559.000 EGLC= 561.457 EGC= 562.399 WSEL= 561.167

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 559.000 EGLC= 561.457 EGC= 561.461 WSEL= 558.984

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 560.30 MAX ELLC= 559.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

904.000	4.00	559.00	559.00	0.00	561.46	2.46	0.42	0.65	555.00
805.0	0.0	805.0	0.0	0.0	64.0	0.0	2.3	1.1	555.00
0.03	0.00	12.58	0.00	0.000	0.015	0.000	0.000	555.00	13.08
0.010985	59.	59.	59.	20	18	0	-39.70	33.85	46.92

CCHV= 0.100 CEHV= 0.300
*SECNO 1000.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 560.600 EGLC= 563.057 EGC= 564.099 WSEL= 562.866

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 560.600 EGLC= 563.057 EGC= 563.060 WSEL= 560.584

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 562.00 MAX ELLC= 560.60

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1000.000	4.00	560.60	560.60	0.00	563.06	2.46	1.05	0.00	556.60
805.0	0.0	805.0	0.0	0.0	64.0	0.0	2.5	1.1	556.60
0.03	0.00	12.58	0.00	0.000	0.015	0.000	0.000	556.60	12.85
0.010985	96.	96.	96.	20	18	0	-40.59	34.30	47.15

*SECNO 1148.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 562.400 EGLC= 564.857 EGC= 566.599 WSEL= 565.366

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 562.400 EGLC= 564.857 EGC= 564.861 WSEL= 562.384

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 564.50 MAX ELLC= 562.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY

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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


3720 CRITICAL DEPTH ASSUMED
  1148.000      4.00     562.40     562.40       0.00     564.86       2.46       1.63       0.00     558.40
     805.0       0.0      805.0        0.0        0.0       64.0        0.0        2.7        1.3     558.40
      0.04      0.00      12.58       0.00      0.000      0.015      0.000      0.000     558.40      13.13
  0.010985      160.       148.       130.         20         18          0     -40.13      34.07      47.20


*SECNO 1264.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   565.400 EGLC=   567.857 EGC=   569.599 WSEL=   568.367

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   565.400 EGLC=   567.857 EGC=   567.861 WSEL=   565.384

3370 NORMAL BRIDGE, NRD=  10 MIN ELTRD=   567.50 MAX ELLC=   565.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1264.000      4.00     565.40     565.40       0.00     567.86       2.46       1.27       0.00     561.40
     805.0       0.0      805.0        0.0        0.0       64.0        0.0        2.9        1.3     561.40
      0.04      0.00      12.58       0.00      0.000      0.015      0.000      0.000     561.40      13.13
  0.010985      116.       116.       116.         20         18          0     -39.48      33.74      46.87


*SECNO 1400.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   567.400 EGLC=   569.857 EGC=   570.899 WSEL=   569.666

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF   567.400 EGLC=   569.857 EGC=   569.861 WSEL=   567.384

3370 NORMAL BRIDGE, NRD=  10 MIN ELTRD=   568.80 MAX ELLC=   567.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  1400.000      4.00     567.40     567.40       0.00     569.86       2.46       1.49       0.00     563.40
     805.0       0.0      805.0        0.0        0.0       64.0        0.0        3.1        1.4     563.40
      0.04      0.00      12.58       0.00      0.000      0.015      0.000      0.000     563.40      12.85
  0.010985      145.       136.       135.         20         18          0     -40.59      34.30      47.15


*SECNO 1500.000
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3280 CROSS SECTION 1500.00 EXTENDED 0.97 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.76

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 569.00 MAX ELLC= 568.00

1500.000	6.37	569.97	0.00	0.00	570.61	0.64	0.58	0.18	564.00
805.0	36.6	742.8	25.5	26.1	111.2	18.3	3.3	1.6	563.60
0.05	1.41	6.68	1.39	0.060	0.015	0.060	0.000	563.60	0.00
0.003534	100.	100.	100.	5	0	0	-115.30	70.00	70.00

*SECNO 2070.000
3280 CROSS SECTION 2070.00 EXTENDED 1.50 FEET

3370 NORMAL BRIDGE, NRD= 15 MIN ELTRD= 572.30 MAX ELLC= 571.30

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3710 WSEL ASSUMED BASED ON MIN DIFF

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 572.30 ELREA= 573.80

2070.000	7.80	573.80	569.83	0.00	574.42	0.62	3.81	1.02	567.10
805.0	136.1	668.9	0.0	73.0	97.3	0.0	7.4	3.4	566.00
0.10	1.86	6.88	0.00	0.060	0.015	0.000	0.000	566.00	0.00
0.003464	1090.	1090.	1090.	20	17	0	-148.60	73.00	73.00

CCHV= 0.300 CEHV= 0.500
*SECNO 2130.000
3280 CROSS SECTION 2130.00 EXTENDED 2.22 FEET

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 573.00 MAX ELLC= 571.50

JACKSON AVENUE

2130.000	8.11	574.21	0.00	0.00	574.61	0.40	0.13	0.07	571.00
805.0	191.1	611.3	2.6	121.8	106.2	5.2	7.6	3.5	566.10
0.10	1.57	5.76	0.50	0.060	0.015	0.060	0.000	566.10	0.00
0.003136	40.	40.	40.	7	0	0	-319.20	150.00	150.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 2180.000
3280 CROSS SECTION 2180.00 EXTENDED 2.49 FEET

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 573.00 MAX ELLC= 571.50

2180.000	8.38	574.48	0.00	0.00	574.78	0.29	0.13	0.03	571.00
805.0	223.9	572.7	8.3	148.6	113.1	11.7	7.9	3.6	566.10
0.10	1.51	5.06	0.71	0.060	0.015	0.060	0.000	566.10	0.00
0.002228	50.	50.	50.	2	0	0	-319.20	150.00	150.00

1490 NH CARD USED
*SECNO 2280.000
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 572.500 EGLC= 574.150 EGC= 575.623 WSEL= 574.669
3280 CROSS SECTION 2280.00 EXTENDED 0.51 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.44

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 574.00 MAX ELLC= 572.50

2280.000	8.10	574.50	570.29	0.00	575.62	1.12	0.43	0.41	566.40
805.0	31.6	762.9	10.5	19.8	87.5	6.9	8.3	3.9	572.50
0.11	1.60	8.72	1.53	0.060	0.018	0.060	0.000	566.40	0.00
0.011391	100.	100.	100.	4	25	0	-155.86	80.00	80.00

*SECNO 2390.000
3280 CROSS SECTION 2390.00 EXTENDED 2.56 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.45

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE, NRD= 15 MIN ELTRD= 574.50 MAX ELLC= 573.10

COOPER STREET

2390.000	9.46	576.16	0.00	0.00	576.26	0.10	0.33	0.31	574.00
630.0	194.5	411.4	24.1	166.1	136.2	26.7	8.9	4.2	566.70
0.12	1.17	3.02	0.90	0.060	0.020	0.060	0.000	566.70	0.00
0.001162	110.	110.	110.	3	0	0	-233.10	150.00	150.00

*SECNO 2440.000
3280 CROSS SECTION 2440.00 EXTENDED 2.20 FEET

3370 NORMAL BRIDGE, NRD= 15 MIN ELTRD= 574.50 MAX ELLC= 573.10

2440.000	9.40	576.20	0.00	0.00	576.36	0.16	0.07	0.03	573.10
630.0	126.8	478.9	24.3	92.6	133.0	22.8	9.2	4.3	566.80
0.12	1.37	3.60	1.07	0.060	0.020	0.060	0.000	566.80	50.00
0.001571	50.	50.	50.	2	0	0	-191.93	100.00	150.00

*SECNO 2600.000
3280 CROSS SECTION 2600.00 EXTENDED 1.46 FEET

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 575.00 MAX ELLC= 573.00

2600.000	9.46	576.46	0.00	0.00	576.60	0.14	0.24	0.00	569.00
630.0	88.1	469.7	72.3	74.3	135.3	61.2	10.2	4.7	567.00
0.14	1.18	3.47	1.18	0.060	0.020	0.060	0.000	567.00	0.00
0.001438	160.	160.	160.	2	0	0	-202.00	120.00	120.00

*SECNO 2601.000
3280 CROSS SECTION 2601.00 EXTENDED 1.55 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.89

2601.000	9.55	576.55	0.00	0.00	576.62	0.08	0.00	0.02	569.00
630.0	28.3	561.4	40.3	114.9	239.8	129.0	10.2	4.7	567.00
0.14	0.25	2.34	0.31	0.150	0.035	0.150	0.000	567.00	0.00
0.000172	1.	1.	1.	2	0	0	0.00	120.00	120.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

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*SECNO 2685.000
3280 CROSS SECTION   2685.00 EXTENDED      4.02 FEET


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  0.43

  2685.000      5.62    576.62      0.00      0.00    576.70      0.08      0.08      0.00    573.30
     630.0     214.8     233.0     182.2     322.5      62.7     245.2      13.0       5.5    571.80
      0.17      0.67      3.72      0.74     0.150     0.035     0.150     0.000    571.00      0.00
  0.000936      240.      235.      180.         2         0         0      0.00    170.00    170.00


CCHV=    0.100 CEHV=    0.300
*SECNO 3020.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  3020.000      3.75    576.75    576.75      0.00    578.05      1.31      0.75      0.37    574.60
     630.0      13.9     616.1       0.0      11.5      66.4       0.0      15.5       6.2    577.20
      0.18      1.21      9.27      0.00     0.150     0.035     0.000     0.000    573.00    104.47
  0.012781      290.      335.      310.        20        14         0      0.00     34.40    138.87


*SECNO 3250.000

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.12

  3250.000      3.84    579.04      0.00      0.00    579.25      0.21      1.09      0.11    576.60
     630.0     103.3     315.5     211.2      73.8      62.1     258.1      16.3       6.6    576.80
      0.20      1.40      5.08      0.82     0.080     0.035     0.150     0.000    575.20     16.81
  0.002846      230.      230.       90.         2         0         0      0.00    208.38    225.20


*SECNO 3515.000

3301 HV CHANGED MORE THAN HVINS
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3515.000	4.02	583.22	583.22	0.00	584.72	1.50	1.31	0.39	583.30
630.0	0.0	630.0	0.0	0.0	64.2	0.0	17.6	7.3	585.00
0.21	0.00	9.81	0.00	0.000	0.030	0.000	0.000	579.20	35.16
0.010988	250.	265.	250.	20	8	0	0.00	21.81	56.97

*SECNO 3770.000

3265 DIVIDED FLOW

3280 CROSS SECTION 3770.00 EXTENDED 0.81 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3770.000	4.71	588.81	588.81	0.00	589.70	0.89	2.15	0.06	590.90
630.0	68.9	560.9	0.1	55.2	70.0	0.3	18.2	7.6	588.40
0.22	1.25	8.02	0.51	0.080	0.030	0.080	0.000	584.10	0.00
0.006669	250.	255.	260.	20	8	0	0.00	99.89	191.30

*SECNO 3945.000

3265 DIVIDED FLOW

3280 CROSS SECTION 3945.00 EXTENDED 0.87 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3945.000	3.37	594.87	594.87	0.00	595.44	0.56	1.47	0.03	595.40
630.0	314.6	315.4	0.0	131.0	38.6	0.0	18.8	8.1	596.70
0.23	2.40	8.18	0.00	0.080	0.030	0.000	0.000	591.50	0.00
0.010925	175.	175.	175.	20	14	0	0.00	125.85	218.89

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 4295.000

3265 DIVIDED FLOW

3280 CROSS SECTION 4295.00 EXTENDED 1.12 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4295.000	4.52	602.12	602.12	0.00	603.11	0.99	2.72	0.13	600.90
630.0	41.0	581.8	7.2	31.6	70.0	11.1	19.8	8.9	602.00
0.24	1.30	8.31	0.65	0.080	0.030	0.080	0.000	597.60	0.00
0.006249	300.	350.	400.	20	11	0	0.00	100.39	242.05

*SECNO 4370.000

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4370.000	4.76	603.46	603.46	0.00	604.41	0.95	0.47	0.00	603.10
630.0	0.2	490.1	139.8	0.3	55.7	73.3	20.0	9.0	602.50
0.24	0.50	8.79	1.91	0.080	0.030	0.080	0.000	598.70	108.20
0.007352	120.	75.	20.	20	8	0	0.00	80.76	234.37

CCHV= 0.300 CEHV= 0.500
*SECNO 4405.000
3280 CROSS SECTION 4405.00 EXTENDED 2.33 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 5.00

MCKEEL STREET

4405.000	6.64	604.34	0.00	0.00	604.63	0.29	0.03	0.20	597.70
630.0	111.0	358.2	160.8	211.1	62.3	299.9	20.3	9.2	598.50
0.25	0.53	5.75	0.54	0.080	0.015	0.080	0.000	597.70	0.00
0.000294	35.	35.	35.	4	0	0	0.00	240.00	240.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 601.21 , NOT 604.34 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
1.25	2.00	2.50	0.00	10.00	2.00	20.60	0.00	598.70	597.70

*SECNO 4480.000
6870 D.S. ENERGY OF 604.63 IS HIGHER THAN COMPUTED ENERGY OF 604.37
3280 CROSS SECTION 4480.00 EXTENDED 2.33 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
633.38	607.40	0.00	611.	20.	21.	21.	601.30	601.80	214.
4480.000	6.63	604.33	0.00	0.00	604.63	0.30	0.00	0.00	597.70
630.0	123.2	361.0	145.8	223.4	62.3	273.9	21.2	9.6	598.50
0.25	0.55	5.79	0.53	0.080	0.015	0.080	0.000	597.70	0.00
0.000300	75.	75.	75.	2	0	10	0.00	240.00	240.00

*SECNO 4520.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4520.000	4.45	604.25	604.25	0.00	605.93	1.68	0.04	0.69	605.90
630.0	0.0	630.0	0.0	0.0	60.6	0.0	21.5	9.7	605.70
0.25	0.00	10.39	0.00	0.000	0.030	0.000	0.000	599.80	105.91
0.011778	40.	40.	40.	20	14	0	0.00	18.34	124.25

CCHV= 0.100 CEHV= 0.300
*SECNO 4630.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

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    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  4630.000      3.09     608.18     608.18       0.00     609.30       1.12       1.29       0.06     609.30
     335.0       0.0      335.0        0.0        0.0       39.5        0.0       21.7        9.7     609.50
      0.26      0.00       8.49       0.00      0.000      0.030      0.000      0.000     605.10      81.33
  0.011641      110.       110.       110.         20         19          0       0.00      17.92      99.25


CCHV=    0.300 CEHV=    0.500
*SECNO 4695.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  4695.000      4.67     612.77     612.77       0.00     613.40       0.63       0.52       0.15     609.20
     335.0      90.9      167.8       76.3       50.2       19.0       43.7       21.8        9.8     609.20
      0.26      1.81       8.82       1.74      0.080      0.030      0.080      0.000     608.10      52.12
  0.005700       80.        65.        50.         20         11          0       0.00     112.69     164.81


*SECNO 4696.000

3370 NORMAL BRIDGE, NRD=  13 MIN ELTRD=   612.00 MAX ELLC=   611.50

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
              CRESTMONT DRIVE
  4696.000      5.45     613.55     613.55       0.00     613.93       0.38       0.01       0.07     609.20
     335.0     115.1      110.1      109.8       71.2       13.2       69.0       21.8        9.8     609.20
      0.26      1.62       8.34       1.59      0.080      0.015      0.080      0.000     608.10      19.33
  0.009795        1.         1.         1.         20         13          0     -72.64     180.20     199.53


*SECNO 4990.000
3280 CROSS SECTION   4990.00 EXTENDED      1.09 FEET


3370 NORMAL BRIDGE, NRD=  11 MIN ELTRD=   619.50 MAX ELLC=   618.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  4990.000      7.59     621.09     621.09       0.00     621.80       0.72       2.22       0.17     615.80
     335.0      72.3      186.3       76.5       38.7       20.8       44.5       22.6       10.6     615.80
      0.27      1.87       8.97       1.72      0.080      0.015      0.080      0.000     613.50       0.00
  0.006764      260.       294.       260.         20          9          0     -45.90      73.59      73.59
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 4991.000
3280 CROSS SECTION 4991.00 EXTENDED 1.84 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.74

4991.000	8.34	621.84	0.00	0.00	621.98	0.14	0.00	0.17	615.80
335.0	89.0	145.8	100.2	77.6	33.8	97.6	22.6	10.6	615.80
0.27	1.15	4.31	1.03	0.080	0.030	0.080	0.000	613.50	0.00
0.000901	1.	1.	1.	3	0	0	0.00	83.03	83.03

*SECNO 5025.000
3280 CROSS SECTION 5025.00 EXTENDED 1.83 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.52

5025.000	6.13	621.83	0.00	0.00	622.10	0.27	0.05	0.07	619.30
335.0	90.9	173.1	71.0	56.7	30.9	51.7	22.7	10.7	619.70
0.28	1.60	5.60	1.37	0.080	0.030	0.080	0.000	615.70	0.00
0.003274	34.	34.	34.	2	0	0	0.00	73.32	73.32

CCHV= 0.100 CEHV= 0.300
*SECNO 5135.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

5135.000	2.87	624.47	624.47	0.00	625.16	0.69	0.58	0.13	623.70
335.0	79.5	253.4	2.1	43.0	33.4	2.8	23.0	10.8	624.10
0.28	1.85	7.59	0.75	0.080	0.030	0.080	0.000	621.60	29.53
0.009466	120.	110.	100.	20	14	0	0.00	70.99	100.51

*SECNO 5325.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

5325.000	2.60	635.30	635.30	0.00	635.85	0.54	1.70	0.01	634.40
335.0	6.1	215.3	113.6	5.8	29.6	67.6	23.4	11.2	634.80
0.29	1.07	7.28	1.68	0.080	0.030	0.080	0.000	632.70	96.09
0.008734	220.	190.	150.	20	15	0	0.00	104.78	200.87

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.300 CEHV= 0.500
*SECNO 5375.000
3280 CROSS SECTION 5375.00 EXTENDED 1.08 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
MT. HOPE AVENUE

5375.000	5.08	639.08	639.08	0.00	639.85	0.77	0.11	0.11	634.00
335.0	69.1	202.4	63.6	94.3	22.4	85.0	23.5	11.4	634.00
0.29	0.73	9.05	0.75	0.080	0.015	0.080	0.000	634.00	0.00
0.000955	40.	50.	60.	20	14	0	0.00	142.70	142.70

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.50	2.50	0.00	4.40	0.00	10.20	0.00	636.80	634.00

*SECNO 5475.000
3280 CROSS SECTION 5475.00 EXTENDED 1.08 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
664.21	644.32	0.00	206.	130.	10.	11.	639.20	642.10	132.

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3710 WSEL ASSUMED BASED ON MIN DIFF
3693 PROBABLE MINIMUM SPECIFIC ENERGY

5475.000	7.28	643.08	641.43	0.00	644.06	0.98	0.07	-0.07	635.80
335.0	33.4	279.0	22.5	75.6	32.0	57.2	24.0	11.7	635.80
0.30	0.44	8.71	0.39	0.080	0.015	0.080	0.000	635.80	0.00
0.000547	100.	100.	100.	20	8	0	0.00	136.64	136.64

*SECNO 5525.000

3301 HV CHANGED MORE THAN HVINS

5525.000	7.18	644.18	0.00	0.00	644.34	0.16	0.03	0.25	641.30
335.0	16.7	307.3	11.0	40.8	92.0	24.7	24.1	11.8	642.30
0.30	0.41	3.34	0.44	0.080	0.030	0.080	0.000	637.00	40.85
0.000594	40.	50.	50.	2	0	0	0.00	121.46	162.31

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T1      GOODKIND & O'DEA, INC.  60 FERONIA WAY, RUTHERFORD, NJ  07070
T2      McKEEL BROOK STORMWATER MANAGEMENT PLAN - ROCKAWAY AND DOVER, NJ
T3      PROPOSED  50 YEAR STORM

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0         5         0         0         0         0         0         0    554.25

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      4         0        -1
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 4

CCHV= 0.300 CEHV= 0.500
*SECNO 58.000
3280 CROSS SECTION 58.00 EXTENDED 0.65 FEET

CROSS SECTIONS TAKEN LOOKING DOWNSTREAM
HEC-2 BASED ON DOVER F.I.S. PREPARED BY THE RBA GROUP DATED 4/5/78
AND UPDATED TO NOV. 1994 AS PER SURVEY BY GOODKIND & O'DEA, INC.

**** THIS MODEL REPRESENTS PROPOSED CONDITIONS, i.e. INSTALLATION OF
A TWIN 4'x 8' BOX CULVERT FROM SECTION II IMPROVEMENTS TO AN
INLET LOCATED APPROX. 160' UPSTREAM OF COOPER STREET CROSSING.***

CONFLUENCE WITH THE ROCKAWAY RIVER

58.000	5.85	554.25	0.00	554.25	554.59	0.34	0.00	0.00	553.60
1010.0	1.9	947.2	60.9	3.3	195.4	37.7	0.0	0.0	548.40
0.00	0.58	4.85	1.61	0.060	0.030	0.060	0.000	548.40	0.00
0.001162	0.	0.	0.	0	0	0	0.00	60.00	60.00

1490 NH CARD USED
*SECNO 59.000
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED
3280 CROSS SECTION 59.00 EXTENDED 0.51 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.47

3370 NORMAL BRIDGE, NRD= 11 MIN ELTRD= 549.00 MAX ELLC= 552.40

59.000	5.71	554.11	0.00	0.00	554.74	0.64	0.00	0.15	553.60
1010.0	2.7	998.2	9.1	2.5	155.1	8.1	0.0	0.0	548.40
0.00	1.07	6.44	1.12	0.060	0.024	0.060	0.000	548.40	0.00
0.005268	1.	1.	1.	2	0	0	-62.10	60.00	60.00

1490 NH CARD USED
*SECNO 96.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED
3280 CROSS SECTION 96.00 EXTENDED 0.82 FEET

3370 NORMAL BRIDGE, NRD= 11 MIN ELTRD= 549.00 MAX ELLC= 552.60

96.000	5.81	554.41	0.00	0.00	554.94	0.53	0.17	0.03	553.60
1010.0	5.1	987.5	17.4	4.1	167.2	13.1	0.2	0.1	548.60
0.00	1.24	5.91	1.33	0.060	0.024	0.060	0.000	548.60	0.00
0.004012	20.	37.	50.	2	0	0	-56.00	60.00	60.00

CCHV= 0.100 CEHV= 0.300
*SECNO 165.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 554.70 MAX ELLC= 553.00

165.000	5.23	554.03	552.61	0.00	555.62	1.58	0.36	0.32	549.00
1010.0	0.0	1010.0	0.0	0.0	100.0	0.0	0.4	0.1	548.80
0.00	0.00	10.10	0.00	0.000	0.015	0.000	0.000	548.80	4.84
0.006957	69.	69.	69.	6	18	0	-103.19	49.80	54.64

*SECNO 340.000
3280 CROSS SECTION 340.00 EXTENDED 1.32 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.47

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 554.50 MAX ELLC= 554.00

340.000	6.53	555.83	0.00	0.00	556.50	0.68	0.80	0.09	550.00
1010.0	31.8	944.1	34.1	19.8	138.3	21.2	0.9	0.4	549.30
0.01	1.60	6.82	1.61	0.060	0.015	0.060	0.000	549.30	0.00
0.003202	175.	175.	175.	3	0	0	-91.35	60.00	60.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 550.000
3280 CROSS SECTION 550.00 EXTENDED 1.32 FEET

3370 NORMAL BRIDGE, NRD= 18 MIN ELTRD= 555.20 MAX ELLC= 553.90

550.000	6.62	556.52	0.00	0.00	557.36	0.84	0.81	0.05	550.20
1010.0	36.2	932.3	41.5	18.5	122.1	21.2	1.8	0.7	549.90
0.02	1.95	7.64	1.96	0.060	0.015	0.060	0.000	549.90	0.00
0.004752	210.	210.	210.	2	0	0	-127.45	60.00	60.00

*SECNO 608.000
3280 CROSS SECTION 608.00 EXTENDED 1.29 FEET

3370 NORMAL BRIDGE, NRD= 18 MIN ELTRD= 555.50 MAX ELLC= 554.30

608.000	6.79	556.79	0.00	0.00	557.65	0.86	0.28	0.01	552.00
1010.0	35.1	934.4	40.5	18.1	121.1	20.6	2.0	0.7	550.00
0.02	1.95	7.72	1.96	0.060	0.015	0.060	0.000	550.00	0.00
0.004903	58.	58.	58.	2	0	0	-103.10	60.00	60.00

*SECNO 845.000

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 559.10 MAX ELLC= 558.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

845.000	3.84	557.84	557.84	0.00	559.71	1.86	1.17	0.30	554.00
1010.0	0.0	1010.0	0.0	0.0	92.2	0.0	2.7	1.0	554.00
0.03	0.00	10.96	0.00	0.000	0.015	0.000	0.000	554.00	8.47
0.004987	220.	237.	270.	20	18	0	-44.30	43.06	51.53

CCHV= 0.600 CEHV= 0.800
*SECNO 904.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 559.000 EGLC= 562.867 EGC= 562.981 WSEL= 561.588

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 559.000 EGLC= 562.867 EGC= 562.872 WSEL= 558.995

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 560.30 MAX ELLC= 559.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

904.000	4.00	559.00	559.00	0.00	562.87	3.87	0.50	1.60	555.00
1010.0	0.0	1010.0	0.0	0.0	64.0	0.0	2.8	1.1	555.00
0.03	0.00	15.78	0.00	0.000	0.015	0.000	0.000	555.00	13.08
0.017292	59.	59.	59.	20	19	0	-39.70	33.85	46.92

CCHV= 0.100 CEHV= 0.300
*SECNO 1000.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 560.600 EGLC= 564.467 EGC= 564.681 WSEL= 563.286

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 560.600 EGLC= 564.467 EGC= 564.472 WSEL= 560.595

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 562.00 MAX ELLC= 560.60

1000.000	4.06	560.66	560.60	0.00	564.53	3.87	1.66	0.00	556.60
1010.0	0.0	1010.0	0.0	0.0	64.0	0.0	2.9	1.1	556.60
0.03	0.00	15.78	0.00	0.000	0.015	0.000	0.000	556.60	12.73
0.017292	96.	96.	96.	0	19	0	-42.65	34.54	47.27

*SECNO 1148.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 562.400 EGLC= 566.267 EGC= 567.181 WSEL= 565.773

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 562.400 EGLC= 566.267 EGC= 566.272 WSEL= 562.395

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 564.50 MAX ELLC= 562.40

1148.000	4.82	563.22	562.40	0.00	567.09	3.87	2.56	0.00	558.40
1010.0	0.0	1010.0	0.0	0.0	64.0	0.0	3.1	1.3	558.40
0.03	0.00	15.78	0.00	0.000	0.015	0.000	0.000	558.40	11.52
0.017292	160.	148.	130.	4	19	0	-69.38	37.36	48.88

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 1264.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 565.400 EGLC= 569.267 EGC= 570.181 WSEL= 568.773

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 565.400 EGLC= 569.267 EGC= 569.272 WSEL= 565.395

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 567.50 MAX ELLC= 565.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1264.000	4.00	565.40	565.40	0.00	569.27	3.87	2.01	0.00	561.40
1010.0	0.0	1010.0	0.0	0.0	64.0	0.0	3.3	1.4	561.40
0.03	0.00	15.78	0.00	0.000	0.015	0.000	0.000	561.40	13.13
0.017292	116.	116.	116.	20	19	0	-39.48	33.74	46.87

*SECNO 1400.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 567.400 EGLC= 571.267 EGC= 571.481 WSEL= 570.086

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 567.400 EGLC= 571.267 EGC= 571.272 WSEL= 567.395

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 568.80 MAX ELLC= 567.40

1400.000	4.35	567.75	567.40	0.00	571.62	3.87	2.35	0.00	563.40
1010.0	0.0	1010.0	0.0	0.0	64.0	0.0	3.5	1.5	563.40
0.04	0.00	15.78	0.00	0.000	0.015	0.000	0.000	563.40	12.14
0.017292	145.	136.	135.	4	19	0	-52.90	35.73	47.86

*SECNO 1500.000
3280 CROSS SECTION 1500.00 EXTENDED 2.97 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.80

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 569.00 MAX ELLC= 568.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
1500.000	8.37	571.97	0.00	0.00	572.27	0.30	0.30	0.36	564.00
1010.0	132.8	786.5	90.6	80.2	159.3	56.4	3.9	1.6	563.60
0.04	1.66	4.94	1.61	0.060	0.015	0.060	0.000	563.60	0.00
0.001195	100.	100.	100.	4	0	0	-115.30	70.00	70.00

*SECNO 2070.000
3280 CROSS SECTION 2070.00 EXTENDED 1.75 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.48

3370 NORMAL BRIDGE, NRD= 15 MIN ELTRD= 572.30 MAX ELLC= 571.30

2070.000	8.05	574.05	0.00	0.00	574.78	0.73	2.38	0.13	567.10
1010.0	215.3	790.0	4.7	85.4	103.3	6.7	10.1	3.7	566.00
0.09	2.52	7.65	0.70	0.060	0.015	0.060	0.000	566.00	0.00
0.005186	1090.	1090.	1090.	8	0	0	-164.10	100.00	100.00

CCHV= 0.300 CEHV= 0.500
*SECNO 2130.000
3280 CROSS SECTION 2130.00 EXTENDED 2.65 FEET

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 573.00 MAX ELLC= 571.50

JACKSON AVENUE

2130.000	8.55	574.65	0.00	0.00	575.04	0.38	0.15	0.10	571.00
1010.0	303.1	691.5	15.4	165.4	117.5	15.7	10.3	3.8	566.10
0.09	1.83	5.88	0.98	0.060	0.015	0.060	0.000	566.10	0.00
0.002862	40.	40.	40.	5	0	0	-319.20	150.00	150.00

*SECNO 2180.000
3280 CROSS SECTION 2180.00 EXTENDED 2.88 FEET

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 573.00 MAX ELLC= 571.50

2180.000	8.78	574.88	0.00	0.00	575.19	0.30	0.13	0.02	571.00
1010.0	329.3	658.6	22.1	188.1	123.4	21.2	10.7	4.0	566.10
0.10	1.75	5.34	1.04	0.060	0.015	0.060	0.000	566.10	0.00
0.002204	50.	50.	50.	2	0	0	-319.20	150.00	150.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

1490 NH CARD USED
*SECNO 2280.000
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 572.500 EGLC= 575.098 EGC= 576.088 WSEL= 574.959
3280 CROSS SECTION 2280.00 EXTENDED 0.83 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.42

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 574.00 MAX ELLC= 572.50

2280.000	8.43	574.83	570.39	0.00	576.11	1.28	0.43	0.49	566.40
1010.0	77.5	906.3	26.2	33.3	94.9	11.7	11.2	4.3	572.50
0.10	2.32	9.55	2.24	0.060	0.018	0.060	0.000	566.40	0.00
0.012253	100.	100.	100.	6	29	0	-155.86	80.00	80.00

*SECNO 2390.000
3280 CROSS SECTION 2390.00 EXTENDED 3.09 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.69

3370 NORMAL BRIDGE, NRD= 15 MIN ELTRD= 574.50 MAX ELLC= 573.10

COOPER STREET

2390.000	9.98	576.68	0.00	0.00	576.78	0.09	0.31	0.36	574.00
790.0	289.5	458.5	42.0	218.6	150.4	38.8	11.9	4.6	566.70
0.11	1.32	3.05	1.08	0.060	0.020	0.060	0.000	566.70	0.00
0.001038	110.	110.	110.	2	0	0	-233.10	150.00	150.00

*SECNO 2440.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3280 CROSS SECTION 2440.00 EXTENDED 2.71 FEET

3370 NORMAL BRIDGE, NRD= 15 MIN ELTRD= 574.50 MAX ELLC= 573.10

2440.000	9.91	576.71	0.00	0.00	576.88	0.17	0.06	0.04	573.10
790.0	192.6	554.6	42.9	120.5	146.6	32.5	12.3	4.7	566.80
0.12	1.60	3.78	1.32	0.060	0.020	0.060	0.000	566.80	50.00
0.001524	50.	50.	50.	2	0	0	-191.93	100.00	150.00

*SECNO 2600.000
3280 CROSS SECTION 2600.00 EXTENDED 1.97 FEET

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 575.00 MAX ELLC= 573.00

2600.000	9.97	576.97	0.00	0.00	577.11	0.15	0.23	0.01	569.00
790.0	140.0	535.3	114.7	100.4	149.1	82.6	13.5	5.1	567.00
0.13	1.39	3.59	1.39	0.060	0.020	0.060	0.000	567.00	0.00
0.001352	160.	160.	160.	2	0	0	-202.00	120.00	120.00

*SECNO 2601.000
3280 CROSS SECTION 2601.00 EXTENDED 2.02 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.48

2601.000	10.02	577.02	0.00	0.00	577.13	0.10	0.00	0.01	569.00
790.0	42.1	692.6	55.3	139.2	252.6	149.0	13.5	5.1	567.00
0.13	0.30	2.74	0.37	0.150	0.035	0.150	0.000	567.00	0.00
0.000220	1.	1.	1.	2	0	0	0.00	120.00	120.00

*SECNO 2685.000
3280 CROSS SECTION 2685.00 EXTENDED 4.52 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.47

2685.000	6.12	577.12	0.00	0.00	577.22	0.10	0.09	0.00	573.30
790.0	280.3	281.6	228.1	371.6	68.7	275.2	16.6	5.8	571.80
0.16	0.75	4.10	0.83	0.150	0.035	0.150	0.000	571.00	0.00
0.001007	240.	235.	180.	2	0	0	0.00	170.00	170.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.100 CEHV= 0.300
*SECNO 3020.000

3265 DIVIDED FLOW

3280 CROSS SECTION 3020.00 EXTENDED 0.27 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3020.000	4.27	577.27	577.27	0.00	578.67	1.40	0.78	0.39	574.60
790.0	25.1	763.9	0.9	17.4	79.1	3.4	19.5	6.7	577.20
0.17	1.44	9.65	0.27	0.150	0.035	0.150	0.000	573.00	102.62
0.011701	290.	335.	310.	20	15	0	0.00	64.23	335.00

*SECNO 3250.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.21

3250.000	4.32	579.52	0.00	0.00	579.72	0.19	0.93	0.12	576.60
790.0	146.6	360.9	282.5	101.7	70.8	325.2	20.5	7.1	576.80
0.19	1.44	5.10	0.87	0.080	0.035	0.150	0.000	575.20	8.33
0.002403	230.	230.	90.	2	0	0	0.00	219.29	227.62

*SECNO 3515.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3515.000	4.50	583.70	583.70	0.00	585.43	1.73	1.16	0.46	583.30
790.0	0.7	789.3	0.0	1.0	74.8	0.0	22.2	7.9	585.00
0.20	0.66	10.56	0.00	0.080	0.030	0.000	0.000	579.20	30.01
0.010789	250.	265.	250.	20	8	0	0.00	27.24	57.25

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 3770.000

3265 DIVIDED FLOW

3280 CROSS SECTION 3770.00 EXTENDED 1.18 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3770.000	5.08	589.18	589.18	0.00	590.10	0.92	2.09	0.08	590.90
790.0	131.6	657.6	0.8	84.8	78.4	1.0	22.9	8.2	588.40
0.21	1.55	8.39	0.77	0.080	0.030	0.080	0.000	584.10	0.00
0.006480	250.	255.	260.	20	8	0	0.00	108.97	192.49

*SECNO 3945.000

3265 DIVIDED FLOW

3280 CROSS SECTION 3945.00 EXTENDED 1.07 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3945.000	3.57	595.07	595.07	0.00	595.71	0.65	1.52	0.03	595.40
790.0	414.8	375.2	0.0	152.3	42.1	0.0	23.6	8.7	596.70
0.22	2.72	8.91	0.00	0.080	0.030	0.000	0.000	591.50	0.00
0.012150	175.	175.	175.	20	16	0	0.00	129.41	219.12

*SECNO 4295.000

3265 DIVIDED FLOW

3280 CROSS SECTION 4295.00 EXTENDED 1.54 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4295.000	4.94	602.54	602.54	0.00	603.56	1.02	2.75	0.11	600.90
790.0	76.1	681.9	32.0	48.9	78.4	29.9	24.9	9.6	602.00
0.23	1.56	8.70	1.07	0.080	0.030	0.080	0.000	597.60	0.00
0.005886	300.	350.	400.	20	11	0	0.00	111.48	244.75

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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


*SECNO 4370.000

3265 DIVIDED FLOW

3280 CROSS SECTION   4370.00 EXTENDED      0.41 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  4370.000      5.21    603.91    603.91      0.00    604.82      0.91      0.43      0.01    603.10
     790.0      13.0     561.6     215.4      15.9      62.5     103.5      25.2       9.8    602.50
      0.23      0.82      8.99      2.08     0.080     0.030     0.080     0.000    598.70      0.00
  0.006605      120.       75.       20.        20         8         0      0.00    125.01    236.90


CCHV=    0.300 CEHV=    0.500
*SECNO 4405.000
3280 CROSS SECTION   4405.00 EXTENDED      2.68 FEET


3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  4.42

               MCKEEL STREET
  4405.000      6.98    604.68      0.00      0.00    605.02      0.34      0.03      0.17    597.70
     790.0     151.2     420.0     218.8     244.2      65.8     346.9      25.5       9.9    598.50
      0.24      0.62      6.38      0.63     0.080     0.015     0.080     0.000    597.70      0.00
  0.000338       35.       35.       35.         4         0         0      0.00    240.00    240.00


SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS     601.79 , NOT     604.68 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     1.25      2.00      2.50      0.00     10.00      2.00     20.60      0.00    598.70    597.70

*SECNO 4480.000
6870 D.S. ENERGY OF   605.02 IS HIGHER THAN COMPUTED ENERGY OF   604.71
3280 CROSS SECTION   4480.00 EXTENDED      2.67 FEET
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
650.36	608.82	0.00	770.	20.	21.	21.	601.30	601.80	217.
4480.000	6.97	604.67	0.00	0.00	605.02	0.35	0.00	0.00	597.70
790.0	165.7	424.0	200.3	255.9	65.7	320.1	26.6	10.4	598.50
0.24	0.65	6.45	0.63	0.080	0.015	0.080	0.000	597.70	0.00
0.000346	75.	75.	75.	2	0	12	0.00	240.00	240.00

*SECNO 4520.000

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4520.000	5.14	604.94	604.94	0.00	606.71	1.77	0.04	0.71	605.90
790.0	0.0	788.8	1.2	0.0	73.8	1.7	26.9	10.5	605.70
0.24	0.00	10.68	0.70	0.000	0.030	0.080	0.000	599.80	104.70
0.010832	40.	40.	40.	20	16	0	0.00	27.57	139.00

CCHV= 0.100 CEHV= 0.300
*SECNO 4630.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4630.000	3.45	608.55	608.55	0.00	609.77	1.23	1.21	0.05	609.30
410.0	0.0	410.0	0.0	0.0	46.1	0.0	27.1	10.5	609.50
0.25	0.00	8.89	0.00	0.000	0.030	0.000	0.000	605.10	80.90
0.011351	110.	110.	110.	20	14	0	0.00	19.10	100.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.300 CEHV= 0.500
*SECNO 4695.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4695.000	4.98	613.08	613.08	0.00	613.65	0.57	0.49	0.20	609.20
410.0	123.2	181.4	105.4	69.3	20.4	62.0	27.2	10.7	609.20
0.25	1.78	8.91	1.70	0.080	0.030	0.080	0.000	608.10	39.10
0.005304	80.	65.	50.	20	13	0	0.00	139.51	178.60

*SECNO 4696.000

3370 NORMAL BRIDGE, NRD= 13 MIN ELTRD= 612.00 MAX ELLC= 611.50

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
CRESTMONT DRIVE

4696.000	5.57	613.67	613.67	0.00	614.07	0.40	0.01	0.05	609.20
410.0	147.1	122.3	140.6	82.7	13.8	80.4	27.2	10.7	609.20
0.25	1.78	8.89	1.75	0.080	0.015	0.080	0.000	608.10	13.96
0.010527	1.	1.	1.	20	13	0	-72.64	191.26	205.22

*SECNO 4990.000
3280 CROSS SECTION 4990.00 EXTENDED 1.34 FEET

3370 NORMAL BRIDGE, NRD= 11 MIN ELTRD= 619.50 MAX ELLC= 618.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4990.000	7.84	621.34	621.34	0.00	622.07	0.73	2.32	0.16	615.80
410.0	96.5	206.5	107.0	45.8	21.9	55.5	28.2	11.5	615.80
0.26	2.11	9.43	1.93	0.080	0.015	0.080	0.000	613.50	0.00
0.006972	260.	294.	260.	20	13	0	-45.90	76.78	76.78

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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


*SECNO 4991.000
3280 CROSS SECTION   4991.00 EXTENDED      2.07 FEET


3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.50

  4991.000      8.57    622.07      0.00      0.00    622.24      0.17      0.00      0.17    615.80
     410.0     110.8     170.4     128.8      83.9      34.8     109.4      28.2      11.5    615.80
      0.26      1.32      4.89      1.18     0.080     0.030     0.080     0.000    613.50      0.00
  0.001117        1.        1.        1.         3         0         0      0.00     85.68     85.68


*SECNO 5025.000
3280 CROSS SECTION   5025.00 EXTENDED      2.07 FEET


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  0.55

  5025.000      6.37    622.07      0.00      0.00    622.37      0.30      0.06      0.07    619.30
     410.0     116.0     198.0      96.0      63.5      32.4      61.0      28.3      11.5    619.70
      0.27      1.83      6.12      1.57     0.080     0.030     0.080     0.000    615.70      0.00
  0.003692       34.       34.       34.         2         0         0      0.00     75.34     75.34


CCHV=    0.100 CEHV=    0.300
*SECNO 5135.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  5135.000      3.11    624.71    624.71      0.00    625.45      0.73      0.61      0.13    623.70
     410.0     107.1     296.9       6.0      54.2      37.2       5.4      28.6      11.7    624.10
      0.27      1.97      7.98      1.11     0.080     0.030     0.080     0.000    621.60     24.89
  0.009051      120.      110.      100.        20        11         0      0.00     76.33    101.22


*SECNO 5325.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  5325.000      2.80    635.50    635.50      0.00    636.07      0.57      1.64      0.02    634.40
     410.0      11.3     247.1     151.6       9.4      32.3      83.1      29.1      12.1    634.80
      0.28      1.20      7.65      1.82     0.080     0.030     0.080     0.000    632.70     88.69
  0.008544      220.      190.      150.        20        12         0      0.00    117.61    206.30
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.300 CEHV= 0.500
*SECNO 5375.000
3280 CROSS SECTION 5375.00 EXTENDED 1.31 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
MT. HOPE AVENUE

5375.000	5.31	639.31	639.31	0.00	640.17	0.86	0.12	0.15	634.00
410.0	93.4	231.0	85.6	110.7	23.4	99.8	29.3	12.3	634.00
0.28	0.84	9.89	0.86	0.080	0.015	0.080	0.000	634.00	0.00
0.001077	40.	50.	60.	20	17	0	0.00	143.27	143.27

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.50	2.50	0.00	4.40	0.00	10.20	0.00	636.80	634.00

*SECNO 5475.000
3280 CROSS SECTION 5475.00 EXTENDED 1.37 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
676.94	642.97	0.00	283.	129.	10.	11.	639.20	642.10	136.

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3720 CRITICAL DEPTH ASSUMED

5475.000	7.57	643.37	643.37	0.00	644.49	1.12	0.08	-0.08	635.80
410.0	52.4	320.3	37.3	94.8	33.3	76.2	29.8	12.6	635.80
0.29	0.55	9.62	0.49	0.080	0.015	0.080	0.000	635.80	0.00
0.000635	100.	100.	100.	20	15	0	0.00	142.31	142.31

*SECNO 5525.000

3301 HV CHANGED MORE THAN HVINS

5525.000	7.64	644.64	0.00	0.00	644.81	0.17	0.03	0.29	641.30
410.0	38.5	349.2	22.3	77.7	98.9	41.1	30.0	12.8	642.30
0.29	0.50	3.53	0.54	0.080	0.030	0.080	0.000	637.00	30.39
0.000601	40.	50.	50.	2	0	0	0.00	137.73	168.12

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T1      GOODKIND & O'DEA, INC.  60 FERONIA WAY, RUTHERFORD, NJ  07070
T2      McKEEL BROOK STORMWATER MANAGEMENT PLAN - ROCKAWAY AND DOVER, NJ
T3      PROPOSED 100 YEAR STORM

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0         6         0         0         0         0         0         0    554.25

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      5         0        -1
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 5

CCHV= 0.300 CEHV= 0.500
*SECNO 58.000
3280 CROSS SECTION 58.00 EXTENDED 0.65 FEET

CROSS SECTIONS TAKEN LOOKING DOWNSTREAM
HEC-2 BASED ON DOVER F.I.S. PREPARED BY THE RBA GROUP DATED 4/5/78
AND UPDATED TO NOV. 1994 AS PER SURVEY BY GOODKIND & O'DEA, INC.

**** THIS MODEL REPRESENTS PROPOSED CONDITIONS, i.e. INSTALLATION OF
A TWIN 4'x 8' BOX CULVERT FROM SECTION II IMPROVEMENTS TO AN
INLET LOCATED APPROX. 160' UPSTREAM OF COOPER STREET CROSSING.***

CONFLUENCE WITH THE ROCKAWAY RIVER

58.000	5.85	554.25	0.00	554.25	554.79	0.54	0.00	0.00	553.60
1270.0	2.4	1191.1	76.5	3.3	195.4	37.7	0.0	0.0	548.40
0.00	0.73	6.09	2.03	0.060	0.030	0.060	0.000	548.40	0.00
0.001837	0.	0.	0.	0	0	0	0.00	60.00	60.00

1490 NH CARD USED
*SECNO 59.000
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED
3280 CROSS SECTION 59.00 EXTENDED 0.39 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.45

3370 NORMAL BRIDGE, NRD= 11 MIN ELTRD= 549.00 MAX ELLC= 552.40

59.000	5.59	553.99	0.00	0.00	555.07	1.08	0.00	0.27	553.60
1270.0	2.4	1259.8	7.9	2.0	150.6	6.3	0.0	0.0	548.40
0.00	1.21	8.37	1.26	0.060	0.024	0.060	0.000	548.40	0.00
0.009260	1.	1.	1.	2	0	0	-62.10	60.00	60.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

1490 NH CARD USED
*SECNO 96.000
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED
3280 CROSS SECTION 96.00 EXTENDED 1.10 FEET

3370 NORMAL BRIDGE, NRD= 11 MIN ELTRD= 549.00 MAX ELLC= 552.60

96.000	6.10	554.70	0.00	0.00	555.42	0.72	0.25	0.11	553.60
1270.0	9.0	1229.6	31.5	5.5	178.0	17.5	0.2	0.1	548.60
0.00	1.64	6.91	1.79	0.060	0.024	0.060	0.000	548.60	0.00
0.005044	20.	37.	50.	3	0	0	-56.00	60.00	60.00

CCHV= 0.100 CEHV= 0.300
*SECNO 165.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 553.000 EGLC= 555.505 EGC= 556.979 WSEL= 555.447

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.68

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 554.70 MAX ELLC= 553.00

165.000	5.15	553.95	552.76	0.00	556.45	2.50	0.49	0.54	549.00
1270.0	0.0	1270.0	0.0	0.0	100.0	0.0	0.4	0.1	548.80
0.00	0.00	12.70	0.00	0.000	0.015	0.000	0.000	548.80	5.03
0.011000	69.	69.	69.	11	19	0	-98.60	49.43	54.46

*SECNO 340.000
3280 CROSS SECTION 340.00 EXTENDED 2.29 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.11

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 554.50 MAX ELLC= 554.00

340.000	7.49	556.79	0.00	0.00	557.43	0.64	0.80	0.19	550.00
1270.0	67.8	1129.3	72.8	34.3	166.4	36.6	1.1	0.4	549.30
0.01	1.97	6.79	1.99	0.060	0.015	0.060	0.000	549.30	0.00
0.002476	175.	175.	175.	3	0	0	-91.35	60.00	60.00

*SECNO 550.000
3280 CROSS SECTION 550.00 EXTENDED 2.10 FEET

3370 NORMAL BRIDGE, NRD= 18 MIN ELTRD= 555.20 MAX ELLC= 553.90

550.000	7.40	557.30	0.00	0.00	558.13	0.83	0.64	0.05	550.20
1270.0	68.9	1122.0	79.1	29.4	145.5	33.6	2.2	0.7	549.90
0.02	2.34	7.71	2.35	0.060	0.015	0.060	0.000	549.90	0.00
0.003835	210.	210.	210.	3	0	0	-127.45	60.00	60.00

*SECNO 608.000
3280 CROSS SECTION 608.00 EXTENDED 1.99 FEET

3370 NORMAL BRIDGE, NRD= 18 MIN ELTRD= 555.50 MAX ELLC= 554.30

608.000	7.50	557.50	0.00	0.00	558.38	0.88	0.23	0.02	552.00
1270.0	65.3	1128.8	75.8	27.9	142.1	31.9	2.4	0.7	550.00
0.02	2.34	7.94	2.38	0.060	0.015	0.060	0.000	550.00	0.00
0.004193	58.	58.	58.	1	0	0	-103.10	60.00	60.00

*SECNO 845.000

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 558.000 EGLC= 560.718 EGC= 561.631 WSEL= 560.103

4575 CRITICAL DEPTH ASSUMED BELOW ELLC OF 558.000 EGLC= 560.718 EGC= 560.724 WSEL= 557.984

3301 HV CHANGED MORE THAN HVINS

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 559.10 MAX ELLC= 558.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

845.000	4.00	558.00	558.00	0.00	560.72	2.72	1.58	0.55	554.00
1270.0	0.0	1270.0	0.0	0.0	96.0	0.0	3.2	1.0	554.00
0.03	0.00	13.23	0.00	0.000	0.015	0.000	0.000	554.00	8.16
0.012151	220.	237.	270.	20	15	0	-47.37	43.69	51.84

CCHV= 0.600 CEHV= 0.800
*SECNO 904.000
3280 CROSS SECTION 904.00 EXTENDED 1.81 FEET

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 560.30 MAX ELLC= 559.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

904.000	7.11	562.11	562.11	0.00	563.63	1.52	0.54	0.72	555.00
1270.0	112.8	1044.5	112.8	38.1	96.7	38.1	3.4	1.1	555.00
0.03	2.96	10.81	2.96	0.060	0.015	0.060	0.000	555.00	0.00
0.007152	59.	59.	59.	20	9	0	-87.05	60.00	60.00

CCHV= 0.100 CEHV= 0.300
*SECNO 1000.000
3280 CROSS SECTION 1000.00 EXTENDED 1.81 FEET

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 562.00 MAX ELLC= 560.60

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1000.000	7.21	563.81	563.81	0.00	565.33	1.52	0.69	0.00	556.60
1270.0	112.7	1044.6	112.7	38.1	96.6	38.1	3.8	1.2	556.60
0.03	2.96	10.81	2.96	0.060	0.015	0.060	0.000	556.60	0.00
0.007159	96.	96.	96.	20	9	0	-92.60	60.00	60.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 1148.000
3280 CROSS SECTION 1148.00 EXTENDED 1.80 FEET

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 564.50 MAX ELLC= 562.40

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1148.000	7.90	566.30	566.30	0.00	567.83	1.53	1.06	0.00	558.40
1270.0	112.2	1045.6	112.2	37.8	96.4	37.8	4.4	1.4	558.40
0.04	2.96	10.84	2.97	0.060	0.015	0.060	0.000	558.40	0.00
0.007226	160.	148.	130.	15	9	0	-120.52	60.00	60.00

*SECNO 1264.000
3280 CROSS SECTION 1264.00 EXTENDED 1.80 FEET

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 567.50 MAX ELLC= 565.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1264.000	7.90	569.30	569.30	0.00	570.83	1.53	0.84	0.00	561.40
1270.0	112.2	1045.6	112.2	37.8	96.4	37.8	4.8	1.6	561.40
0.04	2.96	10.84	2.96	0.060	0.015	0.060	0.000	561.40	0.00
0.007225	116.	116.	116.	20	9	0	-119.00	60.00	60.00

*SECNO 1400.000
3280 CROSS SECTION 1400.00 EXTENDED 1.81 FEET

3370 NORMAL BRIDGE, NRD= 10 MIN ELTRD= 568.80 MAX ELLC= 567.40

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1400.000	7.21	570.61	570.61	0.00	572.13	1.52	0.98	0.00	563.40
1270.0	112.7	1044.6	112.7	38.1	96.6	38.1	5.4	1.8	563.40
0.04	2.96	10.81	2.96	0.060	0.015	0.060	0.000	563.40	0.00
0.007159	145.	136.	135.	3	9	0	-92.60	60.00	60.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 1500.000
3280 CROSS SECTION 1500.00 EXTENDED 3.09 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.02

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 569.00 MAX ELLC= 568.00

1500.000	8.50	572.10	0.00	0.00	572.55	0.45	0.31	0.11	564.00
1270.0	171.6	981.4	117.0	83.6	162.3	58.8	5.9	1.9	563.60
0.05	2.05	6.05	1.99	0.060	0.015	0.060	0.000	563.60	0.00
0.001749	100.	100.	100.	3	0	0	-115.30	70.00	70.00

*SECNO 2070.000
3280 CROSS SECTION 2070.00 EXTENDED 2.44 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.65

3370 NORMAL BRIDGE, NRD= 15 MIN ELTRD= 572.30 MAX ELLC= 571.30

2070.000	8.74	574.74	0.00	0.00	575.40	0.65	2.79	0.06	567.10
1270.0	331.6	900.4	38.0	119.4	120.0	25.5	13.1	4.0	566.00
0.10	2.78	7.51	1.49	0.060	0.015	0.060	0.000	566.00	0.00
0.004087	1090.	1090.	1090.	3	0	0	-164.10	100.00	100.00

CCHV= 0.300 CEHV= 0.500
*SECNO 2130.000
3280 CROSS SECTION 2130.00 EXTENDED 3.27 FEET

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 573.00 MAX ELLC= 571.50

JACKSON AVENUE

2130.000	9.17	575.27	0.00	0.00	575.61	0.34	0.12	0.10	571.00
1270.0	459.9	769.0	41.2	227.0	133.5	30.5	13.4	4.2	566.10
0.10	2.03	5.76	1.35	0.060	0.015	0.060	0.000	566.10	0.00
0.002312	40.	40.	40.	3	0	0	-319.20	150.00	150.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 2180.000
3280 CROSS SECTION 2180.00 EXTENDED 3.43 FEET

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 573.00 MAX ELLC= 571.50

2180.000	9.34	575.44	0.00	0.00	575.73	0.29	0.11	0.01	571.00
1270.0	476.2	747.5	46.3	243.5	137.8	34.4	13.8	4.3	566.10
0.10	1.96	5.42	1.35	0.060	0.015	0.060	0.000	566.10	0.00
0.001965	50.	50.	50.	0	0	0	-319.20	150.00	150.00

1490 NH CARD USED
*SECNO 2280.000
1530 MANNINGS N VALUES FOR CHANNEL COMPOSITED
3280 CROSS SECTION 2280.00 EXTENDED 1.35 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.42

3370 NORMAL BRIDGE, NRD= 14 MIN ELTRD= 574.00 MAX ELLC= 572.50

2280.000	8.95	575.35	575.30	0.00	576.60	1.25	0.39	0.48	566.40
1270.0	168.2	1044.6	57.2	55.2	106.8	19.5	14.5	4.6	572.50
0.11	3.05	9.78	2.93	0.060	0.018	0.060	0.000	566.40	0.00
0.010953	100.	100.	100.	6	9	0	-155.86	80.00	80.00

*SECNO 2390.000
3280 CROSS SECTION 2390.00 EXTENDED 3.55 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.52

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   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


3370 NORMAL BRIDGE, NRD=  15 MIN ELTRD=   574.50 MAX ELLC=   573.10

              COOPER STREET
  2390.000     10.44     577.14      0.00       0.00     577.25      0.10       0.31       0.34     574.00
    1000.0     404.2      532.5     63.3      264.9      162.9      49.4       15.3        4.9     566.70
      0.12      1.53       3.27      1.28      0.060      0.020     0.060      0.000     566.70       0.00
  0.001072      110.       110.      110.          2          0         0    -233.10     150.00     150.00


*SECNO 2440.000
3280 CROSS SECTION   2440.00 EXTENDED      3.17 FEET


3370 NORMAL BRIDGE, NRD=  15 MIN ELTRD=   574.50 MAX ELLC=   573.10

  2440.000     10.36     577.16      0.00       0.00     577.36      0.20       0.07       0.05     573.10
    1000.0     273.3      661.0     65.7      145.3      158.6      41.1       15.8        5.0     566.80
      0.12      1.88       4.17      1.60      0.060      0.020     0.060      0.000     566.80      50.00
  0.001664       50.        50.       50.          2          0         0    -191.93     100.00     150.00


*SECNO 2600.000
3280 CROSS SECTION   2600.00 EXTENDED      2.45 FEET


3370 NORMAL BRIDGE, NRD=  14 MIN ELTRD=   575.00 MAX ELLC=   573.00

  2600.000     10.45     577.45      0.00       0.00     577.61      0.16       0.24       0.01     569.00
    1000.0     204.8      627.6    167.6      125.2      162.3     103.1       17.2        5.4     567.00
      0.14      1.64       3.87      1.63      0.060      0.020     0.060      0.000     567.00       0.00
  0.001402      160.       160.      160.          2          0         0    -202.00     120.00     120.00


*SECNO 2601.000
3280 CROSS SECTION   2601.00 EXTENDED      2.48 FEET


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.19

  2601.000     10.48     577.48      0.00       0.00     577.62      0.14       0.00       0.01     569.00
    1000.0      60.9      863.7     75.4      162.4      264.9     168.1       17.2        5.4     567.00
      0.14      0.37       3.26      0.45      0.150      0.035     0.150      0.000     567.00       0.00
  0.000292        1.         1.        1.          2          0         0       0.00     120.00     120.00
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 2685.000
3280 CROSS SECTION 2685.00 EXTENDED 5.02 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.50

2685.000	6.62	577.62	0.00	0.00	577.74	0.12	0.12	0.01	573.30
1000.0	366.1	345.9	288.0	420.5	74.7	305.2	20.7	6.2	571.80
0.17	0.87	4.63	0.94	0.150	0.035	0.150	0.000	571.00	0.00
0.001150	240.	235.	180.	2	0	0	0.00	170.00	170.00

CCHV= 0.100 CEHV= 0.300
*SECNO 3020.000
3280 CROSS SECTION 3020.00 EXTENDED 1.25 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3020.000	5.25	578.25	578.25	0.00	579.29	1.04	0.73	0.27	574.60
1000.0	44.2	895.2	60.5	34.3	103.7	103.9	24.3	7.7	577.20
0.18	1.29	8.63	0.58	0.150	0.035	0.150	0.000	573.00	75.16
0.006524	290.	335.	310.	20	15	0	0.00	259.84	335.00

*SECNO 3250.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.62

3250.000	4.71	579.91	0.00	0.00	580.13	0.22	0.76	0.08	576.60
1000.0	200.9	429.8	369.3	126.7	77.8	379.3	25.7	8.4	576.80
0.20	1.59	5.53	0.97	0.080	0.035	0.150	0.000	575.20	1.59
0.002496	230.	230.	90.	2	0	0	0.00	227.95	229.55

*SECNO 3515.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3280 CROSS SECTION 3515.00 EXTENDED 0.50 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3515.000	5.40	584.60	584.60	0.00	586.19	1.58	1.06	0.41	583.30
1000.0	26.7	973.3	0.0	21.6	95.1	0.0	27.8	9.2	585.00
0.20	1.23	10.23	0.00	0.080	0.030	0.000	0.000	579.20	0.00
0.007750	250.	265.	250.	20	14	0	0.00	57.77	57.77

*SECNO 3770.000

3265 DIVIDED FLOW

3280 CROSS SECTION 3770.00 EXTENDED 1.54 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3770.000	5.44	589.54	589.54	0.00	590.54	1.00	1.83	0.06	590.90
1000.0	216.1	781.8	2.1	116.6	86.8	2.1	28.7	9.8	588.40
0.21	1.85	9.01	1.02	0.080	0.030	0.080	0.000	584.10	0.00
0.006724	250.	255.	260.	20	5	0	0.00	117.85	193.64

*SECNO 3945.000

3265 DIVIDED FLOW

3280 CROSS SECTION 3945.00 EXTENDED 1.31 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3945.000	3.81	595.31	595.31	0.00	596.04	0.73	1.60	0.03	595.40
1000.0	550.6	449.4	0.0	179.3	46.6	0.0	29.6	10.3	596.70
0.22	3.07	9.65	0.00	0.080	0.030	0.000	0.000	591.50	0.00
0.013201	175.	175.	175.	20	18	0	0.00	133.77	219.39

```
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


*SECNO 4295.000

3265 DIVIDED FLOW

3280 CROSS SECTION   4295.00 EXTENDED      1.97 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  4295.000      5.37    602.97    602.97      0.00    604.04      1.07      2.80      0.10    600.90
    1000.0     121.5     802.9      75.6      66.6      87.0      54.2      31.2      11.2    602.00
      0.23      1.83      9.23      1.40     0.080     0.030     0.080     0.000    597.60      0.00
  0.005758      300.      350.      400.        20        11         0      0.00    122.78    247.54


*SECNO 4370.000

3265 DIVIDED FLOW

3280 CROSS SECTION   4370.00 EXTENDED      0.78 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  4370.000      5.58    604.28    604.28      0.00    605.24      0.96      0.42      0.01    603.10
    1000.0      37.9     653.6     308.5      30.8      68.0     134.9      31.5      11.4    602.50
      0.24      1.23      9.61      2.29     0.080     0.030     0.080     0.000    598.70      0.00
  0.006725      120.       75.       20.        20         8         0      0.00    144.90    239.00


CCHV=    0.300 CEHV=    0.500
*SECNO 4405.000
3280 CROSS SECTION   4405.00 EXTENDED      3.04 FEET


3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  4.09

               MCKEEL STREET
  4405.000      7.34    605.04      0.00      0.00    605.44      0.41      0.04      0.17    597.70
    1000.0     204.4     500.3     295.4     277.8      69.4     394.7      31.9      11.6    598.50
      0.24      0.74      7.21      0.75     0.080     0.015     0.080     0.000    597.70      0.00
  0.000403       35.       35.       35.         4         0         0      0.00    240.00    240.00
```

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 602.48 , NOT 605.04 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	2.00	2.50	0.00	10.00	2.00	20.60	0.00	598.70	597.70

*SECNO 4480.000
6870 D.S. ENERGY OF 605.44 IS HIGHER THAN COMPUTED ENERGY OF 605.07
3280 CROSS SECTION 4480.00 EXTENDED 3.02 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
678.22	610.55	0.00	979.	22.	21.	21.	601.30	601.80	219.
4480.000	7.32	605.02	0.00	0.00	605.44	0.42	0.00	0.00	597.70
1000.0	221.8	505.5	272.7	289.2	69.2	367.4	33.2	12.0	598.50
0.24	0.77	7.30	0.74	0.080	0.015	0.080	0.000	597.70	0.00
0.000414	75.	75.	75.	2	0	13	0.00	240.00	240.00

*SECNO 4520.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4520.000	5.93	605.73	605.73	0.00	607.54	1.81	0.05	0.69	605.90
1000.0	0.0	982.6	17.4	0.0	90.2	13.1	33.6	12.1	605.70
0.24	0.00	10.89	1.33	0.000	0.030	0.080	0.000	599.80	103.31
0.009779	40.	40.	40.	20	11	0	0.00	42.84	146.15

CCHV= 0.100 CEHV= 0.300
*SECNO 4630.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4630.000	3.88	608.98	608.98	0.00	610.33	1.35	1.12	0.05	609.30
510.0	0.0	510.0	0.0	0.0	54.7	0.0	33.8	12.2	609.50
0.25	0.00	9.33	0.00	0.000	0.030	0.000	0.000	605.10	80.39
0.011040	110.	110.	110.	20	14	0	0.00	20.52	100.90

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    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


CCHV=    0.300 CEHV=    0.500
*SECNO 4695.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  4695.000      5.16     613.26     613.26       0.00     613.92       0.66       0.53       0.21     609.20
     510.0      161.2      209.4      139.4       82.3       21.2       74.6       33.9       12.3     609.20
      0.25       1.96       9.89       1.87      0.080      0.030      0.080      0.000     608.10      31.47
  0.006223        80.        65.        50.         20         11          0       0.00     155.21     186.68


*SECNO 4696.000

3370 NORMAL BRIDGE, NRD=  13 MIN ELTRD=   612.00 MAX ELLC=   611.50

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
               CRESTMONT DRIVE
  4696.000      5.67     613.77     613.77       0.00     614.25       0.48       0.01       0.05     609.20
     510.0      188.0      142.0      180.0       91.8       14.2       89.4       33.9       12.3     609.20
      0.25       2.05      10.02       2.01      0.080      0.015      0.080      0.000     608.10       9.92
  0.012846         1.         1.         1.         20         12          0     -72.64     199.58     209.50


*SECNO 4990.000
3280 CROSS SECTION   4990.00 EXTENDED      1.61 FEET


3370 NORMAL BRIDGE, NRD=  11 MIN ELTRD=   619.50 MAX ELLC=   618.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
  4990.000      8.11     621.61     621.61       0.00     622.39       0.78       2.63       0.15     615.80
     510.0      127.8      233.8      148.3       53.2       23.1       67.8       35.0       13.2     615.80
      0.26       2.40      10.14       2.19      0.080      0.015      0.080      0.000     613.50       0.00
  0.007512       260.       294.       260.         20         13          0     -45.90      80.12      80.12
```

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 4991.000
3280 CROSS SECTION 4991.00 EXTENDED 2.35 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.34

4991.000	8.85	622.35	0.00	0.00	622.56	0.21	0.00	0.17	615.80
510.0	139.8	200.3	169.9	91.6	36.1	124.6	35.0	13.2	615.80
0.26	1.53	5.55	1.36	0.080	0.030	0.080	0.000	613.50	0.00
0.001375	1.	1.	1.	3	0	0	0.00	88.46	88.46

*SECNO 5025.000
3280 CROSS SECTION 5025.00 EXTENDED 2.36 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.58

5025.000	6.66	622.36	0.00	0.00	622.70	0.34	0.07	0.07	619.30
510.0	149.4	227.4	133.2	72.0	34.1	73.0	35.1	13.2	619.70
0.27	2.07	6.67	1.83	0.080	0.030	0.080	0.000	615.70	0.00
0.004080	34.	34.	34.	2	0	0	0.00	76.80	76.80

CCHV= 0.100 CEHV= 0.300
*SECNO 5135.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

5135.000	3.38	624.98	624.98	0.00	625.78	0.80	0.65	0.14	623.70
510.0	144.8	353.1	12.1	67.7	41.4	8.4	35.5	13.4	624.10
0.27	2.14	8.53	1.43	0.080	0.030	0.080	0.000	621.60	19.83
0.008977	120.	110.	100.	20	8	0	0.00	82.16	101.99

*SECNO 5325.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

5325.000	3.00	635.70	635.70	0.00	636.32	0.63	1.67	0.02	634.40
510.0	19.4	289.4	201.2	14.6	35.1	99.7	36.1	13.9	634.80
0.28	1.33	8.25	2.02	0.080	0.030	0.080	0.000	632.70	81.27
0.008910	220.	190.	150.	20	11	0	0.00	130.46	211.73

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.300 CEHV= 0.500
*SECNO 5375.000
3280 CROSS SECTION 5375.00 EXTENDED 1.60 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
MT. HOPE AVENUE

5375.000	5.60	639.60	639.60	0.00	640.53	0.94	0.13	0.16	634.00
510.0	128.1	264.6	117.3	131.9	24.6	119.1	36.3	14.0	634.00
0.28	0.97	10.74	0.98	0.080	0.015	0.080	0.000	634.00	0.00
0.001183	40.	50.	60.	20	14	0	0.00	143.99	143.99

SPECIAL BRIDGE

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
0.00	1.50	2.50	0.00	4.40	0.00	10.20	0.00	636.80	634.00

*SECNO 5475.000
3280 CROSS SECTION 5475.00 EXTENDED 2.38 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
697.83	643.33	0.00	383.	128.	10.	11.	639.20	642.10	140.

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3710 WSEL ASSUMED BASED ON MIN DIFF

5475.000	8.58	644.38	0.00	0.00	645.06	0.69	0.00	0.00	635.80
510.0	103.9	317.5	88.6	163.3	37.7	155.9	37.1	14.4	635.80
0.29	0.64	8.41	0.57	0.080	0.015	0.080	0.000	635.80	0.00
0.000411	100.	100.	100.	20	0	8	0.00	155.00	155.00

*SECNO 5525.000

3301 HV CHANGED MORE THAN HVINS

5525.000	8.05	645.05	0.00	0.00	645.24	0.18	0.02	0.15	641.30
510.0	68.7	404.0	37.3	113.7	105.0	57.5	37.4	14.5	642.30
0.29	0.60	3.85	0.65	0.080	0.030	0.080	0.000	637.00	21.30
0.000659	40.	50.	50.	3	0	0	0.00	151.87	173.17

THIS RUN EXECUTED 4DEC95 8:19:20

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

PROPOSED 2 YEAR STORM

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	EG	DIFWSX	XLCH	VCH	TOPWID	SSTA	ENDST	QLOB	QCH	QROB
	58.000	310.00	554.25	554.28	0.00	0.00	1.49	60.00	0.00	60.00	0.58	290.74	18.6
	58.000	690.00	554.25	554.41	0.00	0.00	3.31	60.00	0.00	60.00	1.30	647.13	41.5
	58.000	805.00	554.25	554.47	0.00	0.00	3.86	60.00	0.00	60.00	1.51	754.98	48.5
	58.000	1010.00	554.25	554.59	0.00	0.00	4.85	60.00	0.00	60.00	1.90	947.24	60.8
	58.000	1270.00	554.25	554.79	0.00	0.00	6.09	60.00	0.00	60.00	2.39	1191.09	76.5
*	59.000	310.00	554.24	554.29	-0.01	1.00	1.90	60.00	0.00	60.00	1.15	304.95	3.9
*	59.000	690.00	554.19	554.47	-0.06	1.00	4.30	60.00	0.00	60.00	2.28	680.03	7.6
*	59.000	805.00	554.17	554.56	-0.08	1.00	5.05	60.00	0.00	60.00	2.52	794.02	8.4
*	59.000	1010.00	554.11	554.74	-0.14	1.00	6.44	60.00	0.00	60.00	2.72	998.19	9.1
*	59.000	1270.00	553.99	555.07	-0.26	1.00	8.37	60.00	0.00	60.00	2.37	1259.76	7.8
	96.000	310.00	554.26	554.31	0.02	37.00	1.90	60.00	0.00	60.00	1.16	304.91	3.9
	96.000	690.00	554.29	554.56	0.10	37.00	4.18	60.00	0.00	60.00	2.81	677.64	9.5
	96.000	805.00	554.32	554.68	0.15	37.00	4.83	60.00	0.00	60.00	3.45	789.82	11.7
	96.000	1010.00	554.41	554.94	0.31	37.00	5.91	60.00	0.00	60.00	5.07	987.55	17.3
	96.000	1270.00	554.70	555.42	0.72	37.00	6.91	60.00	0.00	60.00	8.97	1229.57	31.4
	165.000	310.00	554.23	554.38	-0.03	69.00	3.10	50.58	4.46	55.04	0.00	310.00	0.0
	165.000	690.00	554.14	554.88	-0.15	69.00	6.90	50.23	4.63	54.86	0.00	690.00	0.0
	165.000	805.00	554.10	555.11	-0.22	69.00	8.05	50.08	4.70	54.79	0.00	805.00	0.0
	165.000	1010.00	554.03	555.62	-0.38	69.00	10.10	49.80	4.84	54.64	0.00	1010.00	0.0
*	165.000	1270.00	553.95	556.45	-0.76	69.00	12.70	49.43	5.03	54.46	0.00	1270.00	0.0
	340.000	310.00	554.34	554.49	0.11	175.00	3.10	47.82	6.34	54.16	0.00	310.00	0.0
	340.000	690.00	554.91	555.47	0.77	175.00	6.07	60.00	0.00	60.00	4.85	679.96	5.1
	340.000	805.00	555.20	555.83	1.09	175.00	6.50	60.00	0.00	60.00	11.65	780.89	12.4
*	340.000	1010.00	555.83	556.50	1.79	175.00	6.82	60.00	0.00	60.00	31.82	944.10	34.0
*	340.000	1270.00	556.79	557.43	2.85	175.00	6.79	60.00	0.00	60.00	67.82	1129.33	72.8

	SECNO	Q	CWSEL	EG	DIFWSX	XLCH	VCH	TOPWID	SSTA	ENDST	QLOB	QCH	QRO
	550.000	310.00	554.48	554.70	0.13	210.00	3.76	48.06	5.44	53.50	0.00	310.00	0.
	550.000	690.00	555.67	556.41	0.76	210.00	6.99	60.00	0.00	60.00	7.12	674.73	8.
	550.000	805.00	555.98	556.77	0.78	210.00	7.29	60.00	0.00	60.00	16.01	770.64	18.
	550.000	1010.00	556.52	557.36	0.70	210.00	7.64	60.00	0.00	60.00	36.18	932.29	41.
	550.000	1270.00	557.30	558.13	0.51	210.00	7.71	60.00	0.00	60.00	68.89	1121.97	79.
	608.000	310.00	554.55	554.77	0.07	58.00	3.76	44.15	8.92	53.08	0.00	310.00	0.
	608.000	690.00	556.00	556.73	0.33	58.00	6.94	60.00	0.00	60.00	7.56	673.78	8.
	608.000	805.00	556.28	557.07	0.31	58.00	7.27	60.00	0.00	60.00	16.10	770.40	18.
	608.000	1010.00	556.79	557.65	0.27	58.00	7.72	60.00	0.00	60.00	35.11	934.37	40.
	608.000	1270.00	557.50	558.38	0.19	58.00	7.94	60.00	0.00	60.00	65.34	1128.83	75.
*	845.000	310.00	555.73	556.60	1.18	237.00	7.47	34.78	12.61	47.39	0.00	310.00	0.
*	845.000	690.00	556.94	558.42	0.94	237.00	9.78	39.53	10.24	49.76	0.00	690.00	0.
*	845.000	805.00	557.26	558.90	0.97	237.00	10.30	40.77	9.61	50.39	0.00	805.00	0.
*	845.000	1010.00	557.84	559.71	1.05	237.00	10.96	43.06	8.47	51.53	0.00	1010.00	0.
*	845.000	1270.00	558.00	560.72	0.50	237.00	13.23	43.69	8.16	51.84	0.00	1270.00	0.
*	904.000	310.00	557.26	558.40	1.53	59.00	8.58	26.95	16.53	43.47	0.00	310.00	0.
*	904.000	690.00	558.90	560.80	1.96	59.00	11.07	33.44	13.28	46.72	0.00	690.00	0.
*	904.000	805.00	559.00	561.46	1.74	59.00	12.58	33.85	13.08	46.92	0.00	805.00	0.
*	904.000	1010.00	559.00	562.87	1.16	59.00	15.78	33.85	13.08	46.92	0.00	1010.00	0.
*	904.000	1270.00	562.11	563.63	4.11	59.00	10.81	60.00	0.00	60.00	112.77	1044.47	112.
*	1000.000	310.00	558.86	560.00	1.60	96.00	8.58	27.20	16.40	43.60	0.00	310.00	0.
*	1000.000	690.00	560.50	562.40	1.60	96.00	11.07	33.88	13.06	46.94	0.00	690.00	0.
*	1000.000	805.00	560.60	563.06	1.60	96.00	12.58	34.30	12.85	47.15	0.00	805.00	0.
	1000.000	1010.00	560.66	564.53	1.66	96.00	15.78	34.54	12.73	47.27	0.00	1010.00	0.
*	1000.000	1270.00	563.81	565.33	1.70	96.00	10.81	60.00	0.00	60.00	112.72	1044.56	112.
*	1148.000	310.00	560.66	561.80	1.80	148.00	8.58	27.07	16.56	43.63	0.00	310.00	0.
*	1148.000	690.00	562.30	564.20	1.80	148.00	11.07	33.65	13.33	46.99	0.00	690.00	0.
*	1148.000	805.00	562.40	564.86	1.80	148.00	12.58	34.07	13.13	47.20	0.00	805.00	0.
	1148.000	1010.00	563.22	567.09	2.56	148.00	15.78	37.36	11.52	48.88	0.00	1010.00	0.
*	1148.000	1270.00	566.30	567.83	2.49	148.00	10.84	60.00	0.00	60.00	112.16	1045.64	112.
*	1264.000	310.00	563.66	564.80	3.00	116.00	8.58	26.89	16.56	43.44	0.00	310.00	0.
*	1264.000	690.00	565.30	567.20	3.00	116.00	11.07	33.33	13.33	46.67	0.00	690.00	0.
*	1264.000	805.00	565.40	567.86	3.00	116.00	12.58	33.74	13.13	46.87	0.00	805.00	0.
*	1264.000	1010.00	565.40	569.27	2.18	116.00	15.78	33.74	13.13	46.87	0.00	1010.00	0.
*	1264.000	1270.00	569.30	570.83	3.00	116.00	10.84	60.00	0.00	60.00	112.18	1045.65	112.
*	1400.000	310.00	565.66	566.80	2.00	136.00	8.58	27.20	16.40	43.60	0.00	310.00	0.
*	1400.000	690.00	567.30	569.20	2.00	136.00	11.07	33.88	13.06	46.94	0.00	690.00	0.
*	1400.000	805.00	567.40	569.86	2.00	136.00	12.58	34.30	12.85	47.15	0.00	805.00	0.
	1400.000	1010.00	567.75	571.62	2.35	136.00	15.78	35.73	12.14	47.86	0.00	1010.00	0.
*	1400.000	1270.00	570.61	572.13	1.31	136.00	10.81	60.00	0.00	60.00	112.72	1044.56	112.

	SECNO	Q	CWSEL	EG	DIFWSX	XLCH	VCH	TOPWID	SSTA	ENDST	QLOB	QCH	QROE
*	1500.000	310.00	566.75	567.08	1.09	100.00	4.64	24.00	27.00	51.00	0.00	310.00	0.0
	1500.000	690.00	568.81	569.77	1.51	100.00	7.84	24.00	27.00	51.00	0.00	690.00	0.0
*	1500.000	805.00	569.97	570.61	2.57	100.00	6.68	70.00	0.00	70.00	36.65	742.82	25.5
*	1500.000	1010.00	571.97	572.27	4.22	100.00	4.94	70.00	0.00	70.00	132.81	786.55	90.6
*	1500.000	1270.00	572.10	572.55	1.48	100.00	6.05	70.00	0.00	70.00	171.59	981.45	116.9
*	2070.000	310.00	568.39	569.09	1.64	1090.00	6.75	24.00	49.00	73.00	0.00	310.00	0.0
	2070.000	690.00	573.33	573.94	4.52	1090.00	6.58	73.00	0.00	73.00	71.08	618.92	0.0
*	2070.000	805.00	573.80	574.42	3.82	1090.00	6.88	73.00	0.00	73.00	136.14	668.86	0.0
*	2070.000	1010.00	574.05	574.78	2.08	1090.00	7.65	100.00	0.00	100.00	215.29	790.02	4.6
*	2070.000	1270.00	574.74	575.40	2.65	1090.00	7.51	100.00	0.00	100.00	331.61	900.42	37.9
*	2130.000	310.00	568.46	569.33	0.08	40.00	7.47	26.00	100.00	126.00	0.00	310.00	0.0
	2130.000	690.00	573.44	574.12	0.10	40.00	6.82	126.00	0.00	126.00	38.57	651.43	0.0
	2130.000	805.00	574.21	574.61	0.42	40.00	5.76	150.00	0.00	150.00	191.12	611.27	2.6
	2130.000	1010.00	574.65	575.04	0.60	40.00	5.88	150.00	0.00	150.00	303.13	691.48	15.3
	2130.000	1270.00	575.27	575.61	0.53	40.00	5.76	150.00	0.00	150.00	459.85	768.99	41.1
*	2180.000	310.00	569.14	569.59	0.68	50.00	5.37	26.00	100.00	126.00	0.00	310.00	0.0
	2180.000	690.00	573.90	574.35	0.46	50.00	5.86	126.00	0.00	126.00	107.10	582.90	0.0
	2180.000	805.00	574.48	574.78	0.27	50.00	5.06	150.00	0.00	150.00	223.94	572.75	8.3
	2180.000	1010.00	574.88	575.19	0.23	50.00	5.34	150.00	0.00	150.00	329.28	658.63	22.0
	2180.000	1270.00	575.44	575.73	0.16	50.00	5.42	150.00	0.00	150.00	476.20	747.46	46.3
	2280.000	310.00	569.27	569.91	0.13	100.00	6.43	25.98	36.33	65.00	0.00	310.00	0.0
*	2280.000	690.00	573.98	575.19	0.08	100.00	8.84	52.86	27.05	79.91	0.00	690.00	0.0
*	2280.000	805.00	574.50	575.62	0.01	100.00	8.72	80.00	0.00	80.00	31.59	762.90	10.5
*	2280.000	1010.00	574.83	576.11	-0.05	100.00	9.55	80.00	0.00	80.00	77.47	906.30	26.2
*	2280.000	1270.00	575.35	576.60	-0.09	100.00	9.78	80.00	0.00	80.00	168.19	1044.64	57.1
	2390.000	220.00	570.09	570.26	0.82	110.00	3.31	27.00	100.00	127.00	0.00	220.00	0.0
*	2390.000	530.00	575.76	575.87	1.78	110.00	3.08	150.00	0.00	150.00	131.53	385.69	12.7
*	2390.000	630.00	576.16	576.26	1.66	110.00	3.02	150.00	0.00	150.00	194.50	411.35	24.1
*	2390.000	790.00	576.68	576.78	1.86	110.00	3.05	150.00	0.00	150.00	289.54	458.49	41.9
*	2390.000	1000.00	577.14	577.25	1.80	110.00	3.27	150.00	0.00	150.00	404.24	532.47	63.2
	2440.000	220.00	570.14	570.32	0.05	50.00	3.46	25.02	104.84	131.00	0.00	220.00	0.0
	2440.000	530.00	575.81	575.97	0.05	50.00	3.52	100.00	50.00	150.00	85.06	431.78	13.1
	2440.000	630.00	576.20	576.36	0.04	50.00	3.60	100.00	50.00	150.00	126.79	478.86	24.3
	2440.000	790.00	576.71	576.88	0.03	50.00	3.78	100.00	50.00	150.00	192.55	554.59	42.8
	2440.000	1000.00	577.16	577.36	0.02	50.00	4.17	100.00	50.00	150.00	273.33	661.00	65.6
	2600.000	220.00	570.32	570.51	0.18	160.00	3.46	27.00	51.00	78.00	0.00	220.00	0.0
	2600.000	530.00	576.08	576.23	0.27	160.00	3.42	120.00	0.00	120.00	55.74	428.48	45.7
	2600.000	630.00	576.46	576.60	0.26	160.00	3.47	120.00	0.00	120.00	88.06	469.69	72.2
	2600.000	790.00	576.97	577.11	0.26	160.00	3.59	120.00	0.00	120.00	139.96	535.33	114.7
	2600.000	1000.00	577.45	577.61	0.29	160.00	3.87	120.00	0.00	120.00	204.75	627.61	167.6

	SECNO	Q	CWSEL	EG	DIFWSX	XLCH	VCH	TOPWID	SSTA	ENDST	QLOB	QCH	QRO
	2601.000	220.00	570.38	570.52	0.06	1.00	3.00	27.00	51.00	78.00	0.00	220.00	0.
*	2601.000	530.00	576.20	576.26	0.12	1.00	2.08	120.00	0.00	120.00	20.49	478.07	31.
*	2601.000	630.00	576.55	576.62	0.09	1.00	2.34	120.00	0.00	120.00	28.30	561.41	40.
*	2601.000	790.00	577.02	577.13	0.06	1.00	2.74	120.00	0.00	120.00	42.07	692.62	55.
*	2601.000	1000.00	577.48	577.62	0.02	1.00	3.26	120.00	0.00	120.00	60.89	863.68	75.
*	2685.000	220.00	573.30	573.79	2.92	235.00	6.70	99.13	52.47	170.00	25.14	153.06	41.
*	2685.000	530.00	576.25	576.33	0.06	235.00	3.47	170.00	0.00	170.00	174.16	202.40	153.
*	2685.000	630.00	576.62	576.70	0.07	235.00	3.72	170.00	0.00	170.00	214.80	232.98	182.
*	2685.000	790.00	577.12	577.22	0.10	235.00	4.10	170.00	0.00	170.00	280.33	281.59	228.
*	2685.000	1000.00	577.62	577.74	0.14	235.00	4.63	170.00	0.00	170.00	366.11	345.88	288.
*	3020.000	220.00	575.83	576.18	2.53	335.00	4.79	27.72	108.85	136.57	1.87	218.13	0.
*	3020.000	530.00	576.39	577.62	0.14	335.00	8.98	31.94	106.04	137.98	8.50	521.50	0.
*	3020.000	630.00	576.75	578.05	0.13	335.00	9.27	34.40	104.47	138.87	13.91	616.09	0.
*	3020.000	790.00	577.27	578.67	0.15	335.00	9.65	64.23	102.62	335.00	25.15	763.92	0.
*	3020.000	1000.00	578.25	579.29	0.63	335.00	8.63	259.84	75.16	335.00	44.23	895.23	60.
*	3250.000	220.00	577.27	577.75	1.44	230.00	6.05	117.69	50.14	167.83	9.23	183.51	27.
*	3250.000	530.00	578.72	578.94	2.33	230.00	5.07	201.13	22.46	223.58	78.17	285.71	166.
*	3250.000	630.00	579.04	579.25	2.29	230.00	5.08	208.38	16.81	225.20	103.30	315.49	211.
*	3250.000	790.00	579.52	579.72	2.26	230.00	5.10	219.29	8.33	227.62	146.62	360.92	282.
*	3250.000	1000.00	579.91	580.13	1.66	230.00	5.53	227.95	1.59	229.55	200.87	429.81	369.
*	3515.000	220.00	581.43	582.30	4.16	265.00	7.49	17.11	38.83	55.94	0.00	220.00	0.
*	3515.000	530.00	582.85	584.23	4.14	265.00	9.40	20.85	35.92	56.76	0.00	530.00	0.
*	3515.000	630.00	583.22	584.72	4.18	265.00	9.81	21.81	35.16	56.97	0.00	630.00	0.
*	3515.000	790.00	583.70	585.43	4.17	265.00	10.56	27.24	30.01	57.25	0.65	789.35	0.
*	3515.000	1000.00	584.60	586.19	4.69	265.00	10.23	57.77	0.00	57.77	26.69	973.31	0.
*	3770.000	220.00	586.82	587.68	5.39	255.00	7.43	17.69	170.10	187.79	0.00	220.00	0.
*	3770.000	530.00	588.57	589.41	5.72	255.00	7.61	94.08	0.00	190.55	37.48	492.52	0.
*	3770.000	630.00	588.81	589.70	5.59	255.00	8.02	99.89	0.00	191.30	68.92	560.95	0.
*	3770.000	790.00	589.18	590.10	5.48	255.00	8.39	108.97	0.00	192.49	131.60	657.64	0.
*	3770.000	1000.00	589.54	590.54	4.94	255.00	9.01	117.85	0.00	193.64	216.07	781.80	2.
*	3945.000	220.00	594.01	594.44	7.20	175.00	6.19	110.12	0.00	217.83	68.18	151.82	0.
*	3945.000	530.00	594.66	595.24	6.09	175.00	8.09	122.06	0.00	218.65	247.05	282.95	0.
*	3945.000	630.00	594.87	595.44	6.06	175.00	8.18	125.85	0.00	218.89	314.64	315.36	0.
*	3945.000	790.00	595.07	595.71	5.89	175.00	8.91	129.41	0.00	219.12	414.79	375.21	0.
*	3945.000	1000.00	595.31	596.04	5.76	175.00	9.65	133.77	0.00	219.39	550.57	449.43	0.
*	4295.000	220.00	599.91	600.81	5.89	350.00	7.64	16.13	92.92	109.05	0.00	220.00	0.
*	4295.000	530.00	601.48	602.73	6.82	350.00	9.04	43.32	0.00	110.52	10.60	519.39	0.
*	4295.000	630.00	602.12	603.11	7.25	350.00	8.31	100.39	0.00	242.05	41.00	581.79	7.
*	4295.000	790.00	602.54	603.56	7.47	350.00	8.70	111.48	0.00	244.75	76.09	681.89	32.
*	4295.000	1000.00	602.97	604.04	7.66	350.00	9.23	122.78	0.00	247.54	121.49	802.91	75.

	SECNO	Q	CWSEL	EG	DIFWSX	XLCH	VCH	TOPWID	SSTA	ENDST	QLOB	QCH	QROI
*	4370.000	220.00	601.40	602.46	1.49	75.00	8.26	12.56	111.55	124.11	0.00	220.00	0.0
*	4370.000	530.00	603.15	604.08	1.67	75.00	8.49	72.64	109.73	232.65	0.00	434.59	95.4
*	4370.000	630.00	603.46	604.41	1.34	75.00	8.79	80.76	108.20	234.37	0.16	490.05	139.7
*	4370.000	790.00	603.91	604.82	1.37	75.00	8.99	125.01	0.00	236.90	12.98	561.58	215.4
*	4370.000	1000.00	604.28	605.24	1.31	75.00	9.61	144.90	0.00	239.00	37.90	653.61	308.4
*	4405.000	220.00	602.34	602.70	0.94	35.00	4.97	240.00	0.00	240.00	3.16	210.60	6.2
*	4405.000	530.00	604.02	604.30	0.86	35.00	5.46	240.00	0.00	240.00	84.44	322.95	122.6
*	4405.000	630.00	604.34	604.63	0.88	35.00	5.75	240.00	0.00	240.00	111.00	358.19	160.8
*	4405.000	790.00	604.68	605.02	0.77	35.00	6.38	240.00	0.00	240.00	151.24	419.98	218.7
*	4405.000	1000.00	605.04	605.44	0.76	35.00	7.21	240.00	0.00	240.00	204.36	500.28	295.3
*	4480.000	220.00	602.88	603.06	0.54	75.00	3.75	237.53	0.00	240.00	19.44	179.55	21.0
*	4480.000	530.00	604.01	604.30	0.00	75.00	5.49	240.00	0.00	240.00	95.19	324.63	110.1
*	4480.000	630.00	604.33	604.63	-0.01	75.00	5.79	240.00	0.00	240.00	123.19	360.98	145.8
*	4480.000	790.00	604.67	605.02	-0.01	75.00	6.45	240.00	0.00	240.00	165.74	424.00	200.2
*	4480.000	1000.00	605.02	605.44	-0.01	75.00	7.30	240.00	0.00	240.00	221.82	505.50	272.6
*	4520.000	220.00	602.68	603.30	-0.20	40.00	6.34	14.76	108.68	123.44	0.00	220.00	0.0
*	4520.000	530.00	603.83	605.37	-0.19	40.00	9.98	17.37	106.66	124.03	0.00	530.00	0.0
*	4520.000	630.00	604.25	605.93	-0.08	40.00	10.39	18.34	105.91	124.25	0.00	630.00	0.0
*	4520.000	790.00	604.94	606.71	0.27	40.00	10.68	27.57	104.70	139.00	0.00	788.82	1.1
*	4520.000	1000.00	605.73	607.54	0.70	40.00	10.89	42.84	103.31	146.15	0.00	982.60	17.4
*	4630.000	120.00	606.82	607.50	4.14	110.00	6.63	13.45	82.95	96.40	0.00	120.00	0.0
*	4630.000	280.00	607.89	608.92	4.07	110.00	8.14	16.97	81.67	98.64	0.00	280.00	0.0
*	4630.000	335.00	608.18	609.30	3.94	110.00	8.49	17.92	81.33	99.25	0.00	335.00	0.0
*	4630.000	410.00	608.55	609.77	3.61	110.00	8.89	19.10	80.90	100.00	0.00	410.00	0.0
*	4630.000	510.00	608.98	610.33	3.25	110.00	9.33	20.52	80.39	100.90	0.00	510.00	0.0
*	4695.000	120.00	611.30	612.72	4.47	65.00	9.58	4.40	107.80	112.20	0.00	120.00	0.0
*	4695.000	280.00	612.52	613.18	4.62	65.00	8.63	90.19	63.05	153.24	68.71	154.36	56.9
*	4695.000	335.00	612.77	613.40	4.59	65.00	8.82	112.69	52.12	164.81	90.91	167.78	76.3
*	4695.000	410.00	613.08	613.65	4.53	65.00	8.91	139.51	39.10	178.60	123.20	181.42	105.3
*	4695.000	510.00	613.26	613.92	4.28	65.00	9.89	155.21	31.47	186.68	161.20	209.37	139.4
*	4696.000	120.00	611.05	613.09	-0.25	1.00	11.47	15.51	102.19	117.71	0.00	120.00	0.0
*	4696.000	280.00	613.46	613.80	0.94	1.00	7.73	172.39	23.13	195.51	92.66	98.99	88.3
*	4696.000	335.00	613.55	613.93	0.77	1.00	8.34	180.20	19.33	199.53	115.07	110.11	109.8
*	4696.000	410.00	613.67	614.07	0.59	1.00	8.89	191.26	13.96	205.22	147.09	122.28	140.6
*	4696.000	510.00	613.77	614.25	0.51	1.00	10.02	199.58	9.92	209.50	188.00	141.99	180.0
*	4990.000	120.00	616.86	618.52	5.81	294.00	10.34	12.26	23.85	36.12	0.00	120.00	0.0
*	4990.000	280.00	620.95	621.58	7.49	294.00	8.20	71.82	0.00	71.82	56.62	165.13	58.2
*	4990.000	335.00	621.09	621.80	7.54	294.00	8.97	73.59	0.00	73.59	72.27	186.26	76.4
*	4990.000	410.00	621.34	622.07	7.67	294.00	9.43	76.78	0.00	76.78	96.51	206.46	107.0
*	4990.000	510.00	621.61	622.39	7.84	294.00	10.14	80.12	0.00	80.12	127.83	233.82	148.3

	SECNO	Q	CWSEL	EG	DIFWSX	XLCH	VCH	TOPWID	SSTA	ENDST	QLOB	QCH	QRO
*	4991.000	120.00	618.04	618.80	1.18	1.00	7.00	4.40	27.80	32.20	0.00	120.00	0.
*	4991.000	280.00	621.62	621.73	0.67	1.00	3.89	80.22	0.00	80.22	72.68	127.73	79.
*	4991.000	335.00	621.84	621.98	0.76	1.00	4.31	83.03	0.00	83.03	88.97	145.85	100.
*	4991.000	410.00	622.07	622.24	0.73	1.00	4.89	85.68	0.00	85.68	110.81	170.42	128.
*	4991.000	510.00	622.35	622.56	0.74	1.00	5.55	88.46	0.00	88.46	139.80	200.27	169.
*	5025.000	120.00	618.91	620.13	0.87	34.00	8.86	5.58	29.22	34.80	0.00	120.00	0.
*	5025.000	280.00	621.60	621.85	-0.02	34.00	5.26	70.98	0.00	70.98	71.67	155.49	52.
*	5025.000	335.00	621.83	622.10	-0.01	34.00	5.60	73.32	0.00	73.32	90.87	173.13	70.
*	5025.000	410.00	622.07	622.37	0.00	34.00	6.12	75.34	0.00	75.34	116.00	198.03	95.
*	5025.000	510.00	622.36	622.70	0.01	34.00	6.67	76.80	0.00	76.80	149.39	227.39	133.
*	5135.000	120.00	623.55	624.02	4.64	110.00	5.76	39.91	47.47	88.67	10.83	109.17	0.
*	5135.000	280.00	624.29	624.93	2.69	110.00	7.22	66.07	33.19	99.26	60.40	219.28	0.
*	5135.000	335.00	624.47	625.16	2.64	110.00	7.59	70.99	29.53	100.51	79.54	253.36	2.
*	5135.000	410.00	624.71	625.45	2.65	110.00	7.98	76.33	24.89	101.22	107.12	296.90	5.
*	5135.000	510.00	624.98	625.78	2.62	110.00	8.53	82.16	19.83	101.99	144.78	353.14	12.
*	5325.000	120.00	634.55	634.94	11.01	190.00	5.39	66.74	108.89	180.23	0.05	102.95	17.
*	5325.000	280.00	635.16	635.67	10.87	190.00	6.89	96.22	100.60	196.81	3.54	189.30	87.
*	5325.000	335.00	635.30	635.85	10.83	190.00	7.28	104.78	96.09	200.87	6.14	215.29	113.
*	5325.000	410.00	635.50	636.07	10.79	190.00	7.65	117.61	88.69	206.30	11.27	247.15	151.
*	5325.000	510.00	635.70	636.32	10.72	190.00	8.25	130.46	81.27	211.73	19.38	289.43	201.
*	5375.000	120.00	636.84	638.27	2.28	50.00	9.61	4.40	72.80	77.20	0.00	120.00	0.
*	5375.000	280.00	638.86	639.59	3.71	50.00	8.48	142.16	0.00	142.16	51.11	181.60	47.
*	5375.000	335.00	639.08	639.85	3.78	50.00	9.05	142.70	0.00	142.70	69.10	202.35	63.
*	5375.000	410.00	639.31	640.17	3.81	50.00	9.89	143.27	0.00	143.27	93.38	231.01	85.
*	5375.000	510.00	639.60	640.53	3.90	50.00	10.74	143.99	0.00	143.99	128.13	264.57	117.
*	5475.000	120.00	638.64	640.07	1.80	100.00	9.61	4.40	67.80	72.20	0.00	120.00	0.
*	5475.000	280.00	640.79	643.32	1.93	100.00	12.75	4.40	67.80	72.20	0.00	280.00	0.
*	5475.000	335.00	643.08	644.06	4.00	100.00	8.71	136.64	0.00	136.64	33.43	279.03	22.
*	5475.000	410.00	643.37	644.49	4.06	100.00	9.62	142.31	0.00	142.31	52.37	320.31	37.
*	5475.000	510.00	644.38	645.06	4.78	100.00	8.41	155.00	0.00	155.00	103.90	317.52	88.
*	5525.000	120.00	640.43	640.60	1.79	50.00	3.27	13.50	115.71	129.20	0.00	120.00	0.
*	5525.000	280.00	643.95	644.08	3.15	50.00	2.99	105.20	53.23	158.43	9.15	264.49	6.
	5525.000	335.00	644.18	644.34	1.10	50.00	3.34	121.46	40.85	162.31	16.70	307.34	10.
	5525.000	410.00	644.64	644.81	1.28	50.00	3.53	137.73	30.39	168.12	38.47	349.22	22.
	5525.000	510.00	645.05	645.24	0.68	50.00	3.85	151.87	21.30	173.17	68.69	403.97	37.

PROPOSED 2 YEAR STORM

SUMMARY PRINTOUT TABLE 100

	SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG
*	4480.000	603.00	601.30	605.88	601.80	99.44	121.13	30.00	0.30	5.18	602.88	3.75	603.0
*	4480.000	606.48	601.30	624.58	601.80	21.50	504.89	30.00	0.00	6.31	604.01	5.49	604.3
*	4480.000	607.40	601.30	633.38	601.80	19.84	610.83	30.00	0.00	6.63	604.33	5.79	604.6
*	4480.000	608.82	601.30	650.36	601.80	20.26	769.82	30.00	0.00	6.97	604.67	6.45	605.0
*	4480.000	610.55	601.30	678.22	601.80	21.69	978.63	30.00	0.00	7.32	605.02	7.30	605.4
*	5475.000	640.42	639.20	640.06	642.10	120.00	0.00	59.00	0.00	2.84	638.64	9.61	640.0
*	5475.000	643.49	639.20	656.42	642.10	131.19	148.97	30.00	0.00	4.99	640.79	12.75	643.3
*	5475.000	644.32	639.20	664.21	642.10	129.96	205.65	30.00	0.00	7.28	643.08	8.71	644.0
*	5475.000	642.97	639.20	676.94	642.10	129.12	283.15	30.00	0.00	7.57	643.37	9.62	644.4
*	5475.000	643.33	639.20	697.83	642.10	127.57	382.69	30.00	0.00	8.58	644.38	8.41	645.0

SUMMARY OF ERRORS AND SPECIAL NOTES

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WARNING SECNO=     59.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     59.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     59.000  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     59.000  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     59.000  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    165.000  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    340.000  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    340.000  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=    845.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    845.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    845.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=    845.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    845.000  PROFILE=  2  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    845.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    845.000  PROFILE=  3  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    845.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    845.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    845.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=    845.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    845.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    845.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=    904.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    904.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    904.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=    904.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    904.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    904.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=    904.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    904.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    904.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=    904.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    904.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    904.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=    904.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    904.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    904.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

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CAUTION SECNO=   1000.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1000.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1000.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1000.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1000.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1000.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1000.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1000.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1000.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
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CAUTION SECNO=   1000.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1000.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

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CAUTION SECNO=   1148.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1148.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1148.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1148.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1148.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1148.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1148.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1148.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1148.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1148.000  PROFILE=  5  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=   1264.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1264.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1264.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1264.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1264.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1264.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1264.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1264.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1264.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1264.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1264.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1264.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1264.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1264.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1264.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

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CAUTION SECNO=   1400.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1400.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
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CAUTION SECNO=   1400.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1400.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1400.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1400.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1400.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1400.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1400.000  PROFILE=  5  MINIMUM SPECIFIC ENERGY

WARNING SECNO=   1500.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   1500.000  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   1500.000  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   1500.000  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   2070.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO=   2070.000  PROFILE=  3  WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO=   2070.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
WARNING SECNO=   2070.000  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   2070.000  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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CAUTION SECNO=   2130.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   2130.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

WARNING SECNO=   2180.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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WARNING SECNO=   2390.000  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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WARNING SECNO=   2601.000  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   2601.000  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   2601.000  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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WARNING SECNO=   2685.000  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   2685.000  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   2685.000  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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CAUTION SECNO=   3020.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3020.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   3020.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3020.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3020.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   3020.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3020.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3020.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   3020.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3020.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3020.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

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WARNING SECNO=   3250.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   3250.000  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   3250.000  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   3250.000  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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CAUTION SECNO=   3515.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3515.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   3515.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3515.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3515.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
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CAUTION SECNO=   3515.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
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CAUTION SECNO=   3770.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3770.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   3770.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
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CAUTION SECNO=   3770.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

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CAUTION SECNO=   3945.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   3945.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3945.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3945.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
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CAUTION SECNO=   3945.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3945.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
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CAUTION SECNO=   3945.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3945.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   3945.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3945.000  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3945.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

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CAUTION SECNO=   4295.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4295.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
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CAUTION SECNO=   4295.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4295.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4295.000  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4295.000  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4295.000  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4295.000  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4295.000  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4295.000  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4295.000  PROFILE=  5  CRITICAL DEPTH ASSUMED
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CAUTION SECNO=   4695.000  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

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HYDRAULIC CALCULATIONS
CULVERT ANALYSIS

APPENDIX C

PROJECT: McKEEL BROOK
PROP. TWIN 4'×8' BOX CULVERT

STATION: _____
SHEET 1 OF 1

CULVERT DESIGN FORM
DESIGNER / DATE: WJH / 4-4-95
REVIEWER / DATE: _____ / _____

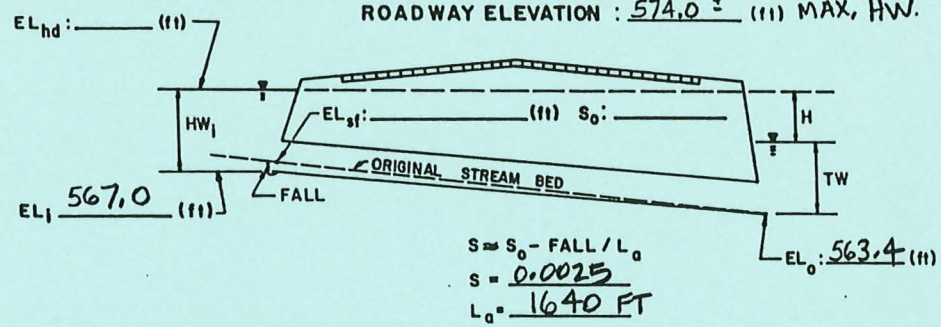
HYDROLOGICAL DATA

SEE ADD'L. SHTS.
- ☐ METHOD: _____
- ☐ DRAINAGE AREA: _____ ☐ STREAM SLOPE: _____
- ☐ CHANNEL SHAPE: _____
- ☐ ROUTING: _____ ☐ OTHER: _____

DESIGN FLOWS/TAILWATER

R.I. (YEARS)	FLOW (cfs)	TW (ft)
	TRIAL FLOWS.	

ROADWAY ELEVATION: 574.0 ± (ft) MAX. HW.



$S \approx S_o - FALL / L_a$
$S = 0.0025$
$L_a = 1640$ FT

CULVERT DESCRIPTION: MATERIAL - SHAPE - SIZE - ENTRANCE	TOTAL FLOW Q (cfs)	FLOW PER BARREL Q/N (1)	HEADWATER CALCULATIONS: INLET CONTROL HW1/D (2)	HW1	FALL (3)	EL hi (4)	OUTLET CONTROL TW (5)	dc	(dc+D)/2	ho (6)	ke	H (7)	EL ho (8)	CONTROL HEADWATER ELEVATION	OUTLET VELOCITY	COMMENTS
TWIN 4'×8' R.C. BOX	200	100	0.65	2.6		569.6	2.2	1.75	2.9	2.9	0.2	1.3	567.6	569.6	3.1	TW. EL. 565.6
"	400	200	1.06	4.2		571.2	3.3	2.7	3.3	3.3	0.2	5.2	571.9	571.9	6.2	TW. EL. 566.7
"	500	250	1.3	5.2		572.2	3.7	3.2	3.6	3.7	0.2	8.0	575.1	575.1	7.8	TW. EL. 567.1
"	450	225	1.15	4.6		571.6	3.5	3.0	3.5	3.5	0.2	6.5	573.4	573.4	7.0	TW. EL. 566.9
→ "	460	230	1.2	4.8		571.8	3.5	3.0	3.5	3.5	0.2	6.8	573.7	573.7	7.2	TW. EL. 566.9

TECHNICAL FOOTNOTES:

(1) USE Q/NB FOR BOX CULVERTS

(2) $HW_1/D = HW/D$ OR HW_1/D FROM DESIGN CHARTS

(3) $FALL = HW_1 - (EL_{hd} - EL_{sf})$; FALL IS ZERO FOR CULVERTS ON GRADE

(4) $EL_{hi} = HW_1 + EL_1$ (INVERT OF INLET CONTROL SECTION)

(5) TW BASED ON DOWN STREAM CONTROL OR FLOW DEPTH IN CHANNEL.

(6) h_o = TW or $(d_c + D/2)$ (WHICHEVER IS GREATER)

(7) $H = \left[1 + k_e + (29 n^2 L)/R^{1.33}\right] V^2/2g$

(8) $EL_{ho} = EL_o + H + h_o$

SUBSCRIPT DEFINITIONS:
- a. APPROXIMATE
- f. CULVERT FACE
- hd. DESIGN HEADWATER
- hi. HEADWATER IN INLET CONTROL
- ho. HEADWATER IN OUTLET CONTROL
- I. INLET CONTROL SECTION
- o. OUTLET
- sf. STREAMBED AT CULVERT FACE
- tw. TAILWATER

COMMENTS / DISCUSSION:
TOTAL FLOW SHOWN ABOVE DOES NOT INCLUDE 100 CFS (IN EXISTING CULVERT/CHANNEL SYSTEM). TAILWATER ELEVATIONS BASED ON TOTAL FLOW + 100 CFS (EXIST. SYSTEM).

CULVERT BARREL SELECTED:
SIZE: TWIN 4' x 8'
SHAPE: RECT.
MATERIAL: R.C. n 0.015
ENTRANCE: _____

RETROFITTED DETENTION BASIN DETAILS

APPENDIX D

THIS APPENDIX CONTAINS SUPPORTING COMPUTATIONS AND SKETCHES/DRAWINGS FOR RETROFITTING THE FOLLOWING EXISTING DETENTION BASINS:

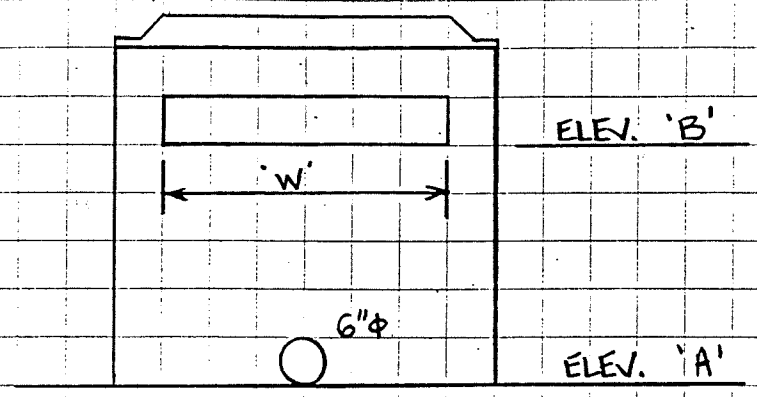
MCKEEL BROOK
TOWNSQUARE OFFICE
CONVENIENCE CENTER

A SCHEMATIC OF THE REVISED OUTLET STRUCTURES IS SHOWN ON PAGE 2 OF 8.

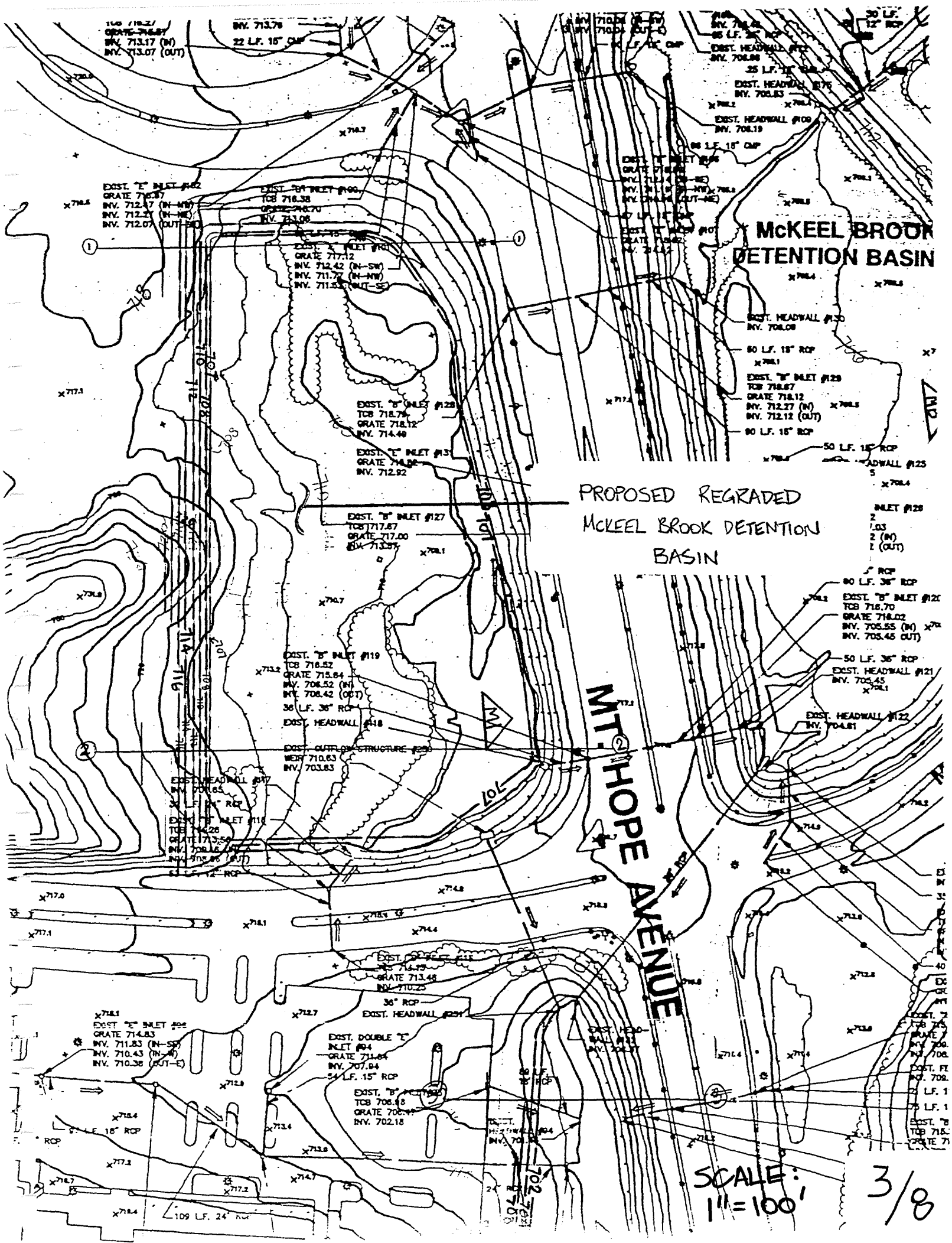
REVISED GRADING PLANS FOR EACH BASIN ARE SHOWN ON PAGES 3, 4, AND 5 OF 8.

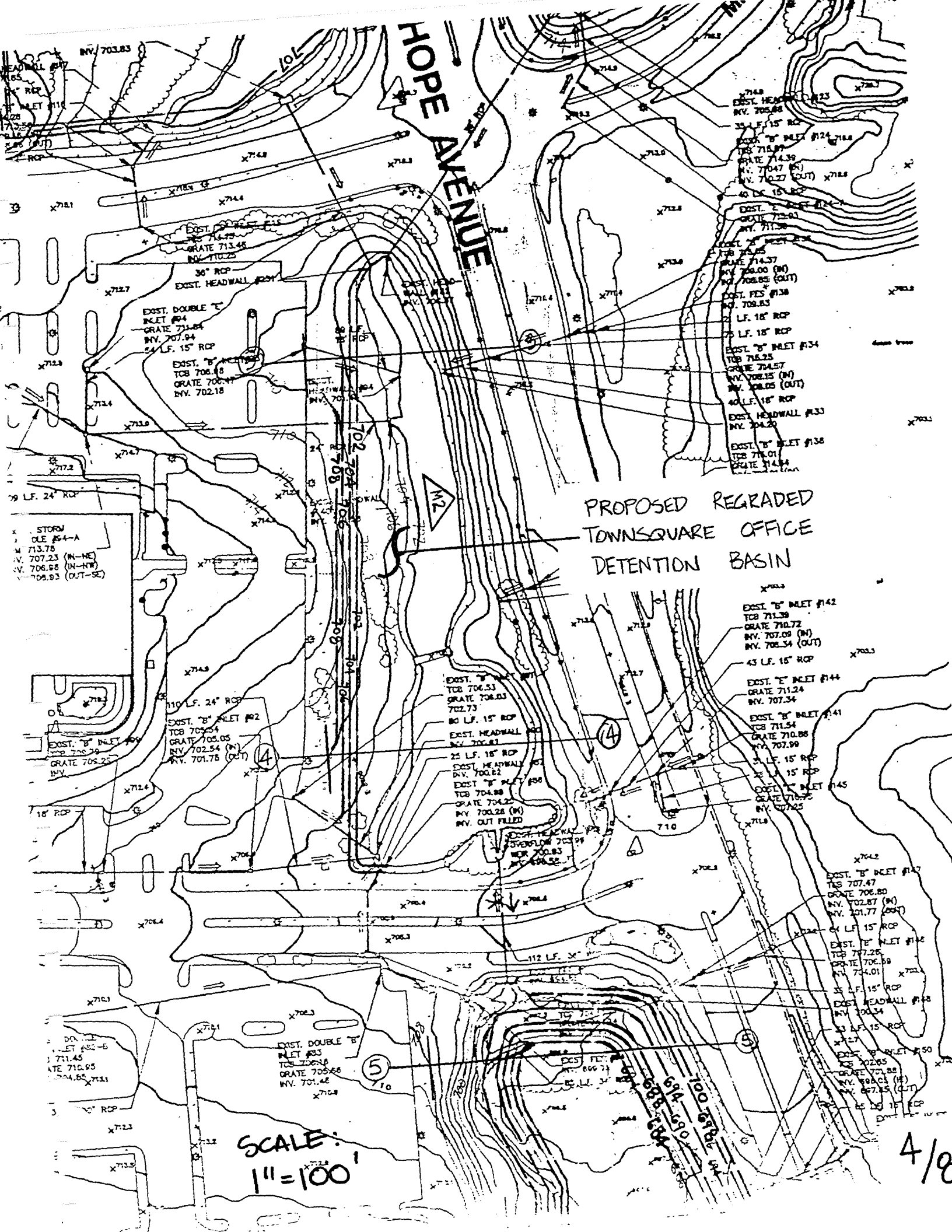
REVISED STORAGE-ELEVATION CURVES FOR EACH BASIN ARE SHOWN ON PAGES 6, 7, & 8 OF 8.

SCHEMATIC
OUTLET STRUCTURE DETAIL

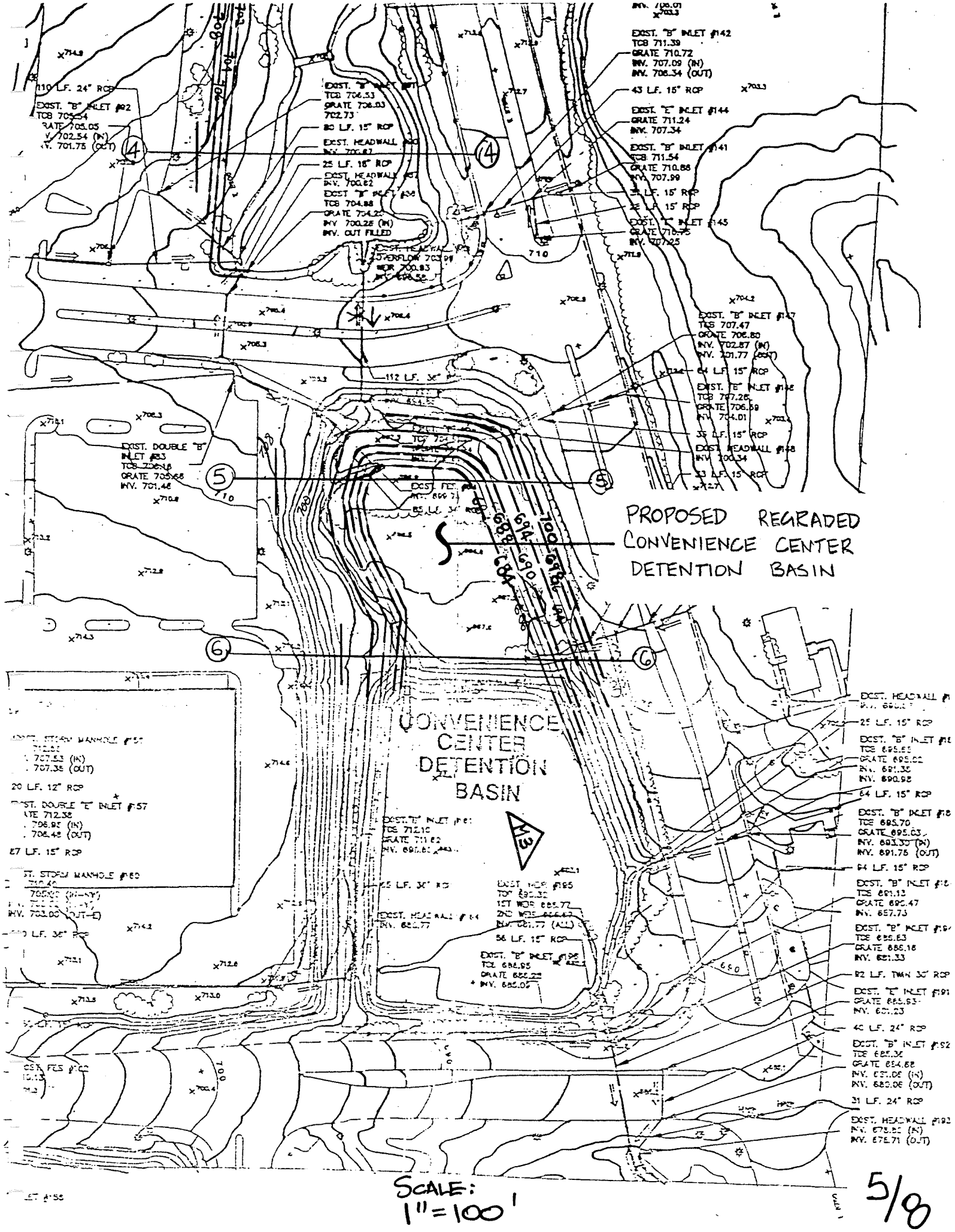


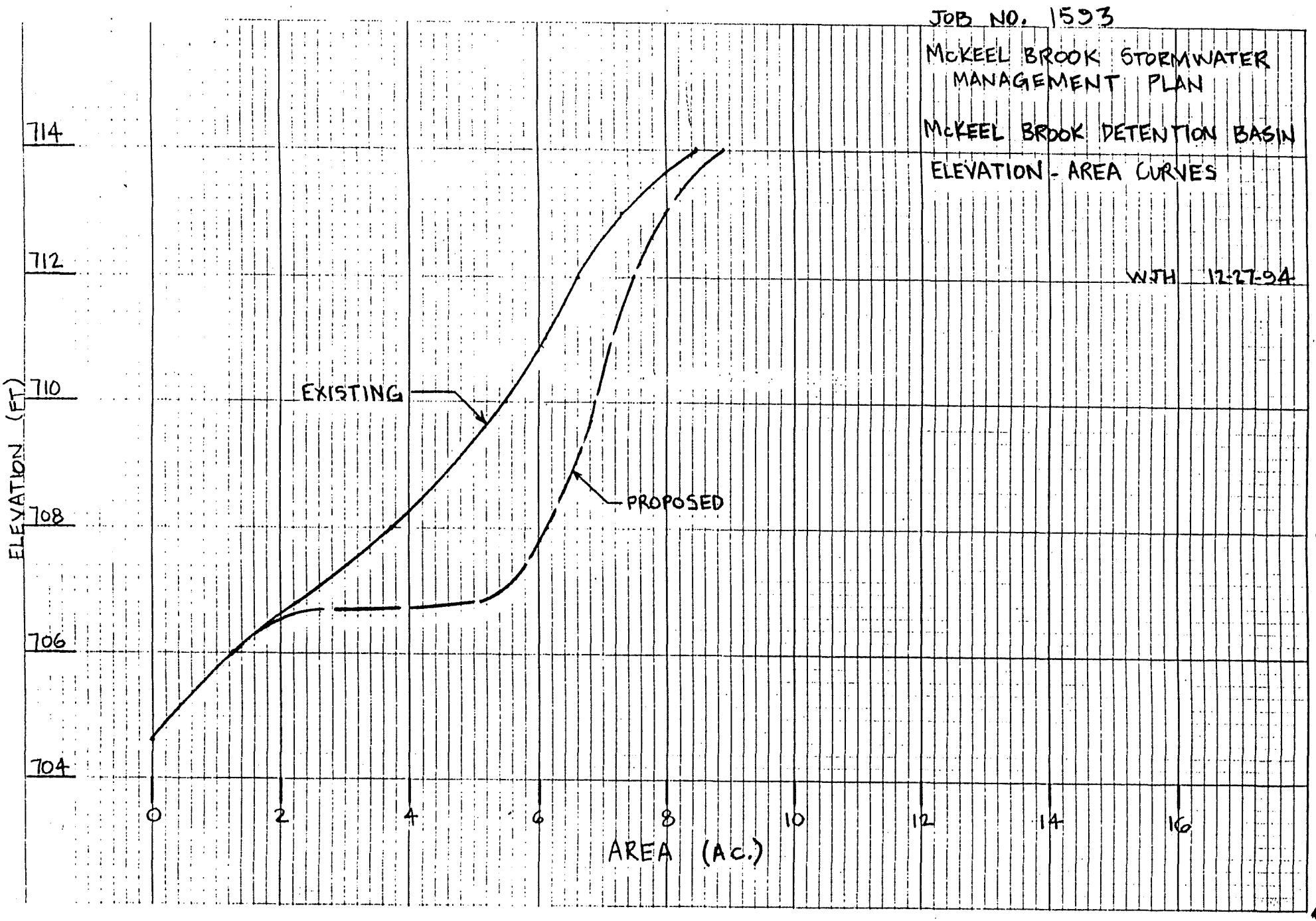
BASIN	'W' (FT.)	ELEV. 'A'	ELEV. 'B'
McKEEL BROOK	12	704.6	710
TOWNSQUARE OFFICE	30	701.0	703
CONVENIENCE CENTER	30	682.0	686


McKEEL BROOK
DETENTION BASIN
PROPOSED REGRADED
MCKEEL BROOK DETENTION
BASIN
MT. HOPE AVENUE
SCALE:
1" = 100'
3/8

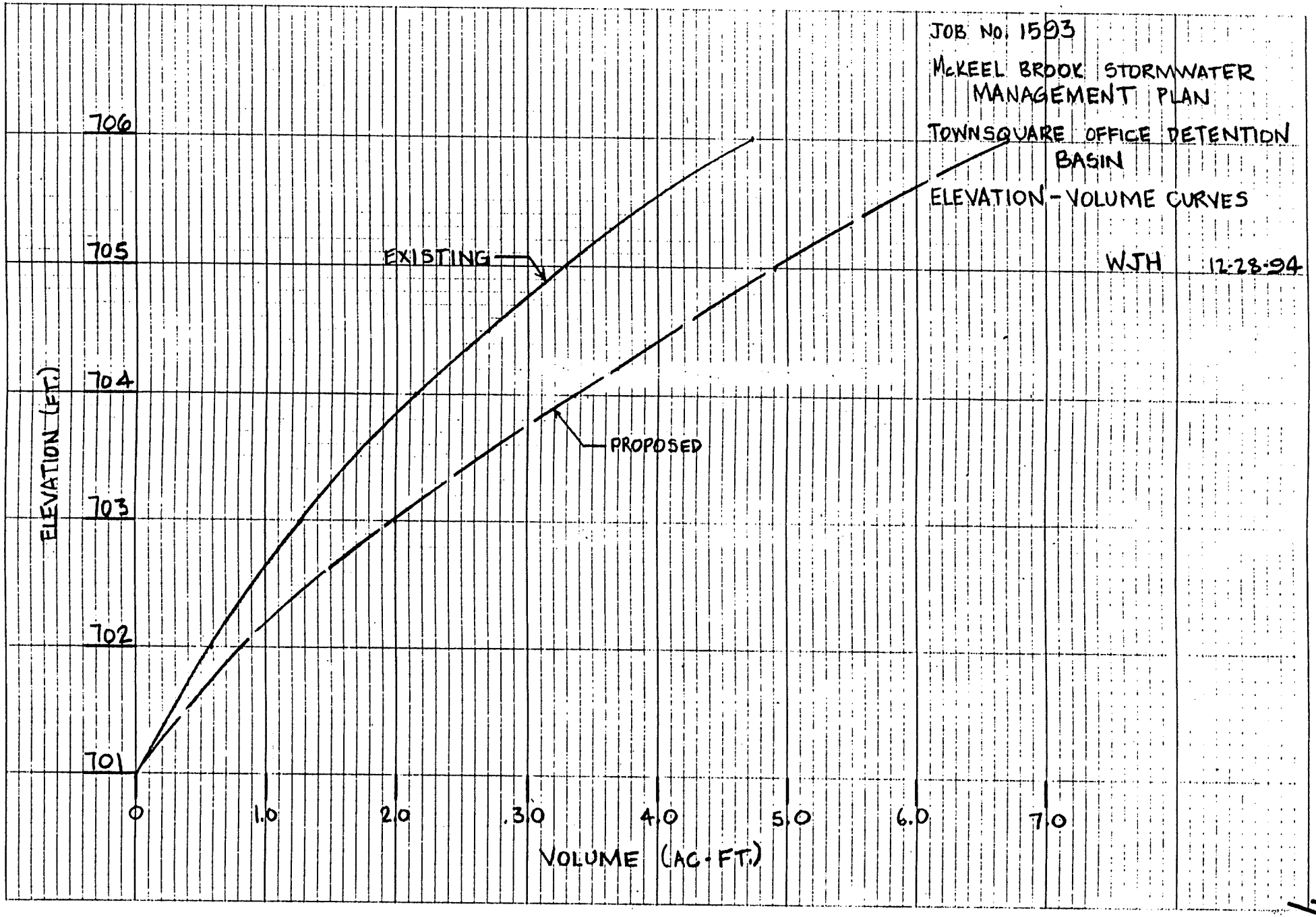

HOPE AVENUE
PROPOSED REGRADED
TOWNSQUARE OFFICE
DETENTION BASIN
SCALE:
1" = 100'
EXIST. DOUBLE "E"
INLET #94
GRATE 711.84
INV. 707.94
54 LF. 15" RCP
EXIST. "B" INLET #134
TCB 715.25
GRATE 714.57
INV. 708.15 (IN)
INV. 708.05 (OUT)
40 LF. 18" RCP
EXIST. HEADWALL #133
INV. 704.20
EXIST. "B" INLET #138
EXIST. "B" INLET #142
TCB 711.39
GRATE 710.72
INV. 707.09 (IN)
INV. 708.34 (OUT)
43 LF. 15" RCP
EXIST. "E" INLET #144
GRATE 711.24
INV. 707.34
EXIST. "B" INLET #141
TCB 711.54
GRATE 710.88
INV. 707.99
EXIST. "B" INLET #145
EXIST. "B" INLET #147
TCB 707.47
GRATE 706.80
INV. 702.87 (IN)
INV. 701.77 (OUT)
64 LF. 15" RCP
EXIST. "B" INLET #148
TCB 707.25
GRATE 706.59
INV. 704.01
35 LF. 15" RCP
EXIST. HEADWALL #148
INV. 700.34
43 LF. 15" RCP
EXIST. "B" INLET #150
TCB 702.65
GRATE 701.88
INV. 698.65 (IN)
INV. 697.85 (OUT)
EXIST. "B" INLET #92
TCB 706.38
GRATE 705.05
INV. 702.54 (IN)
INV. 701.75 (OUT)
110 LF. 24" RCP
EXIST. "B" INLET #91
TCB 706.53
GRATE 705.83
702.73
80 LF. 15" RCP
EXIST. HEADWALL #90
INV. 700.82
25 LF. 15" RCP
EXIST. HEADWALL #87
INV. 700.62
EXIST. "B" INLET #86
TCB 704.88
GRATE 704.22
INV. 700.28 (IN)
INV. OUT FILLED
EXIST. HEADWALL #85
OVERFLOW 703.99
WSE 700.83
112 LF. 36"
EXIST. DOUBLE "B"
INLET #93
TCB 706.18
GRATE 705.68
INV. 701.48
EXIST. FES #136
INV. 709.83
72 LF. 18" RCP
75 LF. 18" RCP
EXIST. HEADWALL #251
36" RCP
EXIST. "B" INLET #250
TCB 716.79
GRATE 713.45
INV. 710.25
EXIST. "B" INLET #94-A
INV. 707.23 (IN-NE)
INV. 706.98 (IN-NW)
INV. 706.93 (OUT-SE)
24" RCP
24 LF. 24" RCP
18" RCP
702
704
706
708
710
712
714
716
718
690
692
694
696
698
700

4/8


PROPOSED REGRADED
CONVENIENCE CENTER
DETENTION BASIN
CONVENIENCE
CENTER
DETENTION
BASIN
EXIST. "B" INLET #142
TOB 711.39
GRATE 710.72
INV. 707.09 (IN)
INV. 706.34 (OUT)
43 L.F. 15" RCP
EXIST. "E" INLET #144
GRATE 711.24
INV. 707.34
EXIST. "B" INLET #141
TOB 711.54
GRATE 710.88
INV. 707.99
EXIST. "E" INLET #145
EXIST. "B" INLET #147
TOB 707.47
GRATE 706.80
INV. 702.87 (IN)
INV. 701.77 (OUT)
64 L.F. 15" RCP
EXIST. "E" INLET #146
TOB 707.26
GRATE 706.59
INV. 704.01
35 L.F. 15" RCP
EXIST. HEADWALL #148
INV. 700.34
33 L.F. 15" RCP
110 L.F. 24" RCP
EXIST. "B" INLET #92
TOB 705.54
GRATE 705.05
INV. 702.54 (IN)
INV. 701.75 (OUT)
EXIST. "B" INLET #91
TOB 706.53
GRATE 706.03
702.73
80 L.F. 15" RCP
EXIST. HEADWALL #90
INV. 700.87
25 L.F. 18" RCP
EXIST. HEADWALL #87
INV. 700.62
EXIST. "B" INLET #88
TOB 704.88
GRATE 704.22
INV. 700.28 (IN)
INV. OUT FILLED
EXIST. HEADWALL #89
OVERFLOW 703.99
WEIR 700.83
112 L.F. 36"
EXIST. DOUBLE "B"
INLET #83
TOB 706.48
GRATE 705.68
INV. 701.48
85 L.F. 36" RCP
EXIST. STORM MANHOLE #57
707.53 (IN)
707.35 (OUT)
20 L.F. 12" RCP
EXIST. DOUBLE "E" INLET #57
TOB 712.38
706.95 (IN)
706.48 (OUT)
87 L.F. 15" RCP
EXIST. STORM MANHOLE #60
INV. 703.00 (OUT-E)
EXIST. "E" INLET #61
TOB 712.10
GRATE 711.62
EXIST. WEIR #185
TOP 690.32
1ST WEIR 688.77
2ND WEIR 686.43
INV. 681.77 (ALL)
56 L.F. 15" RCP
EXIST. "B" INLET #186
TOB 686.95
GRATE 686.28
INV. 685.05
EXIST. HEADWALL #64
INV. 688.77
25 L.F. 15" RCP
EXIST. "B" INLET #18
TOB 695.63
GRATE 695.02
INV. 691.35
INV. 690.98
64 L.F. 15" RCP
EXIST. "B" INLET #18
TOB 695.70
GRATE 695.03
INV. 693.30 (IN)
INV. 691.75 (OUT)
94 L.F. 15" RCP
EXIST. "B" INLET #18
TOB 691.12
GRATE 690.47
INV. 687.73
EXIST. "B" INLET #19
TOB 688.63
GRATE 688.18
INV. 681.33
82 L.F. TWIN 36" RCP
EXIST. "E" INLET #191
GRATE 688.93
INV. 681.23
40 L.F. 24" RCP
EXIST. "B" INLET #192
TOB 685.32
GRATE 684.68
INV. 681.06 (IN)
INV. 680.06 (OUT)
31 L.F. 24" RCP
EXIST. HEADWALL #193
INV. 678.86 (IN)
INV. 678.71 (OUT)
EXIST. FES #C2
EXIST. FES #55
694
688
684
690
700
680
SCALE:
1" = 100'


JOB NO. 1593
McKEEL BROOK STORMWATER MANAGEMENT PLAN
McKEEL BROOK DETENTION BASIN
ELEVATION - AREA CURVES
WJH 12-27-94
EXISTING
PROPOSED
ELEVATION (FT)
714
712
710
708
706
704
0
2
4
6
8
10
12
14
16
AREA (Ac.)

6/8


JOB No. 1593
McKEEL BROOK STORMWATER MANAGEMENT PLAN
TOWNSQUARE OFFICE DETENTION BASIN
ELEVATION-VOLUME CURVES
WJH 12-28-94
EXISTING
PROPOSED
ELEVATION (FT.)
706
705
704
703
702
701
0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
VOLUME (AC-FT.)

TELEDYNE POST
20FH-10J 10X10 PER INCH
LITHO IN U.S.A.

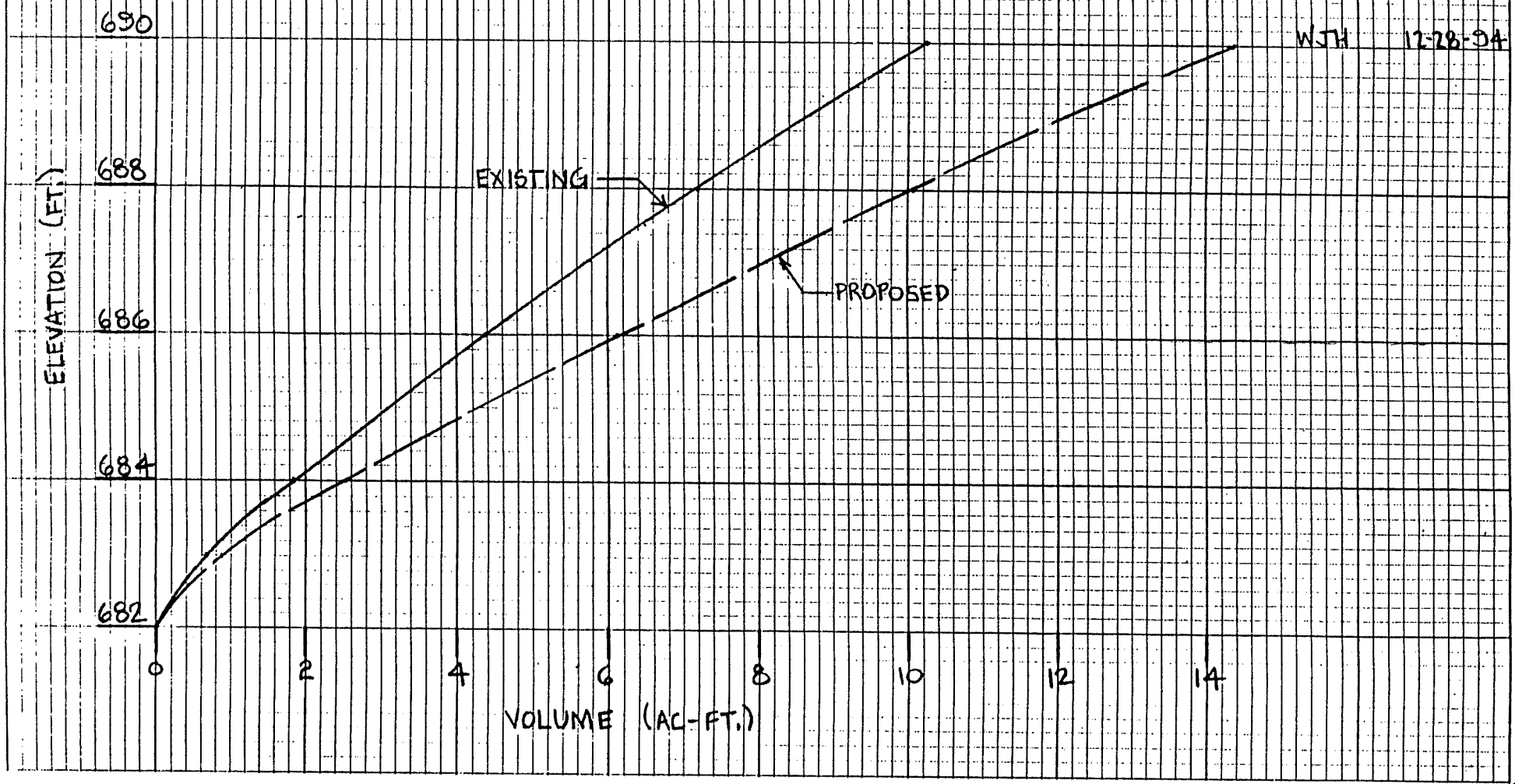
JOB NO. 1593

McKEEL BROOK STORMWATER MANAGEMENT PLAN

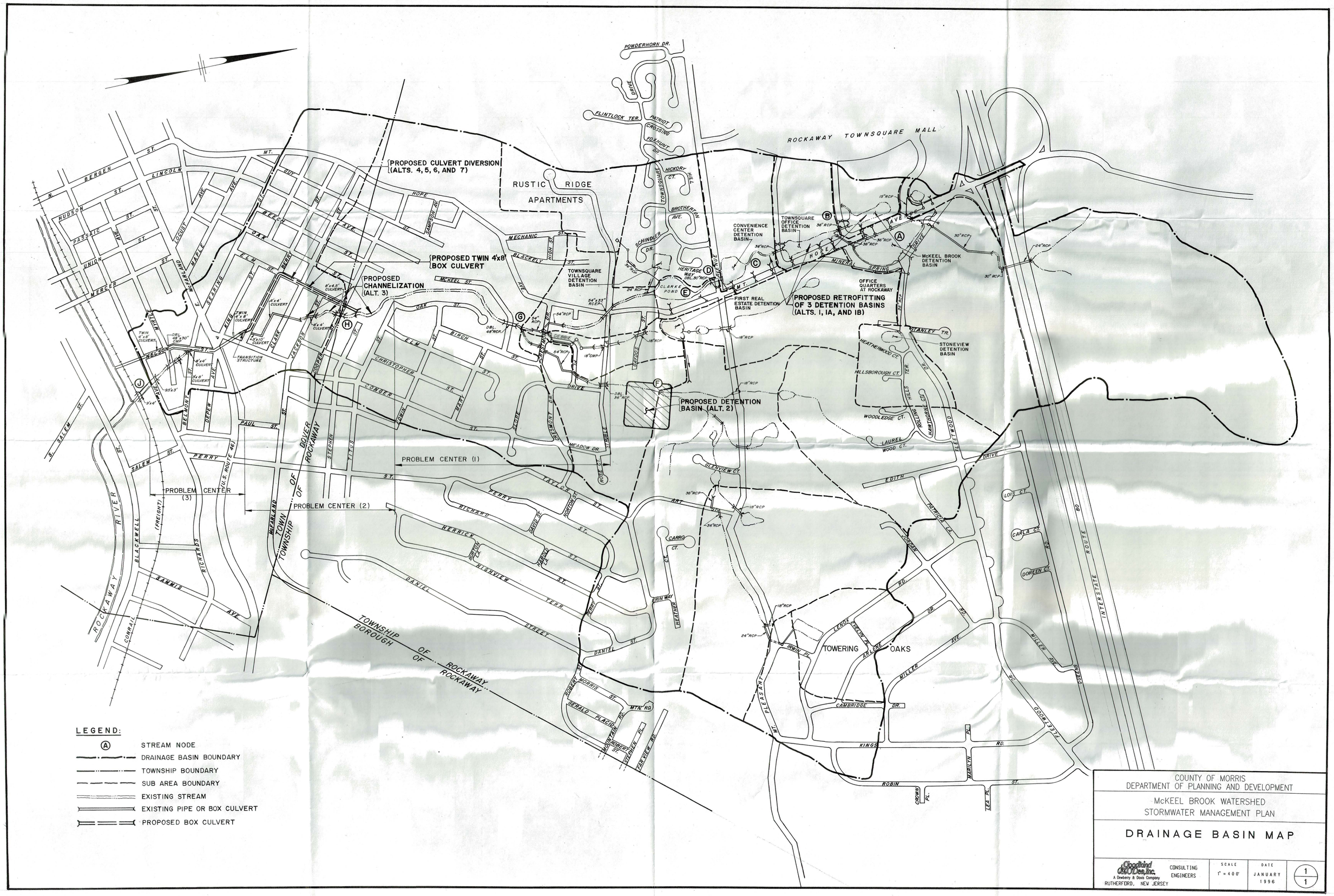
CONVENIENCE CENTER DETENTION BASIN

ELEVATION-VOLUME CURVES

WJH 12-28-94



ATTACHMENTS



COUNTY OF MORRIS
DEPARTMENT OF PLANNING AND DEVELOPMENT

McKEEL BROOK WATERSHED
STORMWATER MANAGEMENT PLAN

DRAINAGE BASIN MAP

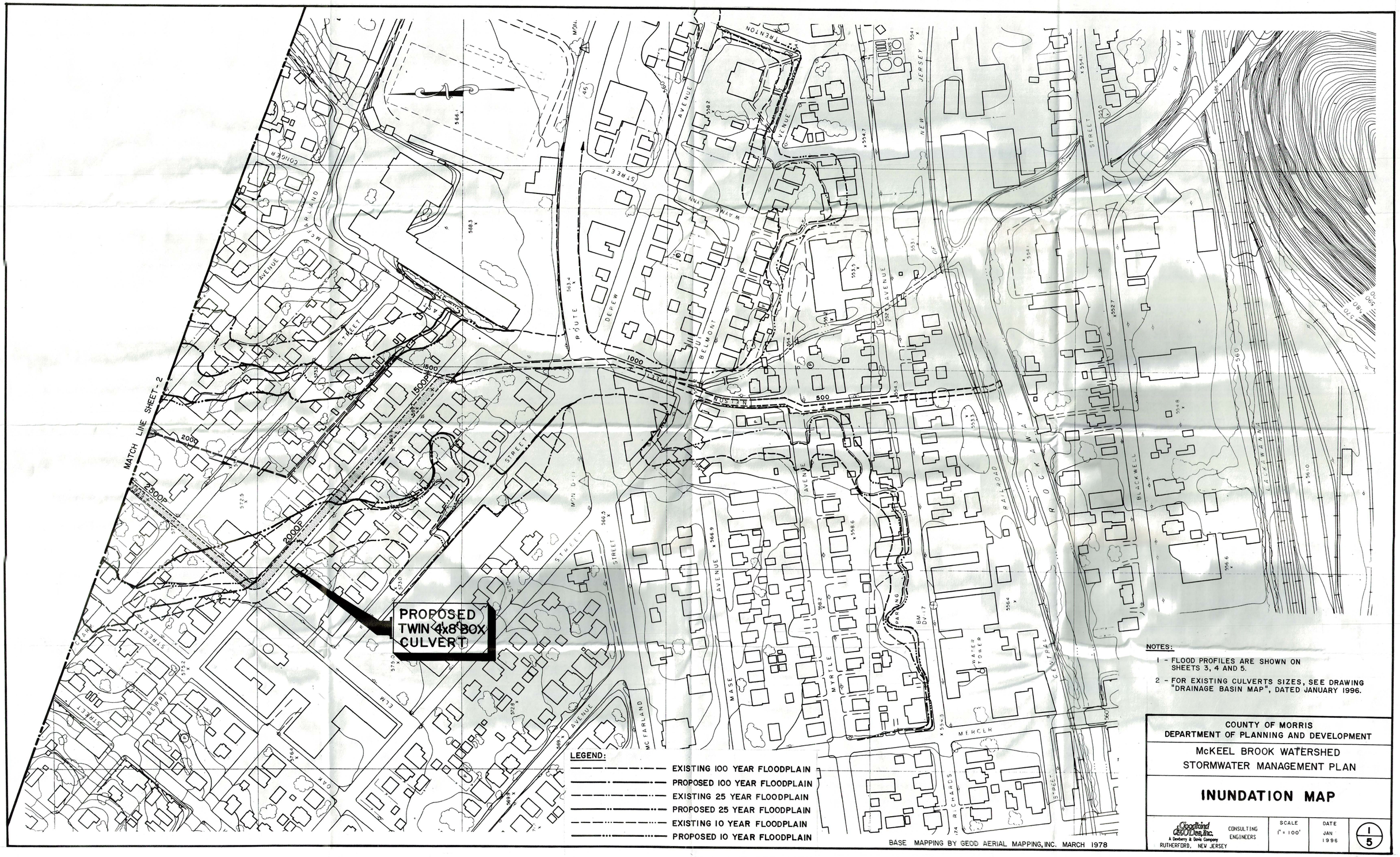
Cloudland & O'Dea, Inc.
A Dewberry & Davis Company
RUTHERFORD, NEW JERSEY

CONSULTING ENGINEERS

SCALE 1" = 400'

DATE JANUARY 1996

1/1



LEGEND:

- EXISTING 100 YEAR FLOODPLAIN
- PROPOSED 100 YEAR FLOODPLAIN
- EXISTING 25 YEAR FLOODPLAIN
- PROPOSED 25 YEAR FLOODPLAIN
- EXISTING 10 YEAR FLOODPLAIN
- PROPOSED 10 YEAR FLOODPLAIN

BASE MAPPING BY GEOD AERIAL MAPPING, INC. MARCH 1978

NOTES:

1 - FLOOD PROFILES ARE SHOWN ON SHEETS 3, 4 AND 5.

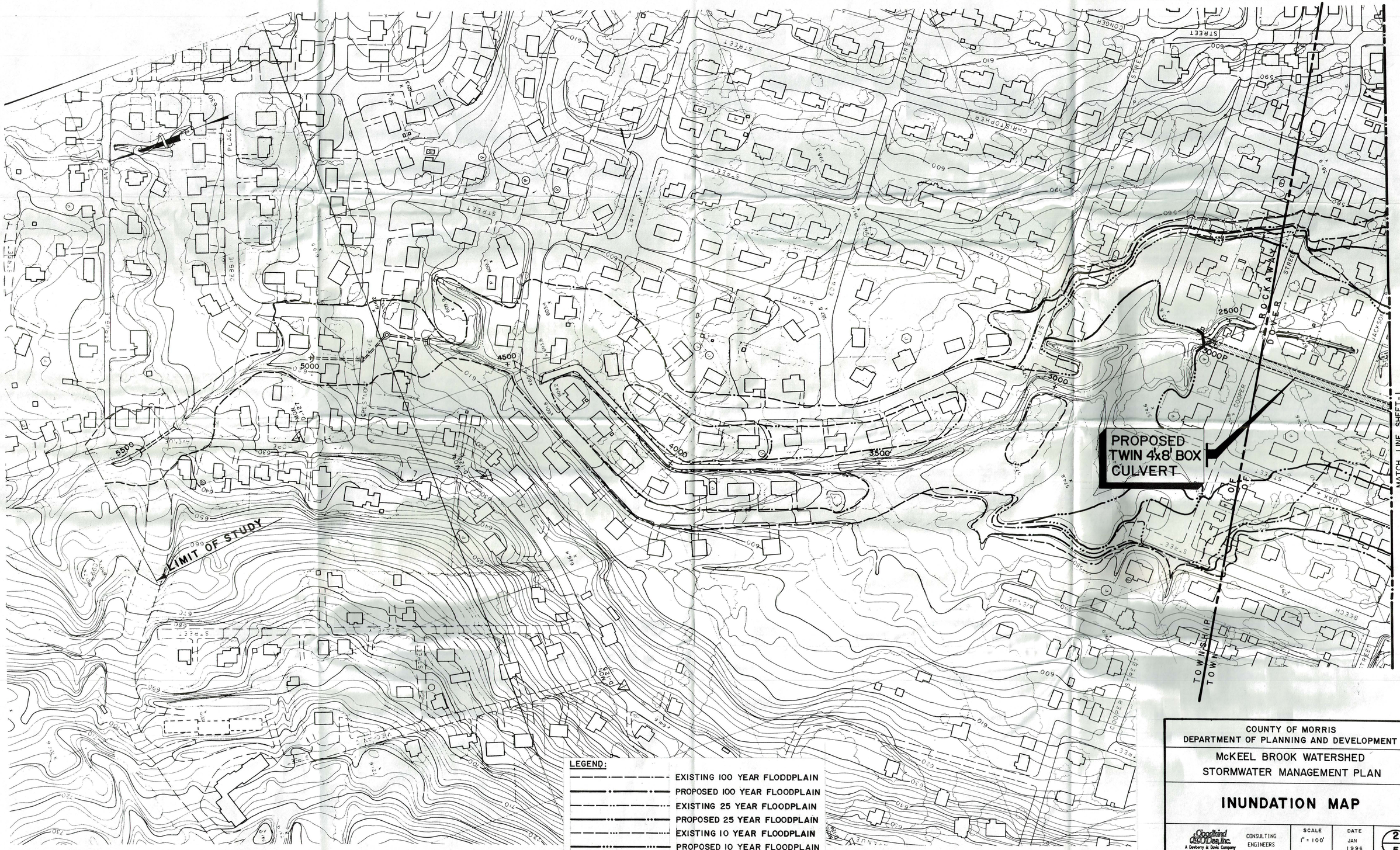
2 - FOR EXISTING CULVERTS SIZES, SEE DRAWING "DRAINAGE BASIN MAP", DATED JANUARY 1996.

COUNTY OF MORRIS
DEPARTMENT OF PLANNING AND DEVELOPMENT

McKEEL BROOK WATERSHED
STORMWATER MANAGEMENT PLAN

INUNDATION MAP

Goodkind & O'Dea, Inc. A Dewberry & Davis Company RUTHERFORD, NEW JERSEY	CONSULTING ENGINEERS	SCALE 1" = 100'	DATE JAN 1996	1/5



COUNTY OF MORRIS
DEPARTMENT OF PLANNING AND DEVELOPMENT

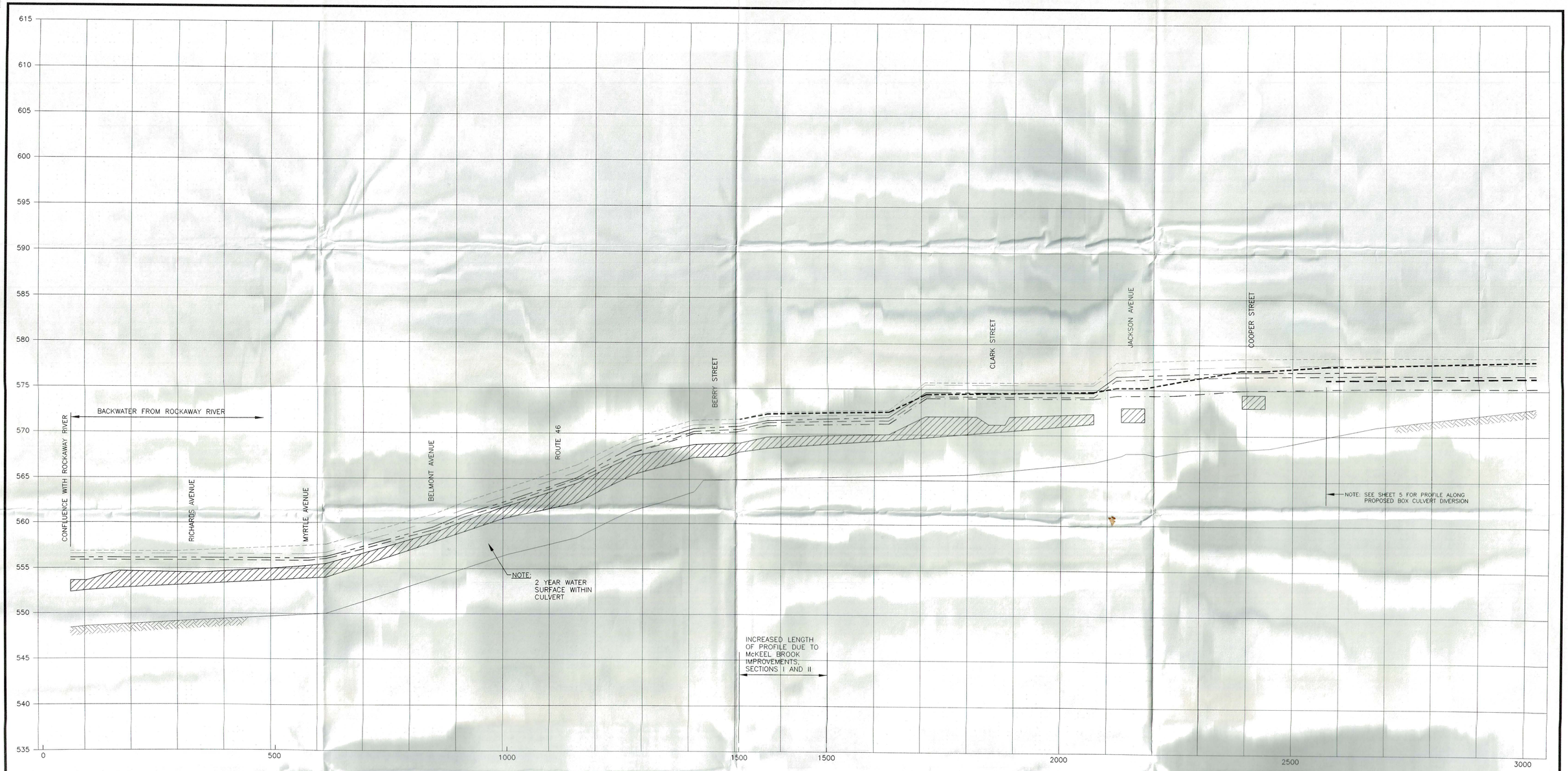
McKEEL BROOK WATERSHED
STORMWATER MANAGEMENT PLAN

INUNDATION MAP

Goodkind & O'Dea, Inc.
A Dewberry & Davis Company
RUTHERFORD, NEW JERSEY

CONSULTING ENGINEERS

SCALE	DATE	
1" = 100'	JAN 1996	2/5



LEGEND:

EXISTING		PROPOSED
	100 – YEAR WATER SURFACE PROFILE	
	50 – YEAR WATER SURFACE PROFILE	
	25 – YEAR WATER SURFACE PROFILE	
	10 – YEAR WATER SURFACE PROFILE	
	2 – YEAR WATER SURFACE PROFILE	
	THALWEG	

McKEEL BROOK PROFILE

SCALE: 1" = 5' V.
1' = 100' H.

COUNTY OF MORRIS
DEPARTMENT OF PLANNING AND DEVELOPMENT

McKEEL BROOK WATERSHED
STORMWATER MANAGEMENT PLAN

McKEEL BROOK PROFILE

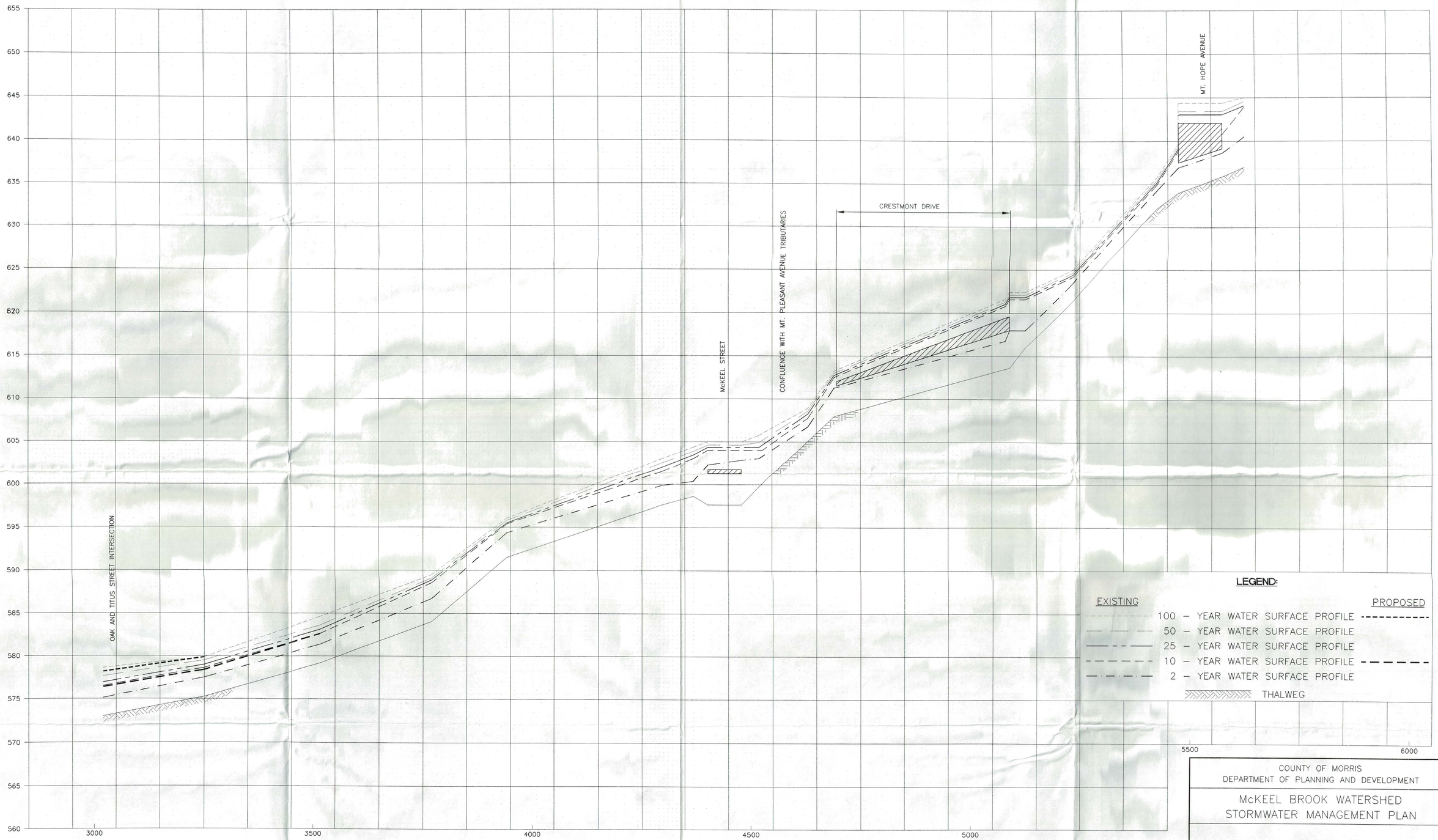
Goodkind & O'Dea, Inc.
A Dewberry & Davis Company
RUTHERFORD, NEW JERSEY

CONSULTING ENGINEERS

SCALE: AS NOTED

DATE: JANUARY 1996

3/5



McKEEL BROOK PROFILE

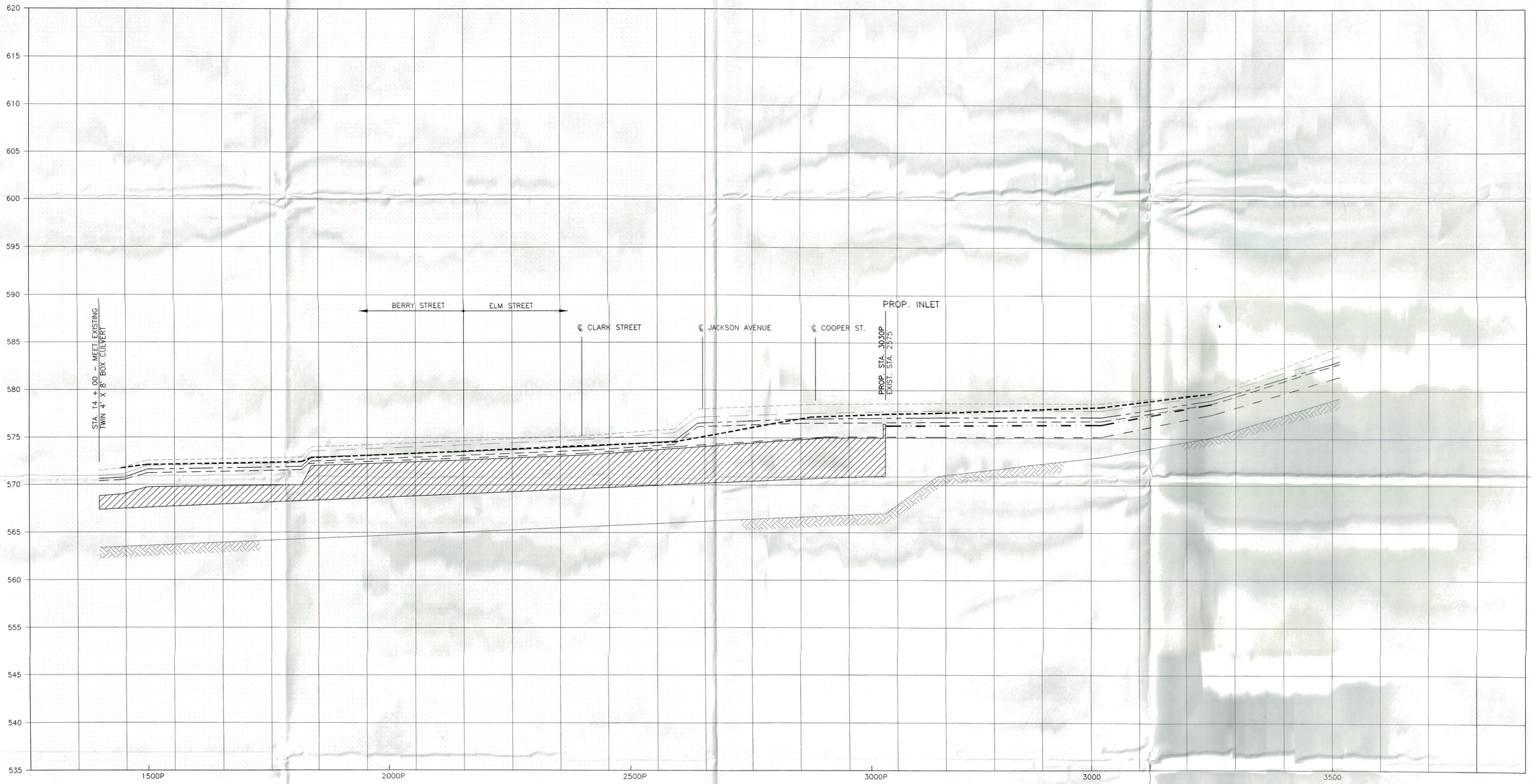
SCALE: 1" = 5' V
1" = 100' H

COUNTY OF MORRIS
DEPARTMENT OF PLANNING AND DEVELOPMENT

McKEEL BROOK WATERSHED
STORMWATER MANAGEMENT PLAN

McKEEL BROOK PROFILE

Goodkind & O'Dea, Inc. A Dewberry & Davis Company RUTHERFORD, NEW JERSEY	CONSULTING ENGINEERS	SCALE: AS NOTED	DATE JANUARY 1996	4/5



LEGEND:

EXISTING		PROPOSED
- - - - - - - - - -	100 – YEAR WATER SURFACE PROFILE	- - - - - - - - - -
— — — — — —	50 – YEAR WATER SURFACE PROFILE	
—— - - ——	25 – YEAR WATER SURFACE PROFILE	
– – – – – –	10 – YEAR WATER SURFACE PROFILE	– – – – – –
—·—·—·—	2 – YEAR WATER SURFACE PROFILE	
	THALWEG	

PROFILE ALONG PROPOSED TWIN 4' X 8' BOX CULVERT DIVERSION

SCALE: 1" = 5' VERT.
1" = 100' HORIZ.

COUNTY OF MORRIS
DEPARTMENT OF PLANNING AND DEVELOPMENT

McKEEL BROOK WATERSHED
STORMWATER MANAGEMENT PLAN

McKEEL BROOK PROFILE

Goodkind & O'Dea, Inc.
A Dewberry & Davis Company
RUTHERFORD, NEW JERSEY

CONSULTING ENGINEERS

SCALE: AS NOTED

DATE: JANUARY 1996

5/5